i3 MICROCLEAN®

OPERATOR MANUAL

Original Instructions

Cold Jet®
the force of nature

OM.MC.20160506

Printed in the U.S.A

EC Declaration of Conformity

We as the manufacturer:

Cold Jet LLC

455 Wards Corner Road

Loveland, OH 45140 US

declare that the following product:

Product Designation: i³ MicroClean **Model no.: 2A0169** **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 953:1997+A1:2009
EN 1088:1995+A2:2008
EN ISO 4414:2010
EN ISO 13732-3:2008
EN ISO 13849-1:2008/AC:2009
EN ISO 13857:2008
EN 60204-1:2006/AC:2010

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

Cold Jet Europe bvba, Mr. Wim Eeckelaers, Dellestraat 55, B-3550 Heusden-Zolder, Belgium

Place of Issue: Loveland, OH

Name: Mike E. Rivir

Position: V.P. – Engineering, Cold Jet LLC.

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 nonconductive 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.


i3
MICROCLEAN®
SAFETY GUIDELINES

The i³ MicroClean 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 i³ MicroClean manual before operating the unit.

⚠ **The i³ MicroClean 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 as the cleaning media
- Always turn the application safety on 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 i³ MicroClean uses solid state carbon dioxide (CO_2). CO_2 is nontoxic, non-corrosive and nonconductive. 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, nuggets or slices. 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 i³ MicroClean 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 i³ MicroClean. The information can be obtained from the governing codes of your local/national body.
- Always use a CO_2 monitoring device when using the i³ MicroClean in a confined space.

MICROCLEAN®

COMPONENT GUIDE

The single hose electric i³ MicroClean features Cold Jet's patented shaved dry ice technology, providing unparalleled precision and reliability. This environmentally responsible system enables you to safely clean delicate surfaces and complex cavities and crevices that other machines can't reach—without surface abrasion, disassembly or harmful secondary waste.

IN THIS SECTION

SPECIFICATIONS

Weight (empty)	130lb (59kg)
Dimensions	22 x 16 x 21in (56 x 41 x 53cm)
Dry Ice Capacity	6 x 6 x12in (150 x 150 x 300mm) (24.5lbs./11kg) 5 x 5 x 12in (127 x 127 x 300mm) with inserts (16.5 lbs. 7.5 kg.)
Variable Feed Rate	0 - 1.2 lbs/min (0-0.6 kg/min)
Power Consumption	100 - 140 VAC 1 Ø 60 Hz 300W (watts) 200 - 240 VAC 1 Ø 50 Hz 300W (watts)
Feeder Drive	1/4 Hp, 1.1 A, 230 VAC, 1, 750 RPM, AC Motor
Blast Pressure Range	20 - 140 psig (1.4 - 9.7 bar)
Supply Pressure Range	50 - 140 psig (3.4 - 9.7 bar)
Air Consumption Range	12 – 50 scfm @ 100 psig (0.3 – 1.4 m3/min @ 6.9 bar) *Dependent on nozzle selection*
A-Weighted Emission Sound Pressure Level Range	84 (distance of 10 ft.) – 97 dbA (distance of 2 ft.)* ** Nozzle 13865-259 @ 80 PSI blast pressure*

OM.MC.20160506

1 Applicator Hook

2 Safety Guard Lock

3 Chute Access Port

4 Carrying Handle (Two Person Lift)

5 Ventilation

6 Blast Pressure Gauge

7 Blast Pressure Regulator

8 Control Cable Connect

9 Blast Hose Connect

1 Ice Block Level Indicator
2 Data Plate
3 Fill Lid
4 Bleed Valve
5 Air Supply Hose Connect

1 Main Power Circuit Breaker
2 Power On / Reset
3 Hour Meter
4 Applicator Light Switch
5 Feed Rate Control
6 Trigger Disable

Note: The blast applicator pictured includes an optional light.

1 LED Lights

2 Nozzle Connector

3 Trigger

4 Hanger

5 Mode Select Switch

| Air Only

O Off

|| Air + Ice

MICROCLEAN®

UNIT OPERATION

START UP

⚠ Read all safety instructions before operation and follow them closely (p. 2-3)

⚠ 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 and sharp blade surfaces.

⚠ Before loading dry ice, be sure the trough area is clear of excess moisture and debris.

⚠ The i³ MicroClean may be placed on the cart. To increase stability of the unit, lock the wheels on the cart.

⚠ Due to the high center of gravity, caution must be used when transporting the unit on the cart.

Before starting the i³ MicroClean, verify the following parameters:

- The air pipe is at least 0.5 inches (12 mm) in diameter
- The air pressure does not exceed 140 psig (9.7 bar)
- The air temperature does not exceed 122°F (50°C)
- The main power circuit breaker, bleed valve and applicator mode select switch are in the OFF (O) position.
- The dry ice trough is dry, clean and free of debris.

To start the i³ MicroClean:

⚠ If using the pellet & nugget shaving option, refer to Appendix B: Pellet & Nugget Shaving (p.22)

1. Securely attach the blast hose and control cable to the i³ MicroClean.
2. Securely attach the blast applicator to the blast hose and control cable.
3. Securely attach a nozzle to the blast applicator.
4. Securely attach the air supply hose to the i³ MicroClean.
5. Move the bleed valve to the open (I) position to purge water out of the lines.
6. Move the bleed valve to the closed (O) position.
7. Securely attach the static bonding cable to the supplied blast hose collar or to the target surface and an electrically conductive supporting structure.
8. Turn on the air compressor or open air supply valve and allow the air supply hose to pressurize.
9. Plug the power cord into an electrical outlet.
    - If an extension cord is necessary, it must comply with the power requirements of the i³ MicroClean and all governing electrical codes. The i³ MicroClean's data plate indicates the operating voltage and amperage range.
10. Move the main power circuit breaker to the ON (I) position.

11. Pull the blue trigger disable button out and press green power on/reset button (⟳). Hold this button down until the green lights turns on.
12. Move the feed rate control to maximum.
13. Move the applicator mode select switch to the air + dry ice position (II).
14. Point the nozzle in a safe direction and squeeze the trigger to purge the system.
    - The i³ MicroClean must be purged before filling with dry ice.
15. Return the feed control to zero, then slowly increase the dial to the desired setting.
16. Move the applicator mode select switch to the OFF (O) position.
17. Move the pusher plate back to the end of the trough, away from shaver wheel.
18. Place dry ice into the trough, against the rotary knives.
19. Close the fill lid.
20. Press green power on/reset button (⟳). Hold this button down until the green light turns on.
21. Move the applicator mode select switch to the air + dry ice position (II).
22. Squeeze the blast applicator trigger to blast.

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.
4. Hold nozzles perpendicular to the surface for fastest cleaning (recommended for most applications).
5. Optimum standoff distance is 2 in (5 cm) for most nozzles.
6. Never allow foreign objects in the dry ice trough.
7. Do not abuse the 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.
9. Reduce the feed rate to avoid clogging the nozzle at pressures below 50 psi (3.4 bar).

RE-LOADING DRY ICE

⚠ Always wear gloves to protect hands from exposure to cryogenic temperatures and sharp blade surfaces.

1. Move the applicator mode select switch to the OFF (O) position.
2. Move the pusher plate back to the end of the trough away, from shaver wheel.
3. Remove excess dry ice and wipe out excess moisture.
4. Place dry ice into the trough, against the rotary knives.
5. Close the fill lid.
6. Press green reset power on/reset button (⟳). Hold this down until the green light turns on.
7. Move the applicator mode select switch to the air + dry ice position (II).
8. Squeeze the blast applicator trigger to blast.

SHUT DOWN

⚠ Always wear gloves to protect hands from exposure to cryogenic temperatures and sharp blade surfaces.

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

To shut down the i³ MicroClean:

1. Release trigger to stop blasting.
2. Move the blast applicator mode select switch to the OFF (O) position.
3. Push in the blue trigger disable button. Turn the main power circuit breaker to the OFF (O) position to shut off the power.
4. Open the fill lid and remove remaining dry ice from the trough.
5. Close the fill lid.
6. Shut off the compressed air supply.
7. Open the bleed valve to evacuate all remaining pressure.
8. When the air hose is fully depressurized, disconnect all electric cables and hoses.

MICROCLEAN®

MAINTENANCE

⚠ Before removing the panel on the chain drive/feeder side of the machine, unlock the safety guard lock.

DAILY	Drain water out of the air lines before using the i³ MicroClean by turning the bleed valve to the ON (I) position.
	While the i³ MicroClean is in operation, check the pressure gauge for damage.
	Inspect the air and blast hoses for damage such as cuts or kinks.
	Inspect the silicone blast hose's sleeve for damage such as cuts or kinks. If inner hose sleeve inflates during operation or hose leak is otherwise detected, hose is damaged and must not be used.
WEEKLY	Inspect the rotary knives for wear and damage.
	Ensure the nozzle airflow exit end is not deformed or burred.
MONTHLY	Check the air filter element and replace if needed, using Cold Jet part number 4I0308
	Lubricate the chain using Cold Jet part number 80635-001. Spray the lubricant through the slotted vents on the left side of the panel.
BIANNUAL	Inspect pneumatic air lines for damage.
	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 chain tension.

PROBLEM	CHECK THIS	SOLUTION
Machine will NOT start	Is the unit plugged in?	Plug unit in.
	Is there electric at the outlet?	Turn the power on to the outlet.
	Is the main power circuit breaker in the ON (I) position?	Move the main power circuit breaker to the ON (I) position.
	Is the green power/reset button light on?	Press and hold the green power/ reset button until light turns on.
Machine blasts air but not dry ice	Is the applicator mode select switch in the air only (I) position?	Move the applicator mode select switch to the air and ice (II) position.
	Has dry ice been placed behind the pusher plate?	Remove dry ice, move the plate to the back of the trough, away from the blade, and re-load dry ice.
	Do rotary knives look damaged?	Call Cold Jet for support.
	Is a foreign object lodged in the feeder chute and the feeder shaver is not turning?	
	Is too much dry ice clogging the feeder chute?	Complete the "Unclog the Dry Ice Chute" procedure.
	Is the feeder rate greater than 0?	Increase feeder rate.
	Is the fill lid open?	Close the fill lid.
	Are you using extended lengths of blast hose?	Make sure your feed rate and compressed air supply is sufficient to compensate for the extended length of your blast hose setup.
Machine will NOT blast	Is the blue trigger disable light off?	Pull the blue trigger disable button out.
	Is the green power on/reset light on?	Press the green power/reset button. Hold until green light turns on.
	Is the applicator mode select switch in the OFF (O) position?	Move the applicator mode select switch to the air + dry ice position (II).

PROBLEM	CHECK THIS	SOLUTION
Machine will NOT blast (cont'd)	Is the incoming air pressure gauge showing pressure?	Connect the air supply hose and turn air supply on.
		Make sure the regulator is open by pulling out the regulator knob and adjusting clockwise
	Is the control cable connected to the MicroClean and the applicator?	Connect cable to machine and applicator.
STILL will not blast	The nozzle may be clogged. Move the applicator mode position to air only (I) and blast air 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)

UNCLOG THE DRY ICE CHUTE

⚠ 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 and sharp blade surfaces.

To unclog the dry ice chute:

1. Remove the dry ice
2. Set the feed rate control to maximum and move the applicator mode select switch to the air + ice position (II).
3. Close the trough door and press the green power on/reset button (⟳) . Hold this button down until the green light turns on.
4. Open the chute access port.
5. Blow out the dry ice with the applicator nozzle until clear.

⚠ Dry ice will blow out. Protect eyes, face and skin from contact with dry ice particles.

⚠ Remember to use preventive methods to avoid clogging in extremely humid environments:

- Before loading dry ice, clean excess moisture from the trough area.

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

North America

USA-Cold Jet,LLC (World Headquarters)	24-hour Customer Support and Technical Service Inside the US: +1 800.777.9101 Outside the US: +1 513.576.8981 FAX: + 1 513.831.3672
Canada-Cold Jet Canada	Phone: +1 800.337.9423 Ext. 501 FAX: +1 513.831.1209 After Hours Technical Support: +1 800.777.9101
Latin America-Cold Jet Latinoamérica	Phone: +52 (81) 1097.0445 After Hours Technical Support: + 1 513.576.8981

Europe

Belgium-Cold Jet Europe bvba (European Headquarters)	Phone: +32 (0) 13 53 95 47 FAX: +32 (0) 13 53 95 49 After Hours Technical Support: +1 513.576.8981
Germany-Cold Jet Deutschland GmbH	Phone: +49 (0) 6551 9606-0 FAX: +49 (0) 6551 9606-26 After Hours Technical Support: +1 513.576.8981
Spain-Cold Jet Madrid	Phone: +34 91 426 79 63 After Hours Technical Support: +1 513.576.8981

Asia

China	Phone: +86 21 5296 7161 After Hours Technical Support: +1 513.576.8981
Japan/Korea	Phone: +811 6869 2665 After Hours Technical Support: +1 513.576.8981

OM.MC.20160506

MICROCLEAN®

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 i³ MicroClean, the air compressor needs to produce an air volume 10% greater than the i³ MicroClean 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 i³ MicroClean:

- For distances less than 50 ft (15 m) between the air compressor and the i³ MicroClean, Cold Jet recommends a flexible 0.5 in (13 mm) air hose, preferably the hose supplied with the i³ MicroClean.
- For distances greater than 50 ft (15 m) between the air compressor and the i³ MicroClean, 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 i³ MicroClean 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 i³ MicroClean.

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 i³ MicroClean 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 i³ MicroClean, the air compressor needs to produce an air volume 10% greater than the i³ MicroClean'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 i³ MicroClean needs to be a minimum 0.5in (13 mm) in diameter for lengths up to 50 ft (15 m). Longer runs may require larger hose sizes.

Experience Cold Jet's patented shaved MicroParticle technology. The i³ MicroClean with optional DX upgrade can now shave both pellets and nuggets. MicroParticles allow you to clean and prepare surfaces with more precision, more delicacy, less air and less noise than traditional dry ice pellet blasters. With DX add-on (available as an installed or stand-alone option) operating the i³ MicroClean with pellets or nuggets is simple.

⚠ The information below is for the i³ MicroClean systems that have been modified to operate with pellet and nugget media. **Using pellets and nuggets in non-modified systems will cause significant performance limitations.**

⚠ Once the i³ MicroClean Deluxe (DX) is installed, dry ice blocks smaller than 5x5 in (125x125 mm) will not feed effectively in the i³ MicroClean.

⚠ To ensure consistent, maximum performance from the system, read all information below.

IN THIS SECTION

SPECIFICATIONS

All specifications remain the same with the pellet & nugget shaving option, except for those mentioned below.

Dry Ice Capacity	Pellets/Nuggets: 9 lbs/4 kg
Variable Feed Rate	0-0.6 lbs/min (0-0.3 kg/min) *Will vary, dependent on pellet/nugget size and age*
Air Consumption Range	30-50 scfm @ 100 psig (0.85 - 1.4 m^3/min @ 6.9 bar) *Dependent on nozzle selection*

PELLET/NUGGET DOOR

A secondary door prevents free media from falling out of the hopper during loading and use.

• After loading the dry ice media, verify that the pellet/nugget door can be closed and latched. Note: the system will not operate with the pellet/nugget door ajar.

flip latch to open & close door

FEED RATE DIAL

With the unique and varying sizes of pellet and nugget media that can be utilized in the i³ MicroClean, the feed rate indicator has been simplified to showcase minimal to maximum feed.

• For your specific application and media setup, begin with minimal feed and increase the dial until you find what setting works best.

• The Pellet and Nugget Shaving kit is designed to work with nozzles that are 30 scfm (0.85 m^3/min) or greater. It is not advised for nozzles less than 30 scfm. Check with your sales or service representative concerning nozzles that operate at 30 scfm (0.85 m^3/min) or greater to understand the best performance setup for your system.

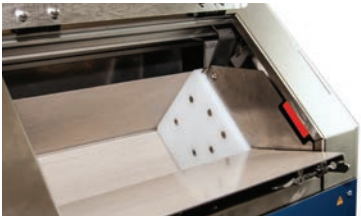
simplified feed rate indicator

nozzles must be 30 scfm or greater

PUSHER PLATE

A unique pusher plate provides more surface area to ensure consistent pellet and nugget media feeding.

• The pusher plate is designed to work optimally with pellets and nuggets. If using blocks, a 6x6 in. (150x150 mm) block is recommended. Blocks smaller than 5x5 in. (125x125 mm) will not feed effectively in the i³ MicroClean.



newly designed pusher plate for pellets and nuggets

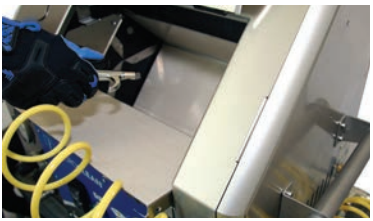
air nozzle used to clear trough area

COMPRESSED AIR NOZZLE

As moisture in the environment around the i³ MicroClean increases, condensation will develop inside the trough. If this moisture is not eliminated, dry ice media can begin sticking and cause feeding issues.

TROUBLESHOOTING

PROBLEM	CHECK THIS	SOLUTION
Dry ice output has noticeably decreased	Is the trough and/or shaver wheel blades covered with water ice buildup?	Use compressed air nozzle to clear trough area of excess moisture or remaining dry ice before startup, refill and shut-down.
	Is ice bonding to trough wall and restricting movement of pusher plate? *(more likely when surrounding temperature and humidity levels are high)*	Move pusher plate to middle of trough prior to filling with pellets/ nuggets to reduce amount of dry ice bonding to trough.



air nozzle used to clear trough area

pusher plate at center of trough before filling

When safety instructions are followed, most of the risks associated with the i³ MicroClean 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 i³ MicroClean 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. Shaver Blades

The blades used to shave dry ice blocks are sharp and present a danger to the operator. If the proper safety equipment is not used, there is a risk of injury. Operators should always wear hand protection.

3. Noise Emissions

When the proper safety precautions are not followed, prolonged exposure to the noise emitted by the i³ MicroClean can cause damage. Long-term exposure to loud noises can result in loss of hearing or tinnitus. Always wear ear protection.

4. Pressurized Air

Operating the i³ MicroClean 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.

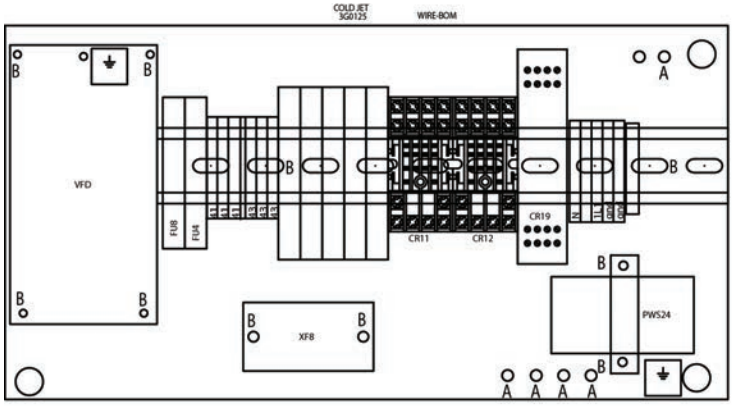
Never hold the air stream directly against skin. This could result in an air embolism, which is often fatal.

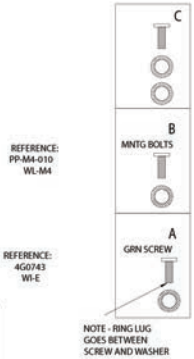
5. Static Electricity

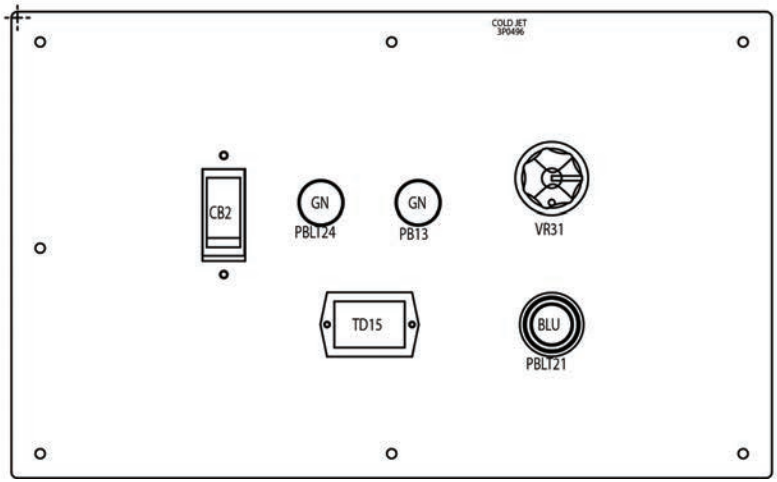
⚠ Static electricity can interfere with the proper functioning of a pacemaker.

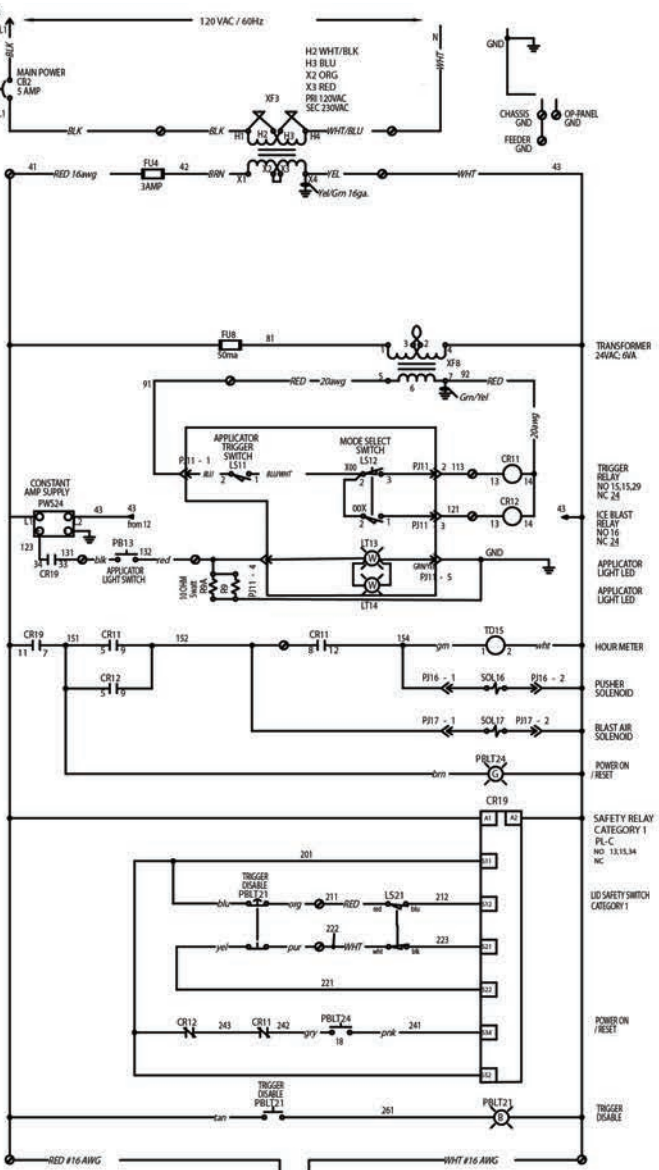
Even when grounding or bonding procedures are followed, static electricity can present a danger to the operator. To reduce this risk, always follow grounding or bonding instructions.

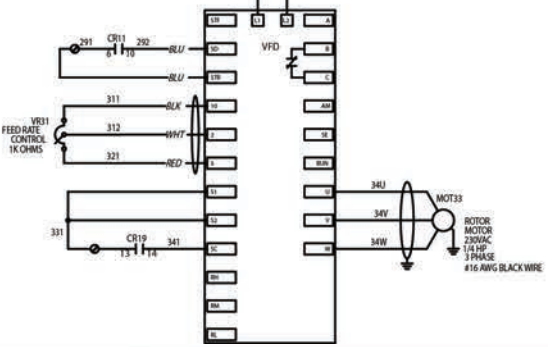
IN THIS SECTION

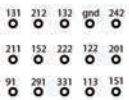

COLD JET
3G0125
WIRE-BOM
VFD
FU8
FU4
CR11
CR12
CR19
XF8
PWS24


C
B
MNTG BOLTS
A
GRN SCREW
REFERENCE:
PP-M4-010
WL-M4
REFERENCE:
4G0743
WI-E
NOTE - RING LUG
GOES BETWEEN
SCREW AND WASHER


COLD JET
3P0496
CB2
GN
PBL124
GN
PB13
VR31
TD15
BLU
PBL121







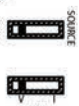
NOTE:
-ALL WIRES ARE 18AWG UNLESS OTHERWISE SPECIFIED.

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

-OEM INSTALLED WIRES TO BE STRANDED COPPER WITH MTW INSULATION.

MTR SETTINGS
1. Pr. Settings

0 2
1 80
4 80
5 80
6 80
7 1
8 0.4
9 1.25
18 80
31 10
32 3
33 0
34 2.99
73 1
80 0.18
90 10.99
125 81.00
126 80.00
267 1
79 2
77 1



PANEL DEVICES

TAGS	USER1	QTY	DESCRIPTION
LS21 PJ01 PJ16 PJ17	4G1008	4	PLASTIC NUT PG11
MOT33 PJ11	4G1010	2	PLASTIC NUT PG16
PJ16 PJ17	410152-A	2	POWER CONNECTOR,FEMALE DIN, FORM B 3PIN
PJ01	4G0760	144	CABLE SO Cable 16/3 BLACK, WHITE, GRN
PJ11	3G0092	1	RECEPTACLE FEMALE CONTROL CONNECTOR QUICK CONTROL CONNECTOR 7 PIN 5 CONDUCTOR
PJ01	4H0167	1	PLUG, 15 AMP SPLASH PROOF 3 PIN
CR11 CR12	4G1529	2	4-POLE RELAY TYPE RU 24VAC DPST-NO 24 VAC, 60 Hz COIL, 5 AMP CONTACT
CR11 CR12	4G1038	4	RELAY CLIP TYPE RY
CR11 CR12	4G1037	2	4-POLE BASE SOCKET TYPE RY
CR19	4G2069	1	RELAY SAFETY 230VAC 4 N.O.
PWS24	4G1499	1	CURRENT SUPPLY 700MA
FU4	4G1554	1	1 POLE FUSE GENERAL PURPOSE 250VAC 3AMP
FU8	4G1041	1	1 POLE FUSE GENERAL PURPOSE 250VAC 50ma
FU4 FU8	4G1555	2	FUSED DISCONNECT TERMINAL BLOCK WITHPIVOTABLE FUSE HOLDER FUSE HOLDER 250VAC 5X20MM HOLDER
LS21	4G1558	1	SAFETY LIMIT SWITCH MAGNETIC 2 NC 1 NO
LS21 PJ01 PJ16 PJ17	4G1007	4	GRIP CORD PG11 PLASTIC 6-11.5MM
MOT33 PJ11	4G1009	2	CORD GRIP PG16
PWS24	3G0081-B	1	LED BRACKET BRACKET
XF8	4G1358	1	SPLICE
XF3	NH-M6	1	NUT M6 NYLOCK LOCK NUT
XF3	SH-M6-070	1	M6 X 070 SOCKET HEAD
XF3	WO-M6	1	M6 OVERSIZE FLAT WASHER
R9 R9A	4G1615	2	RESISTOR 10 OHMS 5 WATT
SP2	4G0099	1	END SECTION - FEM6 HARDWARE END SECTION GREY, THICKNESS 2.8MM FOR TERMINAL BLOCKS MA2,5/5, MA4/6, M6/8 & M10/10
SP2	4G0066	6	HARDWARE JUMPERS
	4G0058	9	FEED-THROUGH 30AMPS
SP2	4G0063	1	HARDWARE END BARRIER
	4G1400	5	3LEVEL SENSORTERMINAL BLOCK - DIKD 1,5 MULTI-LEVEL 24AMPS GRAY, 0.2-2.5MM^2, 30-14 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK

PANEL DEVICES

TAGS	USER1	QTY	DESCRIPTION
VFD	4G1556	1	VFD CONTROLLER 3 PHASE OUT 230VAC
MOT33	4G1501	60	SHIELDED THREE CONDUCTOR MOTOR WIRE 16AWG
XF3	SH0001-A	1	1PH TRANSFORMER TORIODAL 0.3KVA 115X230-230V, 50/60HZ
XF8	4G1039-A	1	1 PH TRANSFORMER DRY TRANSFORMER 6VA 120X230VAC - 24VAC

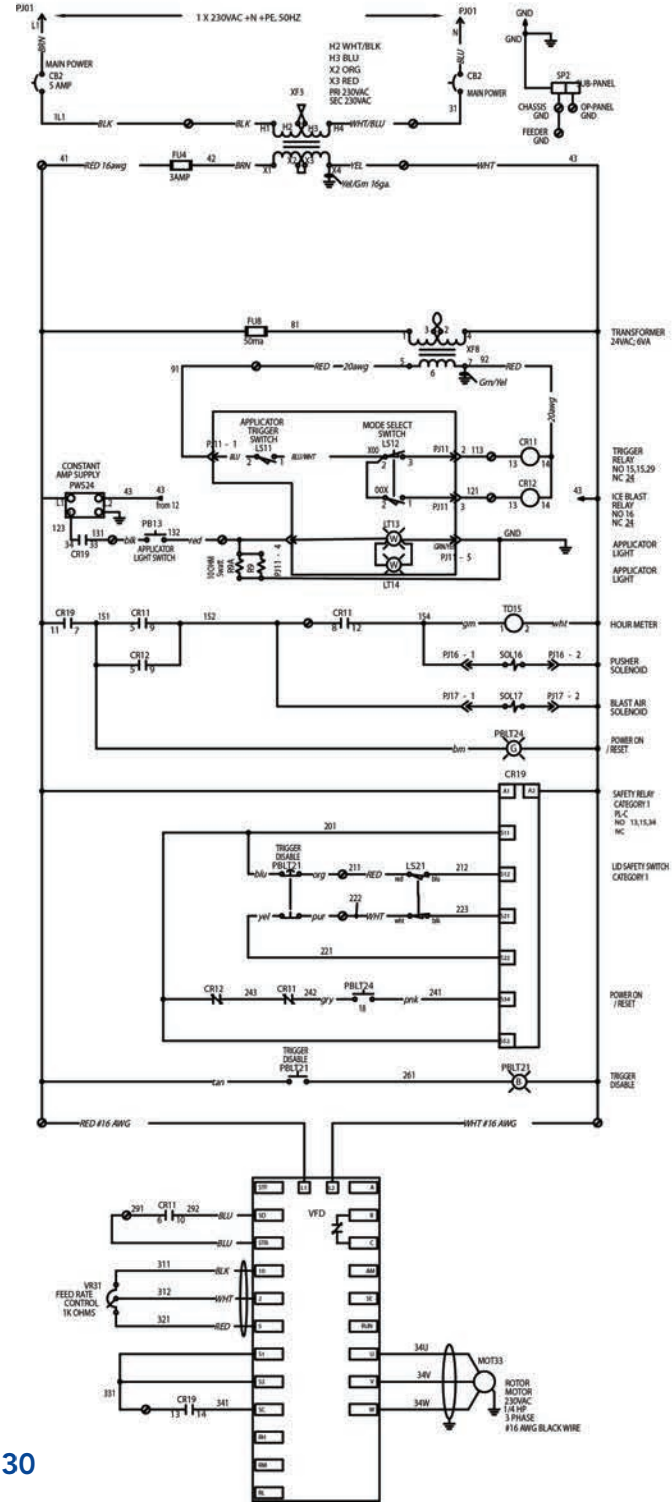
OP-PANEL DEVICES

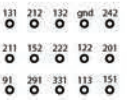
TAGS	USER1	QTY	DESCRIPTION
VR31	4G0750	1	KNOB
CB2	4G1044	1	COVER
TD15	4G1307	2	TERMINAL, SPADE CONNECTION
CB2	13464	2	TERMINAL SPADE CONNECTOR
CB2	4G1043	1	CIRCUIT BREAKER 1-POLE 5AMPS
TD15	PP-M3-008	2	SCREW FASTENER 3mm X 8mm
CB2	PP-M4-010	2	M4 BUTTON HEAD M4 FASTENER
PB13	4G1587	1	PUSH BUTTON 22.5mm IEC STYLE GREEN
PBLT24	4G1159	1	ILLUMINATED PUSH BUTTON - MOMENTARY, NEMA 4/13 22mm GREEN
PBLT21	4G1502	1	PUSH BUTTON - PUSH-PULL 40mm MUSHROOM BLUE
PB13 PBLT24	4G1256	2	BASE 22.5mm BASE
PBLT21	4G1155	1	LATCH AND CONTACT 22.5mm IEC STYLE 1 NC
PB13 PBLT21 PBLT24	4G1557	3	CONTACT 22.5mm IEC STYLE N.O.
PBLT21	4G1631	1	CONTACT 22.5mm IEC STYLE N.C.
PBLT24	4G1206	1	LED 22.5mm IEC STYLE GREEN
PBLT21	4G1259	1	LED 22.5mm IEC STYLE BLUE 120/220VAC
TD15	4G1187	1	HOUR METER 230VAC
VR31	4G1031	1	10K OHM VARIABLE RESISTOR
VR31	4G0081	36	SHIELDED THREE CONDUCTOR 20AWG

HARDWARE

USER1	QTY	DESCRIPTION
WL-M4	10	WASHER, LOCK 4mm WASHER, LOCK
RNR-E	5	#10 RING LUG LUG 18-20AWG
WI-E	5	STARWASHER 6mm WASHER
RNB-E	2	#10 RING LUG LUG 14-16AWG
4G0743	5	SCREW 10-32 X 3/8 FASTENER
4G0423-R	12	RED, MTW SINGLE STRAND 16AWG
4G0423-W	12	WHITE, MTW SINGLE STRAND 16AWG
4G0423-Y/G	12	YELLOW / GREEN, MTW SINGLE STRAND 16AWG
4G0084-BL	96	BLUE, MTW 1 CONDUCTOR 18AWG
4G0084-R	144	RED, MTW SINGLE STRAND 18AWG
4G2070	18	CABLE, MULTI-COLOR, GRAY PVC JACKET 20ga. 12 CONDUCTOR
4G0084-W	6	WHITE, MTW SINGLE STRAND 18AWG 18AWG
80268-008	16	SPIRAL WRAP 1/2" BLACK
3P0496-C	1	L3 OPERATOR PLATE ENCLOSURE ALUMINUM
3G0206	1	L3 SUBPLATE ENCLOSURE ALUMINUM
NL-M6	4	M6 NYLOCK LOCK NUT
WL-M6	4	WASHER, LOCK 6mm WASHER, LOCK
4P0021	2	PROTECTIVE GROUND LABEL
4G0061	2	TERMINAL BLOCK FOR GROUND WIRES - M 6/8.P FEED-THROUGH GROUND 50AMPS GREEN-YELLOW, 22-8AWG, W/ RAIL CONTACT SCREW CLAMP CONNECTION
3G0125	1	L3 ENCLOSURE ALUMINUM
4G0068	10	DIN RAIL 1.35" ALUMINUM
PP-M4-010	10	M4 BUTTON HEAD M4 FASTENER

SCHEMATICS: 110V (3OF3)





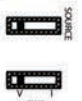
NOTE:
-ALL WIRES ARE 18AWG UNLESS OTHERWISE SPECIFIED.

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

-OEM INSTALLED WIRES TO BE STRANDED COPPER WITH MTW INSULATION.

MTR SETTINGS
1. Pr. Settings

0 2
1 80
4 80
5 80
6 80
7 1
8 0.4
9 1.25
18 80
31 10
32 3
33 0
34 2.99
73 1
80 0.18
90 10.99
125 81.00
126 80.00
267 1
79 2
77 1



COLD JET
3G0125
WIRE-BOM
VFD
FU8
FU4
CR11
CR12
CR19
XF8
PWS24

C
B
MNTG BOLTS
A
GRN SCREW
REFERENCE:
PP-M4-010
WL-M4
REFERENCE:
4G0743
WI-E
NOTE - RING LUG
GOES BETWEEN
SCREW AND WASHER

COLD JET
3P0496
CB2
GN
PBL24
GN
PB13
VR31
TD15
BLU
PBL21

PANEL DEVICES

TAGS	USER1	QTY	DESCRIPTION
LS21 P501 P316 P317	4G1008	4	PLASTIC NUT PG11
MOT33 P311	4G1010	2	PLASTIC NUT PG16
P316 P317	4H0152-A	2	POWER CONNECTOR, FEMALE DIN, FORM B 3PIN
P311	3G0092	1	RECEPTACLE FEMALE CONTROL CONNECTOR QUICK CONTROL CONNECTOR 7 PIN 5 CONDUCTOR
P501	4H0149	1	PLUG, 15 AMP, EU CONFIGURATION SPLASH PROOF 3 PIN
CR11 CR12	4G1529	2	4-POLE RELAY TYPE RU 24VAC DPST-NO 24 VAC, 60 Hz COIL, 5 AMP CONTACT
CR11 CR12	4G1038	4	RELAY CLIP TYPE RY
CR11 CR12	4G1037	2	4-POLE BASE SOCKET TYPE RY
CR19	4G2069	1	RELAY SAFETY 230VAC 4 N.O.
PWS24	4G1499	1	CURRENT SUPPLY 700MA
FU4	4G1554	1	1 POLE FUSE GENERAL PURPOSE 250VAC 3AMP
FU8	4G1041	1	1 POLE FUSE GENERAL PURPOSE 250VAC 50ma
FU4 FU8	4G1555	2	FUSED DISCONNECT TERMINAL BLOCK WITHPIVOTABLE FUSE HOLDER FUSE HOLDER 250VAC 5X20MM HOLDER
LS21	4G1558	1	SAFETY LIMIT SWITCH MAGNETIC 2 NC 1 NO
LS21 P501 P316 P317	4G1007	4	GRIP CORD PG11 PLASTIC 6-11.5MM
MOT33 P311	4G1009	2	CORD GRIP PG16
PWS24	3G0081-B	1	LED BRACKET BRACKET
XF8	4G1358	1	SPLICE
XF3	NH-M6	1	NUT M6 NYLOCK LOCK NUT
XF3	SH-M6-070	1	M6 X 070 SOCKET HEAD
XF3	WO-M6	1	M6 OVERSIZE FLAT WASHER
P501	4H0150	144	16/3 SO, HARMONIZED 16AMP CORD EUROPE STYLE
Rp RbA	4G1615	2	RESISTOR 10 OHMS 5 WATT
SP2	4G0059	1	END SECTION - FEM6 HARDWARE END SECTION GREY, THICKNESS 2.8MM FOR TERMINAL BLOCKS MA2,5/5, M4/6, M6/8 & M10/10
SP2	4G0066	6	HARDWARE JUMPERS
	4G0058	9	FEED-THROUGH 30AMPS
SP2	4G0063	1	HARDWARE END BARRIER

PANEL DEVICES

TAGS	USER1	QTY	DESCRIPTION
	4G1400	5	3LEVEL SENSOR TERMINAL BLOCK - DIKD 1,5 MULTI-LEVEL 24AMPS GRAY, 0.2-2.5MM^2, 30-14 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK
VFD	4G1536	1	VFD CONTROLLER 3 PHASE OUT 230VAC
MOT33	4G1501	60	SHIELDED THREE CONDUCTOR MOTOR WIRE 16AWG
XF3	SH0001-A	1	1PH TRANSFORMER TOROIDAL 0.5KVA 115X230-230V, 50/60HZ
XF8	4G1039-A	1	1 PH TRANSFORMER DRY TRANSFORMER 6VA 120X230VAC - 24VAC

OP.PANEL DEVICES

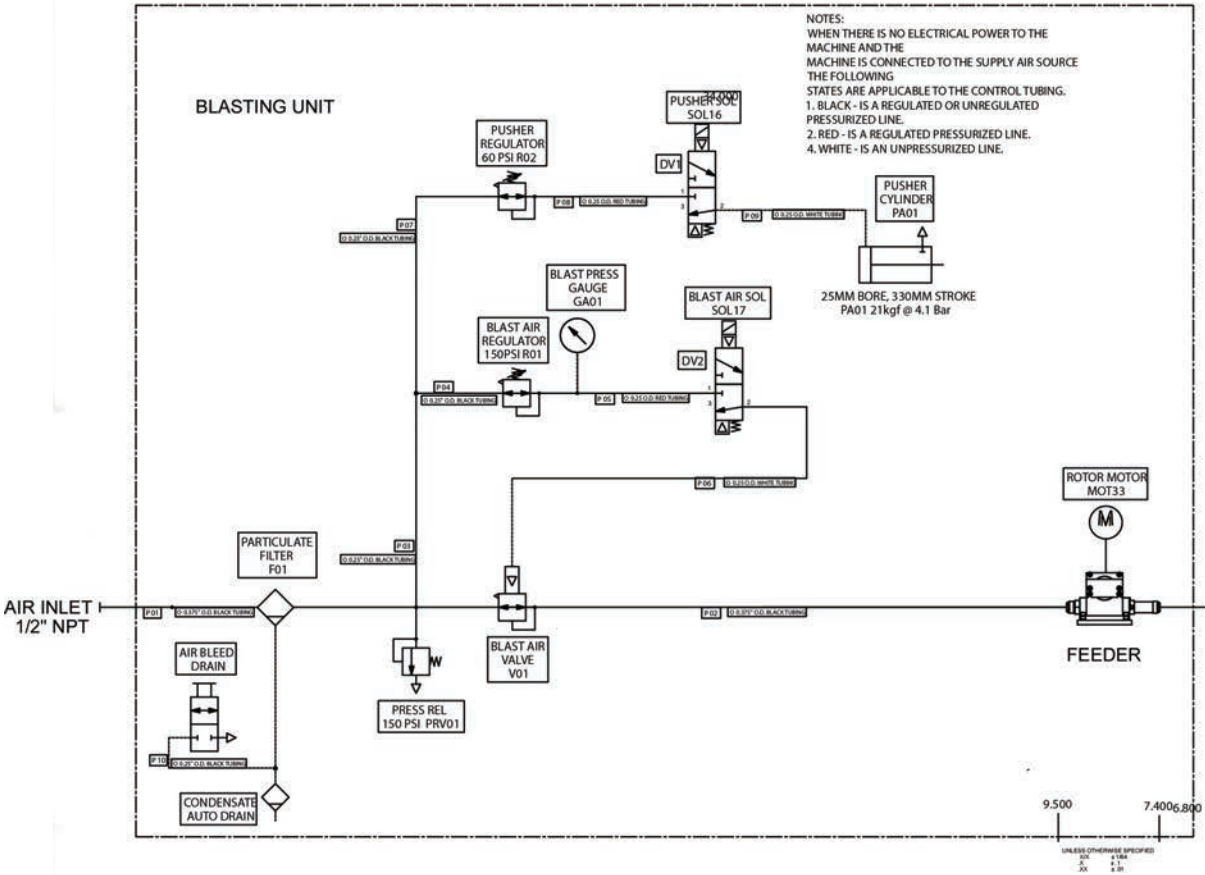
TAGS	USER1	QTY	DESCRIPTION
VR31	4G0750	1	KNOB
CB2	4G1044	1	COVER
TD15	4G1307	2	TERMINAL, SPADE CONNECTION
CB2	13464	4	TERMINAL SPADE CONNECTOR
CB2	4G1043	1	CIRCUIT BREAKER 1-POLE 5AMPS
TD15	PP-M3-008	2	SCREW FASTENER 3mm X 8mm
CB2	PP-M4-010	2	M4 BUTTON HEAD M4 FASTENER
PB13	4G1587	1	PUSH BUTTON 22.5mm IEC STYLE GREEN
PBLT24	4G1159	1	ILLUMINATED PUSH BUTTON - MOMENTARY, NEMA 4/13 22mm GREEN
PBLT21	4G1502	1	PUSH BUTTON - PUSH-PULL 40mm MUSHROOM BLUE
PB13 PBLT24	4G1256	2	BASE 22.5mm BASE
PBLT21	4G1155	1	LATCH AND CONTACT 22.5mm IEC STYLE 1 NC
PB13 PBLT21 PBLT24	4G1557	3	CONTACT 22.5mm IEC STYLE N.O.
PBLT21	4G1631	1	CONTACT 22.5mm IEC STYLE N.C.
PBLT24	4G1206	1	LED 22.5mm IEC STYLE GREEN
PBLT21	4G1259	1	LED 22.5mm IEC STYLE BLUE 120/220VAC
TD15	4G1187	1	HOUR METER 230VAC
VR31	4G1031	1	10K OHM VARIABLE RESISTOR
VR31	4G0081	36	SHIELDED THREE CONDUCTOR 20AWG

HARDWARE

USER1	QTY	DESCRIPTION
WL-M4	10	WASHER, LOCK 4mm WASHER, LOCK
RNR-E	5	#10 RING LUG LUG 18-20AWG
WI-E	5	STAR WASHER 6mm WASHER
RNB-E	2	#10 RING LUG LUG 14-16AWG
4G0743	5	SCREW 10-32 X3/8 FASTENER
4G0423-R	12	RED, MTW SINGLE STRAND 16AWG
4G0423-W	12	WHITE, MTW SINGLE STRAND 16AWG
4G0423-Y/G	12	YELLOW / GREEN, MTW SINGLE STRAND 16AWG
4G0084-BL	96	BLUE, MTW 1 CONDUCTOR 18AWG
4G0084-R	144	RED, MTW SINGLE STRAND 18AWG
4G0084-W	6	WHITE, MTW SINGLE STRAND 18AWG 18AWG
80268-008	16	SPIRAL WRAP 1/2" BLACK
4G2070	18	CABLE, MULTI-COLOR, GRAY PVC JACKET 20ga. 12 CONDUCTOR
3P0496-C	1	I3 OPERATOR PLATE ENCLOSURE ALUMINUM
3G0206	1	I3 SUBPLATE ENCLOSURE ALUMINUM
NL-M6	4	M6 NYLOCK LOCK NUT
WL-M6	4	WASHER, LOCK 6mm WASHER, LOCK
4P0021	2	PROTECTIVE GROUND LABEL
4G0061	2	TERMINAL BLOCK FOR GROUND WIRES - M 6/8.P FEED-THROUGH GROUND 50AMPS GREEN-YELLOW, 22-8AWG, W/ RAIL CONTACT SCREW CLAMP CONNECTION
3G0125	1	I3 ENCLOSURE ALUMINUM
4G0068	10	DIN RAIL 1.35" ALUMINUM
PP-M4-010	10	M4 BUTTON HEAD M4 FASTENER

SCHEMATICS: 230V (3OF3)

SCHEMATICS: PNEUMATIC



LEGEND	
LINE/ DEVICE LABEL	FLUID TYPE
P	PNEUMATIC LINE
DV	DIRECTIONAL VALVES
CV	CHECK VALVES
PRV	PRESS RELIEF VALVES
FC	FLOW CONTROLL VALVES
R	REGULATORS
F	FILTERS
GA	GAUGES
M	MANIFOLDS
PA	PNEUMATIC ACTUATORS
SOL	SOLENOIDS
SA	SOLENOID ACTUATORS

The i³ MicroClean 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 circle-with-slash/black graphical symbol indicates a prohibited action to avoid the hazard.

All symbols may not apply to the i³ MicroClean.

IN THIS SECTION

	OPERATION SYMBOL On		OPERATION SYMBOL Hour Meter
	OPERATION SYMBOL Off		OPERATION SYMBOL Air Bleed
	OPERATION SYMBOL Variable Dry Ice Feed Rate		OPERATION SYMBOL Applicator Light
	OPERATION SYMBOL Regulated Air Pressure		OPERATION SYMBOL Reset
	OPERATION SYMBOL Trigger Disable		OPERATION SYMBOL CO_2 Only

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

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's 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.

THIS WARRANTY IS THE SOLE WARRANTY OF CJ AND ANY OTHER WARRANTIES, EXPRESS, IMPLIED IN LAW OR IMPLIED BY FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE, ARE HEREBY SPECIFICALLY EXCLUDED.


Cold Jet
the force of nature

Cold Jet
the force of nature

www.coldjet.com

Americas. Europe. Asia.