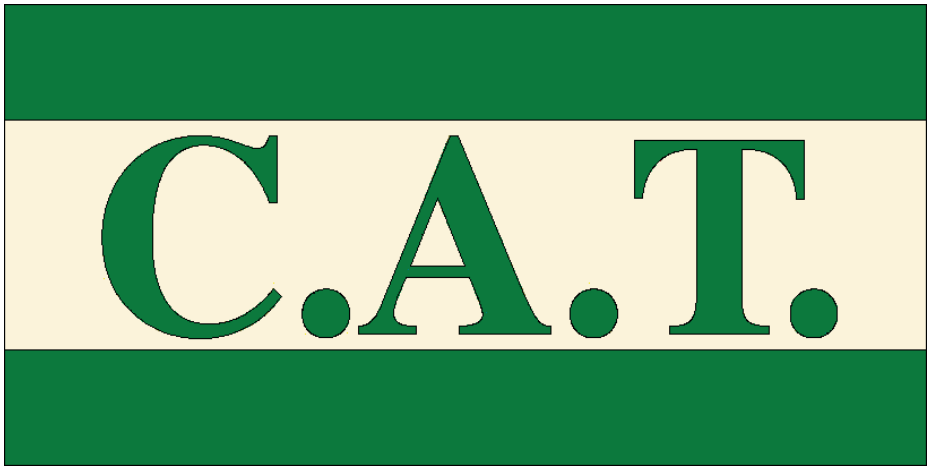

HPVC Pump Manual

Cooling & Applied Technology, Inc
P.O. Box 1279
Russellville, AR 72811-1279
Telephone: 479-890-3433
Fax: 479-967-2651

JBT CAT manufactures, sells, services, and supports food processing equipment worldwide. Our equipment is manufactured to exact customer specifications.

JBT CAT equipment is designed and constructed to meet or exceed the processing environment and applicable industry standards. Equipment is designed with safety and hygiene as an integral part of the design, manufacturing, assembly, and installation processes. Our equipment is generally made of stainless steel and designed to be easily cleaned and maintained. Equipment is manufactured with materials that are non-absorbent, corrosion resistant, and non-toxic.

Any questions regarding our equipment may be directed to your sales representative.

JBT CAT equipment is designed and manufactured under one or more of the following guidelines.

- NFPA 79 - Electrical Standard For Industrial Machinery
- UL508a - Electrical Standard for Industrial Control Panels
- ASME - Boiler and Pressure Vessel Code Rules, Section VIII, Division 1
- USDA Sanitary Guidelines
- NSF/ANSI/3-A 14159-1 – Hygiene requirements for the design of meat and poultry processing equipment.
- NSF/ANSI/3-A 14159-3 - Hygiene requirements for the design of mechanical belt conveyors used in meat and poultry processing.

Limited Warranty

Subject to the terms and conditions set forth herein, Cooling & Applied Technology, Inc. ("CAT") provides this Limited 1-Year Warranty only to the entity that originally purchased the product from CAT (the "Original Purchaser")

1. **Limited Warranty** This Limited Warranty shall warrant that this product described below (the "Product") shall be free from material defects in workmanship and materials under normal use and suggested maintenance from the date of original retail purchase of the Product for the period of 1 year ("Warranty Period"), except as otherwise stated herein.

2. **Exclusive Remedy** The Original Purchaser's sole and exclusive remedy and the entire liability of CAT under this Limited Warranty will be, at CAT's option, to either furnish replacement parts for the Product or to furnish a new or refurbished like-new Product during the Warranty Period at no charge to the Original Purchaser.

3. **Replacement Parts** CAT may, at its option, replace any defective Product, part or component thereof with any reconditioned Product or part that CAT reasonably determines is substantially equivalent or superior in all material respects to the defective Product or part. Replacement Products and parts will be warranted for the remainder of the Warranty Period, or 90 days, whichever is longer, and subject to the same limitations and exclusions set forth in this Limited Warranty. All Products and parts replaced by CAT shall become the property of CAT upon replacement.

4. **Exclusions** This Limited Warranty does not cover: installation, removal, or shipping costs; Products that, in CAT's judgment, have been subjected to abuse, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, accident, or other external causes, including but not limited to earthquake, fire, flood, weather, or condensation; Products whose serial numbers have been altered, tampered with, defaced or removed; Products that have been subject to improper or incorrectly performed maintenance or repair.

5. **Submitting a Claim** Upon discovery of any defect in the Product, the Original Purchaser shall notify CAT in writing at the mailing address or fax number set forth below. Follow CAT's RMA procedures for the return of Product for review. CAT shall evaluate the Product within a reasonable time period, and if CAT determines that the defect in question is covered by this Limited Warranty, CAT shall replace the Product or part in question as soon as practicable. This Limited Warranty excludes labor to remove or install such part.

6. **Limitation of Liability** To the maximum extent permitted by law, CAT is not liable under any contract, negligence, strict liability or other legal or equitable theory for any loss of use of the Product, inconvenience or damages of any character, whether direct, special, incidental, or consequential, resulting from the use of the Product, relating to warranty service, or arising out of any breach of this Limited Warranty, even if CAT has been advised of the possibility of such damages. The sole remedy for a breach of the

foregoing Limited Warranty is replacement of the defective or non-conforming Product or part. The maximum liability of CAT under this warranty is limited to the purchase price of the Product covered by the warranty. The foregoing express written warranties and remedies are exclusive and are in lieu of any other warranties or remedies, express, implied, or statutory. Some states do not allow exclusions or limitations on incidental or consequential damages, so the above limitations may not apply. This Limited Warranty provides specific legal rights, and you may also have other rights which vary from state to state.

7. **Notices** All notices and other communications provided herein shall be sent to the address and/or fax number set forth below:

   COOLING & APPLIED TECHNOLOGY, INC.
   PO Box 1279
   Russellville, AR 72811
   Fax: 479-890-3839

8. **Governing Law** This Limited Warranty shall be governed by the laws of the State of Arkansas.

9. **Transfer** This Limited Warranty is not assignable or otherwise transferable without the express written consent of CAT.

RMA Policy

When you receive your merchandise:	**Please open all boxes immediately and check contents.** We must be notified of any damage or defective products within 2 business days of you receiving your products. In order to serve you better, we request that you also inspect all of your products for obvious defects/blemishes within 2 days of receiving them.
Wrong Products Received:	It is very rare that you will receive an incorrect product; we double-check all orders before we ship them. However, if we made a mistake/error in shipping (it does rarely happen), please contact us. We will issue an RMA Number and return instructions on how and where to return the product. After receipt of the incorrect part we will then ship you the correct product and *pay the shipping costs both ways.* In some instances we may choose to ship a replacement overnight providing we receive another purchase order for the replacement. **If you ordered the incorrect product and would like to return it, then please see the "Returns" section.**
Shipping Damage:	If the packaging appears damaged on the outside, *please refuse to accept it from the carrier*; or please make sure when signing the shipper's proof-of-delivery slip, you include a note stating the package is or appears damaged. If you do accept a damaged shipment, please contact us immediately. Depending on the product and where/how it was shipped, it may be necessary for you to deal with the carrier. Also, if there was any internal (non-visible) damage, this will need to be reported to us or the carrier within two days of receiving the product.
Defective Products:	Within Thirty (30) days of receiving your order, if any product proves to be defective; please contact us immediately. Please DO NOT ship the product back to us without contacting us first and receiving an RMA Number and return instructions. After we receive the defective merchandise, we will test it if need be, and we will ship back to you (at our expense) a nondefective replacement product. Should we determine that the product is in fact defective (and was returned in accordance to our return instructions/policy), we will not only pay the cost of shipping the new non-defective product to you, but we will also reimburse you for standard ground rates/charges (not 2nd day air) that the shipping company charges for shipping the defective product back to us. This does not include any 3rd party processing fees imposed by some shipping companies. This offer is only good in the Continental U.S. If you ship the product back to us from outside of the 48 states, you will need to pay for the cost of sending the product to us. If the product is defective, you will receive a replacement upon receipt of the defective item. If you choose to return the defective item, rather than replace it, a restocking fee will be assessed and your original shipping and processing charges will not be refunded.

Returns:	**CRITERIA REQUIRED FOR RETURNING ITEM(S):** 1. Must be within 30 days from the day you received the item 2. Item must not have been installed 3. The item must be in perfect resalable condition in the original packaging 4. Custom orders or quoted items are non-returnable 5. Item must have been shipped by a Common Carrier (UPS/FedEx/USPS) If the above criteria is met, then we will issue an RMA Number. If you ordered the wrong products and wish to return the product, you will need to contact us to request an RMA Number. Returns will be subject to a 20% Restocking fee. Please do NOT return any product that you have ordered without contacting us for an RMA Number first. This will make processing your credit very difficult and may delay your credit.
Defective Products / Policy on shipping *before* **defective part returned:**	If your replacement order must be shipped prior to your credit being issued you will need to issue another purchase order for the replacement part before it ships. This will ensure that we actually receive the defective item back so that we may receive credit from the manufacturer. Reference will be made on your new order to ensure that you receive your credit when the defective item is returned otherwise replacement will be shipped when defect item is returned.
RMA Explanation:	**Returned Materials Authorization (RMA)** When it is necessary to return a product, please contact us to request an RMA Number. All returns, regardless of how they were shipped or where they were shipped from must be referenced by an RMA Number. Packages returned to us without an RMA number will not be returned to you. Handling returns in the manner that we do is necessary to ensure that you receive proper credit in a timely fashion. When you request an RMA Number to return a product, we will either issue the RMA at that time, or contact the warehouse that it shipped from and request that one be issued. If we need to receive the RMA from another warehouse, we will let you know by forwarding the information to you along with shipping instructions as soon as we receive it. The instructions for return must be followed carefully. Once the product has been received at our warehouse, it will be inspected and you will be credited for the returned product less the applicable Restocking Fee and original shipping and processing charges. If the product is returning to another warehouse, they will contact us

	once they have received the product, inspected it, and we have been issued credit. Once we have been credited for the return, your credit will be issued less the Restocking Fee and original shipping and processing charges.
Restocking Fee:	All returns are subject to a restocking fee. Our standard restocking fee is 20% on returned items. However, this charge may be waived in some instances. ** This amount may be changed at our discretion. ** We may charge more for an item that is obsolete or proprietary to your equipment. Please note: There is substantial cost in processing orders and shipping products. There is also cost in returning products: messages must be answered, RMA Numbers issued, products received and restocked, paperwork processed and mailed, etc. Therefore, a restocking fee is required in order to keep our prices at their lowest
NON-Returnable Items:	**ITEMS THAT ARE NOT RETURNABLE:** Items in your possession for more than 30 days may not be returned. Items that have been *installed* may not be returned. Items that *don't* have original packaging may not be returned. Items that have been used may not be returned. Items that are custom ordered may not be returned. *Electrical* or *Electronic* items may not be returned. Plant-*specific* (special) items may not be returned.

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INTRODUCTION SECTION 1-1

The HPVC pump, from Cooling and Applied Technology, Inc., is a sanitary pump designed to pump most liquids and many solid products. The pump has two moving parts: the inlet and outlet check valves. The pump operates by drawing a vacuum, provided by the control panel, on the vertical tube. This draws the product into the vacuum tube through the inlet check valve, and up the tube until it makes contact with the probe, housed in the cap of the tube. Once product contacts the probe, a signal is sent to the control panel, which in turn removes the vacuum from the tube and applies pressure. This pressure forces the inlet check valve to close and the product is forced out through the outlet check valve.

The capacity of the pump is dependant upon several factors such as air pressure, viscosity of product being pumped, distance product is pumped, and the amount of moisture in product. Since air usage is a factor of air pressure, usage can vary.

GENERAL ASSEMBLY SECTION 1-2

The inlet and outlet check valves are held in place with two sanitary stainless steel clamps. The outlet check valve is welded onto a reducer fitting. Once removed from the crate simply identify the inlet check from the outlet and attach with sanitary clamps to the appropriate ends. The Check valves must be aligned so that the hinge is at the top of the pump base. The vertical tube is attached with another sanitary clamp at the base of the tee.

CONNECTING THE PUMP TO THE CONTROL PANEL SECTION 1-3

The control panel should be connected to the pump as close as possible without putting the control panel in harms way. The control panel comes complete with seven feet of hose to connect the control panel to the pump. The control panel may be mounted farther from the pump than seven feet, but this will decrease the capacity of the pump slightly. Moving the control panel farther away will also increase the air consumption by approximately five- percent for every additional ten feet of air tubing.

The sanitary cap which houses the probe and diffuser screen is placed on top of the vertical tube and secured by a four inch sanitary clamp. Your pump is now connected to the control panel.

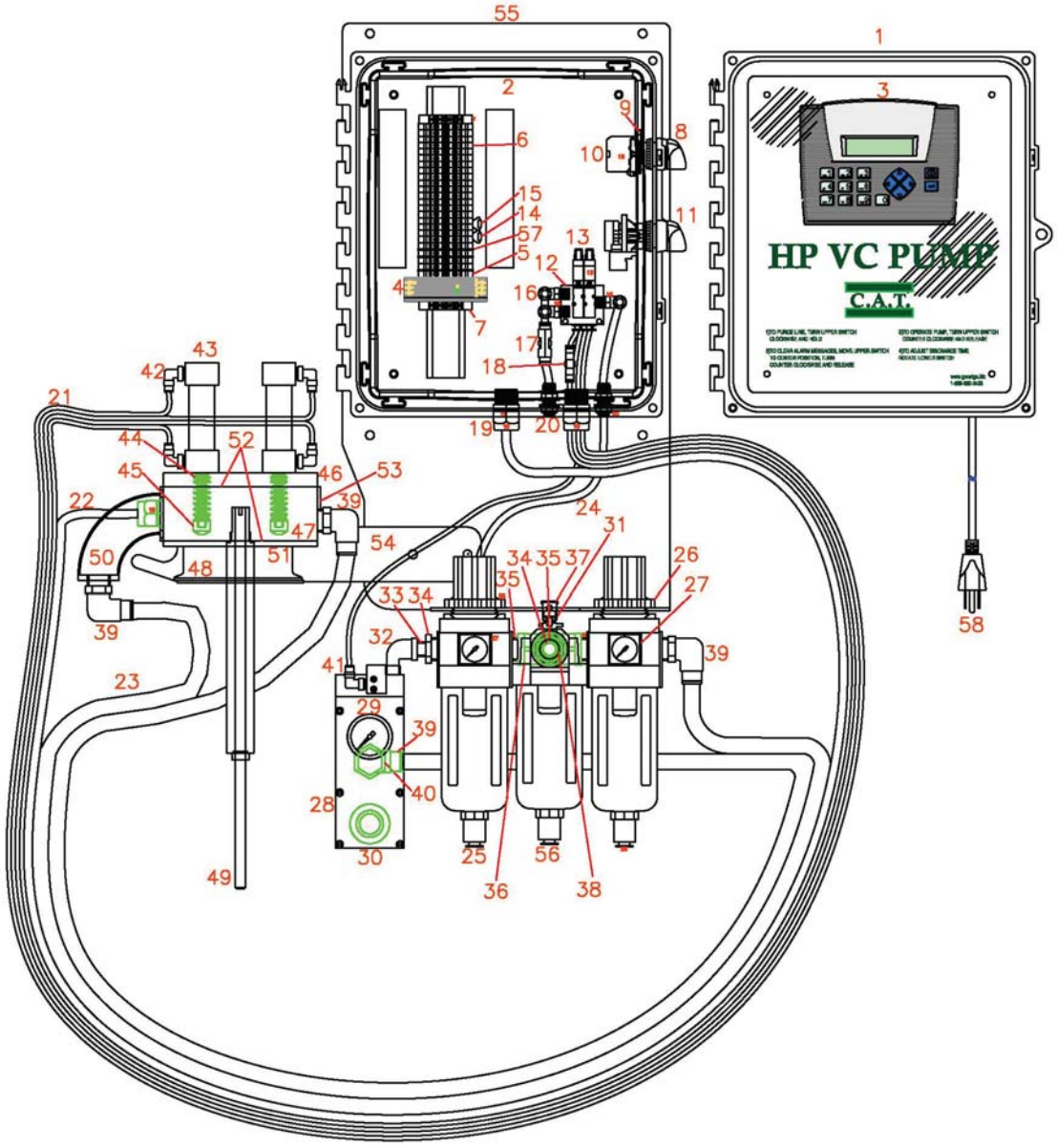
AIR HOOKUP FOR THE HPVC PUMP SECTION 1-4

The HPVC pump is furnished with a one-half inch (NPT) ball valve as the point of connection for compressed air. Although air consumption varies with each application/installation of the HPVC pump; the air supply should be sized to provide at least 32 CFM @ 75 PSI.

Furnished with your pump are an air filter and two regulator-filter combinations equipped with automatic drains. The regulator marked “suction” controls the amount of pressure available to the vacuum generator. This pressure should be set at no more than 75 PSI to ensure maximum efficiency. The regulator marked “discharge” controls the amount of pressure used to discharge the product from the pump. The proper amount of discharge pressure is determined by several factors including pumping distance, required flow rate, product viscosity and piping size.

ELECTRICAL HOOKUP FOR THE HPVC PUMP SECTION 1-5

The control panel requires 120/220VAC at .1 amps.


HP VC PUMP
C.A.T.

The PLC:

The PLC is the center of the HPVC control panel. The PLC interprets the signal from the probe, sets the timing of the pumping sequence, monitors for common problems, and provides diagnostic feedback to an operator the ensure maximum reliability and up-time. Very little physical interaction with the PLC is required as most common adjustments to the pump are made from the exterior of the control panel. During normal operation; the PLC display will display the discharge timer value, probe value, and pump status.

The discharge timer value is the amount of time (in seconds) that the pump will spend in discharge mode after receiving the signal from the probe. The discharge timer value can be easily adjusted with the potentiometer located on the right side of the control panel. The discharge timer has a maximum value of 10 seconds and a minimum value of $1/10^{th}$ of a second.

The probe value is a measure of continuity of the product being pumped, measured between the tip of the probe and the reservoir tube. The range has a maximum value of 1024 and a minimum value of 0. Typically, a very low number indicates that the probe is not in contact with the product being pumped (reservoir tube is empty). Typically, a high number would indicate that product is in contact with the probe (reservoir tube is full). In the above figure a value of 2 is being displayed meaning that the pump is empty of product.

The pump status alerts the operator to the current status of the pump. The status will change from “off” to “suction” or “discharge” depending on the position of the run/purge switch (located on the right side of the control panel) and the pumps current position in the pumping sequence. The status will indicate “waiting” when downstream control of the pump is used and product is no longer needed from the pump.

The Adjustable Probe:

During operation, certain products can coat the sensor probe creating false inputs to the control panel and causing poor performance. Periodic cleaning of the sensor probe may be required in certain applications to maintain reliability. To decrease the frequency of cleanings, the HPVC control panel has an adjustable probe set point. This set point can be changed on the fly to offset the effects of product build-up on the sensor probe during operation. To adjust the probe set point, follow these steps:

1.) Write down the probe value (displayed on the PLC) when the reservoir tube of the pump is empty. Use the manual discharge switch to ensure the pump is empty. This value should be close to zero. A reading higher than 0 (ex. 100) indicates that the probe has some fouling and that the set point can be adjusted to compensate. An extremely high reading while the pump is empty (ex. 500) indicates that the probe is heavily fouled and should be cleaned before proceeding. After recording this value proceed to step 2.
2.) Write down the probe value when the reservoir tube of the pump is full and the probe is in contact with the product. To accomplish this, watch the PCL display, use the run switch to jog the pump until the probe value jumps significantly (ex. 600). This indicates the probe has made contact with the product being pumped. Record this number and proceed to step 3.
3.) Using the two numbers you've written down, subtract the low value from the high value and divide the remainder by two. The quotient is our new probe set point. Record this number and proceed to step 4.

4.) From the PLC display, press the info button and release. A new screen will be displayed requiring a password to proceed. Enter the password “3433” then press the enter button and release.

5.) The next screen contains the probe set point value. Using the numeric keys, enter the new value you calculated in step 3 and press the enter button and release. You have now changed the probe set point.

****note** The pumping cycle is toggled only after the probe value has risen above the set point value; therefore, the set point value must always lie between the maximum and minimum readings from steps 1 and 2. If a set point value is calculated that is greater than the maximum or less than the minimum values from steps 1 and 2, repeat all steps.**

The Delay Timers:

After changing the probe set point the following screen will automatically be displayed.

This screen allows the operator to change the suction and discharge delay timer values. These delay timers will put slight pauses in the pumping sequence which can result in a better pumping action. If there is no specific reason to utilize these timers, it is suggested that they be left at a value of zero. In order to change these values simply use the enter key and the numeric keys to enter the required values. Timers are in increments of seconds. If you do not need to change these values and wish to return to the main screen, Press the enter key three times.

The Alarms:

An alarm screen will be displayed if conditions exist that would stop normal operation of the pump. The pump will remain stopped and the alarm will be displayed until the condition is corrected and the pump control is reset. This screen alerts the operator to the nature of the problem and provides instructions to solve the problem and restart the pump.

This screen indicates that product has been in contact with the probe for a period of time that was unexpectedly long. To identify the cause, the operator should make sure that:

1.) Air shut-off valve is in the open position
2.) Discharge pressure is set high enough to move product (try 40 PSI)
3.) Probe is clean
4.) Air supply is adequate
5.) No blockage exist in the discharge piping

After correcting the condition, to restart the pump simply cycle the run switch to the off position and return it to the run position. If the alarm condition has been corrected, the pump will return to normal operation. If the alarm screen is displayed again contact maintenance personnel for a thorough evaluation including calculation of the probe set point value.

Basic Adjustments:

The HPVC pump has four basic adjustments that are as follows:

1. Discharge timer (adjustment on side of panel)
2. Vacuum pressure (regulator marked suction)
3. Discharge pressure (regulator marked discharge)
4. Sensor probe set point (set via the PLC)

A good starting point for most applications is to set the pressure at the suction regulator to75 PSI and the pressure at the discharge regulator to 40 PSI. The timer should be set at two seconds. The probe set point should be set to 500. Adjust as necessary.

Thick products or high pumping volumes may require you to increase the discharge pressure. The discharge pressure will control the velocity of the product coming out of the pump and should be adjusted according to the desired product flow. The time value on the controller is the interval that the pump is in the discharge mode. A pump set to a short time interval will discharge small amounts of product and cycle too quickly. A pump set to a long time interval will force too much product out of the tube and air lock the check valves. Please note that on very fragile products like tenders or fillets, a longer stroke is more advantageous because the check valves will come in contact with fewer pieces of product.

- **Please note that in certain applications the HPVC pump may have to be primed to start the pump. Applications that may require priming include breast, thigh meat, tenders and other extremely thick products. The pump can be primed by placing either your hand or other object (i.e. plastic bag) over the exit end of the pipe connected to the pump. Once the pump cycles twice nothing else will be required.**

In the unlikely event that your pump is not performing, please see the chart below for help with any problems you might incur.

1. Problem

Pump is not pulling or sucking when the PLC indicates suction.

Cause

1. Outlet check valve may be lodged open with product causing the pump to suck air from piping.
2. Suction regulator is set too low. (Recommended: 55-75 PSI)
3. Low or no air pressure.
4. Air valves not functioning properly.
5. Dirty or defective vacuum generator.
6. Loose connection on piping.
7. Check valves misaligned.

Solution

1. Manually discharge the pump for 2 seconds to clear any blockage. If this does not help, disassemble the pump and clear the check valves.
2. Turn up suction regulator to75 PSI.
3. Check to ensure that the air supply is adequate
4. Disassemble and clean vacuum generator, or replace unit
5. Ensure that all tubing or plumbing connections, both inside the control panel and at the pump, are seated properly and no air is leaking.
7. Align check valve(s) hinge at top of tee. (Refer to Sec, 1-2)

2. Problem

Pump is in suction mode and will not cycle to discharge mode.

Cause

1. PLC failure
2. Probe connection is bad.
3. Outlet check valve lodged open.
4. Probe set point is too high

Solution

1. There are no user serviceable parts inside the PLC. Replacement is recommended if it is found that the PLC has failed
2. Inspect probe connections at both ends of wiring and repair if needed.
3. Purge pump.
4. Calculate probe set point and adjust PLC

3. Problem

Pump stays in discharge mode and will not cycle back to suction mode.

Cause

1. Probe may have product build up that is interfering with normal operation.
2. Pump wiring problem.
3. PLC failure
4. Probe set point is too low

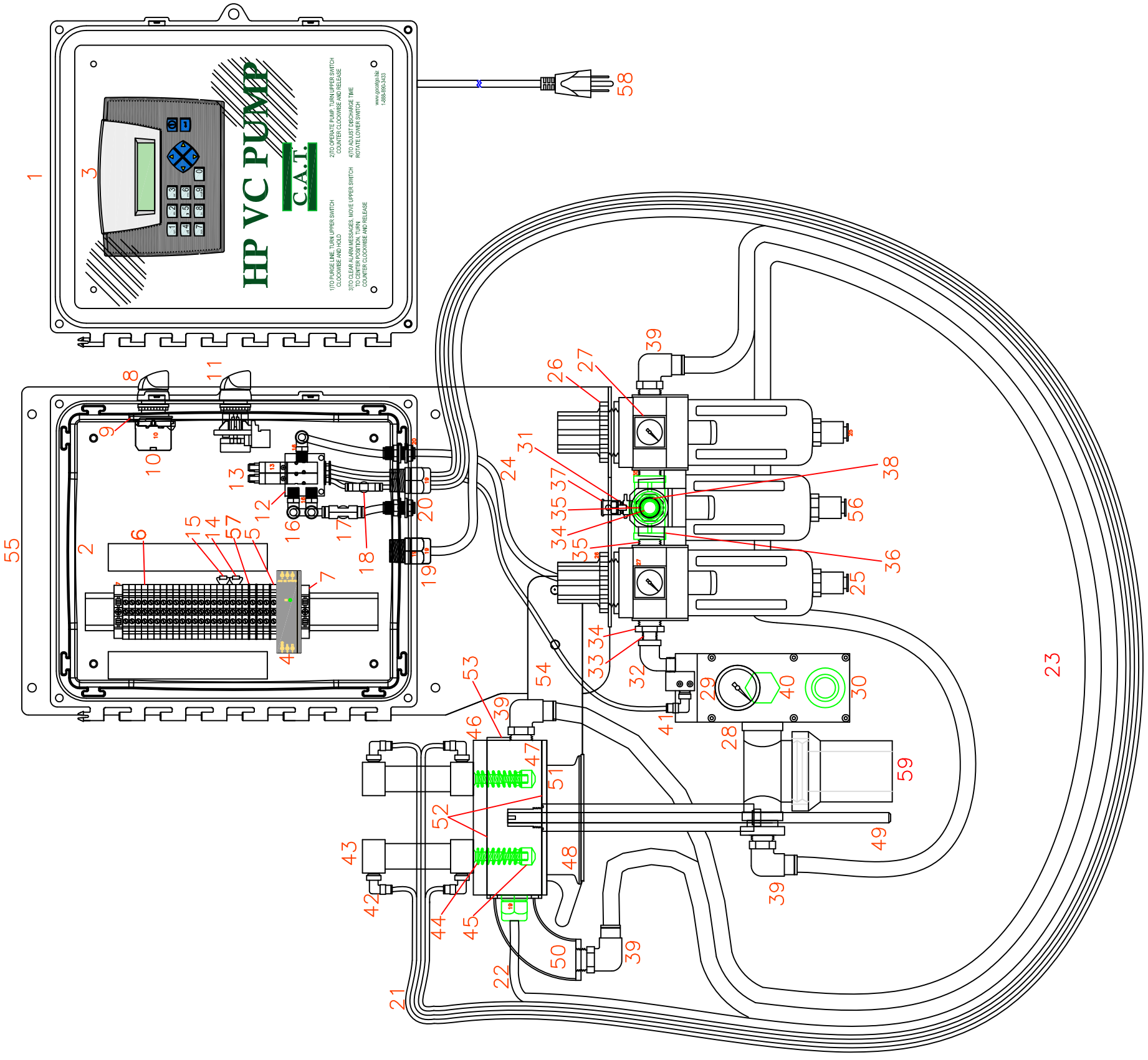
Solution

1. Remove sensor cap from pump and clean probe to remove any product build up.
2. Check all wiring, ensuring that there are no loose connections or corrosion
3. There are no user serviceable parts inside the PLC. Replacement is recommended if it is found that the PLC has failed
4. Calculate probe set point and adjust PLC

Your CAT HPVC pump is designed and built to provide you with many years of reliable service. However, like every other piece of food processing equipment certain items will wear. Below is a recommended spare parts list that will ensure you a minimum of down time should a part need to be replaced.

HPVC Pump Recommended Spare Parts List

SPARE QTY	CATALOG	DESC
1	11949	JAZZ JZ10-11-T17
1	17997	.5 AMP POWER SUPPLY
1	10952	3 POSITION LEFT MAINTAINED RETURN FROM RIGHT
1	18058	NO CONTACT
1	19860	10K POTENTIOMETER ASSEMBLY
1	14707	SYJ VALVE 24VDC
1	12432	8" VACUUM GENERATOR REBUILD KIT
1	16179	COALESCENT FILTER CARTRIDGE
1	12222	CYLINDER FOR SUCTION AND DISCHARGE
2	12245	HP PUMP CYLINDER SPRING
1	52267	HP PUMP CYLINDER PISTON
1	50910	HP PUMP PROBE
1	52272	HP PUMP SENSOR CAP SCREEN
1	12288 (INLCUDES 2-13823, 2-13670, 2-13658, 1-13674)	HP PUMP SENSOR CAP O RING KIT



NOTES:

REVISIONS:

TOLERANCES UNLESS OTHERWISE NOTED:

FRACTIONS	± 1/32
DECIMALS	± .03
ANGLES	± 1°
FINISH	125

C.A.T.
COOLING AND APPLIED TECHNOLOGY, INC.
PO Box 1279
Russellville, AR 72811 TEL: (479) 890 - 3433 FAX: (479) 967 - 2651

HP PUMP CONTROLS
LAYOUT

APPR. BY	DRAWN BY	CO NO.	WO NO.	CAT NO.	REV.
DB	JESSE HORN				
DATE	SCALE	TYPE	DWG-SHT NO.		
10-06-10			E0002		

REV.

DWG-SHT NO: E0002

JOB NO. - LOCATION:

JOB NO. - LOCATION:

DWG-SHT NO: E0003

REV.

NOTES:

REVISIONS:

ITEM	QTY	CATALOG	DESCRIPTION
1	1	12180	12 X 10 X 6 ENCLOSURE WITH FRONT PANEL
2	1	17893	12 X 10 BACK PLATE
3	1	11949	JAZZ JZ10-11-T17
4	1	17997	.5 AMP POWER SUPPLY
5	1	11531	GROUND TERMINAL BLOCK
6	23	11526,11529 OR 11527	RED,BEIGE OR BLACK TERMINAL BLOCK
7	2	14765	DIN RAIL END CLAMP
8	1	10952	3 POSITION LEFT MAINTAINED RETURN FROM RIGHT
9	1	18057	CONTACT MOUNTING LATCH
10	2	18058	NO CONTACT
11	1	19860	10K POTENTIOMETER ASSEMBLY
12	1	11948	SYJ 2 VALVE MANIFOLD
13	2	14707	SYJ VALVE 24VDC
14	1	12192	ZENER DIODE
15	1	12205	700 OHM 1 WATT RESISTOR
16	3	17793	1/8" NPT X 1/4" TUBE SWIVEL 90
17	1	17799	1/4" PUSH TUBE TEE
18	1	17886	5/32" PUSH TUBE TEE
19	5	14869	1/2" CORD GRIP
20	2	15666	1/4" TUBE BULKHEAD CONNECTOR
21	1	12128	5/32" 4 CONDUCTOR TUBING
22	1	17824	16-2 SJ CORD
23	1	12312	DUAL 1/2" TUBING
24	1	12285	1/4" POLY TUBING
25	2	12191	FILTER REGULATOR
26	2	12155	REGULATOR MOUNTING NUT
27	2	12188	REGULATOR GAUGE
28	1	12153	8" VACUUM GENERATOR
29	1	12286	VACUUM GENERATOR GAUGE
30	1	12287	VACUUM GENERATOR MUFFLER
31	1	17792	1/4" NPT X 1/4" TUBE SWIVEL 90
32	1	12206	SS 1/4" STREET ELL
33	1	10938	SS 1/4" CLOSE NIPPLE
34	2	11900	SS 1/2" X 1/4" BUSHING
35	3	18348	SS 1/2" CLOSE NIPPLE
36	1	12497	SS 1/2" CROSS
37	1	13883	SS 1/2" BALL VALVE
38	1	17779	1/2" NPT X 1/2" TUBE STRAIGHT
39	4	17780	1/2" NPT X 1/2" TUBE SWIVEL 90
40	1	11903	SS 3/4" X 1/2" BUSHING
41	1	10089	1/8" NPT X 5/32" TUBE SWIVEL 90
42	4	12196	1/8"BSP X 5/32" TUBE SWIVEL 90
43	2	12222	CYLINDER FOR SUCTION AND DISCHARGE
44	2	12245	HP PUMP CYLINDER SPRING
45	2	52267	HP PUMP CYLINDER PISTON
46	1	52268	HP PUMP SENSOR CAP TOP PLATE
47	1	52269	HP PUMP SENSOR CAP BOTTOM PLATE
48	1	52270	HP PUMP FLANGE ADAPTER
49	1	50910	HP PUMP PROBE
50	1	52271	HP PUMP 90 FREEZE PROTECTOR
51	1	52272	HP PUMP SENSOR CAP SCREEN
52	1	12288	HP PUMP SENSOR CAP O RING KIT
53	1	52273	HP PUMP GROUND STRAP
54	1	52274	HP PUMP SENSOR CAP HOLDER
55	1	52275	HP PUMP CONTROL MOUNT
56	1	12483	5 MICRON FILTER ASSEMBLY
57	3	11534	TERMINAL BARRIER
58	1	14717	120VAC POWER CORD
59	1	13066	VACUUM FILTER

TOLERANCES UNLESS OTHERWISE NOTED:
FRACTIONS ± 1/32
DECIMALS ± .03
ANGLES ± 1°
FINISH 125

COOLING AND APPLIED TECHNOLOGY, INC.
PO Box 1279
Russellville, AR 72811 TEL: (479) 890 - 3433 FAX: (479) 967 - 2651

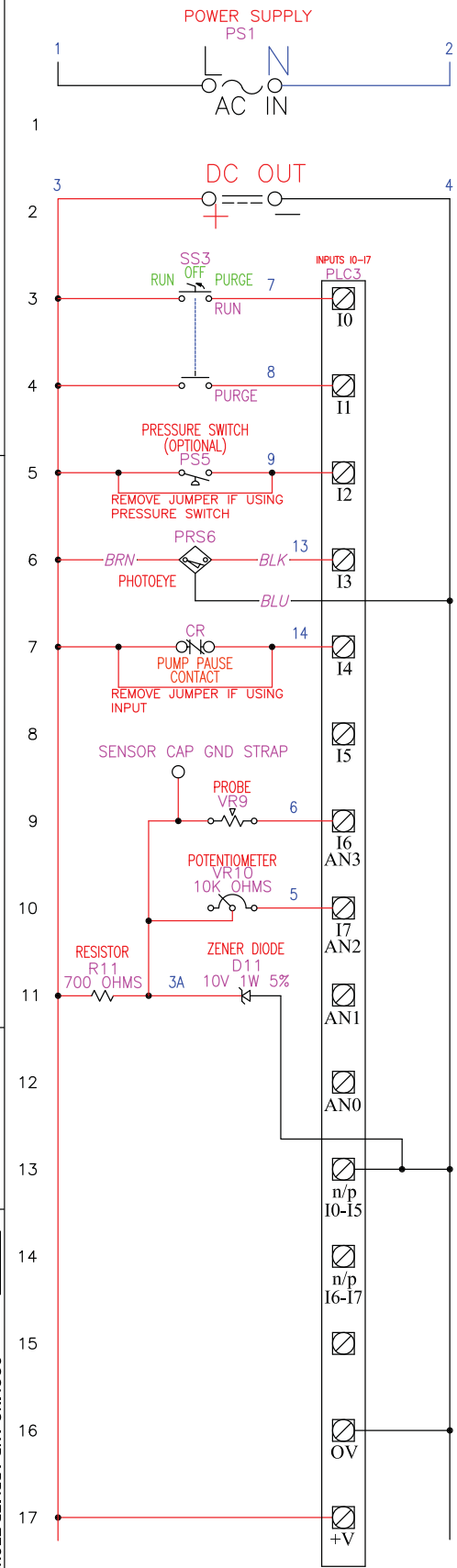
HP PUMP CONTROLS
BOM

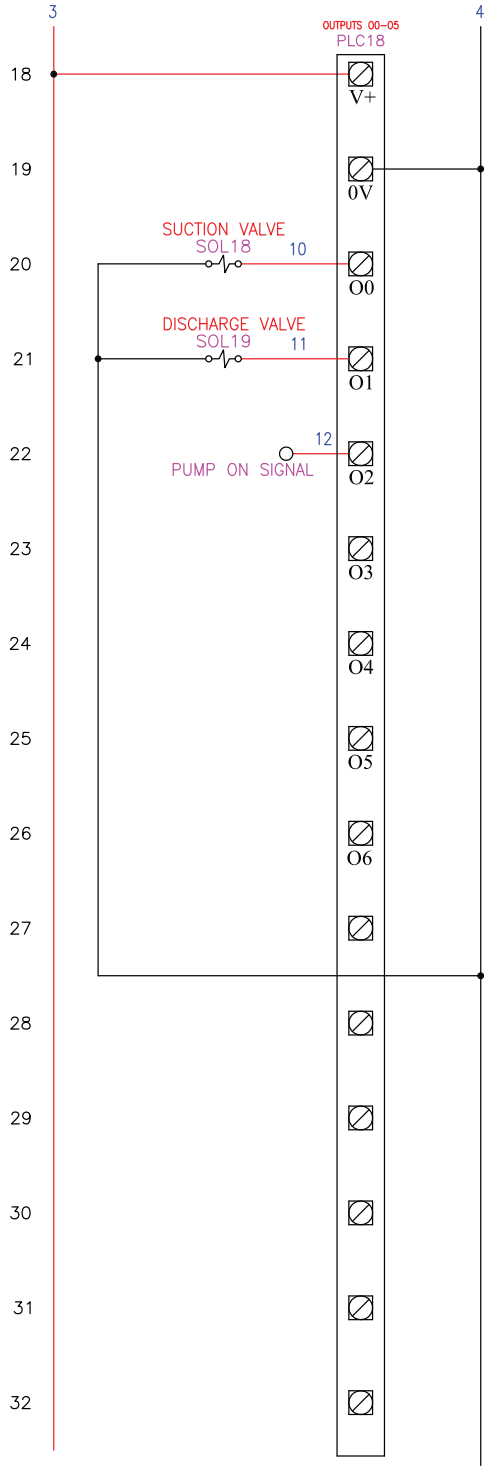
APPR. BY DB
DRAWN BY JESSE HORN
DATE 09-15-10
SCALE
CO NO.
TYPE
WO NO.
DWG-SHT NO. E0003
CAT NO.
REV.

JOB NO. - LOCATION:	DWG-SHT NO:	REV.
	E0001	

NOTES:

REVISIONS:





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TOLERANCES UNLESS OTHERWISE NOTED:
FRACTIONS ± 1/32
DECIMALS ± .03
ANGLES ± 1°
FINISH 125

DATE	APPR BY
09-15-10	DB

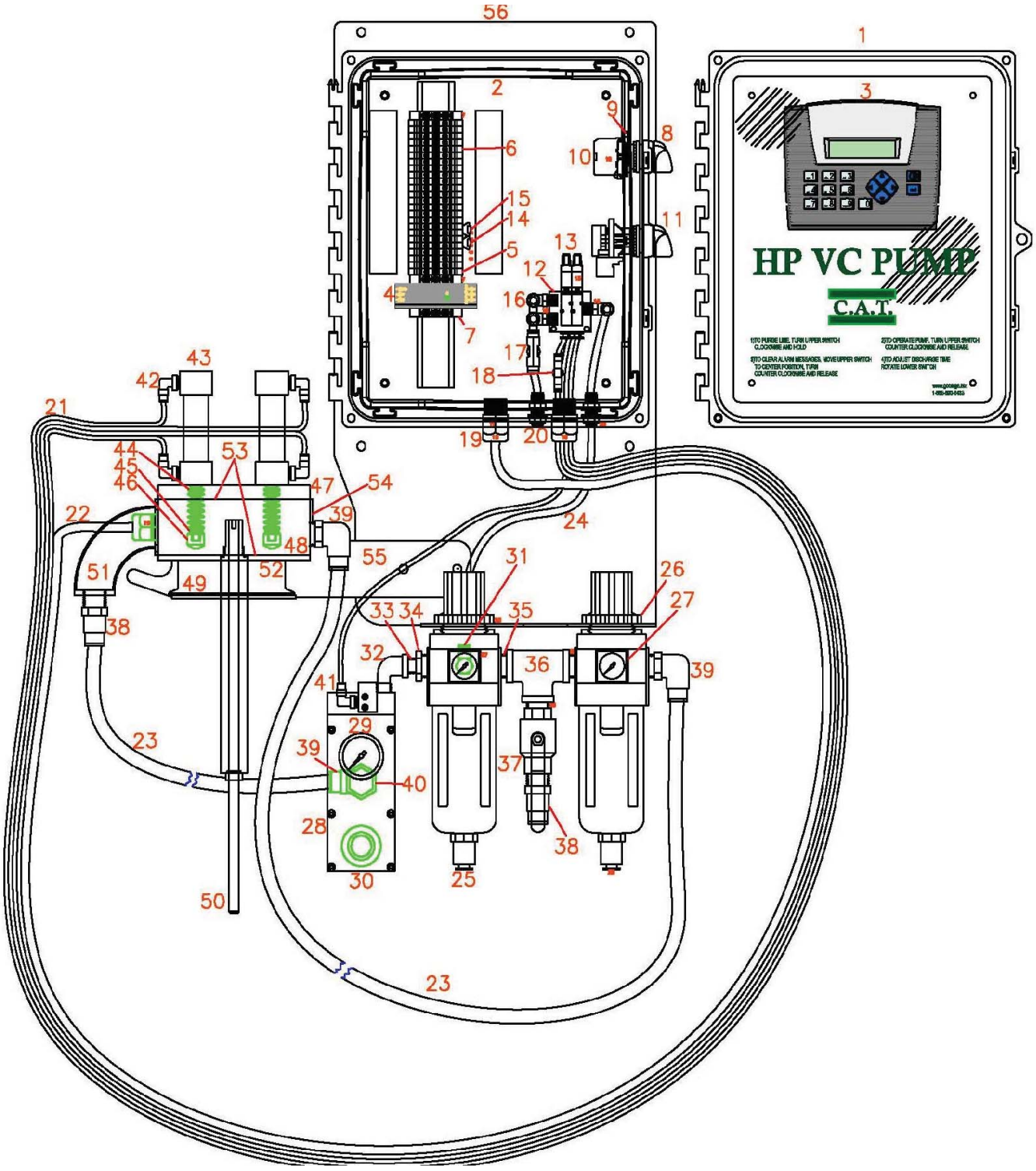
DRAWN BY	CO NO.	WO NO.	CAT NO.
JESSE HORN			

SCALE | TYPE | DWG-SHT NO. E0001 | REV.

HP PUMP CONTROLS
LADDER LOGIC

COOLING AND APPLIED TECHNOLOGY, INC.
P.O.Box 1279
Russellville, AR 72811
TEL: (479) 890 - 3433
FAX: (479) 967 - 2651

CONTROL PANEL LAYOUT **SECTION 1-10**



CHECK DAILY:

1) Check regulator pressure
   - ***** Suction = Approx. 75 PSI
   - ***** Discharge = Approx. 40 PSI (settings vary greatly with product and Distance)

2) Check filter bowls for condensation build-up or damaged/dirty filters

3) Check to make sure diffuser screen is in place

4) Check to make sure the door of the control panel is closed and latched at all times to guard against water ingress. Lock the panel door closed if necessary.

CHECK MONTHLY:

1) Check vacuum generator function
   1.) Disconnect vacuum line at sensor cap and block off or cap the line.
   2.) With the pump turned on and in suction mode a vacuum will build in the line which can be read from the gauge on the vacuum generator.
   3.) With 75 PSI line pressure the generator should develop between 22-26 inches of vacuum. If it is found that the generator is not performing properly a rebuild or cleaning may be needed.

2) Inspect sensor cap including
   1.) All attached air lines
   2.) Sensor cord
   3.) Pneumatic cylinders
   4.) Fasteners
   5.) O-ring seals

3) Inspect control cabinet including
   1.) Door latches
   2.) Door seal
   3.) PLC is securely mounted
   4.) All cord grips and bulkhead fittings tightened
   5.) Check for air leaks
   6.) Check for corrosion
   7.) Potentiometer functions correctly
   8.) Run/purge switch functions correctly
   9.) Valves function correctly

Pump Cleaning Procedure Section 1-12

1.) Empty the discharge piping of product using the purge switch on the control panel.
2.) Disconnect inlet and outlet piping from the pump, keeping clamps and gaskets in a secure place.
3.) Remove sensor cap and diffuser screen from pump and place them on the sensor cap storage bracket, keeping the clamp and gasket in a secure place. By hand, wash the sensor cap, paying special attention to the probe. An abrasive hand pad can be used to scour the probe if necessary. Avoid high pressure spray. Sanitize as necessary and inspect for cleanliness.
4.) Remove reservoir tube from pump base, keeping clamp and gasket in a secure in a secure place. Use high pressure spray to clean the tube. Sanitize as necessary and inspect for cleanliness.
5.) Remove inlet and outlet check valves from the pump base, keeping clamps and gaskets in a secure place. High pressure spray as well as hand washing should be used to ensure thorough cleaning. Sanitize as necessary and inspect for cleanliness.
6.) Clean the pump base with high pressure spray. Sanitize as necessary and inspect for cleanliness.
7.) By hand, wash all clamps and gaskets. Sanitize as necessary and inspect for cleanliness.
8.) Reassemble pump

1.) Let others in the area know you are locking the machine out.
2.) Turn the run switch on the control panel to the off position. (status indicator should read "off")
3.) Unplug the 120 volt power cord from its receptacle and attach a proper lockout device.
4.) Turn the air supply valve to the off position and attach a proper lockout device.
5.) After attaching the lockout devices, put the keys in your pocket.
6.) After locking out the electrical and air supplies, try to start the pump to verify that it is properly disabled. ***If the pump starts or still has power applied, stop and get your supervisors help!***
7.) Release any stored air in the pump by turning the regulator adjusting knobs fully counterclockwise. The pressure gauges should read 0 PSI.
8.) You may now safely perform the necessary work.

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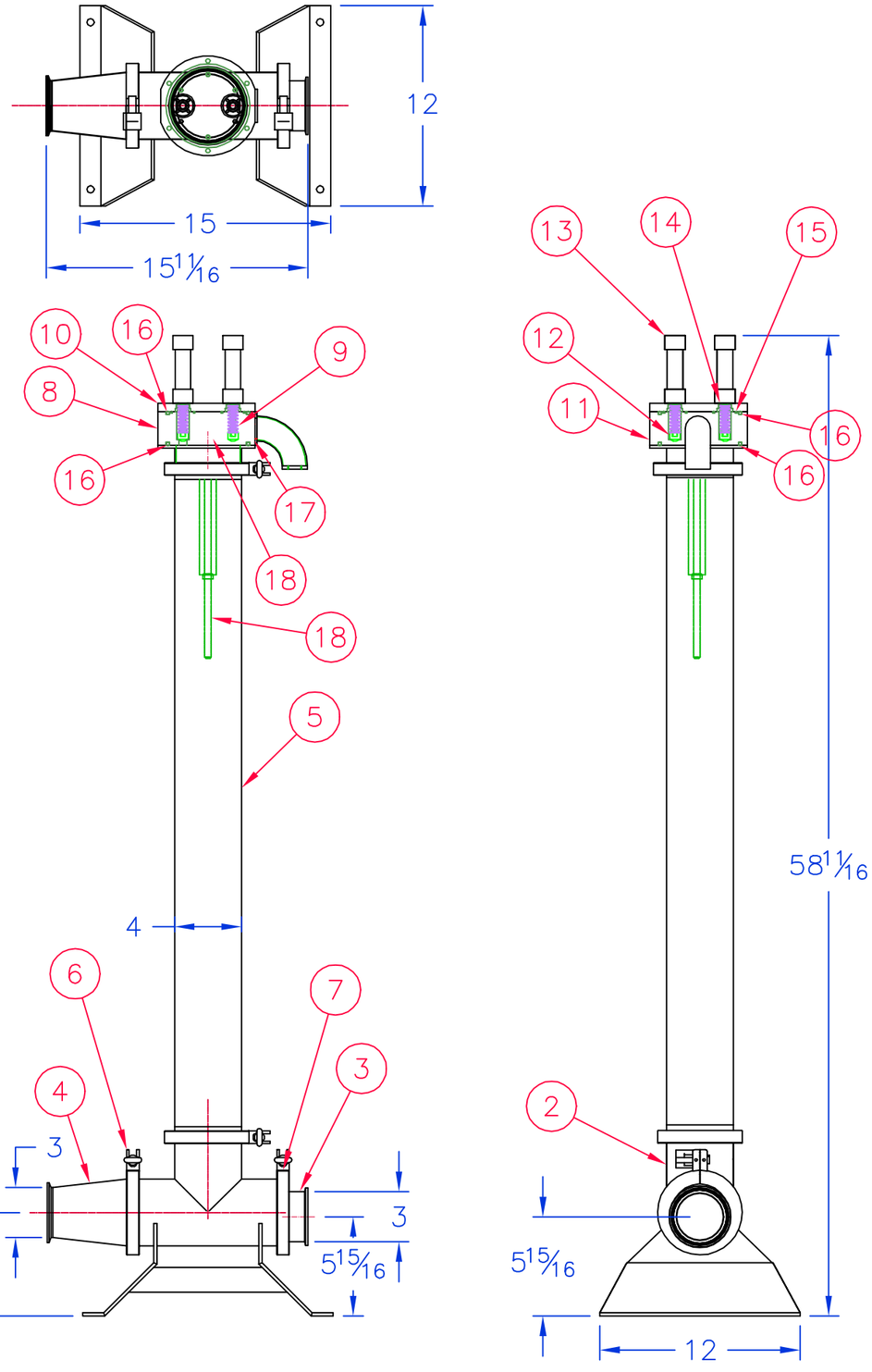

Bill Of Materials

Item	Qty.	Description	Part #
1	1	4 in VC Pump	50404
2	1	Pump Base ASSY	50938
3	1	4 in Inlet Check Valve	50437
4	1	4 in Outlet Check Valve	50438
5	1	4 in Reservoir Tube	50441
6	4	Hinged Clamp 4" HD	12999
7	4	Gasket, 4" Buna-N	12984
8	1	HPVC Pump Sensor Cap Complete ASSY	52258
9	2	Spring	12245
10	1	HPVC Pump Sensor Cap Top Plate	52268
11	1	HPVC Pump Sensor Cap Bottom Plate	52269
12	2	HPVC Pump Cylinder Piston	52267
13	2	Cylinder	12222
14	2	O-Ring for Cylinder	13658
15	2	O-Ring for Cylinder Seal Between Plates	13670
16	2	O-Ring For Between Plates	13670
17	2	O-Ring Suction Manifold Seal	13674
18	1	Pump Probe	50910
19	1	O-ring for Pump Probe	13625

C.A.T.

4" VC Pump

CUSTOMER:	PROPOSAL NO:	DRAWN BY:	DATE:
		David	03-18-08
	JOB NO:	DRAWING NO:	REV:

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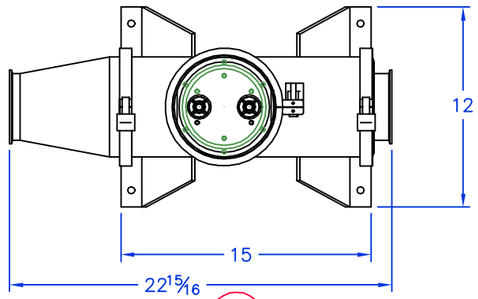

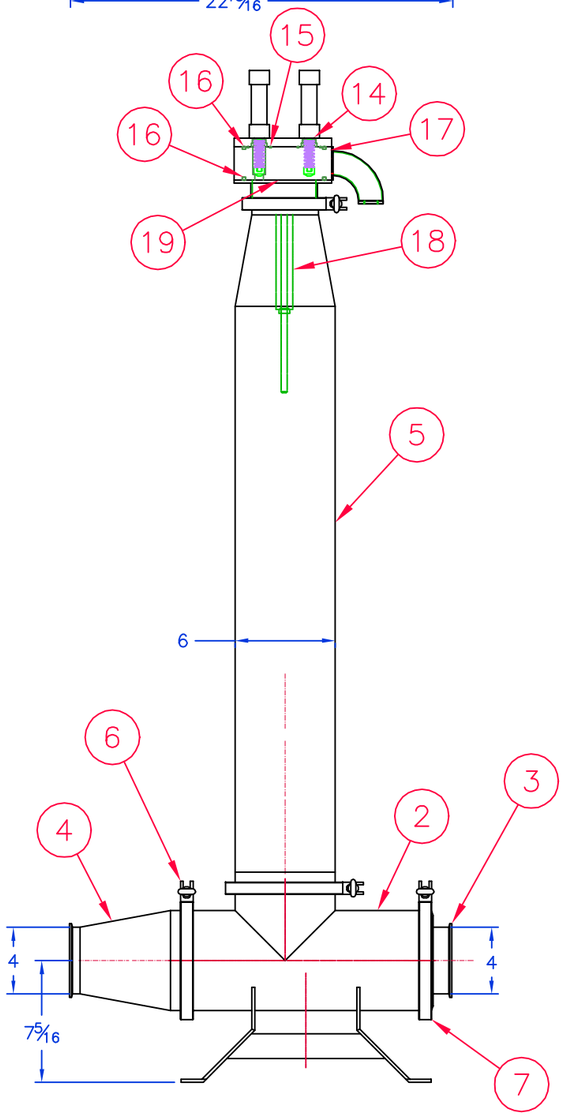

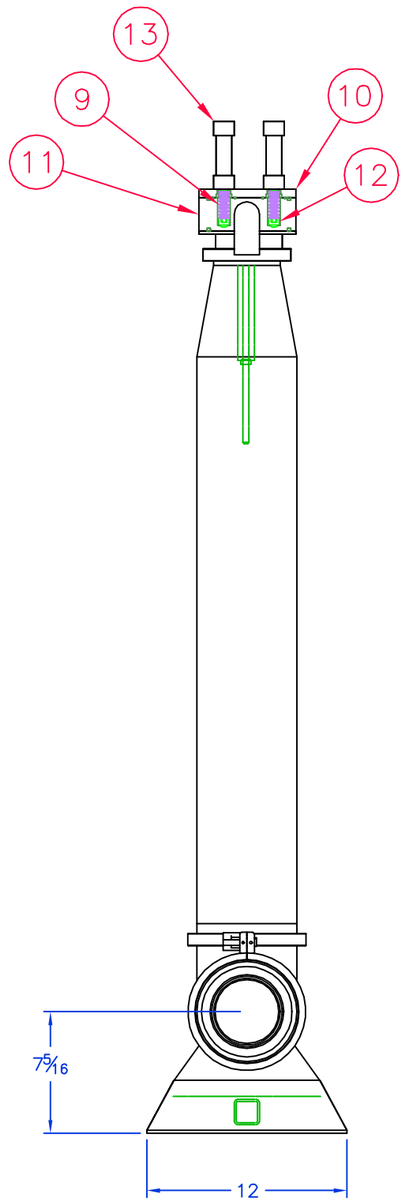

Bill Of Materials

Item	Qty.	Description	Part #
1	1	6 in VC Pump	50407
2	1	Pump Base ASSY	50488
3	1	6 in Inlet Check Valve	50431
4	1	6 in Outlet Check Valve	50432
5	1	6 in Reservoir Tube	50494
6	3	Hinged Clamp 6" HD	13000
7	3	Gasket, 6" Buna-N	12985
8	1	HPVC Pump Sensor Cap Complete ASSY	52258
9	2	Spring	12245
10	1	HPVC Pump Sensor Cap Top Plate	52268
11	1	HPVC Pump Sensor Cap Bottom Plate	52269
12	2	HPVC Pump Cylinder Piston	52267
13	2	Cylinder	12222
14	2	O-Ring for Cylinder	13658
15	2	O-Ring for Cylinder Seal Between Plates	13670
16	2	O-Ring For Between Plates	13670
17	2	O-Ring Suction Manifold Seal	13674
18	1	Pump Probe	50910
19	1	O-ring for Pump Probe	13625

C.A.T.

6" VC Pump

CUSTOMER:	PROPOSAL NO:	DRAWN BY: David	DATE: 03-18-08
	JOB NO:	DRAWING NO:	REV:

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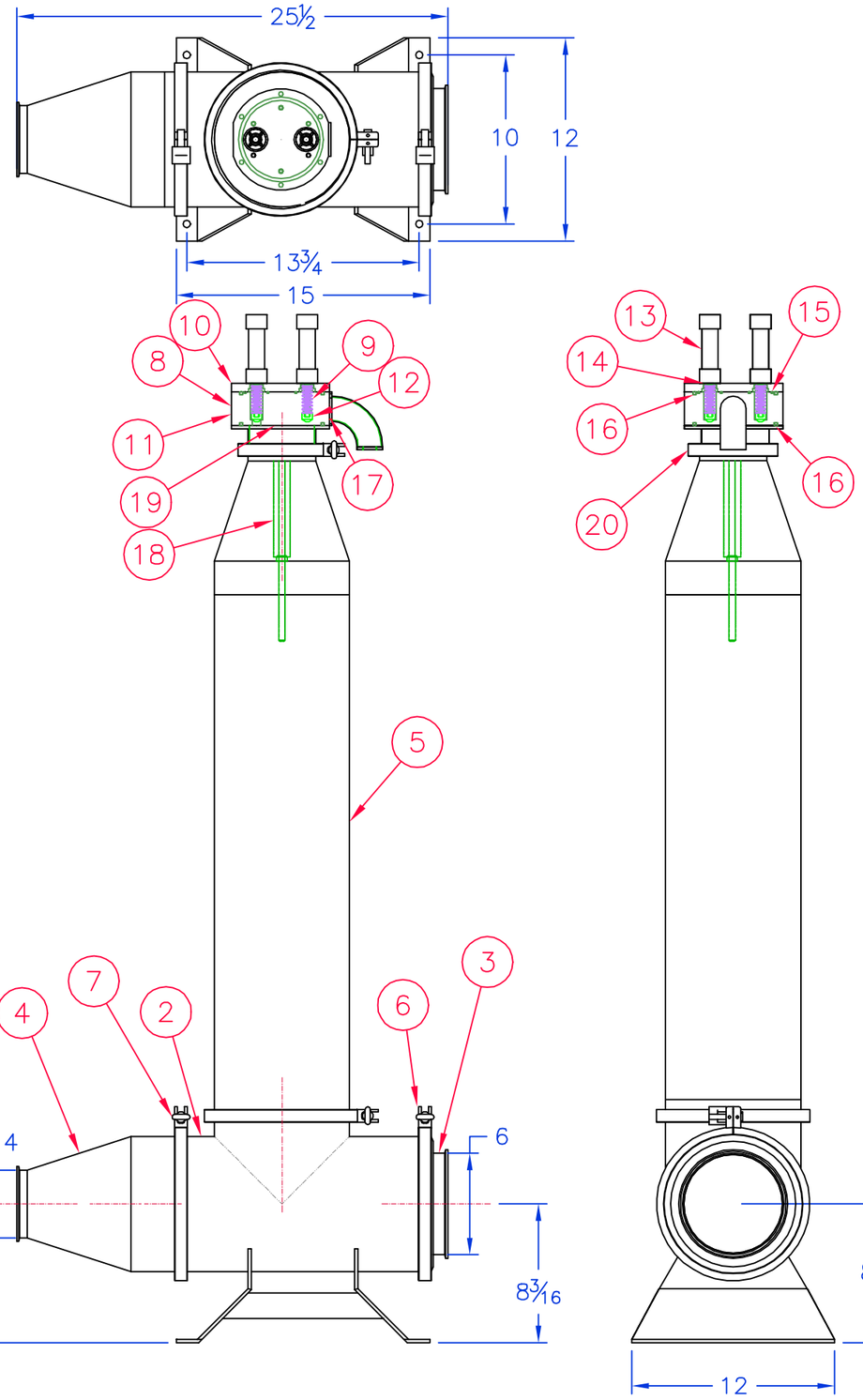

Bill Of Materials

Item	Qty.	Description	Part #
1	1	8 in VC Pump	50412
2	1	8 in Pump Base ASSY	50495
3	1	8 in Inlet Check Valve	50498
4	1	8 in Outlet Check Valve	50496
5	1	8 in Reservoir Tube	50495
6	3	Hinged Clamp 8" HD	12999
7	3	Gasket, 8" Buna-N	12984
8	1	HPVC Pump Sensor Cap Complete ASSY	52258
9	2	Spring	12245
10	1	HPVC Pump Sensor Cap Top Plate	52268
11	1	HPVC Pump Sensor Cap Bottom Plate	52269
12	2	HPVC Pump Cylinder Piston	52267
13	2	Cylinder	12222
14	2	O-Ring for Cylinder	13658
15	2	O-Ring for Cylinder Seal Between Plates	13670
16	2	O-Ring For Between Plates	13670
17	2	O-Ring Suction Manifold Seal	13674
18	1	Pump Probe	50910
19	1	O-ring for Pump Probe	13625
20	1	4 in Buna Gasket	12984

C.A.T.

8 IN VC Pump

CUSTOMER:	PROPOSAL NO:	DRAWN BY:	DATE:
		David	02-16-07
	JOB NO:	DRAWING NO:	REV: