CRYSTAL CAP CLEANERS

Robotic Paint Gun Cleaning

Worldwide Specialists in Robotic Paint Atomizer Cleaning

INSTRUCTION MANUAL

- Installation
- Plumbing
- Programming
- Troubleshooting Guide
- Parts
- Maintenance
- Service
- Worldwide Contact and Support

www.CrystalCap.com

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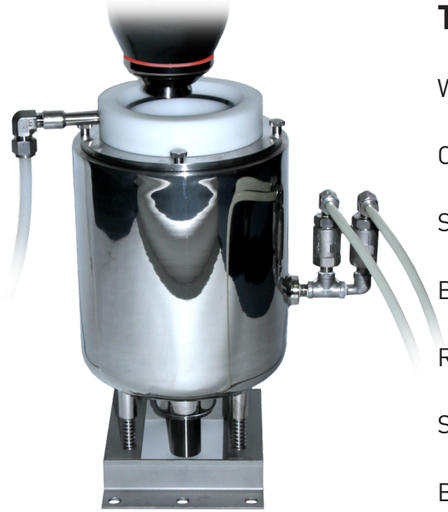
INSTRUCTION MANUAL

For all Models of Gun and Bell Atomizer applications

This manual is for the expressed use by the purchaser of the Crystal Cap Cleaner.



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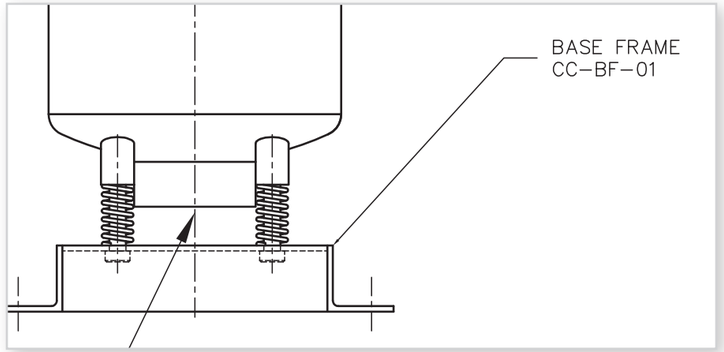
WARNING Ex: II 2G c IIB T4

User information for the spray nozzle cleaning devices (SRG) type: CC 2001 SB, CC 2033 SB, CC 2014 SB, CC 2013 S CC 2113SB

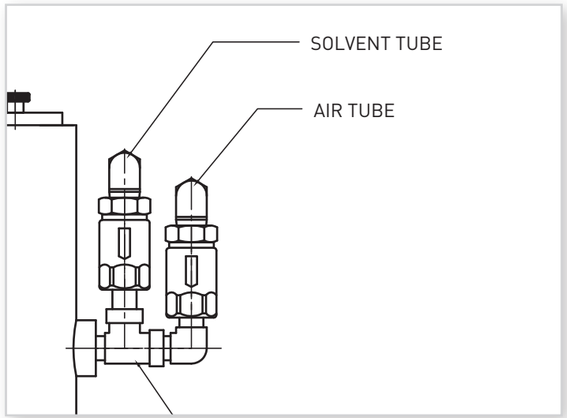
No.	Warning type	Limitations for ATEX certification	Specification
1	Operation	The spray nozzle cleaning device must not be operated using a solution with low conductivity (← 100 pS/m).	CLC/TR 50404
2	Operation	When using solutions with a conductivity of between 100 pS/m and 1,000 pS/m it may not be moved (directly) in the cycle.	CLC/TR 50404
3	Installation / Assembly	The container of the spray nozzle cleaning device must be grounded, or integrated in the potential equalization of the paint-spray line. This can be achieved by one of the following: - a potential equalization cable, or - via a positive fitting connection with an effectively grounded grate platform	CLC/TR 50404
4	Installation / Assembly	Use only the SRG plastic sealing ring specified for the particular spray nozzle.	DIN EN 13463-5
5	Installation / Assembly	The lateral ventilation opening in the SRG container must be protected from the penetration of foreign bodies, i.e. by means of a blind plug, or a 90° pipe elbow directed downward.	DIN EN 13463-5
6	Operation	Ensure that the air pressure and the solution pressure for the spray nozzle cleaning device supply do not exceed a positive pressure of 6.9 bar/100 psig, i.e. by means of protecting the supply with a safety valve.	DIN EN 13463-5
7	Operation	If the spray nozzle cleaning device has been specified for the temperature class T4, solutions with a boiling temperature of ← 110°C must be used; for T3, solutions with a boiling temperature of ← 160°C must be used.	DIN EN 1127-1
8	Operation	The intended position of the nozzle in the spray nozzle cleaning device must be determined (-→ adjustment) and recorded in the nozzle control before startup.	DIN EN 13463-5
9	Maintenance	The impeller must be tested recurrently (at least every 3 years) with regard to the ignition protection type, or the lack of ignition sources. Important testing aspects are the following: running noise and clearance of the roller bearing, as well as the seal between the solution-bearing part and the roller bearing. As an alternative to the testing, the impeller may be replaced (at least every 3 years) with a new one as a precautionary measure.	DIN EN 13463-5
10	Maintenance	The floating plastic sealing ring must be submitted to a recurring inspection (at least annually) regarding its mechanical integrity/damage.	DIN EN 13463-5
11	Assembly / Operation	The SRG may not be connected to zones, in which permanently explosive atmosphere must be anticipated (-→ ex-zone 0). This applies particularly for the drainage-connection to lead away the cleaning solvent. If the ex-zone 0 cannot be prevented or eliminated effectively by the operator, additional constructive explosive-preventing measures must be provided (i.e. explosive-protection isolation.)	DIN EN 1127-1
12	Operation	The SRG may not be used for manual cleaning purposes.	DIN EN 1127-1

ATOMIZER CLEANER INSTALLATION PROCEDURES

MOUNTING:
Secure the unit to a substantial structural component of the paint booth. The unit must be fixed securely using the bolt hole pattern provided on the support bracket. The unit should also be free from excessive vibration, and should be mounted perpendicular to the floor of the booth and grounded.

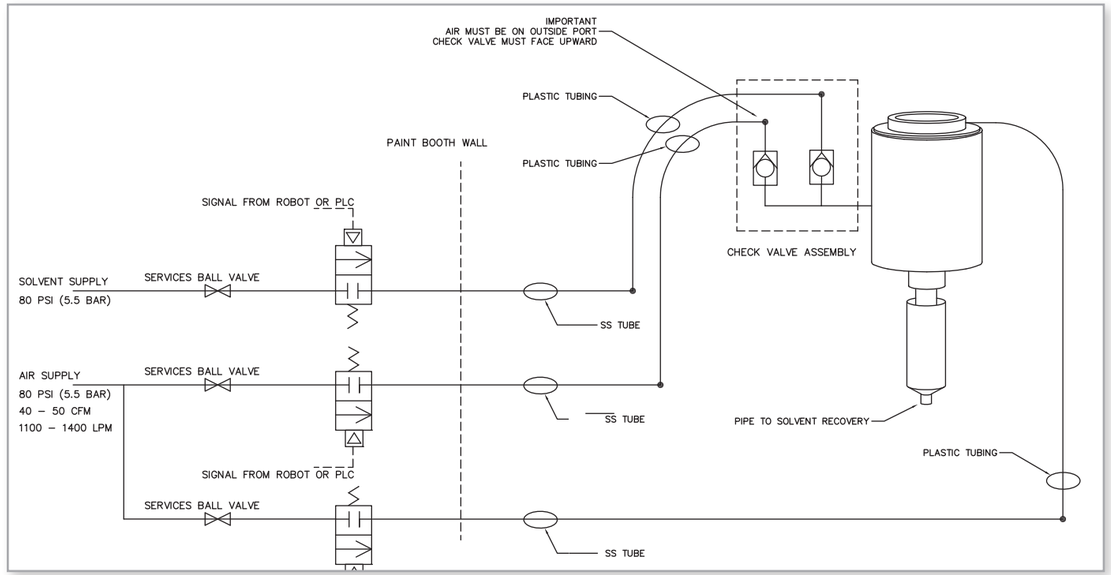


SUPPLY:
The Atomizer cleaner requires a supply of solvent and air at 80-100 PSI (5.5-6.9 BAR). A valve pack controlled by the Robot or superior controller for the paint system should have a Cv. of 0.87 or greater. The run between the valve pack and check valve assembly should be kept to a minimum with a tube size of 10mm or larger. Connections between hard run tube and the check valve assembly should include a "dogleg" of plastic tubing to allow for Z compliance of the cleaner.

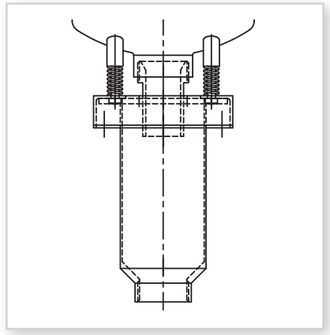


The check valve assembly should be installed with tube entry above in the 1/4" NPT inlet port of the cleaner. Connect the solvent line to the tube connector closest to the vessel, and the airline to the tube connector to the outside on the check valve assembly. It is important to orient the check valve assembly upward as shown on the diagrams and photos.

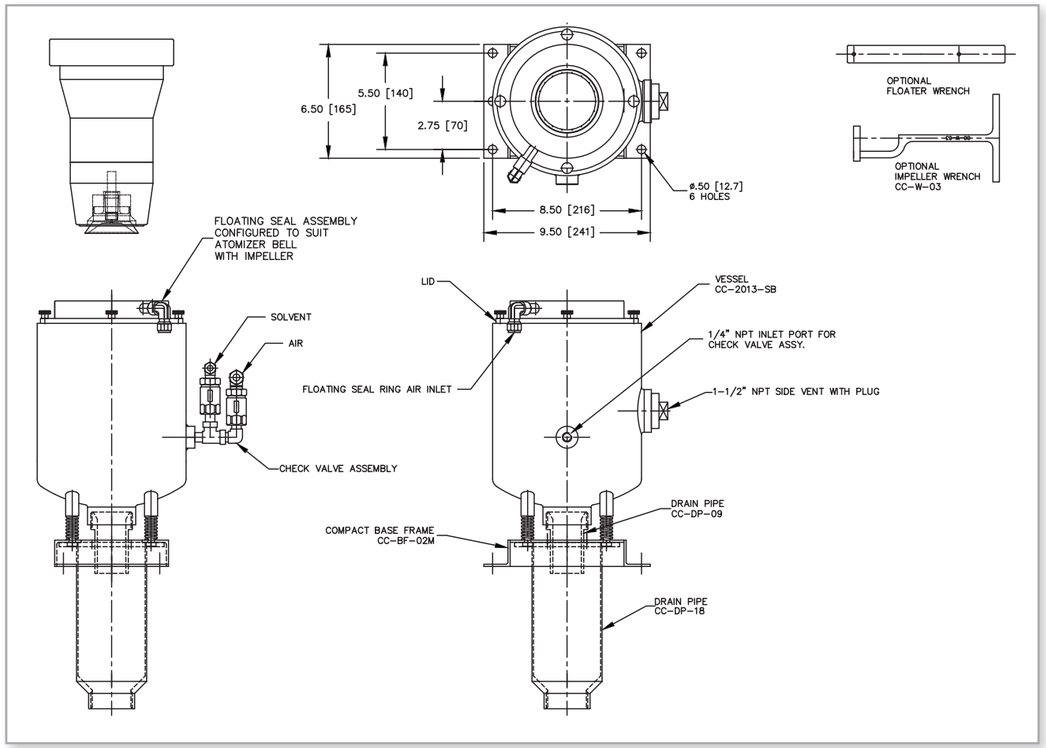
The drying air valve should have a Cv capacity of 1.0-1.4. Air consumption can be as high as 50 scfm. If drying times are critical with water as a cleaning solution, increased airflow decreases the drying time.



DRAINAGE:
For solvent recovery system, connect the 2” npt on the drain system. Restriction free, properly vented drainage systems are desirable to avoid overflow of solvent.



Various drain solutions are available. Please refer to the contact information at the back of the manual for specific custom systems.



GENERAL OPERATION

The following wash cycle will vary due to the available time between jobs, type of paint and type of solvent.

The first fluid on cycle gives a chemical clean, with subsequent fluid on cycles providing high velocity particles for mechanical cleaning as well.

Use a fluid/air chop during cleaning when time is short or when water and heated water as the cleaning fluid. The vapor blasting effect will still be present when the transition from cleaning to drying takes place.

Use an air/fluid chop when time allows for less fluid usage. Some facilities choose not to dump large quantities of raw paint into the cleaner. Others dump the paint into a purge tube beside the cleaner with a circulation system to keep the piping system open. See below.

SEQUENCE OF OPERATION - GUN

1. Robot at HOME POSITION over cleaner (velocity full speed). Turn E-stat off for entire process.
2. Robot enters IN CLEANER. Robot speed, straight down from approach point) Paint gun clean out cycle may be in process.
3. Gun dump solvent through trigger if color changing during cleaning cycle. This will help to clean any previous paint from impeller.
4. Cleaning Cycle: Initialize preset Fan & atomizing air ON @ 10 PSI (.7 Bar) when possible, to aid in keeping solvents from being forced into the gun. Begin CLEAN CYCLE (see page 14).
5. Drying Cycle: Maintain position for 6 seconds to clear manifold of solvent to dry air. trigger off, exit to 50mm ABOVE CLEANER 25mm/sec. Retracting slowly will help dry off the seal surface of the cap retaining nut. (Note this position can be used during entry if home position has gun rotated for maintenance)
6. Fan & atomizing air may be turned off before, during, or after the robot move to achieve drying of air cap retaining nut.
7. Robot moves to LOAD NEXT COLOUR position, Fan & atomizing air off, trigger the gun to load new paint into the paint gun. Best results for gun dump are obtained with paint gun at close range above floaters aiming the stream of paint through the center of the floater while missing the impeller to one side.

BASIC CAP CLEAN CYCLE - GUN

WASH CYCLE	FLUID	AIR	TIME (sec.)
Robot-in-cleaner	1	0	0.5
	0	1	0.5
	1	0	0.5
	0	1	0.5
	1	0	0.5
DRY CYCLE	0	1	3.0
Exit cleaner	0	1	2.0

The above table represents a portion of what you might see on the robot data tables. There will be more information in the table for the paint gun operation. To write a new program for cap clean only, copy an existing cleaning cycle to a new name and edit as shown above to get the timing right. Trim from the straight solvent time to save FLUID, or trim from the fluid/air chop to save time. Refer to robot positions diagram to add and edit positions associated with the program. This program would be used when the line is running large batches of parts without a color change or with clear coat. Refer to subsequent sections of this manual for cleaning during a color change.

DAILY OPERATIONS

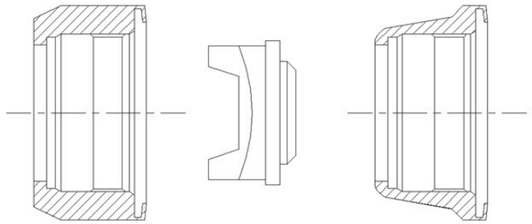
To give optimum performance in the plant, write a SUPER PURGE program, which will consist of the following:

- Turn on paint gun fluid to clean the paint line and wash off the top of the impellers. For fluid savings and improved performance use an air solvent chop. This will also help to keep the solvent recovery system clear.
- During the paint gun solvent purge cycle turn on the cleaner solvent to clean the air cap which directs the spray from the drive nozzles to self-clean the inside of the vessel.
- Complete the process by turning off both paint gun and cleaner solvent. Run cleaner air to dry for a minimum of 7 sec. with the last two sec. pulling out of the vessel. Follow with a pulse of fan and atomizing air at line pressure to clear any solvent from under air cap.
- This program will prevent maintenance issues with the cleaner (particularly with 2k paint), clean the inside of the vessel, and purge the solvent recovery system of paint solids.

ROBOT PROGRAMMING PROCEDURE - GUN

The air cap-retaining ring is used as an interface between the paint gun and the cap cleaner to contain the cleaning action within the vessel. The floating seal matches with the tapered cap ring to give the proper relationship between the air cap and the impeller.

1) Install tapered cap rings on the paint gun where applicable.



ORIGINAL AIR CAP RING AIR CAP CCC SUPPLIED TAPERED AIR CAP RING

2) Move robot into a position over the cleaner. move down into the cleaner to make contact between the tapered surface of the air cap retaining ring and the floating seal assembly on the lid. The following text assumes that the robot tool center point is programmed so the paint gun sprays in a Z- direction.

Tip: If a circular spirit level was used to level the cleaner on the lid, then that same spirit level can be used as an aid to help position the paint gun.

For single gun units, insure that the gun is centered above the impeller

For double gun units, use the lid screws closest to the floating seals to aid in positioning the air caps above the impellers inside the cleaner.

3) Move robot in -. 5 mm increments in Z. Rotate the floating seal assemblies with your fingers between moves to test that a leak-free fit has been achieved between the tapered cap ring and the floating seal O-ring. Teach this point as the clean in position with fine coordinates.

Note: The -. 5 mm steps may have to be repeated later during trial of color change program integration to seat the O-ring to its final seal position.

4) Back the robot up out of the cleaner Z+50mm with a velocity of 25mm/sec. maximum. Teach this point as the above cleaner position with fine coordinates.

5) A position may have to be taught above the cleaner to allow the robot to maneuver to home position when it may be significantly away from the cleaner.

6) Move through the path to assure a smooth motion.

7) With double gun systems, remove the lid from the cleaner by undoing the 4 knurled lid screws. Take care not to lose the lid O-ring when removing the lid from the vessel.

8) Move through the path to the clean in position. Visually inspect to assure the paint gun is positioned over the impellers.

CC-2001-SB

CC-2013-SB

CC-2014-SB
(configured for Double Gun)

SEQUENCE OF OPERATION – BELL ATOMIZER

1. Robot at HOME POSITION over cleaner (velocity full speed). Turn E-stat off for entire process.
2. Robot enters IN ATOMIZER CLEANER (80 – 500 mm/sec. Robot speed, straight down from approach point) Atomizer clean out cycle may be in process.
3. Position firmly seated in the O-ring with the springs lightly compressed in waterborne paint the ring air must be **enabled during the entire cleaning cycle**. This will contain the cleaning solution within the vessel. For solvent application, the ring air can be disabled until the atomizer starts to exit, this will save air consumption.
4. Cleaning Cycle: Initialize shape air preset on bell to prevent contamination of the air bearing. Typical setting would be 150-250 slpm during cleaning portion of the program.
5. Begin CLEAN CYCLE (see chart on Page 11). fluid on time will range between .5 - 1.0sec. Per shot dependent on chemistry. Gun dump solvent through trigger if color changing during cleaning cycle. This can occur concurrently during the cleaning cycle. The most important thing to understand is that painting is occurring within the vessel, and thus everything will be covered with paint. Therefore, it is mandatory to disable the trigger prior to the final shot of cleaning spray. When time is tight, forego the final shot of air.
6. When needed and installed, Center hub cleaning can be used on every cycle with shroud cleaning or as an individual function. Adjust bell cup speed and/or solvent pressure to control the amount of penetration.
7. Drying Cycle: Reduce shape air preset to 100 - 150 slpm. Set exit velocity to 20mm/sec. Exit to 20mm to where the gap opens up between the atomizer and O-ring at the tapered portion of the shroud. This place will allow the booth air to be drawn in and create a laminar flow over the shroud thus stripping the fluids off. Turn ring air off and fully exit vessel as fast as is practical. Some drying problems are associated with insufficient air supply and incorrect exit strategy.

GENERAL OPERATION

The Page 8 clean cycle will vary due to the available time between jobs, type of paint and type of fluid.

The first fluid on cycle gives a chemical clean, with subsequent fluid on cycles providing high velocity particles for mechanical cleaning as well.

When time is short and when either cold or heated water is used as the cleaning fluid, delete the air chops during cleaning segment of the program to improve efficiency, (dependent on the characteristics of the paint buildup). The vapor blasting effect will still be present when the transition from cleaning to drying takes place.

BASIC CLEAN CYCLE - BELL ATOMIZER

WASH CYCLE	FLUID	AIR	Ring Air	TIME (sec.)
Robot-in-cleaner	1	0	0	0.5
	0	1	0	1.0
	1	0	0	0.5
	0	1	0	1.0
	1	0	0	0.5
DRY CYCLE	0	1	1	1.0
Exit-cleaner	0	1	1	2.0

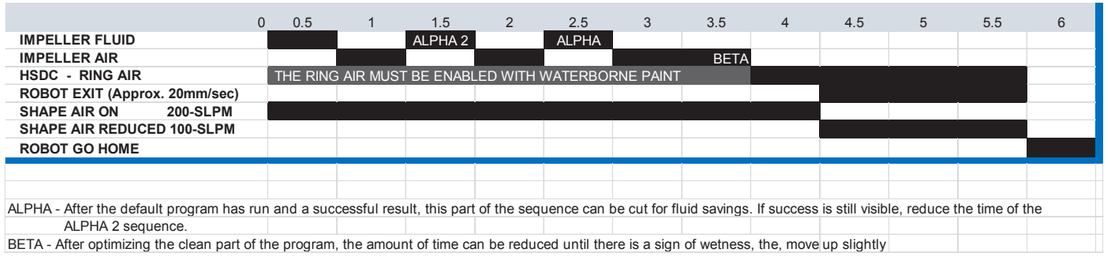
There will be more information in the table for the atomizer operation. To write a new program for atomizer clean only, copy an existing cleaning cycle to a new name and edit as shown above to get the timing right. Decrease from the fluid time to save fluid depending on valve reaction time or line length, or increase or reduce repetitions from the fluid/air chop to adjust cleaning results.

ROBOT PROGRAMMING - ABB – CBS SYSTEM ONLY

1) Move the atomizer slowly into a position over the cleaner. Slowly move down into the cleaner to the canister docking position. Adjust the frame to position the cleaner to make contact between the tapered surface of the shroud and the floating seal assembly. The vessel springs should be slightly loaded to assure full contact a between the atomizer and O-ring seal/
2) Back the robot up out of the cleaner Z+30-50mm to where the gap opens up between the atomizer and O-ring at the tapered portion of the shroud. Teach with the velocity of 10 - 25mm/sec. maximum with fine coordinates as the drying position.
3) This place will allow the booth air to be drawn in and create a laminar flow over the shroud thus stripping the fluids off. Turn ring air and shape air off and fully exit vessel as fast as is practical.
4) A position may have to be taught above the cleaner to allow the robot to maneuver to home position when it may be significantly away from the cleaner.
5) Exit slowly through the path to assure a smooth motion.

PROGRAMMING ADDENDUM

Here is the most basic “short” program. Crystal Cap Cleaners have included a discussion of the unknown variables in the process to aid your people to optimize for your particular needs.



ALPHA - After the default program has run and a successful result, this part of the sequence can be cut for fluid savings. If success is still visible, reduce the time of the ALPHA 2 sequence.

BETA - After optimizing the clean part of the program, the amount of time can be reduced until there is a sign of wetness, the, move up slightly

Part 1

The fluid ON time for the first step should be long enough to supply the impeller with fluid and wet the shroud. Fast drying paint with a long duration between cleaning opportunities will tend to need a longer fluid on time to break down the material deposits on the shroud. To achieve more cleaning action, use more fluid/air oscillations. With this method the air drives the fluid at the shroud in the form of a high velocity particle. The total fluid used to achieve equal cleaning performance will be less than if fluid was left on without the air on.

Part 2

Allow about one second to complete the previous “vapor-blast” then begin to exit the vessel. It will take longer with a water-based cleaning solution, shorter with a heated water-based cleaning solution, and shortest with a solvent based cleaning solution. The solvent-based type will evaporate off where the water-based type will be mechanically blown off.

Part 3

In the above program, the time between 3.5 seconds and 4 seconds allows the impeller air to stop flowing to enable a improved drying process. The lower helical air holes are enabled to assist with the evacuation of the fluid making the action more efficient

The ring air wipes off any fluid that may be trapped between the tapered surface and the O-ring in the fixed seal. From the sealed position retract the atomizer about 30mm, then shut off the ring air and continue the exit move. If the ring air is enabled with no atomizer in the vessel, the airflow will blow upward. If upward bound droplet marks are witnessed on the shroud, slow down the exit velocity or alter the ring air timing.

Part 4

During a cleaning cycle. Enable the shape air and adjust the setting to find the balance point to allow the holes to be cleaned without contaminating the atomizer with cleaning fluid. A shape air blow out removes any fluid that may have entered the shape air plate holes and any latent fluid that may be remaining in the air path. This procedure takes the risk away from having water drops on the job.

CC-2113-SB

Wall mounted CBS cleaner and fully adjustable frame

IMPELLER MAINTENANCE

Impeller bearing should be replaced annually or as needed
Do not remove impeller for maintenance unless it has stopped operating.

The impeller may stop for one of the following reasons:

One, it requires a new impeller Kit.
Solution: replace it with one from your crib.
Two, it requires some minor maintenance.
Solution: do the following:

Using the wrench provided remove the impeller from the vessel.

Disassemble the impeller by hand.
(It may be necessary to use a 1 ¼" wrench to remove the impeller kit (fluid delivery stem, seal, bearing assembly from the body)

Once you have removed the body from the impeller kit you are ready to clean.
(Do not try to remove bearing assembly from fluid delivery stem)

Soak (the seal and body only) in clean solvent.
Brush with a nylon brush to remove any particles.

Allow to dry or blow dry prior to reassembling.

Rotational drive holes on the body may be blocked, if that is the case use the appropriate wire size to clean out the drive hole on the side then use a pressure air hose to blow it clear.

After all parts are dry and you are ready to reassemble the impeller unit:
(Lubricate the threads on the impeller kit stem with Loctite heavy duty anti-seize to prevent galling.

Place the seal on top of the impeller kit making sure the metal side of the seal is placed into the recessed portion of the bearing assembly).

Place the stainless steel body on top and tighten by using a torque wrench (60in. lbs./6.78 Nm).

Over tightening may squash the seal and hinder rotation.

Check to ensure the impeller spins freely.

Apply Loctite heavy-duty anti-seize or equivalent to stem threads to prevent galling.

Replace in vessel using wrench provided.

Note: It is important to keep contaminates out of the bearing assembly, therefore if placing in solvent, ensure it is completely free of any particulate material. The construction of the impeller is such that no foreign material should find its way into the bearing while it is assembled.

INTEGRATING INTO A COLOR CHANGE CYCLE

The color change cycle begins on completion of the PUSH OUT cycle. The robot proceeds to HOME POSITION while beginning CLEAN OUT cycle.

The first steps of CLEAN OUT cycle direct the paint through the dump line with an air/solvent chop. The cleaner solvent should be turned on as soon as the robot can accomplish the GOTO cleaner move. AT CLEANER statement in the program will assure that the atomizer has made the position to contain the cleaning spray within the vessel. The trigger may be turned on to purge the last bit of paint in the atomizer with the solvent dominant solution directed at the center of the impeller. The cycle should finish with blowing the solvent from the paint line while directing a cap cleaner solvent spray at the atomizer.

FILL CYCLE begins with a GOTO CLEANER move statement followed by an AT CLEANER statement for safety. The color enable regulator over ride, and dump valves are opened to rapidly fill the paint line. Shroud cleaner air is enabled to first eject the charge of solvent left in the manifold then effect the drying cycle. The drying cycle blows off the wet shroud and displaces the humid atmosphere within the vessel through both side port and bottom compliance vent. The robot moves to the ABOVE CLEANER position at no more than 25mm/sec. This action breaks the seal between the shroud and the O-ring in the seal assembly on the top of the vessel. The slow break away allows the liquid trapped immediately below the O-ring to be blown off. Solvents dry fastest followed by hot water then cold water. The cleaner air is turned off and the atomizer shape air is turned on at 80 psi (5.5 bar) or regulator over ride. The chart shows a .5 sec. pause for the atomizer air pulse to exhaust. The final phase is to load the new paint from the color line down to the trigger needle of the gun with the fan and atomizing air off. If the paint is to be disposed of through the cleaner into solvent recovery system, it must be done prior to the last solvent chop otherwise the atomizer will be contaminated.

It is important to run a super purge cycle at break time and or end of shift by driving the robot to the shroud cleaner CLEAN IN position. Run an extended version of the clean out cycle with both the atomizer solvent and shroud cleaner solvent on. Savings can be had with an air solvent chop. This cycle will keep the paint line clean the atomizer and the cleaner operating properly. The life of the solvent recovery system piping will also be extended with this practice.

The directions above are provided as a guide to what actions are possible in an average cycle. Each Atomizer supplier may have a variation of these actions.

A number of installations have opted to remove a cup rinse cycle in lieu of a short fluid purge through the line, this saves time and fluid usage as the actions of the cleaner have replaced the cup rinse cleaning of the outside and inside of the cup at the same time as the shape air holes and shroud are being cleaned.

PREVENTATIVE MAINTENANCE OF CLEANER

1. At the beginning of the shift the operator should reach through the floating seal on the lid to rotate the impeller with a pen or other instrument to ensure it spins freely.
2. Make sure Knurled Knobs are hand tightened to secure lid to vessel
3. At break and end of shift the white plastic floating seal where the atomizer seals with the unit should be wiped down with solvent to clear any over spray. At this time O-ring and floating seal should also be inspected for cuts or gouges.
4. During breaks, please ensure all four shoulder bolts and springs are mounted and as such cleaner comes back to its original position. If any spring/shoulder bolt is missing, the cleaner will appear tilted and will miss its home position when bell exits the cleaner. Incorrect docking can cause damage to applicator and/or cleaner.

Note: At the end of shift, the interior of the vessel should be cleaned automatically.

The robot is run to the clean in position to do an extended atomizer clean and simultaneously doing a fluid purge through the atomizer in the unit.

The paint line and atomizer are cleared of residue, the impeller will be cleared of any solids on the rotating surfaces, the inside of the vessel will be maintained and the recovery system piping will be flushed

The booth cleaning crew prior to covering the unit should insure the floating seals can move to allow compliance with the atomizer.

The cover is opened to allow the side vent (where applicable) to exhaust without contaminating the springs at the base of the vessel, or a pipe is extended to below the grating.

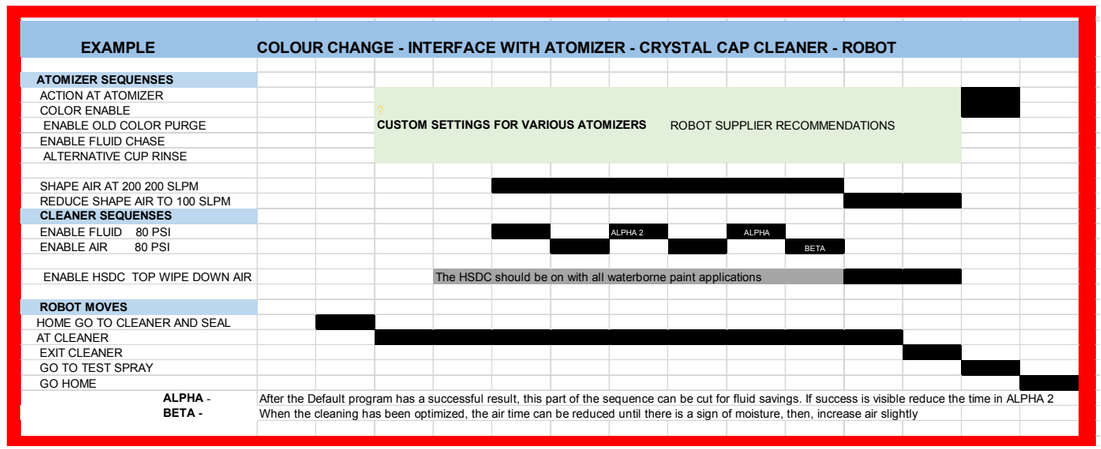
For servicing our impellers, we use the following for bench tools:

Impeller wrench Crystal Cap Cleaners Inc. part no. CC-W-03

Torque wrench assembly consisting of:
(1) 3/8" click type torque wrench with reversible ratchet
(1) 3/8" female to 1/2"male adapter
(1) 1 3/8 " six-point deep socket with ½" drive

Tube or jar of Loctite heavy duty anti-seize (#51606)

The following chart is an example of the interface between the Atomizer, Cleaner and Robot moves and actions. The light green section varies with each individual atomizer and preferred program as directed by the Integrator.



Crystal Cap Cleaners have observed over the past 20 years that Robot manufacturers, Integrators and Paint Shop Engineers have opted to change some of our recommended cycle actions due to the many variables in the Paint Shop....

Examples.

A) Limited time for the complete cycle.

B) Chemistry of the paint.

C) Booth downdraft balance.

D) Air and Fluid pressure varying at the cleaner

E) Elimination of a cup rinse in lieu of using the cleaner cycle.

F) Temperature of the Fluid

Start with the Crystal Cap Cleaner recommended default cycle and adjust the settings
If unsatisfactory results are present (See Troubleshooting Guide for assistance)

SPARE PARTS AND ADDITIONAL SUPPORT

We have used the best quality material in the production of our cleaner, with as few moving parts as possible yet we realize some will have to be replaced periodically. Therefore, we provide an attached list of items we feel will need replacing over time. To maintain zero down time, some of our customers have decided to carry some of these parts in inventory although we do carry a supply in our warehouse.

SEE PAGE “C”

For complete technical support
Call: 1 (905) 319-8855
Fax: 1 (905) 319-8857
Email: info@crystalcap.com

TROUBLESHOOTING GUIDE

CONTENTS

CLEANER PRE-SETS AT FACTORY

Crystal Cap Cleaners has the following features available and checked during assembly.

- Floater size for maximum cleaning height at the shroud.
- Drying holes above the seal point for wipe-off.
- Action helical holes below seal point to assist drying
- Impeller configured for maximum and most efficient cleaning of atomizer
- Optional drain assembly for fluid air separation and maximum draining.

CLEANER SETTINGS AT PLANT

- Impeller Air supply controlled by signal from Robot
- Impeller Fluid supply controlled by signal from Robot
- Drying Ring Air supply controlled by signal from Robot.

A service diagram with info on the above is included with the manual

CLEANER OPTIMIZING TIPS

Optimizing the cleaner is accomplished by following these steps –

- When the desired cleaning result is achieved by the default program, try to remove an air chop (fluid/air) to see if the atomizer still comes out clean. Repeat the process to make sure atomizer comes out clean and this way you will utilize least amount of fluid air, and time at the recommended speed etc.
- It is important to follow instructions in the manual and move the atomizer out before full withdrawal to allow for complete and most efficient drying cycle.
- Please check the air and fluid pressures at the cleaner first before attempting any of the above adjustments.
- Paint/Solvent chemistry, booth balance, fluid type, temperature, humidity and pressure stability are all variables. Follow solvent manufacturers' recommendations for temperasture etc. A recirculating solvent system including at the cleaner is recomendated.

CLEANER INTERFACE WITH ATOMIZER

Various settings can be adjusted as follows when atomizer is in the cleaner

- Purge of the old paint can be run
- Followed by the fluid through the applicator
- Cup Rinse can be done
- Cleaning cycle can begin after the push out and fill
- Recommended cup speed is 20,000 rpm.
- Shape air settings recommended at approx. 150 - 200 SLPM on various manufacturers of bell applicators during cleaning. Start on the high side to stay on the dry side, then, reduce to get most effective cleaning.
- If it gets wet behind the cup then raise the shape air back a bit to find the "sweet spot".
- On exit, the shape air should be reduced to 100 SLPM. This will reduce the turbulence on exit, thus preventing any moisture being re-introduced on the atomizer.

ATOMIZER COMES OUT FROM CLEANER CONTAMINATED

Run the following checks –

- Check Impeller Operation, it should spin freely.
- Check the solvent and air pressure at the cleaner. Recommended pressure is 80 PSI on both.
- Check the cycle chart, recommended cycle chart is in the manual.
- Check the shaping air settings, confirm not too high compared to impeller pressures.
- Confirm fluid compatibility with paint.

When above checks have been verified, try to set up and additional air chop. Do not increase the amount of solvent as this will not necessarily clear the contamination. If still there is no improvement, increase the first fluid times from 0.5sec to 1.0 sec, leave the other fluid enables at 0.5 sec.

If contamination remains on the atomizer, please contact our technical support team at info@crystalcap.com with following info –

- Program cycle chart
- Paint type
- Info on Fluid (if water based, fluid temp. etc.)
- Available air and fluid pressures at the cleaner.

ATOMIZER COMES OUT FROM CLEANER WET/MOISTURE

Run the following checks –

- Check the solvent and air pressure at the cleaner. Recommended pressure is 80 PSI on both.
- Check the cycle chart, recommended cycle chart is in the manual.
- Check the shaping air settings, confirm not too low compared to impeller pressures.
- Check the exit speed from the cleaner
- Check with fluid supplier for recommended temperature
- Check atomizer internals for trapped liquid

When above checks have been verified, the most common cause for this situation could be one of the following

- Balance between impeller pressure and shape air is not correct. Recommended pressure is 80 PSI on air/fluid and shape air at 200 SLPM.
- The atomizer has not been moved out as per recommended directions. We recommend exiting the cleaner from "in clean" position at 20mm/second for 1.5 seconds. At this point, shut off the drying ring air and proceed at desired speed. Also, make sure that the shape air setting is not too high during exit, as it will cause turbulence, thus causing wetness to be re-introduced on the applicator.

Other remote causes of wetness –

- Cup speed should not be in excess of 20,000 rpm.
- Too much fluid being introduced during the cleaning cycle.
- Impeller has been left on during exit, it should be off
- Venting at base is inadequate, opening up the side air vent will help.

If wetness is still evident, please contact our technical support team at info@crystalcap.com with following info –

- Program cycle chart
- Paint type
- Info on Fluid (if water based, fluid temp. etc.)
- Available air and fluid pressures at the cleaner.

MOISTURE APPARENT AT TOP OF THE CLEANER

- Check to make sure drying ring is tight to the lid
- Check to make sure lid is tight to the cleaner
- Inspect contact O-Ring in the drying ring for nicks or cuts
- Crystal Cap Cleaners have provided a special wrench for this purpose

EXCESSIVE MOISTURE/FOGGING AT THE DRAIN PIPE

- Check there is adequate flow in the drain system. There is large volume of material evacuating the cleaner in a relatively short time.
- Confirm that shape air is turned down during exit from the cleaner, thus reducing amount of material in the cleaner.

CLEANER DRAINING SLOWLY

- Confirm all fluid paths are clear and paint is not building up. Cleaner is designed to be clean after each use. Ensure adequate flushing of paint occurs, including colour change materials, each cycle the cleaner is used.

PAINT BUILDUP IN THE CLEANER

- Confirm all fluid paths are clear and paint is not building up. Cleaner is designed to be clean after each use. Ensure adequate flushing of paint occurs, including colour change materials, each cycle the cleaner is used.

DRAIN SYSTEM PLUGGING

- Confirm all fluid paths are clear and paint is not building up. Cleaner is designed to be clean after each use. Ensure adequate flushing of paint occurs, including colour change materials, each cycle the cleaner is used.

OTHER CONCERNS WITH A CRYSTAL CAP CLEANER

For all other questions or concerns regarding the operation or optimizing of a Crystal Cap Cleaner, please contact our Technical Department at info@crystalcap.com
or call us at +1 (905) 319-8855.

CRYSTAL CAP CLEANERS
Robotic Paint Gun Cleaning

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