

HP COOL TECH, INC.

PowerPump

**INSTALLATION MANUAL
HANWHA XD32, 35 & 38
Series 10000/11000**



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Please read and understand the contents of this manual prior to installation of the HP Cool Tech High Pressure Coolant Pump. Failure to follow Installation, Safety or Checklist Instructions may result in damage to the unit, or injury to personnel.

INTRODUCTION

We are proud to bring to market the HP Cool Tech, Inc high pressure coolant pump, a high pressure coolant delivery system that is competitive with similar systems on the market today.

The HP Cool Tech, Inc high pressure coolant pump was developed in a machine shop, by machinists, for use in the machine shop environment.

Their hands on experience has resulted in the design and development of a unit that solves "real world" problems and helps meet the demands of today's fast paced manufacturing environment.

The HP Cool Tech, Inc high pressure coolant pump will facilitate the processing of a variety of materials through the delivery of high pressure coolant at stable temperatures right to the contact point of tooling and material. Chips will be evacuated at a rapid rate which will permit the use of more aggressive feeds and speeds. This in turn will result in shorter cycle times, improved finishes and increased tool life.

Specifications

Main Motor	10000 Series 7.5 HP, 11.4 KVA 11000 Series 10 HP, 15.2 KVA
Voltage	208/230/460-3 Phase 60 HZ
Control Power	24 VDC
Feed Pressure	5-50 PSI
Fluid Type	Vascomill HD 22 or Equivalent
Output Ports	4/8
Output Pressure	Manual, Single Pressure 425-2000 PSI Electronic, Multi Pressure 425-2000 PSI
Flow Rate	Fixed Volume @ 7.6 GPM Variable Volume up to 7.8 GPM
Filter	5u
Dry Weight	600 LBS

WARNING!!!

This unit is designed to produce a flow of coolant at extremely high pressure! AS SUCH:

- 1. All hoses must be secured to hold 2,000 lbs of pressure.**
- 2. All guards and safety features must be in place on machine.**
Coolant running at high pressure can cut or inject into the body.
- 3. Safety glasses must be worn while using this equipment, High pressure oil can cause serious, permanent eye injury.**
- 4. Small pinholes must be repaired immediately as they have a potential to cause injury.**
- 5. Only trained personnel should operate, repair or maintain the DP Tech, Inc High pressure pump.**

SAFETY

Warning to End User of the HP Cool Tech, Inc high pressure coolant pump
This system is designed to deliver coolant under high pressure to your machining process.
Precautions must be taken to protect personnel and equipment.

1. The HP Cool Tech, Inc high pressure coolant pump must be installed by qualified technicians
2. All machine doors must be in place with all safety locks in operating condition prior to operating the HP Cool Tech, Inc high pressure coolant pump.
3. Certain oils can form a mist under high pressure operating conditions. This represents a potential fire hazard. Therefore, it is recommended that the machine be attended during operation or fire suppression equipment be installed.
4. Prior to installation it is recommended that any cracked or missing guards on the machine be replaced.
5. Chip guards and spindle caps must be in place prior to use of the HP Cool Tech, Inc high pressure coolant pump.
6. Careful consideration must be given to oil line placement while using the HP Cool Tech, Inc high pressure coolant pump as the high pressure can force fine chips into areas of the machine required to remain free of machining debris.
(Collets, Guide Bushing, Collet Slots, etc)
Regular maintenance of these areas should be performed to prevent excessive build up.
7. High voltage is present in the cabinet of the HP Cool Tech, Inc high pressure coolant pump and should be serviced by qualified personnel only.
8. PRIOR TO the beginning of maintenance or repair of the HP Cool Tech, Inc high pressure coolant pump, the assigned technician will:
 - A. Locate and render inoperative any energy providing sources to the equipment.
These sources include, but are not limited to:
 - Electrical
 - Mechanical
 - Stored energy such as springs and air pressure
9. Due to the potential for mist / smoke to form under high pressure conditions, the use of a mist control or air filtration device is recommended.

INSTALLATION

ALL PRECAUTIONS IN THE SAFTEY SECTION OF THIS MANUAL MUST BE MET PRIOR TO INSTALLATION.

1. The HP Cool Tech, Inc high-pressure pump requires either 208 or 460 volt 3 phase-dedicated line. A qualified technician must perform connection to power.
2. Uncrate the HP Cool Tech, Inc high-pressure pump and inspect for damage.
3. The unit must be installed in a location with consideration given to access to the electrical panel and the pump filter as this will need to be accessed during the course of routine maintenance.
4. Install the filter bag, follow the instructions in the operations manual. Do not turn on coolant at this time.
5. **BEFORE PROCEEDING ANY FURTHER, BACKUP THE CNC PARAMETRS AND LADDER TO A FLASH CARD. SEE PAGES 15 and 16**
6. Verify that the X57.0 contact in three rungs of the CNC ladder are normally closed contacts, change to normally closed contacts if necessary.
7. Set keep relays as follows:
 - K7.1, "1"
 - K12.3, "1"
8. Verify 24 volts DC on pin 5 and 0 volts DC on pin 14 of CNC 24 pin output terminal.
9. If available, plug in high-pressure tester to CNC output.
 - A. Press red reset button, CNC should high-pressure alarm.
 - B. Reset CNC.
 - C. MDI CNC M204 thru M219
 - D. Close all doors, turn on flood coolant.
 - E. Single block CNC and verify the sequence is correct.
 - M204 #1 light on
 - M205 #1 light off
 - M206 #2 light on
 - M207 #2 light off
 - M208 #3 light on
 - M209 #3 light off
 - M210 #4 light on
 - M211 #4 light off
 - M212 #5 light on
 - M213 #5 light off

M214 #6 light on
M215 #6 light off
M216 #7 light on
M217 #7 light off
M218 #8 light on
M219 #8 light off

10. TURN THE MACHINE MAIN POWER OFF BEFORE BEGINNING INSTALLATION.

11. Install bulkhead connectors.
See photos to identify gang and backwork panels. Use straight bulkhead connectors on gang and straight bulkhead connectors and 90 degree male/female adaptors on backwork panels.
12. Install 2'' bushing. See photo for position.
13. Attached colored wire ties to pump outlets, bulkhead connectors and hoses using the color-coding chart in owners manual.
14. Route and connect all the hoses to the bulkhead connectors and the high-pressure pump. Hose placement is critical and consideration to sharp edges, corners and moving machine components must be given to hose placement to avoid damage to the hoses during normal operation. The hoses will move when they are pressurized.
15. Remove the air line and fitting from the sub spindle ejector tube and replace the fitting with a 1/4'' JIC x 1/8'' MNPT 90 degree fitting. Be sure that the fitting does not strike the rear cabinet when the ejector is in the home position and the sub spindle is at the maximum Z travel position.
16. Install internal high-pressure hose to the bulkhead connector and ejector fitting. Route the hose along the control-wiring path.
17. Install all remaining internal high-pressure hoses.
18. **VERIFY THAT ALL THE HOSE CONNECTIONS ARE TIGHT.**
19. Install a tee and hose barb between the flood coolant pump and the flexible flood coolant line. Use teflon tape on all the threads
20. Assemble 1'' hose barb and 1'' x 8'' nipple to 90 degree elbow. Use Teflon tape on the threads.
21. Install pipe assembly into coolant tank with one split collar on each side of the tank cover. Adjust the length of pipe in the coolant tank tighten the collars. See photo.

22. Using 1" hose connect the flood coolant outlet from the installed tee to the inlet of the high pressure pump and tighten the clamps
23. Using 1" hose connect return from the installed polypropylene bulkhead to the outlet of the high-pressure pump and tighten the clamps.
24. Install pressure relief valve in port next to high pressure outlets.
25. **TURN THE HIGH PRESSURE DISCONNECT OFF. OPEN ELECTRICAL ENCLOSURE AND TURN OFF THE TWO CIRCUIT BREAKERS.**
26. Using a qualified technician, electrically connect the high pressure pump to the power supply.
27. Verify the voltage at the disconnect of the high-pressure pump.
28. Turn on the high pressure disconnect and the 2 pole circuit breaker and verify the voltage and the line side of the 2 pole circuit breaker. **THIS MUST BE 208/220 VOLTS LINE TO LINE FOR 220 VOLT SERVICE . 460/480 VOLT LINE TO LINE FOR 460 VOLT SERVICE.**
29. Turn on the 1 pole circuit breaker and verify that the PLC run light is on.
30. Turn the pressure relief valve counter clockwise to the stop.
31. Verify the rotation of pump motor
 - Remove orange cover from coupler
 - An arrow on the pump indicates the direction the motor/pump should turn
 - Manually push the starter in the electrical panel and verify the motor/pump is turning in direction of the arrow
 - Replace the coupler housing cover
32. Verify direction of heat exchanger fan. It should be blowing out through the cooler.
33. Close electrical cabinet door, lock and turn on disconnect.
34. Connect the 24 pin connector to the mating jack on the CNC.
35. Power up the CNC.
36. Open the drain valve, turn on the flood coolant and run for 1 minute. Close the drain valve, leave flood coolant on, and check for leaks. Run flood coolant until a steady flow of oil runs thru purge line. The pump is now primed.
37. MDI sub spindle high-pressure line M218, M219 on 8 line pump or M209, M210 on a 4 line pump. Single block first M code and turn pressure relief valve clockwise to raise pressure to 500 PSI. Run for 1 minute to flush the system. Check for leaks. Single block last M code.
38. Perform the installation checklist, initial, date and sign.
39. The warrantee will be void without a signed copy of the installation checklist returned to the vendor.

USE

The unit is M-code driven

Alarms are designed to permit the user to anticipate low pressure conditions and perform maintenance prior to the unit shutting down the machine due to an E-Stop activation.

-A yellow indicator light on the pump cabinet notifies the operator that pressure is dropping due to the filter bag accumulating chips. This condition should be corrected at this time. When the bag is changed, the indicator will not light again until the condition reoccurs.

-In the event a clogged filter bag significantly impedes the flow of coolant, the pump will activate an E-Stop condition and the red filter reset light will go on. The filter must be changed at this time. When the bag is changed the filter reset must be pushed to clear the alarm.

Other conditions that will alarm/E-Stop the machine.

- Thermal overload of pump motor
- Lack of air flow to the coolant unit
- Open machine cabinet door

LAMP	INDICATOR LAMP STATUS	
	CONDITION	CAUSES/ACTION
Green	Pump is running	Normal operation
Yellow	Output filter pressure is below 5 PSI	Change filter media
Solid Red Alarm	Thermal Overload	Phase lose Short circuit Motor overload Reset thermal relay
Red Reset	Clogged filter	Change filter media Push reset button
Red Reset w/Flashing Alarm	High pressure below 50 PSI	Low coolant supply Clogged coolant supply line Damaged pump coupling Output exceeds capacity Low voltage Pressure set below 425 PSI Push reset button

FOLLOWING INSTALLATION THE FOLLOWING CHECKLIST MUST BE COMPLETED PRIOR TO PLACING THE HP COOL TECH, INC. HIGH PRESSURE PUMP INTO SERVICE. CHECK FOR / RESOLVE LEAKS THROUGHOUT TESTING.

#	TEST FUNCTION	VERIFIED BY
1	Fan Rotation	
2	Motor Rotation	
3	Bag filter in place, cover secured	
4	All lines properly connected	
5	Check for leaks, resolve as needed	
6	MAIN SPINDLE- MDI mode Program: #1132=1000 EOB M218 EOB CYCLE START verify through sub spindle coolant is operational, check for leaks	
7	With coolant running, slowly open spindle door, verify high pressure pump shuts off. Repeat process with main door.	
8	MAIN SPINDLE- MDI mode Program: #1132=1000 EOB M218; EOB CYCLE START shut off coolant flow at operator panel, verify pump stops	
9	1. Flood Coolant Pump OFF 2. Cycle start High Pressure Pump (M218) 3. Verify the control generates M code finish error after time out	
10	Verify the high pressure pump shuts off along with the flood coolant via the following commands: 1. M9 (MDI Mode) 2. -Coolant off- hard key	
11	Verify the high pressure pump shuts off when RESET hard key is depressed.	
12	In Automatic Mode, with either door OPEN: -Verify machine will not cycle -Verify door must be closed and RESET hard key is pressed before machine will cycle	
13	With high pressure pump ON, depress E-STOP hard key, verify high pressure pump turns off	
14	REPEAT STEPS 6 THRU 13 WITH SUB SPINDLE	
15	VERIFY FUNCTION OF HP OIL LINES IN BOTH MAIN AND SUB PROGRAMS, CHECK OFF AS VERIFIED	

	LINE	COLOR CODE	VERIFIED BY
16	M204 On (Main)	YELLOW	
17	M205 Off (Main)		
18	M206 On (Main)	GREEN	
19	M207 Off (Main)		
20	M208On (Main)	BLUE	
21	M209Off (Main)		
22	M210 On (Main)	ORANGE	
23	M211 Off (Main)		
24	M212 On (Main)	Red	
25	M213 Off (Main)		
26	M214 On (Main)	PURPLE	
27	M215 Off (Main)		
28	M216 On (Main)	GREY	
29	M217 Off (Main)		
30	M218 On (Main)	BLACK	
31	M219 Off (Main)		
32	M204 On (Sub)	YELLOW	
33	M205 Off (Sub)		
34	M206 On (Sub)	GREEN	
35	M207 Off (Sub)		
36	M208On (Sub)	BLUE	
37	M209Off (Sub)		
38	M210 On (Sub)	ORANGE	
39	M211 Off (Sub)		
40	M212 On (Sub)	RED	
41	M213 Off (Sub)		
42	M214 On (Sub)	PURPLE	
43	M215 Off (Sub)		
44	M216 On (Sub)	GREY	
45	M217 Off (Sub)		
46	M218 On (Sub)	BLACK	
47	M219 Off (sub)		

FOLLOWING INSTALLATION THE FOLLOWING CHECKLIST MUST BE COMPLETED PRIOR TO PLACING THE HP COOL TECH, INC. HIGH PRESSURE PUMP INTO SERVICE. CHECK FOR / RESOLVE LEAKS THROUGHOUT TESTING.

#	TEST FUNCTION	VERIFIED BY
1	Fan Rotation	
2	Motor Rotation	
3	Bag filter in place, cover secured	
4	All lines properly connected	
5	Check for leaks, resolve as needed	
6	MAIN SPINDLE- MDI mode Program: #1132=1000 EOB M218 EOB CYCLE START verify through sub spindle coolant is operational, check for leaks	
7	With coolant running, slowly open spindle door, verify high pressure pump shuts off. Repeat process with main door.	
8	MAIN SPINDLE- MDI mode Program: #1132=1000 EOB M218; EOB CYCLE START shut off coolant flow at operator panel, verify pump stops	
9	1. Flood Coolant Pump OFF 2. Cycle start High Pressure Pump (M218) 3. Verify the control generates M code finish error after time out	
10	Verify the high pressure pump shuts off along with the flood coolant via the following commands: 1. M9 (MDI Mode) 2. -Coolant off- hard key	
11	Verify the high pressure pump shuts off when RESET hard key is depressed.	
12	In Automatic Mode, with either door OPEN: -Verify machine will not cycle -Verify door must be closed and RESET hard key is pressed before machine will cycle	
13	With high pressure pump ON, depress E-STOP hard key, verify high pressure pump turns off	
14	REPEAT STEPS 6 THRU 13 WITH SUB SPINDLE	
15	VERIFY FUNCTION OF HP OIL LINES IN BOTH MAIN AND SUB PROGRAMS, CHECK OFF AS VERIFIED	
	LINE	COLOR CODE
16	M204 On (Main)	YELLOW
		VERIFIED BY

17	M205 Off (Main)		
18	M206 On (Main)	GREEN	
19	M207 Off (Main)		
20	M208On (Main)	BLUE	
21	M209Off (Main)		
22	M210 On (Main)	ORANGE	
23	M211 Off (Main)		
24	M212 On (Main)	Red	
25	M213 Off (Main)		
26	M214 On (Main)	PURPLE	
27	M215 Off (Main)		
28	M216 On (Main)	GREY	
29	M217 Off (Main)		
30	M218 On (Main)	BLACK	
31	M219 Off (Main)		
32	M204 On (Sub)	YELLOW	
33	M205 Off (Sub)		
34	M206 On (Sub)	GREEN	
35	M207 Off (Sub)		
36	M208On (Sub)	BLUE	
37	M209Off (Sub)		
38	M210 On (Sub)	ORANGE	
39	M211 Off (Sub)		
40	M212 On (Sub)	RED	
41	M213 Off (Sub)		
42	M214 On (Sub)	PURPLE	
43	M215 Off (Sub)		
44	M216 On (Sub)	GREY	
45	M217 Off (Sub)		
46	M218 On (Sub)	BLACK	
47	M219 Off (sub)		

High Pressure Coolant Lines

M Code	Color Code	Tool
M204 On	YELLOW	
M205 Off		
M206 On	GREEN	
M207 Off		
M208On	BLUE	
M209Off		
M210 On	ORANGE	
M211 Off		
M212 On	RED	
M213 Off		
M214 On	PURPLE	
M215 Off		
M216 On	GRAY	
M217 Off		
M218 On	BLACK	
M219 Off		

OPERATOR NOTES:

Hanwha XD20 26 and 32 Backup Procedure

BACK UP PROCEDURE MUST BE PERFORMED PRIOR TO MAKING ANY CHANGES TO LADDER PROGRAM OR KEEP RELAYS

Press Set/OFS to setting parameter

Page + or – to 00020 (I/O channel) set to “4”, if not “4”, press #4 then input

Insert memory card

Press “Edit” key

Press “System” key

Press + soft key to “PMC MAINTEN”

Press “I/O” soft key

Select “Memory Card”

“Write”

“Parameter”

Press “OPRT” soft key

Press “New Name” soft key. Make sure file name is created. Write down file name.

Press “EXEC” soft key. Status will change from writing to complete.

Select “Memory Card”

“Write”

“Sequence Program”

Press “New Name” soft key. Make sure file name is created. Write down file name.

Press “EXEC” soft key. Status will change from writing to complete.

Remove card

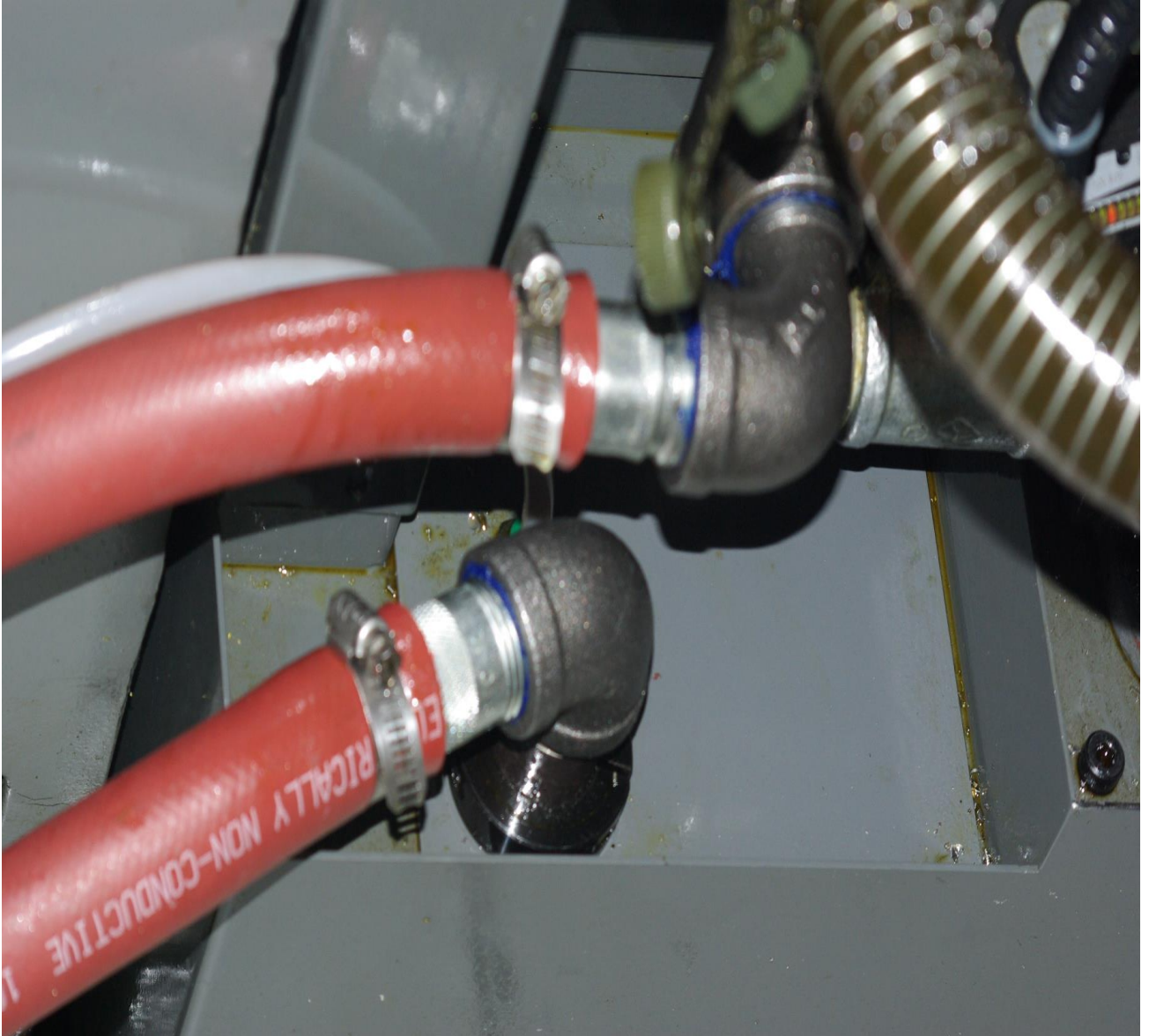
Hanwha XD20 and 26 Keep Relay and Ladder Modifications

KEEP RELAY

Press “Edit Key”
Press “System Key”
Press + soft key to “PMC MAINTEN”
Press + soft to “Keep Relay”
Press “Keep Relay” soft key
Change keep relays as required. See installation manual for keep relay settings.

PMC LADDER

Press “System Key”
Press + soft key to “PMC LADDER”
Press “OPRT” soft key
Press “Edit” soft key
Press + soft key to “Stop”
Press “Yes” soft key
Keyboard type “X57.0”
Press “Search” soft key. Make a note of the line number for X57.0.
Press “Next” soft key. Make a note of the line number for X57.0
Again press “Next” soft key. Make a note of the line number for X57.0
Press “Exit” soft key
Highlight X57.0 on first recorded line number
Press “Zoom” soft key
Change X57.0 from N.O. to N.C.
Press + soft key to “Exit Zoom”
Press “Exit Zoom” soft key
Highlight X57.0 on second recorded line number
Press “Zoom” soft key
Change X57.0 from N.O. to N.C.
Press + soft key to “Exit Zoom”
Press “Exit Zoom” soft key
Highlight X57.0 on third recorded line number
Press “Zoom” soft key
Change X57.0 from N.O. to N.C.
Press + soft key to “Exit Zoom”
Press “Exit Zoom” soft key
Press “Exit Edit” soft key
Press “Yes” soft key
Press “Edit” soft key
Press + soft key to “Run”
Press “Yes” soft key
Press “Exit Edit” soft key



FEED and RETURN HOSES at COOLANT TANK



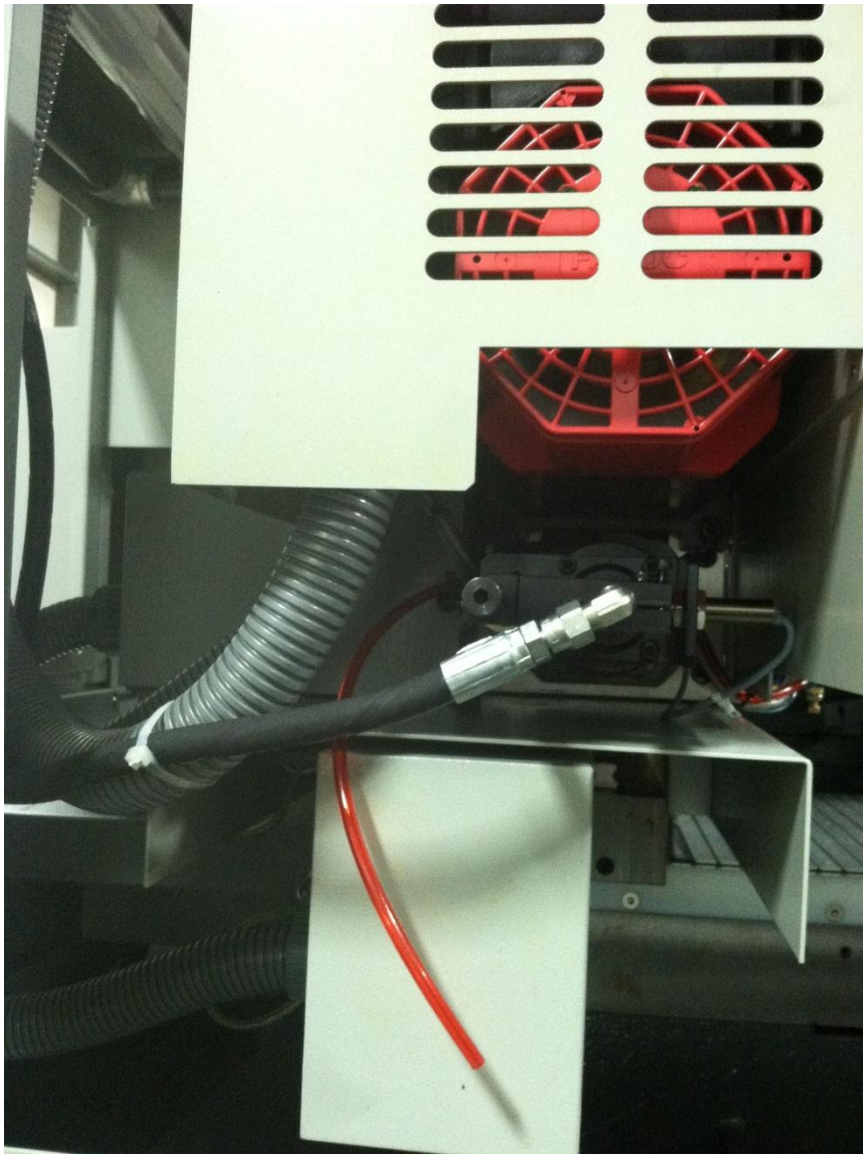
GANG TOOL BULKHEAD CONNECTORS



BULKHEAD CONNECTORS, BACKWORK TOOLS



GANG TOOL HOSE BUSHING



SUBSPINDLE COOLANT HOSE



HOSE BUSHING, BACKWORK TOOLS



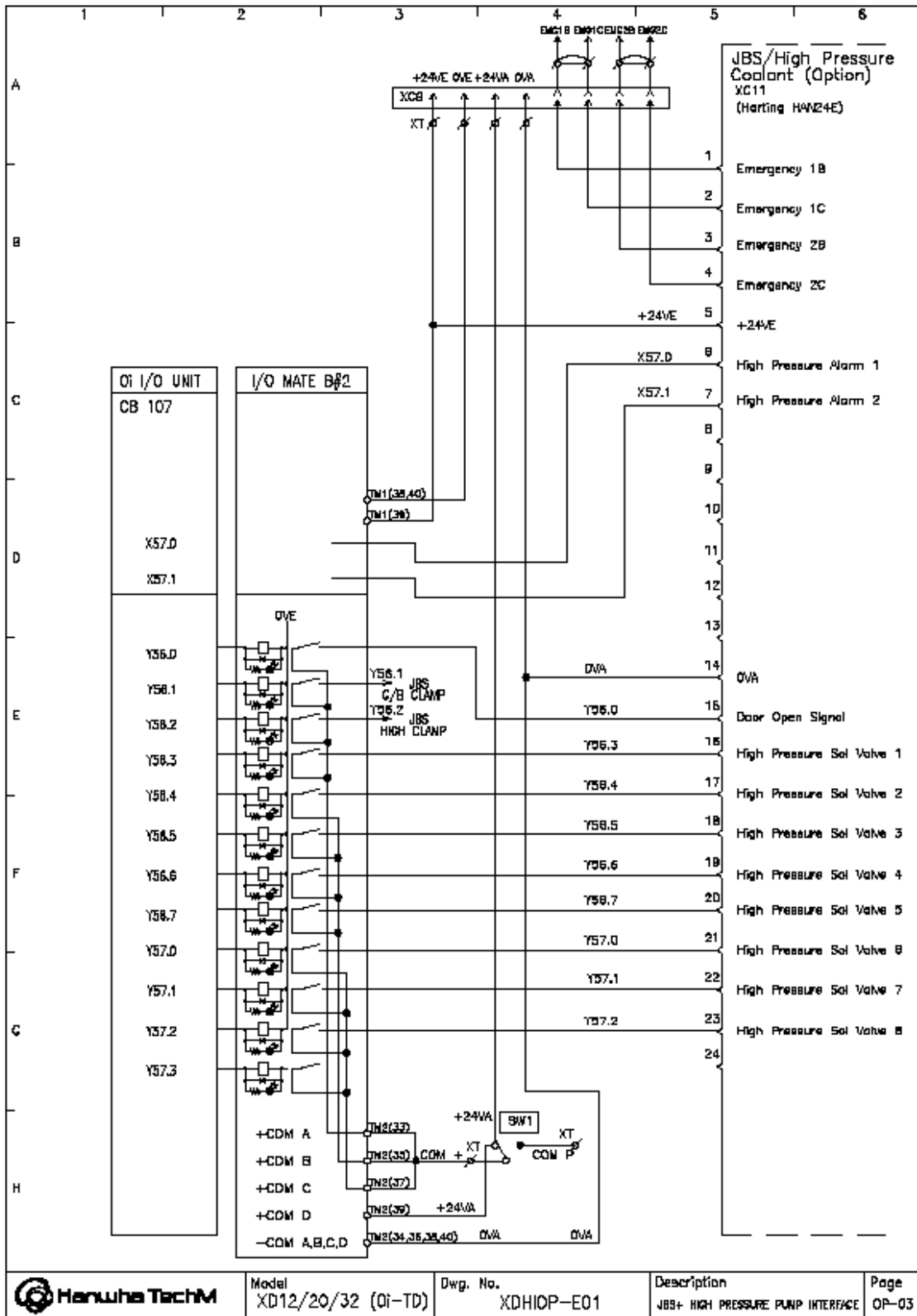
HOSE BUSHING, BACKWORK TOOLS



HOSE BUSHING, GANG TOOLS



BULKHEAD CONNECTORS, BACKWORK TOOLS



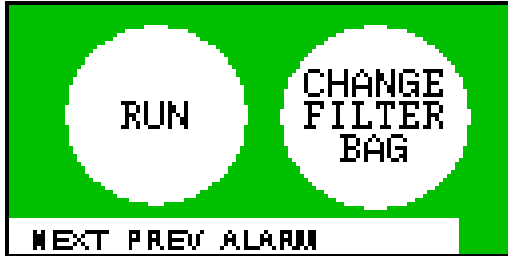
Model
XD12/20/32 (0i-TD)

Dwg. No.
XDHIOP-E01

Description
JBS+ HIGH PRESSURE PUMP INTERFACE

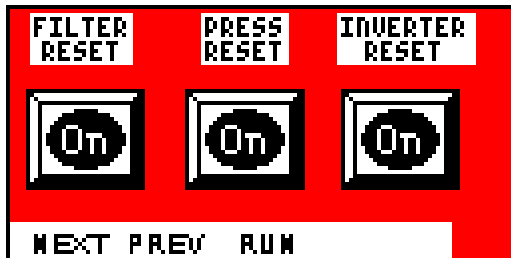
Page
OP-03

VARIABLE HMI OPTION TOUCH SCREEN



“Run/Filter Warning” will display when the pump is running

“Change Filter Bag” on the HMI notifies the operator that the coolant pressure is dropping due to the filter bag accumulating chips. This condition should be corrected at this time. When the bag is changed, the indicator will not light again until the condition reoccurs.



“Filter Reset”. In the event a clogged filter bag significantly impedes the flow of coolant, the pump will activate an E-Stop condition and the “Filter Reset” light will go on. The filter **must** be changed at this time. When the bag is changed the filter reset must be pushed to clear the alarm.

“Press Reset” In the event of low pressure output, (below 50 PSI), the pump will activate and E-Stop condition and the “Press Reset” light will go on.

Causes:

- Clogged coolant supply line
- Damaged pump coupling
- Volume output exceeds capacity
- Low voltage
- Pressure set below 50 PSI

Resolve the cause and press the “Press Reset” button.

“Inverter Reset” In the event of an inverter fault the pump will activate an E-Stop condition and the “Inverter Reset light will go on.

See the drive manual for the alarms. Resolve the condition and press the “Inverter Reset” button



Each port has two M-Code assigned. Even M-Codes turn the port on, odd M-Codes turn the port off.

Press the “Next” or “Prev” F key to scroll thru the screens.

Select the M-Code to set a pressure and touch the large block and a keyboard will appear.

Type in the desired pressure and press “ENT” key.

The pressure can be changed will the pump is running.