



MIXED-FLOW GRAIN DRYER

QuadraTouch Pro™ Dryer Control System



OWNER'S OPERATION MANUAL

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Manual L2414
07/27/2023

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Thank you for purchasing Sukup equipment. 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 equipment will meet your needs. With proper installation and use, it will serve you for many years.

If for some reason you experience difficulties with your Sukup equipment, your authorized Sukup dealer can provide you with the help you need. If you need assistance beyond what your dealer can provide, you can always contact your regional Sukup Distribution Center or our headquarters in Sheffield, Iowa, USA.

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

Steve, Emily, Matt,
Andy, Charles and
The Entire Sukup Family

Sukup Manufacturing Co.
Sheffield, Iowa, USA

Mixed-Flow Grain Dryer Owner's Operation Manual

This manual covers installation and operation of mixed-flow grain 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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Preliminary Information

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DATE	REVISION	PAGE
07/27/2023 – Updated warranty	Updated warranty	2
	Updated statement on updating facility's safety program per NFPA 70E	4
	Updated warning on avoiding unload equipment	7
	Minor editing to improve clarity	9 & 16
	Updated photo of QuadraTouch Pro control screen	25
08/19/2022 – Updated safety icons as needed	Updated safety icons as needed	3, 5 & 7
	Updated power box parts list & statements on tightening wires & minimizing EMI	15
	Added photos & descriptions of grain column RTD sensor & paddle switch	20
	Updated photo of outer grain column cleanout door to show new locking hardware	21

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E-mail: Info@sukup.com Visit us at: www.sukup.com**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 indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



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



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



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. via mail at PO Box 677, Sheffield, Iowa USA 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 the area of this equipment of 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.

Make no unauthorized modifications to machine. Modifications may endanger function and/or safety of unit. Keep unit in good working condition. Keep shields in place. Replace worn or missing shields free of charge by contacting Sukup Manufacturing Co.



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 by spraying 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 could cause death or serious injury.



ANALYZE ARC FLASH/SHOCK HAZARD. Installations of equipment containing switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers are subject to National Electrical Code (NEC) and National Fire Protection Association (NFPA), and enforced under Occupational Safety and Health Administration (OSHA) regulations. These installations must be analyzed for arc flash and shock hazard. Additional requirements under these standards include:

- Facility needs to have written electrical safety program.*
- Equipment shall be FIELD MARKED with a label containing available incident energy and/or required Personal Protective Equipment (PPE) level.

This labeling requirement is employer's responsibility and not that of equipment manufacturer or installer.

- All persons working on or near affected equipment must be properly trained.
- Proper tools and equipment must be provided by installer, operator or employer.

*Be sure to update your facility's safety program. See the most recent edition of NFPA 70E, Standard for Electrical Safety in the Workplace.



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.

NOTE: Refer to OSHA's typical minimal lockout procedures (29CFR 1910.147 App A).

Basic Safety Rules

1. Learn how to use controls and operate equipment.
2. Do not let anyone operate unit without thorough training of 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.

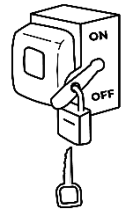
Good housekeeping practices and correct safety procedures will help protect lives, jobs, property and profits.

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



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

Have an electrician install a main power disconnect switch capable of being locked only in OFF position. Mark disconnect clearly as to equipment it operates. Always lock out main power disconnect switch whenever equipment is not in use.



WARNING: When servicing equipment, never enter bin unless all power is locked out and another person is present. Always LOCK OUT all power and always check with voltage meter before servicing.

Failure to do so could result in death or serious injury.

Owners/operators are responsible for developing site-specific Lockout/Tagout procedures based on equipment at their work site. See OSHA's typical minimal lockout procedures (29CFR 1910.147 App A) at www.osha.gov to establish a written plan for your work site.

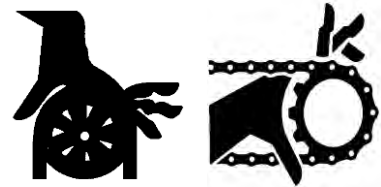


WARNING: KEEP CLEAR OF ALL MOVING PARTS.

Keep people (ESPECIALLY YOUTH) away from equipment, particularly during operation.

Keep away from all moving parts. Keep all shields and screen guards in place. **SHUT OFF AND LOCK OUT** all power before servicing.

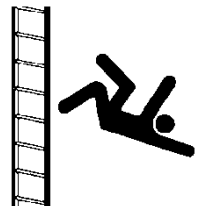
Failure to follow precautions above could result in death or serious injury.



WARNING: METAL IS SLIPPERY WHEN WET

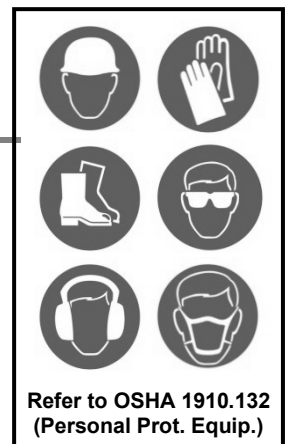
Inspect ladder carefully before use. Never climb deteriorated, damaged or improperly assembled ladder components. Maintain secure hand and foothold when climbing. Never carry items while climbing. Use safety harness and safety line as required by safety regulations.

Failure to heed these precautions could result in 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).

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.

Grain Bin Safety

Owners/operators are responsible for developing site-specific confined space entry procedures. OSHA's confined space entry procedures (29CFR 1910.146) can be found at www.osha.gov.

If you must enter bin for repair or maintenance:

- Use a safety harness, safety line and respirator
- Station another person outside of bin
- Avoid the center of the bin
- Wear appropriate personal protective equipment
- Keep clear of all augers and moving parts



DANGER: Never enter bin unless all power is locked out and another person is present.

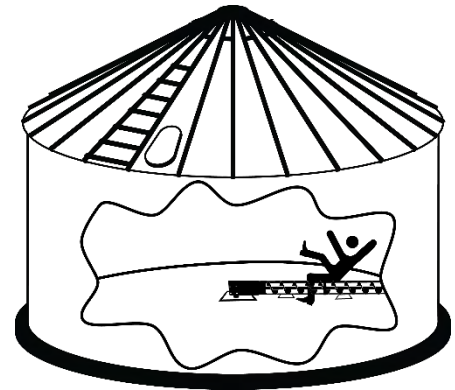


**Unload equipment
can kill or
dismember!**

NEVER enter bin when sweep is running!

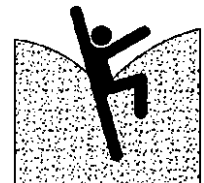
When bin is nearly empty, sweep will travel at an increasingly fast speed. Keep away from sweep and sumps to avoid entanglement.

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



DANGER: Flowing grain may trap and suffocate. If you enter a bin of flowing grain you can be completely submerged in grain in about 8 seconds.

Failure to heed this warning will result in death or serious injury.



EMERGENCIES - KNOW WHAT TO DO

Have emergency numbers and written directions to work site readily available in case of emergency. An area for emergency information to be recorded is provided below.

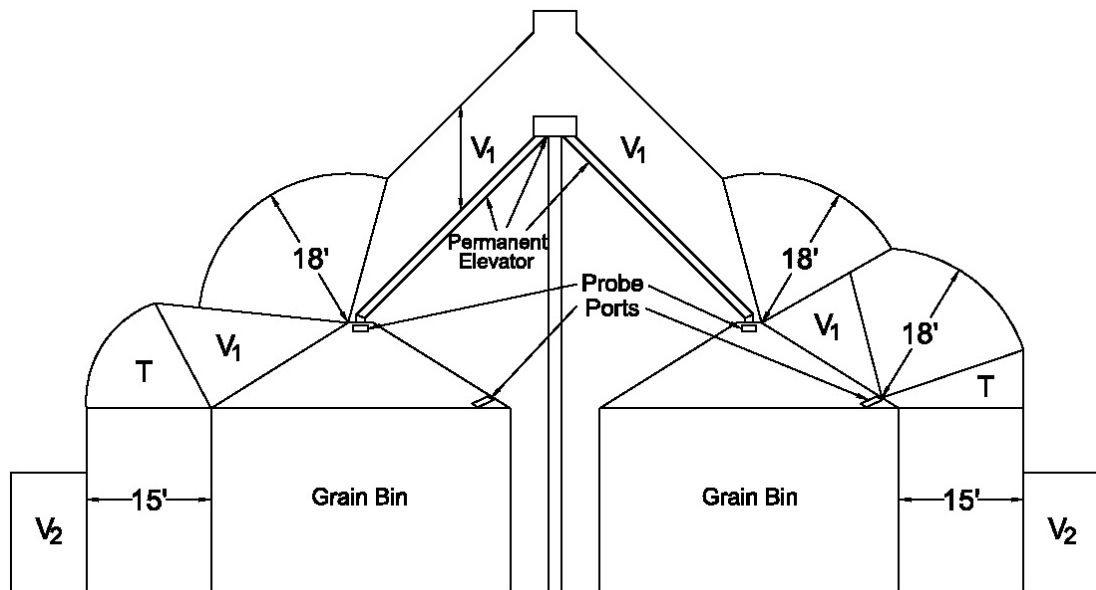
Ambulance • Fire • Police: 9-1-1
Farm rescue team: _____
Local EMS team: _____
Address of work site: _____
Directions to work site: _____

Electrical Wire Clearances

Your local electric utility may be able to provide assistance in planning a safe environment for working around dryers and associated structures. State codes may vary regarding specific clearances for electrical lines around structures. Be certain your local electric utility is in accordance with your state's regulations. **To prevent overhead safety issues, bury electrical lines.**

The American National Standards Institute (ANSI) provides clearance envelopes for Grain Bins filled by permanently installed augers, conveyors or elevators in (ANSI) C2 2007 "National Electrical Safety Code," Rule 234, page 120.

NOTE: An electric utility company may refuse to provide electrical service to any dryer or grain bin built near an existing electric line that does not provide clearance required by ANSI and the National Electrical Safety Code.



V_1 = Vertical clearance above a building required by Rule 234C (Table 234-1)

V_2 = Vertical clearance above land required by Rule 232

T = Transition clearance

Mixed-Flow Grain Dryer Decals

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 the 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 USA; 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 serious injury or death, follow general safety regulations.



2. **Decal L02741 – WARNING:** 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.



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:



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



serious injury or death!

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



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.

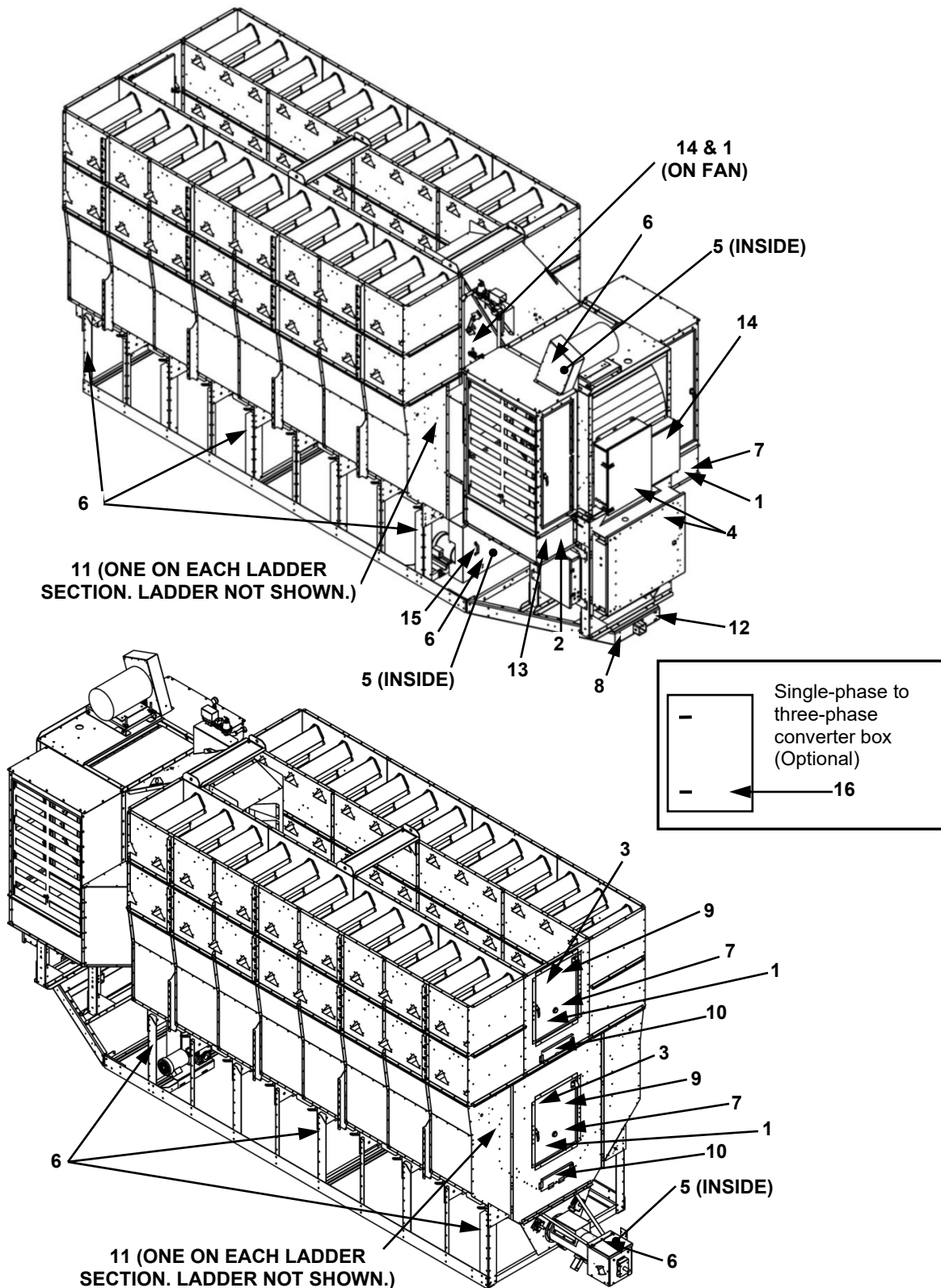


16. **L0163 - DANGER:** Do not open! Severe shock hazard. Mounted on single-phase DC power box.



Mixed-Flow Grain Dryer Safety Decal Placement

Dryers with drag conveyor unload will have additional decals – L01132 & L0114 – on discharge unit, and those with load auger will have Decal L0284 along wet bin.



Emergency Shutdown Locations

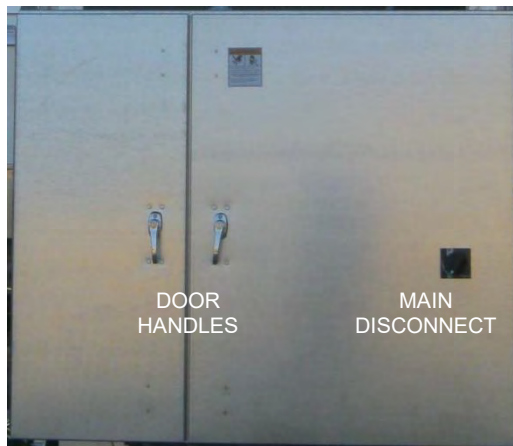


Image 1 – Power distribution box

Power distribution box is located at front of dryer. It contains all main power distribution components, with higher voltage ($\geq 110V$) 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.

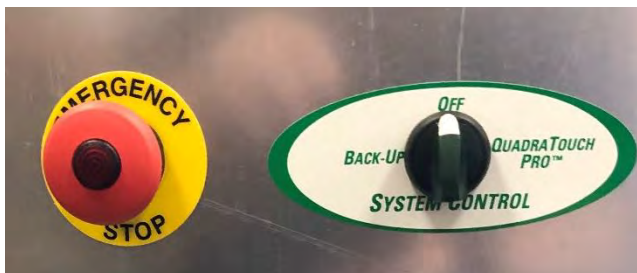


Image 3 – Emergency Stop & System Control switches

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 systems. Power will still be present inside main power box as noted in warning above.

System Control switch is used to select between Back-Up (using green control boards in main power box) or QuadraTouch Pro (using touch screen) operation of dryer. Turning System Control Switch to “Off” will shut down power to both control systems. Power will still be present inside main power box as noted in warning above.

Mixed-Flow Dryer Component Identification, Front and Back Views

Images 4 and 5 identify components on front (left) and back (right) of dryer.



Image 4 – Front of dryer w/ auger unload

1. Main power box (Backup controls are inside)
2. Auxiliary equipment power box
3. Unload auger & meter rolls gear shield
4. Inlet door (Inlets are upright for standard fans)
5. Louvers
6. Mixing chambers
7. Heater box location (on other side of fan duct)



Image 5 – Back of dryer w/ conveyor unload

8. Discharge switch box
9. Meter roll proximity switch
10. Rear junction box
11. Access ladder (Varies with model)
12. Plenum access door with viewing port
13. Rear door switch
14. Column temp switch (One on each side)

Component Identification

Image 6 shows components of head of drag conveyor unload system. Image 7 shows tail of conveyor.



Image 6 – Components of head of unload conveyor

1. Drag conveyor head
2. Motor
3. Belt shield
4. Gearbox cover
5. Meter roll drive chains shield



Image 7 – Components of conveyor tail

6. Tail section shield
7. Chain adjustment screws
8. Discharge lid tilt switch
9. Meter roll proximity switch

Power Box Component Identification

Image 8 identifies components in main power box on a three-fan dryer. There will be a soft start (or optional contactor or VFD) for each fan on dryer.

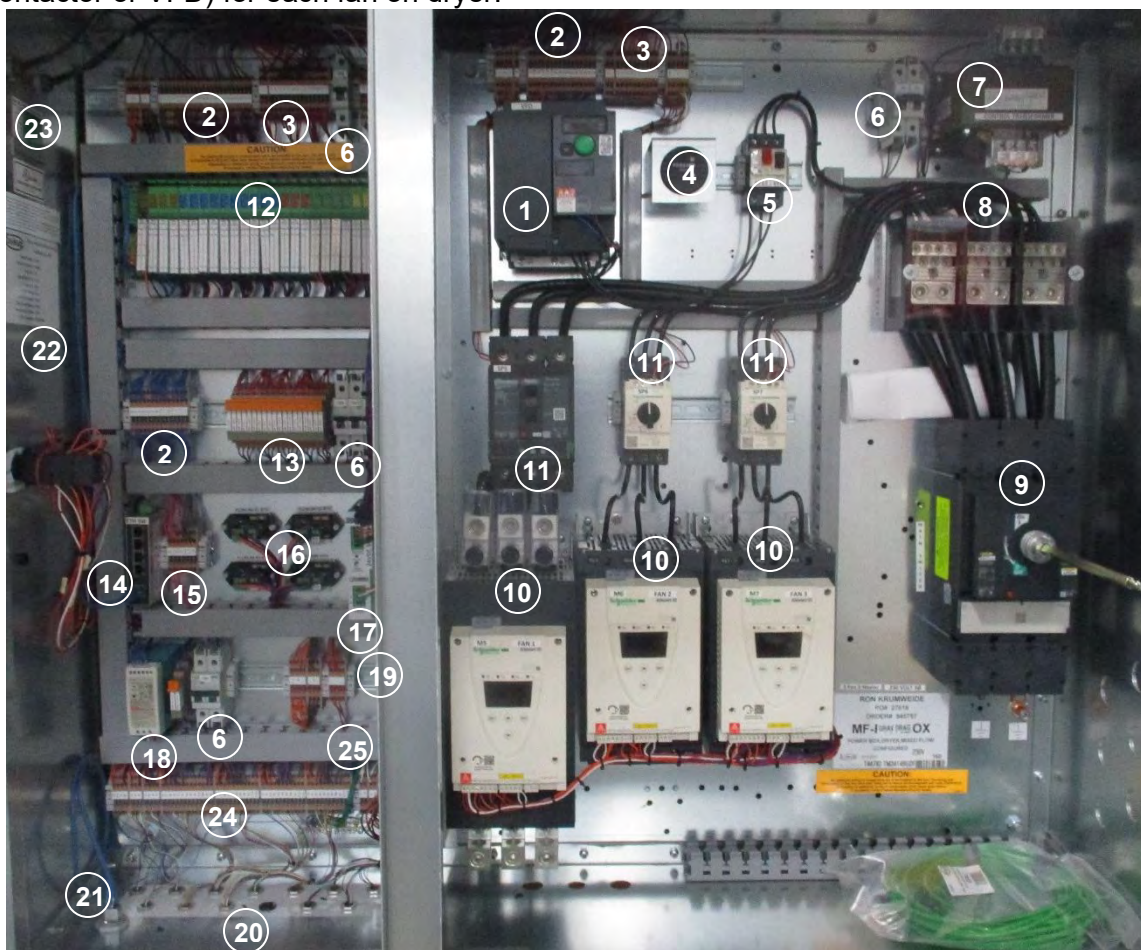


Image 8 – Power box components for three-fan dryer w/ static sample box & soft starts for fans (prior to main switch wiring)

- | | |
|--------------------------------------|---|
| 1. Variable frequency drive | 14. Ethernet switch |
| 2. DC feed-through terminals | 15. RTD terminals |
| 3. AC feed-through terminals | 16. RTD transmitters |
| 4. Hour meter | 17. 24VDC power supply |
| 5. VFD starter protector | 18. Static sample box actuator power source |
| 6. Circuit breaker | 19. Backup control board (on side of box) |
| 7. Control transformer | 20. Bulkheads for M12 cables |
| 8. Power distribution block | 21. Ethernet cable |
| 9. Main switch | 22. Dryer identification information |
| 10. Soft start for fan | 23. Auxiliary power box connections |
| 11. Fan starter protector | 24. Input/output DC terminals |
| 12. Programmable logic control (PLC) | 25. Input/output AC terminals |
| 13. 24VDC relays | |

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.

Pipe Train Component Identification

Image 9 identifies components of liquid pipe train (1-6) and vapor pipe train (8-13). Natural gas-fueled dryers will look different, with fuel supply hose coming from lower left. There is a separate pipe train for each heater on dryer. There is a main gas valve for all natural gas-fueled dryers and for LP-fueled dryers with two or more fans.



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.

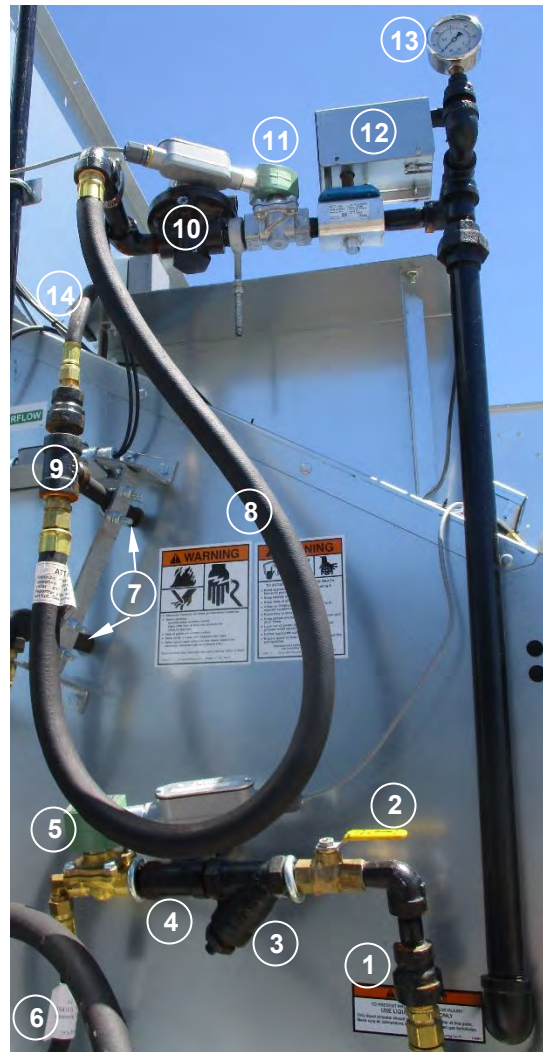


Image 9 – Pipe train components

- | | |
|--|--|
| 1. LP inlet | 8. Vapor hose |
| 2. 1/4-turn shut-off valve | 9. Vapor over-temp switch location. |
| 3. Wye strainer | 10. Vapor solenoid valve |
| 4. High-pressure pop-off valve | 11. Electronic actuator and butterfly valve |
| 5. Liquid solenoid valve | 12. Pressure gauge |
| 6. Liquid propane hose | 13. Pressure relief hose (before installation) |
| 7. LP vaporizer inlet (lower) and outlet (upper) | |

Heater Component Identification

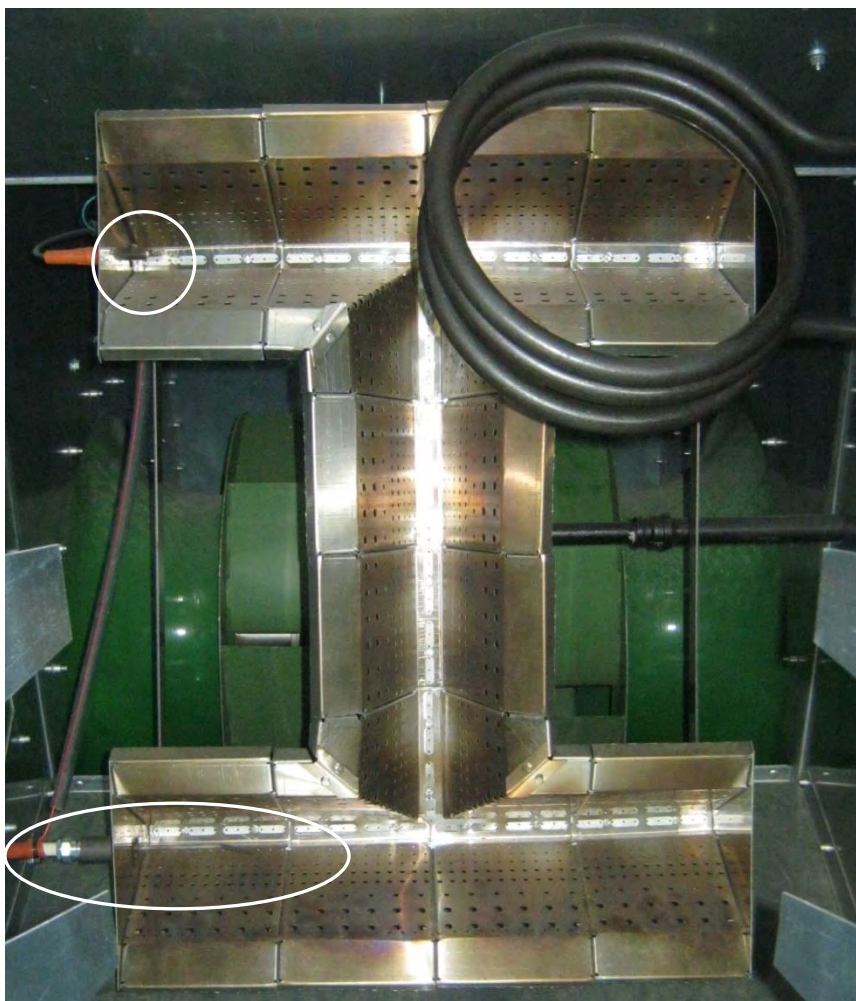


Image 10 – Flame sensor (in oval) vaporizer coil & spark plug (circled)

Image 10 shows burner. Vaporizer coil, spark plug/igniter (circled) and flame sensor rod (in oval) are shown. **NOTE:** Spark plug may be in different location depending on burner.

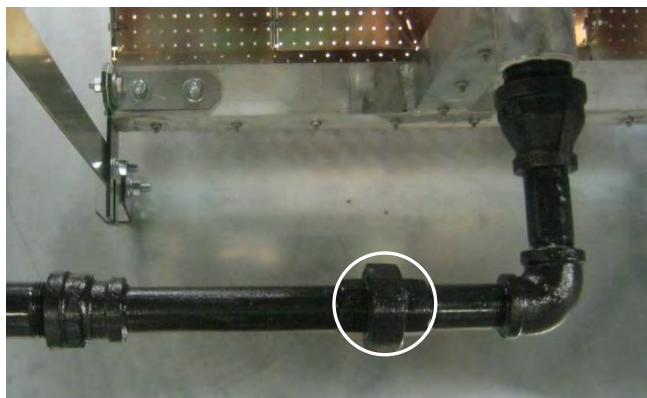


Image 11 – Orifice location

Image 11 shows location of orifice used to restrict flow and build pressure. Open circled union to access orifice.

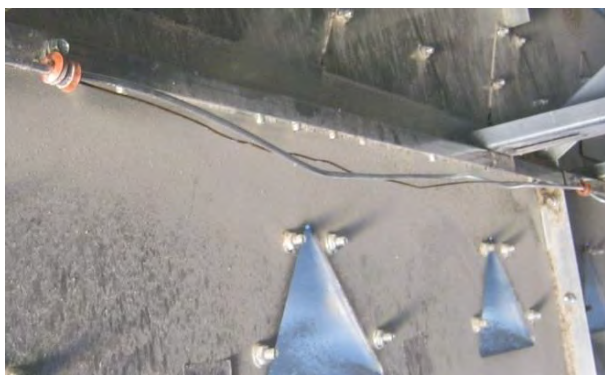


Image 12 – Plenum RTD & over-temp capillary



Image 13 – Plenum RTD (thermometer) tube & static air pressure switch screen

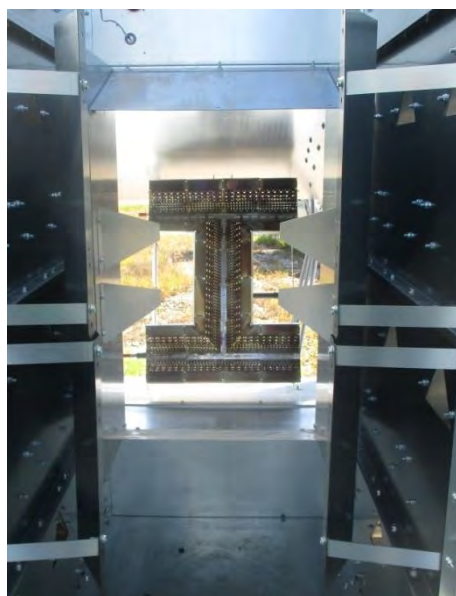


Image 14 – Air deflector vanes

Image 12 shows plenum RTD (Resistance Temperature Detector) aluminum tube and plenum over-temp capillary (copper).

Image 13 shows plenum RTD tube (left), plenum over-temp capillary, and static air pressure switch screen. **NOTE:** Air switch may not be present depending on date of dryer manufacture.

Image 14 shows air deflector vanes (triangular) on natural-gas-fueled dryer module prior to stacking. Vanes are same for LP-fueled dryer.

Door & Unload Proximity Switches



Image 15 – Rear door switch

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

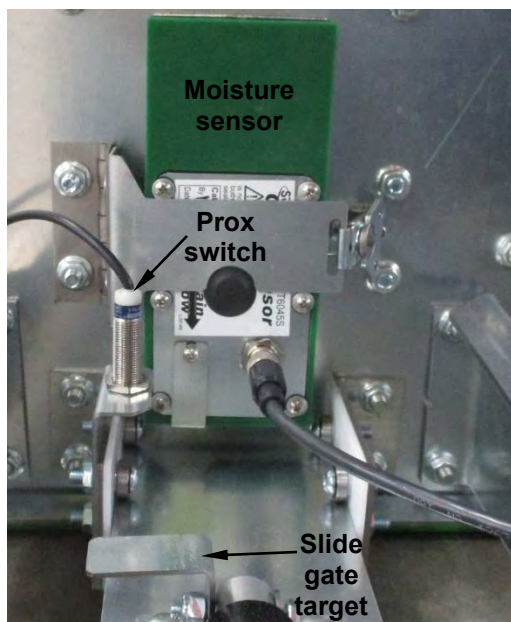


Image 16 – Proximity switch & moisture sensor in static sample box

Image 16 shows proximity switch and discharge moisture sensor in static sample box.



Image 17 – Unload auger proximity switch

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

Column RTD Sensor, Discharge Moisture Sensor & Fill Switches



Image 18 – Grain column temperature sensor

Image 18 shows single-point grain column RTD (Resistance Temperature Detector) sensor before installation. There are four on dryer.



Image 19 – Discharge moisture sensor location

Image 19 shows location of discharge moisture sensor (behind rain shield). Sensor is mounted to bottom of discharge chute. On dryer with drag conveyor unload, sensor will be in a static sample box. See Image 16.



Image 20 – Paddle switch on gravity fill dryer

Image 20 shows paddle switch on gravity-fill dryer.



Image 21 – Paddle switch on auger-fill dryer

Image 21 shows paddle switch on auger-filled dryer. Switch is on opposite end of fill hopper.

Cleanouts



Image 22 – Outer grain column cleanout door



Image 23 – Inner grain column cleanout door



Image 24 – Unload auger cleanout door cam lock



Image 25 – Plenum cleanout/blowout door

Image 22 shows outer grain column cleanout door. Hardware used to lock door closed is circled.

Image 23 shows inner grain column cleanout door.

Image 24 shows handle for unload auger cleanout door cam lock.

Image 25 shows partially open rear door for plenum cleanout/blowout.

Unload Auger, Meter Roll Motor & Proximity Switch

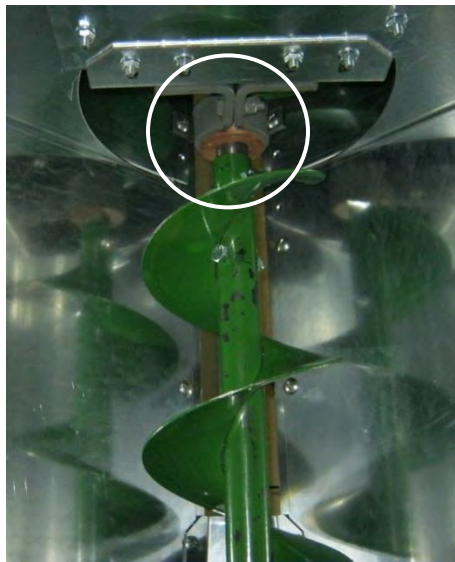


Image 26 – Take-away auger

Image 26 shows unload auger with hanger bearing (circled). Auger will not be present on dryer with drag conveyor unload.



Image 27 – Meter roll motor

Image 27 shows meter roll motor with gear reducer.



Image 28 – Meter roll proximity switch

Image 28 shows meter roll proximity switch.

Service Doors



Image 29 – Unload auger/meter roll drive service door

Image 29 shows unload auger/meter roll drive service door. It is located at lower front of dryer. Behind are belts for unload auger and chains for meter rolls.



Image 30 – Conveyor tail section door

Image 30 shows drag conveyor tail section door.



Image 31 Unload auger service door

Image 31 shows unload auger rear service door. It is located at rear of dryer and also serves as a step (note traction tape). Hinged door opens upward.

Switch Boxes, Inlet Louvers & Inlet Doors

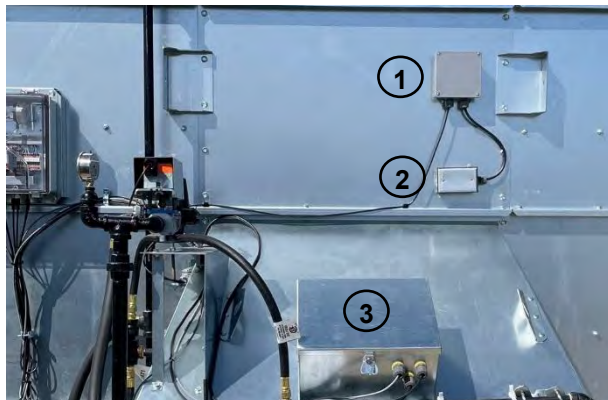


Image 32 – Control switch boxes

Image 32 shows location of over-temp switch (inside box 1), plenum RTD junction box (2), and heater high-limit switch (3).



Image 33 – Air inlet louvers

Image 33 shows air inlet louvers.



Image 34 – Inlet door on up-blast fan

Image 34 shows inlet door on intake for up-blast fan.

There is one inlet on each side of fan. Both inlet doors should be closed when dryer is running.

QuadraTouch Pro Controller



Image 35 – QuadraTouch Pro control box

QuadraTouch Pro controller (Image 35) 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 in 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 QuadraTouch Pro panel is accessible by removing screws on bottom corners of hinged panel. See Image 35.



MIXED-FLOW DRYER

With *QuadraTouch Pro™*
Dryer Control System



Installation Manual

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<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023	– Updated photos of QuadraTouch Pro control screen	1 & 43
	Added instructions for attaching legs to frame of 32' dryer w/ extended unload.....	16
	Updated instructions for assembling gravity fill sections.	24-26
	Added relief pipe installation instructions	40
	Updated instructions for attachment of grounding wire to static sample box	44
	Updated Contact Information page.....	46
08/19/2022	– Added references to Technical Data section, L24135, for foundation & fuel info.	3
	Added key to dryer model expandability	7
	Added reference to L19875 for installation of grain column temperature sensors	23

Introduction

This manual provides instructions for installation of a Sukup Mixed-Flow Grain Dryer. It is to be used as a supplement to Sukup Mixed-Flow Grain Dryer Manual, L2414, which identifies components of dryer and provides instructions for operation and maintenance. Please read both manuals thoroughly before installation or operation.

A crane and a telehandler will be needed for stacking modules. See Page 2-7 for approximate weights and Page 2-9 for approximate heights of cooling modules. Heating modules, also known as tier sections, are generally 8' tall. Height of wet bin will depend on type ordered and dryer size.

When removing from truck, place modules near foundation in order they will be assembled. Cooling section (base module) should be closest. **NOTE:** Taking inventory of supplied parts and laying them out orderly will increase efficiency of installation.

Service platforms and ladder cages that are not preinstalled at factory should be assembled to dryer modules in field before modules are stacked. When unloading from truck, leave enough room around modules for assembly of service platforms and ladder cages. **See Mixed-Flow Dryer Platforms Installation Manual & Parts Assembly, L24145, for platform, ladder and safety cage layouts and installation instructions.**

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.

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Pre-Installation Requirements

Location

Numerous factors need to be taken into consideration when determining where to install dryer. Important things 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 a minimum of 3 feet clearance from other structures on side of dryer and 5 feet minimum clearance from other structures at fan inlet.
6. Minimizing handling distances of 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 (3 feet minimum clearance), or where load section can contact power lines.



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

Foundation

See Automatic Grain Dryers Technical Data section, L24135, for foundation requirements.

Gas & Electric Hookup

Initial gas and electric hookups should be performed only by qualified gas and electrical service technicians in accordance with all applicable local, state and national code requirements. See Automatic Grain Dryers Technical Data section, L24135, for electrical usage information, and see Appendix B of this manual for electrical requirements.

See Automatic Grain Dryers Technical Data section, L24135, for fuel system information.

DO NOT use a pressure regulator at LP supply tank.

Open LP inlet shut-off valve slowly to prevent inadvertent closing of excess flow valves.

Support Leg Locations for Mixed-Flow Dryers

Figs. 2-1 through 2-3 show proper support leg locations for mixed-flow dryers. Lift **ONLY** with Sukup lift brackets or equivalent.

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.

Dryer must be mounted a minimum of 16 inches above surface to allow for cleanout.

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

- Supports under grain columns must be at least every 4 feet
- Support under front hitch
- Fasten dryer legs to foundation using anchor bolts

Dryer legs are available from Sukup Manufacturing Co. in 2-foot, 3-foot, 4-foot, 5-foot and 6-foot lengths. Support kits come with necessary hardware to attach legs to dryer frame. Customer must supply hardware to attach to concrete pad.

Optional dryer ladder extensions are available from Sukup Manufacturing Co. in lengths of 2 feet (B50816), 3 feet (B50815), 4 feet (B50813), 5 feet (B50814), 6 feet (B50812), 8 feet (B50811), and 10 feet (B50810).

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

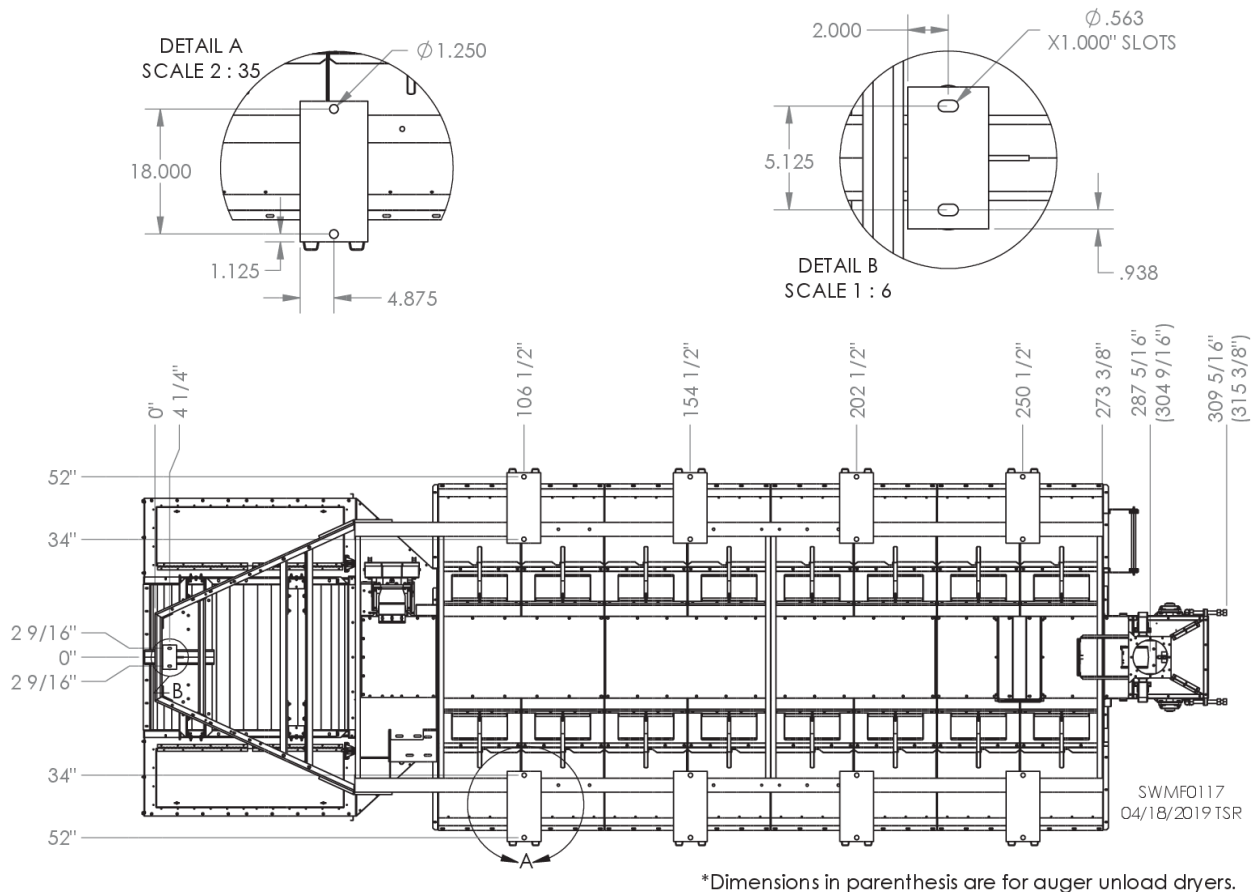


Fig. 2-1 – Support leg locations for 16' mixed-flow dryer

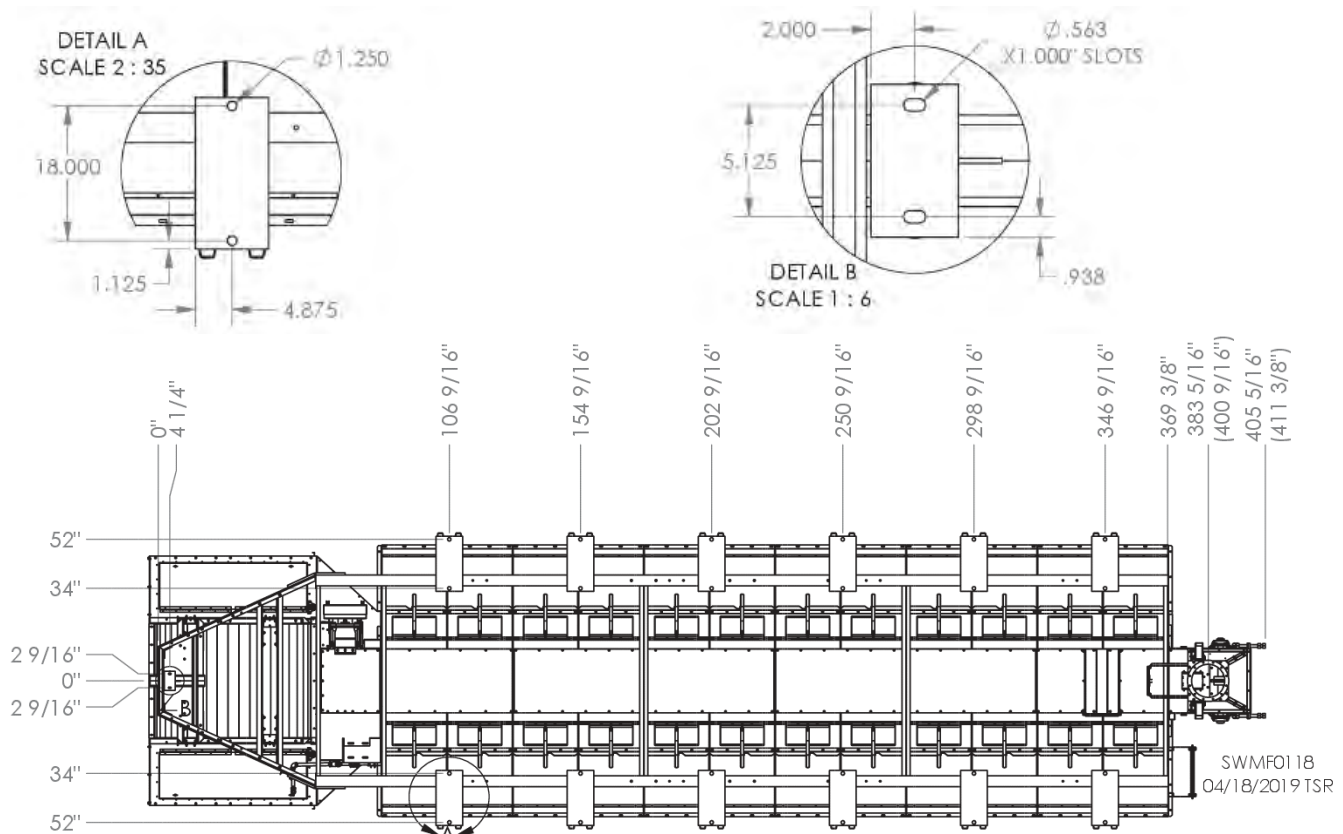


Fig. 2-2 - Support leg locations for 24' mixed-flow dryer

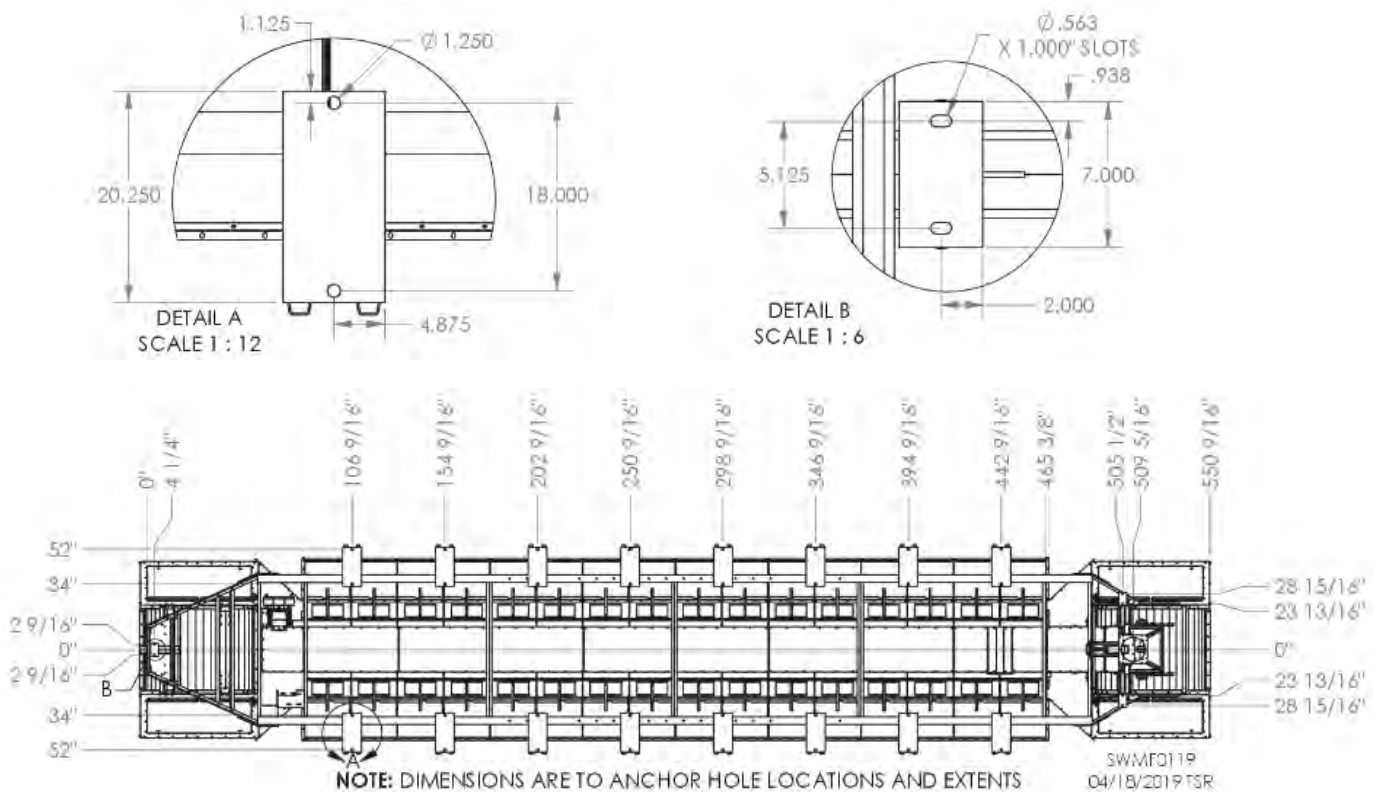


Fig. 2-3 - Support leg locations for 32' mixed-flow dryer

Figs. 2-4 through 2-6 show discharge dimensions depending on unload type.

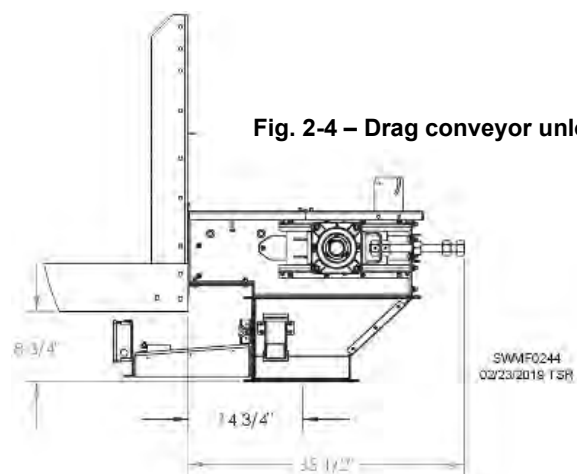


Fig. 2-5 – Auger unload

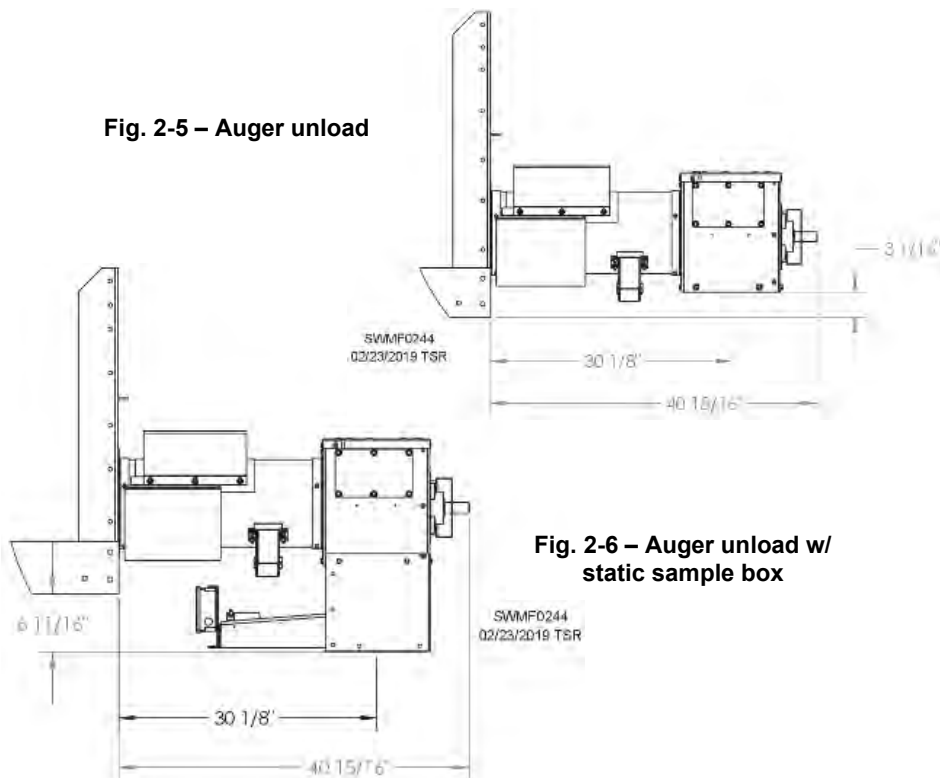


Fig. 2-6 – Auger unload w/ static sample box

Table 2-1 shows maximum conveyor extension allowed, in feet, without increase in motor horsepower, depending on length and height of cooling section.

Table 2-1 – Max conveyor extensions w/o hp increase

MAX. CONVEYOR EXTENSION (FT) W/O POWER INCREASE			
LENGTH	MEDIUM	TALL	EXTRA-TALL
16'	24	14	29
24'	16	31	21
32'	38	23	38

Module Weights

See Table 2-2 for weights (in pounds) of modules.

MODEL	BASE	EXTRA TALL BASE EXT.	BARE HEAT 1	BARE HEAT 2	FULL HEAT MID 1	FULL HEAT MID 2	FULL HEAT TOP	ROOF
TM1606 EXDB	10000	0	7400	0	0	0	0	3700
TM1606 EXNO	12500	0	0	0	0	0	0	3700
TM1606 EXYS	13600	0	3900	0	0	0	0	3700
TM1608 EXDB	9000	1700	6800	3800	0	0	0	3700
TM1608 EXNO	13600	0	5600	3800	0	0	0	3700
TM1608 EXYS	10000	0	6700	3800	0	0	0	3700
TM1609 EXDB	9000	1700	6800	5400	0	0	0	3700
TM1609 EXNO	13600	0	5600	5100	0	0	0	3700
TM1609 EXYS	10000	0	6700	5100	0	0	0	3700
TM1610 EXNO	13600	0	6900	0	0	0	8300	3700
TM1610 EXYS	10000	0	7400	0	0	0	8300	3700
TM1612 EXNO	10000	0	6700	3800	0	0	8300	3700
TM1612 EXYS	9000	1700	6800	3800	0	0	8300	3700
TM1613 EXNO	10000	0	6700	5100	0	0	8300	3700
TM1613 EXYS	9000	1700	6800	5400	0	0	8300	3700
TM1614 EXNO	10000	0	7400	0	8300	0	8300	3700
TM1616 EXNO	9000	1700	6800	3800	8300	0	8300	3700
TM1617 EXNO	9000	1700	6800	5400	8300	0	8300	3700
TM2405 EXDB	12700	0	8500	0	0	0	0	5500
TM2405 EXNO	16600	0	0	0	0	0	0	5500
TM2405 EXYS	13650	0	7900	0	0	0	0	5500
TM2406 EXDB	12700	0	10600	0	0	0	0	5500
TM2406 EXNO	16600	0	0	0	0	0	0	5500
TM2406 EXYS	13650	0	9700	0	0	0	0	5500
TM2409 EXNO	13650	0	7900	0	0	0	10800	5500
TM2409 EXYS	12700	0	8500	0	0	0	10800	5500
TM2410 EXDB	11500	2600	12100	0	0	0	11000	5500
TM2410 EXNO	13650	0	9700	0	0	0	10800	5500
TM2410 EXYS	12700	0	10600	0	0	0	10800	5500
TM2413 EXNO	12700	0	8500	0	10800	0	10800	5500
TM2414 EXNO	12700	0	10600	0	10800	0	10800	5500
TM2414 EXYS	11500	2600	12100	0	11000	0	10800	5500
TM2418 EXNO	11500	2600	12100	0	11000	10800	10800	5500
TM3209 EXDB	17560		12880	10500	0	0	0	7300
TM3209 EXNO	17800	3200	10600	10000	0	0	0	7300
TM3209 EXYS	18600	0	11600	10000	0	0	0	7300
TM3210 EXNO	17800	0	12800	0	0	0	13200	7300
TM3210 EXYS	18600	0	13900	0	0	0	13200	7300
TM3212 EXNO	18600	0	11600	6500	0	0	13200	7300
TM3212 EXYS	17560	3200	12300	6500	0	0	13200	7300
TM3213 EXNO	18600	0	11600	10000	0	0	13200	7300
TM3213 EXYS	17560	3200	12880	10500	0	0	13200	7300
TM3214 EXNO	18600	0	13900	0	13200	0	13200	7300
TM3216 EXNO	17560	3200	12300	6500	13200	0	13200	7300
TM3217 EXNO	17560	3200	12880	10500	13200	0	13200	7300

Table 2-2 – Weights of modules

KEY: EXNO = Non-Expandable; EXYS = Expandable by 4 tiers; EXDB = Expandable by 8 tiers.

Dryer Identification Keys

Use Table 2-3 to identify characteristics of dryer based on model number found on white sticker inside of main power box. Also see tables on next page.

Dryer Number Key

TM	Mixed-Flow Dryer
24	Dryer Column Length (ft)
12	Column Height (Sections)
B	Power & Gas Requirements
U	Safety Standard / Perf Sheet Style
2	Starting Requirements / Expandability
A	Load & Unload Options
X	Special Engineering (Absent if not required)

Power & Gas Key

Letter	Phases	Voltage	Frequency	Fuel
Y	3 PH	208	60 Hz	LP
Z	3 PH	208	60 Hz	NG
A	3 PH	230	60 Hz	LP
B	3 PH	230	60 Hz	NG
C	3 PH	460	60 Hz	LP
D	3 PH	460	60 Hz	NG
E	3 PH	575	60 Hz	LP
F	3 PH	575	60 Hz	NG
G	1 PH	230	60 Hz	LP
H	1 PH	230	60 Hz	NG
J	1 PH → 3 PH	230	60 Hz	LP
K	1 PH → 3 PH	230	60 Hz	NG
L	3 PH	380	50 Hz	LP
M	3 PH	380	50 Hz	NG
N	3 PH	400	50 Hz	LP
P	3 PH	400	50 Hz	NG
Q	3 PH	415	50 Hz	LP
R	3 PH	415	50 Hz	NG

Safety Standard / Perf Sheet Key

	.063 Hole	.047 X .188 Slot
Domestic	U	A
Canadian	C	B
CE / Europe	E	F
Danish	D	G
Ukrainian	S	H

Starting Requirement / Expandability Key

	Normal	4 Tier Exp	8 Tier Exp
Line Start	1	4	7
Soft Start	2	5	8
VFD Start	3	6	9

Load & Unload Key

Letter	Load System	Unload
A	Auger	Auger
B	Auger	Drag Conveyor
C	Drag Conveyor	Auger
D	Drag Conveyor	Drag Conveyor
E	Gravity	Auger
F	Gravity	Drag Conveyor

04/02/2018 ; CSH

Table 2-3 – Dryer identification keys

Identifying Cooling Sections

Height of cooling section varies with dryer model. Table 2-4 shows section heights and, depending on dryer model, standard and maximum expandable cooling sections. Heights are measured from dryer frame to bottom of first mixing tier. Expansions add four (Expandable) or eight (Double-Expandable) tiers.

Table 2-4 –
Cooling Sections

SECTION DESCRIPTION	HEIGHT
MEDIUM	9' 11"
TALL	11' 11"
EXTRA TALL	13' 11"

MODEL	STANDARD COOLING COLUMN HEIGHT	EXPANDABLE COOLING COLUMN HEIGHT	DOUBLE EXPANDABLE COOLING COLUMN HEIGHT
TM1606	MEDIUM*	MEDIUM	TALL
TM1608	MEDIUM	TALL	EXTRA TALL
TM1609	MEDIUM	TALL	EXTRA TALL
TM1610	MEDIUM	TALL	EXTRA TALL
TM1612	TALL	EXTRA TALL	N/A
TM1613	TALL	EXTRA TALL	N/A
TM1614	TALL	N/A	N/A
TM1616	EXTRA TALL	N/A	N/A
TM1617	EXTRA TALL	N/A	N/A

MODEL	STANDARD COOLING COLUMN HEIGHT	EXPANDABLE COOLING COLUMN HEIGHT	DOUBLE EXPANDABLE COOLING COLUMN HEIGHT
TM2405	MEDIUM*	MEDIUM	TALL
TM2406	MEDIUM*	MEDIUM	TALL
TM2409	MEDIUM	TALL	EXTRA TALL
TM2410	MEDIUM	TALL	EXTRA TALL
TM2413	TALL	N/A	N/A
TM2414	TALL	EXTRA TALL	N/A
TM2418	EXTRA TALL	N/A	N/A

TM3209	MEDIUM	TALL	EXTRA TALL
TM3210	MEDIUM	TALL	EXTRA TALL
TM3212	TALL	EXTRA TALL	N/A
TM3213	TALL	EXTRA TALL	N/A
TM3214	TALL	N/A	N/A
TM3216	EXTRA TALL	N/A	N/A
TM3217	EXTRA TALL	N/A	N/A

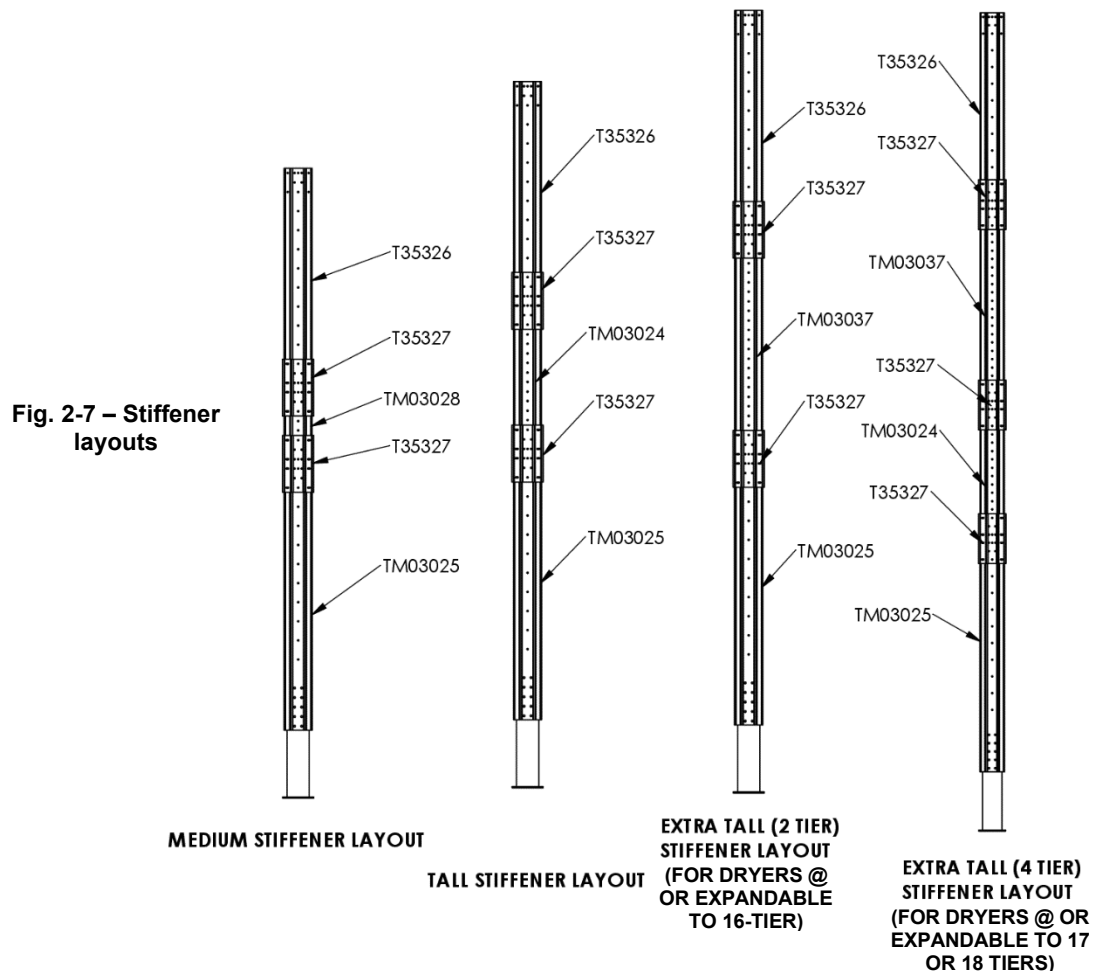
*Six-tier & smaller dryers are expandable by default

TM2413CU2B is an example of a dryer ID number (Boldface added for illustration).

- A **Standard** dryer is indicated by number **1, 2** or **3** in location of boldfaced digit.
- An **Expandable** dryer is indicated by number **4, 5** or **6** in that location.
- A **Double-expandable** dryer is indicated by number **7, 8** or **9** in that location.

Stiffeners for Mixed-Flow Dryers

Fig. 2-7 shows stiffener layouts for mixed-flow dryers. Layout will depend on height of cooling section. See Table 2-4.



Order of Installation

Following are main steps to take in installing Mixed-Flow Grain Dryer.

- Attach stiffeners to base module and anchor base module (cooling section) to concrete pad.
- Install heater ducts and support structures.
- Attach lower platform
- Attach mixing tiers (If not already attached, build platforms on ground and attach before lifting module. If upper platforms were factory-assembled, remove shipping straps/braces).
- Attach roof module (fill section).
- Attach/connect ladders and safety cages.



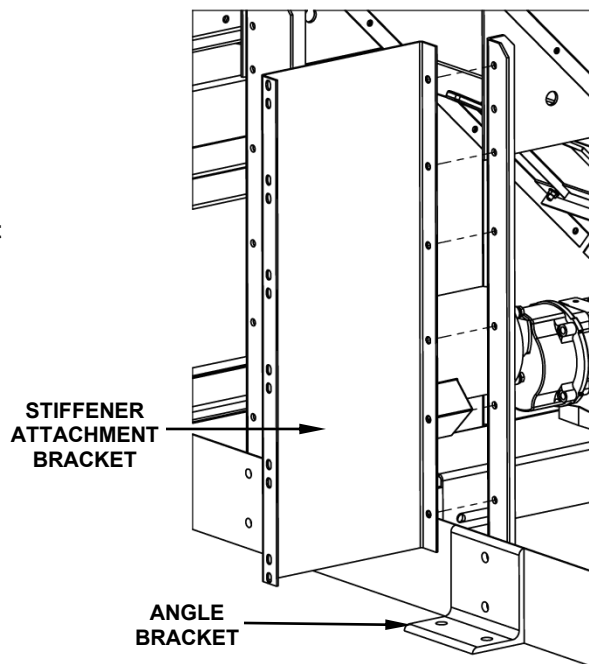
WARNING: Do not station a crew member in a position where he or she could be struck or crushed by a section of dryer or platform that is being lowered into place by crane. Wind can blow lifted materials, potentially crushing, striking or pinning a person. Failure to heed this warning could result in death or serious injury.

On-Site Installation

NOTE: Use 3/8 – 16 x 1" bolts (J0611) unless otherwise noted.

Bolt stiffener attachment brackets (TM03006) to narrow vertical supports as shown in Fig. 2-8. On back half of 32' dryer, attach stiffener attachment brackets so flanges point in opposite direction.

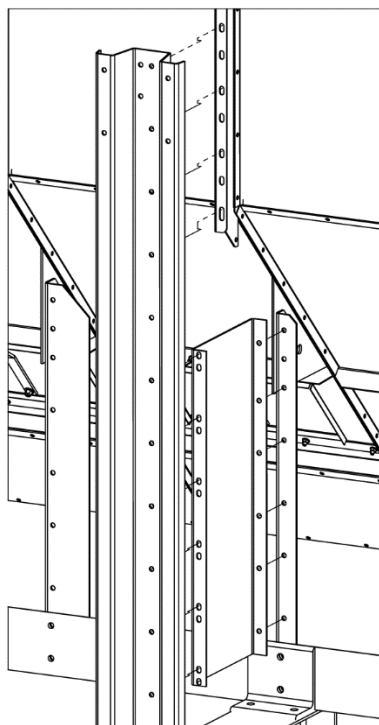
Fig. 2-8 – Attaching stiffener attachment brackets to narrow vertical supports



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Also attach angle brackets (TM03005) to frame below stiffener attachment bracket as shown in Fig. 2-8.

Fig. 2-9 – Attaching stiffeners



Loosely attach lower stiffeners (TM03025) to factory-attached brackets on module and to stiffener attachment brackets. See Fig. 2-9.

Attachment of additional stiffener sections will depend on height of base module. See stiffener layouts in Fig. 2-7. Fig. 2-10 shows attachment of stiffeners on dryer with medium cooling section. There are three stiffener sections and two splice plates used. Loosely attach middle and/or upper stiffeners to factory-attached brackets and to splice plates (T35327). Use punches as needed to align splice bolt holes with stiffener bolt holes. See Figs. 2-11 and 2-12 for attaching stiffeners to tall and extra-tall cooling sections.

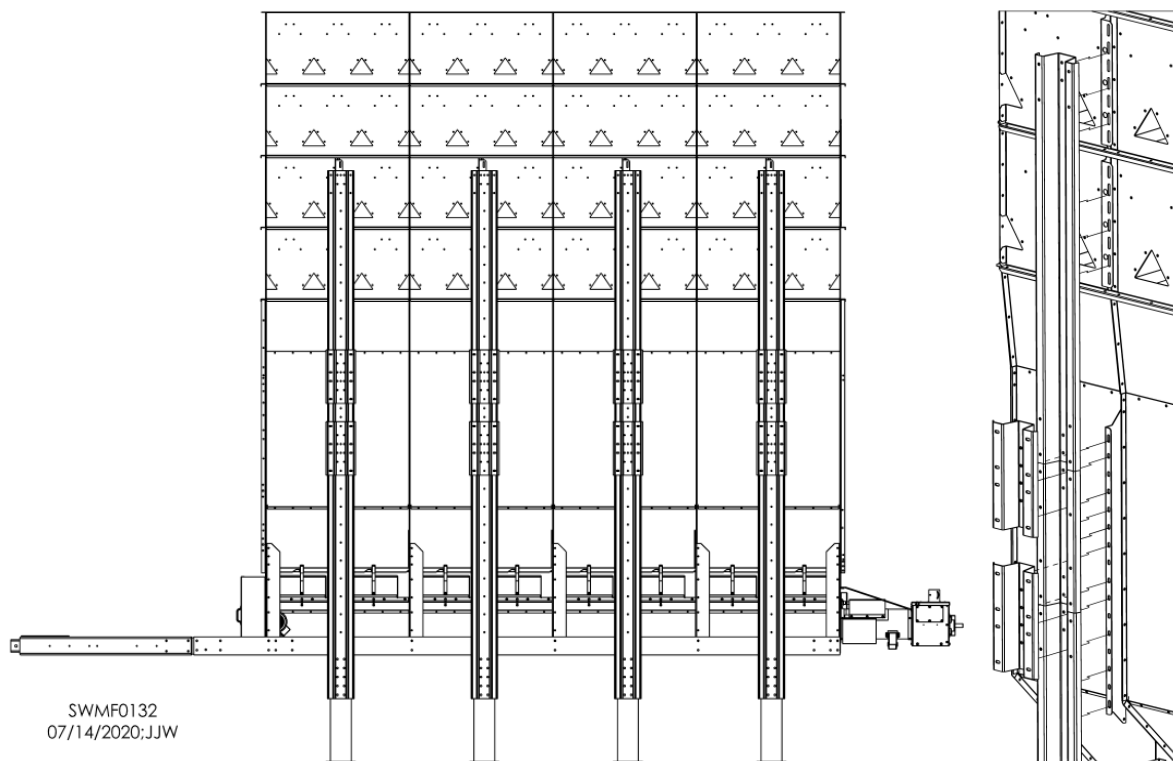


Fig. 2-10 – Attaching stiffeners to dryer with medium-height cooling section

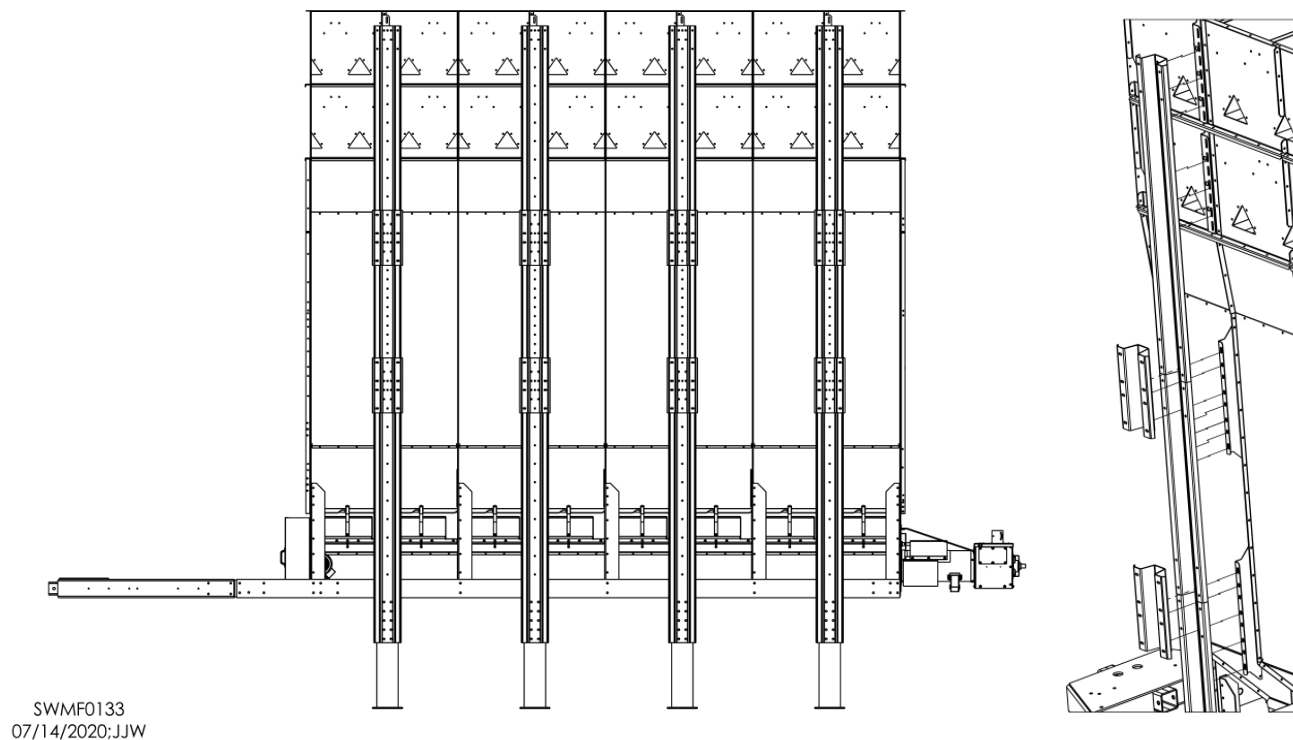


Fig. 2-11 – Attaching stiffeners to dryer with tall cooling section

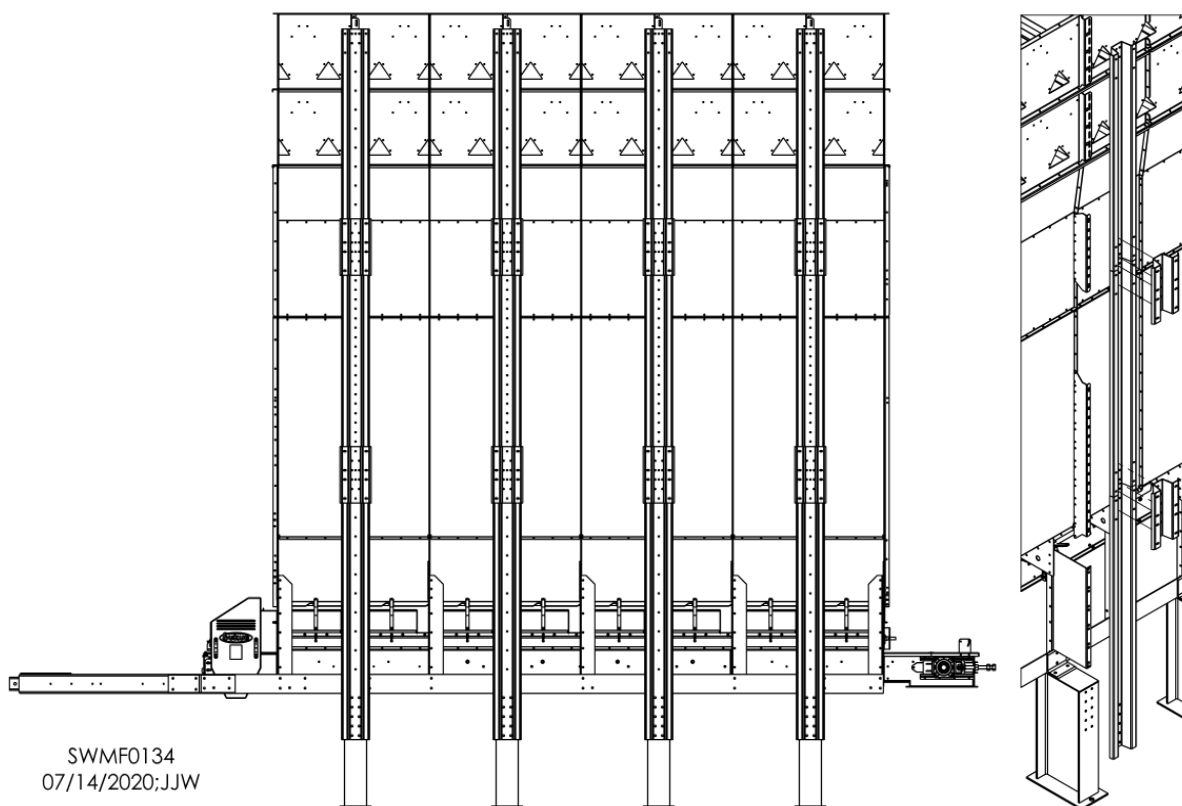


Fig. 2-12 – Attaching stiffeners to dryer with extra-tall cooling section & two mixing modules

NOTE: Attach platform supports to modules before lifting.



Image 2-1 – Lifting dryer base into position over foundation

Use crane to lift base of dryer into position over foundation. Position base weldments (legs) under angle brackets (TM03005). Bracket shown in Fig. 2-8.

If foundation is not level, shim legs as needed to ensure base (cooling) section of dryer will be level when set. Shims must be under I-beam flanges as shown in Fig. 2-13.

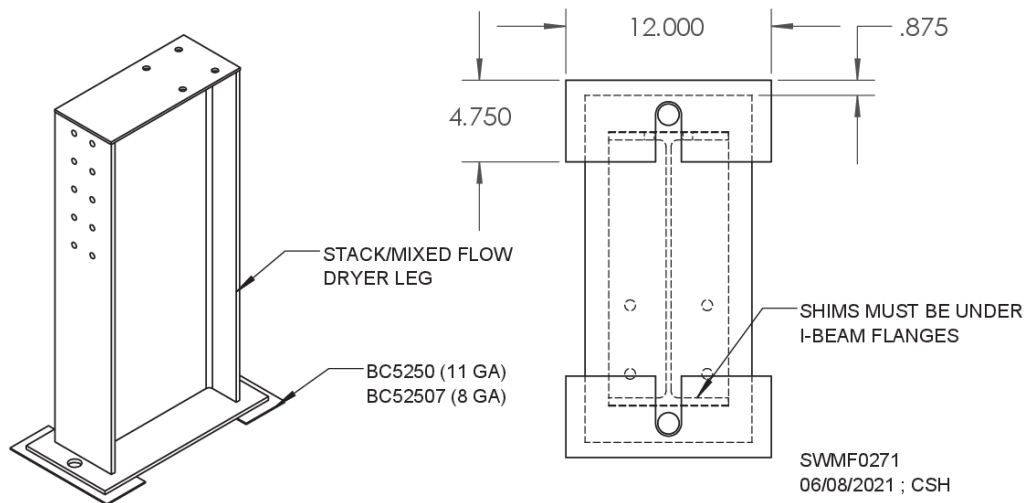
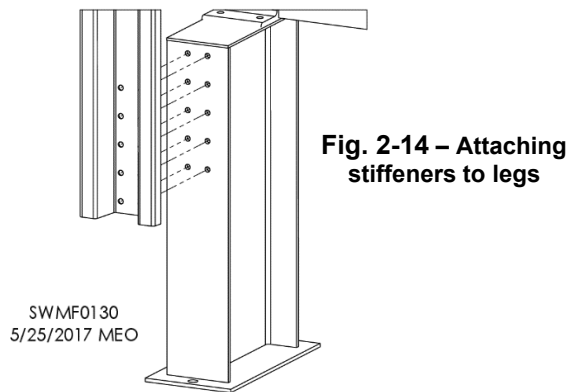


Fig. 2-13 – Shims under I-beam flanges

NOTICE: Use only factory-installed lifting brackets to lift dryer sections. Failure to do so may cause damage to dryer. See bracket location examples on Pages 2-18 through 2-22.

Attach stiffeners to base weldments (dryer legs) as shown in Fig. 2-14. Use 1/2" hardware with lock washers. Insert bolts from inside of leg.



Sukup Manufacturing Co. recommends using Hilti HAS-E anchors with 12" embed and HY 200 adhesive.

Table 2-5 shows number of anchors by dryer length, and part number of anchor kit. All anchor bolts are 3/4" x 14".

DRYER LENGTH	ANCHOR QTY.	ANCHOR KIT #
16'	16	TM16960
24'	24	TM24960
32'	32	TM32960

Table 2-5 – Anchor bolts by dryer length

Also, 16' & 24' dryers require two 1/2" x 5-1/2" anchors (J07781) to anchor front leg; 32' dryers require six.

Follow Hilti installation instructions provided with anchors.

Drill holes in concrete for anchor bolts. Install as instructed by manufacturer. Secure each with a washer and nut as shown in Image 2-2.



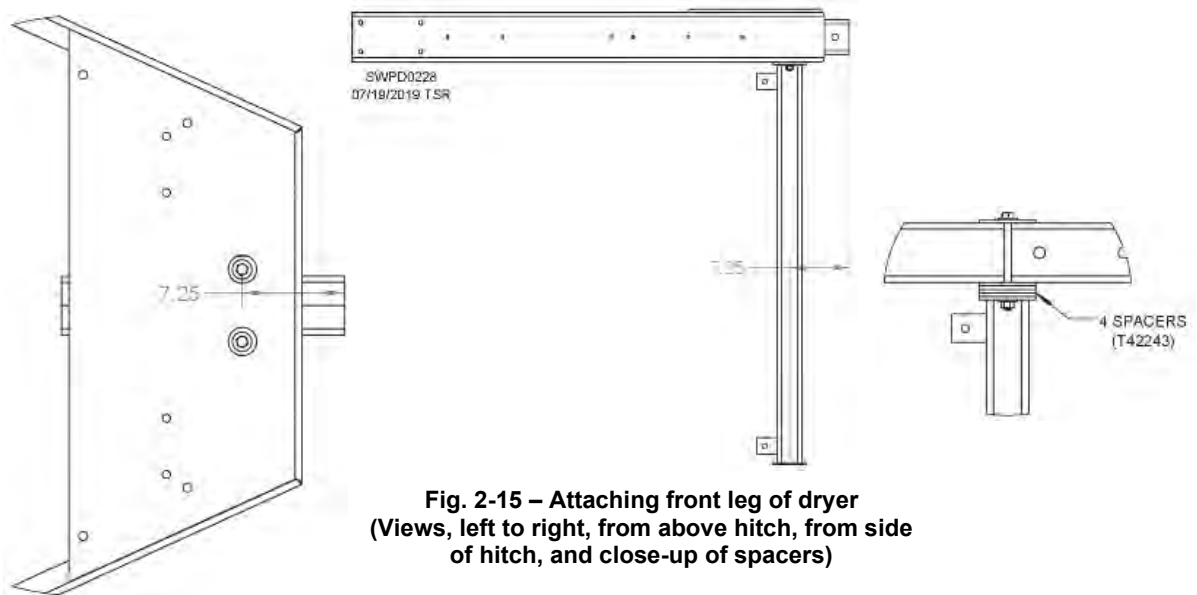
Image 2-2 – Anchor bolt on base weldment

Tighten stiffener bolts at this time. See Image 2-3. Also attach angle brackets to legs.



Image 2-3 – Tightening stiffener bolts

Attach support leg to front of dryer using 1/2" hardware and spacers (T42243) as needed to ensure dryer is level. Center of leg should be 7-1/4" from end of tongue. See Fig. 2-15. Use one spacer above hitch and others as needed below, between leg and hitch.



**Fig. 2-15 – Attaching front leg of dryer
(Views, left to right, from above hitch, from side of hitch, and close-up of spacers)**

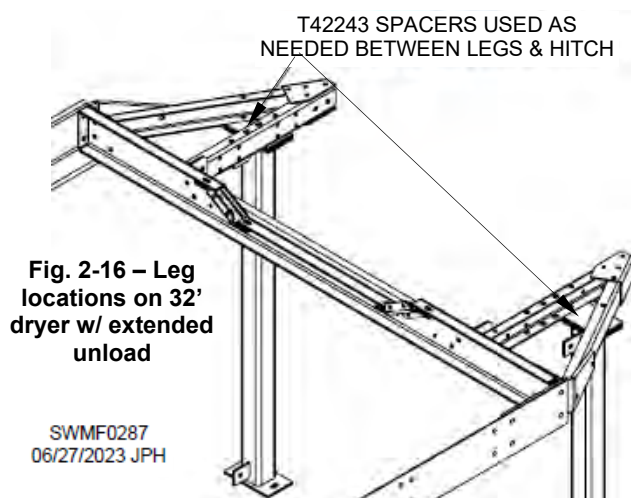
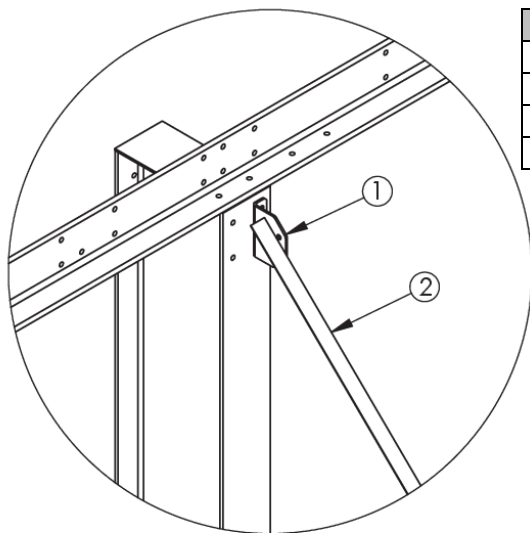


Fig. 2-16 – Leg locations on 32' dryer w/ extended unload

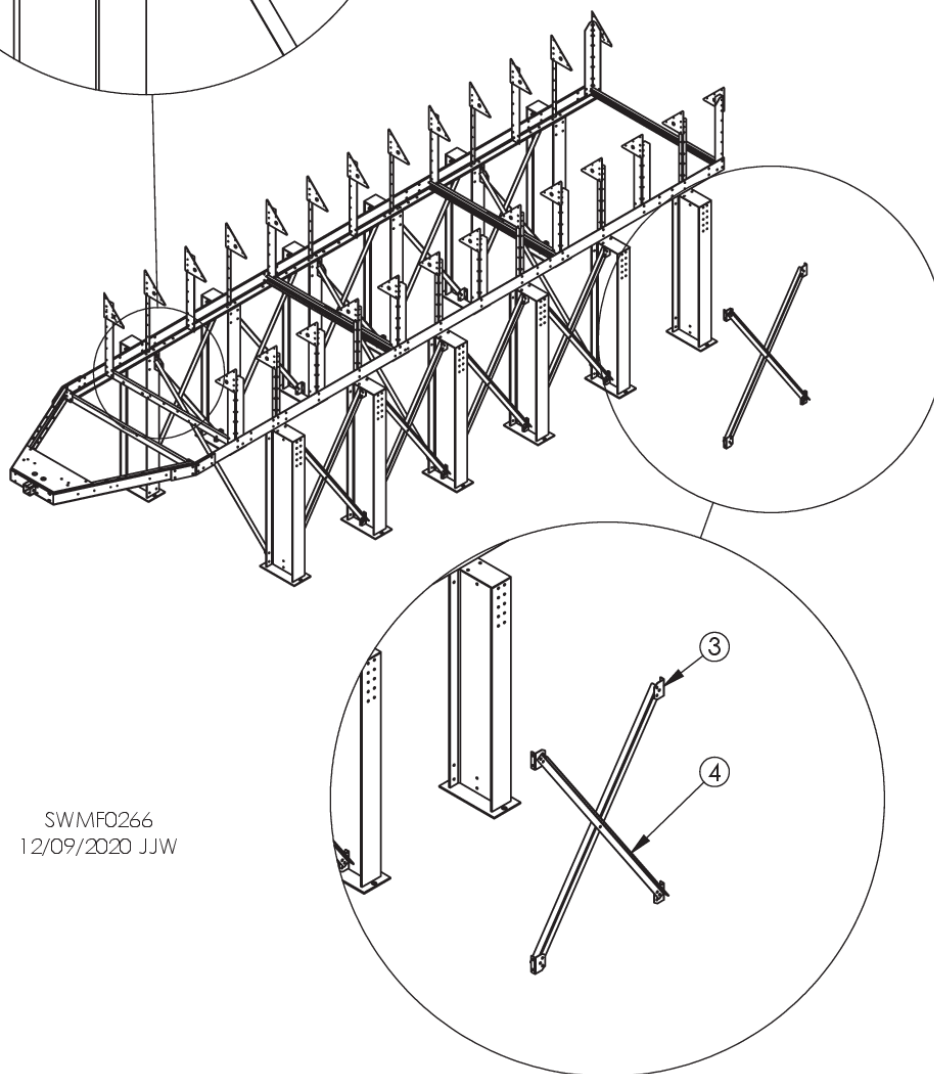
On 32' dryer with extended unload, attach two support legs, one at each location shown in Fig. 2-16. (Some Parts removed for clarity.) Use 1/2" hardware and spacers (T42243) as needed to ensure dryer is level. Use one spacer above hitch and others as needed below, between leg and hitch.

Attach cross braces between 6' legs using 1/2" hardware and brackets provided. See Fig. 2-17.



ITEM #	PART #	DESCRIPTION	QTY.
1	TM03032	PLATE, BRACING, INSIDE, 6' LEG	12
2	TM03033	ANGLE, BRACING, LEGS 95"	6
3	TM03034	PLATE, X-BRACING, SIDE, 6' LEG	40
4	TM03035	ANGLE, X-BRACING, INSIDE, 80.5"	20

Fig. 2-17 & Table 2-6 – Attaching cross-braces used with 6' legs



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Lift modules **ONLY** with Sukup lift brackets or equivalents. See Table 2-2 for module weights.

Lift brackets are located in plenums and on roof sections as shown in Figs. 2- 18 through 2-27. On some models, brackets must be removed before stacking next module. For example, see Detail A of Fig. 2-18. Cross brackets such as those shown in Details B-D below, and side brackets such as those shown in Figs. 2-20 and 2-21 should be removed after stacking for best heat distribution in plenum.

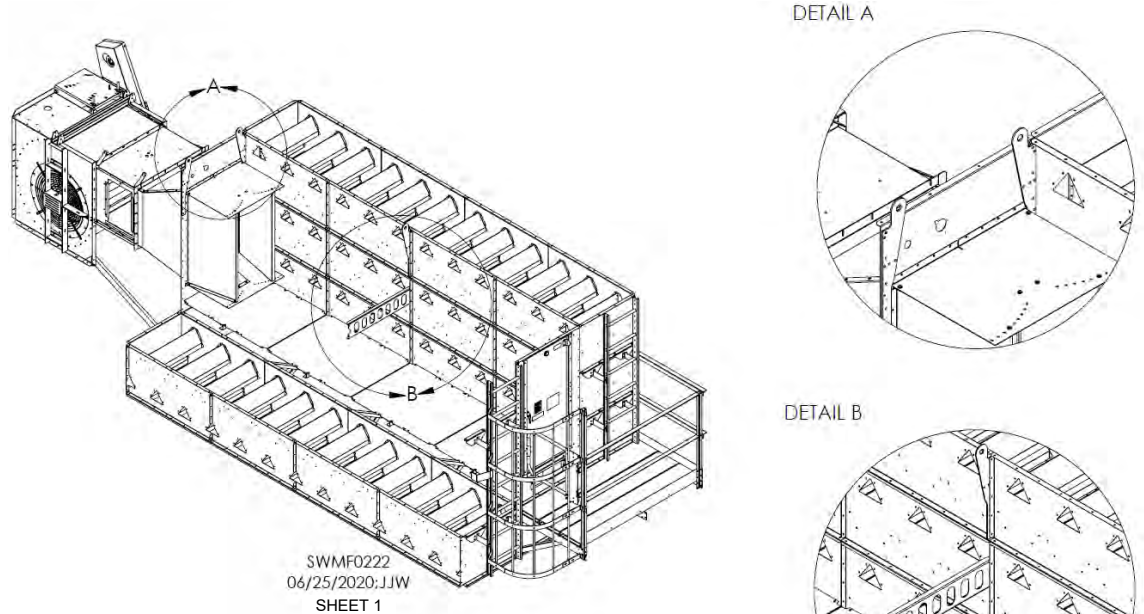


Fig. 2-18 – Lift brackets on 16' fan module

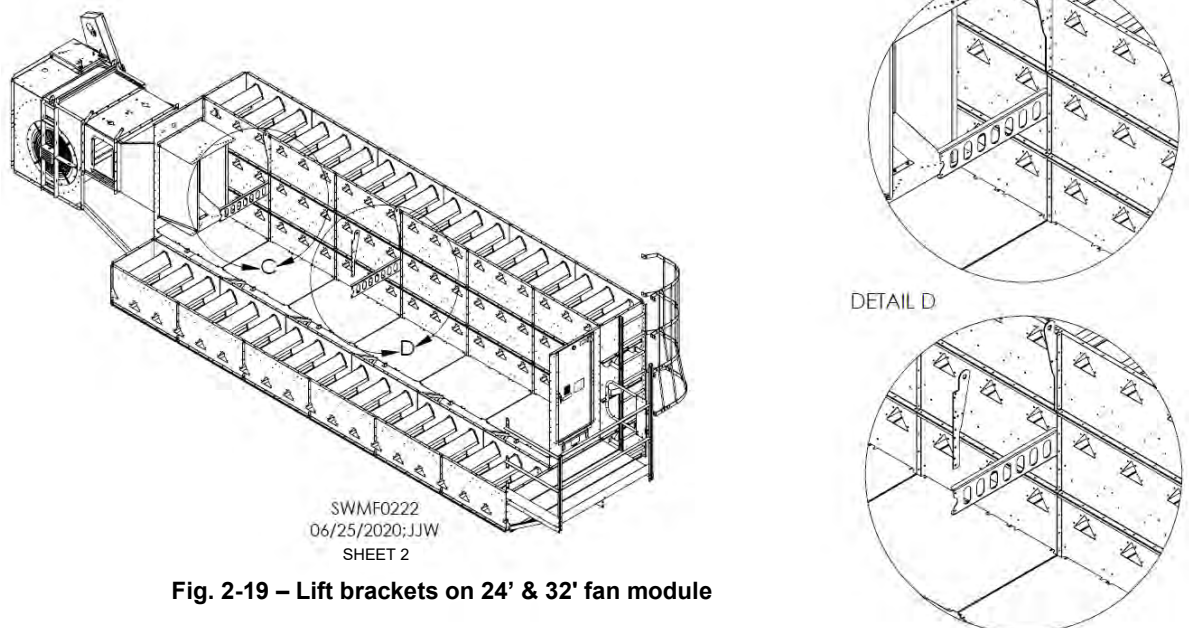


Fig. 2-19 – Lift brackets on 24' & 32' fan module

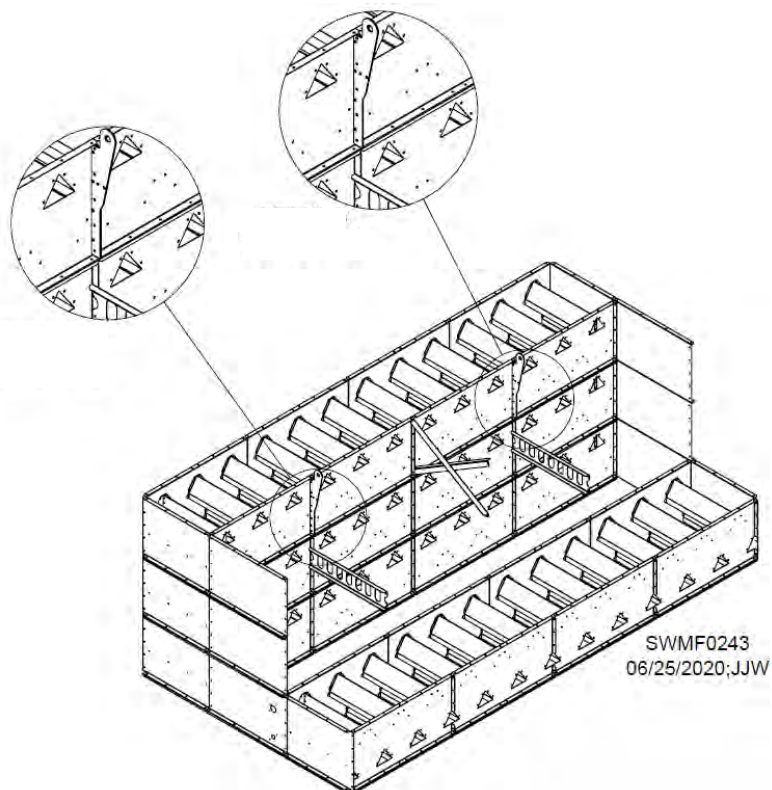


Fig. 2-20 – Lift brackets on 16' module without fan
(All lift brackets in modules without fans are located 8' apart on centers)

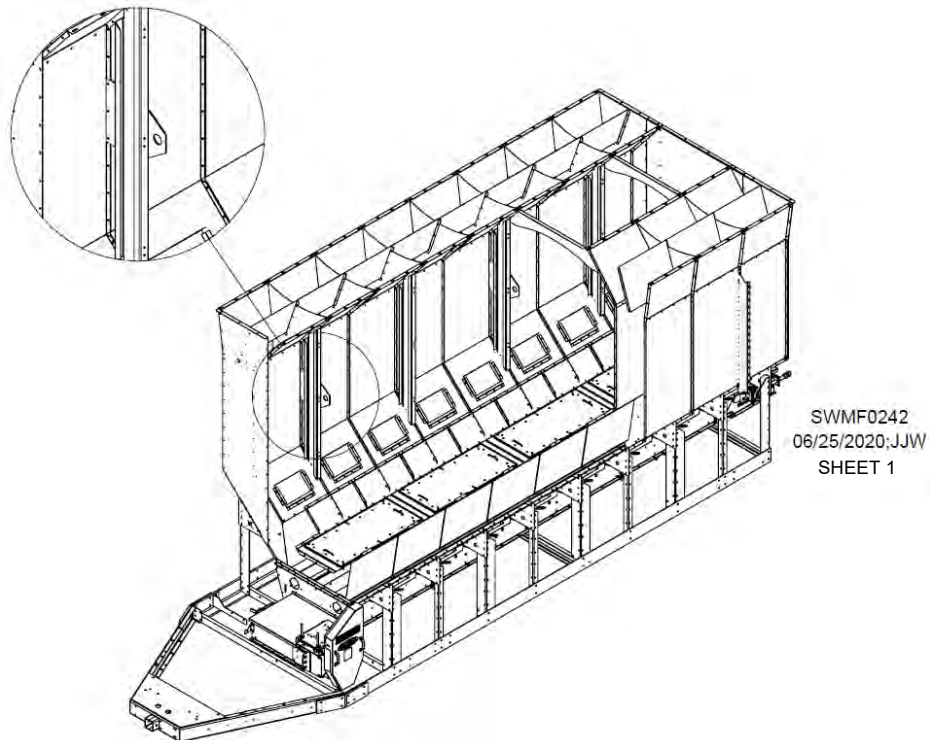


Fig. 2-21 – Lift brackets on 16' medium or tall cooling module

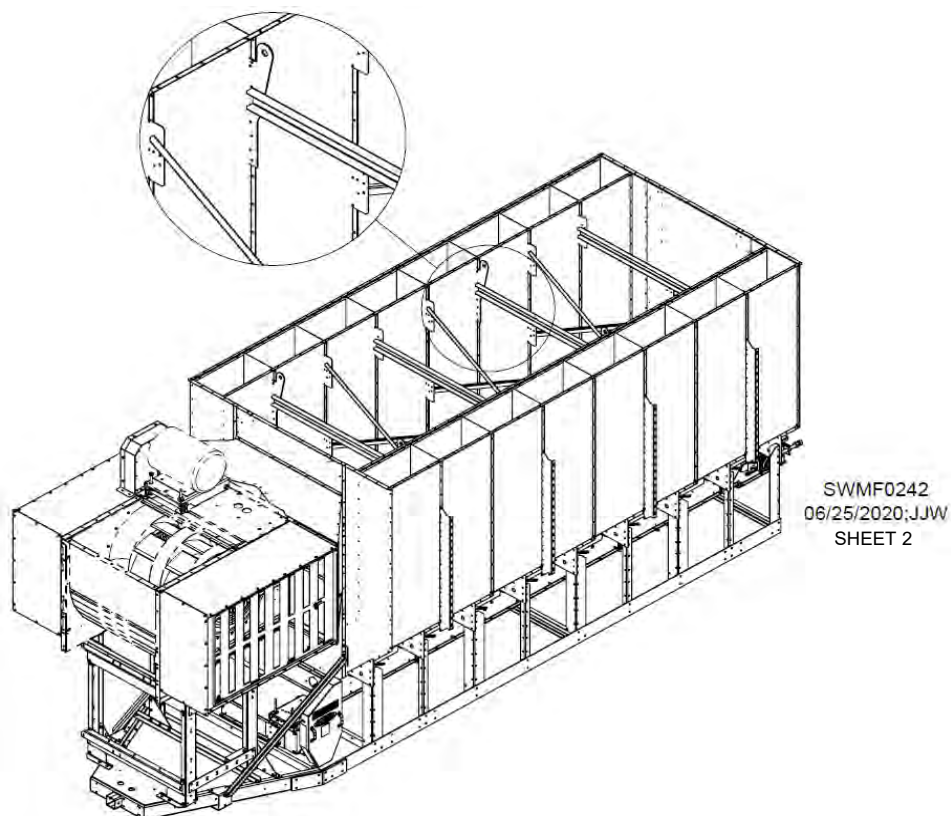


Fig. 2-22 – Lift brackets on 16' extra-tall cooling module

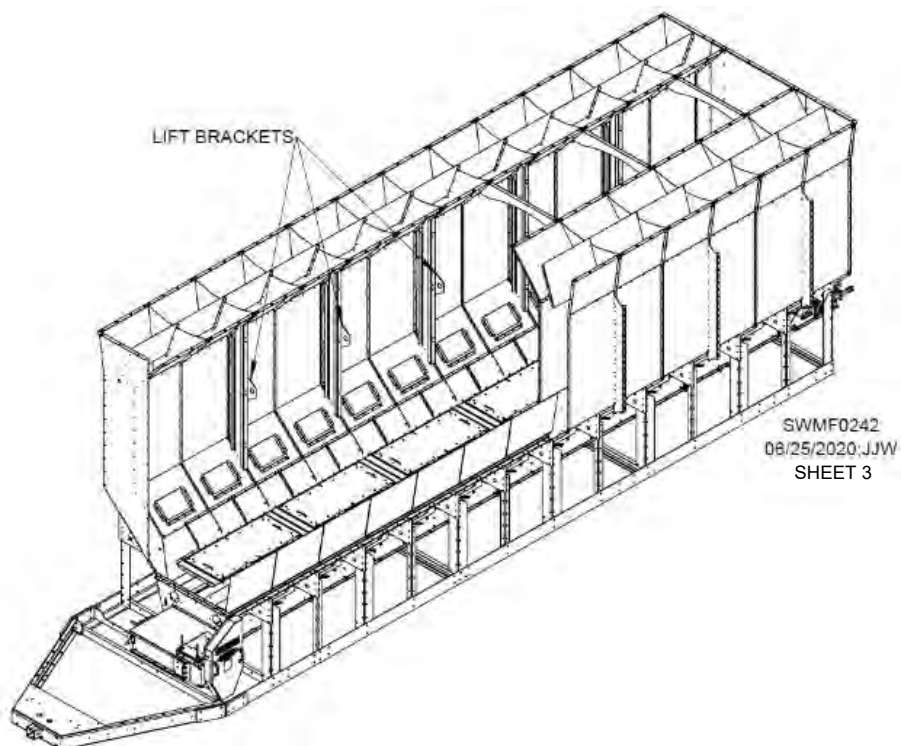


Fig. 2-23 – Lift brackets on 24' medium or tall cooling module

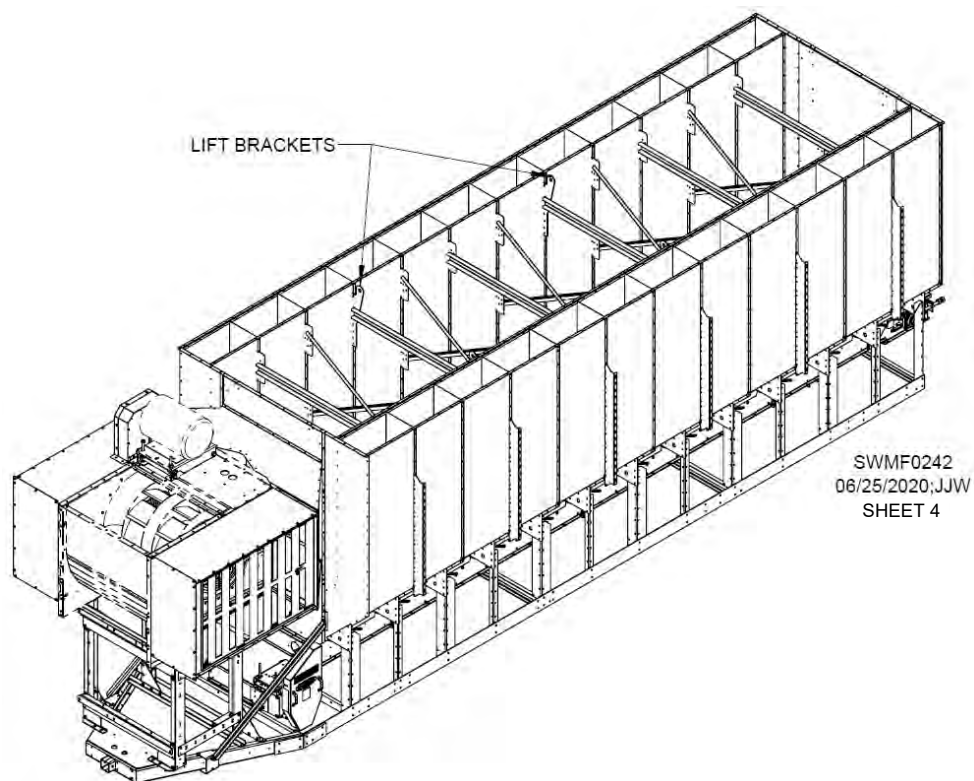


Fig. 2-24 – Lift brackets on 24' extra-tall cooling module

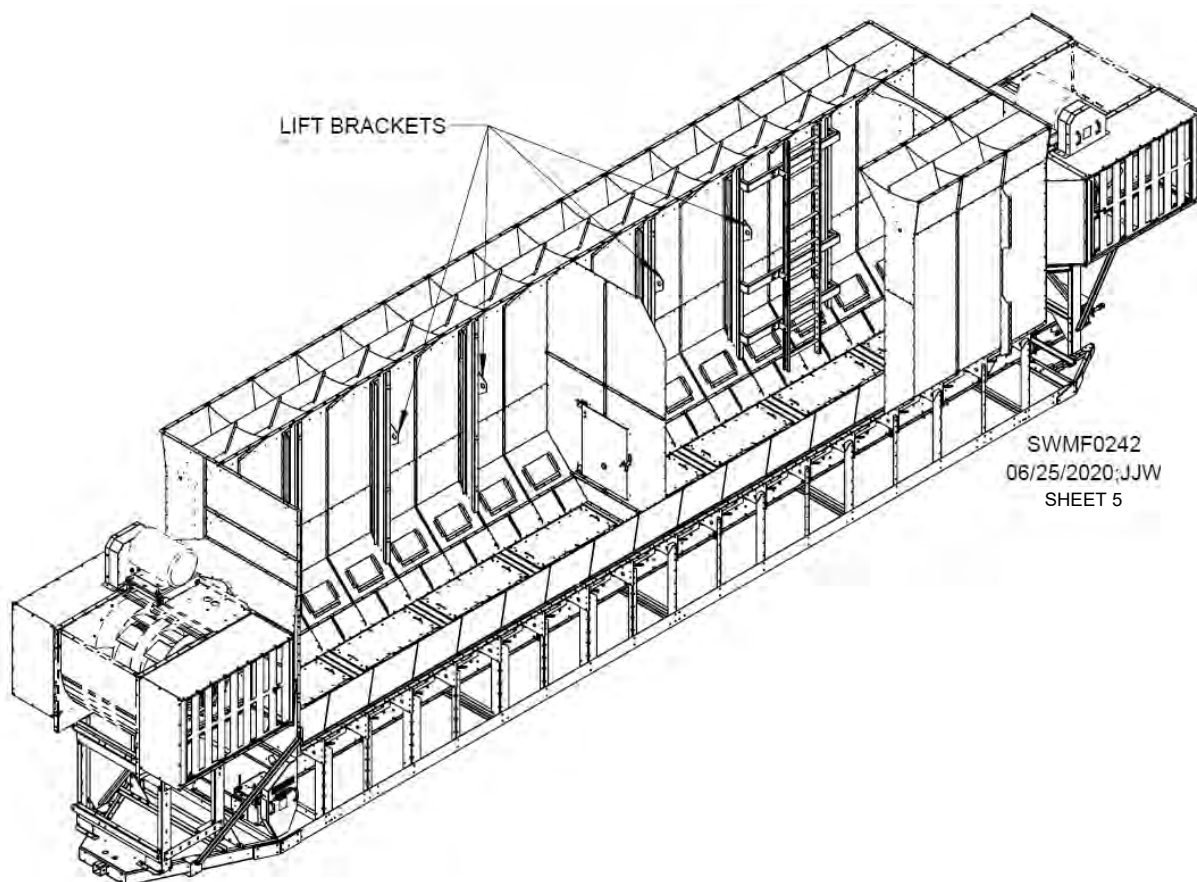


Fig. 2-25 – Lift brackets on 32' medium or tall cooling module

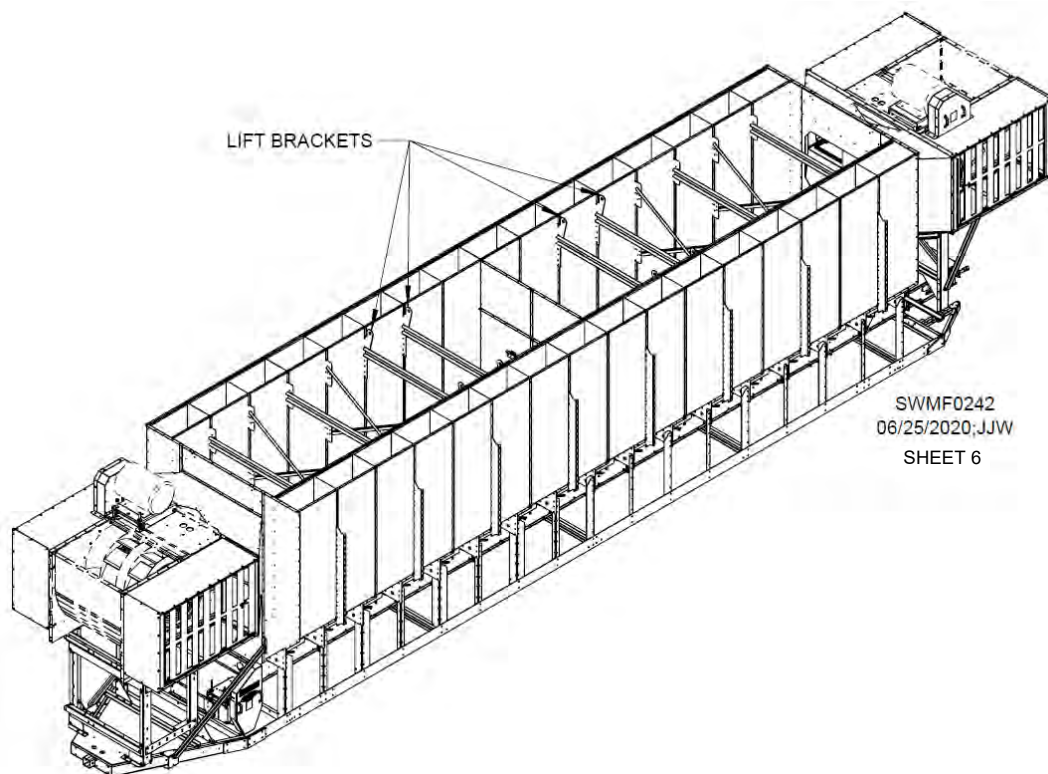


Fig. 2-26 – Lift brackets on 32' extra tall cooling module

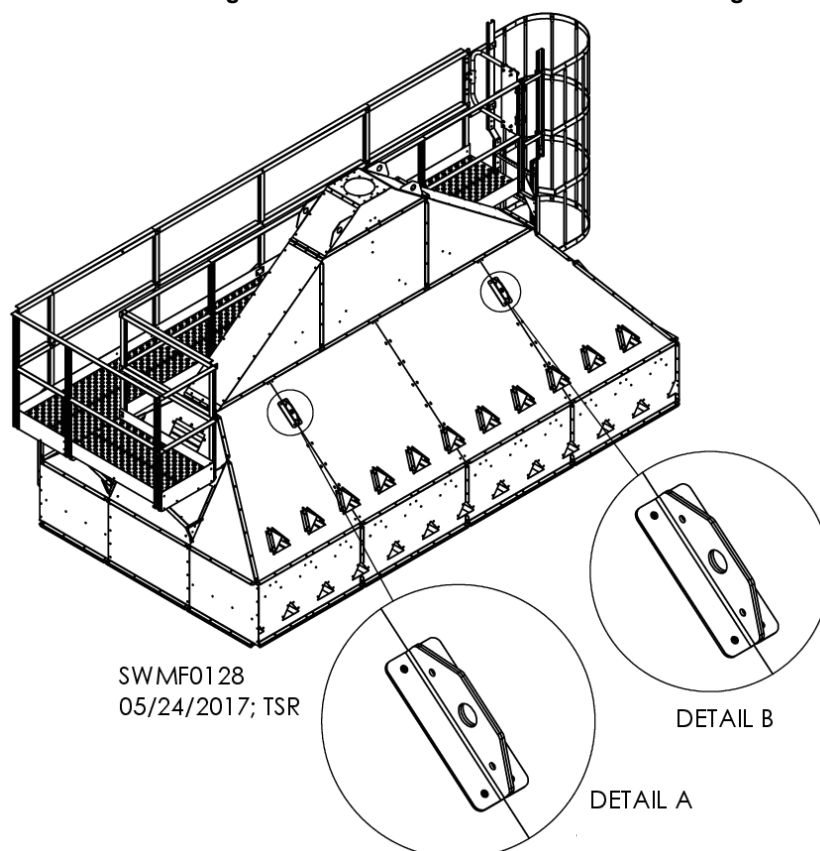


Fig. 2-27 – Lift brackets on roof module
(Locations are same for auger-fill dryers. Brackets are located 8' apart on centers.)



Image 2-4 – Lowering mixing tiers onto cooling section

See Assembly Instructions L19875 for installation of grain column temperature sensors (TM91320). **TIP:** Attach sensors before modules are lifted into place.

Lift first module of grain-mixing tiers onto cooling (base) section of dryer. See Image 2-4. Once in place, connect sections by bolting flanges together. Use punches as needed to align bolt holes.

Attach any additional tier modules in same manner, providing appropriate transition (air duct) and fan support. See Pages 2-27 and 2-28 for duct assembly. See Pages 2-29 to 2-37 for fan support and support structure attachment depending on dryer model.

See Pages 2-24 to 2-26 to assemble peak section, depending on dryer model. Attach peak section to roof module using 5/16" hardware before roof module is attached to top of dryer. See Image 2-5.



Image 2-5 – Attaching peak section to roof module

Use lift brackets provided to lift roof section. See Image 2-6. **DO NOT** lift roof module using brackets on peak section. Secure by bolting flanges together.

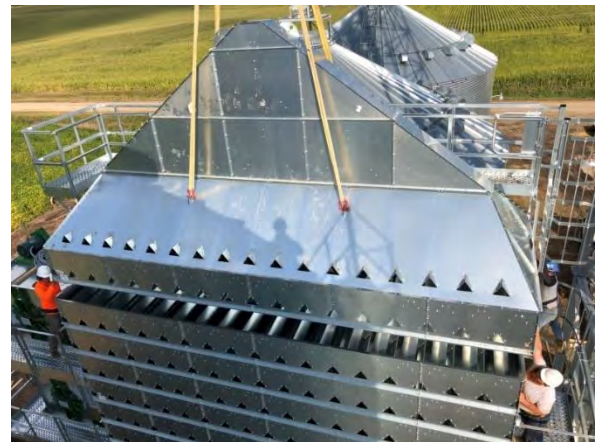
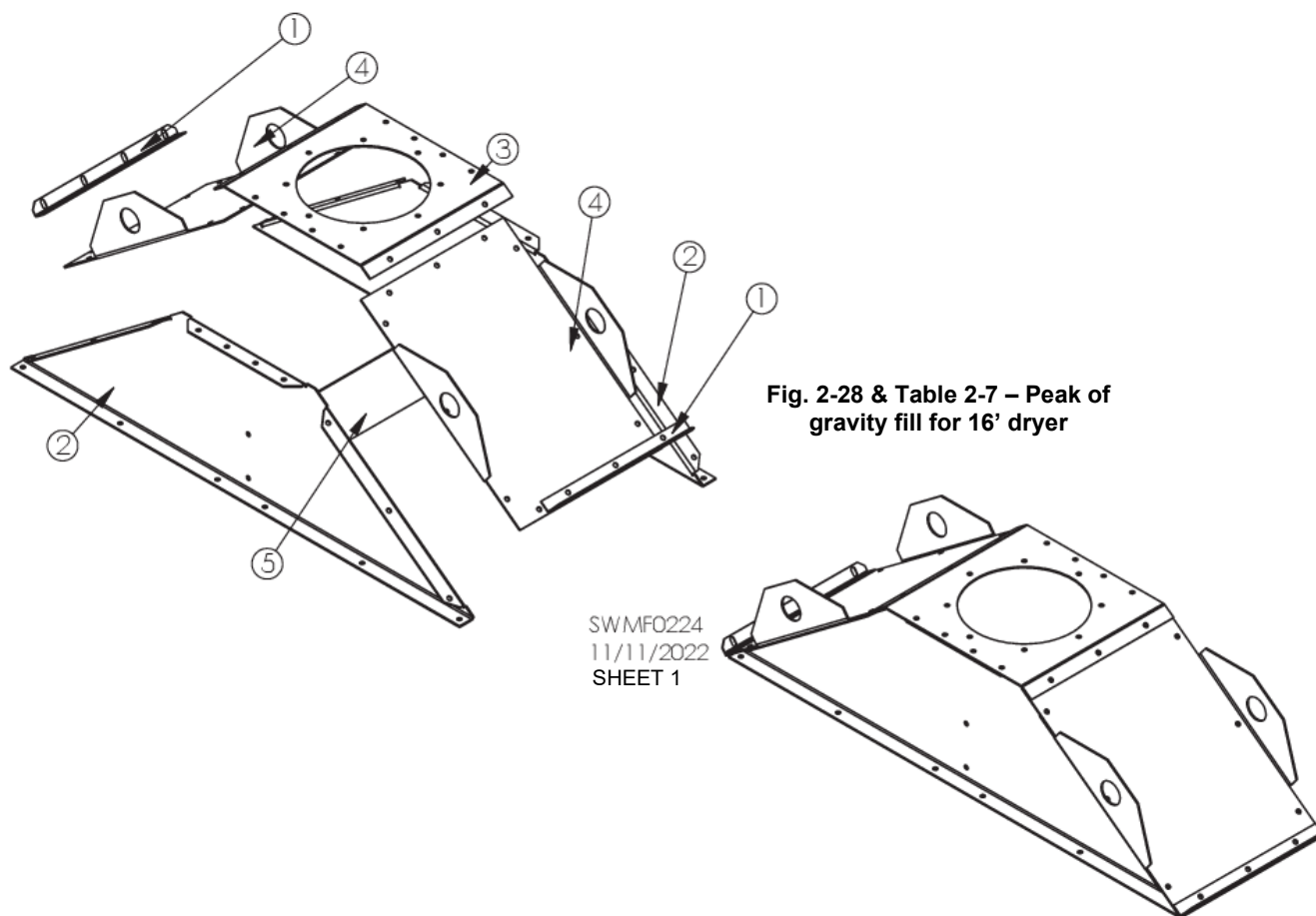


Image 2-6 – Attaching roof module

Assemble peak of gravity fill for 16' dryer as shown in Fig. 2-28 using 5/16" hardware.



REF. #	DESCRIPTION	QTY.	PART #
1	ANGLE, SPLICE, COVER, GRAV FILL	2	TM04065
2	SIDE, EXTENSION, INLET, GRAV FILL	2	TM04066
3	TOP, EXTENSION, INLET, GRAV VILL	1	TM04067
4	COVER, EXT, INLET, GRAV FILL	2	TM04068
5	BRACE, INTERIOR, GRAVITY FILL	1	TM04070

Assemble peak of gravity fill for 24' dryer as shown in Fig. 2-29 using 5/16" hardware.

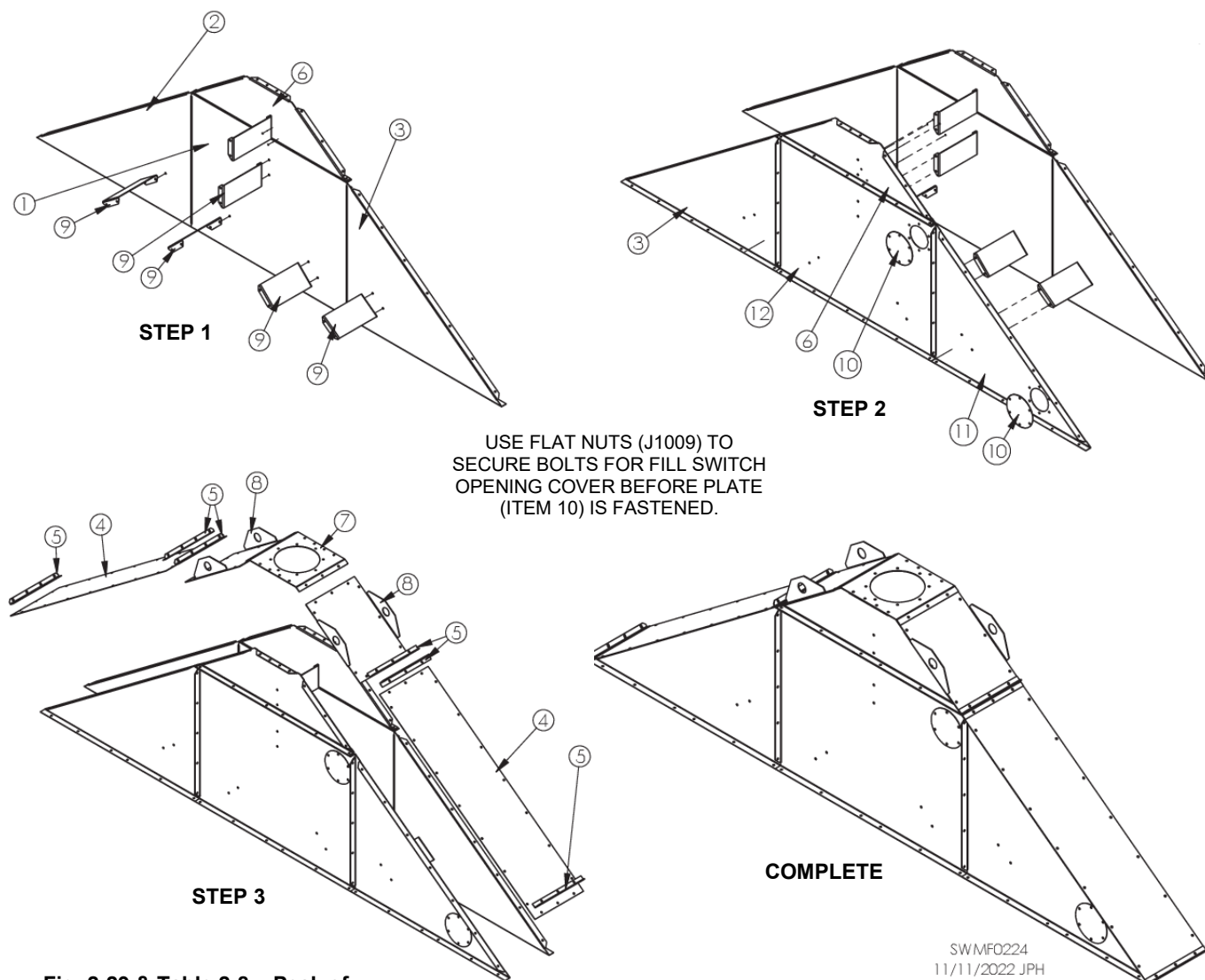


Fig. 2-29 & Table 2-8 – Peak of gravity fill for 24' dryer

REF. #	DESCRIPTION	QTY.	PART #
1	SIDEWALL, CENTER, GRAV FILL	1	TM04060
2	SIDEWALL, SIDE, RIGHT, GRAV FILL	1	TM04061
3	SIDEWALL, SIDE, LEFT, GRAV FILL	2	TM04062
4	COVER, SIDE, FULL, GRAV FILL	2	TM04063
5	ANGLE, SPLICE, COVER, GRAV FILL	6	TM04065
6	SIDE, EXTENSION, INLET, GRAV FILL	2	TM04066
7	TOP, EXTENSION, INLET, GRAV FILL	1	TM04067
8	COVER, EXT, INLET, GRAV FILL	2	TM04068
9	BRACE, INTERIOR, GRAV FILL	6	TM04070
10	COVER, OPENING, SWITCH, FILL	2	TM04074
11	SIDEWALL, GRAV FILL, RT, SNSR	1	TM04088
12	SIDEWALL, CENTER, GRAVITY FILL	1	TM04099

Assemble peak of gravity fill for 32' dryer as shown in Fig. 2-30 using 5/16" hardware.

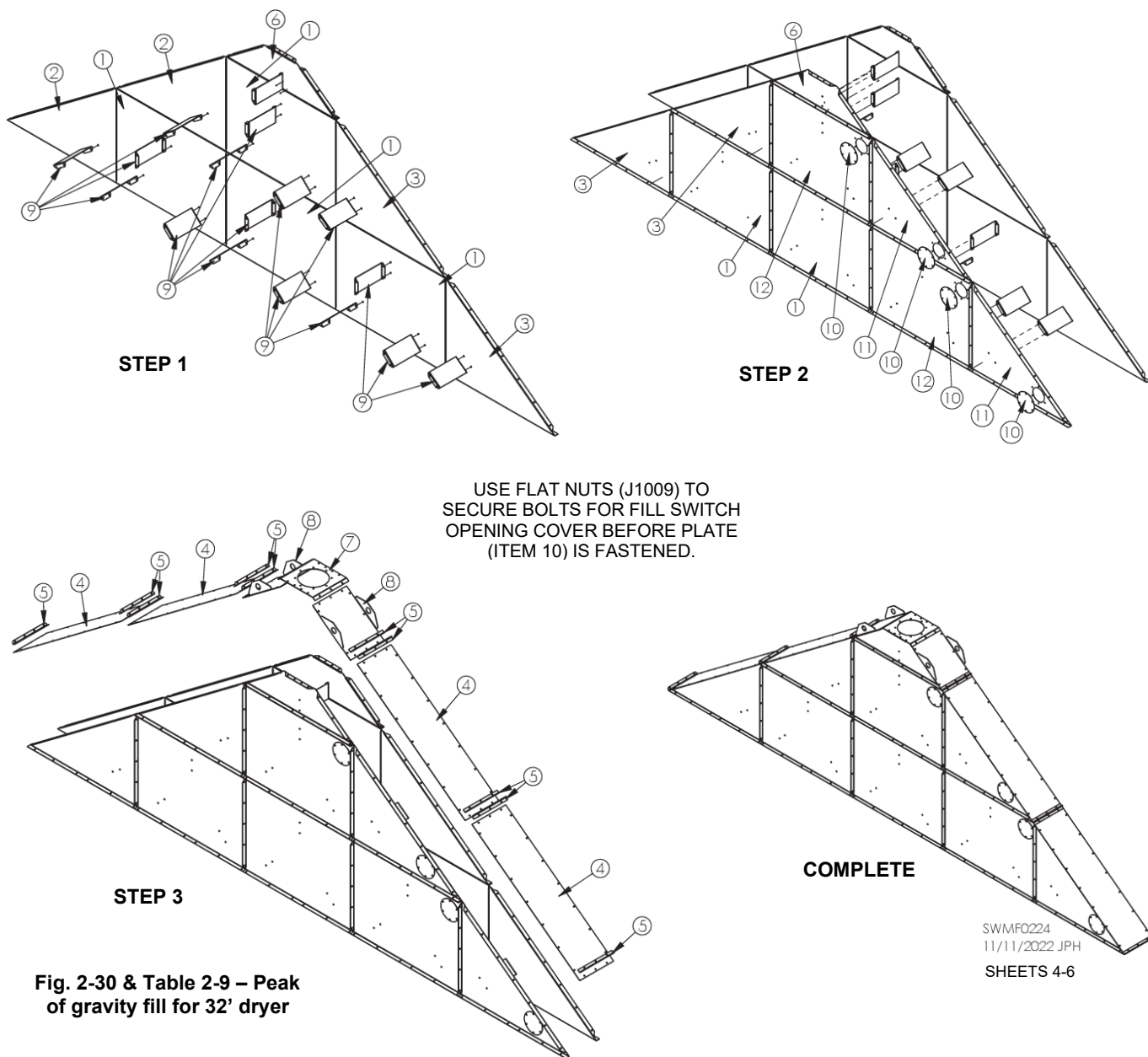
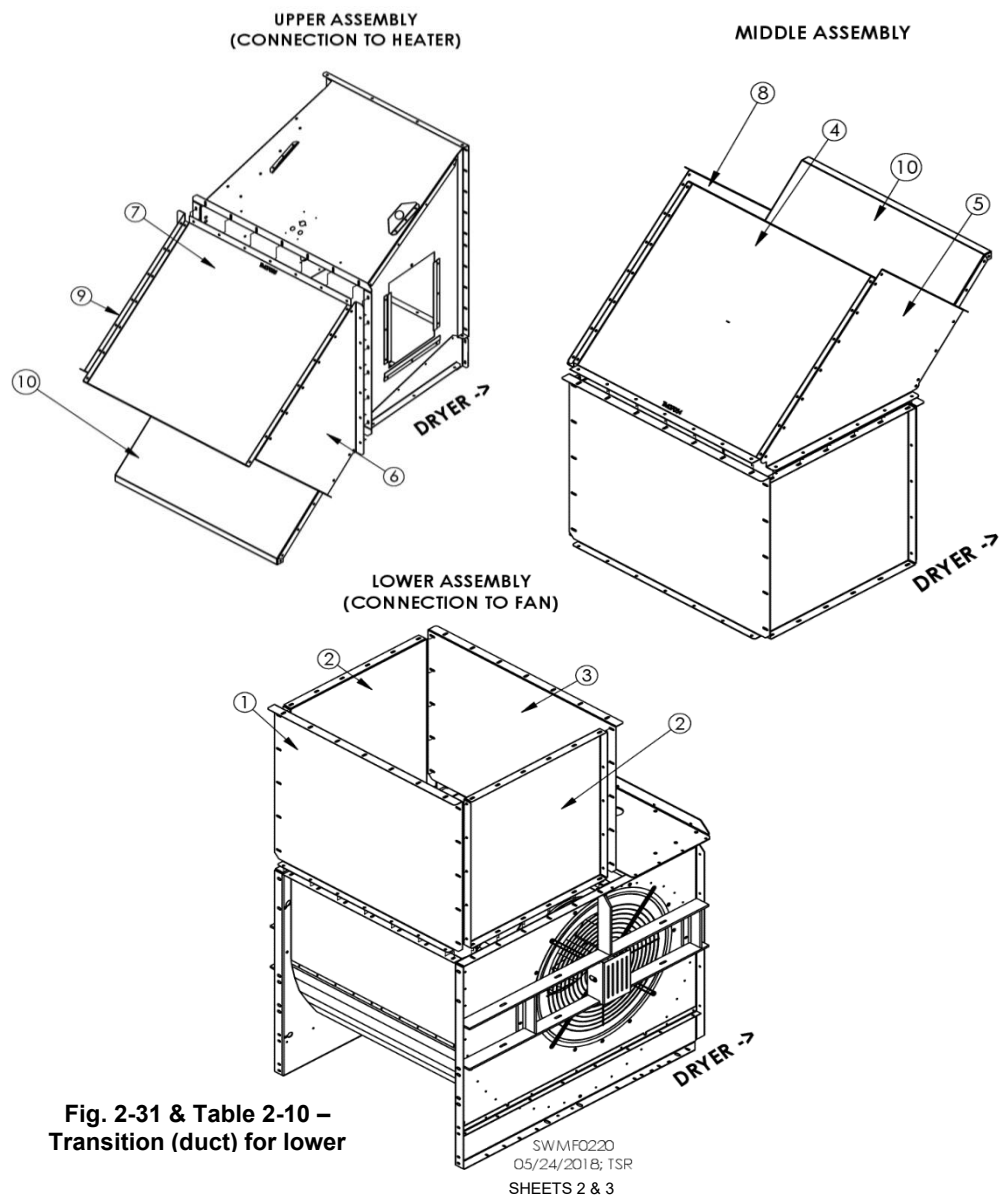


Fig. 2-30 & Table 2-9 – Peak of gravity fill for 32' dryer

REF. #	DESCRIPTION	QTY.	PART #
1	SIDEWALL, CENTER, GRAV FILL	6	TM04060
2	SIDEWALL, SIDE, RIGHT, GRAV FILL	2	TM04061
3	SIDEWALL, SIDE, LEFT, GRAV FILL	4	TM04062
4	COVER, SIDE, FULL, GRAV FILL	4	TM04063
5	ANGLE, SPLICE, COVER, GRAV FILL	10	TM04065
6	SIDE, EXTENSION, INLET, GRAV FILL	2	TM04066
7	TOP, EXTENSION, INLET, GRAV FILL	1	TM04067
8	COVER, EXT, INLET, GRAV FILL	2	TM04068
9	BRACE, INTERIOR, GRAV FILL	17	TM04070
10	COVER, OPENING, SWITCH, FILL	4	TM04074
11	SIDEWALL, GRAV FILL, RT, SNSR	2	TM04088
12	SIDEWALL, CENTER, GRAVITY FILL	2	TM04099

Attach transition (air duct) pieces to lower fan as shown in Fig. 31. See next page if installing on extra-tall cooling section.



REF. #	DESCRIPTION	QTY.	PART #
1	PLATE, TOP, FAN TRANS.	1	TM07041
2	PLATE, SIDE, FAN TRANS.	2	TM07042
3	PLATE, BOTTOM, FAN TRANS.	1	TM07043
4	MID PLATE, HEATER TRANS.	1	TM07034
5	PLATE, SIDE, LOWER, RT	1	TM07038
6	PLATE, SIDE, UPPER, RT	1	TM07037
7	TOP PLATE, HEATER TRANS.	1	TM07035
8	PLATE, SIDE, LOWER, LT	1	TM07040
9	PLATE, SIDE, UPPER, LT	1	TM07039
10	PLATE, BTM, FAN TRANS.	1	TM07036

If dryer has extra tall cooling section, attach spacer pieces first as shown in Fig. 2-32, then attach lower fan transition pieces.

TRANSITION SPACER ASSEMBLY (EXTRA TALL COOLING SECTION)

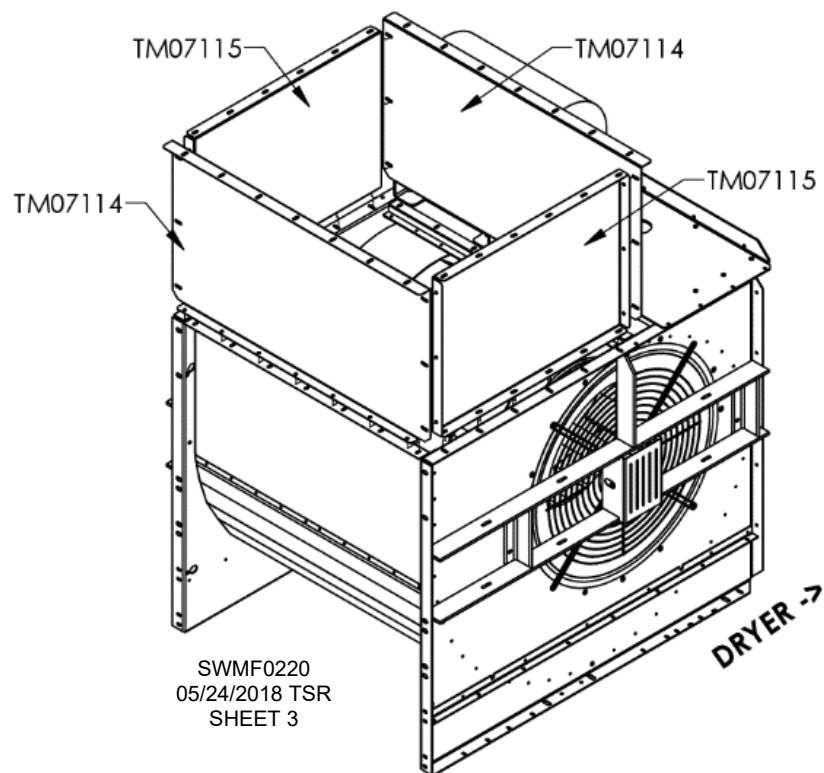
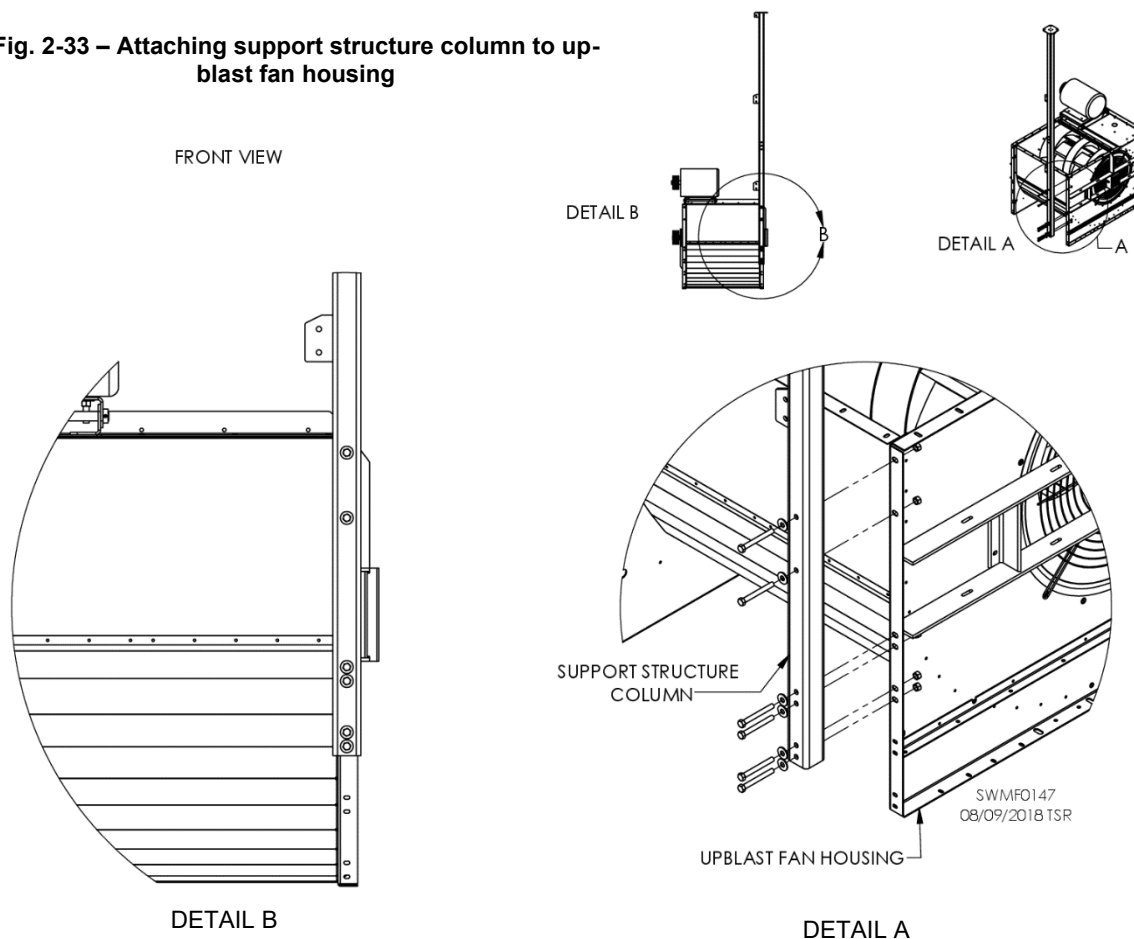


Fig. 2-32 – Transition (duct) spacer for lower fan

Support Structure Attachment

See Fig. 2-33 for attachment of support structure column to up-blast fan housing. Attach using 1/2" hardware supplied in support structure hardware box.

Fig. 2-33 – Attaching support structure column to up-blast fan housing



See Fig. 2-34 for attachment of support structure for Size 27 or Size 30 fan on 16', 24' or 32' dryer. Find hardware in carton supplied with support structure. Start by attaching bracket TM06352 (Size 27) or TM06351 (Size 30) to structure as shown in Detail A. Attach bracket assembly to fan as shown in Detail B after fan module has been attached to base module.

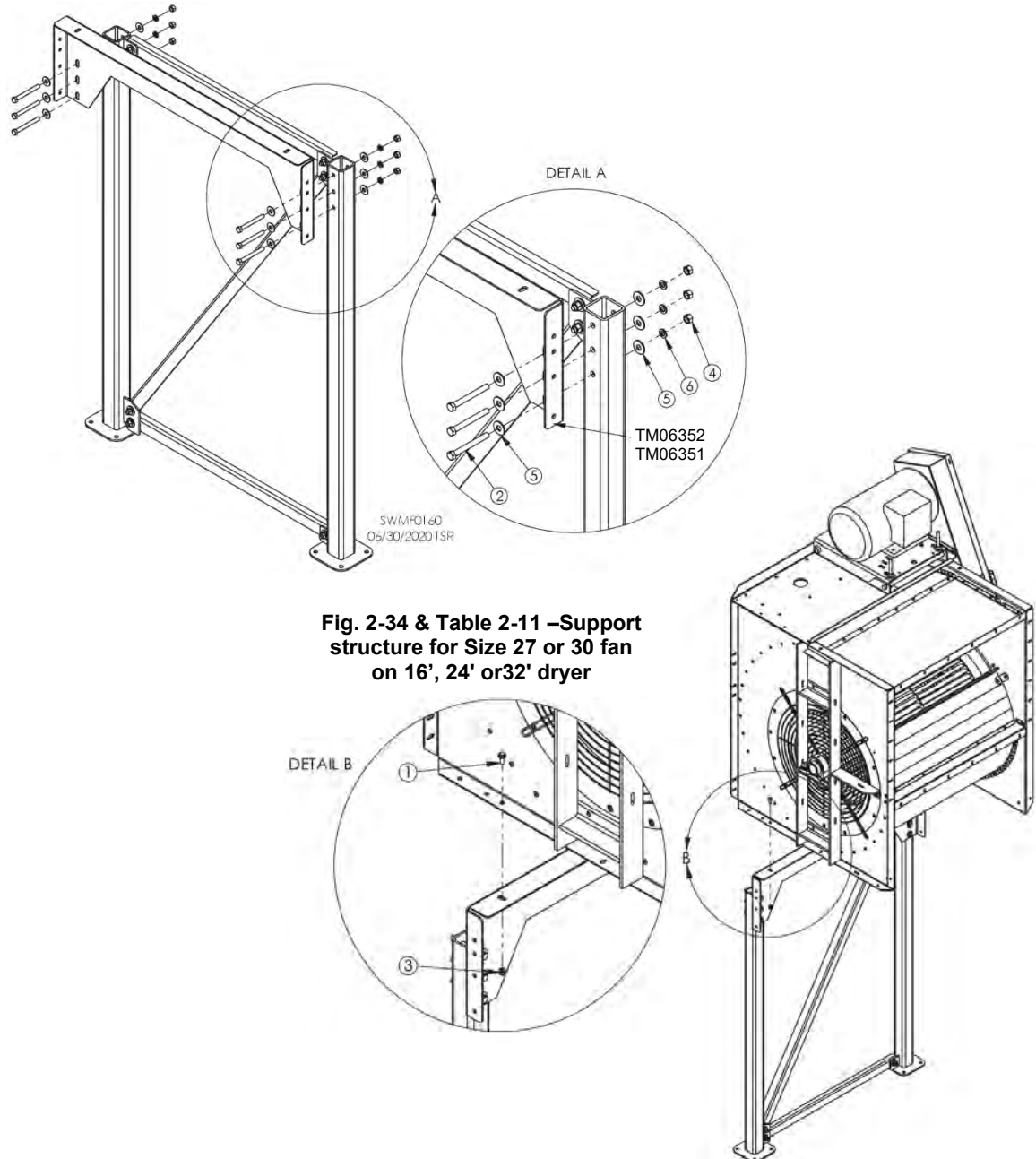


Fig. 2-34 & Table 2-11 –Support structure for Size 27 or 30 fan on 16', 24' or 32' dryer

REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 3/8-16, 1.00, GR8, HHWZ	2	J0611
2	SCREW, 1/2-13, 4 1/2, GR5, HHCS	6	J0758
3	NUT, 3/8-16 FLANGE WHIZLOK	2	J1017
4	NUT, HEX, 1/2-13, PLT	6	J1040
5	WASHER, FLAT, 1/2	12	J1125
6	WASHER, LOCK, 1/2, PLT	6	J1215
	BRACKET, STRCTR TO FAN, SIZE 27	1	TM06352
	BRACKET, STRCTR TO FAN, SIZE 30	1	TM06351

See Fig. 2-35 for attachment of bracing to support structure and to dryer. Brackets TM06370 are attached to dryer at factory. Find hardware in carton MF-FANSPT-HDWR supplied with support structure.

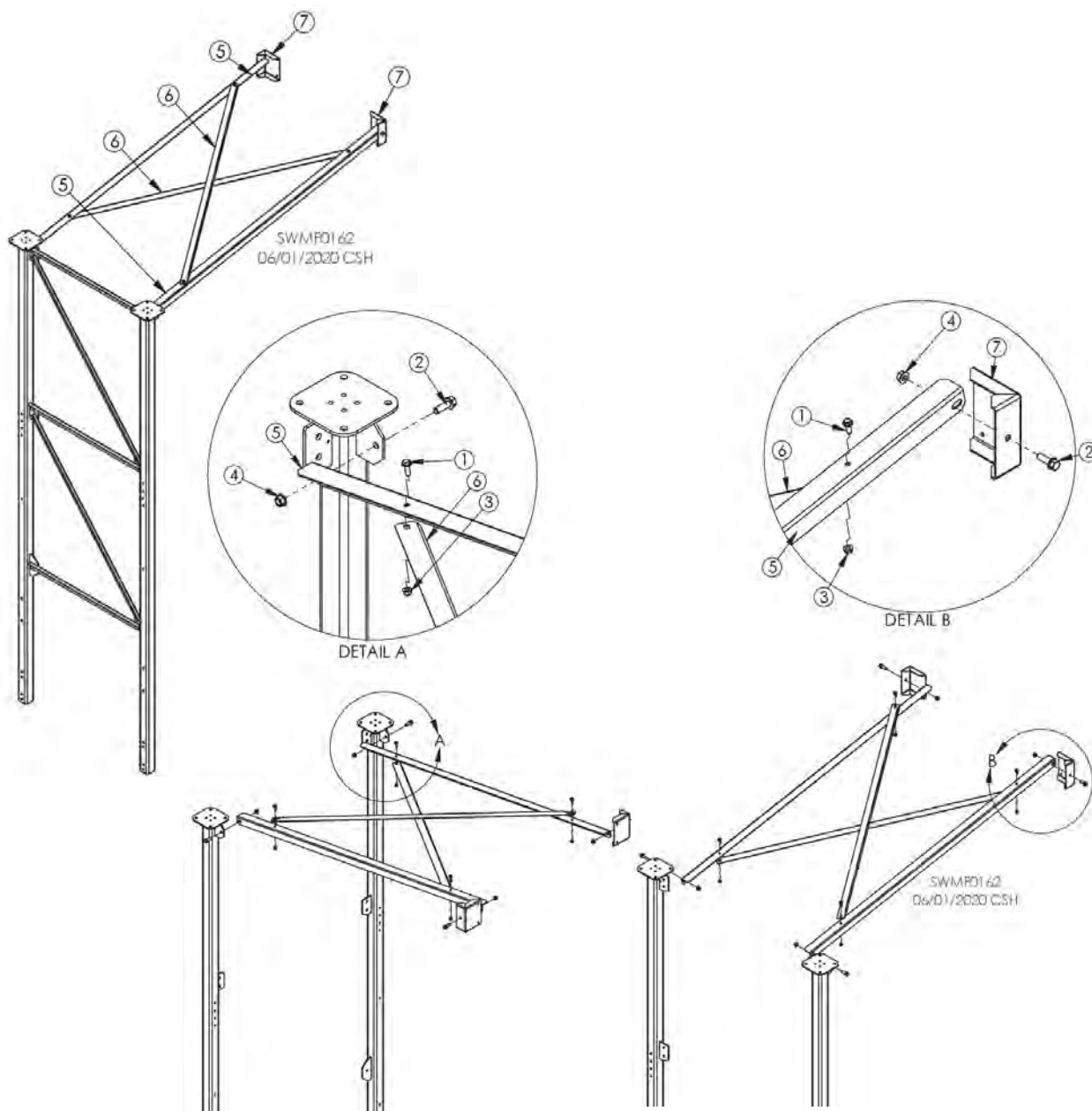


Fig. 2-35 & Table 2-12 – Attaching bracing to support structure & dryer

REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 3/8-16, 1.00, GR8, HHWZ	4	J0611
2	SCREW, 1/2-13, 1.50, PLT, GR5, HHWZ	4	J07302
3	NUT, 3/8-16 FLANGE WHIZLOK	4	J1017
4	NUT, 1/2-13, PLT, GR5, FLANGE	4	J10401
5	BRACE, STRCTR TO DRYER, 84.75"	2	TM06349
6	BRACE, CROSS, STRCTR TO DRYER, 75"	2	TM06350
7	BRACKET, SPPRT, STRCTR TO DRYER	2	TM06370

Fan Support Structures

Tables 2-13 to 2-15 identify fan support structure used for each dryer model.

Standard Dryer Fan Support Structures

SWMF0150
06/23/2021 RPE

DRYER MODEL	STANDARD STRUCTURE	DRYER MODEL	STANDARD STRUCTURE	DRYER MODEL	STANDARD STRUCTURE (FRONT)	STANDARD STRUCTURE (REAR)
TM1606	N/A	TM2405	N/A	TM3209	TM06291	TM06291
TM1608	TM06291	TM2406	N/A	TM3210	TM06293	TM06291
TM1609	TM06291	TM2409	TM06292	TM3212	TM06296	TM06291
TM1610	TM06293	TM2410	TM06293	TM3213	TM06289	TM06291
TM1612	TM06296	TM2413	TM06293	TM3214	TM06294	TM06291
TM1613	TM06289	TM2414	TM06294	TM3216	TM06297	TM06299
TM1614	TM06294	TM2418	TM06295	TM3217	TM06298	TM06299
TM1616	TM06297					
TM1617	TM06298					

N/A – NOT APPLICABLE

Expandable Dryer Fan Support Structures

DRYER MODEL	EXPANDABLE STRUCTURE	DRYER MODEL	EXPANDABLE STRUCTURE	DRYER MODEL	EXPANDABLE STRUCTURE (FRONT)	EXPANDABLE STRUCTURE (REAR)
TM1606	TM06293	TM2405	TM06292	TM3209	TM06291	TM06291
TM1608	TM06291	TM2406	TM06293	TM3210	TM06294	TM06291
TM1609	TM06291	TM2409	TM06293	TM3212	TM06297	TM06299
TM1610	TM06294	TM2410	TM06294	TM3213	TM06298	TM06299
TM1612	TM06297	TM2413	N/E	TM3214	N/E	N/E
TM1613	TM06298	TM2414	TM06295	TM3216	N/E	N/E
TM1614	N/E	TM2418	N/E	TM3217	N/E	N/E
TM1616	N/E					
TM1617	N/E					

N/E – NOT EXPANDABLE

8T Expandable Dryer Fan Support Structures

DRYER MODEL	EXPANDABLE STRUCTURE	DRYER MODEL	EXPANDABLE STRUCTURE	DRYER MODEL	EXPANDABLE STRUCTURE (FRONT)	EXPANDABLE STRUCTURE (REAR)
TM1606	TM06291	TM2405	TM06293	TM3209	TM06299	TM06299
TM1608	TM06299	TM2406	TM06291	TM3210	N/E	N/E
TM1609	TM06299	TM2409	N/E	TM3212	N/E	N/E
TM1610	N/E	TM2410	TM06295	TM3213	N/E	N/E
TM1612	N/E	TM2413	N/E	TM3214	N/E	N/E
TM1613	N/E	TM2414	N/E	TM3216	N/E	N/E
TM1614	N/E	TM2418	N/E	TM3217	N/E	N/E
TM1616	N/E					
TM1617	N/E					

N/E – NOT EXPANDABLE

See Figs. 2-36 through 2-45 for assembly of support structures.

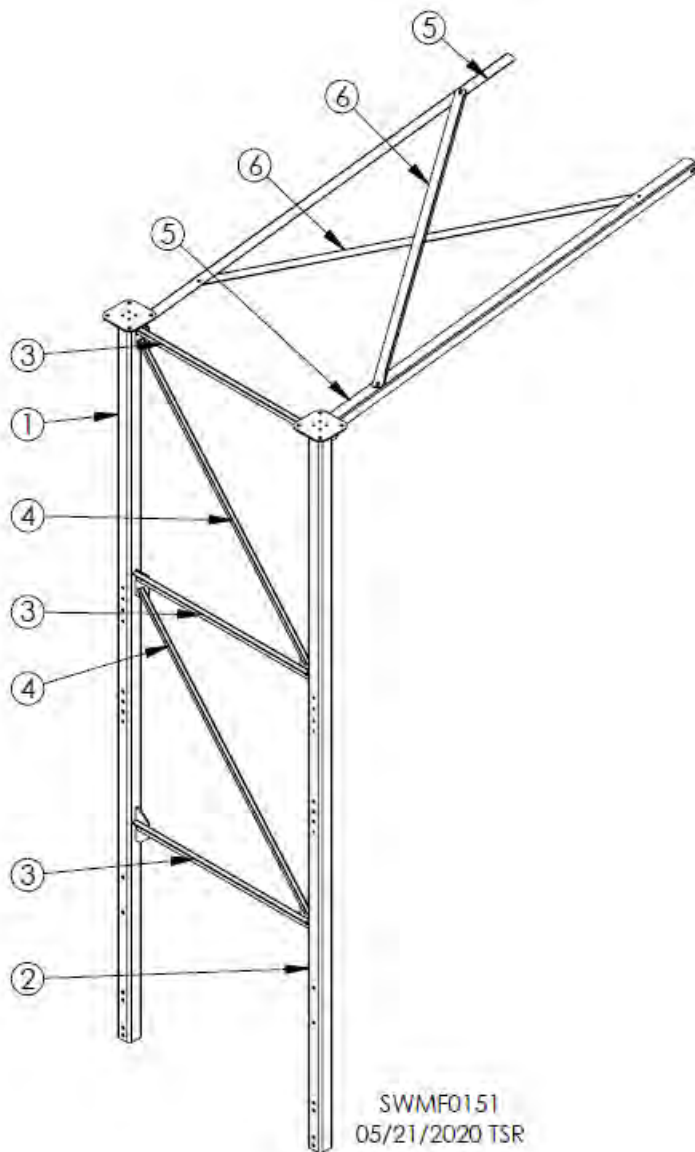


Fig. 2-36 & Table 2-16 – TM06291 (12' base)

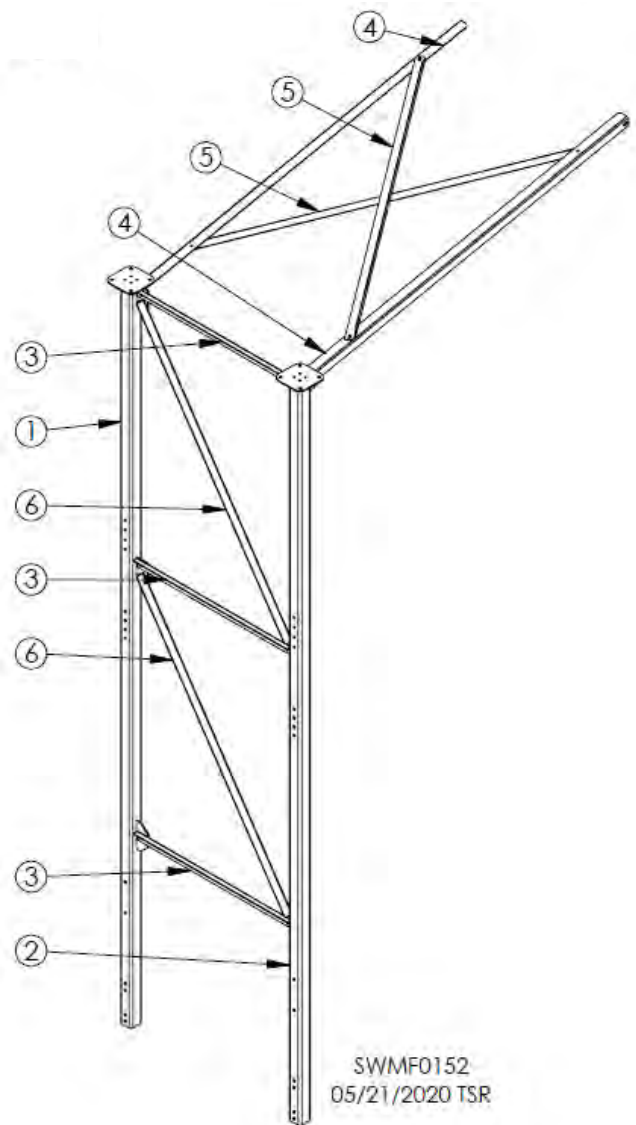


Fig. 2-37 & Table 2-17 – TM06299 (14' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 12' WELDMENT	1	TM06318
2	COLUMN, LT, SPPRT, 12' WELDMENT	1	TM06319
3	BRACE, SPPRT, HORZ, STRCTR, 40"	3	TM06330
4	BRACE, SPPRT, DIAG, STRCTR, 59.7"	2	TM06345
5	BRACE, STRCTR TO DRYR, 84.75"	2	TM06349
6	BRACE, CROSS, STRCTR TO DRYR, 75"	2	TM06350

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 14' WELDMENT	1	TM06326
2	COLUMN, LT, SPPRT, 14' WELDMENT	1	TM06327
3	BRACE, SPPRT, HORZ, STRCTR, 40"	3	TM06330
4	BRACE, STRCTR TO DRYR, 84.75"	2	TM06349
5	BRACE, CROSS, STRCTR TO DRYR, 75"	2	TM06350
6	BRACE, SPPRT, DIAG, STRCTR, 69.5"	2	TM06354

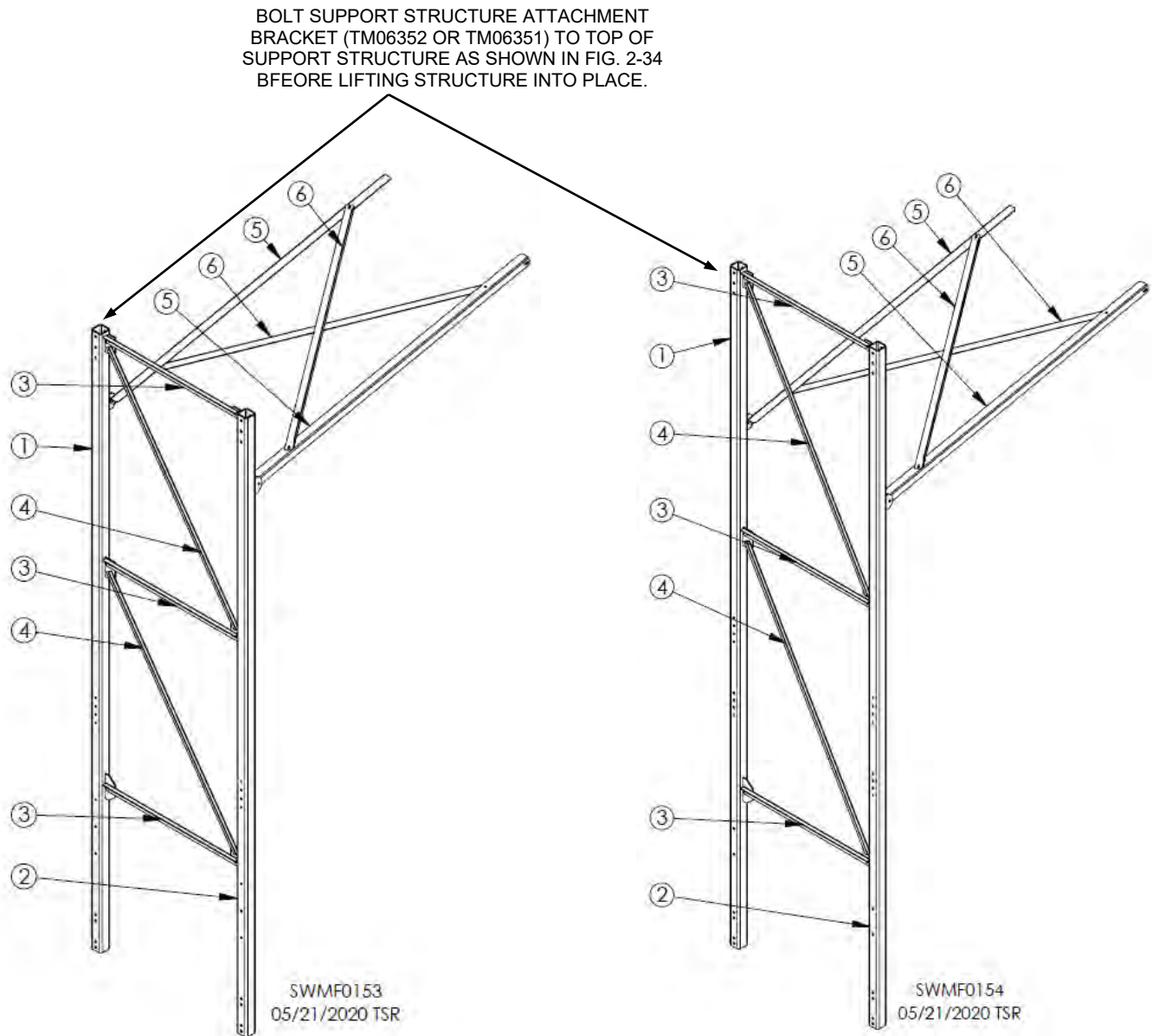


Fig. 2-38 & Table 2-18 – TM06292 (13-1/2' base)

Fig. 2-39 & Table 2-19 – TM06293 (15-1/2' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 13.5' WELDMENT	1	TM06322
2	COLUMN, LT, SPPRT, 13.5' WELDMENT	1	TM06323
3	BRACE, SPPRT, HORZ, STRCTR, 40"	3	TM06330
4	BRACE, SPPRT, DIAG, STRCTR, 67"	2	TM06347
5	BRACE, STRCTR TO DRYR, 84.75"	2	TM06349
6	BRACE, CROSS, STRCTR TO DRYR, 75"	2	TM06350

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, 15.5' WELDMENT	1	TM06324
2	COLUMN, LT, 15.5' WELDMENT	1	TM06325
3	BRACE, SPPRT, HORZ, STRCTR, 40"	3	TM06330
4	BRACE, SPPRT, DIAG, STRCTR, 77"	2	TM06348
5	BRACE, STRCTR TO DRYR, 84.75"	2	TM06349
6	BRACE, CROSS, STRCTR TO DRYR, 75"	2	TM06350

BOLT SUPPORT STRUCTURE ATTACHMENT
BRACKET (TM06352 OR TM06351) TO TOP OF
SUPPORT STRUCTURE AS SHOWN IN FIG. 2-34
BEFORE LIFTING STRUCTURE INTO PLACE.

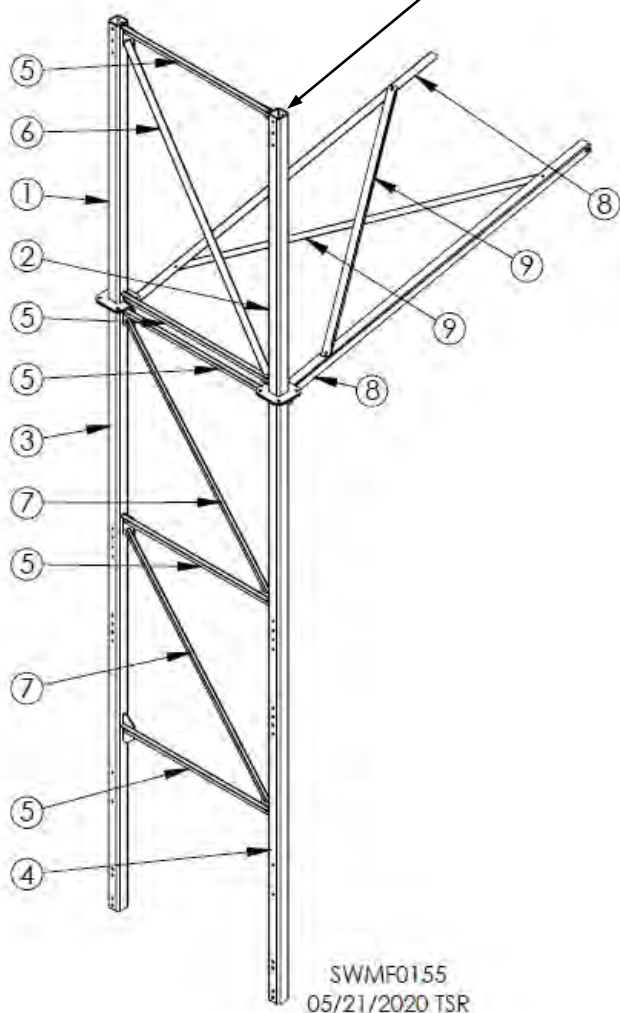


Fig. 2-40 & Table 2-20 – TM06294 (17-1/2' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 5.5', WELDMENT	1	TM06310
2	COLUMN, LT, SPPRT, 5.5', WELDMENT	1	TM06311
3	COLUMN, RT, SPPRT, 12', WELDMENT	1	TM06318
4	COLUMN, LT, SPPRT, 12', WELDMENT	1	TM06319
5	BRACE, SPPRT, HORZ, STRCTR, 40"	5	TM06330
6	BRACE, SPPRT, DIAG, STRCTR, 71"	1	TM06331
7	BRACE, SPPRT, DIAG, STRCTR, 59.7"	2	TM06345
8	BRACE, STRCTR TO DRYR, 84.75"	2	TM06349
9	BRACE, CROSS, STRCTR TO DRYR, 75"	2	TM06350

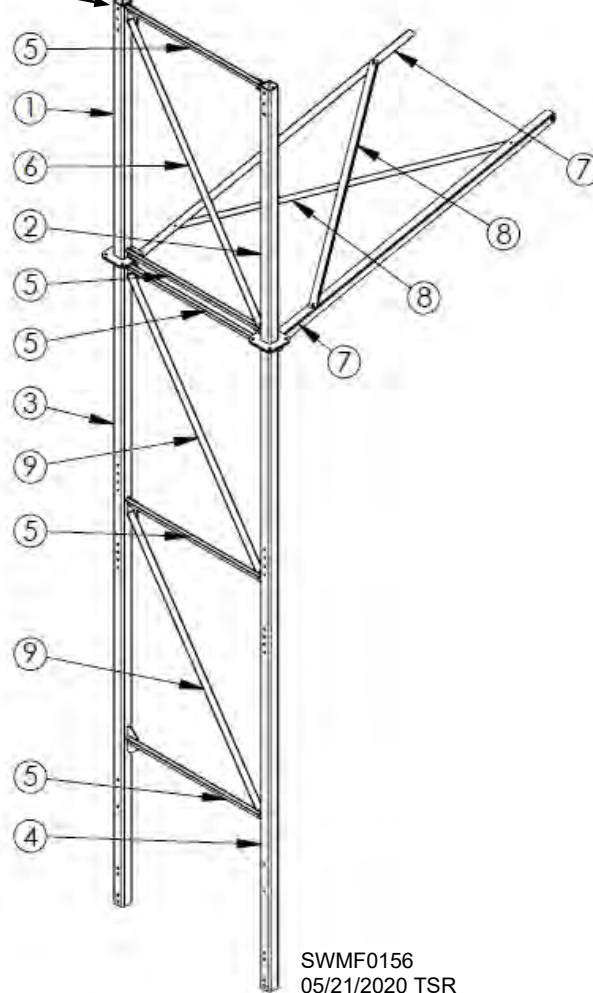


Fig. 2-41 & Table 2-21 – TM06295 (19-1/2' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 5.5', WELDMENT	1	TM06310
2	COLUMN, LT, SPPRT, 5.5', WELDMENT	1	TM06311
3	COLUMN, RT, SPPRT, 14', WELDMENT	1	TM06326
4	COLUMN, LT, SPPRT, 14', WELDMENT	1	TM06327
5	BRACE, SPPRT, HORZ, STRCTR, 40"	5	TM06330
6	BRACE, SPPRT, DIAG, STRCTR, 71"	1	TM06331
7	BRACE, SPPRT, DIAG, STRCTR, 84.75"	2	TM06349
8	BRACE, STRCTR TO DRYR, 75"	2	TM06350
9	BRACE, CROSS, STRCTR TO DRYR, 69.5"	2	TM06354

BOLT SUPPORT STRUCTURE ATTACHMENT
BRACKET (TM06352 OR TM06351) TO TOP OF
SUPPORT STRUCTURE AS SHOWN IN FIG. 2-34
BEFORE LIFTING STRUCTURE INTO PLACE.

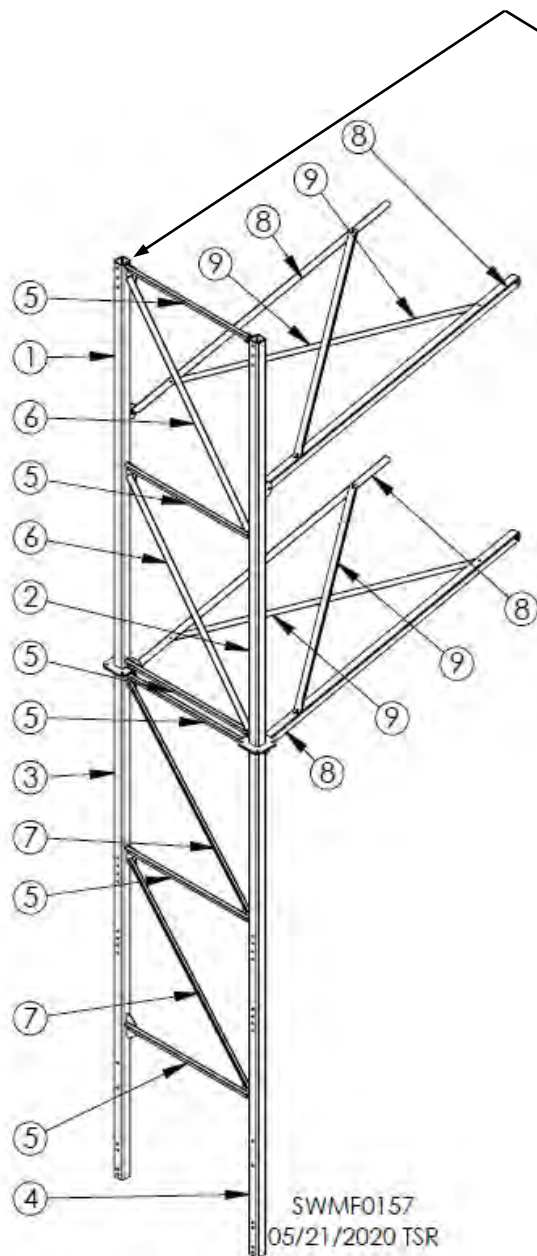


Fig. 2-42 & Table 2-22 –
TM06296 (21-1/2' base)

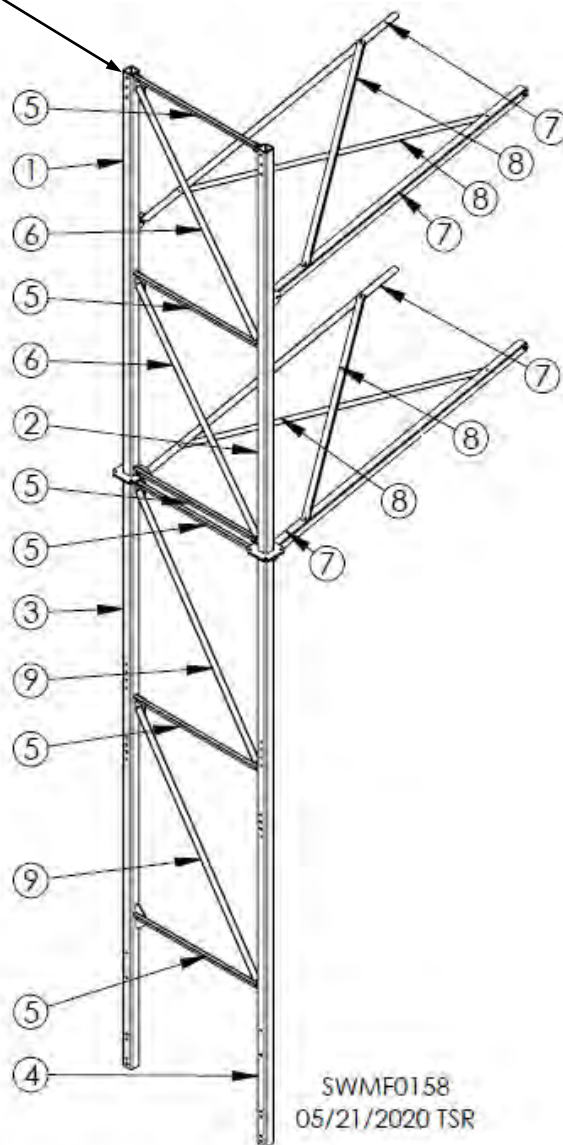


Fig. 2-43 & Table 2-23 –
TM06297 (23-1/2' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 9.5', WELDMENT	1	TM06314
2	COLUMN, LT, SPPRT, 9.5', WELDMENT	1	TM06315
3	COLUMN, RT, SPPRT, 12', WELDMENT	1	TM06318
4	COLUMN, LT, SPPRT, 12', WELDMENT	1	TM06319
5	BRACE, SPPRT, HORZ, STRCTR, 40"	6	TM06330
6	BRACE, SPPRT, DIAG, STRCTR, 65"	2	TM06343
7	BRACE, SPPRT, DIAG, STRCTR, 59.7"	2	TM06345
8	BRACE, STRCTR TO DRYR, 84.75"	4	TM06349
9	BRACE, CROSS, STRCTR TO DRYR, 75"	4	TM06350

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 9.5', WELDMENT	1	TM06314
2	COLUMN, LT, SPPRT, 9.5', WELDMENT	1	TM06315
3	COLUMN, RT, SPPRT, 14', WELDMENT	1	TM06326
4	COLUMN, LT, SPPRT, 14', WELDMENT	1	TM06327
5	BRACE, SPPRT, HORZ, STRCTR, 40"	6	TM06330
6	BRACE, SPPRT, DIAG, STRCTR, 65"	2	TM06343
7	BRACE, STRCTR TO DRYR, 84.75"	4	TM06349
8	BRACE, CROSS, STRCTR TO DRYR, 75"	4	TM06350
9	BRACE, SPPRT, DIAG, STRCTR, 69.5"	2	TM06354

BOLT SUPPORT STRUCTURE ATTACHMENT
BRACKET (TM06352 OR TM06351) TO TOP OF
SUPPORT STRUCTURE AS SHOWN IN FIG. 2-34
BEFORE LIFTING STRUCTURE INTO PLACE.

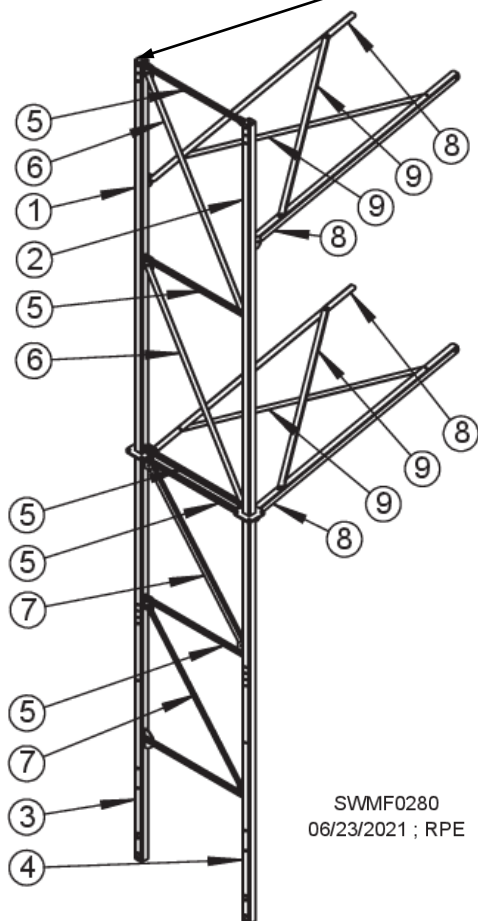


Fig. 2-44 & Table 2-24 –
TM06289 (23-1/2' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 11.5', WELDMENT	1	TM06316
2	COLUMN, LT, SPPRT, 11.5', WELDMENT	1	TM06317
3	COLUMN, RT, SPPRT, 12', WELDMENT	1	TM06318
4	COLUMN, LT, SPPRT, 12', WELDMENT	1	TM06319
5	BRACE, SPPRT, HORZ, STRCTR, 40"	6	TM06330
6	BRACE, SPPRT, DIAG, STRCTR, 74.5"	2	TM06344
7	BRACE, SPPRT, DIAG, STRCTR, 59.7"	2	TM06345
8	BRACE, STRCTR TO DRYR, 84.75"	4	TM06349
9	BRACE, CROSS, STRCTR TO DRYR, 75"	4	TM06350

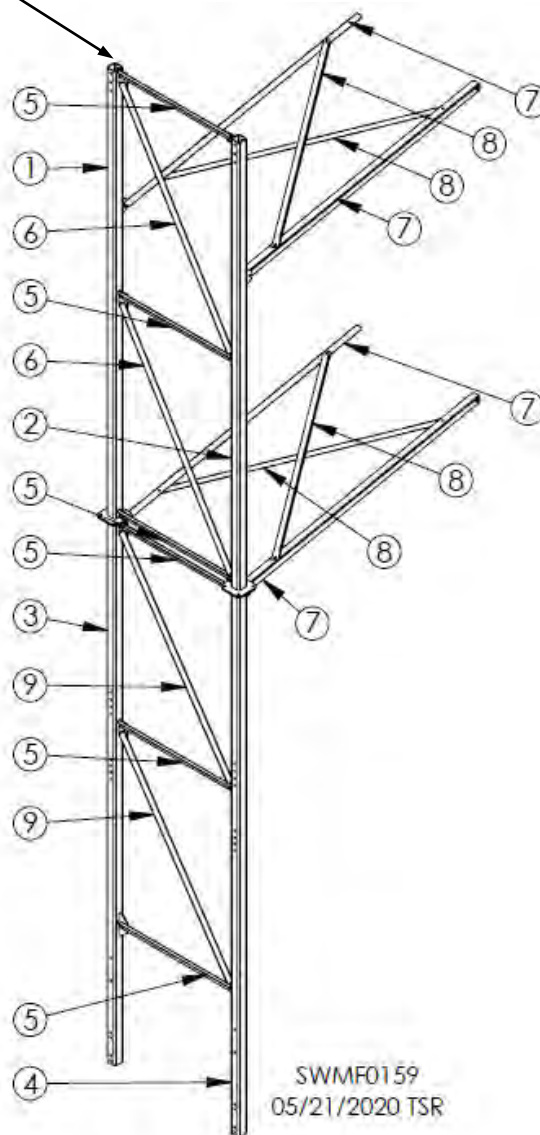


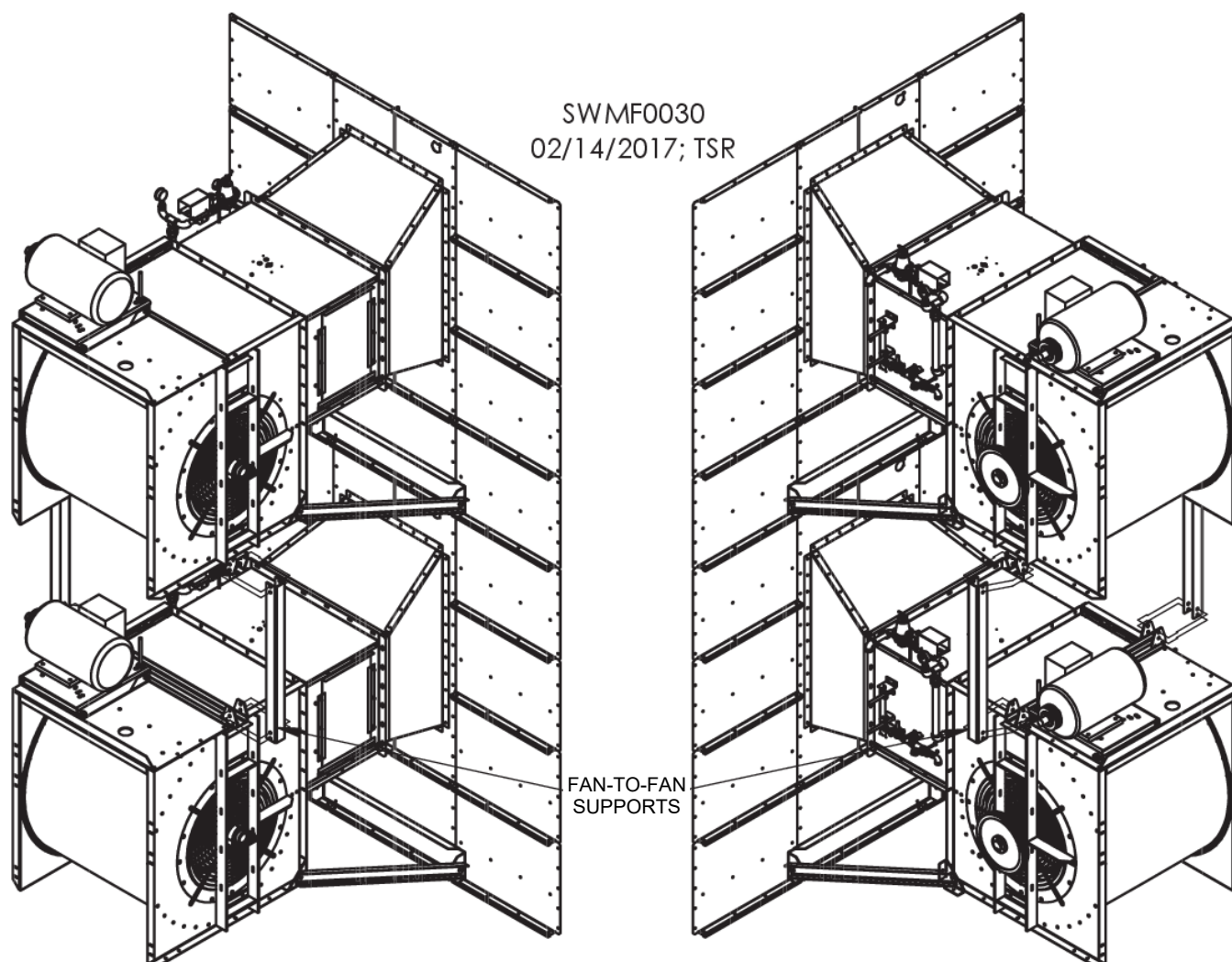
Fig. 2-45 & Table 2-25 –
TM06298 (25-1/2' base)

REF. #	DESCRIPTION	QTY.	PART #
1	COLUMN, RT, SPPRT, 11.5', WELDMENT	1	TM06316
2	COLUMN, LT, SPPRT, 11.5', WELDMENT	1	TM06317
3	COLUMN, RT, SPPRT, 14', WELDMENT	1	TM06326
4	COLUMN, LT, SPPRT, 14', WELDMENT	1	TM06327
5	BRACE, SPPRT, HORZ, STRCTR, 40"	6	TM06330
6	BRACE, SPPRT, DIAG, STRCTR, 74.5"	2	TM06344
7	BRACE, STRCTR TO DRYR, 84.75"	4	TM06349
8	BRACE, CROSS, STRCTR TO DRYR, 75"	4	TM06350
9	BRACE, SPPRT, DIAG, STRCTR, 69.5"	2	TM06354

Fan-to-Fan Supports

If dryer has two or more upper fans, attach fan-to-fan supports as shown in Fig. 2-46. Part number of supports for Size 27 forward-curve fans is TM06056 (41" long) and for Size 30 forward-curve fans is TM06004 (36" long).

If not done already, start by attaching C-channel weldments (TM06049 for size 27 fan or TM06001 for Size 30) to fan housing flanges using 3/8" hardware and holes provided. In both cases, use 1/2" hardware to attach fan-to-fan supports to C-channel weldments.



**Fig. 2-46 – Fan-to-fan supports attached
(Size 30 fan shown)**

Heater Pipe Trains

Image 2-7 shows pipe train for propane-fueled heater. Image 2-8 shows pipe train for natural gas-fueled heater.



Image 2-7 – Pipe train on LP-fueled heater

Factory-attached cables from pipe trains are connected to heater box. Cables from box(es) must be routed to main power box. Secure to dryer with clamps and to one another with zip ties as needed.



Image 2-8 – Pipe train on NG-fueled heater

Relief Pipe Installation

NOTE: Attachment may vary depending on heat module.

For shipping, relief pipe will be U-bolted to top of heater box mounting bracket as shown in Image 2-9.

For field installation, loosen U-bolts and reposition pipe as shown in Images 2-11 and 2-12 so that end of pipe extends past side of dryer. Tighten U-bolts.



Image 2-9 – End of relief pipe in shipping position



Image 2-10 – Relief pipe elbow in shipping position



Image 2-11 – Extending relief pipe past side of dryer



Image 2-12 – Relief pipe attached above heater box

Control Switches

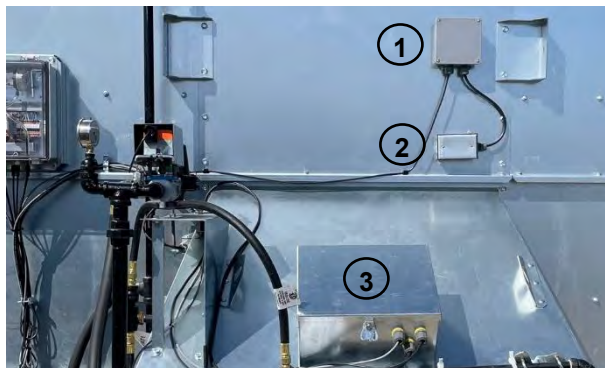


Image 2-13 – Control switch boxes

Image 2-13 shows locations of factory-installed over-temp switch (inside box 1), plenum RTD junction box (2), and heater housing high-limit switch (3) on bottom module.

Load auger motor (if applicable) comes factory-installed. Check belt tension of that and all motors before operating. See guidelines in Service & Maintenance section.

Route any other cables/conduits to main power box and connect to terminals provided. For example, wires for second fan and heater go to 200 series terminals; wires for third fan and heater go to 300 series terminals.

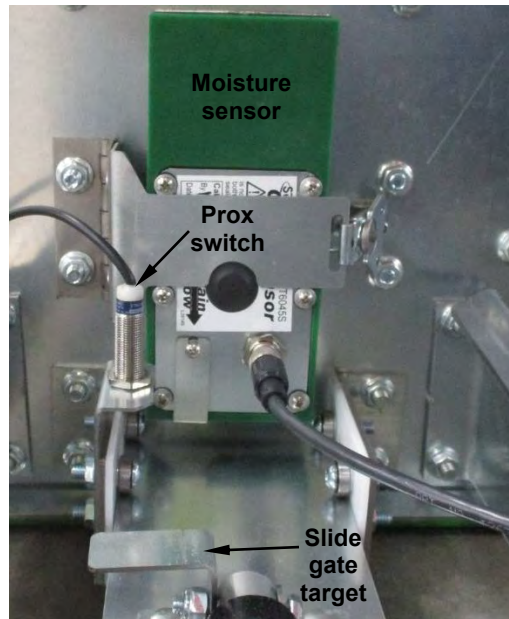


Image 2-14 – Proximity switch & discharge moisture sensor in static sample box

Attach discharge moisture sensor as shown in Component Identification section if dryer has auger unload. If dryer has drag conveyor unload system, attach moisture sensor static sample box under discharge of conveyor using 14 bolts and 5/16" nuts. Fig. 2-47 shows Static sample box for drag conveyor.

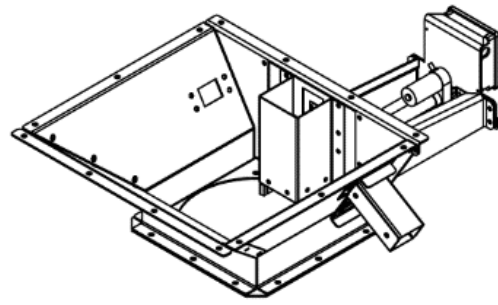


Fig. 2-47 – Static sample box for drag conveyor

In either case, insert moisture sensor into cutout in static sample box **only at time of use**. Secure with strap. See Image 2-14. Ensure arrow on sensor is pointed downward. Attach quick-connect cable to sensor.



Image 2-15 – Discharge moisture sensor conduit at front of dryer

Push discharge moisture sensor cable through conduit on left side of dryer (viewed from back of dryer). At front of dryer, connect moisture sensor cable to cable that goes to main power box. See Image 2-15. Connect other end of cable to designated port on main power box.

If not done already, insert proximity switch into bracket as shown in Image 2-14 and position end so it will be 1/8" to 1/6" above slide gate target when target is positioned directly underneath sensor. Tighten nuts above and below bracket to hold switch firmly in place. Recheck gap and adjust if needed. **NOTICE:** Adjustment of proximity switch is critical. Damage to proximity switch may occur if it comes into contact with gate target.

Wires from actuator and proximity switch on static sample box connect to terminals in junction box on static sample box. Cable from that box must be connected to right rear junction box. Connect as shown on applicable wiring diagram in Service Guide L1986.

Rear Door Switches

On each door switch, ensure black # 1 and # 2 wires are connected to NO (Normally Open) terminals 13 and 14 as shown in Fig. 2-48. (It doesn't matter which wire goes to which terminal as long as both are connected. Green wire can be cut off.)

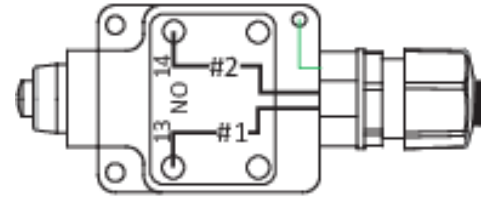


Fig. 2-48 – Rear door switch wiring

Route cable from each door switch to door switch junction box on bottom module. Connect wires as shown in Image 2-16 for two-door dryer. For each additional door switch, remove an orange jumper and plug in switch wires in vacated terminals. Run cable from junction box to right rear junction box. See applicable drawing on Page 5 (16' or 24' dryer) or 6 (32' dryer) of L1986.

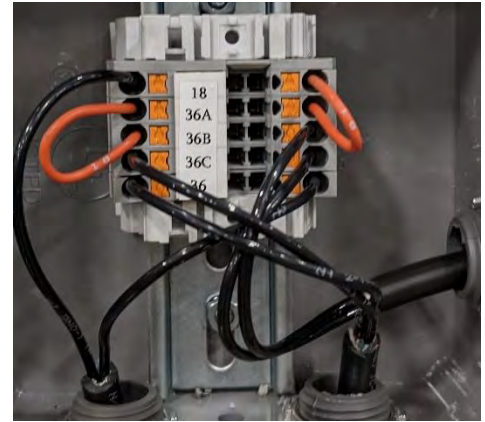


Image 2-16 – Rear door switch wiring

Roof Module Cables

Route cable for paddle switch to main power box. Connect as shown on applicable wiring diagram in L1986.

Also connect wires from work light according to applicable diagram.

Attaching Air Switch Line to Bottom Fan Inlet

1. Run 1/4" black air line from heater box to bottom of heater housing and along bottom edge of fan-heater transition. See Image 2-17. Insert line into heat-cool ducting through an existing hole near belt shield as shown in Image 2-18 or, preferably, drill a 1/2" hole near circled location and insert line through using a grommet.
2. Place a clip on fan inlet cone roughly 1" inside of screen. Position end of air pressure line 5" to 6" inside of screen as shown in Image 2-19. Line should follow curvature of inlet cone. Make sure end of line is pointed slightly downward to prevent water infiltration.
3. Squeeze metal part of clip with pliers to hold line in place.

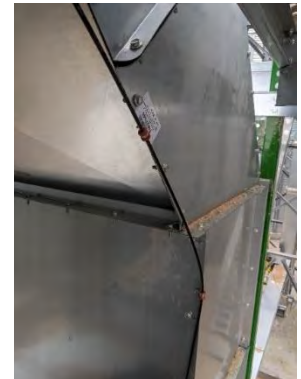


Image 2-17– Air line secured to transition



Image 2-18 – Air line entry (circled)

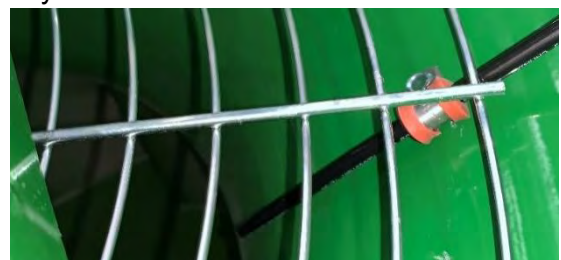


Image 2-19– Air line 5" inside of screen

NOTE: Air switch line for each upper fan is factory-installed.

QuadraTouch Pro Controller



Image 2-20 – QuadraTouch Pro control screen

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

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

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

Cable Length	Part #
50'	J8720
100'	J8721
150'	J8722
200'	J8723

Table 2-26 – Ethernet cable lengths & part numbers

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

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 10°F to 135°F and a storage temperature of -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.

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

NOTICE: 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 2-21 – 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 base section of dryer.

Proper grounding will provide added safety in case of any short or lightning strike. Installation of ground rod and ground wires must conform to National Electrical Code Handbook procedures.

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



Image 2-22 – Grounding at main power box

Crimp a terminal ring onto one end of each grounding wire. Attach one wire to back of main power box as shown in Image 2-22.

Location of other grounding wire will depend on unload system. If dryer has auger unload, bolt grounding wire to discharge tube as shown in Image 2-23. If dryer has a static sample box, attach grounding wire using existing hardware to left of moisture sensor. See Image 2-24.



Image 2-23 – Grounding at discharge tube

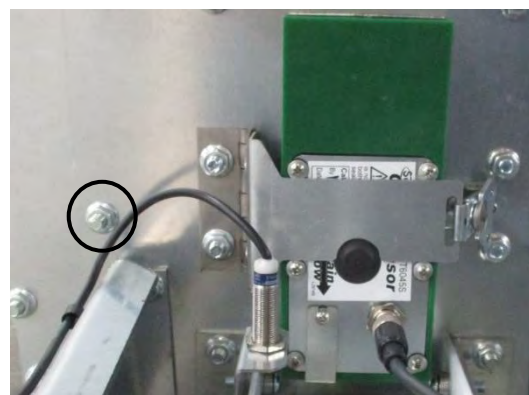


Image 2-24 – Grounding at sample box

Pound entire rod into ground within 8 feet of dryer, even if rod must be at an angle. Clamp ends of wires to rod as shown in Image 2-21.



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.

NOTES



CONTACT INFORMATION

Sukup Dealer Information

Dealer name: _____
Address: _____
Cell phone: _____
Office phone: _____
Fax: _____

In Case of Emergency

Have emergency numbers and written directions to your location near a phone.
Arrange and practice a safety plan.

Ambulance • Fire • Police: 9-1-1

Bin rescue team: _____
Local EMS team: _____
911 Address of work site: _____
Directions to work site: _____



Sukup Manufacturing Co.

1555 255th Street, Box 677

Sheffield, Iowa, USA 50475-0677

Phone: 641-892-4222

Fax: 641-892-4629

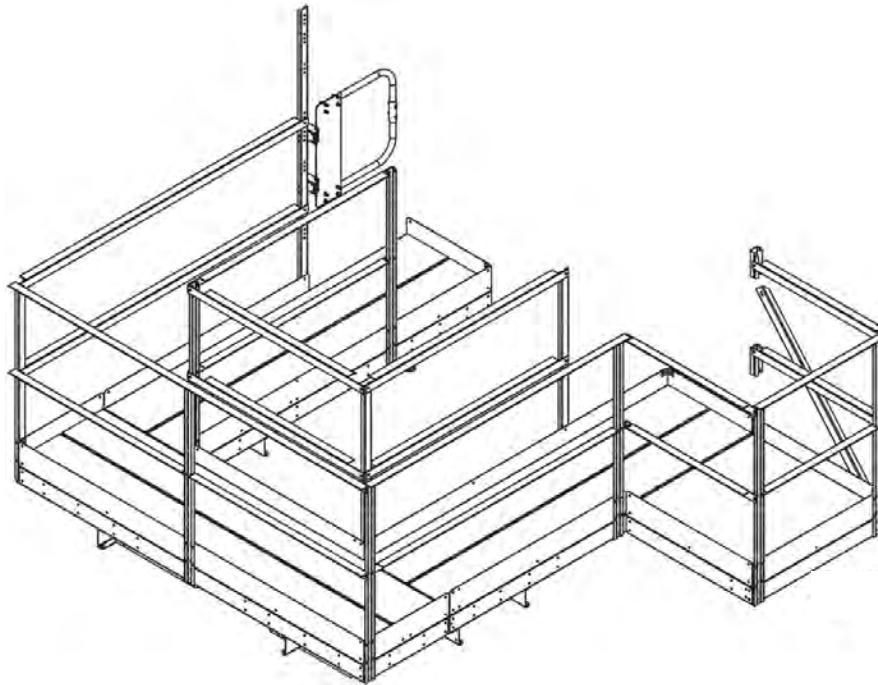
Website: www.sukup.com

Email: info@sukup.com



Mixed-Flow Dryer Platforms

Installation Manual & Parts Assembly



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<u>DATE</u>	<u>REVISION</u>
08/19/2022	– Updated formatting of headings & footers throughout

L24145
08/19/2022

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Introduction

Follow directions in this document for installation of platforms, ladders and safety cages on Mixed-Flow Grain Dryers.

IMPORTANT: Follow applicable safety guidelines in Mixed-Flow Grain Dryer Owner's Operation Manual, L2414, while performing work outlined in this manual.

If you did not receive a copy of Mixed-Flow Grain Dryer Owner's Operation Manual, contact Sukup Manufacturing Co. by phone, fax, e-mail or regular mail and request a copy of Manual L2414. Contact information is on cover and back of this manual.

Receiving and Inspection

Carefully inspect shipment for damage as soon as it is received. Verify that quantity of parts or packages received corresponds to quantity shown on packing slip. Report any damage or shortage to delivery carrier as soon as possible. Sukup Manufacturing's responsibility for damage to equipment ended with acceptance by delivery carrier. Refer to bill of lading. Save all paperwork and documentation furnished with components.

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General Instructions

Find drawings of platforms for your dryer and familiarize yourself with sections, locations and with mounting brackets used.

Following are general instructions:

- Find and examine applicable front and rear platform, ladder and cage layout.
- Assemble platform(s) on ground.
- Lift heater platform and attach to dryer after base module and first heat module have been set.

NOTICE: Ensure dryer is not full of grain when attaching platforms. Loosening bolts for attachment of components could result in damage to dryer if there is pressure from grain.

NOTE: References to left and right sides of dryer are as seen from rear of dryer (discharge end) unless otherwise noted. Leave all bolts loose until completion of handrail and guardrail installation.

Front Platforms, Ladders & Safety Cages

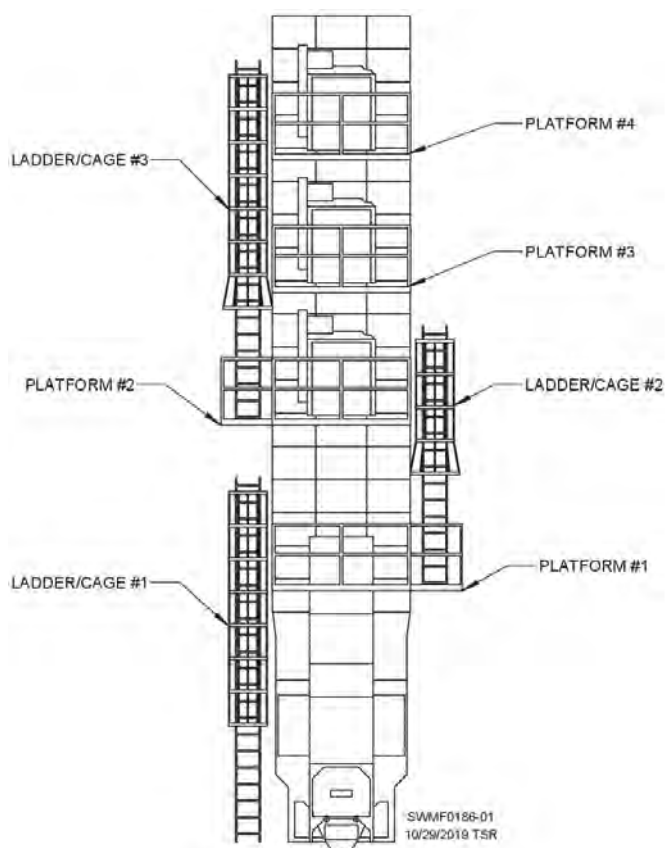
Tables below identify field-installed front platforms for mixed-flow dryers.

DRYER MODEL	STANDARD				4-TIER EXPANDABLE			
	FRONT PLATFORM #			REAR PLATFORM	FRONT PLATFORM #			REAR PLATFORM
	1	2	3		1	2	3	
TM1606					TM05601			TM11028
TM1608	TM05601			TM11028	TM05601			TM11028
TM1609	TM05601			TM11028	TM05601			TM11028
TM1610	TM05600	TM05605		TM11028	TM05600	TM05605		TM11028
TM1612	TM05600	TM05605		TM11028	TM05600	TM05605		TM11028
TM1613	TM05600	TM05605		TM11028	TM05600	TM05605		TM11028
TM1614	TM05600	TM05605	TM05605	TM11028				
TM1616	TM05600	TM05604	TM05605	TM11028				
TM1617	TM05600	TM05604	TM05605	TM11028				
TM2405					TM05601			TM11028
TM2406					TM05601			TM11028
TM2409	TM05600	TM05603		TM11028	TM05600	TM05603		TM11028
TM2410	TM05600	TM05603		TM11028	TM05600	TM05603		TM11028
TM2413	TM05600	TM05603	TM05603	TM11028				
TM2414	TM05600	TM05603	TM05603	TM11028	TM05600	TM05602	TM05603	TM11028
TM2418*	TM05600	TM05602	TM05603	TM11028				
TM3209	TM05601			TM05601	TM05601			TM05601
TM3210	TM05600	TM05603		TM05601	TM05600	TM05603		TM05601
TM3212	TM05600	TM05603		TM05601	TM05600	TM05603		TM05601
TM3213	TM05600	TM05603		TM05601	TM05600	TM05603		TM05601
TM3214	TM05600	TM05603	TM05603	TM05601				
TM3216	TM05600	TM05602	TM05603	TM05601				
TM3217	TM05600	TM05602	TM05603	TM05601				

*Standard Model TM2418 includes platform TM05603 for a fourth platform

DRYER MODEL	8-TIER EXPANDABLE	
	PLATFORM 1	REAR PLATFORM
TM1606	TM05601	TM11028
TM1608	TM05601	TM11028
TM1609	TM05601	TM11028
TM2405	TM05601	TM11028
TM2406	TM05601	TM11028
TM2410**	TM05600	TM11028
TM3209	TM05601	TM05601

**Model TM2410 includes TM05603 for a second platform



Field-Installed Front Platforms

Tables below identify ladders and safety cages for field-installed platforms on mixed-flow dryers.

NOTE: Ladder drawings begin on Page 55. Cage drawings begin on Page 57.

DRYER MODEL	STANDARD					
	LADDER 1	CAGE 1	LADDER 2	CAGE 2	LADDER 3	CAGE 3
TM1608	TM112011	TM11301				
TM1609	TM112011	TM11301				
TM1610	TM112011	TM11301				
TM1612	TM11202	TM11302	TM11213	TM11313		
TM1613	TM11202	TM11302	TM11214	TM11314		
TM1614	TM11202	TM11302	TM11215	TM113151		
TM1616	TM11203	TM11303	TM11213	TM11313	TM11214	TM11321
TM1617	TM11203	TM11303	TM11214	TM11314	TM11214	TM11321
TM2409	TM112011	TM11301	TM11211	TM11311		
TM2410	TM112011	TM11301				
TM2413	TM11202	TM11302	TM11214	TM113141		
TM2414	TM11202	TM11302	TM11215	TM113151		
TM2418	TM11203	TM11303	TM11212	TM11312	TM11222	TM11322
TM3209	TM112011 (2)	TM11301 (2)				
TM3210	TM112011 (2)	TM11301 (2)				
TM3212	TM11202 (2)	TM11302 (2)	TM11213	TM11313		
TM3213	TM11202 (2)	TM11302 (2)	TM11214	TM11314		
TM3214	TM11202 (2)	TM11302 (2)	TM11215	TM113151		
TM3216	TM11203 (2)	TM11303 (2)	TM11213	TM11313	TM11214	TM11321
TM3217	TM11203 (2)	TM11303 (2)	TM11214	TM11314	TM11214	TM11321

DRYER MODEL	4-TIER EXPANDABLE				8-TIER EXPANDABLE	
	LADDER 1	CAGE 1	LADDER 2	CAGE 2	LADDER 1	CAGE 1
TM1606	TM112011	TM11301			TM11202	TM11302
TM1608	TM11202	TM11302			TM11203	TM11303
TM1609	TM11202	TM11302			TM11203	TM11303
TM1610	TM11202	TM11302	TM11212	TM11312		
TM1612	TM11203	TM11303	TM11213	TM11313		
TM1613	TM11203	TM11303	TM11214	TM11314		
TM2405	TM112011	TM11301			TM11202	TM11302
TM2406	TM112011	TM11301			TM11202	TM11302
TM2409	TM11202	TM11302	TM11211	TM11311		
TM2410*	TM11202	TM11302	TM11212	TM11312	TM11203	TM11303
TM2414**	TM11203	TM11303	TM11212	TM11312		
TM3209	TM11202 (2)	TM11302 (2)			TM11203	TM11303
TM3210	TM11202 (2)	TM11302 (2)	TM11212	TM11312		
TM3212	TM11203 (2)	TM11303 (2)	TM11213	TM11313		
TM3213	TM11203 (2)	TM11303 (2)	TM11214	TM11314		

*8-Tier expandable Model TM2410 includes ladder TM11212 & cage TM11312 for a second platform

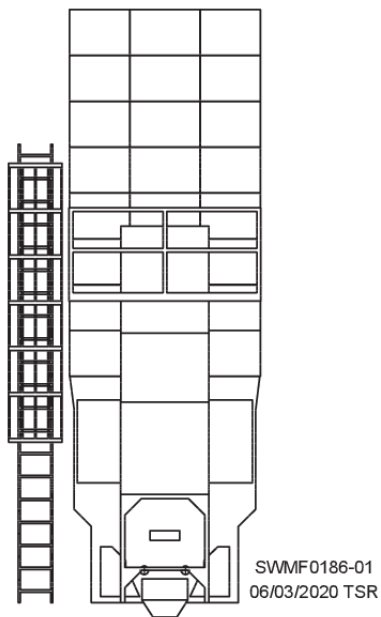
**4-Tier expandable Model TM2414 includes ladder TM11214 & cage TM11321 for a third platform

Front Platform, Ladder & Safety Cage Layouts by Dryer Model

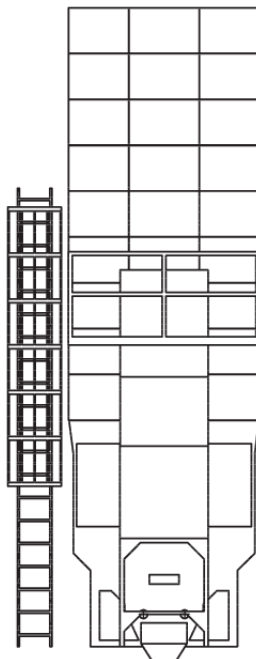
See drawings below and on next pages for locations of front platforms, ladders and safety cages.

Standard Dryer Models

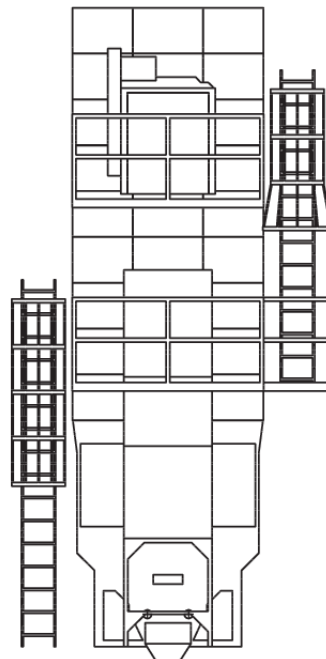
TM1608



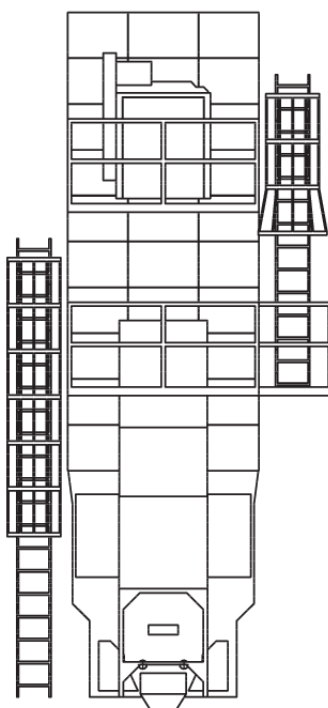
TM1609/TM3209



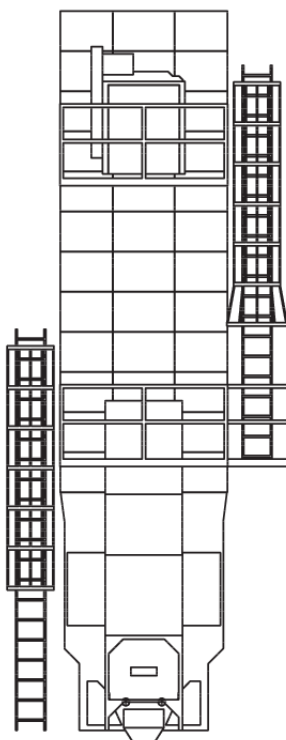
TM2409



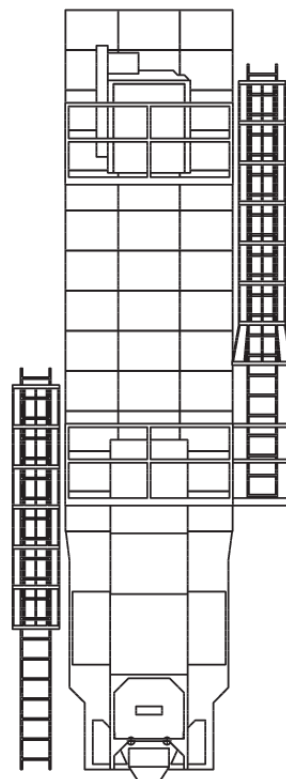
TM1610/TM2410/TM3210

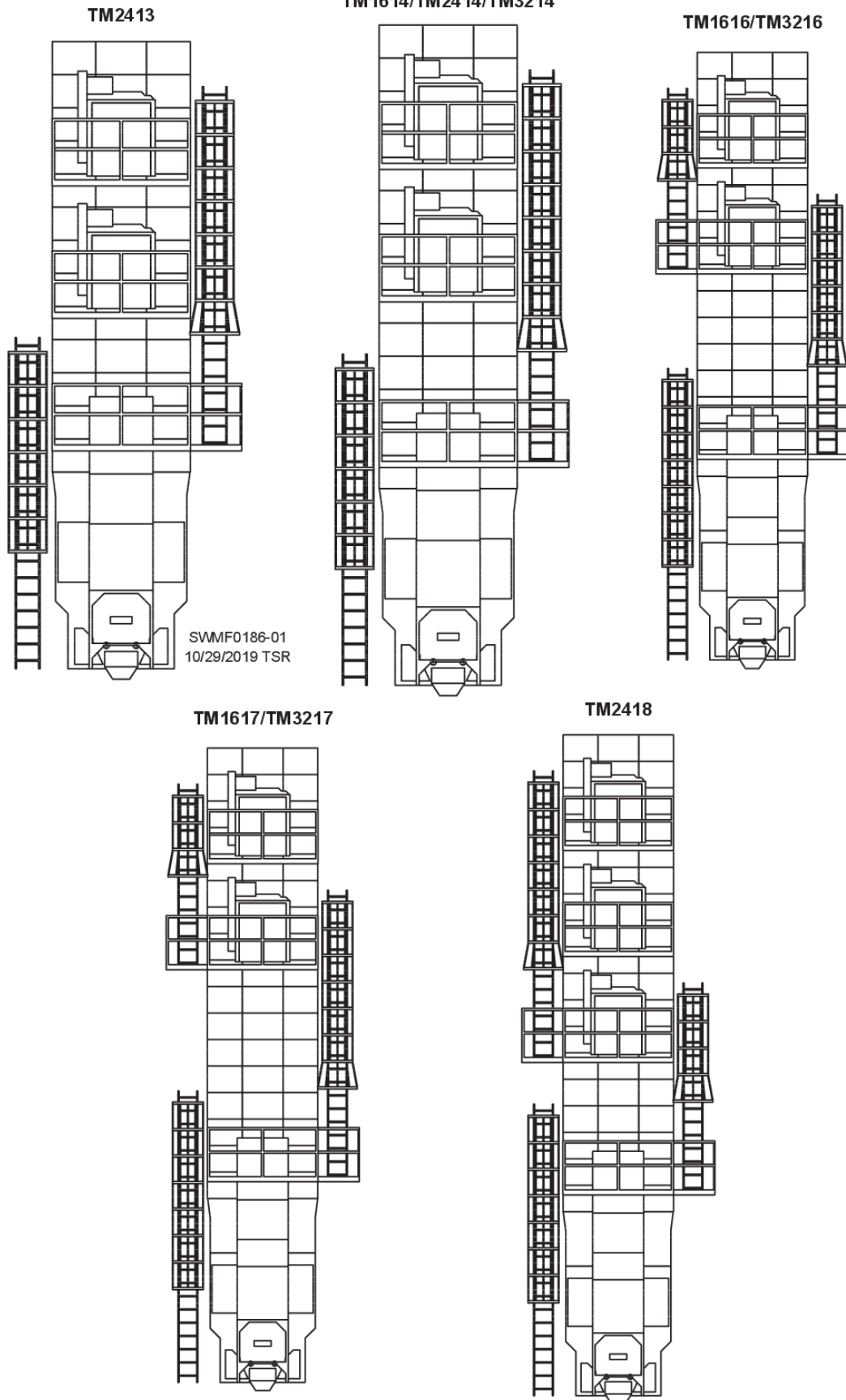


TM1612/TM3212

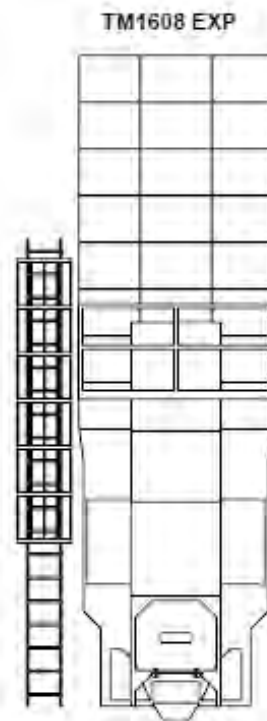
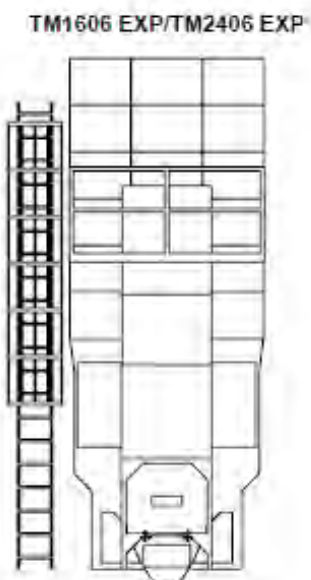
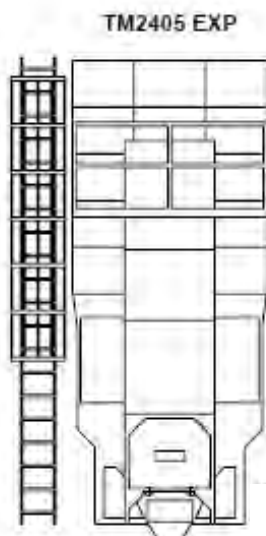


TM1613/TM3213

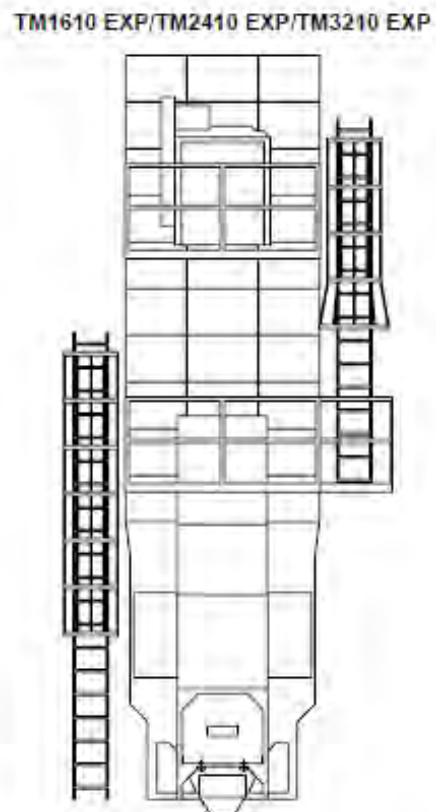
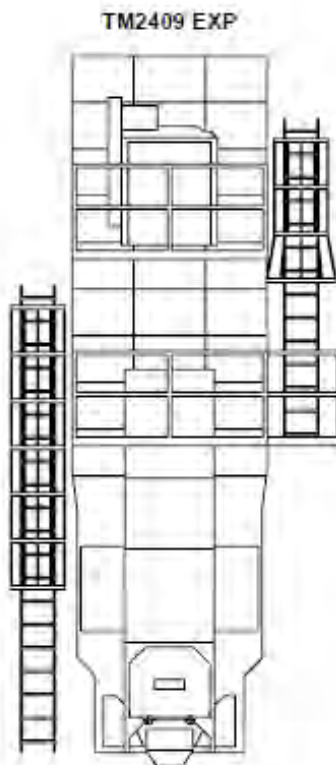
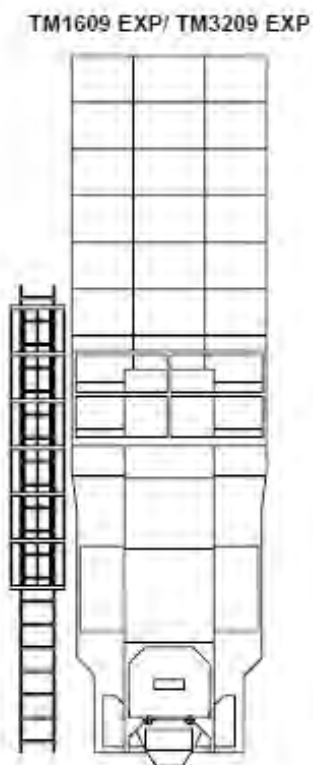




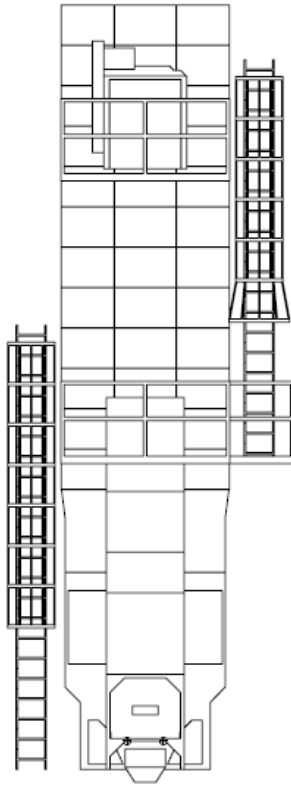
4-Tier Expandable Dryer Models



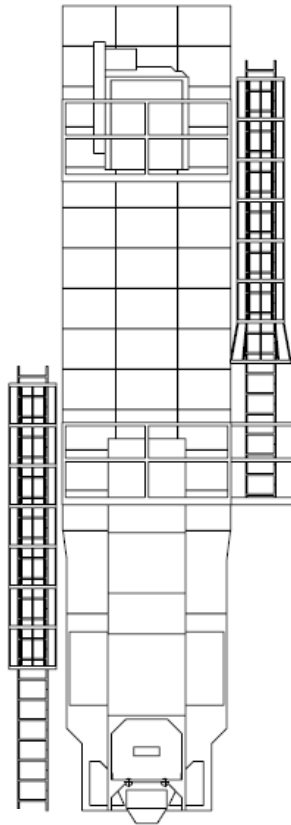
SWMF0186-02 SHEET 1
06/03/2020 TSR



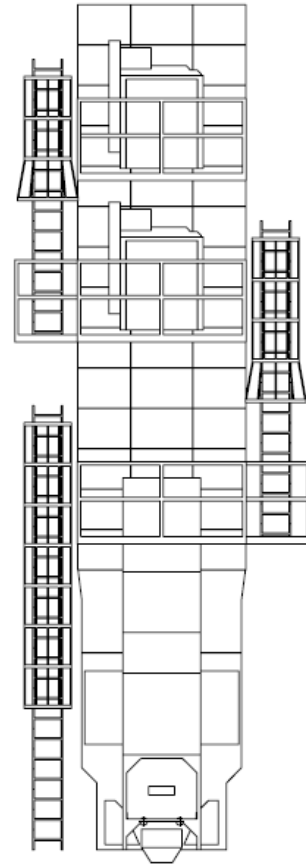
TM1612 EXP/TM3212 EXP



TM1613 EXP/TM3213 EXP

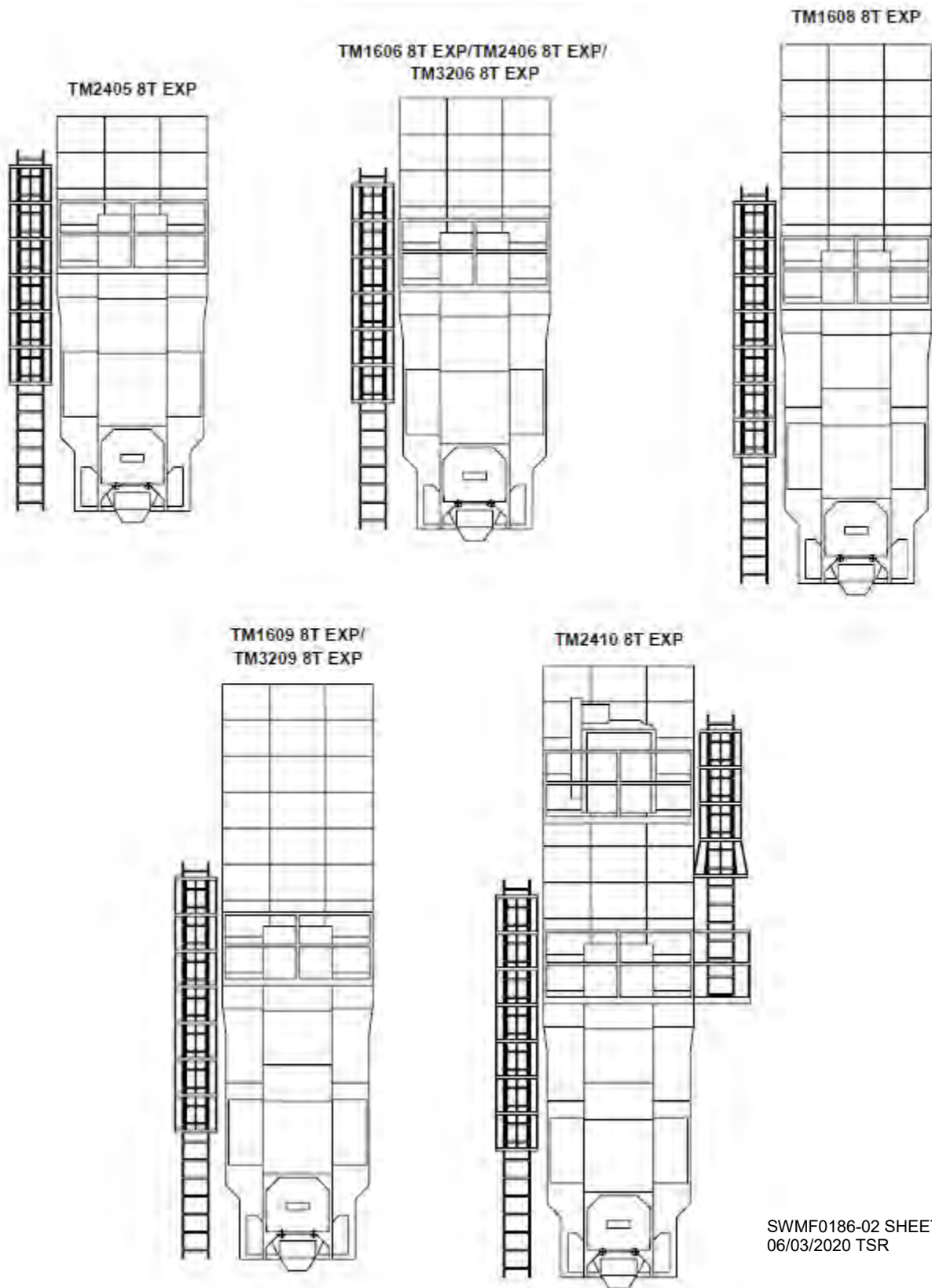


TM2414 EXP



SWMF0186-02 SHEET 2
06/03/2020 TSR

8-Tier Expandable Dryer Models



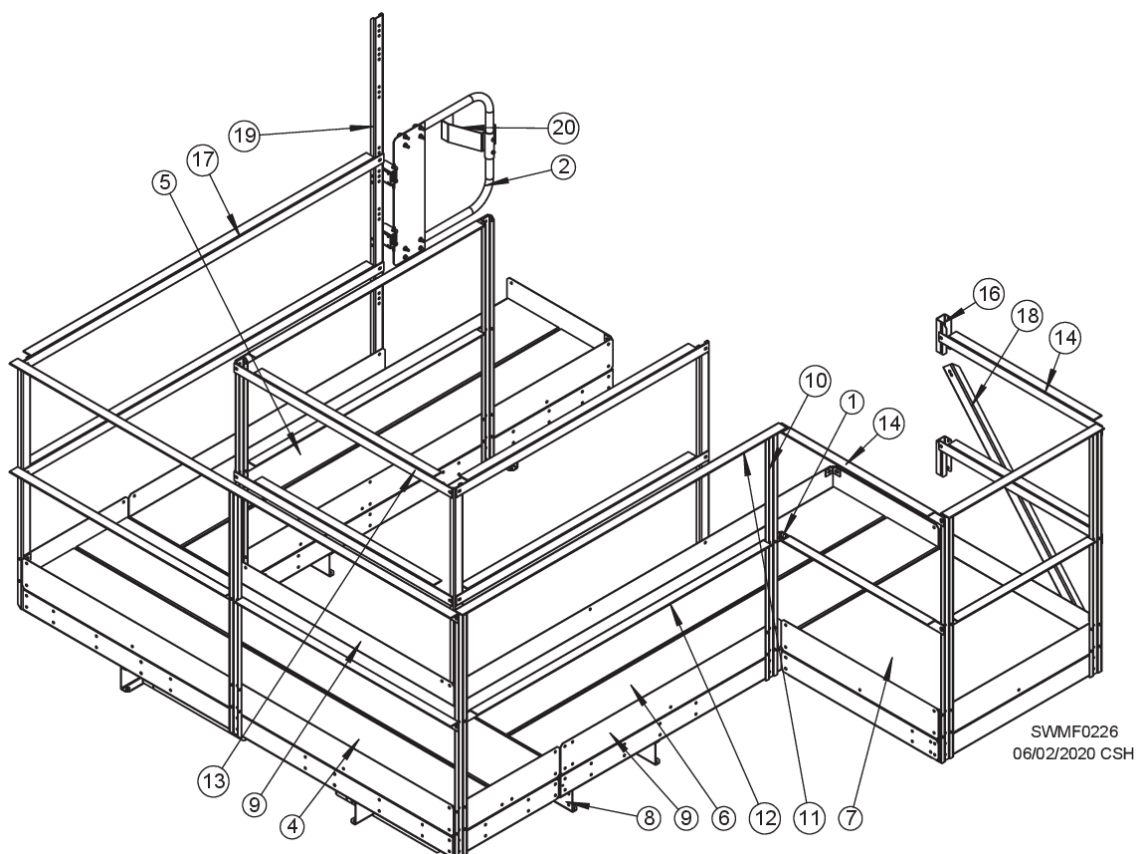
SWMF0186-02 SHEET 3
06/03/2020 TSR

Front Platform Attachment

Drawing and table below and those on next page show front platforms and components. Attachment instructions begin on Page 12.

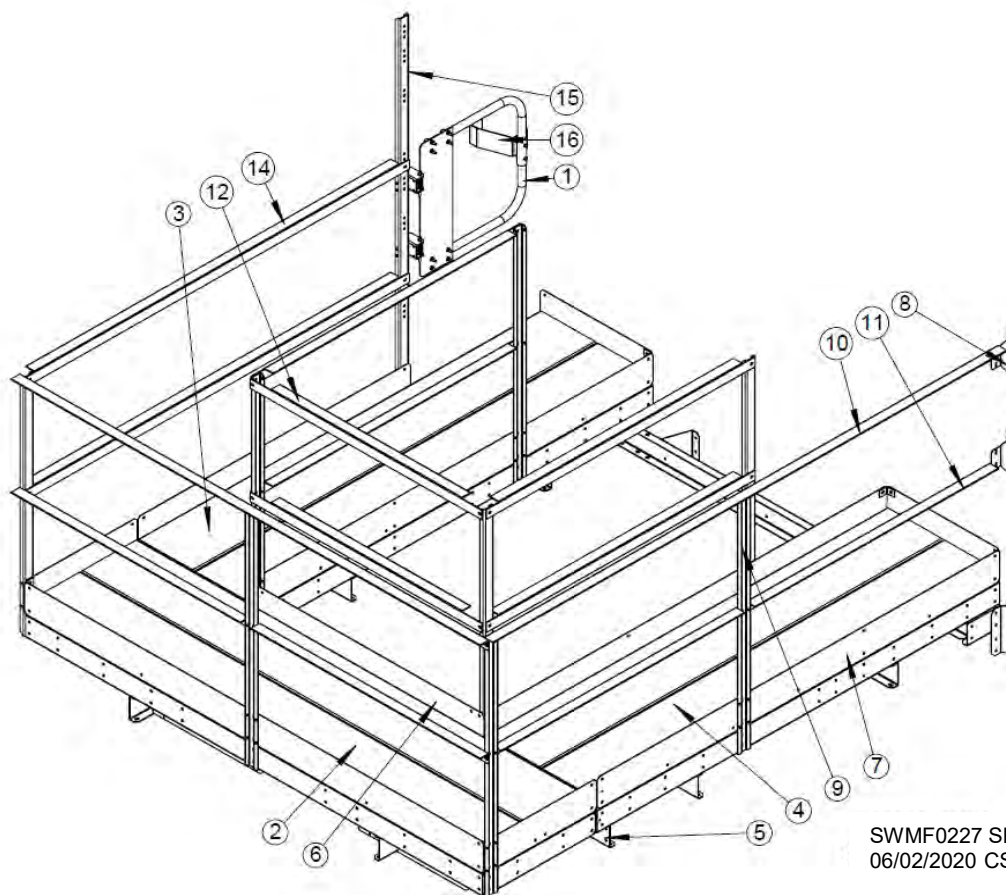
Use 5/16" hardware for all connections.

Lower Heater Standoff Platform (TM05600)



REF. #	DESCRIPTION	QTY.	PART #
1	CLIP, CONN, BENT, WETHOLD	2	TM04115
2	MIXED FLOW SAFETY GATE	1	TM05041
3	BRACKET, SPPRT, STANDOFF TO DRYR	1	TM05471
4	SECTION, PLTFRM, HTR, FRONT	1	TM05610
5	SECTION, PLTFRM, HTR, SIDE, STNDRD	1	TM05612
6	SECTION, PLTFRM, HTR, SIDE, STDOFF	1	TM05614
7	SECTION, PLTFRM, STANDOFF	1	TM05616
8	C-CHANNEL, 97.75", SPPRT STRCTR	1	TM05621
9	TOEKICK, 50.125", PLTFRM	2	TM05636
10	POST, HANDRAIL, 48 11/16", 2019	1	TM05650
11	HANDRAIL, 73.6875", UPPER	1	TM05655
12	HANDRAIL, 73.6875" LOWER	1	TM05656
13	HANDRAIL, 49.5", UPPER/LOWER	2	TM05657
14	HANDRAIL, 37", UPPER/LOWER	4	TM05663
15	KNEE BRACE, SECT, PLTFRM, FRONT	2	TM05667
16	BRACKET, CONN, HANDRAIL, STANDOFF	2	TM05675
17	HANDRAIL, 82", PLATFORM	2	TM05676
18	BRACE, SPPRT, STANDOFF	1	TM05679
19	POST, HANDRAIL, 76"	1	TM05685
20	STOP, GATE, LADDER PLATFORM	1	TM11027

Lower Heater Standard Platform (TM05601)



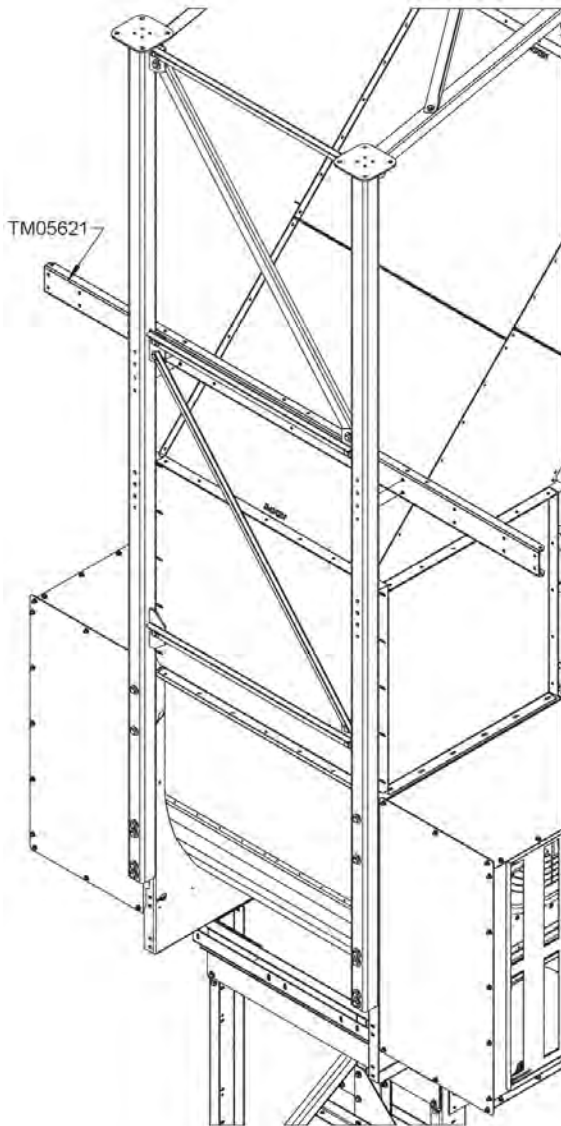
SWMF0227 SHEET 1
06/02/2020 CSH

REF. #	DESCRIPTION	QTY.	PART #
1	MIXED FLOW SAFETY GATE	1	TM05041
2	SECTION, PLTFRM, HTR, FRONT	1	TM05610
3	SECTION, PLTFRM, HTR, SIDE, STNDRD	1	TM05612
4	SECTION, PLTFRM, HTR, SIDE, STDOFF	1	TM05614
5	C-CHANNEL, 97.75", SPPRT STRCTR	1	TM05621
6	TOEKICK, 50.125", PLTFRM	1	TM05636
7	TOEKICK, 86", SECTION, SIDE	1	TM05638
8	BRACKET, CONN, HANDRAIL, MODULE	2	TM05649
9	POST, HANDRAIL, 48 11/16", 2019	1	TM05650
10	HANDRAIL, 109.875", UPPER	1	TM05653
11	HANDRAIL, 109.875", LOWER	1	TM05654
12	HANDRAIL, 49.5", UPPER/LOWER	2	TM05657
13	KNEE BRACE, SECT, PLTFRM, FRONT	2	TM05667
14	HANDRAIL, 82", PLTFRM	2	TM05676
15	POST, HANDRAIL, 76"	1	TM05685
16	STOP, GATE, LADDER PLTFRM	1	TM11027

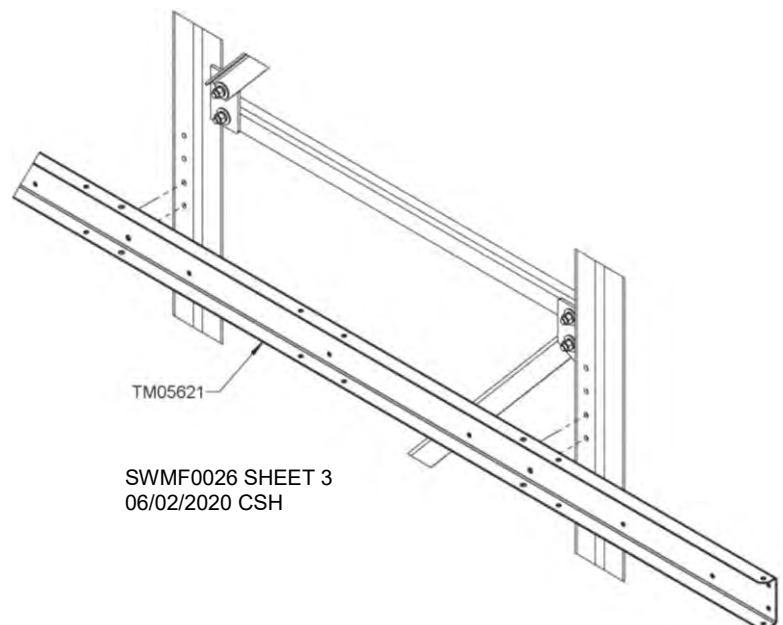
Front Platform Attachment

Drawings below show attachment of C-channel TM05621 to support structure. Lower drawing shows view from back.

NOTE: Attachment instructions apply to standard and standoff lower heater platforms. See Page 28 for instructions to attach left side of platform without a standoff.



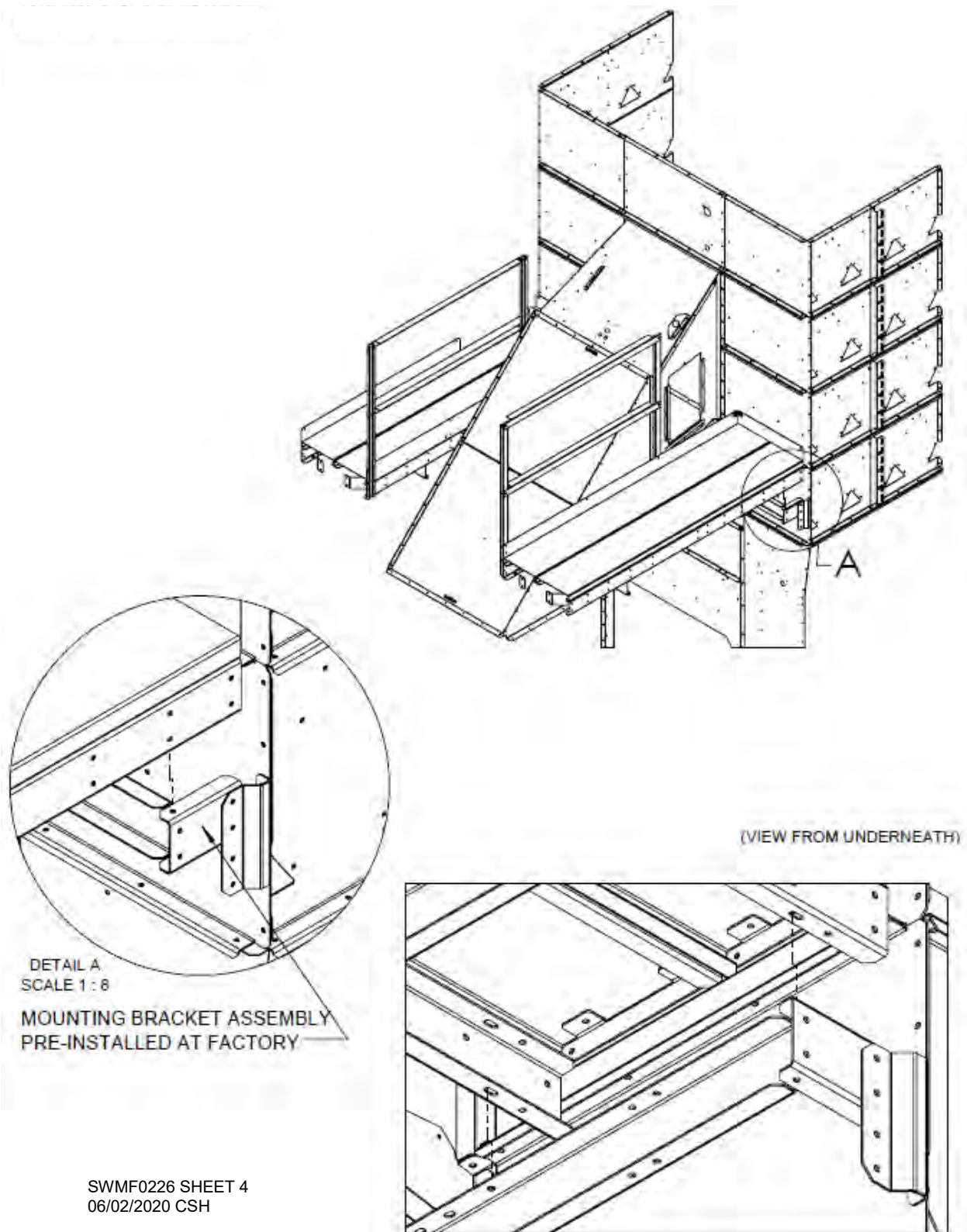
SWMF0026 SHEET 2
06/02/2020 CSH



SWMF0026 SHEET 3
06/02/2020 CSH

Front Platform Attachment

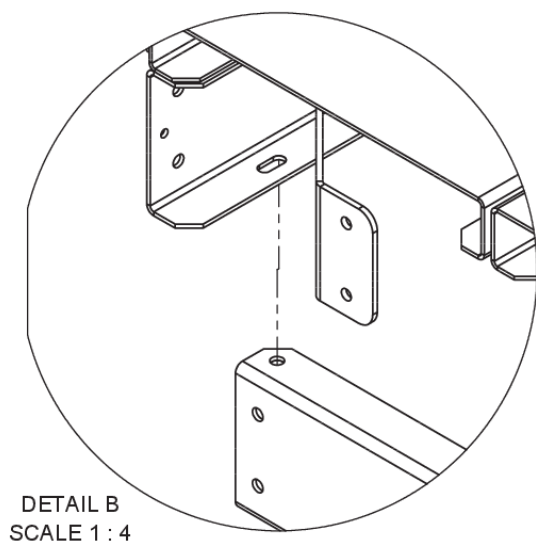
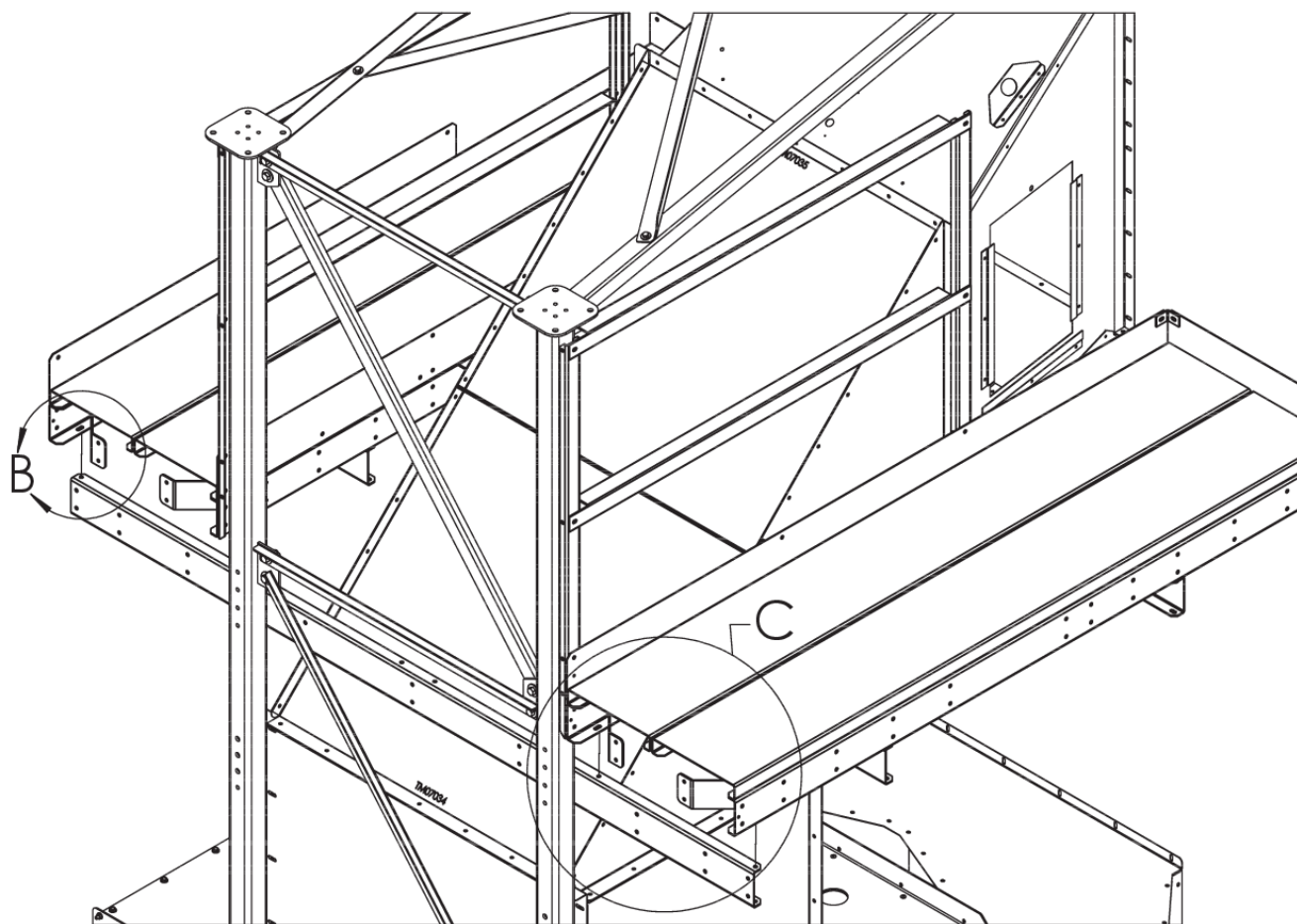
Drawing below shows attachment of side section of platform to dryer.



SWMF0226 SHEET 4
06/02/2020 CSH

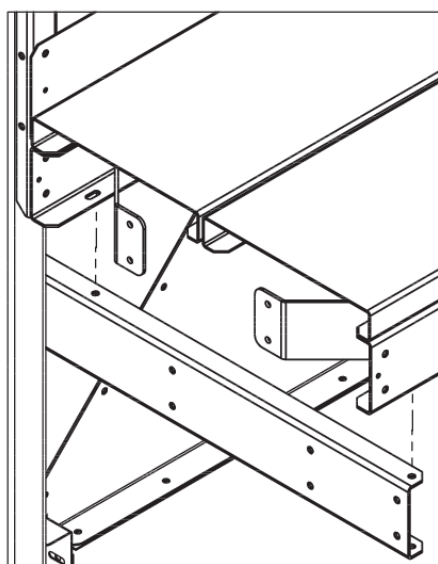
Front Platform Attachment

Drawing below shows attachment of side sections of platform to C-channel TM05621.



DETAIL B
SCALE 1 : 4

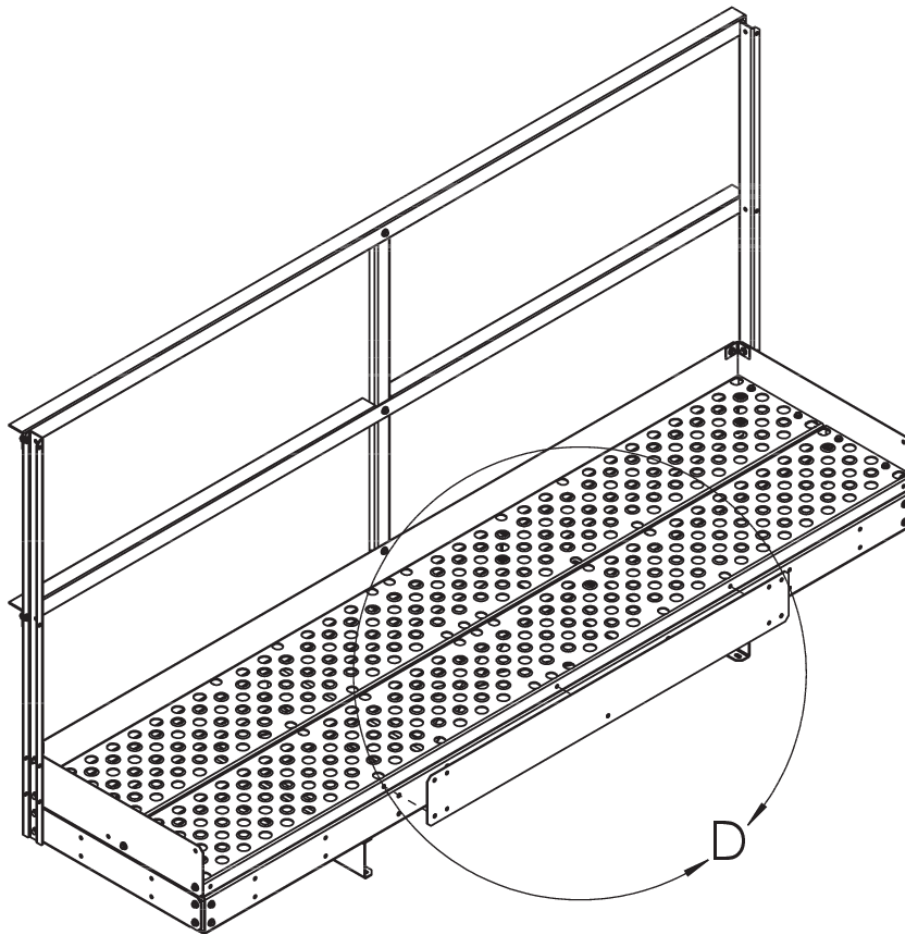
SWMF0226 SHEET 5
06/02/2020 CSH



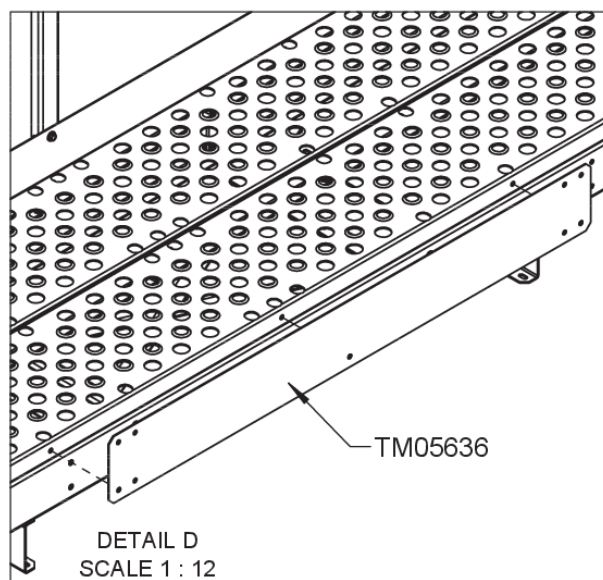
DETAIL C
SCALE 1 : 8

Front Platform Attachment

Drawing below shows attachment of inner toe kick (TM05636) to front section of platform.

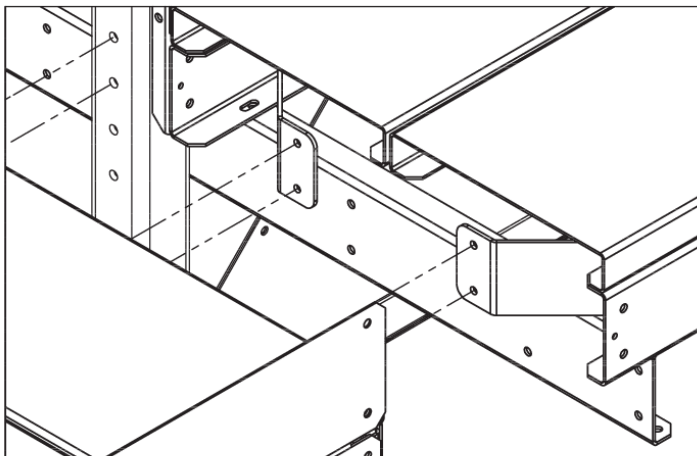
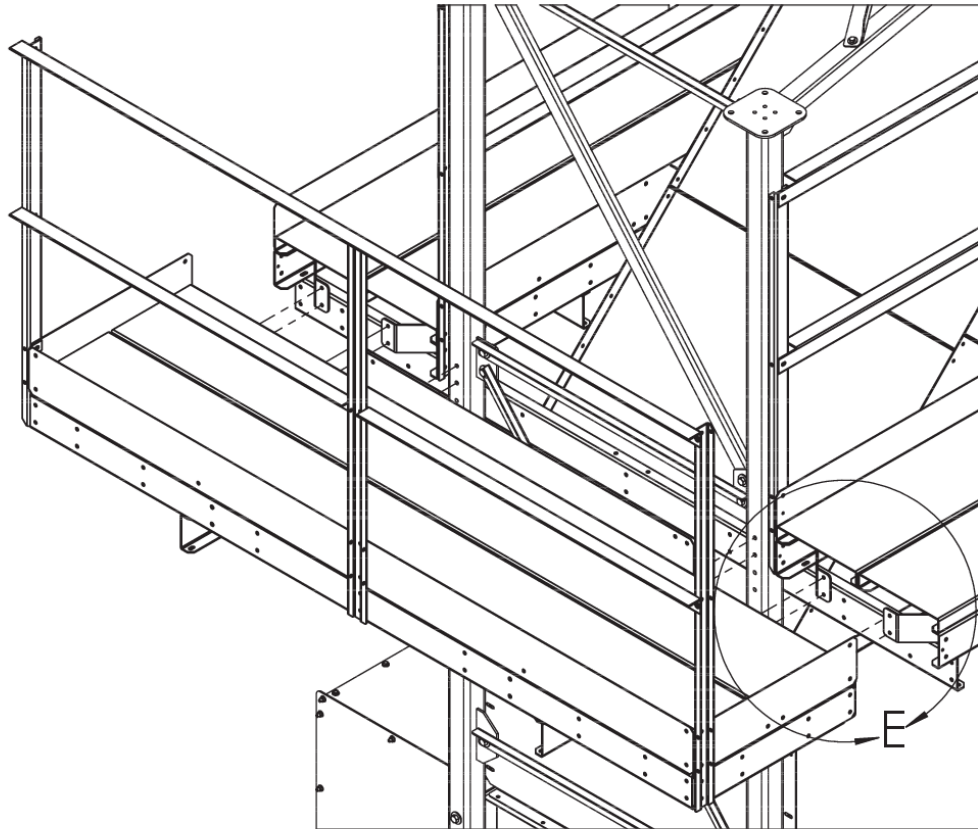


SWMF0226 SHEET 6
06/02/2020 CSH

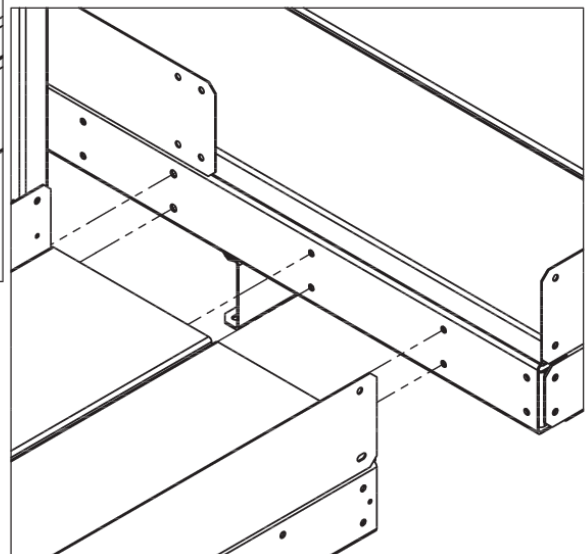


Front Platform Attachment

Drawing below shows attachment of front section of platform to side sections. Lowest drawing shows view from back.



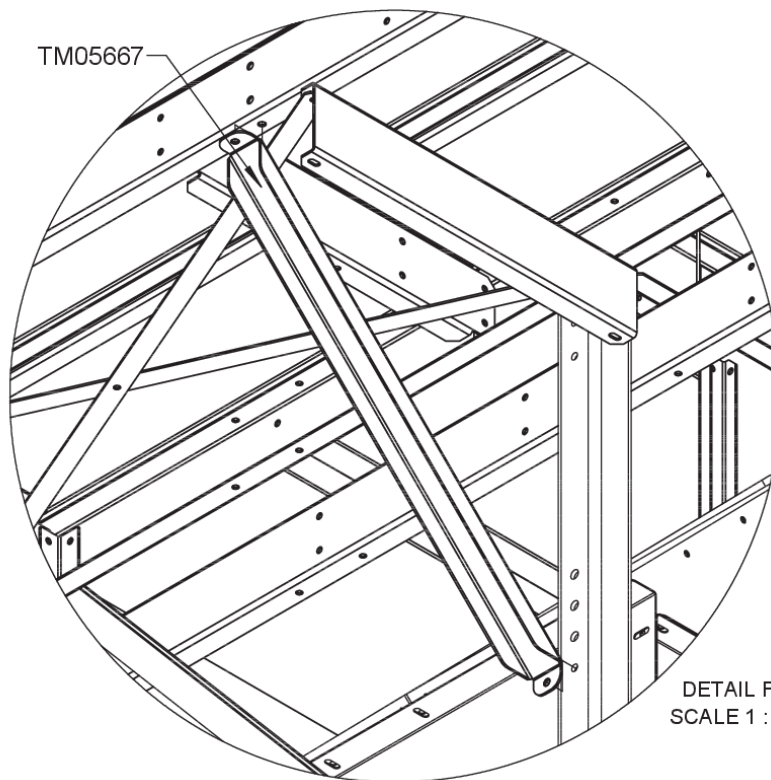
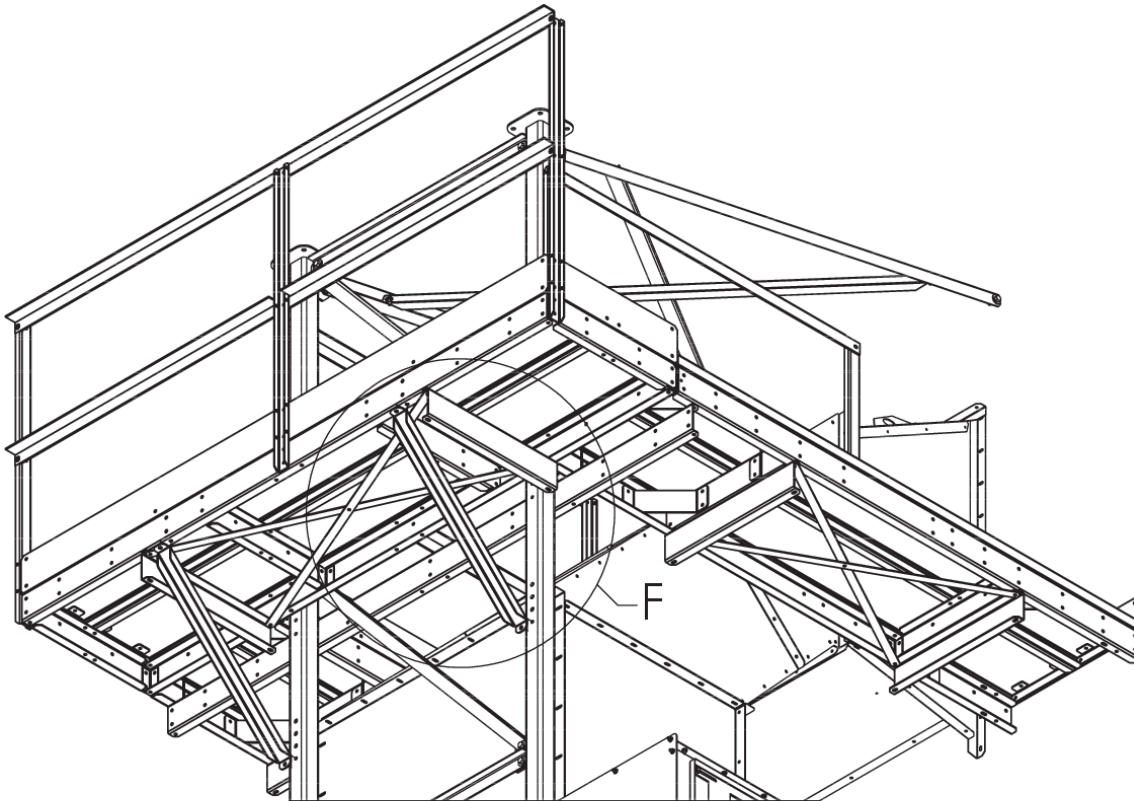
DETAIL E
SCALE 1 : 6



SWMF0226 SHEET 7
06/02/2020 CSH

Front Platform Attachment

Drawing below shows attachment of knee braces (TM05667) to front section of platform.



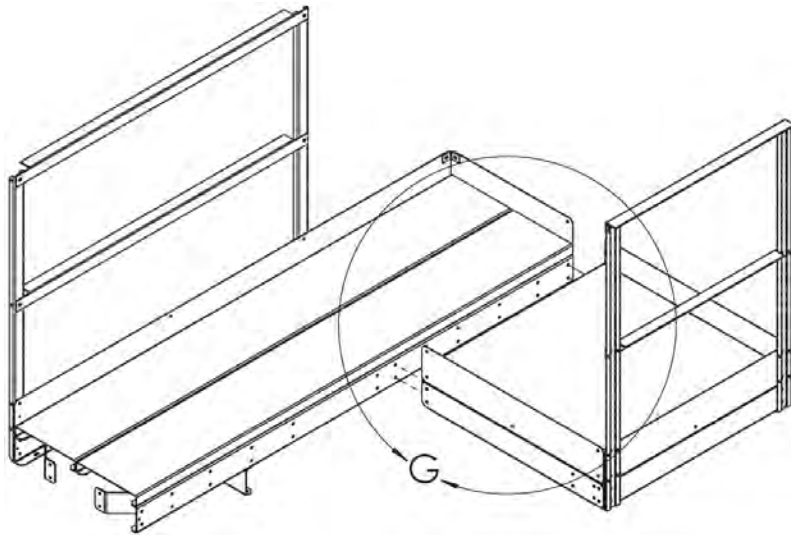
SWMF0226 SHEET 8
06/02/2020 CSH

DETAIL F
SCALE 1 : 8

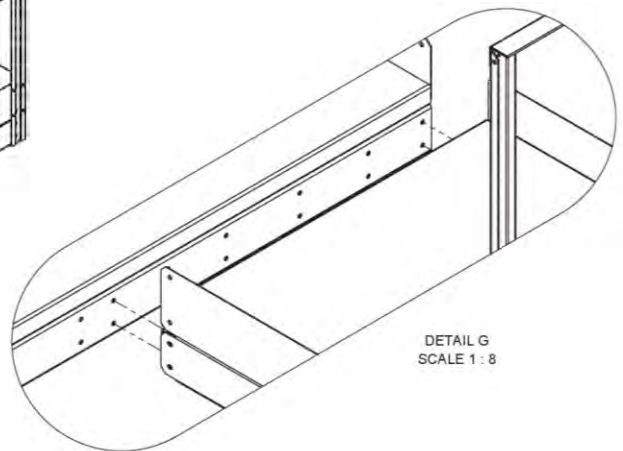
Front Platform Attachment

Drawings below show attachment of standoff section to side section of platform.

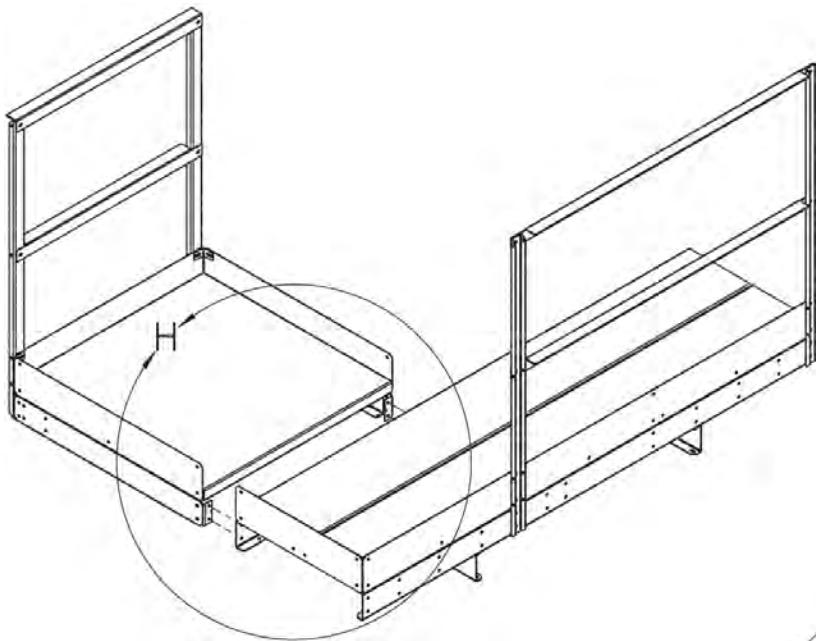
NOTE: Instructions on this and next page are for dryers in which table on Page 3 shows that a TM05600 platform (heater platform with standoff) is required.



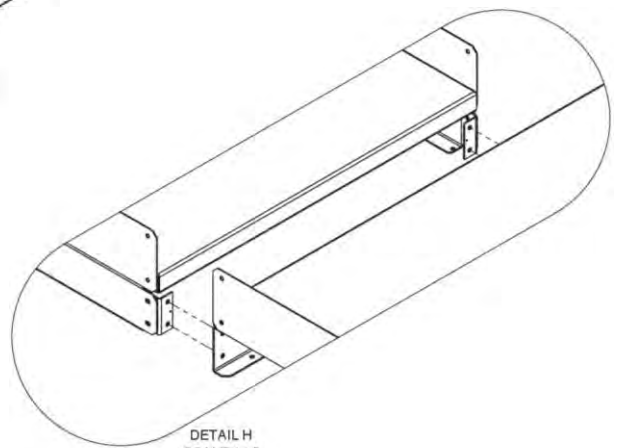
SWMF0226 SHEET 9
06/02/2020 CSH



DETAIL G
SCALE 1 : 8



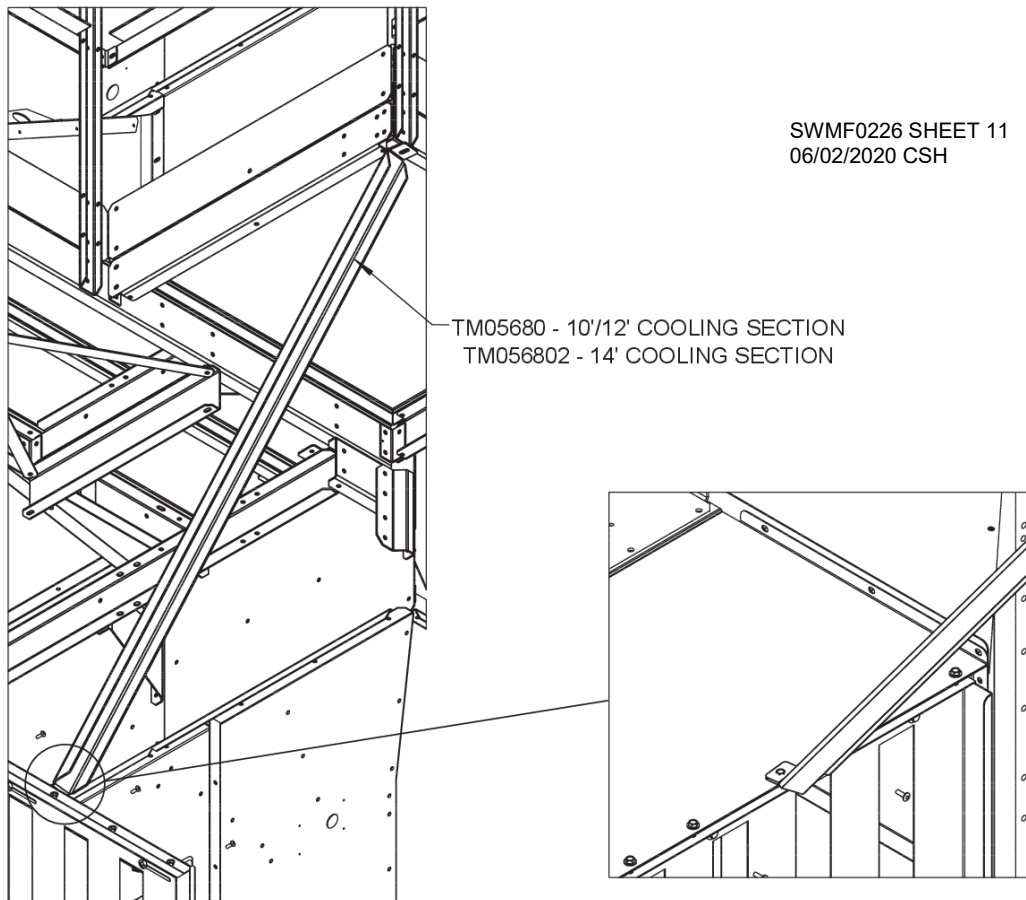
SWMF0226 SHEET 10
06/02/2020 CSH



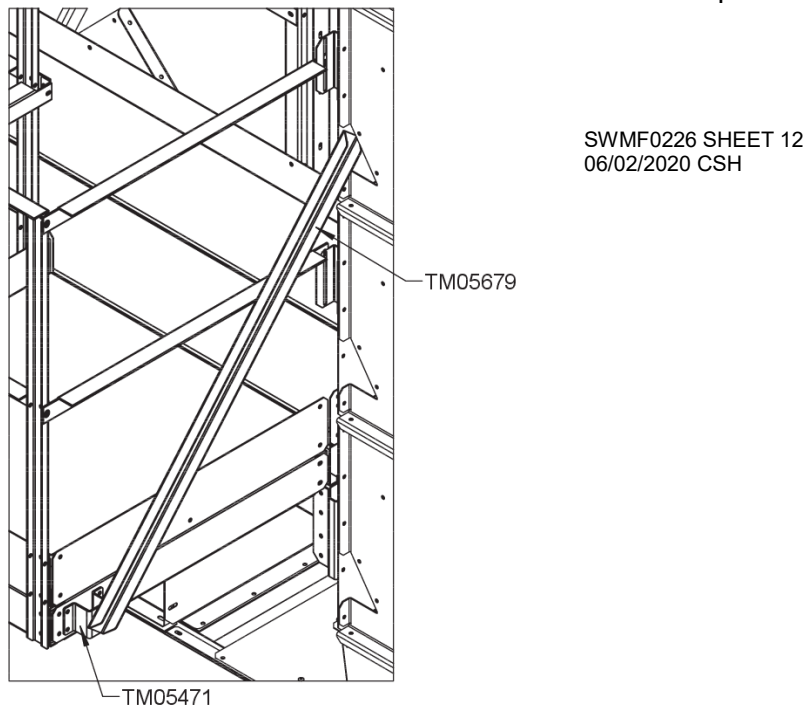
DETAIL H
SCALE 1 : 8

Front Platform Attachment

Drawings below show attachment of knee brace to standoff section and to dryer. View from below is at left. View from above is from inset at lower right.

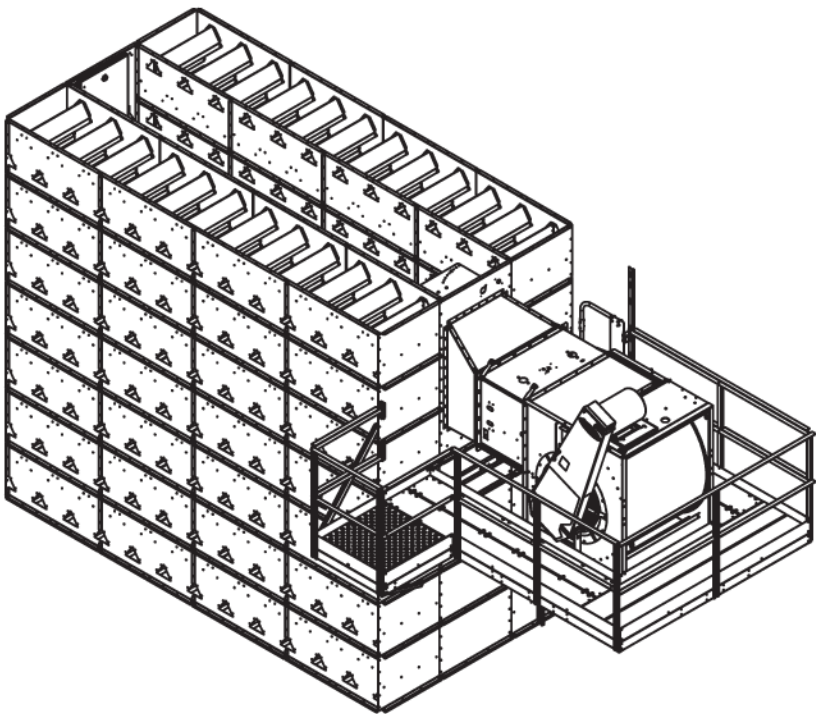


Drawing below shows brace TM05679 attached to bracket TM05471 on lower standoff platform.

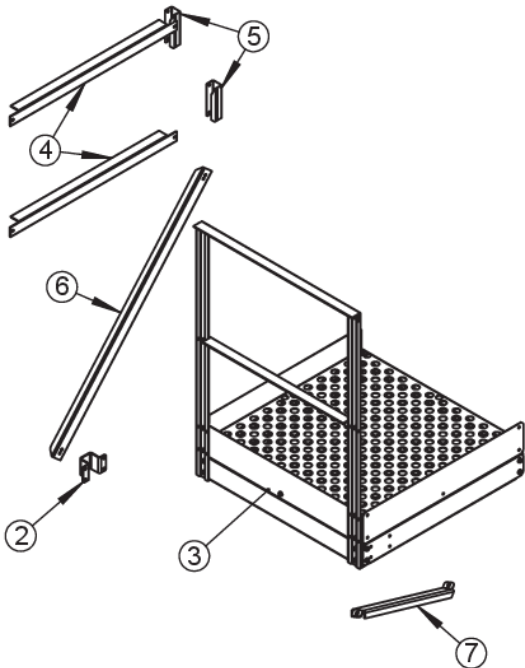


Front Platform Attachment

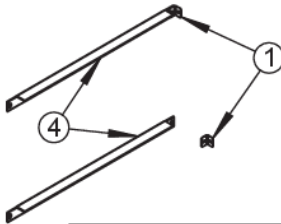
Drawings below show attachment of standoff platform to upper platform. Use 5/16" hardware.



Start by attaching standoff section support pieces as shown below.



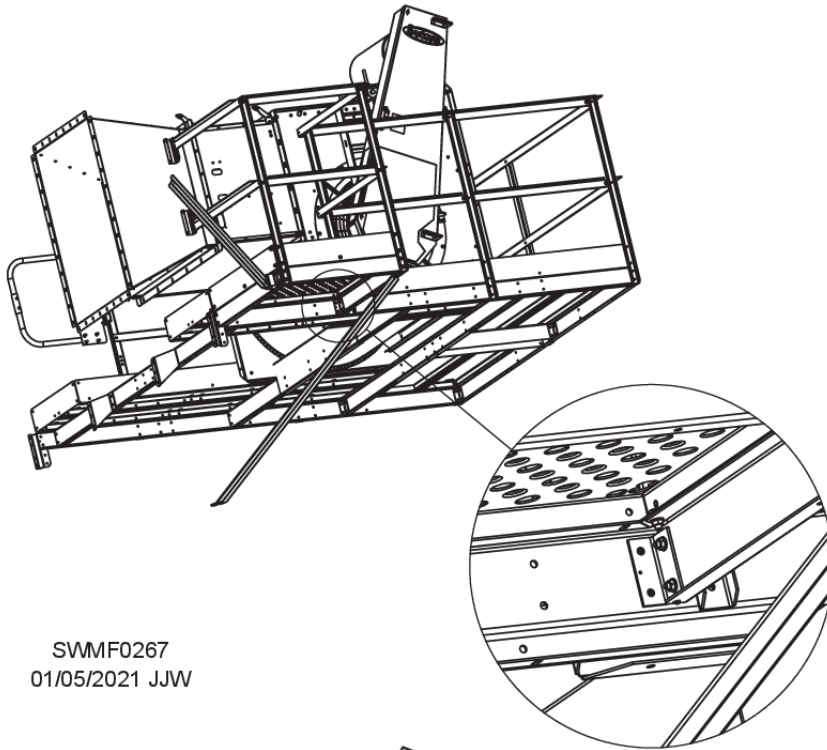
SWMF0267
01/05/2021 JJW



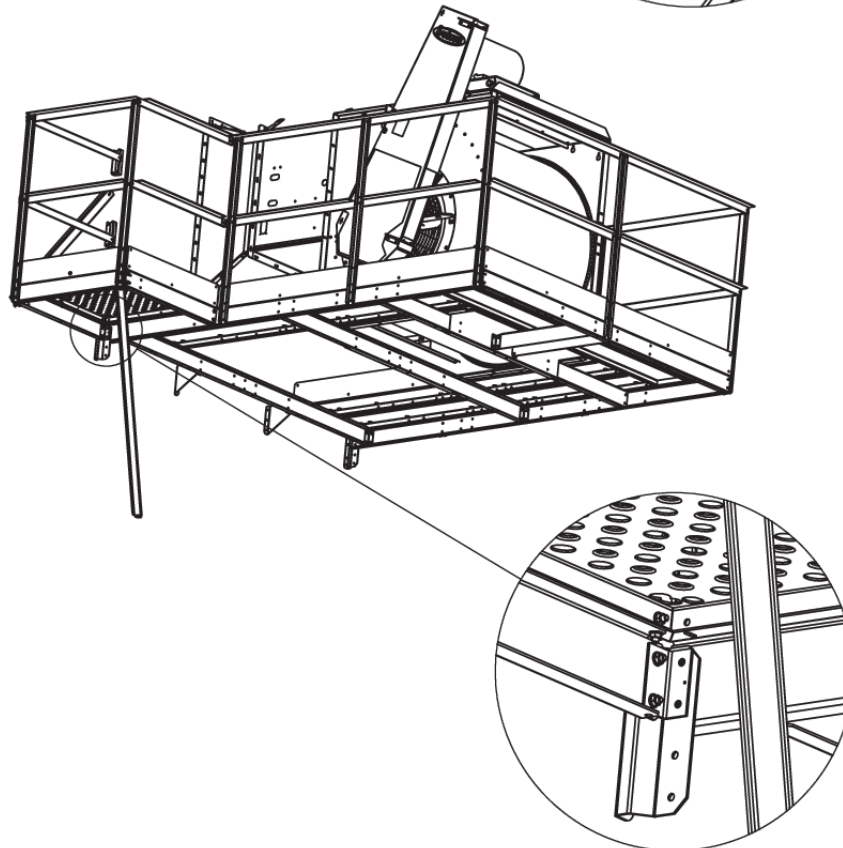
ITEM #	PART #	DESCRIPTION	QTY.
1	TM04115	CLIP,CONN,BENT,WETHOLD	2
2	TM05471	BRACKET,SPPRT,STANDOFF TO DRYR	1
3	TM05616	SECTION,PLTFRM,STANDOFF	1
4	TM05663	HANDRAIL,37",UPPER/LOWER	4
5	TM05675	BRACKET,CONN,HANDRAIL,STANDOFF	2
6	TM05679	BRACE,SPPRT,STANDOFF	1
7	TM05684	BRACE,KNEE,PLTFRM,39 3/4"	1

Front Platform Attachment

Attach corners of standoff section to upper platform as shown below.



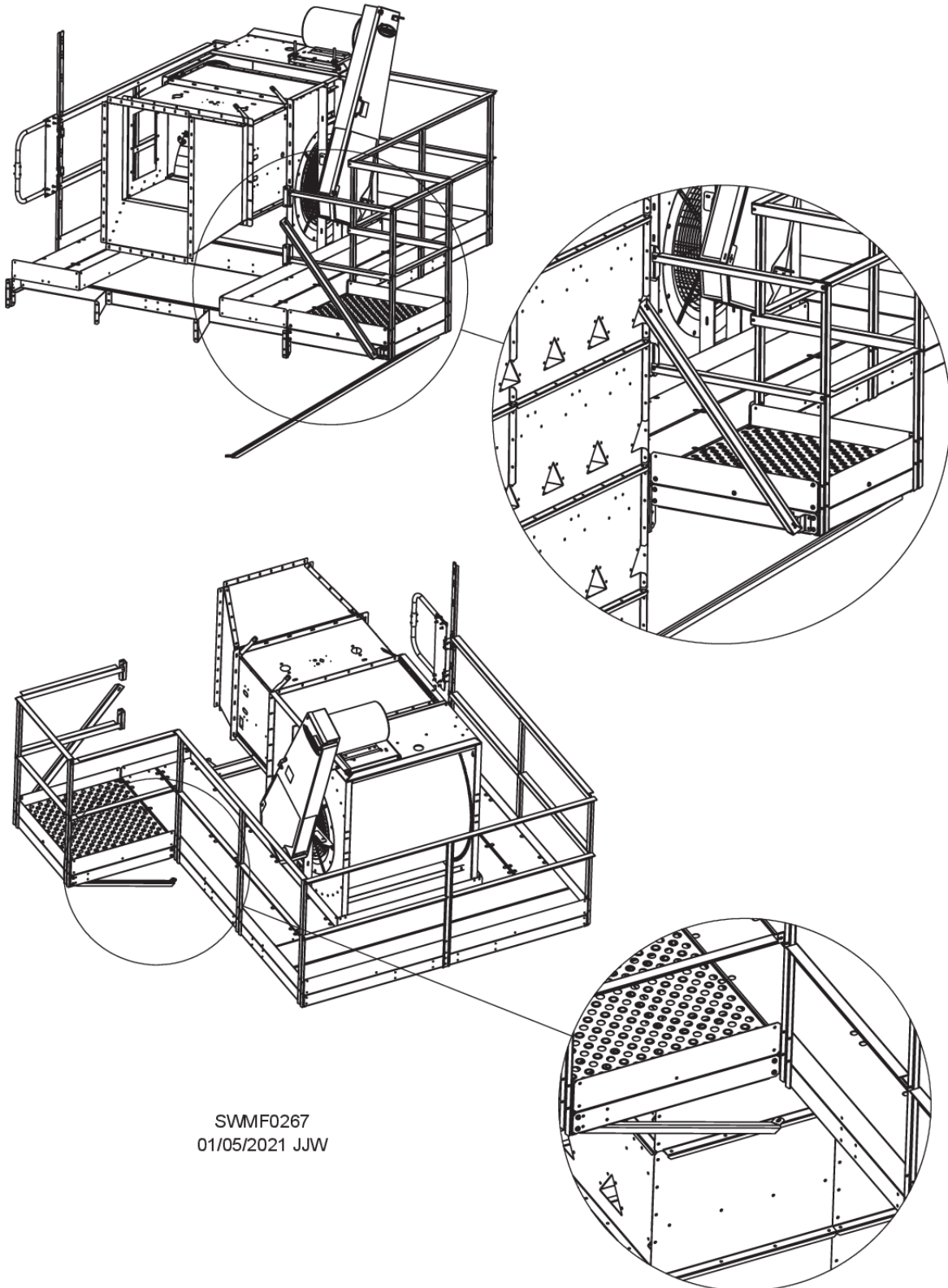
SWMF0267
01/05/2021 JJW



Front Platform Attachment

Attach upper support to standoff platform and dryer as shown in upper view below.

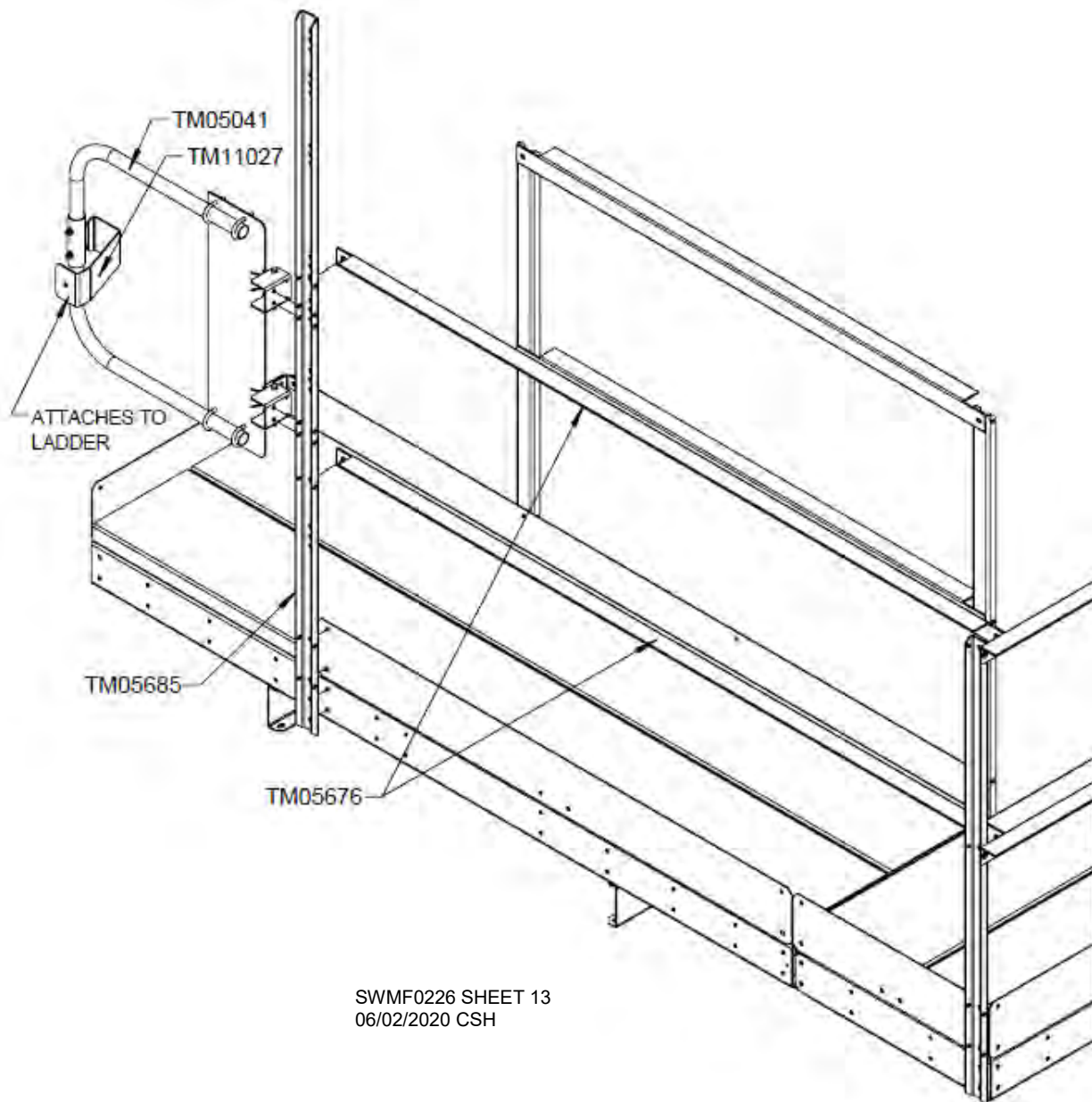
Attach lower support to standoff platform and dryer as shown in lower view below.



SWMF0267
01/05/2021 JJW

Front Platform Attachment

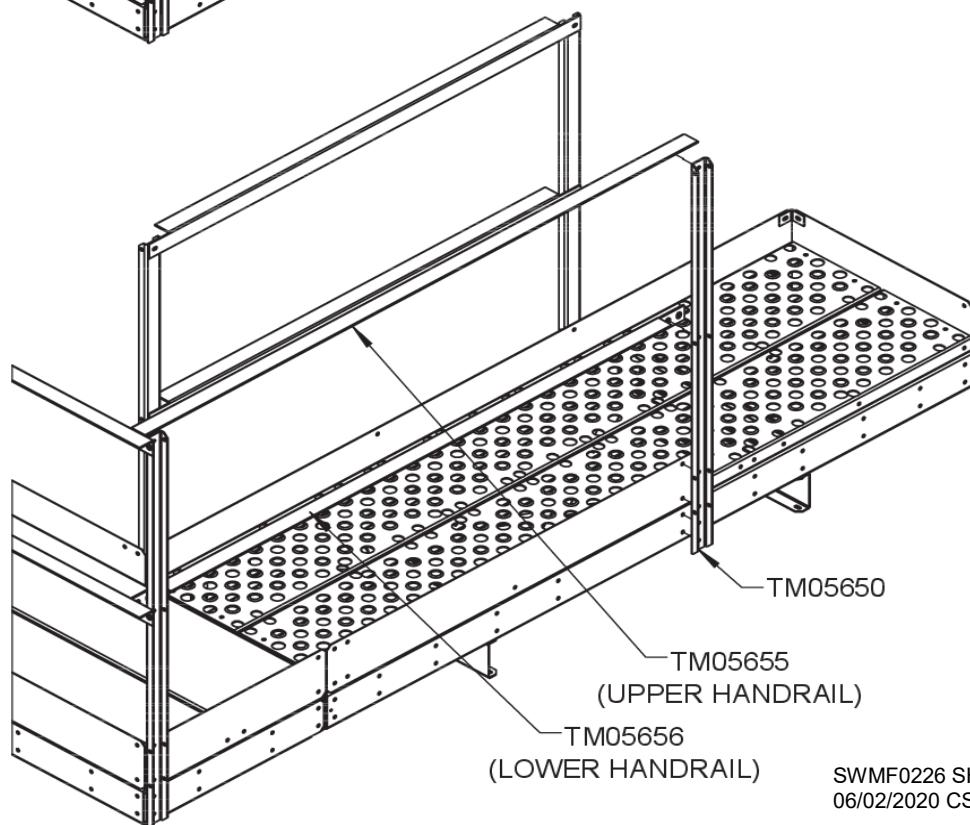
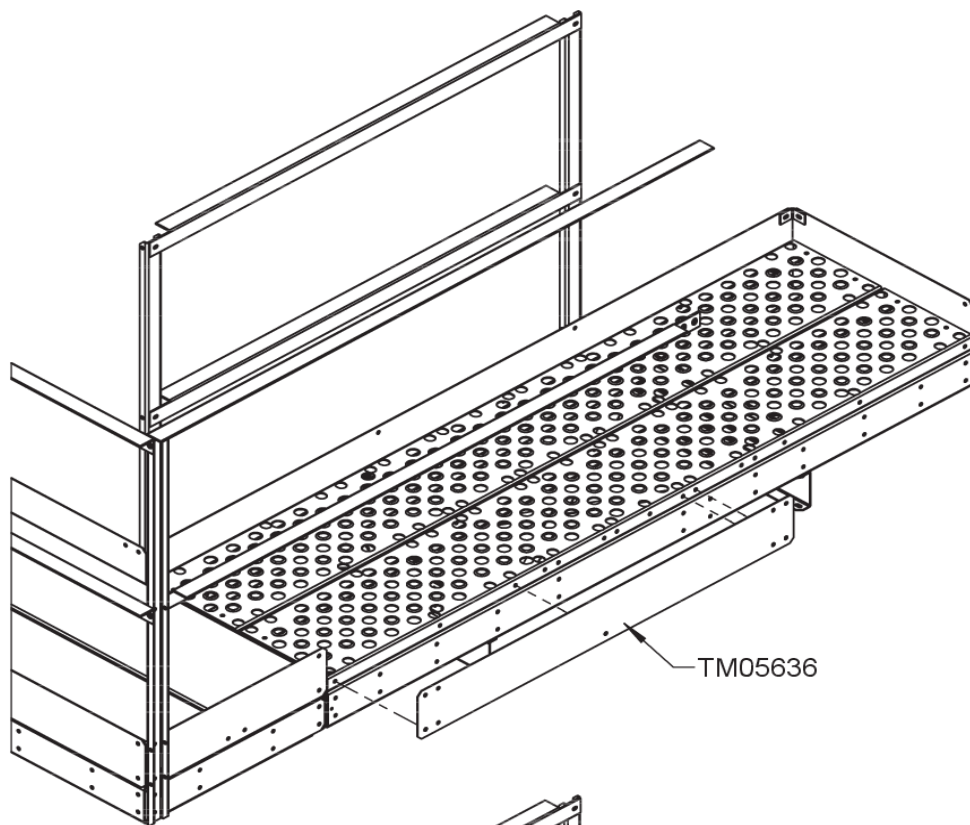
Drawing below shows attachment of brackets on gate (TM05041) to upright (TM05685) and attachment of guard rails TM05676. Drawing also shows attachment of gate catch (TM11027) to ladder.



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06/02/2020 CSH

Front Platform Attachment

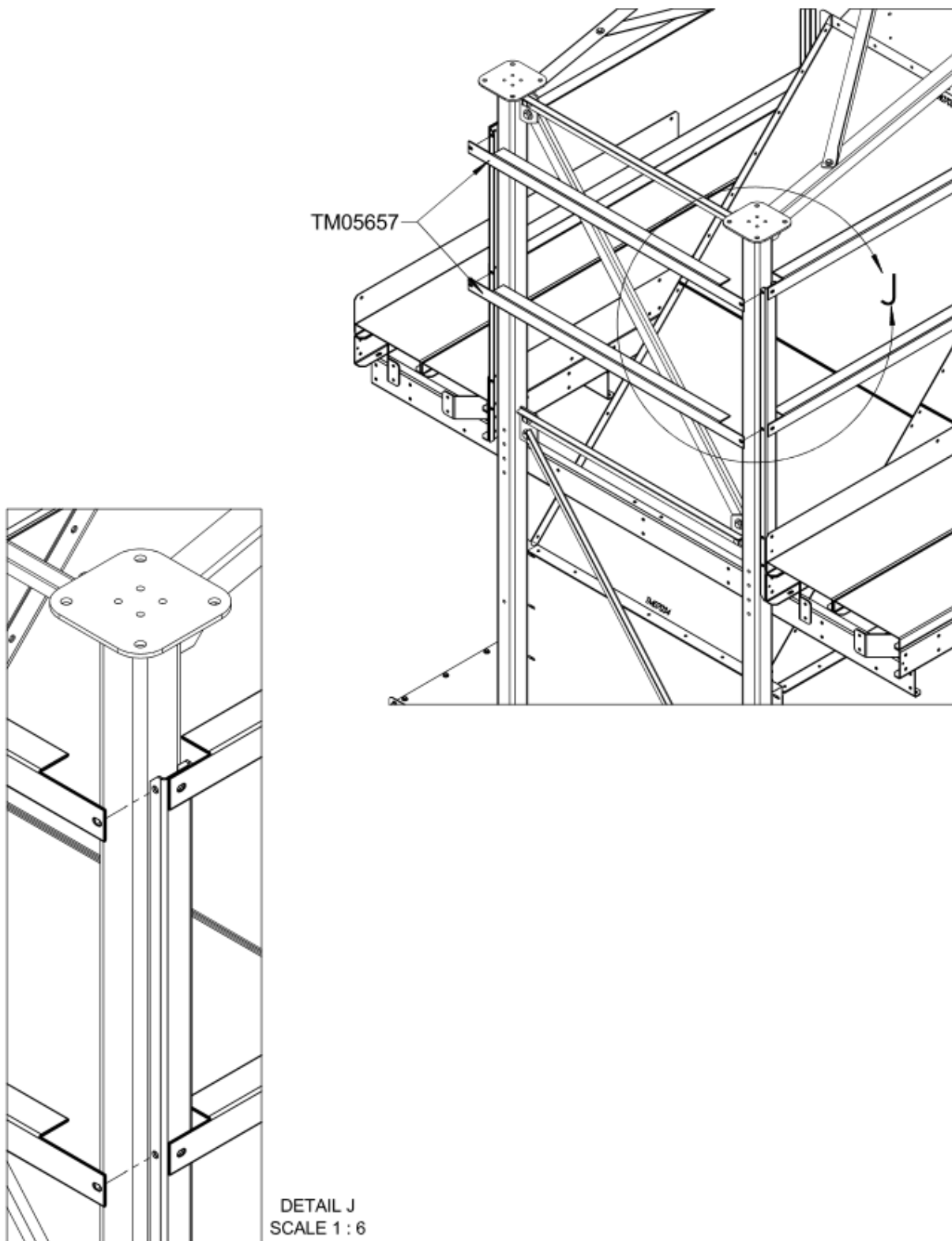
Drawings below show attachment of toe kick (TM05636), upright (TM05650) and left side handrails (TM05655 & TM05656).



SWMF0226 SHEET 14
06/02/2020 CSH

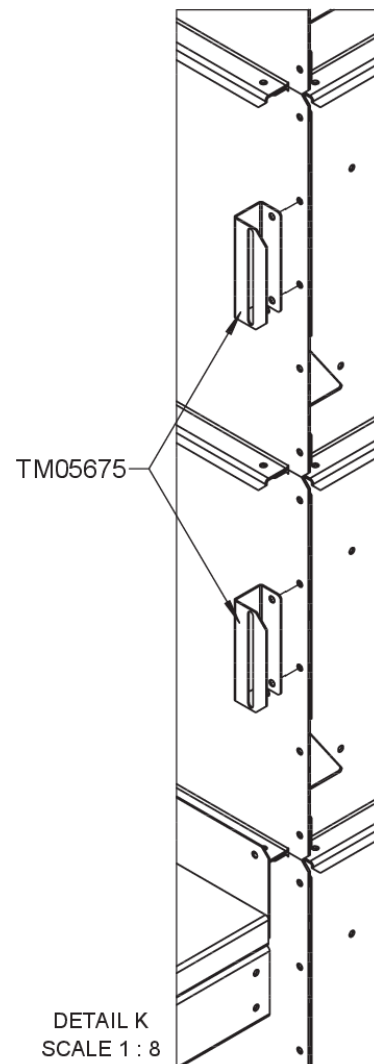
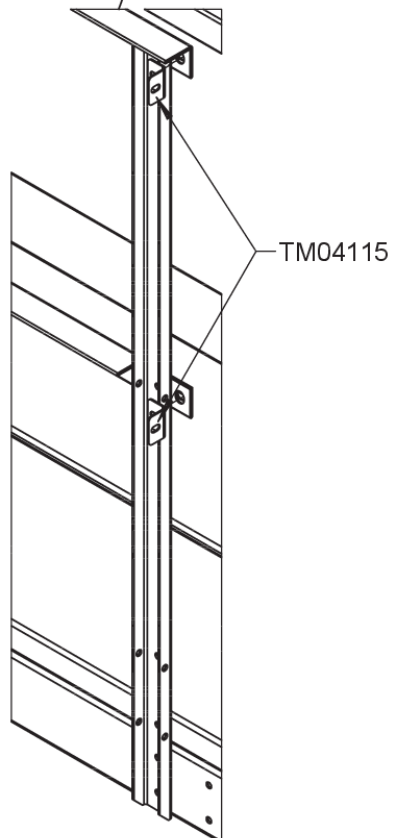
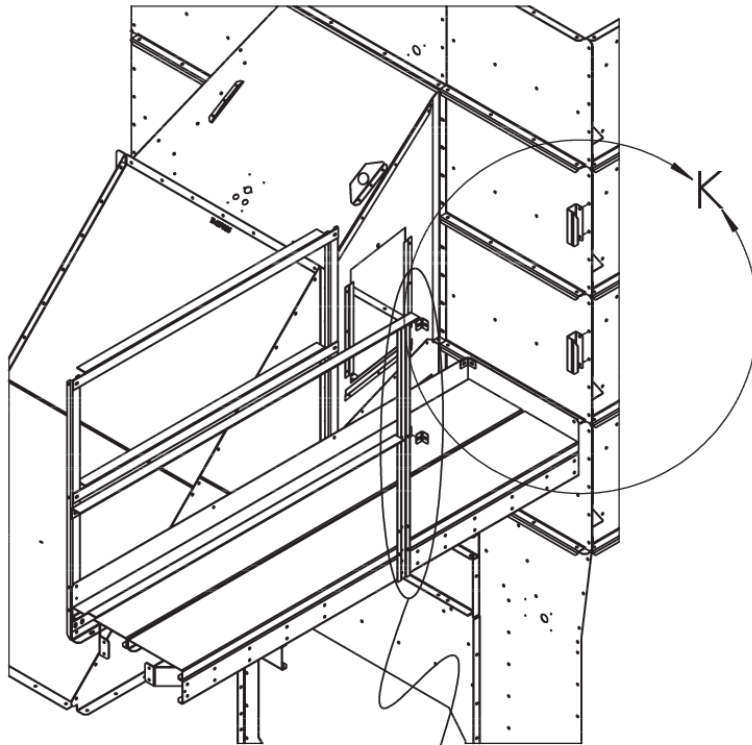
Front Platform Attachment

Drawing below shows attachment of inner hand rails (TM05657) around support structure legs.



Front Platform Attachment

Drawing below shows attachment of handrail connection clips (TM04115) to upright and attachment of standoff handrail connection brackets (TM05675) to dryer.

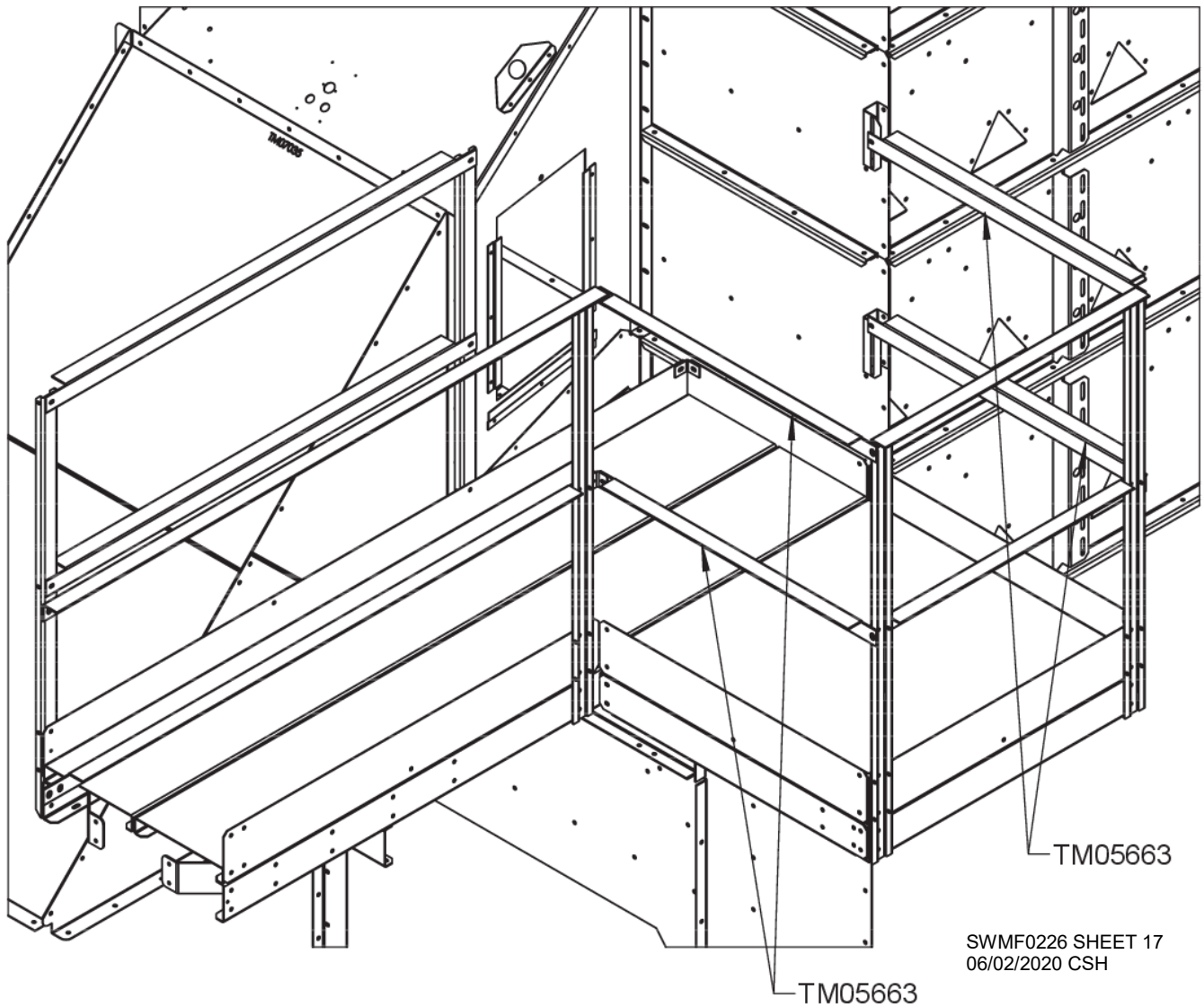


SWMF0226 SHEET 16
06/02/2020 CSH

DETAIL K
SCALE 1 : 8

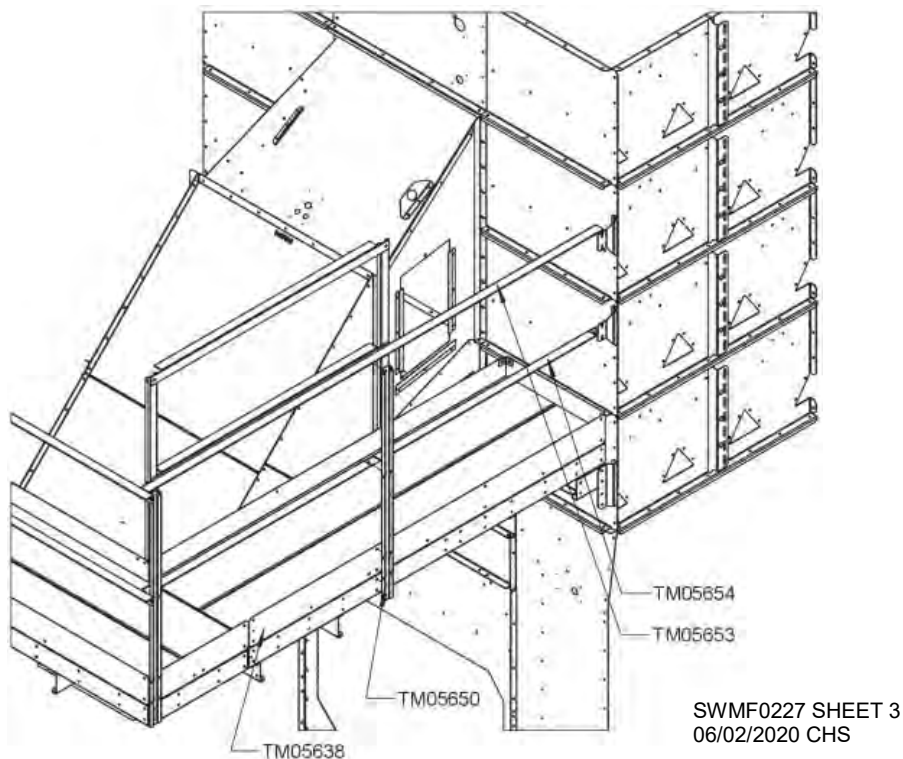
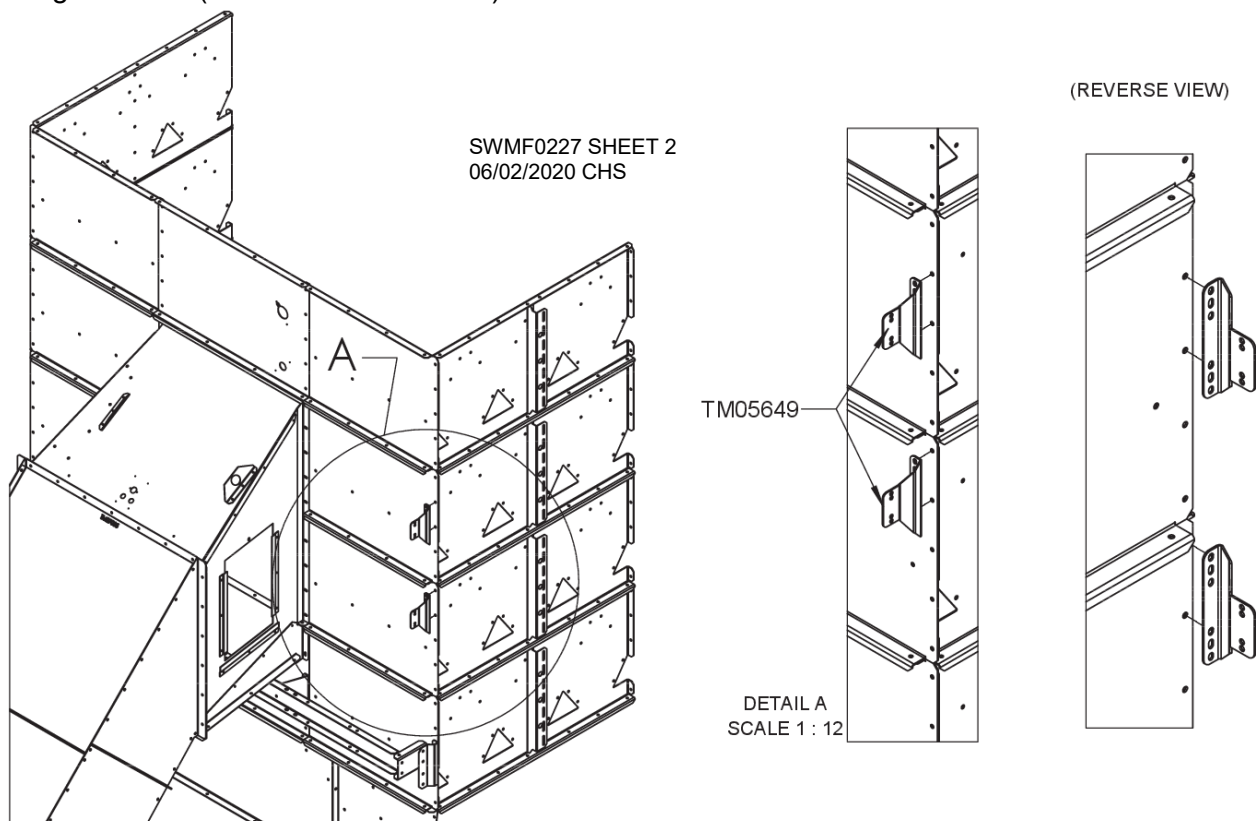
Front Platform Attachment

Drawing below shows attachment of handrails (TM05663) to uprights and to standoff handrail connection brackets (TM05675).



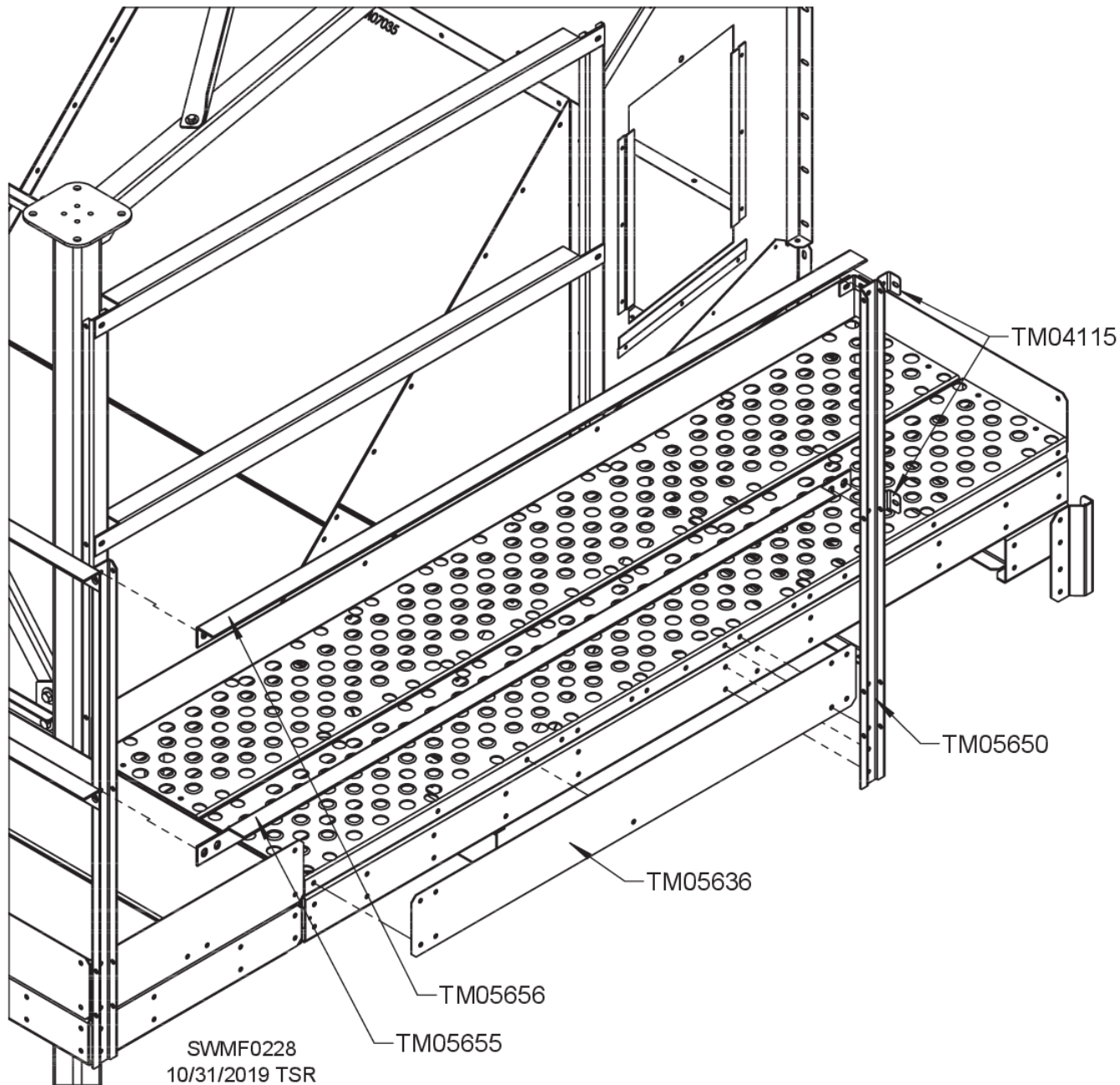
Front Platform Attachment

Drawings below show attachment of left side of standard heater platform (no standoff) to dryer. Attach handrail brackets TM05649 to dryer and attach toe kick (TM05638) and upright (TM05650) to platform. Attach guard rails (TM05653 & TM05654) as shown.



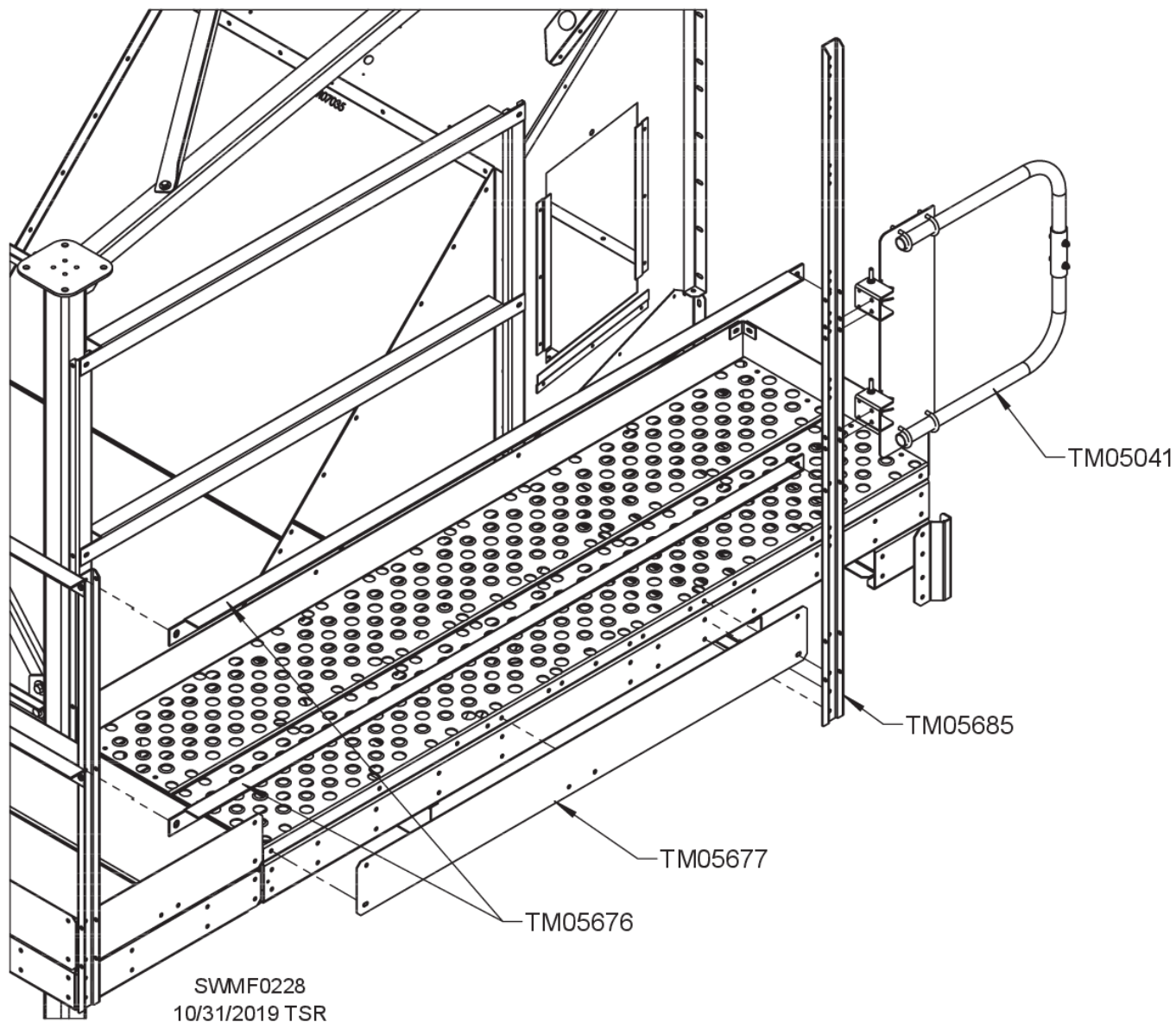
Changing Standoff Side of Platform

Remove TM04115, TM05636, TM05650, TM05655 and TM05656 as shown below and replace with TM05041, TM05676 (2X), TM05677 and TM05685. See next page for gate attachment.



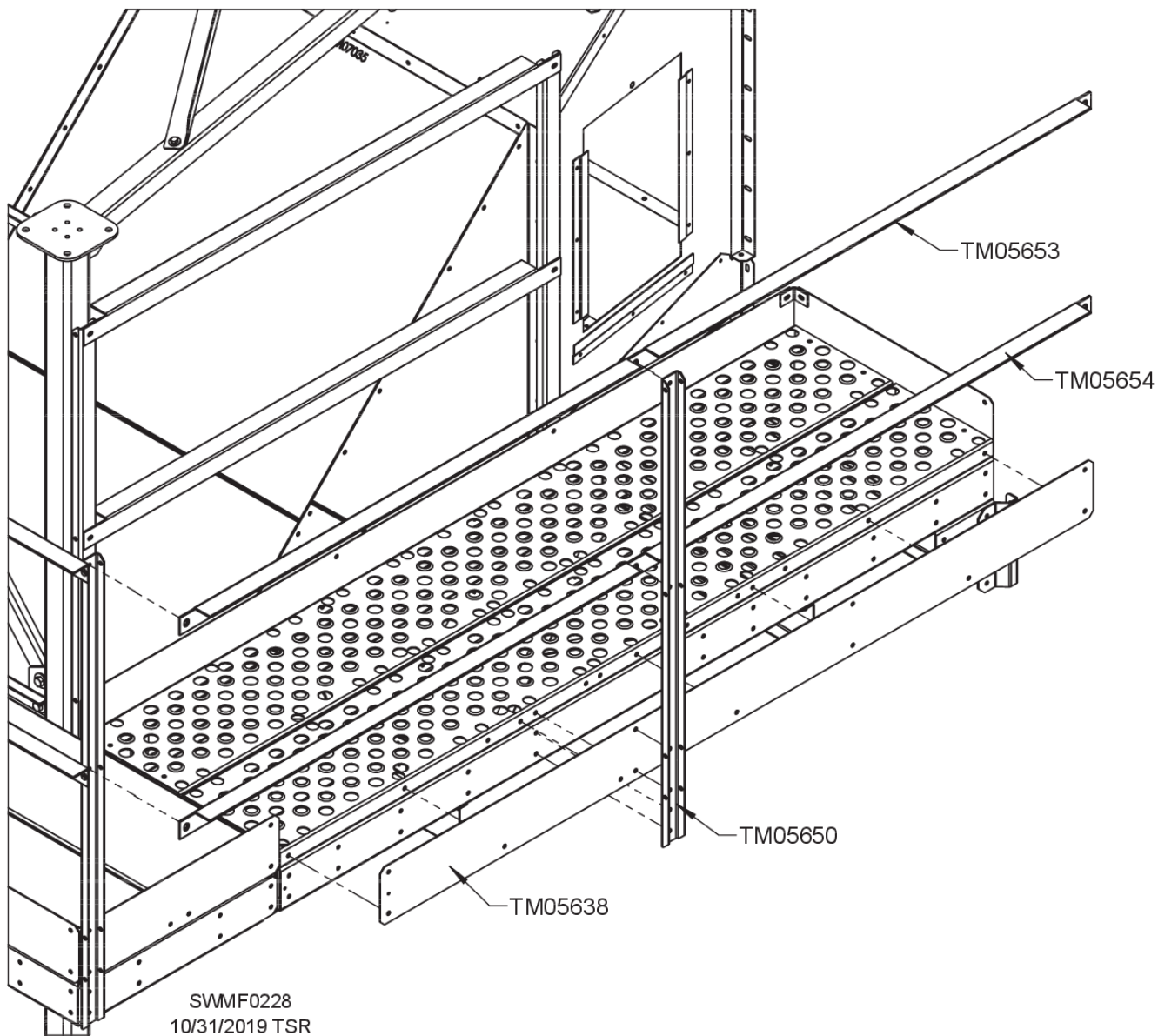
Changing Entry Side of Platform

Remove TM05041, TM05676 (2X), TM05677 and TM05685 as shown below and add parts from either standoff side (See previous page) or standard side (next page) depending on type of platform that comes with dryer. See applicable table on Page 3.



Changing Standard Side of Platform

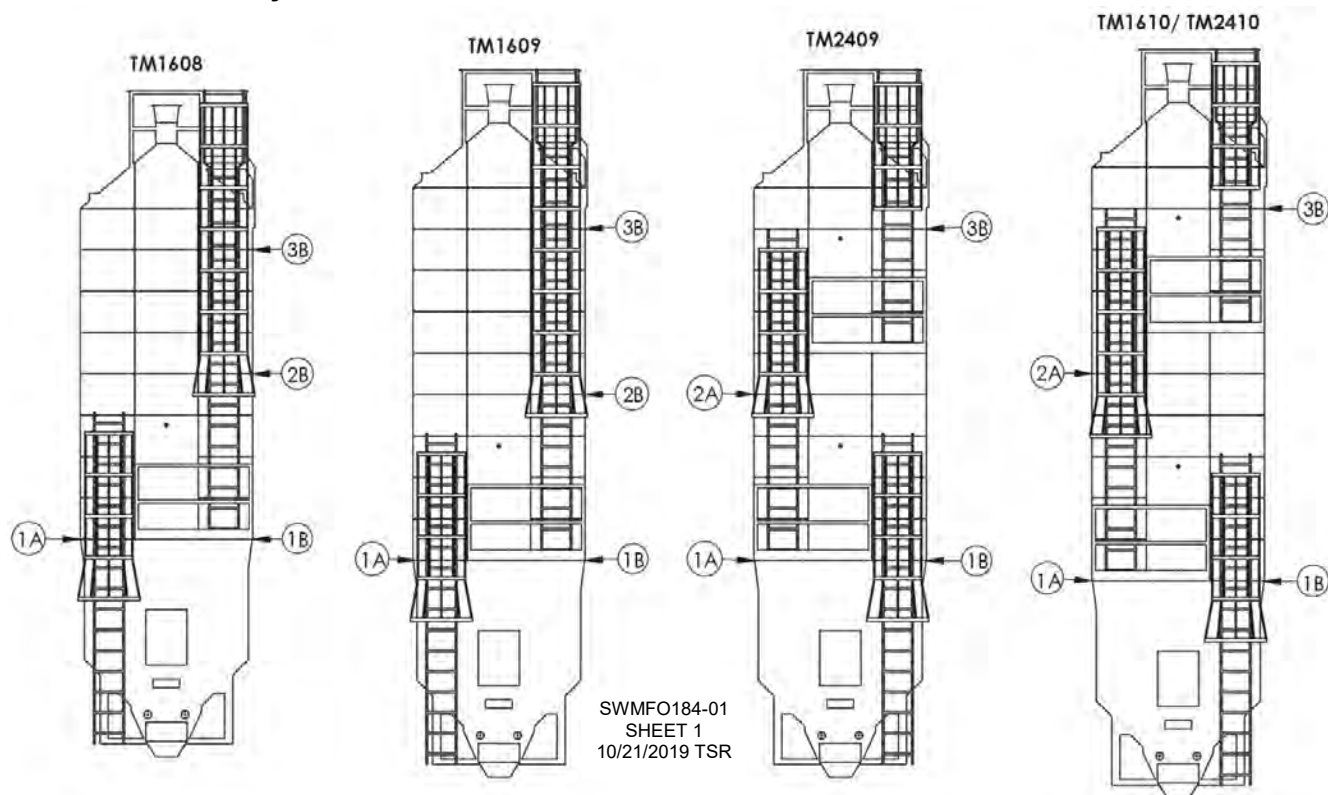
Remove TM05638, TM05650, TM05653 and TM05654 as shown below and replace with TM05041, TM05676 (2X), TM05677 and TM05685. See previous page for gate attachment.



Rear Platform, Ladder & Safety Cage Layouts by Dryer Model

Use drawings below and on next pages to guide attachment of rear platforms, ladders and safety cages. See corresponding list of parts used at connections between modules.

Standard 16' & 24' Dryer Models

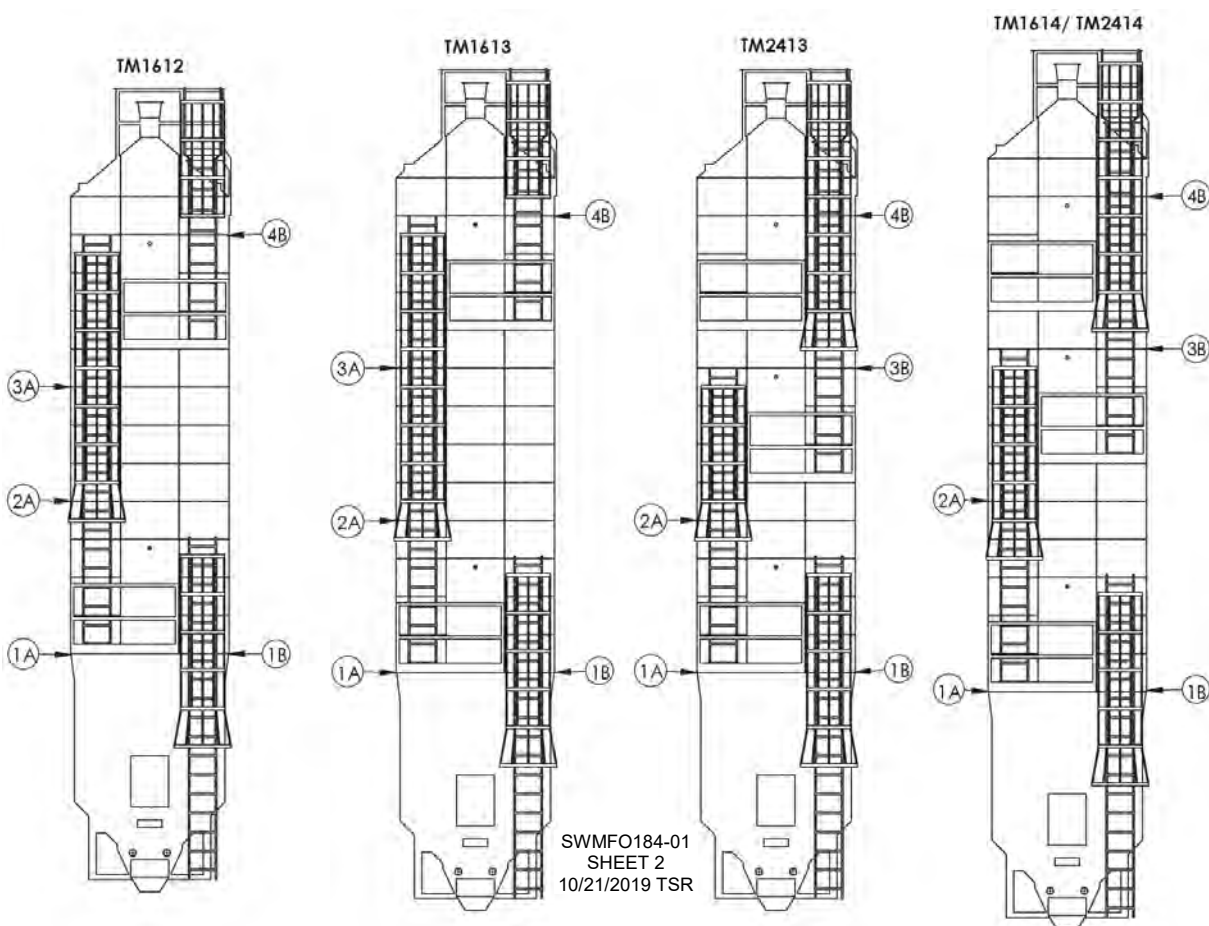


TM1608			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11028
2B	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

TM1609			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11028
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

TM2409			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11028
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545

TM1610 / TM2410			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11028
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545

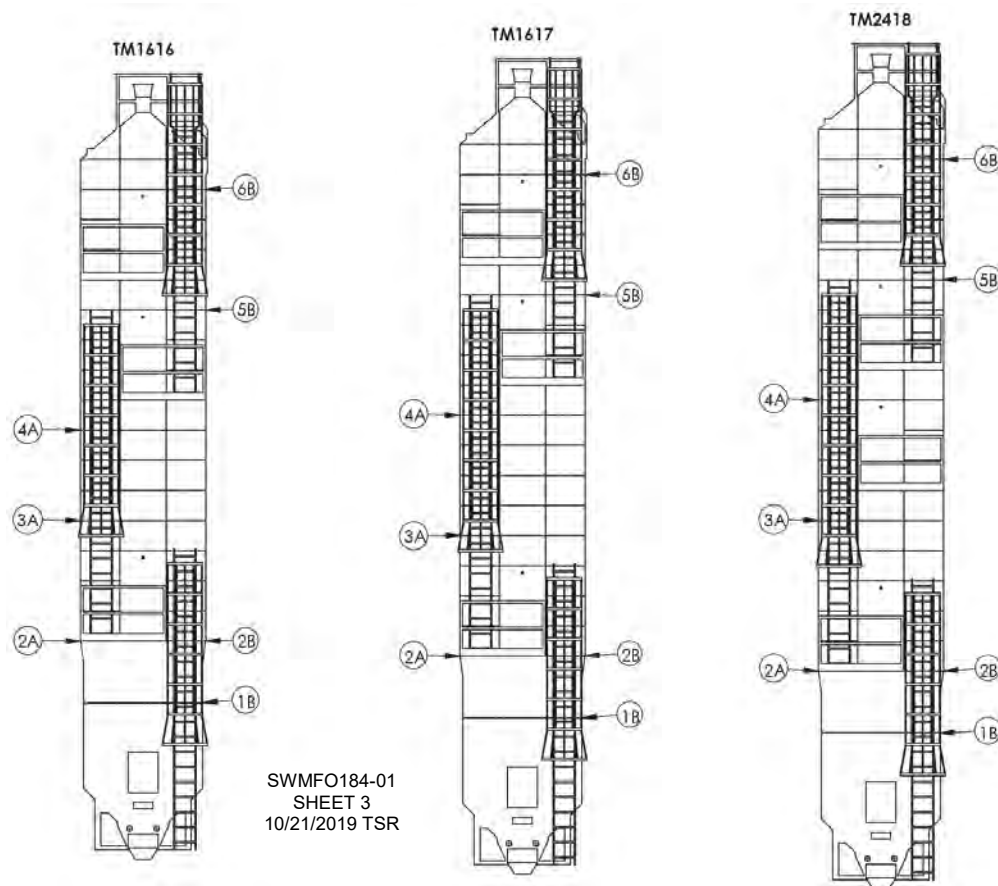


TM1612			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11028
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545

TM2413			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11028
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2B	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
4B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	V07212	

TM1613			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11028
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545

TM1614 / TM2414			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	2	TM11029
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
4B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

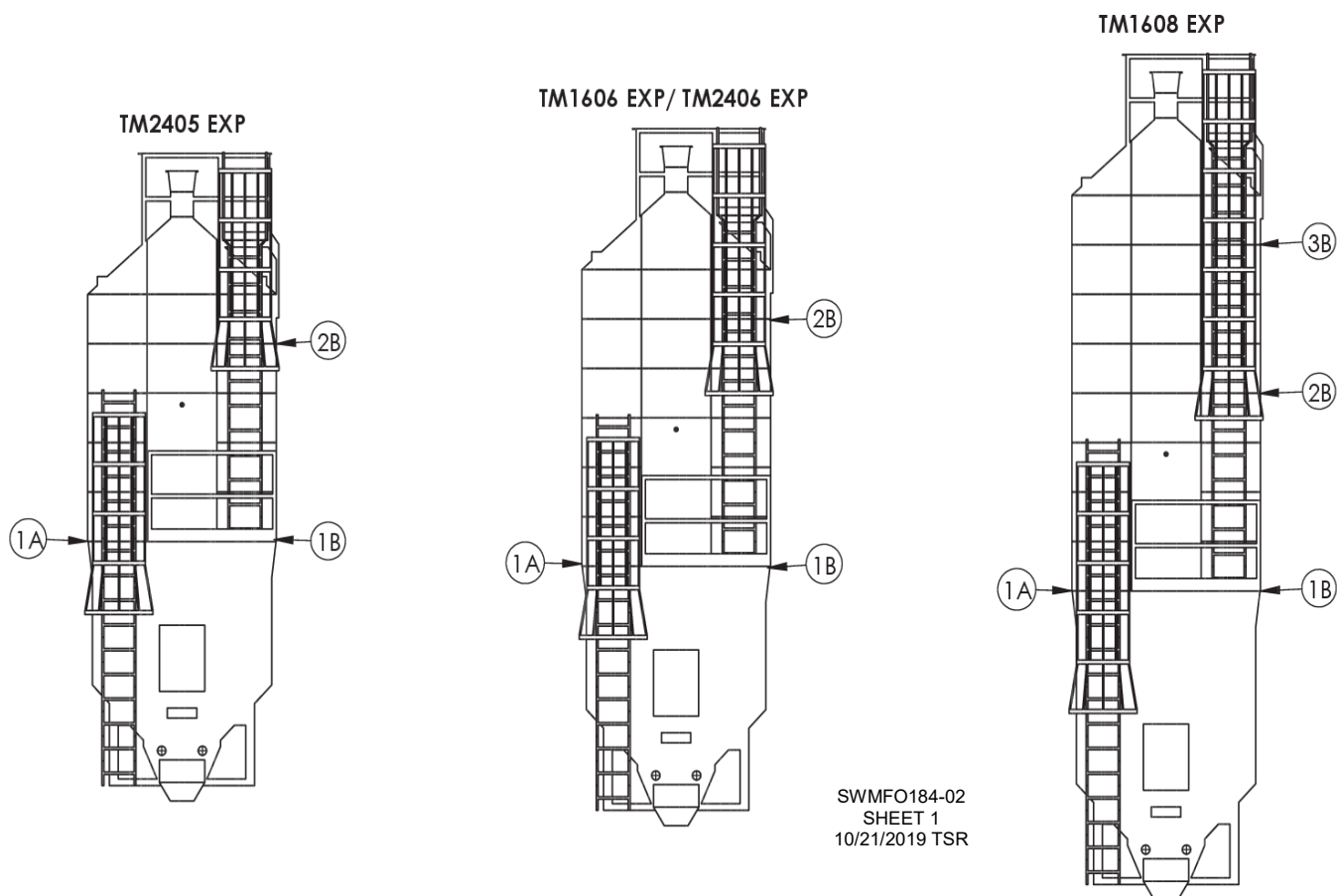


TM1616			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
4A	UPRIGHT, 24'	7	V07212
	SPLICE, LADDER	2	T25545
5B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM1617			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
3A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
4A	UPRIGHT, 24'	7	V07212
	SPLICE, LADDER	2	T25545
5B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM2418			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
5B	SPLICE, LADDER	2	T25545
6B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

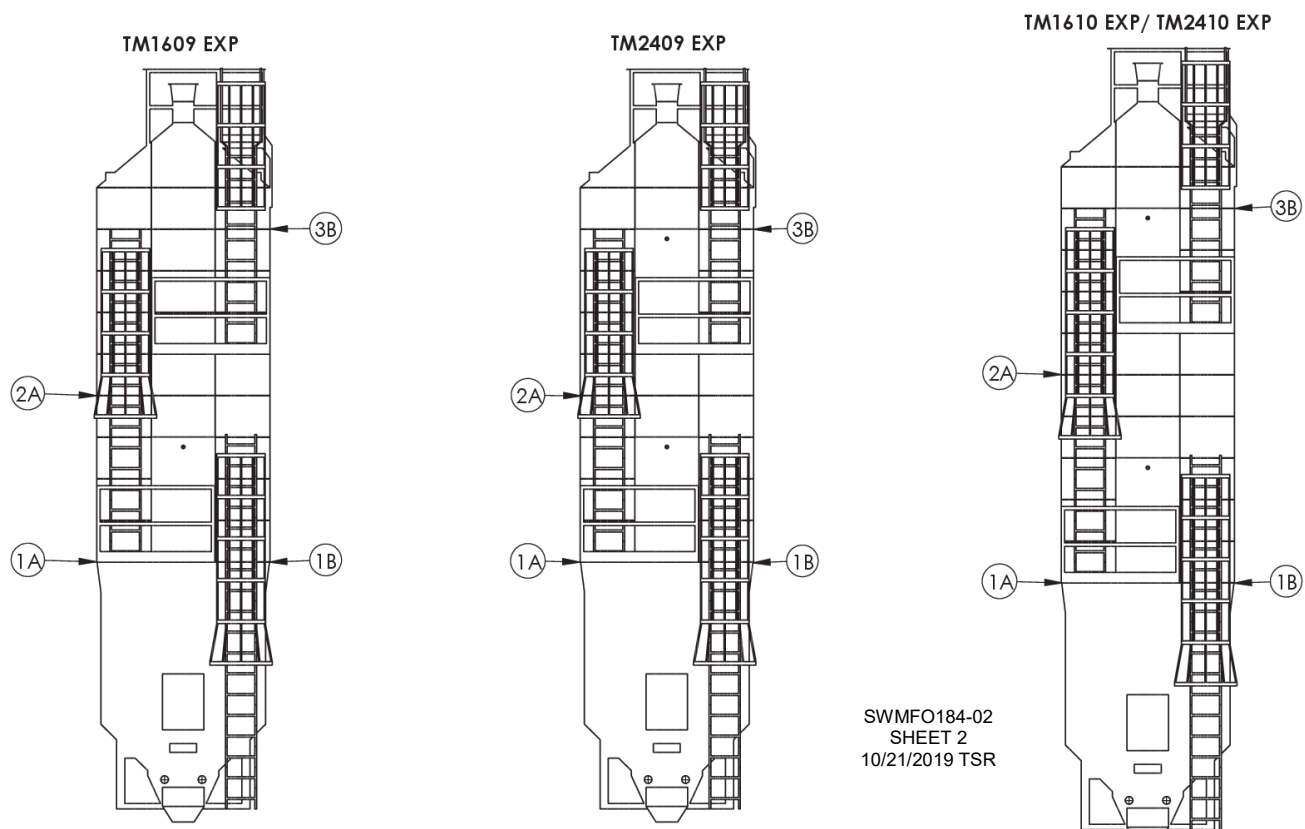
Expandable 16' & 24' Dryer Models



TM2405 EXPANDABLE			
REF.	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

TM1608 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

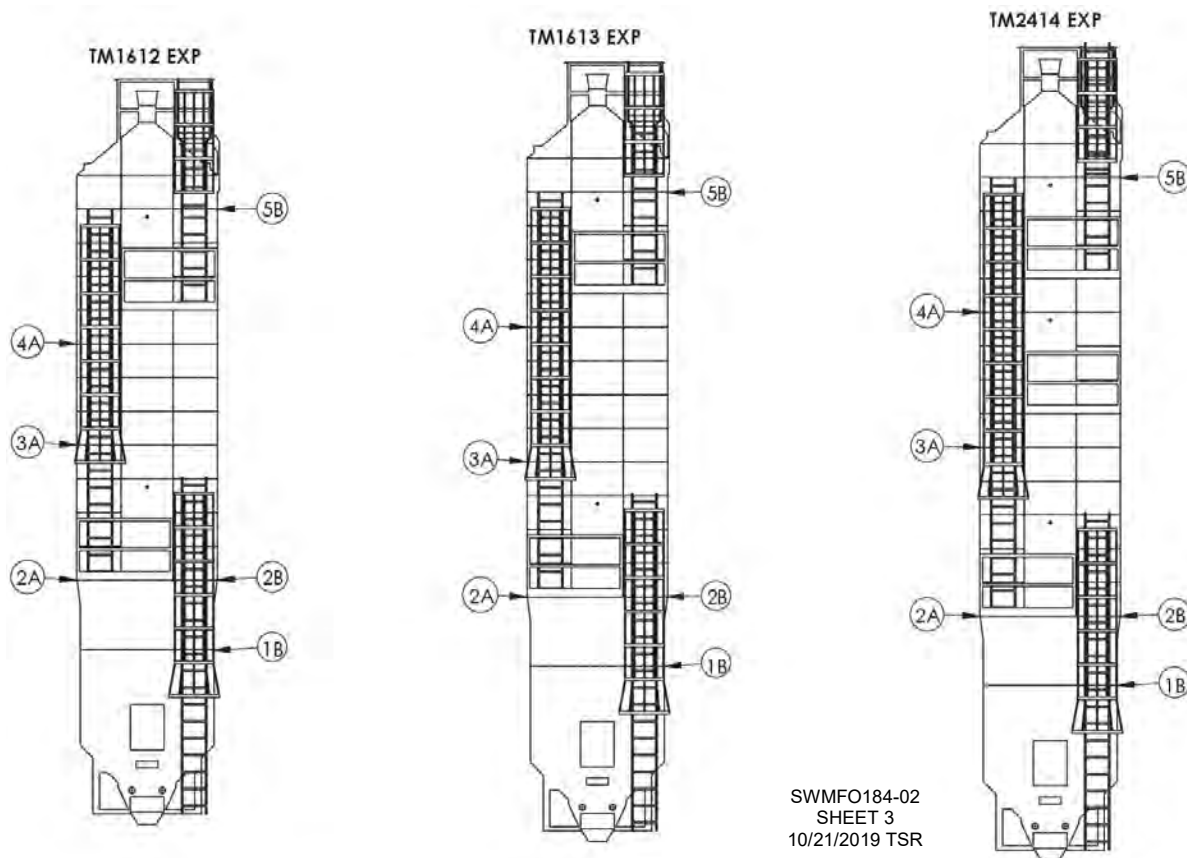
TM1606 / TM2406 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	2	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212



TM1609 EXPANDABLE			
REF.#	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11029
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24"	5	V07212
2A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24"	7	V07212
3B	SPLICE, LADDER	2	T25545

TM2409 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, LOWER, REAR, ASY	1	TM11029
1B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545

TM1610 / TM2410 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, REAR, LWR, LEFT, ASY	1	TM11029
2A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
3B	SPLICE, LADDER	2	T25545



TM1612 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
5B	SPLICE, LADDER	2	T25545

TM1613 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
5B	SPLICE, LADDER	2	T25545

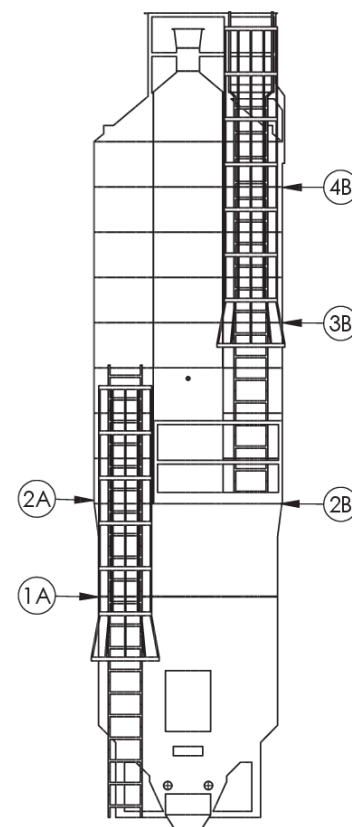
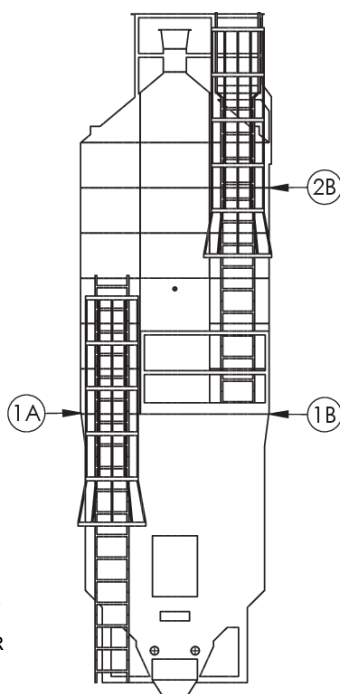
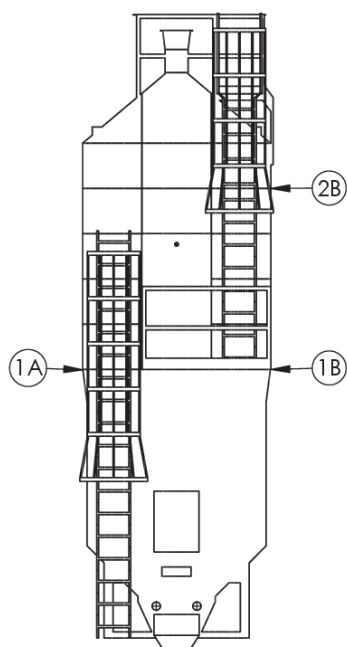
TM2414 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
4A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
5B	SPLICE, LADDER	2	T25545

16' & 24' Double Expandable (8-Tier) Dryer Models

TM1608 8T EXP

TM2405 8T EXP

TM1606 8T EXP/ TM2406 8T EXP

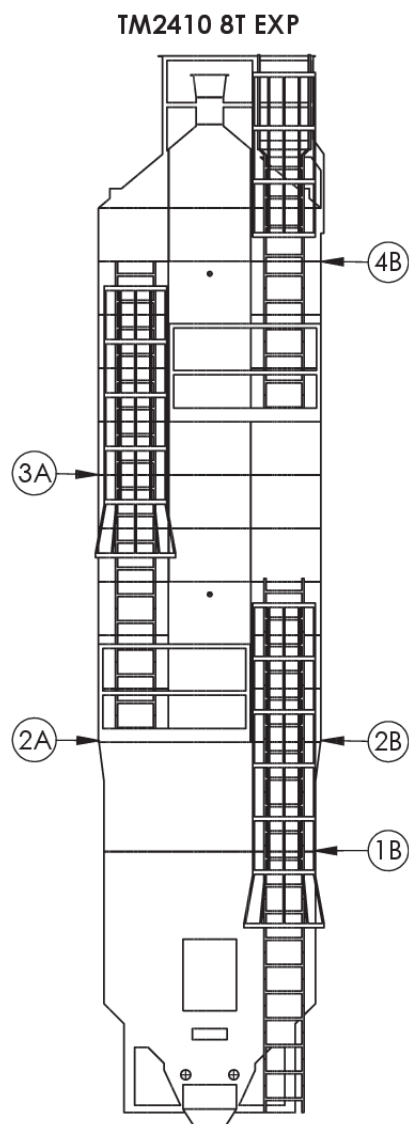
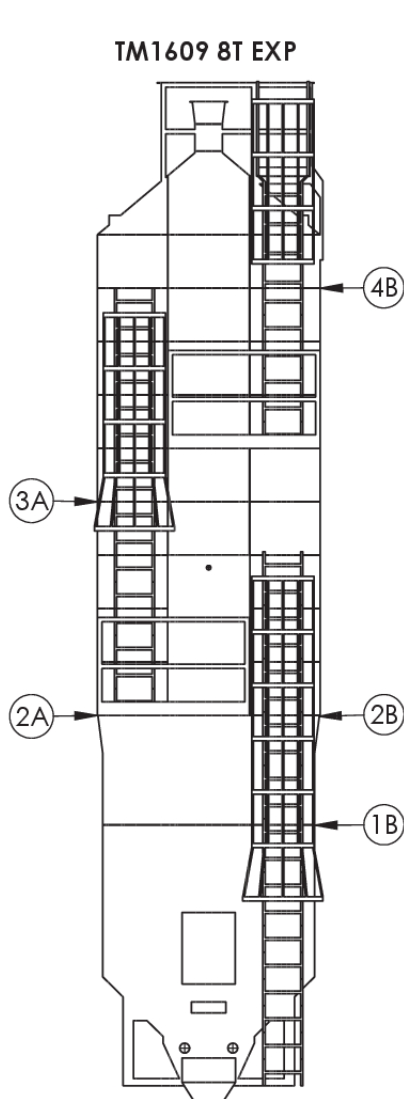


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TM2405 8T EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

TM1606 / TM2406 8T EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
1B	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

TM1608 8T EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
2B	PLATFORM, LOWER, REAR, ASY	1	TM11029
3A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212

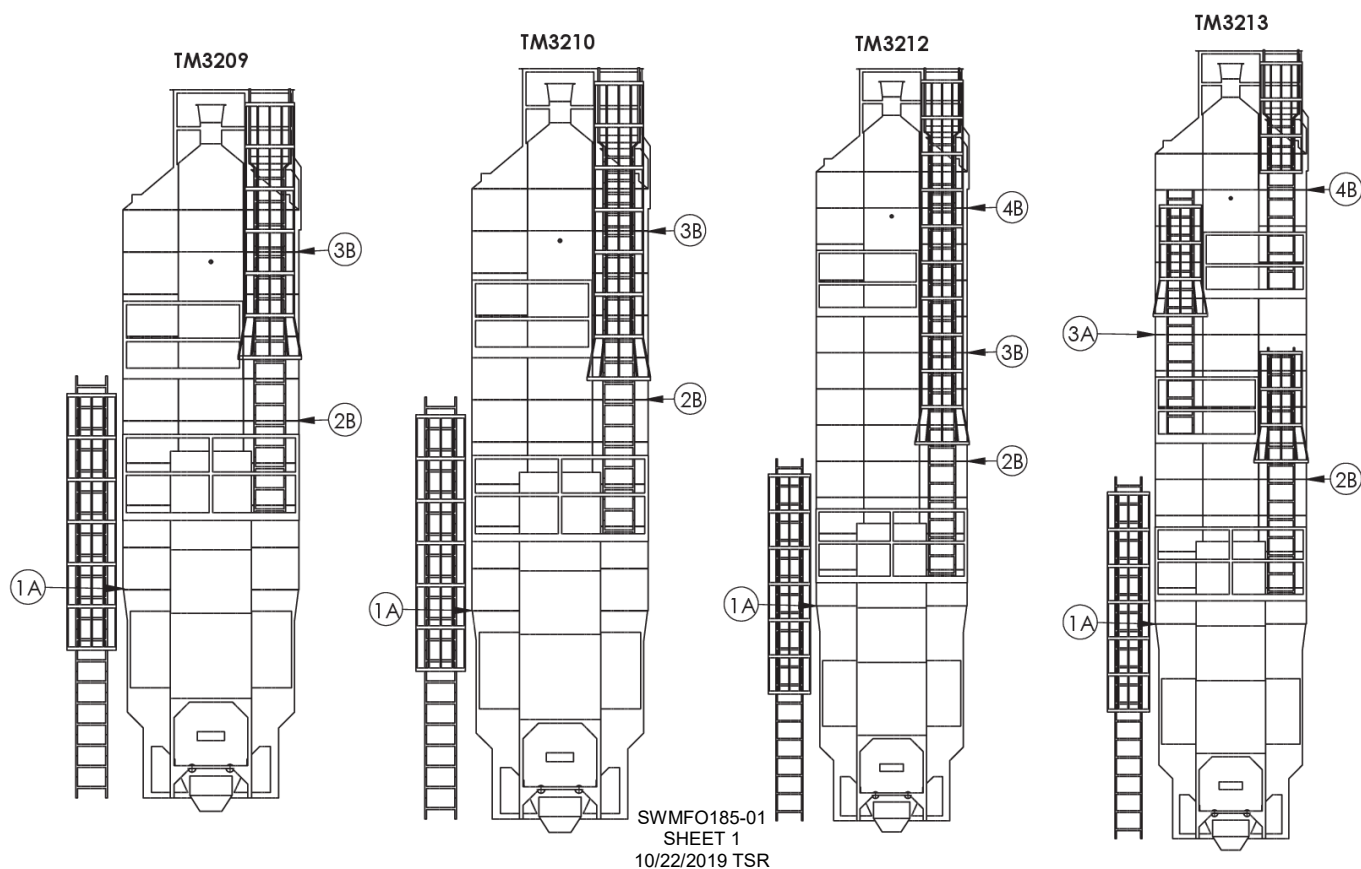


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TM1609 8T EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, LOWER, REAR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 3', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545

TM2410 8T EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
2A	PLATFORM, REAR, LWR, ASY	1	TM11029
2B	SPLICE, LADDER	2	T25545
	CAGE, 4', D-RING, HALF, ASY	1	TM11088
	UPRIGHT, 24'	5	V07212
3A	SPLICE, LADDER	2	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545

Standard 32' Dryer Models

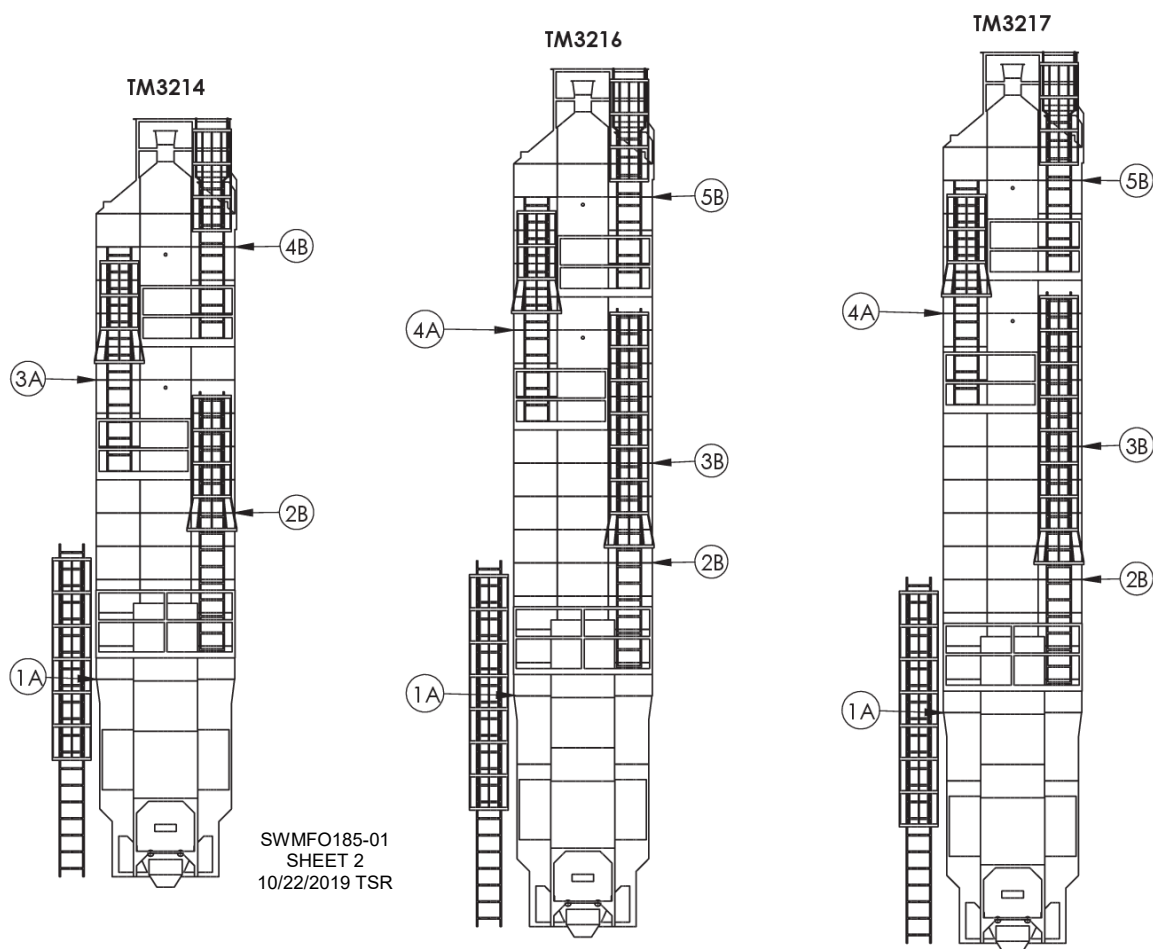


TM3209			
REF #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 18', 10' COOL, GRND ACCESS	1	TM112011
	CAGE, 10', GRND ACCESS	1	TM11301
2B	SPLICE, LADDER	2	T25545
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM3210			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 18', 10' COOL GRND ACCESS	1	TM112011
	CAGE, 10', GRND ACCESS	1	TM11301
2B	SPLICE, LADDER	2	T25545
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM3212			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 18', 12' COOL, GRND ACCESS	1	TM11201
	CAGE, 10', GRND ACCESS	1	TM11301
2B	SPLICE, LADDER	2	T25545
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM3213			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 18', 12' COOL, GRND ACCESS	1	TM11201
	CAGE, 10' GRND ACCESS	1	TM11301
2B	SPLICE, LADDER	2	T25545
3A	SPLICE, LADDER	2	T25545
4B	SPLICE, LADDER	2	T25545

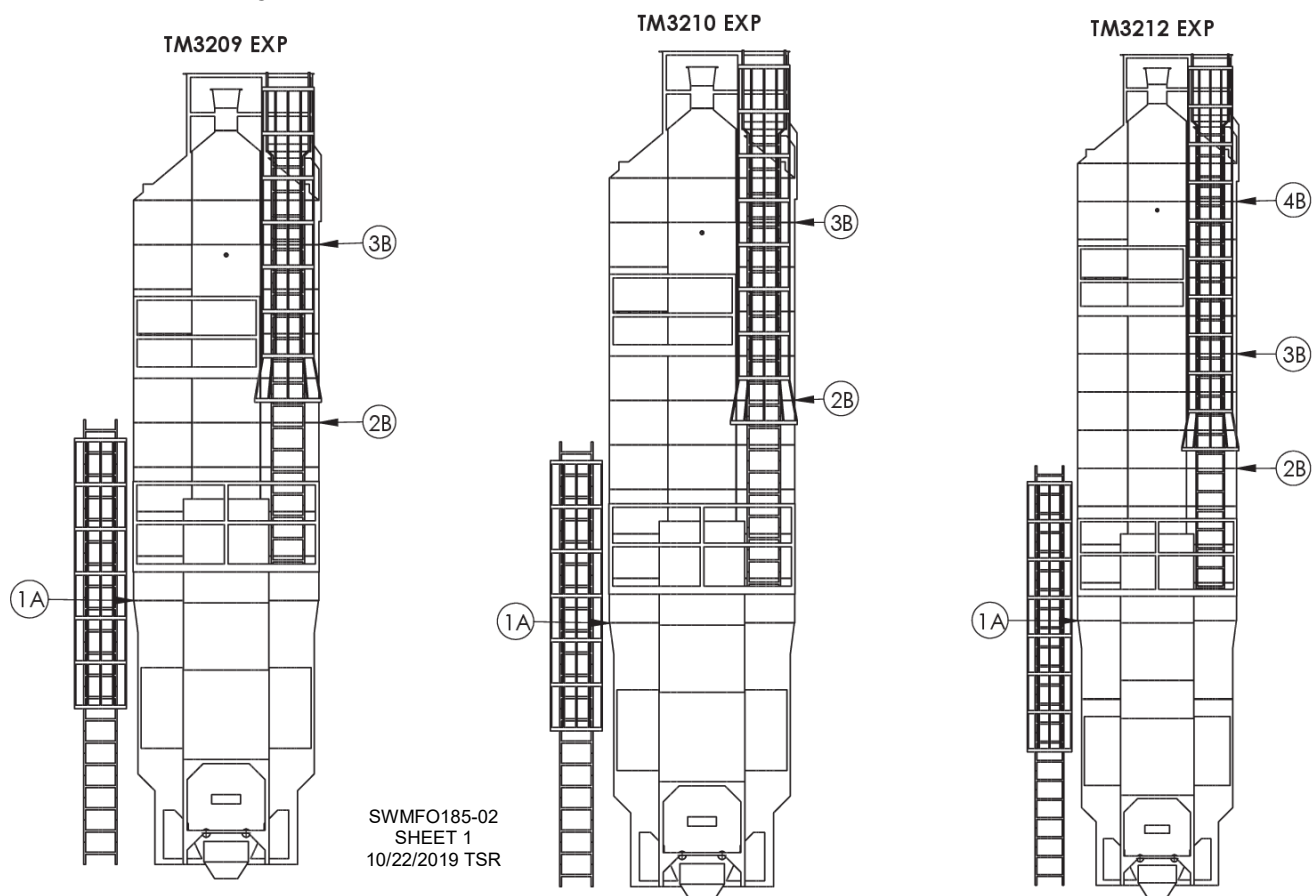


TM3214			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 18', 12'COOL, GRND ACCESS	1	TM11201
	CAGE, 10', GRND ACCESS	1	TM11301
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
3A	SPLICE, LADDER	2	T25545
4B	SPLICE, LADDER	2	T25545

TM3216			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 20', 14'COOL, GRND ACCESS	1	TM11202
	CAGE, 12', GRND ACCESS	1	TM11302
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
4A	SPLICE, LADDER	2	T25545
5B	SPLICE, LADDER	2	T25545

TM3217			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 20', 14'COOL, GRND ACCESS	1	TM11202
	CAGE, 12', GRND ACCESS	1	TM11302
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
4A	SPLICE, LADDER	2	T25545
5B	SPLICE, LADDER	2	T25545

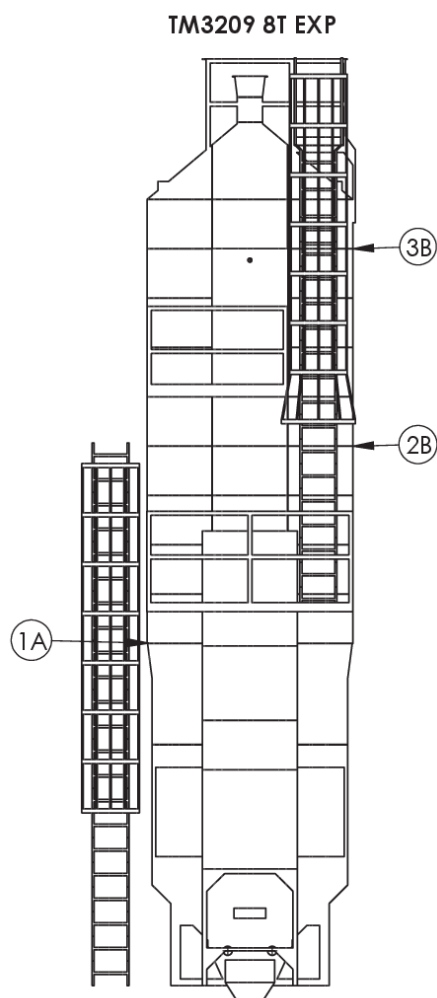
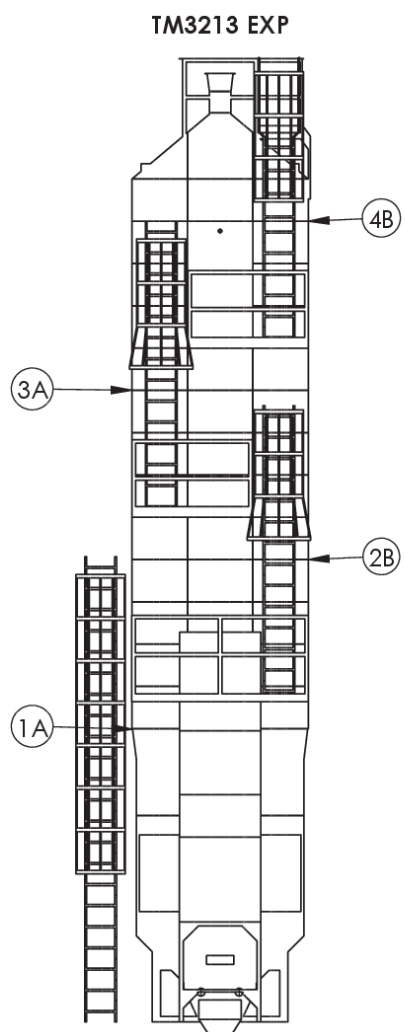
Expandable 32' Dryer Models



TM3209 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 20', 12'COOL, GND ACCESS	1	TM11202
	CAGE, 12', GRND ACCESS	1	TM11302
2B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM3210 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 20', 12'COOL, GND ACCESS	1	TM11202
	CAGE, 12', GRND ACCESS	1	TM11302
2B	D-RING, FLARED	1	B5086
	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

TM3212 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 22', 14'COOL, GND ACCESS	1	TM11203
	CAGE, 14', GRND ACCESS	1	TM11303
2B	SPLICE, LADDER	2	T25545
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	7	V07212
4B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212



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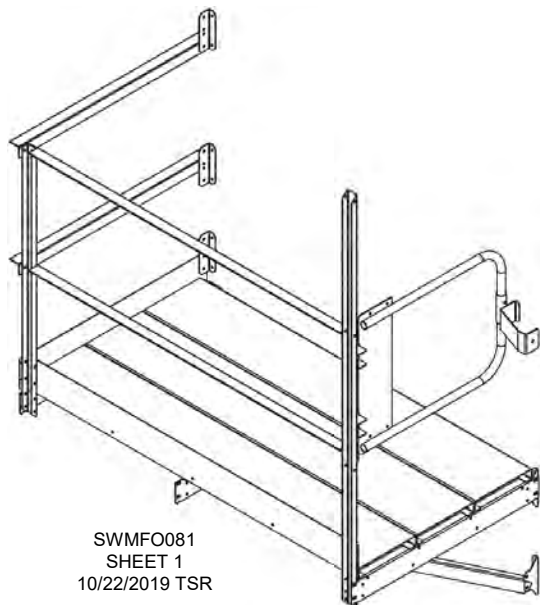
TM3213 EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 22', 14' COOL, GND ACCESS	1	TM11203
	CAGE, 14', GND ACCESS	1	TM11303
2B	SPLICE, LADDER	2	T25545
3A	SPLICE, LADDER	2	T25545
4B	SPLICE, LADDER	2	T25545

TM3209 8T EXPANDABLE			
REF. #	DESCRIPTION	QTY.	PART #
1A	PLATFORM, HEATER, STANDARD	1	TM05601
	LADDER, 22', 14' COOL, GND ACCESS	1	TM11203
	CAGE, 14', GND ACCESS	1	TM11303
2B	SPLICE, LADDER	2	T25545
3B	SPLICE, LADDER	2	T25545
	UPRIGHT, 24'	5	V07212

Cooling Section Rear Platform, TM11028

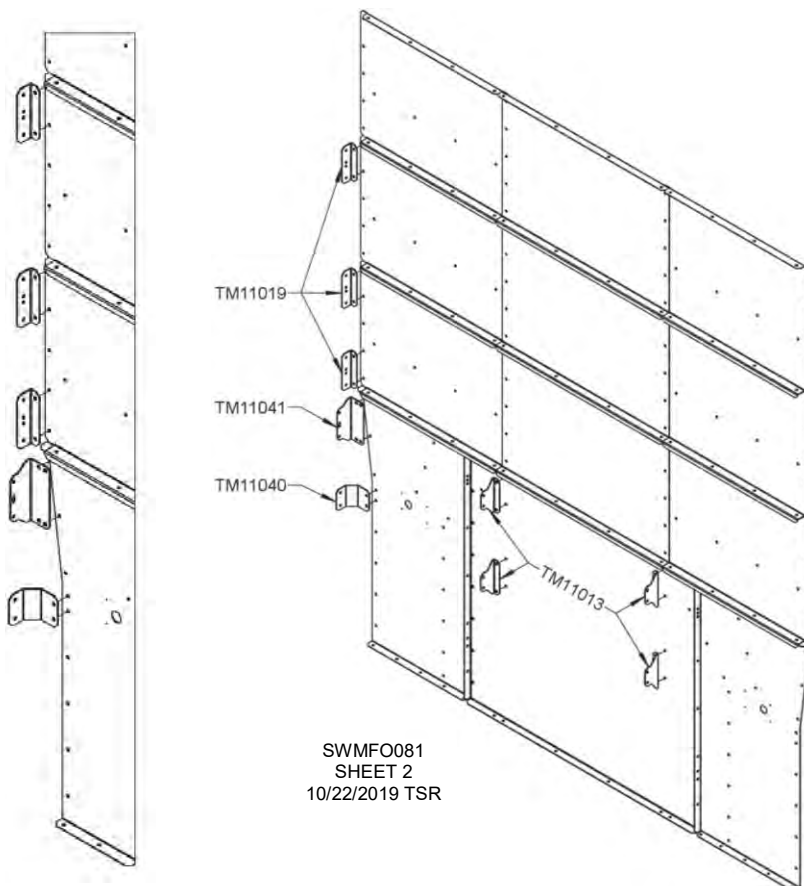
For Medium, Tall & Extra Tall Dryers

See drawing and table below for identification of parts and attachment of cooling section rear platform TM11028. Use 5/16" hardware.



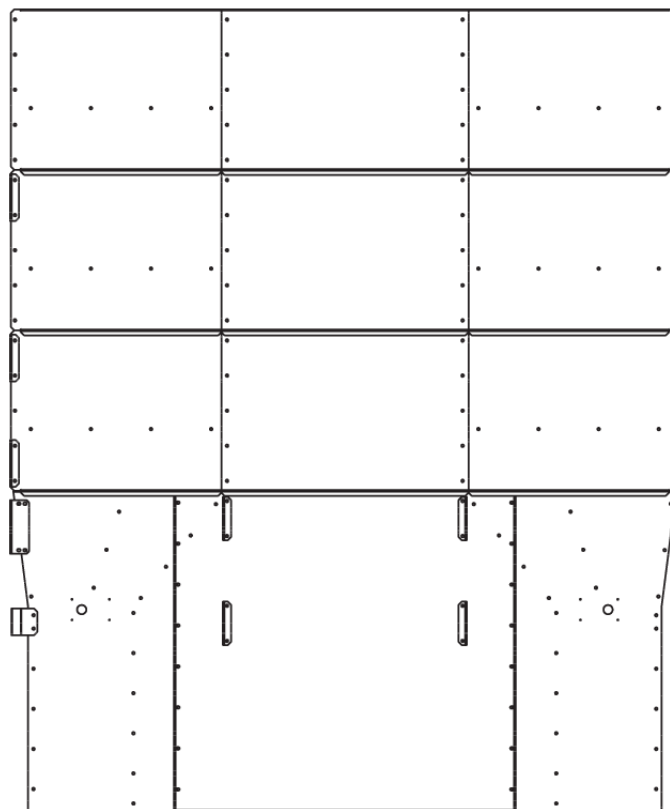
DESCRIPTION	QTY.	PART #
GATE, PLATFORM, BIN LADDER	1	BSG0010
BRACKET, PLATFORM, SIDEWALL	4	TM11013
BRACE, KNEE, REAR PLATFORM	3	TM11014
ANGLE, SUPPORT, REAR PLATFORM	3	TM11015
PLANK, PLATFORM, REAR PLATFORM	3	TM11016
TOEKICK, LONG, REAR PLATFORM	1	TM11017
TOEKICK, SIDE, REAR PLATFORM	1	TM11018
BRACKET, HANDRAIL, REAR PLATFORM	3	TM11019
UPRIGHT, REAR PLATFORM	1	TM11020
HANDRAIL, LOWER, PLATFORM, REAR	2	TM11022
HANDRAIL, SIDE, REAR PLATFORM	2	TM11023
STOP, GATE, LADDER PLATFORM	1	TM11027
BRACKET, LOWER, SIDE, LOWER PLATFORM	1	TM11040
BRACKET, UPPER, SIDE, LOWER PLATFORM	1	TM11041
UPRIGHT, EXTENDED, PLATFORM, REAR	1	TM11120

Attach brackets to back of dryer as shown below.

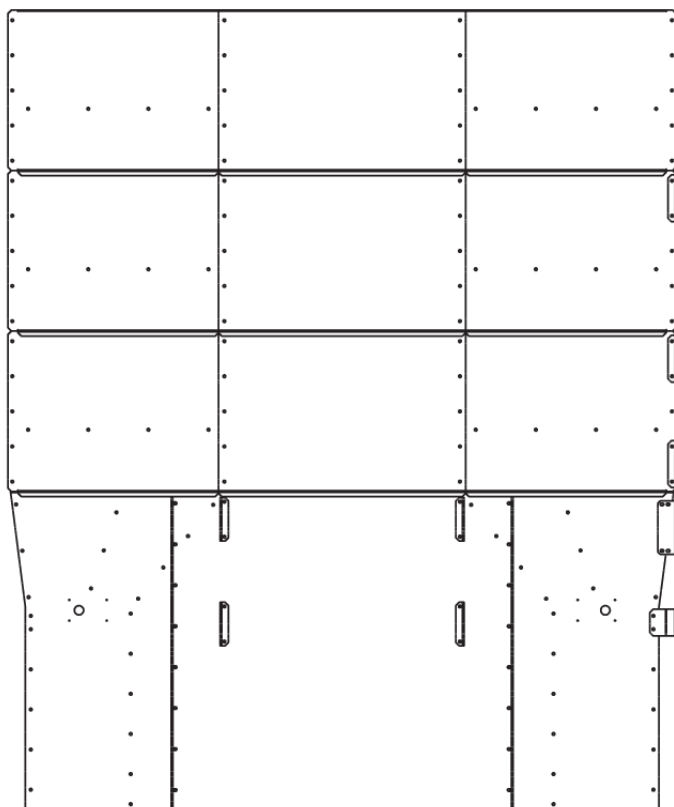


Rear Platform Attachment

Drawing below shows mounting bracket locations for left platform (upper) and right platform (lower).

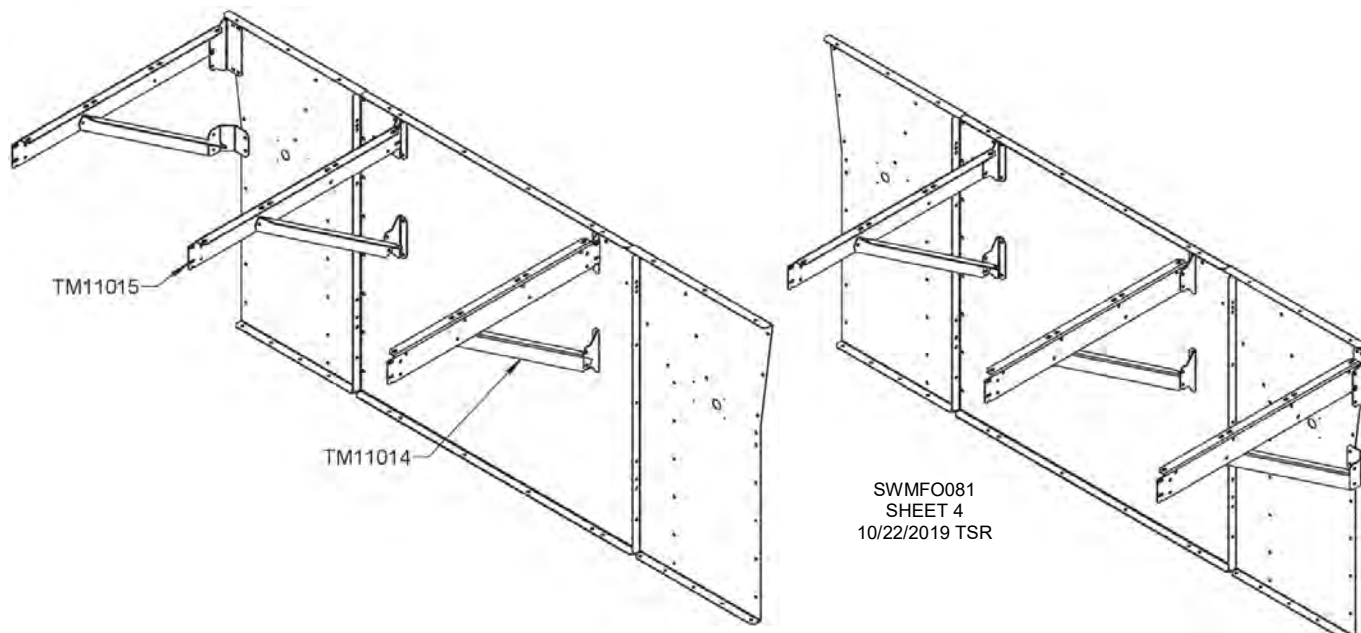


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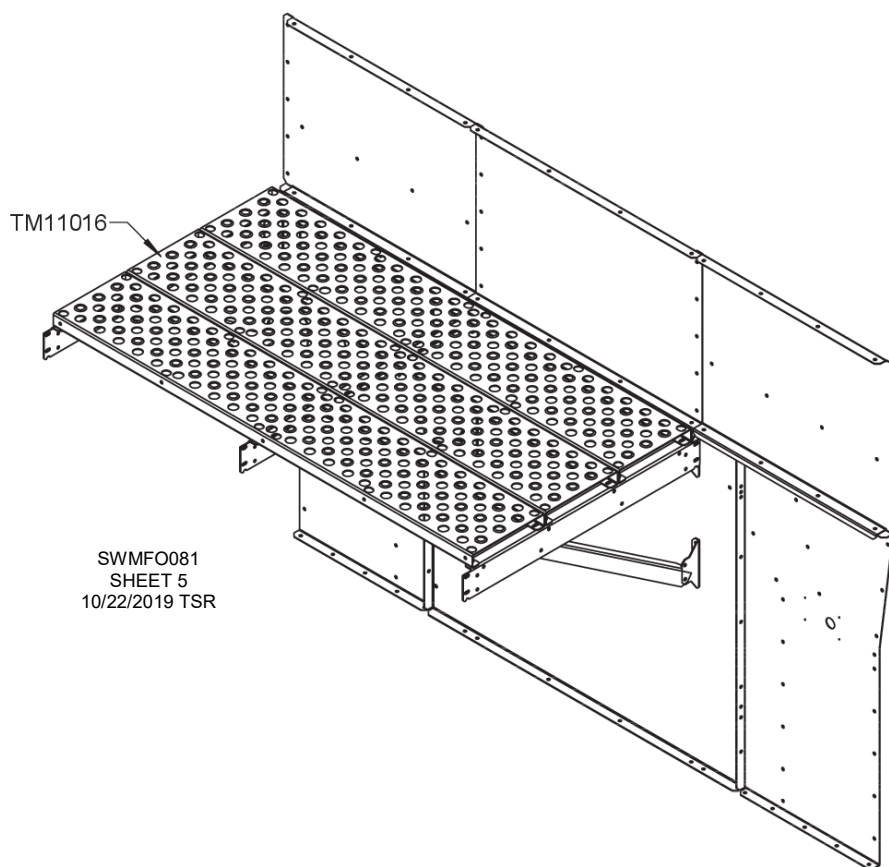


Rear Platform Attachment

Drawings below show mounting of platform support brackets TM11015 and braces TM11014. Drawing at left shows orientation for platform with gate on right. Drawing on right shows orientation for platform with gate on left.

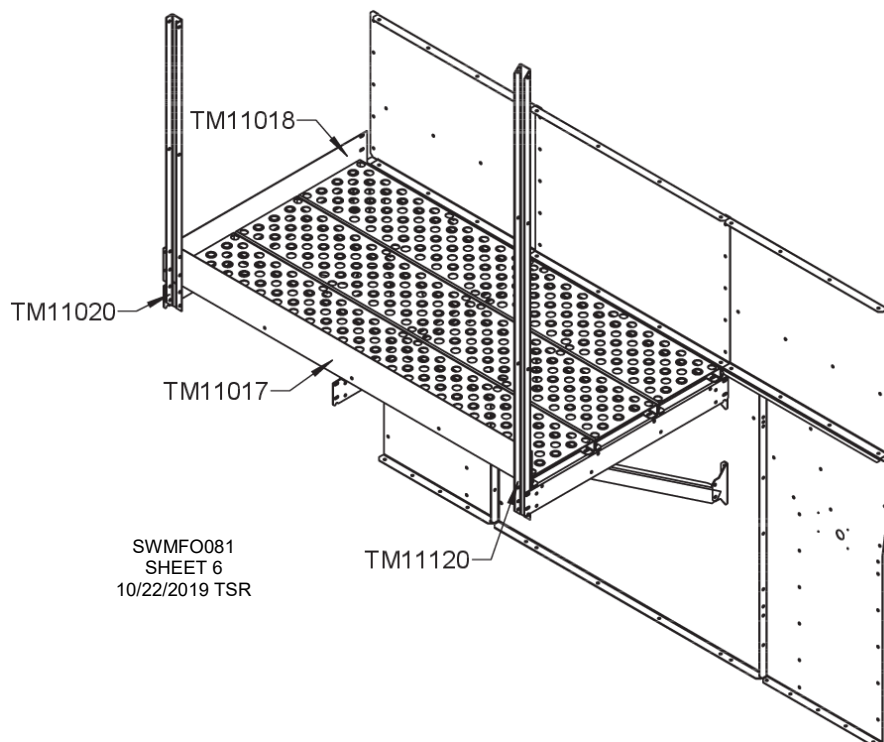


Drawing below show attachment of platform planks (TM11016).

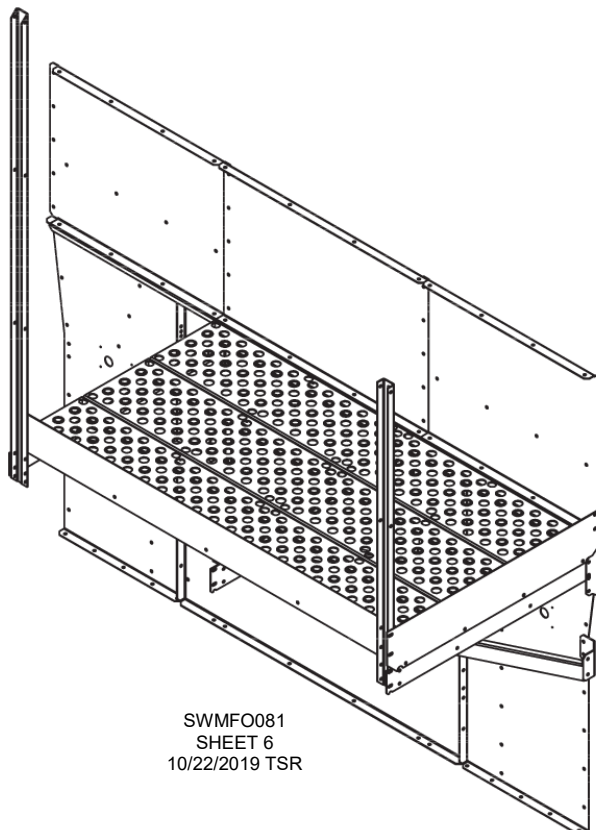


Rear Platform Attachment

Drawing below shows attachment of handrail uprights (TM11020) and toe kicks (TM11017 & TM 11120) for platform with gate on right.



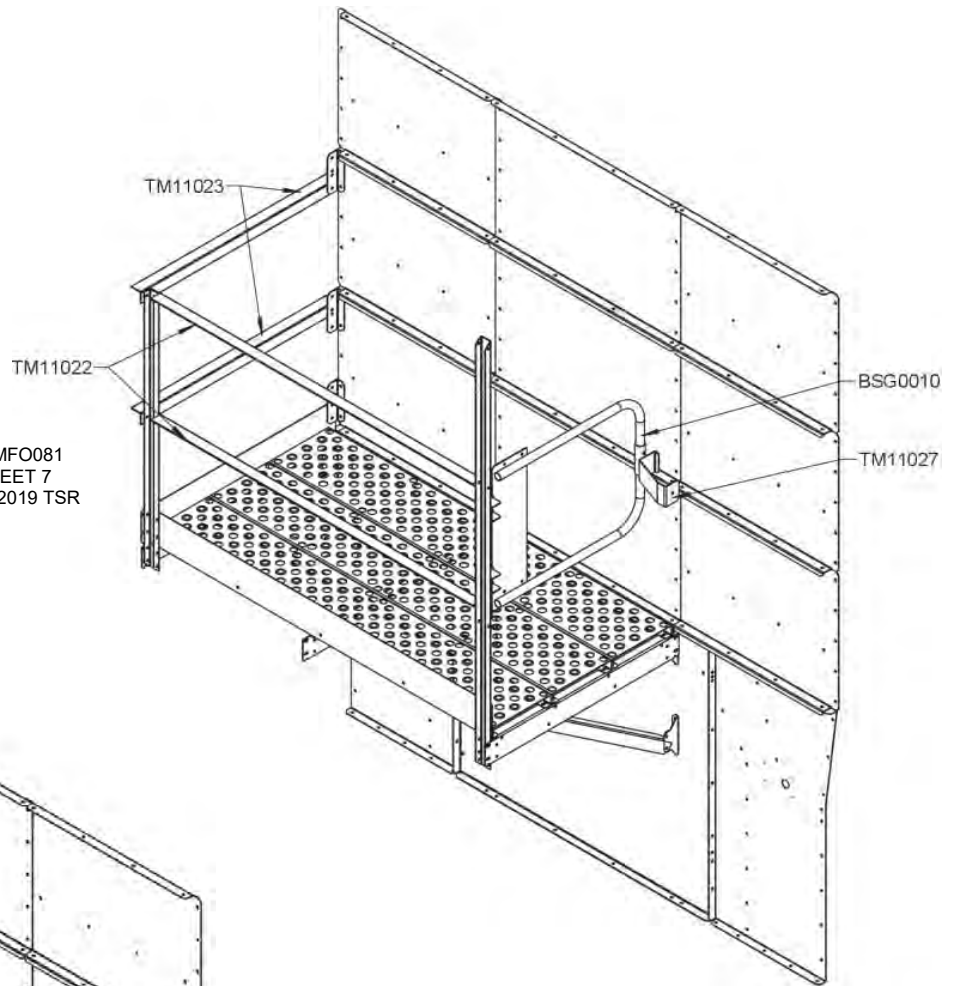
Drawing below shows attachment of handrail uprights (TM11020) and toe kicks (TM11017 & TM 11120) for platform with gate on left.



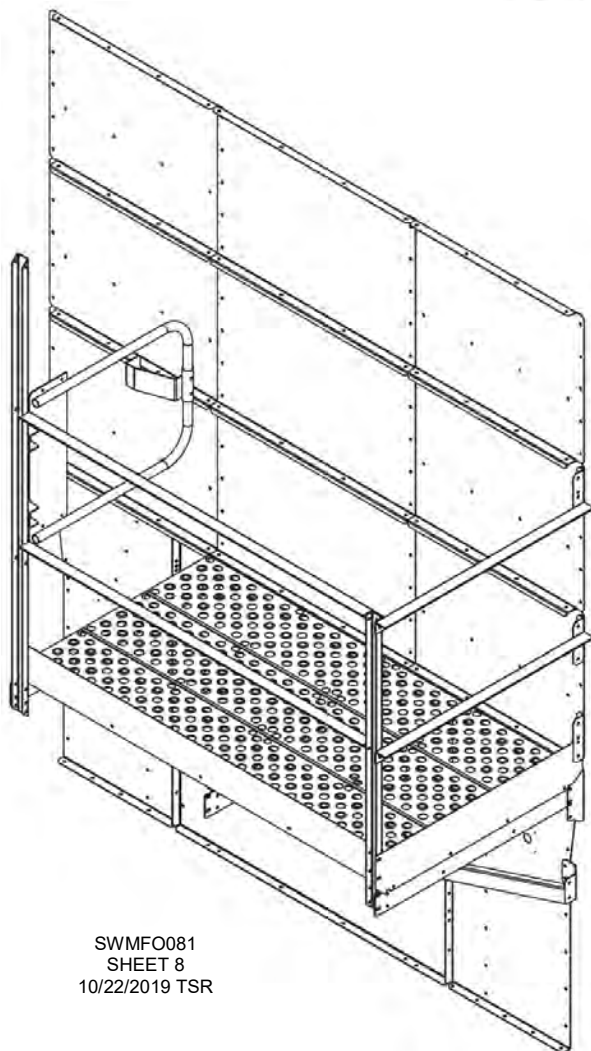
Rear Platform Attachment

Drawings below show attachment of handrails (TM11023 & TM11022), platform gate (BSG0010) and gate stop (TM11027).

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SHEET 8
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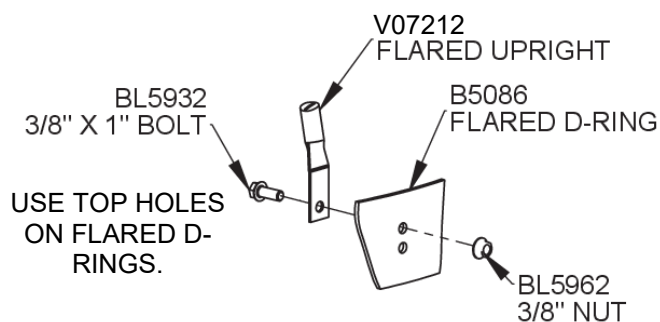
Attaching Ladders & Safety Cages

After studying applicable ladder layout, splice ladder sections together end-to-end using splices (T25545) and hardware provided.

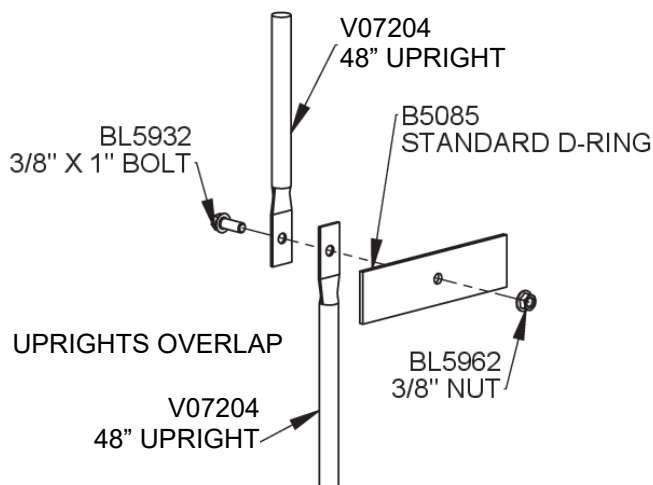
Preassemble cage sections using D-rings, uprights and 3/8" hardware provided. Note that lowest section of cage on each ladder run will have a 2' or 4' flared section.

Safety Cage Assembly

Connect flared uprights (V07212) to flared D-ring (B5086) as shown below for 2' flared cage sections. Use top hole of flared D-ring. Standard 48" uprights (V07204) are used for 4' flared cage sections and connect similarly to flared D-rings.



For standard cage sections, connect standard uprights (V07204) to standard D-rings (B5085) as shown below, ensuring that ends of uprights overlap.



Attaching Ladders to Brackets

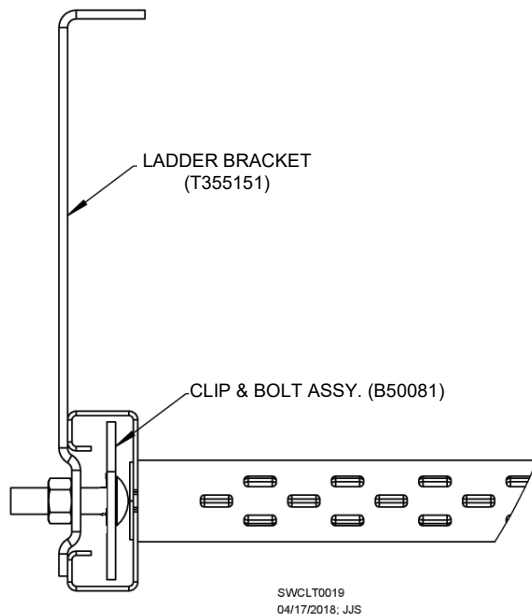
An easy-to-position clip is used to attach ladder bracket (T355151) to ladder. Carriage bolt (J0632) comes pre-assembled to clip bracket (B50084) as shown in Image 1. Position clip in ladder rail and slide clip up or down into desired position. Slide ladder bracket over bolt. Secure with hex nut (J1020) as shown in Image 2.



Image 1 – Clip & bolt assembly



Image 2 – Ladder bracket after attachment to ladder



Mounting Ladder to Front of Dryer

Start by referring to applicable ladder attachment drawing. See Pages 55-56.

Attach ladder to front of dryer as shown in Details A through D using ladder brackets T355151 and applicable braces.

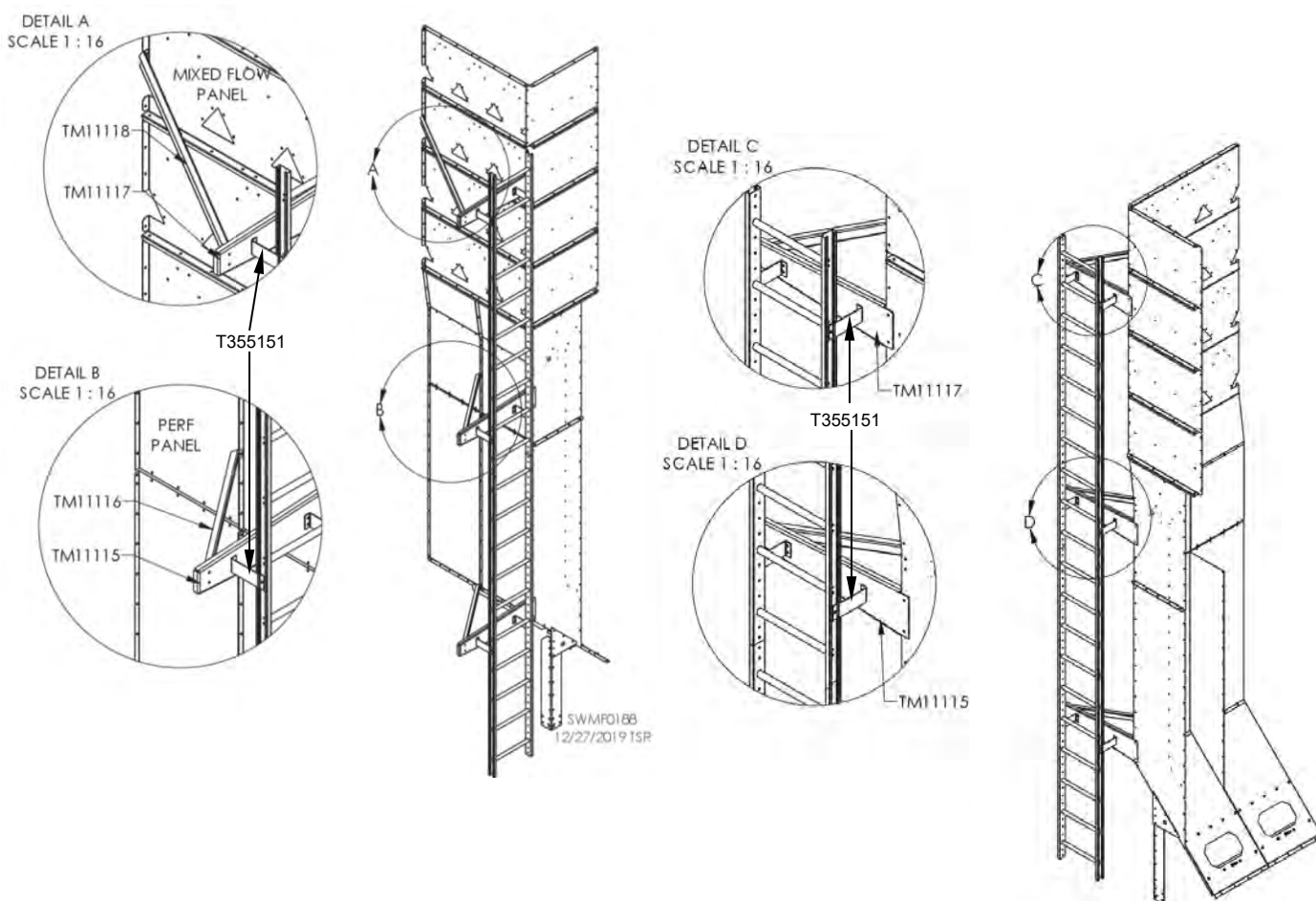
Detail A shows brace TM11118 attachment to vertical flange seam on mixed flow panel. Other end of brace attaches to an outer hole of brace TM11117. Attach ladder brackets T355151 to inner set of holes on brace TM11117.

Detail B shows brace TM11116 attachment to vertical flange of perforated panel on cooling section. Other end of brace attaches to an outer hole of brace TM11115. Attach ladder brackets T355151 to inner set of holes on brace TM11115.

Detail C shows attachment of brace TM11117 to end plate of mixing column and attachment of ladder brackets T355151 to inner sets of holes on brace TM11117.

Detail D shows attachment of brace TM11115 to end plate of cooling section and attachment of ladder brackets T355151 to inner set of holes on brace TM11115.

Space braces TM11117 and TM11115 equidistantly on dryer. Drawing shows 20' ladder with braces spaced about 7' apart.

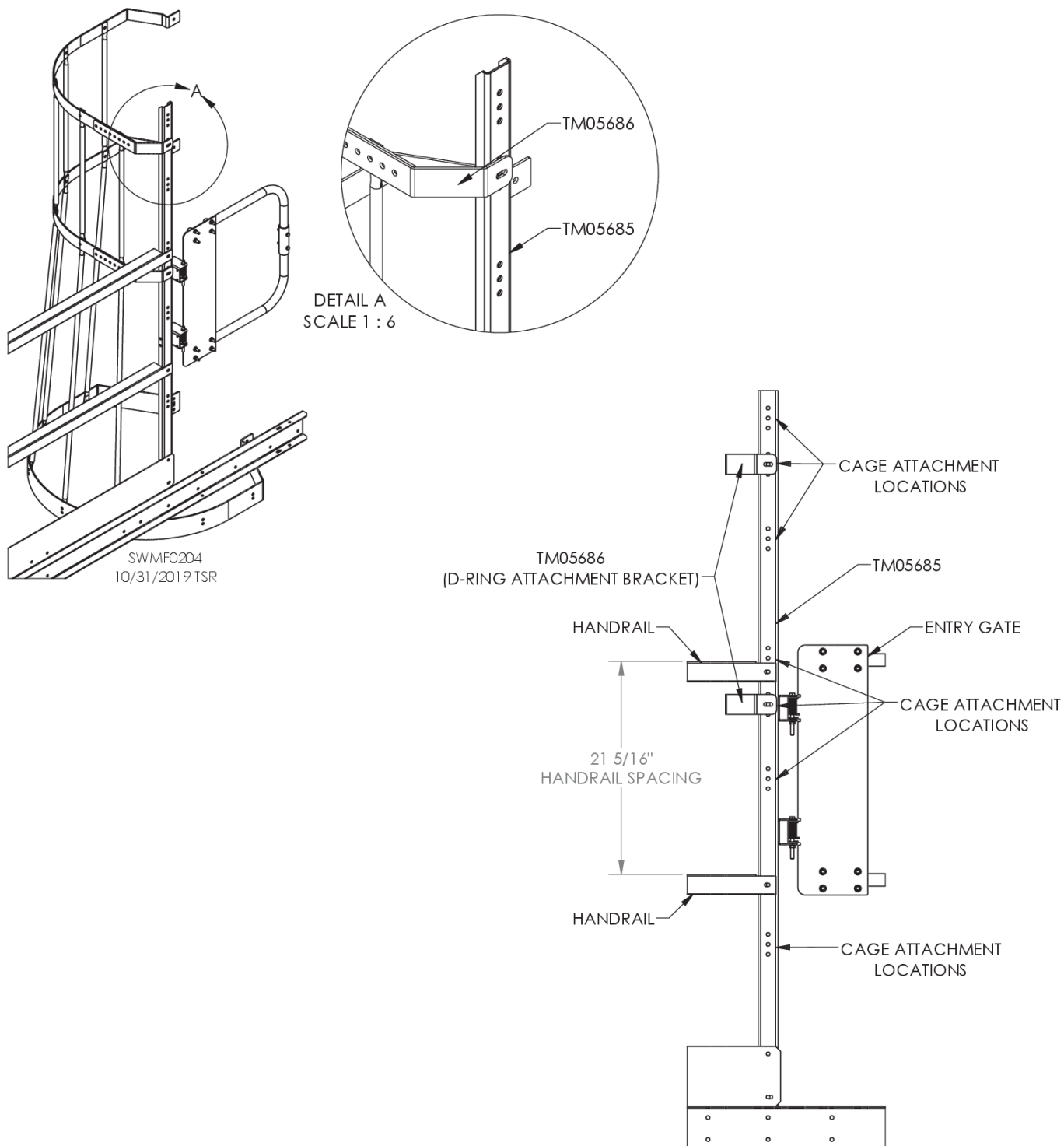


Attaching Safety Cages to Front Ladder & Platform

Start by referring to applicable cage assembly drawing. See Pages 57-61.

Drawing at left below shows attachment of bracket TM05696 to upright TM05685.

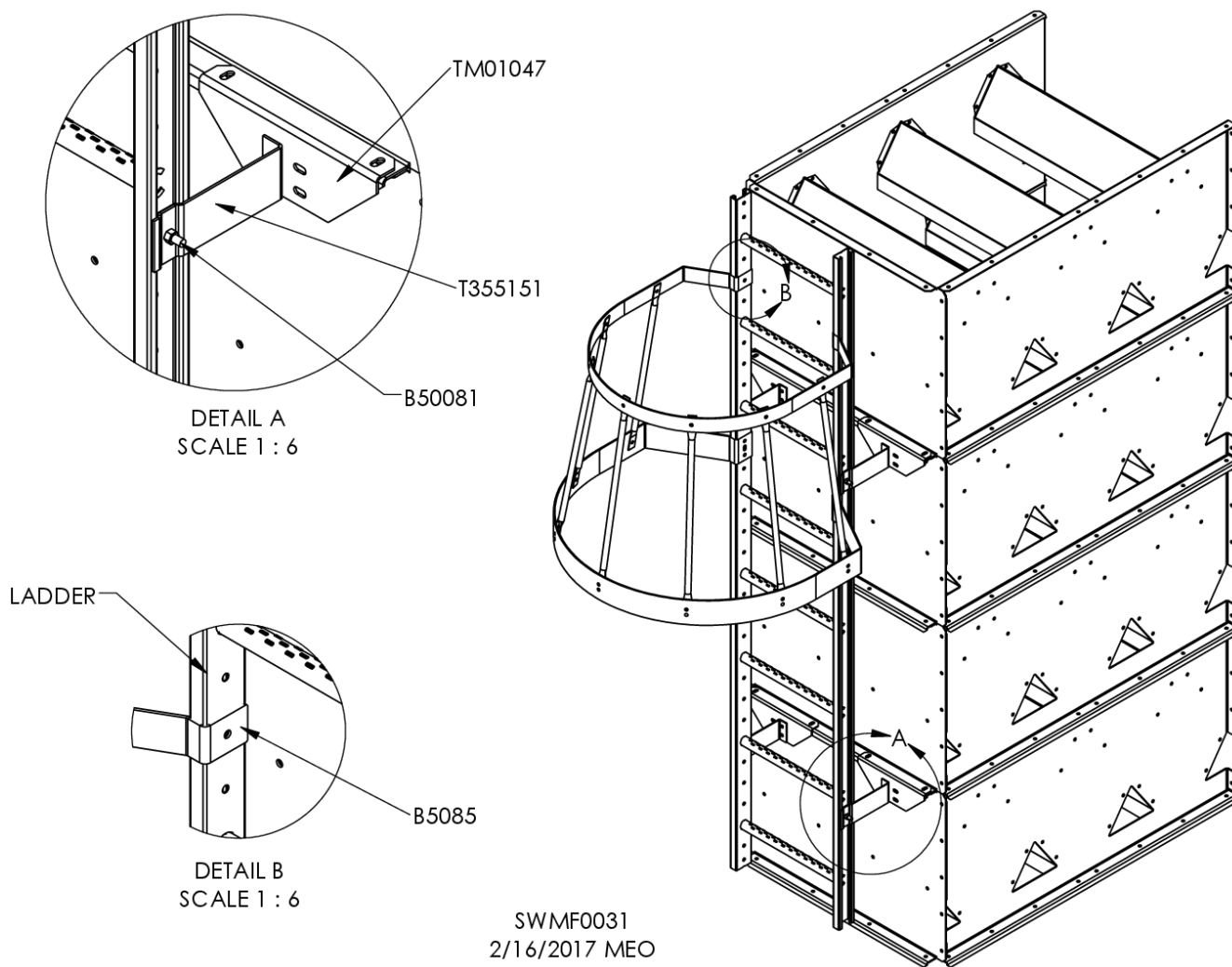
Drawing at lower right shows cage attachment locations.



Attaching Ladder & Safety Cages to Rear of Dryer

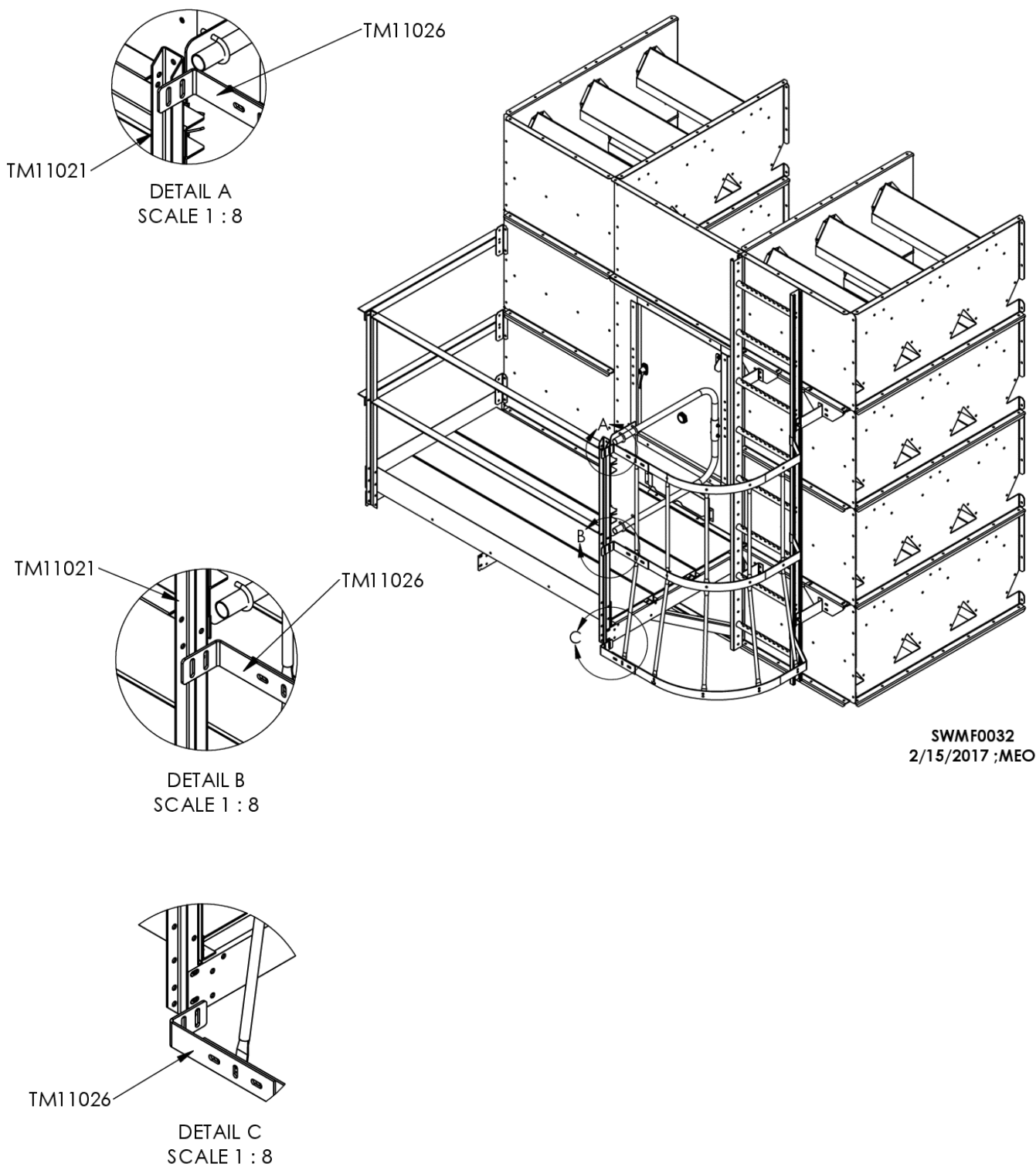
Attach ladder to rear of dryer as shown in Detail A and attach safety cage to ladder as shown in Detail B. Use 3/8" hardware provided to attach standard D-rings (B5085) and flared D-rings (B5086). D-rings attach to inside of ladder rails at center holes.

Attach ladder brackets to dryer using 5/16" hardware provided and end plate ladder brackets (TM01047) as shown in Detail A.



Attaching Safety Cage to Rear Platform & Ladder

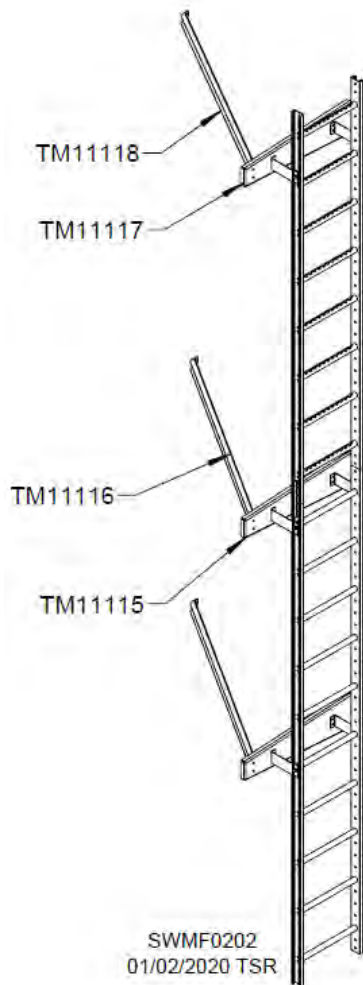
Attach safety cages to platform upright (TM11021) as shown below using D-ring brackets (TM11026) and hardware provided.



Attaching Front Ladder

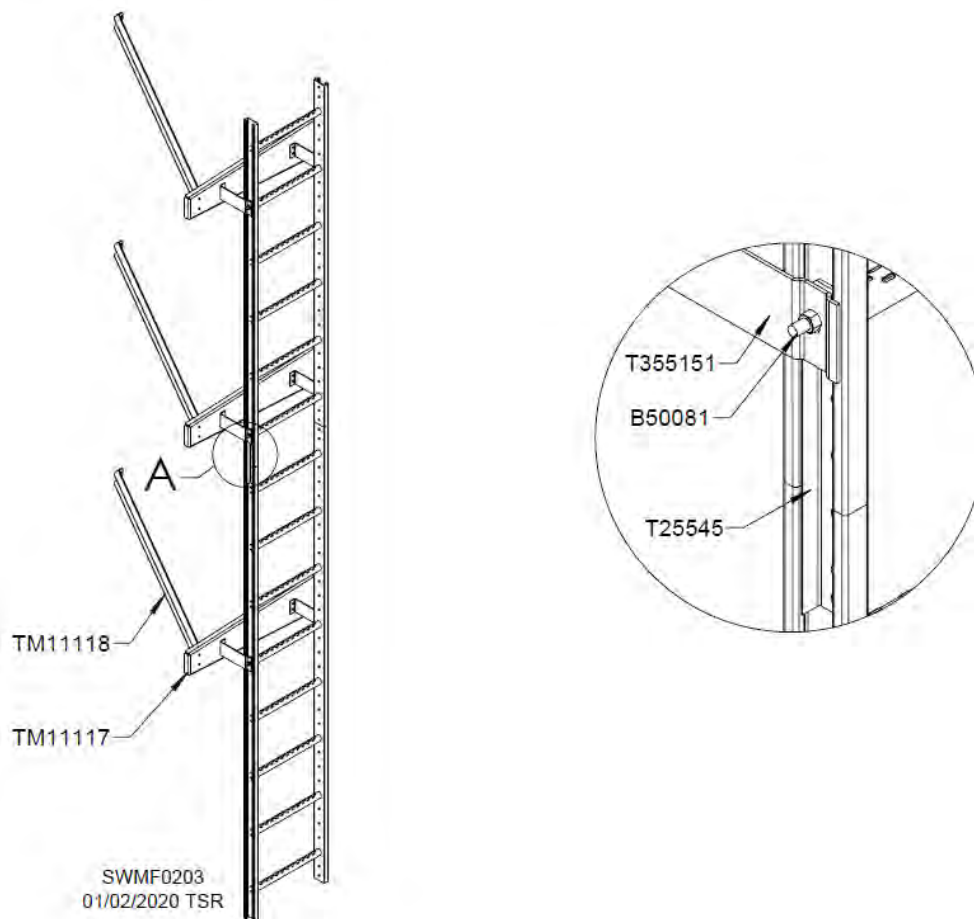
Use drawings on this and following pages to guide attachment of front ladders used on dryer.

NOTE: Ladder and cage pieces included with dryer leg kit must be added to bottom of ground-level entry ladder and cage assemblies.



FIRST PLATFORM ACCESS LADDER (FROM GROUND)

REF. #	DESCRIPTION	TM112011 (18')/QTY.	TM11202 (20')/QTY.	TM11203 (22')/QTY.	PART #
1	CLIP AND BOLT, LADDER	6	8	8	B50081
2	LADDER, 10'	1	2	1	B50810
3	LADDER, 8'	1	-	-	B50811
4	LADDER, 6'	-	-	2	B50812
5	SPLICE, LADDER	2	2	4	T25545
6	BRKT, LADDER, PLATFORM, FRONT	6	8	8	T355151
7	BRACKET, MNTING, LDDR, COOL MOD	2	2	2	TM11115
8	BRACE, 48", STIFF, LDDR, COOL MOD	2	2	2	TM11116
9	BRCKET, MNTING, LDDR, HEAT MOD	1	2	2	TM11117
10	BRACE, 48", STIFF, LDDR, HEAT MOD	1	2	2	TM11118



UPPER PLATFORM ACCESS LADDER

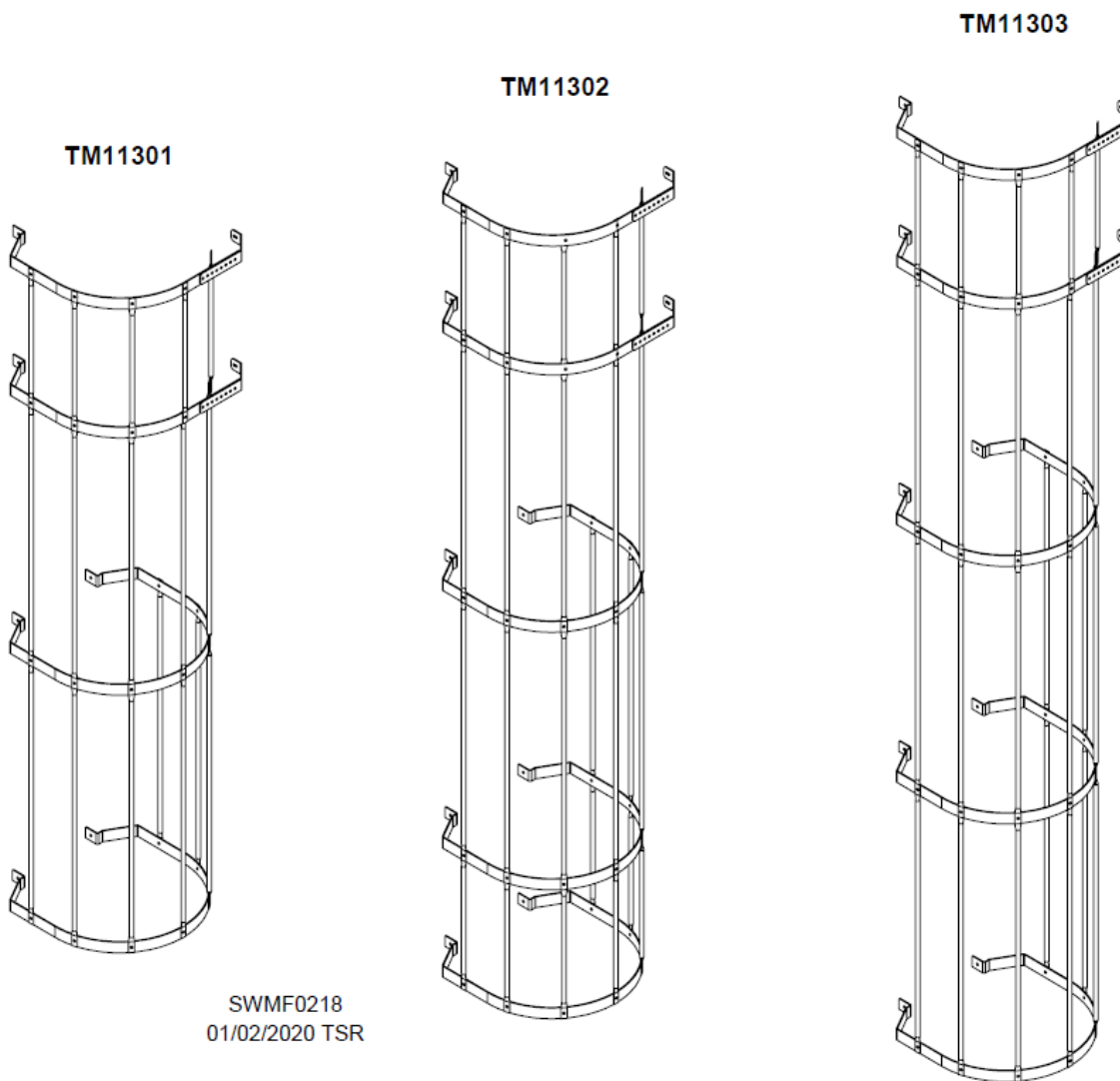
REF. #	DESCRIPTION	TM11211 (14')/QTY.	TM11212 (16')/QTY.	TM11213 (20')/QTY.	TM11214 (22')/QTY.	TM11215 (24')/QTY.	PART #
1	CLIP AND BOLT, LADDER	6	8	6	8	8	B50081
2	LADDER, 10'	-	-	2	1	1	B50810
3	LADDER, 8'	1	2	-	-	1	B50811
4	LADDER, 6'	1	-	-	2	1	B50812
5	SPLICE, LADDER	2	2	2	4	4	T25545
6	BRKT, LADDER, PLTFRM, FRONT	6	8	6	8	8	T355151
7	BRCKT, MNTING, LDDR, HEAT MOD	3	4	3	4	4	TM11117
8	BRACE, 48", STIFF, LDDR, HEAT MOD	3	4	3	4	4	TM11118

UPPER PLATFORM CROSSOVER LADDER

REF. #	DESCRIPTION	TM11221 (14')/QTY.	TM11222 (22')/QTY.	PART #
1	CLIP AND BOLT, LADDER	6	8	B50081
2	LADDER, 10'	-	1	B50810
3	LADDER, 8'	1	-	B50811
4	LADDER, 6'	1	2	B50812
5	SPLICE, LADDER	2	4	T25545
6	BRKT, LADDER, PLATFORM, FRONT	6	8	T355151
7	BRKT, MNTING, LDDR, HEAT MOD	3	4	TM11117
8	BRACE, 48", STIFF, LDDR, HEAT MOD	3	4	TM11118

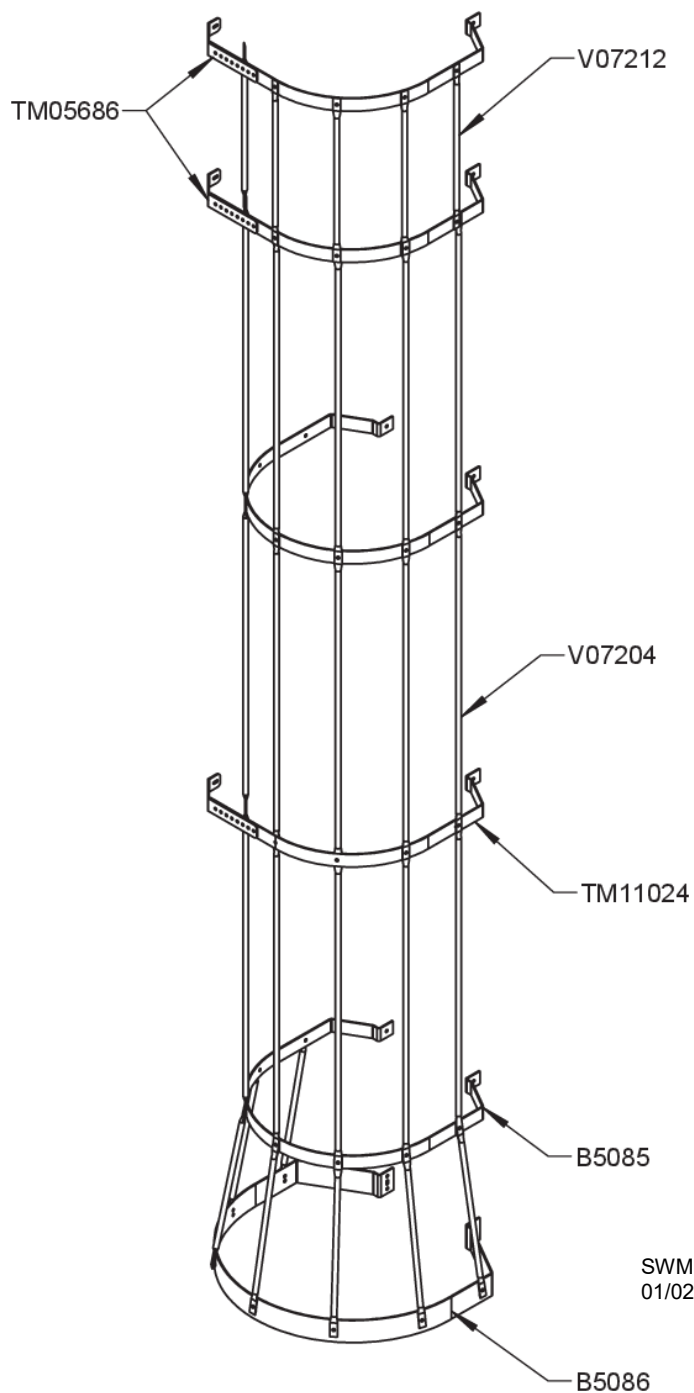
Cage Assemblies

Drawings on this and following pages show ladder cages used on dryers. **NOTE:** Ladder and cage pieces included with dryer leg kit must be added to bottom of ground-level entry ladder and cage assemblies.



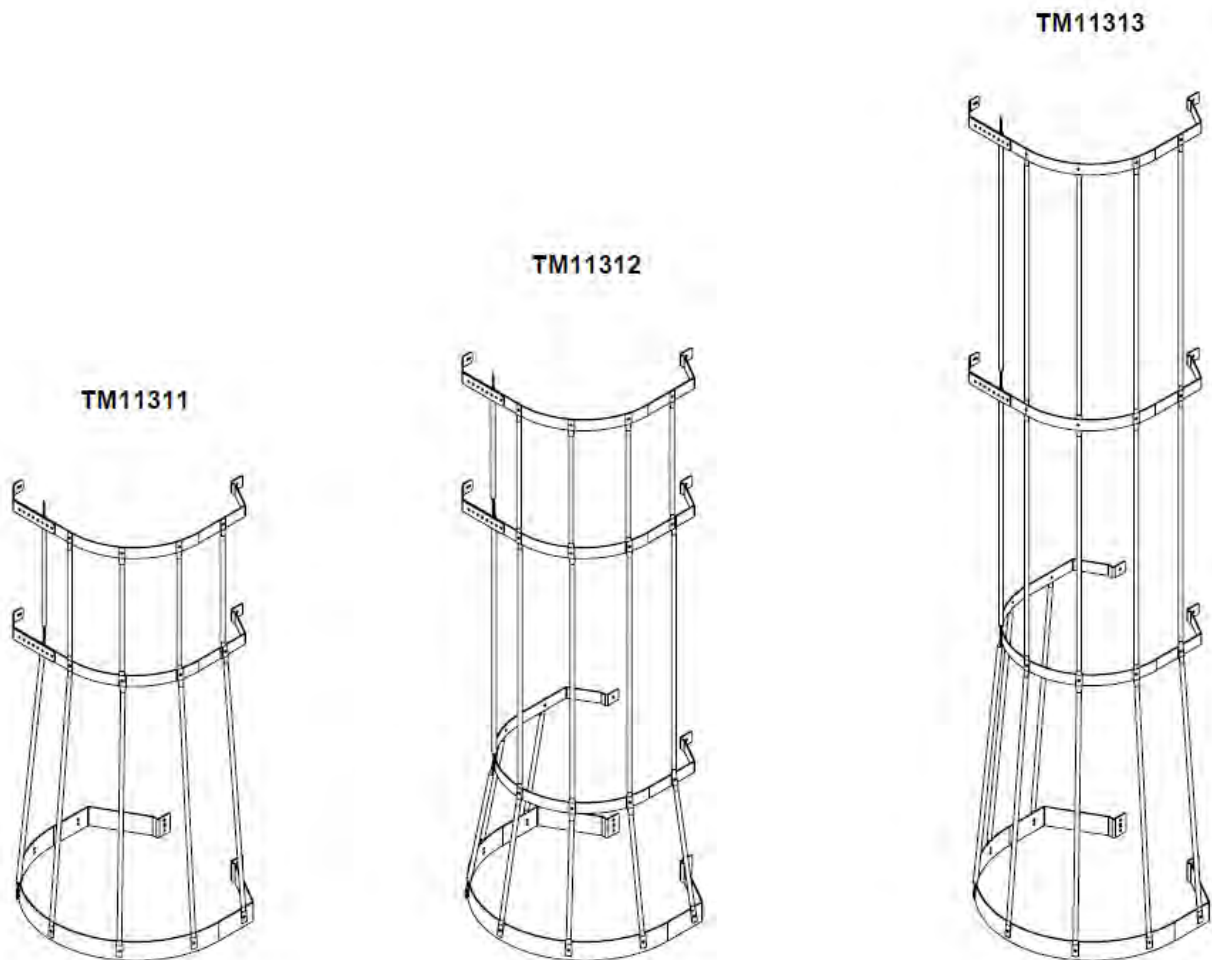
REF. #	DESCRIPTION	TM11301 (10')/QTY.	TM11302 (12')/QTY.	TM11303 (14')/QTY.	PART #
1	D-RING, STANDARD	2	3	3	B5085
2	BRACKET, CONN, D-RING TO PLTFRM	2	2	2	TM05686
3	D-RING, HALF, LADDER CAGE	2	2	2	TM11024
4	UPRIGHT, 4'	12	12	19	V07204
5	UPRIGHT, 2'	5	12	5	V07212

Cage Assembly Component Identification



SWMF0219 SHEET 1
01/02/2020 TSR

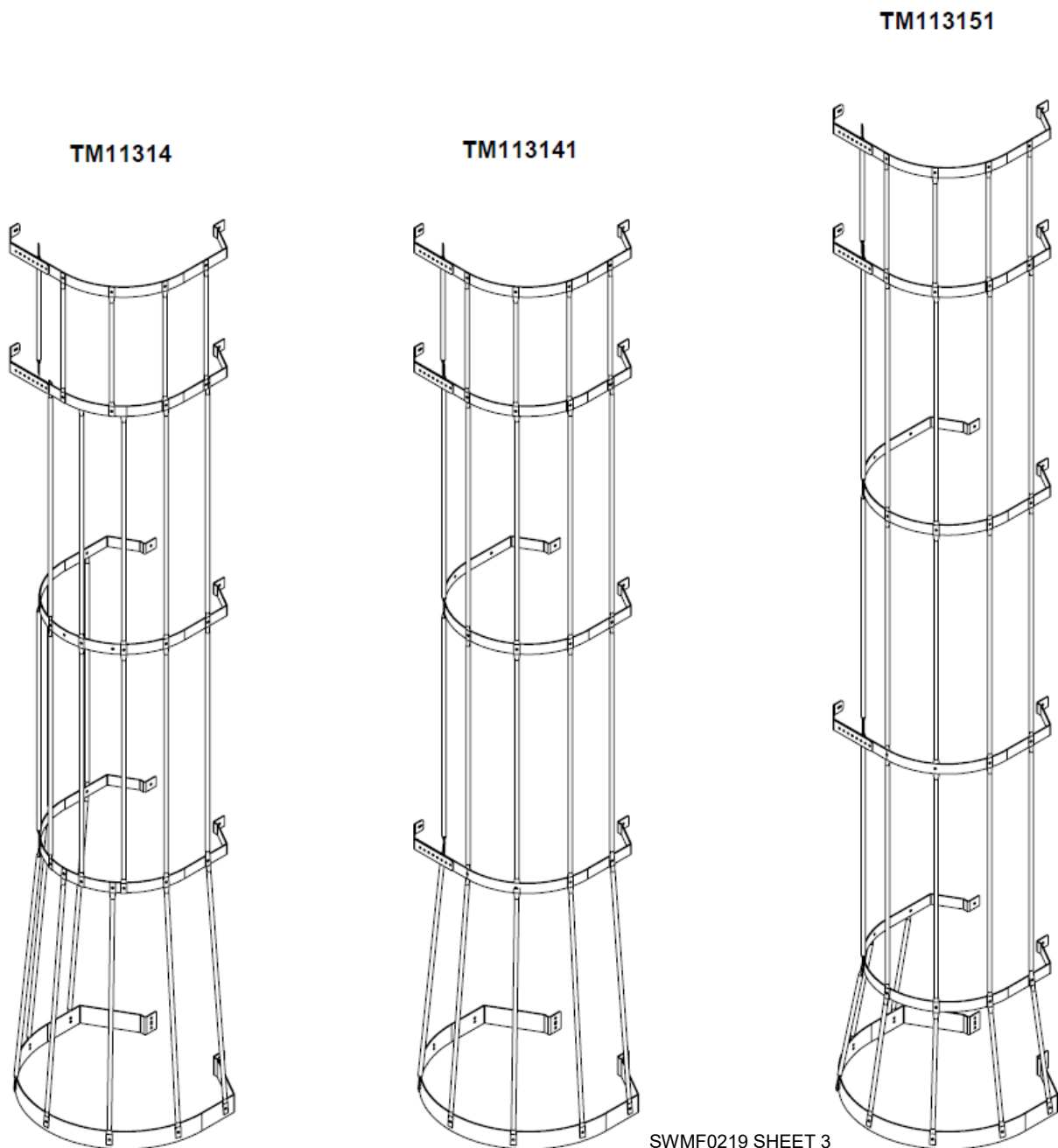
Upper Platform Access Cage



SWMF0219 SHEET 2
01/02/2020 TSR

DESCRIPTION	TM11311 (6')/QTY.	TM11312 (8')/QTY.	TM11313 (12')/QTY.	PART #
D-RING, STANDARD	-	1	1	B5085
D-RING, FLARED	1	1	1	B5086
BRACKET, CONN, D-RING TO PLTFRM	2	2	2	TM05686
D-RING, HALF, LADDER CAGE	2	2	2	TM11024
UPRIGHT, 4'	5	5	17	V07204
UPRIGHT, 2'	5	12	-	V07212

Upper Platform Access Cage

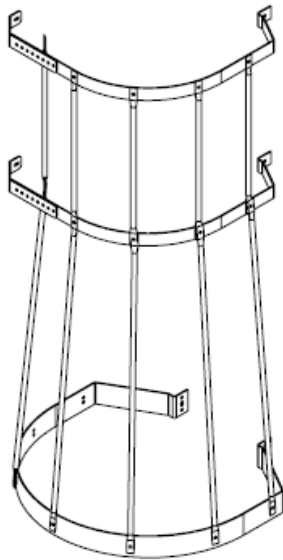


SWMF0219 SHEET 3
01/02/2020 TSR

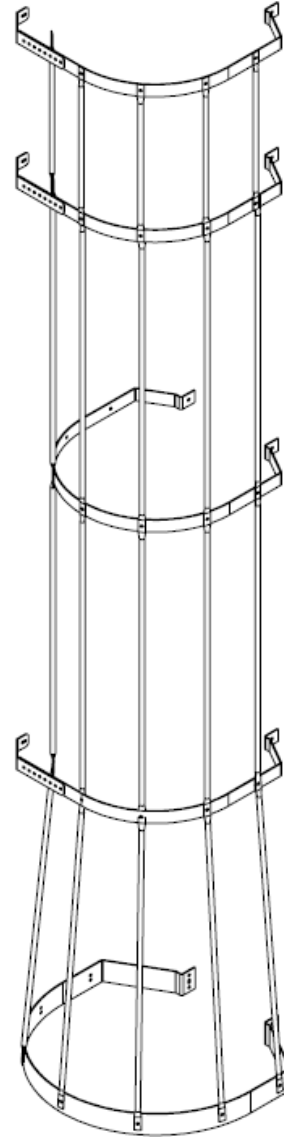
DESCRIPTION	TM11314 (14')/QTY.	TM113141 (14')/QTY.	TM113151 (16')/QTY.	PART #
D-RING, STANDARD	2	1	2	B5085
D-RING, FLARED	1	1	1	B5086
BRACKET, CONN, D-RING TO PLTFRM	2	3	3	TM05686
D-RING, HALF, LADDER CAGE	2	3	3	TM11024
UPRIGHT, 4'	20	15	15	V07204
UPRIGHT, 2'	5	5	12	V07212

Upper Platform Crossover Ladder Cage

TM11321



TM11322



SWMF0219 SHEET 4
01/02/2020 TSR

DESCRIPTION	TM11321 (6')/QTY.	TM11322 (14')/QTY.	PART #
D-RING, STANDARD	-	1	B5085
D-RING, FLARED	1	1	B5086
BRACKET, CONN, D-RING TO PLATFORM	2	3	TM05686
D-RING, HALF, LADDER CAGE	2	3	TM11024
UPRIGHT, 4'	5	15	V07204
UPRIGHT, 2'	5	5	V07212

Contact Information

Owner's manuals are available from Sukup Manufacturing Co. and additional copies can be requested at address, phone number or e-mail address shown below. Please indicate manual number L24145 when requesting Mixed-Flow Dryers Platform Installation Manual & Parts Assembly.

Sukup Dealer Information

Dealer name:	_____
Address:	_____
Cell phone:	_____
Office phone:	_____
Fax:	_____

Emergencies – Know What To Do

Have emergency numbers and written directions to your location readily available in case of emergency. An area for emergency phone numbers to be recorded is provided below.

Ambulance • Fire • Police: 9-1-1
Bin rescue team: _____
Emergency medical squad: _____
Address of work site: _____
Directions to work site: _____



Sukup Manufacturing Co.

1555 255th Street, Box 677

Sheffield, Iowa, USA 50475-0677

Phone: 641-892-4222

Fax: 641-892-4629

Website: www.sukup.com

Email: info@sukup.com

Operation

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<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023	– Updated statement on Dryer Startup before seasonal operation	2
	Removed reference to discontinued incoming moisture sensor	2
08/19/2022	– Added instructions for operation using averaged column temps	4

Make sure to go through Dryer Startup procedures in Appendix E before seasonal operation.

Gas and electrical installations must be done by qualified personnel to ensure quality operation.

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 dryer may decrease significantly from values in product literature as air intake louvers increase vacuum pressure. Adjust position of 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 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 particular 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, dryer proceeds to cool 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. Control panel steps 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

1. Run dryer in Manual mode at unload speed from applicable drying table in Appendix A or based on past experience.
2. When 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.

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.



Image 3-1 – Vaporizer pivot bracket



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. See Image 3-1. 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 adjustment plate

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.

Image 3-2 shows vaporizer adjustment plate inside of heater housing.

Balancing Airflow Rates & Plenum Pressures

Several features of dryer can be used to adjust airflow rates and plenum pressures for optimum drying of each type of grain.

- A vacuum pressure gauge (Image 3-3) provides readings on cooling plenum pressure and airflow rate. This gauge can be used to check both types of pressure in plenum.
- Adjustable louvers are provided for lower fan air inlet. See Image 3-4. **NOTE:** Inlet will be vertical on short cooling section. These louvers allow dryer operator to adjust the amount of outside air that fan takes in compared to return air from cooling plenum. When louvers are fully open, fan will take in mostly outside air, passing very little air through cooling columns. When louvers are fully closed, all air passing through fan comes from cooling plenum by way of the cooling columns. 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. The optimum setpoint is usually somewhere between these two points, and is somewhat based on user preference. When drying corn, pressure in heat plenum is commonly around 1" W.C. and negative pressure in cooling plenum is normally around 1.0" to 1.5" 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 3-3 – Vacuum pressure gauge



Image 3-4 – Adjustable louvers (shown fully closed)

- Fan intake baffles (Image 3.5) are provided for drying small grains such as rapeseed. Small grain creates more pressure against a fan, yet grains are light enough to be blown out of duct openings if airflow rates are too high. In certain situations, high cooling plenum pressures can also cause grain to be pulled over metering rolls, flooding the unload conveyor. Adjusting louvers alone may not be enough to limit airflow. Fan intake baffles can be installed and pivoted to limit airflow through bottom fan. Airflow should be limited to just past the point where grain is no longer being blown from duct openings or being pulled over metering rolls into the unload. Adjusting baffles too far will limit drying capacity. In these situations, louvers and fan intake baffles should be adjusted together to reach desired dryer operation conditions. Alternatively, decrease fan speed by adjusting VFD if fan is so equipped. See Service Bulletin L1973. Contact dealer to obtain.

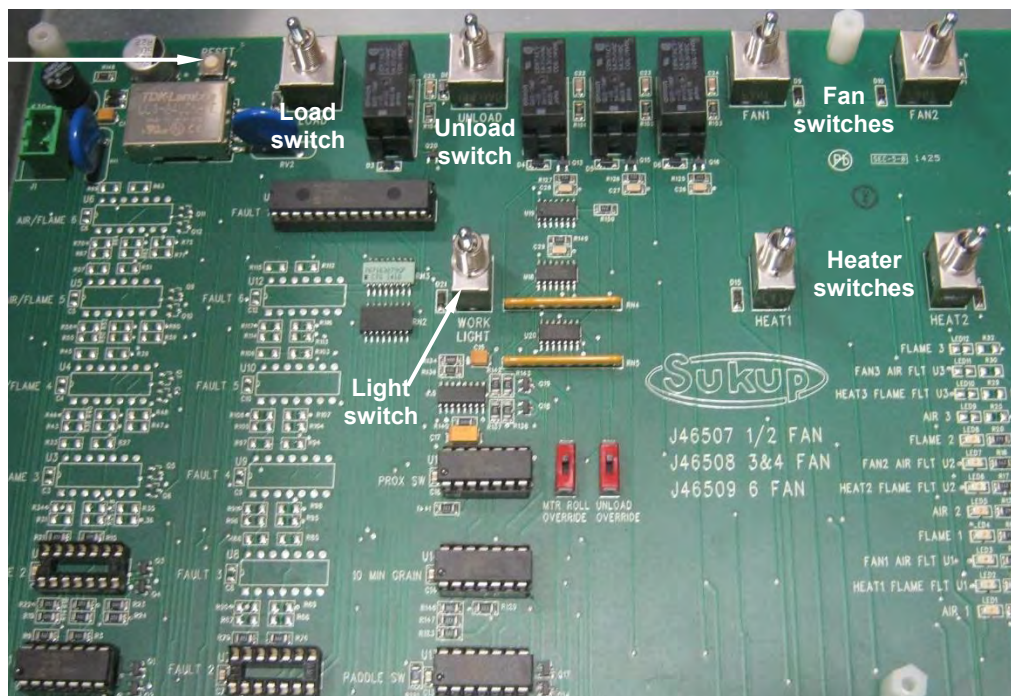


Image 3-5 – Fan intake baffles

Backup Operation Controls

Images 3-6 and 3-7 show backup controls found in Main Power Box. Appearance may differ depending on dryer model.

Reset button
(All toggle switches must be off to reset)



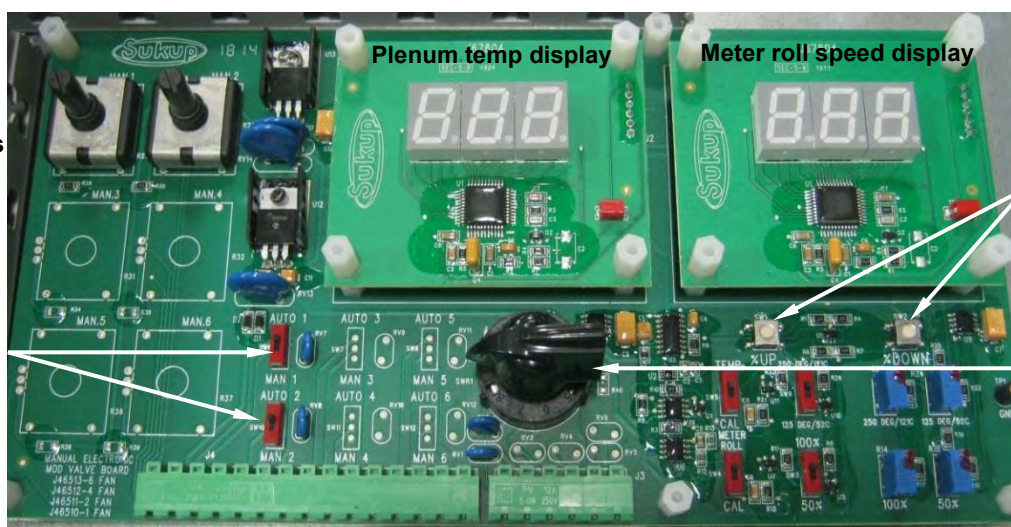
Fans & heaters are numbered like floors of a building, with #1 being lowest

Fault indicator lights

Image 3-6 – Backup operation control board

Heater modulating valve controls

Push Auto/Man switches down for Backup operation



Meter roll speed controls (left for faster, right for slower)

Plenum temp readout switch (only on dryers w/ 2 or more fans)

Image 3-7 – Backup electronic mod valve control board

To operate in Backup mode, turn System Control Switch to Backup.

See applicable Unload Rates table in Appendix A for initial approximate meter roll speed and plenum temperature based on amount of moisture to be removed.

NOTE: Discharge moisture sensor will not be functional in Backup mode. Moisture of grain will need to be checked by an alternate means.

If a fault light comes on, see Troubleshooting section to fix fault. To reset Backup control board, make sure all toggle switches are turned down, then press white Reset button.

IMPORTANT: Push Auto/Man switches back up to run dryer using QuadraTouch Pro.

Service & Maintenance

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<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023	Minor editing & formatting changes	2, 4-6, 8, 10, 11, 13, 23, 24, 27 & 29
	Updated photo of paddle switch T162621 & photo of vapor OT switch.....	4, 6 & 18
	Added instructions for tensioning V-belts.....	28
	Added note on checking tension of chain in conveyor with slide rail returns.....	29
08/19/2022	Minor editing & formatting changes throughout	
	Added note on grain column temperature sensor	2
	Updated instructions for replacing fill switches	4
	Updated part number of air pressure switch	12 & 16
	Updated paddle switch calibration instructions	18
	Added note on single-point grain column RTD sensors	24
	Updated photo of outer grain column cleanup door & instructions for maintenance	26
	Added instructions for maintenance of unload conveyor	29-30

Sensor Removal and Installation

Discharge Moisture Sensor (T6045S)

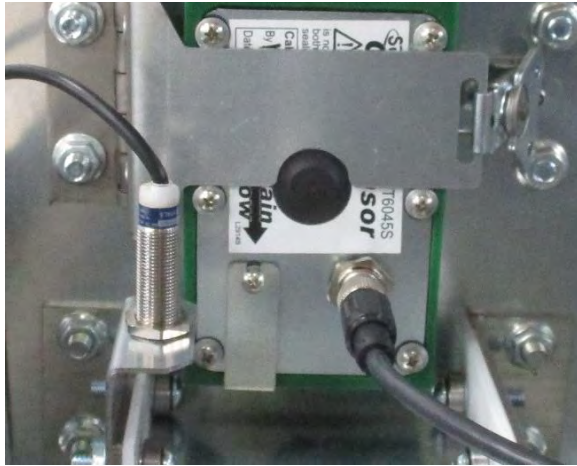


Image 4-1 – Discharge moisture sensor in static sample box under conveyor unload

This sensor is used to monitor moisture as grain exits dryer. Discharge moisture sensor is located in a static sample box under discharge end of conveyor. See Image 4-1. **NOTE:** On dryers with auger unload, sensor is located under grain discharge chute as shown in Image 4-2.

Removal:

1. Remove rain shield if need be.
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.



Image 4-2 – Discharge moisture sensor location on auger-unload dryer

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.



Image 4-3 – Cable connector capped



Image 4-4 – Grain temp sensor

NOTE: Instead of an incoming moisture sensor, dryer has four single-point grain temperature sensors. To replace a temp sensor, remove cover and disconnect wires, then unscrew sensor from holder. Screw in new sensor (shown in Image 4-4) and connect wires as they were in old sensor.

Grain Discharge Chute Switch

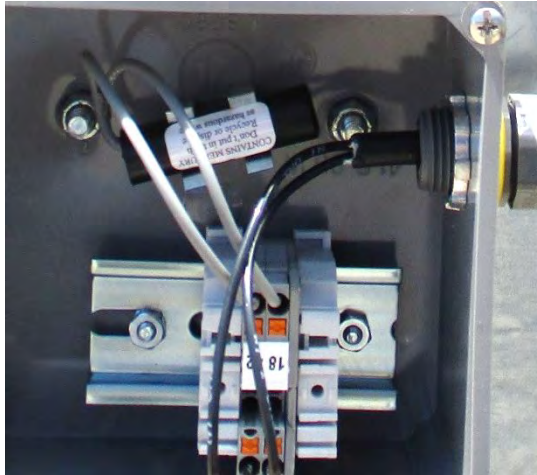


Image 4-5 – Grain discharge chute switch

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

NOTE: If dryer has an auger unload system, it also will have a grain discharge chute switch. See Image 4-7.

Removal and installation are same for both types of discharge chute switch.

Removal:

1. Turn off power at main power box.
2. Locate grain discharge chute switch box.
See Image 4-6 or 4-7.
3. Remove cover of switch box.

4. Disconnect tilt switch (J4441) wires from terminals.
5. Remove switch from retaining clip.

Installation:

1. Insert new tilt switch into retaining clip. **IMPORTANT:** Switch must be installed as shown in Image 4-5, with wires coming from left side so switch will function properly.
2. Connect wires from switch to circuits 18 and 42. See Image 4-6.
3. Reinstall switch box cover. See Page 4-17 to calibrate.



Image 4-6 – Grain discharge chute switch on drag conveyor unload system

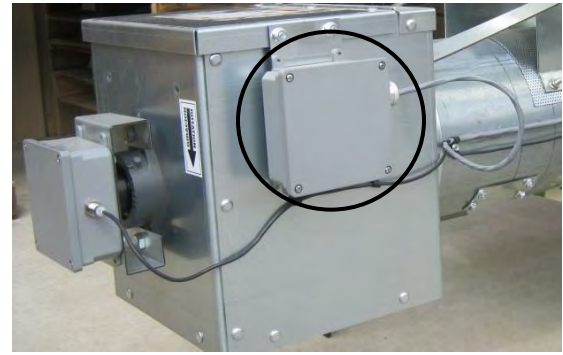


Image 4-7 – Grain discharge chute switch on auger unload system

Paddle Switch

This device is used to detect when dryer is full of or needs grain. Style of switch on depends on style of fill section.

Paddle Switch T162621 for Gravity Fill Section



Image 4-8 – Paddle switch T162621 on gravity-fill section

Paddle Switch (T16244) for Dryer with Auger Fill



Image 4-9 – Paddle switch T16244

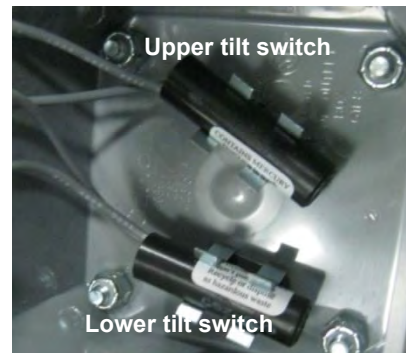


Image 4-10 – J4441 tilt switches

Removal of J4441 tilt switches in Paddle Switch T16244 or T162621:

1. Turn power off at main power box.
2. Remove cover of paddle switch box.
3. For either upper or lower tilt switch, disconnect two wires from dryer wiring.
4. Remove switch from retaining clip.

Installation of J4441 tilt switches in Paddle Switch T16244 or T162621:

1. Insert new tilt switch into retaining clip. **IMPORTANT:** Switches must be installed as shown in Image 4-10. Switch wires must emerge from left of switch. If not installed properly, switch will not function correctly.
2. Connect wires in following manner: All 18's together; 44 (lower switch) to 44; 53 (upper switch) to 53.
3. Reinstall switch box cover.

Static Sample Box Proximity Switch (J4493) & Actuator (J8260)

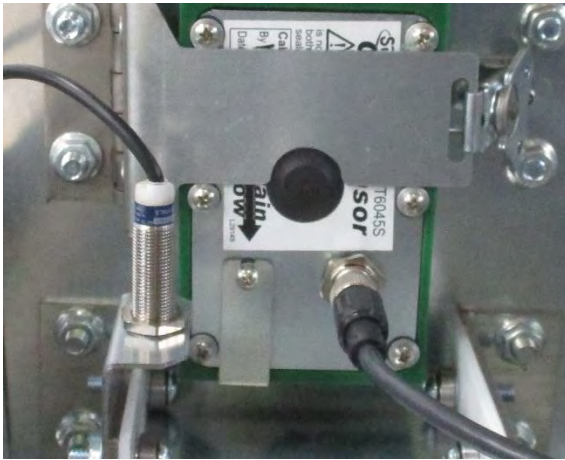


Image 4-11 – Static sample box proximity switch

Static sample box proximity switch is used to monitor function of actuator that opens and closes slide gate. Sample box serves as discharge chute of dryer with drag conveyor unloading system.

Removal of Proximity Switch:

1. Turn off power at main power box.
2. Loosen and remove lower lock nut and remove switch from mounting bracket.
3. Follow wire to junction box and disconnect switch wires after noting connections.

Installation:

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 slide gate target (See Image 4-12) must be no more than 1/8" and no less than 1/16" when target is directly underneath switch. Damage to proximity switch may occur if it comes into contact with slide gate target shown in Image 4-12. Tighten lock nuts on switch after adjusting gap.



Image 4-12 – Actuator for static sample box slide gate

Removal of Actuator:

1. Turn off power at main power box.
2. Follow actuator wire to junction box and disconnect actuator wires.
3. Remove hardware holding actuator to slide gate and mounting frame.

Installation:

1. Ensure that gate slides back and forth freely.
2. Install new actuator by reversing steps used to remove old one.

NOTE: If dryer has auger unload system, see Page 4-14.

Vapor Over-Temperature Switch (T96126)



Image 4-13 – Vapor over-temp switch

This device monitors vapor temperature after it exits vaporizer coil. If temperature exceeds 140°F, a fault message will appear 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 4-13.
3. Loosen clamps that hold sensor in place.
4. Follow wiring to connection point and disconnect after noting connections.

Installation:

1. Put new over-temperature switch in same position as old switch. Secure by tightening clamps. Be careful not to over-tighten.
2. Route new switch wires to location old switch wires were attached.
3. Attach one wire from new switch to circuit 18 and other to circuit X02.

Rear Door Switch (J44872)



Image 4-14 – Rear door switch

If door is open, dryer will not run.

Removal:

1. Turn power off at main power box.
2. Locate door switch at back of dryer.
3. Loosen cable connector.
4. Remove four small screws holding cover plate onto switch. There will be two wires, both black, on normally open (NO) set of contacts (13 and 14).
5. Loosen and remove both wires.
6. Remove two small bolts and two nuts holding door switch in place.
7. Remove switch.

Installation:

1. With cable connector loosened, insert wires into new switch.
2. Connect both wires to normally open set of contacts (13 and 14). (It doesn't matter which wire goes to which terminal as long as both are connected.)
3. Put cover plate back on switch.
4. Bolt new switch to dryer in same place as old one.
5. Make sure end of switch depresses when door is closed. Adjust if necessary.

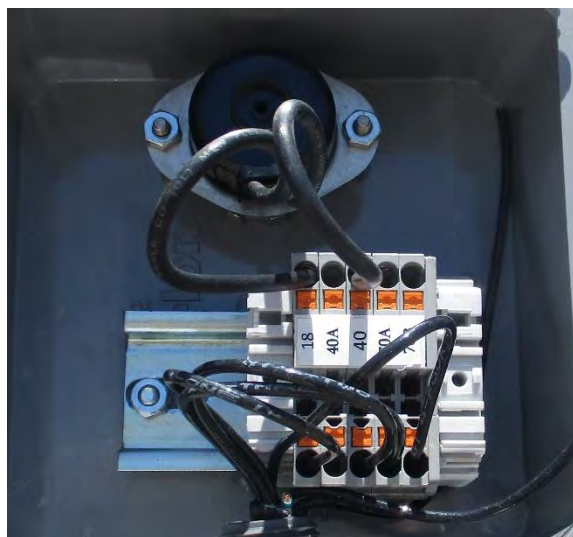
Grain Column Over-Temperature Switch (J4532 – 16', J4533 – 24', J4534 – 32')

Image 4-15 – 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 grain column over-temperature switches.

Removal:

1. Remove switch box cover.
2. Remove switch wires from terminals.
3. Remove fasteners holding switch in box. See Image 4-15.
4. Before removing switch and attached copper capillary, go to 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 4-15. 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.

Heater Housing High-Limit Switch (J5772)

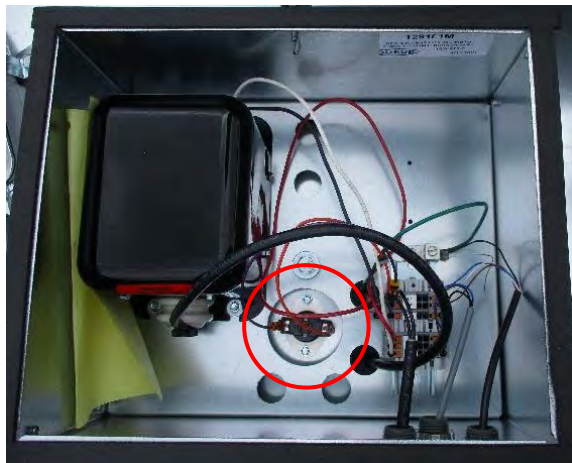


Image 4-16 – Heater housing high-limit switch

Heater housing high-limit switch (circled in Image 4-16) is located inside of a box on top of heater housing. Switch monitors temperature of heater housing. Switch is set for 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 box cover.

Plenum Temperature Sensor RTD (Resistance Temperature Detector) J5642 – 16', J5643 – 24', J5648 – 32'



Image 4-17 – 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 4-17 shows inside of box and Image 4-18 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 handling.

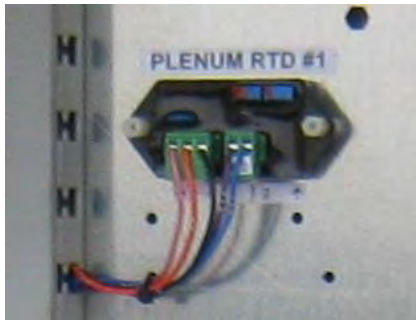


Image 4-18 – Plenum temperature sensor (RTD) transmitter in main power box.

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 previous 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 4-19 – 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 of meter roll switch box at rear of dryer. See Image 4-19.
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 more than 1/8" and no less than 1/16". See Image 4-20. Damage to proximity switch may occur if it comes into contact with rotating target. Tighten lock nuts.
2. Reinstall box covers.

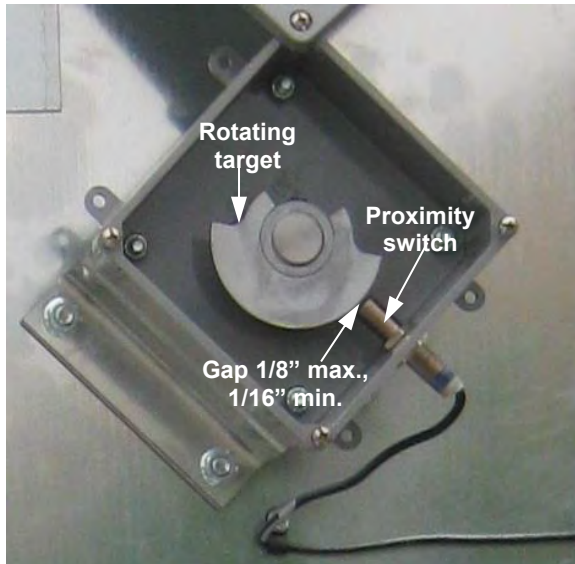


Image 4-20 – Meter roll proximity switch

Air Pressure Switch (T58623)

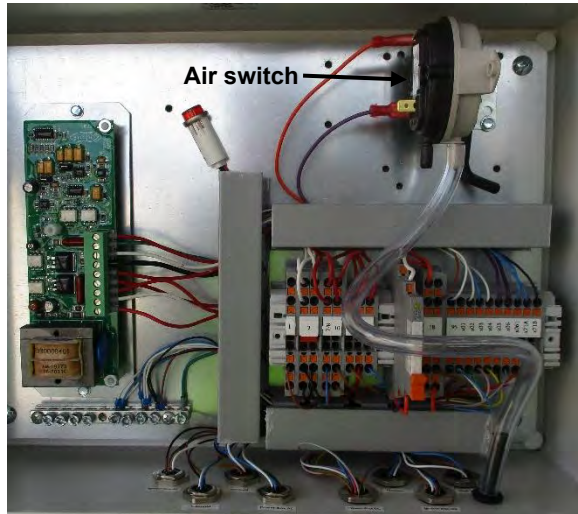


Image 4-21 – Air pressure switch in heater box

Air pressure switch ensures during operation that there is enough air flow into plenum to dry grain properly and use heater safely.

Removal:

1. Locate heater box (near pipe train).
2. Disconnect switch wires and hose.
3. Remove air switch.

Installation:

1. New switch is factory-calibrated and ready for installation.
2. Attach in same location as old switch using previously removed screws.
3. Attach hose and wires.

NOTE: Location of components in heater box and routing of air switch wiring and hose may vary depending on dryer model and date of manufacture.

Image 4-22 shows location of air pressure sensor hose at inlet of upper (forward-curve) fan. Image 4-23 shows location of air pressure sensor hose at inlet of bottom (backward-curve) fan.

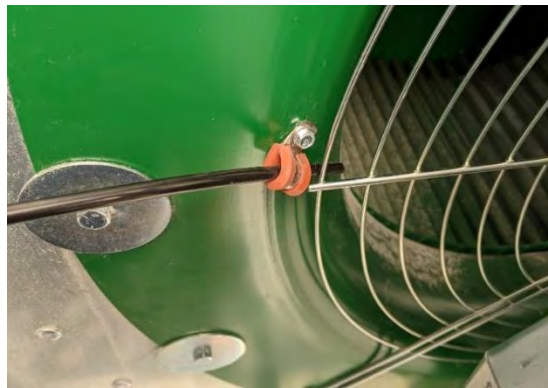


Image 4 22 – Air line at inlet of upper fan



Image 4 23 – Air line at inlet of bottom fan

**Plenum Over-Temperature Switch
J6795 – 16', J6796 – 24', & J67961 – 32'**

Image 4-24 – Plenum over-temperature switch

Plenum over-temperature switch trips when temperature of plenum rises above 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: Uncoil end of capillary to ease removal.

Installation:

1. Uncoil 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 old switch.
5. Replace switch box cover.

Unload Auger Proximity Switch (J4493)



This device monitors rotation of unload auger, if dryer is so equipped. 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 on grain discharge box. See Image 4-25.
3. Remove switch box cover.
4. Loosen and remove lock nut inside of box and remove proximity switch.

Image 4-25 – Unload auger proximity switch

5. Follow wiring to nearby junction box and disconnect prox 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. See Image 4-25.
2. Adjust gap between proximity switch and rotating target. **IMPORTANT:** Gap between tip of switch and rotating target must be no more than 1/8" and no less than 1/16". Tighten lock nuts.
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.

NOTE: If dryer has drag conveyor unload system, proximity switch will be in static sample box. See Page 4-5.

Component Calibration

Meter Roll Proximity Switch (J4493)

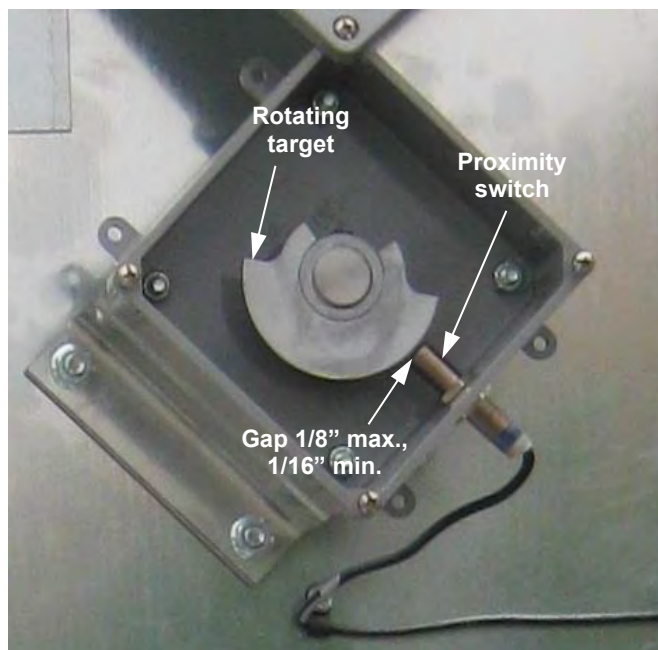


Image 4-26 – Meter roll proximity switch

Locate proximity switch on back of dryer. See Image 4-26. Proximity sensor and rotating target will be located inside of box.

1. To calibrate proximity switch, loosen lock nuts on switch.
2. Adjust switch so tip is no more than 1/8" and no less than 1/16" from target. See Image 4-26. This distance is important for reliable sensing.
3. After switch is in place, tighten lock nuts and replace cover on box.

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

Air Pressure Switch (T58623)

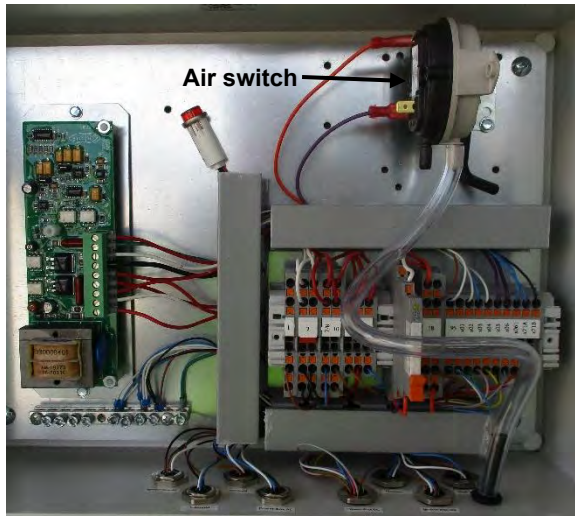


Image 4-27 – Air pressure switch in heater box

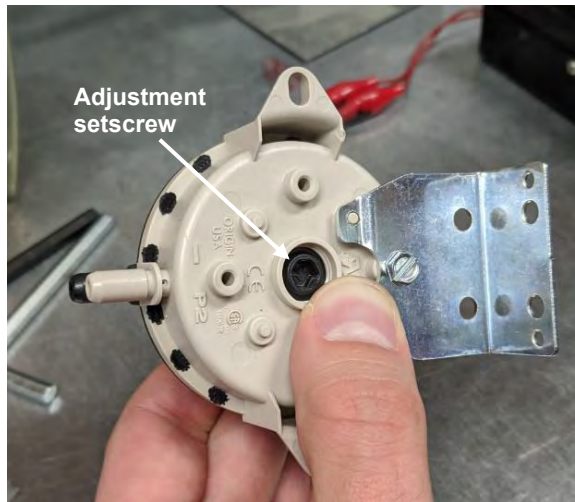


Image 4-28 – Adjustment setscrew

Follow these instructions if it is necessary to adjust air pressure switch:

1. Find switch in heater box (near pipe train).
2. Use hex wrench to turn adjustment screw on air switch clockwise until end of adjustment range is reached, then back off one-quarter turn counterclockwise. This sets the switch to roughly .8-.9 inches water column. Setting doesn't need to be exact.
3. Test switch operation by turning fan off and on while watching for air switch signal to change. Go to PLC Inputs/Outputs Diagnostics page on touch screen: Tools → Diagnostic Tools Menu → PLC Inputs/Outputs Diagnostics. Individual fan inputs/outputs appear in pop-up windows by pressing corresponding buttons.

NOTE: Dryer does not need to be full of grain.

Grain Discharge Chute Switch



Image 4-29 – Grain discharge chute switch on drag conveyor unload system

1. Locate box on discharge chute at rear of dryer. See Image 4-29. Open discharge chute lid.
2. Attached to lid is a bracket holding discharge chute switch. Loosen bolt holding box in place. See Image 4-30.
3. Adjust box so that when discharge chute lid is opened 2" to 3", a fault occurs. Once position has been found, tighten bolt to hold box in place.

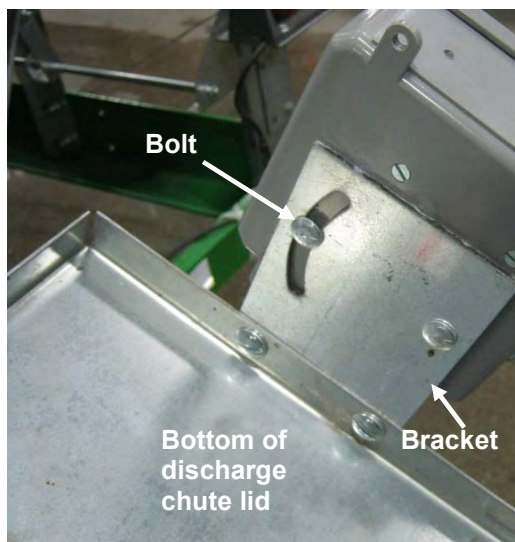


Image 4-30 – Screw and metal bracket

NOTE: Dryer with auger unload will have a similar switch mounted to lid. Use same process as above to calibrate.

Paddle Switches (T162621 for Gravity Load or T16244 for Auger-Load)



Image 4-31 – Paddle switch T16244 on auger-load section



Image 4-32 – Paddle switch T162621 on gravity-fill section

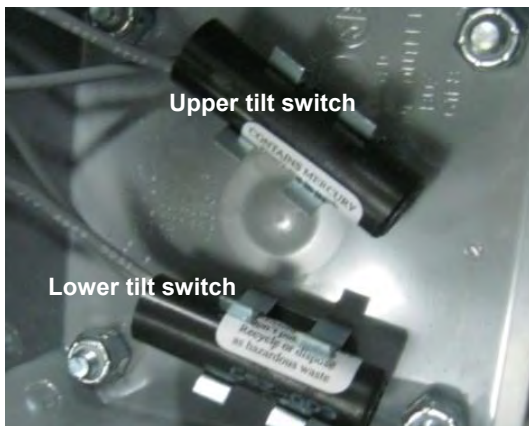


Image 4-33 – Switches (J4441) in each box

1. Find switch box near top of dryer. Image 4-31 shows switch on dryer with auger load system. Image 4-32 shows switch on dryer with gravity load system. Image 4-33 shows tilt switches inside of box.
2. Ensure upper and lower tilt switches are secure inside of box and positioned with wires exiting from left. Wire 53 connects to upper switch. Wire 44 connects to lower switch. Clips in box are positioned at factory to hold switches at appropriate operating levels.
3. Make sure arrow on top of T16244 box is pointed in direction of grain flow. When paddle inside of wet bin hangs straight down, top of box should be level. Paddle and T16244 switch can be mounted on either end of auger fill section, but cannot be on end at which dryer is being filled.
4. To adjust T16244 or T162621, loosen setscrew in shaft collar on backside of box.
5. Turn box until top is level when paddle hangs straight down.
6. Retighten setscrew.

NOTE: Depending on date of manufacture, dryer with gravity-fill wet bin may have a rotary fill switch instead of paddle switch. See Page 4-4. No calibration is necessary.

Adjusting Meter Roll Flow Gates

Standard flow gates on mixed-flow dryers are factory-set at 2" regardless of length of dryer. See Fig. 4-1. To adjust, remove cleanout/access doors and use adjustment bolt and tape measure or 2" spacer block to set distance between gate and inner wall of dryer. See Image 4-34.

NOTE: One full turn of adjustment bolt changes flow gate opening 1/16". Flow gate adjustment bolt turns clockwise to open gate and counterclockwise to close gate.

If dryer has small-grain flow gates, set all at 2-1/4" as shown in Fig. 4-2.

Reinstall cleanout/access doors after adjustments are made.

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

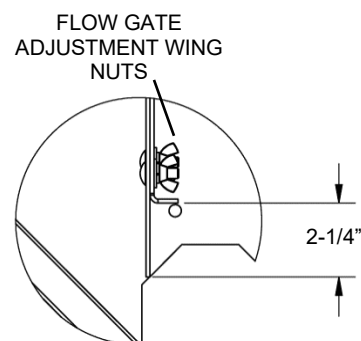
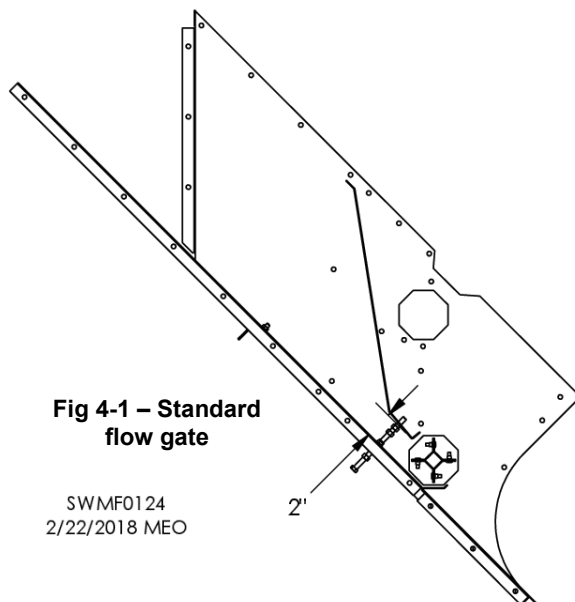


Image 4-34 – Flow gate adjustment

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.



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. Pay close attention to inside of fan hub. Reinstall fan inlet screens.



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

2. Check ventilation openings in motors for any blockage.
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.

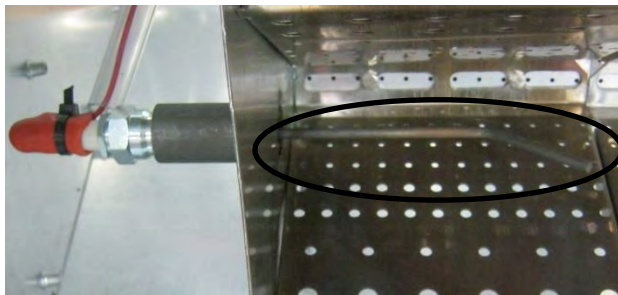


Image 4-35 – Flame rod

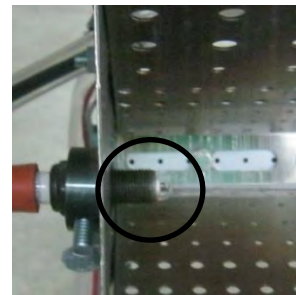


Image 4-36 –Spark plug/igniter

4. Examine flame rod (J5747) for cracked porcelain insulation and verify it is not touching metal burner. See Image 4-35.
5. Examine spark plug (J5739) for proper gap. See Image 4-36. Clean electrodes if required. Gap should be 1/8". Spark plug and flame rod should be examined periodically throughout drying season.

6. Remove gas strainer as shown in Fig. 4-3 and clean.

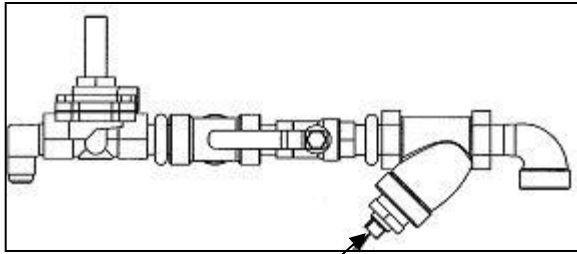


Fig. 4-3 – Remove gas strainer/filter at hex nut

7. Inspect all pipe train components for physical integrity. See Pipe Train Component Identification pages 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 yearly. See Image 4-37. Vaporizer coil should be replaced every five (5) years.

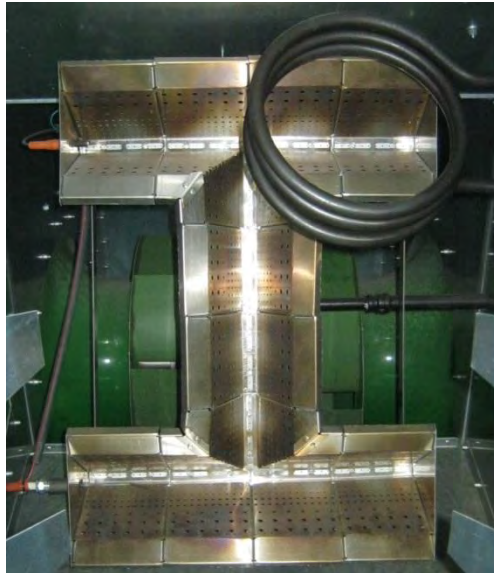


Image 4-37 – Vaporizer coil



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) and, if so equipped, drag conveyor bearings (J00722) 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 -10° to +260°. Use no more than 0.15 ounce (3 grams) for J0010 bearings and no more than 0.18 ounce (5 grams) for J0048 and J000722 bearings.

Daily Maintenance Requirements



Image 4-38– Fan inlet

This assumes 24-hour per day operation during harvest.

1. Clean foreign material from fan air inlets. See Image 4-38.
NOTE: Inlets are horizontal on up-blast fans.
2. Sweep off any areas where fines may have accumulated, paying special attention to perforated screens shown in Image 4-39.

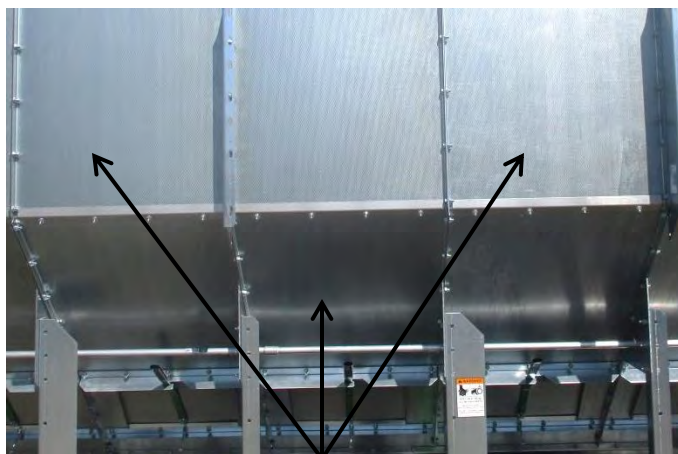


Image 4-39– Perforated screens on base module grain columns (before stiffener attachment)

3. Inspect for even grain movement in all 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 doors. Be sure that tip of each door switch is depressed. See Page 4-7 for close-up of rear door switch.



Image 4-40 – Rear access doors



Image 4-41 – Rear cleanout door

5. Open rear cleanout doors. See Image 4-41. Sweep all fines and debris from front of plenums to rear. Exit dryer and close rear access doors.
6. Run fan in Dry Fire mode until no more debris comes out of rear cleanout doors.
7. Turn fan off.
8. Close rear cleanout doors.
9. If dryer has a discharge tube, sweep fines/debris off of screen. See Image 4-42.



Image 4-42 – Grain discharge chute screen

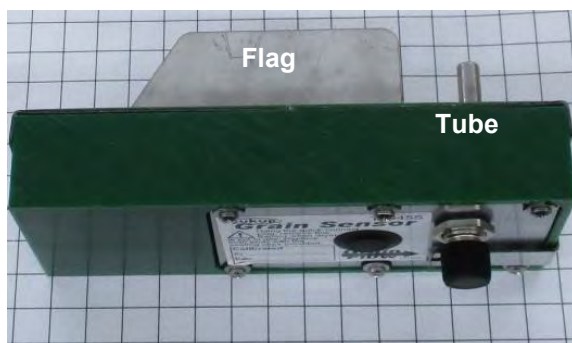


Image 4-43 – Moisture sensor flag & tube



Image 4-44— RTD temperature sensor tube (aluminum)



Image 4-45 – Single-point grain temp RTD

10. Remove discharge moisture sensor and clean sensor flag and tube. See Image 4-43. Do likewise if dryer has optional incoming moisture sensor. See Page 4-2 for discharge moisture sensor locations.
11. Reinstall sensor(s).
12. Inspect each RTD temperature sensor tube. See Image 4-44. Clean if necessary.
13. Restart dryer via touch screen using Automatic or Manual control.

NOTE: Dryer uses four single-point grain temperature sensors (See Image 4-45) to provide average grain temperatures to operating system. No regular maintenance is required.

Semi-Weekly Maintenance Requirements

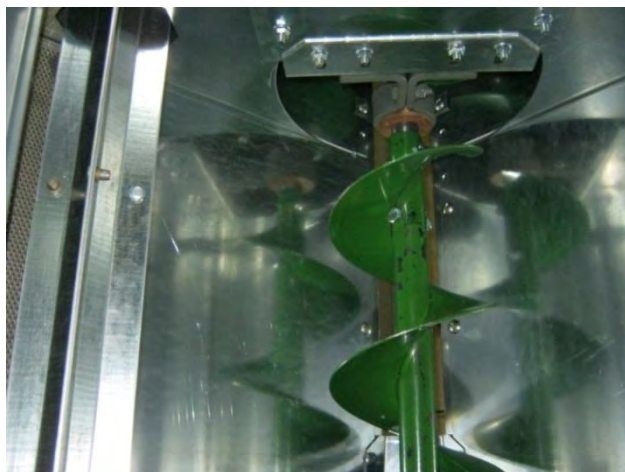


Image 4-46 – Unload auger (floor plate removed)



Image 4-47 – Grain column outside cleanout door handle (auger-unload only)

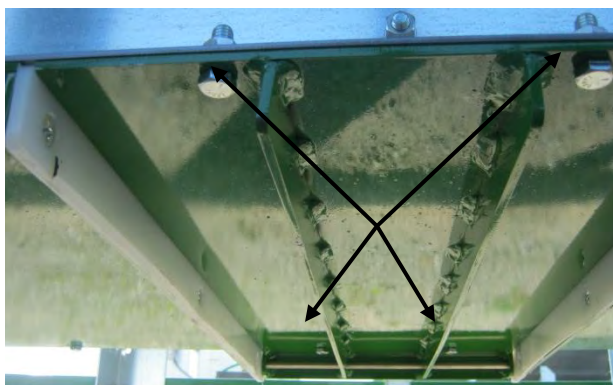


Image 4-48 – Drag conveyor cleanout door
Remove bolts to open

1. Perform all steps of daily maintenance requirements 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 4-46 & 4-47.

NOTE: If dryer has conveyor unload instead of auger, open cleanout door by removing four bolts shown in Image 4-48. A pry bar may be needed to open door. Clean as necessary and replace door.



Image 4-49 – Outer grain column cleanout door

3. Open outer and inner grain column cleanout doors shown in Images 4-49 and 4-50 and remove debris. Close doors. Lock outer cleanout door handle using hardware shown in Image 4-48.
4. Restart dryer via touch screen using Automatic or Manual control.

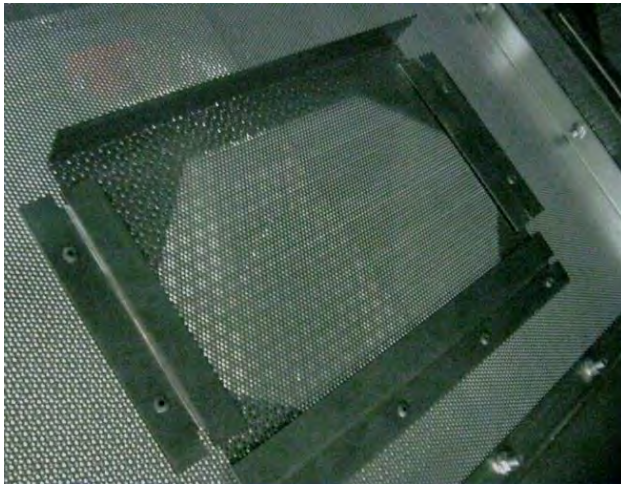


Image 4-50 – Inner grain column cleanout door

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. See next page.
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, especially after dirty drying season. Clean wet bin trash pan if dryer has auger load.

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.

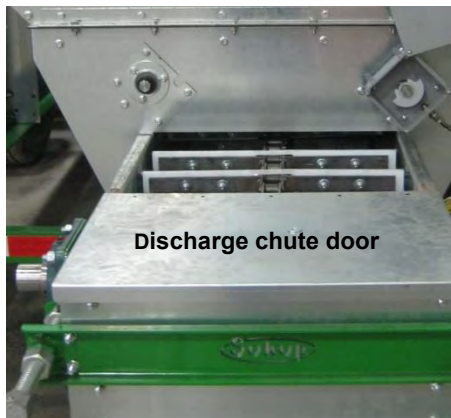


Image 4-51 – Cleanout panel (removed) and discharge chute door on conveyor

3. Leave unload cleanout doors open for water drainage.
4. Lock out electrical power.

NOTE: If dryer has conveyor unload, open cleanout panel and discharge chute door and remove debris. See Image 4-51.

5. Remove moisture sensor(s). Store in a cool, dry place. Be sure to cap both coupler fittings as shown in Images 4-52 and 4-53.

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



Image 4-52 – Moisture sensor cable capped



Image 4-53 – Cable connector capped

6. Ensure that cover of Quadra-Touch Pro console is closed. Remove Ethernet cable, disconnect from power, and store console indoors during offseason.

Adjusting V-Belt Tension

Follow these steps to tension belt.

1. Measure span length. See Fig. 4-4.
2. At center of span, apply enough force to deflect belt $1/64$ " for every 1" of belt span. If span is 32", deflection amount should be $32/64$ ", or $1/2$ ".
3. Use table below to determine pounds of force to apply to gauge proper deflection per belt.

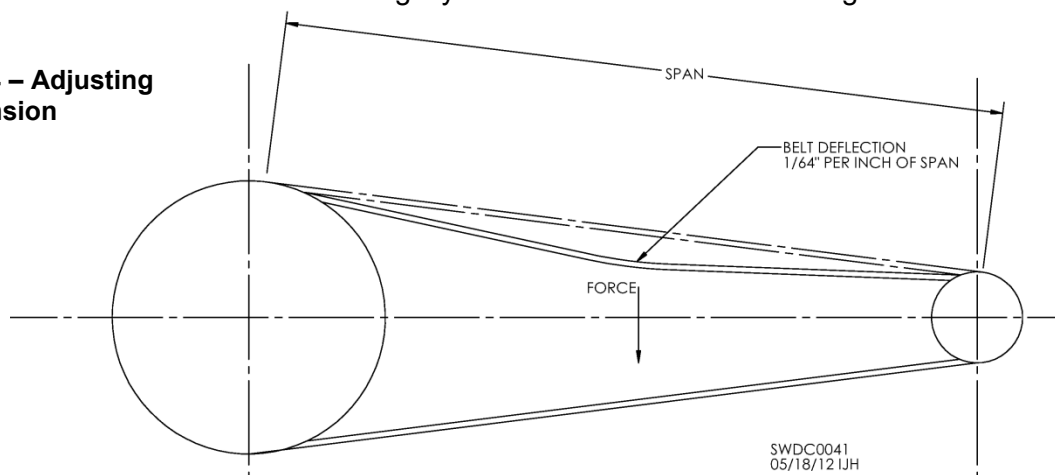
Belt Cross Section	Smallest Pulley Diameter Range	RPM Range	Belt Deflection Setting			
			Deflection = $1/64$ of belt span			
			Uncogged Single V-Belts & Uncogged Banded V-Belts		Cogged V-Belts & Cogged Banded V-Belts	
			Used Belt	New Belt	Used Belt	New Belt
B, BX	3.4 – 4.2"	860 – 2,500	---	---	4.8	7.2
		2,501 – 4,000	---	---	4.1	6.2
	4.4 – 5.6"	860 – 2,500	5.2	7.9	7.1	10.5
		2,501 – 4,000	4.5	6.6	7.1	9.1
	5.8 – 8.6"	860 – 2,500	6.2	9.4	8.4	12.4
		2,501 – 4,000	6.0	6.8	7.3	10.7

Belt deflection settings, in pounds, for Bestorq belts

Sukup products use belts made by Bestorq. Sukup recommends using a Bestorq tension meter to measure belt deflection. Go to www.bestorq.com or call (402) 423-3077 for more information.

After adjusting tension to desired level by adjusting motor mount, remove any foreign material from inside of belt guard. Check that all fasteners are tightly secured. Close and latch belt guard.

Fig. 4-4 – Adjusting belt tension



IMPORTANT: Check and adjust belt tension after first five (5) and 24 hours of operation, then during weekly maintenance.

Drag Conveyor Maintenance



WARNING: Lock out power before performing any maintenance or service inspections. Contact with moving chain and/or paddles could cause death or serious injury.

Regularly scheduled maintenance can greatly increase life of equipment and reduce downtime. A good maintenance program includes general cleaning and upkeep and regular lubrication and inspection. Check conveyor immediately if any unusual noise or vibration is observed. Following is a list of things to check regularly.

1. Inspect conveyor for loose bolts, missing or damaged paddles, overall chain condition, and electrical connections, etc. Any bent or broken paddles should be straightened or replaced.
2. Check chain for tightness after 10, 30 and 100 hours of operation, and every 200 hours thereafter. Remove links as needed if chain cannot be adjusted to proper tightness. Tighten chain by adjusting take-ups on tail section. Take-ups should be adjusted in small increments to ensure tail sprocket is kept square. Chain tension is correct when deflection is approximately 1/2" at a point midway between rollers. See Fig. 4-5. **NOTE:** On conveyor with slide rail returns, it should be possible to lift chain slightly when sufficiently tightened. Making sure chain is properly tensioned will improve longevity of conveyor.

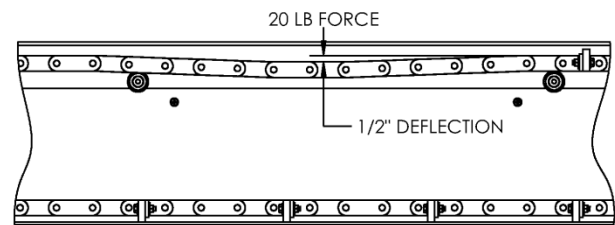


Fig. 4-5 – Tensioning conveyor chain

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3. Bearings are greased at factory and do not need to be greased prior to start-up. Grease all bearings every 800 to 1000 hours after start-up. Do so while unit is running. Use only enough grease until you can see fresh grease at seals. If you cannot lubricate bearings while unit is running, do it immediately upon shutdown while bearing is still warm. Do not grease a cold bearing.
4. Be certain to maintain speed reducer as specified by manufacturer. Follow manufacturer's instructions for regular oil level inspection and oil changes.
5. Check belt drive tension after first five (5) and 24 hours of operation, then at least twice yearly. See previous page. Check pulleys for alignment and to see they are securely tightened.
6. Oil motor every 1000 hours or once yearly if equipped with oil holes, or grease unit if zerks are present.
7. Check all safety decals and replace all that are missing or deteriorated.
8. Check and retighten all fasteners.

Extended Shutdowns

If dryer will not be used for more than one month, follow these steps:

1. Remove all foreign material from conveyor and check that surface coatings are in good condition.
2. Lubricate and protect all bearings and drives according to manufacturer's instructions.
3. Rotate gear reducer occasionally during shutdown according to manufacturer's instructions.
4. Coat all exposed metal surfaces with rust-inhibiting oil according to manufacturer's instructions.

Chain & Sprocket Inspection

Chain

Check periodically for these potential chain and/or sprocket problems. Remedy by realigning or replacing chain, depending on severity of problem, or by replacing sprocket.

1. Chain stretching – 81X chain has stretched 3% (e.g., from 40' to 41.2'). Replace chain.
2. Stiff joints – Chain rollers can get packed with debris, leading to failure of rivets. Clean or replace chain.
3. Sidebar wear – Chain is sliding in trough. Realign chain.
4. Sidebar wear – Inside of links wearing from sprocket teeth. Realign chain.
5. Bushing wear – Bushings are worn or gouged – not polished -- where sprocket tooth touches. Check sprocket and replace if necessary.
6. Attachment wear – Attachments are gouged or bent from hanging up in conveyor. Realign or replace chain.
7. Rivet wear – Heads or tails of rivets worn from rubbing sides of trough. Realign or replace chain.
8. Roller wear – Inner diameters of rollers are worn from chain slack and wobble. Realign or replace chain.

Sprockets

1. Worn teeth – Worn teeth will over-stress chain, causing it to snap in and out of sprocket and possibly hang up when exiting. Replace sprocket.
2. Build-up in pockets – Material packed into pockets of sprocket will cause chain to stretch. Remove material.
3. Teeth scrubbed on sides – Indicates misalignment of sprockets or shaft. Chain could also be worn to point where it won't track properly. Realign or replace chain.
4. Chain rides high on teeth – Chain is elongated and close to needing replacement.
5. Chain bow too tight – Indicates material packed in pockets or flanges too large. Remove material and/or replace chain.
6. Noise – Chain should make a clicking sound (metal on metal) against sprocket. If chain snaps against sprocket, check for issues 1 through 5.

Troubleshooting Guide

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<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023	Updated photo of paddle switch T162621 & photo of vapor OT switch	3 & 4
	Removed references to discontinued rotary fill switch & incoming moisture sensor	3 & 14
	Minor editing to improve clarity	16 & 21
	Added resistance values for single-point grain temp sensors	18
08/19/2022	Minor editing & formatting changes throughout	
	Updated paddle switch troubleshooting instructions	3
	Added instructions for troubleshooting single-point grain column RTD sensors	15
	Updated instructions for troubleshooting electronic modulating valve	21

Fault Troubleshooting

Grain Discharge Chute Switch



Image 5-1 – Grain discharge chute tilt switch

Tilt switch in grain discharge chute switch box detects discharge chute 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 lid open? Remove any obstructions and close door.

2. Is switch box out of adjustment? This can be determined by watching input light 42 on PLC. Adjust angle of switch box after placing door at desired height for fault to occur (2" to 3"). PLC input light turns off when a fault occurs.
3. If unable to adjust switch box and turn on PLC input light, use a voltmeter to determine if tilt switch is malfunctioning.
4. At discharge chute, find switch box fastened to lid. See Image 5-2 or 5-3. This box contains the tilt switch. Remove cover and locate the two wires coming from switch. Check for 24VDC from circuit 18 to ground.
5. If 24VDC is found on circuit 18, check for voltage on circuit 42. If 24VDC is not present, it may be necessary to tilt switch to allow mercury inside to touch contact. If unable to detect 24VDC on circuit 42, switch must be replaced.
6. 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 chute switch and power box.
7. If 24VDC was present on terminal 42 in power box, check PLC input where 42 goes into PLC. If 24VDC is present on input on PLC but light is OFF, then PLC is malfunctioning.



Image 5-2 – Grain discharge chute switch on drag conveyor unload

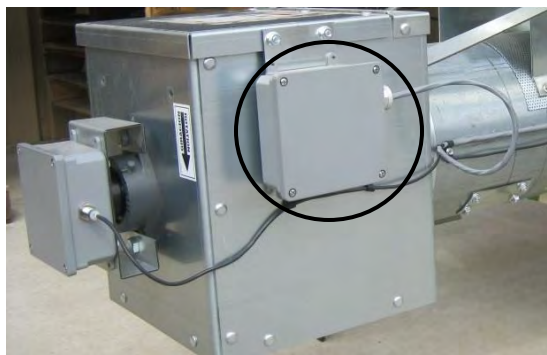


Image 5-3 – Grain discharge chute switch on auger unload

NOTE: For more on signal routing, see Pages 4 & 20 of M12 Cable Service Guide L1986.

Paddle Switches

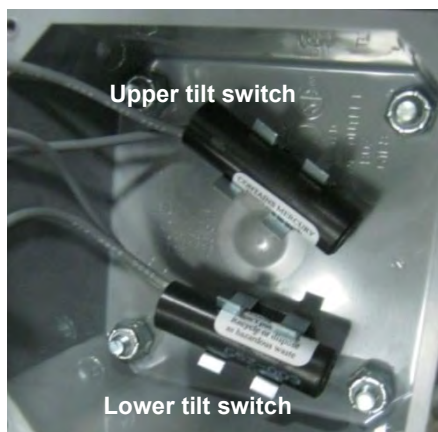


Image 5-4 – Inside of paddle switch box

Paddle switches are used to indicate when dryer is running low or is out of grain. A fault will be displayed when this occurs. Style of switch will depend on fill system. For gravity-fill, dryer will have paddle switch shown in Image 5-5. Dryer with auger fill will have paddle switch shown in Image 5-6. Use steps on this page to troubleshoot paddle switches. Image 5-4 shows inside of paddle switch box.



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 of 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 assembly and check tilt switches for proper placement in their respective holders. See Image 5-4.
5. Check PLC input lights (44-Lower switch; 53-Upper switch) 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 circuit 18, check for 24VDC on other wire going to switch. With paddle in up position, 24VDC should be detected on circuits 44 and 53. 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 terminal in main power box.
8. If 24VDC is detected at terminal in main power box and PLC input lights are not on, PLC may be malfunctioning.



Image 5-5 – Paddle switch T162621 on gravity-fill section



Image 5-6 – Paddle switch T16244 on auger-fill section

NOTE: For more on signal routing, see Pages 4 & 21 of M12 Cable Service Guide L1986.

Vapor Over-Temperature Switch



Image 4-13 – Vapor over-temp switch

On an LP dryer, vapor over-temp switch is located on pipe train for each heater. Its purpose is to detect gas that is overheating and could damage heater components.

Fault message will appear and dryer will shut down if vapor temp gets above 140°F. Vapor pipe should be warm, but not too hot to touch.



Fault Condition

Vapor Over-Temp

- 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. Check for air inlet obstruction. Clean any debris from fan grill.
3. Check to see if vaporizer coil is too close to flame. Adjust coil as needed. See instructions in Operation section.
4. Has vaporizer coil had sufficient time to cool down? Switch will automatically reset when vapor has cooled down.
5. Is PLC input light on? After device has cooled down and reset, PLC input light should be on. If not, follow wires 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 vaporizer O/T switch, and after device has cooled down to ambient temperature, check for 24VDC on X02 circuit coming from over-temp switch.
 - a. If 24VDC is NOT found on X02 circuit, switch must be replaced.
 - b. If 24VDC is found on X02 circuit coming from switch, 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 displayed (after switch has reset, then PLC is malfunctioning).

NOTE: For more on signal routing, see Page 4 of M12 Cable Service Guide L1986.

Rear Door Switch



Image 5-12 – Rear door switch

Rear door switch is located to right of each rear door on dryer. Switch is used to keep dryer from running when a door is open and someone may be in plenum of dryer.



Fault Condition

Rear Door is Open

All dryer models use circuit 36

1. Check rear 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 wires from switches. Remove cover and check for 24VDC on input wire.

NOTE: Circuit 18 serves push-button door switch. If there is more than one plenum, switches are connected in series (36, 36A, 36B & 36C) in DS junction box and 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.



Image 5-13 – Rear door 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 main power box.
 - b. If 24VDC is found on power box terminal 36, check input 36 on PLC for 24VDC.
5. If 24VDC is present on PLC input terminal 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 Pages 4 & 24 of M12 Cable Service Guide L1986.

Grain Column Over-Temperature Switch



Image 5-14 – 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 240°F. Image 5-15 shows switch boxes on back (discharge end) of dryer.



Fault Condition

Right Column Over-Temp

All dryer units use circuit 40 for right side



Fault Condition

Left Column Over-Temp

All dryer units use circuit 41 for left side

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

NOTE: To check for an obstruction, go to Manual operation in QuadraTouch Pro and set unload speed to 50% or higher. Observe grain flow in perforated columns. Any column with an obstruction will be readily visible. Remove 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.



Image 5-15 – Grain column over-temp switches

- a. If 24VDC is NOT detected, 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 number of wire and go to main power box and check for 24VDC on terminal 40/41.
- c. If 24VDC is NOT found on terminal 40/41 in power box, check wiring connections between switch box and power box.
- d. If 24VDC is detected on terminal 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), then PLC is malfunctioning.

NOTE: For more on signal routing, see Pages 4, 8 & 9 of M12 Cable Service Guide L1986.

Heater Housing High-Limit Switch



Image 5-16 – Heater housing high-limit switch

Heater housing high-limit switch is located in a box mounted above heater. Switch trips when heater reaches a temperature considered too high for drying grain. Image 5-16 shows switch. See Image 5-24 for location.



Fault Condition **Heater Housing Over-Temp**

- 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 housing high-limit switch and push red reset button at center of switch.
- d. Go to Manual in QuadraTouch Pro and turn on fan. Ensure fan 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 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 high-limit switch box and main power box.
4. At this point, 24VDC should be present on circuit 18 at high-limit switch in box.
 - 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 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 Pages 4 & 17 of M12 Cable Service Guide L1986.

Meter Roll Proximity Switch



Image 5-17 – Meter roll proximity switch

Meter roll proximity switch is located in junction box at unload end of dryer. Image 5-17 shows switch. Image 5-18 shows location. Switch is used to monitor meter rolls for rotation. If rolls stop turning, fault will be displayed and dryer will shut down.



Fault Condition

Meter 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. See Image 5-18. Make sure end of switch is between 1/16" and 1/8" from rotating target when target passes switch head. 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 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 unload end of dryer (brown wire). This voltage is referenced to ground (blue wire).
7. Light on back of 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 main 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.



Image 5-18 – Meter roll proximity switch on dryer with conveyor unload

NOTE: For more on signal routing, see Pages 4-6 of M12 Cable Service Guide L1986.

Static Sample Box Proximity Switch



Image 5-19 – Sample box proximity switch

A proximity switch in static sample box under conveyor discharge monitors movement of a slide gate. If gate stops moving, a fault will be displayed and dryer will shut down.



Fault Condition

Sample Box Prox Switch Failure
All dryer models use circuit 66

1. Check PLC input for light turning on and off.
2. Turn unload OFF. If slide gate is closed, light on top of proximity switch should now be on.
3. If light is not on, follow wire from proximity switch to junction box. Remove junction box cover.
4. Check for 24VDC on circuit 18. If 24VDC is not found, go to main power box and check for 24VDC on terminal 18. If 24VDC is found on main power box terminal 18, check wiring connections between junction box and main power box.
5. At this point, 24VDC should be present on circuit 18 in junction box on back of dryer (brown wire). This voltage is referenced to ground (blue wire).
6. Make sure switch head is between 1/16" and 1/8" from gate target.
7. Light on back of proximity switch should be on and 24VDC should be present on output (black wire, circuit 66). If not, switch is defective.
8. If 24VDC is found on output wire (circuit 66) 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 (circuit 66) but PLC input light is not on, take note of wire number and go to power box terminal 66 and check for 24VDC.
 - b. If 24VDC is NOT found on power box terminal 66, check wiring connections between junction box and power box.
 - c. If 24VDC is found on power box terminal 66, 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.

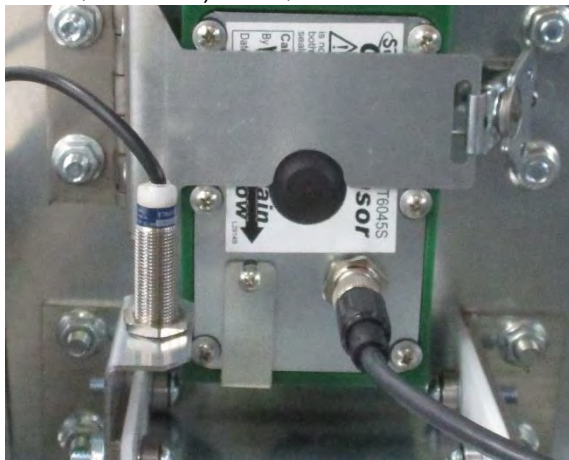


Image 5-20 – Static sample box proximity switch

NOTE: For more on signal routing, see Pages 4-6 of M12 Cable Service Guide L1986.

NOTE: There is a similar switch on dryer with auger unload. See next page.

Unload Auger Proximity Switch



Image 5-21 – Unload auger proximity switch

Unload auger proximity switch is located on discharge box at end of unload auger, if dryer is so equipped. Switch monitors unload auger and will give a fault message and stop dryer if unload auger stops turning. Tip of switch should be between 1/16" and 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 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 displayed, go to Manual in QuadraTouch Pro 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 circuit 18 (brown), with respect to circuit 96 (blue).
 - b. If 24VDC is not found on circuit 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.
5. If possible, position target over switch so switch will be in ON position.
 - a. With switch turned ON, light on back of switch should be on. Check for 24VDC on black 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 power box and check PLC Input light. This light 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.

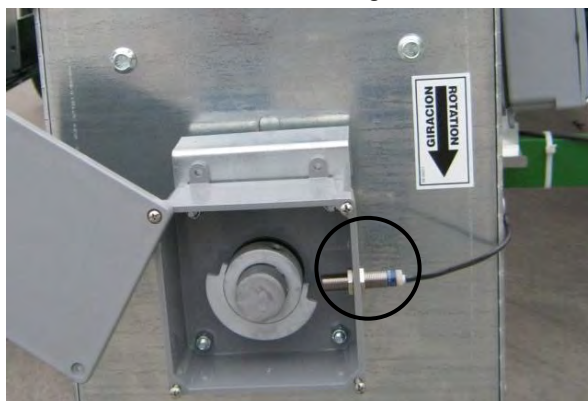


Image 5-22 – Unload auger prox. switch

NOTE: For more on signal routing, see Pages 4-6 of M12 Cable Service Guide L1986.

Air Pressure Switch

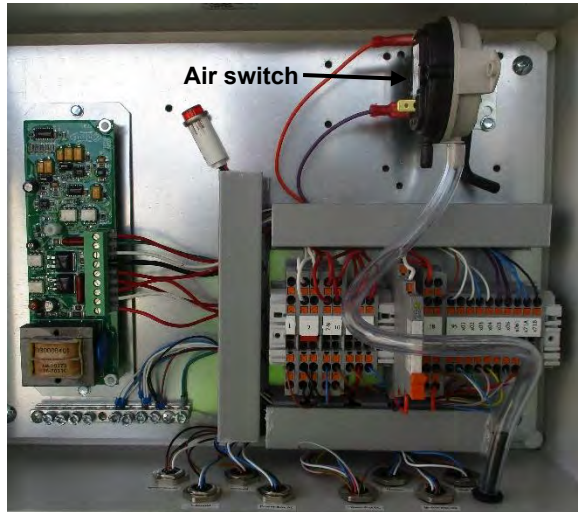


Image 5-23 – Air pressure switch in heater box

An air switch is located in each heater box on dryer, with a small hose running to fan intake. Switch(es) verify that air flow is sufficient for safe operation of dryer. Switch(es) will shut down dryer if there is not enough air flow into plenum.



Fault Condition

Air Switch On, But Fan Output Off

- 4th switch uses circuit 405
- 3rd switch uses circuit 305
- 2nd switch uses circuit 205
- 1st switch (bottom) uses circuit 105

NOTE: Location of parts in heater box and routing of air switch wires and hose may vary depending on dryer date of manufacture.

1. Ensure that hose fits tightly to white port on air switch (black port is not used).
2. Ensure switch wiring is securely connected in heater box and elsewhere.
3. Using Manual Operation in QuadraTouch Pro, turn fan on and check it for proper operation and airflow.
4. If a fault message appears, air switch may be defective or need to be adjusted.
 - a. Open cover of heater box containing air switch.
 - b. With fan turned on, check PLC input light. It should be on.
 - c. If input light is NOT on, use a hex wrench to turn adjustment screw clockwise until input light turns on.
 - d. Once input light is on, turn fan off and observe PLC input light. Light should turn off as fan slows down.
 - e. If light remains on after fan slows, turn adjustment screw counterclockwise slowly until input light turns off.
 - f. While watching PLC input, turn fan on and then off, ensuring input light is turning on and off with fan.
5. If fan is on and PLC light is off for respective X05 circuit:
 - a. Ensure switch is wired to be normally open (NO): Wires attached to 1 (Common) & 2 (NO)
 - b. Ensure air line is not plugged, kinked or damaged. (Rainwater could be an issue if end of air line is even slightly pointing upward.) Repair or reposition line as needed.
 - c. If airline is OK, check to make sure circuit 18 supplying power to switch has 24VDC.
 - d. If 24VDC is present on circuit 18, check for 24VDC on respective X05 circuit starting at switch and working to main power box. Look for location where 24VDC disappears. Repair as needed.
6. If fan is off and PLC light is on for respective X05 circuit, follow steps 5.a, 5.b, & 5.c, then check circuit for location where 24VDC first appears. Repair as needed.
7. If all connections are good, either air switch is defective and should be replaced, or PLC is malfunctioning.
8. Replace switch, making sure to mount it in same position as old switch (Switch MUST be mounted vertically). Attach wires and hose, then double-check all connections.
9. After replacing switch, follow previous instructions to check for fault message.
10. If 24VDC is found on PLC input terminal but input light is not on and fault message is still displayed after pressing RESET, PLC is malfunctioning.

NOTE: For more on signal routing, see Pages 4 & 13 of M12 Cable Service Guide L1986.

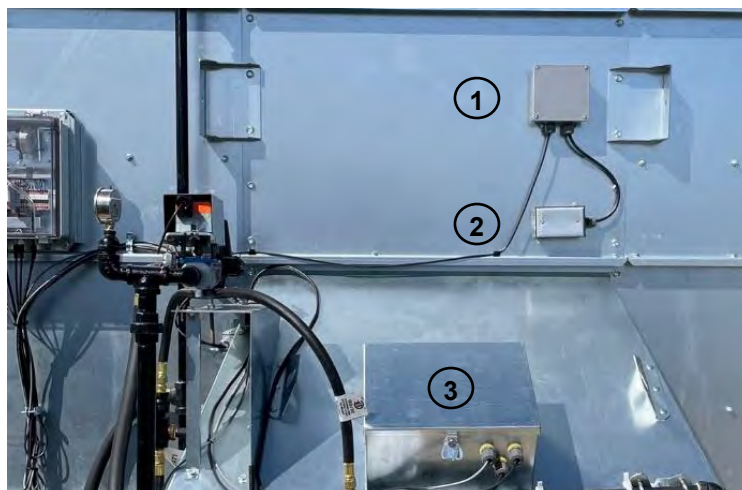


Image 5-24 – Control switch boxes

Image 5-24 shows location of plenum over-temp switch (inside box 1), plenum RTD junction box (2), and heater high-limit switch (3). Position of boxes may vary.

Plenum Over-Temperature Switch



Image 5-25 – Plenum over-temp switch

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



Fault Condition Plenum Over-Temp

- 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 any accumulated debris.
2. With dryer turned off, open door and inspect plenum for any problems.
3. After plenum has cooled, press RESET on QuadraTouch Pro 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 Pages 4 & 11 in M12 Cable Service Guide L1986.

Discharge Moisture Sensor

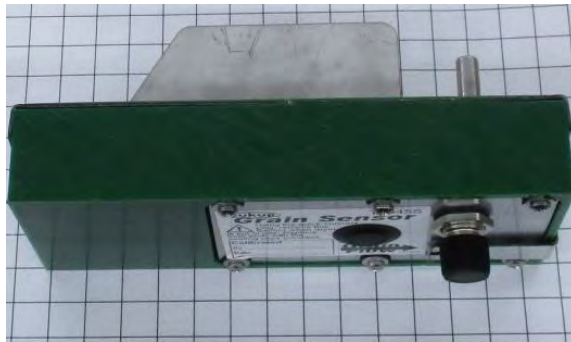


Image 5-26 – Discharge moisture sensor

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



Fault Condition **Input Sensor Not Found**

Follow steps below if “Moisture Sensor Not Found” 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. Check for DC 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.
3. To check temperature monitoring function of sensor, measure between blue and white wires. Sensor output is 10mv/°F, so if ambient temperature is 70°F, output voltage will be .7VDC. If voltage is off by more than 20 degrees F, sensor is out of calibration. Replace sensor or send to Sukup Manufacturing Co. for recalibration.

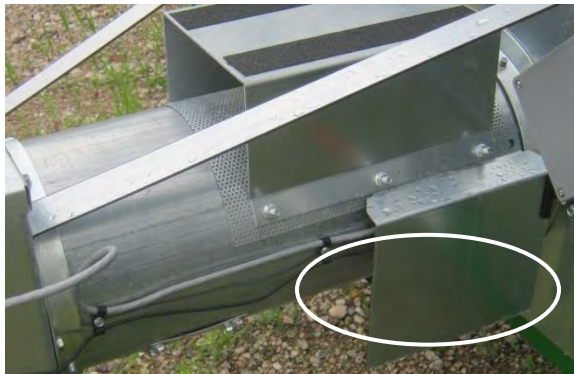


Image 5-27 – Discharge moisture sensor location

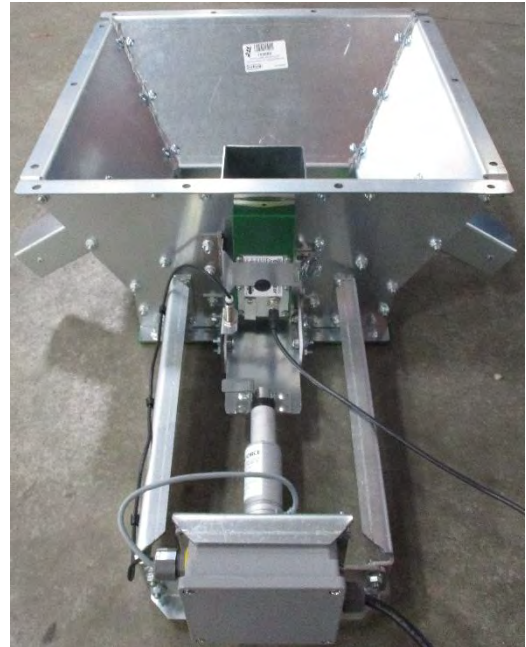


Image 5-28 – Discharge moisture sensor on static sample box (shown removed from drag conveyor)

NOTE: For more on signal routing, see Page 4 of M12 Cable Service Guide L1986.

Single-Point Grain Column RTD (Resistance Temperature Detector) Sensor

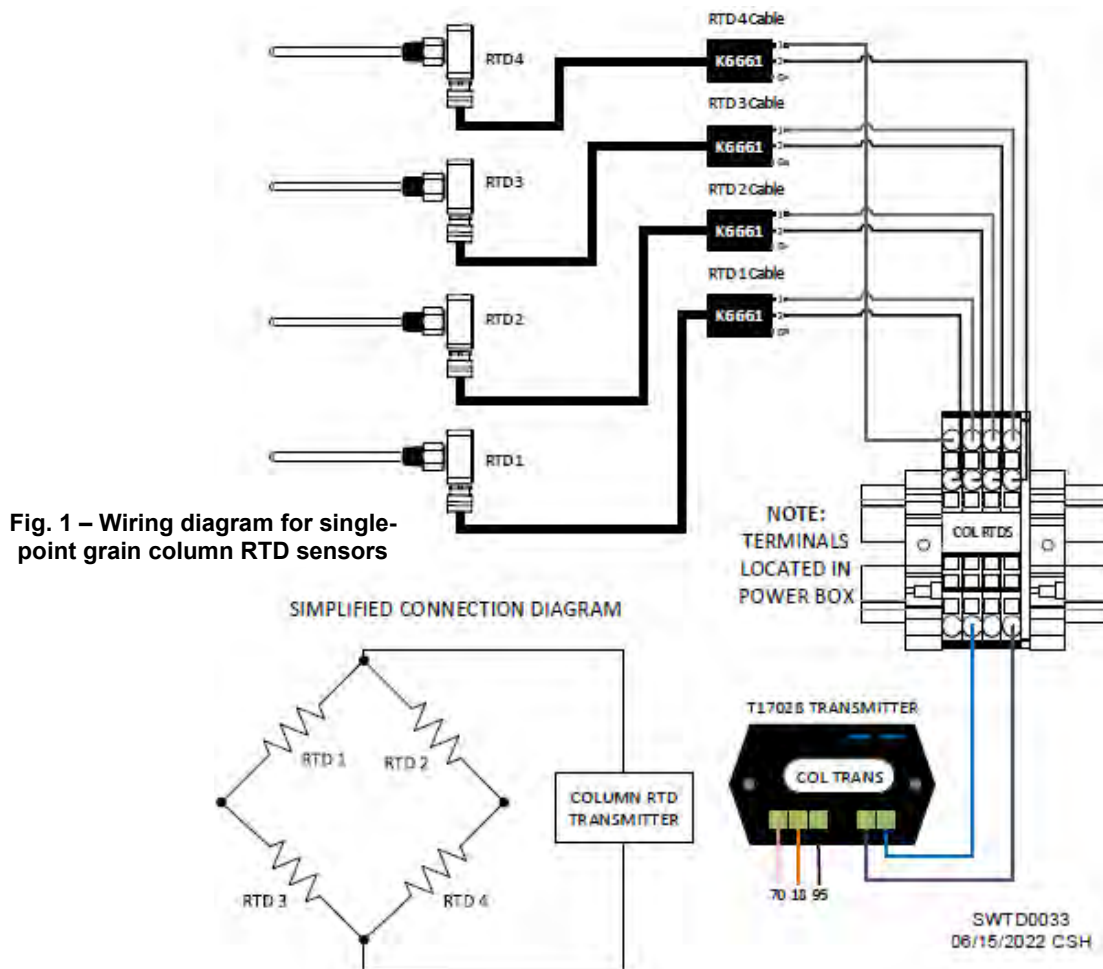


Image 5-29 – Single-point grain column RTD sensor

Four single-point RTD sensors (See Image 5-29) are used to monitor grain temperatures in grain columns of dryer. 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. 1.
2. Test resistance of each RTD with an Ohm meter. Compare to applicable value in table on Page 18. 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 cited above, replace sensor.

NOTE: If blue and purple transmitter wires are removed from terminal block, resistance can also be checked across entire bridge at those points to see if it 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.



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 to 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 touch-screen 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.

Device Troubleshooting

Plenum Temperature Sensor RTD and Transmitter

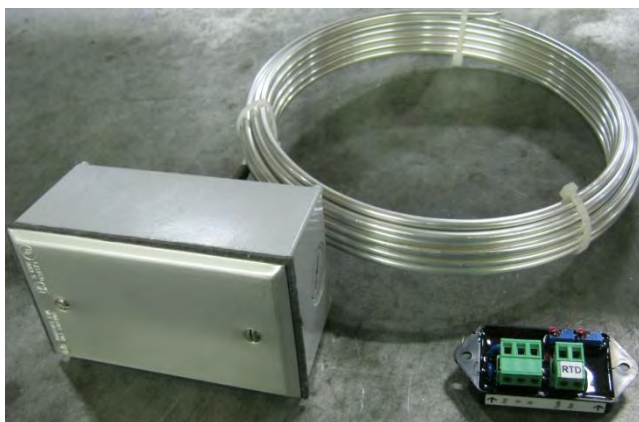


Image 5-30 – Plenum temperature sensor RTD and transmitter

Plenum temperature sensor consists of RTD (Resistance Temperature Detector) and transmitter. See Image 5-24 for location of RTD.

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. See Image 8 in Component Identification section of this manual. A white label should be attached to bottom of transmitter. Two small terminal blocks are located on transmitter. See Image 5-30.

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

Heater Box

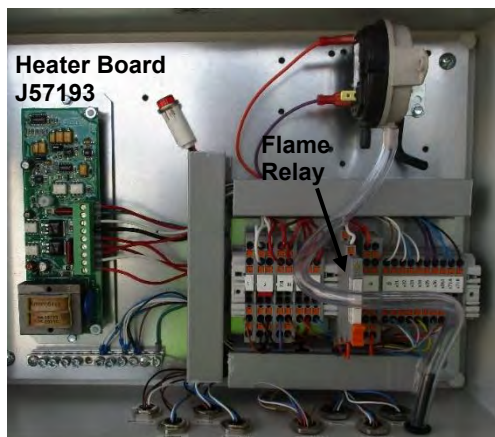


Image 5-31 – Heater box

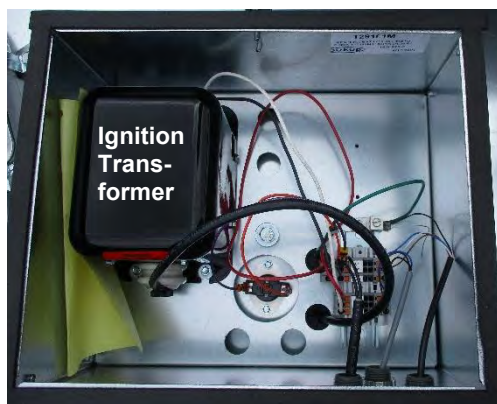


Image 5-32 – Ignition box

Heater Ignition Sequence

1. When heat is called for, 24VDC output(s) on PLC is/are energized, sending a signal to relays:
K4A – Heater 1 (lowest heater)
K9A – Heater 2
K12A – Heater 3
K14A – Heater 4
2. Relay sends 120VAC to respective heater box and 24VDC to PLC, indicating heat is on.
3. 120VAC goes through breaker CB9 for heater 1, CB10 for heater 2, CB11 for heater 3 and CB12 for heater 4. Then 120VAC is sent to each respective heater board, going through wire 112 for heater 1, wire 212 for heater 2, 312 for heater 3 and wire 412 for heater 4.
4. Once 120VAC is present at heater board, a 17-second purge time begins. See Table 5-2.
5. After purge cycle is complete, 120VAC is sent out on wire 10 to liquid solenoid valve, vapor solenoid valve and flame relay. Ignition transformer is also energized from wire 9 for 10 seconds, and red light in heater box is turned on. Gas flows through solenoid valves, butterfly valve, and into burner.
6. After ignition transformer has shut off, gas remains on for an extra 5 seconds. If a flame has not been detected by this time, heater board shuts gas off and goes into a lockout condition. Power

NOTE: During ignition attempt, and as long as flame is sensed, flame relay in heater box is energized, sending a 24VDC signal to PLC.

Flame relay input to PLC is wire 106 for heater 1, 206 for heater 2, 306 for heater 3, and 406 for heater 4.

For more on signal routing, see Pages 4, 13 and 17 of M12 Cable Service Guide L1986.

Table 5-2 shows timing sequence for standard Sukup circuit board J57193. Dryers used in Canada will have a different circuit board; see Table 5-3 on next page for timing sequence for Fenwal board.

NOTE: Regardless of circuit board used, if flame is not detected during trial for ignition (spark), it will attempt ignition again starting with purge. Ignition will be attempted up to three times, after which board locks out.

[illegible]

Table 5-2 – Sukup standard circuit board timing sequence

Table 5-3 shows timing sequence for Fenwal circuit board.

Purge Time	16 Seconds																			
Spark																	6 Seconds			
Gas Valves																	4 Seconds			
Trial for Ignition																	4 Seconds			
Seconds	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Table 5-3 – Fenwal circuit board timing sequence

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 or backup system (via EMOV board in main power box).

Troubleshooting modulating valve requires a familiarity with software being used to control the valve. See Image 5-33 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.

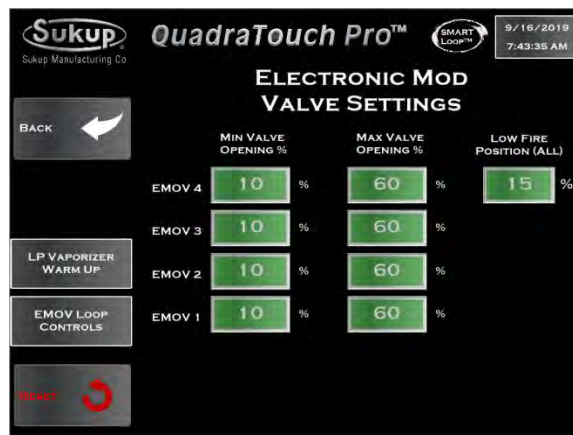


Image 5-33 – Setting EMOV Min & Max openings

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 volt 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 or 461). Low-fire position of EMOV is factory defaulted at 4VDC. This opens valve 25%. Terminals 161, 261, etc., should all have 4VDC (if 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 EMOV does not open, it's likely there is 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 a reference voltage (2VDC to-10VDC) is present at valve, but valve did not open or close, re-confirm there is 24VDC 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 actuator to butterfly valve shaft is loose, it needs to be tightened.



Automatic Grain Dryer

QuadraTouch Pro Dryer Control System

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Appendix A

Specifications

Dryer Specifications
Unload Rates
Dryer Stabilization

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08/19/2022	– Updated expandable dryer unload rates tables	A-5, A-7, A-10, A-12, A-15, A-16

Appendix A

Specifications

Specifications for Mixed-Flow dryers are provided in table below. 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 dryer will perform under your operating conditions. Because we are continually advancing Sukup products, changes may occur that may not be reflected in the specifications.

	Dryer Model	# of Tiers	*Height (Auger Fill)	*Height (Gravity Fill)	Heating Volume (bu)	Total Holding (bu)	**Max Burner Output (MMBtu/hr)	**Avg. Burner Output (MMBtu/hr)	Lower Fan(s) HP	Upper Fan(s) HP	^Est. Cap. 20-15%	^Est. Cap. 25-15%
16'	TM1606+	6	26' 11"	29' 2"	584	976	5.27	3.95	30	None	709	367
	TM1608+	8	30' 11"	33' 2"	778	1170	7.03	5.27	40	None	945	489
	TM1609+	9	32' 11"	35' 2"	875	1267	7.91	5.93	50	None	1063	551
	TM1610+	10	34' 11"	37' 2"	973	1365	8.78	6.59	30	15	1182	612
	TM1612+	12	40' 11"	43' 2"	1167	1619	10.54	7.91	40	15	1418	734
	TM1613+	13	42' 11"	45' 2"	1264	1716	11.42	8.56	50	15	1536	795
	TM1614	14	44' 11"	47' 2"	1362	1813	12.30	9.22	30	(2) 15	1654	856
	TM1616	16	50' 11"	53' 2"	1556	2067	14.05	10.54	40	(2) 15	1891	979
	TM1617	17	52' 11"	55' 2"	1653	2164	14.93	11.20	50	(2) 15	2009	1040
24'	TM2405+	5	24' 11"	30' 2"	729	1325	6.59	4.94	40	None	886	459
	TM2406+	6	26' 11"	32' 2"	875	1471	7.91	5.93	50	None	1063	551
	TM2409+	9	32' 11"	38' 2"	1313	1908	11.86	8.89	40	20	1595	826
	TM2410+	10	34' 11"	40' 2"	1459	2054	13.18	9.88	50	20	1772	918
	TM2413	13	42' 11"	48' 2"	1896	2581	17.13	12.85	40	(2) 20	2304	1193
	TM2414+	14	44' 11"	50' 2"	2042	2727	18.45	13.84	50	(2) 20	2481	1285
	TM2418	18	54' 11"	60' 2"	2626	3399	23.72	17.79	50	(3) 20	3190	1652
32'	TM3209+	9	32' 11"	41' 2"	1751	2549	15.81	11.86	(2) 50	None	2127	1101
	TM3210+	10	34' 11"	43' 2"	1945	2743	17.57	13.18	(2) 30	30	2363	1223
	TM3212+	12	40' 11"	49' 2"	2334	3251	21.08	15.81	(2) 40	30	2836	1468
	TM3213+	13	42' 11"	51' 2"	2529	3446	22.84	17.13	(2) 50	30	3072	1590
	TM3214	14	44' 11"	53' 2"	2723	3640	24.60	18.45	(2) 30	(2) 30	3309	1713
	TM3216	16	50' 11"	59' 2"	3112	4148	28.11	21.08	(2) 40	(2) 30	3781	1958
	TM3217	17	52' 11"	61' 2"	3307	4343	29.87	22.40	(2) 50	(2) 30	4018	2080

*Height is frame to fill; legs not included. Legs 2', 3', 4' or 5' are available.

**Max burner output is based on airflow at 42 cfm/bu and a 200°F temperature rise. Average burner output is 150°F temperature rise.

^Capacities are wet holding bushels based on computer estimates, drying principles and field results drying US # 2 yellow corn. Variations may occur due to grain kernel size, cleanliness, variety, maturity levels, weather conditions, growing season, etc.

+Modules available for expansion at time of order.

Unload Rates for 16' Standard Dryers

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM1606										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	200	400	600	800	1000	1200	1400	1600	1800	2000

UNLOAD RATE CHART TM1608, TM1609, TM1610										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	200	400	600	800	1000	1200	1400	1600	1800	2000

UNLOAD RATE CHART TM1612, TM1613, TM1614										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	250	500	750	1000	1250	1500	1750	2000	2250	2500

UNLOAD RATE CHART TM1616, TM1617										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	300	600	900	1200	1500	1800	2100	2400	2700	3000

Tables below and on next page show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

16' Standard Dryers

TM1606 MIXED-FLOW* (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	107	6%	119	7%	131	7%	143	8%	155	8%	167	9%	179
	12.5	8%	165	9%	184	10%	202	11%	220	12%	239	13%	257	14%	275
	10	12%	236	13%	262	14%	288	16%	315	17%	341	18%	367	20%	393
	7.5	16%	327	18%	364	20%	400	22%	436	24%	473	25%	509	27%	545
	5	23%	456	25%	506	28%	557	30%	608	33%	658	35%	709	38%	760
	3	31%	618	34%	686	38%	755	41%	824	45%	892	48%	961	51%	1030

*TM1606 Expandable by default. Numbers reflect this

TM1608 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	7%	143	8%	159	9%	175	10%	191	10%	207	11%	223	12%	239
	12.5	11%	220	12%	245	13%	269	15%	294	16%	318	17%	343	18%	367
	10	16%	315	17%	350	19%	385	21%	419	23%	454	24%	489	26%	524
	7.5	22%	436	24%	485	27%	533	29%	582	32%	630	34%	679	36%	727
	5	30%	608	34%	675	37%	743	41%	810	44%	878	47%	945	51%	1013
	3	41%	824	46%	915	50%	1007	55%	1098	59%	1190	64%	1281	69%	1373

TM1609 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	8%	161	9%	179	10%	197	11%	215	12%	233	13%	251	13%	268
	12.5	12%	248	14%	275	15%	303	17%	330	18%	358	19%	385	21%	413
	10	18%	354	20%	393	22%	433	24%	472	26%	511	28%	551	29%	590
	7.5	25%	491	27%	545	30%	600	33%	654	35%	709	38%	763	41%	818
	5	34%	684	38%	760	42%	836	46%	912	49%	988	53%	1063	57%	1139
	3	46%	927	51%	1030	57%	1133	62%	1236	67%	1338	72%	1441	77%	1544

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TM1610 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	179	10%	199	11%	219	12%	239	13%	258	14%	278	15%	298
	12.5	14%	275	15%	306	17%	336	18%	367	20%	398	21%	428	23%	459
	10	20%	393	22%	437	24%	481	26%	524	28%	568	31%	612	33%	655
	7.5	27%	545	30%	606	33%	666	36%	727	39%	788	42%	848	45%	909
	5	38%	760	42%	844	46%	928	51%	1013	55%	1097	59%	1182	63%	1266
	3	51%	1030	57%	1144	63%	1258	69%	1373	74%	1487	80%	1602	86%	1716

TM1612 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	215	10%	239	10%	262	11%	286	12%	310	13%	334	14%	358
	12.5	13%	330	15%	367	16%	404	18%	440	19%	477	21%	514	22%	551
	10	19%	472	21%	524	23%	577	25%	629	27%	682	29%	734	31%	786
	7.5	26%	654	29%	727	32%	800	35%	872	38%	945	41%	1018	44%	1091
	5	36%	912	41%	1013	45%	1114	49%	1215	53%	1317	57%	1418	61%	1519
	3	49%	1236	55%	1373	60%	1510	66%	1647	71%	1785	77%	1922	82%	2059

TM1613 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	233	10%	258	11%	284	12%	310	13%	336	14%	362	16%	388
	12.5	14%	358	16%	398	17%	437	19%	477	21%	517	22%	557	24%	596
	10	20%	511	23%	568	25%	625	27%	682	30%	738	32%	795	34%	852
	7.5	28%	709	32%	788	35%	866	38%	945	41%	1024	44%	1103	47%	1181
	5	40%	988	44%	1097	48%	1207	53%	1317	57%	1426	61%	1536	66%	1646
	3	54%	1338	59%	1487	65%	1636	71%	1785	77%	1933	83%	2082	89%	2231

TM1614 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	251	11%	278	12%	306	13%	334	14%	362	16%	390	17%	418
	12.5	15%	385	17%	428	19%	471	21%	514	22%	557	24%	600	26%	642
	10	22%	551	24%	612	27%	673	29%	734	32%	795	34%	856	37%	918
	7.5	31%	763	34%	848	37%	933	41%	1018	44%	1103	48%	1188	51%	1272
	5	43%	1063	47%	1182	52%	1300	57%	1418	61%	1536	66%	1654	71%	1772
	3	58%	1441	64%	1602	70%	1762	77%	1922	83%	2082	90%	2242	96%	2402

TM1616 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	286	11%	318	12%	350	13%	382	14%	414	15%	445	16%	477
	12.5	15%	440	16%	489	18%	538	20%	587	21%	636	23%	685	24%	734
	10	21%	629	23%	699	26%	769	28%	839	30%	909	33%	979	35%	1049
	7.5	29%	872	32%	969	36%	1066	39%	1163	42%	1260	45%	1357	48%	1454
	5	41%	1215	45%	1350	50%	1485	54%	1621	59%	1756	63%	1891	68%	2026
	3	55%	1647	61%	1830	67%	2013	73%	2197	79%	2380	85%	2563	92%	2746

TM1617 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	304	11%	338	12%	372	14%	406	15%	439	16%	473	17%	507
	12.5	16%	468	17%	520	19%	572	21%	624	23%	676	24%	728	26%	780
	10	22%	669	25%	743	27%	817	30%	891	32%	966	35%	1040	37%	1114
	7.5	31%	927	34%	1030	38%	1133	41%	1236	45%	1339	48%	1442	52%	1545
	5	43%	1291	48%	1435	53%	1578	57%	1722	62%	1865	67%	2009	72%	2152
	3	58%	1750	65%	1945	71%	2139	78%	2334	84%	2528	91%	2723	97%	2917

Unload Rates for 16' Expandable Dryers

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM1606										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	200	400	600	800	1000	1200	1400	1600	1800	2000

UNLOAD RATE CHART TM1608, TM1609, TM1610										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	250	500	750	1000	1250	1500	1750	2000	2250	2500

UNLOAD RATE CHART TM1612, TM1613										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	300	600	900	1200	1500	1800	2100	2400	2700	3000

Tables below and on next page show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

16' Expandable Dryers

TM1606 MIXED-FLOW* (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	107	6%	119	7%	131	7%	143	8%	155	8%	167	9%	179
	12.5	8%	165	9%	184	10%	202	11%	220	12%	239	13%	257	14%	275
	10	12%	236	13%	262	14%	288	16%	315	17%	341	18%	367	20%	393
	7.5	16%	327	18%	364	20%	400	22%	436	24%	473	25%	509	27%	545
	5	23%	456	25%	506	28%	557	30%	608	33%	658	35%	709	38%	760
	3	31%	618	34%	686	38%	755	41%	824	45%	892	48%	961	51%	1030

TM1608 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	6%	143	6%	159	7%	175	8%	191	8%	207	9%	223	10%	239
	12.5	9%	220	10%	245	11%	269	12%	294	13%	318	14%	343	15%	367
	10	13%	315	14%	350	15%	385	17%	419	18%	454	20%	489	21%	524
	7.5	17%	436	19%	485	21%	533	23%	582	25%	630	27%	679	29%	727
	5	24%	608	27%	675	30%	743	32%	810	35%	878	38%	945	41%	1013
	3	33%	824	37%	915	40%	1007	44%	1098	48%	1190	51%	1281	55%	1373

TM1609 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	6%	161	7%	179	8%	197	9%	215	9%	233	10%	251	11%	268
	12.5	10%	248	11%	275	12%	303	13%	330	14%	358	15%	385	17%	413
	10	14%	354	16%	393	17%	433	19%	472	20%	511	22%	551	24%	590
	7.5	20%	491	22%	545	24%	600	26%	654	28%	709	31%	763	33%	818
	5	27%	684	30%	760	33%	836	36%	912	40%	988	43%	1063	46%	1139
	3	37%	927	41%	1030	45%	1133	49%	1236	54%	1338	58%	1441	62%	1544

TM1610 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	7%	179	8%	199	9%	219	10%	239	10%	258	11%	278	12%	298
	12.5	11%	275	12%	306	13%	336	15%	367	16%	398	17%	428	18%	459
	10	16%	393	17%	437	19%	481	21%	524	23%	568	24%	612	26%	655
	7.5	22%	545	24%	606	27%	666	29%	727	32%	788	34%	848	36%	909
	5	30%	760	34%	844	37%	928	41%	1013	44%	1097	47%	1182	51%	1266
	3	41%	1030	46%	1144	50%	1258	55%	1373	59%	1487	64%	1602	69%	1716

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TM1612 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	7%	215	8%	239	9%	262	10%	286	10%	310	11%	334	12%	358
	12.5	11%	330	12%	367	13%	404	15%	440	16%	477	17%	514	18%	551
	10	16%	472	17%	524	19%	577	21%	629	23%	682	24%	734	26%	786
	7.5	22%	654	24%	727	27%	800	29%	872	32%	945	34%	1018	36%	1091
	5	30%	912	34%	1013	37%	1114	41%	1215	44%	1317	47%	1418	51%	1519
	3	41%	1236	46%	1373	50%	1510	55%	1647	59%	1785	64%	1922	69%	2059

TM1613 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	8%	233	9%	258	9%	284	10%	310	11%	336	12%	362	13%	388
	12.5	12%	358	13%	398	15%	437	16%	477	17%	517	19%	557	20%	596
	10	17%	511	19%	568	21%	625	23%	682	25%	738	27%	795	28%	852
	7.5	24%	709	26%	788	29%	866	32%	945	34%	1024	37%	1103	39%	1181
	5	33%	988	37%	1097	40%	1207	44%	1317	48%	1426	51%	1536	55%	1646
	3	45%	1338	50%	1487	55%	1636	59%	1785	64%	1933	69%	2082	74%	2231

Unload Rates for 16' Double-Expandable Dryers

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM1606										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	250	500	750	1000	1250	1500	1750	2000	2250	2500

UNLOAD RATE CHART TM1608, 1609										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	300	600	900	1200	1500	1800	2100	2400	2700	3000

Tables below show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

16' Double-Expandable Dryers

TM1606 MIXED-FLOW* (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	4%	107	5%	119	5%	131	6%	143	6%	155	7%	167	7%	179
	12.5	7%	165	7%	184	8%	202	9%	220	10%	239	10%	257	11%	275
	10	9%	236	10%	262	12%	288	13%	315	14%	341	15%	367	16%	393
	7.5	13%	327	15%	364	16%	400	17%	436	19%	473	20%	509	22%	545
	5	18%	456	20%	506	22%	557	24%	608	26%	658	28%	709	30%	760
	3	25%	618	27%	686	30%	755	33%	824	36%	892	38%	961	41%	1030

TM1608 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	143	5%	159	6%	175	6%	191	7%	207	7%	223	8%	239
	12.5	7%	220	8%	245	9%	269	10%	294	11%	318	11%	343	12%	367
	10	10%	315	12%	350	13%	385	14%	419	15%	454	16%	489	17%	524
	7.5	15%	436	16%	485	18%	533	19%	582	21%	630	23%	679	24%	727
	5	20%	608	23%	675	25%	743	27%	810	29%	878	32%	945	34%	1013
	3	27%	824	31%	915	34%	1007	37%	1098	40%	1190	43%	1281	46%	1373

TM1609 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	161	6%	179	7%	197	7%	215	8%	233	8%	251	9%	268
	12.5	8%	248	9%	275	10%	303	11%	330	12%	358	13%	385	14%	413
	10	12%	354	13%	393	14%	433	16%	472	17%	511	18%	551	20%	590
	7.5	16%	491	18%	545	20%	600	22%	654	24%	709	25%	763	27%	818
	5	23%	684	25%	760	28%	836	30%	912	33%	988	35%	1063	38%	1139
	3	31%	927	34%	1030	38%	1133	41%	1236	45%	1338	48%	1441	51%	1544

Unload Rates for 24' Standard Dryers

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM2405, TM2406										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	300	600	900	1200	1500	1800	2100	2400	2700	3000

UNLOAD RATE CHART TM2409, TM2410										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	300	600	900	1200	1500	1800	2100	2400	2700	3000

UNLOAD RATE CHART TM2413, TM 2414										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	375	750	1125	1500	1875	2250	2625	3000	3375	3750

UNLOAD RATE CHART TM2418										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	450	900	1350	1800	2250	2700	3150	3600	4050	4500

Tables below and on next page show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

24' Standard Dryers

TM2405 MIXED-FLOW* (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	4%	134	5%	149	5%	164	6%	179	6%	194	7%	209	7%	224
	12.5	7%	206	8%	229	8%	252	9%	275	10%	298	11%	321	11%	344
	10	10%	295	11%	328	12%	360	13%	393	14%	426	15%	459	16%	492
	7.5	14%	409	15%	454	17%	500	18%	545	20%	591	21%	636	23%	682
	5	19%	570	21%	633	23%	696	25%	760	27%	823	30%	886	32%	950
	3	26%	772	29%	858	31%	944	34%	1030	37%	1115	40%	1201	43%	1287

*TM2405 Expandable by default. Numbers reflect this

TM2406 MIXED-FLOW* (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	161	6%	179	7%	197	7%	215	8%	233	8%	251	9%	268
	12.5	8%	248	9%	275	10%	303	11%	330	12%	358	13%	385	14%	413
	10	12%	354	13%	393	14%	433	16%	472	17%	511	18%	551	20%	590
	7.5	16%	491	18%	545	20%	600	22%	654	24%	709	25%	763	27%	818
	5	23%	684	25%	760	28%	836	30%	912	33%	988	35%	1063	38%	1139
	3	31%	927	34%	1030	38%	1133	41%	1236	45%	1338	48%	1441	51%	1544

*TM2406 Expandable by default. Numbers reflect this

TM2409 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	8%	242	9%	268	10%	295	11%	322	12%	349	13%	376	13%	403
	12.5	12%	372	14%	413	15%	454	17%	496	18%	537	19%	578	21%	619
	10	18%	531	20%	590	22%	649	24%	708	26%	767	28%	826	29%	885
	7.5	25%	736	27%	818	30%	900	33%	982	35%	1063	38%	1145	41%	1227
	5	34%	1025	38%	1139	42%	1253	46%	1367	49%	1481	53%	1595	57%	1709
	3	46%	1390	51%	1544	57%	1699	62%	1853	67%	2008	72%	2162	77%	2317

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TM2410 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	268	10%	298	11%	328	12%	358	13%	388	14%	418	15%	447
	12.5	14%	413	15%	459	17%	505	18%	551	20%	596	21%	642	23%	688
	10	20%	590	22%	655	24%	721	26%	786	28%	852	31%	918	33%	983
	7.5	27%	818	30%	909	33%	1000	36%	1091	39%	1181	42%	1272	45%	1363
	5	38%	1139	42%	1266	46%	1393	51%	1519	55%	1646	59%	1772	63%	1899
	3	51%	1544	57%	1716	63%	1888	69%	2059	74%	2231	80%	2402	86%	2574

TM2413 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	349	10%	388	11%	426	12%	465	13%	504	14%	543	16%	582
	12.5	14%	537	16%	596	17%	656	19%	716	21%	775	22%	835	24%	895
	10	20%	767	23%	852	25%	937	27%	1022	30%	1108	32%	1193	34%	1278
	7.5	28%	1063	32%	1181	35%	1300	38%	1418	41%	1536	44%	1654	47%	1772
	5	40%	1481	44%	1646	48%	1810	53%	1975	57%	2140	61%	2304	66%	2469
	3	54%	2008	59%	2231	65%	2454	71%	2677	77%	2900	83%	3123	89%	3346

TM2414 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	376	11%	418	12%	459	13%	501	14%	543	16%	585	17%	626
	12.5	15%	578	17%	642	19%	707	21%	771	22%	835	24%	899	26%	964
	10	22%	826	24%	918	27%	1009	29%	1101	32%	1193	34%	1285	37%	1376
	7.5	31%	1145	34%	1272	37%	1400	41%	1527	44%	1654	48%	1781	51%	1909
	5	43%	1595	47%	1772	52%	1950	57%	2127	61%	2304	66%	2481	71%	2659
	3	58%	2162	64%	2402	70%	2643	77%	2883	83%	3123	90%	3363	96%	3604

TM2418 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	11%	483	12%	537	13%	590	14%	644	16%	698	17%	752	18%	805
	12.5	17%	743	18%	826	20%	909	22%	991	24%	1074	26%	1156	28%	1239
	10	24%	1062	26%	1180	29%	1298	31%	1416	34%	1534	37%	1652	39%	1770
	7.5	33%	1472	36%	1636	40%	1800	44%	1963	47%	2127	51%	2290	55%	2454
	5	46%	2051	51%	2279	56%	2507	61%	2735	66%	2963	71%	3190	76%	3418
	3	62%	2780	69%	3089	76%	3398	82%	3707	89%	4015	96%	4324	100%	4500

Unload Rates for 24' Expandable Dryers

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM2405, TM2406										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	300	600	900	1200	1500	1800	2100	2400	2700	3000

UNLOAD RATE CHART TM2409, TM2410										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	375	750	1125	1500	1875	2250	2625	3000	3375	3750

UNLOAD RATE CHART TM2414										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	450	900	1350	1800	2250	2700	3150	3600	4050	4500

Tables below and on next page show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

24' Expandable Dryers

TM2405 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	4%	134	5%	149	5%	164	6%	179	6%	194	7%	209	7%	224
	12.5	7%	206	8%	229	8%	252	9%	275	10%	298	11%	321	11%	344
	10	10%	295	11%	328	12%	360	13%	393	14%	426	15%	459	16%	492
	7.5	14%	409	15%	454	17%	500	18%	545	20%	591	21%	636	23%	682
	5	19%	570	21%	633	23%	696	25%	760	27%	823	30%	886	32%	950
	3	26%	772	29%	858	31%	944	34%	1030	37%	1115	40%	1201	43%	1287

TM2406 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	161	6%	179	7%	197	7%	215	8%	233	8%	251	9%	268
	12.5	8%	248	9%	275	10%	303	11%	330	12%	358	13%	385	14%	413
	10	12%	354	13%	393	14%	433	16%	472	17%	511	18%	551	20%	590
	7.5	16%	491	18%	545	20%	600	22%	654	24%	709	25%	763	27%	818
	5	23%	684	25%	760	28%	836	30%	912	33%	988	35%	1063	38%	1139
	3	31%	927	34%	1030	38%	1133	41%	1236	45%	1338	48%	1441	51%	1544

TM2409 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	6%	242	7%	268	8%	295	9%	322	9%	349	10%	376	11%	403
	12.5	10%	372	11%	413	12%	454	13%	496	14%	537	15%	578	17%	619
	10	14%	531	16%	590	17%	649	19%	708	20%	767	22%	826	24%	885
	7.5	20%	736	22%	818	24%	900	26%	982	28%	1063	31%	1145	33%	1227
	5	27%	1025	30%	1139	33%	1253	36%	1367	40%	1481	43%	1595	46%	1709
	3	37%	1390	41%	1544	45%	1699	49%	1853	54%	2008	58%	2162	62%	2317

TM2410 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	7%	268	8%	298	9%	328	10%	358	10%	388	11%	418	12%	447
	12.5	11%	413	12%	459	13%	505	15%	551	16%	596	17%	642	18%	688
	10	16%	590	17%	655	19%	721	21%	786	23%	852	24%	918	26%	983
	7.5	22%	818	24%	909	27%	1000	29%	1091	32%	1181	34%	1272	36%	1363
	5	30%	1139	34%	1266	37%	1393	41%	1519	44%	1646	47%	1772	51%	1899
	3	41%	1544	46%	1716	50%	1888	55%	2059	59%	2231	64%	2402	69%	2574

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TM2414 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	8%	376	9%	418	10%	459	11%	501	12%	543	13%	585	14%	626
	12.5	13%	578	14%	642	16%	707	17%	771	19%	835	20%	899	21%	964
	10	18%	826	20%	918	22%	1009	24%	1101	27%	1193	29%	1285	31%	1376
	7.5	25%	1145	28%	1272	31%	1400	34%	1527	37%	1654	40%	1781	42%	1909
	5	35%	1595	39%	1772	43%	1950	47%	2127	51%	2304	55%	2481	59%	2659
	3	48%	2162	53%	2402	59%	2643	64%	2883	69%	3123	75%	3363	80%	3604

Unload Rates for 24' Double-Expandable Dryers

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM2405, TM2406										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	375	750	1125	1500	1875	2250	2625	3000	3375	3750

UNLOAD RATE CHART TM2410										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	450	900	1350	1800	2250	2700	3150	3600	4050	4500

Tables below show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

24' Double-Expandable Dryers

TM2405 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	4%	134	5%	149	5%	164	6%	179	6%	194	7%	209	7%	224
	12.5	7%	206	8%	229	8%	252	9%	275	10%	298	11%	321	11%	344
	10	10%	295	11%	328	12%	360	13%	393	14%	426	15%	459	16%	492
	7.5	14%	409	15%	454	17%	500	18%	545	20%	591	21%	636	23%	682
	5	19%	570	21%	633	23%	696	25%	760	27%	823	30%	886	32%	950
	3	26%	772	29%	858	31%	944	34%	1030	37%	1115	40%	1201	43%	1287

TM2406 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	161	6%	179	7%	197	7%	215	8%	233	8%	251	9%	268
	12.5	8%	248	9%	275	10%	303	11%	330	12%	358	13%	385	14%	413
	10	12%	354	13%	393	14%	433	16%	472	17%	511	18%	551	20%	590
	7.5	16%	491	18%	545	20%	600	22%	654	24%	709	25%	763	27%	818
	5	23%	684	25%	760	28%	836	30%	912	33%	988	35%	1063	38%	1139
	3	31%	927	34%	1030	38%	1133	41%	1236	45%	1338	48%	1441	51%	1544

TM2410 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	268	10%	298	11%	328	12%	358	13%	388	14%	418	15%	447
	12.5	14%	413	15%	459	17%	505	18%	551	20%	596	21%	642	23%	688
	10	20%	590	22%	655	24%	721	26%	786	28%	852	31%	918	33%	983
	7.5	27%	818	30%	909	33%	1000	36%	1091	39%	1181	42%	1272	45%	1363
	5	38%	1139	42%	1266	46%	1393	51%	1519	55%	1646	59%	1772	63%	1899
	3	51%	1544	57%	1716	63%	1888	69%	2059	74%	2231	80%	2402	86%	2574

Unload Rates for 32' Standard Dryer

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM3209, TM3210										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	400	800	1200	1600	2000	2400	2800	3200	3600	4000

UNLOAD RATE CHART TM3212, TM3213, TM3214										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000

UNLOAD RATE CHART TM3216, TM3217										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	600	1200	1800	2400	3000	3600	4200	4800	5400	6000

Tables below and on next page show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

32' Standard Dryers

TM3209 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	8%	322	9%	358	10%	394	11%	429	12%	465	13%	501	13%	537
	12.5	12%	496	14%	551	15%	606	17%	661	18%	716	19%	771	21%	826
	10	18%	708	20%	786	22%	865	24%	944	26%	1022	28%	1101	29%	1180
	7.5	25%	982	27%	1091	30%	1200	33%	1309	35%	1418	38%	1527	41%	1636
	5	34%	1367	38%	1519	42%	1671	46%	1823	49%	1975	53%	2127	57%	2279
	3	46%	1853	51%	2059	57%	2265	62%	2471	67%	2677	72%	2883	77%	3089

TM3210 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	358	10%	398	11%	437	12%	477	13%	517	14%	557	15%	596
	12.5	14%	551	15%	612	17%	673	18%	734	20%	795	21%	857	23%	918
	10	20%	786	22%	874	24%	961	26%	1049	28%	1136	31%	1223	33%	1311
	7.5	27%	1091	30%	1212	33%	1333	36%	1454	39%	1575	42%	1697	45%	1818
	5	38%	1519	42%	1688	46%	1857	51%	2026	55%	2194	59%	2363	63%	2532
	3	51%	2059	57%	2288	63%	2517	69%	2746	74%	2974	80%	3203	86%	3432

TM3212 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	429	10%	477	10%	525	11%	573	12%	620	13%	668	14%	716
	12.5	13%	661	15%	734	16%	808	18%	881	19%	954	21%	1028	22%	1101
	10	19%	944	21%	1049	23%	1154	25%	1258	27%	1363	29%	1468	31%	1573
	7.5	26%	1309	29%	1454	32%	1600	35%	1745	38%	1890	41%	2036	44%	2181
	5	36%	1823	41%	2026	45%	2228	49%	2431	53%	2633	57%	2836	61%	3038
	3	49%	2471	55%	2746	60%	3020	66%	3295	71%	3569	77%	3844	82%	4118

TM3213 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	9%	465	10%	517	11%	569	12%	620	13%	672	14%	724	16%	775
	12.5	14%	716	16%	795	17%	875	19%	954	21%	1034	22%	1113	24%	1193
	10	20%	1022	23%	1136	25%	1250	27%	1363	30%	1477	32%	1590	34%	1704
	7.5	28%	1418	32%	1575	35%	1733	38%	1890	41%	2048	44%	2205	47%	2363
	5	40%	1975	44%	2194	48%	2414	53%	2633	57%	2853	61%	3072	66%	3292
	3	54%	2677	59%	2974	65%	3272	71%	3569	77%	3867	83%	4164	89%	4462

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TM3214 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	501	11%	557	12%	612	13%	668	14%	724	16%	779	17%	835
	12.5	15%	771	17%	857	19%	942	21%	1028	22%	1113	24%	1199	26%	1285
	10	22%	1101	24%	1223	27%	1346	29%	1468	32%	1590	34%	1713	37%	1835
	7.5	31%	1527	34%	1697	37%	1866	41%	2036	44%	2205	48%	2375	51%	2545
	5	43%	2127	47%	2363	52%	2600	57%	2836	61%	3072	66%	3309	71%	3545
	3	58%	2883	64%	3203	70%	3524	77%	3844	83%	4164	90%	4485	96%	4805

TM3216 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	573	11%	636	12%	700	13%	763	14%	827	15%	891	16%	954
	12.5	15%	881	16%	979	18%	1077	20%	1175	21%	1273	23%	1370	24%	1468
	10	21%	1258	23%	1398	26%	1538	28%	1678	30%	1818	33%	1958	35%	2097
	7.5	29%	1745	32%	1939	36%	2133	39%	2327	42%	2521	45%	2714	48%	2908
	5	41%	2431	45%	2701	50%	2971	54%	3241	59%	3511	63%	3781	68%	4051
	3	55%	3295	61%	3661	67%	4027	73%	4393	79%	4759	85%	5125	92%	5491

TM3217 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	10%	608	11%	676	12%	744	14%	811	15%	879	16%	946	17%	1014
	12.5	16%	936	17%	1040	19%	1144	21%	1248	23%	1352	24%	1456	26%	1560
	10	22%	1337	25%	1486	27%	1634	30%	1783	32%	1931	35%	2080	37%	2228
	7.5	31%	1854	34%	2060	38%	2266	41%	2472	45%	2678	48%	2884	52%	3090
	5	43%	2583	48%	2870	53%	3157	57%	3444	62%	3731	67%	4018	72%	4304
	3	58%	3501	65%	3890	71%	4279	78%	4668	84%	5057	91%	5446	97%	5834

Unload Rates for 32' Expandable Dryer

Tables below show approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM3209, TM3210										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000

UNLOAD RATE CHART TM3212, TM3213										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	600	1200	1800	2400	3000	3600	4200	4800	5400	6000

Tables below show approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

32' Expandable Dryers

TM3209 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	6%	322	7%	358	8%	394	9%	429	9%	465	10%	501	11%	537
	12.5	10%	496	11%	551	12%	606	13%	661	14%	716	15%	771	17%	826
	10	14%	708	16%	786	17%	865	19%	944	20%	1022	22%	1101	24%	1180
	7.5	20%	982	22%	1091	24%	1200	26%	1309	28%	1418	31%	1527	33%	1636
	5	27%	1367	30%	1519	33%	1671	36%	1823	40%	1975	43%	2127	46%	2279
	3	37%	1853	41%	2059	45%	2265	49%	2471	54%	2677	58%	2883	62%	3089

TM3210 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	7%	358	8%	398	9%	437	10%	477	10%	517	11%	557	12%	596
	12.5	11%	551	12%	612	13%	673	15%	734	16%	795	17%	857	18%	918
	10	16%	786	17%	874	19%	961	21%	1049	23%	1136	24%	1223	26%	1311
	7.5	22%	1091	24%	1212	27%	1333	29%	1454	32%	1575	34%	1697	36%	1818
	5	30%	1519	34%	1688	37%	1857	41%	2026	44%	2194	47%	2363	51%	2532
	3	41%	2059	46%	2288	50%	2517	55%	2746	59%	2974	64%	3203	69%	3432

TM3212 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	7%	429	8%	477	9%	525	10%	573	10%	620	11%	668	12%	716
	12.5	11%	661	12%	734	13%	808	15%	881	16%	954	17%	1028	18%	1101
	10	16%	944	17%	1049	19%	1154	21%	1258	23%	1363	24%	1468	26%	1573
	7.5	22%	1309	24%	1454	27%	1600	29%	1745	32%	1890	34%	2036	36%	2181
	5	30%	1823	34%	2026	37%	2228	41%	2431	44%	2633	47%	2836	51%	3038
	3	41%	2471	46%	2746	50%	3020	55%	3295	59%	3569	64%	3844	69%	4118

TM3213 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	8%	465	9%	517	9%	569	10%	620	11%	672	12%	724	13%	775
	12.5	12%	716	13%	795	15%	875	16%	954	17%	1034	19%	1113	20%	1193
	10	17%	1022	19%	1136	21%	1250	23%	1363	25%	1477	27%	1590	28%	1704
	7.5	24%	1418	26%	1575	29%	1733	32%	1890	34%	2048	37%	2205	39%	2363
	5	33%	1975	37%	2194	40%	2414	44%	2633	48%	2853	51%	3072	55%	3292
	3	45%	2677	50%	2974	55%	3272	59%	3569	64%	3867	69%	4164	74%	4462

Unload Rates for 32' Double-Expandable Dryer

Table below shows approximate unload rates in bushels per hour depending on dryer model and meter roll speed.

UNLOAD RATE CHART TM3209										
ROLL SPEED (%)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNLOAD RATE (BU/HR)	600	1200	1800	2400	3000	3600	4200	4800	5400	6000

Table below shows approximate unload rates (bu/hr) based on dryer model and desired moisture removal. **Tables are for corn only.**

32' Double-Expandable Dryers

TM3209 MIXED-FLOW (UNLOAD %), (BU/HR)		TEMPERATURE (°F)													
		160		170		180		190		200		210		220	
MOISTURE REMOVAL (% WET BASIS)	15	5%	322	6%	358	7%	394	7%	429	8%	465	8%	501	9%	537
	12.5	8%	496	9%	551	10%	606	11%	661	12%	716	13%	771	14%	826
	10	12%	708	13%	786	14%	865	16%	944	17%	1022	18%	1101	20%	1180
	7.5	16%	982	18%	1091	20%	1200	22%	1309	24%	1418	25%	1527	27%	1636
	5	23%	1367	25%	1519	28%	1671	30%	1823	33%	1975	35%	2127	38%	2279
	3	31%	1853	34%	2059	38%	2265	41%	2471	45%	2677	48%	2883	51%	3089

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.

Model #	Holding Capacity (bu)	Max Unload (bu/hr)	Unload Time (Minutes)									
			10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
TM1606	916	1500	367	183	122	92	73	61	52	46	41	37
TM1608	1170	2000	351	176	117	88	70	59	50	44	39	35
TM1609	1267	2000	380	190	127	95	76	63	54	48	42	38
TM1610	1365	2000	409	205	136	102	82	68	58	51	45	41
TM1612	1619	2500	388	194	129	97	78	65	55	49	43	39
TM1613	1716	2500	412	206	137	103	82	69	59	51	46	41
TM1614	1813	2500	435	218	145	109	87	73	62	54	48	44
TM1616	2067	3000	413	207	138	103	83	69	59	52	46	41
TM1617	2164	3000	433	216	144	108	87	72	62	54	48	43
TM2405	1235	2250	329	165	110	82	66	55	47	41	37	33
TM2406	1381	2250	368	184	123	92	74	61	53	46	41	37
TM2409	1908	3000	382	191	127	95	76	64	55	48	42	38
TM2410	2054	3000	411	205	137	103	82	68	59	51	46	41
TM2413	2581	3750	413	206	138	103	83	69	59	52	46	41
TM2414	2727	3750	436	218	145	109	87	73	62	55	48	44
TM2418	3399	4500	453	227	151	113	91	76	65	57	50	45
TM3206	1846	3000	369	185	123	92	74	62	53	46	41	37
TM3208	2354	4000	353	177	118	88	71	59	50	44	39	35
TM3209	2549	4000	382	191	127	96	76	64	55	48	42	38
TM3210	2743	4000	412	206	137	103	82	69	59	51	46	41
TM3212	3251	5000	390	195	130	98	78	65	56	49	43	39
TM3213	3446	5000	413	207	138	103	83	69	59	52	46	41
TM3214	3640	5000	437	218	146	109	87	73	62	55	49	44
TM3216	4148	6000	415	207	138	104	83	69	59	52	46	41
TM3217	4343	6000	434	217	145	109	87	72	62	54	48	43

Unload Time Based on Meter Roll Speed Percentage

Appendix B

Electrical Requirements

Listed by Dryer Model
Motor Nameplate Information

<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
08/19/2022	– Updated/added electrical requirements tables	B-3 – B-12



Electrical Requirements

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. **Grain dryer should be only device connected to this disconnect.**

Motor Rated Service Factor (S.F.) is included in all current specifications **for fan motors**. “Panel Amps” shows total current required to **continuously** operate a dryer’s fan motor(s) load and unload motors and control circuitry.

Using Soft Starts: During fan startup, the Soft Start will limit fan motor(s) amp draw to 350% of nameplate full load amps (FLA). If this 350% inrush current cannot be provided by main transformer, motor may not get up to speed before a fault condition occurs, especially in cold weather. Changing Soft Start settings and timing may be required to start fan. Consult Sukup dealer before making any settings adjustments. If motors still will not start after adjustments, a larger transformer or a different starting method, variable frequency drive (VFD) may be needed.

Standard electrical safety practices and codes should be used. Refer to National Electrical Code (NEC) Handbook by National Fire Protection Association (NFPA).

All electrical work should be completed by a qualified electrician.

The following pages list each dryer’s electrical requirements, including motor information and overload settings. **NOTE:** Individual dryer panel number can be found on sticker located on inner left side of power box.

Pay close attention to listed “Panel Amps” and “Total Max Amps” values. Main disconnect switch wiring to power distribution block is sized to accommodate the “Total Max Amps” value.

IMPORTANT: Values in “Panel Amps” column do not include loads from auxiliary motors or expanded dryer. Amps allotted for auxiliaries are included in “Total Max Amps” values.

NOTE: Auxiliary load and unload kits are available. See Appendix C for correct kit number.

If your model number is not listed in following tables, contact Sukup Manufacturing Co.

Appendix B

Electrical Requirements

See table below and those on next pages for electrical requirements based on dryer model number.

NOTE: Total Max Amps value accommodates up to four 10hp (or equivalent) auxiliaries.

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM1606AU1A	LS	230	30	H7125	--	--	--	H3345	H3345	81.7	--	--	--	9	9	3.7	110	230	250
TM1606AU1F	LS	230	30	H7125	--	--	--	--	H3345	81.7	--	--	--		9		99	219	250
TM1606AU4E	LS	230	30	H7125	--	--	--	--	H3345	81.7	--	--	--		9	3.7	103	269	400
TM1606AU4F	LS	230	30	H7125	--	--	--	--	H3345	81.7	--	--	--		9		99	265	400
TM1606AU5A	SS	230	30	H7125	--	--	--	H3345	H3345	81.7	--	--	--	9	9	3.7	110	277	400
TM1606AU5B	SS	230	30	H7125	--	--	--	H3345	H3345	81.7	--	--	--	9	9		106	273	400
TM1606AU5F	SS	230	30	H7125	--	--	--	--	H3345	81.7	--	--	--		9		99	265	400
TM1606BB1E	LS	230	30	H7126	--	--	--	--	H3345	84	--	--	--		9	3.7	105	225	250
TM1606BU2B	SS	230	30	H7125	--	--	--	H3345	H3345	81.7	--	--	--	9	9		106	226	250
TM1606BU4E	LS	230	30	H7125	--	--	--	--	H3345	81.7	--	--	--		9	3.7	103	269	400
TM1606CB1A	LS	460	30	H7126	--	--	--	H3345	H3345	42	--	--	--	4.5	4.5	1.8	56	116	250
TM1606CB6F	VFD	460	30	H7126	--	--	--	--	H3345	42	--	--	--		4.5		51	134	250
TM1606CU1F	LS	460	30	H7125	--	--	--	--	H3345	40.8	--	--	--		4.5		49	109	250
TM1606CU4B	LS	460	30	H7125	--	--	--	H3345	H3345	40.8	--	--	--	4.5	4.5		53	136	250
TM1606CU4F	LS	460	30	H7125	--	--	--	--	H3345	40.8	--	--	--		4.5		49	132	250
TM1606CU5B	SS	460	30	H7125	--	--	--	H3345	H3345	40.8	--	--	--	4.5	4.5		53	136	250
TM1606CU5E	SS	460	30	H7125	--	--	--	--	H3345	40.8	--	--	--		4.5	1.8	51	134	250
TM1606CU8F	SS	460	30	H7125	--	--	--	--	H3345	40.8	--	--	--		4.5		49	155	250
TM1606DB5E	SS	460	30	H7126	--	--	--	--	H3345	42	--	--	--		4.5	1.8	53	136	250
TM1606DB6F	VFD	460	30	H7126	--	--	--	--	H3345	42	--	--	--		4.5		51	134	250
TM1606DU5B	SS	460	30	H7125	--	--	--	H3345	H3345	40.8	--	--	--	4.5	4.5		53	136	250
TM1606DU5F	SS	460	30	H7125	--	--	--	--	H3345	40.8	--	--	--		4.5		49	132	250
TM1606DU6A	VFD	460	30	H7125	--	--	--	H3345	H3345	40.8	--	--	--	4.5	4.5	1.8	55	138	250
TM1606DU8F	SS	460	30	H7125	--	--	--	--	H3345	40.8	--	--	--		4.5		49	155	250
TM1606EB6B	VFD	575	30	H7127	--	--	--	H3352	H3352	32.2	--	--	--	3.7	3.7		42	110	250
TM1606EC5F	SS	575	30	H7127	--	--	--	--	H3352	32.2	--	--	--		3.7		39	107	250
TM1606FB5F	SS	575	30	H7127	--	--	--	--	H3352	32.2	--	--	--		3.7		39	107	250
TM1606FB6B	VFD	575	30	H7127	--	--	--	H3352	H3352	32.2	--	--	--	3.7	3.7		42	110	250
TM1606FB6F	VFD	575	30	H7127	--	--	--	--	H3352	32.2	--	--	--		3.7		39	107	250
TM1606JB6B	VFD	230	30	H7126	--	--	--	H2845	H2845	145.5	--	--	--	21.9	21.9		201	418	400
TM1606JB6F	VFD	230	30	H7126	--	--	--	--	H2845	145.5	--	--	--		21.9		182	399	400
TM1606JU3A	VFD	230	30	H7125	--	--	--	H2845	H2845	141.504	--	--	--	21.9	21.9	8.1	205	345	400
TM1606JU6A	VFD	230	30	H7125	--	--	--	H2845	H2845	141.504	--	--	--	21.9	21.9	8.1	205	423	600
TM1606JU6B	VFD	230	30	H7125	--	--	--	H2845	H2845	141.504	--	--	--	21.9	21.9		196	414	400
TM1606JU6E	VFD	230	30	H7125	--	--	--	--	H2845	141.504	--	--	--		21.9	8.1	186	404	400
TM1606JU6F	VFD	230	30	H7125	--	--	--	--	H2845	141.504	--	--	--		21.9		177	395	400
TM1606KB6F	VFD	230	30	H7126	--	--	--	--	H2845	145.488	--	--	--		21.9		182	399	400
TM1606KU3F	VFD	230	30	H7125	--	--	--	--	H2845	141.504	--	--	--		21.9		177	317	400
TM1606YU4E	LS	208	30	H7125	--	--	--	--	H3345	89.7	--	--	--		9.9	4.1	113	283	400

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM1606YU5A	SS	208	30	H7125	--	--	--	H3345	H3345	89.7	--	--	--	9.9	9.9	4.1	121	292	400
TM1608AU1F	LS	230	40	H7175	--	--	--	--	H3345	110.4	--	--	--		9		130	250	250
TM1608AU2E	SS	230	40	H7175	--	--	--	--	H3345	110.4	--	--	--		9	3.7	134	254	400
TM1608AU4F	LS	230	40	H7175	--	--	--	--	H3345	110.4	--	--	--		9		130	296	400
TM1608AU5B	SS	230	40	H7175	--	--	--	H3345	H3345	110.4	--	--	--	9	9		138	304	400
TM1608AU5F	SS	230	40	H7175	--	--	--	--	H3345	110.4	--	--	--		9		130	296	400
TM1608BU5A	SS	230	40	H7175	--	--	--	H3345	H3345	110.4	--	--	--	9	9	3.7	142	308	400
TM1608BU5F	SS	230	40	H7175	--	--	--	--	H3345	110.4	--	--	--		9		130	296	400
TM1608CB6F	VFD	460	40	H7200T	--	--	--	--	H3345	55.2	--	--	--		4.5		65	148	250
TM1608CU2E	SS	460	40	H7175	--	--	--	--	H3345	60	--	--	--		4.5	1.8	67	127	250
TM1608CU4E	LS	460	40	H7175	--	--	--	--	H3345	60	--	--	--		4.5	1.8	67	150	250
TM1608CU4F	LS	460	40	H7175	--	--	--	--	H3345	60	--	--	--		4.5		65	148	250
TM1608CU5B	SS	460	40	H7175	--	--	--	H3345	H3345	60	--	--	--	4.5	4.5		69	152	250
TM1608CU5F	SS	460	40	H7175	--	--	--	--	H3345	60	--	--	--		4.5		65	148	250
TM1608CU8F	SS	460	40	H7175	--	--	--	--	H4190T	60	--	--	--		7.5		68	174	250
TM1608DU4F	LS	460	40	H7175	--	--	--	--	H3345	60.0	--	--	--		4.5		65	148	250
TM1608DU5F	SS	460	40	H7175	--	--	--	--	H3345	60.0	--	--	--		4.5		65	148	250
TM1608EB4F	LS	575	40	H7179	--	--	--	--	H3352	42.3	--	--	--		3.7		50	118	250
TM1608EB5F	SS	575	40	H7179	--	--	--	--	H3352	42.3	--	--	--		3.7		50	118	250
TM1608FC1E	LS	575	40	H7179	--	--	--	--	H3352	42.3	--	--	--		3.7	1.5	52	102	250
TM1608FC1F	LS	575	40	H7179	--	--	--	--	H3352	42	--	--	--		3.7		50	100	250
TM1608FC2F	SS	575	40	H7179	--	--	--	--	H3352	42.3	--	--	--		3.7		50	100	250
TM1608JU3E	VFD	230	40	H7175	--	--	--	--	H2845	191.213	--	--	--		21.9	8.1	240	380	400
TM1608JU6B	VFD	230	40	H7175	--	--	--	H2845	H2845	191.213	--	--	--	21.9	21.9		251	468	600
TM1608JU6E	VFD	230	40	H7175	--	--	--	--	H2845	191.213	--	--	--		21.9	8.1	240	458	600
TM1608JU6F	VFD	230	40	H7175	--	--	--	--	H2845	191.213	--	--	--		21.9		232	449	600
TM1609AU2E	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9	3.7	161	281	400
TM1609AU2F	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	277	400
TM1609AU4E	LS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9	3.7	161	328	400
TM1609AU5F	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	324	400
TM1609AU7F	LS	230	50	H7205	--	--	--	--	H4190T	135.7	--	--	--		15		164	376	400
TM1609BU2F	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	277	400
TM1609BU4F	LS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	324	400
TM1609BU5F	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	324	400
TM1609CA5F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	162	250
TM1609CA9B	VFD	460	50	H7205	--	--	--	H3345	H4190T	67.9	--	--	--	4.5	7.5		86	192	250
TM1609CU1F	LS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	139	250
TM1609CU2B	SS	460	50	H7205	--	--	--	H3345	H3345	67.9	--	--	--	4.5	4.5		83	143	250
TM1609CU2E	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5	1.8	81	141	250
TM1609CU2F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	139	250
TM1609CU4F	LS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	162	250
TM1609CU5B	SS	460	50	H7205	--	--	--	H3345	H3345	67.9	--	--	--	4.5	4.5		83	166	250
TM1609CU5F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	162	250
TM1609CU8F	SS	460	50	H7205	--	--	--	--	H4190T	68	--	--	--		7.5		82	188	250

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM1609CU9F	VFD	460	50	H7205	--	--	--	--	H4190T	68	--	--	--		7.5		82	188	250
TM1609DB9F	VFD	460	50	H7210	--	--	--	--	H4190T	67	--	--	--		7.5		81	187	250
TM1609DU2F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	139	250
TM1609DU5E	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5	1.8	81	164	250
TM1609DU5F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	162	250
TM1609EC1E	LS	575	50	H7230	--	--	--	--	H3352	52.9	--	--	--		3.7	1.5	63	113	250
TM1609FB6F	VFD	575	50	H7230	--	--	--	--	H3352	52.9	--	--	--		3.7		62	130	250
TM1609FC2B	SS	575	50	H7230	--	--	--	H3352	H3352	52.9	--	--	--	3.7	3.7		65	115	250
TM1609FC2F	SS	575	50	H7230	--	--	--	--	H3352	52.9	--	--	--		3.7		62	112	250
TM1609JB3F	VFD	230	50	H7210	--	--	--	--	H2845	233.1	--	--	--		21.9		277	417	600
TM1609JU3F	VFD	230	50	H7205	--	--	--	--	H2845	235.032	--	--	--		21.9		279	419	600
TM1609JU6B	VFD	230	50	H7205	--	--	--	H2845	H2845	235.032	--	--	--	21.9	21.9		298	516	600
TM1609JU6F	VFD	230	50	H7205	--	--	--	--	H2845	235.032	--	--	--		21.9		279	497	600
TM1609MS2F	SS	380	50	L3075	--	--	--	--	L3036	69	--	--	--		7.2		94	174	250
TM1609YU2F	SS	208	50	H7205	--	--	--	--	H3345	148.4	--	--	--		9.9		172	292	400
TM1610AU1B	LS	230	30,15	H7125	H6275	--	--	H3345	H3345	81.7	42.6	--	--	9	9		153	273	400
TM1610AU1F	LS	230	30,15	H7125	H6275	--	--	--	H3345	81.7	42.6	--	--		9		145	265	400
TM1610AU2A	SS	230	30,15	H7125	H6275	--	--	H3345	H3345	81.7	42.6	--	--	9	9	3.7	157	277	400
TM1610AU2F	SS	230	30,15	H7125	H6275	--	--	--	H3345	81.7	42.6	--	--		9		145	265	400
TM1610AU4F	LS	230	30,15	H7125	H6275	--	--	--	H3345	82	42.6	--	--		9		145	311	400
TM1610AU5F	SS	230	30,15	H7125	H6275	--	--	--	H3345	81.7	42.6	--	--		9		145	311	400
TM1610BU2A	SS	230	30,15	H7125	H6275	--	--	H3345	H3345	81.7	42.6	--	--	9	9	3.7	157	277	400
TM1610CB3F	VFD	460	30,15	H7126	H6110T	--	--	--	H3345	42	21.8	--	--		4.5		74	134	250
TM1610CB6F	VFD	460	30,15	H7126	H6110T	--	--	--	H3345	42	21.8	--	--		4.5		74	157	250
TM1610CU1A	LS	460	30,15	H7125	H6275	--	--	H3345	H3345	40.8	21.3	--	--	4.5	4.5	1.8	78	138	250
TM1610CU1F	LS	460	30,15	H7125	H6275	--	--	--	H3345	40.8	21.3	--	--		4.5		72	132	250
TM1610CU2E	SS	460	30,15	H7125	H6275	--	--	--	H3345	40.8	21.3	--	--		4.5	1.8	74	134	250
TM1610CU4F	LS	460	30,15	H7125	H6275	--	--	--	H3345	40.8	21.3	--	--		4.5		72	155	250
TM1610CU5F	SS	460	30,15	H7125	H6275	--	--	--	H3345	40.8	21.3	--	--		4.5		72	155	250
TM1610DU4B	LS	460	30,15	H7125	H6275	--	--	H3345	H3345	40.8	21.3	--	--	4.5	4.5		76	159	250
TM1610DU4F	LS	460	30,15	H7125	H6275	--	--	--	H3345	40.8	21.3	--	--		4.5		72	155	250
TM1610DU5F	SS	460	30,15	H7125	H6275	--	--	--	H3345	40.8	21.3	--	--		4.5		72	155	250
TM1610EB6B	VFD	575	30,15	H7127	H6100	--	--	H3352	H3352	32.2	16.7	--	--	3.7	3.7		60	128	250
TM1610EB6F	VFD	575	30,15	H7127	H6100	--	--	--	H3352	32.2	16.7	--	--		3.7		57	125	250
TM1610EC1E	LS	575	30,15	H7127	H6100	--	--	--	H3352	32.2	16.7	--	--		3.7	1.5	59	109	250
TM1610EC2F	SS	575	30,15	H7127	H6100	--	--	--	H3352	32.2	16.7	--	--		3.7		57	107	250
TM1610FB3F	VFD	575	30,15	H7127	H6100	--	--	--	H3352	32.2	16.7	--	--		3.7		57	107	250
TM1610FB6B	VFD	575	30,15	H7127	H6100	--	--	H3352	H3352	32.2	16.7	--	--	3.7	3.7		60	128	250
TM1610FB6F	VFD	575	30,15	H7127	H6100	--	--	--	H3352	32.2	16.7	--	--		3.7		57	125	250
TM1610FC2F	SS	575	30,15	H7127	H6100	--	--	--	H3352	32.2	16.7	--	--		3.7		57	107	250
TM1610JB3F	VFD	230	30,15	H7126	H6035	--	--	--	H2845	145.5	58	--	--		21.9		254	394	400
TM1610JB6F	VFD	230	30,15	H7126	H6035	--	--	--	H2845	145.488	58	--	--		21.9		254	472	600
TM1610JU3F	VFD	230	30,15	H7125	H5755	--	--	--	H2845	141.504	62	--	--		21.9		255	395	400
TM1610KB6F	VFD	230	30,15	H7126	H6035	--	--	--	H2845	145.488	58	--	--		21.9		254	472	600

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM1610KU6F	VFD	230	30,15	H7125	H5755	--	--	--	H2845	141.504	62	--	--		21.9		255	472	600
TM1610YU2F	SS	208	30,15	H7125	H6275	--	--	--	H3345	89.7	46.6	--	--		9.9		159	279	400
TM1610YU5F	SS	208	30,15	H7125	H6275	--	--	--	H3345	89.7	46.6	--	--		9.9		159	329	400
TM1612CU2F	SS	460	40,15	H7175	H6275	--	--	--	H3345	60	21.3	--	--		4.5		88	148	250
TM1612CU5F	SS	460	40,15	H7175	H6275	--	--	--	H4190T	60	21.3	--	--		7.5		91	174	250
TM1612DU4F	LS	460	40,15	H7175	H6275	--	--	--	H4190T	60	21.3	--	--		7.5		91	174	250
TM1612EB1E	LS	575	40,15	H7179	H6100	--	--	--	H3352	42.3	16.7	--	--		3.7	1.5	70	120	250
TM1612EB1F	LS	575	40,15	H7179	H6100	--	--	--	H3352	42.3	16.7	--	--		3.7		68	118	250
TM1612EB6F	VFD	575	40,15	H7179	H6100	--	--	--	H4112	42.3	16.7	--	--		5.8		70	138	250
TM1612EC1E	LS	575	40,15	H7179	H6100	--	--	--	H3352	42.3	16.7	--	--		3.7	1.5	70	120	250
TM1612FB1B	LS	575	40,15	H7179	H6100	--	--	H3352	H3352	42.3	16.7	--	--	3.7	3.7		71	121	250
TM1612FB6B	VFD	575	40,15	H7179	H6100	--	--	H3352	H4112	42	16.7	--	--	3.7	5.8		74	142	250
TM1612FB6E	VFD	575	40,15	H7179	H6100	--	--	--	H4112	42	16.7	--	--		5.8	1.5	72	140	250
TM1612FB6F	VFD	575	40,15	H7179	H6100	--	--	--	H4112	42	16.7	--	--		5.8		70	138	250
TM1612FC1A	LS	575	40,15	H7179	H6100	--	--	H3352	H3352	42	16.7	--	--	3.7	3.7	1.5	73	123	250
TM1612JU3A	VFD	230	40,15	H7175	H5755	--	--	H2845	H2845	191.213	62	--	--	21.9	21.9	8.1	337	477	600
TM1612JU3B	VFD	230	40,15	H7175	H5755	--	--	H2845	H2845	191.213	62	--	--	21.9	21.9		328	468	600
TM1612JU6F	VFD	230	40,15	H7175	H5755	--	--	--	H3675	191.213	62	--	--		23.6		311	528	600
TM1613AU4F	LS	230	50,15	H7205	H6275	--	--	--	H4190T	135.7	42.6	--	--		15		210	376	400
TM1613AU5F	SS	230	50,15	H7205	H6275	--	--	--	H4190T	135.7	42.6	--	--		15		210	376	400
TM1613BU1F	LS	230	50,15	H7205	H6275	--	--	--	H3345	135.7	42.6	--	--		9		204	324	400
TM1613BU2E	SS	230	50,15	H7205	H6275	--	--	--	H3345	135.7	42.6	--	--		9	3.7	208	328	400
TM1613BU2F	SS	230	50,15	H7205	H6275	--	--	--	H3345	135.7	42.6	--	--		9		204	324	400
TM1613BU4F	LS	230	50,15	H7205	H6275	--	--	--	H4190T	135.7	42.6	--	--		15		210	376	400
TM1613BU5F	SS	230	50,15	H7205	H6275	--	--	--	H4190T	135.7	42.6	--	--		15		210	376	400
TM1613CU2F	SS	460	50,15	H7205	H6275	--	--	--	H3345	67.9	21.3	--	--		4.5		102	162	250
TM1613CU4B	LS	460	50,15	H7205	H6275	--	--	H3345	H4190T	67.9	21.3	--	--	4.5	7.5		109	192	250
TM1613CU4F	LS	460	50,15	H7205	H6275	--	--	--	H4190T	68	21.3	--	--		7.5		105	188	250
TM1613CU5F	SS	460	50,15	H7205	H6275	--	--	--	H4190T	67.9	21.3	--	--		7.5		105	188	250
TM1613DB3F	VFD	460	50,15	H7210	H6110T	--	--	--	H3345	67.3	21.8	--	--		4.5		102	162	250
TM1613DB6B	VFD	460	50,15	H7210	H6110T	--	--	H3345	H4190T	67.3	21.8	--	--	4.5	7.5		109	192	250
TM1613DU1E	LS	460	50,15	H7205	H6275	--	--	--	H3345	67.9	21.3	--	--		4.5	1.8	104	164	250
TM1613DU2F	SS	460	50,15	H7205	H6275	--	--	--	H3345	67.9	21.3	--	--		4.5		102	162	250
TM1613FB4F	LS	575	50,15	H7230	H6100	--	--	--	H4112	52.9	16.7	--	--		5.8		82	150	250
TM1613JU3F	VFD	230	50,15	H7205	H5755	--	--	--	H2845	235.032	62	--	--		21.9		357	497	600
TM1613MS2F	SS	380	50,15	L3075	L3003	--	--	--	L3036	69	24	--	--		7.2		120	200	250
TM1613YU5F	SS	208	50,15	H7205	H6275	--	--	--	H4190T	148.4	46.6	--	--		16.6		230	400	400
TM1614AU1E	LS	230	30,15,15	H7125	H6275	H6275	--	--	H3345	81.7	42.6	42.6	--		9	3.7	195	315	400
TM1614AU2E	SS	230	30,15,15	H7125	H6275	H6275	--	--	H3345	81.7	42.6	42.6	--		9	3.7	195	315	400
TM1614AU2F	SS	230	30,15,15	H7125	H6275	H6275	--	--	H3345	81.7	42.6	42.6	--		9		191	311	400
TM1614BU1F	LS	230	30,15,15	H7125	H6275	H6275	--	--	H3345	81.7	42.6	42.6	--		9		191	311	400
TM1614CU1F	LS	460	30,15,15	H7125	H6275	H6275	--	--	H3345	40.8	21.3	21.3	--		4.5		96	156	250
TM1614FB2F	SS	575	30,15,15	H7127	H6100	H6100	--	--	H3352	32.2	16.7	16.7	--		3.7		75	125	250
TM1614JU3B	VFD	230	30,15,15	H7125	H5755	H5755	--	H2845	H2845	141.504	62	62	--	21.9	21.9		351	491	600

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM1614JU3E	VFD	230	30,15,15	H7125	H5755	H5755	--	--	H2845	141.504	62	62	--		21.9	8.1	341	481	600
TM1616FB1F	LS	575	40,15,15	H7179	H6100	H6100	--	--	H4112	42.3	16.7	16.7	--		5.8		89	139	250
TM1616JU3B	VFD	230	40,15,15	H7175	H5755	H5755	--	H2845	H3675	191.213	62	62	--	21.9	23.6		407	547	600
TM1617AU2F	SS	230	50,15,15	H7205	H6275	H6275	--	--	H4190T	135.7	42.6	42.6	--		15		256	376	400
TM1617CU1F	LS	460	50,15,15	H7205	H6275	H6275	--	--	H4190T	67.9	21.3	21.3	--		7.5		128	188	250
TM1617FB1F	LS	575	50,15,15	H7230	H6100	H6100	--	--	H4112	52.9	16.7	16.7	--		5.8		100	150	250
TM1617FB3F	VFD	575	50,15,15	H7230	H6100	H6100	--	--	H4112	52.9	16.7	16.7	--		5.8		100	150	250
TM1617KU3F	VFD	230	50,15,15	H7205	H5755	H5755	--	--	H3675	235.032	62	62	--		23.6		436	576	600
TM2405AU2B	SS	230	40	H7175	--	--	--	H4190T	H3345	110.4	--	--	--	15	9		143	263	400
TM2405AU2F	SS	230	40	H7175	--	--	--	--	H3345	110	--	--	--		9		130	250	250
TM2405CU1A	LS	460	40	H7175	--	--	--	H4190T	H4190T	60	--	--	--	7.5	7.5	1.8	77	137	250
TM2405CU5B	SS	460	40	H7175	--	--	--	H4190T	H3345	60	--	--	--	7.5	4.5		71	163	250
TM2405FB4B	LS	575	40	H7179	--	--	--	H4112	H3352	42	--	--	--	5.8	3.7		55	129	250
TM2405FB5B	SS	575	40	H7179	--	--	--	H4112	H3352	42.3	--	--	--	5.8	3.7		55	129	250
TM2406AB4A	LS	230	50	H7210	--	--	--	H4190T	H4910T	134.6	--	--	--	15	22.5	3.7	188	372	400
TM2406AB4E	LS	230	50	H7210	--	--	--	--	H4910T	135	--	--	--		22.5	3.7	175	359	400
TM2406AU5A	SS	230	50	H7205	--	--	--	H4190T	H4910T	136	--	--	--	15	22.5	3.7	189	373	400
TM2406AU5B	SS	230	50	H7205	--	--	--	H4190T	H3345	135.7	--	--	--	15	9		170	354	400
TM2406AU5F	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	341	400
TM2406BB2E	SS	230	50	H7210	--	--	--	--	H4190T	134.6	--	--	--		15	3.7	167	287	400
TM2406BB5E	SS	230	50	H7210	--	--	--	--	H4910T	134.6	--	--	--		22.5	3.7	175	359	400
TM2406BU5F	SS	230	50	H7205	--	--	--	--	H3345	135.7	--	--	--		9		157	341	400
TM2406CU4B	LS	460	50	H7205	--	--	--	H4190T	H3345	67.9	--	--	--	7.5	4.5		85	177	250
TM2406CU4E	LS	460	50	H7205	--	--	--	--	H4910T	67.9	--	--	--		11.3	1.8	88	180	250
TM2406CU5F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	171	250
TM2406CU8B	SS	460	50	H7205	--	--	--	H4190T	H4190T	67.9	--	--	--	7.5	7.5		88	212	250
TM2406CU8F	SS	460	50	H7205	--	--	--	--	H4190T	67.9	--	--	--		7.5		82	206	250
TM2406DB6F	VFD	460	50	H7210	--	--	--	--	H3345	67.3	--	--	--		4.5		78	170	250
TM2406DU2B	SS	460	50	H7205	--	--	--	H4190T	H3345	67.9	--	--	--	7.5	4.5		85	145	250
TM2406DU5B	SS	460	50	H7205	--	--	--	H4190T	H3345	67.9	--	--	--	7.5	4.5		85	177	250
TM2406DU5F	SS	460	50	H7205	--	--	--	--	H3345	67.9	--	--	--		4.5		79	171	250
TM2406EB6F	VFD	575	50	H7230	--	--	--	--	H3352	52.9	--	--	--		3.7		62	135	250
TM2406FB1A	LS	575	50	H7230	--	--	--	H4112	H4112	52.9	--	--	--	5.8	5.8	1.5	70	120	250
TM2406JU6A	VFD	230	50	H7205	--	--	--	H3675	H4900	235.032	--	--	--	23.6	38.6	8.1	327	577	600
TM2406JU6B	VFD	230	50	H7205	--	--	--	H3675	H2845	235.032	--	--	--	23.6	21.9		300	550	600
TM2406JU6F	VFD	230	50	H7205	--	--	--	--	H2845	235.032	--	--	--		21.9		279	530	600
TM2406JU9F	VFD	230	50	H7205	--	--	--	--	H3675	235.032	--	--	--		23.6		281	642	600
TM2406YU5B	SS	208	50	H7205	--	--	--	H4190T	H3345	148.4	--	--	--	16.6	9.9		186	375	400
TM2406YU5F	SS	208	50	H7205	--	--	--	--	H3345	148.4	--	--	--		9.9		172	361	400
TM2406YU6B	VFD	208	50	H7205	--	--	--	H4190T	H3345	148.4	--	--	--	16.6	9.9		186	375	400
TM2406YU8F	SS	208	50	H7205	--	--	--	--	H4190T	148.4	--	--	--		16.6		179	437	600
TM2409AU1A	LS	230	40,20	H7175	H6800	--	--	H4190T	H4910T	110.4	58.7	--	--	15	22.5	3.7	225	345	400
TM2409AU1B	LS	230	40,20	H7175	H6800	--	--	H4190T	H3345	110.4	58.7	--	--	15	9		207	327	400
TM2409AU1F	LS	230	40,20	H7175	H6800	--	--	--	H3345	110.4	58.7	--	--		9		194	314	400

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM2409AU2B	SS	230	40,20	H7175	H6800	--	--	H4190T	H3345	110.4	58.7	--	--	15	9		207	327	400
TM2409AU4F	LS	230	40,20	H7175	H6800	--	--	--	H4190T	110.4	58.7	--	--		15		200	384	400
TM2409AU5E	SS	230	40,20	H7175	H6800	--	--	--	H4910T	110.4	58.7	--	--		22.5	3.7	212	396	400
TM2409AU5F	SS	230	40,20	H7175	H6800	--	--	--	H4190T	110.4	58.7	--	--		15		200	384	400
TM2409BU1F	LS	230	40,20	H7175	H6800	--	--	--	H3345	110.4	58.7	--	--		9		194	314	400
TM2409BU5F	SS	230	40,20	H7175	H6800	--	--	--	H4190T	110.4	58.7	--	--		15		200	384	400
TM2409CA2B	SS	460	40,20	H7175	H6800	--	--	H4190T	H3345	60	29.3	--	--	7.5	4.5		103	163	250
TM2409CU1F	LS	460	40,20	H7175	H6800	--	--	--	H3345	60	29.3	--	--		4.5		97	157	250
TM2409CU2B	SS	460	40,20	H7175	H6800	--	--	H4190T	H3345	60	29.3	--	--	7.5	4.5		103	163	250
TM2409CU2F	SS	460	40,20	H7175	H6800	--	--	--	H3345	60	29.3	--	--		4.5		97	157	250
TM2409CU4F	LS	460	40,20	H7175	H6800	--	--	--	H4190T	60	29.3	--	--		7.5		100	192	250
TM2409CU5A	SS	460	40,20	H7175	H6800	--	--	H4190T	H4910T	60	29.3	--	--	7.5	11.3	1.8	113	205	250
TM2409CU5E	SS	460	40,20	H7175	H6800	--	--	--	H4910T	60	29.3	--	--		11.3	1.8	106	198	250
TM2409CU5F	SS	460	40,20	H7175	H6800	--	--	--	H4190T	60	29.3	--	--		7.5		100	192	250
TM2409DU2B	SS	460	40,20	H7175	H6800	--	--	H4190T	H3345	60	29.3	--	--	7.5	4.5		103	163	250
TM2409DU2E	SS	460	40,20	H7175	H6800	--	--	--	H4910T	60	29.3	--	--		11.3	1.8	106	166	250
TM2409DU5E	SS	460	40,20	H7175	H6800	--	--	--	H4910T	60	29.3	--	--		11.3	1.8	106	198	250
TM2409DU5F	SS	460	40,20	H7175	H6800	--	--	--	H4190T	60	29.3	--	--		7.5		100	192	250
TM2409FB1B	LS	575	40,20	H7179	H7050	--	--	H4112	H3352	42.3	21.9	--	--	5.8	3.7		79	129	250
TM2409FB6B	VFD	575	40,20	H7179	H7050	--	--	H4112	H4112	42.3	21.9	--	--	5.8	5.8		81	155	250
TM2409FB6F	VFD	575	40,20	H7179	H7050	--	--	--	H4112	42.3	21.9	--	--		5.8		76	150	250
TM2409FC1E	LS	575	40,20	H7179	H7050	--	--	--	H4952	42.3	21.9	--	--		8.7	1.5	81	131	250
TM2409JU6B	VFD	230	40,20	H7175	H6800	--	--	H3675	H3675	191.213	101.668	--	--	23.6	23.6		364	615	600
TM2409JU6F	VFD	230	40,20	H7175	H6800	--	--	--	H3675	191	102	--	--		23.6		344	594	600
TM2409KU6E	VFD	230	40,20	H7175	H6800	--	--	--	H4900	191.213	101.668	--	--		38.6	8.1	369	619	600
TM2409YU2B	SS	208	40,20	H7175	H6800	--	--	H4190T	H3345	119.6	63.3	--	--	16.6	9.9		224	344	400
TM2410AU1F	LS	230	50,20	H7205	H6800	--	--	--	H3345	135.7	58.7	--	--		9		221	341	400
TM2410AU2B	SS	230	50,20	H7205	H6800	--	--	H4190T	H3345	135.7	58.7	--	--	15	9		234	354	400
TM2410AU2F	SS	230	50,20	H7205	H6800	--	--	--	H3345	135.7	58.7	--	--		9		221	341	400
TM2410AU4F	LS	230	50,20	H7205	H6800	--	--	--	H4190T	135.7	58.7	--	--		15		228	411	400
TM2410AU5B	SS	230	50,20	H7205	H6800	--	--	H4190T	H4190T	135.7	58.7	--	--	15	15		241	424	400
TM2410AU5F	SS	230	50,20	H7205	H6800	--	--	--	H4190T	135.7	58.7	--	--		15		228	411	400
TM2410AU8B	SS	230	50,20	H7205	H6800	--	--	H4190T	H4190T	135.7	58.7	--	--	15	15		241	488	600
TM2410AU8E	SS	230	50,20	H7205	H6800	--	--	--	H4910T	135.7	58.7	--	--		22.5	3.7	240	487	600
TM2410AU8F	SS	230	50,20	H7205	H6800	--	--	--	H4190T	135.7	58.7	--	--		15		228	475	600
TM2410BU5F	SS	230	50,20	H7205	H6800	--	--	--	H4190T	135.7	58.7	--	--		15		228	411	400
TM2410CA5B	SS	460	50,20	H7205	H6800	--	--	H4190T	H4190T	67.9	29.3	--	--	7.5	7.5		120	212	250
TM2410CA5F	SS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	206	250
TM2410CU1B	LS	460	50,20	H7205	H6800	--	--	H4190T	H3345	67.9	29.3	--	--	7.5	4.5		117	177	250
TM2410CU2B	SS	460	50,20	H7205	H6800	--	--	H4190T	H3345	67.9	29.3	--	--	7.5	4.5		117	177	250
TM2410CU2F	SS	460	50,20	H7205	H6800	--	--	--	H3345	67.9	29.3	--	--		4.5		111	171	250
TM2410CU3F	VFD	460	50,20	H7205	H6800	--	--	--	H3345	67.9	29.3	--	--		4.5		111	171	250
TM2410CU4B	LS	460	50,20	H7205	H6800	--	--	H4190T	H4190T	67.9	29.3	--	--	7.5	7.5		120	212	250
TM2410CU4F	LS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	206	250

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM2410CU5B	SS	460	50,20	H7205	H6800	--	--	H4190T	H4190T	67.9	29.3	--	--	7.5	7.5		120	212	250
TM2410CU5F	SS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	206	250
TM2410CU7A	LS	460	50,20	H7205	H6800	--	--	H4190T	H4910T	67.9	29.3	--	--	7.5	11.3	1.8	126	250	250
TM2410CU7B	LS	460	50,20	H7205	H6800	--	--	H4190T	H4190T	67.9	29.3	--	--	7.5	7.5		120	244	250
TM2410CU7F	LS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	238	250
TM2410CU8A	SS	460	50,20	H7205	H6800	--	--	H4190T	H4910T	67.9	29.3	--	--	7.5	11.3	1.8	126	250	250
TM2410CU8B	SS	460	50,20	H7205	H6800	--	--	H4190T	H4190T	67.9	29.3	--	--	7.5	7.5		120	244	250
TM2410CU8E	SS	460	50,20	H7205	H6800	--	--	--	H4910T	67.9	29.3	--	--		11.3	1.8	120	244	250
TM2410CU8F	SS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	238	250
TM2410DB6F	VFD	460	50,20	H7210	H6610T	--	--	--	H4190T	67.3	28.8	--	--		7.5		113	204	250
TM2410DU1A	LS	460	50,20	H7205	H6800	--	--	H4190T	H4910T	67.9	29.3	--	--	7.5	11.3	1.8	126	186	250
TM2410DU2F	SS	460	50,20	H7205	H6800	--	--	--	H3345	67.9	29.3	--	--		4.5		111	171	250
TM2410DU3F	VFD	460	50,20	H7205	H6800	--	--	--	H3345	67.9	29.3	--	--		4.5		111	171	250
TM2410DU4F	LS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	206	250
TM2410DU5B	SS	460	50,20	H7205	H6800	--	--	H4190T	H4190T	67.9	29.3	--	--	7.5	7.5		120	212	250
TM2410DU5F	SS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	206	250
TM2410DU5F	SS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	206	250
TM2410DU8F	SS	460	50,20	H7205	H6800	--	--	--	H4190T	67.9	29.3	--	--		7.5		114	238	250
TM2410EC1E	LS	575	50,20	H7230	H7050	--	--	--	H4952	52.9	21.9	--	--		8.7	1.5	92	142	250
TM2410EC2F	SS	575	50,20	H7230	H7050	--	--	--	H3352	52.9	21.9	--	--		3.7		85	135	250
TM2410EC5F	SS	575	50,20	H7230	H7050	--	--	--	H4112	52.9	21.9	--	--		5.8		88	161	250
TM2410FB6F	VFD	575	50,20	H7230	H7050	--	--	--	H4112	52.9	21.9	--	--		5.8		88	161	250
TM2410FC2F	SS	575	50,20	H7230	H7050	--	--	--	H3352	52.9	21.9	--	--		3.7		85	135	250
TM2410JU3B	VFD	230	50,20	H7205	H6800	--	--	H3675	H2845	235.032	101.668	--	--	23.6	21.9		410	550	600
TM2410JU3F	VFD	230	50,20	H7205	H6800	--	--	--	H2845	235.032	101.668	--	--		21.9		390	530	600
TM2410JU6F	VFD	230	50,20	H7205	H6800	--	--	--	H3675	235.032	101.668	--	--		23.6		392	642	600
TM2410KU3F	VFD	230	50,20	H7205	H6800	--	--	--	H2845	235.032	101.668	--	--		21.9		390	530	600
TM2410PE5F	SS	400	50,20	L3075	L3008	--	--	--	H4910	69	28.5	--	--		9.2		132	247	250
TM2410YU2F	SS	208	50,20	H7205	H6800	--	--	--	H3345	148.4	63.3	--	--		9.9		241	361	400
TM2410YU5F	SS	208	50,20	H7205	H6800	--	--	--	H4190T	148.4	63.3	--	--		16.6		248	437	600
TM2410ZU2F	SS	208	50,20	H7205	H6800	--	--	--	H3345	148.4	63.3	--	--		9.9		241	361	400
TM2410ZU5F	SS	208	50,20	H7205	H6800	--	--	--	H4190T	148.4	63.3	--	--		16.6		248	437	600
TM2413AU1B	LS	230	40,20,20	H7175	H6800	H6800	--	H4190T	H4190T	110.4	58.7	58.7	--	15	15		277	397	400
TM2413AU1F	LS	230	40,20,20	H7175	H6800	H6800	--	--	H4190T	110.4	58.7	58.7	--		15		264	384	400
TM2413AU2E	SS	230	40,20,20	H7175	H6800	H6800	--	--	H4910T	110.4	58.7	58.7	--		22.5	3.7	276	396	400
TM2413AU2F	SS	230	40,20,20	H7175	H6800	H6800	--	--	H4190T	110.4	58.7	58.7	--		15		264	384	400
TM2413BU1A	LS	230	40,20,20	H7175	H6800	H6800	--	H4190T	H4910T	110.4	58.7	58.7	--	15	22.5	3.7	289	409	400
TM2413BU2A	SS	230	40,20,20	H7175	H6800	H6800	--	H4190T	H4910T	110.4	58.7	58.7	--	15	22.5	3.7	289	409	400
TM2413CU2B	SS	460	40,20,20	H7175	H6800	H6800	--	H4190T	H4190T	60	29.3	29.3	--	7.5	7.5		138	198	250
TM2413CU2F	SS	460	40,20,20	H7175	H6800	H6800	--	--	H4190T	60	29.3	29.3	--		7.5		132	192	250
TM2413DU1F	LS	460	40,20,20	H7175	H6800	H6800	--	--	H4190T	60	29.3	29.3	--		7.5		132	192	250
TM2413JU3F	VFD	230	40,20,20	H7175	H6800	H6800	--	--	H3675	191.213	101.668	101.668	--		23.6		454	594	600
TM2414AU1F	LS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	411	400
TM2414AU2B	SS	230	50,20,20	H7205	H6800	H6800	--	H4190T	H4190T	135.7	58.7	58.7	--	15	15		304	424	400

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM2414AU2E	SS	230	50,20,20	H7205	H6800	H6800	--	--	H4910T	135.7	58.7	58.7	--		22.5	3.7	304	424	400
TM2414AU2F	SS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	411	400
TM2414AU4F	LS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	475	600
TM2414AU5F	SS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	475	600
TM2414BU2F	SS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	411	400
TM2414BU4F	LS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	475	600
TM2414BU5F	SS	230	50,20,20	H7205	H6800	H6800	--	--	H4190T	135.7	58.7	58.7	--		15		291	475	600
TM2414CA6F	VFD	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	238	250
TM2414CU1F	LS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	206	250
TM2414CU2B	SS	460	50,20,20	H7205	H6800	H6800	--	H4190T	H4190T	67.9	29.3	29.3	--	7.5	7.5		152	212	250
TM2414CU2E	SS	460	50,20,20	H7205	H6800	H6800	--	--	H4910T	67.9	29.3	29.3	--		11.3	1.8	152	212	250
TM2414CU2F	SS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	206	250
TM2414CU4B	LS	460	50,20,20	H7205	H6800	H6800	--	H4190T	H4190T	67.9	29.3	29.3	--	7.5	7.5		152	244	250
TM2414CU4F	LS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	238	250
TM2414CU5F	SS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	238	250
TM2414DA6F	VFD	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	238	250
TM2414DB5F	SS	460	50,20,20	H7210	H6610T	H6610T	--	--	H4190T	67.3	28.8	28.8	--		7.5		144	236	250
TM2414DB6B	VFD	460	50,20,20	H7210	H6610T	H6610T	--	H4190T	H4190T	67.3	28.8	28.8	--	7.5	7.5		150	242	250
TM2414DB6F	VFD	460	50,20,20	H7210	H6610T	H6610T	--	--	H4190T	67.3	28.8	28.8	--		7.5		144	236	250
TM2414DU1F	LS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	206	250
TM2414DU2F	SS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	206	250
TM2414DU4B	LS	460	50,20,20	H7205	H6800	H6800	--	H4190T	H4190T	67.9	29.3	29.3	--	7.5	7.5		152	244	250
TM2414DU5F	SS	460	50,20,20	H7205	H6800	H6800	--	--	H4190T	67.9	29.3	29.3	--		7.5		146	238	250
TM2414EB6F	VFD	575	50,20,20	H7230	H7050	H7050	--	--	H4112	52.9	21.9	21.9	--		5.8		111	185	250
TM2414EC2F	SS	575	50,20,20	H7230	H7050	H7050	--	--	H4112	52.9	21.9	21.9	--		5.8		111	161	250
TM2414FB6F	VFD	575	50,20,20	H7230	H7050	H7050	--	--	H4112	52.9	21.9	21.9	--		5.8		111	185	250
TM2414JU6F	VFD	230	50,20,20	H7205	H6800	H6800	--	--	H3675	235.032	101.668	101.668	--		23.6		502	752	800
TM2414MS2F	SS	380	50,20,20	L3075	L3008	L3008	--	--	H4910	69	28.5	28.5	--		9.2		168	248	250
TM2414YU5B	SS	208	50,20,20	H7205	H6800	H6800	--	H4190T	H4190T	148.4	63.3	63.3	--	16.6	16.6		331	520	600
TM2414YU5F	SS	208	50,20,20	H7205	H6800	H6800	--	--	H4190T	148.4	63.3	63.3	--		16.6		317	506	600
TM2418AU1B	LS	230	50,20,20,20	H7205	H6800	H6800	H6800	H4190T	H4190T	135.7	58.7	58.7	58.7	15	15		368	488	600
TM2418AU1F	LS	230	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	135.7	58.7	58.7	58.7		15		355	475	600
TM2418AU2F	SS	230	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	135.7	58.7	58.7	58.7		15		355	475	600
TM2418BU1F	LS	230	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	135.7	58.7	58.7	58.7		15		355	475	600
TM2418CU1F	LS	460	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	67.9	29.3	29.3	29.3		7.5		178	238	250
TM2418CU2F	SS	460	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	67.9	29.3	29.3	29.3		7.5		178	238	250
TM2418DU1F	LS	460	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	67.9	29.3	29.3	29.3		7.5		178	238	250
TM2418DU2F	SS	460	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	67.9	29.3	29.3	29.3		7.5		178	238	250
TM2418YU2F	SS	208	50,20,20,20	H7205	H6800	H6800	H6800	--	H4190T	148.4	63.3	63.3	63.3		16.6		386	506	600
TM3208CU1B	LS	460	40,40	H7175	H7175	--	--	H4910T	H4190T	60	60	--	--	11.3	7.5		138	198	250
TM3208CU5F	SS	460	40,40	H7175	H7175	--	--	--	H4190T	60	60	--	--		7.5		128	233	250
TM3209AU5F	SS	230	50,50	H7205	H7205	--	--	--	H4190T	135.7	135.7	--	--		15		311	520	600
TM3209CU4B	LS	460	50,50	H7205	H7205	--	--	H4910T	H4190T	67.9	67.9	--	--	11.3	7.5		165	270	250
TM3209CU5B	SS	460	50,50	H7205	H7205	--	--	H4910T	H4190T	67.9	67.9	--	--	11.3	7.5		165	270	250

Appendix B

DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM3209CU5E	SS	460	50,50	H7205	H7205	--	--	--	H4910T	67.9	67.9	--	--		11.3	1.8	162	266	250
TM3209CU5F	SS	460	50,50	H7205	H7205	--	--	--	H4190T	67.9	67.9	--	--		7.5		156	260	250
TM3209CU8F	SS	460	50,50	H7205	H7205	--	--	--	H4910T	67.9	67.9	--	--		11.3		160	309	400
TM3209DU5F	SS	460	50,50	H7205	H7205	--	--	--	H4190T	67.9	67.9	--	--		7.5		156	260	250
TM3209DU8F	SS	460	50,50	H7205	H7205	--	--	--	H4910T	67.9	67.9	--	--		11.3		160	309	400
TM3209JU3B	VFD	230	50,50	H7205	H7205	--	--	H4900	H3675	235.032	235.032	--	--	38.6	23.6		570	710	800
TM3209JU6F	VFD	230	50,50	H7205	H7205	--	--	--	H3675	235.032	235.032	--	--		23.6		537	830	800
TM3210CU2A	SS	460	30,30,30	H7125	H7125	H7125	--	H4910T	H4910T	40.8	40.8	40.8	--	11.3	11.3	1.8	157	217	250
TM3210CU2B	SS	460	30,30,30	H7125	H7125	H7125	--	H4910T	H4190T	40.8	40.8	40.8	--	11.3	7.5		151	211	250
TM3210CU2E	SS	460	30,30,30	H7125	H7125	H7125	--	--	H4910T	40.8	40.8	40.8	--		11.3	1.8	147	207	250
TM3210DB2A	SS	460	30,30,30	H7126	H7126	H7126	--	H4910T	H4910T	42	42	42	--	11.3	11.3	1.8	161	221	250
TM3210DC2A	SS	460	30,30,30	H7126	H7126	H7126	--	H4910T	H4910T	42	42	42	--	11.3	11.3	1.8	161	221	250
TM3210DU5F	SS	460	30,30,30	H7125	H7125	H7125	--	--	H4190T	40.8	40.8	40.8	--		7.5		141	246	250
TM3210FB3F	VFD	575	30,30,30	H7127	H7127	H7127	--	--	H4112	32.2	32.2	32.2	--		5.8		111	161	250
TM3210FB6F	VFD	575	30,30,30	H7127	H7127	H7127	--	--	H4112	32.2	32.2	32.2	--		5.8		111	196	250
TM3212AU2F	SS	230	40,40,30	H7175	H7175	H7125	--	--	H4190T	110.4	110.4	81.7	--		15		345	465	600
TM3212AU5F	SS	230	40,40,30	H7175	H7175	H7125	--	--	H4910T	110.4	110.4	81.7	--		22.5		353	562	600
TM3212CU5B	SS	460	40,40,30	H7175	H7175	H7125	--	H4910T	H4910T	60	60	40.8	--	11.3	11.3		186	291	400
TM3212CU5F	SS	460	40,40,30	H7175	H7175	H7125	--	--	H4910T	60	60	40.8	--		11.3		177	281	250
TM3212YU2F	SS	208	40,40,30	H7175	H7175	H7125	--	--	H4190T	119.6	119.6	89.7	--		16.6		376	496	600
TM3212YU5F	SS	208	40,40,30	H7175	H7175	H7125	--	--	H4910T	119.6	119.6	89.7	--		24.9		385	602	600
TM3213CU2B	SS	460	50,50,30	H7205	H7205	H7125	--	H4910T	H4190T	67.9	67.9	40.8	--	11.3	7.5		210	270	250
TM3213CU2F	SS	460	50,50,30	H7205	H7205	H7125	--	--	H4190T	67.9	67.9	40.8	--		7.5		200	260	250
TM3213CU4F	LS	460	50,50,30	H7205	H7205	H7125	--	--	H4910T	67.9	67.9	40.8	--		11.3		204	309	400
TM3213CU5B	SS	460	50,50,30	H7205	H7205	H7125	--	H4910T	H4910T	67.9	67.9	40.8	--	11.3	11.3		214	318	400
TM3213CU5F	SS	460	50,50,30	H7205	H7205	H7125	--	--	H4910T	67.9	67.9	40.8	--		11.3		204	309	400
TM3213DU5F	SS	460	50,50,30	H7205	H7205	H7125	--	--	H4910T	67.9	67.9	40.8	--		11.3		204	309	400
TM3213EC5B	SS	575	50,50,30	H7230	H7230	H7127	--	H4952	H4952	52.9	52.9	32.2	--	8.7	8.7		167	252	250
TM3213EC5F	SS	575	50,50,30	H7230	H7230	H7127	--	--	H4952	52.9	52.9	32.2	--		8.7		160	245	250
TM3214AU2F	SS	230	30,30,30,30	H7125	H7125	H7125	H7125	--	H4190T	81.7	81.7	81.7	81.7		15		371	491	600
TM3214CU1B	LS	460	30,30,30,30	H7125	H7125	H7125	H7125	H4910T	H4190T	40.8	40.8	40.8	40.8	11.3	7.5		195	255	250
TM3214CU2B	SS	460	30,30,30,30	H7125	H7125	H7125	H7125	H4910T	H4190T	40.8	40.8	40.8	40.8	11.3	7.5		195	255	250
TM3214CU2F	SS	460	30,30,30,30	H7125	H7125	H7125	H7125	--	H4190T	40.8	40.8	40.8	40.8		7.5		186	246	250
TM3214DU2B	SS	460	30,30,30,30	H7125	H7125	H7125	H7125	H4910T	H4190T	40.8	40.8	40.8	40.8	11.3	7.5		195	255	250
TM3214DU2F	SS	460	30,30,30,30	H7125	H7125	H7125	H7125	--	H4190T	40.8	40.8	40.8	40.8		7.5		186	246	250
TM3214EC2B	SS	575	30,30,30,30	H7127	H7127	H7127	H7127	H4952	H4112	32.2	32.2	32.2	32.2	8.7	5.8		154	204	250
TM3214EC2F	SS	575	30,30,30,30	H7127	H7127	H7127	H7127	--	H4112	32.2	32.2	32.2	32.2		5.8		146	196	250
TM3214FC1F	LS	575	30,30,30,30	H7127	H7127	H7127	H7127	--	H4112	32.2	32.2	32.2	32.2		5.8		146	196	250
TM3216CU2F	SS	460	40,40,30,30	H7175	H7175	H7125	H7125	--	H4910T	60	60	40.8	40.8		11.3		221	281	250
TM3216MS2F	SS	380	40,40,30,30	L3078	L3078	L3022	L3022	--	H5310	60	60	52.5	52.5		14.5		252	332	400
TM3217AU2F	SS	230	50,50,30,30	H7205	H7205	H7125	H7125	--	H4910T	135.7	135.7	81.7	81.7		22.5		497	617	600
TM3217BU1F	LS	230	50,50,30,30	H7205	H7205	H7125	H7125	--	H4910T	135.7	135.7	81.7	81.7		22.5		497	617	600
TM3217CU2B	SS	460	50,50,30,30	H7205	H7205	H7125	H7125	H4910T	H4910T	67.9	67.9	40.8	40.8	11.3	11.3		258	318	400
TM3217CU2F	SS	460	50,50,30,30	H7205	H7205	H7125	H7125	--	H4910T	67.9	67.9	40.8	40.8		11.3		249	309	400

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DRYER MODEL #	START METHOD	VOLTAGE	FAN(S) HP	FAN MTR 1	FAN MTR 2	FAN MTR 3	FAN MTR 4	LOAD MTR #	UNLOAD MTR #	FAN 1	FAN 2	FAN 3	FAN 4	LOAD SETTING	UNLOAD SETTING	VFD SETTING	PANEL AMPS	TOTAL MAX AMPS	MAIN SWITCH SIZE
TM3217DU1B	LS	460	50,50,30,30	H7205	H7205	H7125	H7125	H4910T	H4910T	67.9	67.9	40.8	40.8	11.3	11.3		258	318	400
TM3217DU1F	LS	460	50,50,30,30	H7205	H7205	H7125	H7125	--	H4910T	67.9	67.9	40.8	40.8		11.3		249	309	400
TM3217DU2B	SS	460	50,50,30,30	H7205	H7205	H7125	H7125	H4910T	H4910T	67.9	67.9	40.8	40.8	11.3	11.3		258	318	400
TM3217DU2F	SS	460	50,50,30,30	H7205	H7205	H7125	H7125	--	H4910T	67.9	67.9	40.8	40.8		11.3		249	309	400
TM3217DU3F	VFD	460	50,50,30,30	H7205	H7205	H7125	H7125	--	H4910T	67.9	67.9	40.8	40.8		11.3		249	309	400
TM3217PS2F	SS	400	50,50,30,30	L3075	L3075	L3022	L3022	--	H5310	69	69	52.5	52.5		14.5		292	372	400

Appendix B

Motor Nameplate Information

See table below for motor nameplate information. **NOTE:** List is updated often. Contact Sukup Manufacturing Co. for unlisted motor numbers.

MOTOR #	VOLTAGE	PHASE	HP	S.F.	MIN WIRE SIZE	FLA	OVERLOAD	FRAME	COND. HOLE	SHAFT	ENCLOSURE
H1143	208	3	1	1.15	14	3.5	3.5	56C	1/2	0.625	TEFC
H1530	208	3	1.5	1.15	14	5.3	5.3	145T	1/2	0.875	TEFC
H2475	208	3	2	1.25	14	6.4	6.4	145T	1/2	0.875	TEFC
H3245	208	3	3	1.25	14	8.4	8.4	182T	3/4	1.125	ODP
H3345	208	3	3	1.15	14	8.6	8.6	182T	3/4	1.125	TEFC
H4110	208	3	5	1.25	12	13.6	13.6	184T	3/4	1.125	ODP
H4190	208	3	5	1.15	12	13.9	13.9	184T	3/4	1.125	TEFC
H4800	208	3	7.5	1.15	10	20.6	20.6	213T	1	1.375	ODP
H4910	208	3	7.5	1.15	10	20	20	213T	1	1.375	TEFC
H5310	208	3	10	1.15	8	27	27	215T	1	1.375	TEFC
H5475	208	3	10	1.25	8	28.8	28.8	215T	3/4	1.375	ODP
H6110	208	3	15	1.15	6	39	39	254T	1-1/4	1.625	TEFC
H6275	208	3	15	1.15	6	40.5	40.5	254TZ	1-1/4	1.625	ODP
H6610	208	3	20	1.15	4	54	54	256T	1-1/4	1.625	TEFC
H6800	208	3	20	1.15	4	55	55	256TZ	1-1/4	1.625	ODP
H7100	208	3	25	1.15	2	66	66	584T	1-1/2	1.875	TEFC
H7110	208	3	25	1.15	2	66	66	284T	1-1/2	1.875	ODP
H7125	208	3	30	1.15	2	78	78	286TZ	1-1/2	1.875	ODP
H7126	208	3	30	1.15	2	81	81	286T	2	1.875	TEFC
H7175	208	3	40	1.15	1/0	104	104	324T	2	2.125	ODP
H7200	208	3	40	1.15	1/0	100	100	324T	2	2.125	TEFC
H7205	208	3	50	1.15	3/0	129	129	326T	2	2.125	ODP
H7210	208	3	50	1.15	3/0	125	125	326T	2	2.125	TEFC
H1100	230	1	1	1.15	14	7	7	56	1/2	0.625	TEFC
H1525	230	1	1.5	1.15	14	8.6	8.6	56H	1/2	0.625	TEFC
H2175	230	1	2	1.15	14	12.4	12.4	182T	3/4	1.25	TEFC
H2845	230	1	3	1.15	12	19	19	184T	3/4	1.125	TEFC
H3675	230	1	5	1.15	10	20.5	20.5	184T	3/4	1.125	TEFC
H4900	230	1	7.5	1.15	8	33.6	33.6	215T	3/4	1.375	TEFC

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MOTOR #	VOLTAGE	PHASE	HP	S.F.	MIN WIRE SIZE	FLA	OVERLOAD	FRAME	COND. HOLE	SHAFT	ENCLOSURE
H5176	230	1	10	1.25	6	40	40	215TZ	3/4	1.375	ODTF
H5300	230	1	10	1.15	6	40	40	215T	3/4	1.375	TEFC
H6035	230	1	15	1	6	58	58	256TZ	1	1.625	TEFC
H5755	230	1	17	1	6	62	62	256TZ	1	1.625	OPEN
H1143	230	3	1	1.15	14	3.2	3.2	56C	1/2	0.625	TEFC
H1530	230	3	1.5	1.15	14	4.8	4.8	145T	1/2	0.875	TEFC
H2475	230	3	2	1.25	14	5.8	5.8	145T	1/2	0.875	TEFC
H3245	230	3	3	1.25	14	8	8	182T	3/4	1.125	ODP
H3345	230	3	3	1.15	14	7.8	7.8	182T	3/4	1.125	TEFC
H4110	230	3	5	1.25	14	12.6	12.6	184T	3/4	1.125	ODP
H4190	230	3	5	1.15	14	12.6	12.6	184T	3/4	1.125	TEFC
H4800	230	3	7.5	1.15	10	19.8	19.8	213T	1	1.375	ODP
H4910	230	3	7.5	1.15	10	18.6	18.6	213T	1	1.375	TEFC
H5310	230	3	10	1.15	10	25	25	215T	1	1.375	TEFC
H5475	230	3	10	1.25	10	26.8	26.8	215T	3/4	1.375	ODP
H6110	230	3	15	1.15	6	37	37	254T	1-1/4	1.625	TEFC
H6275	230	3	15	1.15	6	37	37	254TZ	1-1/4	1.625	ODP
H6610	230	3	20	1.15	4	50	50	256T	1-1/4	1.625	TEFC
H6800	230	3	20	1.15	4	51	51	256TZ	1-1/4	1.625	ODP
H7100	230	3	25	1.15	4	58.5	58.5	584T	1-1/2	1.875	TEFC
H7110	230	3	25	1.15	4	59.6	59.6	284T	1-1/2	1.875	ODP
H7125	230	3	30	1.15	2	71	71	286TZ	1-1/2	1.875	ODP
H7126	230	3	30	1.15	2	73	73	286T	2	1.875	TEFC
H7175	230	3	40	1.15	1	96	96	324T	2	2.125	ODP
H7200	230	3	40	1.15	1	92	92	324T	2	2.125	TEFC
H7205	230	3	50	1.15	2/0	118	118	326T	2	2.125	ODP
H7210	230	3	50	1.15	2/0	117	117	326T	2	2.125	TEFC
L3036	380	3	3	1.15	14	6.4	6.4	184T	3/4	1.125	TEFC
L3036	400	3	3	1.15	14	6.1	6.1	184T	3/4	1.125	TEFC
H4910	400	3	5	1.15	14	8.0	8.0	213T	1	1.375	TEFC
H5310	400	3	7.5	1.25	14	11.6	11.6	215T	1	1.375	TEFC
L3005	400	3	10	1.15	12	14.3	14.3	215T	1	1.375	TEFC
L3003	400	3	15	1.15	10	21	21.0	254T	1-1/4	1.625	TEFC

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MOTOR #	VOLTAGE	PHASE	HP	S.F.	MIN WIRE SIZE	FLA	OVERLOAD	FRAME	COND. HOLE	SHAFT	ENCLOSURE
L3008	400	3	20	1	10	28.5	28.5	256T	1-1/4	1.625	TEFC
L3082	400	3	25	1.15	6	36.0	36	284T	1-1/2	1.875	TEFC
L3022	400	3	30	1.25	4	42.0	42	286T	2	1.875	TEFC
L3078	400	3	40	1.15	4	53.0	53.0	324T	2	2.125	TEFC
L3075	400	3	50	1	2	69.0	69.0	326T	2	2.125	TEFC
H1143	460	3	1	1.15	14	1.6	1.6	56C	1/2	0.625	TEFC
H1530	460	3	1.5	1.15	14	2.4	2.4	145T	1/2	0.875	TEFC
H2475	460	3	2	1.25	14	2.9	2.9	145T	1/2	0.875	TEFC
H3245	460	3	3	1.25	14	4	4	182T	3/4	1.125	ODP
H3345	460	3	3	1.15	14	3.9	3.9	182T	3/4	1.125	TEFC
H4110	460	3	5	1.25	14	6.3	6.3	184T	3/4	1.125	ODP
H4190	460	3	5	1.15	14	6.3	6.3	184T	3/4	1.125	TEFC
H4800	460	3	7.5	1.15	14	16.8	16.8	213T	1	1.375	ODP
H4910	460	3	7.5	1.15	14	9.4	9.4	213T	1	1.375	TEFC
H5310	460	3	10	1.15	14	12.5	12.5	215T	1	1.375	TEFC
H5475	460	3	10	1.25	12	13.4	13.4	215T	3/4	1.375	ODP
H6110	460	3	15	1.15	10	18.5	18.5	254T	1-1/4	1.625	TEFC
H6275	460	3	15	1.15	10	18.5	18.5	254TZ	1-1/4	1.625	ODP
H6610	460	3	20	1.15	10	25	25	256T	1-1/4	1.625	TEFC
H6800	460	3	20	1.15	8	25.5	25.5	256TZ	1-1/4	1.625	ODP
H7100	460	3	25	1.15	8	29.3	29.3	584T	1-1/2	1.875	TEFC
H7110	460	3	25	1.15	8	29.8	29.8	284T	1-1/2	1.875	ODP
H7125	460	3	30	1.15	6	35.5	35.5	286TZ	1-1/2	1.875	ODP
H7126	460	3	30	1.15	6	36.5	36.5	286T	2	1.875	TEFC
H7175	460	3	40	1.25	4	48	48	324T	2	2.125	ODP
H7200	460	3	40	1.15	4	46	46	324T	2	2.125	TEFC
H7205	460	3	50	1.15	2	59	59	326T	2	2.125	ODP
H7210	460	3	50	1.15	4	58.5	58.5	326T	2	2.125	TEFC
H1110	575	3	1	1.15	14	1.3	1.3	56	1/2	0.625	TEFC
H1545	575	3	1.5	1.15	14	1.9	1.9	56	1/2	0.625	TEFC
H2553	575	3	2	1.25	14	2.3	2.3	145T	1/2	0.875	TEFC
H3352	575	3	3	1.15	14	3.2	3.2	182T	3/4	1.125	TEFC
H4112	575	3	5	1.15	14	5	5	184T	3/4	1.125	TEFC
H4952	575	3	7.5	1.15	14	7.6	7.6	213T	1	1.375	TEFC

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MOTOR #	VOLTAGE	PHASE	HP	S.F.	MIN WIRE SIZE	FLA	OVERLOAD	FRAME	COND. HOLE	SHAFT	ENCLOSURE
H5600	575	3	10	1.15	14	10	10	215T	1	1.375	TEFC
H6100	575	3	15	1.15	12	14.5	14.5	254T	1-1/4	1.625	TEFC
H7050	575	3	20	1.15	10	19	19	256T	1-1/4	1.625	TEFC
H7101	575	3	25	1.15	10	23.6	23.6	284T	1-1/2	1.875	TEFC
H7127	575	3	30	1.15	8	28	28	286T	1-1/2	1.875	TEFC
H7179	575	3	40	1.15	6	36.8	36.8	324T	2	2.125	TEFC
H7230	575	3	50	1.15	4	46	46	326T	2	2.125	TEFC

Appendix C

Optional Dryer Accessories

Auxiliary Motors
Creating MySukup.com Account

<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023	Removed reference to discontinued rotary fill switch	C-2
	Added reference to optional airlock attachment instructions	C-9
	Removed reference to discontinued GSM modem	C-9
08/19/2022	Added Step 1d to order MySukup.com service; added T-shooting instructions	C-6, C-8 & C-9
	Added references to separate document for Aspirator instructions	C-9

Auxiliary Motors

Auxiliary control box is located directly above power box. Inside of auxiliary box there are three (3) optional control circuits. Two (2) control circuits are provided for loading system and one (1) control circuit is provided for unloading system.

For unloading system, a single control circuit is used to start and stop an external unload device at **same time as unload auger of dryer**.

Auxiliary loading system has two (2) optional control circuits. When commencing load sequence, there is a **factory-programmed delay of 5 seconds** between start of load motor and first auxiliary. After first auxiliary has started, there is an **additional factory-programmed 5 second delay** before second auxiliary is started. Delay settings can be adjusted using QuadraTouch Pro system.

Sukup grain dryers use paddle switches as grain level indicators. See photos in Troubleshooting section. Paddle switch has two position switches in it. As paddle is raised by grain, the first (lower) switch closes, indicating dryer is becoming full. When this happens, output for load auxiliary 2 turns off. Typically this is the wet bin auger. When second (upper) switch closes, dryer is completely full. Dryer then turns off load auger and first auxiliary load simultaneously. Dryer will not start load system again until both paddle switches are in their respective "off" positions.

IMPORTANT: Auxiliary components should only be installed in Auxiliary power box located near main power box. **DO NOT** install auxiliary components in main power box.



Installing components

When installing components in Auxiliary box, starter protector is mounted on top DIN rail and contactor is mounted on middle DIN rail directly below.

If component kits are purchased from Sukup Manufacturing Co., starter protectors and contactors will be pre-wired together.

Wiring components

Wiring auxiliaries:

1. Terminal Assignments (Dry Contacts – Potential Free):
 - a. 5 & 7 Load Auxiliary 1 (i.e. Incline)
 - b. 8 & 9 Load Auxiliary 2 (i.e. Horizontal)
 - c. 14 & 15 Unload Auxiliary

IMPORTANT: Terminals 5 & 7, 8 & 9, and 14 & 15 are all potential free contacts. This means that there is no voltage present on these terminals when dryer leaves factory. If auxiliary contactors use a 110VAC coil voltage, supply terminals 5 and 8 with 110VAC via a jumper wire from 1. Therefore, 7 and 9 will be coil voltages for Load Auxiliaries 1 and 2, respectively. The same goes for 14 (coil voltage) and 15 (unload contactor coil).

NOTE: If contactors are not purchased from Sukup Manufacturing Co. **AND** use a coil voltage other than 115VAC, **DO NOT** jumper 1 to 5, 8 or 14. Supply terminals 5, 8 or 14 with correct coil voltage.

1. Fault protection wiring
 - Wire 49D – Fed from terminal strip into first motor overload contact (N/O - will be closed during normal operation)
 - **All additional motor overload contacts are then wired in series**
 - Wire 49* – Taken from last motor overload contact to terminal strip
- * Final letter (i.e. – 49E) depends on number of overloads used.
2. Power wiring
 - Installed similar to those located in power box

IMPORTANT: If contacts installed are not purchased from Sukup Manufacturing, fault protection must be installed. Contact Sukup Manufacturing to purchase these components.

NOTE: On three-phase systems, wild leg should always be connected to center terminal of Main Disconnect switch.

Auxiliary Load & Unload Kit (Optional)

Dryers may be equipped with auxiliary load and/or unload motor starters/overloads. These can only be field-installed.

From tables below, use HP, Voltage and Phase to determine correct auxiliary kit number.

HP	Voltage	Phase	Nameplate FLA	Kit Part #	Starter Protector	Contactor	Wire Size	Minimum Amps	Maximum Amps
5	230	1	20.5	T4660	J5238 (17-23A)	J52462 (40A)	#10	17	23
7.5			33.6	T4662	J52423 (30-40A)	J52462 (40A)	#8	30	40
10			40.0	T4663	J52422 (37-50A)	J5247 (60A)	#6	37	50
15			58.0	T4664	J52421 (48-65A)	J5247 (60A)	#4	48	65
5	208/230	3	12.6	T4672	J5243 (13-18A)	J52302 (18A)	#10	13	18
7.5			18.6	T4673	J5238 (17-23A)	J52462 (40A)	#10	17	23
10			25.0	T4674	J52423 (24-32A)	J52462 (40A)	#8	24	32
15			37.0	T4676	J52422 (37-50A)	J5247 (60A)	#6	37	50
20	460	3	50.0	T4677	J52421 (48-65A)	J5247 (60A)	#4	48	65
5			6.3	T4670	J5236 (6-10A)	J52302 (18A)	#10	6	10
7.5			9.4	T4671	J5237 (9-14A)	J52302 (18A)	#10	9	14
10			12.5	T4672	J5243 (13-18A)	J52302 (18A)	#10	13	18
15	575	3	18.5	T4673	J5238 (17-23A)	J52462 (40A)	#10	17	23
20			25.0	T4674	J52423 (24-32A)	J52462 (40A)	#8	24	32
5			5.0	T4670	J5236 (6-10A)	J52302 (18A)	#10	6	10
7.5			7.6	T4670	J5236 (6-10A)	J52302 (18A)	#10	6	10
10	575	3	10.0	T4671	J5237 (9-14A)	J52302 (18A)	#10	9	14
15			14.5	T4672	J5243 (13-18A)	J52302 (18A)	#10	13	18
20			19.0	T4673	J5238 (17-23A)	J52462 (40A)	#10	17	23

Auxiliary Load and Unload Kit Specifications

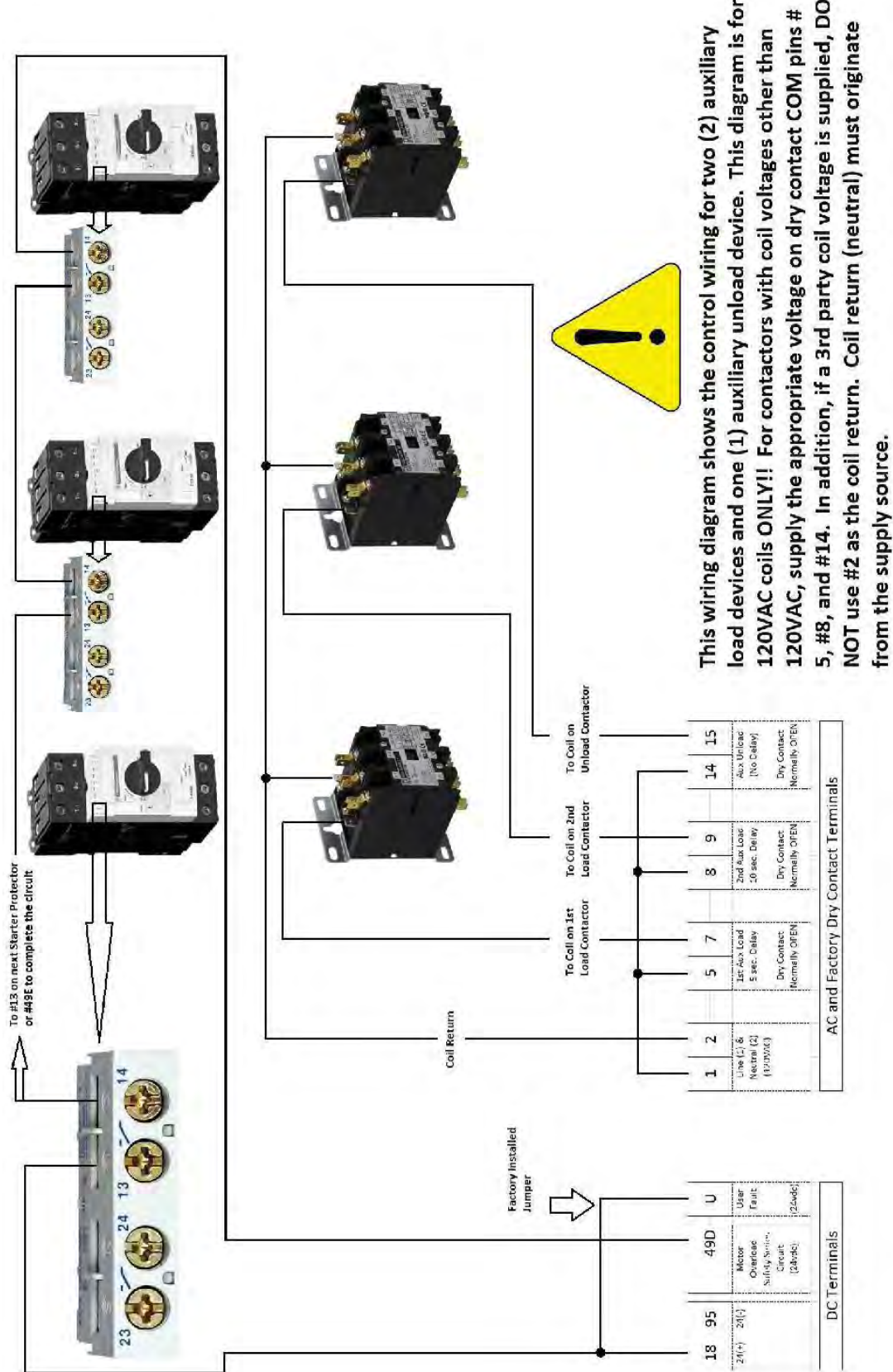
NOTICE: Most main switches and distribution blocks have been sized to handle up to four (4) 10 HP kits on dryer. Refer to electrical load requirements to ensure that main switch and distribution block are sized adequately. If unsure, contact your dealer.

IMPORTANT: If additional auxiliaries are required, dealer is responsible for determining if dryer can handle additional load. If dryer is not able to handle extra load, auxiliary must have its own power source independent of dryer.

Temperature Compensated Overloads, 3-Phase Units

All dryers manufactured as three-phase units are equipped with temperature-compensated overloads. If auxiliary load and unload kits are installed and not purchased from Sukup Manufacturing Co., it is recommended that temperature-compensated units be used.

Auxiliary Load & Unload Terminals



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 invite 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.

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 & Power Converter Programming & Troubleshooting

**ATS22 Soft Start
Altivar 320 Variable Frequency Drive
Single- to Three-Phase Power Converter
Altivar 630 Variable Frequency Drive**

<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023 – Updated ATS22 programming instructions.....		D2
08/19/2022 – Updated Altivar VFD troubleshooting pages		D-8 – D-12

Programming ATS22 Soft Start

1. Press Down arrow until **ConF** appears on screen. Press ENTER.
2. Press Down arrow until **UIn** appears. Press ENTER.
3. Press Up or Down arrows as needed to set voltage. If dryer voltage is 230V, set to 240. If 380V, set to 400. If 460V, set to 480. If 575V, set to 600. Press ENTER.*
4. Press Down arrow until **In** appears. Press ENTER.
5. Press Up or Down arrow as needed to set motor current. Find largest FLA value on sticker in main power box and enter that number. Press ENTER.*
6. Press Down arrow until **LAC** appears. Press ENTER.
7. Press Down arrow until **on** appears. Press ENTER.*
8. Press Escape to reach **ConF** Press ENTER.
9. Press Escape and then press Down arrow until **SEt** appears. Press ENTER.
10. If not already present, press Down arrow until **t90** appears. Press ENTER.
11. Press Up arrow to set to 50. Press ENTER.*
12. Press Down arrow until **tLS** appears. Press ENTER.
13. Press Up arrow until 50 appears. Press ENTER.*
14. Press Down arrow until **ACC** appears. Press ENTER.
15. Press Up arrow until 15 appears. Press ENTER.*
16. Press Down arrow until **tHP** appears. Press ENTER.
17. Press Up arrow until 20 appears. Press ENTER.*
18. Press Escape to reach **SEt** Press ENTER.
19. Press Down arrow until **ADJ** appears. Press ENTER.
20. Press Down arrow until **SSC** appears. Press ENTER.
21. Press Down arrow until **oFF** appears. Press ENTER.*
22. Press Escape until **ADJ** appears. Press ENTER.
23. Press Escape.
24. Press Down arrow until **IO** appears. Press ENTER.
25. Press Down arrow until **r1** appears. Press ENTER.
26. Press Down arrow until **Tr Ip** appears. Press ENTER.*
27. Press Down arrow until **r2** appears. Press ENTER.
28. Press Down arrow until **rUn** appears. Press ENTER.*
29. Press Escape until **IO** appears. Press ENTER.
30. Press Escape to get back to **rdY**.

*Display should blink, indicating that new value is set into memory.

Turn power off and then turn back on after programming.

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
b P F	Bypass contactor detected fault	• Switch-off the soft starter and contact Schneider Electric services.
C F F	Invalid configuration on power-up	• Revert to the factory setting in the soft starter U E I L menu • Reconfigure the soft starter
E L F	External detected fault	• Clear the cause of the detected fault
G r d F	Ground leakage current detected fault	• Check the electrical insulation of the motor • Check the installation • Check the values of G r d d , G r d t parameters in P r D menu page 57
I n F	Internal detected fault	• Disconnect and reconnect the control supply. If the detected fault persists, contact Schneider Electric product support
O C F	Motor overcurrent	• Check the values of O I d and O I t parameters in P r D menu page 56
O H F	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
O L F	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 L H P parameter in S E t menu page 52 and I n parameter in c o n F menu page 50 • Wait for the motor to cool before restarting
O S F	Overvoltage	• Check U L n parameter in c o n F menu • Check the power supply circuit and voltage • Check O S d and O S t parameters in P r D menu
O t F	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 P t C setting in P r D menu page 59 • Wait for the motor to cool before restarting

Diagnostics / Troubleshooting

Trip code displayed	Name	Remedy
<i>PHbd</i>	Phase unbalance	- Check the line voltage. - Check the values of <i>Ubd</i>, <i>Ubt</i> parameters in <i>PrD</i> menu page <i>57</i>.
<i>PHF</i>	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 <i>PrD</i> menu	- Check the line frequency. - Check the configuration of <i>PHL</i>.
<i>PiF</i>	Phase inversion Line phase inversion does not conform to the selection made by <i>PHr</i> in <i>PrD</i> menu	Invert two lines phases or set <i>PHr</i> = <i>OFF</i>.
<i>ErrAP</i>	Trap code	Disconnect and reconnect the control supply. If the detected fault persists, contact Schneider Electric support.
<i>SCF</i>	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.
<i>SLF</i>	Modbus Time Out	Serial link detected fault. Check the RS485 connection.
<i>Snbf</i>	Too many starts	The number of soft starts has exceeded the maximum allowed by <i>Snb</i> in <i>SLG</i> period. See <i>Snb</i> page <i>53</i>.
<i>SSCr</i>	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.
<i>StF</i>	Starting time detected fault Too long start time	- Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) - Check that <i>EL5</i> (Max start time) is bigger than <i>ACC</i> (Acceleration time). See <i>SEt</i> menu page <i>51</i>. - 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.
<i>LbS</i>	Too many starts	- Wait 5 minutes for frame size A. - Wait 15 minutes for frame sizes B, C, D and E. <i>LbS</i> appears after <i>Snbf</i> trip message, when trying to reset the soft starter before end of the timer.
<i>UCF</i>	Motor underload (undercurrent)	Check the values of <i>Uld</i> and <i>Ule</i> parameters in <i>PrD</i> menu page <i>57</i>.
<i>USF</i>	Under voltage or no voltage	- Check <i>Uln</i>, <i>USd</i> and <i>USE</i> parameters in <i>PrD</i> menu - Check line voltage.

Remote keypad messages

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

Programming Altivar 320 Variable Frequency Drive

Use green jog dial for navigation by turning clockwise or counterclockwise. Pressing jog dial enables user to make a selection or confirm information. Use adjacent ESC button to quit a menu or parameter or to clear value displayed in order to revert to value in memory.

Setting Standard Motor Frequency (bFr):

1. Push dial once to get into menu system.
2. Turn dial to Configuration menu, (**ConF**); push dial to enter menu.
3. Turn dial to FULL menu, (**FuLL**); push dial to enter menu.
4. Turn dial to Motor Control menu, (**drC**); push dial to enter menu.
5. Turn dial to Standard Motor Frequency menu, (**bFr**); push dial to enter menu.
6. Turn dial until applicable value from table below is shown; push dial to enter new value.
Number will flash once, meaning new value is set.
7. Press **ESC** until **RDY** is displayed.

Setting Rated Motor Voltage (unS):

1. Push dial once to get into menu system.
2. Turn dial to Configuration menu, (**ConF**); push dial to enter menu.
3. Turn dial to FULL menu, (**FuLL**); push dial to enter menu.
4. Turn dial to Simply Start menu, (**SiN**); push dial to enter menu.
5. Turn dial to Rated Motor Voltage menu, (**unS**); push dial to enter menu.
6. Turn dial until applicable value from table below is shown; push dial to enter new value.
Number will flash once, meaning new value is set.
7. Press **ESC** until **RDY** is displayed.

	230V 3HP 1Ø or 3Ø 60HZ	460V 3HP 3Ø 60HZ	575V 3HP 3Ø 60HZ	380V 3HP 3Ø 50HZ
bFr	60	60	60	50
unS	230	460	575	380

NOTE: On 460V dryer, if Altivar 320 is being installed for first time, meter roll motor must be rewired from 230V to 460V.

Programming for Dryer with Drag Conveyor Unload

Setting R1 Configuration (r1):

1. Push dial once to get into menu system.
2. Turn dial to Configuration menu, (**ConF**); push dial to enter menu.
3. Turn dial to FULL menu, (**FuLL**); push dial to enter menu.
4. Turn dial to Inputs/Outputs menu, (**i_o**); push dial to enter menu.
5. Turn dial to R1 Configuration menu, (**r1**); push dial to enter menu.
6. Display will show (**r1**) again, or turn dial until it does and push dial to enter.
7. Turn dial to No drive fault, (**FLt**), is shown; push dial to enter new value.
8. Press **ESC** until **RDY** is displayed.

Setting R2 Configuration (r2):

1. Push dial once to get into menu system.
2. Turn dial to Configuration menu, (**ConF**); push dial to enter menu.
3. Turn dial to FULL menu, (**FuLL**); push dial to enter menu.
4. Turn dial to Inputs/Outputs menu, (**i_o**); push dial to enter menu.
5. Turn dial to R2 Configuration menu, (**r2**); push dial to enter menu.
6. Display will show (**r2**) again, or turn dial until it does and push dial to enter.
7. Turn dial to Drive running, (**run**), is shown; push dial to enter new value.
8. Press **ESC** until **RDY** is displayed.

Troubleshooting Altivar 320 Variable Frequency Drive

NOTE: The following pages are from Altivar Machine ATV320 Variable Speed 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]** (r 5 t) in freewheel stop and **[Fast stop]** (F 5 t) 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]** (t t t) and **[2 wire type]** (t t t) 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]** (r 5 t) and remain in stop mode until the communication bus sends a command.

Code	Name / Description
d t t -	[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]** (R t r -) function, page 266.
- By means of a logic input or control bit assigned to the **[FAULT RESET]** (r 5 t -) 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]** (t d t) 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.

RSF, *brF*, *SOF*, *SPF* and *LnF* 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
<i>RnF</i>	[Load slipping]	The difference between the output frequency and the speed feedback is not correct.	- Check the motor, gain and stability 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
<i>RSF</i>	[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.
<i>bLF</i>	[Brake control]	- Brake release current not reached. - Brake engage frequency threshold [Brake engage freq] (<i>bEn</i>) only regulated when brake logic control is assigned.	- Check the drive/motor connection. - Check the motor windings. - Check the [Brake release I FW] (<i>ibr</i>) and [Brake release I Rev] (<i>ird</i>) settings page 206. - Apply the recommended settings for [Brake engage freq] (<i>bEn</i>).
<i>brF</i>	[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.
<i>CrFI</i>	[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.
<i>EEFI</i>	[Control Eeprom]	Internal memory detected fault, control block.	- Check the environment (electromagnetic compatibility). - Turn off, reset, return to factory settings.
<i>EEF2</i>	[Power Eeprom]	Internal memory detected fault, power card.	Contact Schneider Electric Product Support.
<i>FCFI</i>	[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.
<i>HdF</i>	[IGBT desaturation]	Short-circuit or grounding at the drive output.	Check the cables connecting the drive to the motor, and the motor insulation.
<i>ILF</i>	[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.
<i>LnFI</i>	[Rating error]	The power card is different from the card stored.	Check the reference of the power card.
<i>LnF2</i>	[Incompatible PB]	The power card is incompatible with the control block.	Check the reference of the power card and its compatibility.
<i>LnF3</i>	[Internal serial link]	Communication interruption between the internal cards.	- Check the internal connections. - Contact Schneider Electric Product Support.
<i>LnF4</i>	[Internal-mftg zone]	Internal data inconsistent.	Recalibrate the drive (performed by Schneider Electric Product Support).
<i>LnF5</i>	[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.
<i>LnF9</i>	[Internal- I measure]	The current measurements are incorrect.	- Replace the current sensors or the power card. - Contact Schneider Electric Product Support.
<i>LnF8</i>	[Internal-mains circuit]	The input stage is not operating correctly.	Contact Schneider Electric Product Support.
<i>LnFb</i>	[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
INF	[Internal- CPU]	• Internal microprocessor detected fault.	• Turn off and reset. • Contact Schneider Electric Product Support.
SFFF	[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] (LFr)) 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] (FqF -) 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] (LFr) and [High Speed] (HSP). It is recommended to have at least [Max frequency] (LFr) ≥ 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
ENF	[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.
ENF	[CANopen com.]	• Communication interruption on the CANopen® bus.	• Check the communication bus. • Check the time-out. • Refer to the CANopen® User's manual.
EPFI	[External fit-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.
FBE5	[FB stop fit.]	• Function blocks have been stopped while motor was running.	• Check [Stop FB Stop motor] (Fb5n) 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.
LF F3	[AI3 4-20mA loss]	• Loss of the 4-20 mA reference on analog input AI3.	• Check the connection on the analog inputs.
o b F	[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.] (brR) function page 181, if it is compatible with the application. • Check the supply voltage.
o L F	[Overcurrent]	• Parameters in the [SETTINGS] (SEt -) and [MOTOR CONTROL] (drL -) 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] (CLr). • Increase the switching frequency.
o H F	[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.
o L C	[Proc. overload fit]	• Process overload.	• Check and remove the cause of the overload. • Check the parameters of the [PROCESS OVERLOAD] (oLd -) function, page 286.
o L F	[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.
o P F I	[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
o P F 2	[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] (o P L) to [Output cut] (o R C), 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] (o P L) = [Yes] (Y E 5). 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] (o P L) = [No] (n o), see instructions given page 270. - Check and optimize the following parameters: [IR compensation] (u F r) page 99, [Rated motor volt.] (u n 5) and [Rated mot. current] (n L r) page 94 and perform [Auto tuning] (t u n) page 95.
o S F	[Mains overvoltage]	- Supply voltage too high. - Disturbed mains supply.	Check the supply voltage.
o t F L	[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.
P t F L	[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.
S C F 1	[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] (t t r), page 109. - Increase the switching frequency.
S C F 3	[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] (t t r), page 109. - Reduce the switching frequency.
S C F 4	[IGBT short circuit]	Power component detected fault.	Contact Schneider Electric Product Support.
S C F 5	[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.
S L F 1	[Modbus com.]	Communication interruption on the Modbus bus.	- Check the communication bus. - Check the time-out. - Refer to the Modbus User's manual.
S L F 2	[PC com.]	Communication interruption with PC Software.	- Check the PC Software connecting cable. - Check the time-out.
S L F 3	[HMI com.]	Communication interruption with the graphic display terminal or remote display terminal.	- Check the terminal connection - Check the time-out.
S S F	[Torque/current lim]	Switch to torque or current limitation.	- Check if there are any mechanical problems. - Check the parameters of [TORQUE LIMITATION] (t o L -) page 228 and the parameters of the [TORQUE OR I LIM. DETECT.] (t i d -), page 278.
t J F	[IGBT overheat]	Drive overheated.	- Check the size of the load/motor/drive. - Reduce the switching frequency. - Wait for the motor to cool before restarting.
t n F	[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.
u L F	[Proc. underload Fit]	Process underload.	- Check and remove the cause of the underload. - Check the parameters of the [PROCESS UNDERLOAD] (u L d -) function, page 284.

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

Detected Fault	Name	Probable cause	Remedy
C F F	[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).
C F 1 C F 12	[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.
C S F	[Ch. Sw. fault]	Switch to not valid channels.	Check the function parameters.
d L F	[Dynamic load fault]	Abnormal load variation.	- Check that the load is not blocked by an obstacle. - Removal of a run command causes a reset.
F b E	[FB fault]	Function blocks error.	See [FB Fault] (F b F E) for more details.
H C F	[Cards pairing]	The [CARDS PAIRING] (P P 1 -) 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] (P P 1) if the card was changed deliberately.
P H F	[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] (P L) = [No] (n o) page 94.
u S F	[Undervoltage]	- Supply mains too low. - Transient voltage dip.	Check the voltage and the parameters of [UNDERVOLTAGE MGT] (u S b -), page 273.

Option card changed or removed

When an option card is removed or replaced by another, the drive locks in [Incorrect config.] (C F F) 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.] (C F F) 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
i n i t	[Initialization in progress]	The microcontroller is initializing. Search underway for communication configuration.
C o m . E (1)	[Communication error]	Time out detected fault (50 ms). This message is displayed after 20 attempts at communication.
A - 1 1 (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.
C L r (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.
d E u . E (1)	[Drive disparity]	The drive brand does not match that of the remote display terminal.
r o m . E (1)	[ROM anomaly]	The remote display terminal detects a ROM anomaly on the basis of checksum calculation.
r a m . E (1)	[RAM anomaly]	The remote display terminal detects a RAM anomaly.
C P u . E (1)	[Other detected faults]	Other detected faults.

(1) Flashing

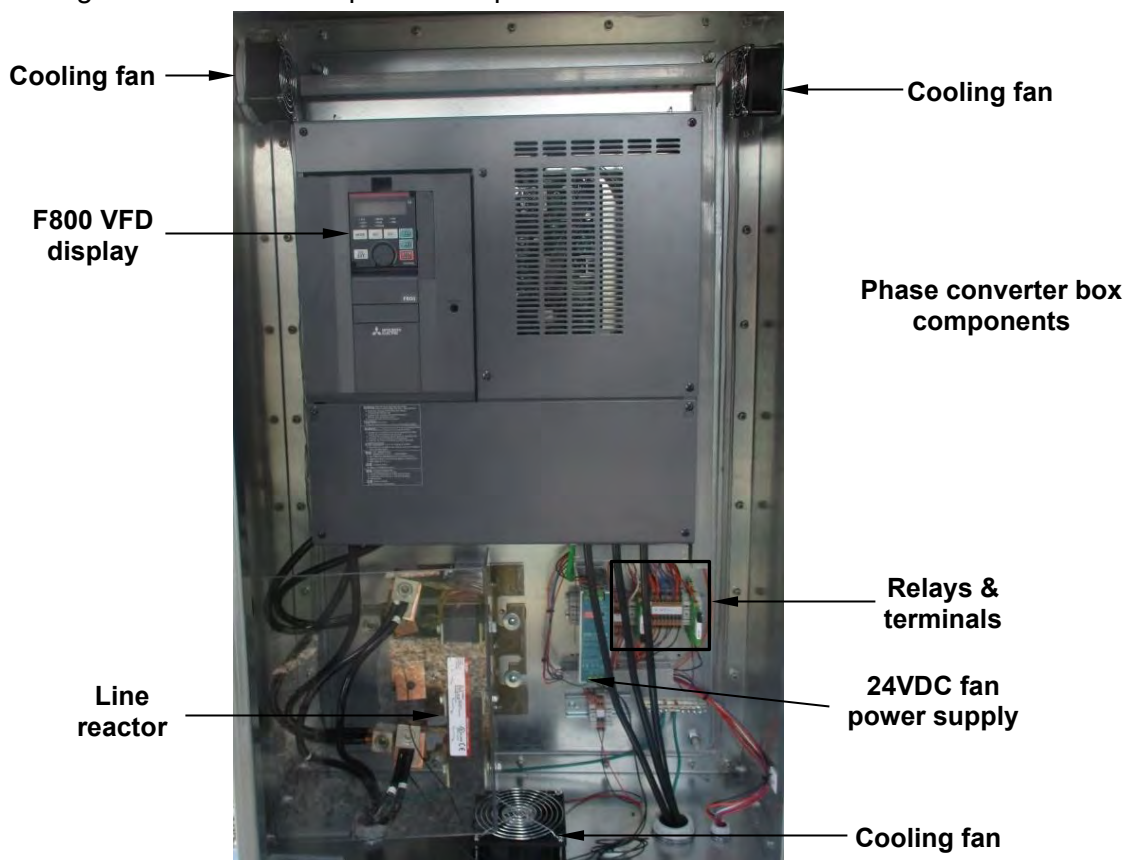
Single- to Three-Phase Power Converter

Programming F800 Variable Frequency Drive

If dryer has a phase converter, use parameters on next page and follow Steps 1-8 on subsequent pages to program F800 VFD. Also see wiring diagram provided.

For troubleshooting, check that settings shown on following pages are correct. If not, reset them using these instructions.

Image below shows components of phase converter box where F800 VFD is located.



WARNING: Disconnect power to phase converter before servicing. Failure to do so could result in electrical shock causing death or serious injury.

Single- to Three-Phase Drive Systems

HP Conversion	Input Wire Size	Output Wire Size	Breaker Amp Setting (A)	Breaker Part #	VFD Part #	Line Reactor Part #	Motor Amp Consumption (A)
20	2	6	95.5	J68821	J68811	J68841	55.1
30	1/O	2	143.2	J68822	J68813	J68843	82.8
40	3/O	2	207.6	J68823	J68814	J68844	120
50	1 PAR	10	238.7	J68824	J68815	J68845	138
60	1/O PAR	1/O	276.8	J68824	J68816	J68846	160

Sukup Manufacturing Centrifugal Fan Mitsubishi F800 Series Programming Settings

Customer: Sukup
Job: Centrifugal Fan
PO: NA
VFD: F800

Date: 5/28/2019
Contact:
Programmer: Dan

Program Parameters in this order

Parameters	Name	Setting Range	Minimum Setting Increments	Initial Value	Customer Setting
P 77	Parameter write selection	0 to 2	1	0	2
This allows you to program in any mode and while it's running.					
P 1	Maximum frequency	0 to 120	0.01Hz	120	60
Drive will not exceed this speed.					
P 2	Minimum frequency	0 to 120	0.01Hz	0	60
Drive will not run below this speed except on start.					
P 7	Acceleration time	0 to 3600	0.1s	15	25
Time in seconds from 0 - 60 Hz.					
P 9	Electronic thermal O/L relay/Rated motor current	0 to 500	0.01A	31	See table below
Motor OL. Usually FLA x S.F.					
P 57	Restart coasting time	0,0.1 to 30,9999	0.1s	9999	2
Wait time for the inverter to perform a restart while rolling.					
P 162	Automatic restart after instantaneous power failure	0 to 3,10 to 13	1	0	13
Frequency search at every start (reduced impact restart)					
P 195	ABC1 terminal function selection	0 to 5,8,10 to 19,25,26,35,39,40 to 42,45 to 54,57,64	1	99	199
Fault Condition or Power Loss breaks the connection between Terminals A1 and C1. When powered up and no Fault, A1 and C1 are connected.					
P 196	ABC2 terminal function selection	0 to 5,8,10 to 19,25,26,35,39,40 to 42,45 to 54,57,64	1	9999	1
When the Drive is at speed, Terminals A1 and C1 are connected. When drive is not at speed, Terminals A1 and C1 are disconnected					
P 250	Stop selection	0 to 100,1000 to 1100,8888,9999	0.1s	9999	0
This causes the drive to coast to stop. It disables the deceleration timer.					
P 882	Regeneration avoidance operation selection	0 to 2	1	0	1
Helps prevent Over Voltage Faults caused by Regen from motor.					

MOTOR HP	AMPS
20	55.2
30	82.8
40	120
50	138



BEGIN BY PUSHING THE MODE BUTTON 1 TIME

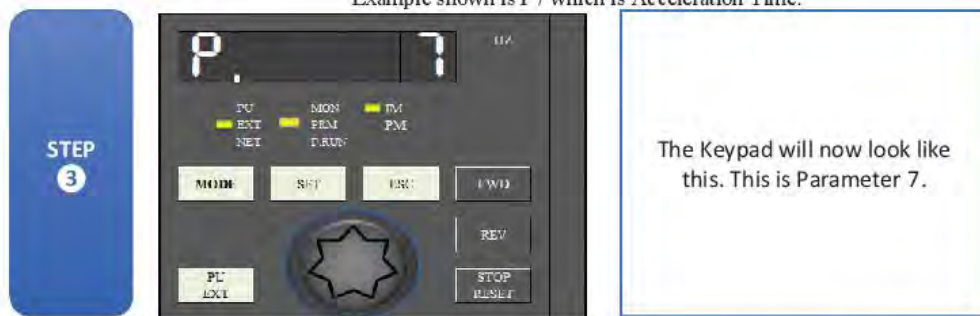
MODE



TURN THE KNOB AND GO TO THE DESIRED PARAMETER



Example shown is P7 which is Acceleration Time.



NOW PRESS THE SET BUTTON TO GO INTO THE PARAMETER

SET



TURN THE KNOB TO MAKE YOUR CHANGE



STEP
5

The Keypad will now look like this. You have changed the Acceleration time to 30.0 seconds.

NOW PRESS THE SET BUTTON TO STORE YOUR CHANGE

SET

STEP
6

The Keypad will now be Flashing between the Parameter number and the New value you just entered. This is what you want to see.

TURN THE KNOB TO GO TO YOUR NEXT PARAMETER



STEP
7

The Keypad will now be displaying the next Parameter you want to change. As an example we are going to P77.

REPEAT STEPS 4 THRU 6 UNTILL YOU ARE DONE WITH ALL PARAMETER

STEP
8

MODE

→

MODE

→

MODE

WHEN DONE PROGRAMMING, RETURN TO MAIN SCREEN BY PRESSING THE MODE BUTTON THREE TIMES



Note: Unused Wires will not be present in the conduits.

7/15/2020

Programming Altivar 630 VFD for Fan

1. Push OK button with directional arrows to get into menu system.
2. Navigate to [Simply Start] or [Complete settings] depending on parameter to be set.
3. Enter each setting by following applicable pathway shown below. Press OK after each entry.

PATHWAY	PARAMETER	SETTING
[Simply Start]	[Motor Standard]	60
[Simply Start]	[Nom Motor Voltage]	230, 460, 575*
[Simply Start]	[Nom Motor Current]	Motor FLA* Svc. Factor
[Simply Start]	[Acceleration]	25.0
[Complete settings] [Input/Output] [Relay] [R1 configuration]	[R1 Assignment]	[Operating State Fault]
[Complete settings] [Input/Output] [Relay] [R2 configuration]	[R2 Assignment]	[Drive Running]
[Complete settings] [Input/Output] [Relay] [R3 configuration]	[R3 Assignment]	[Drive Running]
[Complete settings] [Motor parameters]	[Motor Control Type]	[U/F VC Energy Sav]
[Complete settings] [Generic functions] [Stop configuration]	[Type of Stop]	[Freewheel]

*Based on site & drive

For troubleshooting, check that settings shown above are correct. If not, reset them using these instructions. For more information see Diagnostics and Troubleshooting section of Altivar Process ATV600 Variable Speed Drives Programming Manual, EAV64318, dated 05/2019, available on Sukup website and at www.schneider-electric.com

Appendix E

Dryer Startup

Actions Required to Start Dryer

<u>DATE</u>	<u>REVISION</u>
08/19/2022	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. System Control Switch needs to be turned to "QuadraTouch Pro" position. If using Backup system, "Back-Up" needs to be selected. 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" and choose "Manual Operation".
2. Press "Load" to turn on load auger (if dryer is so equipped). 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.

NOTE: If dryer has gravity-fill, verify in Step 2 that any auxiliary relays are also energized.

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. Switch will illuminate when in Back-Up or 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. Air pressure switches are deactivated during Dry Fire mode. All other monitored safeties are operational at this time.

Fan & 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 17-second purge delay. Air switches are deactivated during Dry Fire mode. Flame sensor will still be active.

Appendix F

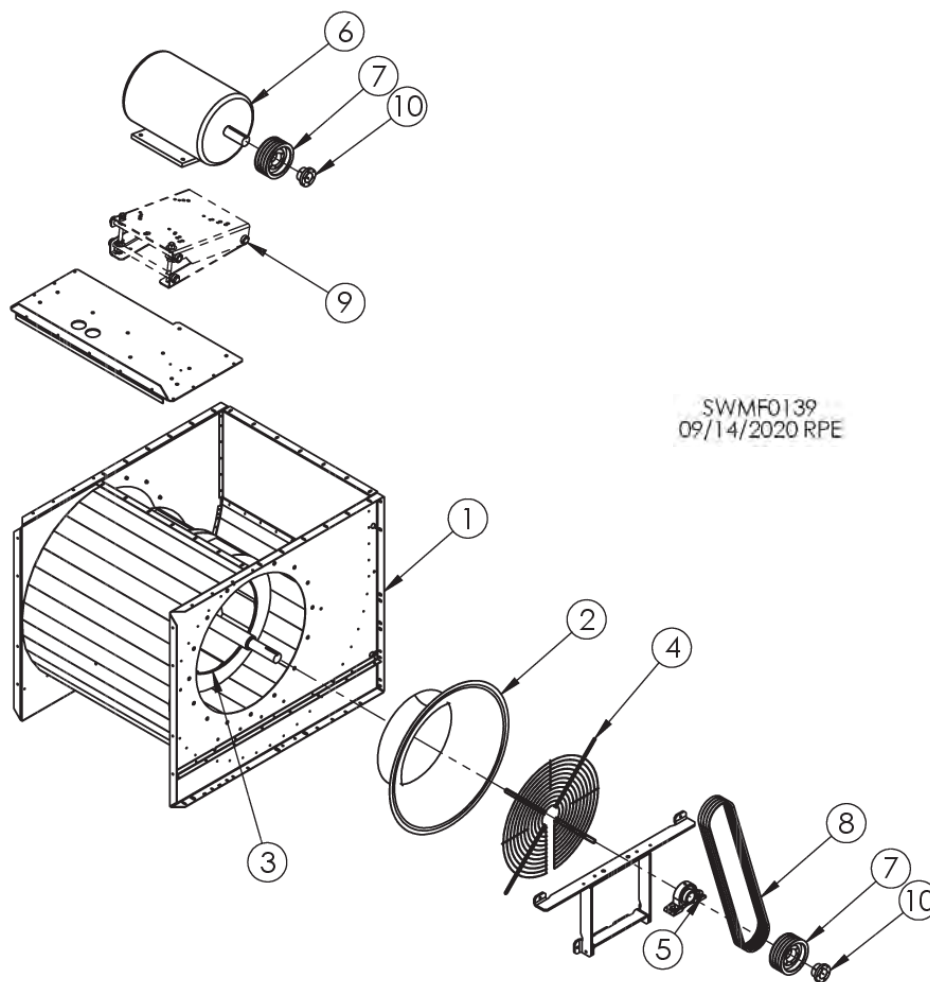
Mixed-Flow Dryer Parts/Assemblies

<u>DATE</u>	<u>REVISION</u>	<u>PAGE</u>
07/27/2023	Updated drawings & parts lists for fans	4-5
	Updated gravity fill section drawings & parts list	38 & 39
	Updated drawings to show belts & added description of belts	42
08/19/2022	Updated part number for sight glass in heater housing	6-11
	Updated description of auger shaft T16436	33, 34, 52-55
	Updated descriptions of parts 4, 5, 9 & 10	41
	Added note on cooling section ID & updated descriptions of pulleys J0337, J03371 & J03385 ..	42
	Updated description & part number of metering roll assy.	47

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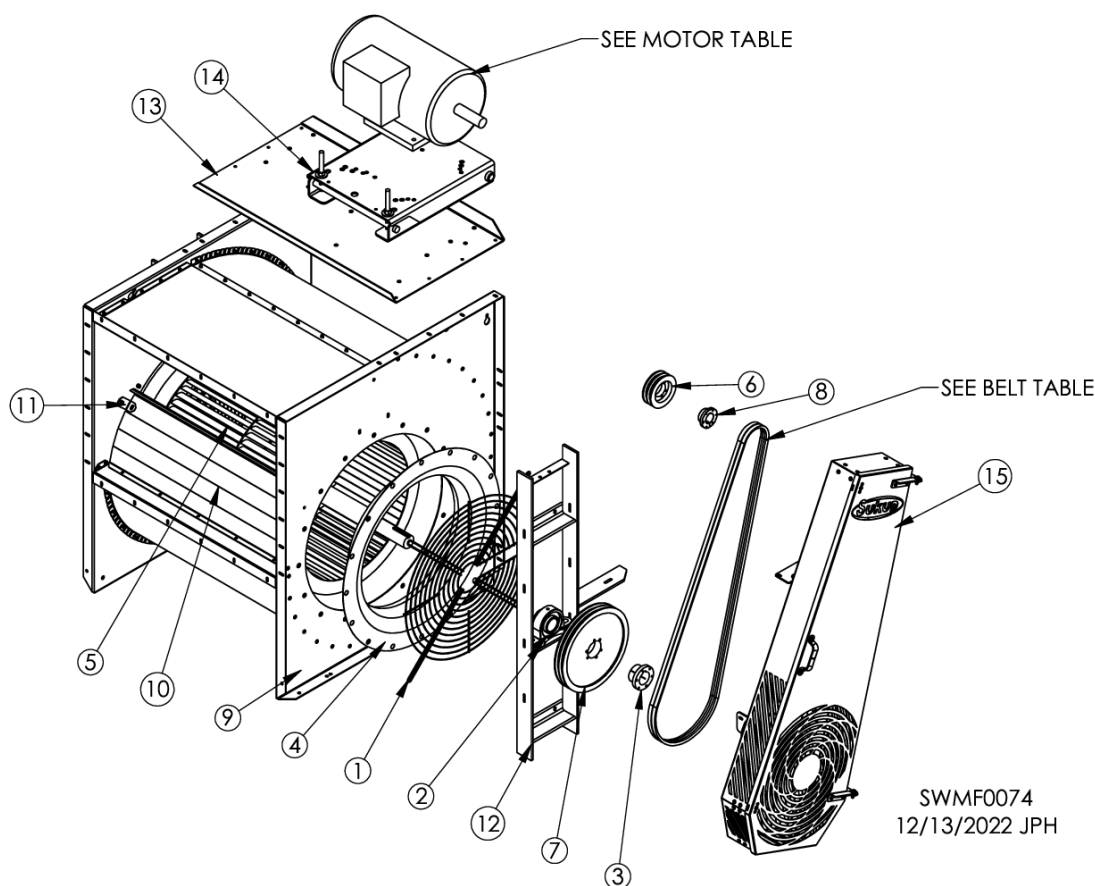
FAN PARTS-----	F-3
HEATER PARTS-----	F-6
PIPE TRAINS-----	F-12
FRAMES-----	F-17
CAM LOCK ASSEMBLIES-----	F-20
COOLING SECTION PARTS-----	F-22
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UP-BLAST FAN



REF. #	DESCRIPTION	30HP, 3PH	40HP, 3PH	50HP, 3PH
1	HOUSING	TM07087	TM07087	TM07087
2	INLET	D1275	D1275	D1275
3	BLADE	T292051	T292041	T292001
4	INLET SCREEN	D3165	D3165	D3165
5	BEARING	J0048	J0048	J0048
6	MOTOR	H7126	H7200T	H7210
7	PULLEY	J03499	J03499	J03499
8	BELT	J0241	J0254	J0254
9	MOTOR MOUNT	TM07210	TM07210	TM07210
10	BUSHING	J0432	J0432	J0432

SIZE 27 CENTRIFUGAL FAN

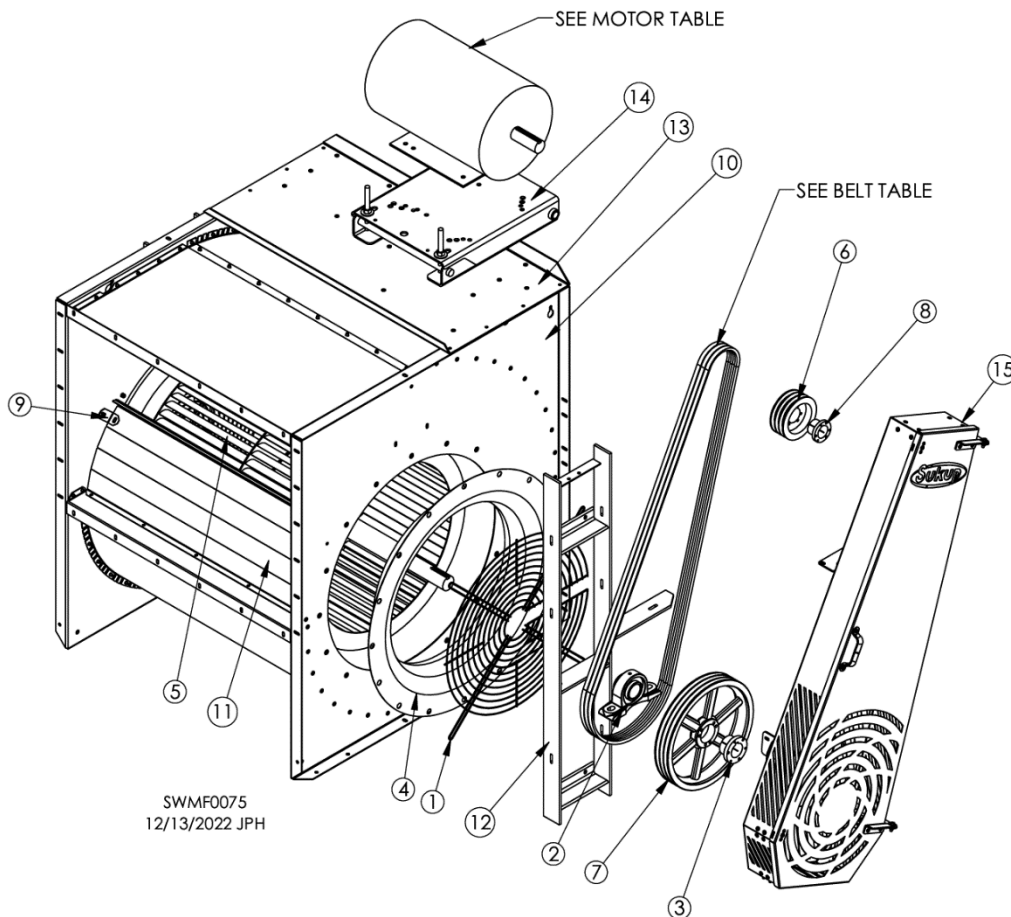


REF. #	DESCRIPTION	QTY.	PART #
1	SCREEN, 30-50HP, DRIVE SIDE, D IN	2	D3165
2	BRG, 2-1/8", SNGL, PILLOW BLOCK	2	J0048
3	BUSHING, 2-1/8", SK	1	J0432
4	CONE, INLET, SIZE 27, FORWARD CURVE	2	J3127
5	WHEEL, SHAFT, FAN, CENT, SIZE 27	1	J3133
6	PULLEY, 5", 2B50SDS	1	J03390
7	PULLEY, 13.6", 2B136SK	1	J03952
8	BUSH, 1-5/8", SDS	1	J04253
9	HOUSING, CENT, F-C, SIZE 27 BLADE	1	T29250
10	BLADE, CUTOFF, FAN, F-C, SIZE 27	1	T29256
11	CLIP, MOUNT, CUTOFF BLADE, F-C	2	T29257
12	SUPPORT, BEARING, FAN, CENT, F-C	2	T29258
13	ASSY, MOTOR MOUNT, F-C, SIZE 27	1	T29260
14	MOUNT, MOTOR, PIVOT, CENT FAN	1	T29360
15	SHIELD, GALV, SIZE 27, ASSY	1	TM08050

DESCRIPTION	HP	PART #
MTR, 15HP, 1PH, 2V, 1750 RPM, TEFC	15	H6035
MTR, 15HP, 3PH, 2/4V, 1750 RPM, TEFC	15	H6110T
MTR, 20HP, 3PH, 2/4V, 1750 RPM, TEFC	20	H6610T
MTR, 30HP, 3PH, 2V, 1750 RPM, TEFC	30	H7126
MTR, 40HP, 3PH, 2/4V, 1750 RPM, TEFC	40	H7200T
MTR, 50HP, 3PH, 230-460V, 1750 RPM, TEFC	50	H7210

BELT DESCRIPTION	PART #
BELT, BX114	J02314
BELT, BX120	J02532
BELT, BX124	J02533
BELT, BX123	J02535
BELT, BX128	J02536

SIZE 30 CENTRIFUGAL FAN 24' & 32' DRYERS

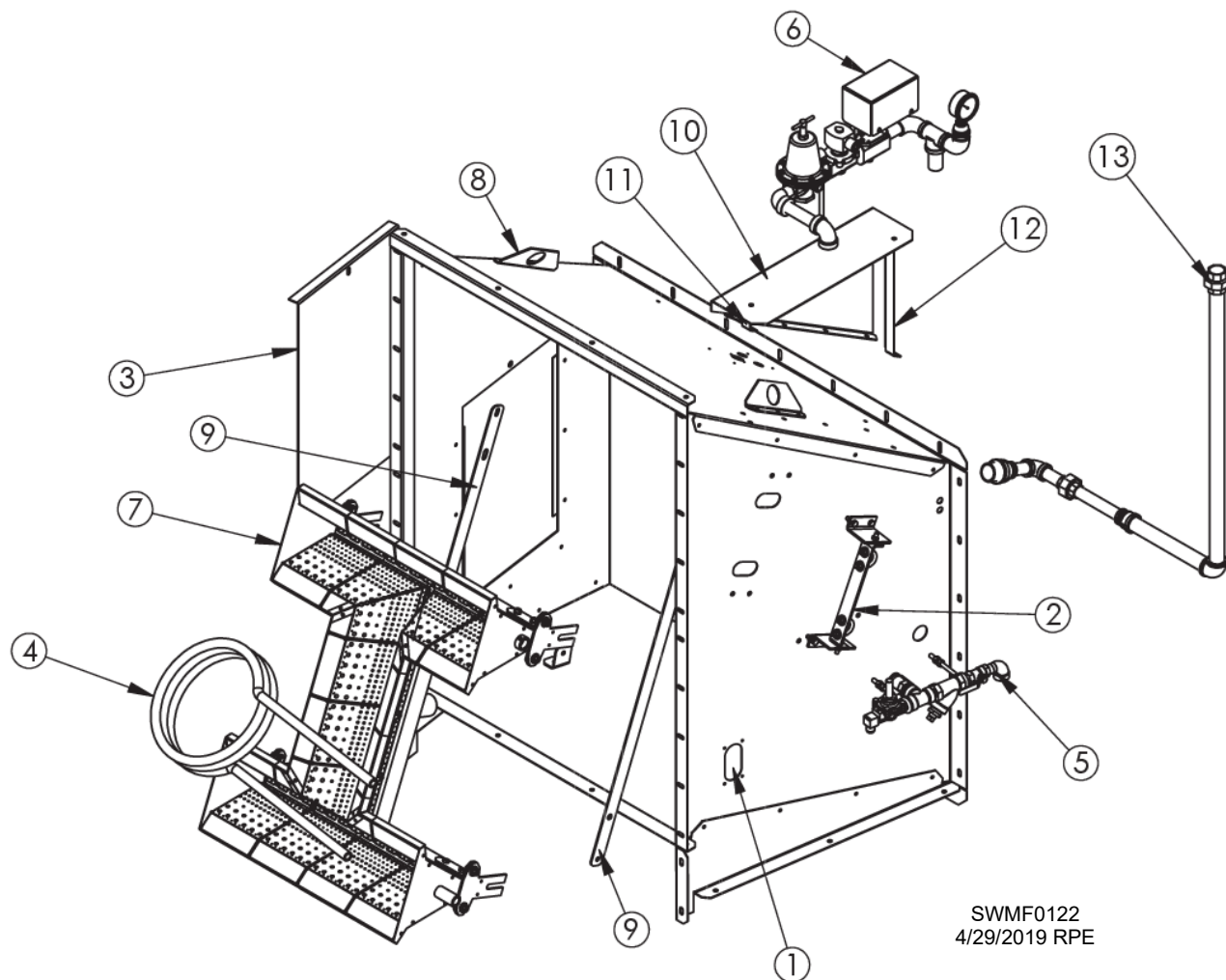


REF. #	DESCRIPTION	QTY.	PART #
1	SCREEN, 30-50HP, DRIVE SIDE, D IN	2	D3165
2	BRG, 2-1/8", SNGL, PILLOW BLOCK	2	J0048
3	BUSHING, 2-1/8", SK	1	J0432
4	CONE, INLET, SIZE 30, FORWARD CURV	2	J3128
5	WHEEL, SHAFT, FAN, CENT, SIZE 30	1	J3134
6	PULLEY, 6", 3B60SD	1	J03441
7	PULLEY, 16", 3B160SK	1	J03991
8	BUSH, 1-7/8" BORE, SD	1	J04284
9	CLIP, MOUNT, CUTOFF BLADE, F-C	2	T29257
10	HOUSING, CENT, F-C, SIZE 30 BLADE	1	T29270
11	BLADE, CUTOFF, FAN, F-C, SIZE 30	1	T29276
12	SUPPORT, BEARING, FAN, CENT, F-C	2	T29278
13	ASSY, MOTOR MOUNT, F-C, SIZE 30	1	T29290
14	MOUNT, MOTOR, PIVOT, CENT FAN	1	T29360
15	SHIELD, GALV, SIZE 30, ASSY	1	TM08059

DESCRIPTION	HP	PART #
MTR, 15HP, 1PH, 2V, 1750 RPM, TEFC	15	H6035
MTR, 15HP, 3PH, 2/4V, 1750 RPM, TEFC	15	H6110T
MTR, 20HP, 3PH, 2/4V, 1750 RPM, TEFC	20	H6610T
MTR, 30HP, 3PH, 2V, 1750 RPM, TEFC	30	H7126
MTR, 40HP, 3PH, 2/4V, 1750 RPM, TEFC	40	H7200T
MTR, 50HP, 3PH, 230-460V, 1750 RPM, TEFC	50	H7210

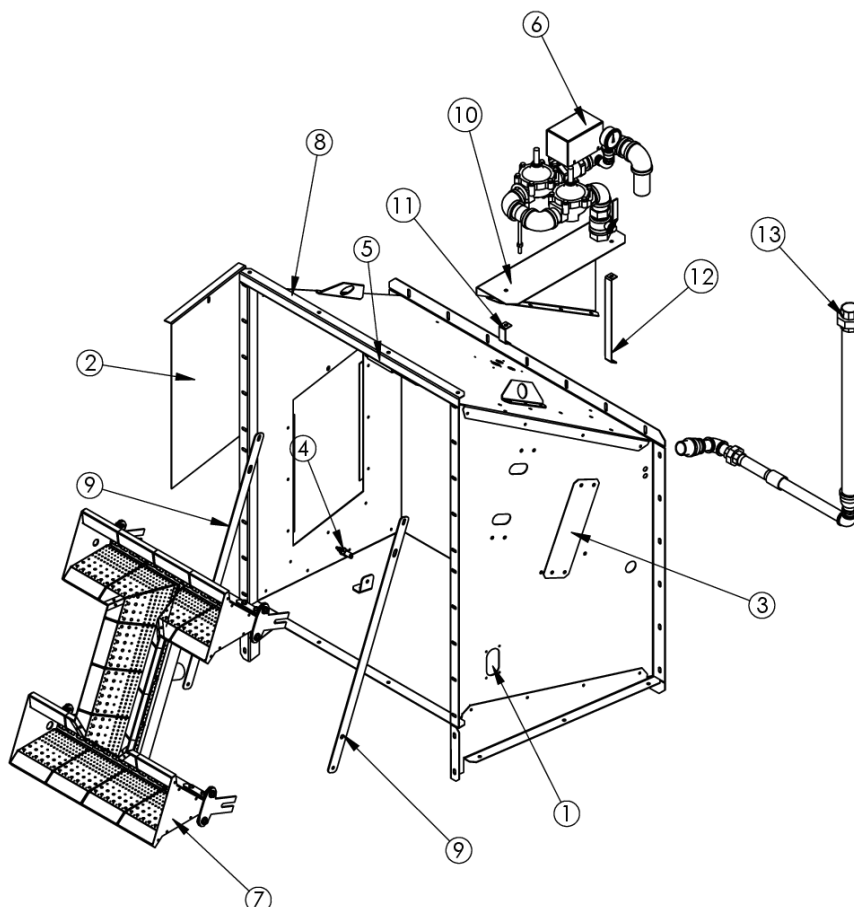
BELT DESCRIPTION	PART #
BELT, BX114	J02314
BELT, BX120	J02532
BELT, BX124	J02533
BELT, BX123	J02535
BELT, BX128	J02536

LP HEATER



REF. #	DESCRIPTION	QTY.	PART #
1	PLEXIGLASS, DRILLED, DOWNSTREAM	1	T17688
2	ASSY, PIVOT BRACKET, VAP, 90 DEG	1	D6322
3	DOOR, SERVICE, CENTER HTR, GALV.	1	D7024
4	VAPORIZER, 3 COIL, 10.5" ID, EXT	1	D70323
5	PIPE TRAIN, LIQUID, 1/2" CENT REV	1	T17134
6	PIPE TRAIN, LP, CENT, REV 3/4"	1	T17221
7	BURNER ELEMENT, ALUMINUM, H, ASSY	1	T29630
8	HOUSING, CENT BURNER, MIXED CFD	1	TM07020
9	BAR, MOUNT, BURNER ELEMENT	2	TM07021
10	SHELF, MOUNTING, PIPE TRAIN	1	TM07022
11	SUPPORT, SMALL, SHELF, PIPE TRAIN	1	TM07023
12	SUPPORT, LARGE, SHELF, PIPE TRAIN	1	TM07024
13	PIPE, ENTRY, HOUSING, LP, DOMESTIC	1	TM07100

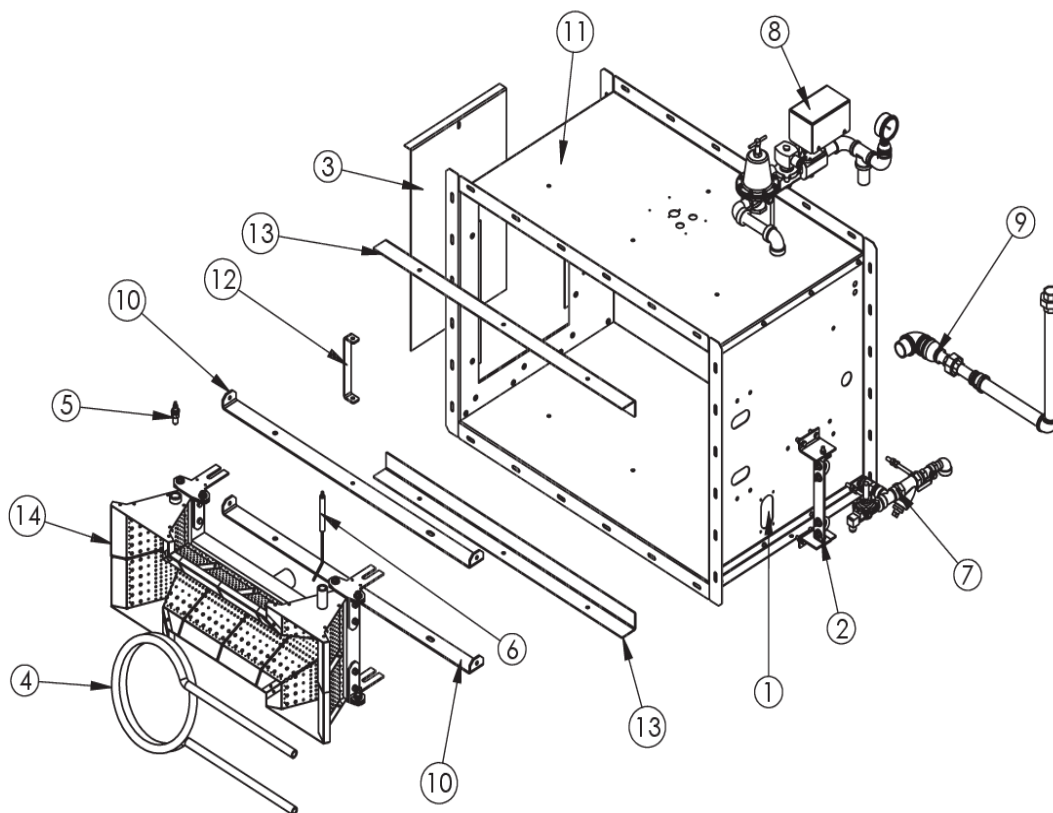
NG HEATER



SWMF0123
5/23/2017 MEO

REF. #	DESCRIPTION	QTY.	PART #
1	PLEXIGLASS, DRILLED, DOWNSTREAM	1	T17688
2	DOOR, SERVICE, CENT HTR, GALV.	1	D7024
3	PLATE, SLOT COVER, NO VAPRZR	1	D7052
4	SPARK PLUG, #64	1	J5739
5	FLAME SENSOR, 2F4-INS3/16-310SS	1	J5747
6	PIPE TRAIN, NG, CENT, REV 1.5"	1	T17201
7	BURNER ELEMENT, ALUMINUM, H, ASSY	1	T29630
8	HOUSING, CENT BURNER, MIXED CFD	1	TM07020
9	BAR, MOUNT, BURNER ELEMENT	2	TM07021
10	SHELF, MOUNTING, PIPE TRAIN	1	TM07022
11	SUPPORT, SMALL, SHELF, PIPE TRAIN	1	TM07023
12	SUPPORT, LARGE, SHELF, PIPE TRAIN	1	TM07024
13	PIPE, ENTRY, HOUSING, NG, DOMESTIC	1	TM07110

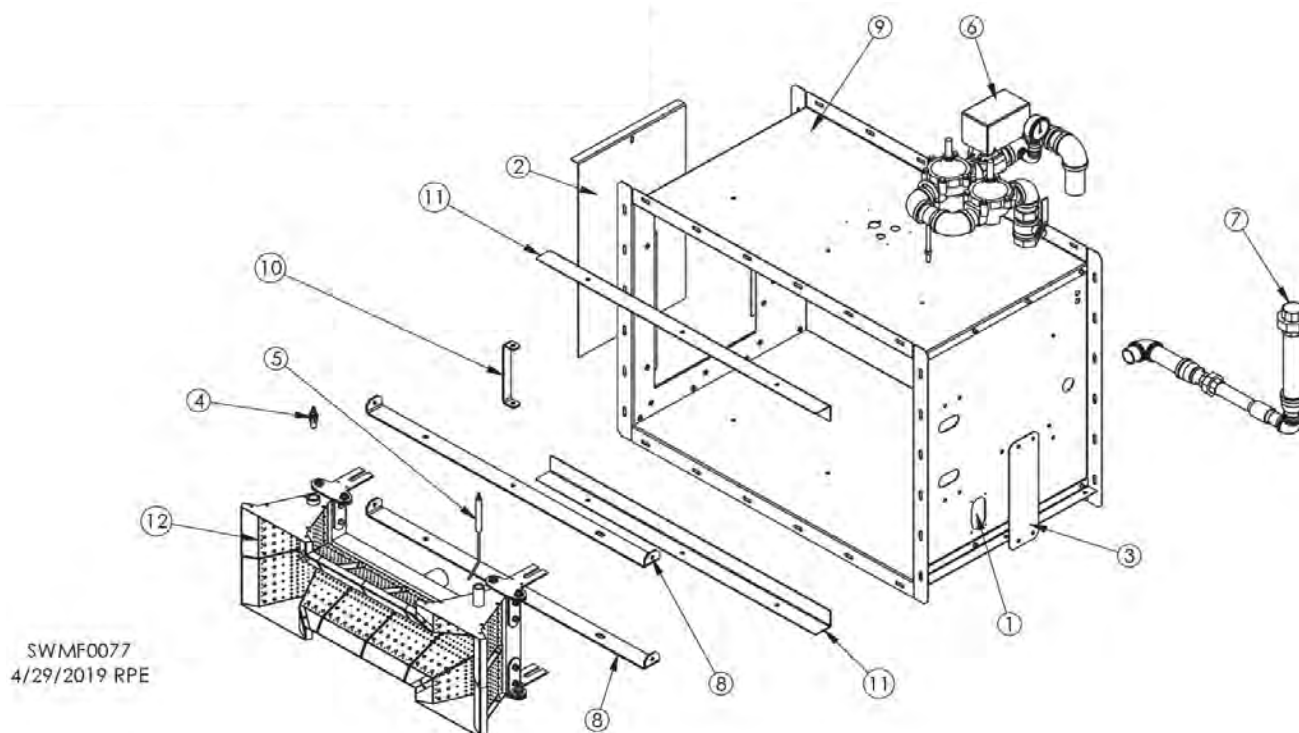
SIZE 27 LP HEATER



SWMF0076
4/29/2019 RPE

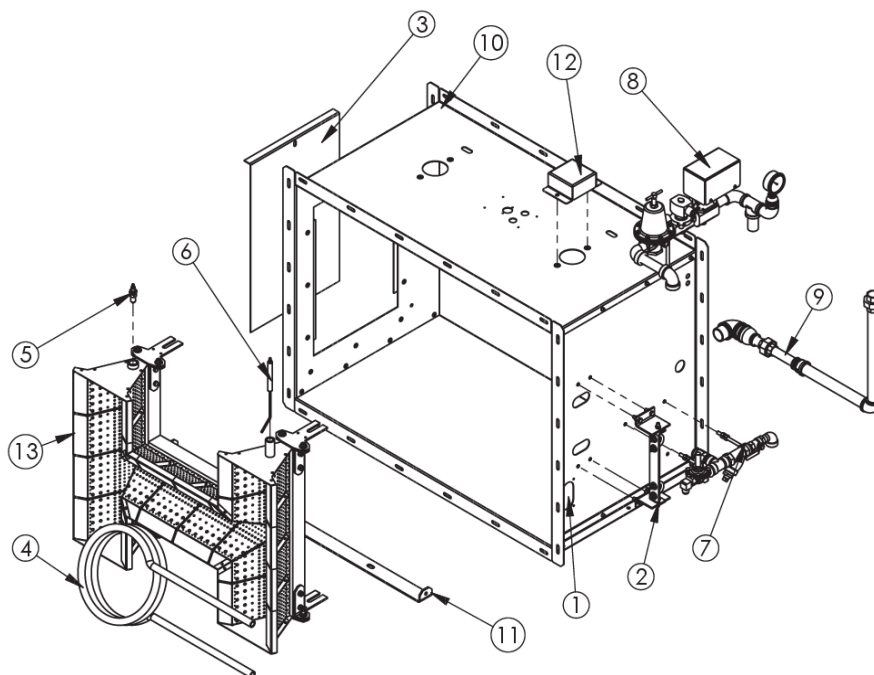
REF. #	DESCRIPTION	QTY.	PART #
1	PLEXIGLASS, DRILLED, DOWNSTREAM	1	T17688
2	ASSY, PIVOT BRACKET, VAP, 90 DEG	1	D6322
3	DOOR, SERVICE, CENT HTR, GALV.	1	D7024
4	VAPORIZER, 2 COIL, 10.5" ID, EXT	1	D70324
5	SPARK PLUG, #64	1	J5739
6	FLAME SENSOR, 2F4-INS3 / 16-310SS	1	J5747
7	PIPE TRAIN, LIQUID, 1/2" CENT REV	1	T17134
8	PIPE TRAIN, LP, CENT, REV 3/4"	1	T17221
9	PIPE, ENTRY, HOUSING, LP, DOMESTIC	1	T17239
10	STRAP, MOUNT, BURNER, H-BRNR	2	T291256
11	HOUSING, BURNER, #27, GALV, H	1	T29129
12	BRACE, TOP, SUPPORT, HEATER	1	T291294
13	PLATE, PROFILE, 2", I-BURNER	2	T291295
14	BURNER ELEMENT, ALUMINUM, ASSY	1	T29650

SIZE 27 NG HEATER



REF. #	DESCRIPTION	QTY.	PART #
1	PLEXIGLASS, DRILLED, DOWNSTREAM	1	T17688
2	DOOR, SERVICE, CENT HTR, GALV.	1	D7024
3	PLATE, SLOT COVER, NO VAPORIZER	1	D7052
4	SPARK PLUG, #64	1	J5739
5	FLAME SENSOR, 2F4-INS3 / 16-310SS	1	J5747
6	PIPE TRAIN, ELMDVLV, NG, CENT, REV	1	T17201
7	PIPE, ENTRY, HOUSING, NG, DOMESTIC	1	T17238
8	STRAP, MOUNT, BURNER, H-BRNR	2	T291256
9	HOUSING, BURNER, #27, GALV, H	1	T29129
10	BRACE, TOP, SUPPORT, HEATER	1	T291294
11	PLATE, PROFILE, 2", I-BURNER	2	T291295
12	BURNER ELEMENT, ALUMINUM, I, ASSY	1	T29650

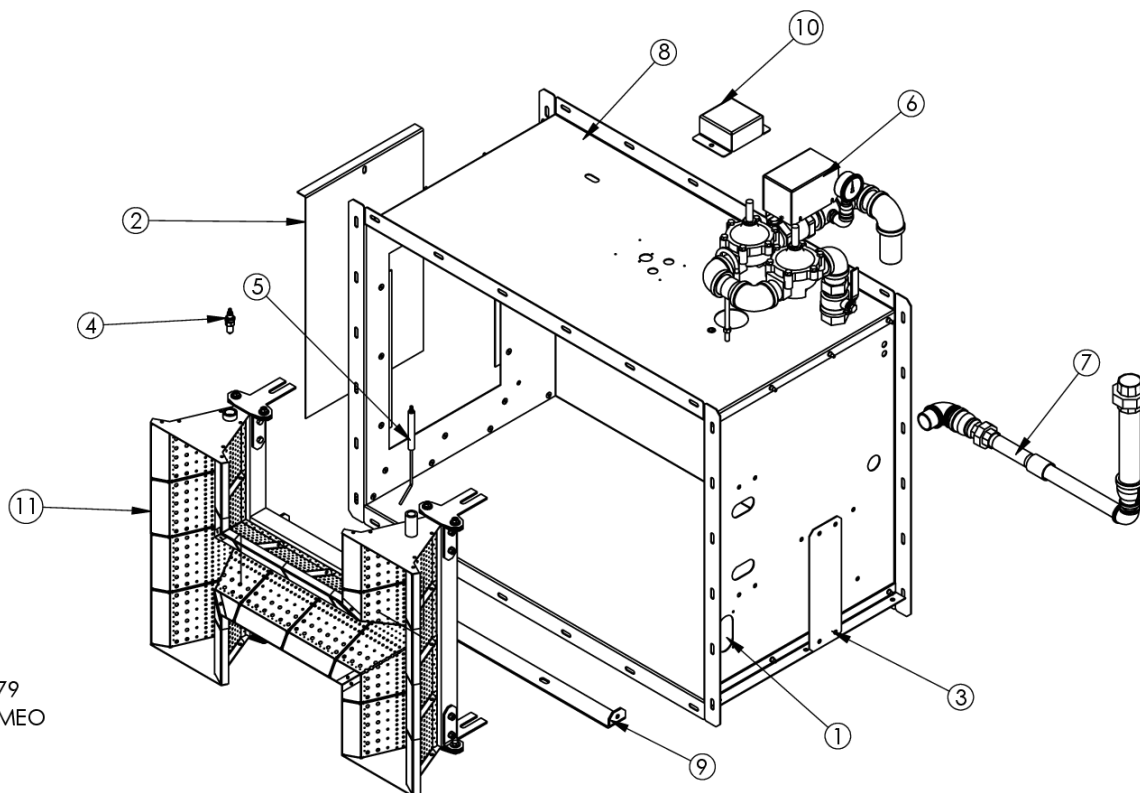
SIZE 30 LP HEATER



SWMF0078
8/17/2019 CSH

REF. #	DESCRIPTION	QTY.	PART #
1	PLEXIGLASS, DRILLED, DOWNSTREAM	1	T17688
2	ASSY, PIVOT BRACKET, VAP, 90 DEG	1	D6322
3	DOOR, SERVICE, CENT HTR, GALV.	1	D7024
4	VAPORIZER, 3 COIL, 10.5" ID, EXT	1	D70323
5	SPARK PLUG, #64	1	J5739
6	FLAME SENSOR, 2F4-INS3 / 16-310SS	1	J5747
7	PIPE TRAIN, LIQUID, 1/2" CENT REV	1	T17134
8	PIPE TRAIN, LP, CENT, REV 3/4"	1	T17134
9	PIPE, ENTRY, HOUSING, LP, DOMESTIC	1	T17237
10	HOUSING, BURNER, #30, GALV, H	1	T29125
11	STRAP, MOUNT, BURNER, H-BURNER	1	T291254
12	COVER, FLAME SENSOR, #30, H-BURNER	1	T291255
13	BURNER ELEMENT, ALUMINUM, H, ASSY	1	T29630

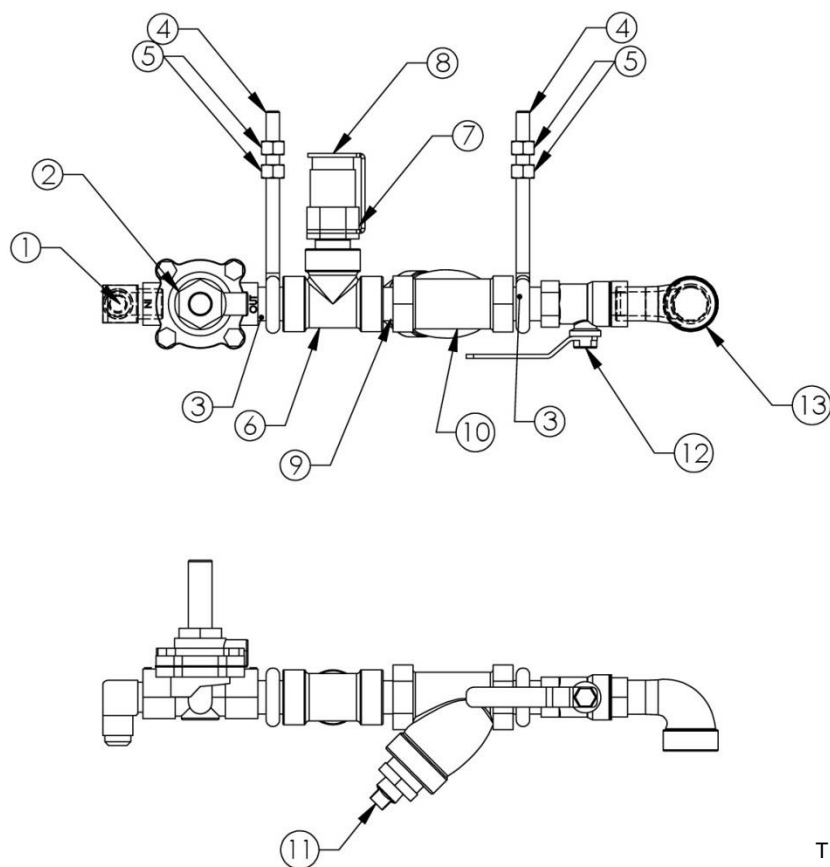
SIZE 30 NG HEATER



SWMF0079
4/11/2017 MEO

REF. #	DESCRIPTION	QTY.	PART #
1	PLEXIGLASS, DRILLED, DOWNSTREAM	1	T17688
2	DOOR, SERVICE, CENT HTR, GALV.	1	D7024
3	PLATE, SLOT COVER, NO VAPORIZER	1	D7052
4	SPARK PLUG, #64	1	J5739
5	FLAME SENSOR, 2F4-INSC / 16-310SS	1	J5747
6	PIPE TRAIN, NG, CENT, REV 1.5"	1	T17201
7	PIPE, ENTRY, HOUSING, NG, DOMESTIC	1	T17236
8	HOUSING, BURNER, #30, GALV, H	1	T29125
9	STRAP, MOUNT, BURNER, H-BURNER	1	T291254
10	COVER, FLAME SENSOR, #30, H-BURNER	1	T291255
11	BURNER ELEMENT, ALUMINUM, H, ASSY	1	T29630

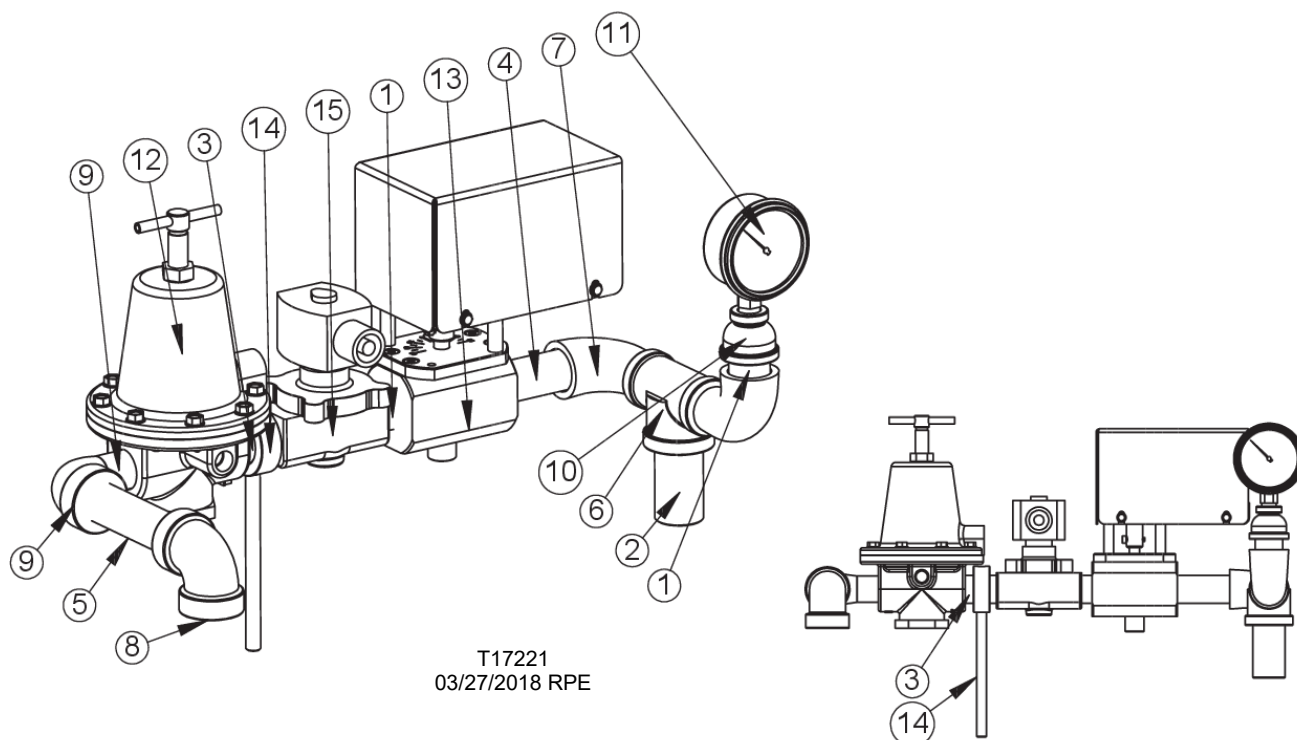
LP 1/2" PIPE TRAIN



T17134
02/04/2019 JFJ

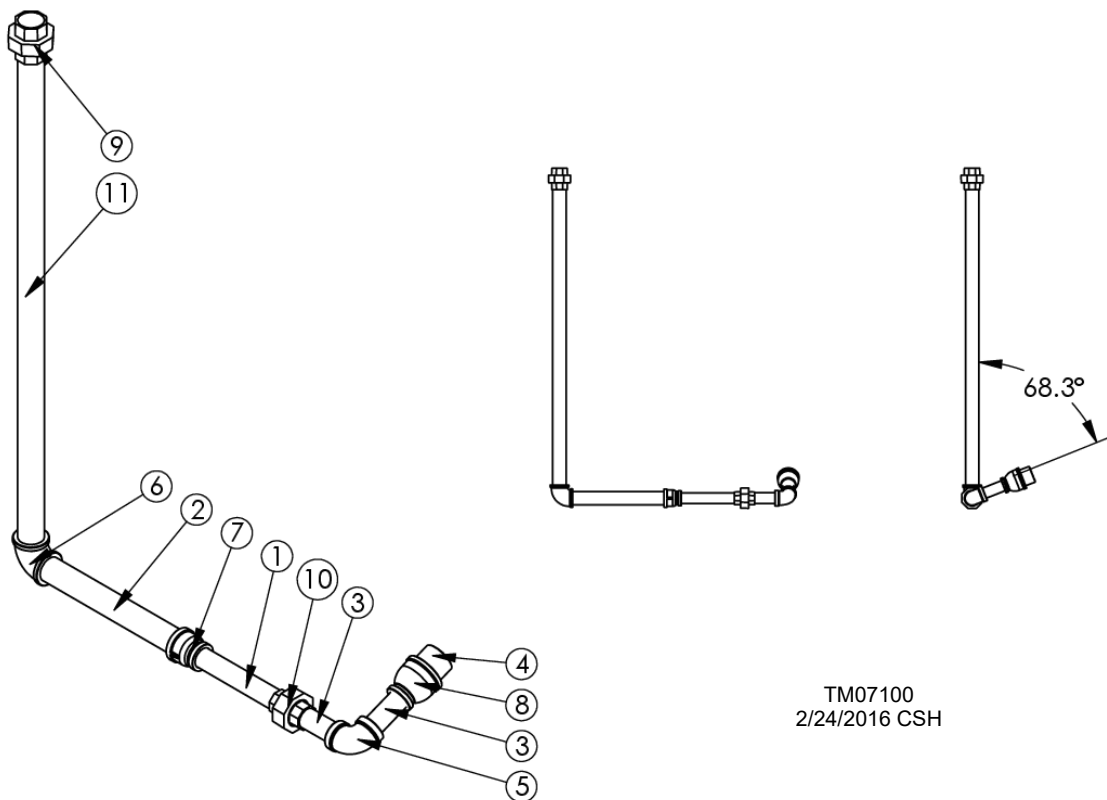
REF. #	DESCRIPTION	QTY.	PART #
1	ELBOW, 1/2 FL X 1/2 MIP, 90°, E1-8D	1	J2745
2	SOLENOID ASSY, LIQUID, 1/2" W/WIRES	1	T17034
3	NIPPLE, 1/2 X 1-1/2, SCH40	2	J2406
4	EYEBOLT, 3/8-16, 4.25, 1" ID EYE	2	J0860
5	NUT, HEX, 3/8-16, PLT	4	J1020
6	TEE, 1/2 X 1/2 X 1/2, SCH80	1	J2472
7	VALVE, 1/2", RELIEF, 3129G, H135-2	1	J6170
8	RAIN CAP, 7545-10	1	J6200
9	NIPPLE, 1/2" X CLOSE, SCH80	1	J2407
10	STRAINER, LIQUID, 1/2"	1	J5992
11	PLUG, 3/8, PIPE, BLACK	1	J2610
12	VALVE, 1/2", BALL, ITT 1550	1	J6082
13	ELBOW, STREET, 1/2, 90 DEG, SCH80	1	J2519

LP 3/4" PIPE TRAIN



REF. #	DESCRIPTION	QTY.	PART#
1	NIPPLE, 3/4" X CLOSE, SCH 40	2	J2410
2	NIPPLE, 1.00 X 2.5 SCH40	1	J24173
3	NIPPLE, 3/4" X 2", SCH40	1	J2420
4	NIPPLE, 3/4" X 3"	1	J2423
5	PIPE, 3/4 X 4 1/2, SCH 80	1	J24251
6	TEE, 3/4 X 3/4 X 1, SCH40	1	J24811
7	ELBOW, STREET, 3/4", 90 DEG, SCH 40	2	J2530
8	ELBOW, 3/4, 90 DEG, SCH 80	1	J2531
9	ELBOW, STREET, 3/4, 90 DEG, EX HVY	1	J2532
10	COUPLING, REDUCING, 3/4 X 1/4 SCH40	1	J2574
11	GAUGE, PRES, 0-30, LIQ, 1/4BTM, MT	1	J5960
12	REGULATOR, 3/4", 1586VN	1	J6163
13	VALVE, BUTTERFLY, 3/4", SCC, W/MNT	1	T161916NN
14	EYEBOLT, PIPE TRAIN, 4.75" THREAD	1	T18810
15	VALVE, 3/4" VAPOR ASSY, W/WIRES	1	T20215

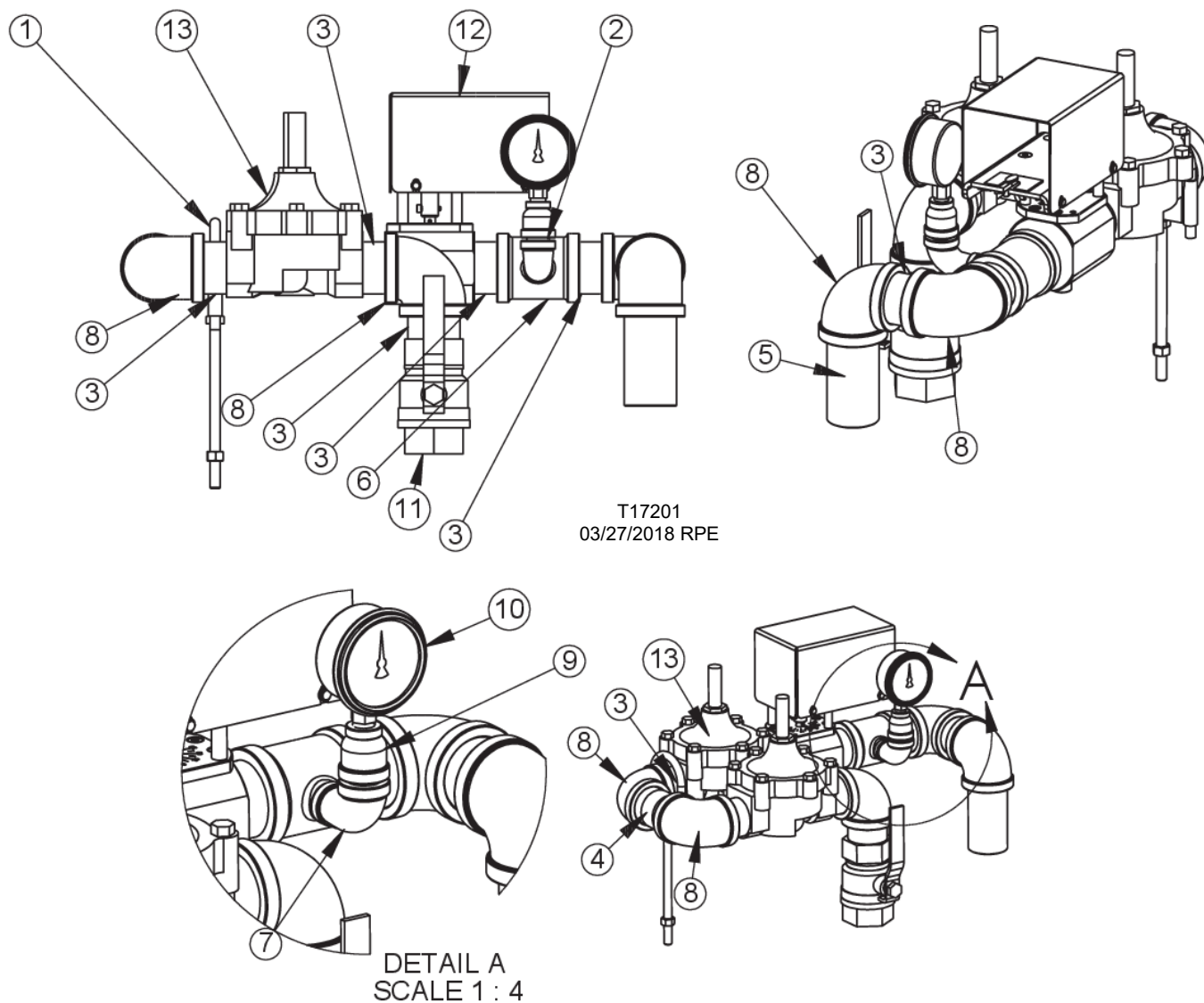
LP 3/4" BURNER PIPE



TM07100
2/24/2016 CSH

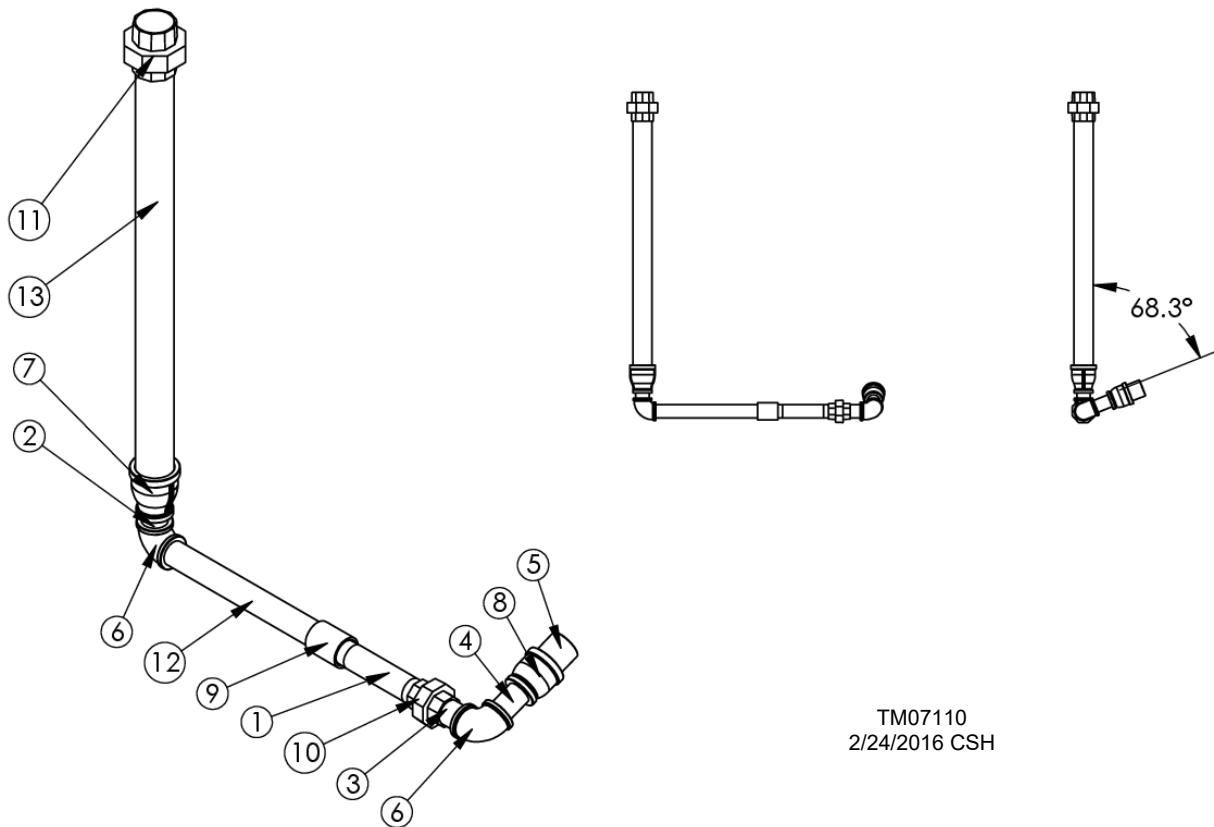
REF. #	DESCRIPTION	QTY.	PART #
1	ORIFICE PIPE, 3/4" X 6 1/4"	1	D7124
2	NIPPLE, 1 X 10, SCH 40	1	J24171
3	NIPPLE, 3/4" X 3"	2	J2423
4	NIPPLE, 1.25 X CLOSE	1	J2500
5	ELBOW, 3/4, 90 DEG, SCH40	1	J2525
6	ELBOW, 1, 90 DEG, SCH40	1	J25251
7	COUPLING, RED, 1 X 3/4", SCH40	1	J2552
8	COUPLING, REDUCING, 1 1/4 X 3/4 SCH40	1	J2576
9	UNION, 1" SCH40	1	J2696
10	UNION, 3/4, BLACK, #150	1	J2710
11	PIPE, 1" X 30", SCH40	1	T17219

NG 1-1/2" PIPE TRAIN



REF. #	DESCRIPTION	QTY.	PART #
1	CLAMP, PIPE TRAIN, 2"	1	D71163
2	NIPPLE, 1/2 X CLOSE, SCH40	1	J2405
3	NIPPLE, 1 1/2" X CLOSE SCH40	8	J2431
4	NIPPLE, 1 1/2" X 3", SCH40	1	J2433
5	NIPPLE, 1 1/2" X 4", SCH40	1	J2436
6	TEE, REDUCE, 1 1/2" X 1 1/2" X 1/2"	1	J2479
7	ELBOW, STREET, 1/2 , 90 DEG, SCH40	1	J2520
8	ELBOW, 1 1/2", 90 DEG, SCH40	5	J2541
9	COUPLING, REDUCING, 1/2" X 1/4" SCH 40	1	J2572
10	GAUGE, PRESSURE, 0-15, LIQ, 1/4" BTM, MT	1	J5967
11	VALVE, 1 1/2", BALL	1	J6087
12	VALVE, BUTTERFLY, 1 1/2" SCC, W/MNT	1	T161917NN
13	SOLND ASSY, NG, 1 1/2", CENT REV	2	T20209

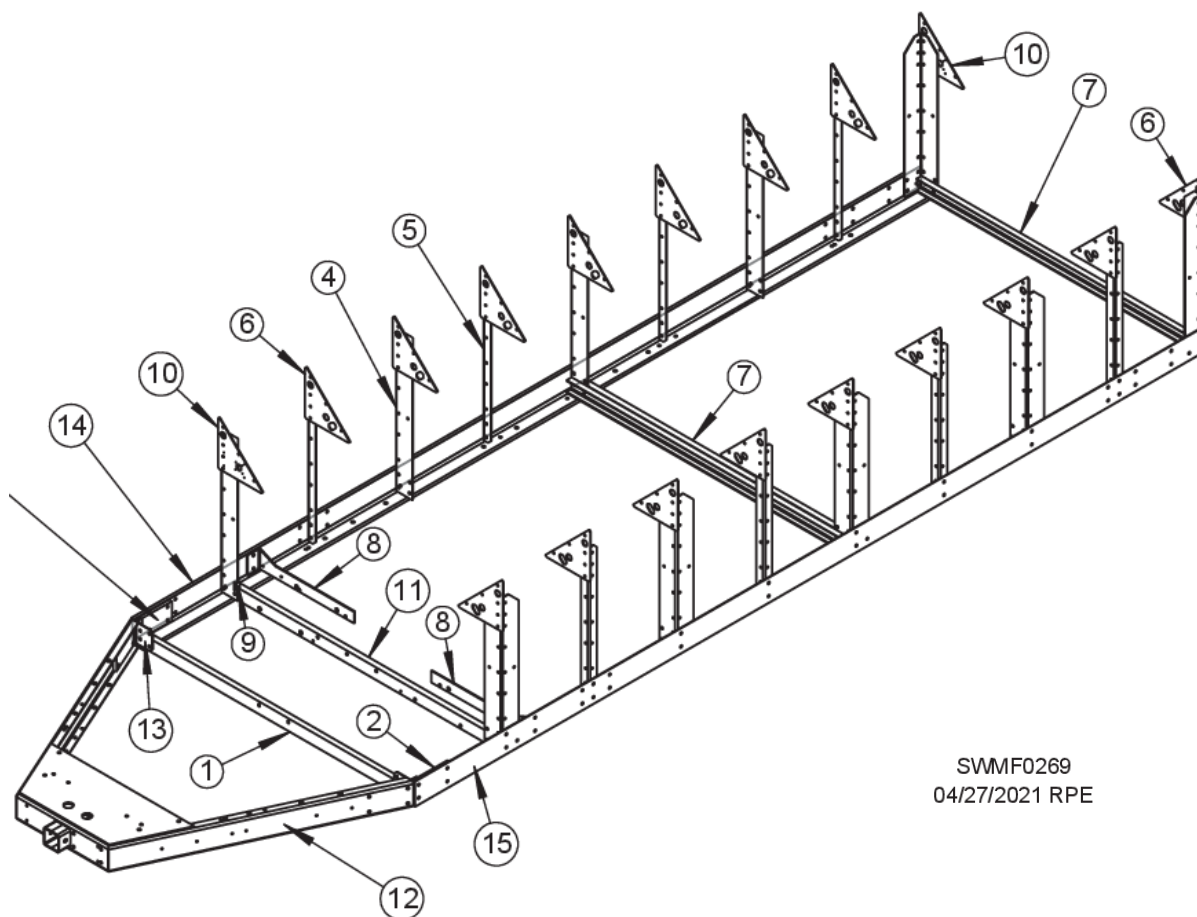
NG 1-1/2" BURNER PIPE



TM07110
2/24/2016 CSH

REF. #	DESCRIPTION	QTY.	PART #
1	ORIFICE PIPE, 1" X 6"	1	D71191
2	NIPPLE, 1" X CLOSE SCH40	1	J2417
3	NIPPLE, 1" X 2", SCH40	1	J24172
4	NIPPLE, 1" X 2 1/2", SCH40	1	J24173
5	NIPPLE, 1 1/4" X 2", SCH40	1	J25011
6	ELBOW, 1, 90 DEG., SCH40	2	J25251
7	COUPLING, REDUCING, 1 1/2" X 1", SCH40	1	J2553
8	COUPLING, REDUCING, 1 1/4" X 1", SCH40	1	J25761
9	COUPLING, 1, BLACK, SCH40	1	J2675
10	UNION, 1", SCH40	1	J2696
11	UNION, 1 1/2", SCH40	1	J2707
12	PIPE, 1" X 11", SCH40	1	T17217
13	PIPE, 1 1/2" X 25", SCH40	1	T251641

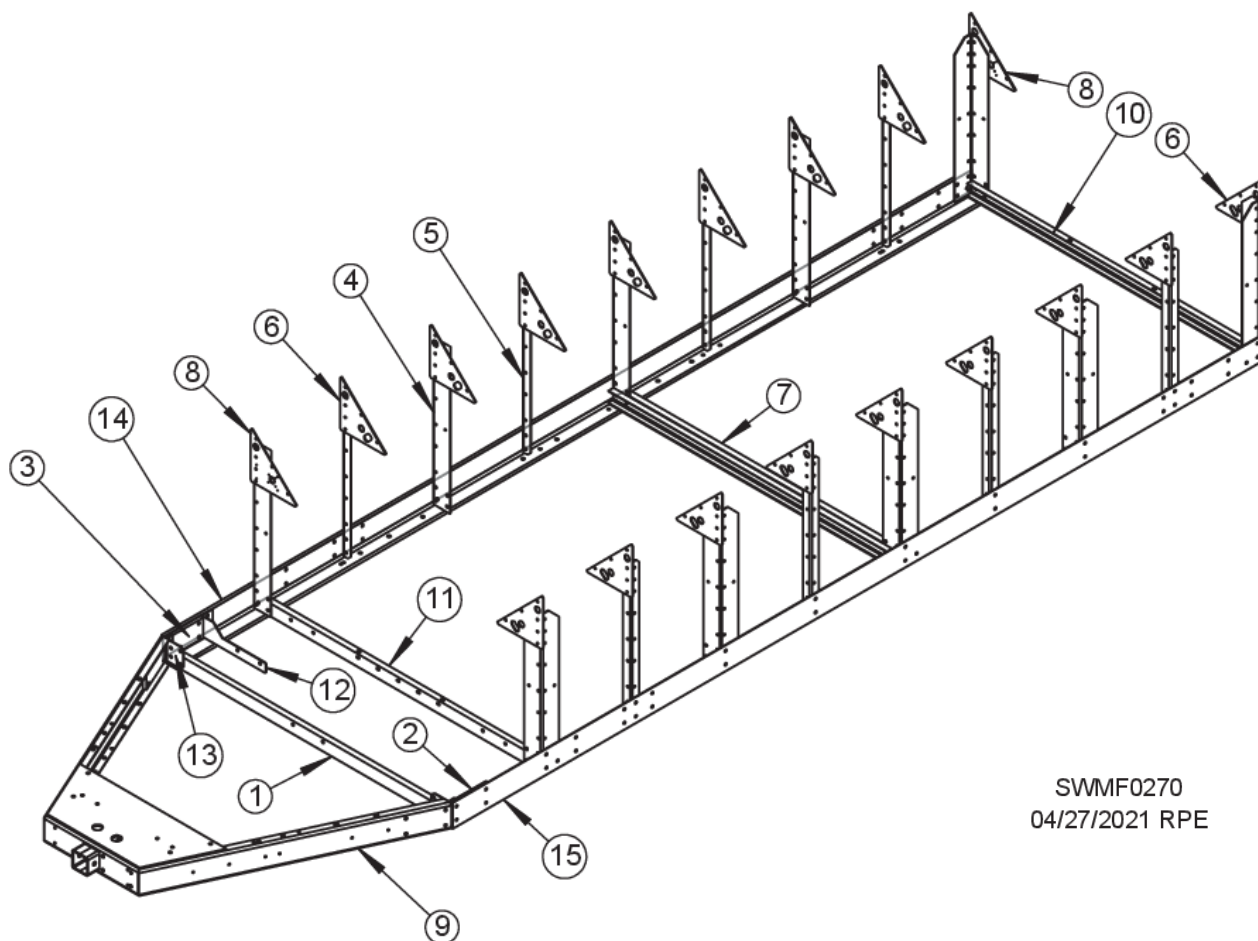
FRAME FOR 16' OR 24' DRYER W/ AUGER UNLOAD



SWMF0269
04/27/2021 RPE

ITEM #	DESCRIPTION	16'		24'	
		QTY.	PART #	QTY.	PART #
1	CHANNEL,CROSS,74.8125",FRONT	1	T15325	1	T15325
2	PLATE,HITCH CONNECTOR,INSD,LH	1	T15326	1	T15326
3	PLATE,HITCH CONNECTOR,INSD,RH	1	T15327	1	T15327
4	WIDE VERTICAL SUPPORT	10	T16322	14	T16322
5	NARROW VERTICAL SUPPORT	8	T16323	12	T16323
6	PLATE,MAIN CONNECTOR	16	T16324	24	T16324
7	CROSS CHANNEL	3	T16325	5	T16325
8	DC MOTOR BRACE	2	T16328	2	T16328
9	TIGHTENER ANGLE	1	T16329	1	T16329
10	PLATE, CONNECTOR,BOX CONDUIT	2	T16331	2	T16331
11	FRONT CROSS CHANNEL	1	T16333	1	T16333
12	HITCH RECEIVER WELDMENT	1	T24423	1	T24423
13	BRACKET,CROSS CHANNEL	2	T80147	2	T80147
14	RIGHT FRAME ANGLE	1	T80205	1	T24419
15	LEFT FRAME ANGLE	1	T80206	1	T24420

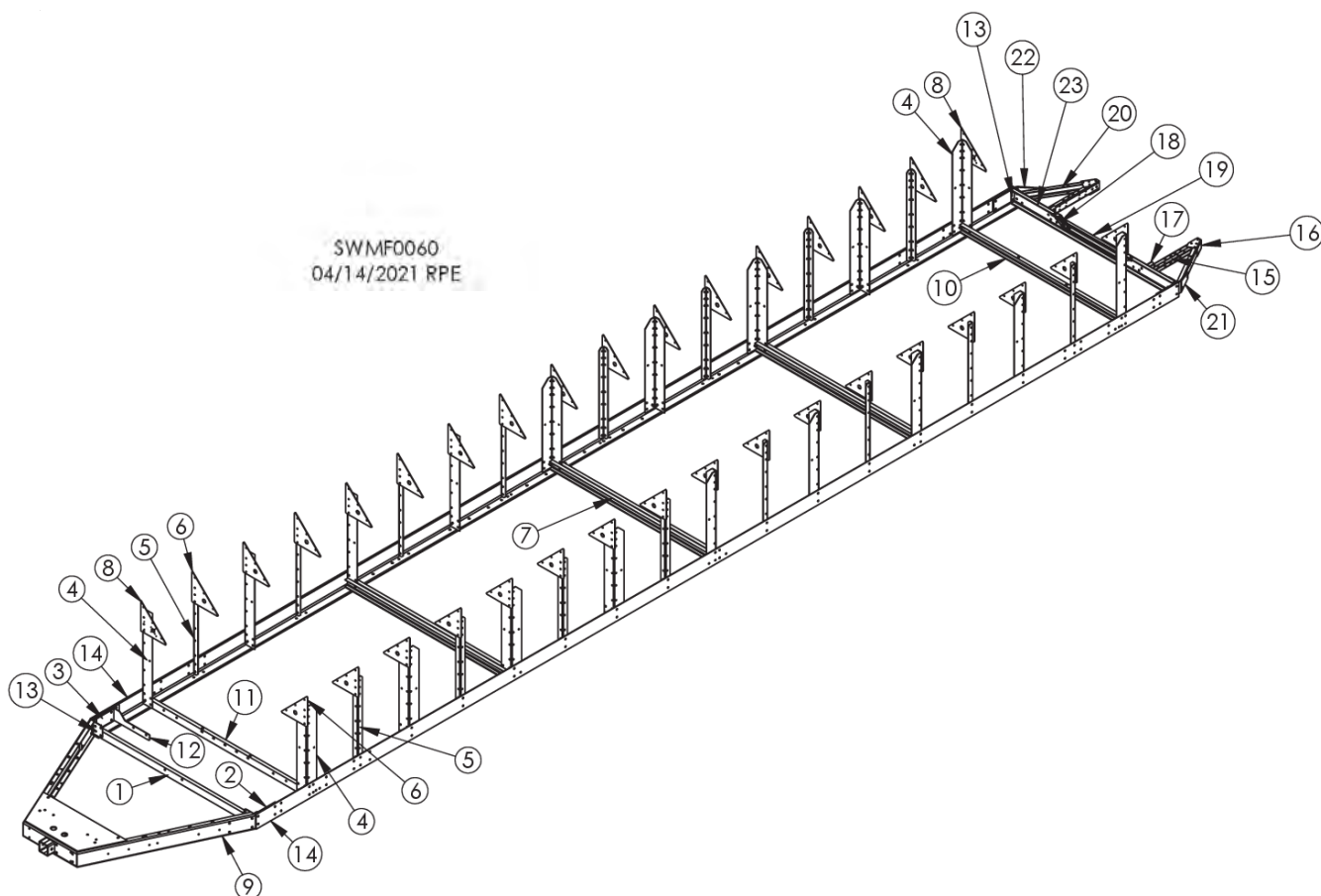
FRAME FOR 16' OR 24' DRYER W/ DRAG CONVEYOR UNLOAD



SWMF0270
04/27/2021 RPE

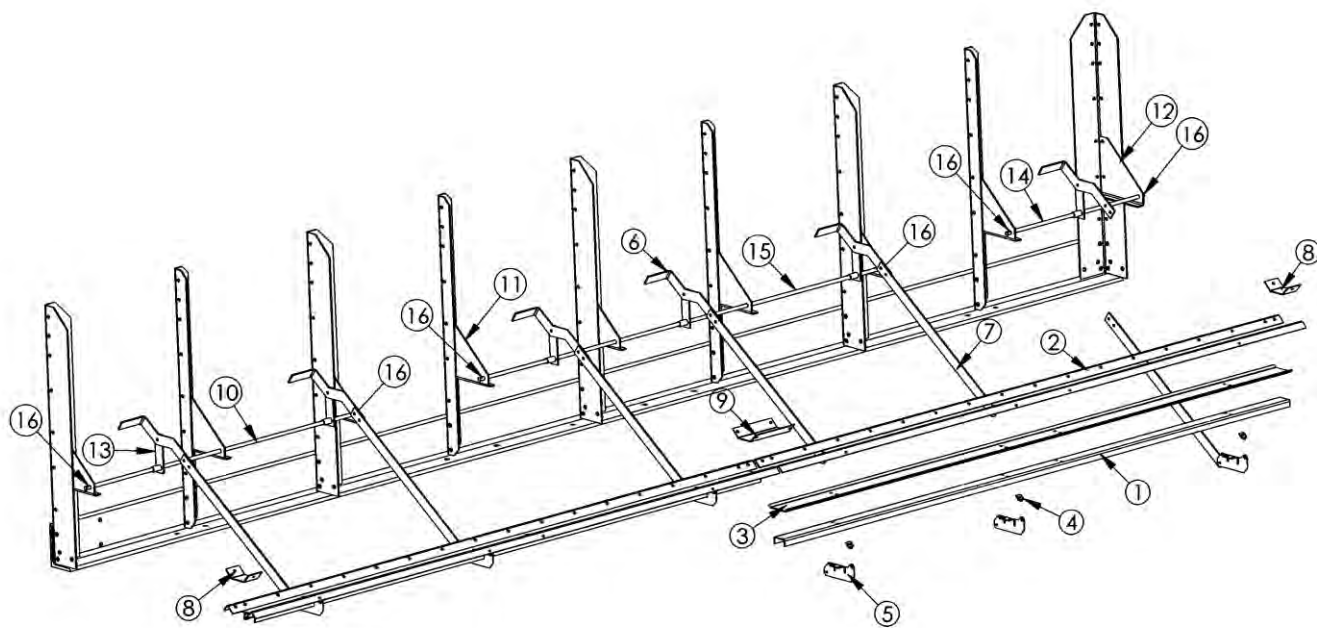
ITEM #	DESCRIPTION	16'		24'	
		QTY.	PART #	QTY.	PART #
1	CHANNEL,CROSS,74.8125",FRONT	1	T15325	1	T15325
2	PLATE,HITCH CONNECTOR,INSD,LH	1	T15326	1	T15326
3	PLATE,HITCH CONNECTOR,INSD,RH	1	T15327	1	T15327
4	WIDE VERTICAL SUPPORT	10	T16322	14	T16322
5	NARROW VERTICAL SUPPORT	8	T16323	12	T16323
6	PLATE,MAIN CONNECTOR	16	T16324	24	T16324
7	CROSS CHANNEL	2	T16325	4	T16325
8	PLATE, CONNECTOR,BOX CONDUIT	2	T16331	2	T16331
9	HITCH RECEIVER WELDMENT	1	T24423	1	T24423
10	CROSS CHANNEL, DRAG UNLOAD	1	T5002	1	T5002
11	FRONT CROSS CHANNEL, DRAG	1	T5003	1	T5003
12	BRACKET,GEAR BOX,SUPPORT	1	T5023	1	T5023
13	BRACKET,CROSS CHANNEL	2	T80147	2	T80147
14	RIGHT FRAME ANGLE	1	T80205	1	T24419
15	LEFT FRAME ANGLE	1	T80206	1	T24420

FRAME FOR 32' DRYER W/ DRAG CONVEYOR UNLOAD



REF. #	DESCRIPTION	QTY.	PART #
1	CHANNEL,CROSS,74.8125",FRONT	1	T15325
2	PLATE,HITCH CONNECTOR,INSD,LH	1	T15326
3	PLATE,HITCH CONNECTOR,INSD,RH	1	T15327
4	WIDE VERTICAL SUPPORT	18	T16322
5	NARROW VERTICAL SUPPORT	16	T16323
6	PLATE,MAIN CONNECTOR	32	T16324
7	CROSS CHANNEL	6	T16325
8	PLATE, CONNECTOR,BOX CONDUIT	2	T16331
9	HITCH RECEIVER WELDMENT	1	T24423
10	CROSS CHANNEL, DRAG UNLOAD	1	T5002
11	FRONT CROSS CHANNEL, DRAG	1	T5003
12	BRACKET,GEAR BOX,SUPPORT	1	T5023
13	BRACKET,CROSS CHANNEL	4	T80147
14	FRAME ANGLE, MIXED FLOW DRYER	2	TM03017
15	CHANNEL,TRI,#1,FRAME,REAR,32'	2	TM03039
16	BRACKET,CONN,CHANNEL,FRAME,32'	2	TM03044
17	BRACKET,ANGLE,FRAME,REAR,32'	2	TM03045
18	BRACE,STIFFENER,CHANNEL,CROSS	2	TM03047
19	CHANNEL,STIFF,CHANNEL,CROSS	1	TM03049
20	CHANNEL,26.28,TRI,2,FRAME,REAR	2	TM03051
21	PLATE,SPLICE,L,INSD,FRAME,REAR	1	TM03052
22	PLATE,SPLICE,R,INSD,FRAME,REAR	1	TM03053
23	CHANNEL,CROSS,75.25,FRAME,REAR	1	TM03054

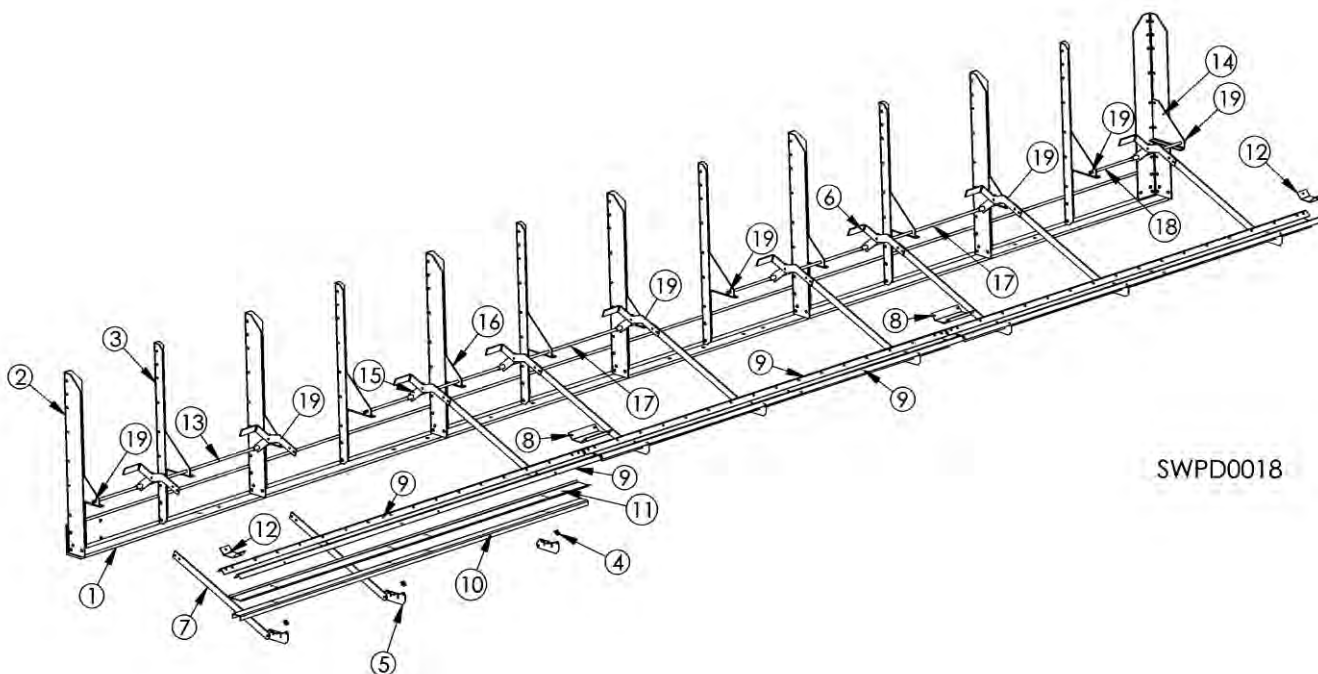
CAM LOCK ASSEMBLY FOR 16' DRYER



SWPD0016

REF. #	DESCRIPTION	QTY.	PART #
1	8' DOOR SUPPORT, CAM LOCK	2	T17454
2	8' ANGLE, CAM LOCK	4	T17456
3	8' DOOR, CAM LOCK	2	T17455
4	PIVOT BRACKET	6	T16393
5	HINGE, BOTTOM DOOR, CAM LOCK	6	T16387
6	HANDLE, CAM LOCK	6	T16382
7	EXTENSION ARM, CAM LOCK	6	T16386
8	SEAL PLATE, END, CAM LOCK	2	T16398
9	SEAL PLATE, MID, CAM LOCK	1	T16390
10	SHAFT, 49.75", CAM LOCK	1	T16400
11	GUSSET, FRONT, CAM LOCK	8	T16380
12	GUSSET, REAR, CAM LOCK	1	T16381
13	PIVOT ARM WELDMENT, CAM LOCK	6	T16383
14	SHAFT, 25", CAM LOCK	1	T20401
15	SHAFT, CAM LOCK, 74"	1	T12516
16	PIN, COTTER, 1/8", 1, PLT	6	J1420

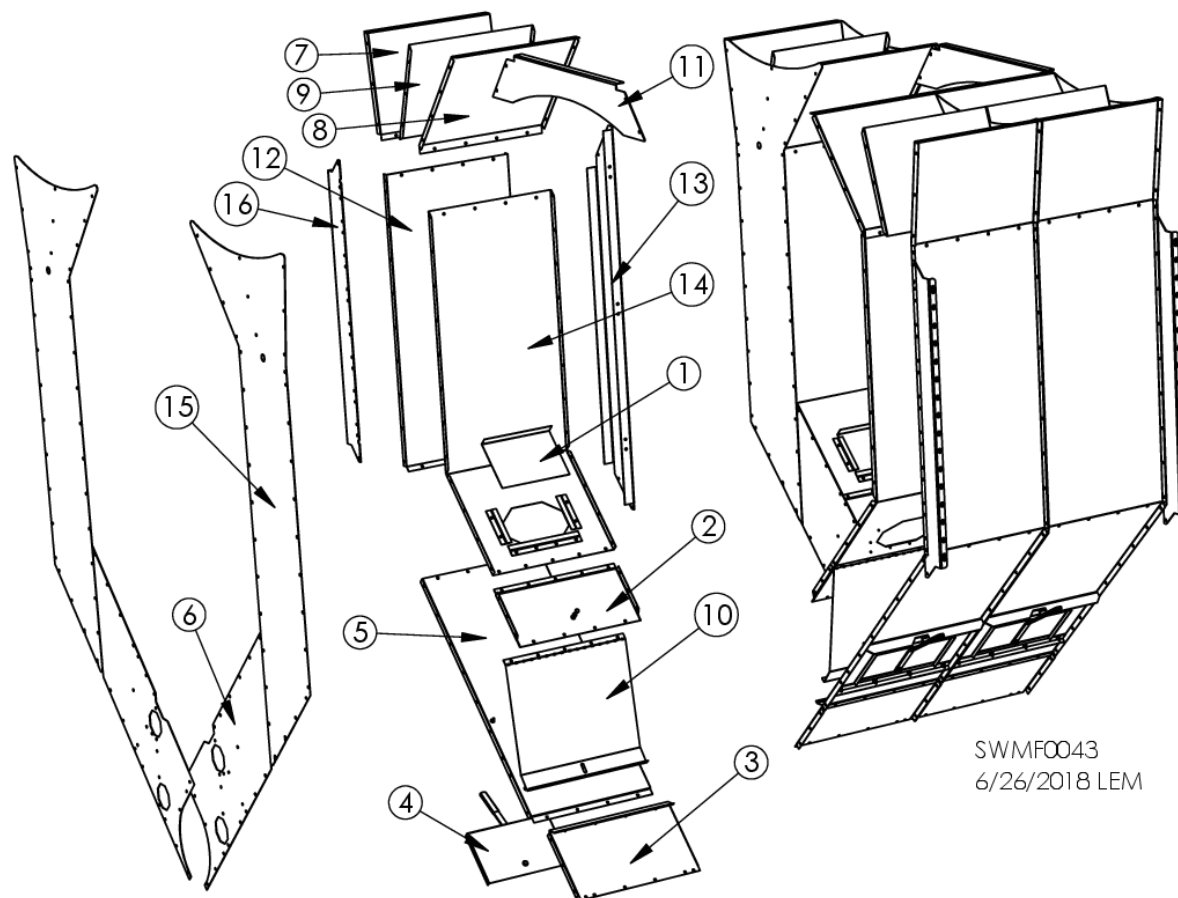
CAM LOCK ASSEMBLY FOR 24' DRYER



SWPD0018

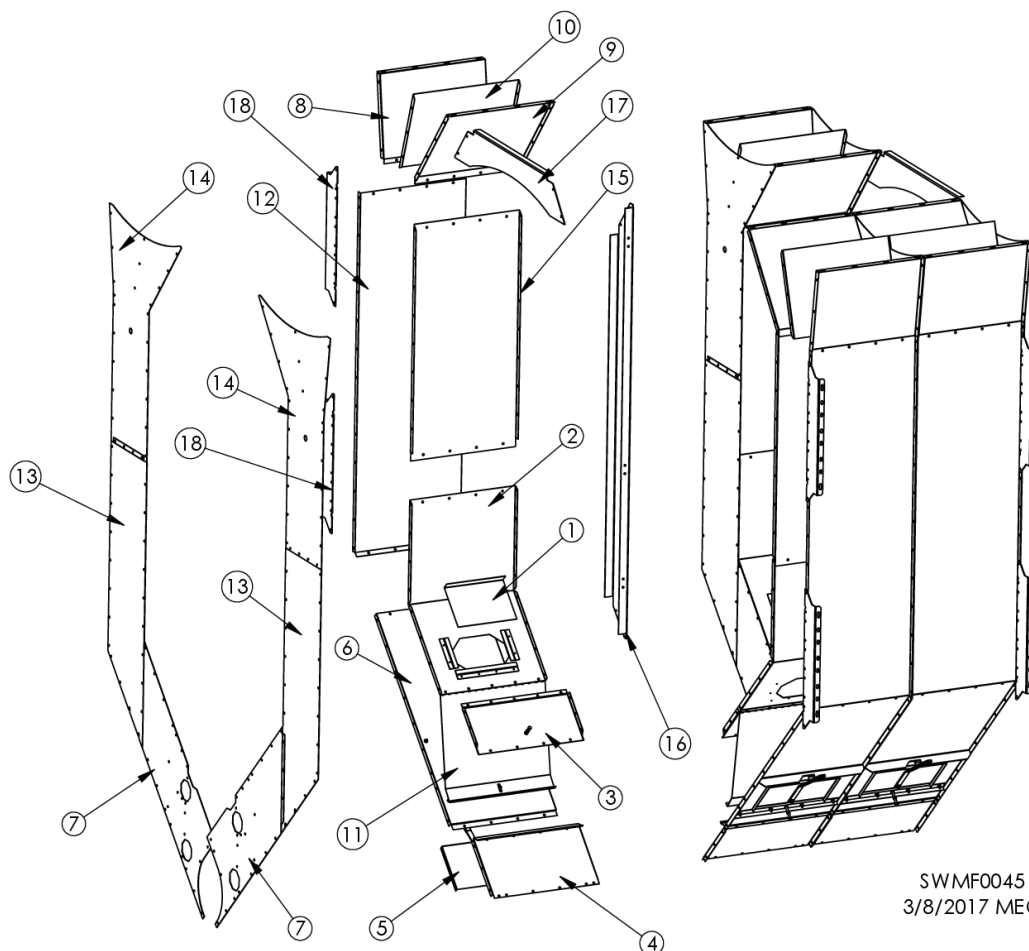
REF. #	DESCRIPTION	QTY.	PART #
1	RIGHT FRAME ANGLE	1	T24319
2	WIDE VERTICAL SUPPORT	7	T16322
3	NARROW VERTICAL SUPPORT	8	T16323
4	PIVOT BRACKET	9	T16393
5	HINGE, BOTTOM DOOR, CAM LOCK	9	T16387
6	HANDLE, CAM LOCK	9	T16382
7	EXTENSION ARM, CAM LOCK	9	T16386
8	SEAL PLATE, MID, CAM LOCK	2	T16390
9	8' ANGLE, CAM LOCK	6	T17456
10	8' DOOR SUPPORT	3	T17454
11	8' DOOR, CAM LOCK	3	T17455
12	SEAL PLATE, END, CAM LOCK	2	T16398
13	SHAFT, CAM LOCK, 49.75"	1	T16400
14	GUSSET, REAR	1	T16381
15	PIVOT ARM WELDMENT	9	T16383
16	GUSSET, FRONT	12	T16380
17	SHAFT, CAM LOCK, 74"	2	T12516
18	SHAFT, CAM LOCK, 25"	1	T20401
19	PIN, COTTER, 1/8, 1, PLT	8	J1420

MEDIUM COOLING SECTION PARTS FOR DRYER W/ AUGER UNLOAD



REF. #	DESCRIPTION	16'		24'		32'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	INNER ACCESS DOOR	16	T16225W	24	T16225W	32	T16225W
2	RIGID ADJUSTMENT PLATE W/ BOLT	16	T17903AM2	24	T17903AM2	32	T17903AM2
3	BOTTOM RIGID DOOR	16	T17904	24	T17904	32	T17904
4	OUTER CLEANOUT DOOR ASSY.	16	T17908AM	24	T17908AM	32	T17908AM
5	BOTTOM OUTER PERF. PANEL ASSY.	16	T17919WAM	24	T17919WAM	32	T17919WAM
6	LOWER DIVIDER	14	T17924	22	T17924	30	T17924
7	OUTER TRANSITION PLATE	16	TM02006	24	TM02006	32	TM02006
8	INNER TRANSITION PLATE	16	TM02007	24	TM02007	32	TM02007
9	COLUMN FLOW DIVIDER	16	TM02010	24	TM02010	32	TM02010
10	FLOW CONTROL GATE	16	TM02011	24	TM02011	32	TM02011
11	COOLING COLUMN FLOOR BRACE	4	TM02035	6	TM02035	8	TM02035
12	OUTSIDE MEDIUM PERF. PANEL	16	TM02039	24	TM02039	32	TM02039
13	SUPPORT BRACE	6	TM02043	10	TM02043	12	TM02043
14	INNER SIDE PERF PANEL	16	TM02126	24	TM02126	32	TM02126
15	MEDIUM DIVIDER PLATE	14	TM02131	22	TM02131	30	TM02131
16	SIDE UPRIGHT BRACE	8	TM03029	12	TM03029	16	TM03029

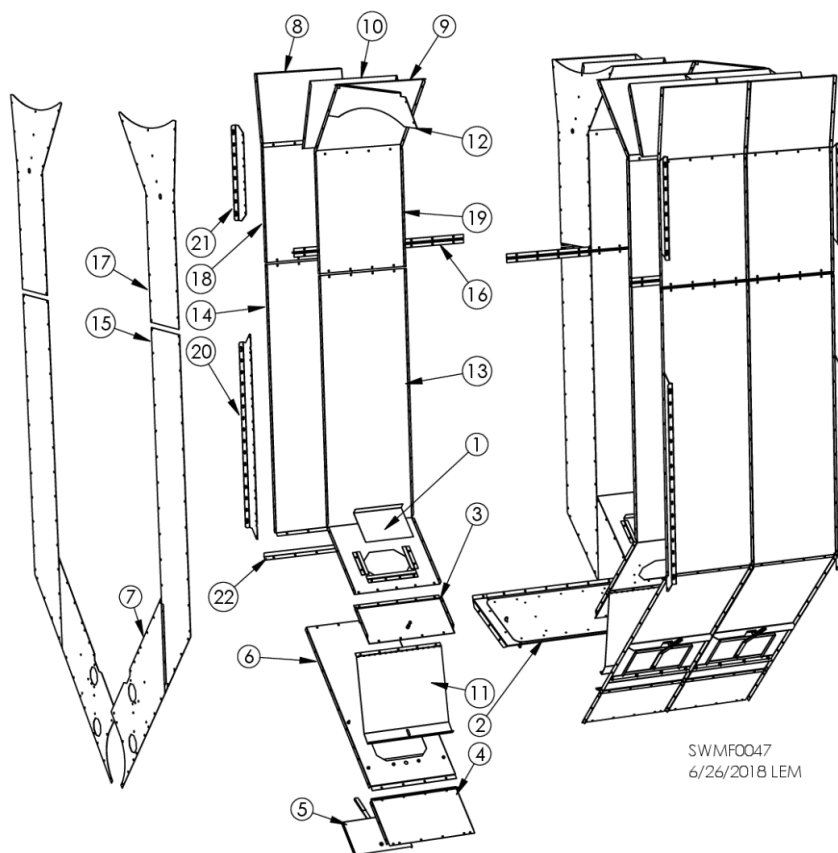
TALL COOLING SECTION PARTS FOR DRYER W/ AUGER UNLOAD



SWMF0045
3/8/2017 MEO

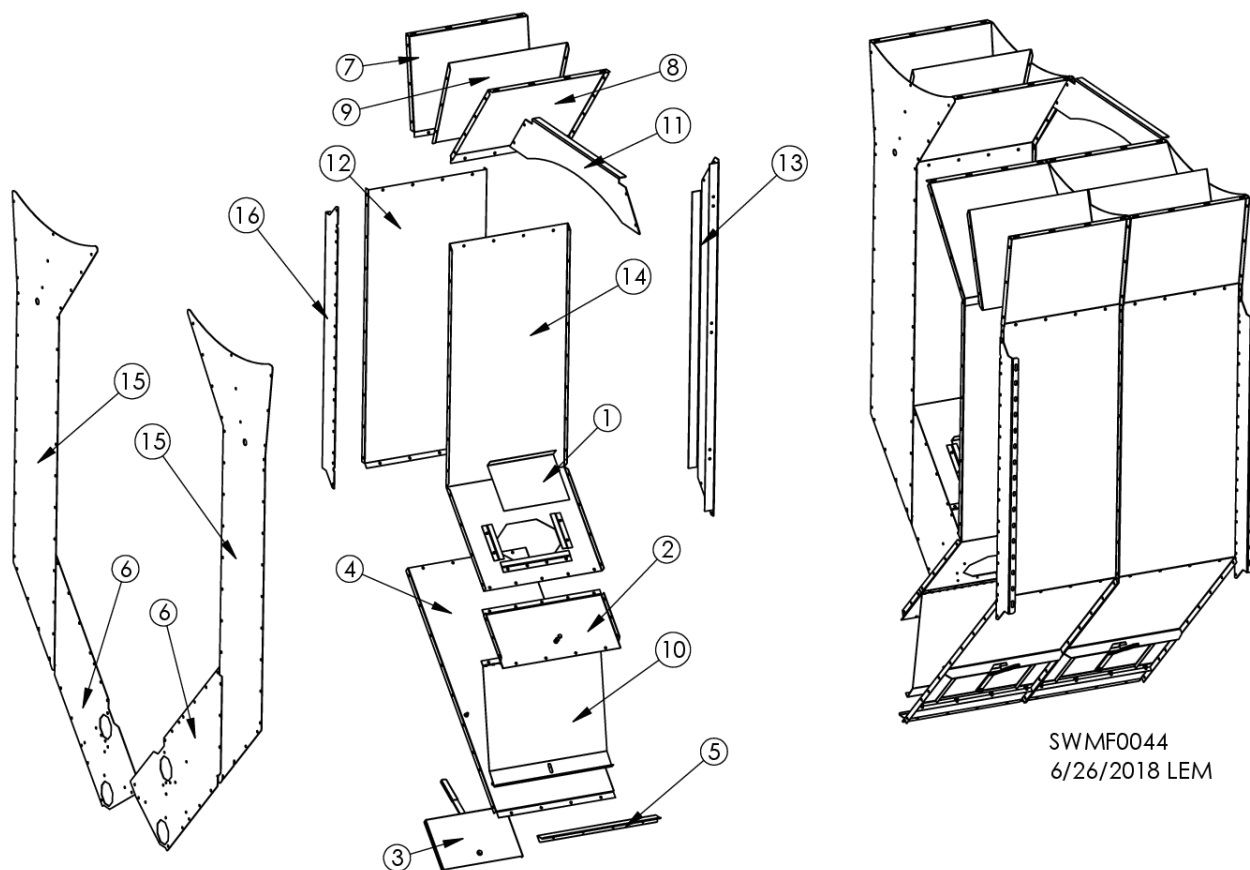
REF. #	DESCRIPTION	16'		24'		32'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	INNER ACCESS DOOR	16	T16225W	24	T16225W	32	T16225W
2	INNER SIDE PERF. PANEL	16	T17512AM	24	T17512AM	32	T17512AM
3	RIGID ADJUSTMENT PLATE W/ BOLT	16	T17903AM2	24	T17903AM2	32	T17903AM2
4	BOTTOM RIGID DOOR	16	T17904	24	T17904	32	T17904
5	OUTER CLEANOUT DOOR ASSY.	16	T17908AM	24	T17908AM	32	T17908AM
6	BOTTOM OUTER PERF. PANEL ASSY.	16	T17919WAM	24	T17919WAM	32	T17919WAM
7	LOWER DIVIDER	14	T17924	22	T17924	30	T17924
8	OUTER TRANSITION PLATE	16	TM02006	24	TM02006	32	TM02006
9	INNER TRANSITION PLATE	16	TM02007	24	TM02007	32	TM02007
10	COLUMN FLOW DIVIDER	16	TM02010	24	TM02010	32	TM02010
11	FLOW CONTROL GATE	16	TM02011	24	TM02011	32	TM02011
12	OUTSIDE LONG PERF. PANEL	16	TM02017	24	TM02017	32	TM02017
13	DIVIDER PLATE	14	TM02018	22	TM02018	30	TM02018
14	TRANSITION DIVIDER PLATE	14	TM02019	22	TM02019	30	TM02019
15	INSIDE 4' PERF. EXTENSION	16	TM02024	24	TM02024	32	TM02024
16	SUPPORT BRACE	6	TM02027	10	TM02027	12	TM02027
17	COOLING COLUMN FLOOR BRACE	4	TM02035	6	TM02035	8	TM02035
18	SIDE UPRIGHT BRACE	8	TM03009	12	TM03009	16	TM03009

EXTRA TALL COOLING SECTION PARTS FOR DRYER W/ AUGER UNLOAD



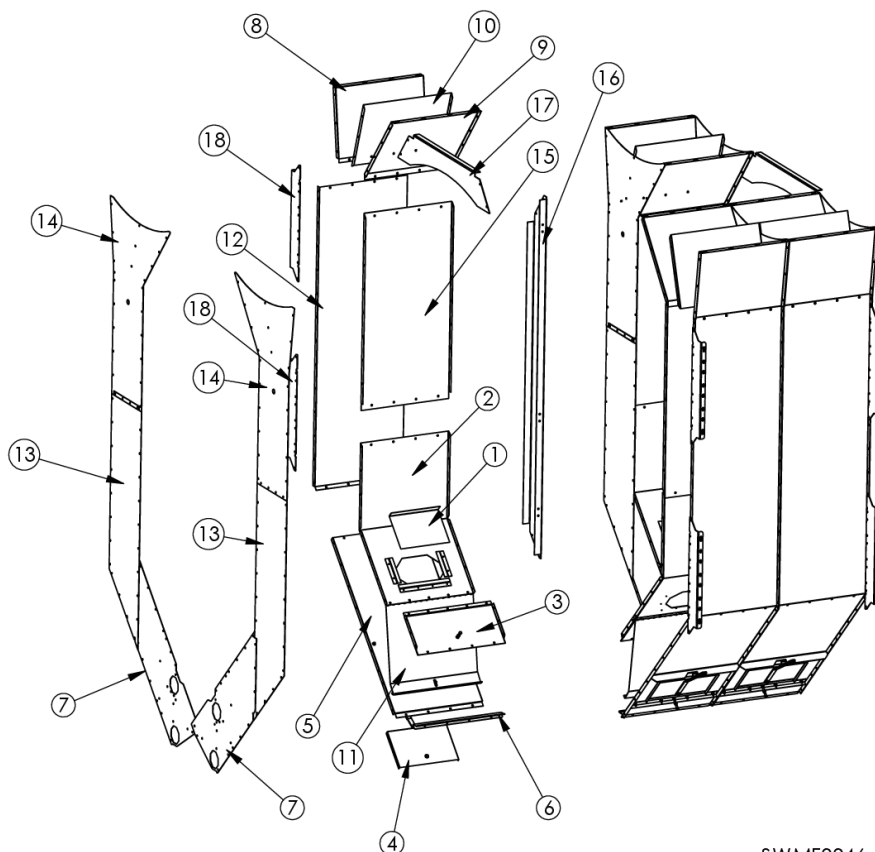
REF. #	DESCRIPTION	16'		24'		32'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	INNER ACCESS DOOR	16	T16225W	24	T16225W	32	T16225W
2	PLENUM FLOOR	4	T17320	6	T17320	8	T17320
3	RIGID ADJUSTMENT PLATE W/ BOLT	16	T17903AM2	24	T17903AM2	32	T17903AM2
4	BOTTOM RIGID DOOR	16	T17904	24	T17904	32	T17904
5	OUTER CLEANOUT DOOR ASSY.	16	T17908AM	24	T17908AM	32	T17908AM
6	BOTTOM OUTER PERF. PANEL ASSY.	16	T17919WAM	24	T17919WAM	32	T17919WAM
7	LOWER DIVIDER	14	T17924	22	T17924	30	T17924
8	OUTER TRANSITION PLATE	16	TM02006	24	TM02006	32	TM02006
9	INNER TRANSITION PLATE	16	TM02007	24	TM02007	32	TM02007
10	COLUMN FLOW DIVIDER	16	TM02010	24	TM02010	32	TM02010
11	FLOW CONTROL GATE	16	TM02011	24	TM02011	32	TM02011
12	COOLING COLUMN FLOOR BRACE	4	TM02035	6	TM02035	8	TM02035
13	INNER PERF. PANEL	16	TM02150	24	TM02150	32	TM02150
14	OUTER MID PERF. PANEL	16	TM02152	24	TM02152	32	TM02152
15	X-TALL COLUMN DIVIDER PLATE	14	TM02155	22	TM02155	30	TM02155
16	MODULE CONNECTOR BRACKET	32	TM02156	48	TM02156	64	TM02156
17	DIVIDER PLATE	14	TM02160	22	TM02160	30	TM02160
18	TOP OUTER PANEL	16	TM02165	24	TM02165	32	TM02165
19	TOP INNER PANEL	16	TM02166	24	TM02166	32	TM02166
20	STIFFENER BRACE	8	TM03029	12	TM03029	16	TM03029
21	UPPER SIDE BRACE	8	TM03038	12	TM03038	16	TM03038
22	EDGE COVER	16	T17285	24	T17285	32	T17285

MEDIUM COOLING SECTION PARTS FOR DRYER W/ DRAG CONVEYOR UNLOAD



REF. #	DESCRIPTION	16'		24'		32'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	INNER ACCESS DOOR	16	T16225W	24	T16225W	32	T16225W
2	RIGID ADJUSTMENT PLATE W/ BOLT	16	T17903AM2	24	T17903AM2	32	T17903AM2
3	OUTER CLEANOUT DOOR ASSY.	16	T17908AM	24	T17908AM	32	T17908AM
4	BOTTOM OUTER PERF. PANEL ASSY.	16	T17919WAM	24	T17919WAM	32	T17919WAM
5	BOTTOM RIGID BRACKET	16	T5026	24	T5026	32	T5026
6	LOWER DIVIDER	14	T5027	22	T5027	30	T5027
7	OUTER TRANSITION PLATE	16	TM02006	24	TM02006	32	TM02006
8	INNER TRANSITION PLATE	16	TM02007	24	TM02007	32	TM02007
9	COLUMN FLOW DIVIDER	16	TM02010	24	TM02010	32	TM02010
10	FLOW CONTROL GATE	16	TM02011	24	TM02011	32	TM02011
11	COOLING COLUMN FLOOR BRACE	4	TM02035	6	TM02035	8	TM02035
12	OUTSIDE MEDIUM PERF. PANEL	16	TM02039	24	TM02039	32	TM02039
13	SUPPORT BRACE	6	TM02043	10	TM02043	12	TM02043
14	INNER SIDE PERF PANEL	16	TM02126	24	TM02126	32	TM02126
15	MEDIUM DIVIDER PLATE	14	TM02131	22	TM02131	30	TM02131
16	SIDE UPRIGHT BRACE	8	TM03029	12	TM03029	16	TM03029

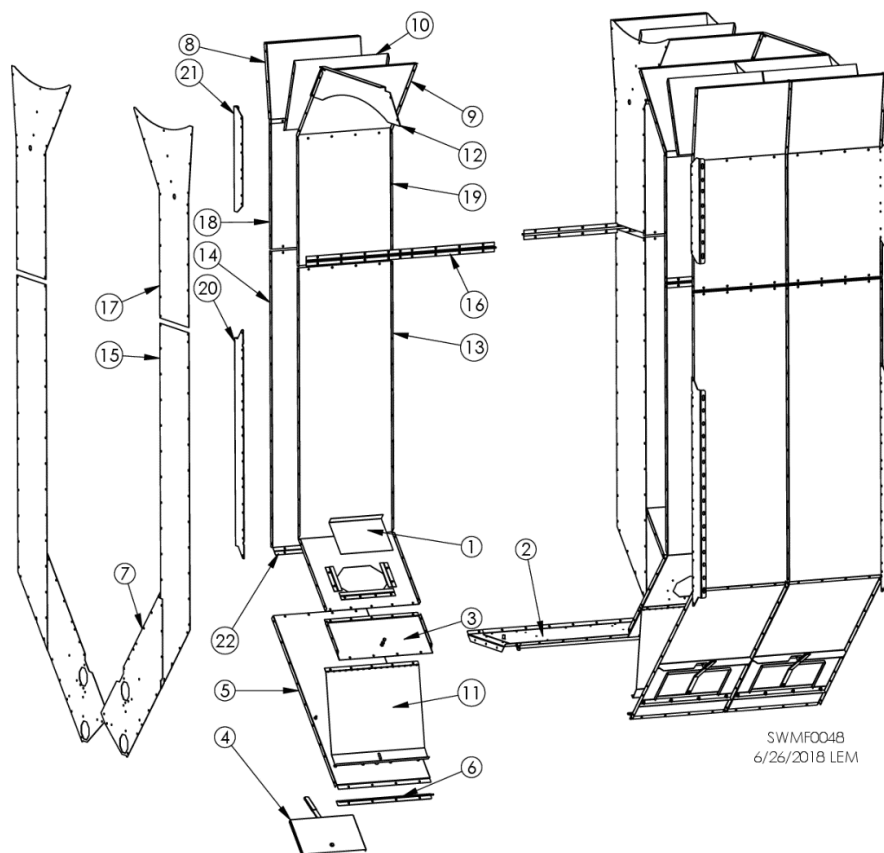
TALL COOLING SECTION PARTS FOR DRYER W/ DRAG CONVEYOR UNLOAD



SWMF0046
3/9/2017 MEO

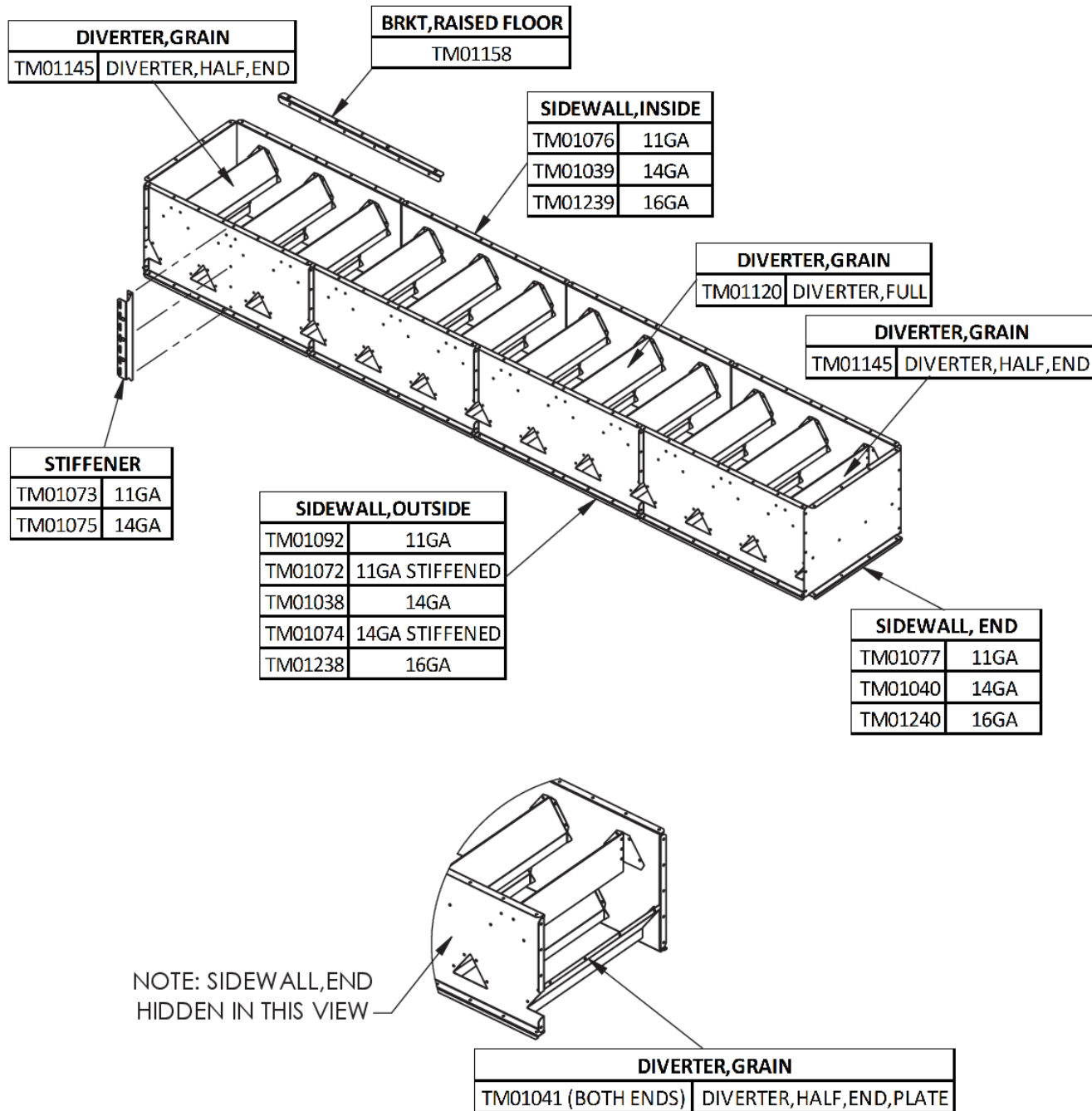
REF. #	DESCRIPTION	16'		24'		32'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	INNER ACCESS DOOR	16	T16225W	24	T16225W	32	T16225W
2	INNER SIDE PERF. PANEL	16	T17512AM	24	T17512AM	32	T17512AM
3	RIGID ADJUSTMENT PLATE W/ BOLT	16	T17903AM2	24	T17903AM2	32	T17903AM2
4	OUTER CLEANOUT DOOR ASSY.	16	T17908AM	24	T17908AM	32	T17908AM
5	BOTTOM OUTER PERF. PANEL ASSY.	16	T17919WAM	24	T17919WAM	32	T17919WAM
6	BOTTOM RIGID BRACKET	16	T5026	24	T5026	32	T5026
7	LOWER DIVIDER	14	T5027	22	T5027	30	T5027
8	OUTER TRANSITION PLATE	16	TM02006	24	TM02006	32	TM02006
9	INNER TRANSITION PLATE	16	TM02007	24	TM02007	32	TM02007
10	COLUMN FLOW DIVIDER	16	TM02010	24	TM02010	32	TM02010
11	FLOW CONTROL GATE	16	TM02011	24	TM02011	32	TM02011
12	OUTSIDE LONG PERF. PANEL	16	TM02017	24	TM02017	32	TM02017
13	DIVIDER PLATE	14	TM02018	22	TM02018	30	TM02018
14	TRANSITION DIVIDER PLATE	14	TM02019	22	TM02019	30	TM02019
15	INSIDE 4' PERF. EXTENSION	16	TM02024	24	TM02024	32	TM02024
16	SUPPORT BRACE	6	TM02027	10	TM02027	12	TM02027
17	COOLING COLUMN FLOOR BRACE	4	TM02035	6	TM02035	8	TM02035
18	SIDE UPRIGHT BRACE	8	TM03009	12	TM03009	16	TM03009

EXTRA TALL COOLING SECTION PARTS FOR DRYER W/ DRAG CONVEYOR UNLOAD



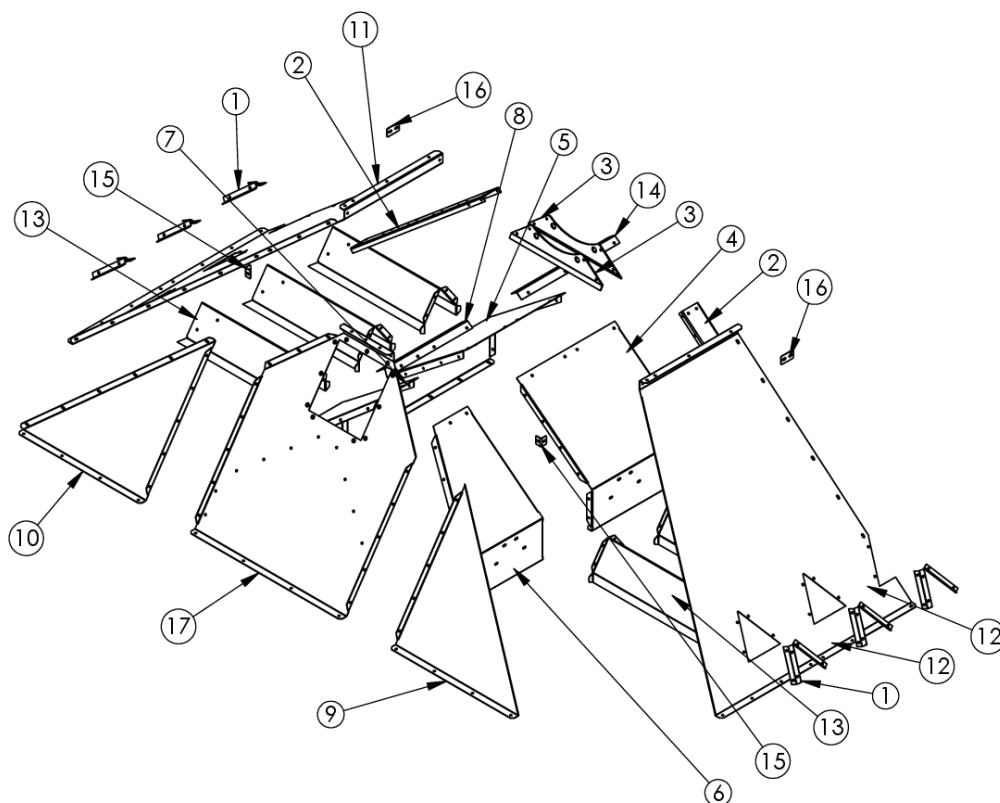
REF. #	DESCRIPTION	16'		24'		32'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	INNER ACCESS DOOR	16	T16225W	24	T16225W	32	T16225W
2	PLENUM FLOOR	4	T17320	6	T17320	8	T17320
3	RIGID ADJUSTMENT PLATE W/ BOLT	16	T17903AM2	24	T17903AM2	32	T17903AM2
4	OUTER CLEANOUT DOOR ASSY.	16	T17908AM	24	T17908AM	32	T17908AM
5	BOTTOM OUTER PERF. PANEL ASSY.	16	T17919WAM	24	T17919WAM	32	T17919WAM
6	DRAG RIGID BRACKET	16	T5026	24	T5026	32	T5026
7	DRAG DIVIDER BRACKET	14	T5027	22	T5027	30	T5027
8	OUTER TRANSITION PLATE	16	TM02006	24	TM02006	32	TM02006
9	INNER TRANSITION PLATE	16	TM02007	24	TM02007	32	TM02007
10	COLUMN FLOW DIVIDER	16	TM02010	24	TM02010	32	TM02010
11	FLOW CONTROL GATE	16	TM02011	24	TM02011	32	TM02011
12	COOLING COLUMN FLOOR BRACE	4	TM02035	6	TM02035	8	TM02035
13	INNER PERF. PANEL	16	TM02150	24	TM02150	32	TM02150
14	OUTER MID PERF. PANEL	16	TM02152	24	TM02152	32	TM02152
15	X-TALL COLUMN DIVIDER PLATE	14	TM02155	22	TM02155	30	TM02155
16	MODULE CONNECTOR BRACKET	32	TM02156	48	TM02156	64	TM02156
17	DIVIDER PLATE	14	TM02160	22	TM02160	30	TM02160
18	TOP OUTER PANEL	16	TM02165	24	TM02165	32	TM02165
19	TOP INNER PANEL	16	TM02166	24	TM02166	32	TM02166
20	STIFFENER BRACE	8	TM03029	12	TM03029	16	TM03029
21	UPPER SIDE BRACE	8	TM03038	12	TM03038	16	TM03038
22	EDGE COVER	16	T17285	24	T17285	32	T17285

GRAIN COLUMN PARTS



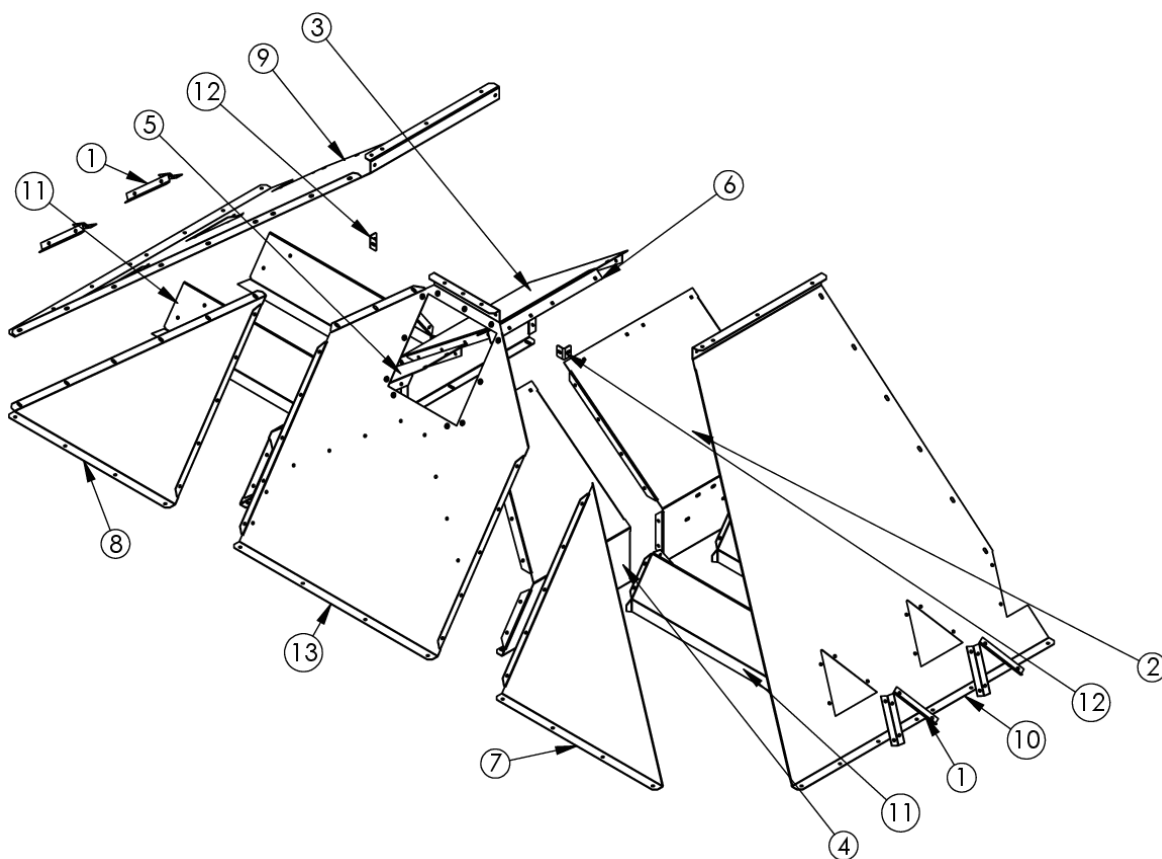
SWMF0262
01/07/2020 JJW

PARTS FOR REAR SECTION OF ROOF



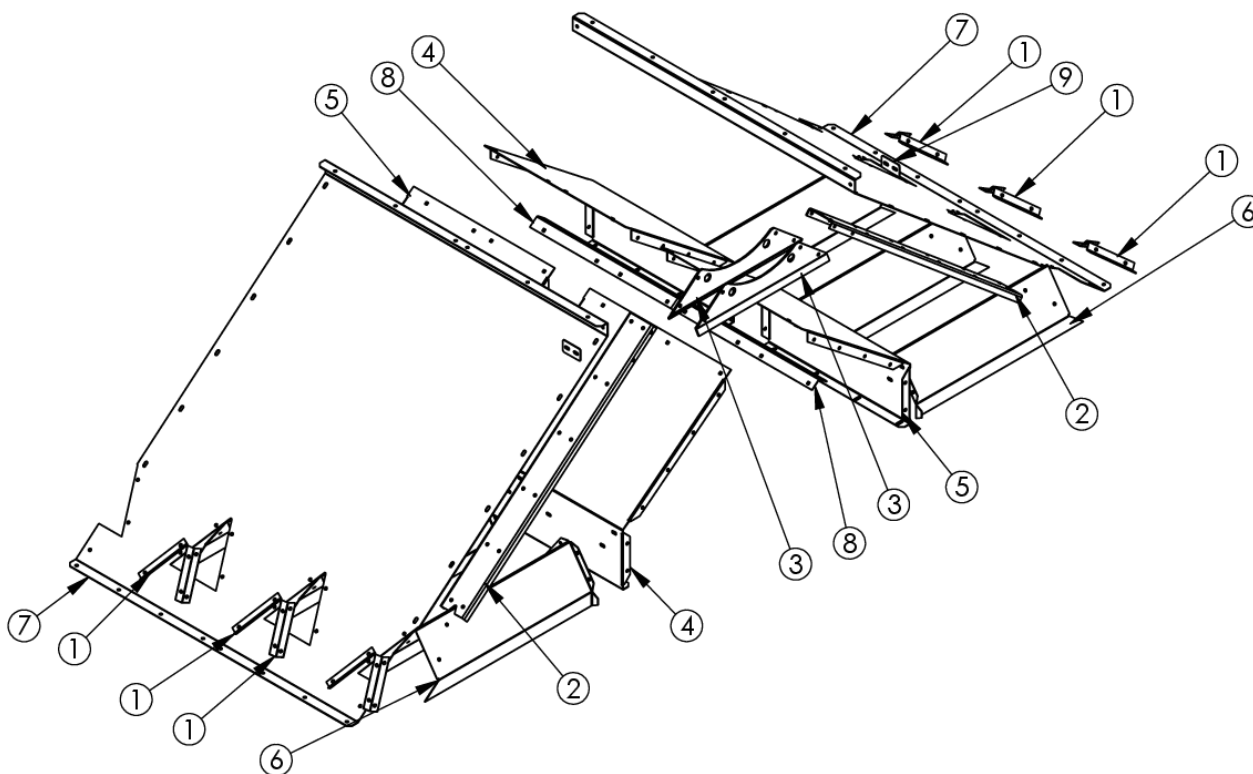
REF. #	DESCRIPTION	QTY.	PART#
1	ANGLE, MOUNTING, DIVERTER	12	TM04012
2	CHANNEL, SPLICE, SIDEWALL	2	TM04016
3	PLATE, CONNECTOR, RIDGE, WET HOLD	2	TM04017
4	COVER, LEFT, PLENUM, WEHOLD	1	TM04101
5	COVER, RIGHT, PLENUM, WETHOLD	1	TM04102
6	COVER, END, LEFT, PLENUM, WETHOLD	1	TM04103
7	COVER, END, RIGHT, PLENUM, WETHOLD	1	TM04104
8	CONNECTOR, END, 20.25", PEAK	1	TM04105
9	PANEL, END, LEFT, WETHOLD	1	TM04107
10	PANEL, END, RIGHT, WETHOLD	1	TM04108
11	PANEL, RIGHT, SIDEWALL, WETHOLD	1	TM04110
12	PANEL, LEFT, SIDEWALL, WETHOLD	1	TM04111
13	DIVERTER, GRAIN, WETHOLD, 2018	6	TM04112
14	CONNECTOR, 24", PEAK, CENTER	1	TM04114
15	CLIP, CONN, BENT, WETHOLD	2	TM04115
16	CLIP, CONN, STRAIGHT, WETHOLD	2	TM04116
17	PANEL, END, CNTR, MOINST. SNSR, ASY	1	TM04119

PARTS FOR FRONT SECTION OF ROOF



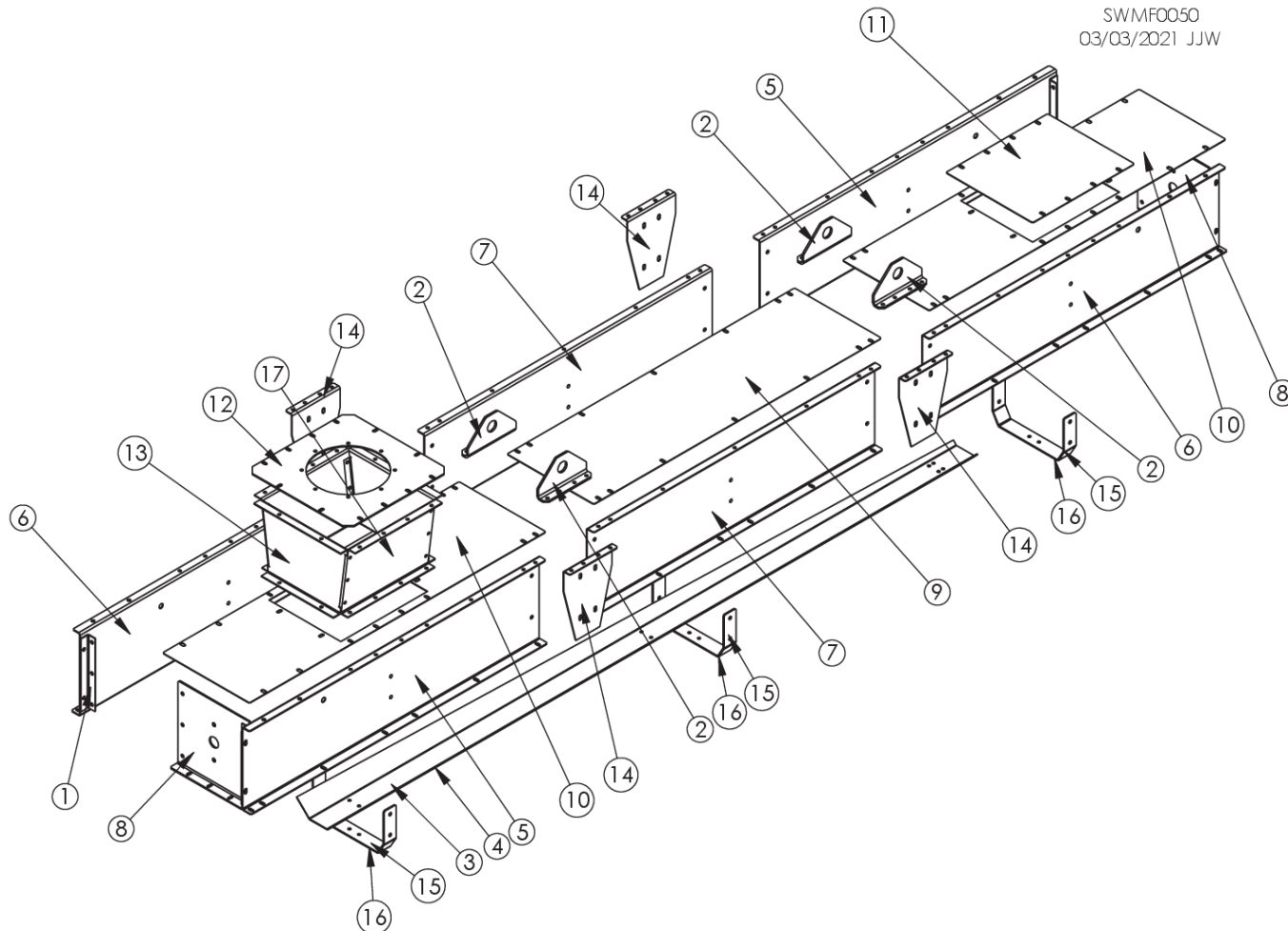
REF. #	DESCRIPTION	QTY.	PART #
1	ANGLE, MOUNTING, DIVERTER	8	TM04012
2	COVER, LEFT, PLENUM, WETHOLD	1	TM04101
3	COVER, RIGHT, PLENUM, WETHOLD	1	TM04102
4	COVER, END, LEFT, PLENUM, WETHOLD	1	TM04103
5	COVER, END, RIGHT, PLENUM, WETHOLD	1	TM04104
6	CONNECTOR, END, 20.25", PEAK	1	TM04105
7	PANEL, END, LEFT, WETHOLD	1	TM04107
8	PANEL, END, RIGHT, WETHOLD	1	TM04108
9	PANEL, RIGHT, SIDEWALL, WETHOLD	1	TM04110
10	PANEL, LEFT, SIDEWALL, WETHOLD	1	TM04111
11	DIVERTER, GRAIN, WETHOLD, 2018	4	TM04112
12	CLIP, CONN, CENT, WETHOLD	2	TM04115
13	PANEL, END, CNTR, MOIST. SNSR, ASY	1	TM04119

PARTS FOR CENTER SECTION OF ROOF



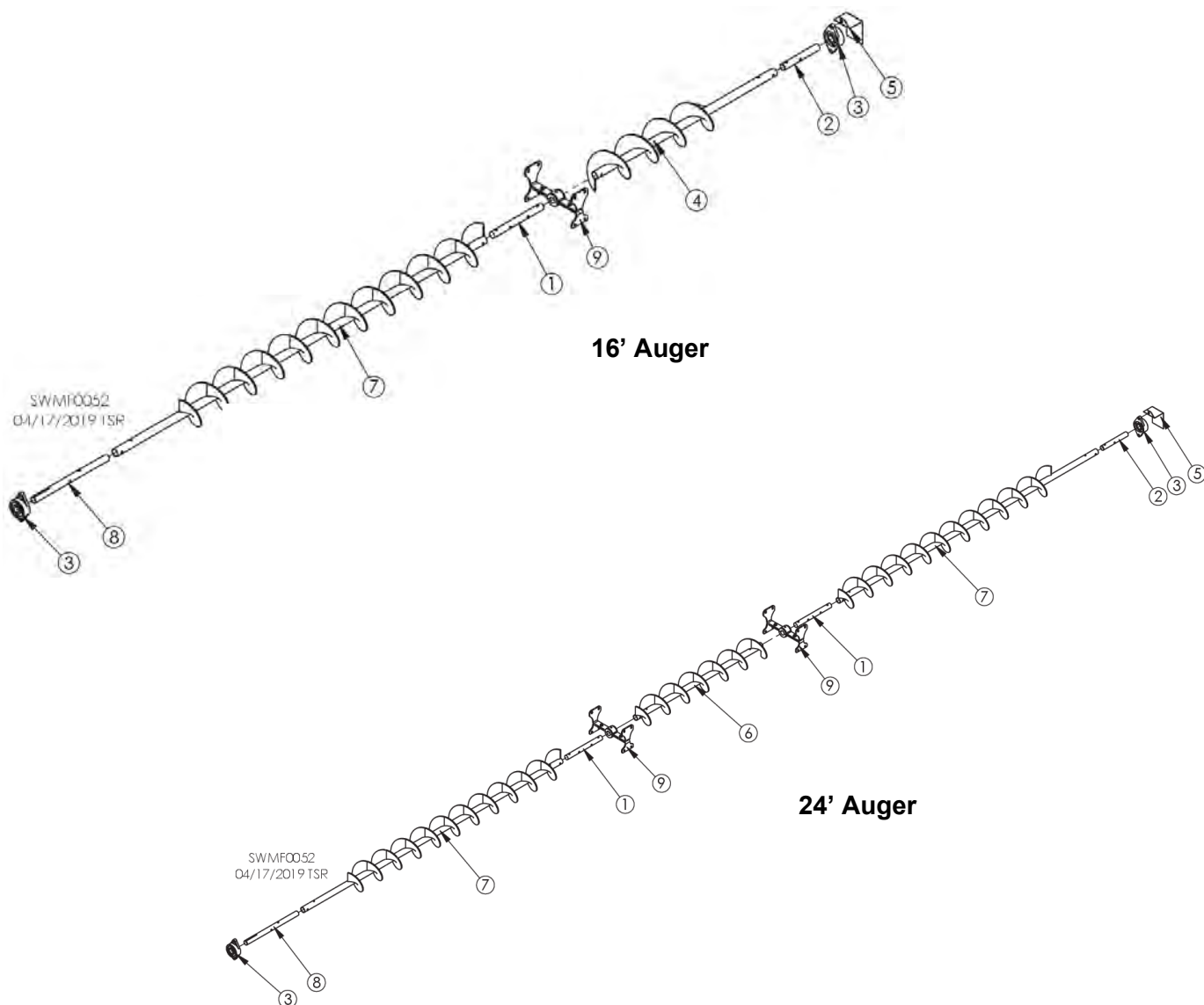
REF. #	DESCRIPTION	QTY.	PART #
1	ANGLE, MOUNTING, DIVERTER	12	TM04012
2	CHANNEL, SPLICE, SIDEWALL	2	TM04016
3	PLATE, CONNECTOR, RIDGE, WETHOLD	2	TM04017
4	COVER, LEFT, PLENUM, WETHOLD	2	TM04101
5	COVER, RIGHT, PLENUM, WETHOLD	2	TM04102
6	DIVERTER, GRAIN, WETHOLD, 2018	6	TM04112
7	PANEL, CENTER, SIDEWALL, WETHOLD	2	TM04113
8	CONNECTOR, 24", PEAK, CENTER	2	TM04114
9	CLIP, CONN, STRAIGHT, WETHOLD	2	TM04116

LOAD AUGER HOUSING FOR 16', 24' & 32' DRYER

SWMF0050
03/03/2021 JJW

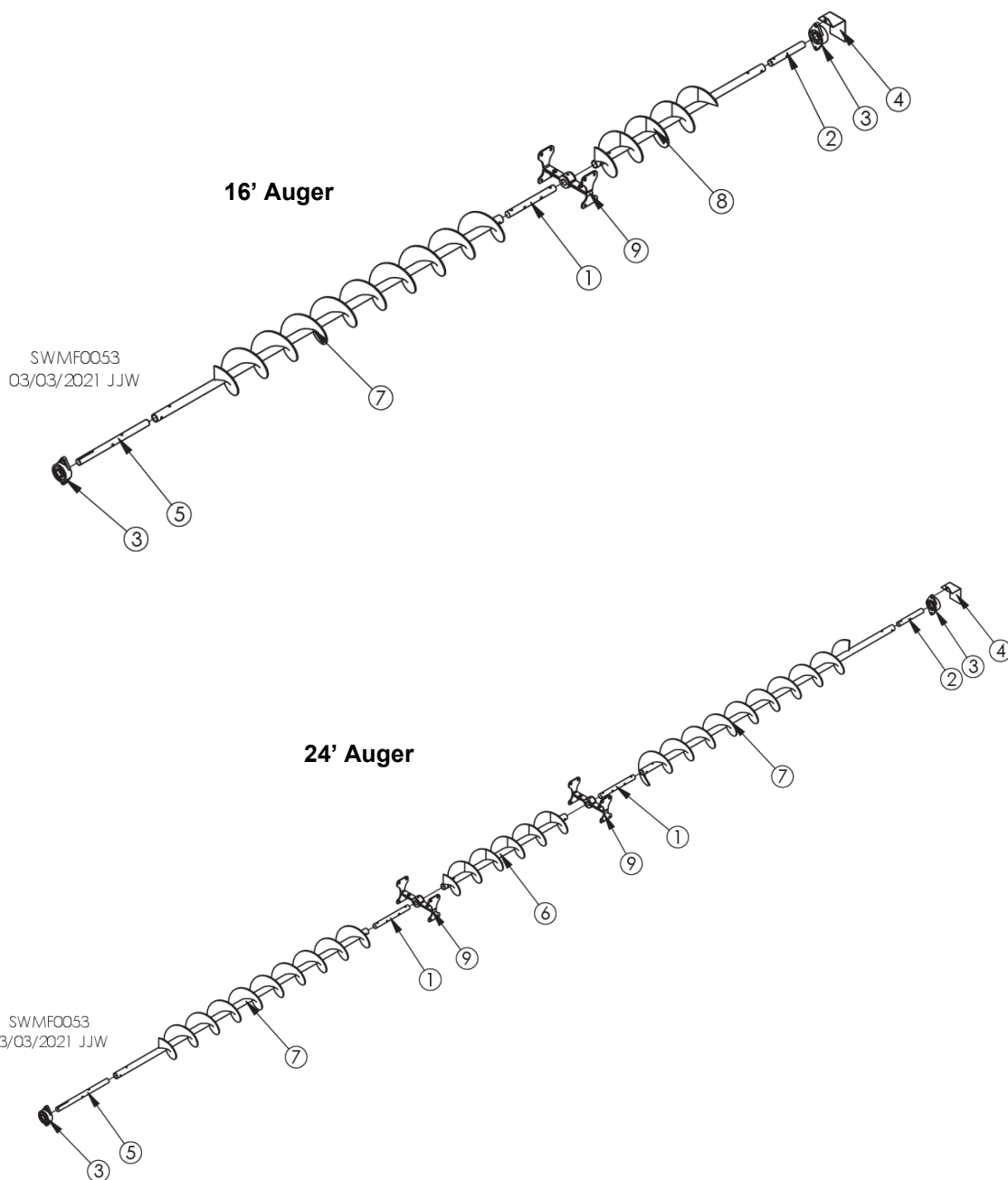
REF. #	DESCRIPTION	16' QTY.	24' QTY.	32' QTY	PART #
1	ANGLE,MOUNTING,BEARING PLATE	4	4	4	TM04026
2	BRACKET,LIFTING,WET HOLD	4	4	4	TM04046
3	TRASH PAN,9'	1	1	0	TM04117
4	PAN,TRASH,9',9" AUGER	0	0	1	TM04144
5	PANEL,SIDE,END,RIGHT	2	2	2	TM04120
6	PANEL,SIDE,END,LEFT	2	2	2	TM04121
7	PANEL,SIDE,MID	2	6	10	TM04122
8	PLATE,END,BEARING	2	2	2	TM04123
9	COVER,MIDDLE,HOUSING,AUGER	1	3	5	TM04124
10	COVER,END,HOUSING,AUGER	2	2	2	TM04125
11	COVER,HOLE,HOPPER,LOAD	1	1	1	TM04126
12	PLATE,MOUNT,10",HOPPER,LOAD	1	1	1	TM04127
13	END,HOPPER,LOAD	2	2	2	TM04128
14	PLATE,SPLICE,HOUSING,AUG,LOAD	4	8	12	TM04129
15	BRACKET,MOUNT,TRASH PAN	3	3	0	TM04130
16	BRACKET,MOUNT,TRASH PAN,9" AUGER	0	0	3	TM04149
17	SIDE,HOPPER,LOAD	2	2	2	TM04133

7" LOAD AUGER FOR 16' & 24' DRYER



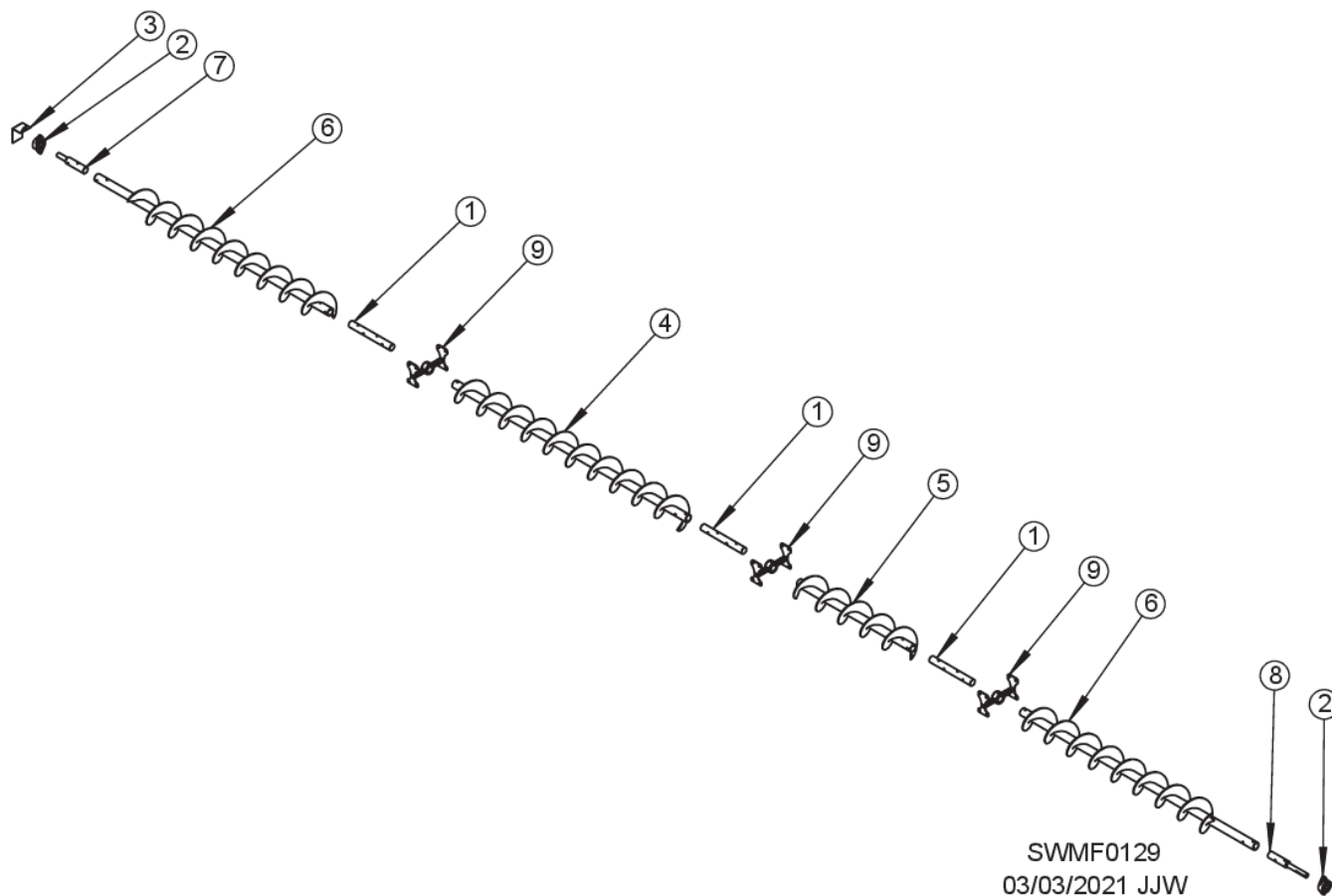
REF. #	DESCRIPTION	16' QTY	24' QTY	PART #
1	SHAFT, 8" HANGER BEARING	1	2	F4720
2	SHAFT, 1.25" X 9" LONG	1	1	G73291
3	BRG, 1.25", FLG, W/LC, HCFTS207-20	2	2	J0010
4	4' REAR, TOP AUGER	1	-	T12503
5	REAR SHAFT SHIELD	1	1	T16420
6	TOP MIDDLE AUGER (20')	-	1	T16427
7	AUGER, TOP, TILT SW SIDE 93.5"	1	2	T16428
8	SHAFT, TOP FRONT, 13-1/4"	1	1	T16436
9	BRACKET, HANGER, AUGER, LOAD, ASY	1	2	TM04134

8" LOAD AUGER FOR 16' & 24' DRYER



REF. #	DESCRIPTION	16' QTY	24' QTY	PART #
1	SHAFT, 8" HANGER BEARING	1	2	F4720
2	SHAFT, 1.25" x 9" LG	1	1	G73291
3	BRG, 1.25, FLG, W/LC, HCFTS207-20	2	2	J0010
4	REAR SHAFT SHIELD	1	1	T16420
5	SHAFT, TOP FRONT, 13-1/4"	1	1	T16436
6	AUGER, TOP MIDDLE (20 FT), 8" OD	-	1	T17427
7	AUGER, TOP, MERC SW SIDE, 8", 93.50 LG.	1	2	T17428
8	AUGER, BTM REAR, 45 1/2", 8" OD	1	-	T17431
9	BRACKET, HANGER, AUGER, LOAD, ASY	1	2	TM04134

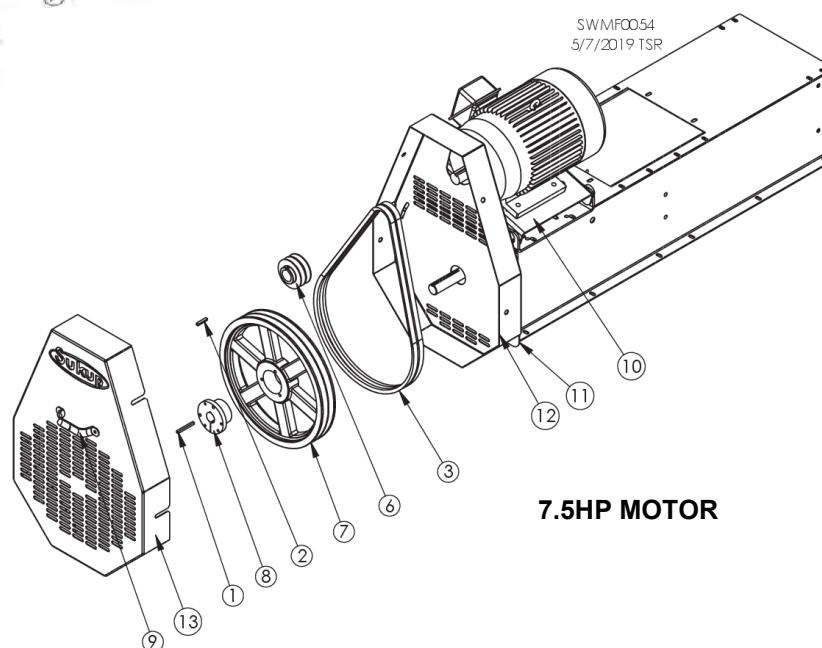
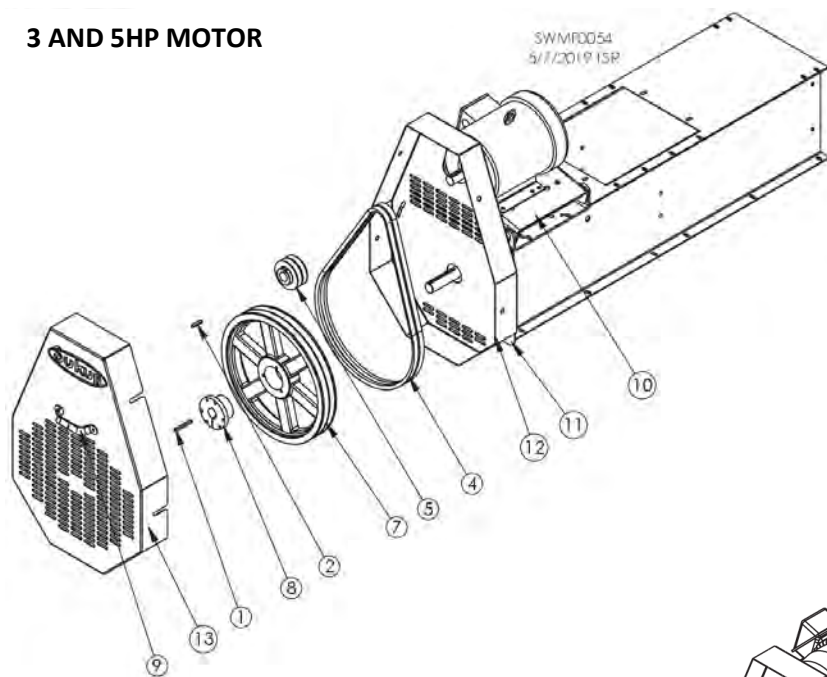
9" LOAD AUGER FOR 32' DRYER



REF. #	DESCRIPTION	QTY.	PART #
1	SHAFT, 2 X 16.5", 2014	3	EU0042
2	BRG, 1.25, FLG, W/LC, HCFTS207-20	2	J0010
3	REAR SHAFT SHIELD	1	T16420
4	AUGER, TOP, MID, 93.5", 9" OD	1	T17443
5	AUGER, TOP, MID, 45.5", 9" OD	1	T17444
6	AUGER, TOP, END, 93.5", 9" OD	2	T17445
7	SHAFT, AUGER, LOAD, 2", 11" LONG	1	T17446
8	SHAFT, DRIVE, AUGER, 2", 14.75"	1	T174461
9	BRACKET, HANGER, AUGER, LOAD, 2"	3	TM04139

LOAD AUGER DRIVE COMPONENTS FOR 3HP TO 7.5HP MOTORS

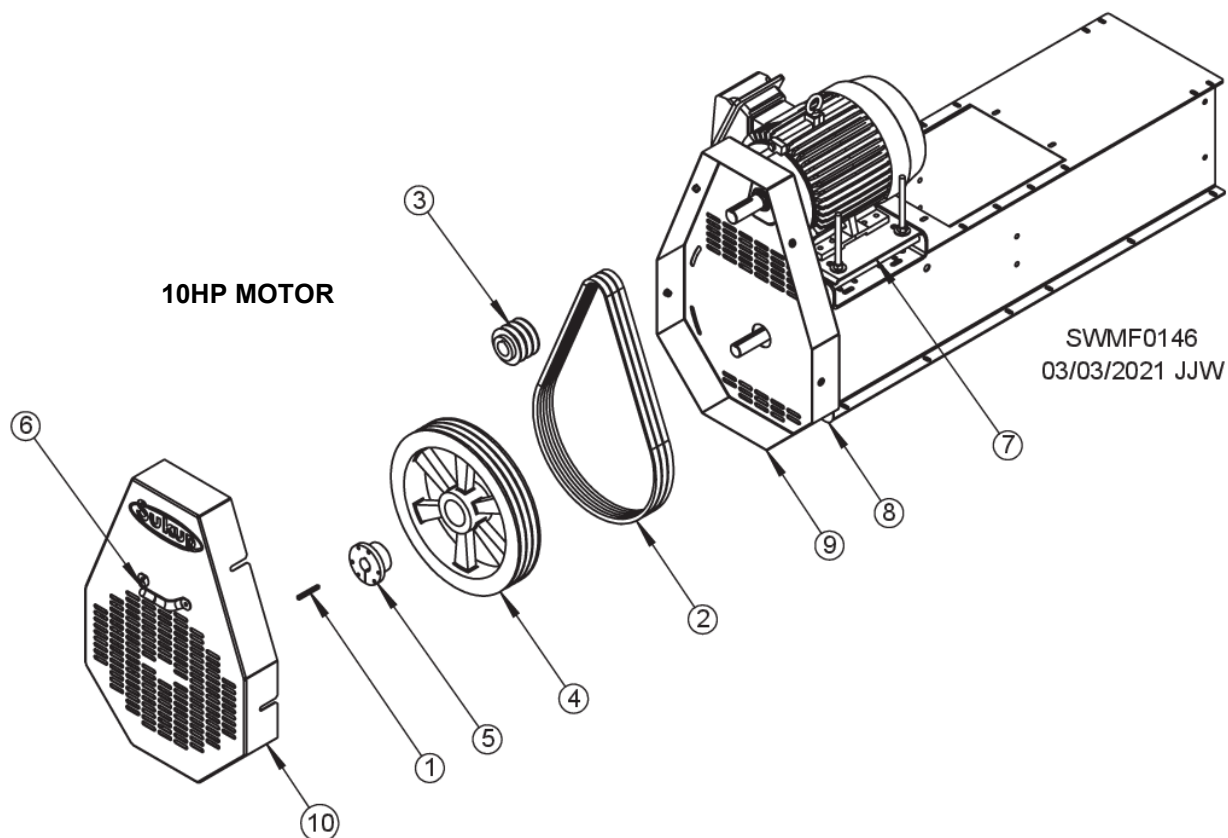
3 AND 5HP MOTOR



7.5HP MOTOR

REF. #	DESCRIPTION	3-5HP QTY.	7.5HP QTY	PART #
1	KEY, 1/4" SQ X 2 1/2" LONG	1	1	E5720
2	KEY, 1/4" X 1 1/2"	1	1	E9007
3	BELT, BX60	-	2	J0223
4	BELT, BX58	2	-	J02361
5	PULLEY, 3.5 OD, 1.25, DBL, B, CAST	1	-	J0317
6	PULLEY, 3.5 OD, 1.375, DBL, B GRV	-	1	J0318
7	PULLEY, 15.75 OD, DBL, B GR, SK	1	1	J03992
8	BUSHING, 1.25, SK, SK114	1	1	J0410
9	HANDLE, PULL, V4, VA FANS	1	1	J3232
10	MOUNT, MOTOR, PIVOT, LOAD, UNLOAD	1	1	T29371
11	BRACKET, BELT SHIELD, LOAD MOTOR	2	2	TM04136
12	SHIELD, BELT, REAR, MOTOR, LOAD	1	1	TM04147
13	SHIELD, BELT, FRONT, MOTOR, LOAD	1	1	TM04148

LOAD AUGER DRIVE COMPONENTS FOR 10 HP MOTOR

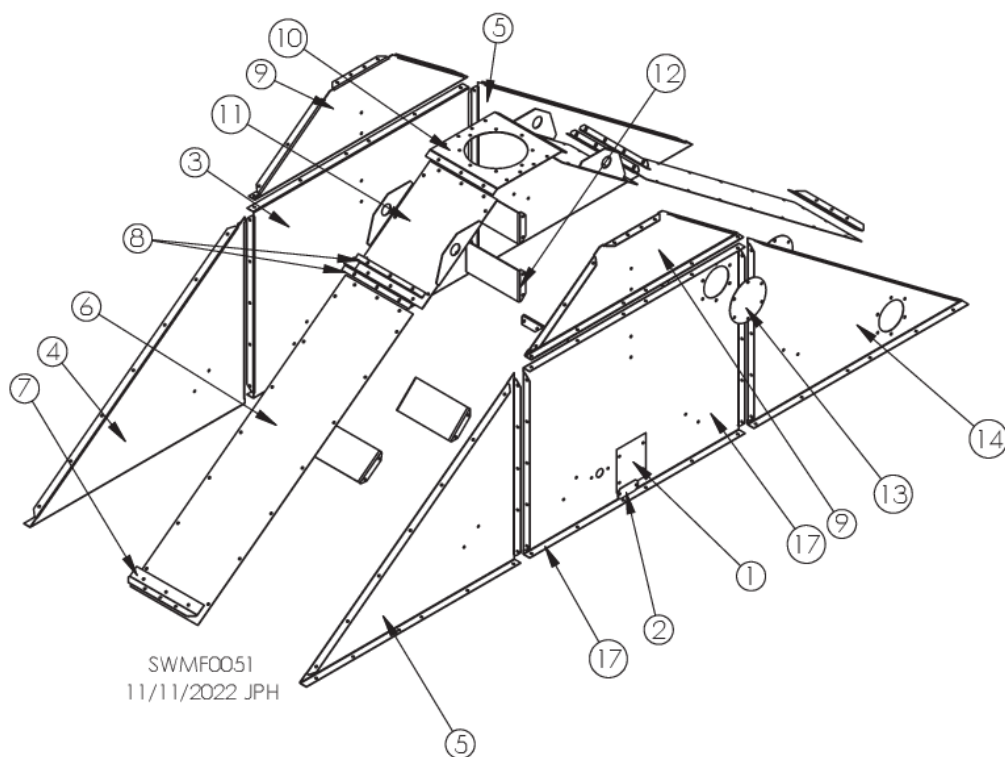


REF. #	DESCRIPTION	QTY.	PART #
1	KEY, 1/4" SQ x 2.500 LONG	1	E5720
2	BELT, BX60	3	J0223
3	PULLEY, 3.5 OD, X1 3/8 TRP B GRV	1	J0331
4	PULLEY, 15.4, TRIPLE, B GRV	1	J0396
5	BUSHING, 1.25, SK, SK114	1	J0410
6	HANDLE, PULL, V4, VA FANS	1	J3232
7	MOUNT, MTR, PIVOT, LD/UNLD, CCW	1	T29375
8	BRACKET, BELT SHIELD, LOAD MOTOR	2	TM04136
9	SHIELD, BELT, REAR, MTR, LOAD, ASY	1	TM04146
10	SHIELD, BELT, FRONT, MOTOR, LOAD	1	TM04148

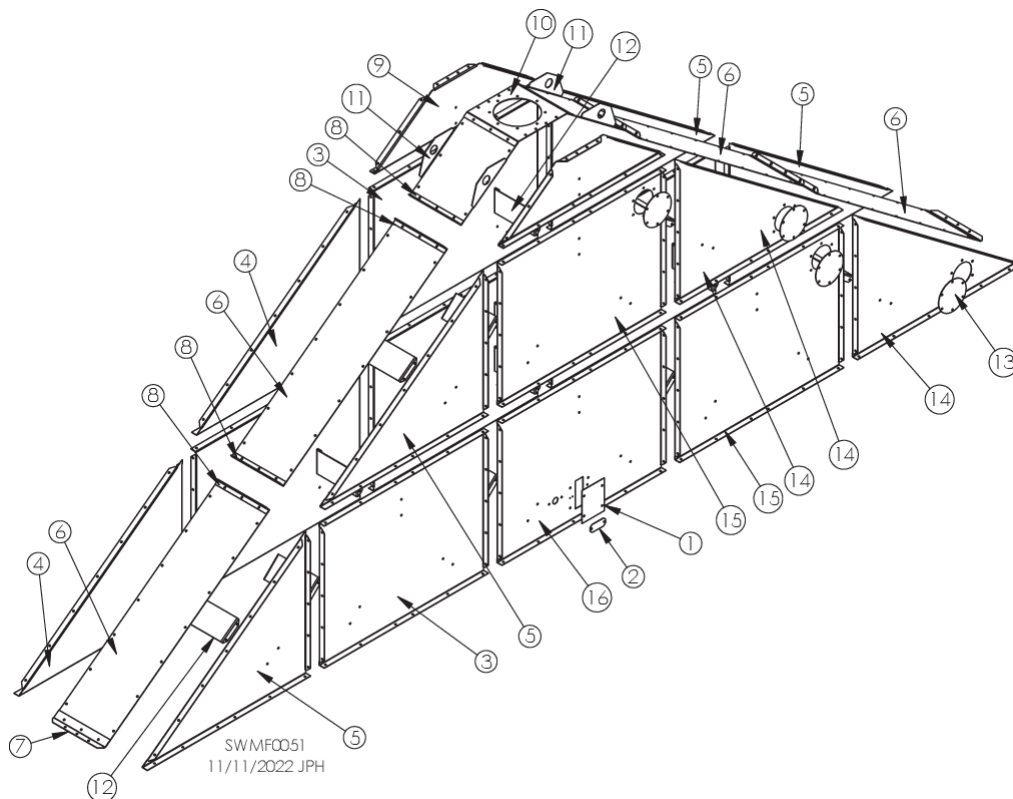
GRAVITY LOAD PARTS FOR 16', 24' & 32' DRYER

REF. #	DESCRIPTION	16' QTY	24' QTY	32' QTY	PART #
1	PLATE, COVER, RF GARNER END	1	1	1	T17415
2	COVER PLATE, SAMPLE SPOUT	1	1	1	T43936
3	SIDEWALL, CENTER, GRAVITY FILL	1	5	14	TM04060
4	SIDEWALL, SIDE, RIGHT, GRAVITY FILL	1	2	3	TM04061
5	SIDEWALL, SIDE, LEFT GRAVITY FILL	2	4	6	TM04062
6	COVER, SIDE, FULL, GRAVITY FILL	2	4	6	TM04063
7	ANGLE, SPLICE, COVER, BOTTOM	2	2	1	TM04064
8	ANGLE, SPLICE, COVER, GRVITY FILL	4	8	12	TM04065
9	SIDE, EXTENSION, INLET, GRAVITY FILL	2	2	2	TM04066
10	TOP, EXTENSION, INLET, GRAVITY FILL	1	1	1	TM04067
11	COVER, EXT, INLET, GRAVITY FILL	2	2	2	TM04068
12	BRACE, INTERIOR, GRAVITY FILL	6	17	40	TM04070
13	COVER, OPENING, SWITCH, FILL	2	4	6	TM04074
14	SIDEWALL, GRAVITY FILL, RT, SNSR	1	2	3	TM04088
15	SIDEWALL, CENTER, GRAVITY FILL	-	2	3	TM04099
16	SIDEWALL, GRAVITY FILL, SENSORS	-	1	1	TM04160
17	SIDEWALL, GRAVITY FILL, MOIST SNSR	1	-	-	TM04172

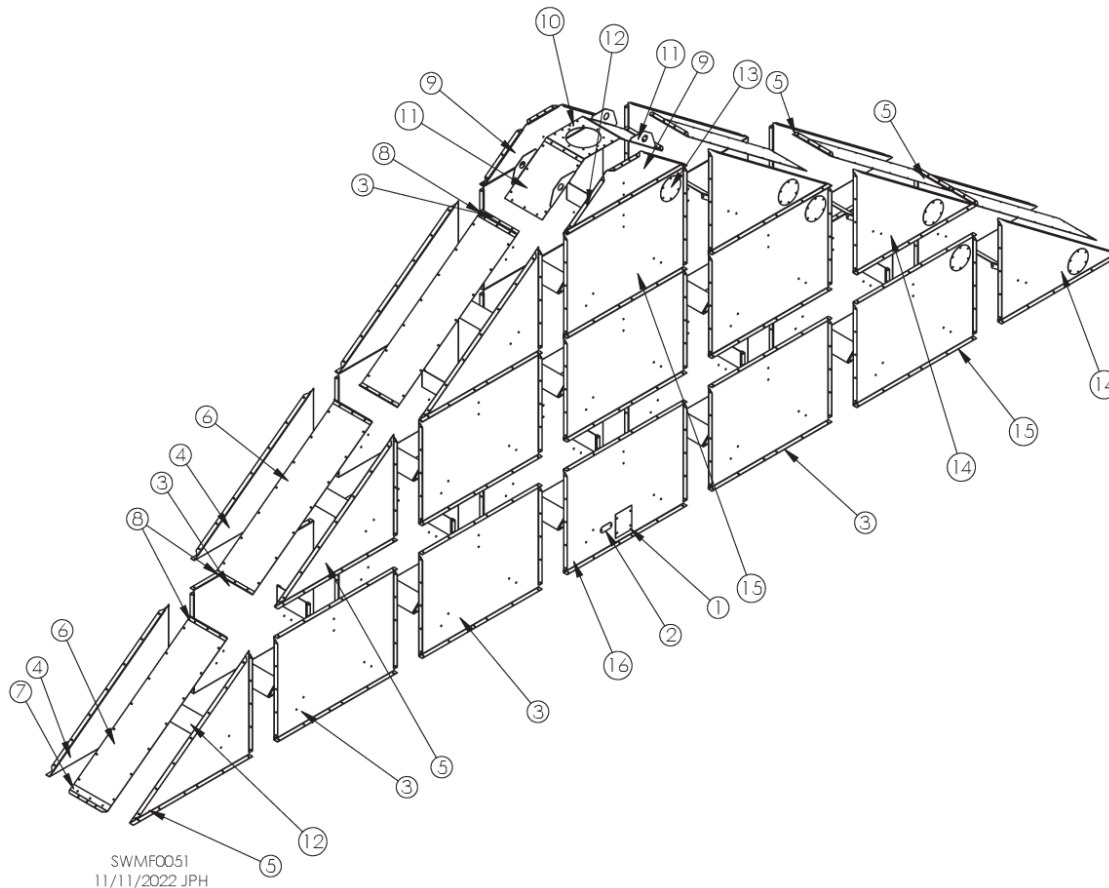
GRAVITY LOAD FOR 16' DRYER



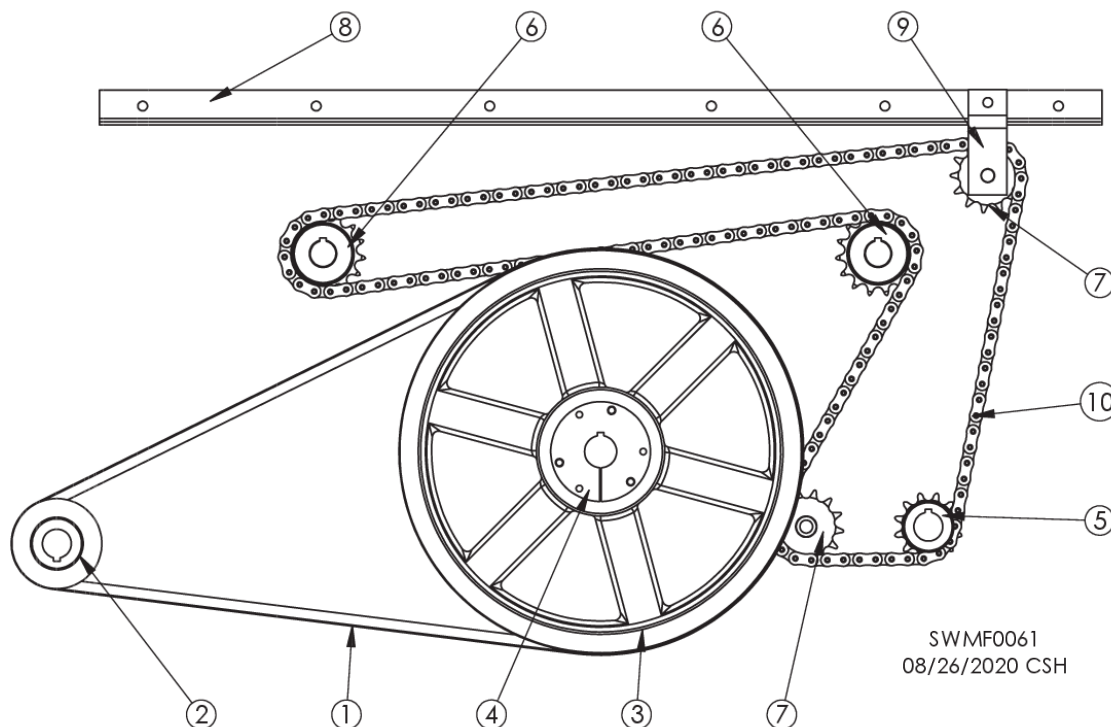
GRAVITY LOAD FOR 24' DRYER



GRAVITY LOAD FOR 32' DRYER



DRIVE (FRONT) END OF DRYER W/ AUGER UNLOAD



REF. #	DESCRIPTION	QTY.	PART #
1	BELT, BX72 (15.75 X 3.5)	2	J0246
2	PULLEY, 3.5 OD, 1.25, DBL, B, CAST	1	J0317*
3	PULLEY, 15.75 OD, DBL, B GR, SK	1	J03992
4	BUSHING, 1.25, SK, SK114	1	J0410
5	SPROCKET, 50B12, 1.125" BR	1	J16612**
6	SPROCKET, 50B14, 1 BORE	2	J1663***
7	SPROCKET, IDLER, 50-13	2	J1685
8	BOTTOM SINGLE SPLICE	1	T17925
9	BRACKET WELDMENT, IDLER SPROCKET	1	T17965
10	CHAIN, #50, 145 LINKS, UNLOAD	1	TM08001

*Pulley J0317 is for 3-5hp motor. Use J0318 for 7.5hp motor.

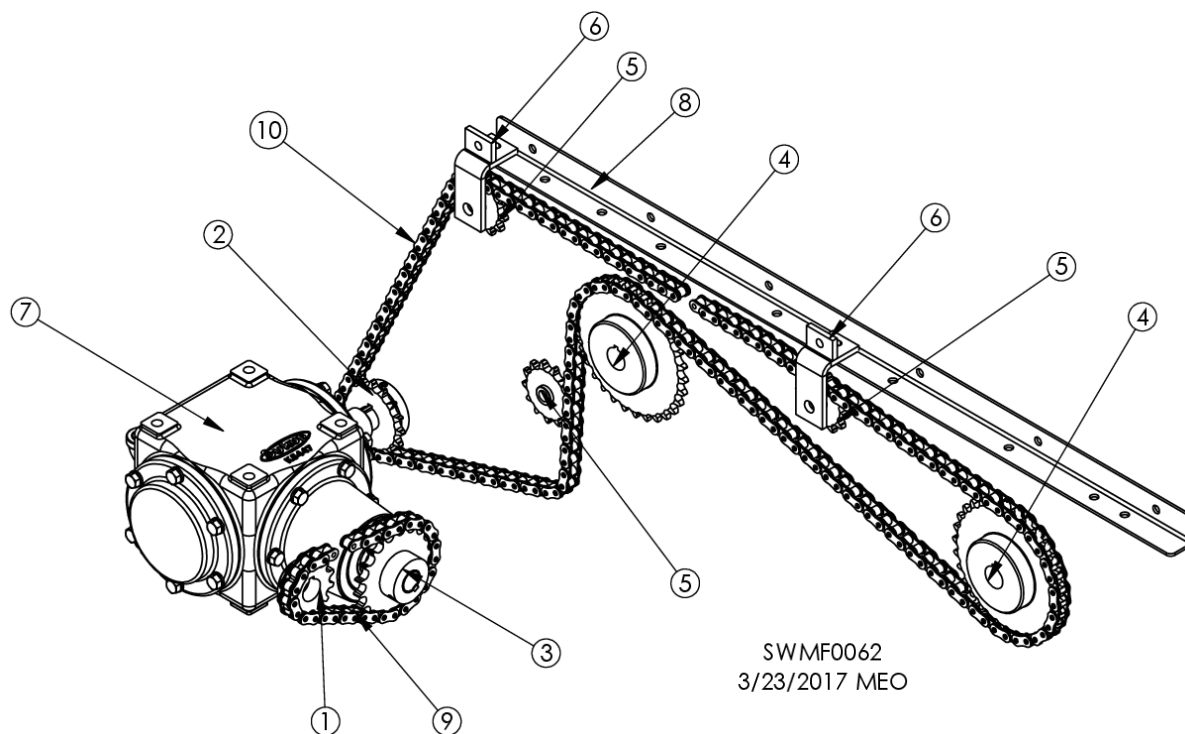
**Sprocket J16612 is for dryer w/ Medium cooling section; Use J16741 for Tall or Extra Tall.

***Sprocket J1663 is for dryer w/ Medium cooling section; Use J1675 for Tall or J1665 for Extra Tall.

COOLING SECTION HEIGHTS	
MEDIUM	9' 11"
TALL	11' 11"
EXTRA TALL	13' 11"

Heights are measured from dryer frame to bottom of first mixing tier.

DRIVE (FRONT) END OF DRYER W/ DRAG UNLOAD

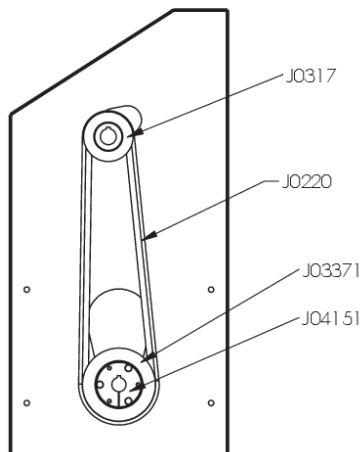


REF. #	DESCRIPTION	QTY.	PART #
1	SPROCKET,50B12,1 BORE,KEYWAY	1	J1660
2	SPROCKET,50B16,1" BORE	1	J1668
3	SPROCKET,50B20,1 BORE	1	J1672
4	SPROCKET,50B30,1"BR	2	J1678
5	SPROCKET, IDLER, 50BB13H X 1/2"	3	J1685
6	BRACKET WELDMENT, IDLER SPROCKET	2	T17965
7	GEAR BOX, 1.5:1, RIGHT ANGLE	1	T5082
8	BOTTOM ANGLE SPLICE, DRAG	1	T5091
9	CHAIN,#50,31 LINKS,UNLOAD	1	TM08002
10	CHAIN,#50,171 LINKS,UNLOAD	1	TM08003

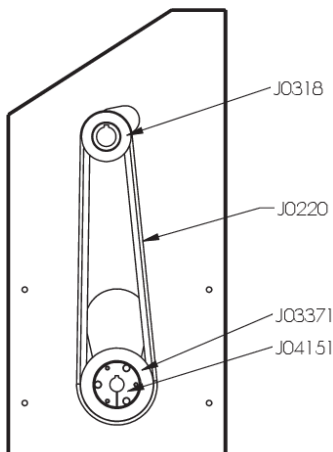
PULLEYS, BUSHINGS & BELTS FOR DRYER W/ DRAG UNLOAD

NOTE: See Page 2-9 to identify height of cooling section – Medium, Tall or Extra Tall.

MEDIUM (UP TO 5HP) SWMF0063
12/08/2022 RDS



MEDIUM (OVER 5HP)



PULLEYS

J0317, 3.5" OD, 1-1/8" ID, DBL B
J0318, 3.5" OD, 1-3/8" ID, DBL B
J0337, 5.15" OD, 2" ID, SD
J03371, 5.15" OD, 2" ID, SD
J03385, 5.95" OD, 2" ID, SD

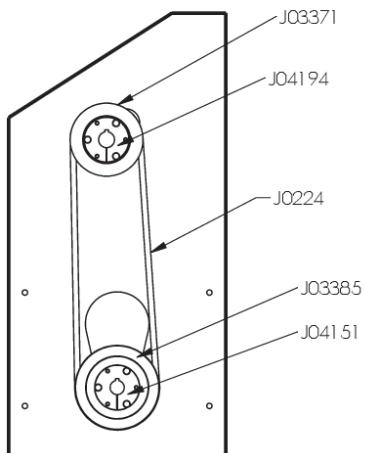
BUSHINGS

J0415, 1" BORE, SD
J04151, 1" BORE, SDS
J04194, 1.125" BORE, SDS
J04241, 1.375" BORE, SDS

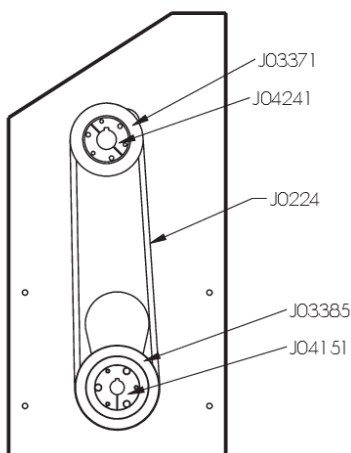
BELTS

J0220, BX48
J0224, BX50
J0226, BX51

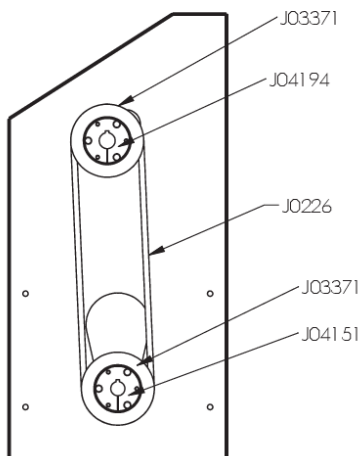
TALL (UP TO 5HP) SWMF0063
12/08/2022 RDS



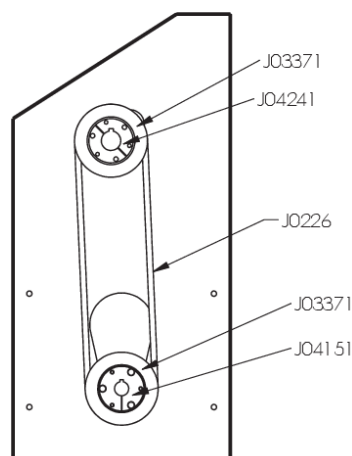
TALL (OVER 5HP)



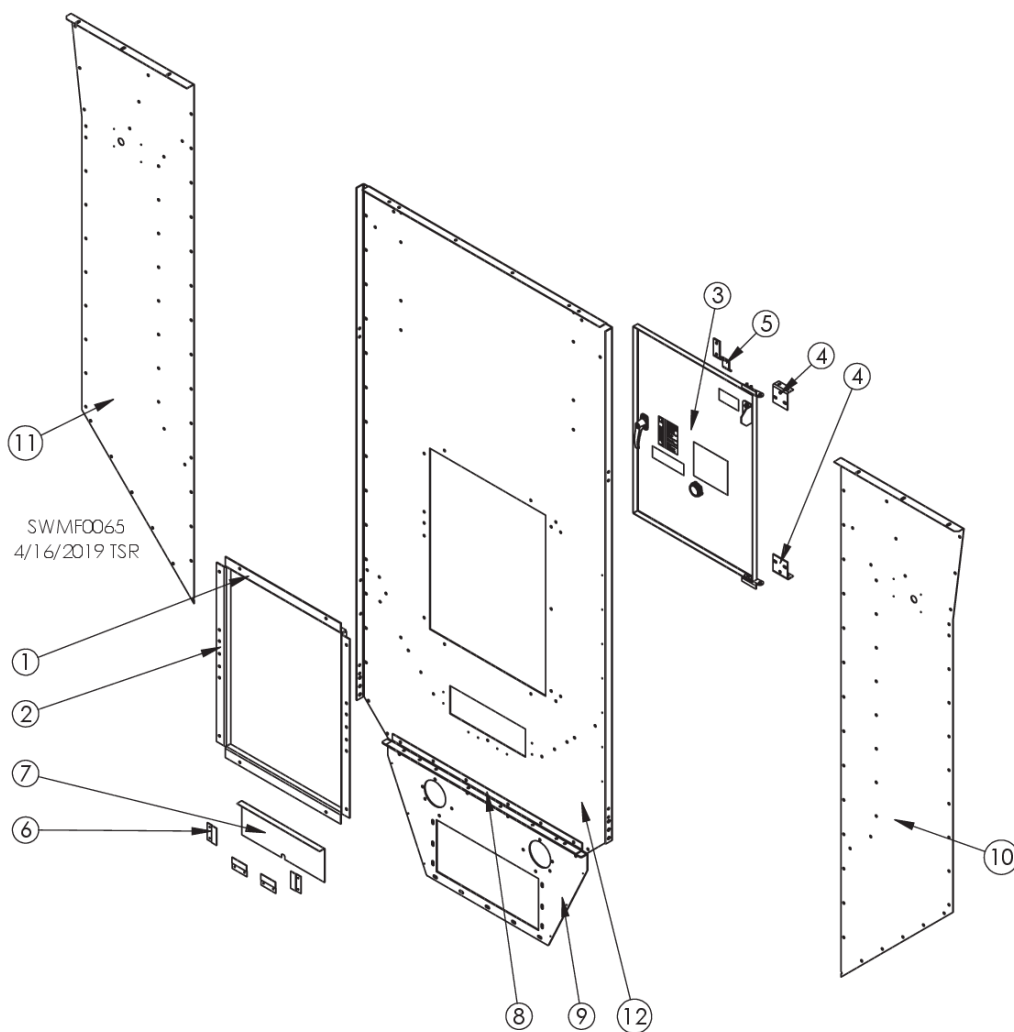
EXTRA TALL (UP TO 5HP) SWMF0063
12/08/2022 RDS



EXTRA TALL (OVER 5HP)

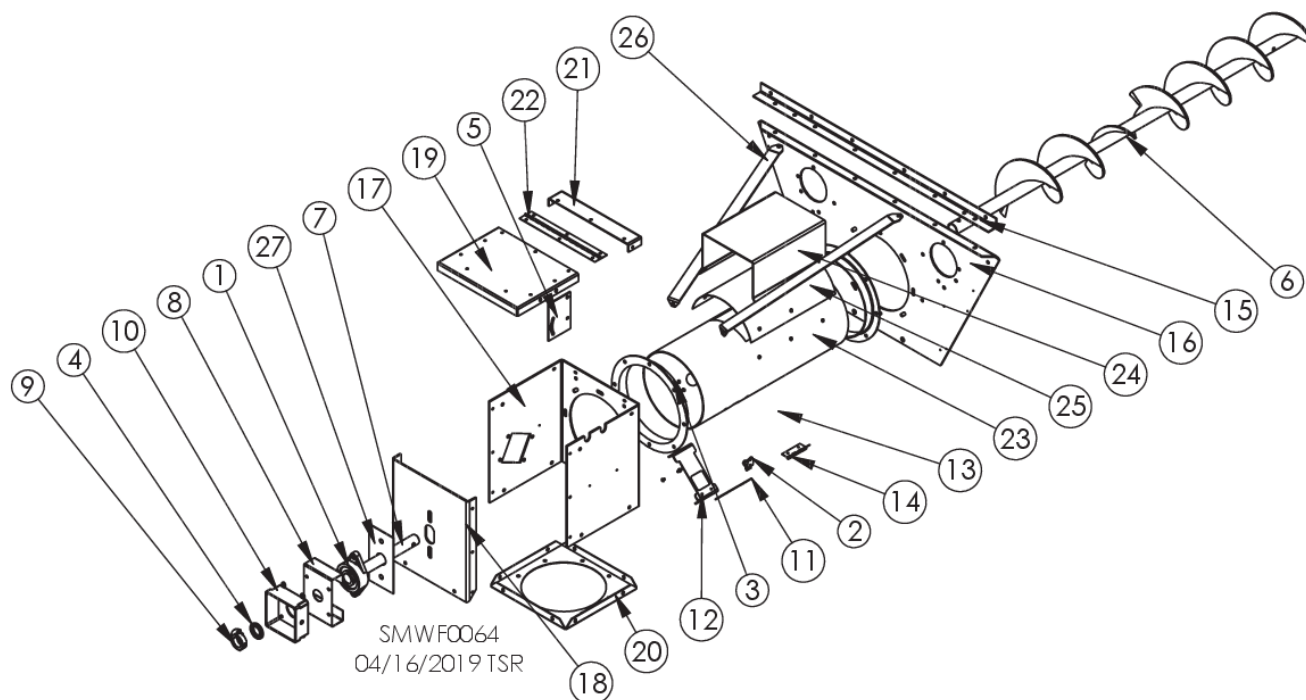


UNLOAD (BACK) END OF DRYER W/ MEDIUM-HEIGHT COOLING SECTION



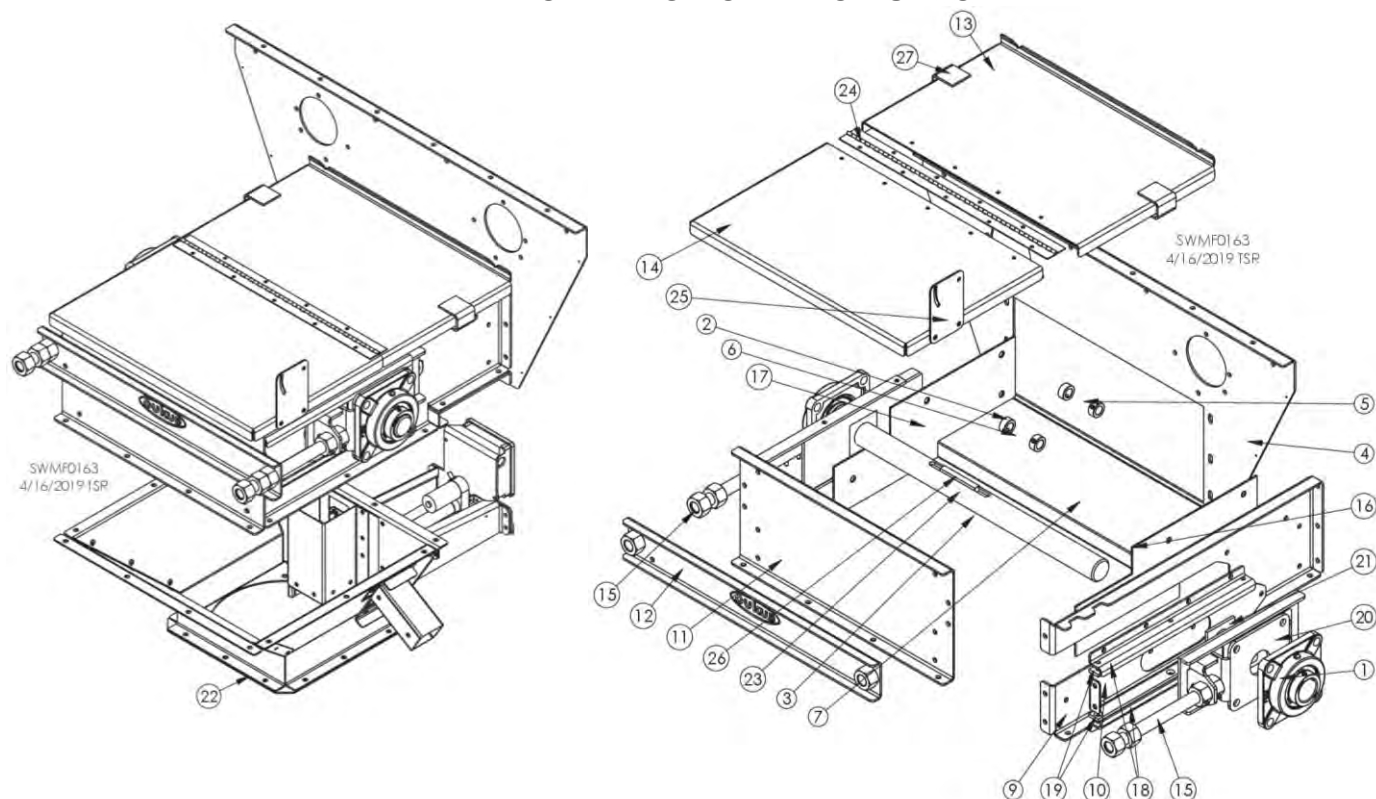
REF. #	DESCRIPTION	QTY.	PART #
1	EDGING TOP & BOTTOM, DOOR	2	T16136
2	EDGING SIDES, REAR DOOR	2	T16137
3	REAR ENTRY DOOR	1	T16147AM
4	HINGE, BRACKET	2	T16148
5	CATCH, REAR ACC DOOR	1	T16151
6	SIDE RAIL, BLOWOUT DOOR	4	T16154
7	BLOWOUT DOOR	1	T17658
8	BOTTOM ANGLE SPLICE	1	T17925
9	PLATE, BACK, SPRT, DRAG	1	T5028
10	PLATE, SIDE, RH, END MEDIUM	1	TM02037
11	PLATE, SIDE, LH, END MEDIUM	1	TM02038
12	PLATE, END, REAR, MEDIUM	1	TM02042

AUGER UNLOAD



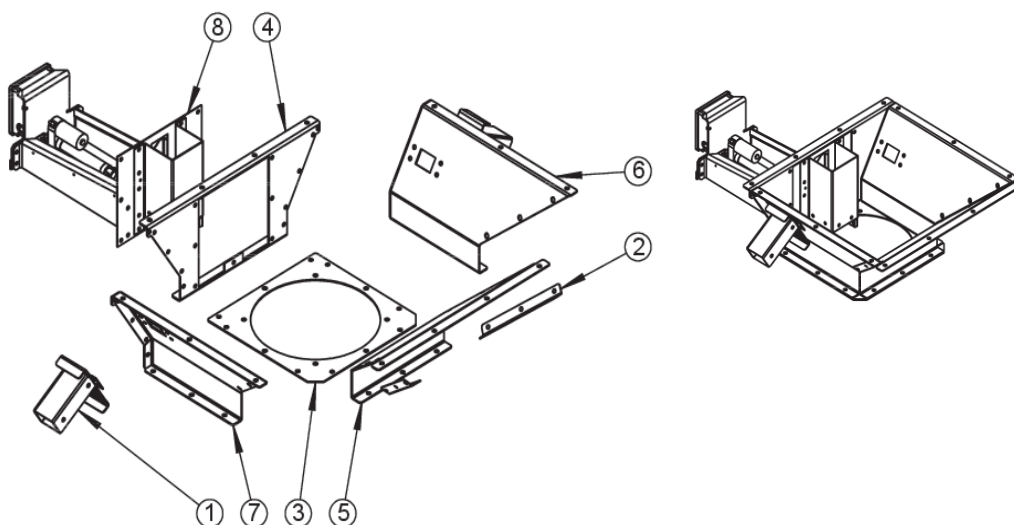
REF. #	DESCRIPTION	QTY.	PART #
1	BRG, 1.25, FLG, W/LC, HCFTS207-20	1	J0010
2	LATCH, 3-10 LL, 2-57-1625-07-00	1	J2310
3	RING, 10", FLANGE	2	J6610
4	SEAL 2" OD 1 1/4" ID CR# 12481	1	J7023
5	MERC SWITCH PLATE	1	T16358
6	BOTTOM REAR AUGER	1	T16431
7	SHAFT, 1.25 X 10, BOTTOM AUGER	1	T17251
8	BRACKET, PROX. SW, UNLOAD AUGER	1	T17252
9	TARGET. PROX. SW., UNLOAD AUGER	1	T17256
10	BOX, PROX. SWITCH, UNLOAD AUGER	1	T17263
11	COVER, SAMPLE SPOUT (UNLOAD)	1	T17663
12	SPOUT, SAMPLE, UNLOAD, AUGER, ASSY	1	T17668
13	STRAP, MOISTURE SENSOR – REAR	1	T17850
14	HINGLE, MOISTURE SENSOR – REAR	1	T17851
15	BOTTOM ANGLE SPLICE	1	T17925
16	REAR BOTTOM END PLATE	1	T25521
17	FRONT-SIDES, SUMP BOX	1	T25670
18	REAR PLATE, SUMP BOX	1	T25671
19	LID, SUMP BOX	1	T25672
20	BOTTOM, SUMP BOX	1	T25674
21	LID HINGE SIDE, SUMP BOX	1	T25675
22	HINGE, SUMP BOX	1	T25676
23	TUBE, DISCHARGE	1	T25677
24	STEP, UNLOAD TUB	1	T25678
25	COVER, TUBE, REAR DISCHARGE	1	T25679
26	BRACE FOR UNLOAD AUGER	2	T25681
27	BEARING SHIM PLATE	1	T25682

BACK END OF DRAG CONVEYOR UNLOAD



REF. #	DESCRIPTION	QTY.	PART #
1	BRG, 1.9375, 4-BOLT, PEER	2	J0722
2	COLLAR, SHAFT, 3/4	4	J1327
3	SPROCKET, 81X, C, 8T, 1.9375" BORE	1	J2134
4	PLATE, BACK, SPRT, DRAG	1	T5028
5	RD, 3/4" OD, 21" LONG, RETURN	2	T5036
6	ROLLER, RD, CHAIN RETURN, UHMW	2	T5037
7	BOTTOM, 21", HEAD, 3/16 WELDMENT	1	T5049
8	SIDE, RIGHT, HEAD, CFD, DRAG	1	T5050
9	SIDE, LEFT, HEAD, CFD, DRAG	1	T5051
10	BRACKET, SIDE, HEAD, COVER	2	T5052
11	BRACKET, BACK, HEAD	1	T5053
12	HEAD, TENSIONER, WELDMENT, DRAG	1	T5054
13	TOP, COVER, HEAD, CFD, DRAG	1	T5055
14	TOP, COVER, HEAD, HINGE	1	T5055-01
15	ROD, ADJ. WELD, 12"	2	T5056
16	LINER, HEAD, LEFT	1	T5057
17	LINER, HEAD, RIGHT	1	T5058
18	BRACKET, GUIDE, TENSION, HEAD	4	T5059
19	GUIDE, TENSIONER, UHMW, HEAD	4	T5060
20	HEAD, TENSIONER, WELDMENT, DRAG	2	T5062
21	COVER, UHMW, 1 15/16"	2	T5063
22	STATIC SAMPLER, DRAG, ASY	1	T50660
23	SHAFT, 1.9375, TAIL, 21" X 31.25"	1	T5090
24	HINGE, RELIEF DOOR, HEAD, DRAG	1	T5092
25	PLATE, TILT SWITCH, HEAD, UNLOAD	1	T5099
26	KEY, 1/2" SQ, 3 7/8" L	1	W60529
27	CLAMP, TOP, CONV, ASY	2	W60784

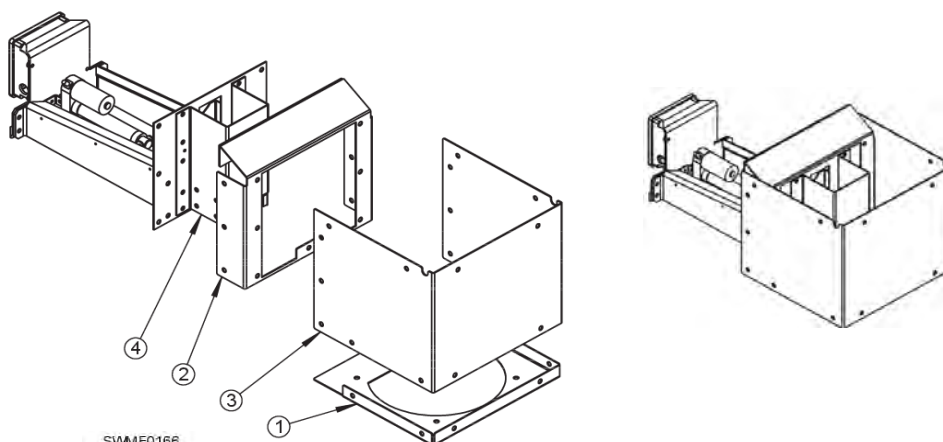
STATIC SAMPLE BOX FOR DRAG CONVEYOR UNLOAD



SVMF0166
05/08/2019 RPE

REF. #	DESCRIPTION	QTY.	PART #
1	SPOUT, SAMPLE, UNLOAD, DRAG, ASSY	2	T17677
2	BRACE, CORNER, COVER, SAMPLER	2	T50656
3	BOTTOM, HOUSING, SAMPLER, DRAG	1	T50661
4	FRONT, HOUSING, SAMPLER, DRAG	1	T50662
5	BACK, HOUSING, SAMPLER, DRAG	1	T50663
6	RIGHT, HOUSING, SAMPLER, DRAG	1	T50664
7	LEFT, HOUSING, SAMPLER, DRAG	1	T50665
8	SAMPLER, GRAIN, STATIC, INSERT, ASY	1	T50780

STATIC SAMPLE BOX FOR AUGER UNLOAD

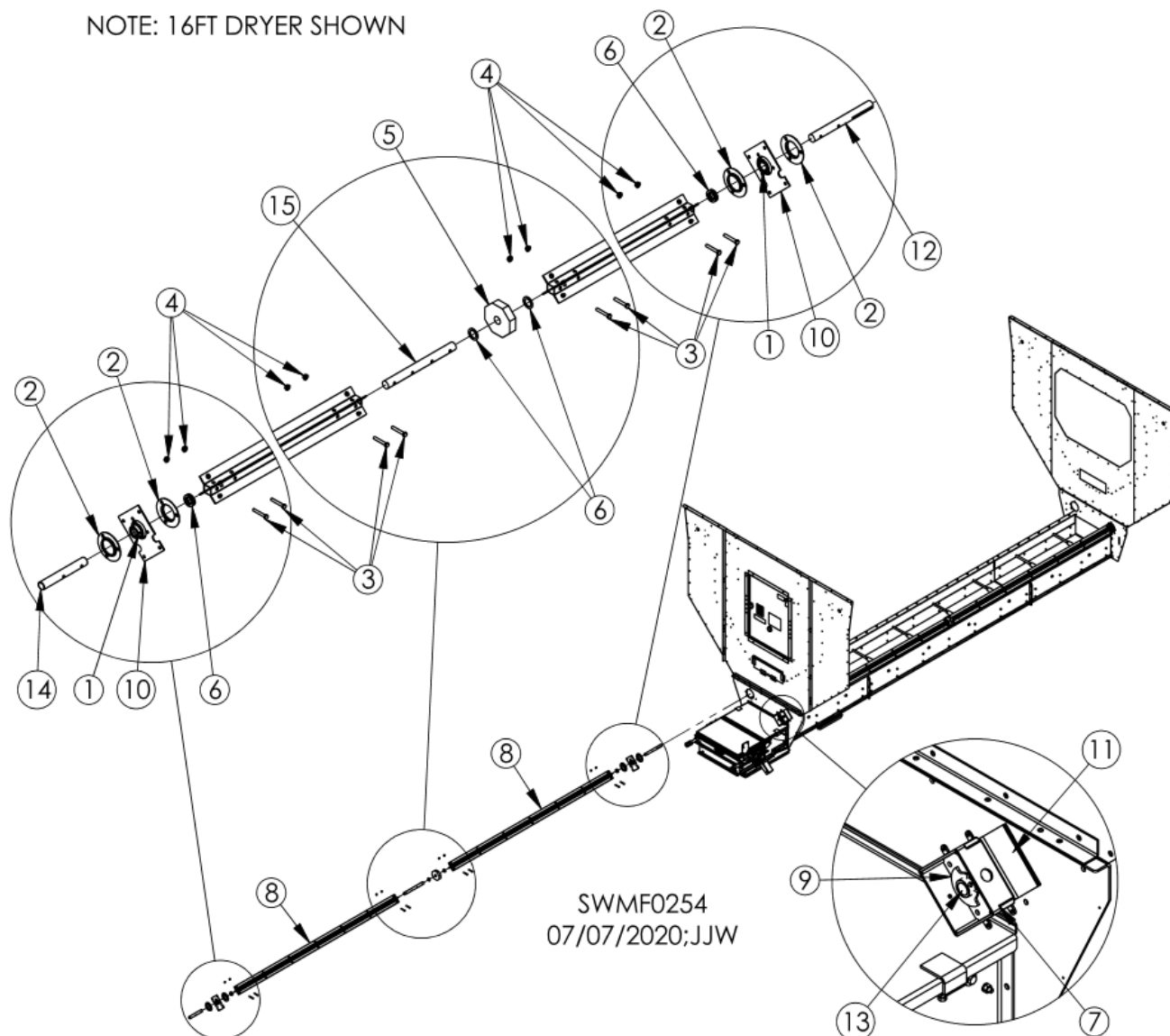


SVMF0166
05/08/2019 RPE

REF. #	DESCRIPTION	QTY.	PART #
1	BOTTOM, HOUSING, DAMPLER, AUG	1	T50671
2	FRONT, HOUSING, SAMPLER, AUG	1	T50672
3	BACK & SIDES, HOUSING, SAMPLER, AUG	1	T50673
4	SAMPLER, GRAIN, STATIC, INSRT, ASY	1	T50780

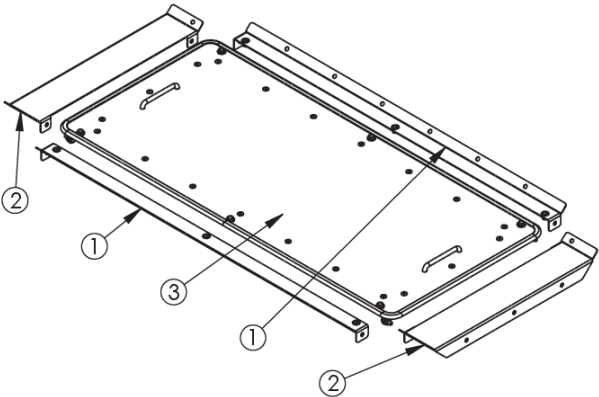
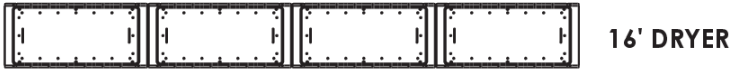
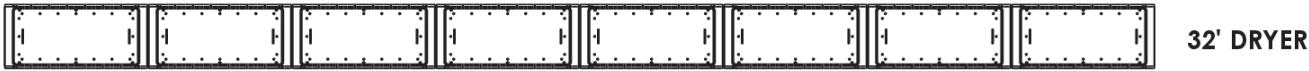
METERING ROLLS

NOTE: 16FT DRYER SHOWN



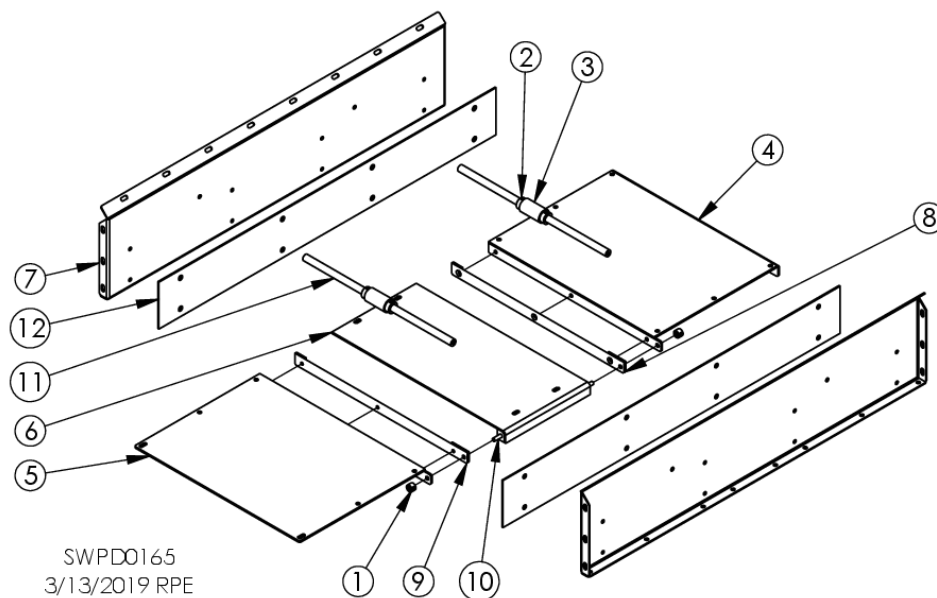
REF. #	DESCRIPTION	16' QTY.	24' QTY.	32' QTY.	PART #
1	BRG, 1", CENTER, FH205-16, W/L CLR	4	4	4	J00058
2	FLANGETTE, 3 HOLE, 205 BRG (BRH52MS)	8	8	8	J0098
3	SCREW, 5/16-18, 2, PLT, GR5, HHCS	16	24	32	J0585
4	NUT, WHIZ, 5/16-18	16	24	32	J1110
5	BUSHING, WOODEN, OCTAGON, 1" ID	2	4	6	J1245
6	BUSHING, MACHINE, 1-18 GA	40	48	56	J1266
7	BOX, 5 X 5'	1	1	1	T16265
8	METERING ROLL ASSY, 8', ALUMINUM	4	6	8	J3033
9	TARGET	1	1	1	T17281
10	METER PLATE	4	4	4	T17920
11	ENCODER BRACKET	1	1	1	T17921
12	FRONT SHAFT, METER ROLL	2	2	2	T18266
13	TOP REAR SHAFT, METER ROLL	1	1	1	T18267
14	BOTTOM REAR SHAFT, METER ROLL	1	1	1	T18628
15	CONNECTING SHAFT, METER ROLL	2	4	6	T18269

INNER CLEANOUT PANEL ASSEMBLY



REF. #	DESCRIPTION	QTY.	PART #
1	FRAME, SIDE, DOOR, PLEN, BOLT, ASY	2	T17204AM
2	FRAME, END, DOOR, PLUNUM, BOLT ON	2	T17205
3	DOOR, FLOOR, PLENUM, BOLT ON, ASY	1	T17212

DRAG CONVEYOR CLEANOUT DOOR ASSEMBLY

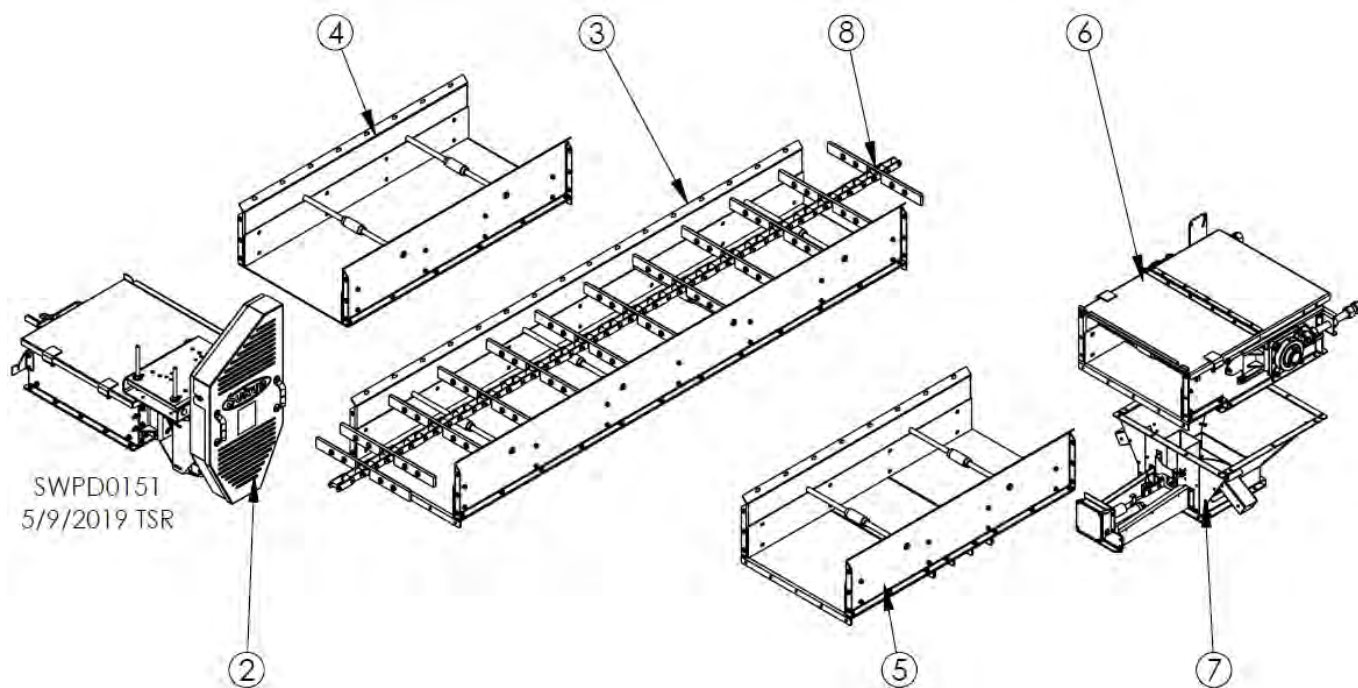


REF. #	DESCRIPTION	QTY.	PART #
1	COLLAR, SHAFT, 3/8"	2	J1319
2	COLLAR, SHAFT, 3/4"	4	J1327
3	ROLLER, RD, CHAIN RETURN, UHMW	2	T5037
4	BOTTOM, FRONT, CLEANOUT, WELDMENT	1	T50381
5	BOTTOM, REAR, CLEANOUT, WELDMENT	1	T50382
6	DOOR, CLEANOUT, WELDMENT	1	T50383
7	SIDE, 9", BODY, 4', CLEANOUT	2	T50384
8	STRIP, UHMW, STRIP, FRONT	1	T50385
9	STRIP, UHMW, GUIDE, BACK	1	T50386
10	ROD, PIVOT, 14", 3/8"	1	T50387
11	ROD, ROLLER, RETURN, 3/4", 21"	2	W60452-01
12	LINER, 9", BODY, 4'	2	W71263

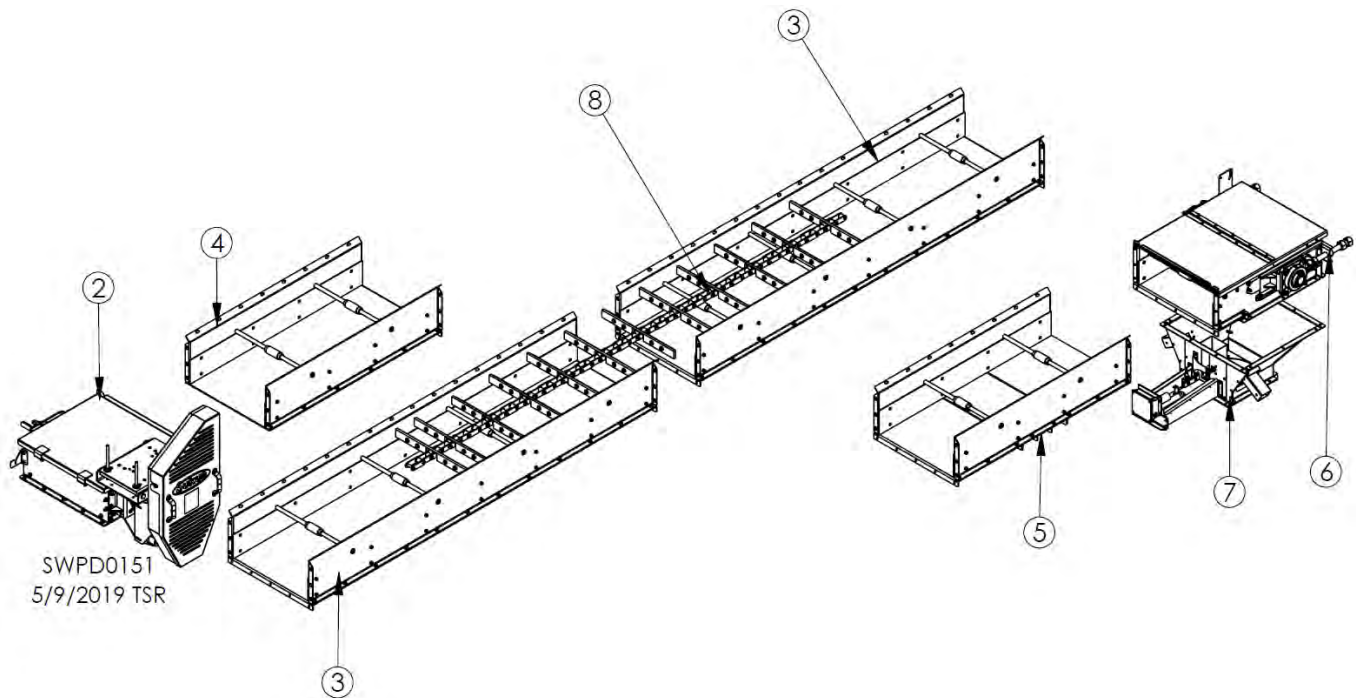
DRAG CONVEYOR ASSEMBLY PARTS FOR 16', 24' & 32' DRYER

REF. #	DESCRIPTION	16' QTY.	24' QTY.	32' QTY.	PART #
1	BODY, 30", CONV, 2109, EXTENSION	-	-	1	T177304
2	TAIL, CONV, 2109, 1.9375BRG	1	1	1	T50041
3	BODY, 8', CONV, 2109, 3/16, 10GA	1	2	3	T5030
4	BODY, 4', CONV, 2109, 3/16, 10GA	1	1	1	T5038
5	BODY, 4', CONV, 2109, CLEANOUT	1	1	1	T50380
6	HEAD, CONV, 2109, 1.9375BRG, 3/16	1	1	1	T5048
7	STATIC SAMPLER, DRAG, ASY	1	1	1	T50660
8	CHAIN, 21", 81X, CONVEYOR, ASY	4	6	8	W60518

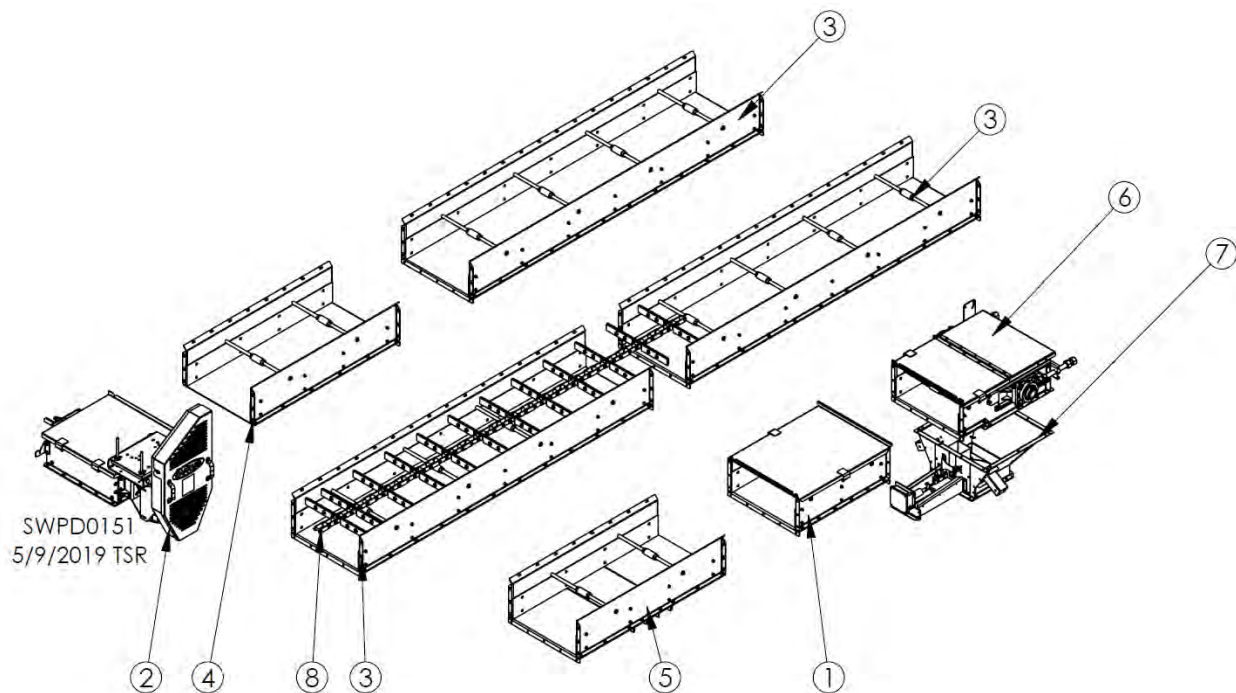
DRAG CONVEYOR ASSEMBLY FOR 16' DRYER



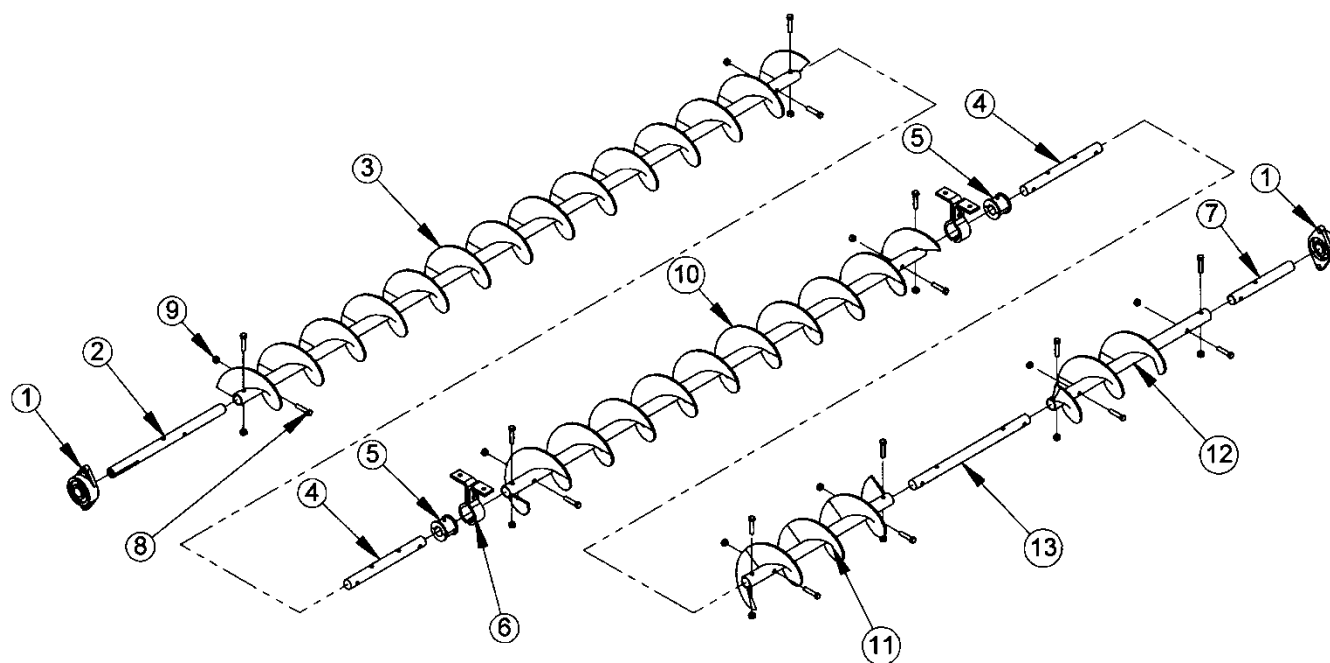
DRAG CONVEYOR ASSEMBLY FOR 24' DRYER



DRAG CONVEYOR ASSEMBLY FOR 32' DRYER



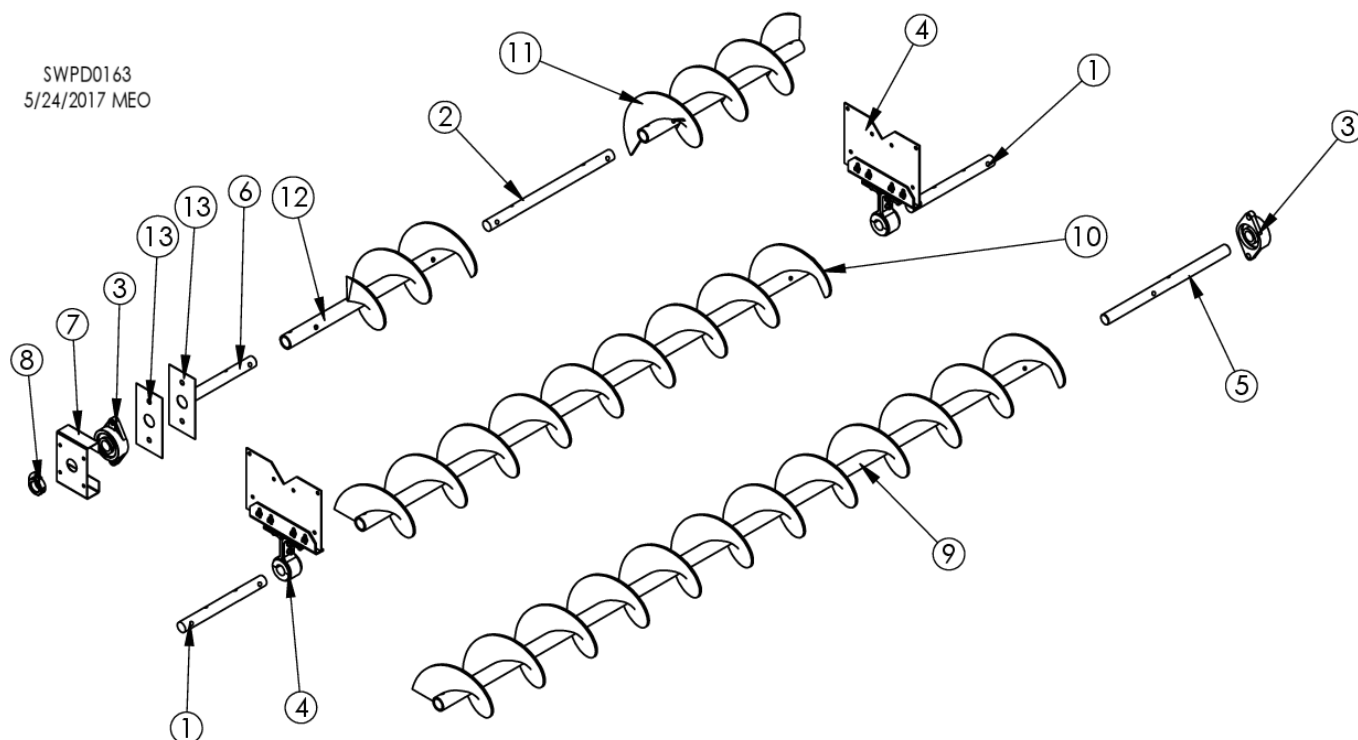
7" UNLOAD AUGER ASSEMBLY FOR 16' DRYER



SWPD0032

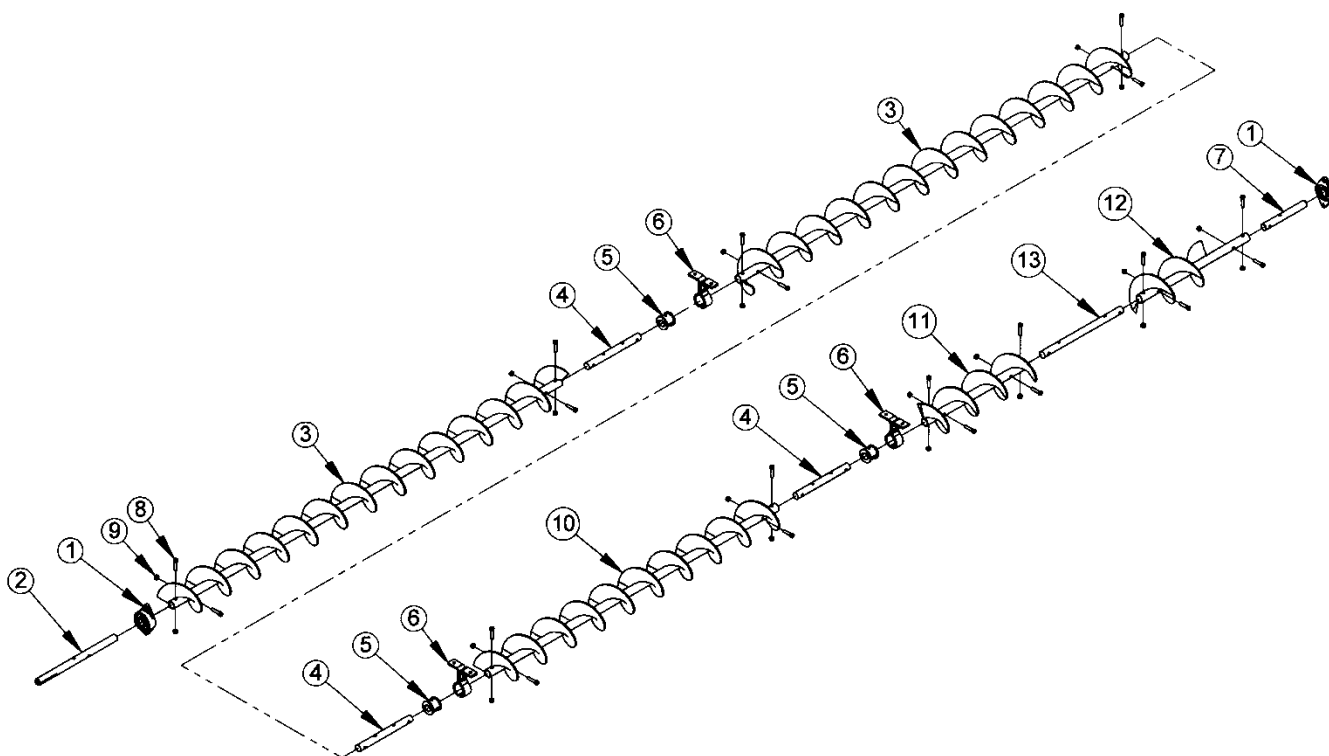
REF. #	DESCRIPTION	QTY.	PART #
1	BEARING, 1.25, FLANGE, W/LC, HCFTS207-20	2	J0010
2	SHAFT, TOP FRONT, 13-1/4"	1	T16436
3	AUGER, BOTTOM FRONT, 93-1/2"	1	T16430
4	SHAFT, 8", HANGER BEARING	2	F4720
5	BUSHING, WOOD, 1.25", I.D.	2	J0096
6	HANGER, AUGER, T, 6CH2203	2	J0097
7	SHAFT, 1.25" X 10"	1	T17251
8	SCREW, 7/16-14, 2, PLT	16	J0718
9	NUT, LOCK, 7/16-14, PLT	16	J1034
10	AUGER, BOTTOM MIDDLE, 69-1/2"	1	T16432
11	AUGER, BOTTOM REAR, 24"	1	T12498
12	AUGER, BOTTOM, STD. UNLD. EXT.	1	T12493
13	SHAFT, AUGER, MOISTURE SENSOR	1	F4723

8" UNLOAD AUGER ASSEMBLY FOR 16' DRYER



REF. #	DESCRIPTION	QTY.	PART #
1	SHAFT, 8" HANGER BEARING	2	F4720
2	SHAFT, AUGER, MOISTURE SENSOR	1	F4723
3	BRG, 1.25, FLG, W/LC, HCFTS207-20	2	J0010
4	T HANGER BRG & PLATE ASSY, UNLOAD AUGER	2	T16131AM
5	SHAFT, TOP FRONT, 13-1/4"	1	T16436
6	SHAFT, 1.25 X 10, BOTTOM AUGER	1	T17251
7	BRACKET, PROX. SW, UNLOAD AUGER	1	T17252
8	TARGET, PROX. SW., UNLOAD AUGER	1	T17256
9	AUGER, BTTM FRONT 93 1/2", 8" OD	1	T17430
10	AUGER, BTTM MIDDLE, 69 1/2", 8" OD	1	T17432
11	AUGER, BTTM, REAR, 24"	1	T17434
12	AUGER, BTTM, STD UNLD EXT	1	T17435
13	BEARING SHIM PLATE	2	T25682

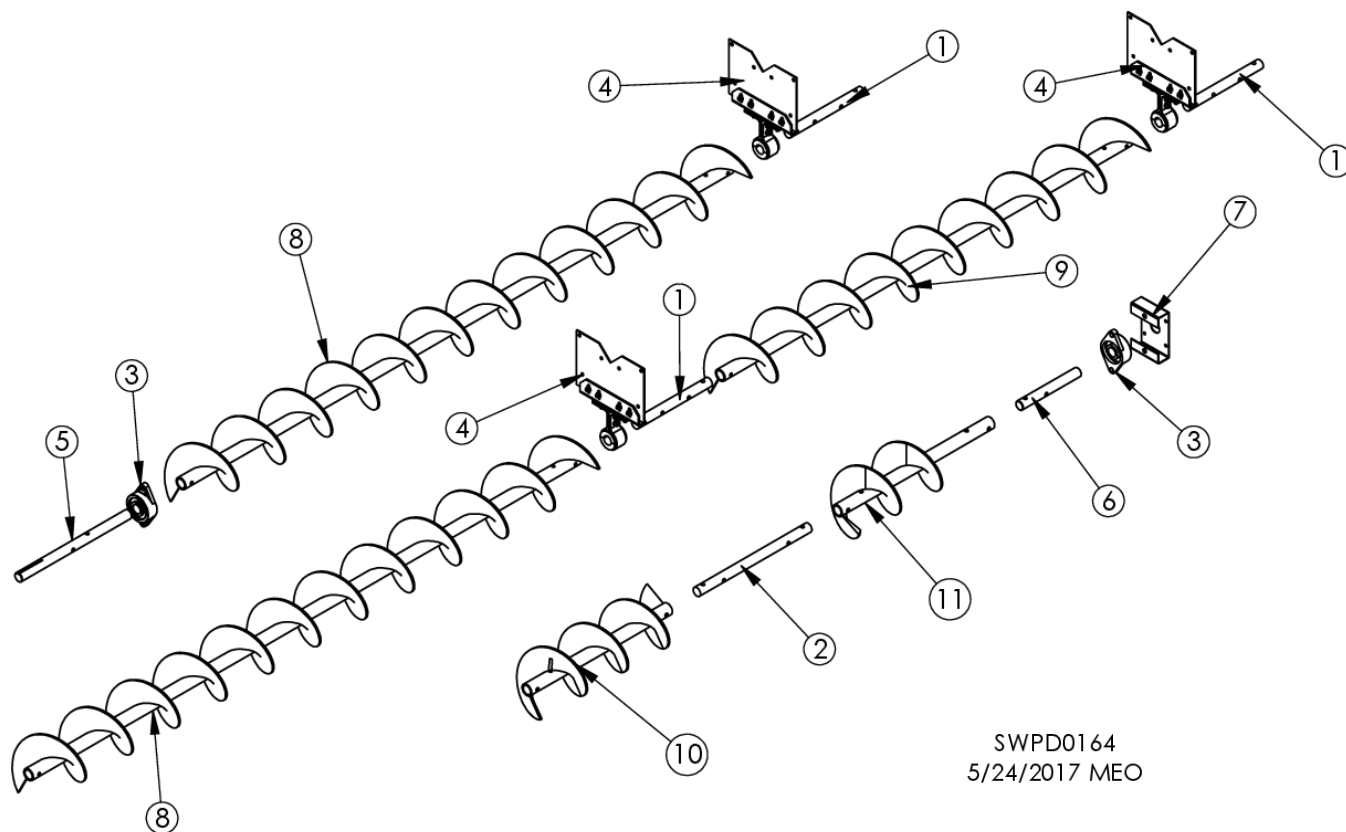
7" UNLOAD AUGER ASSEMBLY FOR 24' DRYER



SWPD0034

REF. #	DESCRIPTION	QTY.	PART #
1	BEARING, 1.25, FLANGE, W/LC, HCFTS207-20	2	J0010
2	SHAFT, TOP FRONT, 13-1/4"	1	T16436
3	AUGER, BOTTOM FRONT, 93-1/2"	2	T16430
4	SHAFT, 8" HANGER BEARING	3	F4720
5	BUSHING, WOOD, 1.25" I.D.	3	J0096
6	HANGER AUGER, T, 6CH2203	3	J0097
7	SHAFT, 1.25" X 10", BOTTOM AUGER	1	T17251
8	SCREW, 7/16-14, 2, PLT	20	J0718
9	NUT, LOCK, 7/16-14, PLT	20	J1034
10	AUGER, BOTTOM MIDDLE, 69-1/2"	1	T16432
11	AUGER, BOTTOM REAR, 24"	1	T12498
12	AUGER, BOTTOM, STD. UNLD. EXT.	1	T12493
13	SHAFT, AUGER, MOISTURE SENSOR	1	F4723

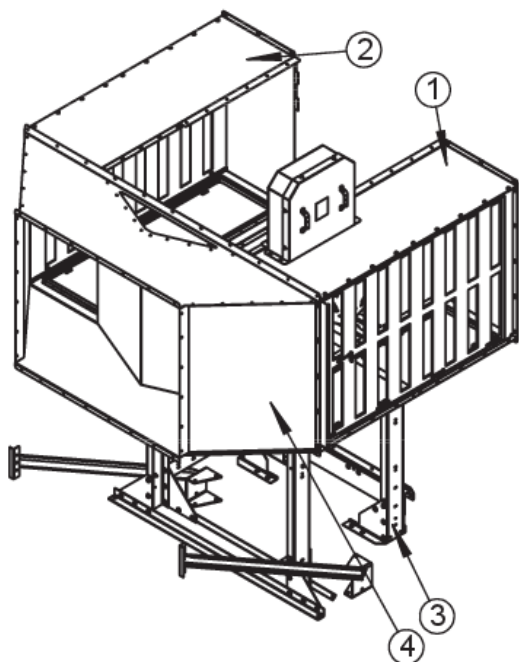
8" UNLOAD AUGER ASSEMBLY FOR 24' DRYER



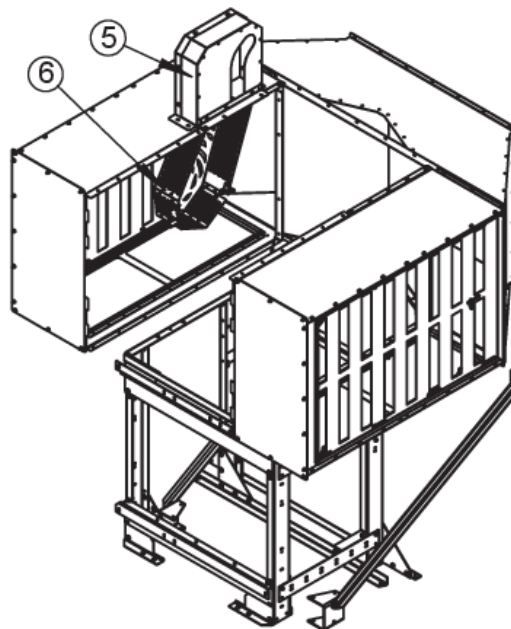
SWPD0164
5/24/2017 MEO

REF. #	DESCRIPTION	QTY.	PART#
1	SHAFT, 8" HANGER BEARING		
2	SHAFT, AUGER, MOISTURE SENSOR	1	F4723
3	BRG, 1.25, FLG, W/LC, HCFTS207-20	2	J0010
4	T HANGER BRG & PLATE ASSY, UNLOAD AUGER	3	T16131AM
5	SHAFT, TOP FRONT, 13-1/4"	1	T16436
6	SHAFT, 1.25 X 10, BOTTOM AUGER	1	T17251
7	BRACKET, PROX. SW, UNLOAD AUGER	1	T17252
8	AUGER, BTTM FRONT, 93 1/2", 8" OD	2	T17430
9	AUGER, BTTM MIDDLE, 69 1/2", 8" OD	1	T17432
10	AUGER, BTTM, REAR, 24"	1	T17434
11	AUGER, BTTM, STD UNLD EXT	1	T17435

TM90084, UP-BLAST FAN SUPPORT



SWMF0169
12/10/2020 RPE



REF. #	DESCRIPTION	QTY.	PART #
1	INTAKE PLENUM, RH	1	TM07066
2	INTAKE PLUNUM, LH	1	TM07067
3	SUPPORT, FAN, ASSY, MIXED FLOW	1	TM07075
4	TRANSITION, SUCT COOL, MED, ASSY	1	TM07090
5	SHIELD, BELT, UPPER, CCW	1	TM07190
6	SHIELD, BELT, LOWER, UPBLAST	1	TM07269

See next pages for parts in each assembly.

TM90084, UP-BLAST FAN SUPPORT PARTS

REF. #	DESCRIPTION	QTY.	PART #
1	INTAKE PLENUM, RH	1	TM07066
	AIR PANEL, STATIONARY ASSEM	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
	KNOB,PLASTIC, 5/16-18 X 3/4"	1	J4167
	AIR PANEL, ADJUSTABLE	1	T80104
	DOOR ASSY,CENT,FRONT,RIGHT	1	T80268
	PANEL,RIGHT,DOOR,CENT,FRONT	1	T802465
	HOLDER,LATCH,RIGHT,DOOR,FRONT	1	T802467
	FRAME,DOOR,SHORT,CENT DRY FRONT	2	T802464
	FRAME,DOOR,LONG,LATCH,COMP.	2	T802681
	HINGE,DOOR,CENT DRYER,FRONT	2	T802461
	HINGE, STAINLESS, A-803, 2" WIDE, .120 PIN	1	J2271-26
	HINGE, STAINLESS, HALF	1	J2271-01-26
	HINGE, STAINLESS, HALF	1	J2271-01-26
	SPACER,DOOR,CENT DRYER,FRONT	2	T802462
	DOOR,FRONT,INTAKE,CENT DRYER	1	T80269
	LATCH,COMPRESSION,KNURLED	2	J23013
	LATCH,SPRING BOLT	1	J2294
	PANEL,LT,DUCT,INTAKE,BLOWER	1	TM07137
	LT TOP PANEL, BLWR INTAKE DUCT	1	T80120
	NUT, WHIZ, 5/16-18	29	J1110
	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	29	J0536
	SCREW,5/16-18,1.25,PLT,GR5	8	J0550
	WASHER,FLAT,5/16	16	J1111
	NUT, LOCK, 5/16-18, PLT	8	J1010

TM90084, UP-BLAST FAN SUPPORT PARTS

REF. #	DESCRIPTION	QTY.	PART #
2	INTAKE PLENUM, LH	1	TM07067
	AIR PANEL, STATIONARY ASSEM	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	T80267
	PANEL,LEFT,DOOR,CENT,FRONT	1	T802471
	HOLDER,LATCH,RIGHT,DOOR,FRONT	1	T802467
	FRAME,DOOR,SHORT,CENT DRY FRONT	2	T802464
	FRAME,DOOR,LONG,LATCH,COMP.	2	T802681
	HINGE,DOOR,CENT DRYER,FRONT	2	T802461
	HINGE, STAINLESS, A-803, 2" WIDE, .120 PIN	1	J2271-26
	HINGE, STAINLESS, HALF	1	J2271-01-26
	HINGE, STAINLESS, HALF	1	J2271-01-26
	SPACER,DOOR,CENT DRYER,FRONT	2	T802462
	DOOR,FRONT,INTAKE,CENT DRYER	1	T80269
	LATCH,COMPRESSION,KNURLED	2	J23013
	LATCH,SPRING BOLT	1	J2294
	AIR PANEL, ADJUSTABLE	1	T80104
	RT SD PANEL,BLOWER INTAKE DUCT	1	TM07053
	LT TOP PANEL, BLWR 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	29	J1110
	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	29	J0536

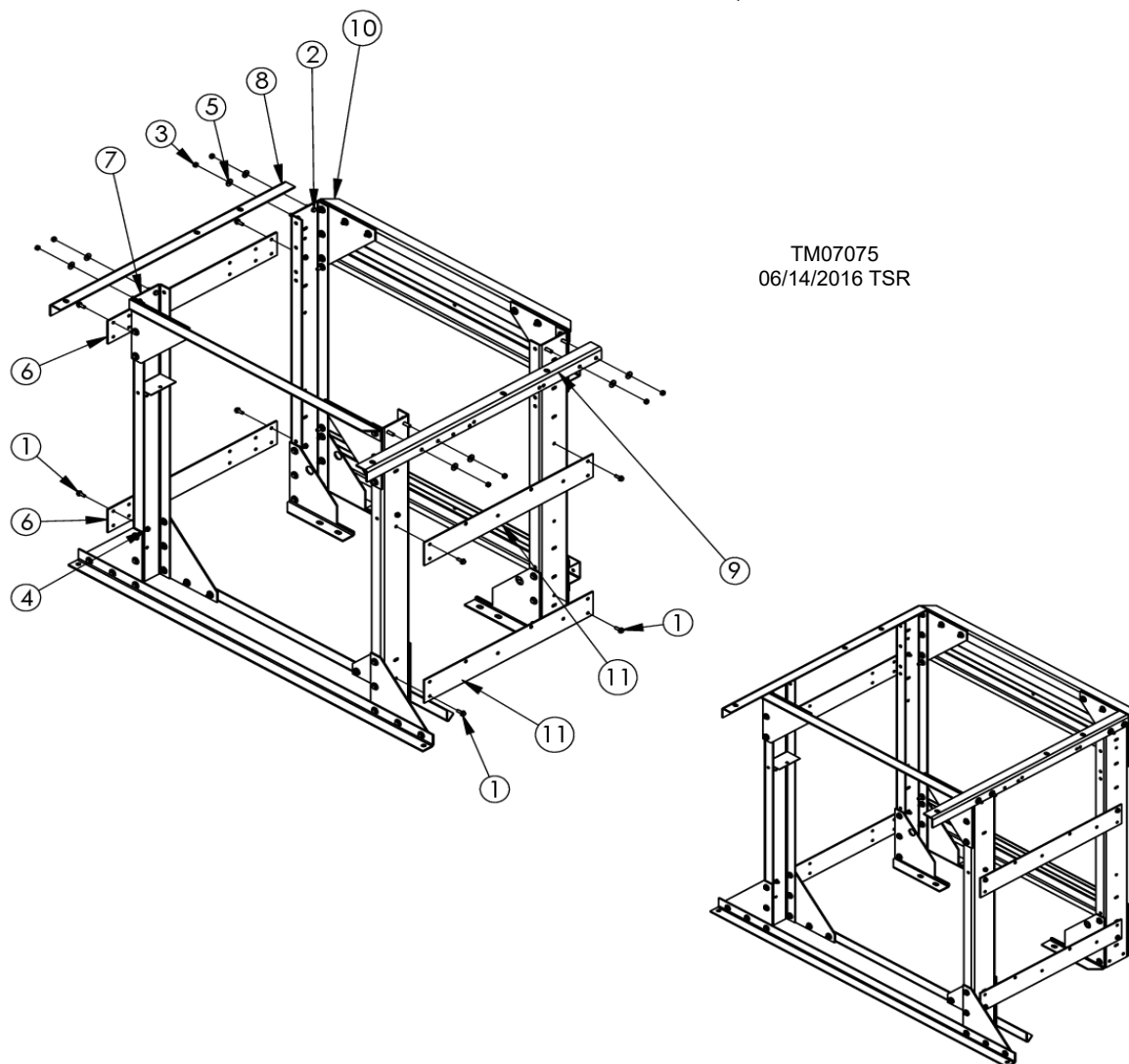
TM90084, UP BLAST FAN SUPPORT PARTS

REF. #	DESCRIPTION	QTY.	PART #
3	SUPPORT, FAN, ASSY, MIXED FLOW	1	TM07075
	FRAME,FAN,FRONT,SPPRT,REAR	1	TM07155
	FRONT LEG, BLOWER MOUNT FRAME	2	T80137
	BRACKET,LEFT,FRONT LEGS,BLOWER	2	TM07157
	GUSSET PLATE, BLOWER MOUNT FRAME	2	T80138
	BASE,HORZ 1,BLOWER MOUNT FRAME	1	T80140
	BRACKET,RT,FRONT LEGS, BLOWER	2	TM07158
	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
	BRACE,PBOX,MOUNT,SUPPORT	2	T80290
	MOUNT,SANDWICH,VIBRATION,DAMP	6	J5110
	BRACE,TOP,PBOX,DAMPEN	1	T80291
	BRACE,BTM,PBOX,DAMPEN	1	T80292
	FRAME,HEATER SUPPORT,FRONT	1	T80161
	REAR LEG, BLOWER MOUNT FRAME	2	T80136
	GUSSET PLATE, BLOWER MOUNT FRAME	6	T80138
	CLIP, CENTER BOTTM PANEL, BLOWER DUCT	2	T80126
	BASE,HORZ 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	6	J0606
	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	2	J0536
	NUT, WHIZ, 5/16-18	2	J1110
	SCREW, 3/8 -16,1,PLT	4	J0606
	HOZT SIDE,LEFT,FRAME MOUNT	1	TM07064
	HOZT SIDE,RIGHT,FRAME MOUNT	1	TM07065
	BRACE,MNTG,AUX BOX	2	T291574
	SCREW, 3/8-16, 1.25, PLT, GR5, HHCS	8	J0616
	NUT,HEX,3/8-16,PLT LOCK	8	J1025
	WASHER,FLAT,3/8,PLT	8	J1117
	SCREW, 5/16-18, 1.00, PLT, G5, HHWZ	4	J0537
	NUT, WHIZ, 5/16-18	4	J1110

TM90084, UP-BLAST FAN SUPPORT PARTS

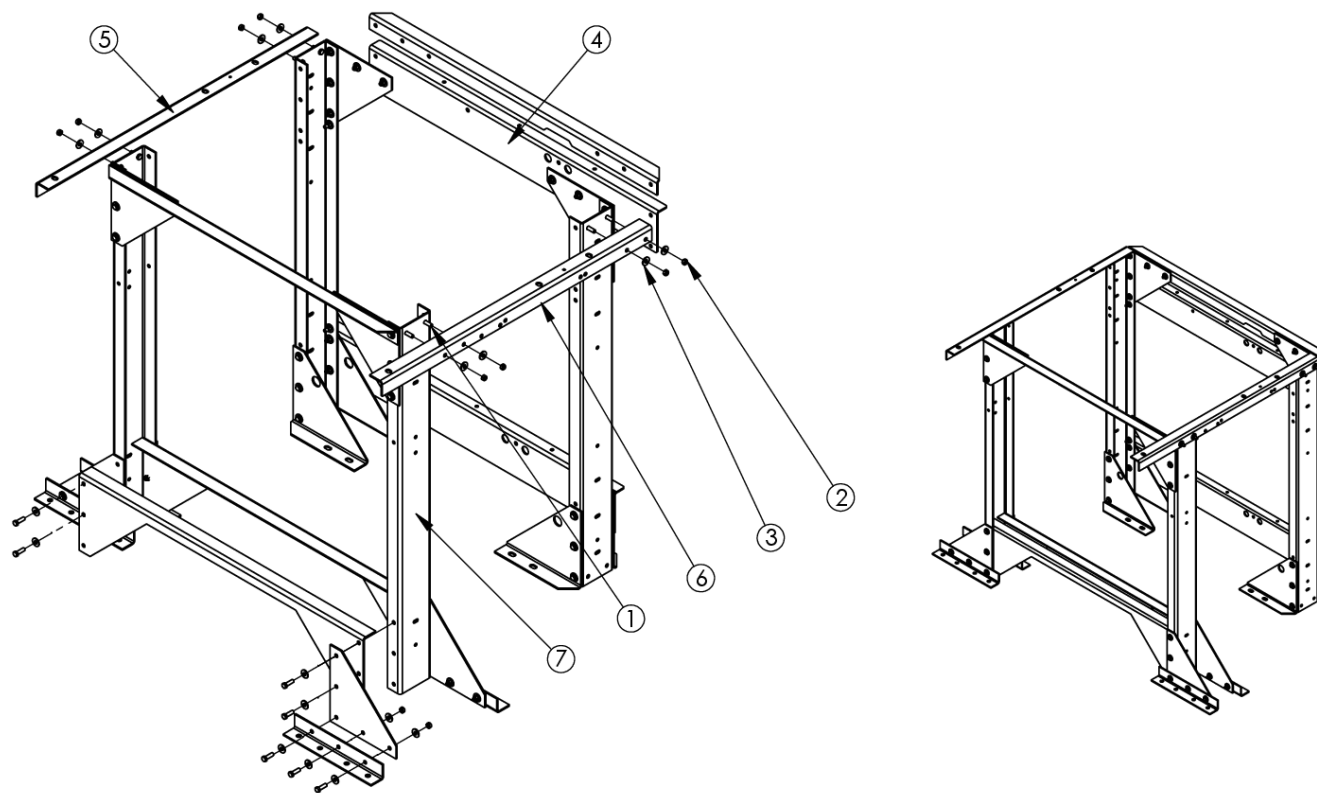
REF. #	DESCRIPTION	QTY.	PART #
4	TRANSITION,SUCT COOL,MED,ASY	1	TM07090
	DIVERTER, SUCT. COOL	1	TM07044
	PLATE, TOP, TRANS, COOPLENUM, MED	1	TM07091
	PLATE, BTM, DUCT, SUCT COOL	1	TM07046
	PLATE, SIDE, RIGHT, SUCT. COOL	2	TM07048
5	SHIELD,BELT,UPPER,CCW	1	TM07190
	SHIELD,BELT,REAR,UPPER,CCW	1	TM07192
	COVER,REAR,SHIELD,BELT,UPPER	1	TM07194
	COVER,SIDE,SHIELD,BELT, TOP	1	TM07193
	RIVET, POP, 3/16X1/8, 18R12JPS/62	10	J1597
	NUT, SERT, 5/16-18 X .312 GRIP	6	J1012
	DANGER, REPLACE MISSING SHIELD	1	L0271
	SHIELD,BELT,FRONT,UPPER,ASY	1	TM07197
	SHIELD,BELT,FRONT,UPPER	1	TM07191
	HANDLE,PULL,V4,VA FANS	2	J3232
	BOLT 1/4 - 20 X 1/2	4	J0504
	NUT, HEX, 1/4 - 20	4	J0990
	WARNING KEEP AWAY MOV PTS	1	L0284
	BRACKET,ASY,MNT,SHIELD,BELT	1	TM07196
	BRACKET,MNT,SHIELD,BELT,UPPER	1	TM07195
	NUT,RIVET,5/16"-18	3	J1007
	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	9	J0536
	SHIELD,BELT,LOWER,UPBLAST,ASY	1	TM07269
	SHIELD,BELT,LOWER,UPBLAST	1	TM07270
	TAB,RGHT, TOP,SHIELD,BELT,LOWER	1	TM07274
	TAB,LEFT, TOP,SHIELD,BELT,LOWER	1	TM07275
	TAB,RGHT,BTM,SHIELD,BELT,LOWER	1	TM07276
	TAB,LEFT,BTM,SHIELD,BELT,LOWER	1	TM07277
	BRACKET,CORNER,145 DEG,SHIELD	2	TM07278
6	HUCKBOLT,3/16"	22	J0475
	SLEEVE, HUCKBOLT,3/16"	22	J0891
	COVER,END,SHIELD,BELT,LOWER	1	TM07271

TM07075, FAN SUPPORT FRAME FOR FRONT FANS



REF.	DESCRIPTION	QTY.	PART #
1	SCREW, 5/16-18, 1.00, PLT, G5, HHWZ	4	J0537
2	SCREW, 3/8-16, 1.25, PLT, GR5, HHCS	8	J0616
3	NUT, HEX, 3/8-16, PLT, LOCK	8	J1025
4	NUT, WHIZ, 5/16-18	4	J1110
5	WASHER, FLAT, 3/8, PLT	8	J1117
6	BRACE, MNTG, AUX BOX	2	T291574
7	FRAME, HEATER SUPPORT, FRONT	1	T80161
8	HOZT SIDE, LEFT, FRAME MOUNT	1	TM07064
9	HOZT SIDE, RIGHT, FRAME MOUNT	1	TM07065
10	FRAME, FAN, FRONT, SPRT, REAR	1	TM07155

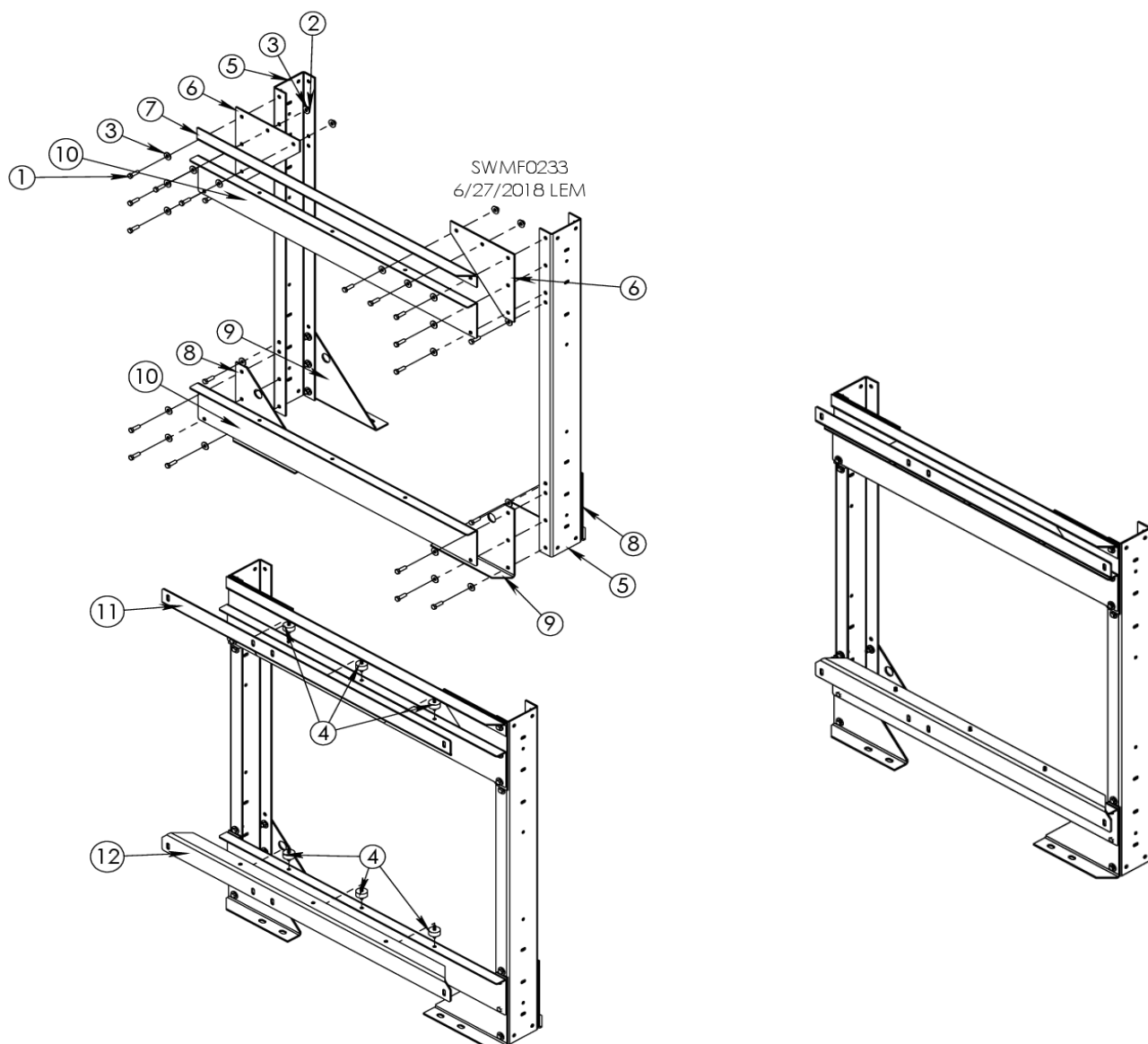
TM07150, FAN SUPPORT FRAME FOR REAR FANS ON 32' DRYERS



SWMF0230
5/24/2018 LEM

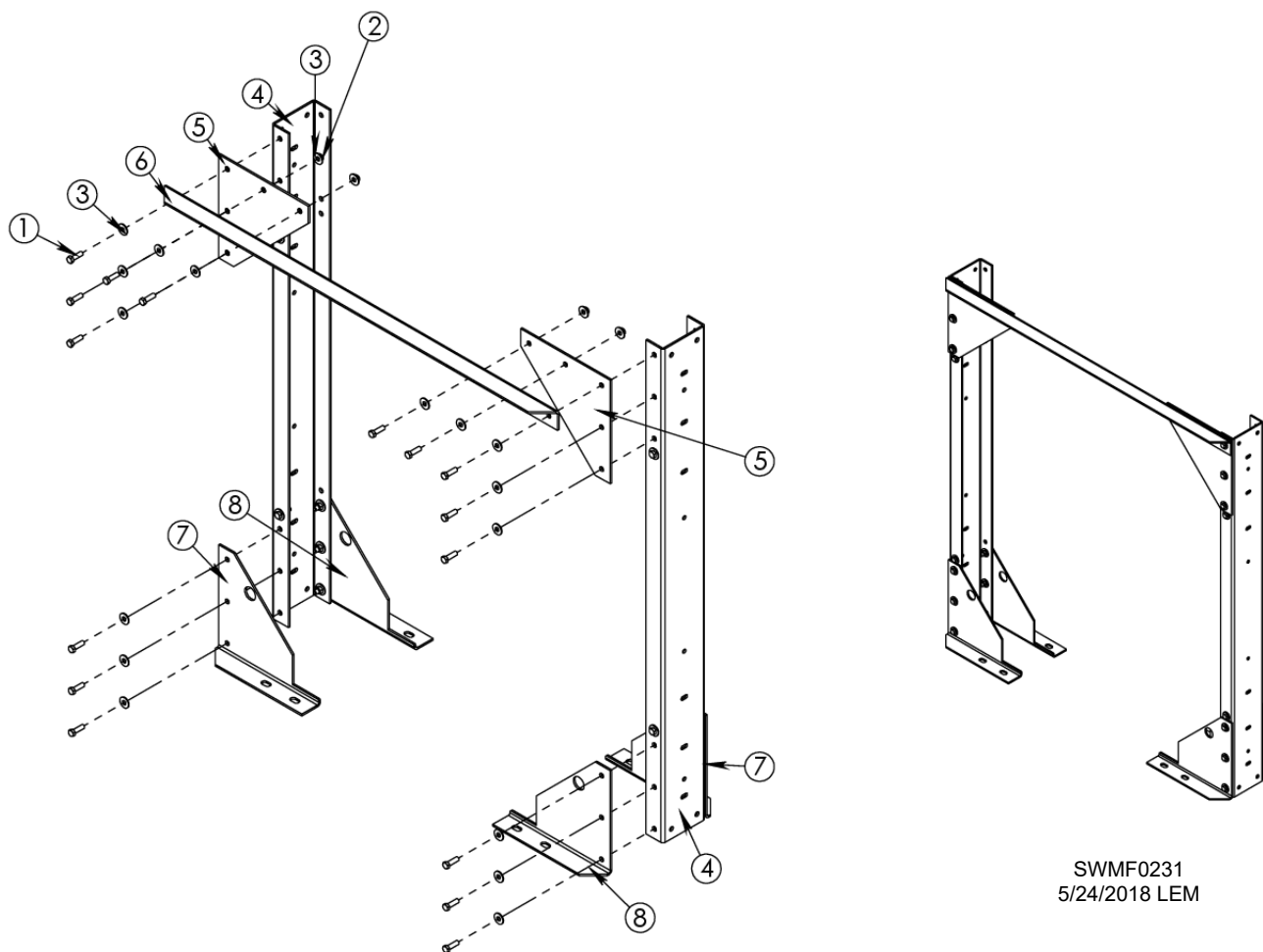
REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 3/8-16, 1.25, PLT, GR5, HHCS	8	J0616
2	NUT, HEX, 3/8-16, PLT LOCK	8	J1025
3	WASHER, FLAT, 3/8, PLT	8	J1117
4	FRAME, HEATER, SUPPORT, BACK	1	T80160
5	HOZT SIDE, RIGHT, FRAME MOUNT	1	TM07064
6	HOZT SIDE, LEFT, FRAME MOUNT	1	TM07065
7	FRAME, SPPRT, FRONT, FAN, REAR	1	TM07151

TM07155, FAN SUPPORT FRAME, BACK



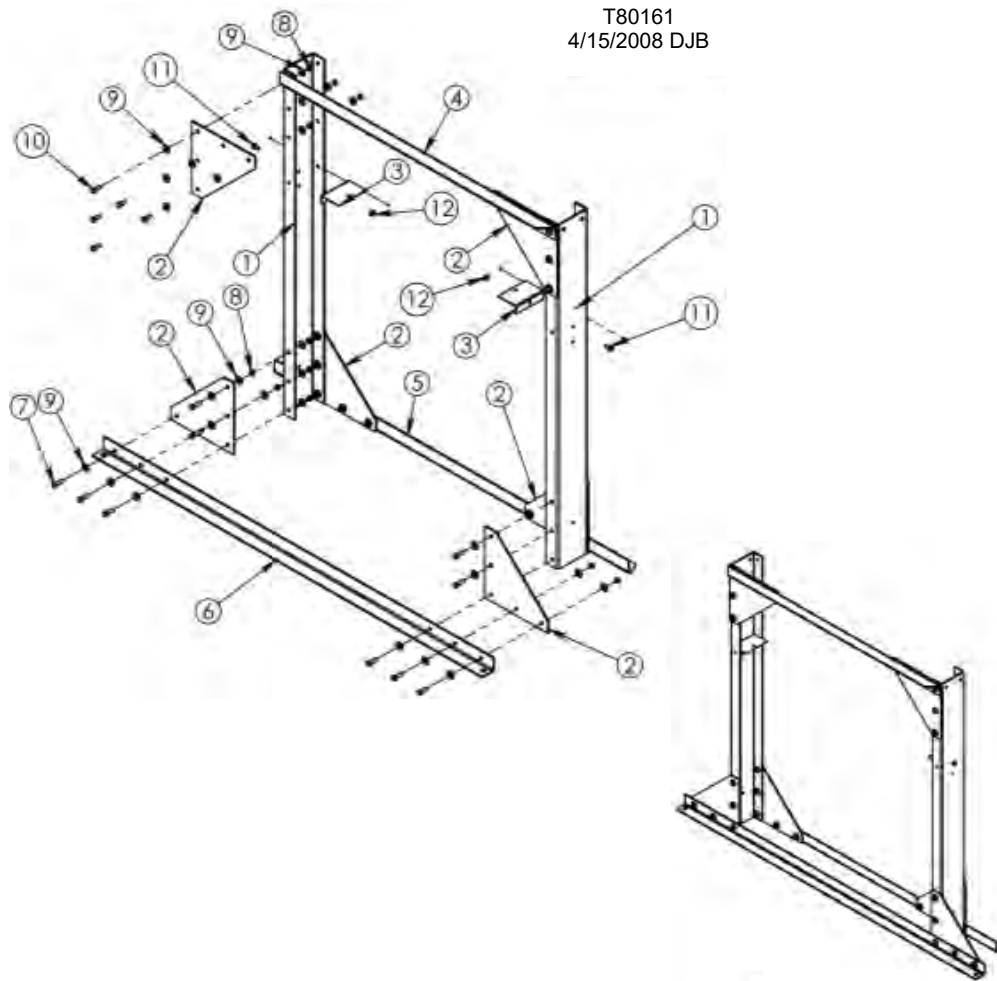
REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 3/8-16, 1.25, PLT, GR5, HHCS	26	J0616
2	NUT, HEX, 3.8-16, PLT LOCK	26	J1025
3	WASHER, FLAT, 3/8, PLT	52	J1117
4	MOUNT, SANDWICH, VIBRATION, DAMP	6	J5110
5	FRONT LEG, BLOWER MOUNT FRAME	2	T80137
6	GUSSET PLATE, BLOWER MOUNT FRAME	2	T80138
7	BASE, HORZ 1, BLOWER MOUNT FRAME	1	T80140
8	LF BRKT, FRONT LEGS, BLOWER MOUNT FRAME	2	T80155
9	RT BRACKET, FRONT LEGS, BLOWER	2	T80156
10	BRACE, PBOX, MOUNT, SUPPORT	2	T80290
11	BRACE, TOP, PBOX, DAMPEN	1	T80291
12	BRACE, BTM, PBOX, DAMPEN	1	T80292

TM07156, BACK FAN SUPPORT FRAME



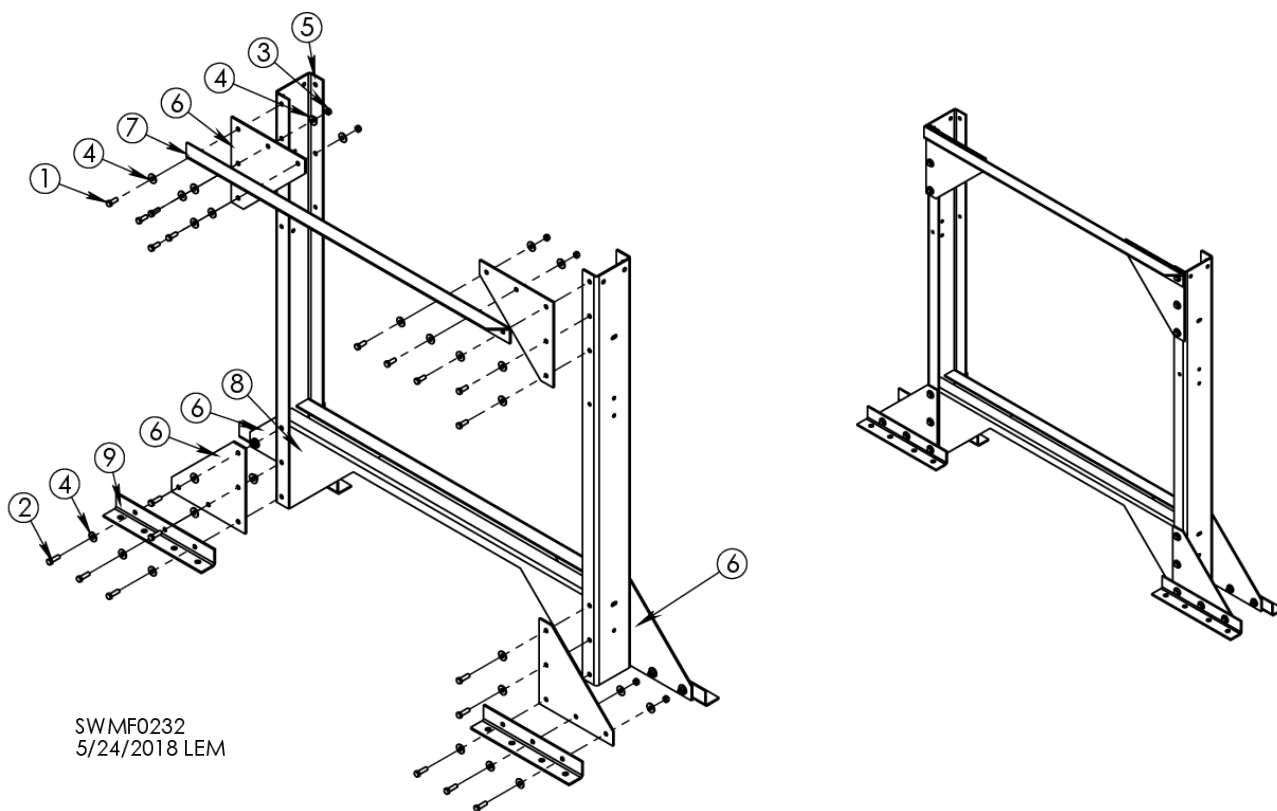
REF. #	DESCRIPTION	QTY.	PART #
1	SCREW 3/8-16, 1.25, PLT, GR5, HHCS	26	J0616
2	NUT, HEX, 3/8-16, PLT LOCK	26	J1025
3	WASHER, FLAT, 3/8, PLT	52	J1117
4	FRONT LEG, BLOWER MOUNT FRAME	2	T80137
5	GUSSET PLATE, BLOWER MOUNT FRAME	2	T80138
6	BASE, HORZ 1, BLOWER MOUNT FRAME	1	T80140
7	BRACKET, LEFT, FRONT LEGS, BLOWER	2	TM07157
8	BRACKET, RT, FRONT LEGS, BLOWER	2	TM07158

T80161, FAN SUPPORT FRAME, FRONT

T80161
4/15/2008 DJB

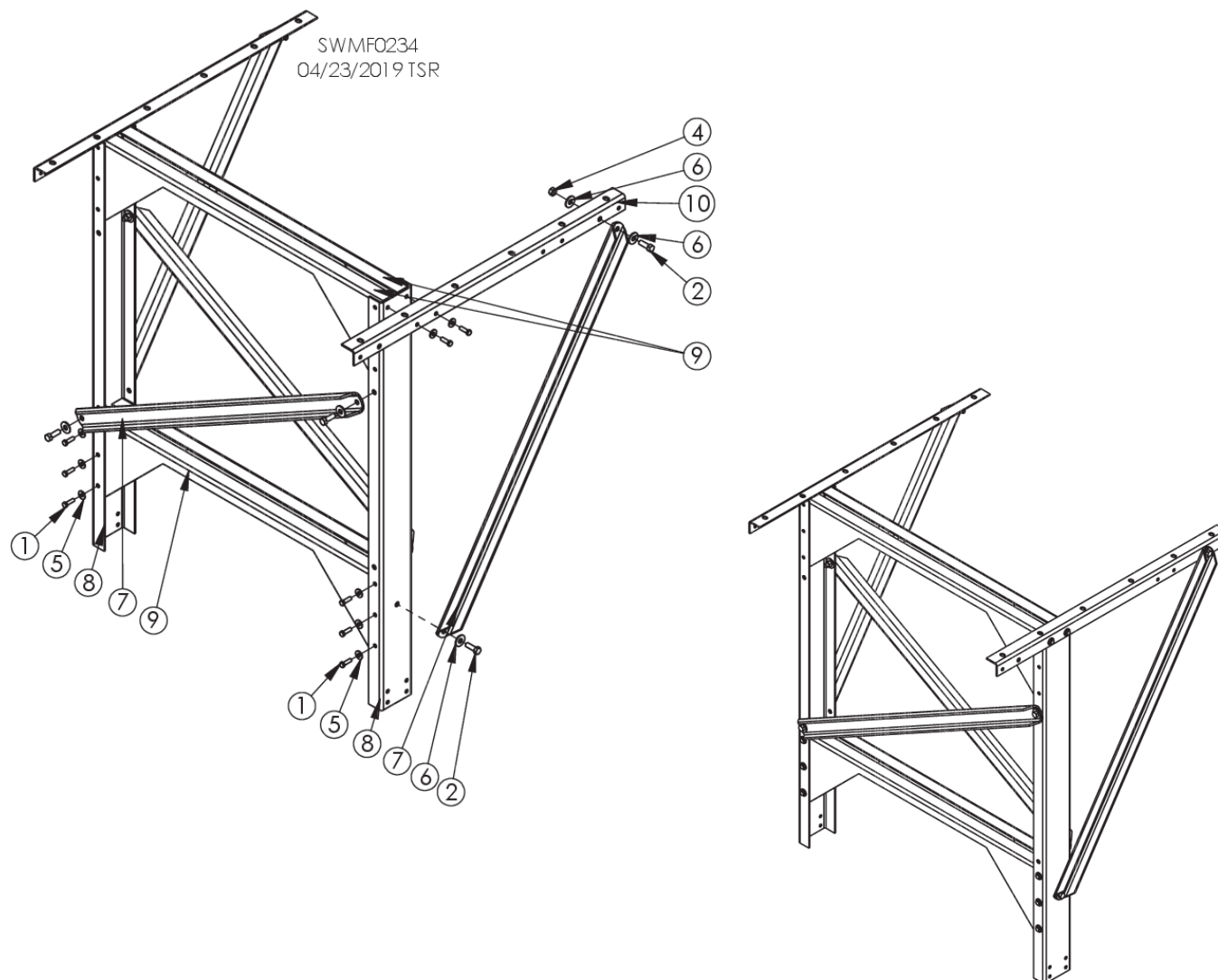
REF. #	DESCRIPTION	QTY.	PART #
1	REAR LEG, BLOWER MOUNT FRAME	2	T80136
2	GUSSET PLATE, BLOWER MOUNT FRAME	6	T80138
3	CLIP, CENTER BOTTOM PANEL, BLOWER DUCT	2	T80126
4	HOZT BASE 1, BLOWER MOUNT FRAME	1	T80140
5	HOZT BASE 2, BLOWER MOUNT FRAME	1	T80141
6	HOZT BASE 3, BLOWER MOUNT FRAME	1	T80142
7	SCREW, 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, 5/16-18	2	J1110

TM07151, FAN SUPPORT FRAME, FRONT



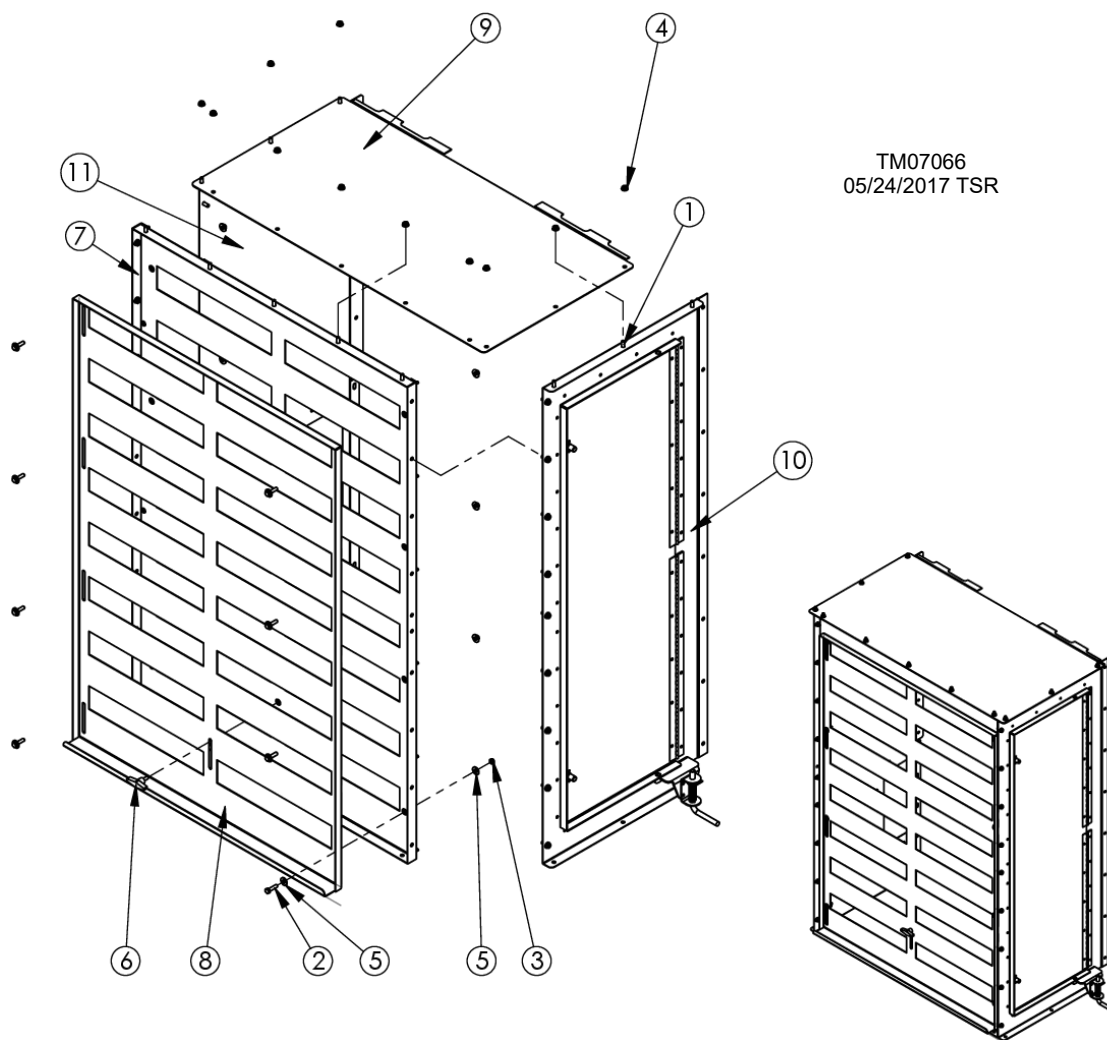
REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 3/8-16, 1, PLT	10	J0606
2	SCREW, 3/8-16, 1.25, PLT, GR5, HHCS	20	J0616
3	NUT, HEX, 3/8-16, PLT, LOCK	30	J1025
4	WASHER, FLAT, 3/8, PLT	60	J1117
5	REAR LEG, BLOWER MOUNT FRAME	2	T80136
6	GUSSET PLATE, BLOWER MOUNT FRAME	6	T80138
7	BASE, HORZ 1, BLOWER MOUNT FRAME	1	T80140
8	BRACE, CROSS, SPRT, FAN, REAR	2	TM07152
9	ANGLE, SUPPORT, 14", FAN, REAR	4	TM07153

TM07149, FAN SUPPORT FRAME FOR REAR FAN ON 32' DRYER



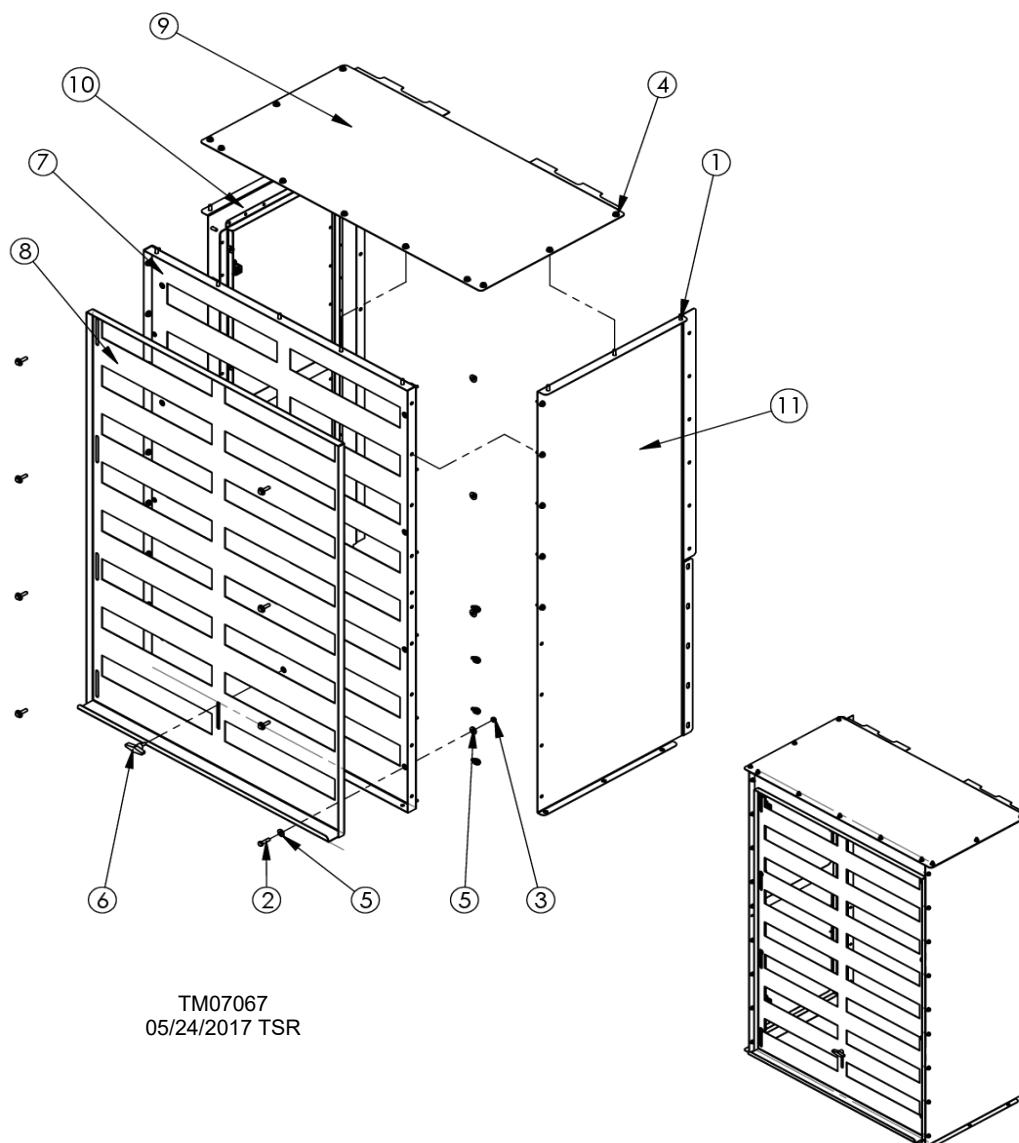
REF. #	DESCRIPTION	QTY.	PART #
1	SCREW 3/8-16, 1.25, PLT, GR5, HHCS	16	J0616
2	SCREW, 1/2-13, 1.5, GR5, HHCS	8	J0730
3	NUT, HEX, 3/8-16, PLT, LOCK	16	J1025
4	NUT, 1/2-13, PLT, GR8, LOCK	8	J1042
5	WASHER, FLAT, 3/8, PLT	32	J1117
6	WASHER, FLAT, 1/2	16	J1125
7	BRACE, KNEE, FRAME, REAR, 32'	4	TM03042
8	LEG, FRAME, BLOWER MOUNT, 32'	2	TM03048
9	BRACE, CROSS, SPPRT, FAN REAR	4	TM07152
10	SIDE, HORZ, FRAME, FAN, 32'	2	TM07165

TM07066, UP-BLAST FAN INTAKE, RIGHT



REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 5/16-18, 3/4", PLT, GR5, HHWZ	29	J0536
2	SCREW, 5/16-18, 1.25, PLT GR5	8	J0550
3	NUT, LOCK, 5/16-18, PLT	8	J1010
4	NUT, WHIZ, 5/16-18	29	J1110
5	WASHER, FLAT, 5/16	16	J1111
6	KNOB, PLASTIC, 5/16-18 X 3/4"	1	J4167
7	AIR PANEL, STATIONARY ASSY	1	T80101
8	AIR PANEL, ADJUSTABLE	1	T80104
9	LT TOP PANEL, BLWR INTAKE DUCT	1	T80120
10	DOOR ASSY, CENT, FRONT, RIGHT	1	T80268
11	PANEL, LT, DUCT, INTAKE, BLOWER	1	TM07137

TM07067, UP-BLAST FAN INTAKE, LEFT



TM07067
05/24/2017 TSR

REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 5/16-18, 3/4", PLT, GR5, HHWZ	29	J0536
2	SCREW, 5/16-18, 1.25, PLT, GR5	8	J0550
3	NUT, LOCK, 5/16-18, PLT	8	J1010
4	NUT, WHIZ, 5/16-18	29	J1110
5	WASHER, FLAT, 5/16	16	J1111
6	KNOB, PLASTIC, 5/16-18 X 3/4"	1	J4167
7	AIR PANEL, STATIONARY ASSY	1	T80101
8	AIR PANEL, ADJUSTABLE	1	T80104
9	LT TOP PANEL, BLWR INTAKE DUCT	1	T80120
10	DOOR ASSY, CENT, FRONT, LEFT	1	T80267
11	RT SD PANEL, BLOWER, INTAKE DUCT	1	TM07053



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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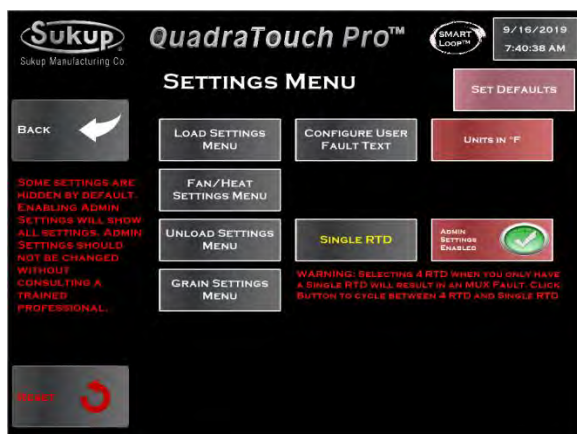
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Tower Dryer Operation

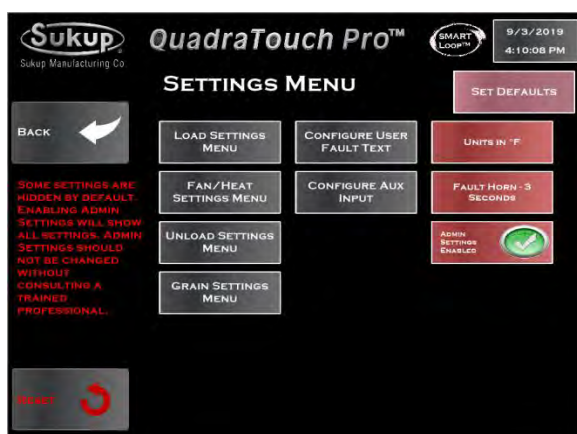
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Settings

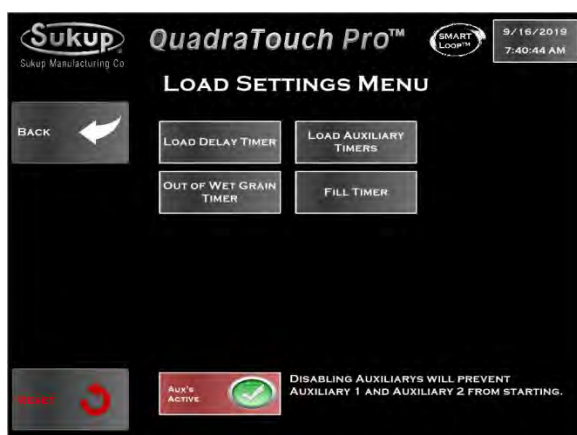
Cross-Flow/Mixed-Flow

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.

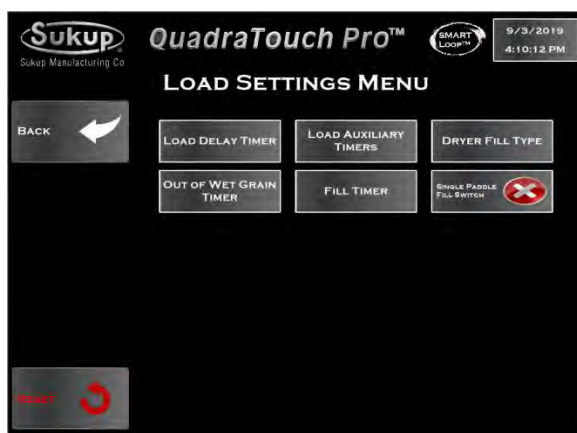


Load Settings

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

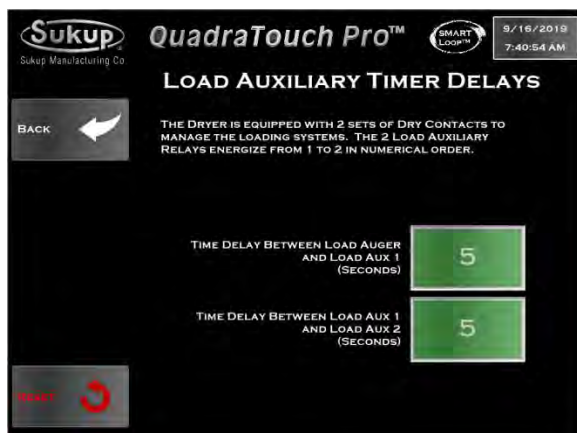
Load Settings Menu for tower dryers provides access to set load timers, dryer fill type, and extended wet bin dual paddle switch operation.



All Dryers

Settings → Load Settings Menu → Load Delay Timer

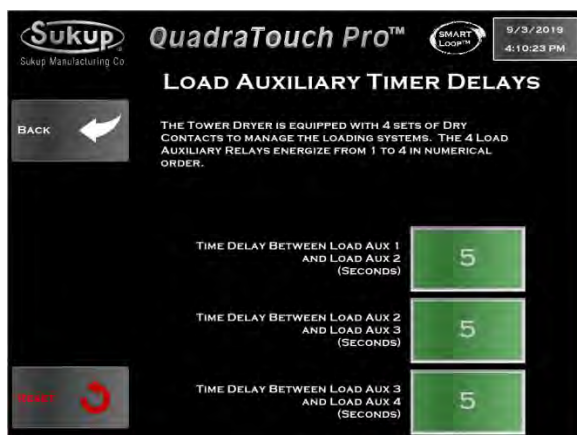
Set Load Delay Timer to prevent overload from auxiliary equipment starting too often.



Cross-Flow/Mixed-Flow

Settings → Load Settings Menu → Load Auxiliary Timers

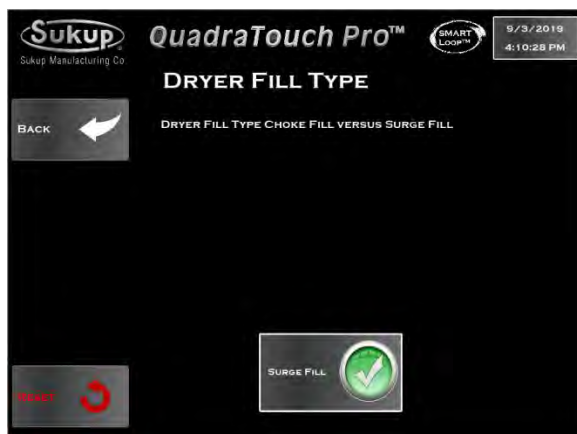
Time delays between load auxiliaries for cross-flow and mixed-flow dryers can be set here.



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.

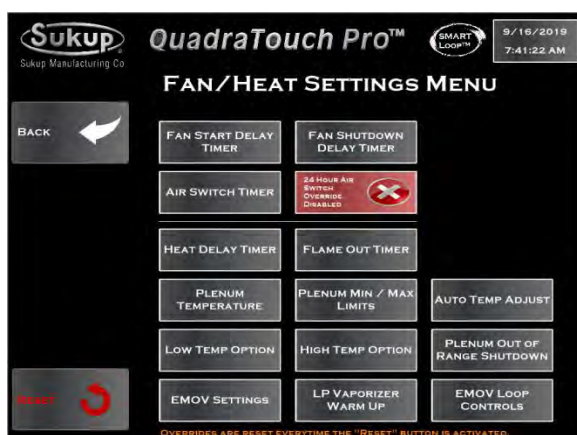


All Dryers

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.

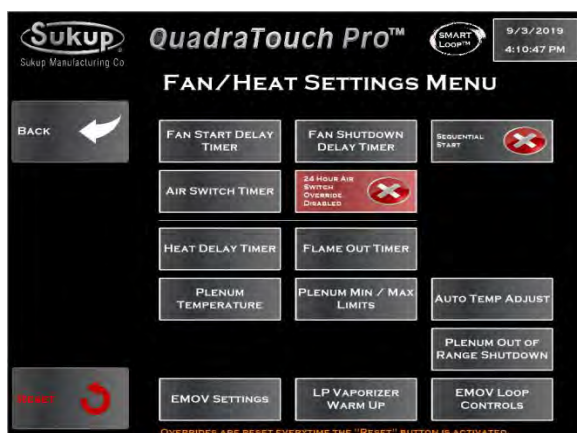


Fan/Heat Settings

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.

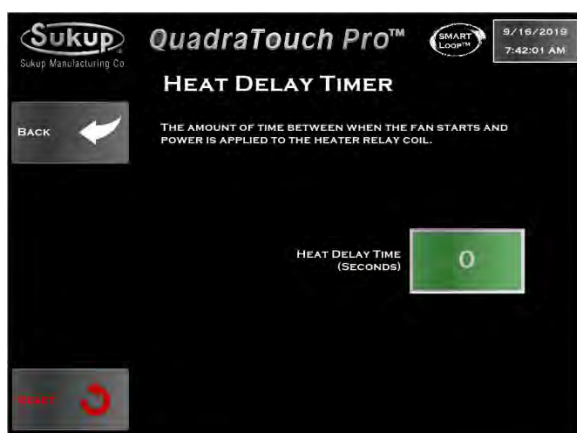


All Dryers

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.

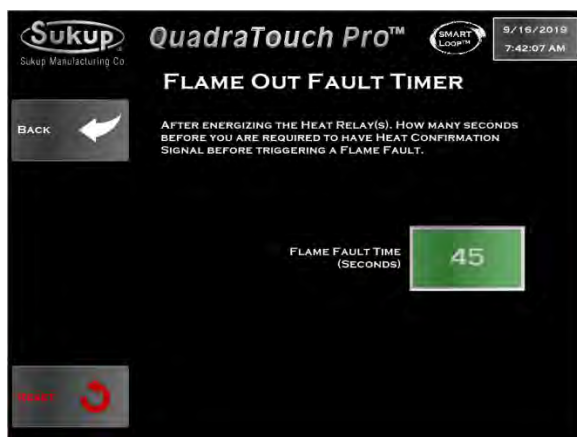
There is a 24-Hour Air Switch Override that resets every time user presses Reset button. This allows continued operation while user waits for parts, for example.



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

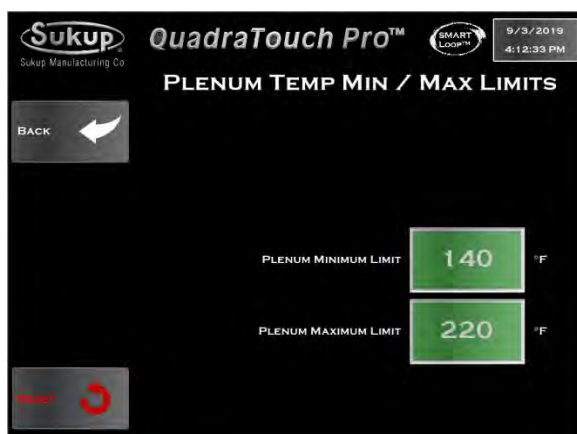
A longer flame fault time may be needed if heater ignition isn't occurring before the time entered. Applies to LME69, LME71, & LME73 controllers which require manual reset.



All Dryers

Settings → Fan/Heat Settings → Plenum Temperature

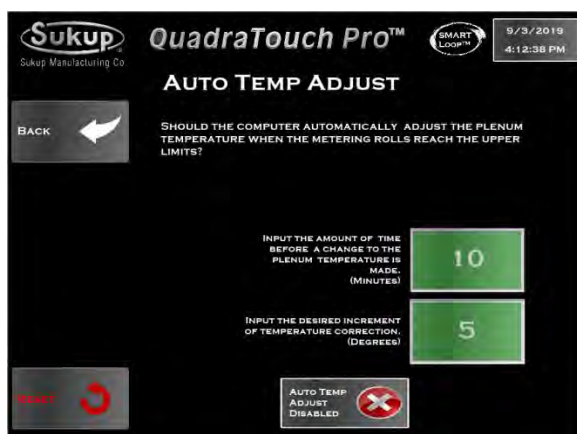
Plenum Temperature page is starting point to set temperatures for each plenum. There is one plenum on a tower dryer. Temperatures for up to six plenums can be set for other dryers.



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

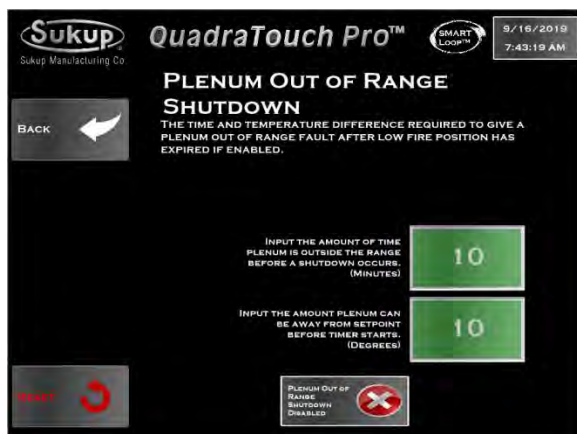
If enabled on cross-flow or mixed-flow dryer, Low Temp Option allows plenum temp to be set as low as 100°F. Permanent damage may result if a low-temp kit (orifice and port cup) is not installed in starfire burner used with 28" axial fan.



Cross-Flow/Mixed-Flow

Settings → Fan/Heat Settings → High Temp Option

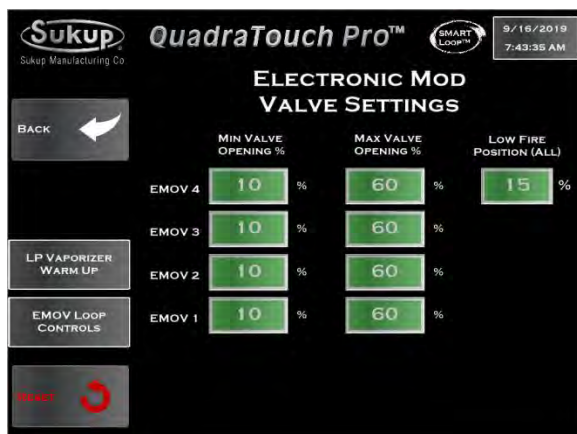
If enabled on cross-flow or mixed-flow dryer, High Temp Option allows plenum temp to be set above 220°F. Drying at temperatures above 220°F increases chance of having a fire in dryer and of having plenum and column over-temp faults.



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

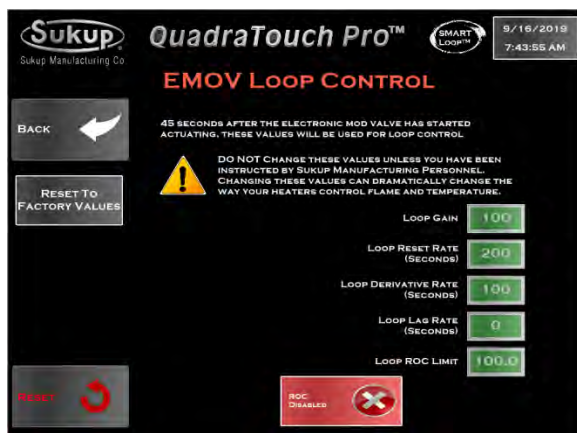
Electronic mod valve settings generally do not need to be touched, but can be if needed. Minimum opening should be 10% for all. Maximum opening should be 80-100% on tower dryers and 60% for all others. Low Fire Position is the percentage that valve stem will be open when heater ignition takes place.



All Dryers

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

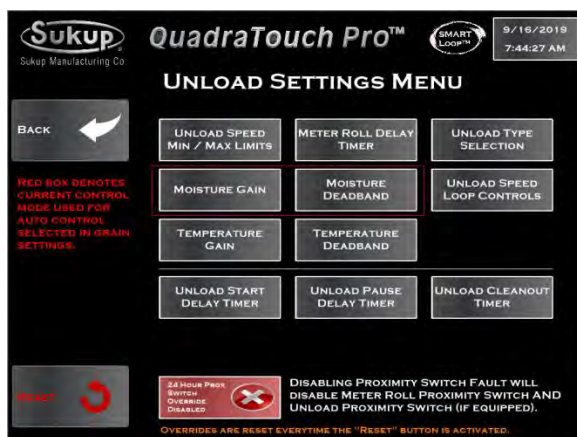
Amount of time that EMOV will stay open in Low-Fire position after lighting can be adjusted to give vaporizer more time to warm up. Default time is 20 seconds for all dryers.



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.

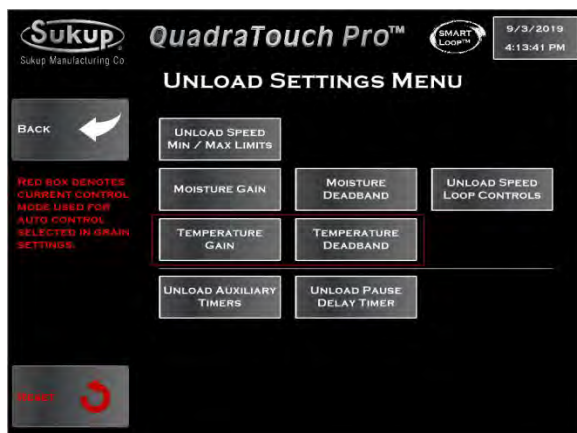


Unload Settings

Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu

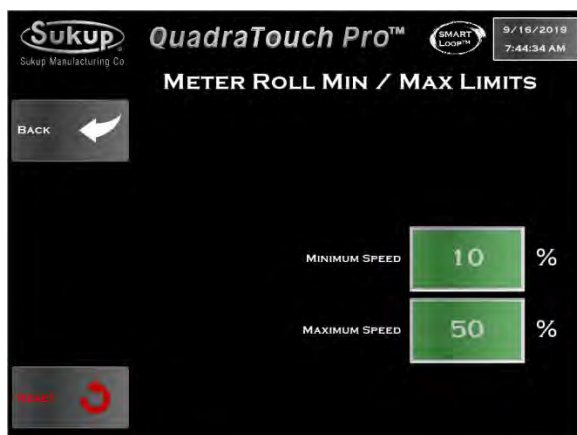
Unload Settings Menu for cross-flow and mixed-flow dryers shows settings that are commonly used during operation.



Tower

Settings → Unload Settings Menu

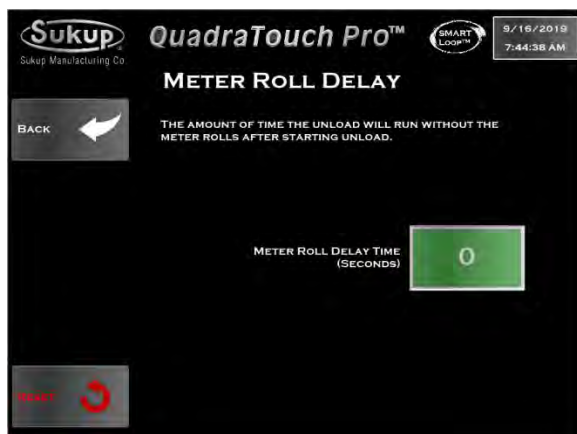
Unload Settings Menu for tower dryer shows settings that are commonly used during operation.



All Dryers

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

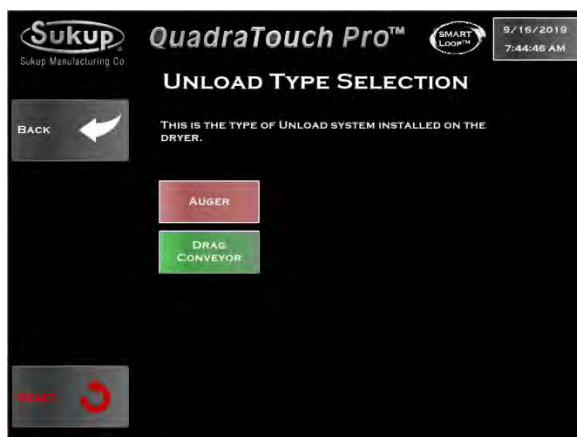
Press Unload Speed Min / Max button shown on previous screen to set Meter Roll Min / Max Limits. Minimum and maximum settings dictate how fast or slow dryer is capable of running. Never unload faster than take-away system is capable of running.



Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu → Meter Roll Delay Timer

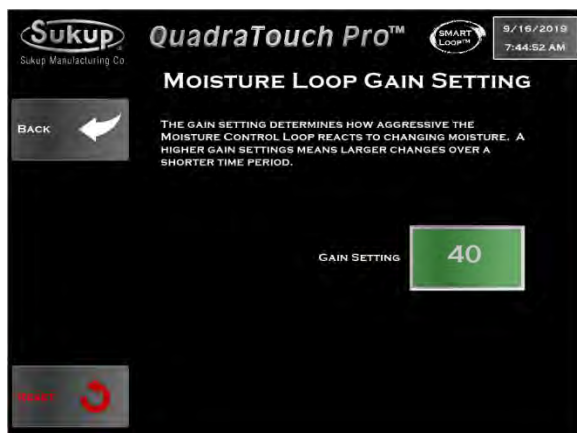
Set amount of time that unload system will run without meter rolls after starting of unload system.



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

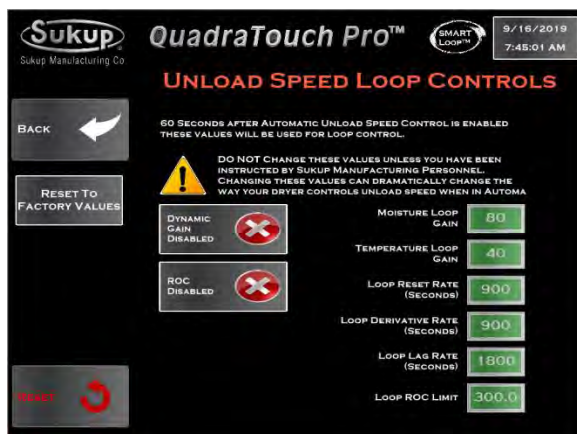
Moisture Loop Gain settings are important for optimum operation when discharging based on moisture. Choosing a higher setting will mean more aggressive changes in a shorter amount of time. When dryer is running at slower speeds, this number should stay around 40 or so. Conversely, at higher speeds, it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

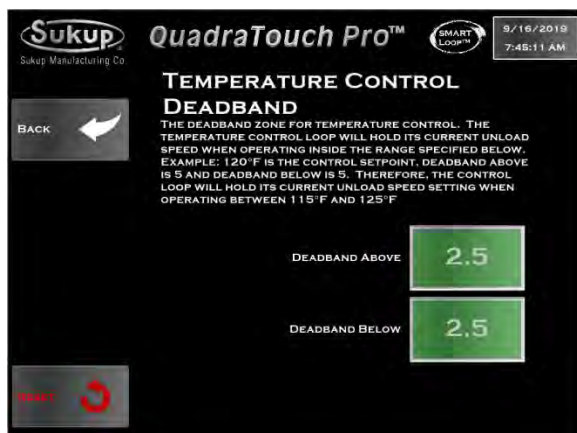
Sixty seconds after Automatic Unload Speed Controls is enabled, these values will be used for SMART Loop control. DO NOT change unless instructed to do so by Sukup Manufacturing Co.



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

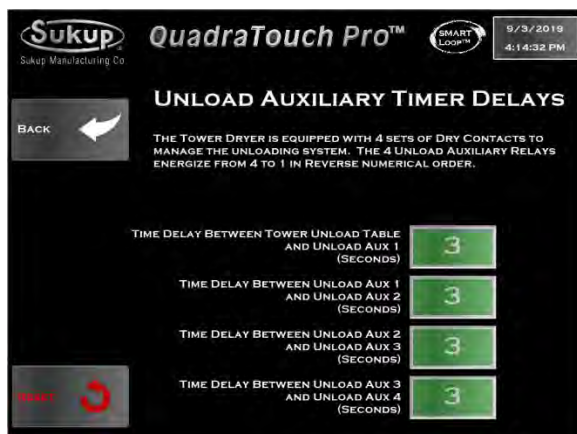
For some systems, it may be preferable to lock in the unload speed when grain is discharging very near the target setpoint. This is referred to as the loop deadband.



Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu → Unload Start Delay Timer

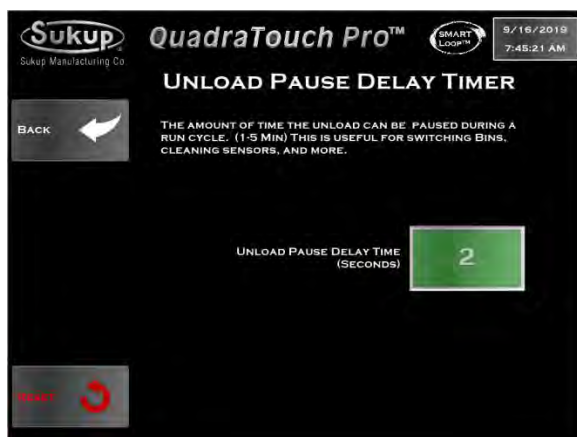
Set length of delay between point at which dryer is ready to start and point at which unload system starts.



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.

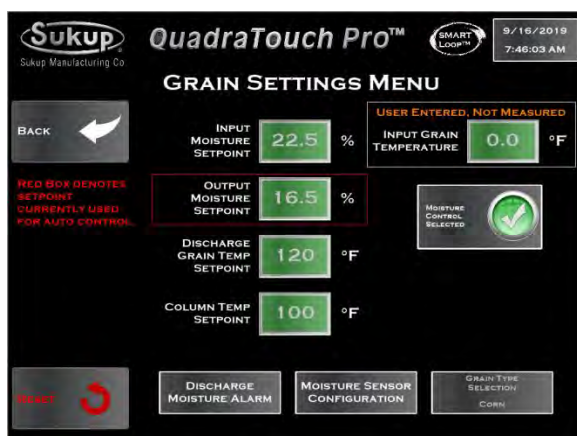


Cross-Flow/Mixed-Flow

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.

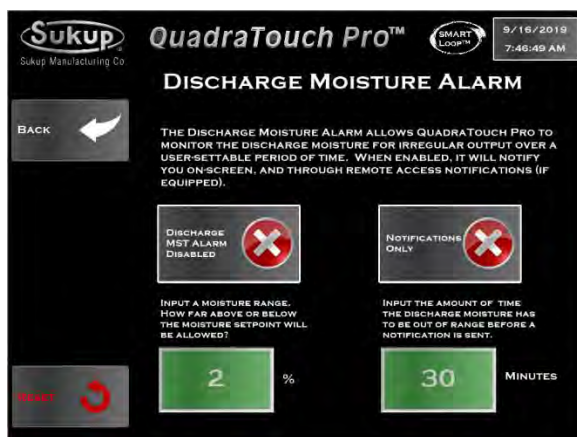


Grain Settings

All Dryers

Settings → Grain Settings Menu

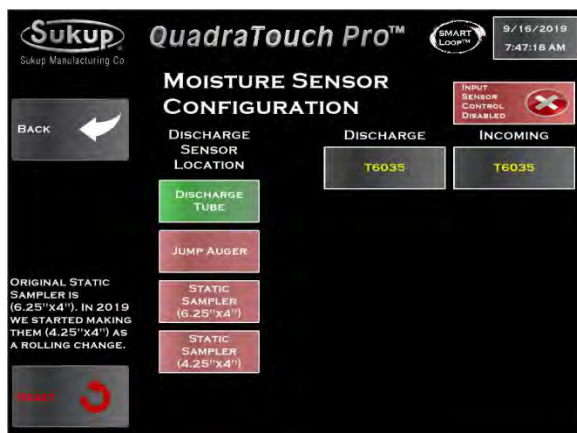
Enter moisture content and temperature of incoming grain, and desired output moisture content and temperature, as well as column temperature setpoint. **NOTE:** Discharge Grain Temp not available on Tower Dryers



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.

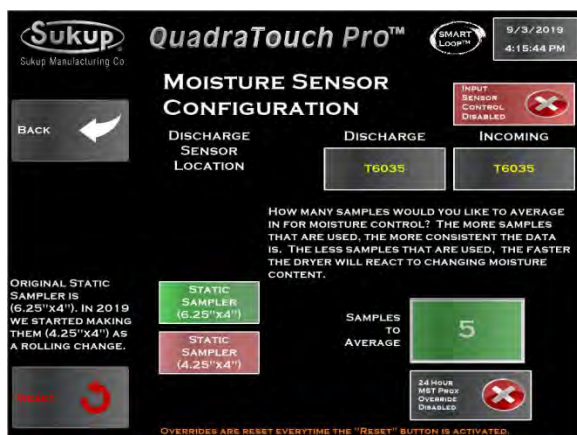


Cross-Flow/Mixed-Flow

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.

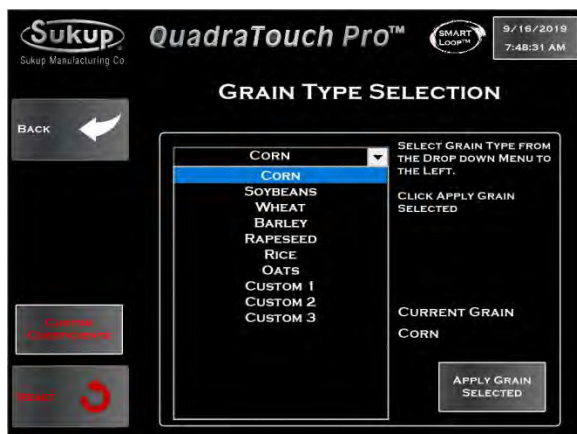


Tower

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

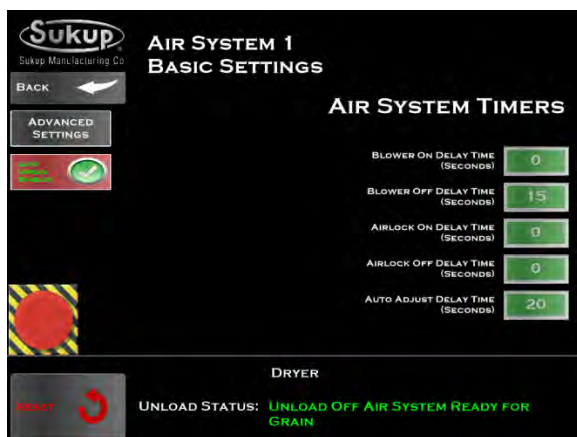
Enable 24 Hour MST Prox Override to allow for operation in manual mode only while waiting on parts, for example..



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.

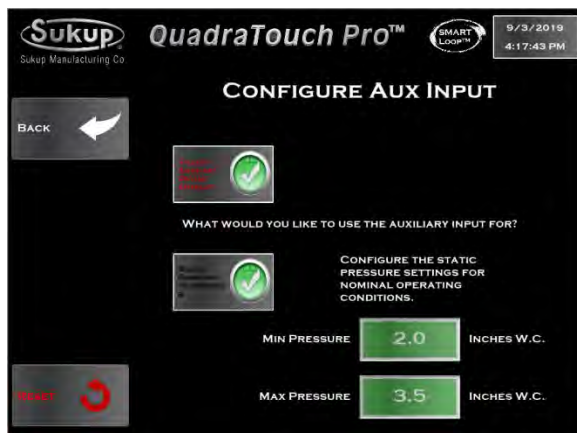


Configure User Fault Text

All Dryers

Settings → Configure User Fault Text

If desired, change User Fault message wording.



Configure Aux Input

Tower Dryer

Settings → Configure Aux Input

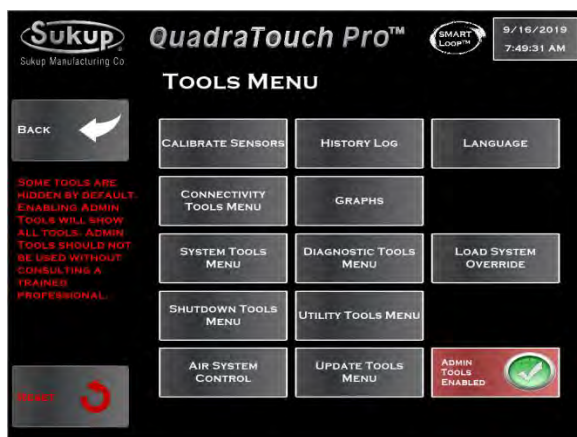
Analog input can be configured for an additional temperature sensor or static air pressure sensor.

Fault Horn

Tower Dryer

Settings → Fault Horn

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

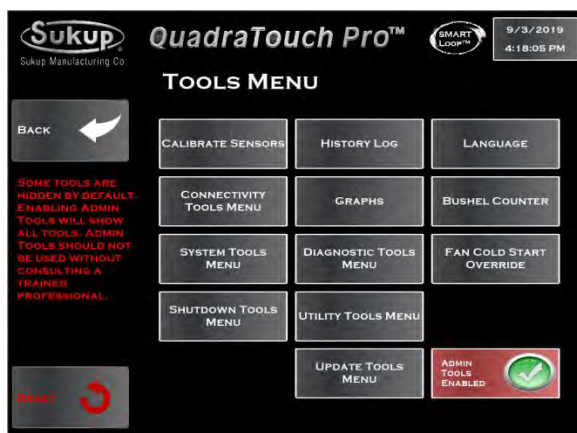


Tools

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.

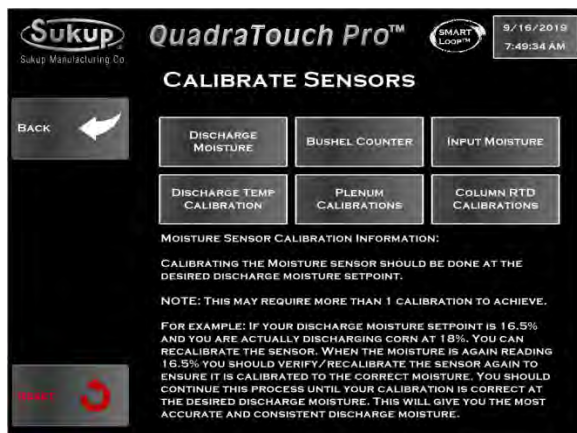
Make sure Admin Tools are enabled to see tools that would otherwise be hidden.



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

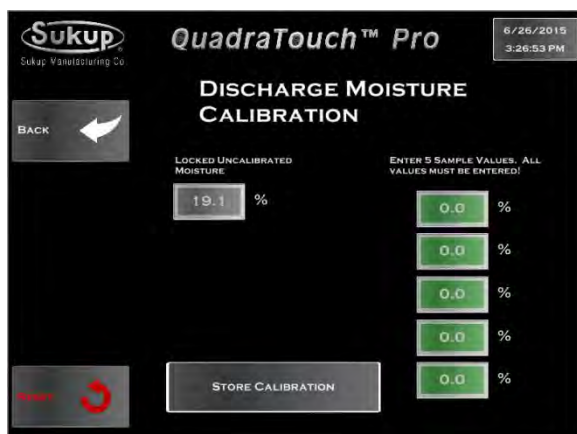
The dryer's moisture sensor(s), Plenum RTD's, and column RTD's, as well as bushel counter, can be calibrated here. Bushel counter must be calibrated in order to access the counting and bushel shutdown features shown in the Tools Menu.



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

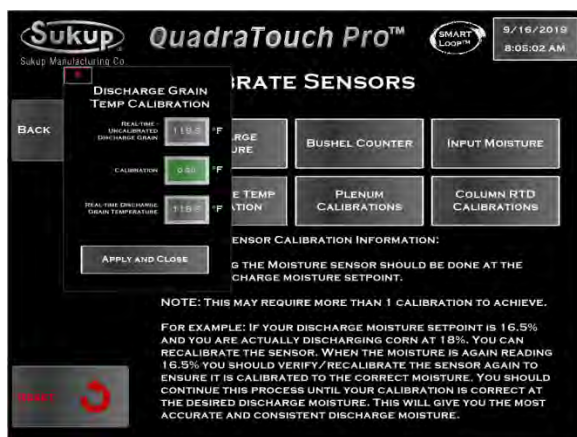
Press button to start timer. When load is finished, press it again to stop timer. Enter the number of bushels discharged during that time. Dryer will calculate and store the bu/hr rate.



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

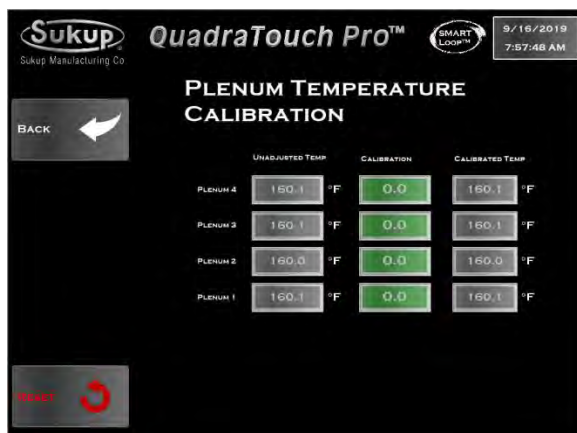
Tools → Calibrate Sensors → Discharge Temp Calibration

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

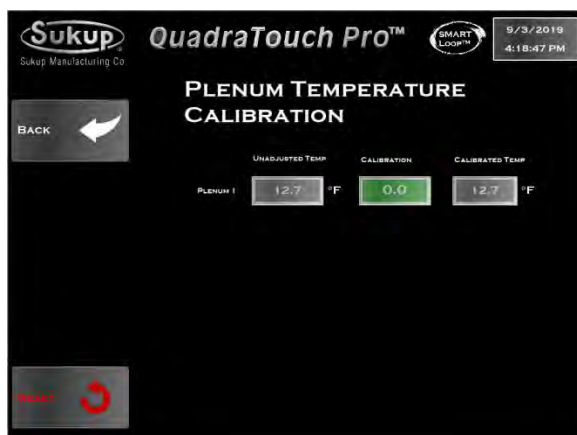
Press Plenum Calibration to enter calibration for each plenum temperature. These sensors are generally very accurate, so exercise caution when adjusting these values.



Tower

Tools → Calibrate Sensors → Plenum Temperature Calibration

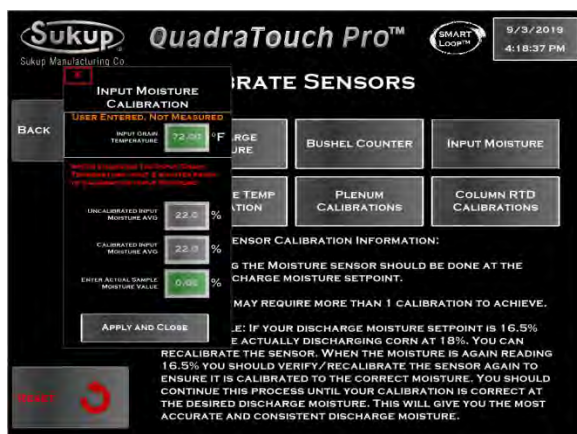
Press Plenum Calibration to enter calibration for plenum temperature. This sensor is generally very accurate, so exercise caution when adjusting.



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

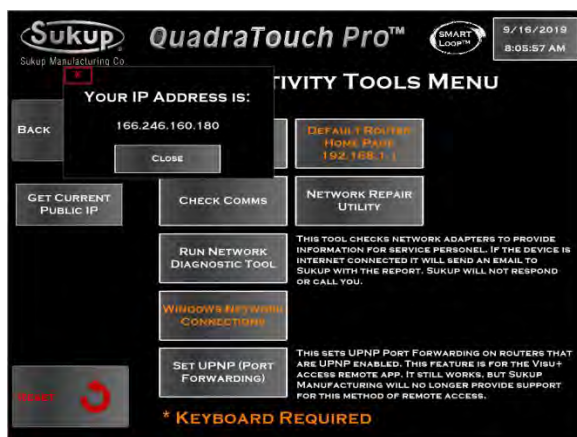
Select language used by dryer operator.

Connectivity Tools

All Dryers

Tools → Connectivity Tools Menu

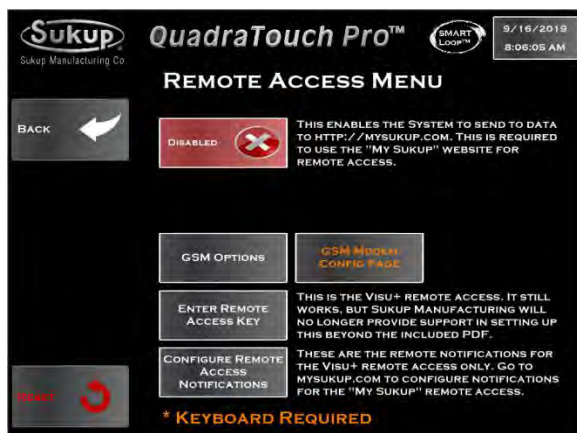
This page provides access to various connectivity tools including setup of remote access via MySukup.com or GSM modem. Additionally, use of Network Diagnostic Tool and Network Repair Utility can be initiated here. **NOTE:** Keyboard is required for some functions.



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

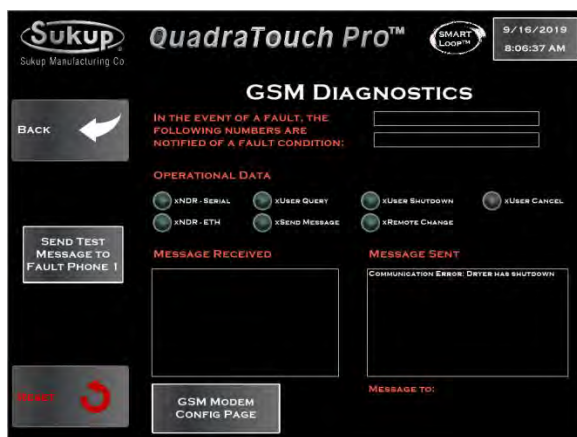
Read agreement and indicate preference on acceptance.



All Dryers

Tools → Connectivity Tools Menu → Remote Access Menu → GSM Options

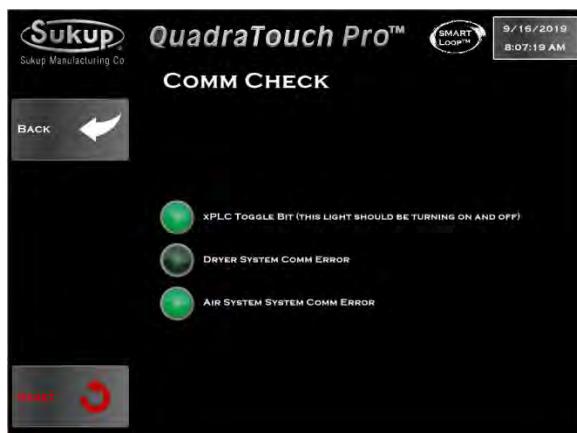
Follow steps as prompted to set up MySukup.com or GSM connection. Image at left shows screen for entering phone numbers for GSM control. Press GSM Diag. box on lower right to get to diagnostics page.



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

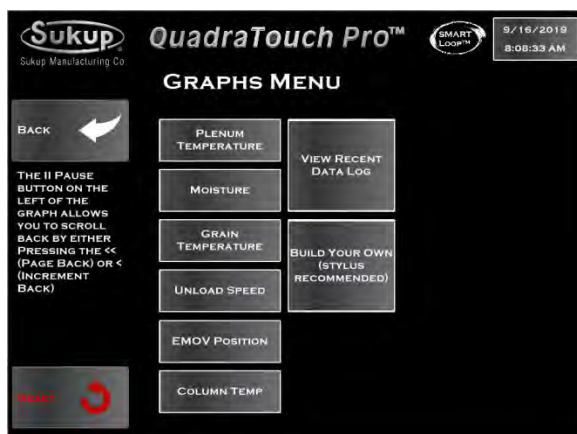
Pressing Check Comms button enables user to check connectivity with dryer's programmable logic controls and with air system if one is connected. The xPLC Toggle Bit button will turn on and off when PLC and touch panel are communicating.



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.

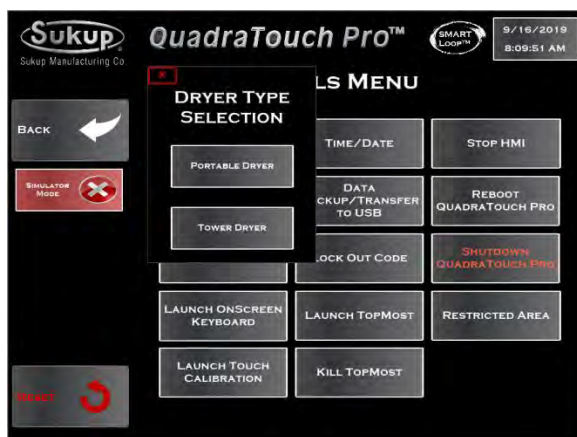


Graphs

All Dryers

Tools → Graphs

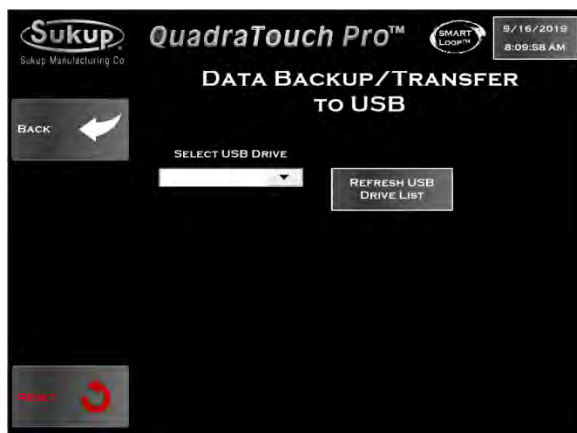
QuadraTouch Pro operating system allows dryer user to look at graphs both in real-time and for past. **NOTE:** Since some screens contain a lot of data, use of a stylus will be helpful.



All Dryers

Tools → 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 Identification 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.



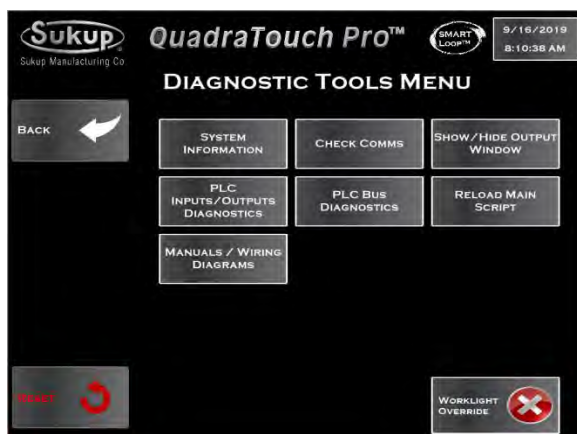
All Dryers

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.

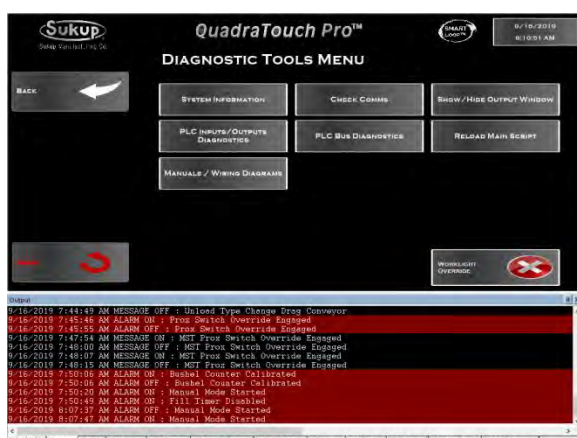


Diagnostic Tools

All Dryers

Tools → Diagnostic Tools Menu

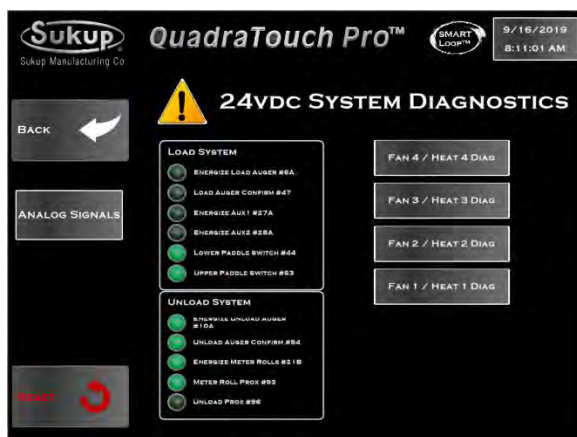
Screen shows diagnostic tools that can be used. See Page 22 to Check Comms (communication between devices) and Page 23 for input of System Information if not done already.



All Dryers

Tools → Diagnostic Tools Menu → Show/Hide Output Window

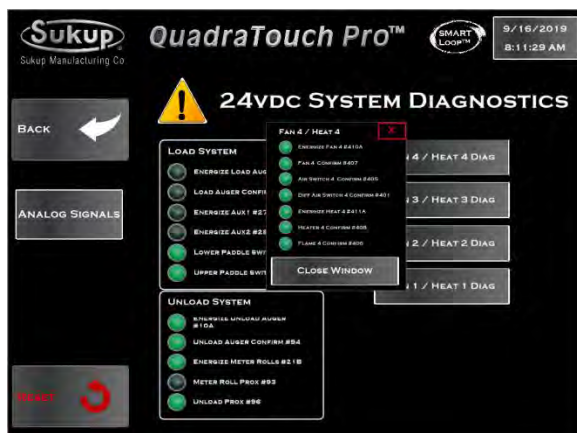
Pressing Show/Hide Output Button shows output window. It may look different than shown and can be dragged to other location on touch screen by pressing on Output bar.



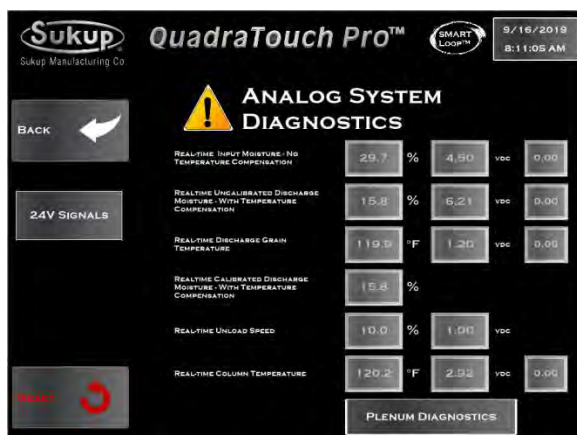
PLC Inputs/Outputs for All Dryers

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.

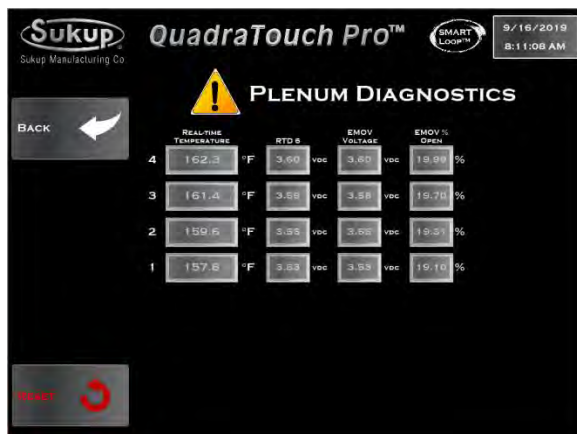


Individual fan inputs/outputs are shown in pop-up windows by pressing corresponding buttons.



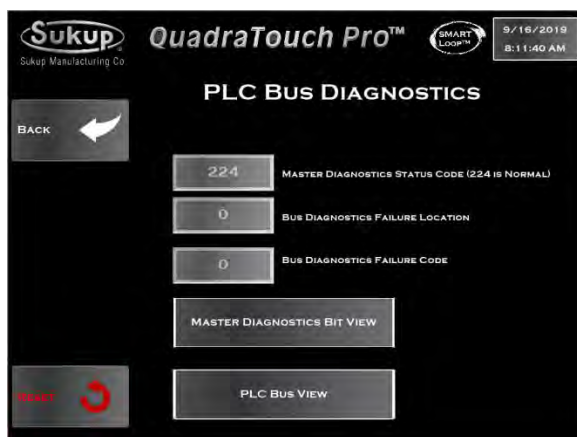
Tools → Diagnostic Tools Menu → Analog System Diagnostics

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 three times.



PLC Bus Diagnostics for All Dryers

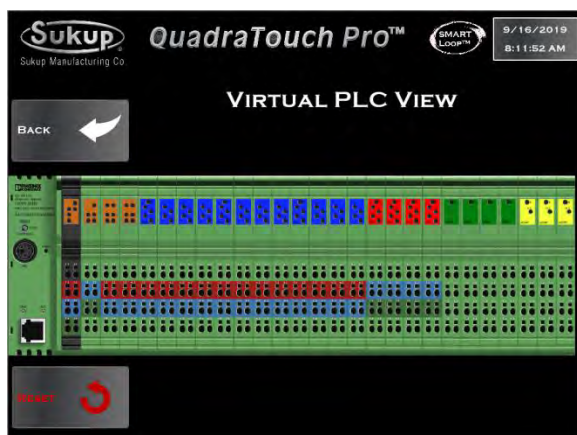
Tools → Diagnostic Tools Menu → PLC Bus Diagnostics

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.



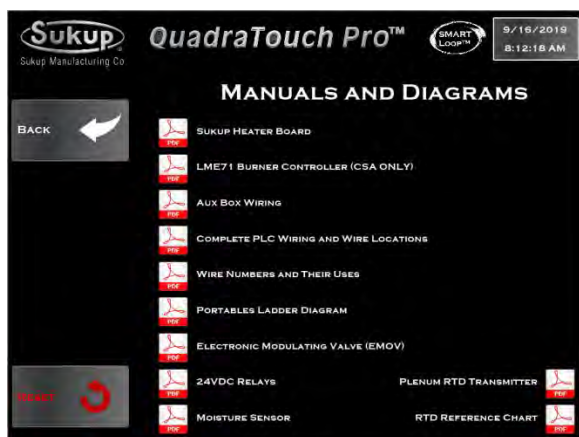
Tools → Diagnostic Tools Menu → PLC Bus Diagnostics → PLC Bus View

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

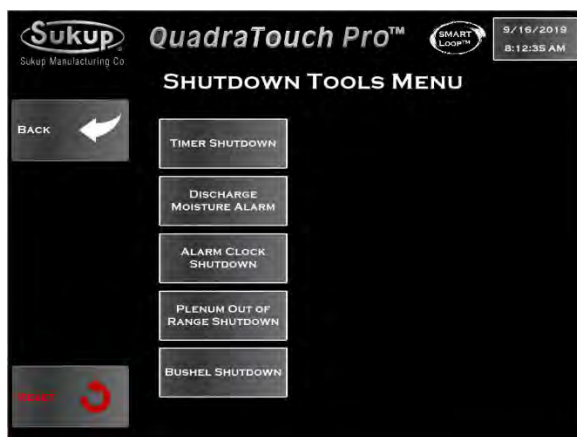
Tools → Diagnostic Tools Menu →
Manuals/Wiring Diagrams

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.

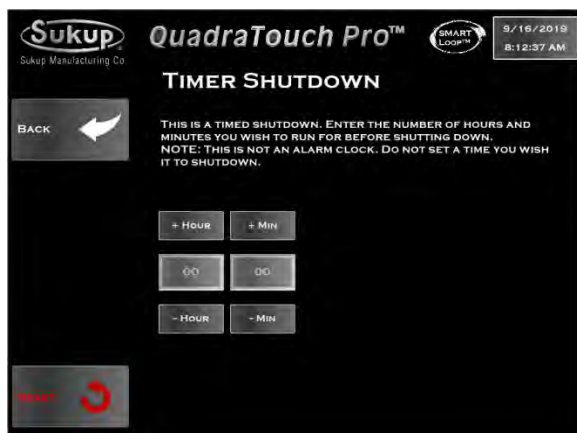


Shutdown Tools

All Dryers

Tools → Shutdown Tools Menu

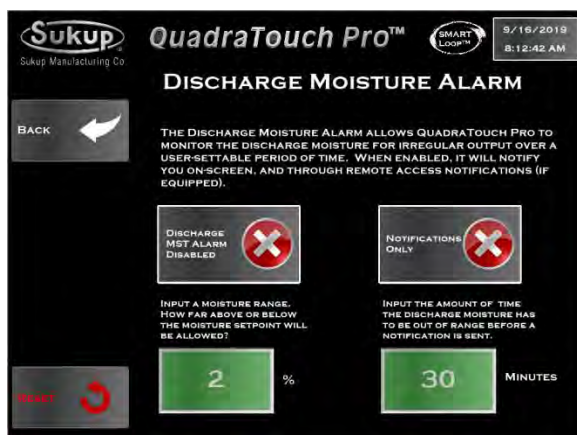
This menu provides access for shutdown settings. User can specify amount of time for each function.



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

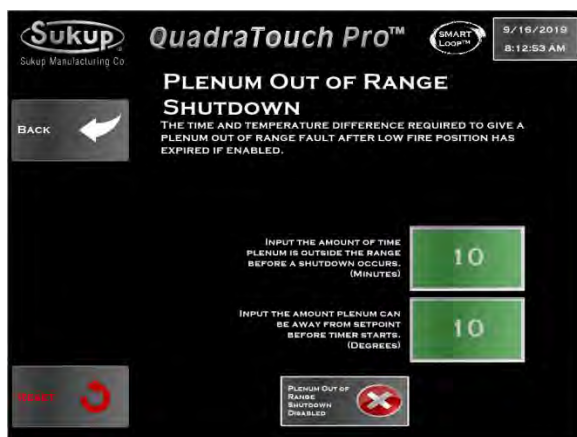
Enter acceptable range of discharge grain moisture and amount of time it must be out of range before a shutdown occurs.



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.

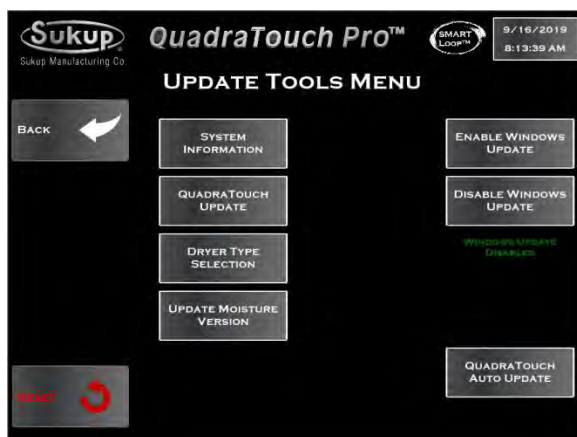


Air System Control

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.

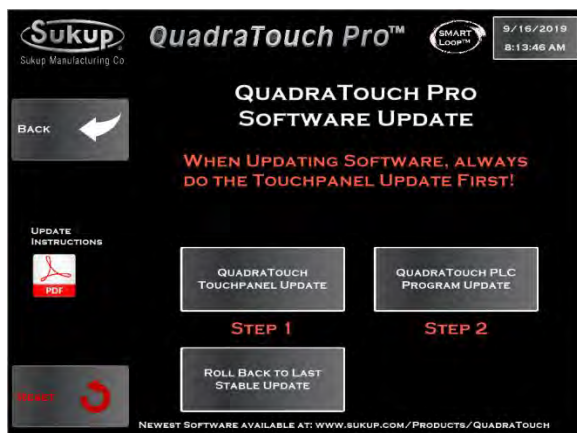


Update Tools

All Dryers

Tools → Update Tools Menu

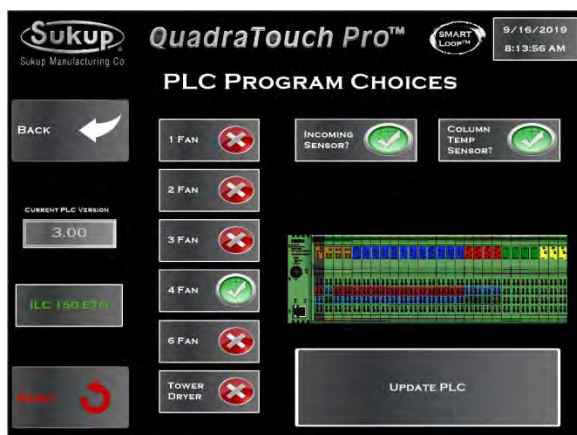
This page provides access to enter system information (See Page 23), update QuadraTouch Pro software, enter type of dryer (See Page 24) and update version of moisture sensor(s).



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

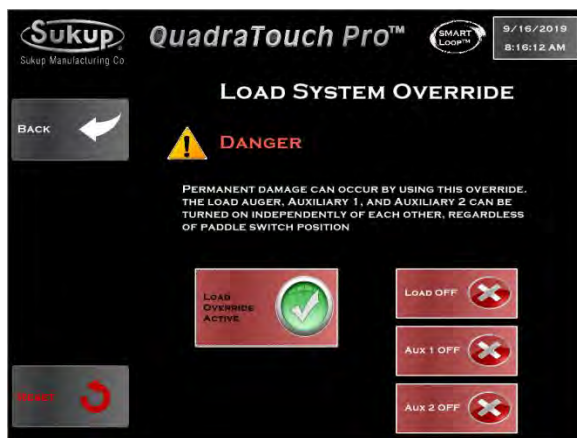
Tools → Update Tools Menu

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

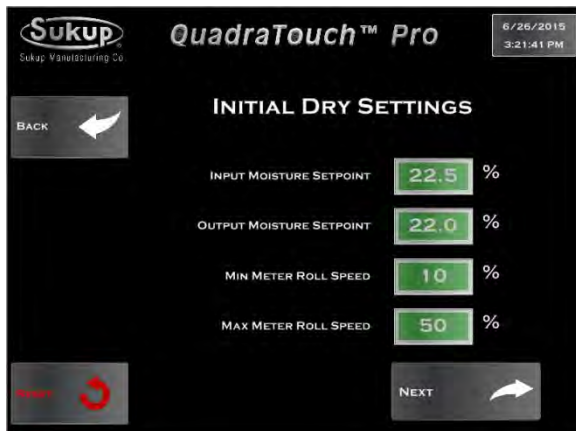
Pressing Start on main screen will bring up Start Menu. Dryer can be used in many different drying modes, the most common of which is Continuous Flow. This section will describe each mode and how it's accessed.



Continuous Flow (Automatic)

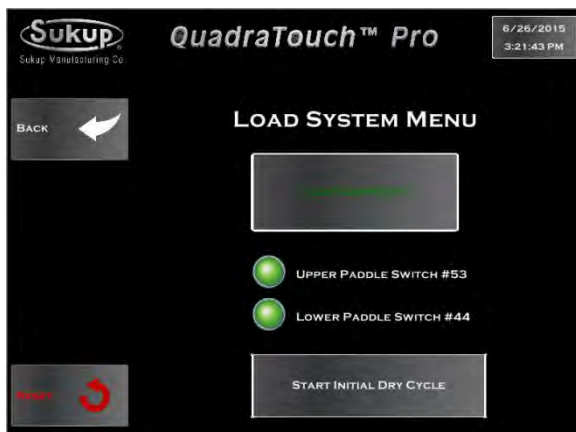
Start → Continuous Flow

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.



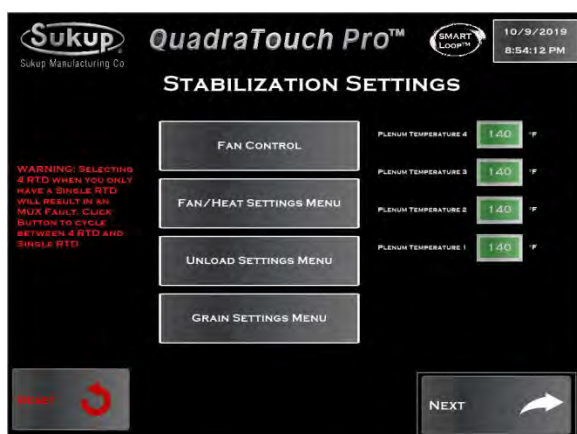
Start → Continuous Flow → Initial Dry → Next

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.



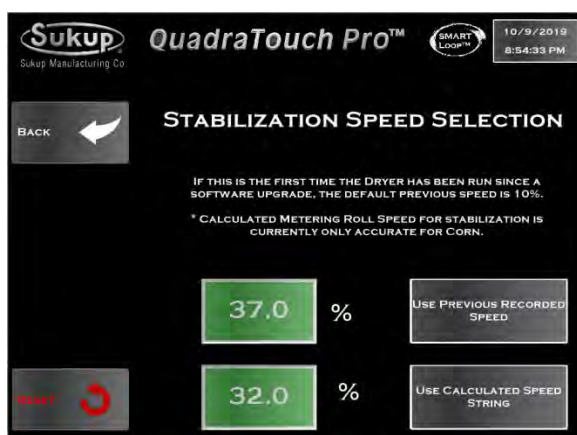
Start → Continuous Flow → Restart with Stabilization → Fan/Heat Control

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

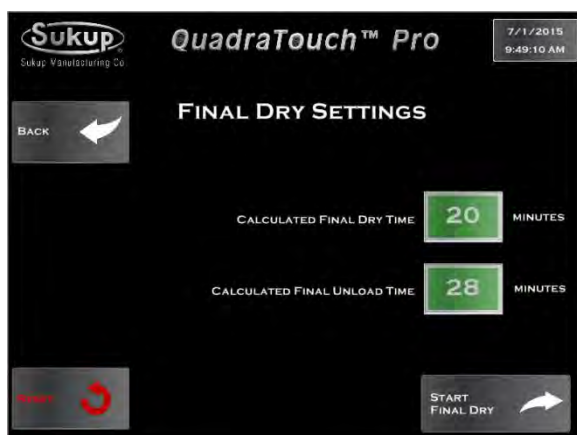
Plenum temperature and discharge moisture setpoint can be confirmed or changed.



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

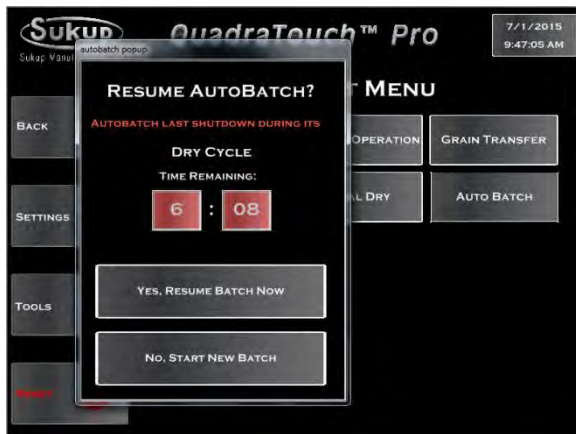
Start → Final Dry

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

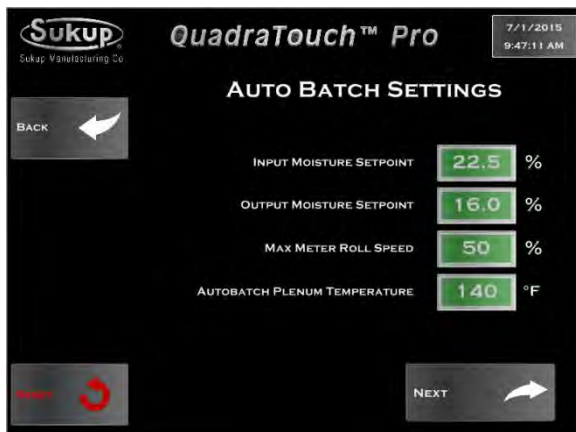
Final Dry mode will automatically exit when the timers have expired.



Auto Batch

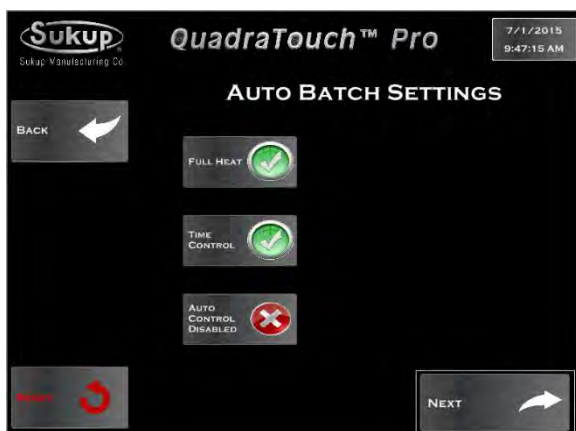
Start → Auto Batch

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.



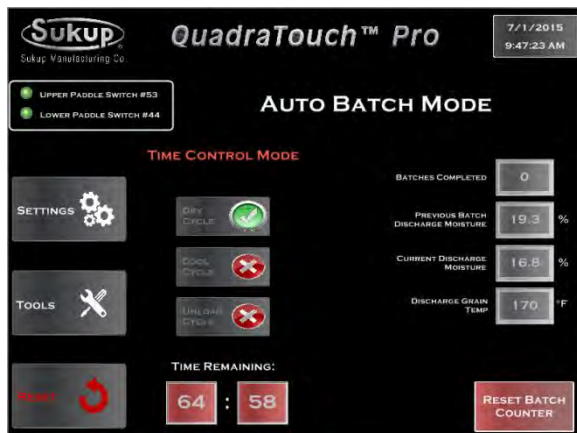
Start → Auto Batch → Start New Batch → Auto Batch Settings

Choose heat or heat/cool operation and control method.



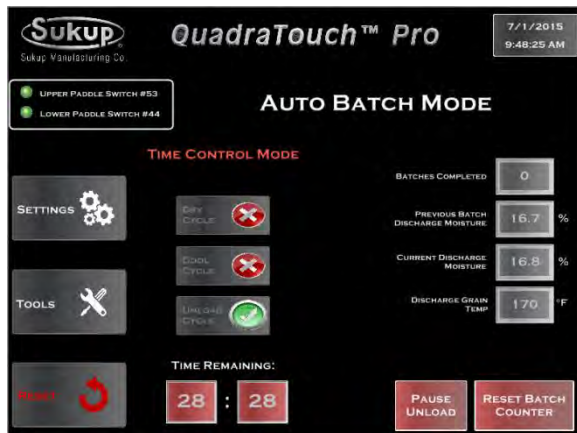
Start → Auto Batch → Start New Batch → Auto Batch Settings

Based on entered settings, dryer will calculate a base point to start from.



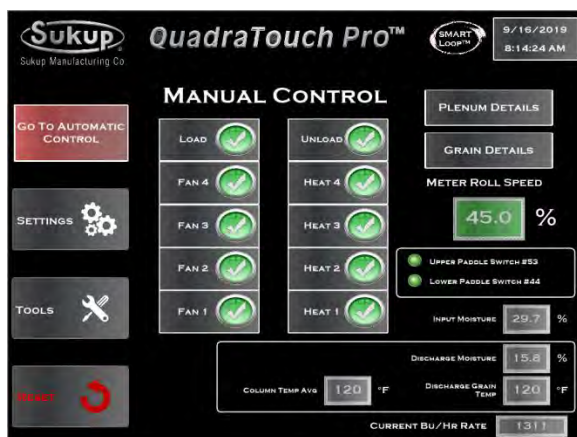
Start → Auto Batch

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

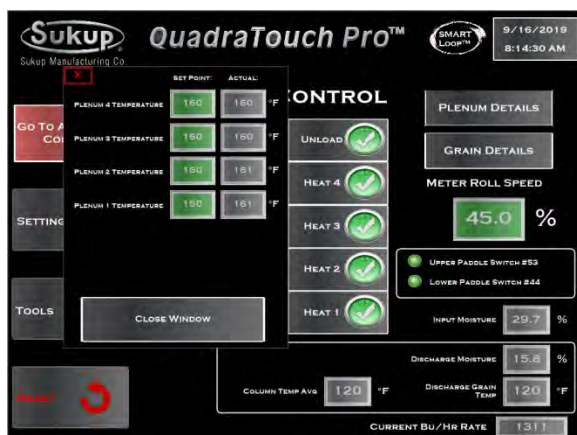
The Unload Cycle can be paused during operation, but needs to be resumed before the next cycle starts. Each of the mode times can be changed using the settings menu.



Manual Operation of Cross-Flow/Mixed-Flow Dryers

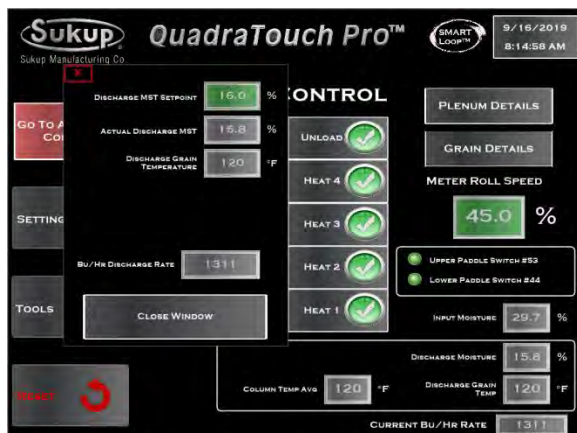
Start → Manual Operation

Plenum temperature and discharge moisture setpoints can be set.



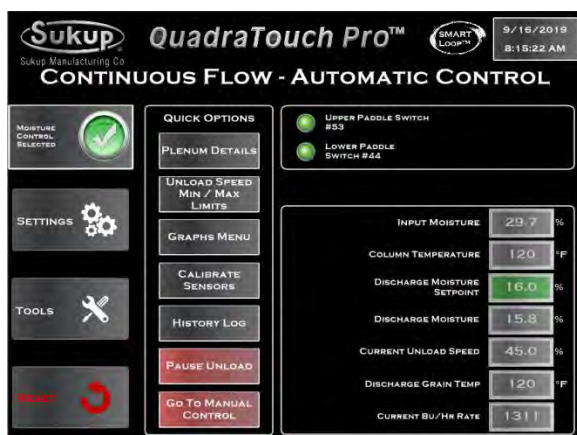
Start → Manual Operation

Press Plenum Details to get a pop-up window to enter plenum temperature setpoint.



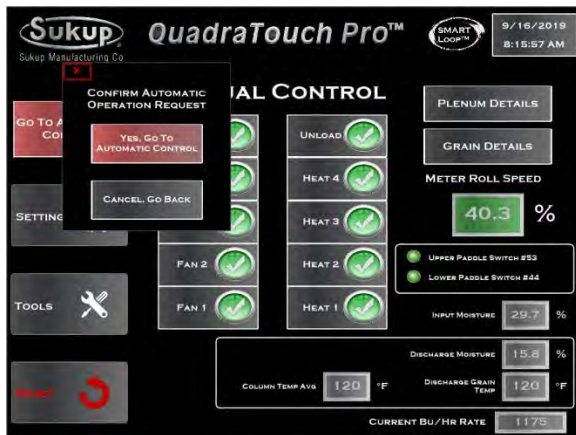
Start → Manual Operation

Press Grain Details to get a pop-up window to enter discharge moisture setpoint.



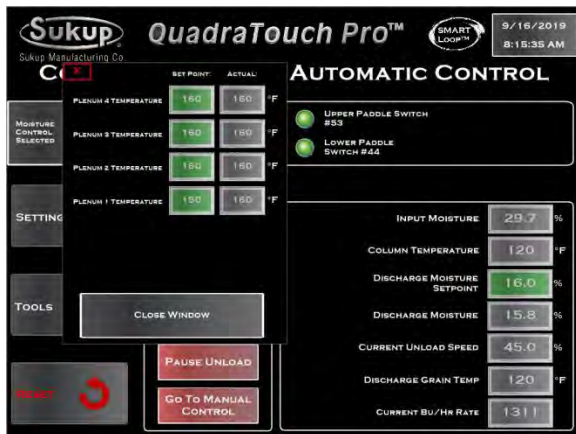
Start → Manual Operation

Press Go to Automatic Control button to get to Continuous Flow Automatic Control page.



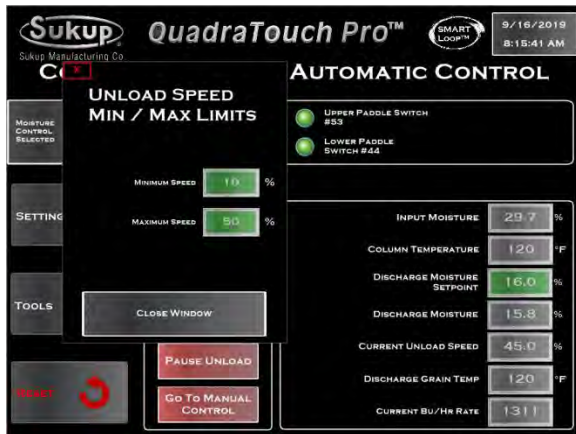
Start → Manual Operation → Go to Automatic Control → Confirm Automatic Operation Request

Press Yes if automatic control is desired, then press Plenum Details.



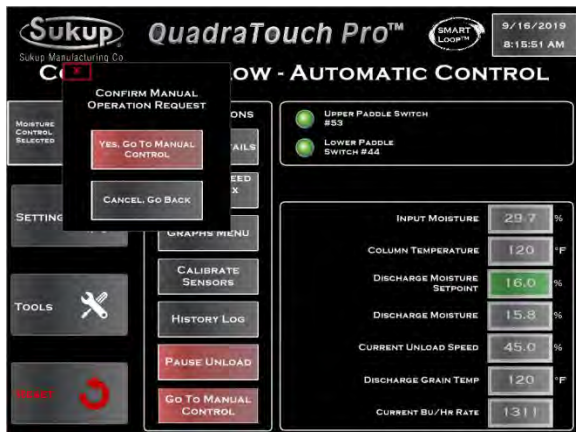
Start → Manual Operation → Go to Automatic Control → Plenum Details

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.



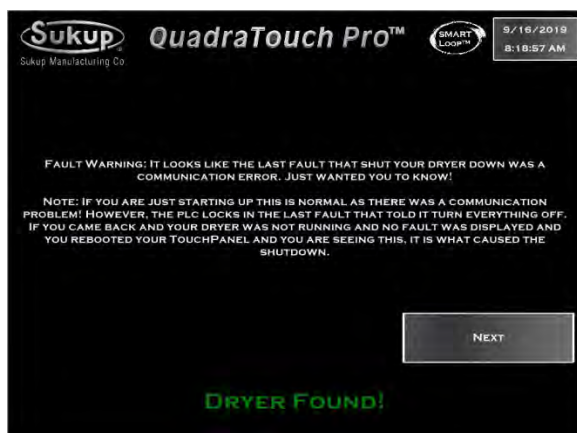
Press Go to Manual Control button at bottom of screen and confirm in pop-up window.



Resetting to QuadraTouch Pro Home Page

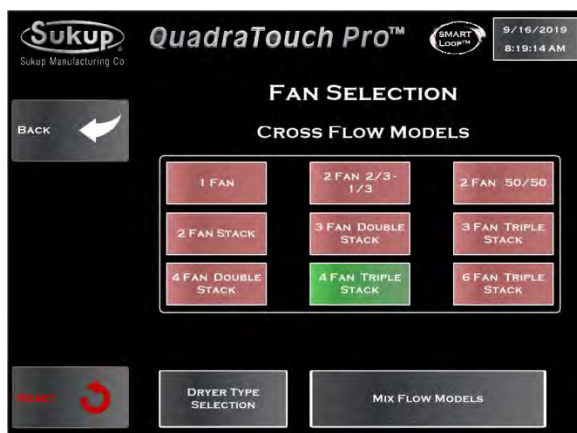
All Dryers

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).

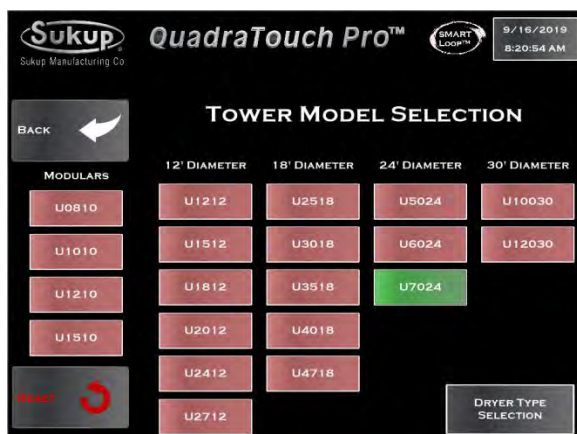


Image at left shows model selection page for tower dryer. Press "Back" after making selection.

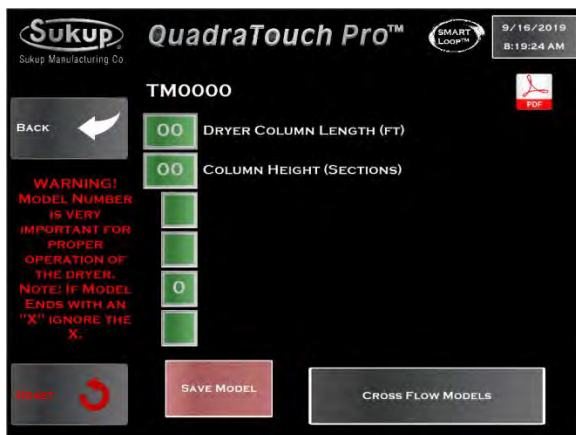


Image at left shows screen for entering dryer length and column height (tiers) for mixed-flow dryers.

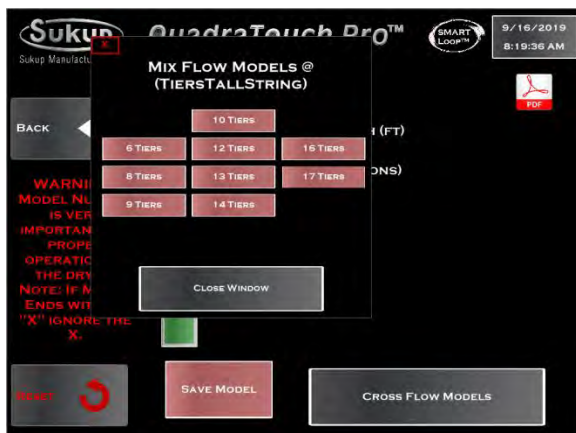


Image at left shows pop-up window for entering number of (tiers) for mixed-flow dryer.

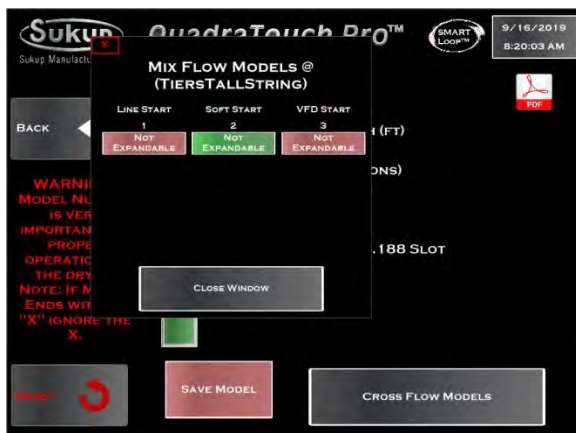


Image at left shows pop-up window for entering start type (Soft start, line start, VFD start) and expandability of dryer.

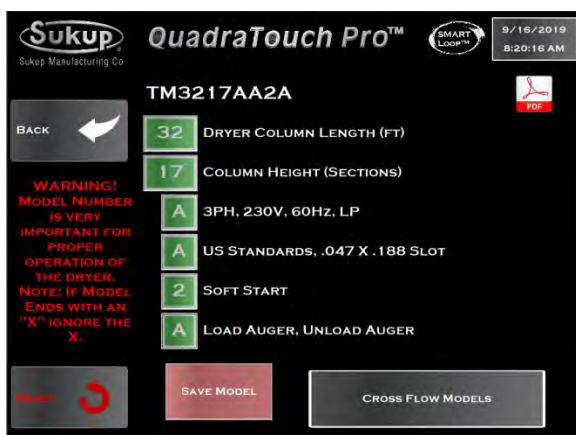


Image at left shows dryer identification screen after entry of all parameters. Press "Save Model" after confirming selections.



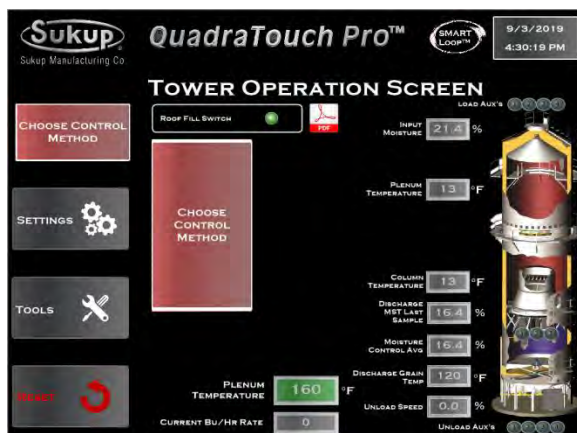
Tower Dryer Operation

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.

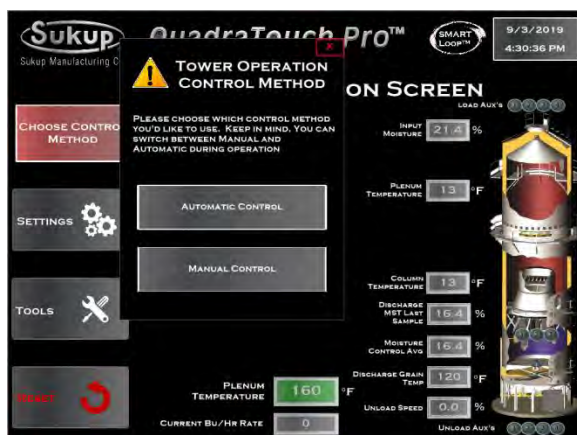
The first key difference is in the Start menu. It will prompt you to answer if the burner tarp has been removed.

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.



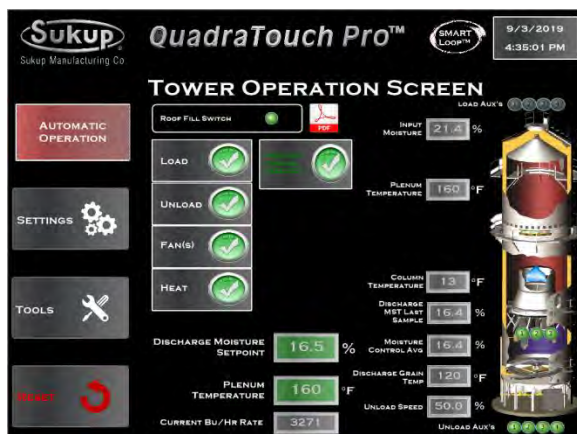
Choose how you'd like to operate the Tower Dryer, Automatic or Manual.

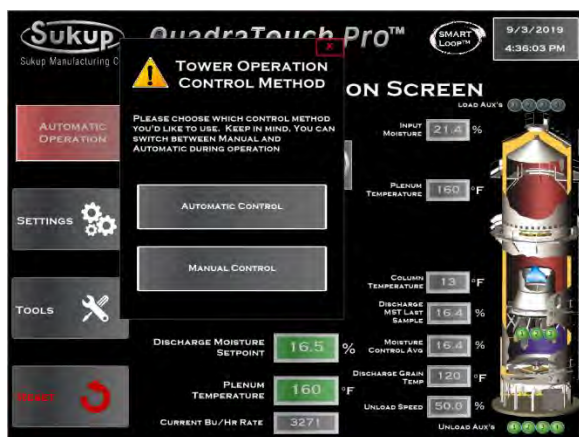


Automatic Operation

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).

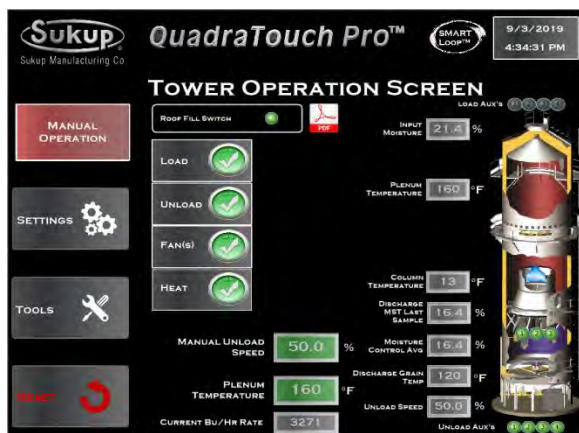
Notice there is a blinking button indicating you are discharging based on moisture or grain column temperature.





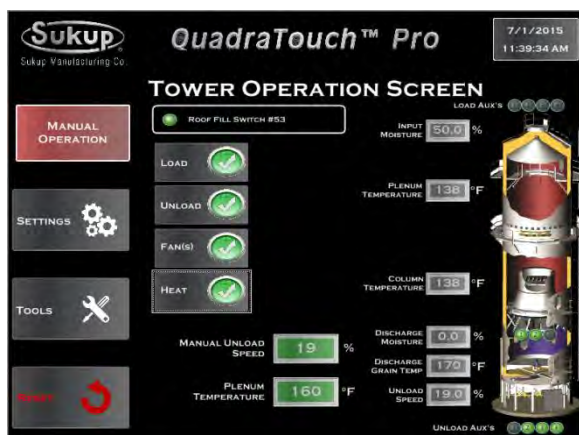
Changing from Moisture to Temperature Control

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.

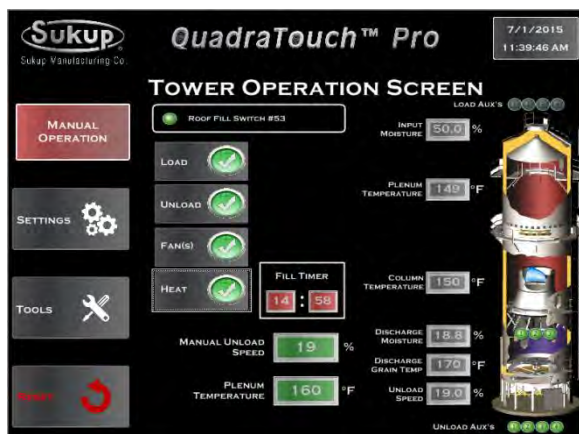


Manual Operation

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

<u>DATE</u>	<u>REVISIONS</u>	<u>PAGE</u>
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

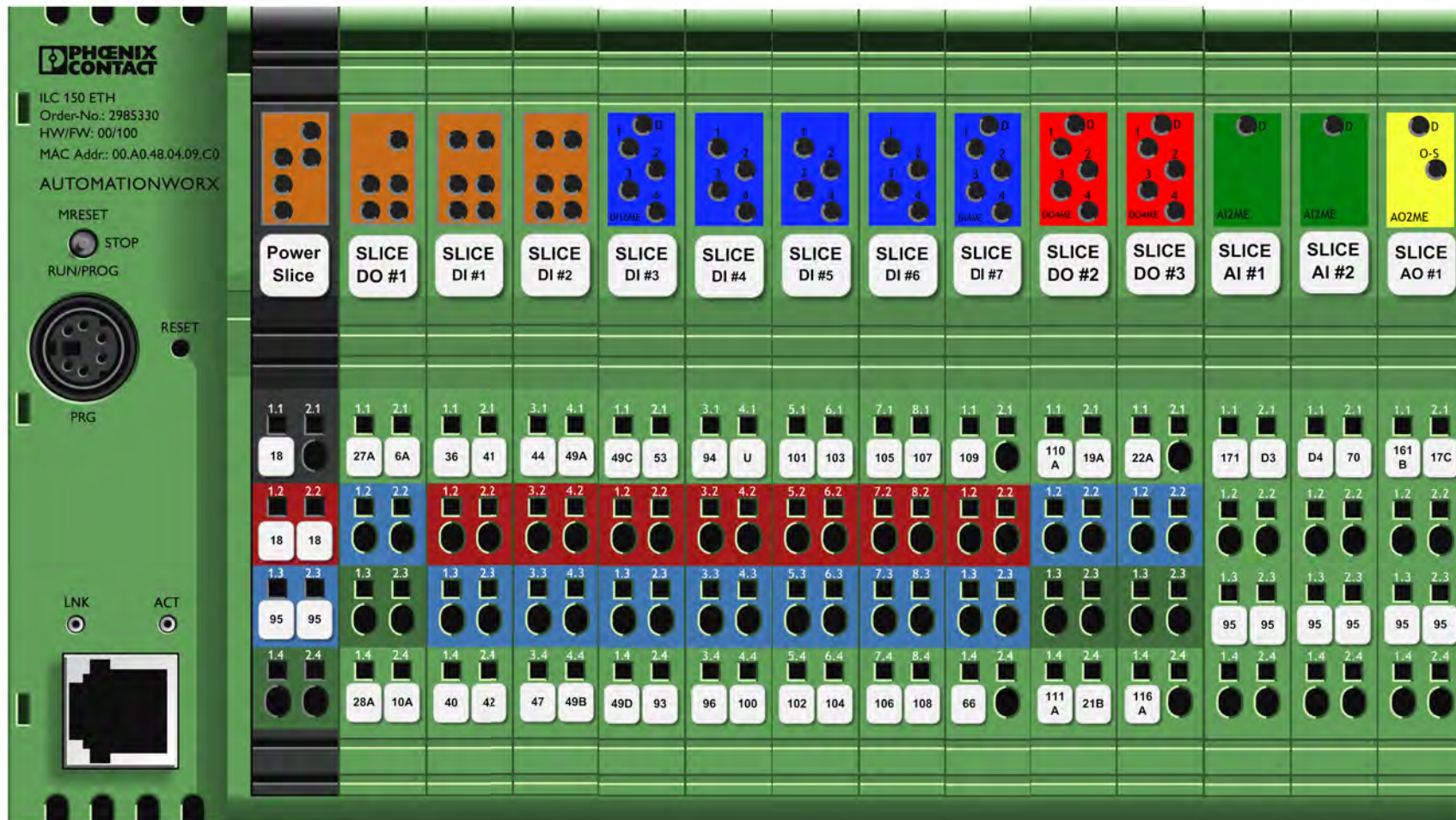
Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

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

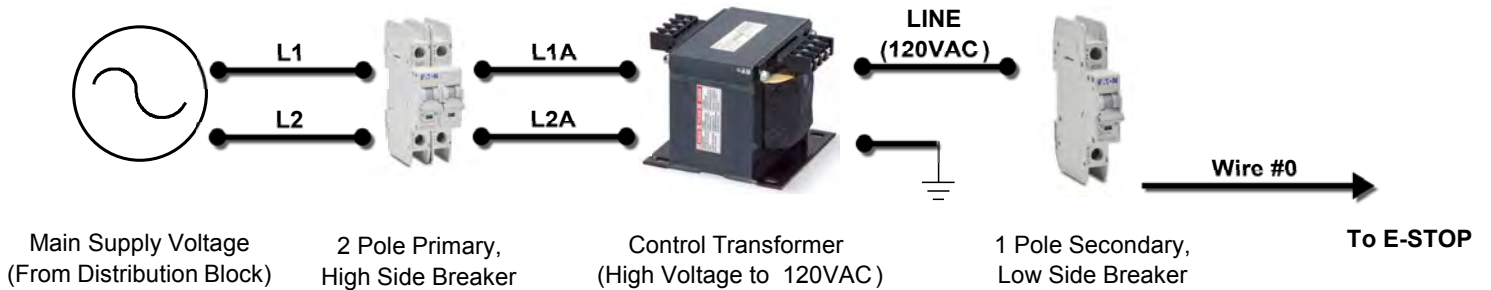
1 Fan PLC Setup



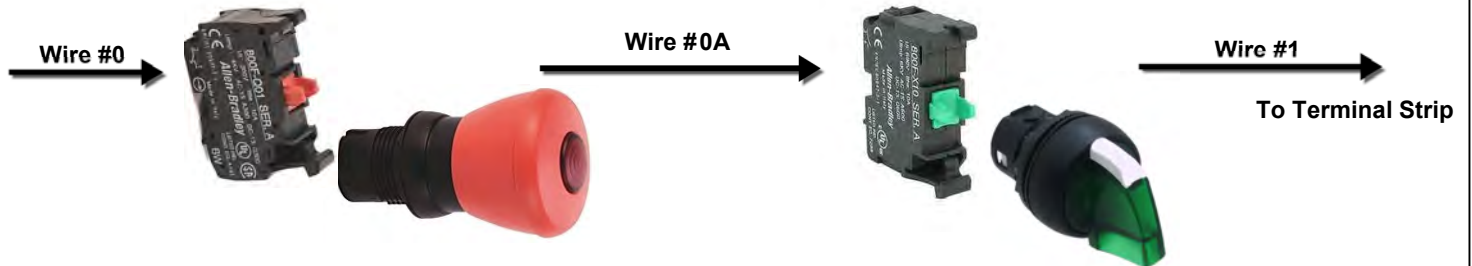
Title: PORTABLE DRYER: 1 FAN PLC Setup	
Author: SUKUP MFG CO - MRK	
Date: 3/15	Sheet: 101.1
Revision: 3/18/2019 - DWS (1)	

[illegible]

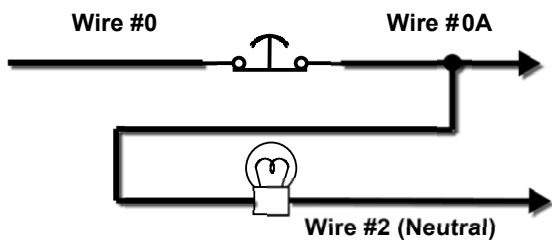
Emergency Stop and System Control Switch Wiring



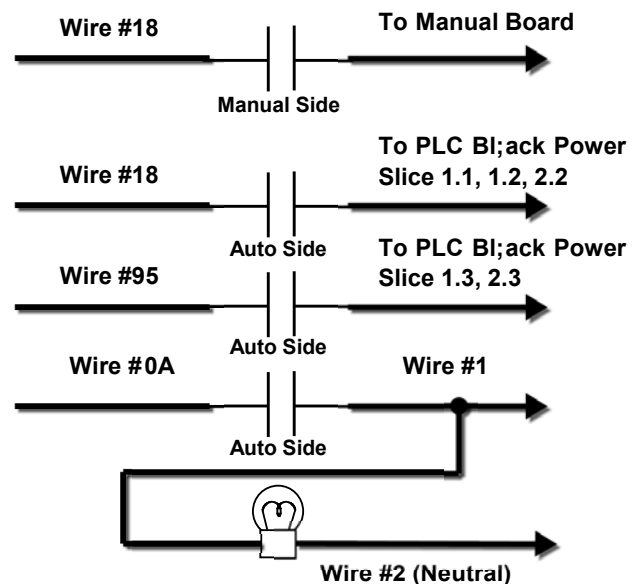
NOTE: 575VAC is Fused
Instead of 2 Pole breaker shown



E-STOP (Emergency Stop Switch)



System Control Switch Manual --- OFF --- Auto (3 Position)



Title: PORTABLE DRYER: Emergency Stop and System Control Switch Wiring

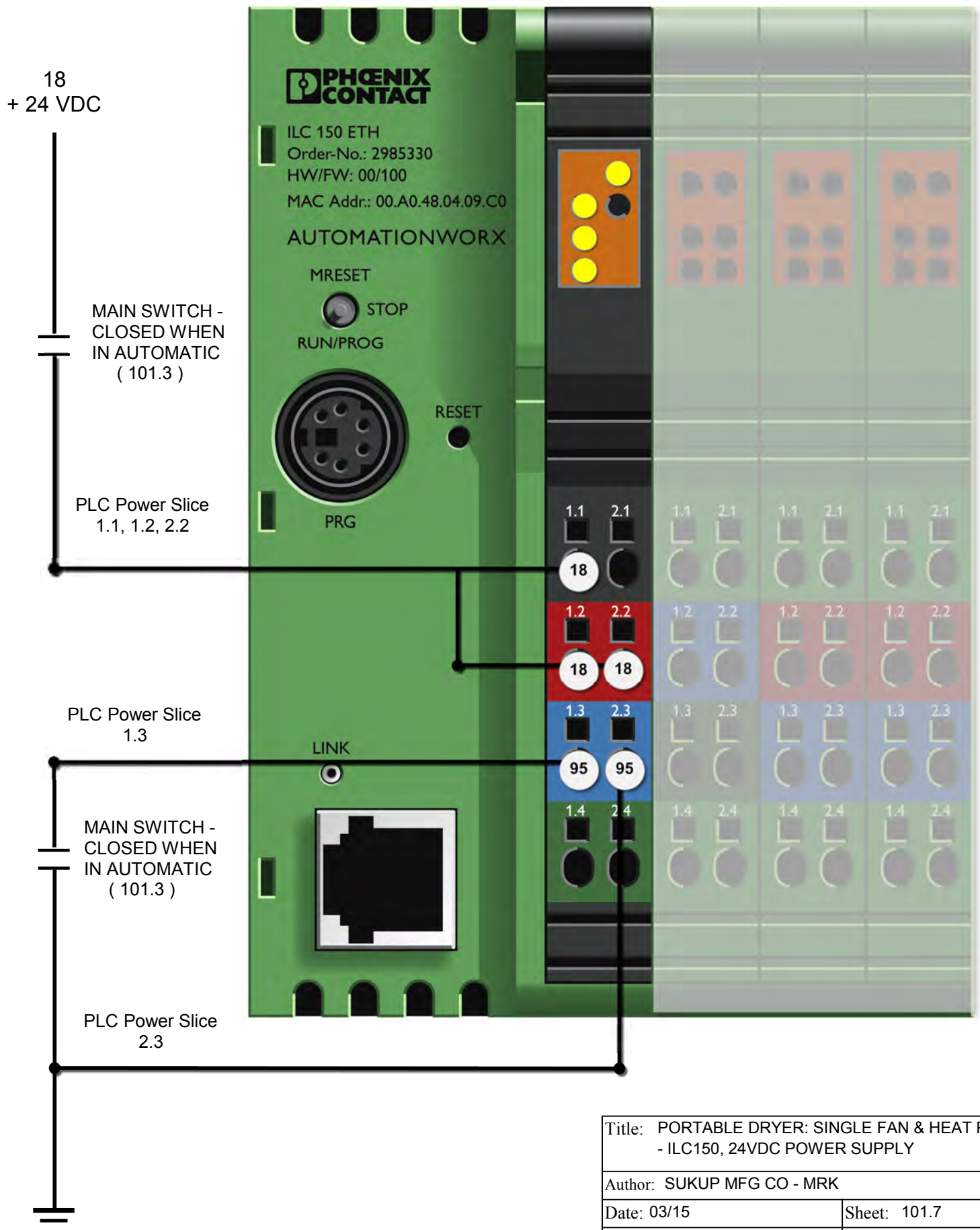
Author: SUKUP MFG CO - MRK

Date: 03/15

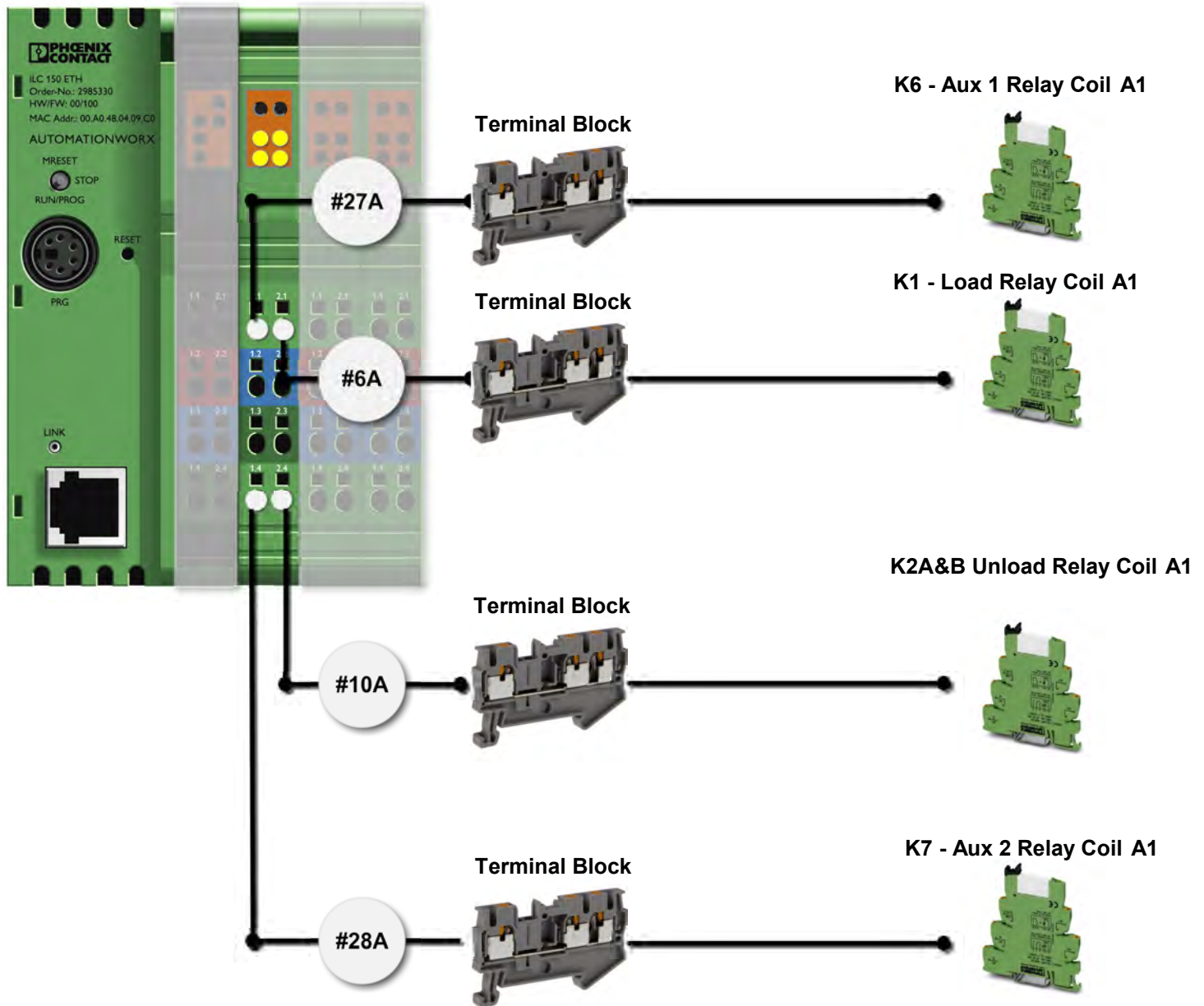
Sheet: 101.3

Revision: 8/17/2017 - DWS (1)

PLC POWER SLICE (Designated by Black Wiring Arm)



PLC DO SLICE #1 (Digital Output Card #1 - same as red cards)



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

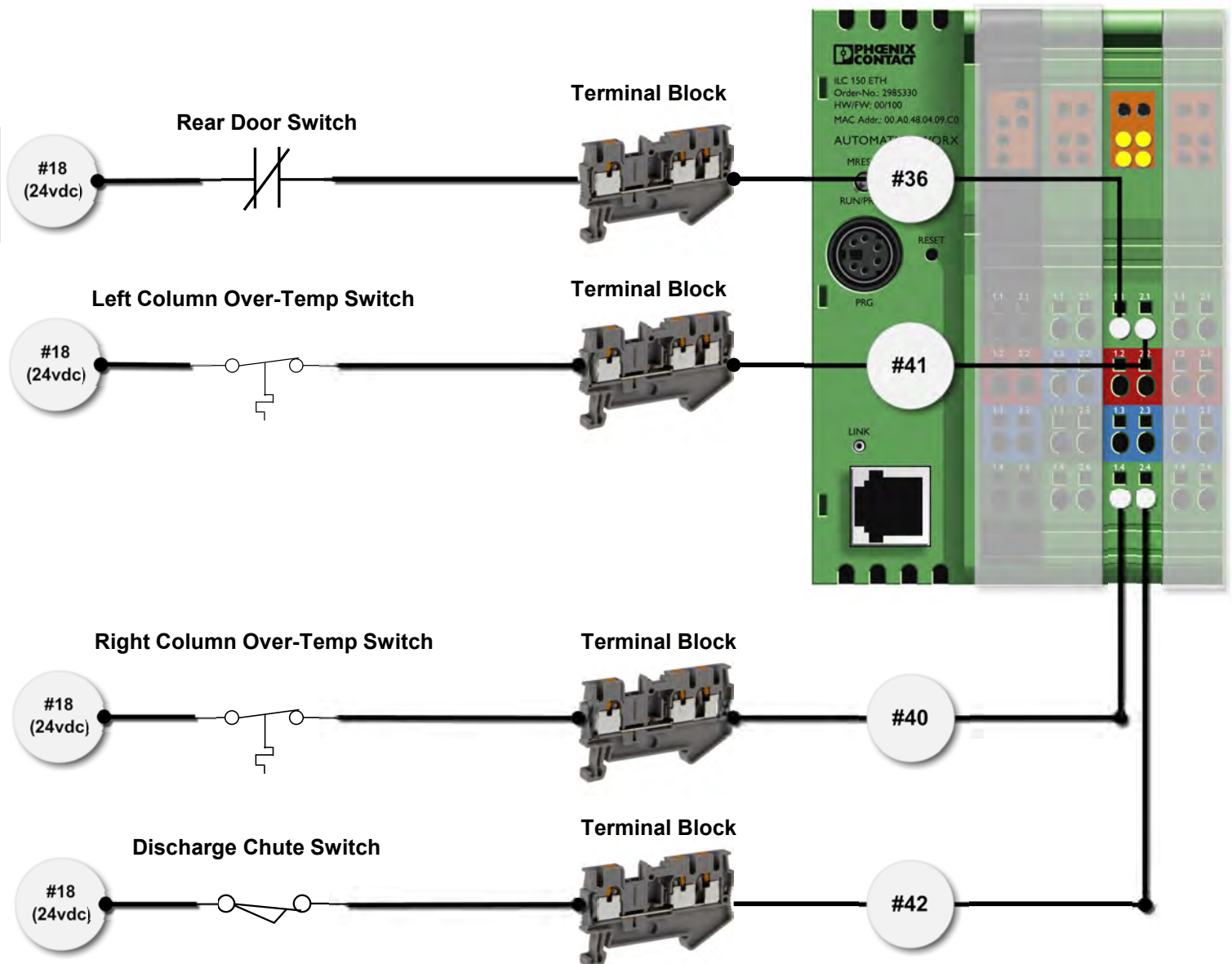
Author: SUKUP MFG CO - MRK

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

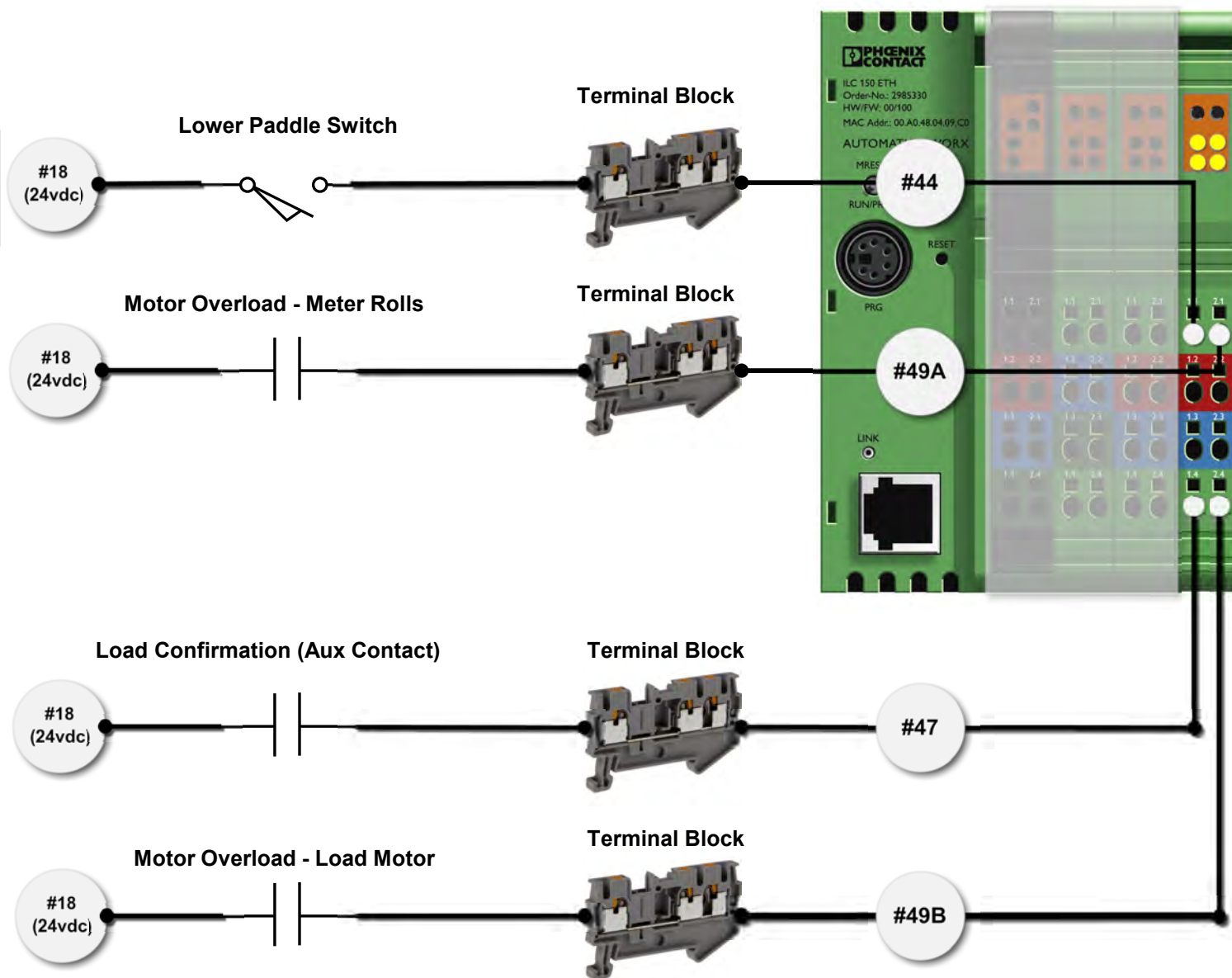
Author: SUKUP MFG CO - MRK

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

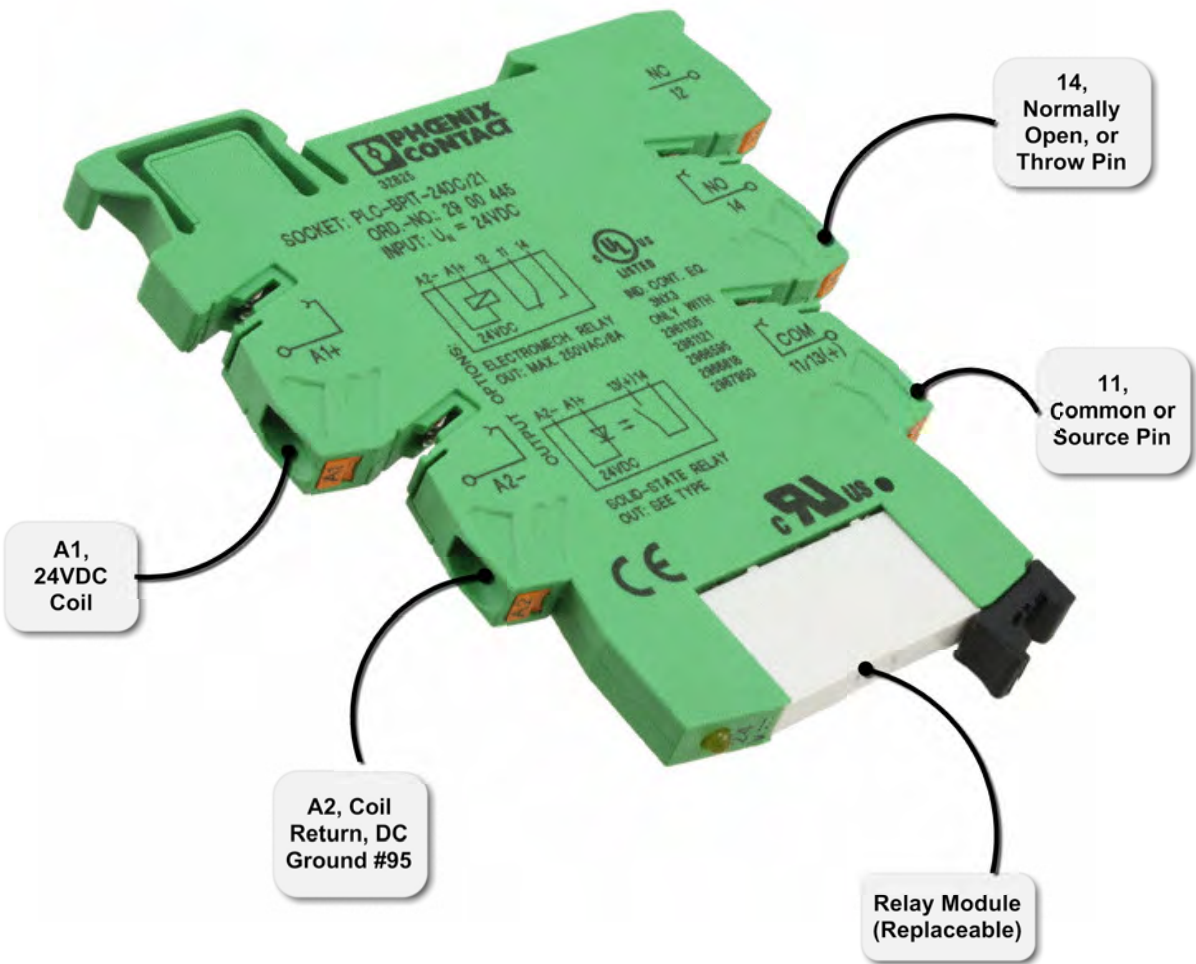
Author: SUKUP MFG CO - MRK

Date: 03/15

Sheet: 101.10

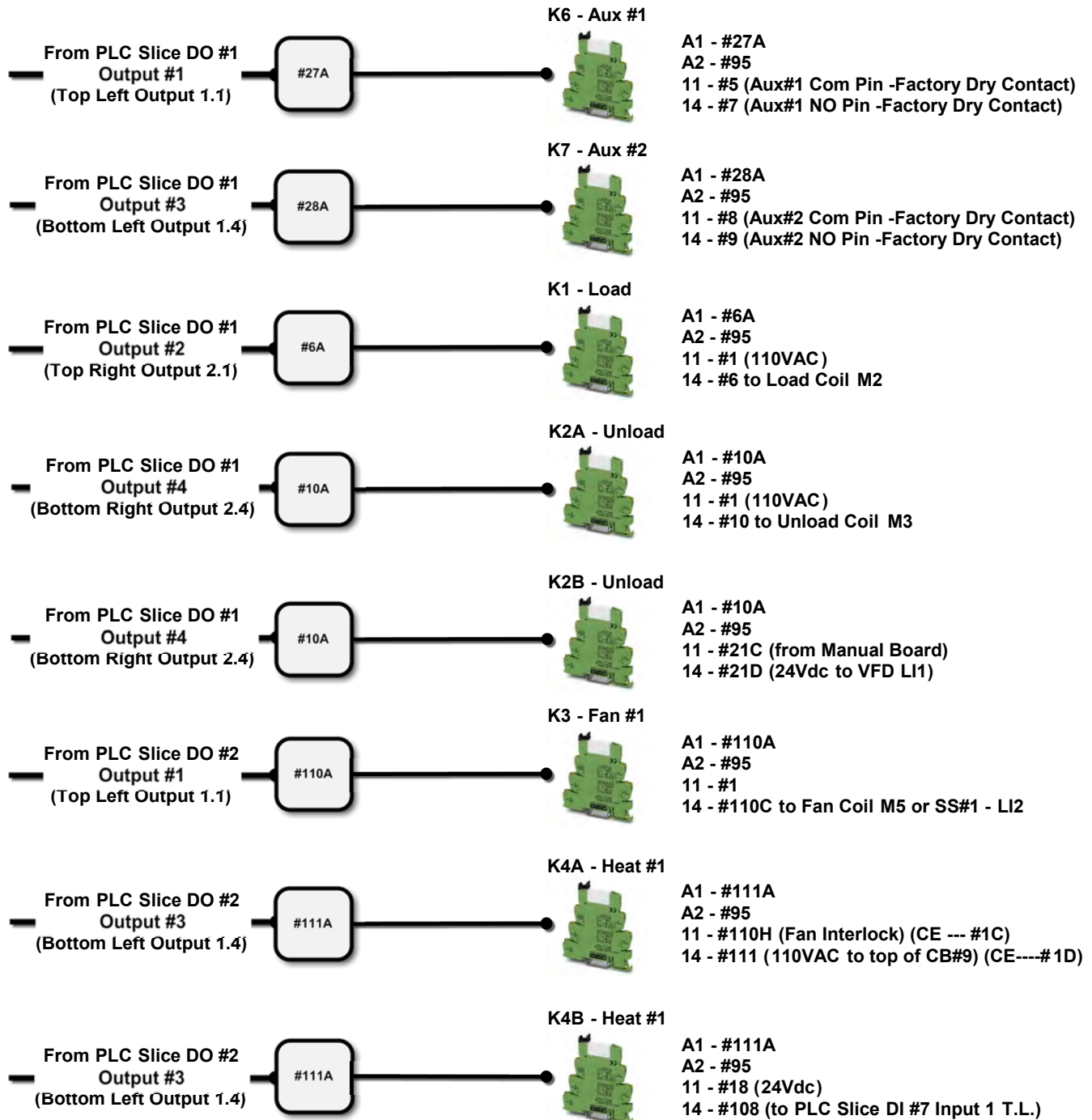
Revision: 6/6/2017 - DWS (1)

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



Title: PORTABLE DRYER: PLC Relay Wiring

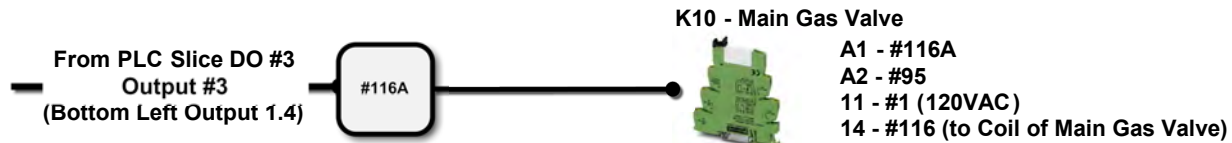
Author: SUKUP MFG CO - MRK

Date: 3/15

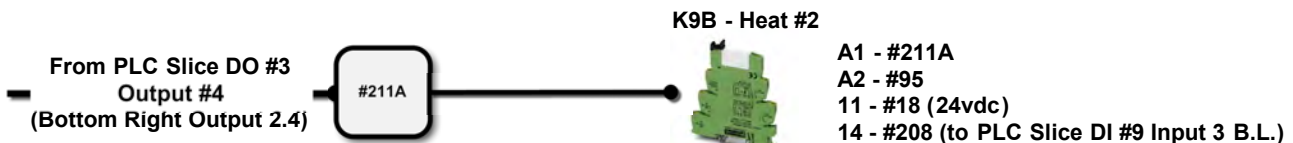
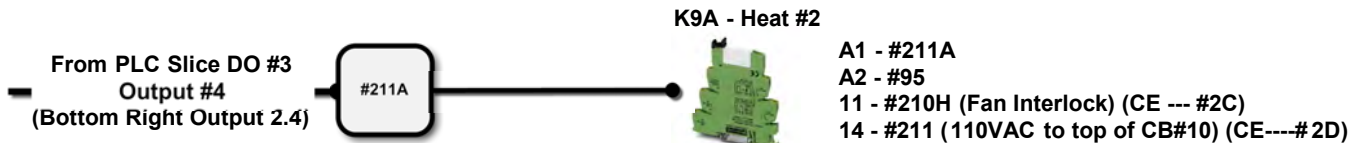
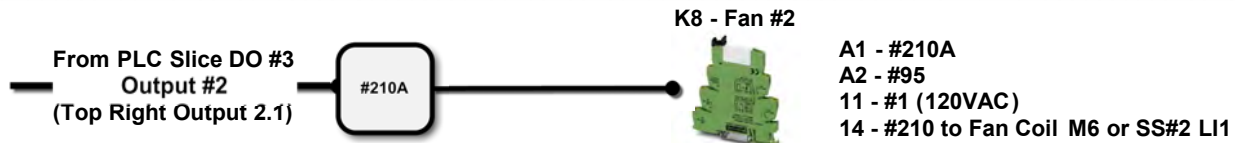
Sheet: 101.12

Revision: 6/7/2017 - DWS (1)

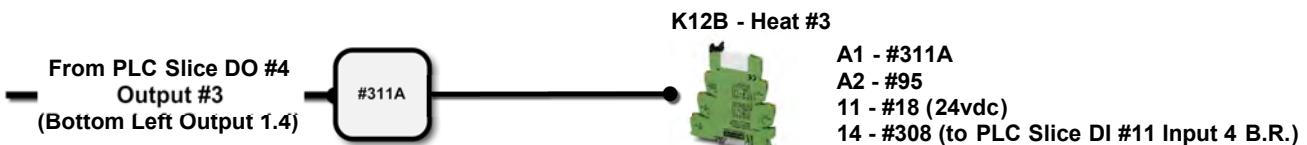
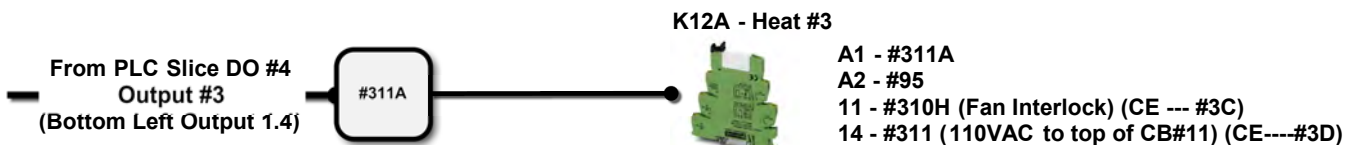
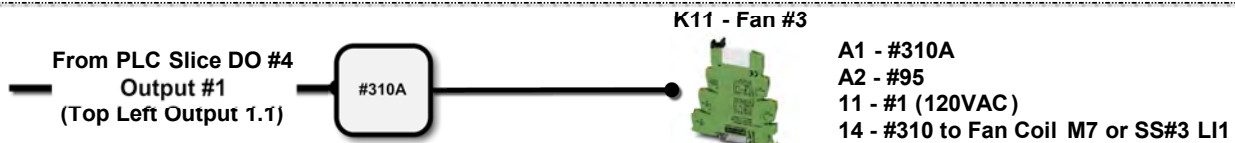
1-6 Fan PLC Relay Wiring



1 Fan - Stop Here



2 Fan - Stop Here



3 Fan - Stop Here

Title: PORTABLE DRYER: PLC Relay Wiring

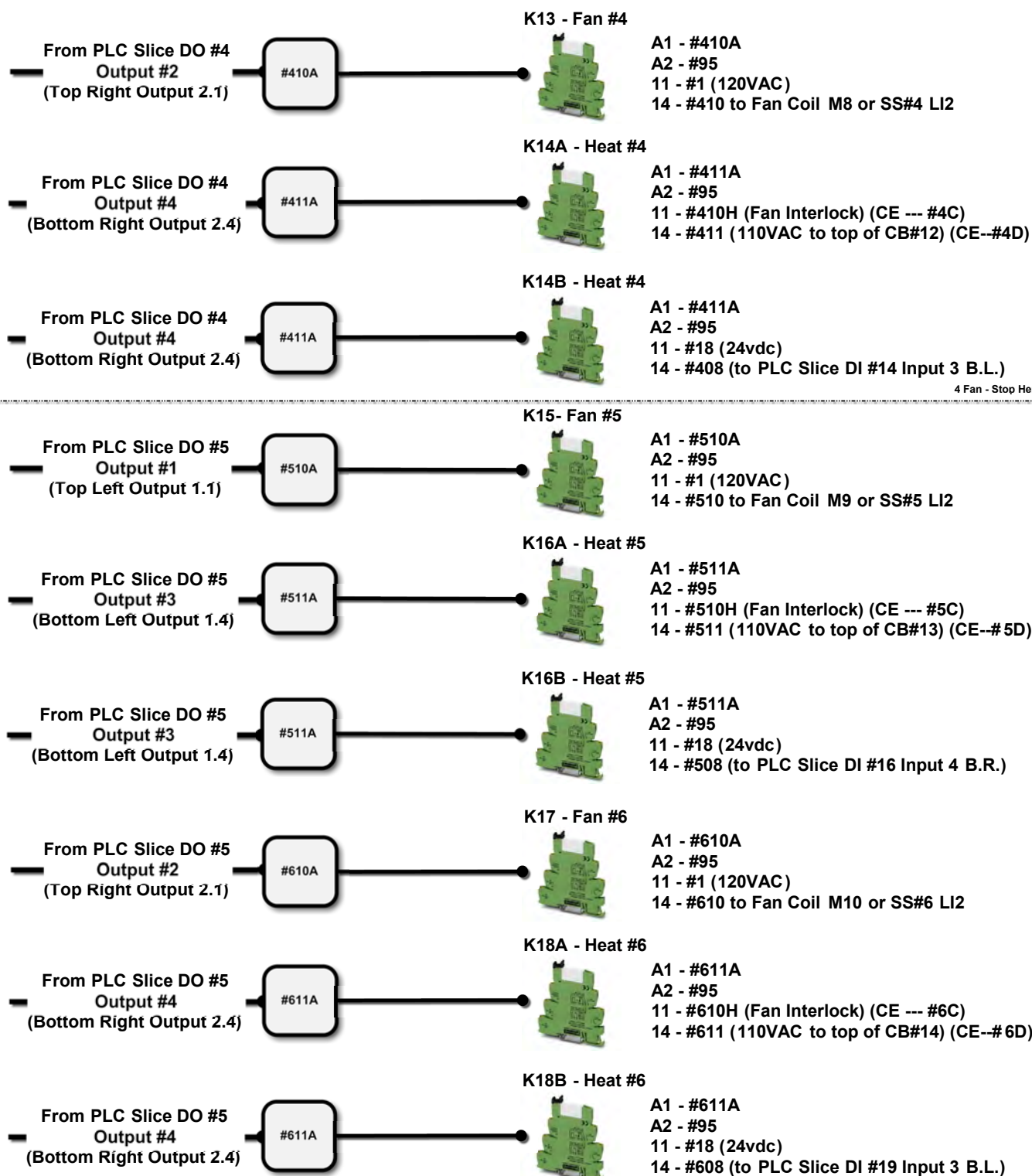
Author: SUKUP MFG CO - MRK

Date: 3/15

Sheet: 101.13

Revision:

1-6 Fan PLC Relay Wiring



Title: PORTABLE DRYER: PLC Relay Wiring

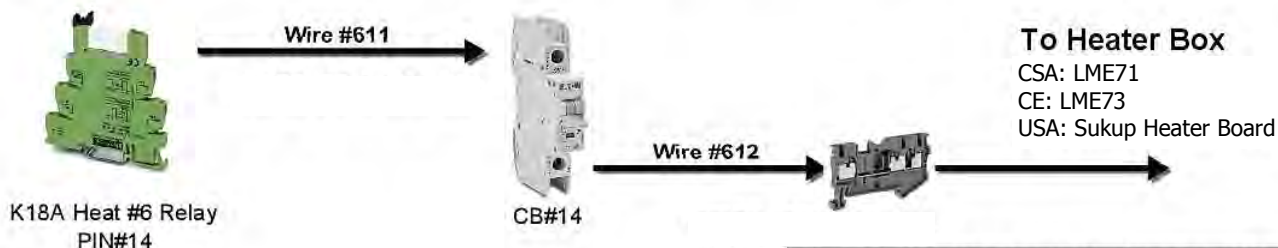
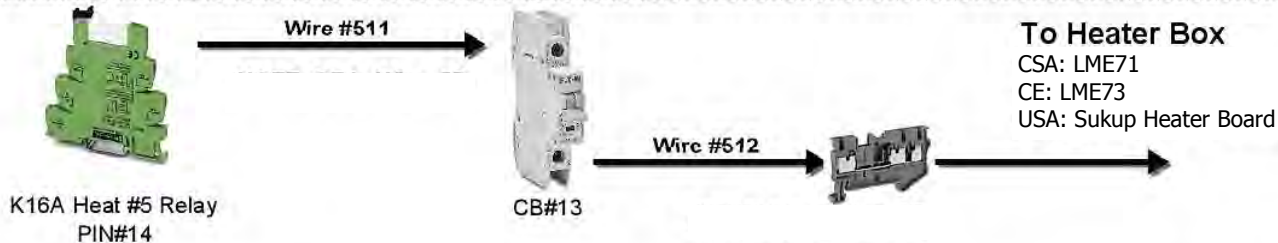
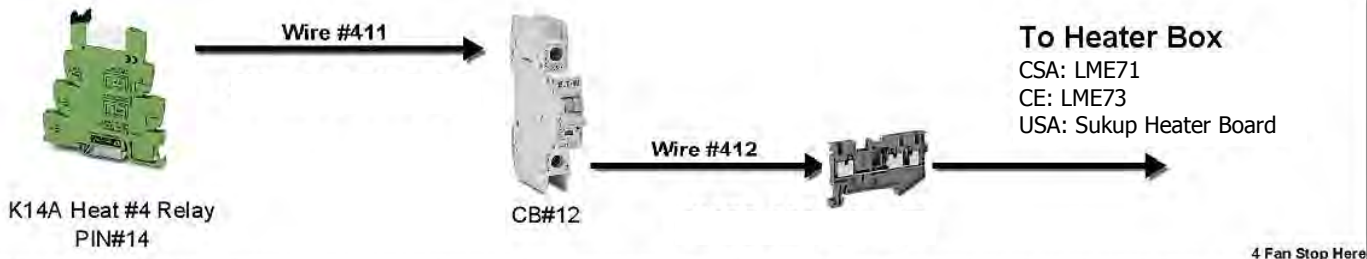
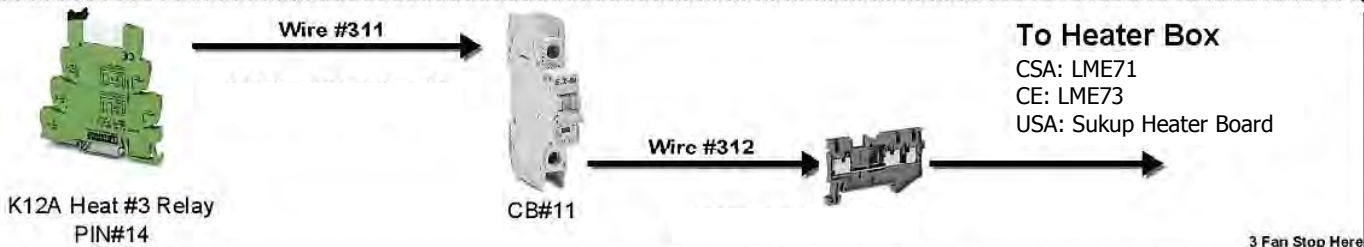
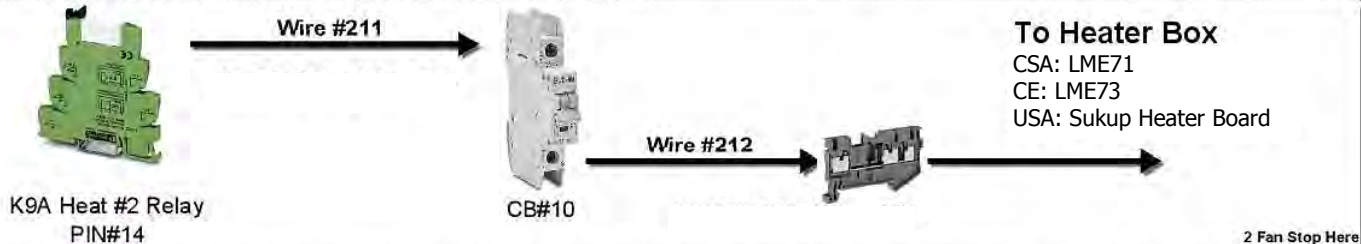
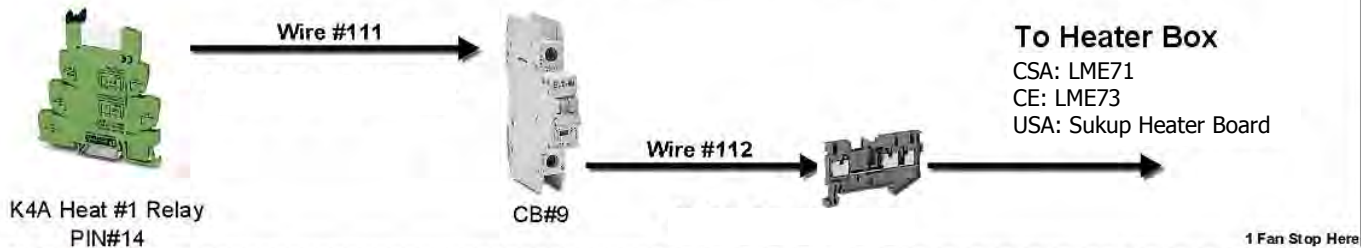
Author: SUKUP MFG CO - MRK

Date: 3/15

Sheet: 101.14

Revision:

Heater Relay and Heater Breaker Wiring



Title: PORTABLE DRYER: Heater Breaker Wiring

Author: SUKUP MFG CO - MRK

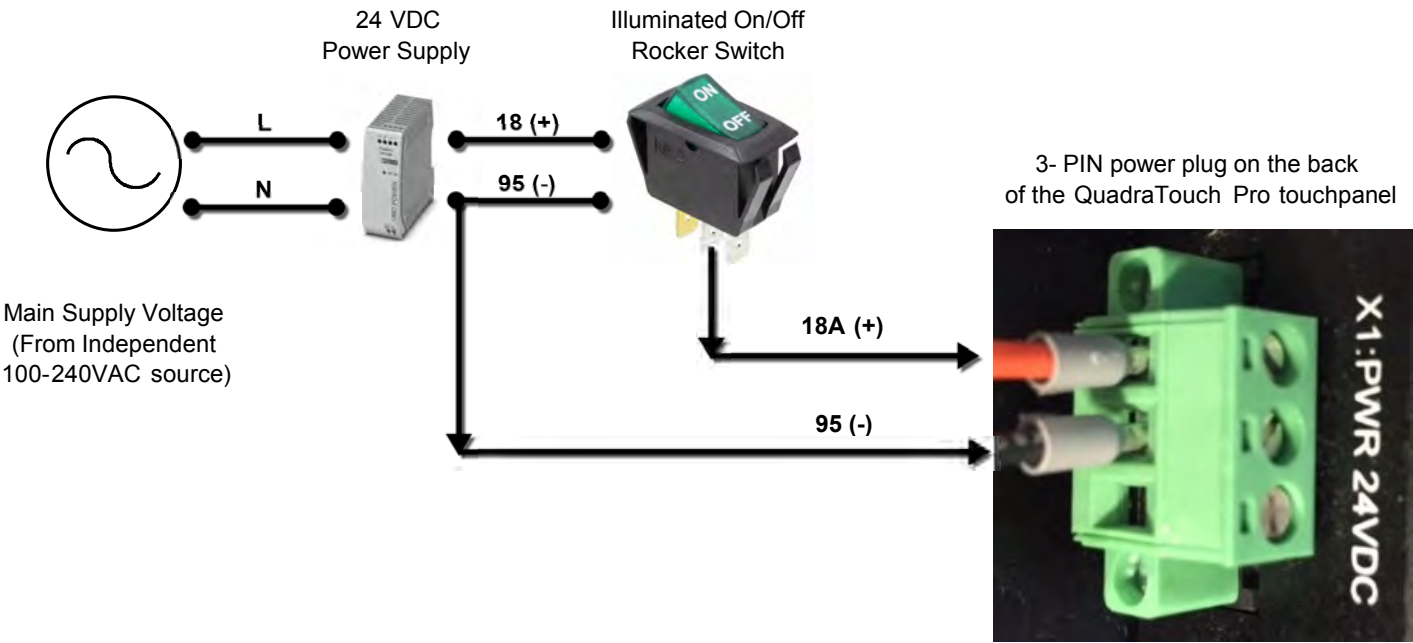
Date: 03/15

Sheet: 101.16

Revision:

Rev: 12/01/18

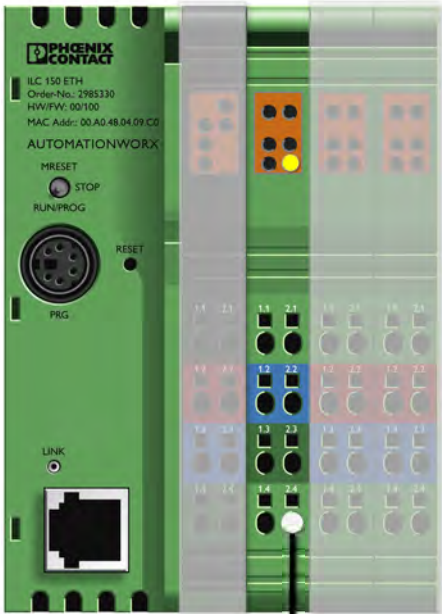
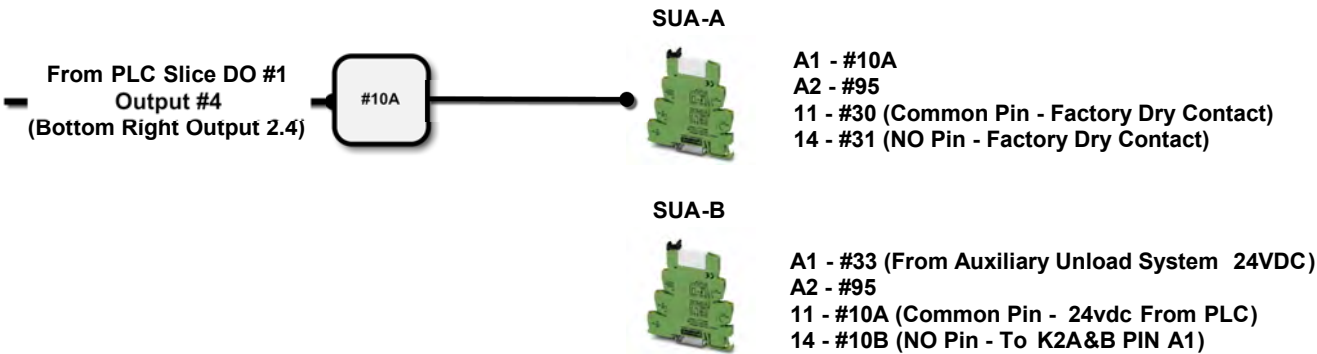
2016 QuadraTouch Pro™ Wiring



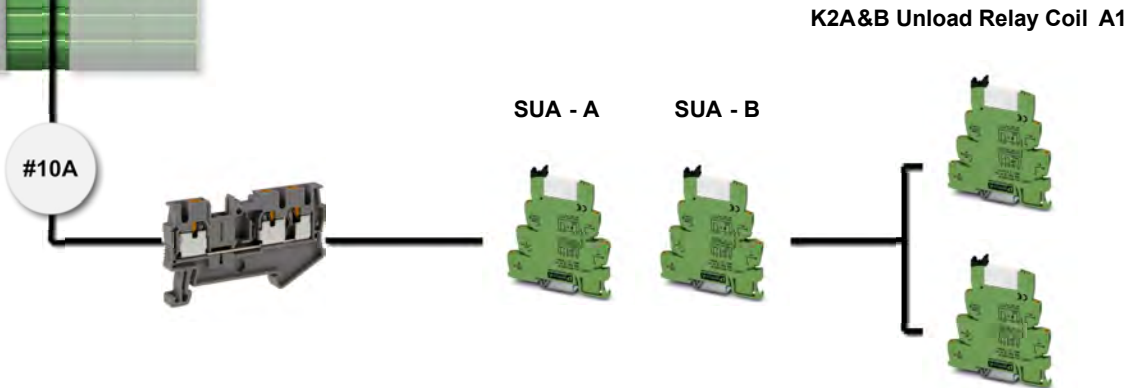
Title: T23476/U23476: QuadraTouch Pro™ Wiring	
Author: SUKUP MFG CO - MRK	
Date: 10/15	Sheet: 101.17
Revision:	

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.

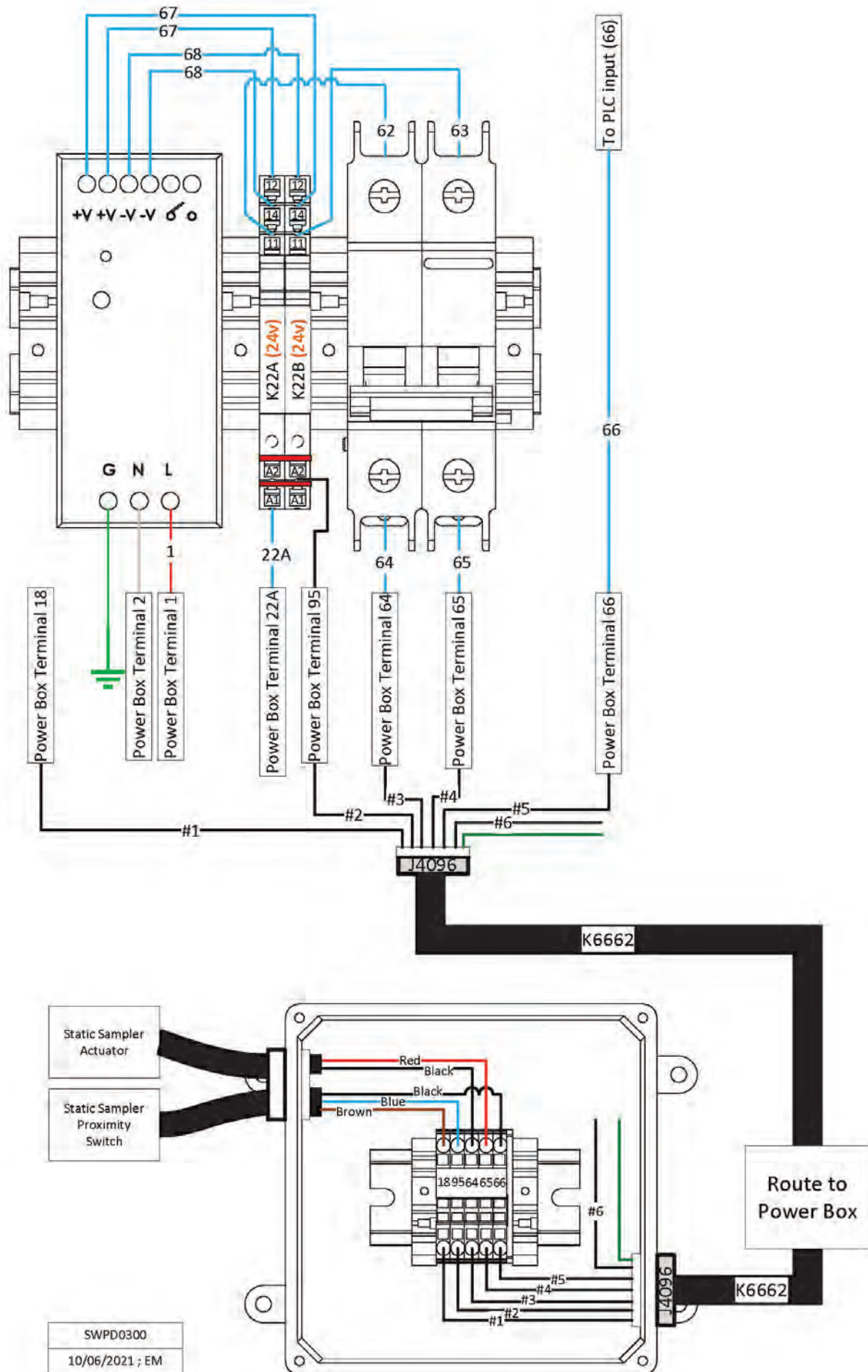


The Output 10A from the PLC energizes the SUA-A, A1 coil. Wire 30 is connected to wire 31 (factory dry contact). This is the "GO" command for the auxiliary unloading system. This system needs to close a contact (wires 32 & 33) when it's ready for the dryer to unload in to the auxiliary unload system. 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.

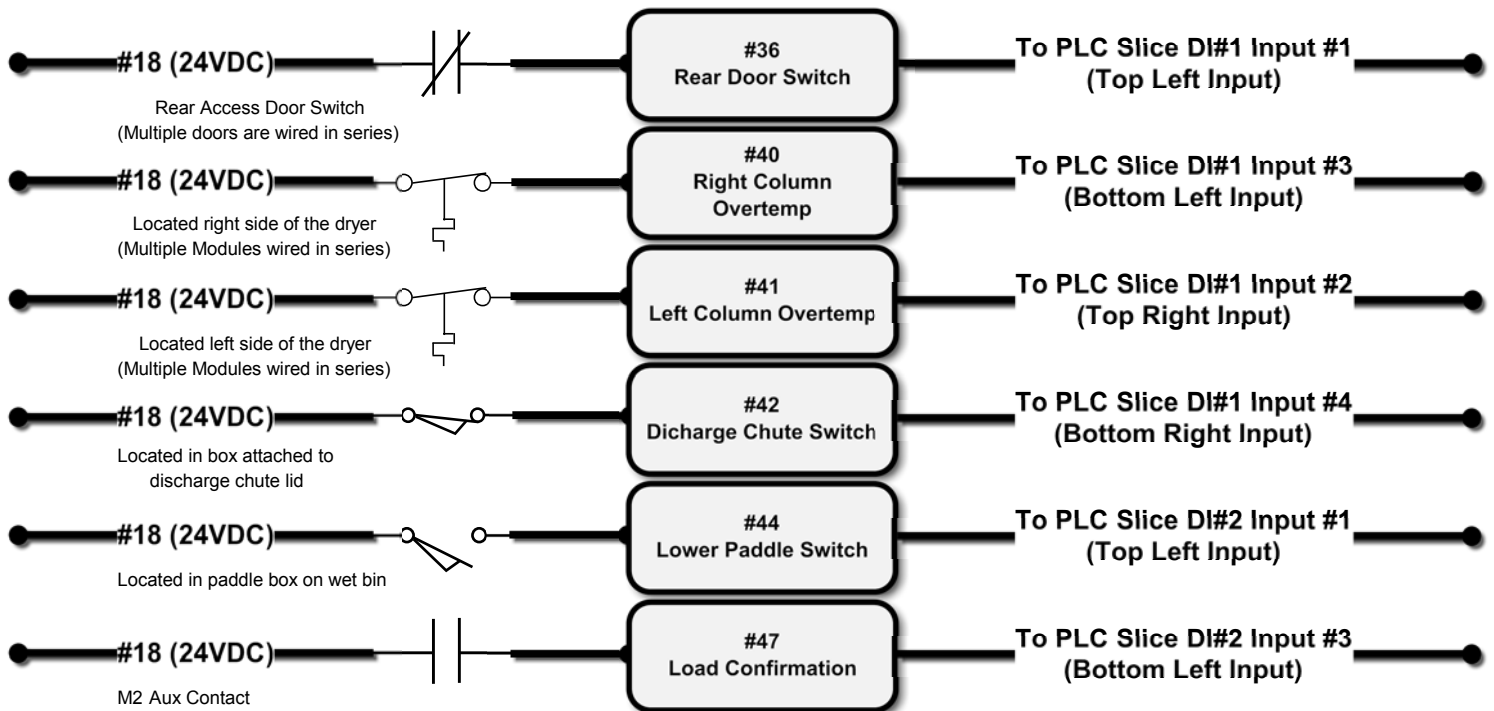


Title: PORTABLE DRYER: SUA Relay Wiring	
Author: SUKUP MFG CO - MRK	
Date: 10/15	Sheet: 101.18
Revision:	

Static Sample Circuit Diagram (MF/Portables)



PLC Digital Inputs 1-6 Fan



Title: PORTABLE DRYER: Digital Input Line Diagram

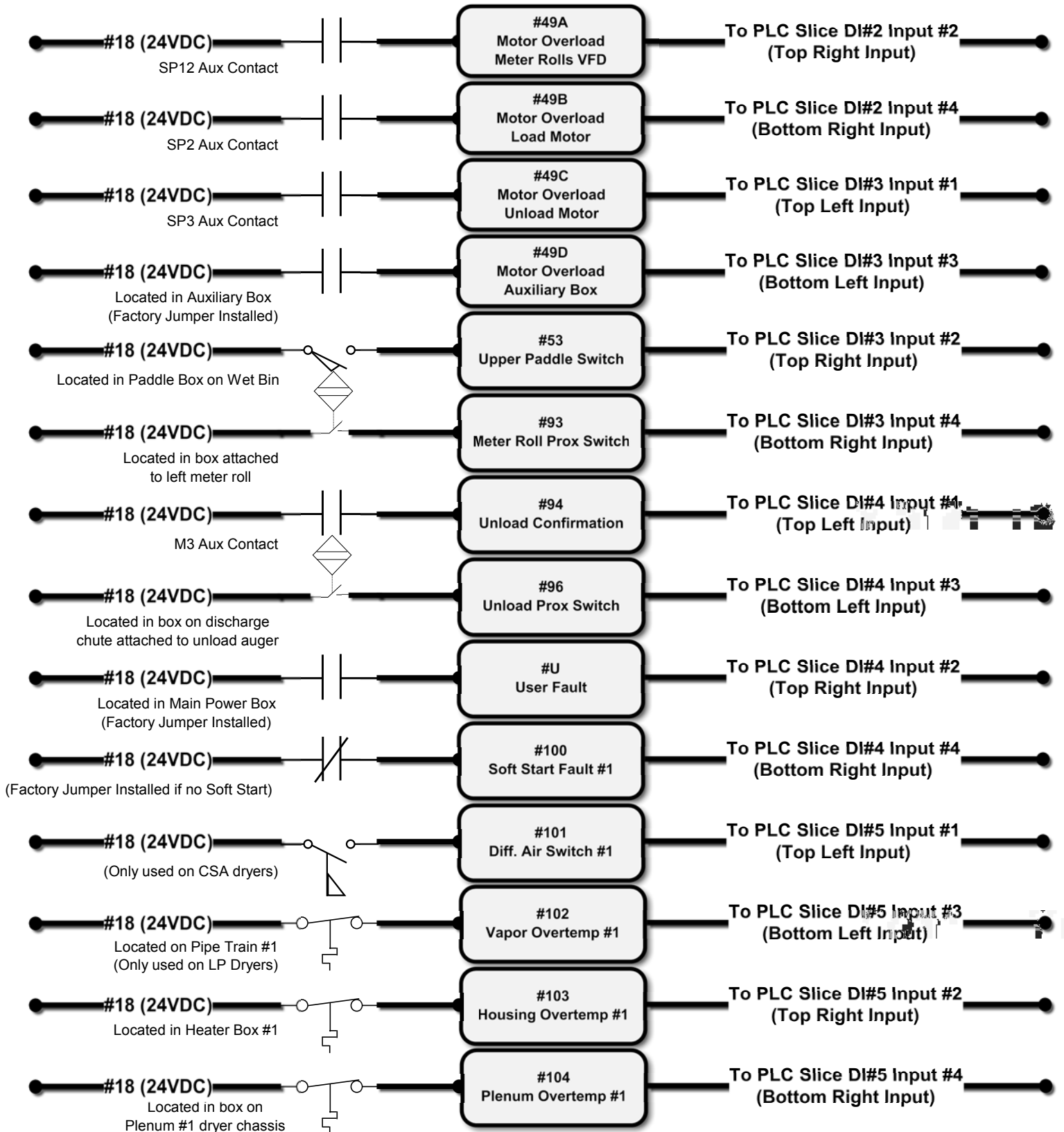
Author: SUKUP MFG CO - MRK

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

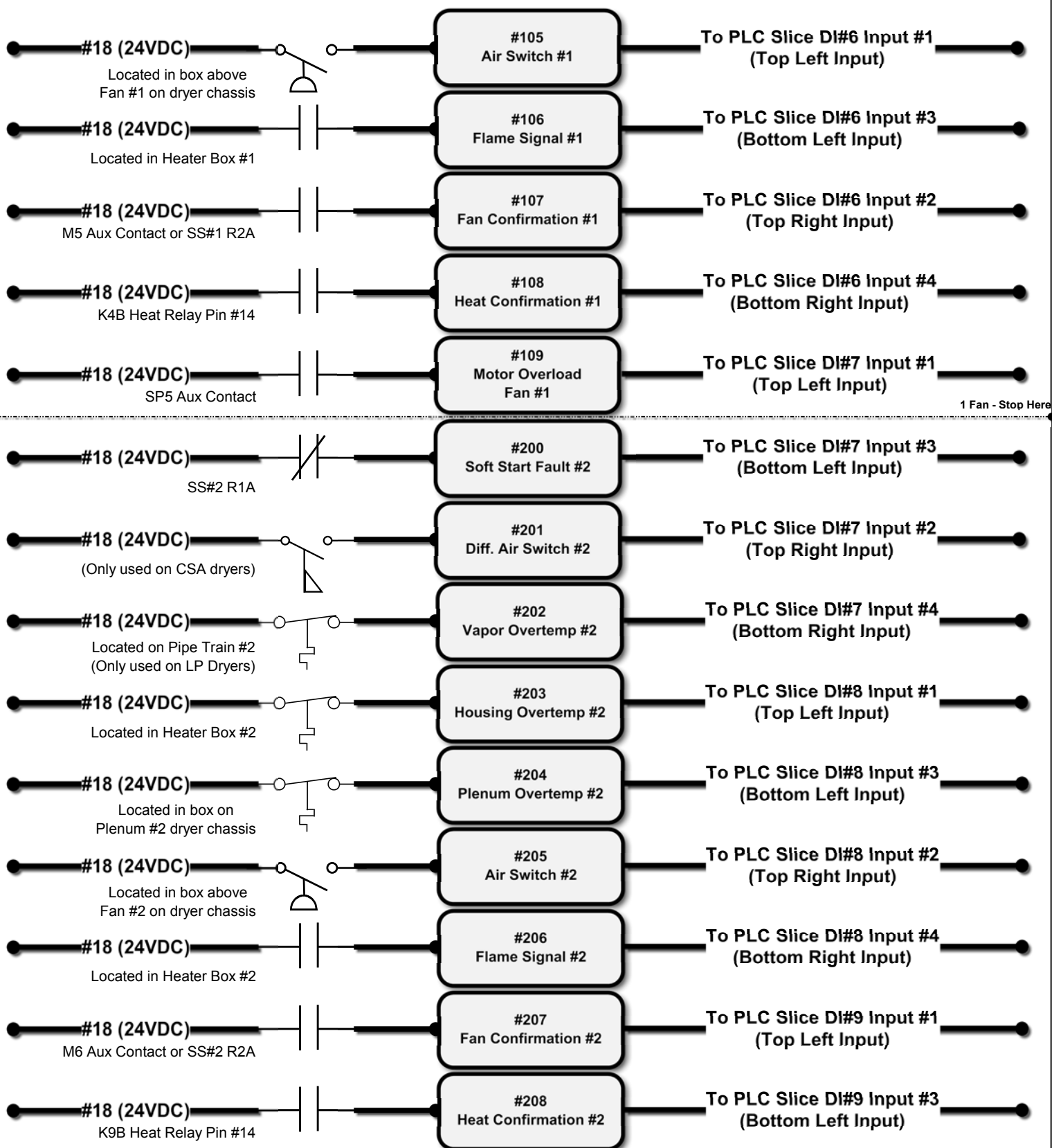
Author: SUKUP MFG CO - MRK

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

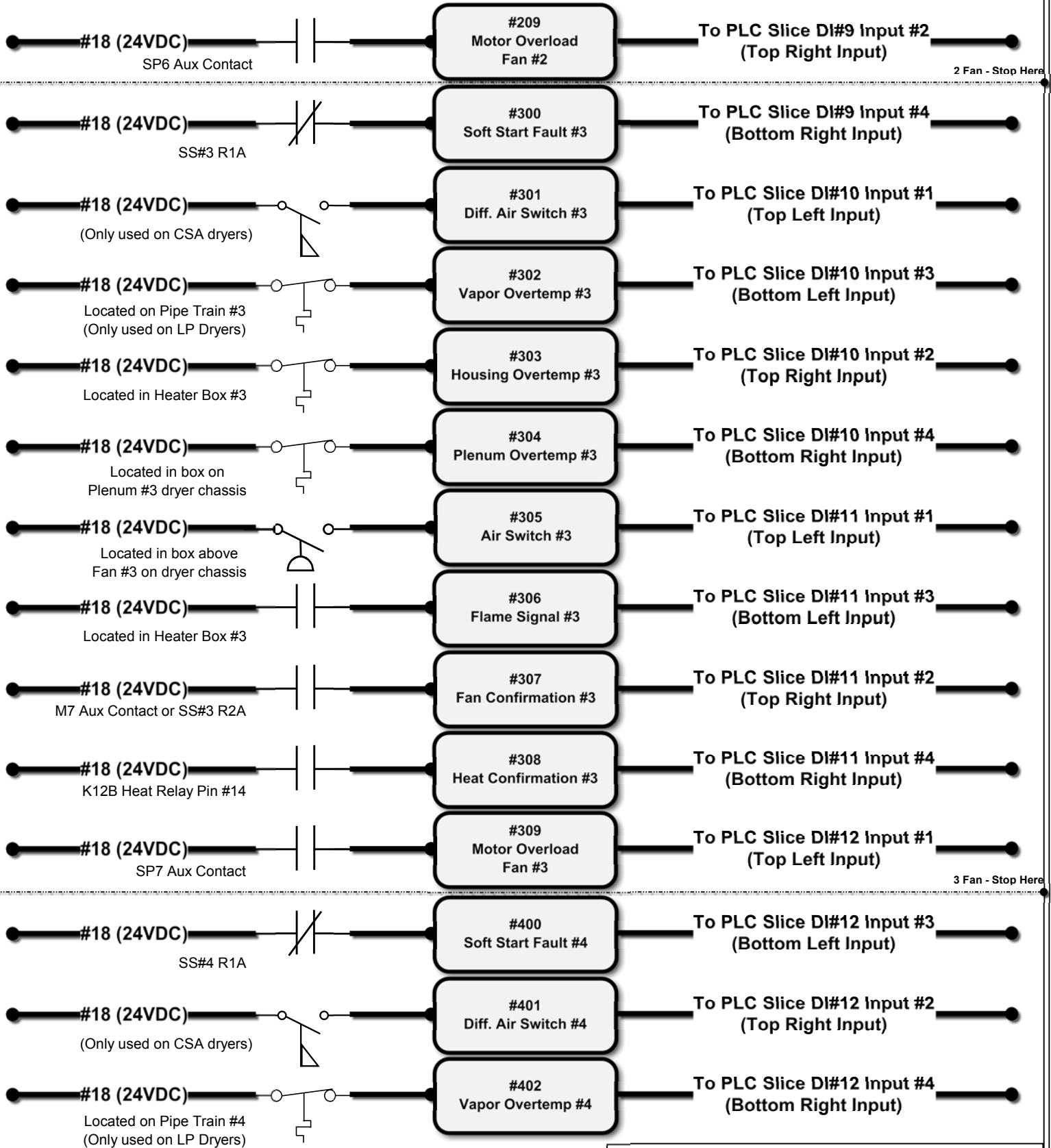
Author: SUKUP MFG CO - MRK

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

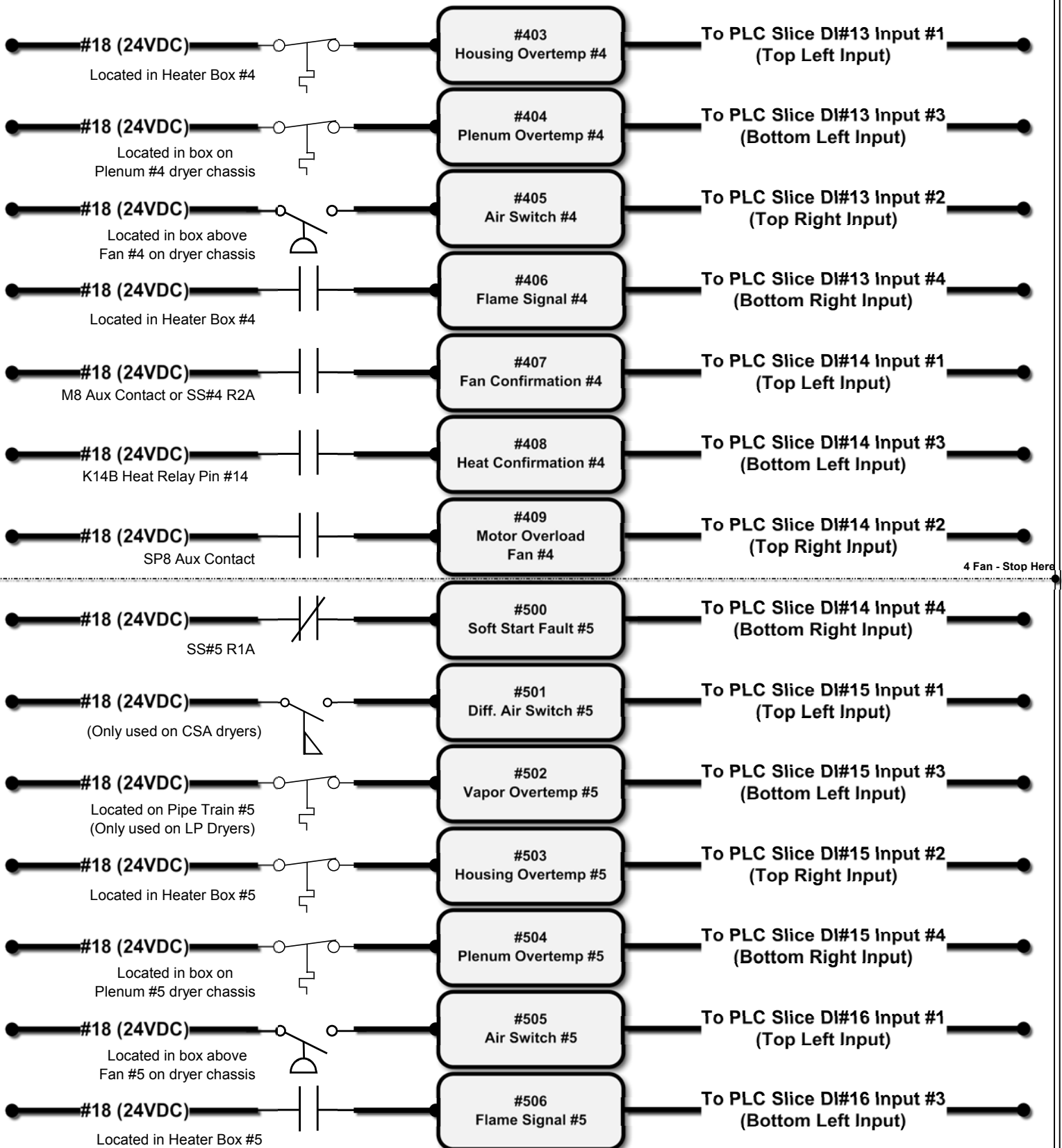
Author: SUKUP MFG CO - MRK

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

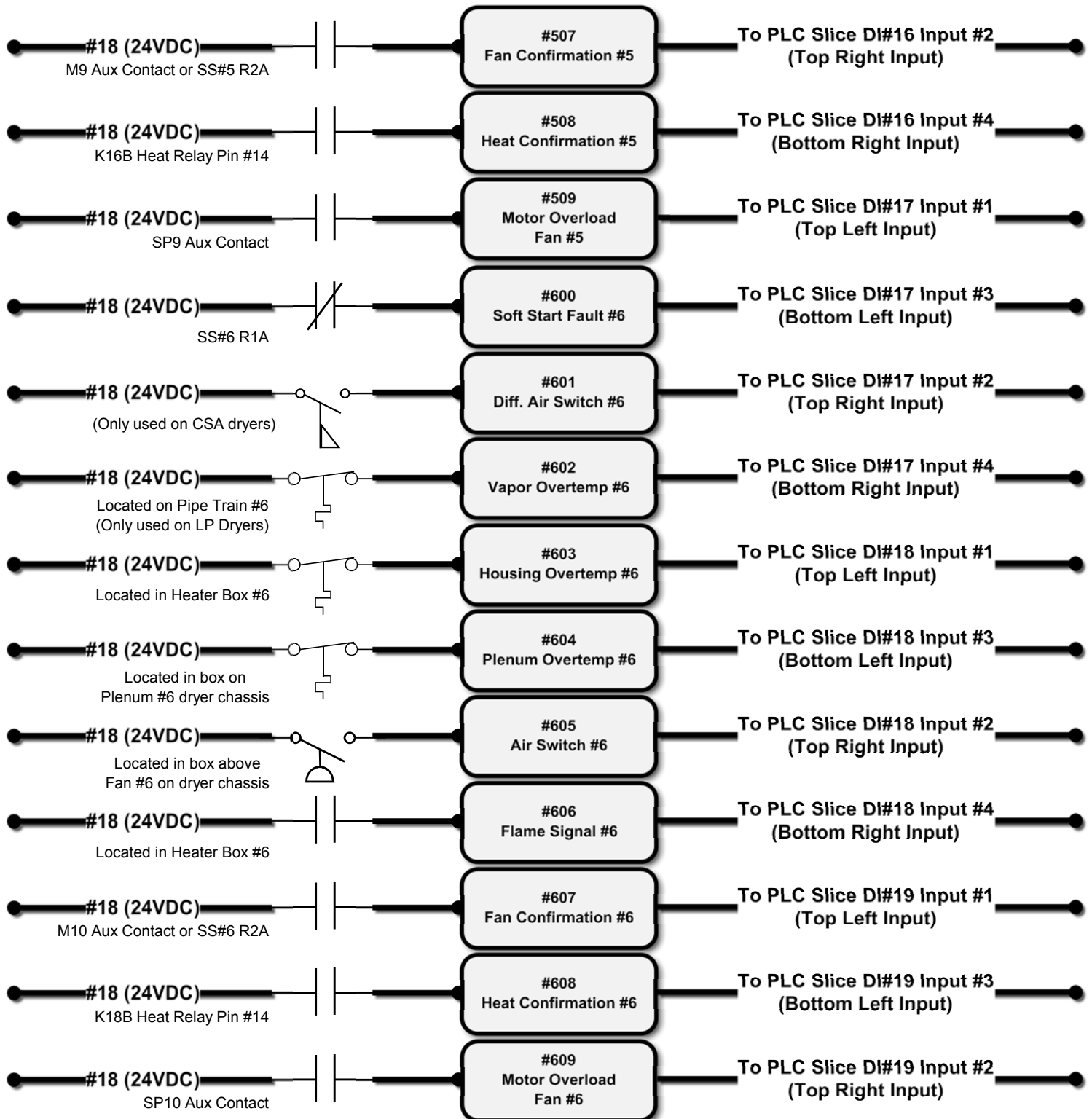
Author: SUKUP MFG CO - MRK

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

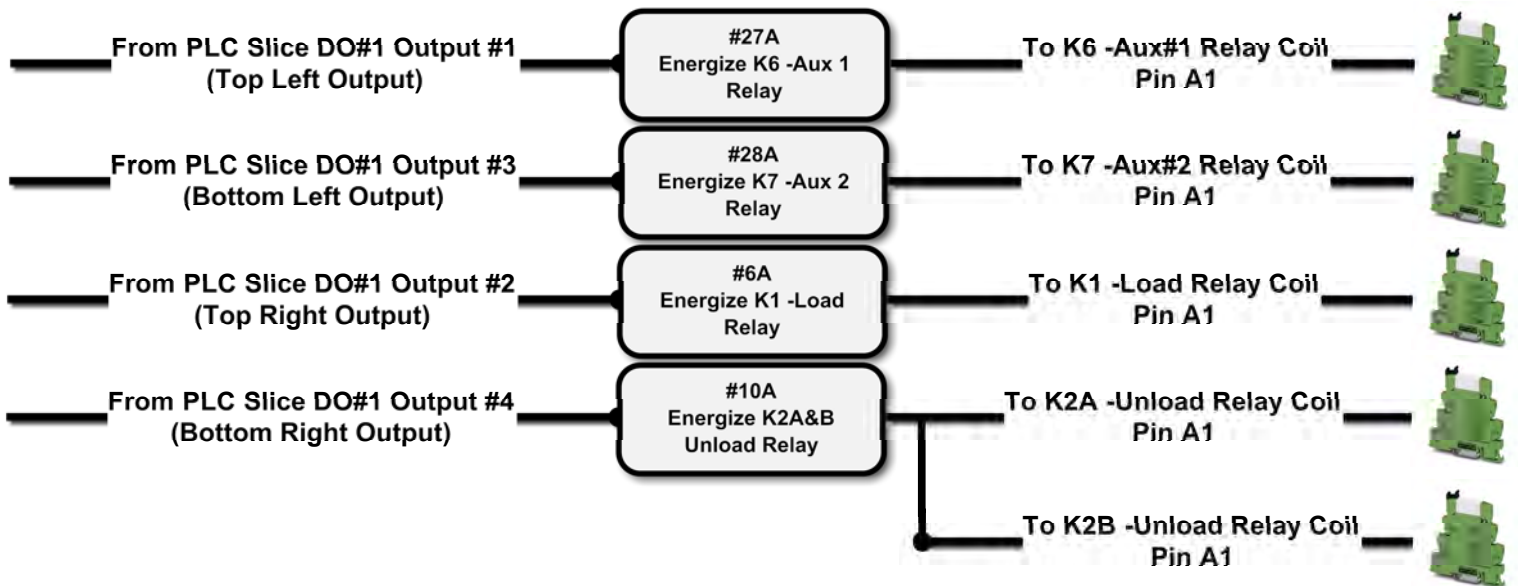
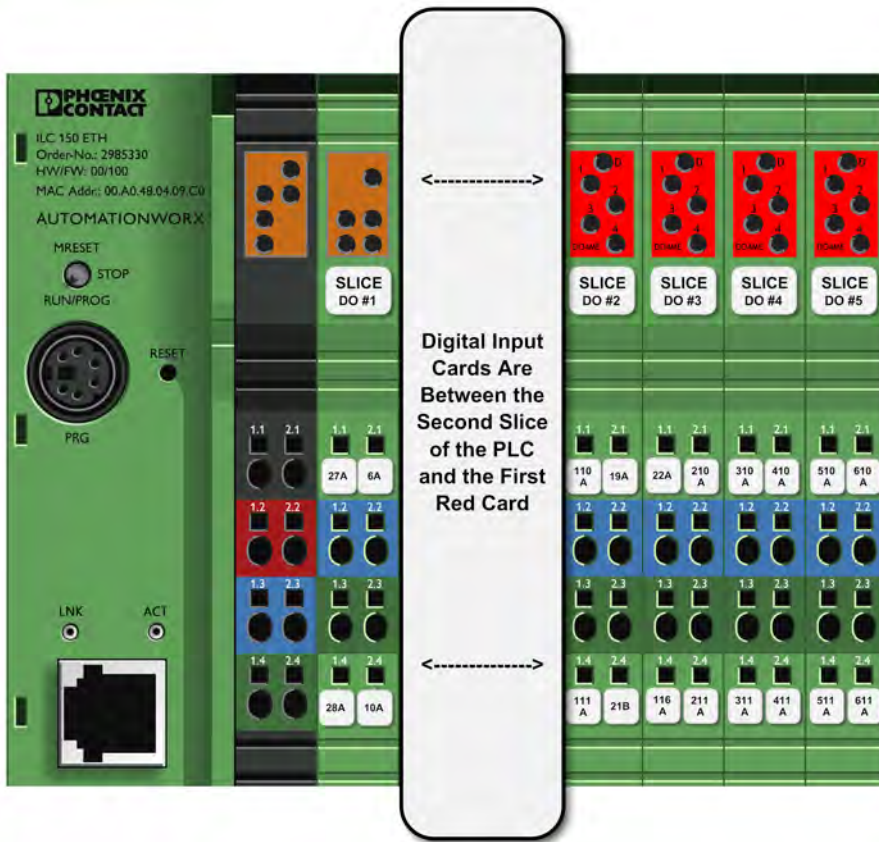
Author: SUKUP MFG CO - MRK

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

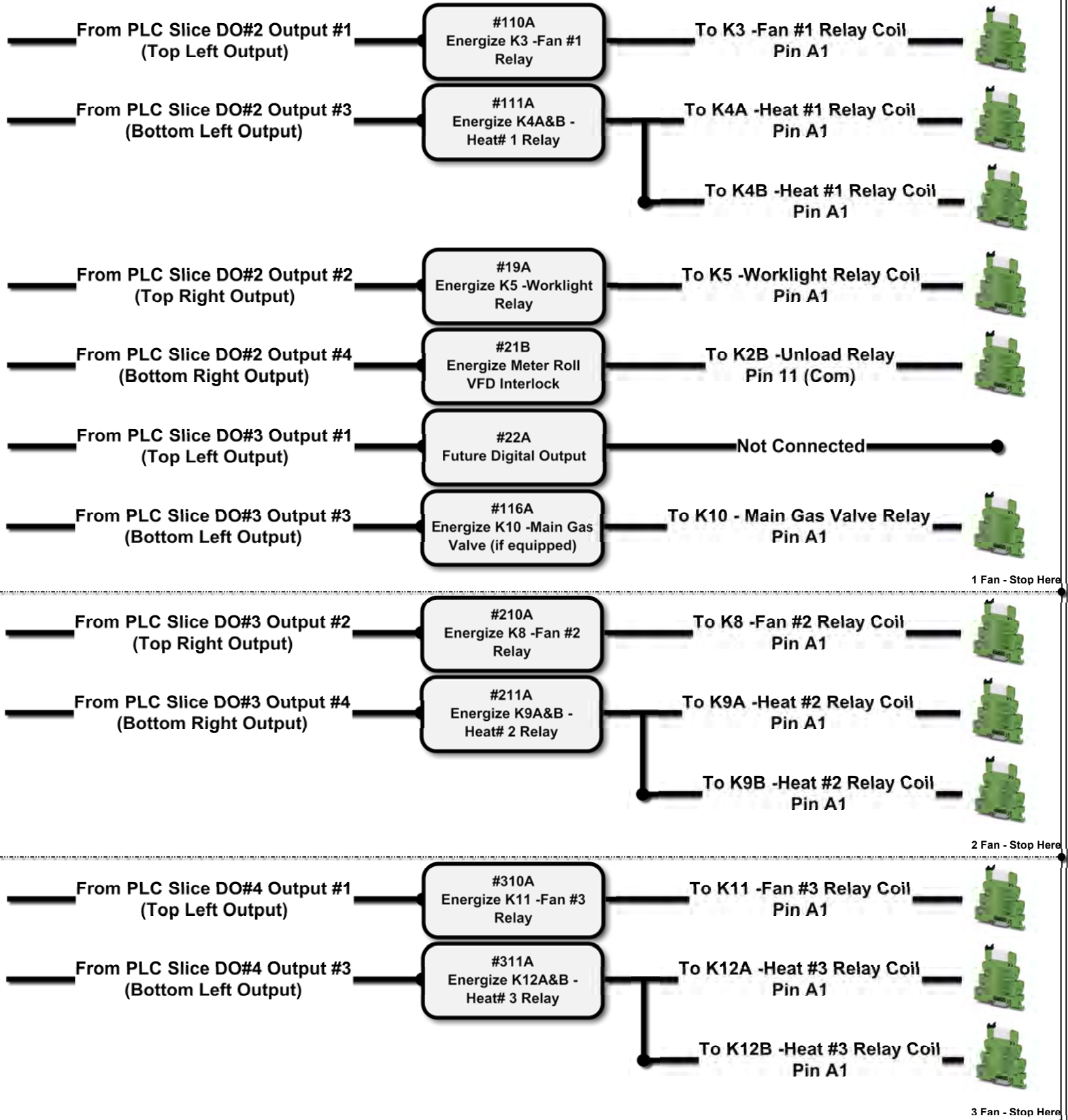
Author: SUKUP MFG CO - MRK

Date: 03/15

Sheet: 103.1

Revision:

PLC Digital Outputs 1-6 Fan



Title: PORTABLE DRYER: Digital Output Line Diagram

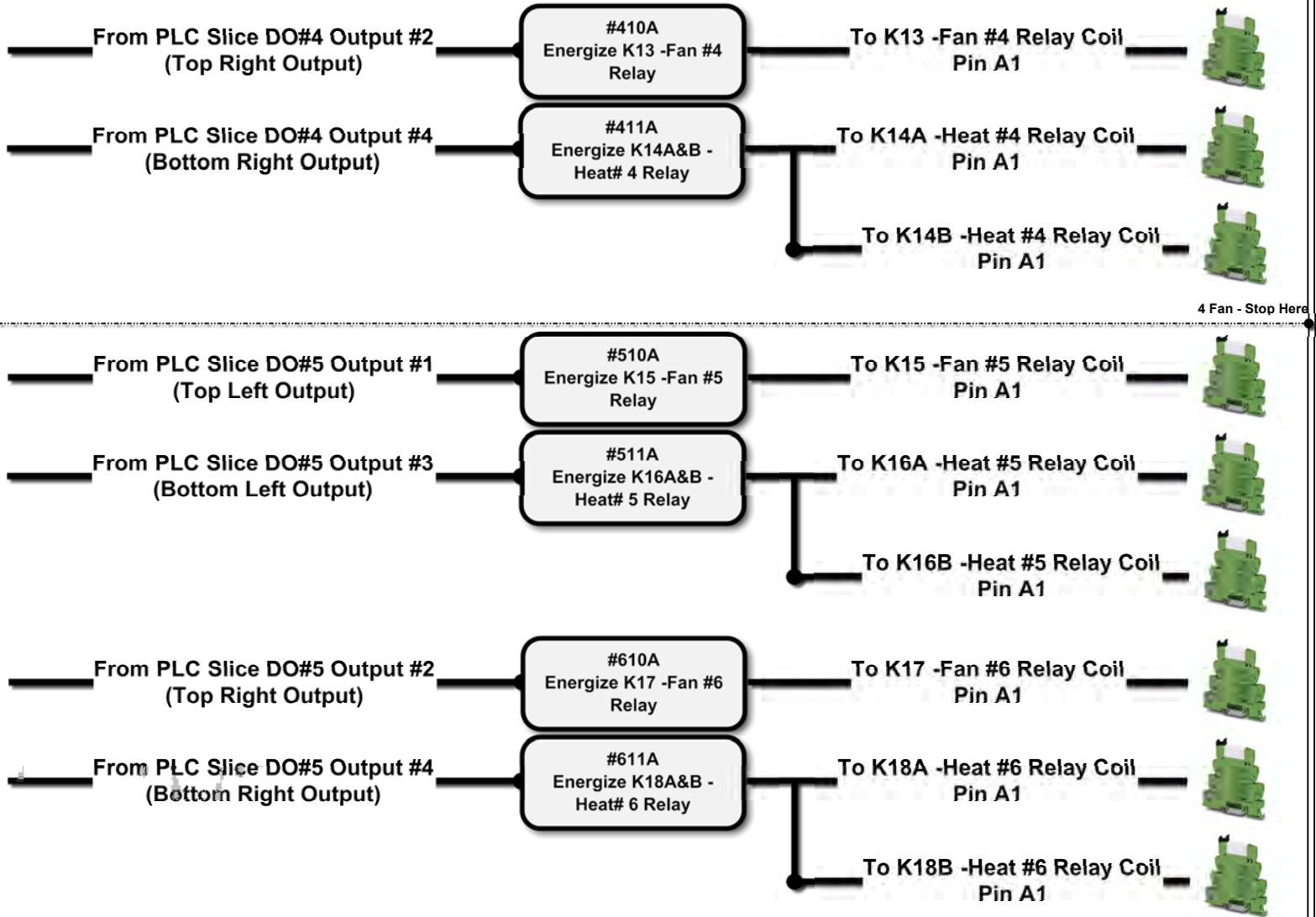
Author: SUKUP MFG CO - MRK

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

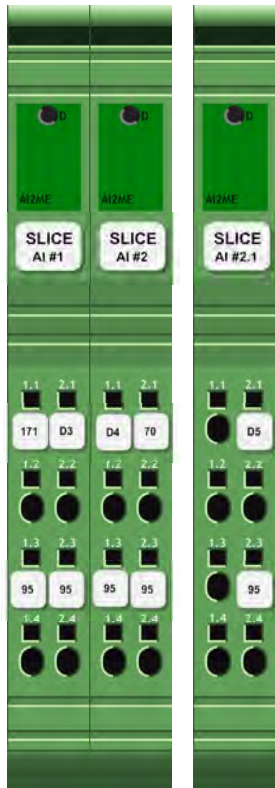
Date: 03/15

Sheet: 103.3

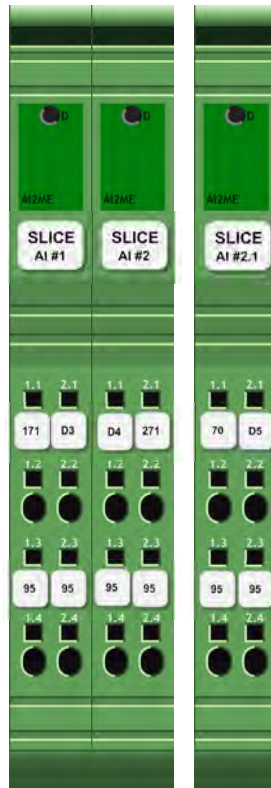
Revision:

PLC Analog Inputs 1-6 Fan

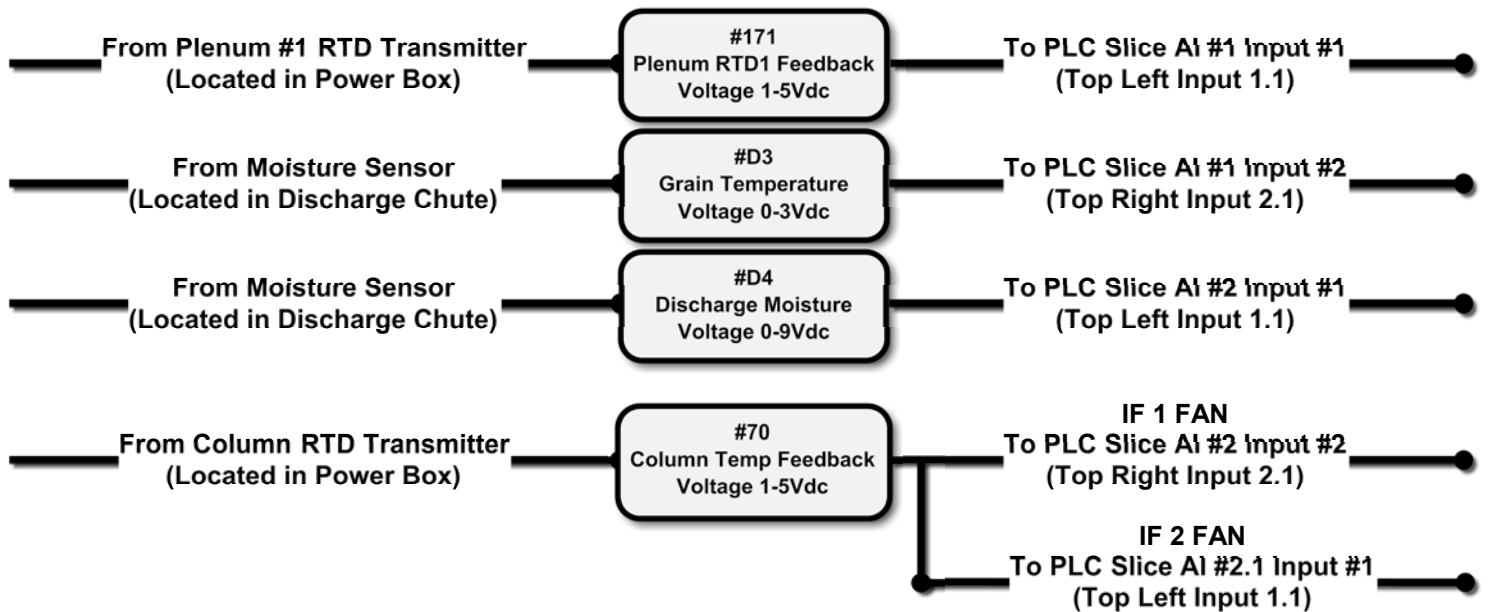
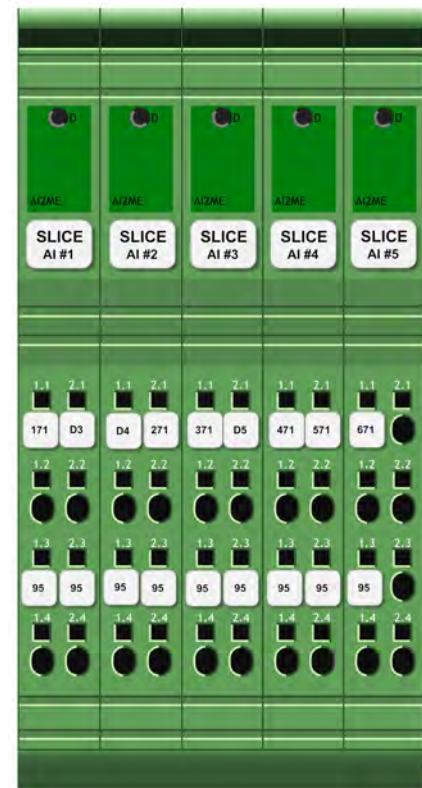
1 Fan



2 Fan



3-6 Fan



1 Fan without 2.1 (Input MST Sensor) - Stop Here

Title: PORTABLE DRYER: Analog Input Line Diagram

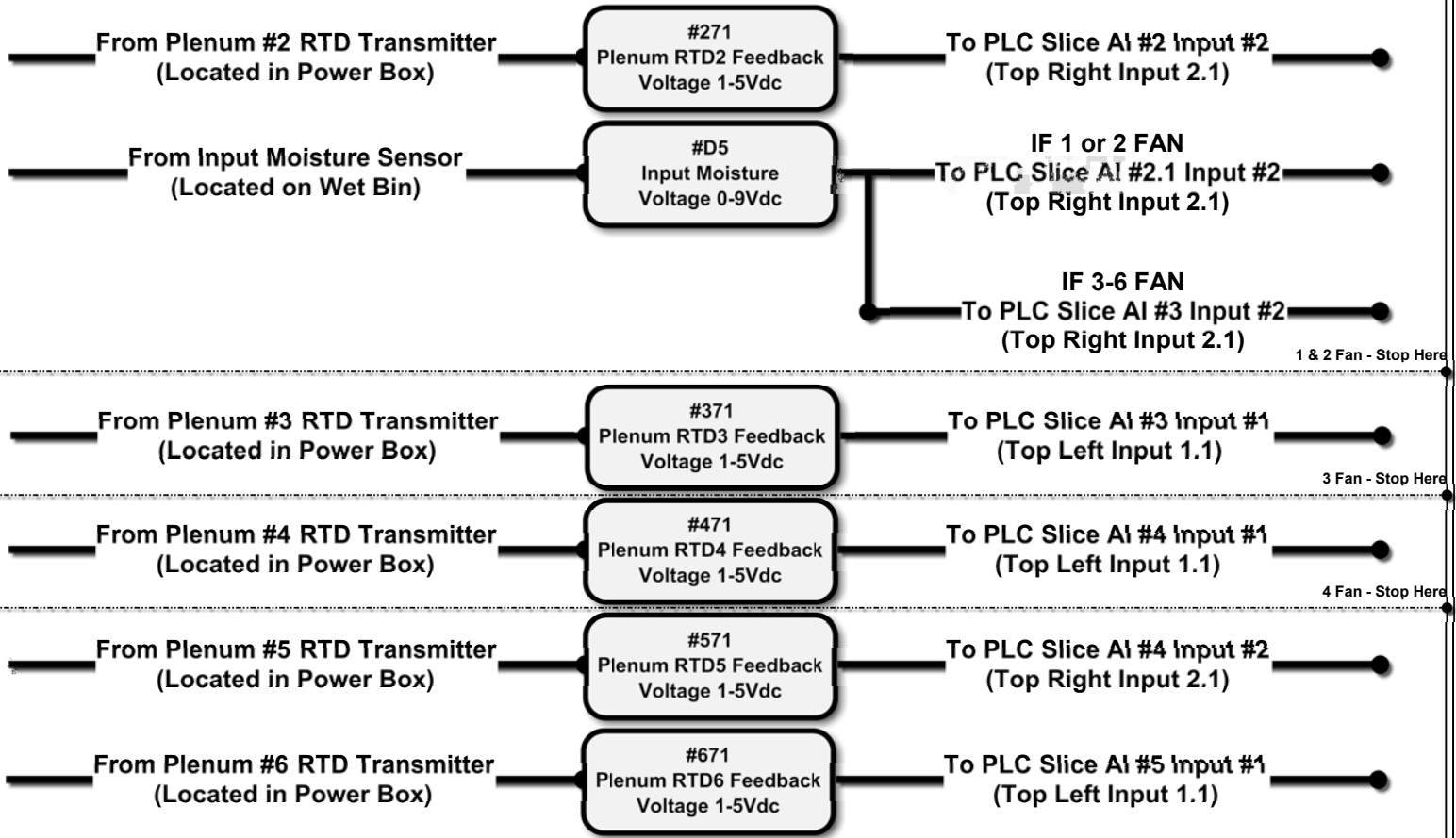
Author: SUKUP MFG CO - MRK

Date: 03/15

Sheet: 104.1

Revision:

PLC Analog Inputs 1-6 Fan



Title: PORTABLE DRYER: Analog Input Line Diagram

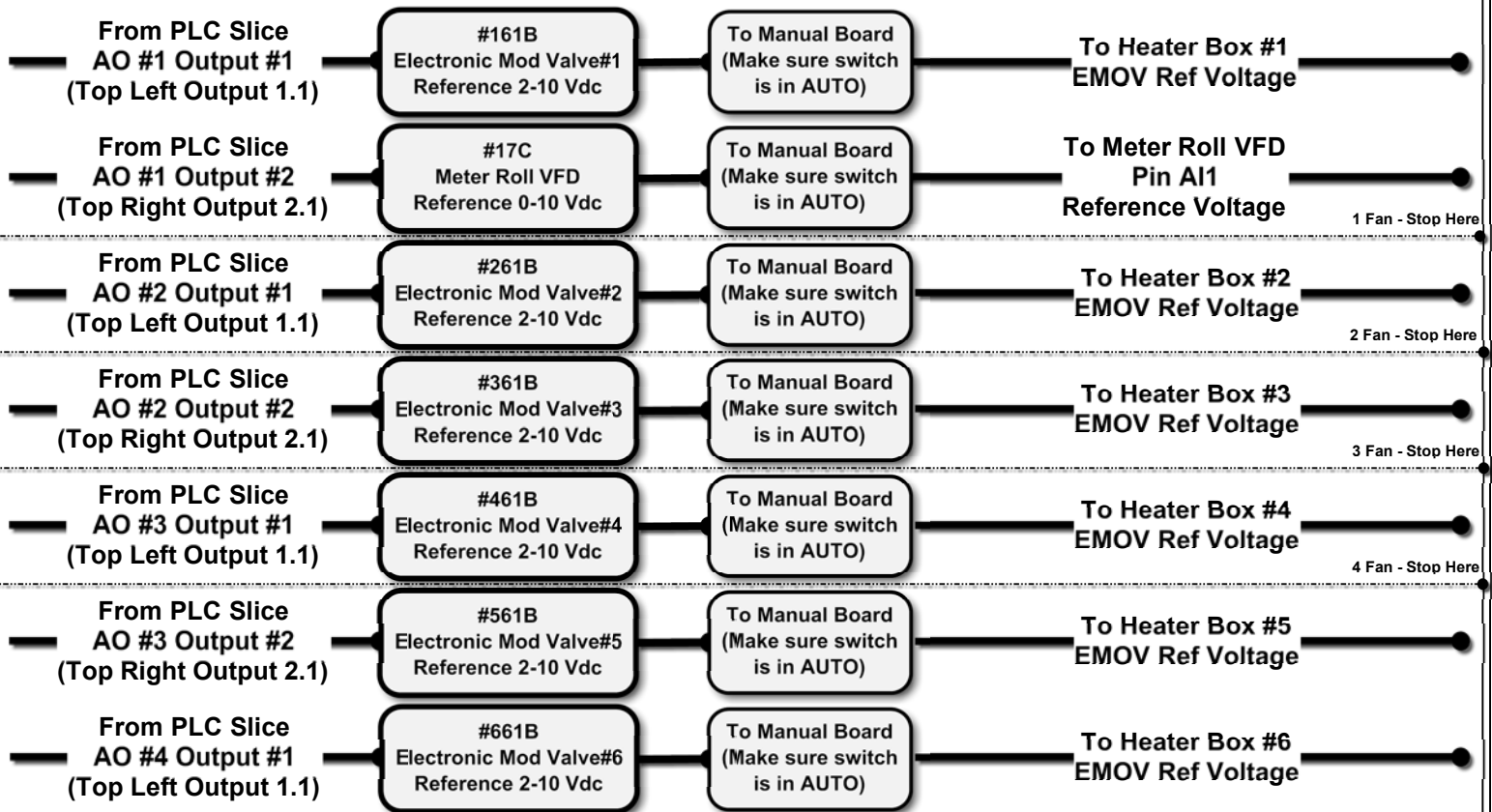
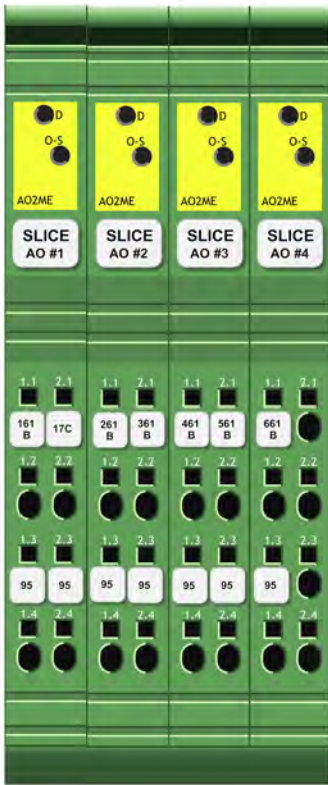
Author: SUKUP MFG CO - MRK

Date: 03/15

Sheet: 104.2

Revision:

PLC Analog Outputs 1-6 Fan



Title: PORTABLE DRYER: Analog Input Line Diagram

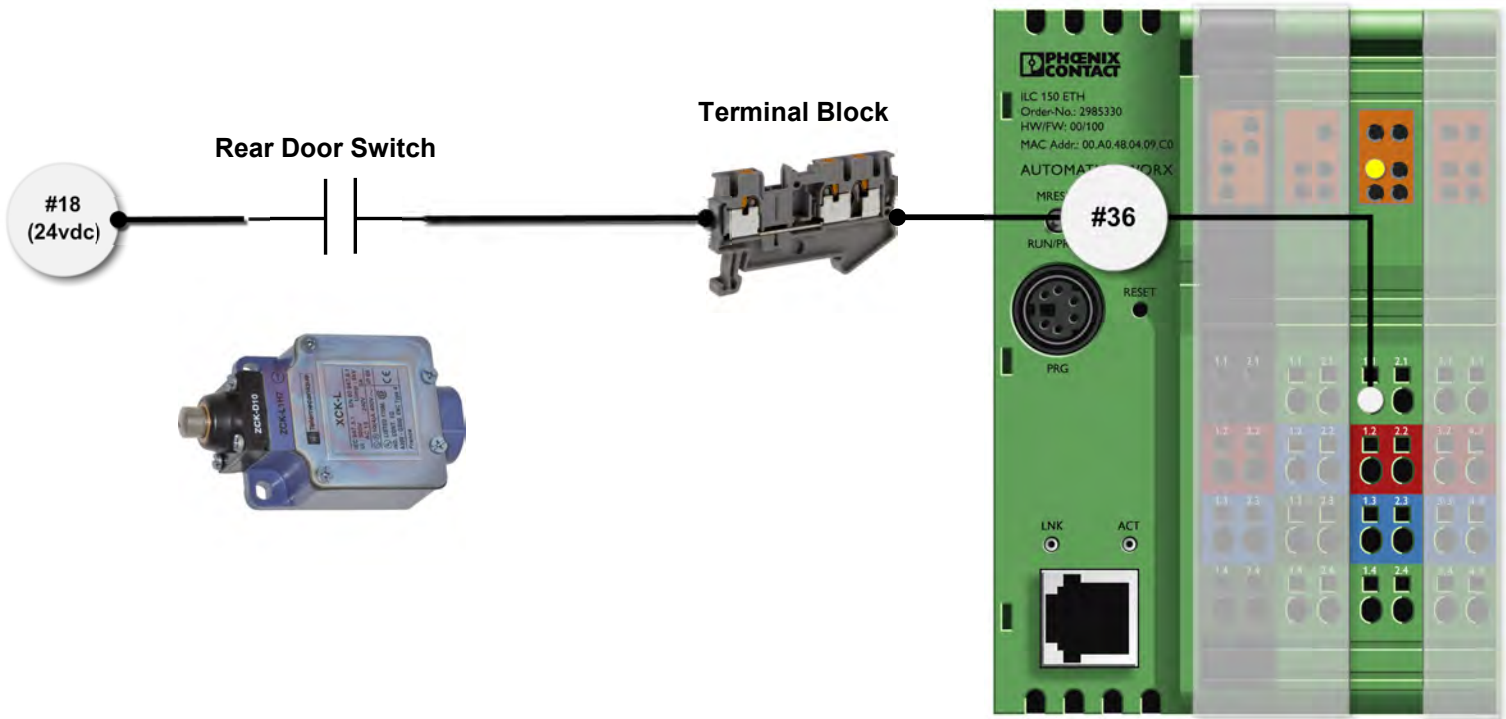
Author: SUKUP MFG CO - MRK

Date: 03/15

Sheet: 105.1

Revision:

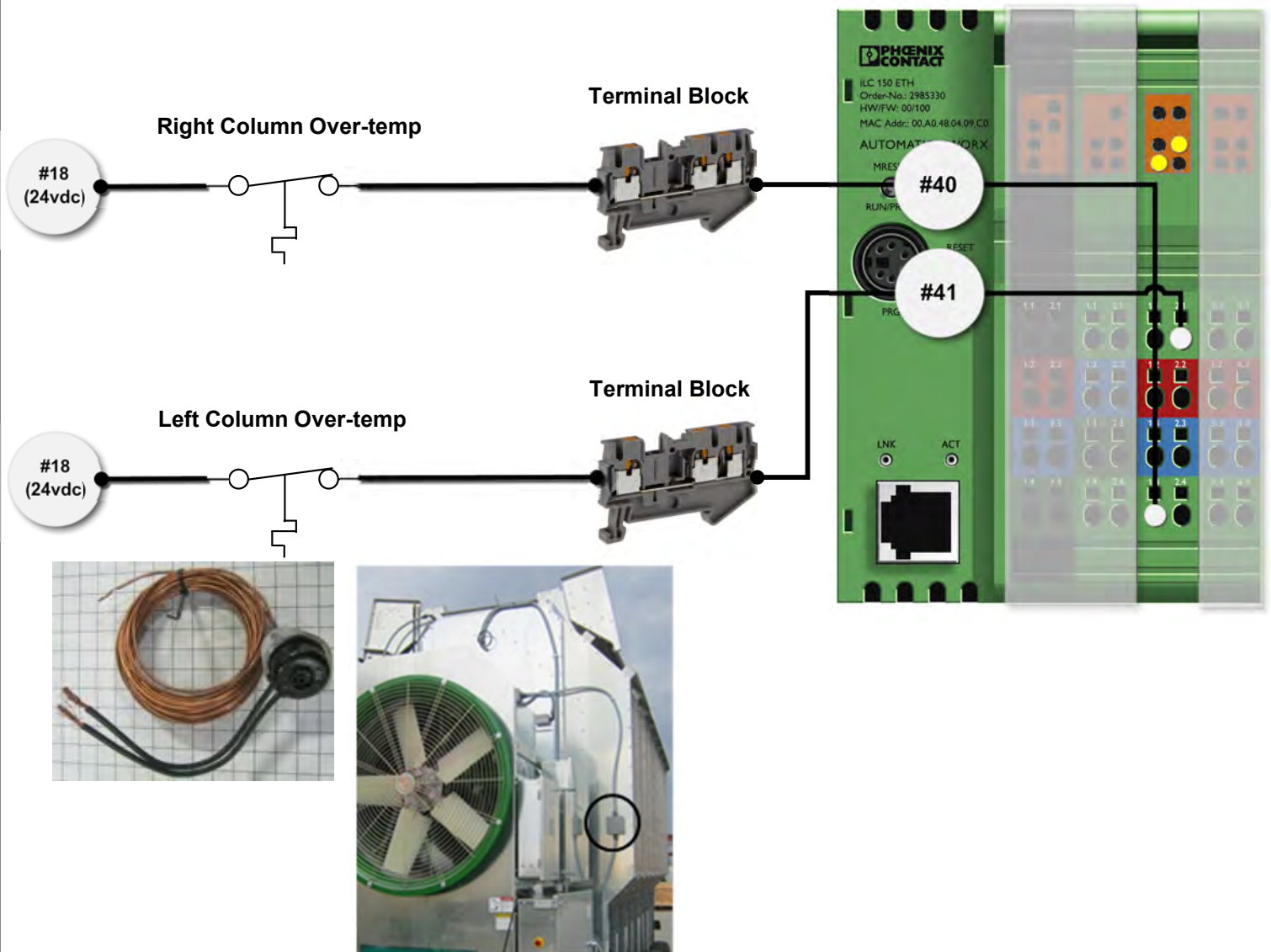
Rear Door Circuit #36



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

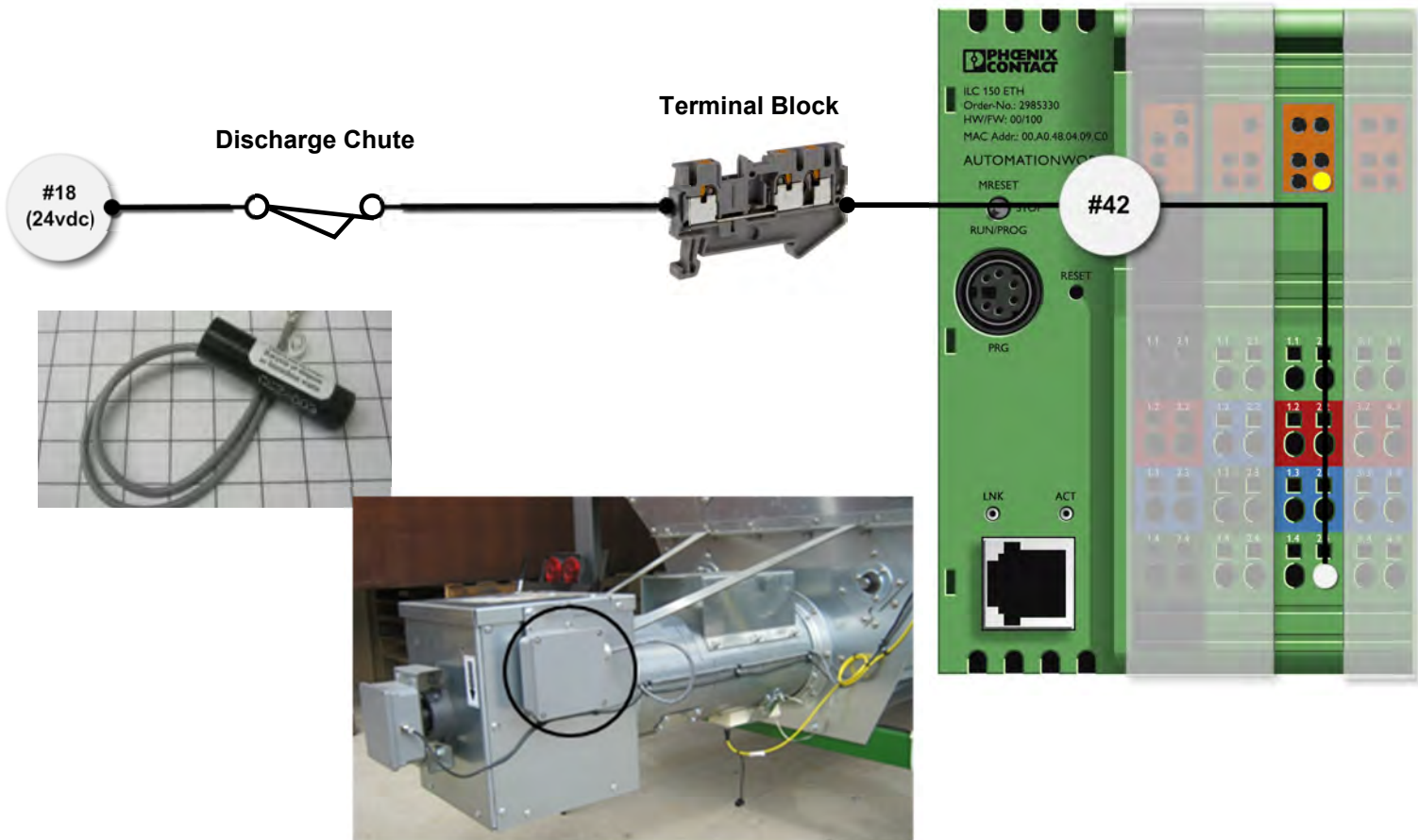
Column High-Limit Circuits #40 and #41



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

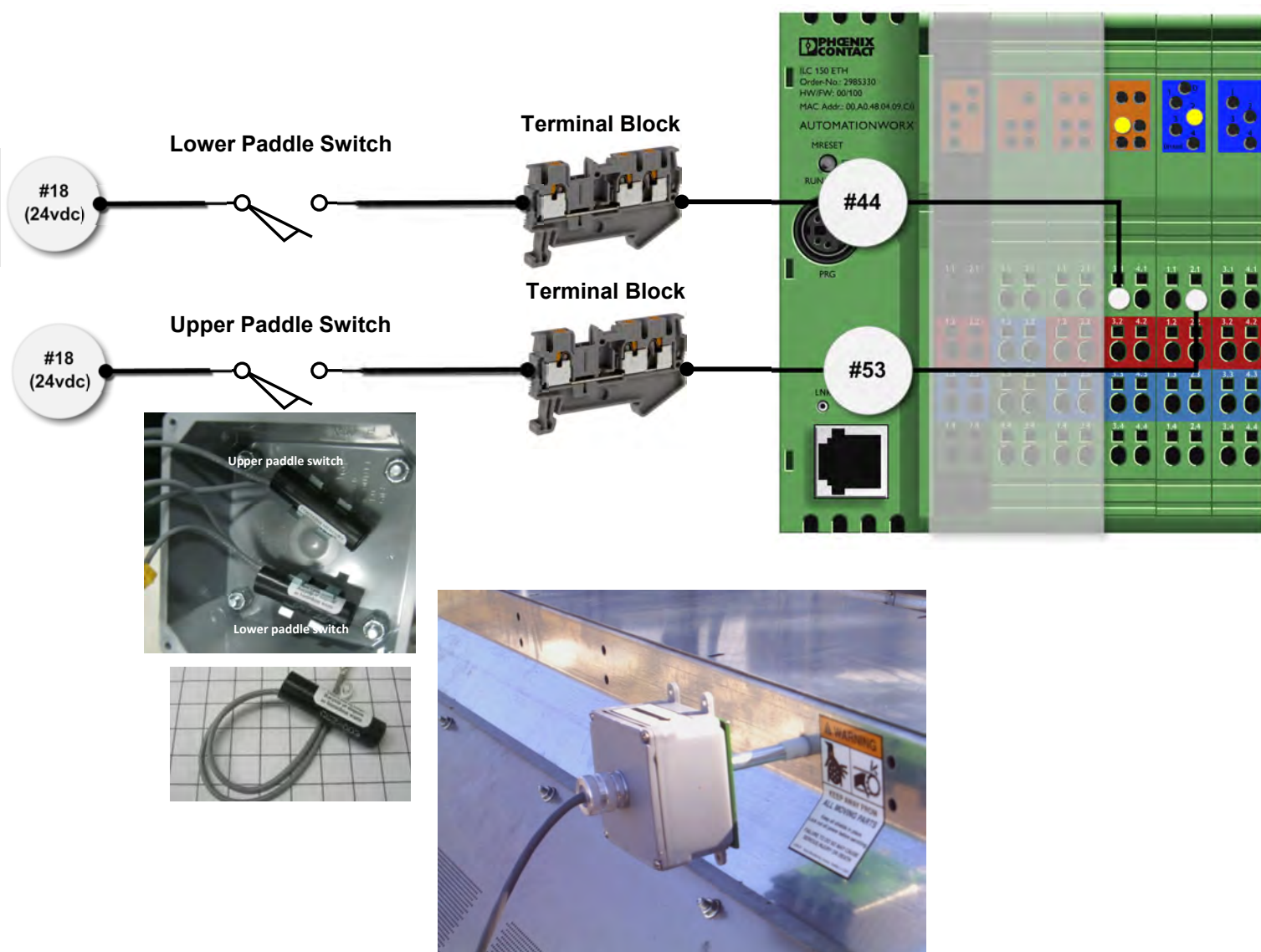
Rear Discharge Chute #42



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

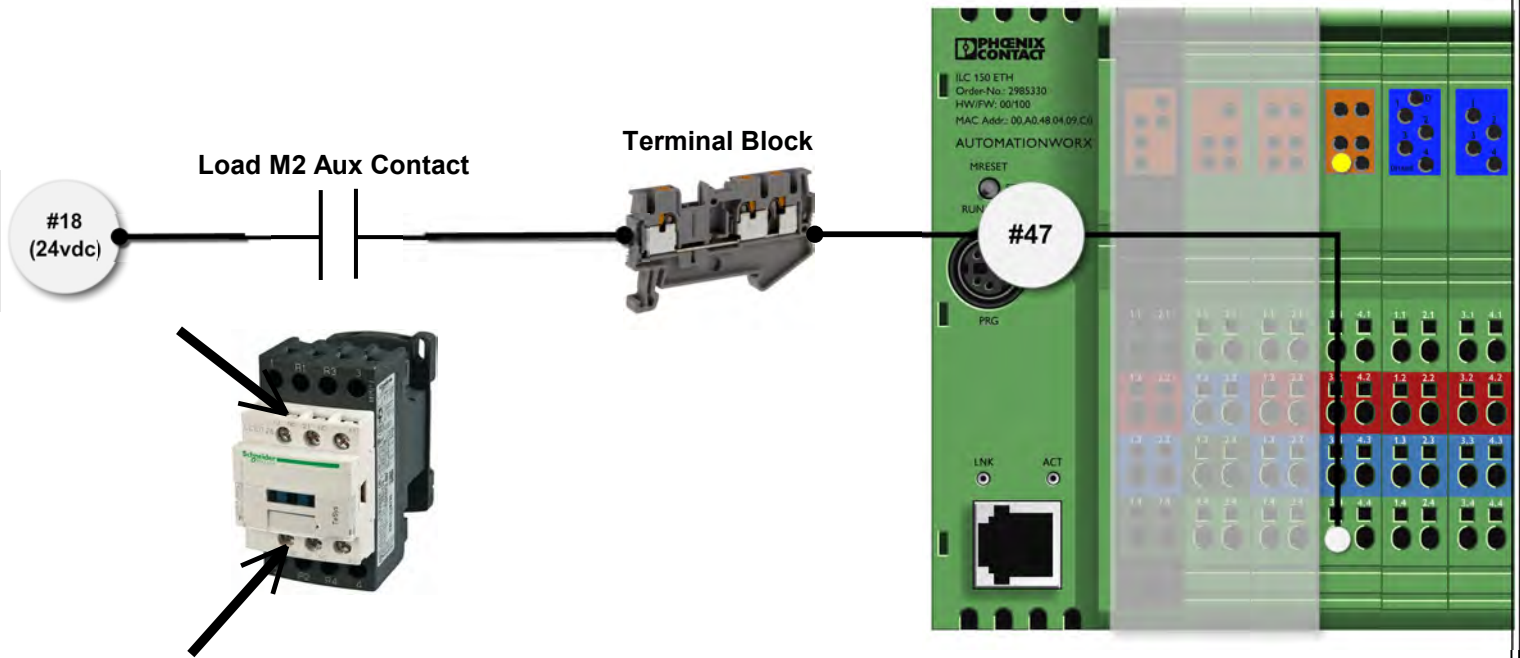
Author: SUKUP MFG CO - MRK

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

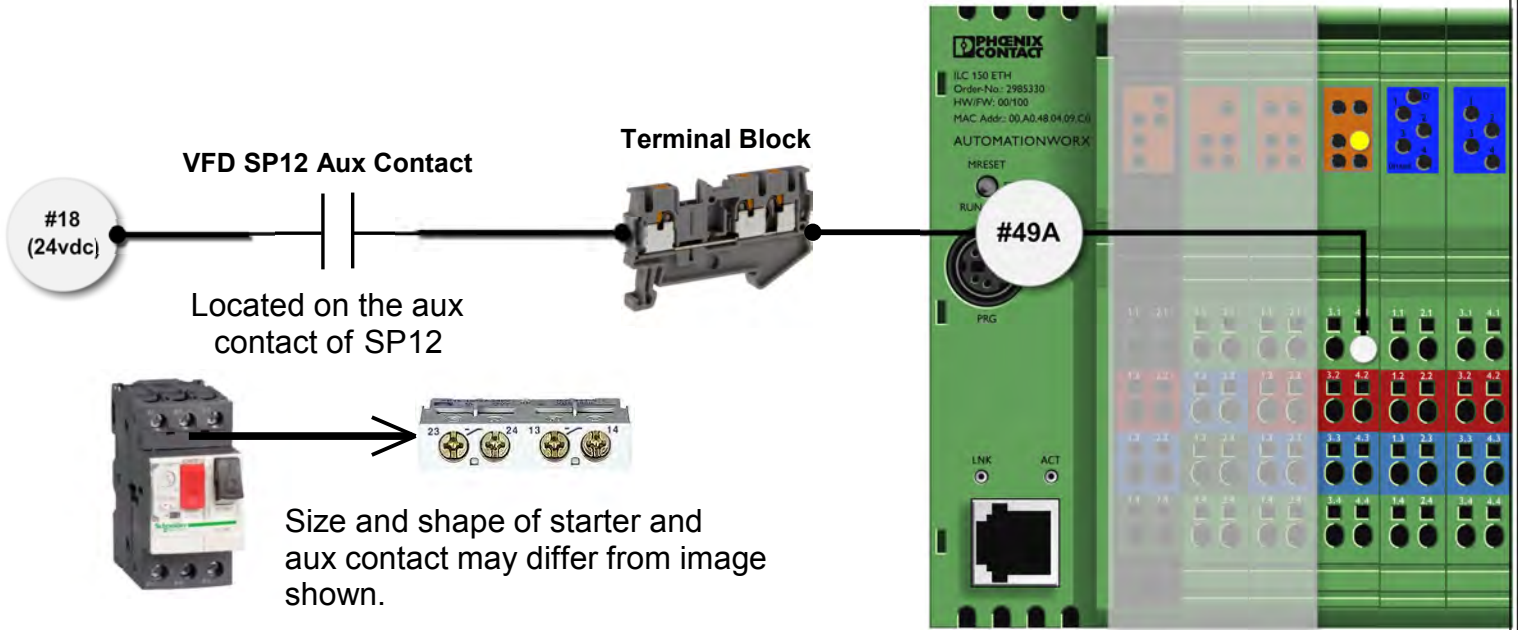
Author: SUKUP MFG CO - MRK

Date: 03/15

Revision: 6/7/2017 - DWS (1)

106.5

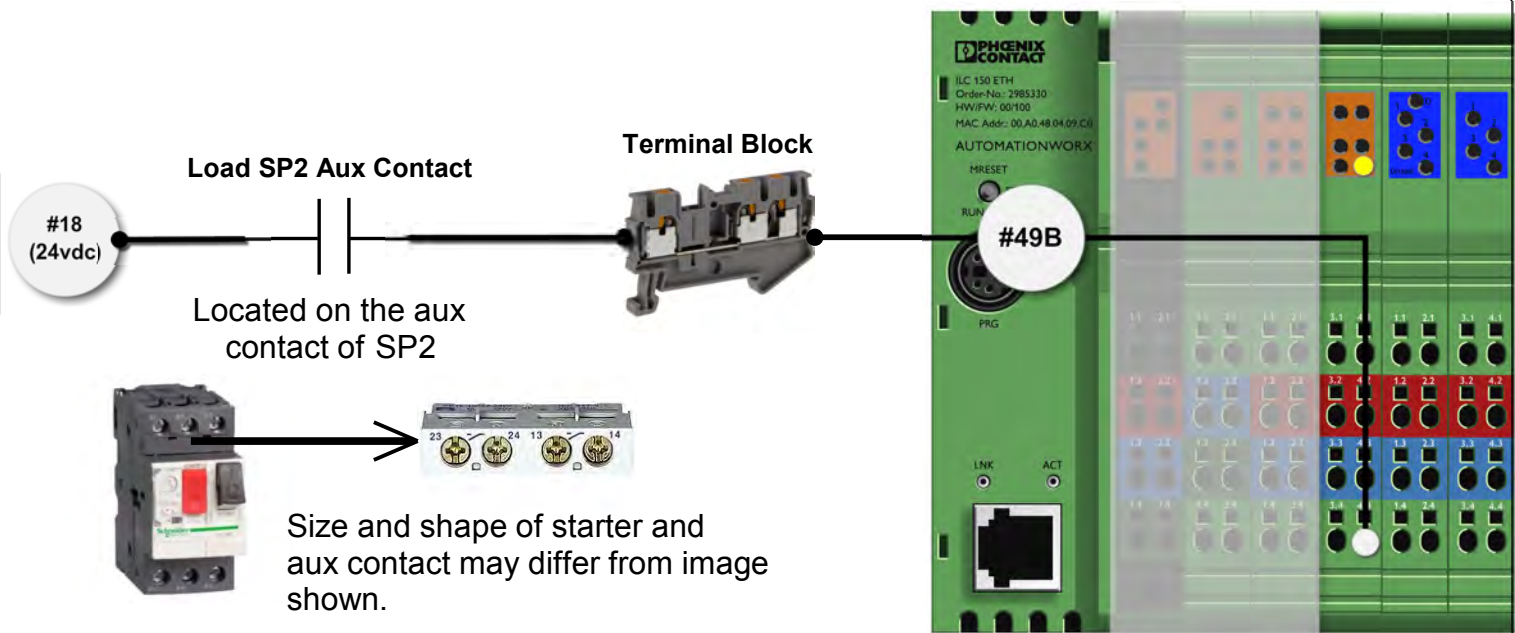
Motor Overload VFD #49A



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

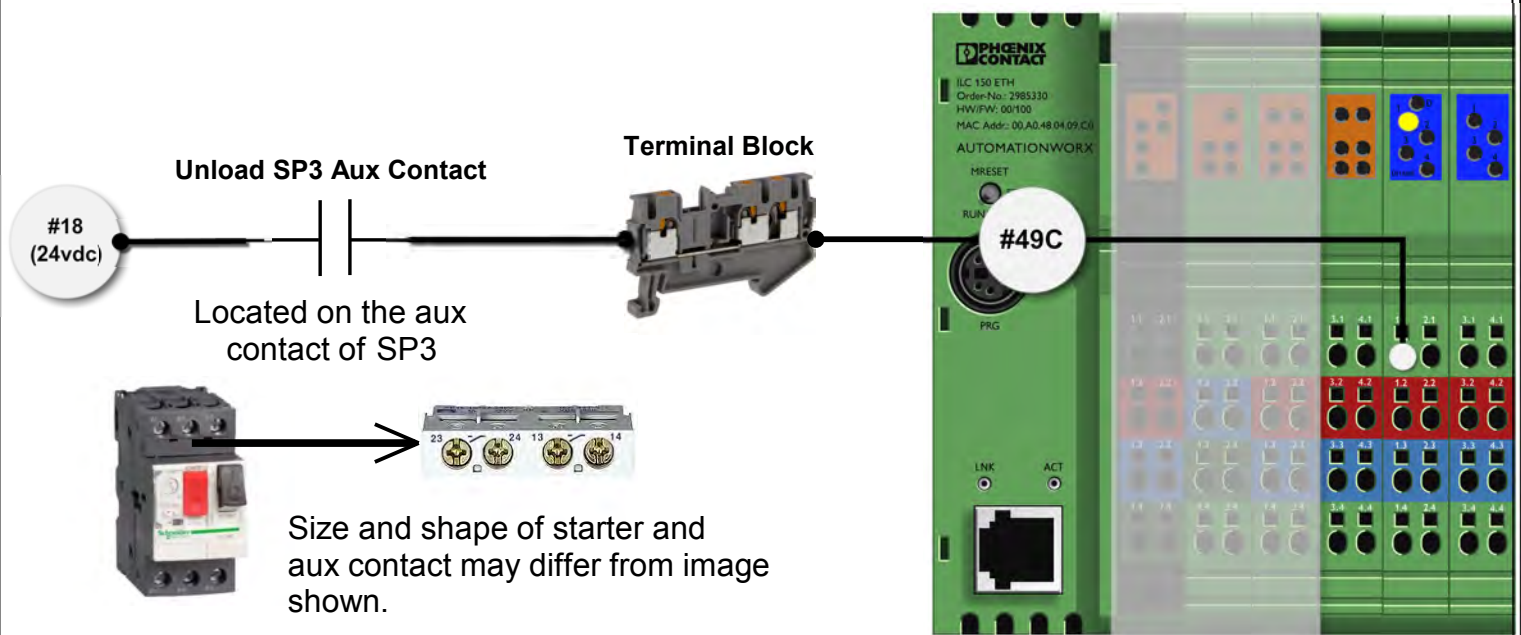
Motor Overload Load #49B



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

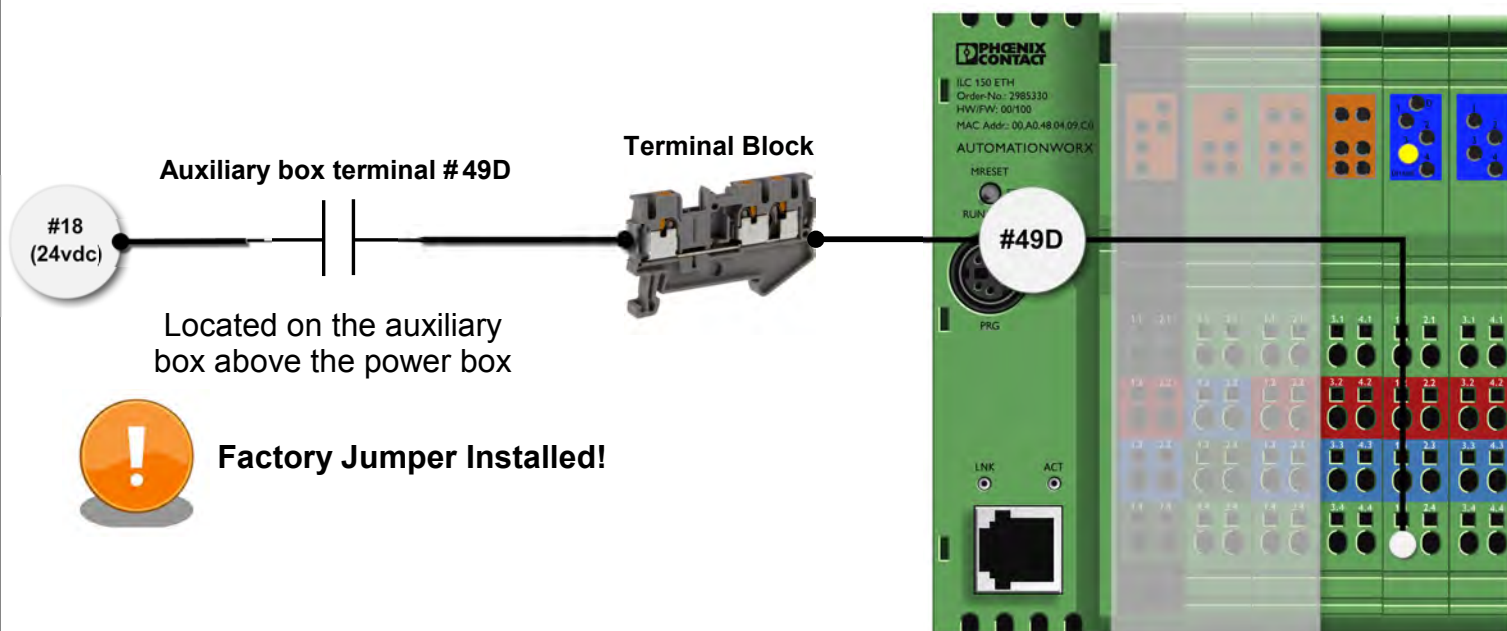
Motor Overload Unload #49C



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

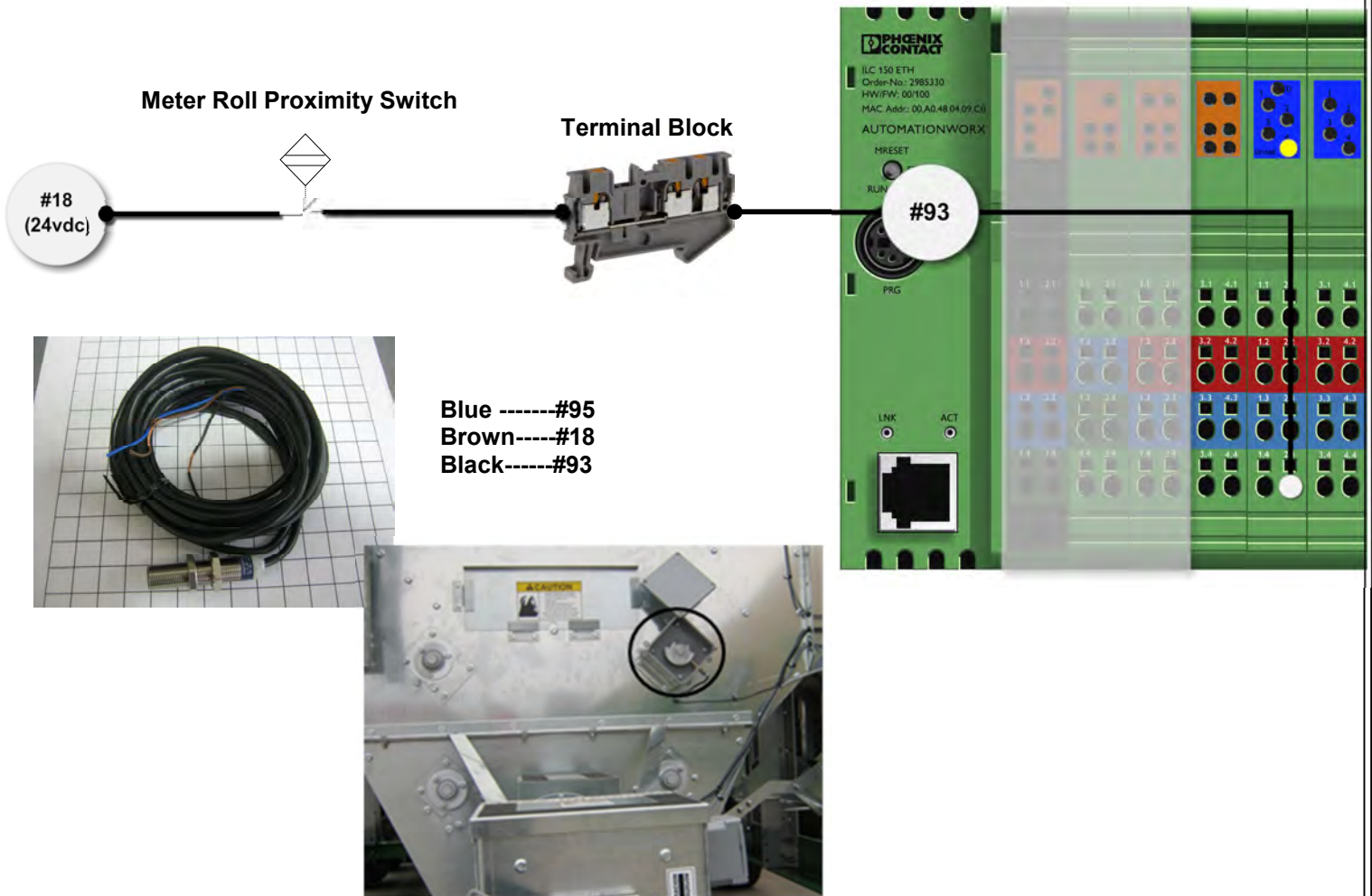
Motor Overload Auxiliary Box #49D



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

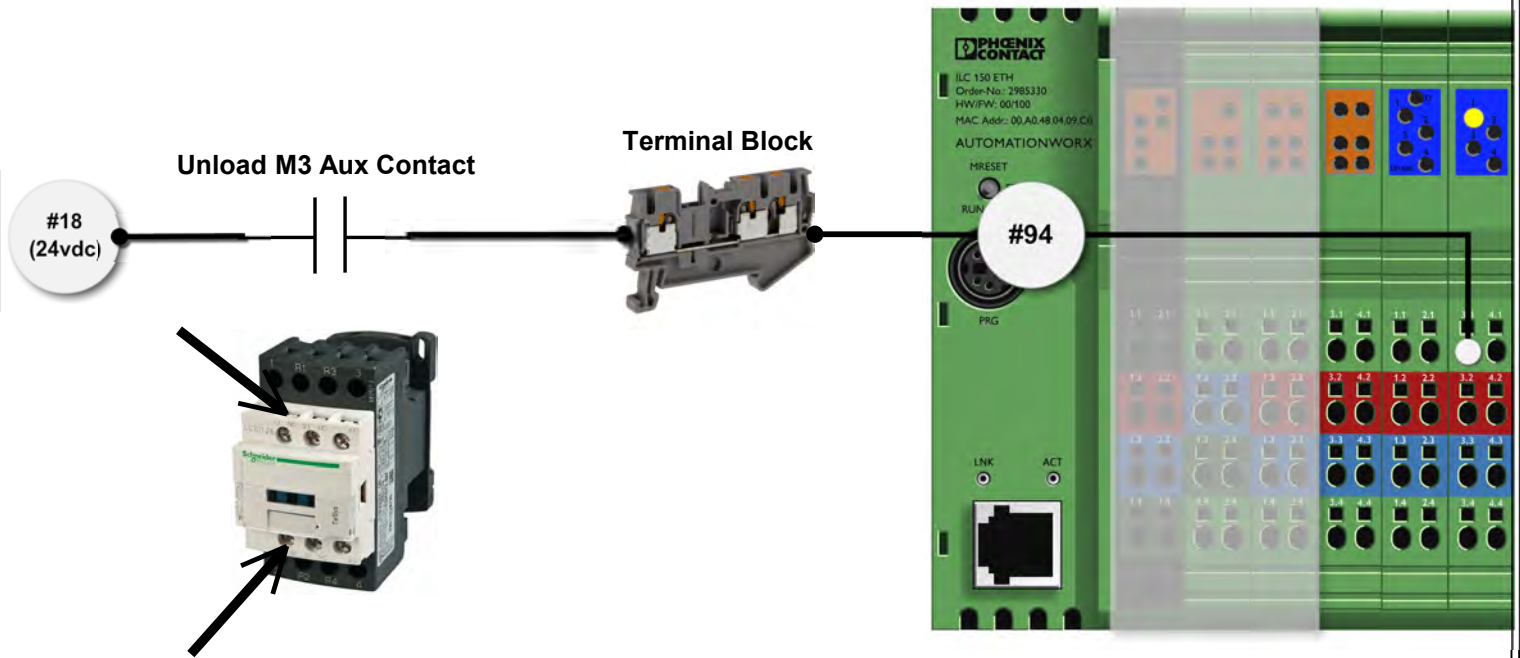
Meter Roll Proximity Switch #93



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

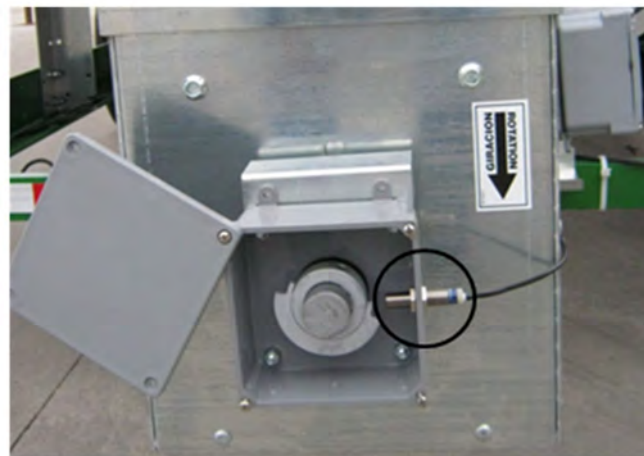
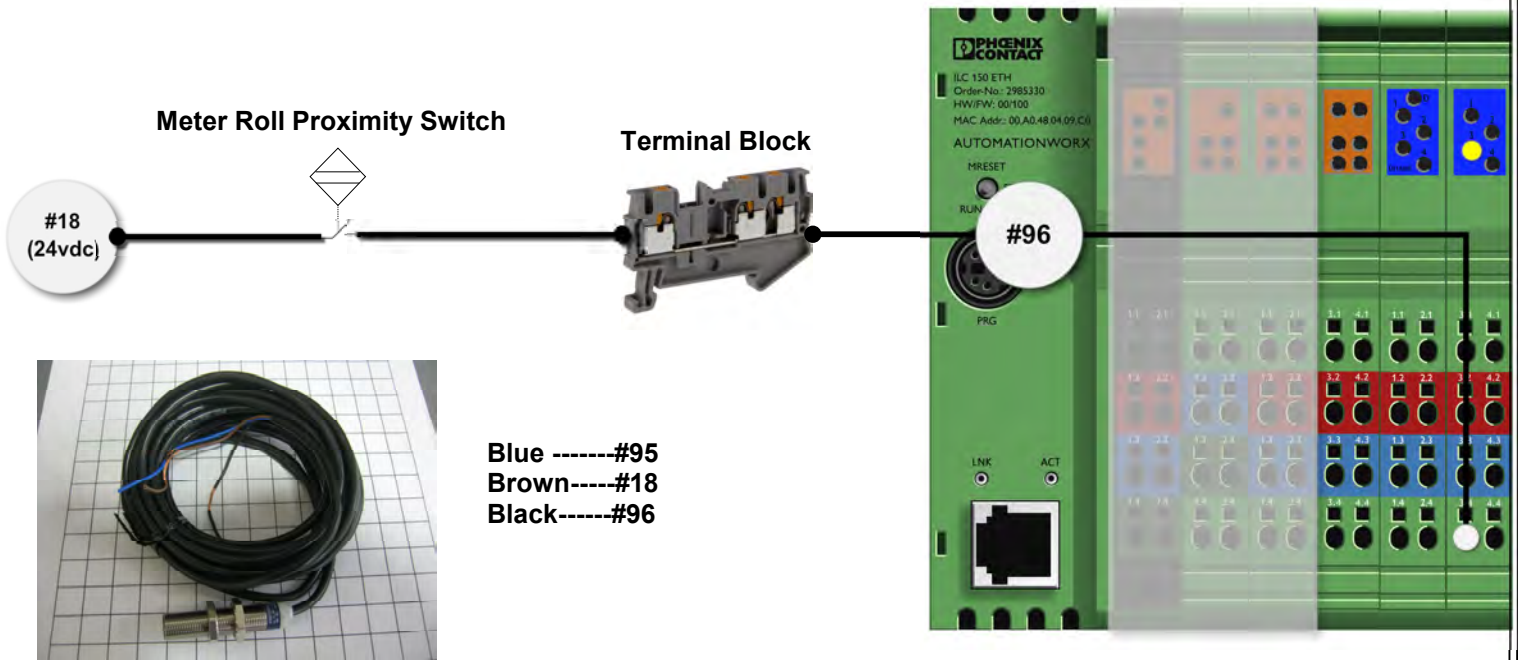
Unload Confirmation #94



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



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

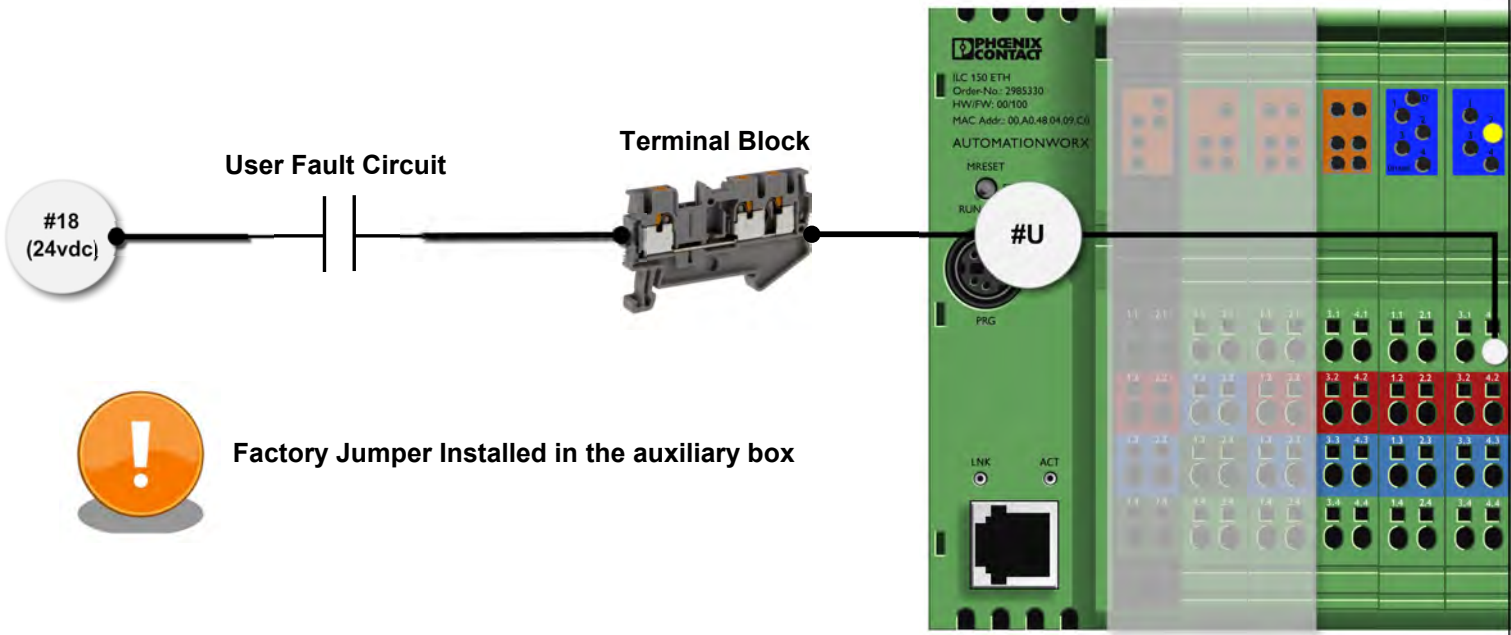
Author: SUKUP MFG CO - MRK

Date: 03/15

Revision: 6/7/2017 - DWS (1)

106.12

User Fault Circuit #U



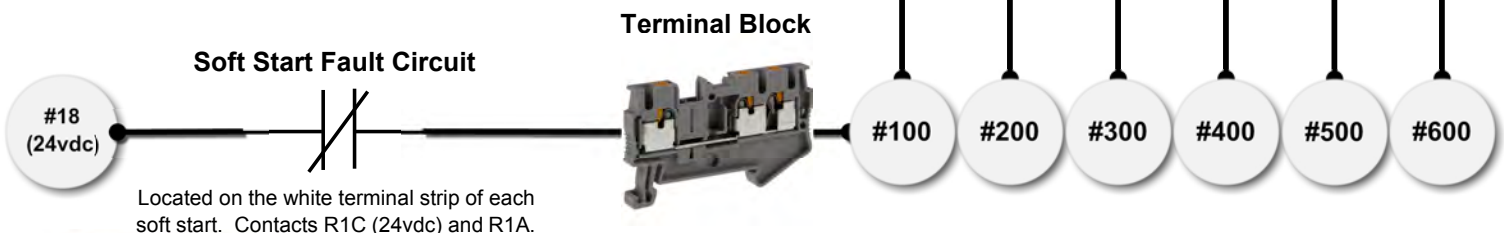
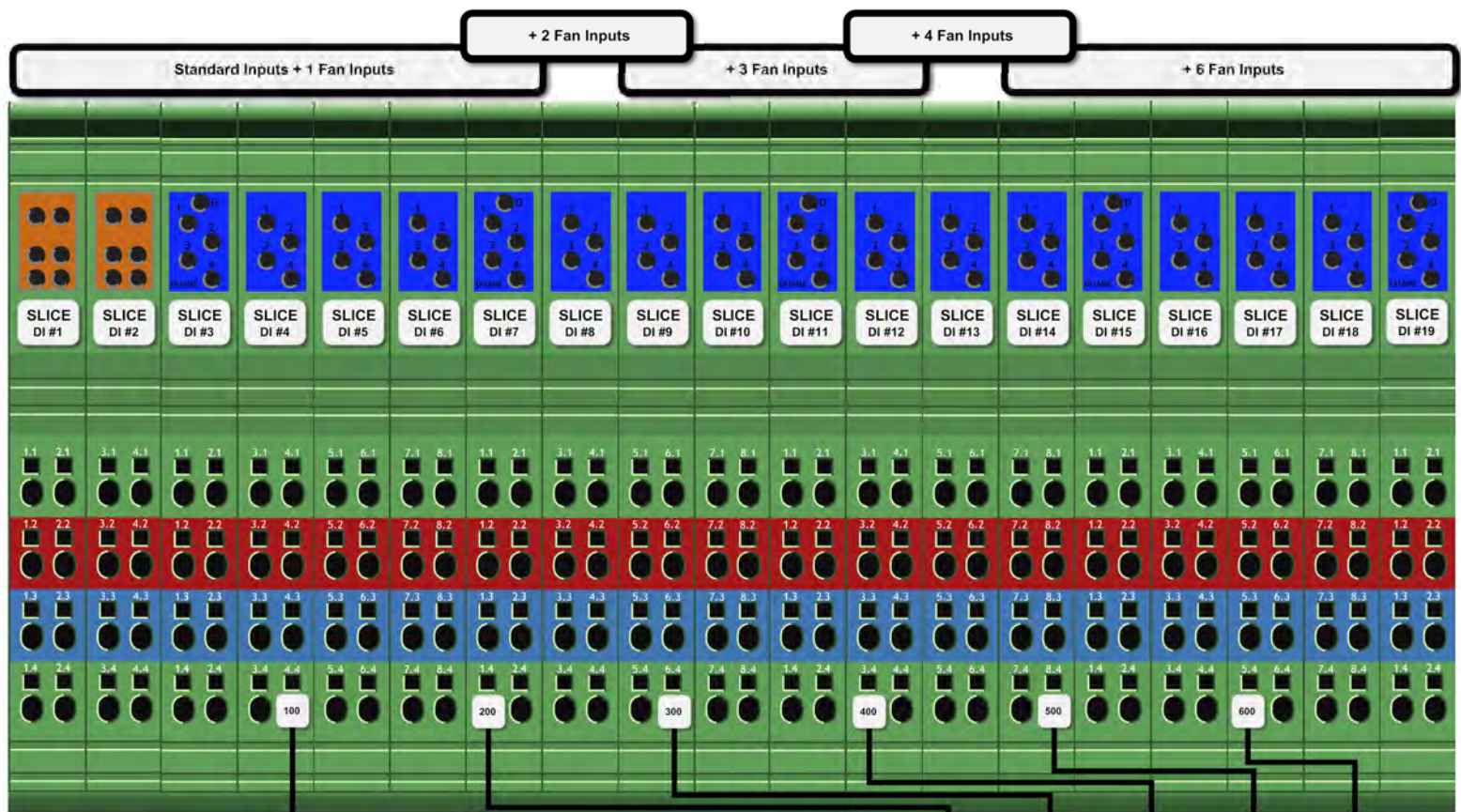
Factory Jumper Installed in the auxiliary box



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



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

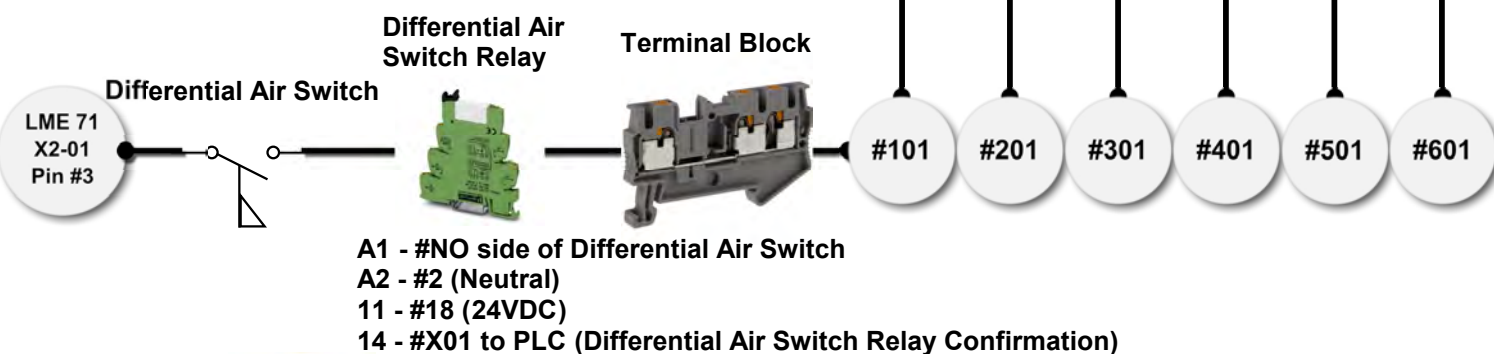
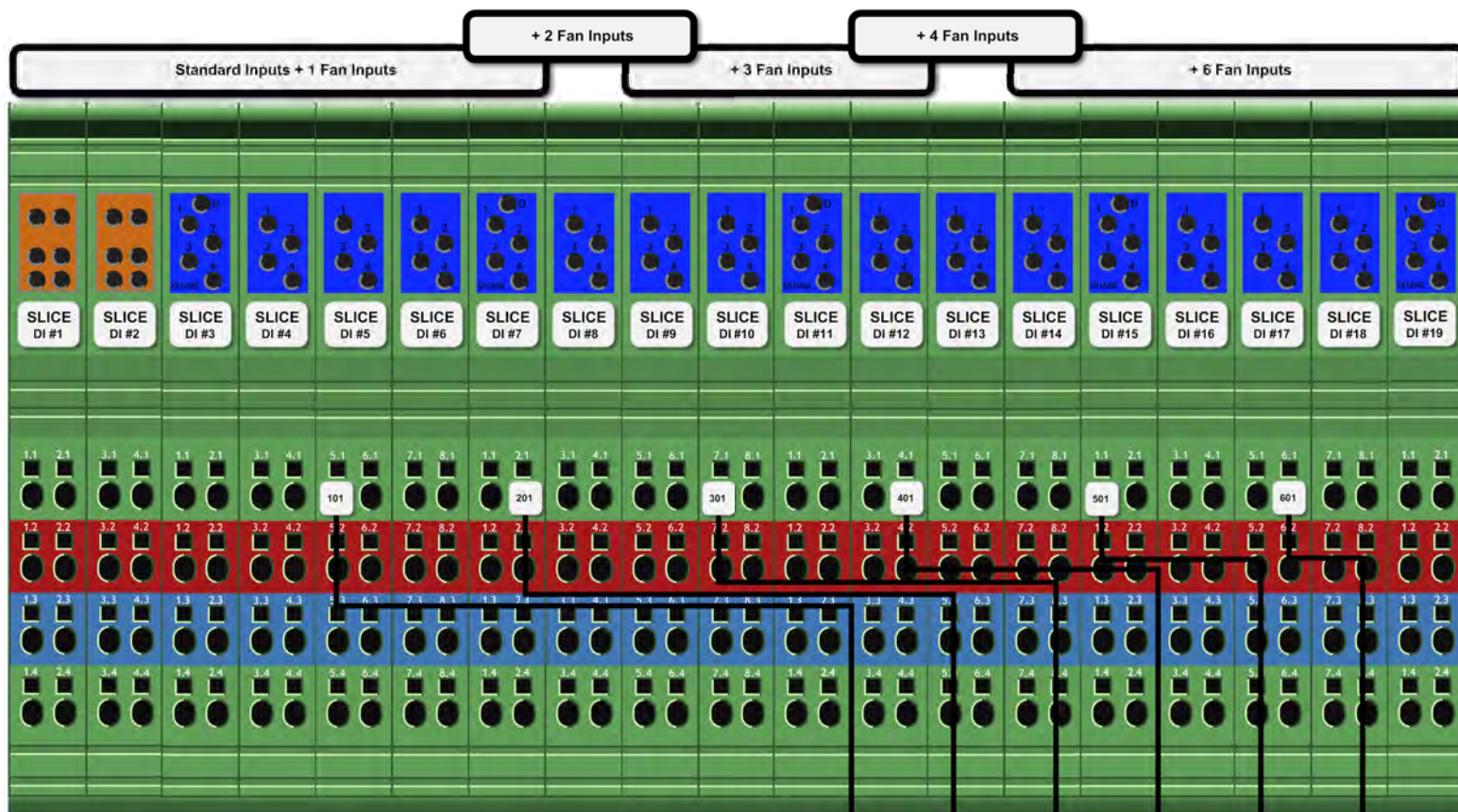
Author: SUKUP MFG CO - MRK

Date: 03/15

Revision: 6/7/2017 - DWS (1)

106.14

Differential Air Switch Circuits #101, #201, #301, #401, #501, #601

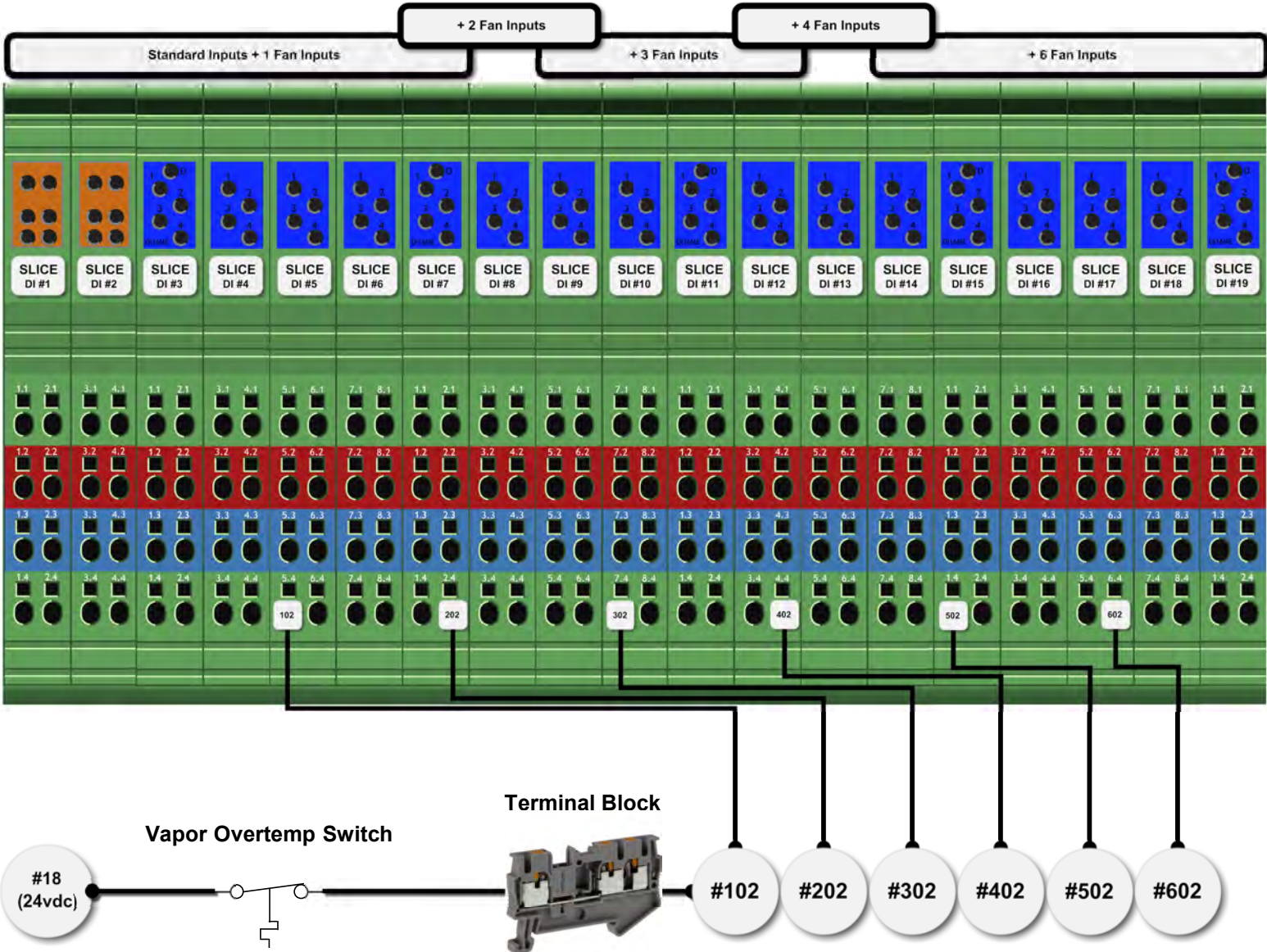


CSA Dryers ONLY
Domestic USA and International CE dryers have factory jumper installed

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

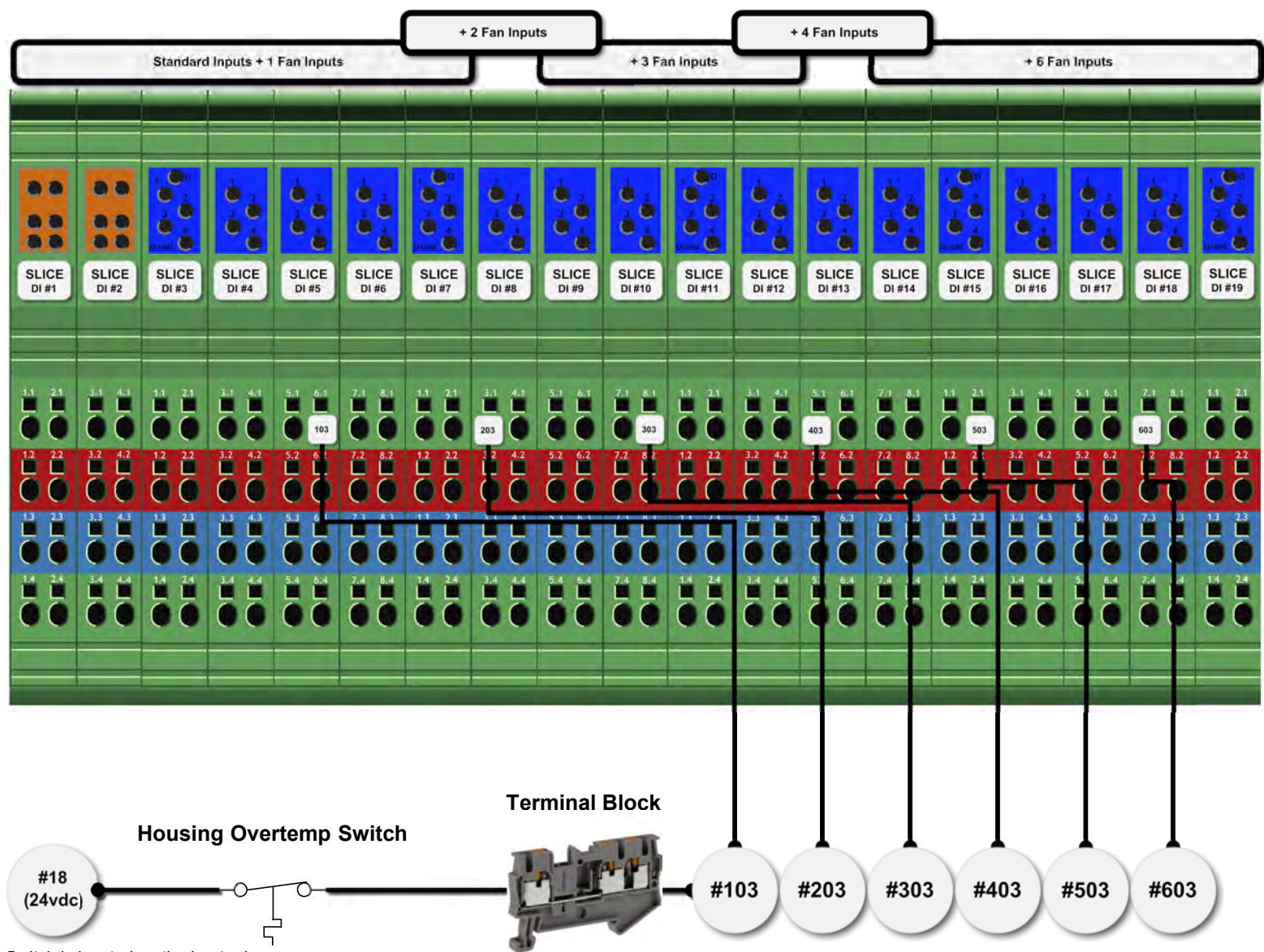
Author: SUKUP MFG CO - MRK

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

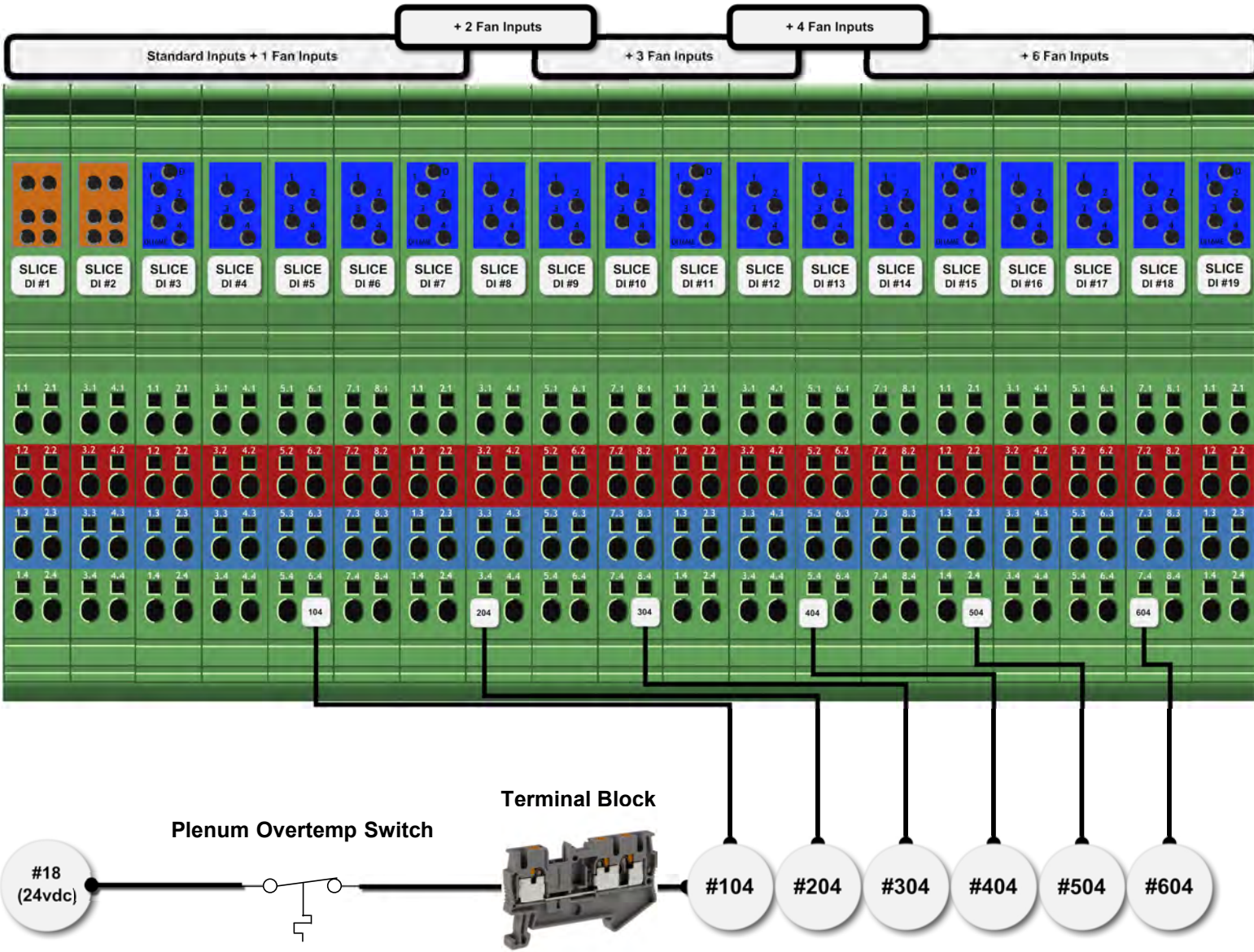
Author: SUKUP MFG CO - MRK

Date: 03/15

Revision: 6/7/2017 - DWS (1)

106.17

Plenum Over-Temp Circuits #104, #204, #304, #404, #504, #604



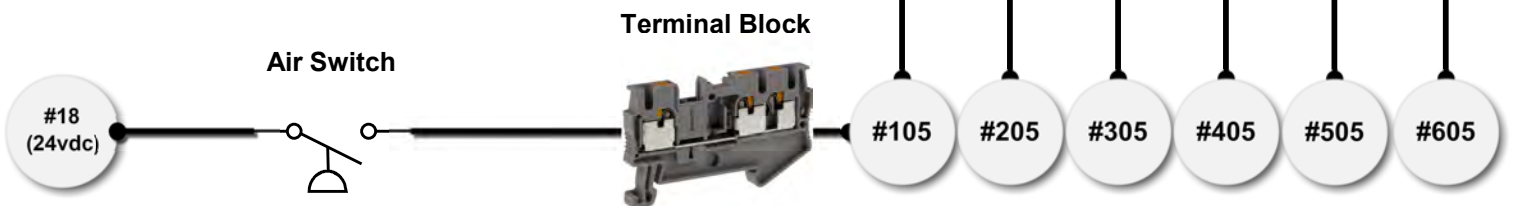
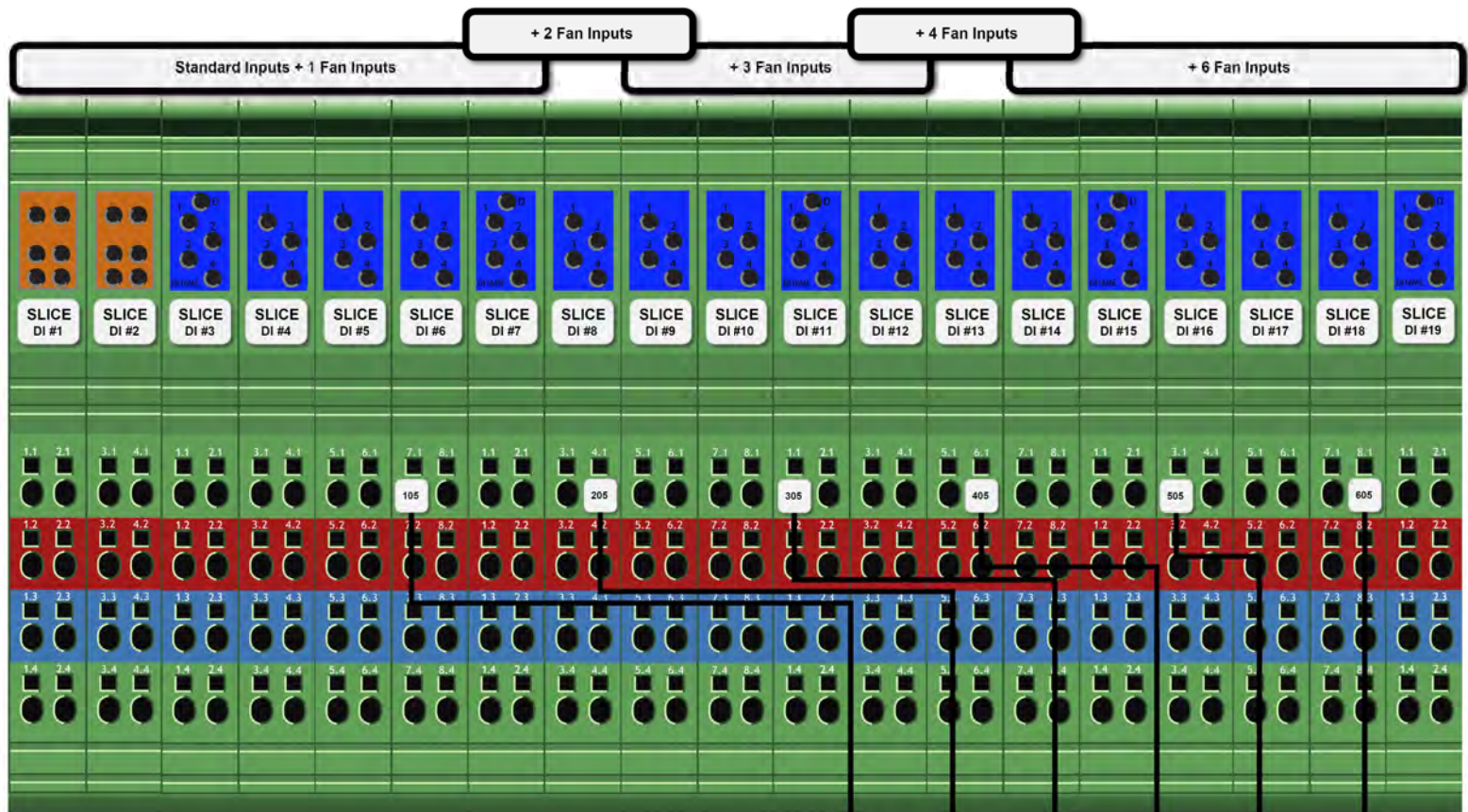
Switch is located in a box with the air switch on the chassis of the dryer above each fan/ heater housing



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.

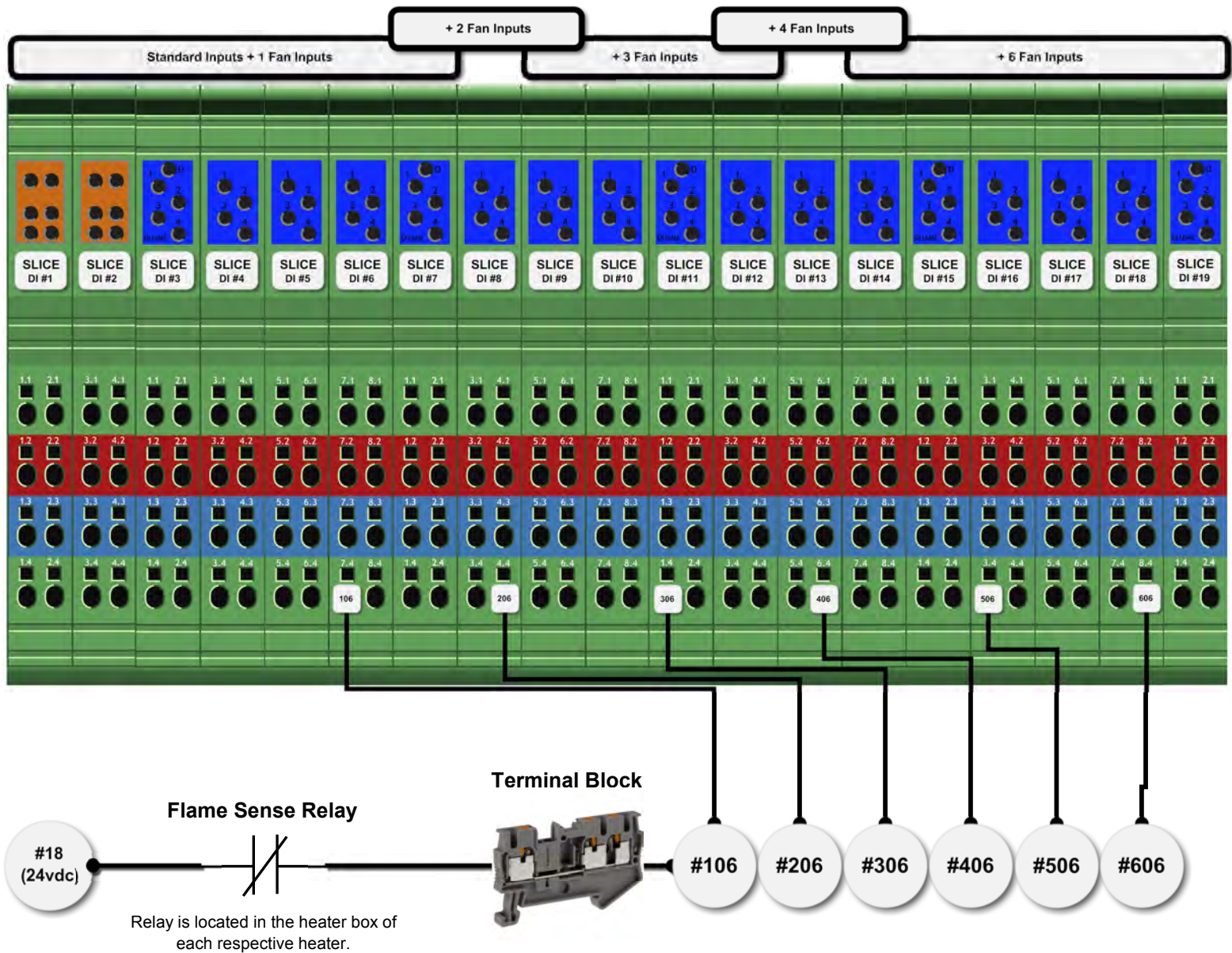
Title: PORTABLE DRYER: Air Switch Circuit

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

Fan Confirmation Circuit

#18 (24vdc)

Located on the side of fan contactor (aux contact) or soft start R2A.

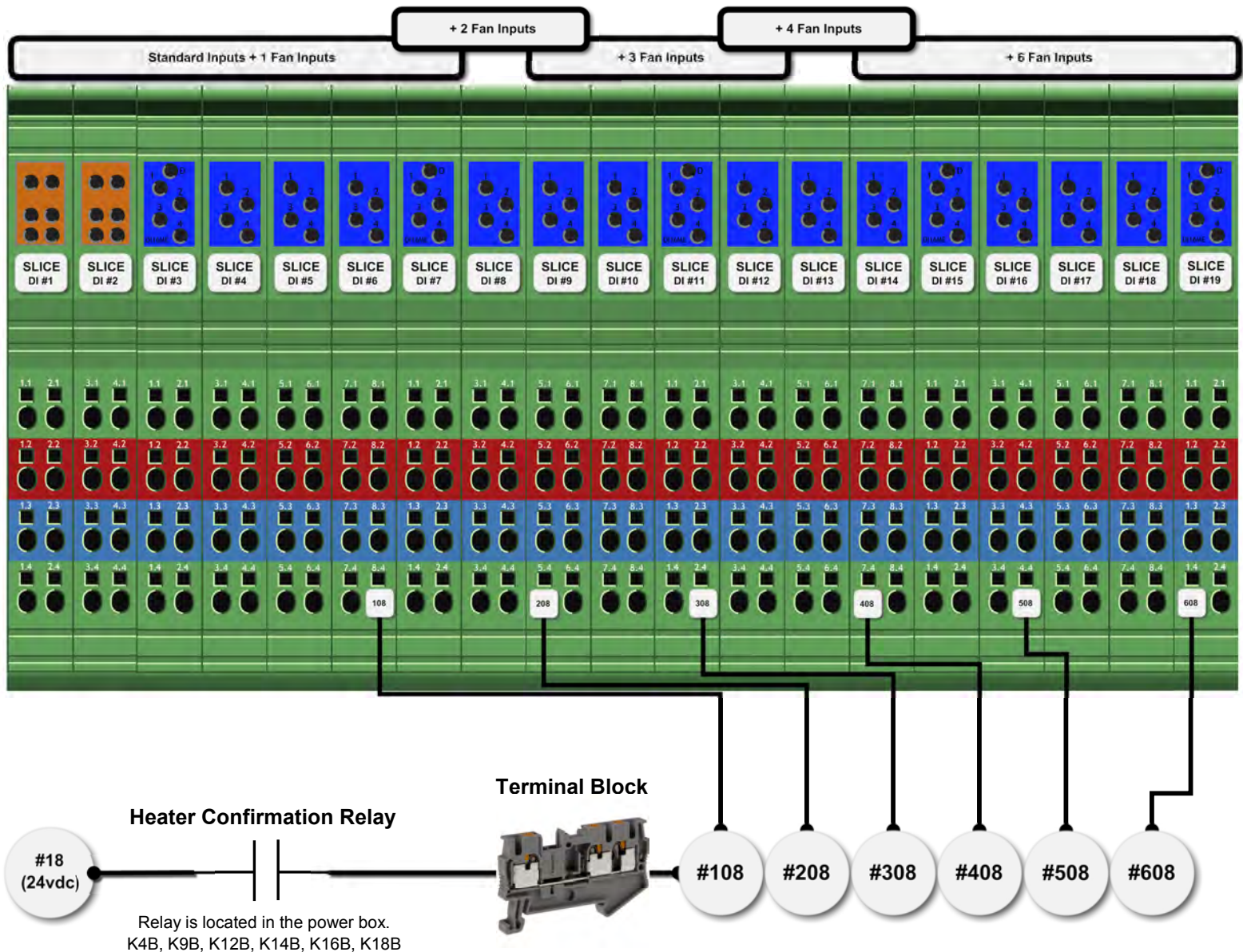
Terminal Block

#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



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

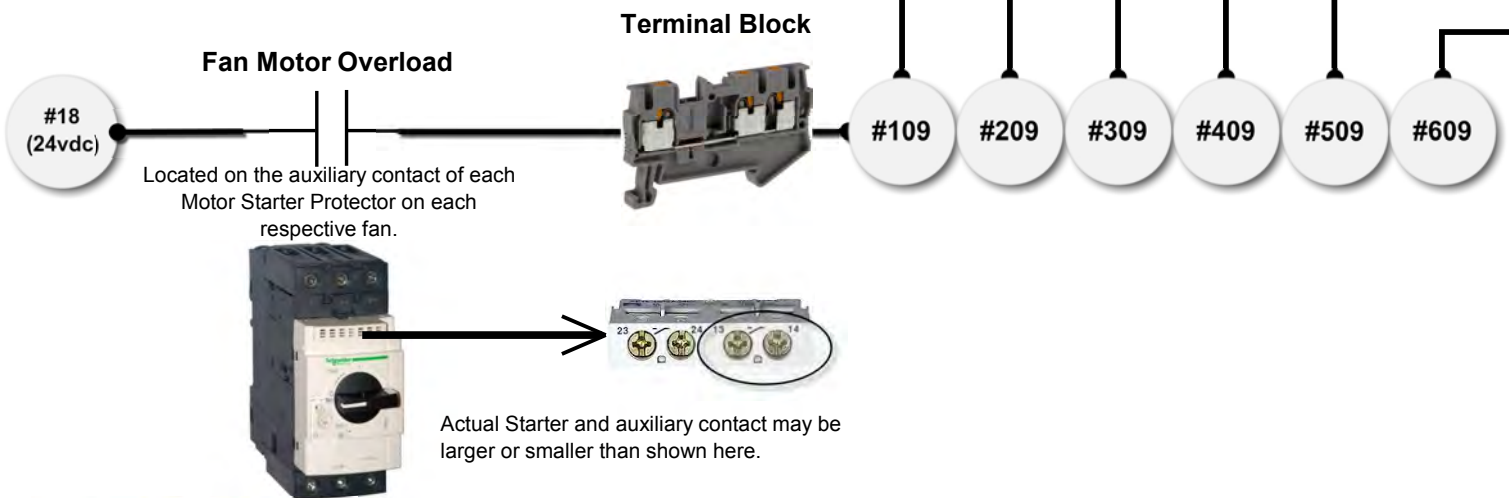
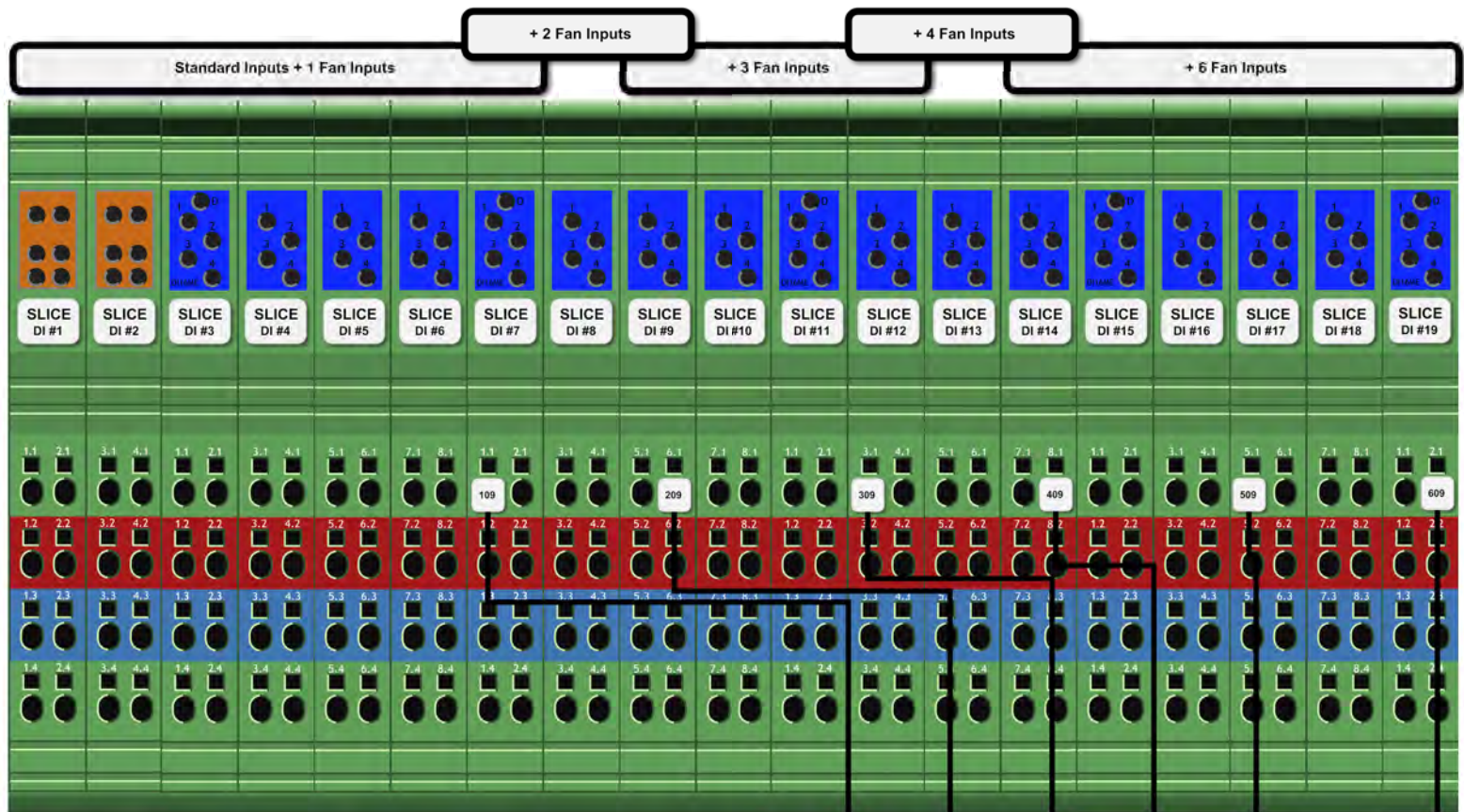
Author: SUKUP MFG CO - MRK

Date: 03/15

Revision: 6/7/2017 - DWS (1)

106.22

Fan Motor Overload Circuits #109, #209, #309, #409, #509, #609



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

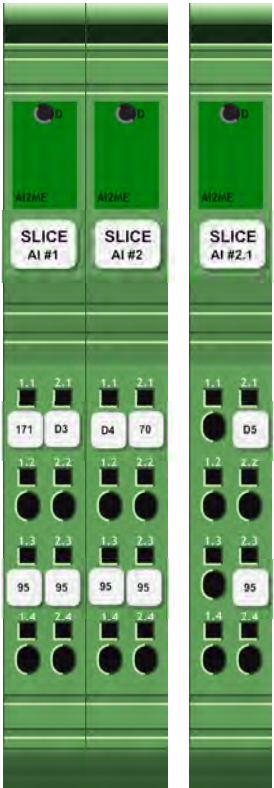
Date: 03/15

Revision: 6/7/2017 - DWS (1)

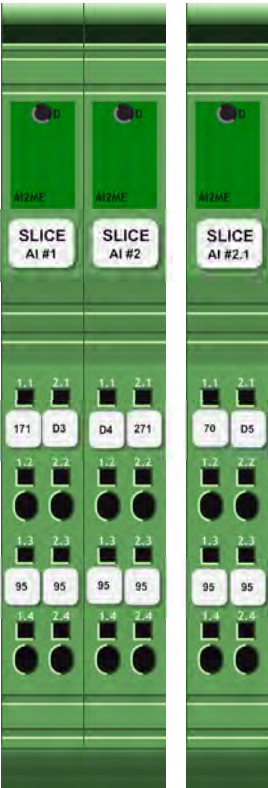
106.23

Plenum RTD Transmitter

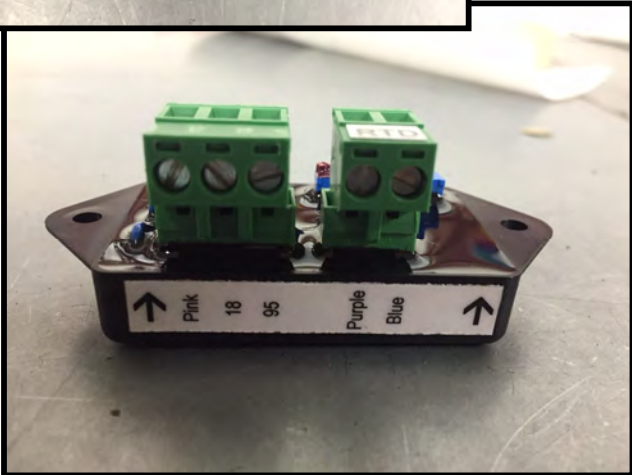
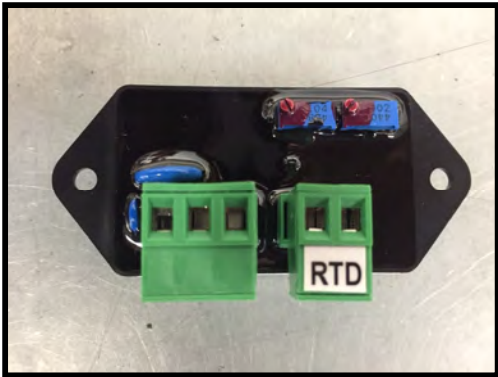
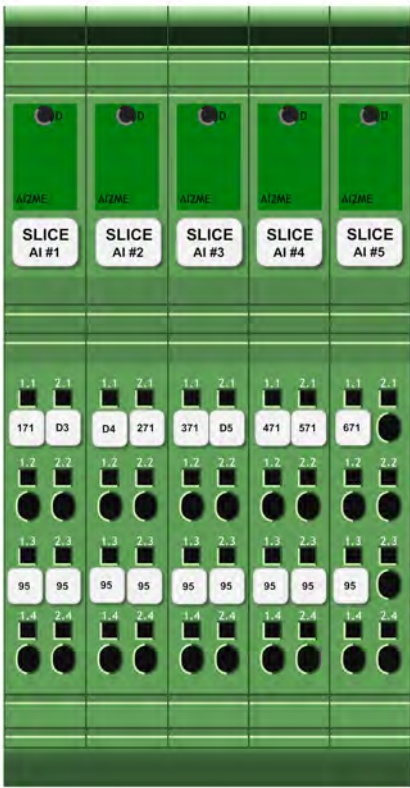
1 Fan



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

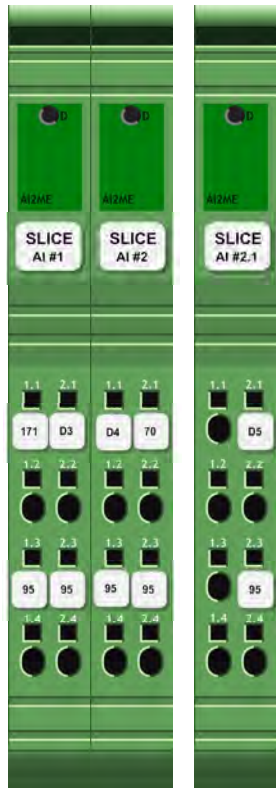
Date: 03/15

Sheet: 106.24

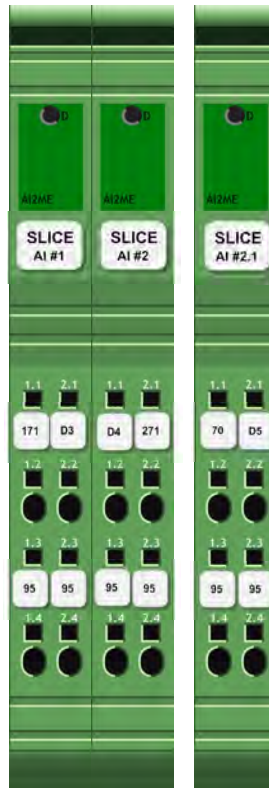
Revision:

Moisture Sensor

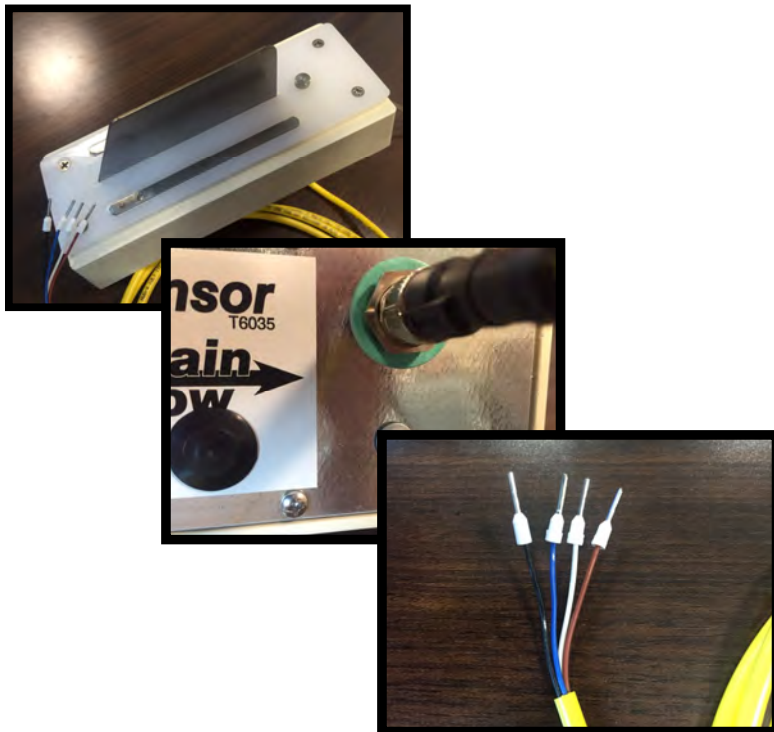
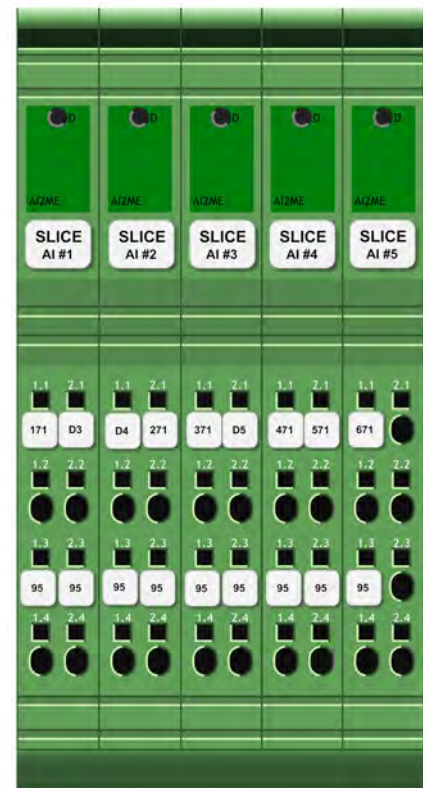
1 Fan



2 Fan



3-6 Fan



Pinout:

Black Wire: Moisture Reference (D4 or D5)

Blue Wire: Temperature Reference (D3)

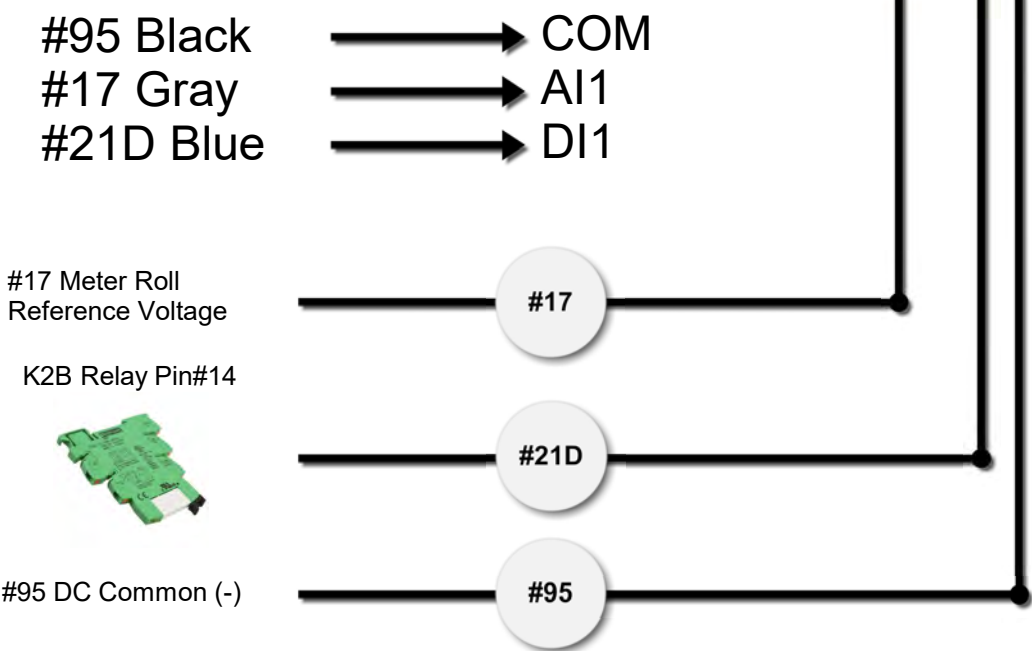
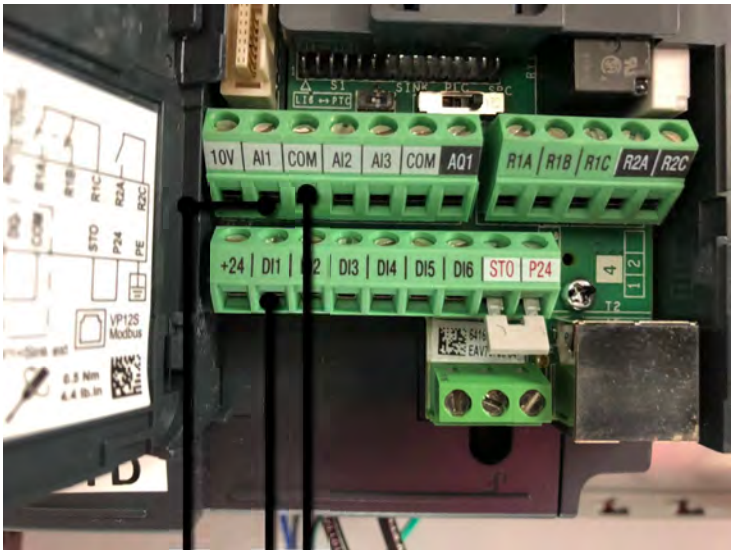
Brown: #18 - 24vdc Supply

White: #95 - DC common (-)

Important: take advantage of the quick connect plug, take the sensor inside during the off-season!

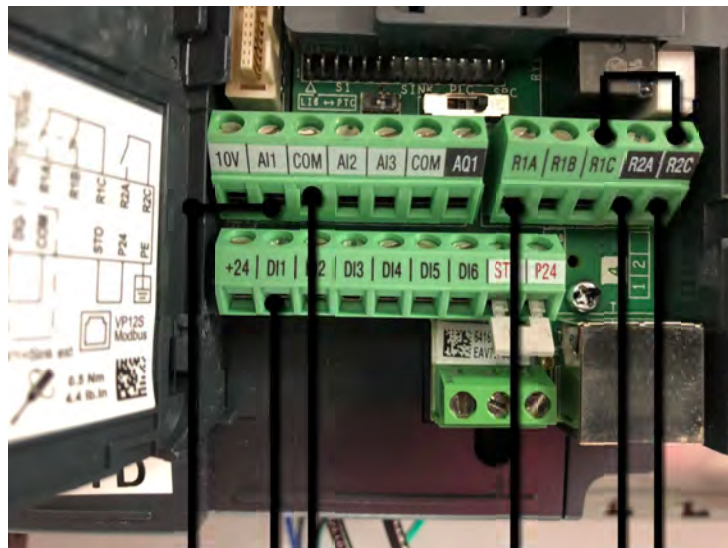
Title: PORTABLE DRYER: Moisture Sensor	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 106.25
Revision:	

ATV 320 VFD Wiring Diagram



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

K2B Relay Pin#14

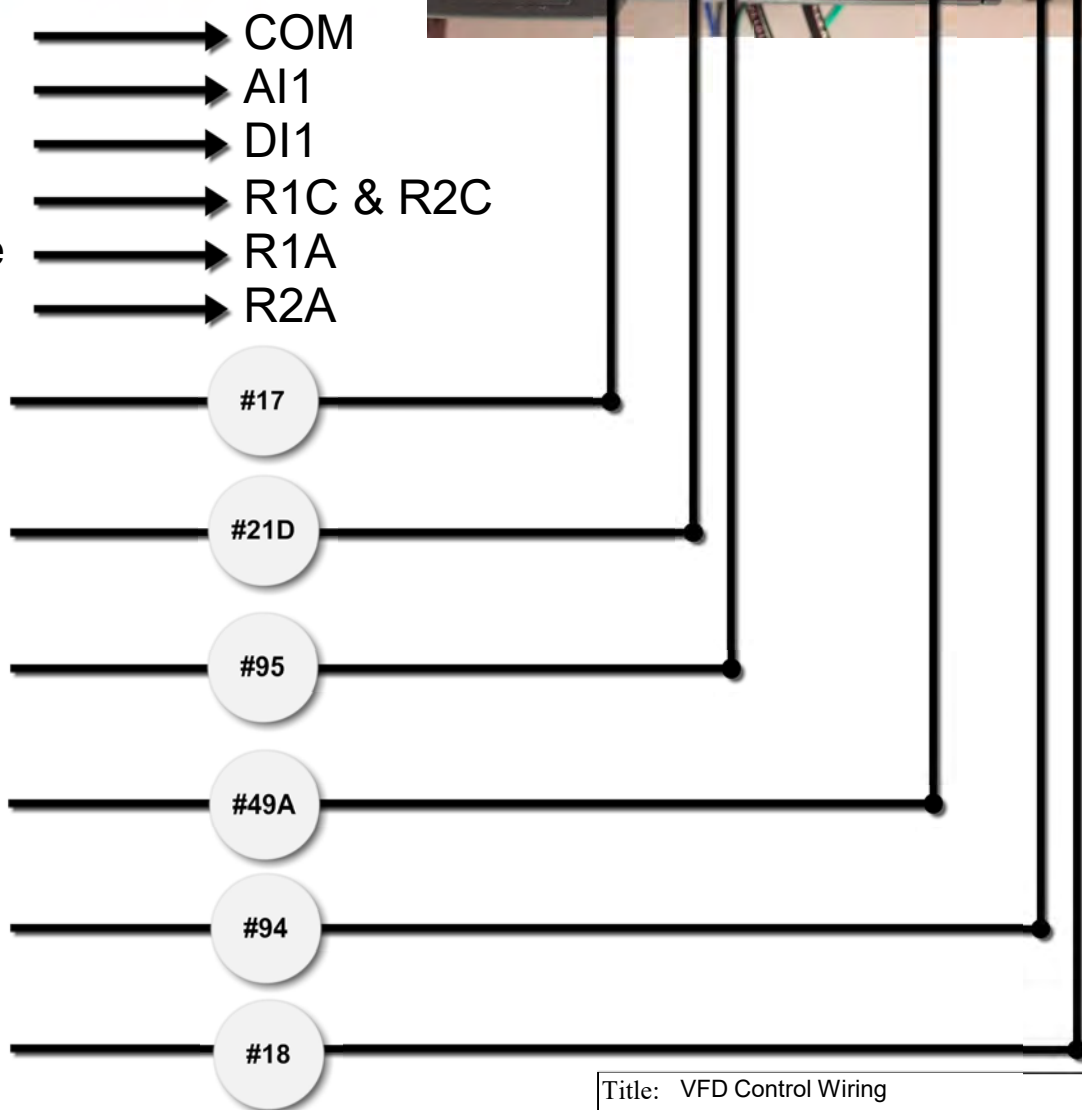


#95 DC Common (-)

#49A VFD Motor
Overload

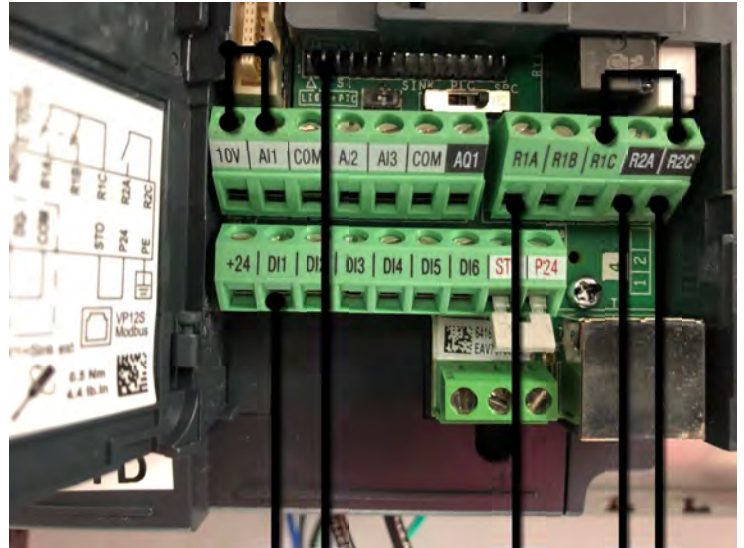
#94 Unload
Confirmation

#18 24vdc (+)



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

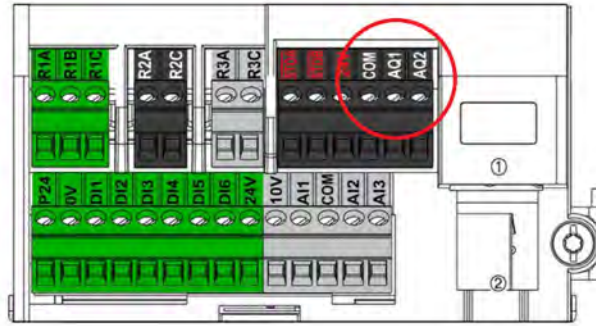
Author: SUKUP MFG CO - MRK

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

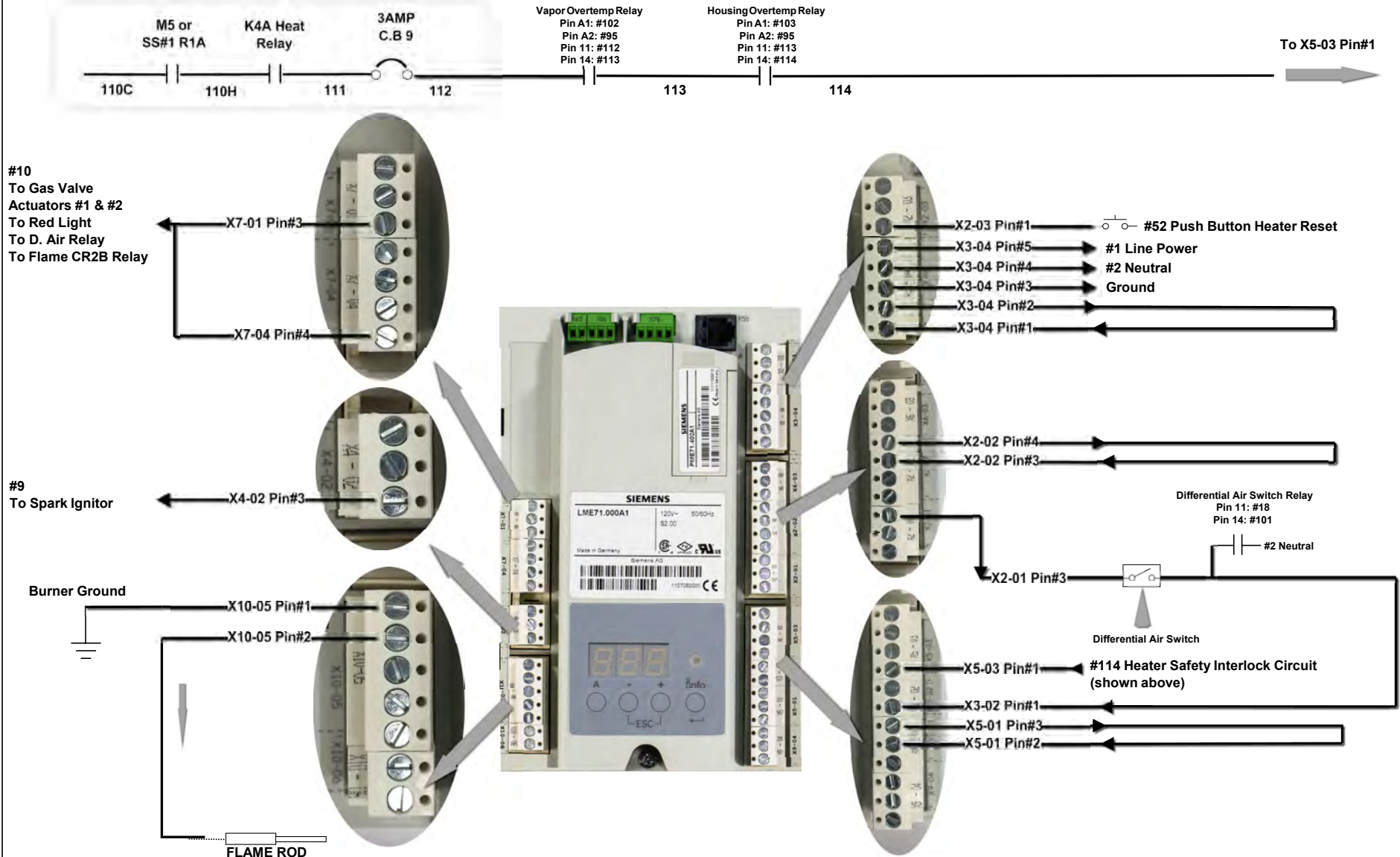
Special Note:

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

Located in Power Box



Title: Portable Dryer Heater Control Unit - LME71 CSA

Author: SUKUP MFG CO - MRK

Date: 6/15

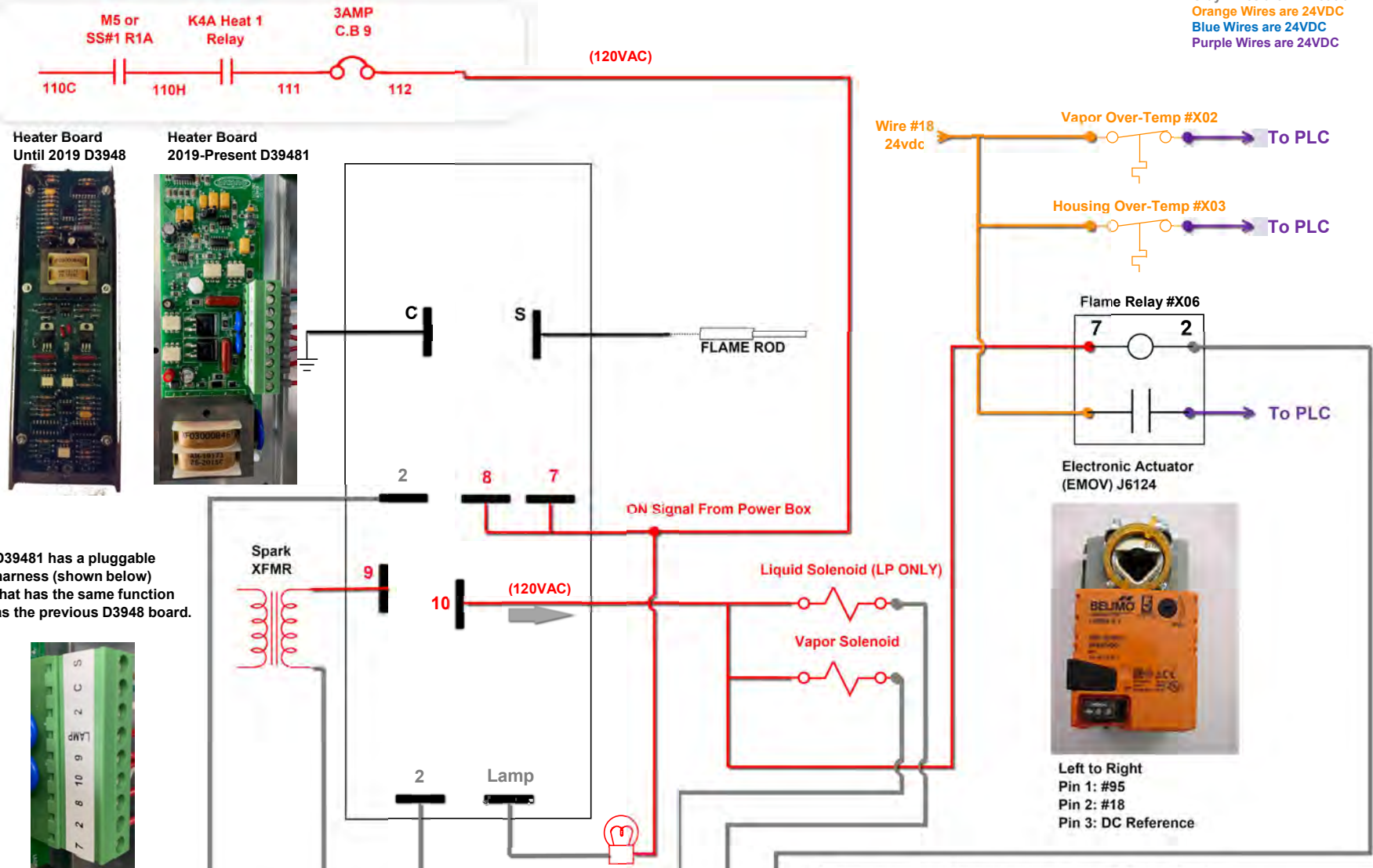
Sheet: 107.7

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



Title:	Sukup Heater Ignition Board D3948 & D39481
Author:	SUKUP MFG CO - MRK
Date:	5/2015
Revision:	8/14/2020 - MRK (3)
Sheet:	107.8

ATS22 Soft Start Wiring

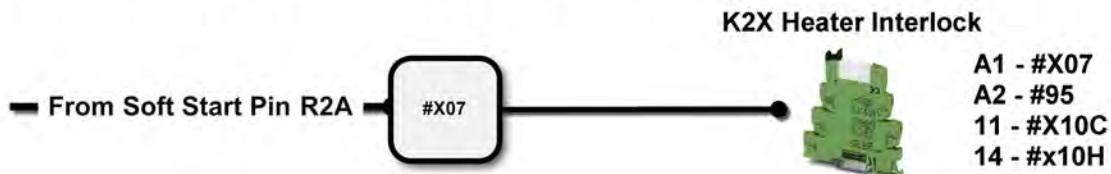


- CL1 - Wire #1 (Line, 110VAC)
- CL2 - Wire #2 (Neutral)
- R1C - Wire #18 (24vdc)
- R1A - Wire #(X00) (Soft Start Fault Monitoring)
- R2C - Wire #18 (24vdc)
- R2A - Wire #X07 (Soft Start in RUN mode - Confirmation of full run speed)
- LI1 - Wire #1 (Line, 110VAC)
- LI2 - Wire #X10C (110Vac Run Command 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)



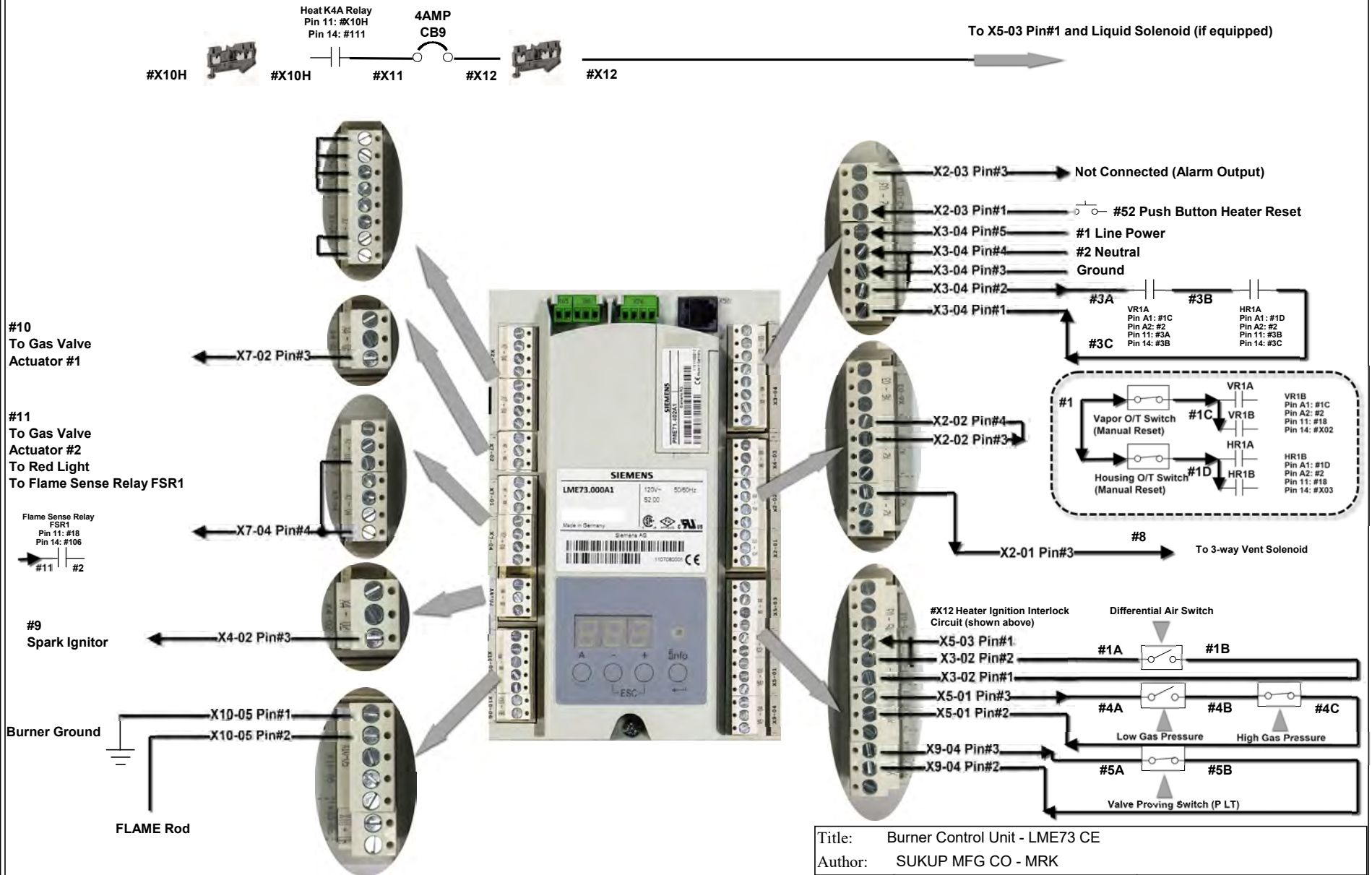
Title: ATS22 Soft Start Wiring

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

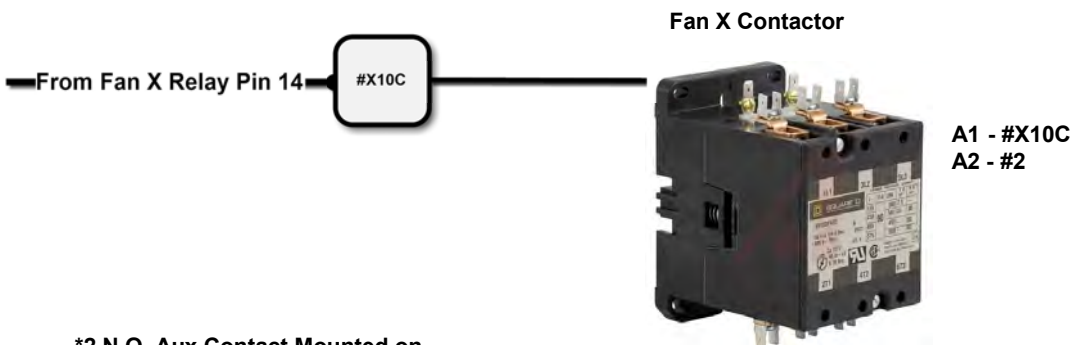
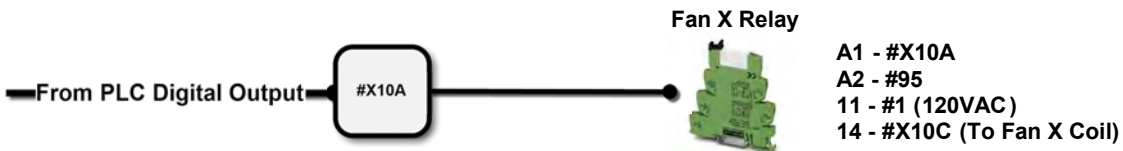
Date: 1/2019

Sheet: 107.25

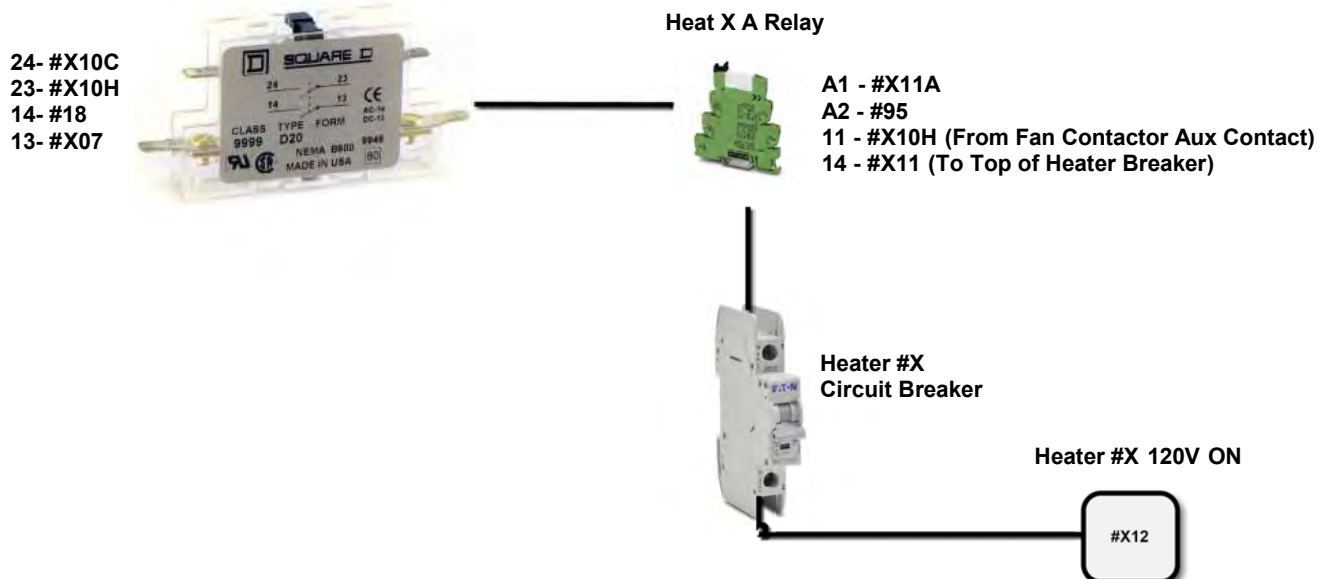
Revision:

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.



*2 N.O. Aux Contact Mounted on the side of the Fan X contactor



*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

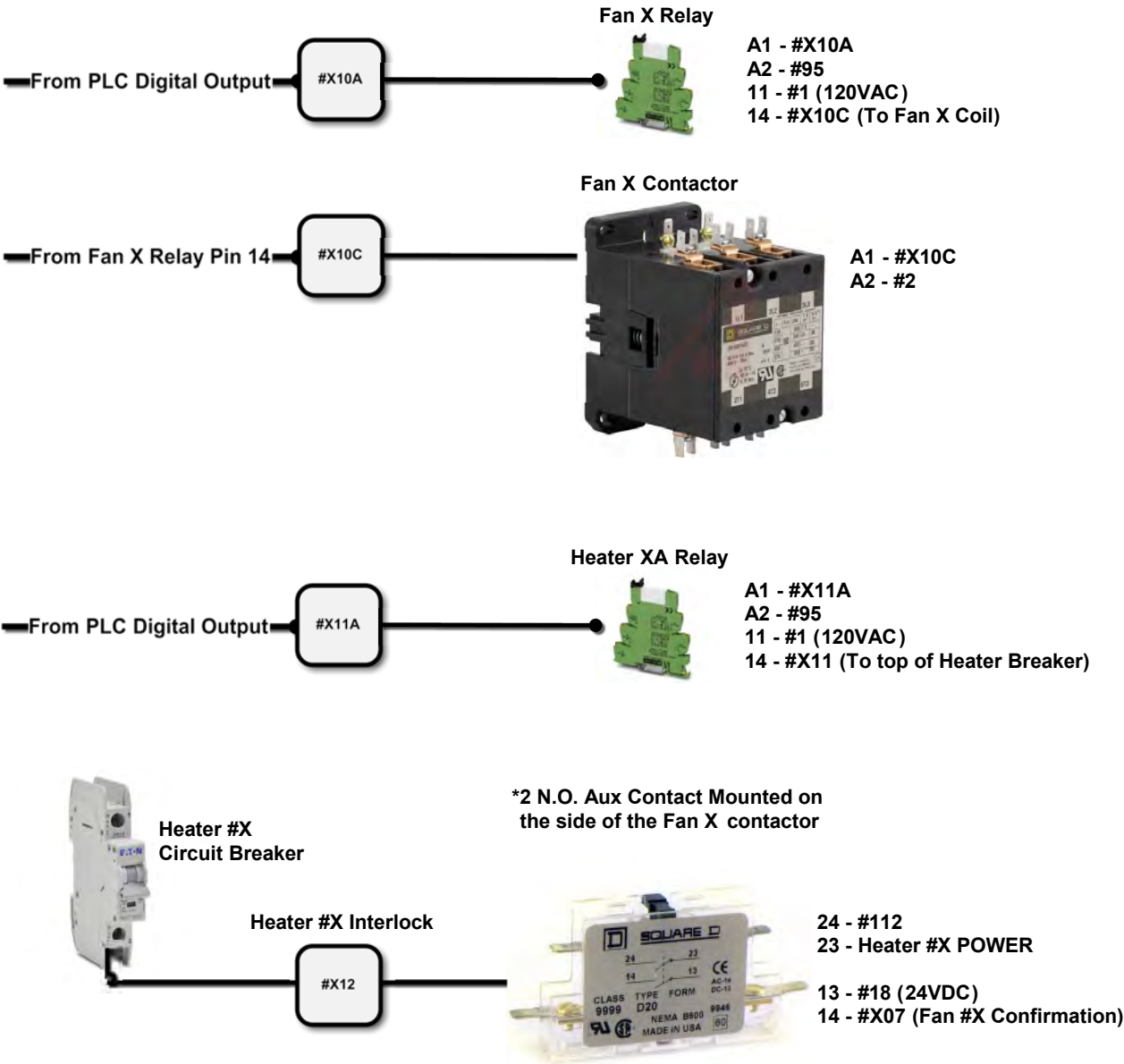
Date: 3/16

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.

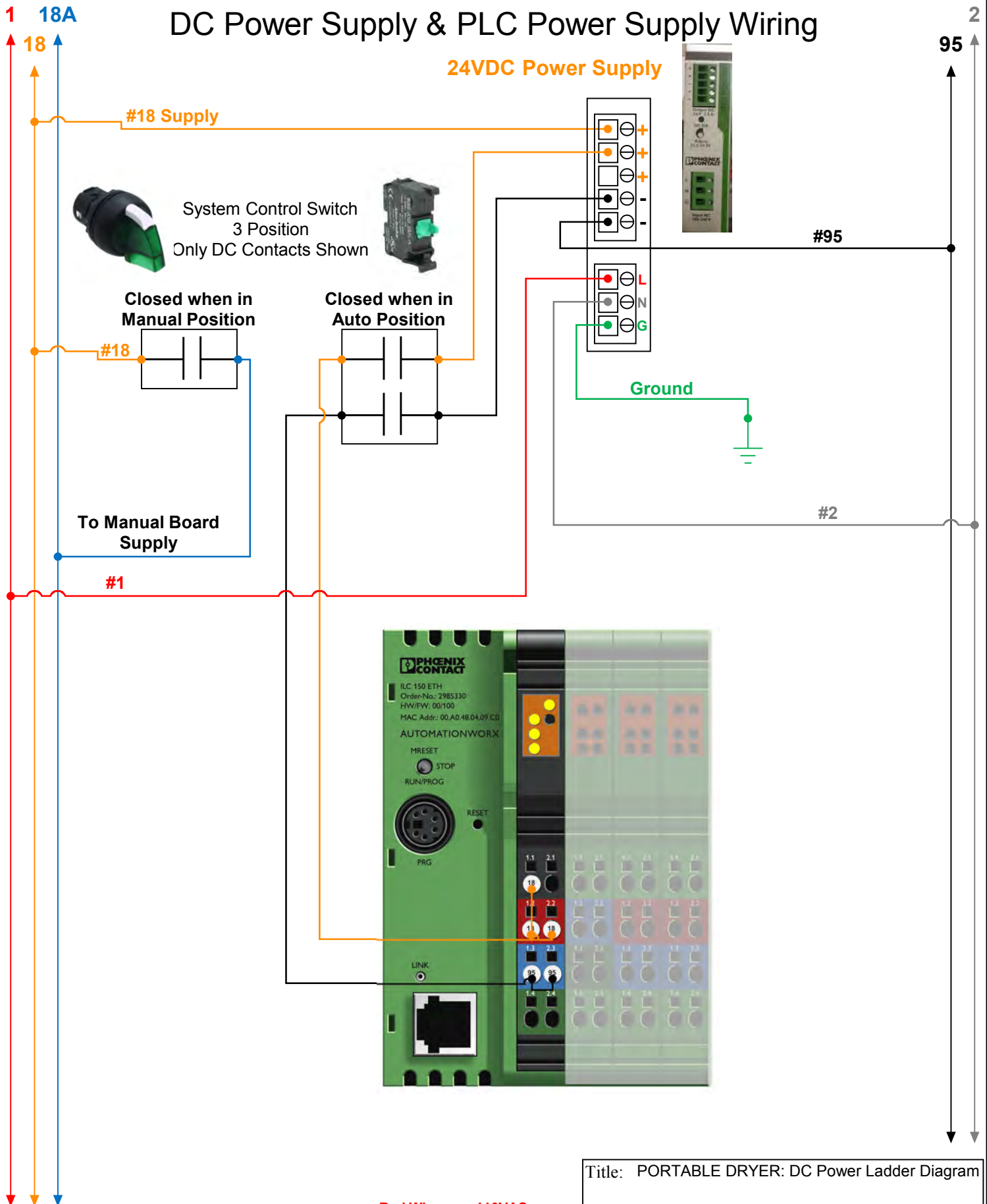
Title: PORTABLE DRYER: Retrofit Fan/Heater Wiring	
Author: SUKUP MFG CO - MRK	
Date: 3/16	Sheet: 113.2
Revision:	



1 18A

DC Power Supply & PLC Power Supply Wiring

24VDC Power Supply



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

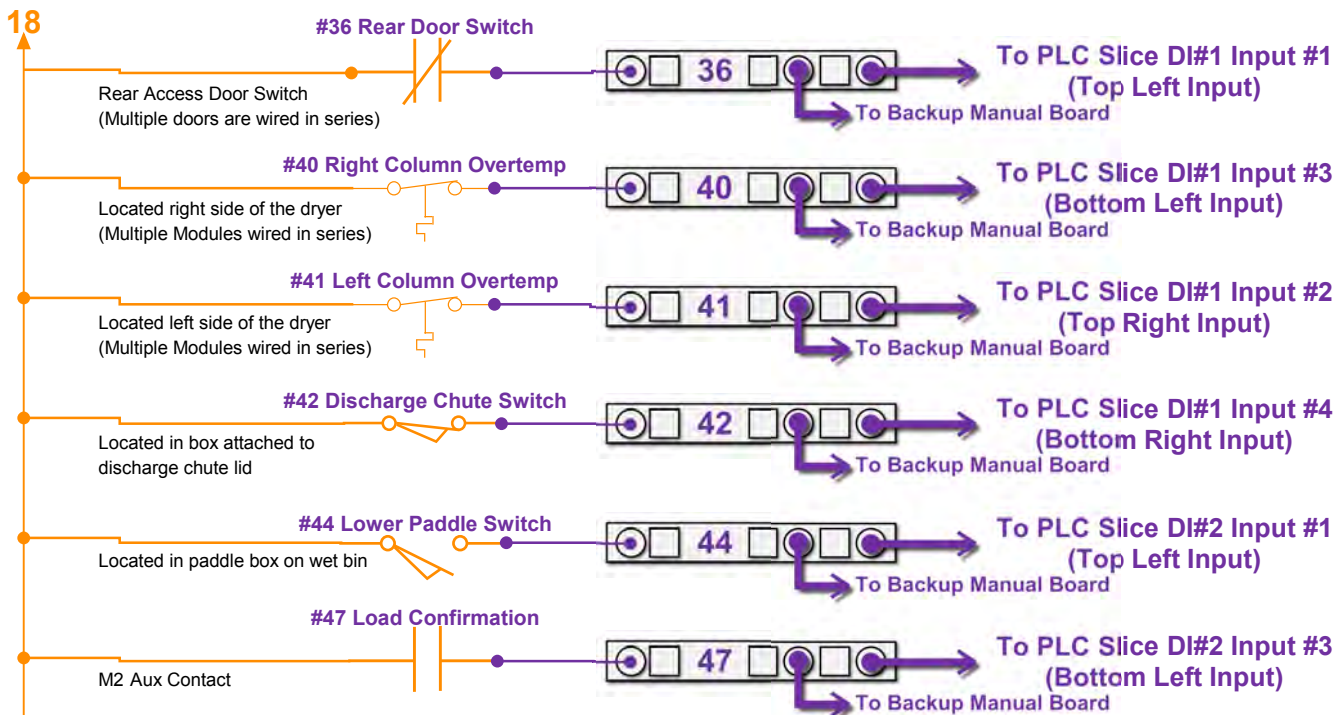
Author: SUKUP MFG CO - DWS

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

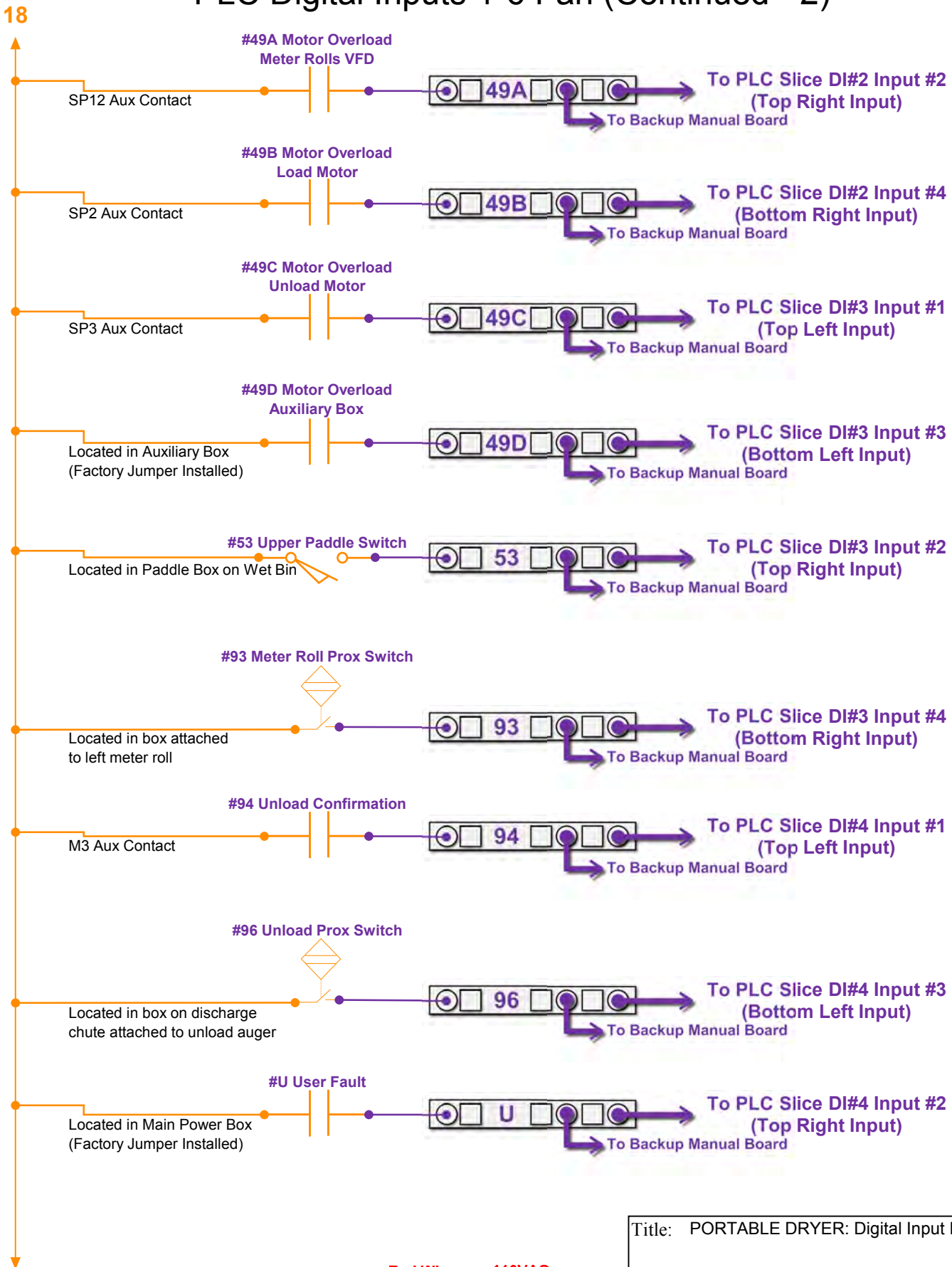
Author: SUKUP MFG CO - DWS

Date: 6/7/2017

Sheet: 115.3

Revision:

PLC Digital Inputs 1-6 Fan (Continued - 2)

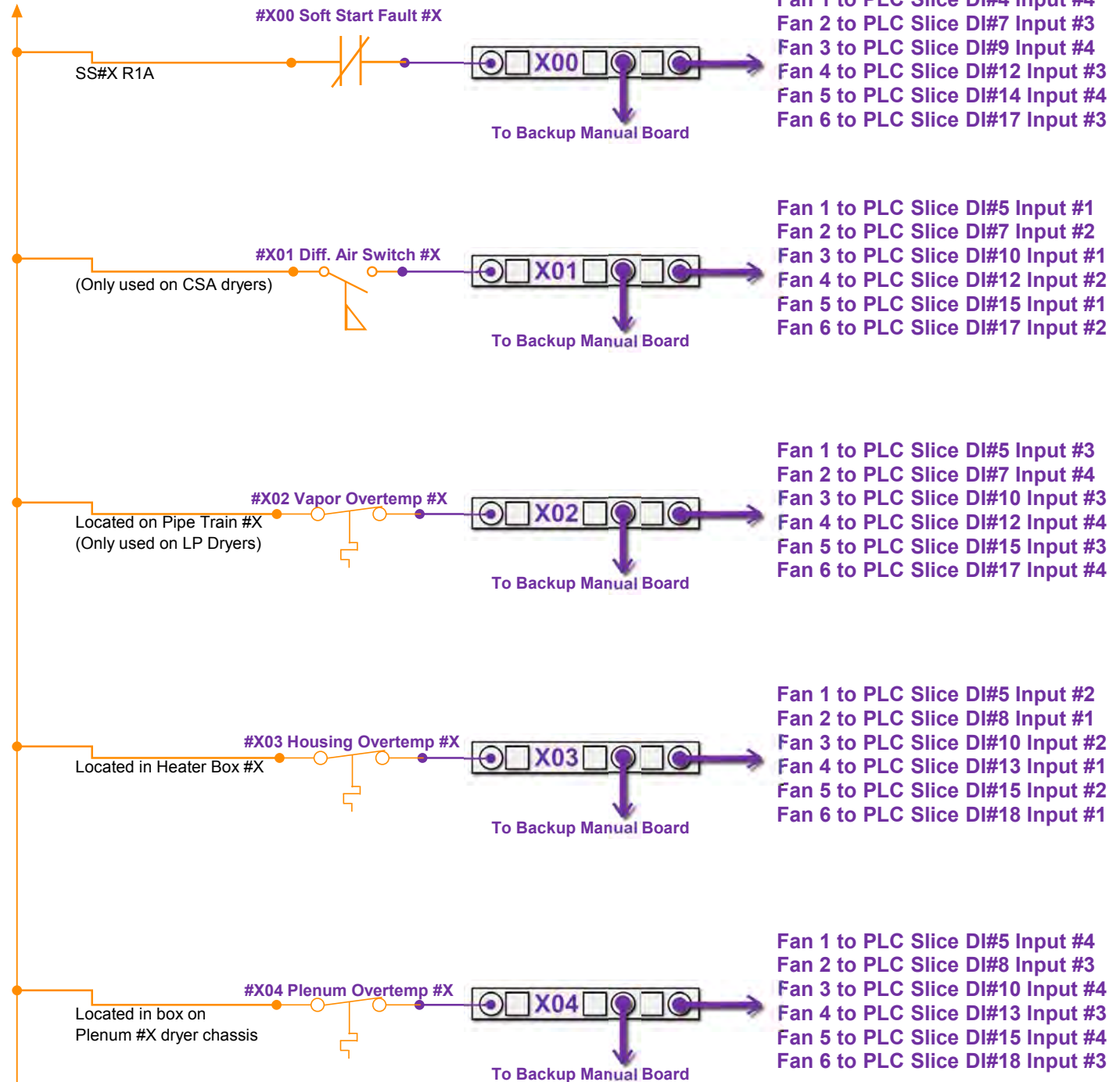


Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

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

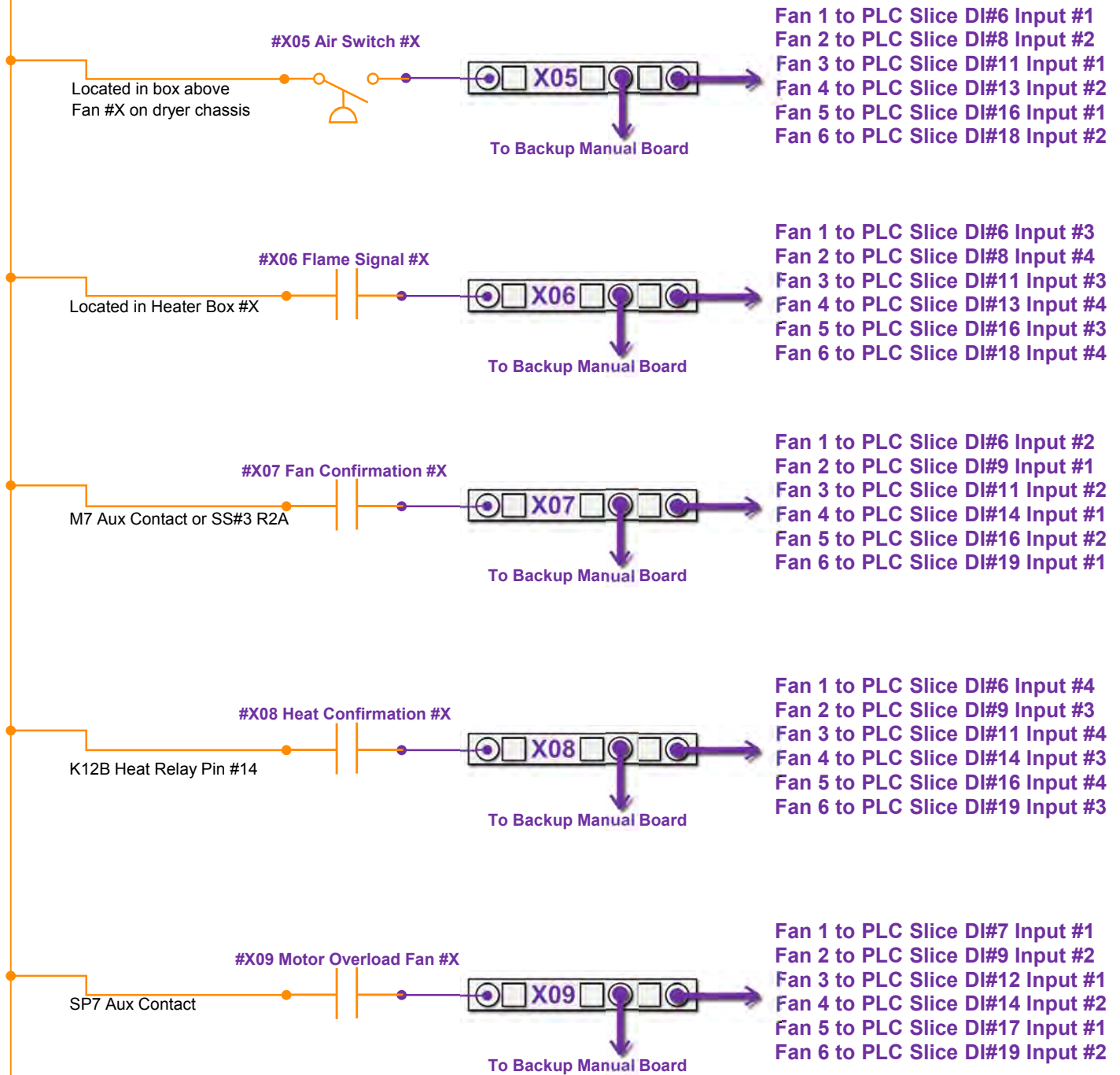
PLC Input Reference
 Input #1 - Top Left
 Input #2 - Top Right
 Input #3 - Bottom Left
 Input #4 - Bottom Right

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



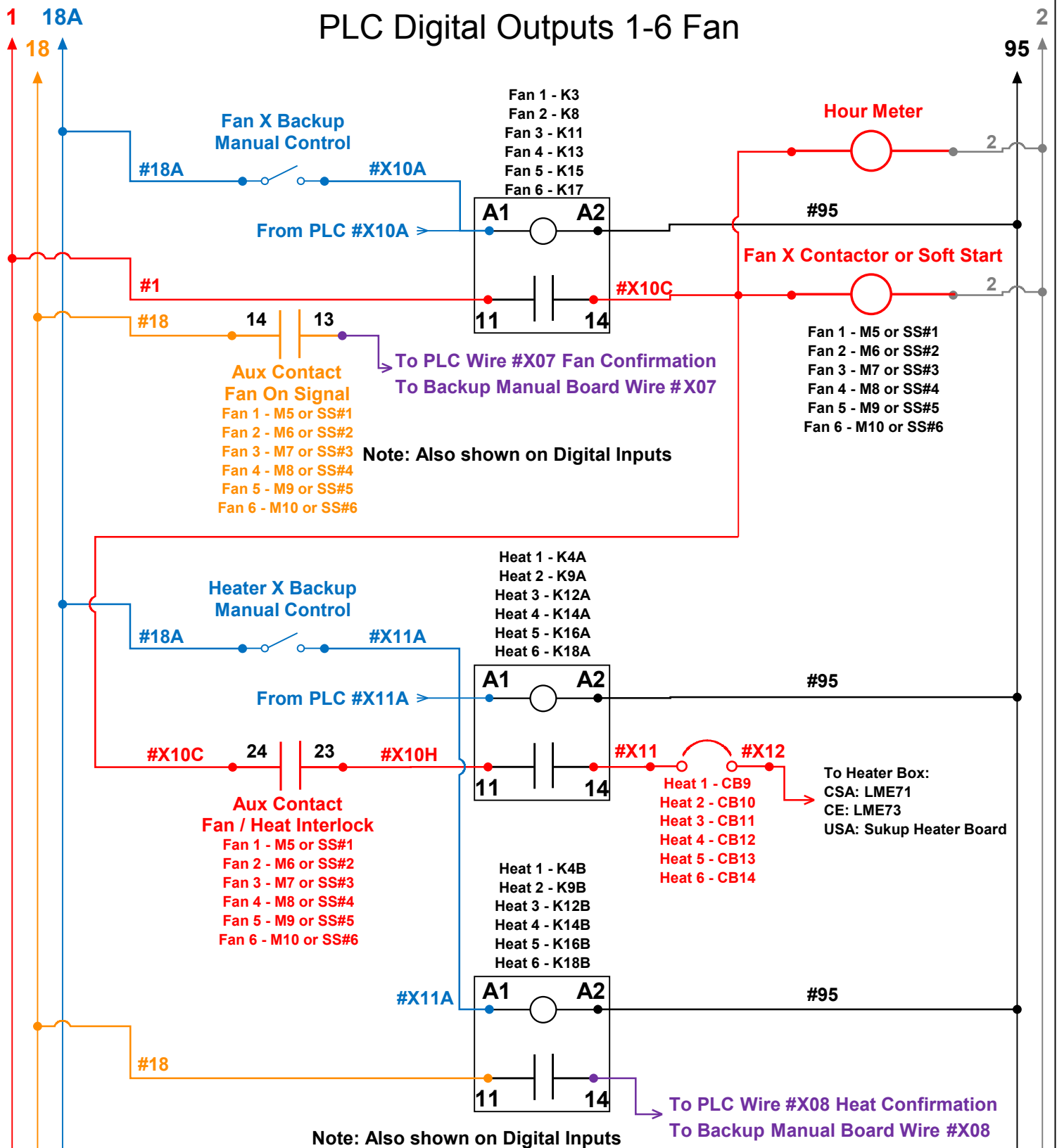
Replace "X" with Fan Number

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

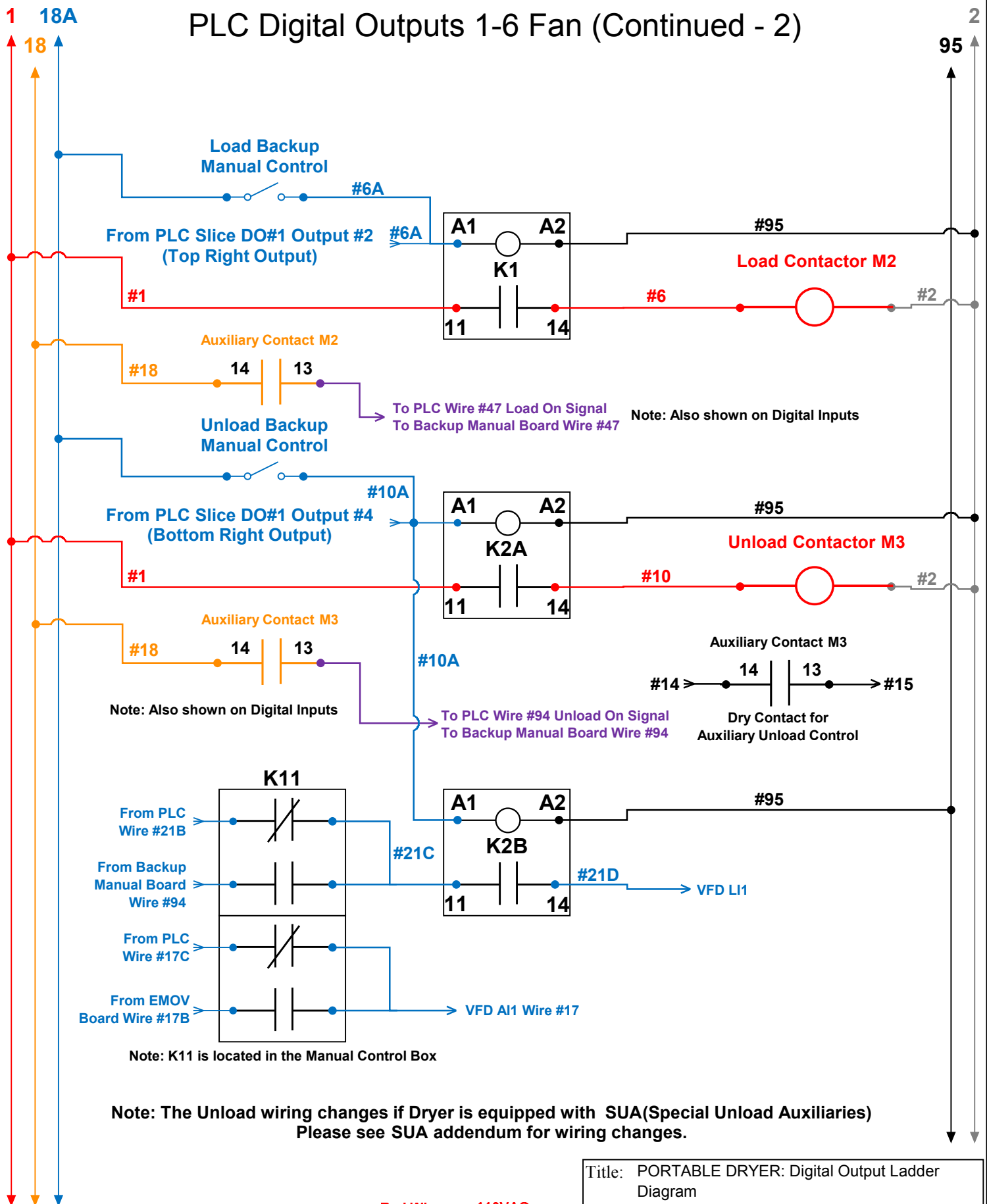


Note: Replace X in wire number with Fan or Heater Number

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.**

Title: PORTABLE DRYER: Digital Output Ladder Diagram

Author: SUKUP MFG CO - DWS

Date: 6/7/2017

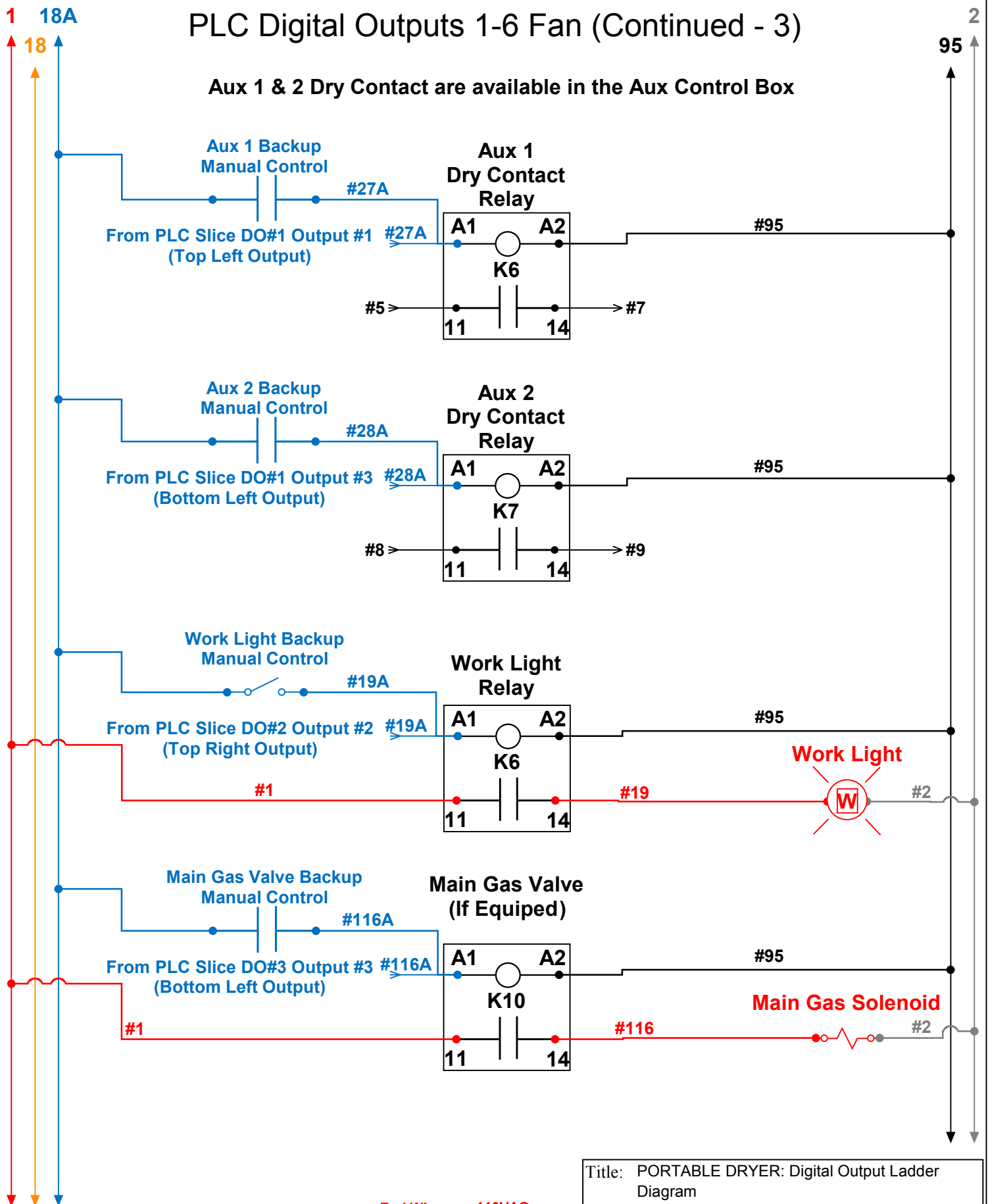
Sheet: 115.8

Revision:

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

PLC Digital Outputs 1-6 Fan (Continued - 3)

Aux 1 & 2 Dry Contact are available in the Aux Control Box



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

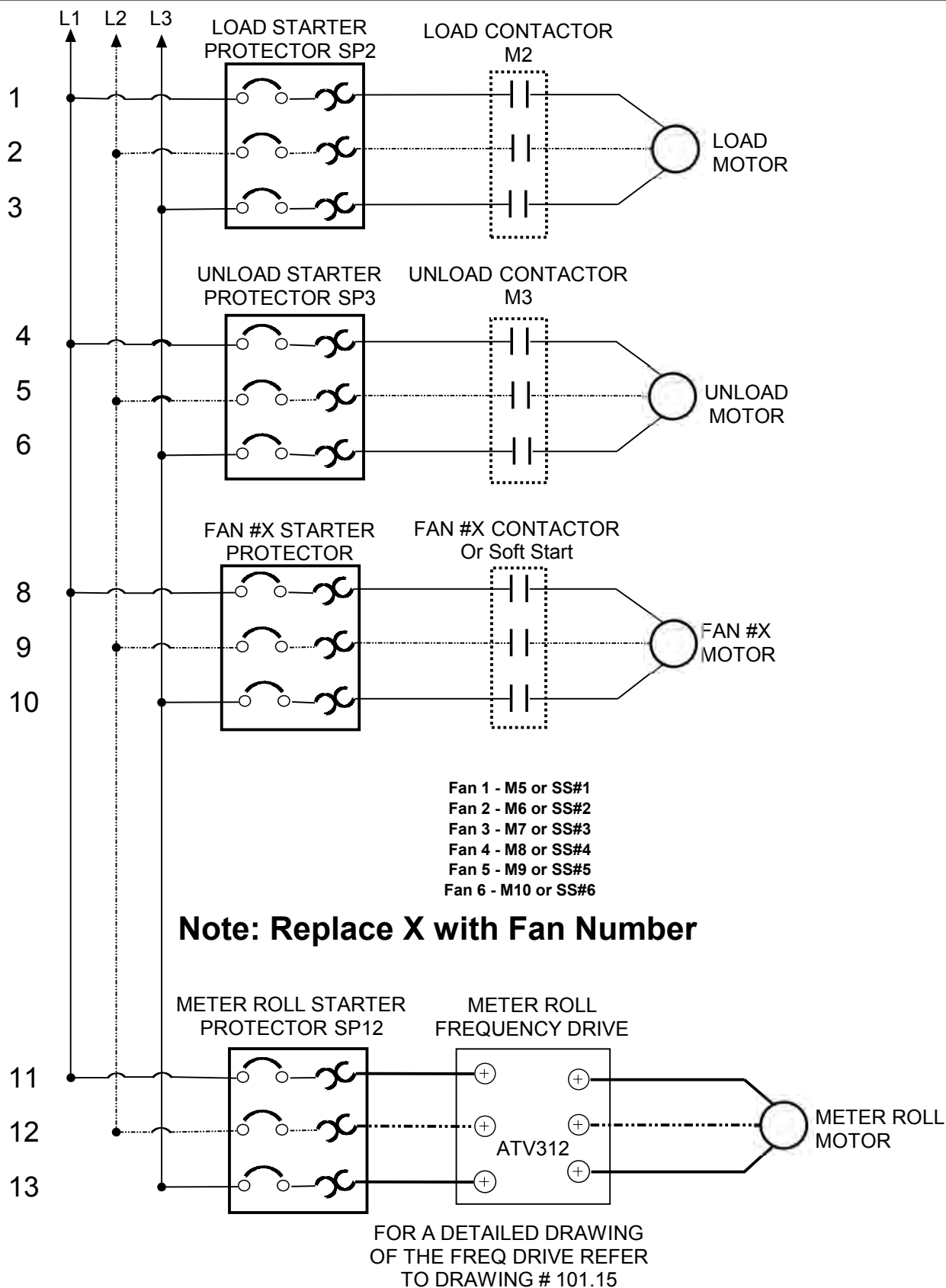
Title: PORTABLE DRYER: Digital Output Ladder Diagram

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: