Aero **40FP**

OPERATOR MANUAL

Cold Jet®

Original Instructions

OM.A40FP.20150807

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EC Declaration of Conformity

We as the manufacturer:

Cold Jet, LLC

455 Wards Corner Road

Loveland, OH 45140 US

+1 513 831 3211 / +1 513 831 1209

declares that the following product:

Product Designation: Aero 40FP Model no.: 2A0290 Voltage: 120/230 VOLTS AC

complies with all relevant requirements of the directives listed below:

Directive 2006/42/EC [Machinery Directive]
Directive 2004/108/EC [EMC Directive]

References to the harmonized standards used:

EN ISO 12100:2010	EN ISO 4414:2010	EN ISO 13857:2008
EN 953:1997+A1:2009	EN ISO 13732-3:2008	EN 60204-1:2006/AC:2010
EN 1088:1995+A2:2008	EN ISO 13849-1:2008/AC:2009	

Person in the European Community authorized to compile the technical documentation:

Cold Jet Europe bvba, Mr. Wim Eeckelaers, Zone 1 Researchpark 330 B-1731 Zellik, Belgium

Place and Date of Issue: Loveland, OH

Michael E. Rivir
V.P.-Engineering,Cold Jet, LLC.

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WHAT IS DRY ICE CLEANING?

Dry ice cleaning is similar to sand blasting, plastic bead blasting or soda blasting where a medium is accelerated in a pressurized air stream to impact a surface to be cleaned or prepared.

However, instead of using hard abrasive media to grind on a surface (and damage it), dry ice cleaning uses soft dry ice accelerated at supersonic speeds to impact the surface and lift the undesirable item off the underlying substrate.

DRY ICE CLEANING:

- is a non-abrasive, nonflammable and non-conductive cleaning method
- is environmentally-responsible and contains no secondary contaminants such as solvents or grit media
- is clean and approved for use in the food industry
- allows most items to be cleaned in place without time-consuming disassembly
- can be used without damaging active electrical or mechanical parts or creating fire hazards
- can be used to remove production residues, release agents, contaminants, paints, oils and biofilms
- can be as gentle as dusting smoke damage from books or as aggressive as removing weld slag from tooling
- can be used for many general cleaning applications

Cold Jet dry ice cleaning uses compressed air to accelerate frozen carbon dioxide (CO_2) “dry ice” pellets to a high velocity. Dry ice pellets can be made on-site or supplied. Pellets are made from food grade carbon dioxide that has been specifically approved by the FDA, the EPA and the USDA.

Carbon dioxide is a non-poisonous, liquefied gas, which is both inexpensive and easily stored at work sites.

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Aero **40FP**

SAFETY GUIDELINES

The Aero 40FP is safe and easy to operate; however, certain precautions must be followed during its use. To understand all the necessary precautions, you must read the entire Aero 40FP manual before operating the unit.

⚠ The Aero 40FP should only be operated by authorized and trained personnel.

IN THIS SECTION

GENERAL SAFETY REQUIREMENTS

- Always follow the guidelines of the governing codes of your local/national body as a minimum standard for ensuring safety.
- Always wear thermal gloves, eye and ear protection (safety glasses and ear plugs).
- Never expose bare skin to CO_2 ice.
- Never point the nozzle at self or anyone else and always exercise extreme caution when people are in the blast area.
- Never use a wire tie to hold the applicator trigger in the on position. This will cause damage that will void the warranty.
- Never use the blasting unit or hoses for anything other than the intended use.
- Never operate in a confined space without an approved ventilation system.
- Never operate the unit with guards removed.
- Never mask the machine's ventilation holes.
- Never operate a damaged blasting unit.
- Never exceed recommended hose or blasting unit pressure levels.
- Do not kink the blast hose before, during or after operation.
- Never disconnect the air supply hose without first shutting off the source air and removing the line pressure.
- Only Cold Jet trained service technicians are certified to work on electrical components.

- Do not operate equipment with electrical parts exposed, jumpered or rendered inoperable.
- Only use dry ice pellets as the cleaning media.
- Always engage applicator safety switch before laying it down or passing it to someone.
- Always turn the main power off and remove the applicator control cable before removing the blast hose.
- Always ensure that hoses are securely attached.
- Keep hoses and power cord out of forklift traffic areas.
- Check hoses and cables for nicks and gouge.

ELECTROSTATIC DISCHARGE

- Static discharge may ignite flammables.
- Electrostatic discharge can be hazardous to the operator and the equipment.
- The static charge of CO_2 varies with the amount of dry ice and humidity present.

Ground the Material Being Cleaned

Always ground the material being cleaned to assure safe operation while blasting.

1. Know your environment.

- Electrostatic buildup changes as humidity levels change and will vary by location. Electrostatic discharge is higher at low humidity levels and occurs most often during winter.

2. Attach static bond cable.

- To minimize electrostatic buildup between the part being cleaned and the applicator, attach the static bond cable between the target surface and the blast hose connection or to an electrically conductive supporting structure. Use a conductivity tester for confirmation.

3. Plug into a grounded power outlet.

- This step is critical for electrostatic dissipation. If the ground is not connected, a charge may build up on the unit or the applicator.

CO_2 SAFETY

- The Aero 40FP uses solid state carbon dioxide (CO_2). CO_2 is nontoxic, noncorrosive and non-conductive. It is approved by the FDA and USDA.
- Solid CO_2 is extremely cold (-109 °F/-78 °C). Always protect skin from direct contact with CO_2 pellets. Direct contact with skin or eyes quickly causes tissue damage.
- Vapor CO_2 can displace the oxygen from any breathing environment rapidly.
- Only operate the 40FP with a proper ventilation system that maintains the concentration levels of the governing codes of your local/national body.
- Always review and observe all safety guidelines when using materials that displace oxygen.
- All operators and supervisors should familiarize themselves with the literature on the physiological characteristics of CO_2 before using the 40FP. The information can be obtained from the governing codes of your local/national body.
- Always use a CO_2 monitoring device when using the 40FP in a confined space.

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COMPONENT GUIDE

The 40FP guarantees the best pellet integrity, maximum cleaning aggression, and the most reliable blast stream on the market. In addition to the standard Aero features, the 40FP uses multiple agitation devices to eliminate clogging—allowing you to blast through the 40lb hopper without stopping.

IN THIS SECTION

SPECIFICATIONS

Weight (empty)	257lb (117kg)
Dimensions	36 x 20 x 40in (91 x 51 x 102cm)
Dry Ice Capacity	40 lb (18.2 kg)
Variable Feed Rate	0 - 4.5 lbs/min (0 - 2 kg/min)
Power Requirements	100 - 140 volts AC 1 Phase (50/60 Hz) 2.5 amps 200 - 240 volts AC 1 Phase (50/60 Hz) 1.2 amps
Feeder Drive	1/4 HP, AC Motor 1, 750 RPM
Blast Pressure Range	20 - 250 psi (1.4 - 17.2 bar)
Supply Pressure Range	65 - 250 psi (4.4 - 17.2 bar)
Air Consumption Range	50-165 CFM (1.4 - 4.7 m^3/min) at 80 psi (5.5 bar)

1 Fill lid

2 Bleed valve

3 Air supply connection

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AERO 40FP (BACK)

1 Blast pressure control
2 Nozzle hanger
3 AC power cord
4 Blast hose connection

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CONTROL PANEL

1 Power switch
2 Blast / power indicator
3 Disable blast, blue light = disabled
4 Feed rate control
5 Incoming / blast air pressure
6 Hour meter

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PERFORMANCE APPLICATOR

1 Machine power indicator
2 Air only - off - air & ice
3 Light switch
4 Blast lights
5 Nozzle retention collar

6 Electric cable connection
7 Blast hose connector
8 Front / rear concurrent hand trigger
9 Threaded mount & hook hanger

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HEAVY DUTY APPLICATOR

1 LED light switch (optional)
2 Applicator safety switch
3 Air / ice control
4 Electric cable connection

5 Nozzle retention collar
6 Blast hose connector
7 Trigger
8 LED light (optional)

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UNIT OPERATION

IN THIS SECTION

START UP

- ⚠ Read all safety instructions before operation and follow them closely (p. 2-4).
- ⚠ Always wear proper personal protective equipment including eye protection to guard against flying objects, ear protection to prevent hearing loss and gloves to protect hands from exposure to cryogenic temperatures.
- ⚠ Before loading dry ice, purge with compressed air to be sure the system is clear of excess moisture and debris.

To start the Aero 40FP:

1. Make sure the Power Switch is off and the bleed valve is closed.
2. Attach the blast hose and control cable to the machine.
3. Attach the applicator to the blast hose and control cable.
4. Attach a nozzle to the applicator.
5. Attach the whip check to the air supply hose, then attach the air supply hose to the machine. (Check the data plate for the operating pressure range.)
6. Connect the static bond cable to the connector on the hose and then to the target surface.
7. Turn air supply on and allow the air hose to pressurize.
8. Plug the power cord into an electrical outlet. If an extension cord is necessary, it must comply with the power requirements of this unit and all governing electrical codes. (Check the data plate for the operating voltage range.)
9. Turn the Control Panel Power Switch on and ensure the Disable Blast button is disengaged (blue light is off).

10. Before loading dry ice, purge the system. Open bleed valve for 30 seconds to remove accumulated moisture from the internal filtration system. Enable the applicator, place applicator in Air + Dry Ice mode, set the feed rate to maximum and blast with compressed air for 30 seconds to clear any moisture build-up in the air and feeder system.
11. Disable the applicator, open the lid, fill with dry ice and close the lid. Enable the blast applicator.
12. The unit is now ready to use. Please read the section on Blast Cleaning Technique before proceeding.

BLAST CLEANING TECHNIQUE

⚠ Read all safety instructions before operation and follow them closely.

1. Always purge the system with air upon start-up, after breaks and before loading dry ice. Following the proper start-up procedure will remove any water ice and moisture build up in the system.
2. Position the blast hose for maximum maneuverability before blasting.
3. Do not kink the blast hose or use the blast hose to pull / maneuver the machine.
4. Hold nozzles perpendicular to the surface for fastest cleaning (recommended for most applications).
5. Optimum standoff distance is 2 - 6 in (5 - 15 cm) for most nozzles.
6. Never allow foreign objects in the dry ice hopper.
7. Do not abuse the nozzles, blast hose, applicator or control cable.
8. To find the optimum feed rate, set the feeder speed to 0 and increase the rate to achieve desired results. Use the minimum amount that is effective.
9. Reduce the feed rate to avoid clogging the nozzle at pressures below 50 psi (3.4 bar).
10. Use the Blast Pressure control by operating the push / pull locking mechanism and turning the dial clockwise to increase and counter-clockwise to decrease.

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RE-LOADING DRY ICE

⚠ Always wear gloves to protect hands from exposure to cryogenic temperatures.

1. Disable the applicator.
2. Place dry ice into the hopper.
3. Close the fill lid.
4. Enable the applicator mode to the air + dry ice position.
5. Squeeze the blast applicator trigger to blast.

SHUT DOWN

⚠ Always wear gloves to protect hands from exposure to cryogenic temperatures.

⚠ Always disconnect electric cables and hoses before transporting the unit.

To shut down the Aero 40FP:

1. Stop blasting and push in the Disable Blast Button on the Control Panel.
2. Remove unused ice from the hopper.
3. Pull out the Disable Blast Button on the Control Panel.
4. Flip the Air/Ice Control Switch on the Applicator to Air Only and blast for 1 minute.
5. Stop blasting and disable the Applicator Safety.
6. Turn OFF the Power Switch.
7. Turn OFF the compressed air supply.
8. Open the bleed valve to relieve all remaining pressure.
9. If open, close the fill lid.
10. When the air hose is fully depressurized, disconnect the machine.

⚠ When shutting the machine down for more than 15 minutes, always make sure the hopper is empty and blast with air only for 1 minute. Failure to do so may result in feeder and/or nozzle freeze-up.

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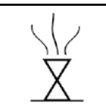
MAINTENANCE

SYMBOL GLOSSARY

IN THIS SECTION

The Aero 40FP uses ISO safety symbols. The symbols come in three categories:

1. A yellow warning triangle/black graphical symbol indicates what the hazard is.
2. A blue mandatory action circle/white graphical symbol indicates an action to take to avoid the hazard.
3. A red prohibited action circle-with-slash/black graphical symbol indicates an action to avoid.

	OPERATION SYMBOL On		OPERATION SYMBOL Hour Meter
	OPERATION SYMBOL Off		OPERATION SYMBOL Air Bleed
	OPERATION SYMBOL Variable Dry Ice Feed Rate		OPERATION SYMBOL Trigger Disable
	OPERATION SYMBOL Regulated Air Pressure		

	WARNING SYMBOL Electrical Shock		MANDATORY ACTION Consult Operators Manual
	WARNING SYMBOL General Danger		MANDATORY ACTION Disconnect Power
	WARNING SYMBOL Hand Crush		MANDATORY ACTION General Mandatory
	WARNING SYMBOL Debris		MANDATORY ACTION Lock Out in De-Energized State
	WARNING SYMBOL Static Shock		MANDATORY ACTION Maintain Safe Pressure
	WARNING SYMBOL Hand Entaglement- Chain Drive		MANDATORY ACTION Wear Ear Protection
	WARNING SYMBOL Low Temperature		MANDATORY ACTION Wear Eye Protection
	WARNING SYMBOL Blade		MANDATORY ACTION Wear Protective Gloves
	WARNING SYMBOL Explosive Release of Pressure		PROHIBITED ACTION Do Not Operate with Guard Removed
	WARNING SYMBOL Skin Puncture / Pressurized Jet		PROHIBITED ACTION No Foreign Objects

DAILY	Use the bleed valve to drain water out of the air filter before using the machine.
	While in operation, check the pressure gauge for damage.
	Inspect the air and blast hoses for damage (IE: cuts or scuff marks).
WEEKLY	Look through the hopper to check the rotor for nicks or gouges.
	Make sure the nozzle airflow exit end is not deformed or burred.
MONTHLY	Inspect the air filter by unscrewing the base a 1/4 turn clockwise.
	Inspect the hopper thumper for worn or damaged parts and also check for loose fittings.
BIANNUAL	Inspect pneumatic air lines
	Inspect the power cord for damage.
	Inspect all lights.
	Inspect the static bonding cable for damage.
	Inspect all the accessories for damage.
	Inspect all valves.
	Inspect for air leaks.

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PROBLEM	CHECK THIS	SOLUTION
Machine will NOT start	Is the unit plugged in?	Plug unit in.
	Is the power switch in the ON position?	Push power switch to ON.
	It still will not start?	Call Cold Jet for support.
Machine blasts air but not pellets	Is the Air/Ice Control Switch set to Air ONLY?	Set the Air/Ice Control Switch to Air and Dry Ice.
	Is the hopper clogged?	Call Cold Jet for support.
	Is applicator Air/Ice control in position?	Call Cold Jet for support.
	Is a foreign object lodged in the feeder assembly?	Call Cold Jet for support.
Machine will NOT blast	Is the air supply connected and the air supply on?	The nozzle may be clogged. Blast with air only to unclog the nozzle.
	Is the incoming air pressure gauge showing pressure?	The nozzle may be clogged. Blast with air only to unclog the nozzle.
	Is the applicator control cable connected to the machine and the applicator?	The nozzle may be clogged. Blast with air only to unclog the nozzle.
	Is the pressure regulator open and displaying pressure?	The nozzle may be clogged. Blast with air only to unclog the nozzle.

If the problem is not resolved, please contact our Customer Support Hotline at:
+1-800-777-9101 (+1-513-576-8981)

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For technical support, accessories and spare parts, contact the appropriate Cold Jet office.

North America

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After Hours Technical Support: +1 513.576.8981

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WARRANTY

Cold Jet® (“CJ”) warrants its products (“Equipment”) provided under this Agreement to be free from defects in materials and workmanship for a period of 12 months (90 days on used equipment), under normal use, maintenance and service as stipulated in the Operator Manual, Commissioning, and Operator Training. At the discretion of CJ, failure to complete Installation, Commissioning, and Operator Training shall result in forfeit of warranty rights. CJ warrants that the equipment will be in good working order on the Date of Shipment and will conform to CJ’s official published specifications.

The warranty period is 12 months (90 days for used equipment) for CJ manufactured Equipment. Original Equipment Manufacturers’ warranties provided by CJ on equipment purchased under this Agreement not manufactured by CJ will be passed through to the Buyer. The warranty period commences on the Date of Shipment of the Equipment.

CJ’s liability is limited to repairing or replacing, at its option, any covered part of its Equipment, which CJ has determined to be defective. Said repair or replacement will be made by CJ or its authorized representative free of charge to the Buyer during the warranty period. Any replaced part will become the property of CJ. If, after repeated efforts, CJ is unable to restore its Equipment to good working order, or to replace the defective parts all as warranted, CJ may replace the Equipment in its entirety at its discretion. Any claim must be made in writing to CJ within 30 days after the defect is discovered and any claim not made within that period shall be deemed waived or released and denied.

Warranty service provided under this Agreement does not assume uninterrupted operation of the Equipment. The suitability of the equipment for the purpose intended is not included in the warranty.

This warranty shall not apply and CJ shall be neither responsible nor liable for:

A) Consequential, collateral or special losses or damages;

B) Equipment conditions caused by abnormal conditions of use, accident, neglect or misuse of Equipment, improper storage or damages resulting during shipment as determined by CJ;

C) The replacement of normal wear items, including but not limited to air, blast and whip end hoses;

D) Deviation from the Equipment’s prescribed maintenance programs, replacement parts, operating instructions, specifications or other terms of sale;

E) Labor charges, loss or damage resulting from improper operation, maintenance or repairs made by person(s) other than CJ or CJ-authorized service representatives;

F) Improper application of the product.

In no event shall CJ be liable for claims, whether arising from breach of contract or warranty claims of negligence or negligent manufacture, in excess of the purchase price.

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Aero 40FP

APPENDIX

IN THIS SECTION

PLANT AIR (CENTRAL COMPRESSED AIR SYSTEM)

Manufacturing plants with central compressed air systems should have an after cooler and a 2-stage coalescing filter assembly downstream of the receiver tank. Hot metal pipes are an indication this is needed. To verify that the plant air system is adequate for the Aero 40FP, the air compressor needs to produce an air volume 10% greater than the Aero 40FP maximum air volume in addition to the air volume consumed by normal plant operation. To determine adequate air volume, watch the pressure gauge while blasting.

- If the gauge drops slowly, the compressor is insufficient.
- If the gauge drops quickly, there is a restriction or the pipe is too small.
- If the gauge stays steady, then the compressor and piping are adequate.

To maintain adequate pressure to the Aero 40FP:

- For distances less than 100 ft (30 m) between the air compressor and the Aero 40FP, Cold Jet recommends a flexible 1 in (25 mm) air hose, preferably the hose supplied with the Aero 40FP.
- For distances greater than 100 ft (30 m) between the air compressor and the Aero 40FP, Cold Jet recommends a larger hose/pipe to maintain adequate blast pressure.

⚠ If an air drop is seldom used or is being used with the Aero 40FP for the first time, water and rust may have collected in the line. Before connecting to the air supply, purge the line to prevent contamination of the Aero 40FP.

APPENDIX A:
BLAST AIR QUALITY
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PORTABLE AIR

Portable air compressors are mainly used for shop tools, not dry ice blasting units; therefore, they may not be equipped to cool or remove air moisture.

⚠ An after cooler and moisture trap/filter MUST be used. An after cooler with a 15 °F (-9 °C) approach is required to reduce the discharge air temperature 180 °F (82 °C) to within 15 °F (-9°C) of ambient air temperature.

If an air cooler is not used:
- Incoming air moisture will rapidly cool and freeze at the Aero 40FP feeder.
- Ice will accumulate in the feeder, distorting the air flow and seal.
- Ice will break off inside the hose and lodge in the nozzle, causing a jam.
- Ice may exit the nozzle and damage the target surface.

If blasting continuously, use an air dryer to further reduce the air moisture (dew point). Desiccant dryers produce a dew point of -40 °F (-40 °C), resulting in a dew point low enough for continuous blasting.

To verify the compressor is of adequate size for the Aero 40FP, the air compressor needs to produce an air volume 10% greater than the Aero 40FP's maximum permissible air volume. To determine adequate air volume, watch the pressure gauge while blasting.

- If the gauge drops slowly, the compressor is insufficient.
- If the gauge drops quickly, there is a restriction or the pipe is too small.
- If the gauge stays steady, then the compressor and piping are adequate.

To maintain adequate pressure, the hose size from the compressor to the Aero 40FP needs to be a minimum 1 in (25 mm) in diameter for lengths up to 100 ft (30 m). Longer runs may require larger hose sizes.

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APPENDIX B: RESIDUAL RISKS

When safety instructions are followed, most of the risks associated with the Aero 40FP are mitigated. However, the operator should be aware that a few residual risks remain.

1. Carbon Dioxide

CO_2 is an asphyxiant gas, which displaces the oxygen in the air. When the carbon dioxide levels are not monitored, there is a risk of exposure to high concentrations of CO_2. Exposure to high concentrations of carbon dioxide can result in shortness of breath, headaches, dizziness, increased heart rate, impaired hearing, nausea, loss of consciousness or, in extreme cases, death. Always use a CO_2 monitoring device when using the Aero 40FP in a confined space.

Solid CO_2 is extremely cold (-109 °F/-78 °C). This presents a risk to the operator, as direct contact with skin or eyes quickly causes tissue damage. Always protect skin from direct contact with CO_2 pellets, nuggets or slices.

2. Noise Emissions

When the proper safety precautions are not followed, prolonged exposure to the noise emitted by the Aero 40FP can cause damage. Long-term exposure to loud noises can result in loss of hearing or tinnitus. Always wear ear protection.

3. Pressurized Air

Operating the Aero 40FP requires the use of pressurized air, resulting in the risk of hoses bursting or fittings failing. Always be alert when operating the machinery. If a failure does occur, be sure to turn off the air at the source.

Never hold the air stream directly against skin. This could result in an air embolism, which is often fatal.

4. Static Electricity

⚠️ Static electricity can interfere with the proper functioning of a pacemaker.

Even when grounding or bonding procedures are followed, static electricity can present a danger to the operator. To reduce this risk, always follow grounding or bonding instructions.

APPENDIX C: SCHEMATICS

IN THIS SECTION

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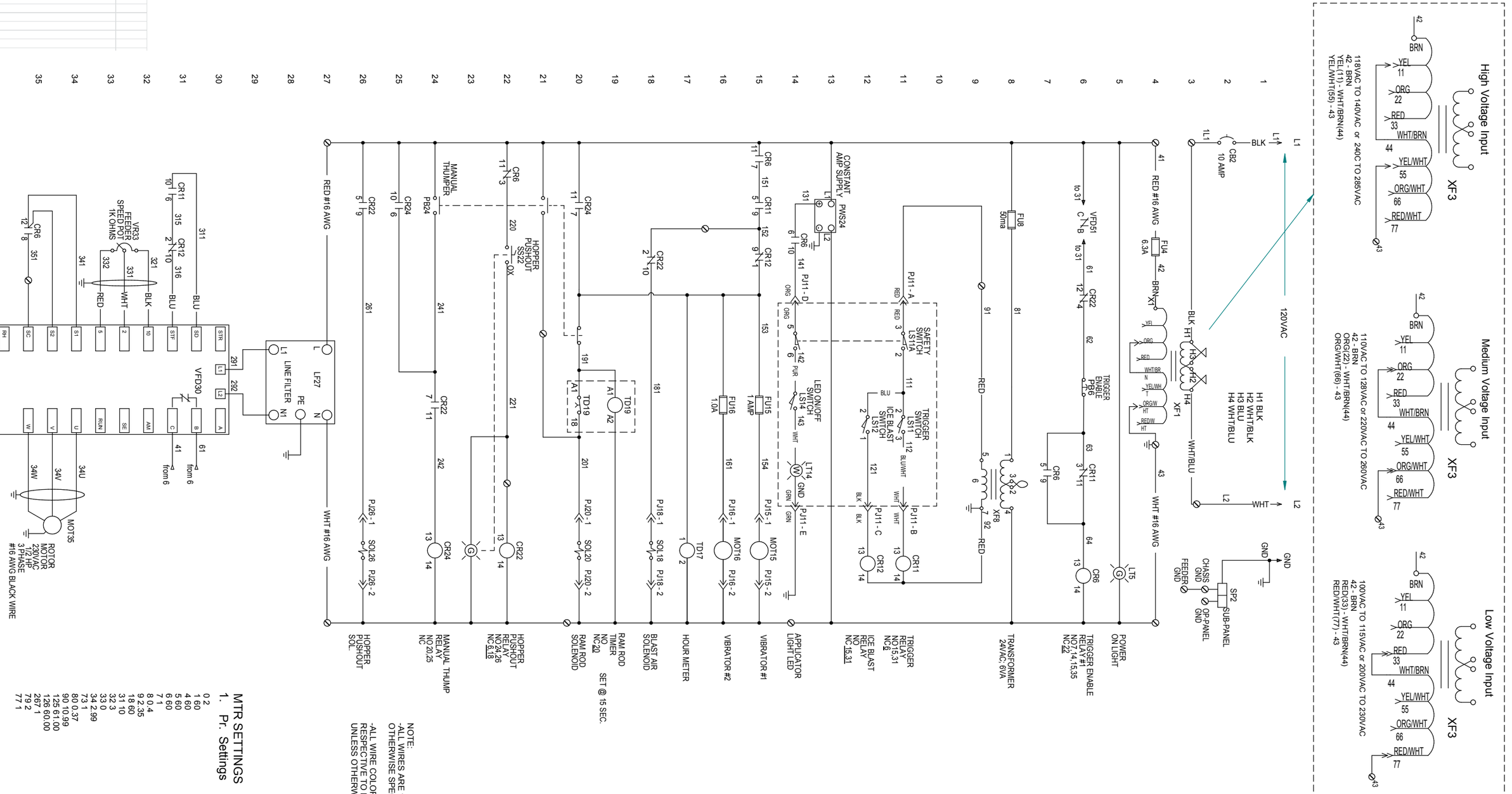
REVISION HISTORY		
REV	DESCRIPTION	DATE



MTR SETTINGS

1. Pr. Settings

0	2
1	60
4	60
5	60
6	60
7	1
8	0.4
9	2.35
18	60
31	10
32	3
33	0
34	2.99
73	1
80	0.37
90	10.99
125	61.00
126	60.00
267	1
79	2
77	1

NOTE:
-ALL WIRES ARE 18AWG UNLESS OTHERWISE SPECIFIED.

-ALL WIRE COLOR IS RED & WHITE RESPECTIVE TO POWER AND COMMON UNLESS OTHERWISE SPECIFIED.

SCHEMATIC

UNLESS OTHERWISE SPECIFIED
X/X ± 1/64
.X ± .1
.XX ± .01
.XXX ± .005
.XXXX ± .0005
ANGLES ± .5°
SURFACES 125

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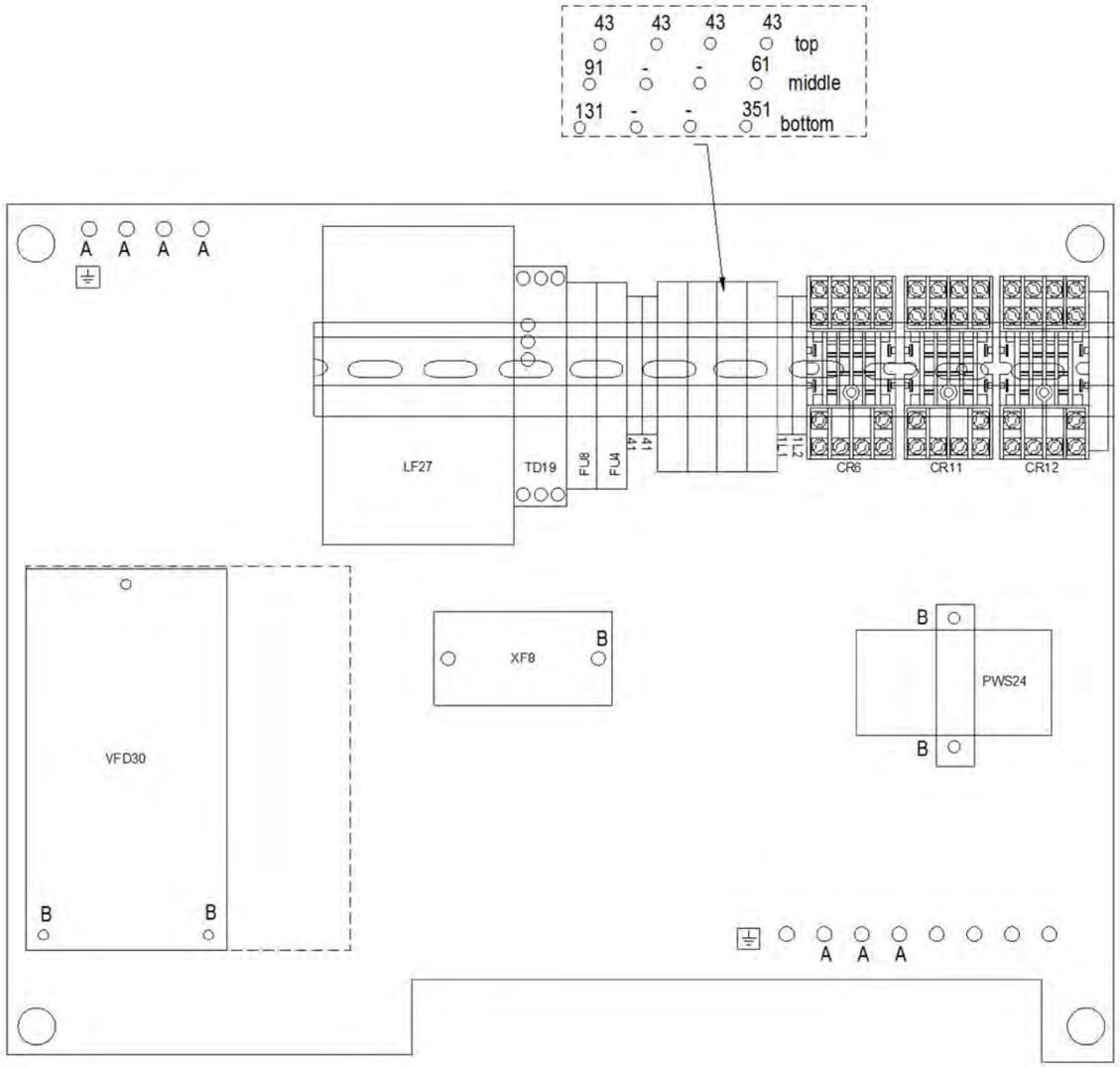
MANUFACTURABILITY REVIEW:	DATE:
FIRST ARTICLE INSPECTION:	DATE:
FUNCTIONAL VERIFICATION:	DATE:
VANTAGE ENTRY:	DATE:

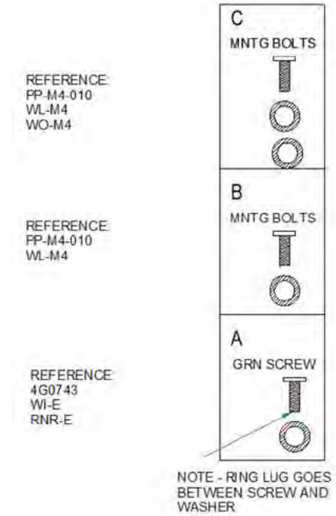
Cold Jet.

TYPE: D ASSEMBLY

TITLE: SCHEMATIC AND BOM, ELECTRICAL, 120VAC, AERO 80 FP

MATERIAL:		STOCK SIZE: -	PROJECT: PD00258
DERIVED FROM: 6G0159	DATE: -	RELEASE DATE: -	SHEET 1 OF 3
CHANGED BY: -	DATE: -	PART NUMBER: 6G0312	REVISION:
CREATED BY: mbishop	DATE: 05\19\2015		





PANEL LAYOUT

UNLESS OTHERWISE SPECIFIED
X/ ± 1/64
X ± .1
XX ± .01
XXX ± .005
XXXX ± .0005
ANGLES ± 1°
SURFACES 125

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MANUFACTURABILITY REVIEW:	DATE:
FIRST ARTICLE INSPECTION:	DATE:
FUNCTIONAL VERIFICATION:	DATE:
RELEASED BY:	DATE:

Cold Jet.

TYPE: D ASSEMBLY

TITLE: SCHEMATIC AND BOM, ELECTRICAL, 120VAC, AERO 40FP

MATERIAL:		STOCK SIZE: –	PROJECT: AD00292
DERIVED FROM: –	DATE: –	RELEASE DATE: –	SHEET 2 OF 3
DRAWED BY: mbishop	DATE: 7/2/2015	PART NUMBER: 6G0310	REVISION: D
CHECKED BY: mbishop	DATE: 08/19/2015		

ITEM	USER1	TAGS	QTY	SUB	DESC	MISC1
1	3G0085-A	PJ11	1		CABLE	MOLDED PANEL CONNECTION
2	4G1501		50in.		CABLE	16/4 W/ SHIELD
3	4G0760	L1	180in.		CABLE	16/3 TYPE OS
4	4H0167	L1	1		NEMA PLUG	5-15 SPLASH PROOF
5	4G1358		1		INSULATION DISPLACEMENT	CONN.
6	13464		2		FULL INS CONNECTOR	
7	4G0750	VR33	1		KNOB	BLACK
8	4G1031	VR33	1		POTENTIOMETER	10K OHMS
9	4G1042	CB2	1		CIRCUIT SWITCH	
10	4G1044	CB2	1		CIRCUIT COVER	
11	4G1155	PB6	1		BASE	SW 1NC CONTACTS 22.5mm
12	4G1187	TD17	1		HOUR METER	240VAC
13	4G1206	LT14	1		BASE LIGHT MODULE	220VAC LED
14	4G1255	LT14	1		PILOT HEAD LIGHT	22.5 mm
15	4G1256	LT14	1		PILOT LIGHT BASE	
16	4G1307		2		CONNECTOR	18-22 AWG
17	4G1502	PB6	1		PUSHBUTTON	
18	4G0366		1		CAP HOLE PLUG	
19	4G1793		1		CORD GRIP	
20	4G1794		1		LOCKNUT	
21	4G1007		2		GRIP	CORD PG11
22	4G1008		2		LOCKNUT	PG11
23	4G1009		1		GRIP	CORD PG16
24	4G1010		1		LOCKNUT	PG16
25	4I0152-A	PJ18, PJ20	2		CABLE	6' DIN "I"
26	4P0021		2		LABEL	PROTECTIVE GROUND
27	4P0023A		1		LABEL	EARTH GROUND GRAPHIC
28	4G0063		1		END CLAMP	
29	4G0495		1		WASHER, SEALING, 1/2"	STEEL RING W/ NEOPRENE
30	4G0709		1		FITTING, BUSHING	3/4" X 1/2"
31	4Z0045		76in.		WEATHERSTRIP INSULATION	
32	4G1127		1		CORD GRIP, 5-12MM, 1/2"	GRAY POLYMER
33	4G1358		4		CONNECTOR, INSULATION	DISPLACEMENT, 16-22AWG
34	4G1039-A	XF8	1		TRANSFORMER	6VA 230/115VAC
35	2H0020	XF3	1		TRANSFORMER	1KVA 120/230 VAC
36	4G1814	PWS24	1		LED POWER SOURCE	
37	3G0183	PWS24	1		POWER SUPPLY BRACKET	
38	3G0208		1		SUB-PANEL	
39	4G0058		4		TERMINAL BLOCK	#22 - #10 AWG
40	4G0063		1		TERMINAL BLOCK CLAMP	GREY
41	4G0066		2		HORIZONTAL JUMPER BAR	
42	4G0068		11in.		DIN TRACK	
43	4G0081		50in.		CABLE	3 COND.
44	4G0084-BL		120in.		WIRE	
45	4G0084-R		240in.		WIRE	
46	4G0084-W		100in.		WIRE	
47	4G0423-B		40in.		WIRE	
48	4G0423-W		6in.		WIRE	
49	4G0423-Y/G		40in.		WIRE	
50	4G1361		5		CONNECTOR, INSULATION	DISPLACEMENT, 16-22AWG, T
51						
52						

53	4G1041	FU8	1		FUSE	50 MA
54	4G1108-A	TD19	1		RECYCLING TIMER	
55	4G1218	FU4, FU8	2		FUSED TERMINAL BLOCK	W/ BLOWN
56	4G1224	FU4	1		FUSE	250 VAC 6.3A
57	4G1358		6		CONNECTOR INSULATION DISPLACEMENT	
58						
59	4G1400		4		TERMINAL BLOCKS	3 AMP
60	4G1401		4		TERMINAL BLOCK JUMPER	10 POLE
61	4G1490	CR6	1		RELAY	240 V
62	4G1037	CR6,CR11,CR12	3		SOCKET RELAY	
63	4G1038	CR6,CR11,CR12	6		RELAY CLIP	
64	4G1529	CR11,CR12	2		RELAY CONTROL	24VAC 4 POLE
65	4G1588	VFD30	1		VFD CONTROLLER	230 VAC 1/2HP
66	4H0200-A	LF27	1		FILTER	10 AMP TRANSIANT
67	RNR-E		6		LUG, RING	#10, 18-20AWG
68	FNR-C		5		LUG, FORK	22-18 #6 STUD
69	RNB-E		3		LUG, RING	#10, 14-16 AWG
70	WF-M4		2		WASHER, FLAT	M4
71	WI-E		8		WASHER, LOCK	
72	WL-M4		12		WASHER, LOCK	M4
73	PP-M4-010		10		SCREW, 10mm	PHILLIPS PAN HEAD
74	NL-06C		4		NUT, NYLON, 3/8"	M4
75	WI-06		4		WASHER, LOCK, 3/8"	INTERNAL TOOTH
76	WF-06		4		WASHER, FLAT, 3/8"	
77	WL-08		1		WASHER, LOCK	1/2 IN
78	HH-08C-016		1		SCREW, 1/2 - 13 X 1"	HEX HEAD CAP
79	PP-M3-005		2		SCREW	PHILLIPS PAN HEAD
80	4Z0417-A		4		SCREW	PHILLIPS PAN HEAD
81	4G0743		7		SCREW	10-32 x3/8
82	PP-M4-012		2		SCREW, 12mm	PHILLIPS PAN HEAD
83	4G1259	PB6	1		MODULE, PUSHBUTTON LT.	BLUE, 230 V
84	4G1557	PB6	1		CONTACT BLOCK, NO.	10 AMP, 600 V
85	13488		10		CONNECTOR, CABLE END, #18, RED	
86	WO-M4		2		WASHER, OVRESIZED.	M4XM12 OD.

BILL OF MATERIAL

UNLESS OTHERWISE SPECIFIED
X/X ± .064
X ± .1
XX ± .01
XXX ± .005
XXXX ± .0005
ANGLES ± .5°
SURFACES 125

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Cold Jet.

D
TYPE: ASSEMBLY
TITLE: SCHEMATIC AND BOM, ELECTRICAL, 120VAC, AERO 40FP

MATERIAL: --	FINISH: --	ISSUE DATE: --	PROJECT: AD00292
DRAWN BY: mkilgroe	DATE: 7/15/2015	RELEASED BY: --	SHEET: 3 OF 3
CHECKED BY: mkilgroe	DATE: 07/15/2015	PART NUMBER: 6G0310	REVISION: D

REVISION HISTORY		
REV	DESCRIPTION	DATE
A	UPDATE BOM TO MATCH AS BUILT	5/10/2015
B	P1: ADD LINE 7 TRIGGER DISABLE LIGHT, REMOVE APPLICATOR P3: ADD 4G1289 & 4G1567, ADD TAG NUMBERS	5/23/2015
C	FIRST ARTICLE BUILD: P1: ADD TERMINAL LINE 14, TD19 SETTING 1.10 WAS 8.60, ADD WIRE COLOR LINE 2, P2: ADD GROUND LABELS, ADD TRIPPLE-STACK TERMINAL CHART, ADD END CAP. P3: ADD 4G0063, 13488, WO-344, UPDATED QTY'S.	7/8/2015
D	P1: MOVE POWER ON LIGHT FROM LINE 3 TO LINE 14, NOW TURNS OFF WHEN TRIGGER DISABLED	7/21/2015

High Voltage Input

118VAC TO 140VAC or 240VAC TO 285VAC
42 - BRN
YEL(11) - WHT/BRN(44)
YEL/WHT(55) - 43

Medium Voltage Input

110VAC TO 128VAC or 220VAC TO 260VAC
42 - BRN
ORG(22) - WHT/BRN(44)
ORG/WHT(66) - 43

Low Voltage Input

100VAC TO 115VAC or 200VAC TO 230VAC
42 - BRN
RED(33) - WHT/BRN(44)
RED/WHT(77) - 43

230 VAC

H1 BLK
H2 WHT/BLK
H3 BLU
H4 WHT/BLU

SEE APPLICATOR INFORMATION FOR SPECIFIC SCHEMATIC

MTR SETTINGS
1. Pr. Settings

0.2	
1.60	
4.60	
5.60	
6.60	
7.1	
8.0.4	
9.1.12	
18.80	
31.10	
32.3	
33.0	
34.2.99	
73.1	
80.0.188	
90.10.99	
125.61.00	
126.60.00	
267.1	
79.2	
77.1	

SINK / SOURCE
SW8

NOTE:
-ALL WIRES ARE 18AWG UNLESS OTHERWISE SPECIFIED.

-ALL WIRE COLOR IS RED & WHITE RESPECTIVE TO POWER AND COMMON UNLESS OTHERWISE SPECIFIED.

-USING A BOND CABLE, BOND THE OPERATOR PANEL TO A GROUND.

TD19 SETTING
0.1-1
1.5
1.10
5

UNLESS OTHERWISE SPECIFIED
X/X ± 1/64
X ± .1
XX ± .01
XXX ± .005
XXXX ± .0005
ANGLES ± .5°
SURFACES 125

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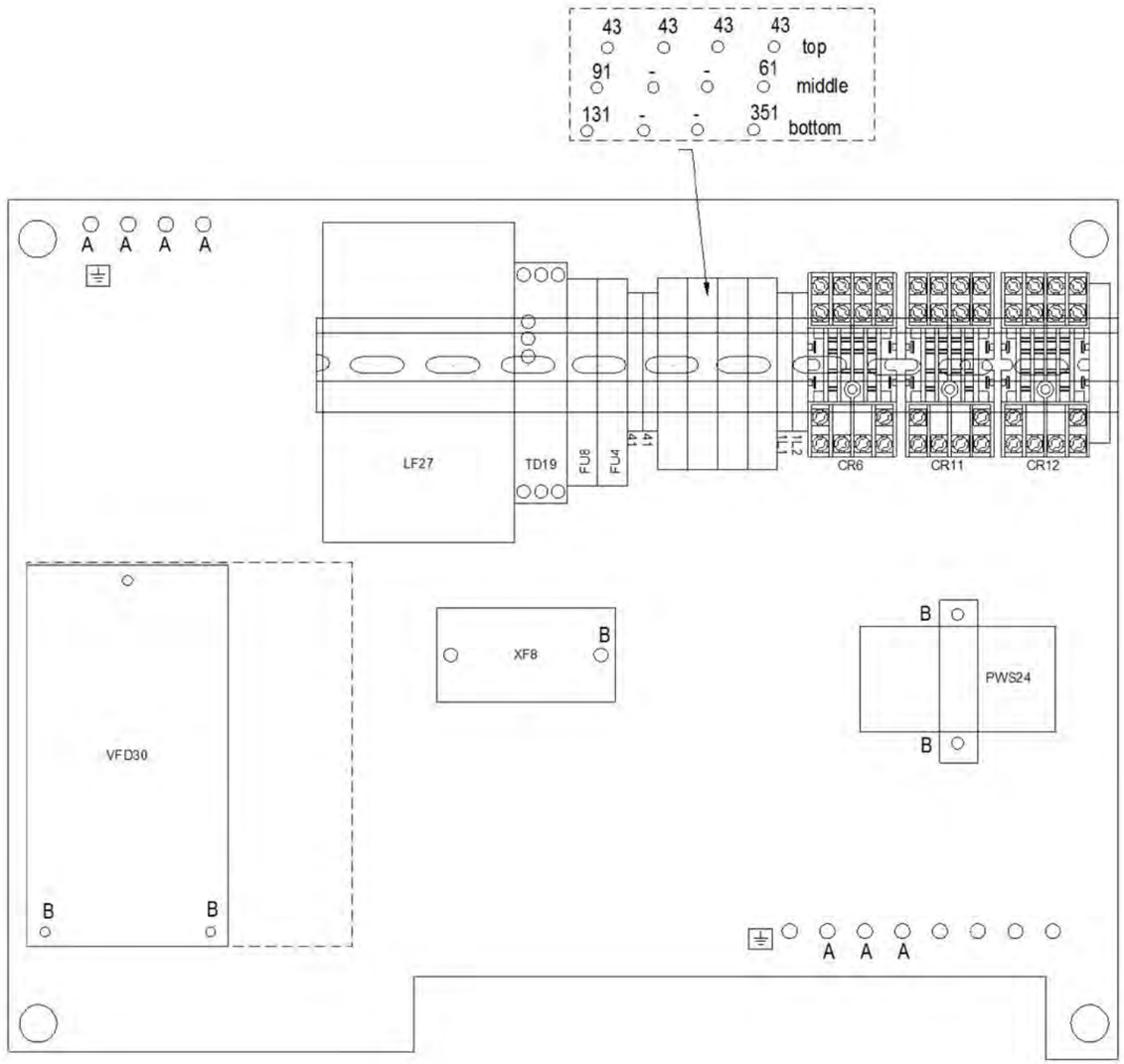
Cold Jet.

D
TYPE: ASSEMBLY
TITLE: SCHEMATIC AND BOM, ELECTRICAL, 230VAC, AERO 40FP

MATERIAL: -	FINISH: -	PROJECT: AD00292	
DRAWING PROJ: -	DWG: -	RELEASE DATE: -	SHEET 1 OF 3
DRAWN BY: mkilgroe	DATE: 7/15/2015	PART NUMBER: 6G0311	REVISION: D
CREATED BY: mkilgroe	DATE: 05/19/2015		

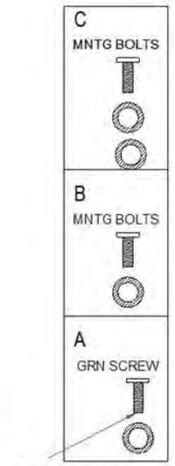
SCHEMATIC



REFERENCE:
PP-M4-010
WL-M4
WO-M4

REFERENCE:
PP-M4-010
WL-M4

REFERENCE:
4G0743
WI-E
RNR-E



NOTE - RING LUG GOES BETWEEN SCREW AND WASHER

PANEL LAYOUT

UNLESS OTHERWISE SPECIFIED
X.X ±1.64
X ±1
XX ±.01
XXX ±.005
XXXX ±.0005
ANGLES ±1°
SURFACES 125

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MANUFACTURABILITY REVIEW:	DATE:
FIRST ARTICLE INSPECTION:	DATE:
FUNCTIONAL VERIFICATION:	DATE:
RELEASE BY:	DATE:

Cold Jet.

D

TYPE: ASSEMBLY

TITLE: SCHEMATIC AND BOM, ELECTRICAL, 230VAC, AERO 40FP

MATERIAL: –		STOCK SIZE: –	PROJECT: AD00292
DERIVED FROM: –	DATE: –	RELEASE DATE: –	SHEET 2 OF 3
CHANGED BY: mbishop	DATE: 7/21/2015	PART NUMBER: 6G0311	REVISION: D
CREATED BY: mbishop	DATE: 05/18/2015		

ITEM	USER1	TAGS	QTY	SUB	DESC	MISC1
1	3G0085-A	PJ11	1		CABLE	MOLDED PANEL CONNECTION
2	4G1501		50in.		CABLE	16/4 W/ SHIELD
3	4H0150	L1	180in.		CABLE	16/3 TYPE OS
4	4H0149	L1	1		NEMA PLUG	PLUG CEE7/7 16 AMPS
5	4G1358		1		INSULATION DISPLACEMENT	CONN.
6	13464		2		FULL INS CONNECTOR	
7	4G0750	VR33	1		KNOB	BLACK
8	4G1031	VR33	1		POTENTIOMETER	10K OHMS
9	4G1043	CB2	1		CIRCUIT SWITCH	
10	4G1044	CB2	1		CIRCUIT COVER	
11	4G1155	PB6	1		BASE	SW 1NC CONTACTS 22.5mm
12	4G1187	TD17	1		HOUR METER	240VAC
13	4G1206	LT14	1		BASE LIGHT MODULE	220VAC LED
14	4G1255	LT14	1		PILOT HEAD LIGHT	22.5 mm
15	4G1256	LT14	1		PILOT LIGHT BASE	
16	4G1307		2		CONNECTOR	18-22 AWG
17	4G1502	PB6	1		PUSHBUTTON	
18	4G0366		1		CAP HOLE PLUG	
19	4G1793		1		CORD GRIP	
20	4G1794		1		LOCKNUT	
21	4G1007		2		GRIP	CORD PG11
22	4G1008		2		LOCKNUT	PG11
23	4G1009		1		GRIP	CORD PG16
24	4G1010		1		LOCKNUT	PG16
25	4I0152-A	PJ18, PJ20	2		CABLE	6' DIN "I"
26	4P0021		2		LABEL	PROTECTIVE GROUND
27	4P0023A		1		LABEL	EARTH GROUND GRAPHIC
28	4G0063		1		END CLAMP	
29	4G0495		1		WASHER, SEALING, 1/2"	STEEL RING W/ NEOPRENE
30	4G0709		1		FITTING, BUSHING	3/4" X 1/2"
31	4Z0045		76in.		WEATHERSTRIP INSULATION	
32	4G1127		1		CORD GRIP, 5-12MM, 1/2"	GRAY POLYMER
33	4G1358		4		CONNECTOR, INSULATION	DISPLACEMENT, 16-22AWG
34	4G1039-A	XF8	1		TRANSFORMER	6VA 230/115VAC
35	2H0020	XF3	1		TRANSFORMER	1KVA 120/230 VAC
36	4G1814	PWS24	1		LED POWER SOURCE	
37	3G0183	PWS24	1		POWER SUPPLY BRACKET	
38	3G0208		1		SUB-PANEL	
39	4G0058		4		TERMINAL BLOCK	#22 - #10 AWG
40	4G0063		1		TERMINAL BLOCK CLAMP	GREY
41	4G0066		2		HORIZONTAL JUMPER BAR	
42	4G0068		11in.		DIN TRACK	
43	4G0081		50in.		CABLE	3 COND
44	4G0084-BL		120in.		WIRE	
45	4G0084-R		240in.		WIRE	
46	4G0084-W		100in.		WIRE	
47	4G0423-B		40in.		WIRE	
48	4G0423-W		6in.		WIRE	
49	4G0423-Y/G		40in.		WIRE	
50	4G1361		5		CONNECTOR, INSULATION	DISPLACEMENT, 16-22AWG, T
51						
52						

53	4G1041	FU8	1		FUSE	50 MA
54	4G1108-A	TD19	1		RECYCLING TIMER	
55	4G1218	FU4, FU8	2		FUSED TERMINAL BLOCK	W/ BLOWN
56	4G1224	FU4	1		FUSE	250 VAC 6.3A
57	4G1358		6		CONNECTOR INSULATION DISPLACEMENT	
58						
59	4G1400		4		TERMINAL BLOCKS	3 AMP
60	4G1401		4		TERMINAL BLOCK JUMPER	10 POLE
61	4G1490	CR6	1		RELAY	240 V
62	4G1037	CR6,CR11,CR12	3		SOCKET RELAY	
63	4G1038	CR6,CR11,CR12	6		RELAY CLIP	
64	4G1529	CR11,CR12	2		RELAY CONTROL	24VAC 4 POLE
65	4G1588	VFD30	1		VFD CONTROLLER	230 VAC 1/2HP
66	4H0200-A	LF27	1		FILTER	10 AMP TRANSIANT
67	RNR-E		6		LUG, RING	#10, 18-20AWG
68	FNR-C		5		LUG, FORK	22-18 #6 STUD
69	RNB-E		3		LUG, RING	#10, 14-16 AWG
70	WF-M4		2		WASHER, FLAT	M4
71	WI-E		8		WASHER, LOCK	
72	WL-M4		12		WASHER, LOCK	M4
73	PP-M4-010		10		SCREW, 10mm	PHILLIPS PAN HEAD
74	NL-06C		4		NUT, NYLON, 3/8"	M4
75	WI-06		4		WASHER, LOCK, 3/8"	INTERNAL TOOTH
76	WF-06		4		WASHER, FLAT, 3/8"	
77	WL-08		1		WASHER, LOCK	1/2 IN
78	HH-08C-016		1		SCREW, 1/2 - 13 X 1"	HEX HEAD CAP
79	PP-M3-005		2		SCREW	PHILLIPS PAN HEAD
80	4Z0417-A		4		SCREW	PHILLIPS PAN HEAD
81	4G0743		7		SCREW	10-32 x3/8
82	PP-M4-012		2		SCREW, 12mm	PHILLIPS PAN HEAD
83	4G1259	PB6	1		MODULE, PUSHBUTTON LT.	BLUE, 230 V
84	4G1557	PB6	1		CONTACT BLOCK, NO.	10 AMP, 600 V
85	13488		10		CONNECTOR, CABLE END, #18, RED	
86	WO-M4		2		WASHER, OVRESIZED,	M4XM12 OD.

BILL OF MATERIAL

UNLESS OTHERWISE SPECIFIED
X/X ± 1/64
.X ± .1
.XX ± .01
.XXX ± .005
.XXXX ± .0005
ANGLES ± .5°
SURFACES 125

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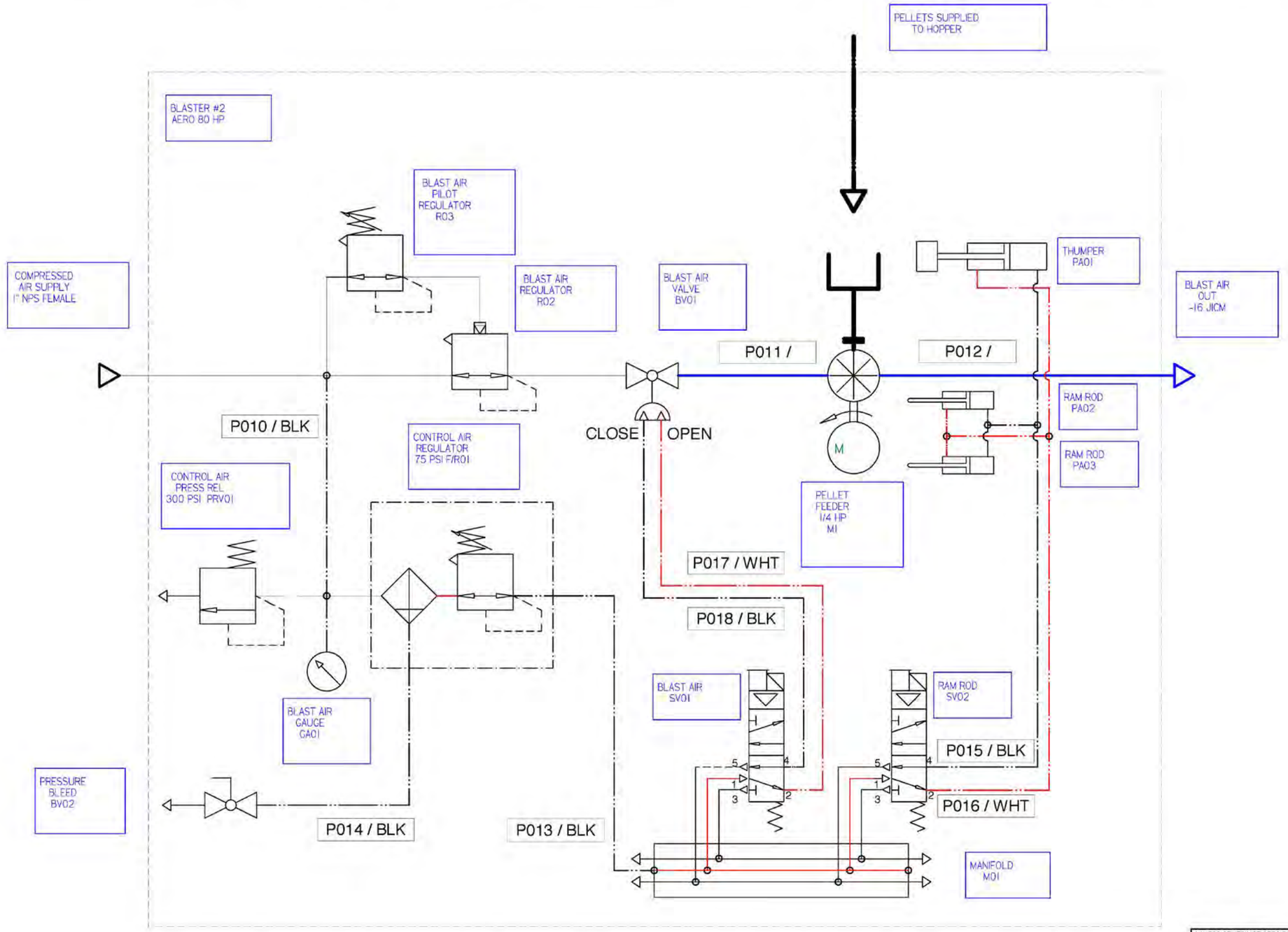
Cold Jet.

D

TYPE: ASSEMBLY

TITLE: SCHEMATIC AND BOM, ELECTRICAL, 230VAC, AERO 40FP

MATERIAL: -	FINISH: -	PROJECT: AD00292
DRAWN BY: mkidnie	DATE: 7/31/2015	RELEASED DATE: -	SHEET 3 OF 3
CHECKED BY: mkidnie	DATE: 08/18/2015	PART NUMBER: 6G0311	REVISION: D



LEGEND	
LINE/ DEVICE LABEL	DEFINITION
BV	BALL VALVES
PRV	PRESS RELIEF VALVES
FC	FLOW CONTROL VALVES
PS	PRESSURE SWITCHES
TS	TEMPERATURE SWITCHES
LS	LEVEL SWITCHES
R	REGULATORS
F	FILTERS
GA	GAUGES
M	MANIFOLDS
PA	PNEUMATIC ACTUATORS
SA	SOLENOID ACTUATORS
FLT	FLOAT SWITCH
SV	SOLENOID VALVE
F/R	FILTER /REGULATOR

HOSE LEGEND	
	BLASTING PELLETS, MANUAL FEE
	-20 TUBING, 304 SST, .060" WAL
	-16 FLEXIBLE HOSE
	-
	.25" NYLON TUBING, BLACK
	.25" NYLON TUBING, WHITE
	MECHANICAL FITTINGS
	FIELD CONNECTIONS

UNLESS OTHERWISE SPECIFIED
XX ± 1/64
.X ± .1
.XX ± .01
.XXX ± .005
.XXXX ± .0005
ANGLES ± .5°
SURFACES 125

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MANUFACTURABILITY REVIEW	DATE		
TEST ARTICLE VERIFICATION	DATE		
FUNCTIONAL VERIFICATION	DATE		
RELEASE ENTRY	DATE		

Cold Jet.

D — ASSEMBLY

TITLE: BLAST UNIT, AERO 40FP

MATERIAL:		STOCK SIZE:	PROJECT: PD00257
DRAWN FROM: Enter Source Part	DATE: -	DOCUMENT NO.: Error: No reference	SHEET 3 OF 3
CHANGED BY: -	DATE: -	PART NUMBER: 2A0290	REVISION
CREATED BY: MHVIR	DATE: 03\27\2015		

OM.A40FP.20150807

OM.A40FP.20150807