HENNIG

PROTECT YOUR SUCCESS

INSTALLATION GUIDE

ULTRAFLOW HIGH-PRESSURE COOLANT SYSTEMS

ULTRAFLOW

The Hennig UltraFlow High-Pressure Coolant System is the ultimate high pressure coolant pump for more demanding applications. These include multi-spindle machines, multi-turret lathes or other large machining applications where more flow is needed. The system features multiple options for the pump configuration and has dual 5-micron filtration (10-micron optional) which allows the user to change one bag while the system is still in operation. The 70 gallon reservoir provides plenty of extra coolant capacity while still maintaining a small footprint. Utilizing our Adaptive Flow Control, the coolant flow is dynamically adjusted to output the desired pressure, which can be set from the UltraFlow HMI or from the CNC's Macro Variables via Ethernet.

Your Hennig system undergoes 100% end-of-line test and inspection to verify proper function, prior to packing and shipment.

For questions regarding your system, or assistance in new applications, contact a customer service representative: 815-636-9900 or info@hennig-inc.com

Table of Contents

SYSTEM OVERVIEW

Unit Specifications				
Voltage		208/230 VAC (480 VAC optional)		
Full Load Amperage*		20 amp	40 amp	
Max Flow		8 gpm	16 gpm	
Max Pressure		1,000 PSI (69 bar)		
Filter		Dual 5 micron (10 micron optional)		
Inlet		Mounted suction hose w/ foot valve		
Outlet	System	8x1	8x2	16 gpm
	Type	3/8 NPT	3/8 NPT	1/2 NPT
	Quantity	1	2	2

**16 GPM systems require a 50A drop.*
8 GPM systems require a 25A drop or can be wired to pull power from the machine tool.

Features

- Up to 1,000 psi (69 bar)
- Up to 16 GPM (60.5 l/min)
- Fluid Type: Water-based
- Variable flow, electronically adjustable pressure
- Touchscreen smart control
- 70 gallon reservoir
- Dual 5 micron filtration (10 micron optional)
- 208/230 VAC (480 VAC optional)
- Caster wheels
- 2-year warranty

Pump Options

- 16 x 1: Single 16 GPM piston pump
  2 port standard
- 8 x 1: Single 8 GPM piston pump
  Single port standard, 2 port optional
- 8 x 2: Dual 8 GPM piston pumps
  Independently controlled, separate ports. 2 port optional per outlet

L	W	H
38" (965.2 mm)	26" (660.4 mm)	54" (1371.6 mm)

INCLUDED WITH YOUR SYSTEM

Part	Description	Quantity		
		8x1	8x2	16x1
1	High-pressure extension hose	1	2	2
2	Female connector/cable assembly	1	1	1
3	3/8" and 1/2" JIS/BSPP fittings	1 each	2 each	2 each
4	3/8" and 1/2" JIC fittings	1 each	2 each	2 each
5	3/8" and 1/2" JIS sealing cones	1 each	2 each	2 each
6	Run relays (115V, 230V, 24V)	1	2	1
7	Terminals (bag of ~50)	1	1	1
8	3-pole breaker	1	1	1
9	Extra install wire	-	-	-
10	*Feed/relief kit	1	1	1
11	MCODE kit	1	1	1
12	2" Drain back hose kit	1	1	1

INCLUDED WITH YOUR SYSTEM

10

The 8x1 system has a smaller relief pipe, mount, and plate (pictured: 8x2/16x1 systems)

11

12

LIFT POINTS

The top of the system has four 3/8-16 threaded holes. Use all four eye bolts when lifting the system. Eye bolts and lifting bracket are included and installed on new systems.

Installing/removing the eye bolts

The installation and removal of eye bolts may seem straightforward, but it is critical to follow the correct procedure to avoid damaging the system. The system includes a removable lifting bracket, which is essential for lifting the unit safely. Please adhere to the steps below for installing and removing the eye bolts and the lifting bracket:

1. Access the Hidden Lifting Bracket

Open the top cover to expose the hidden lifting bracket (1).

2. Remove the Eye Bolts and Lifting Bracket

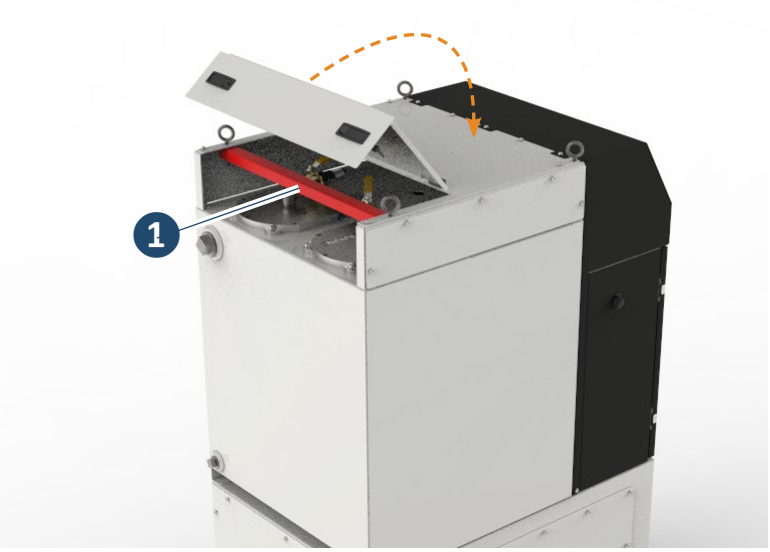
Hold the lifting bracket securely with one hand while removing the eye bolts, as the bolts are what secure the bracket to the system.

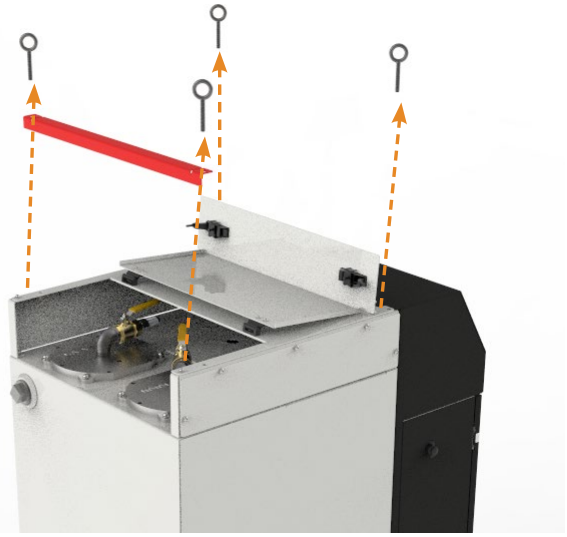
Important: *Allowing the bracket to drop onto the system is not recommended and may result in damage.*

3. Retain the Lifting Bracket

Do not discard, misplace, or lose the lifting bracket. The system cannot be lifted without this bracket.

Note: Any damage incurred during lifting without the bracket is not covered by the warranty.





INSTALL FEED/RELIEF MOUNT

1. Find a suitable location on the coolant tank to pull coolant.

Coolant must be pulled from the clean side of the tank. If no suitable location can be found, do one of the following:

- Remove the pump that's being replaced by the UltraFlow system and use that space for the feed/relief mount.
- Cut a new hole into the coolant tank.

2. Install the feed/relief mount.

Drilling may be required if the existing tank holes don't line up or none are available.

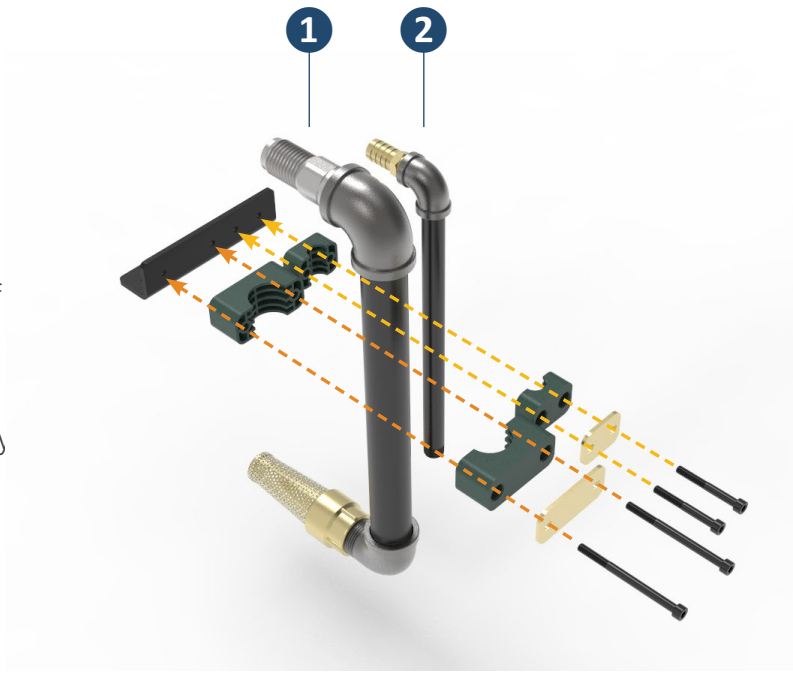
3. Attach the feed and relief pipes to the mount.

Ensure the barb fittings are at the top.

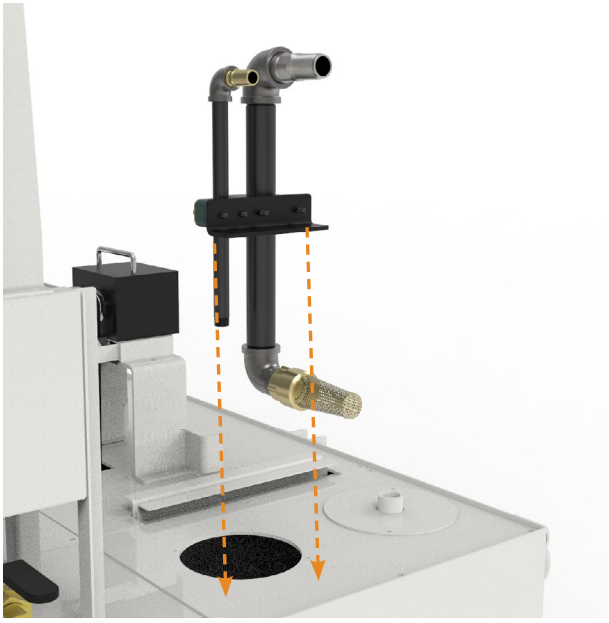
1 Feed pipe
Adjust height so the foot valve is close to the bottom of the tank but not making contact.

2 Relief pipe
Adjust height so that the opening is submerged roughly 2" to reduce foaming the coolant.

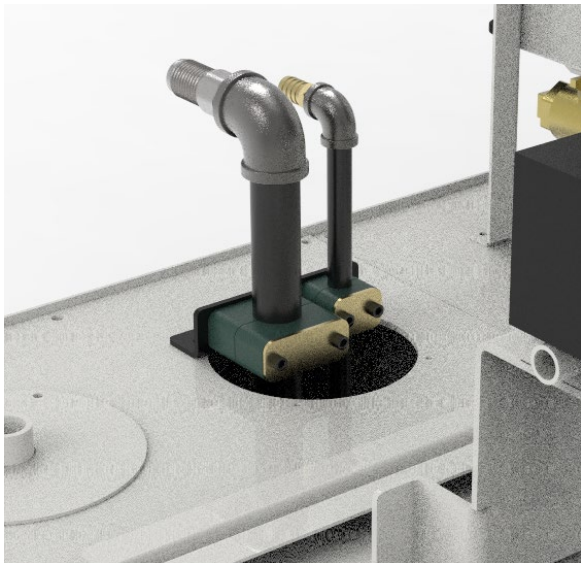
The size of the feed pipe and relief pipe are based on the system you're using.
8x1: relief line is smaller than the feed line
8x2, 16x1: feed and relief lines are the same size



Feed/Relief pipe installation



Feed/Relief mount installation



Feed/Relief pipe installed

CONNECT COOLANT HOSES

The rear of the system has three coolant connections and the power cable.

1 Coolant feed 2 Relief out 3 High-pressure out 4 Power cable/interface

1. **Connect the coolant feed tube.**
   Add hose from T-assembly to feed pipe on the machine's tank.

2. **Connect the relief hose.**
   One end to the relief pipe.

3. **Connect the high-pressure hose.**
   One end to the high-pressure outlet on rear of the UltraFlow. Other end to the high-pressure through-spindle line on the machine tool.
   A high-pressure hose may need to be custom made depending on length and fittings that come with the machine. The install kit comes with common fittings: 3/8" and 1/2" JIC, JIS/BSPP.

4. **Connect overflow hose**
   Remove the plug. Install the barb fitting. Attach hose with supplied worm clamps. Find a suitable location for the overflow hose to drain.

CONNECTING POWER/ELECTRICAL CONNECTIONS

System	Power Supply Source	Systems Amps (Drop Required)
8x1	Female connector	20 (25)
8x2, 16x1	208V plug	40 (50)

Female connector mounting

1. **Find a suitable location for the female connector housing.**

   The connector (included in the install kit) should be within reach of the cable coming off the UltraFlow while leaving slack so the UltraFlow can be moved around without disconnecting.

2. **Mount connector to the machine.**

   Once mounted, determine the wire routing and wire length from the connector to the machine's electrical box. Ensure wires can be safely placed away from moving parts so they don't get damaged.

   Connector comes with whip/pigtail pre-wired. If whip/pigtail isn't long enough, extend on your own or contact Hennig for a new/longer whip.

Female connector mounted to CNC enclosure, shown with male connector attached.

8x1

Female connector provides power and signals to the UltraFlow system.

8x2, 16x1: 208v plug

Female connector only provides signals to the UltraFlow system. It's powered with a 208v plug.

CONNECTING POWER/ELECTRICAL CONNECTIONS

Note: The relay is used to trigger the run signal. Typically the 230V coil relay is used, it can be triggered from the through spindle coolant contactor. If a contactor is not present in the machine a 24v relay can be used.

Electrical connections (interface cable pinout)

System: 8x1

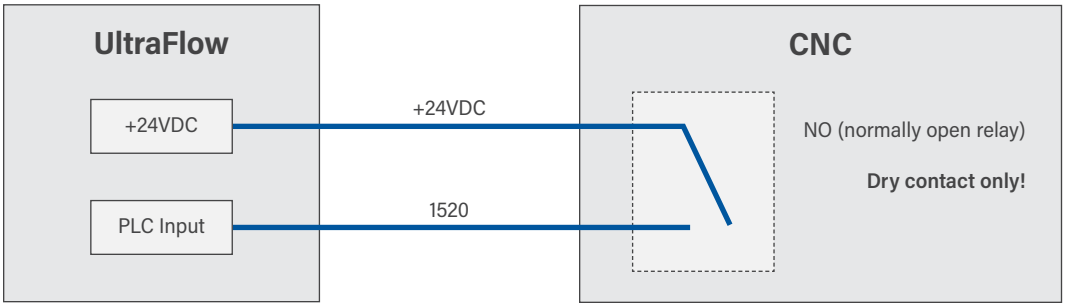
Wire	PIN	Description	Wire Size	Color
U0	1	230 VAC	12 (AWG TFFN)	BLK
VO	2	230 VAC	12 (AWG TFFN)	BLK
WO	3	230 VAC	12 (AWG TFFN)	BLK
PE	4	Earth ground	12 (AWG TFFN)	GRN/YEL
1520	5	Run signal from machine	20 (AWG TFFN)	BLU
A-SIG	6	Alarm signal to machine	20 (AWG TFFN)	BLU
Valve 1	7	Valve for port 1	20 (AWG TFFN)	BLU
Valve 2	8	Valve for port 2	20 (AWG TFFN)	BLU
+24 VDC	9	+24 VDC power	20 (AWG TFFN)	BLU
A-COM	10	Alarm signal to machine	20 (AWG TFFN)	BLU
SP1	11	Spare 1	20 (AWG TFFN)	BLU
Valve C	12	Valve ports common	20 (AWG TFFN)	BLU/WHT

System: 8x2, 16x1

Wire	PIN	Description	Wire Size	Color
VC-12	1	Valve common ports 1 & 2	20 (AWG TFFN)	BLU/WHT
Valve 1	2	Valve for port 1	20 (AWG TFFN)	BLU
Valve 2	3	Valve for port 2	20 (AWG TFFN)	BLU
PE	4	Earth ground	16 (AWG TFFN)	GRN/YEL
1520	5	Run signal 1 from machine	20 (AWG TFFN)	BLU
A-SIG	6	Alarm signal to machine	20 (AWG TFFN)	BLU
1510 *(8x2)* **SP1** *(16x1)*	7	Run signal 2 from machine Spare 1	20 (AWG TFFN)	BLU
SP1 *(8x2)* **SP2** *(16x1)*	8	Spare 1 Spare 2	20 (AWG TFFN)	BLU
+24 VDC	9	+24 VDC power	20 (AWG TFFN)	BLU
A-COM	10	Alarm signal to machine	20 (AWG TFFN)	BLU
SP2 *(8x2)* **SP3** *(16x1)*	11	Spare 2 Spare 3	20 (AWG TFFN)	BLU

Wire	PIN	Description	Wire Size	Color
VC-34	12	Valve common ports 3 & 4	20 (AWG TFFN)	BLU/WHT
Valve 3	13	Valve for port 3	20 (AWG TFFN)	BLU
Valve 4	14	Valve for port 4	20 (AWG TFFN)	BLU
Spare	15	-	-	-
Spare	16	-	-	-
Spare	17	-	-	-
Spare	18	-	-	-
Spare	19	-	-	-
Spare	20	-	-	-
Spare	21	-	-	-
Spare	22	-	-	-
Spare	23	-	-	-
Spare	24	-	-	-

Run diagram



CONNECTING POWER/ELECTRICAL CONNECTIONS

Note: The 8x1 system draws power directly from the CNC machine via the female connector, while the high-load required by the 8x2 and 16x1 systems uses a separate power source via a 208V plug. These systems require a 50A drop.

***8x1 system only**

Cabinet wiring

1. **Pull pigtail wires through to the machine's electrical box.**

* 2. **Install the 3-pole breaker and relay.**

Locate an open slot in the CNC's electrical box and mount the breaker and relay.

* 3. **Supply 230 volt, 3-phase power to the top of the breaker.**

* 4. **Connect female connector to the bottom of the breaker.**

Locate and attach black wires U0, V0, W0 (from the female connector) to the bottom of the breaker.

5. **Connect female connector to relay.**

Locate and attach blue signal wires (1520, +24VDC) from the female connector to the COM and NO (normally open) on the supplied relay.

- +24VDC to COM
- 1520 to NO

The 8x2 system requires a second run signal. Wiring is the same as above, but the signal is 1510.

6. **Connect contactor to the relay.**

Option A: 230V relay

Option B: 24V relay. Locate the 24V signal for the m-code you would like to trigger the system.

- Wire A1 to the 24V m-code signal
- Wire A2 to 0V of the machine

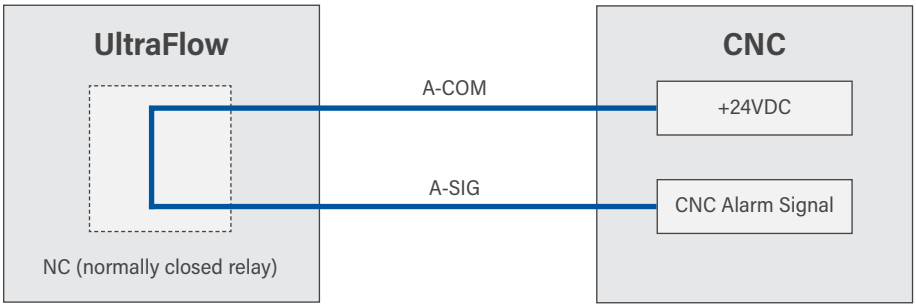
Option C: 115V relay (If your machine runs off 115v or an external solution to trigger the system is desired.)

- Wire L to A1
- Wire N to A2

CONNECTING POWER/ELECTRICAL CONNECTIONS

Alarm signal wiring

Alarm Signal Diagram

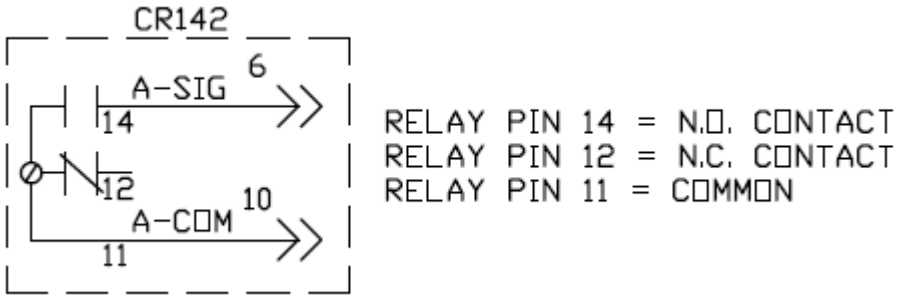


Connect CNC alarm signal to the UltraFlow.

Locate and attach blue wires (A-SIG, A-COM) from the UltraFlow relay to the CNC machine.

- A-COM to CNC +24VDC
- A-SIG to CNC alarm signal

From the factory, the UltraFlow comes wired with a Normally Closed (NC) Alarm Signal. If your application needs a Normally Open (NO) Alarm Signal, you will need to change the alarm wires from Relay C142, PIN 12 (NC) to PIN 14 (NO) inside the UltraFlow's electrical cabinet.



UltraFlow PLC schematic

CONNECTING POWER/ELECTRICAL CONNECTIONS

M-code pressure installation

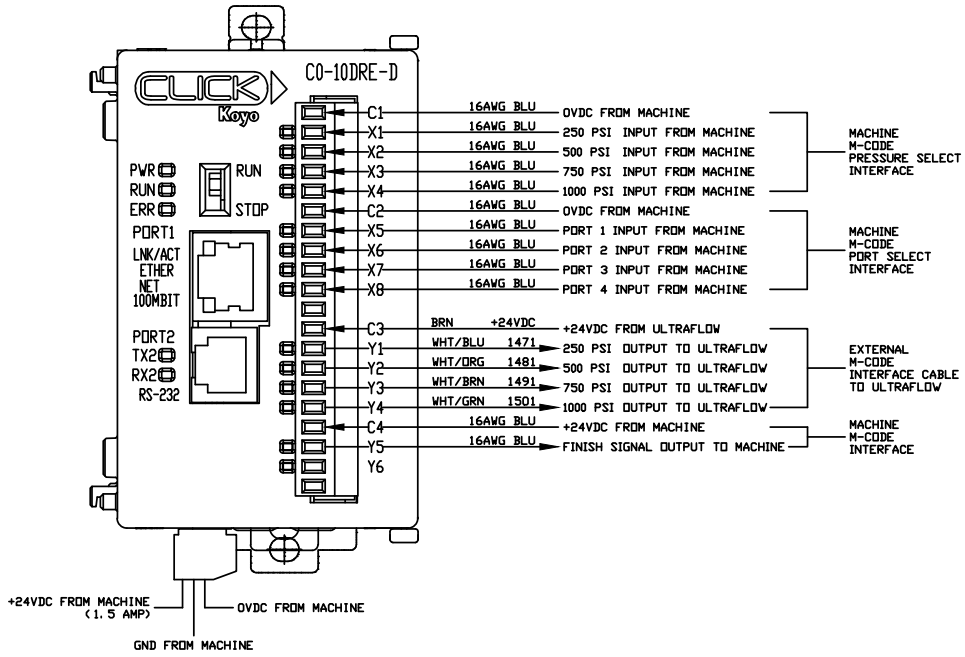
The Click PLC can take 4 spare m-code inputs and send the following pressures to the UltraFlow coolant system: 250 PSI, 500 PSI, 750 PSI and 1,000 PSI. The system's HMI can also be used to select your desired pressure.

Required tools

- Small flathead screwdriver
- Wire cutters
- Hand drill
- Zip ties
- PLC upload cable (supplied)

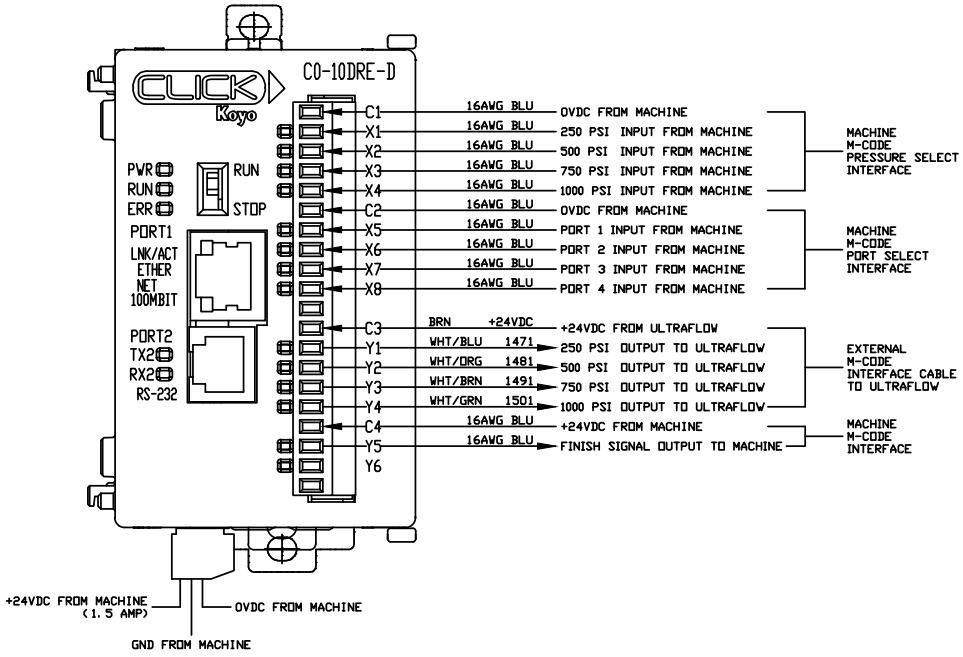
1. Mount the "Click PLC" in the machine tool's electrical cabinet near the spare m-code i/o board or relays.
2. Source 24 VDC power and GND and wire into the bottom plug on the PLC according to the terminal descriptions.
3. Plug connector in on the side of the UltraFlow system and wire according the diagram on page 13.
4. Connect spare m-code relays to the Click PLC according to the wiring diagram below.
5. Connect m-code finish signal (if required) according to the wiring diagram on page 13.

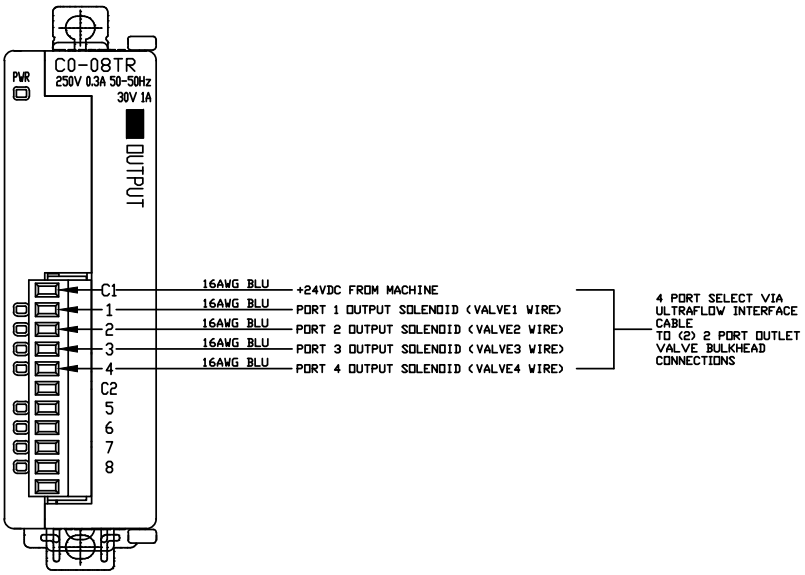
M-code: Click PLC wiring to UltraFlow (8x1, 8x2)



CONNECTING POWER/ELECTRICAL CONNECTIONS

M-code: Click PLC wiring to UltraFlow (16x1)





PRIMING THE SYSTEM

1. **Verify system is ready for priming.**

   Ensure all filters, O-rings, hoses, and clamps are in place and properly sealed.

2. **Remove fill port plug.**

   The fill plug is located on the coolant feed hose's "T" connector on the back of the UltraFlow system.

3. **Fill with coolant.**

   Pour coolant/water into the fill port. Ensure all air bubbles are removed from the pump and the coolant feed hose.

2. **Replace fill port plug.**

   Use thread tape to ensure the plug is properly sealed.

Fill port plug

CHECK SYSTEM PHASING

IMPORTANT! *Before first start-up, follow the steps below to check the rotation of the feed pump to confirm system phasing is correct.*

Note: The system comes with a fill pump switch on the front of the electrical box. The fill pump switch is set to "off" when shipped so it will not run dry on initial power up.

1. Remove cover panel

8x1, 8x2

Using a 6mm allen wrench, remove the bolts holding the cover panel on the right of the system.

16x1

Using a 6mm allen wrench, remove the bolts holding the cover panel on the front of the system.

The panel holds two fans which are wired to the UltraFlow, be careful not to damage the wires when removing.

2. Power up system.

If not already done, connect the male end of the power cable from the UltraFlow to the female connector.

3. Manually run the priming pump.

There are two ways to run the priming pump:

- Use the switch on the outside of the electrical box
- Use the contactor in the electrical panel

If coolant is not being pulled up the line into the prime pump, turn the system off and repeat the priming procedure from page 13 until the pump is able to pull coolant from the tank.

4. Check the pump rotation.

Looking through the rear guard, make sure the fill pump fan is turning the same direction as the arrow sticker on the pump. If the fan is not turning the same direction as the arrow, stop the fill pump, disconnect power from the system, and swap two of the main black wires (going into the top of the main disconnect inside the UltraFlow electrical cabinet). Run the pump to verify the turning direction is correct.

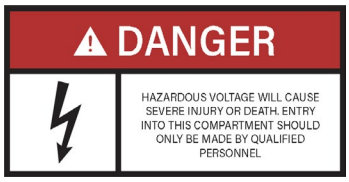
5. Enable the fill pump.

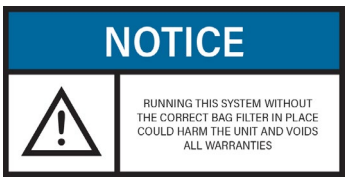
Turn on the system and then turn on the fill pump switch. The system will automatically fill the tank and turn the fill pump on/off as needed.

6. Great job, you did it!

You've installed your UltraFlow High-Pressure Coolant System. Go to the next page for operation instructions.

OPERATION





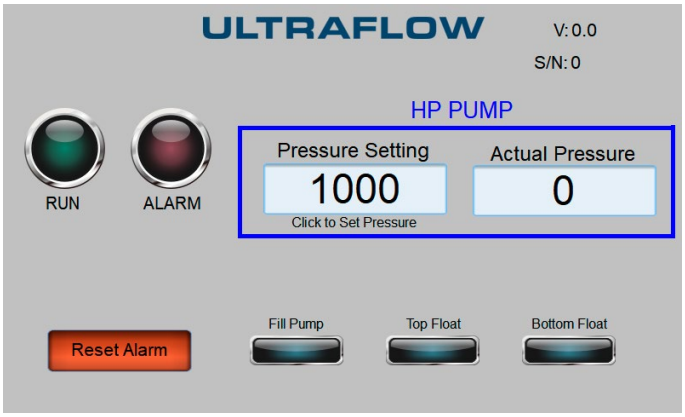
How it works

The UltraFlow system is equipped with our Adaptive Pressure Control, which regulates the flow of coolant to output the desired pressure regardless of the orifice size in the tool (within capabilities of the pump).

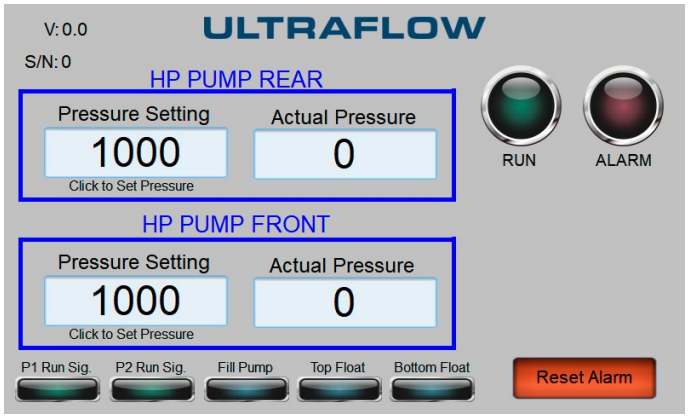
Setting the pressure

To adjust the pressure settings, simply touch the Pressure Setting field to activate the keyboard. When the keyboard pops up, enter the desired pressure setting and click "OK".

8x1, 16x1



8x2



MAINTENANCE

Filter replacement

NOTICE

RUNNING THIS SYSTEM WITHOUT THE CORRECT BAG FILTER IN PLACE COULD HARM THE UNIT AND VOIDS ALL WARRANTIES

To prolong the life of the system and to ensure proper operation, the filter must be replaced every 3-6 months, depending on its use.

The system uses two filters. To avoid shutting down the system during filter replacement, maintenance should be performed one filter at a time.

1. Open the cover panel.

Using the dual latches on the back of the system, flip open the cover panel.

2. Shut off coolant flow to filter

Simply turn the valve handle to the off position. Using a 6mm allen wrench, remove the M8 bolts (x6) holding the filter cover plate. Remove the filter cover plate, providing access to the filter.

3. Replace the filter.

Remove the filter by simply lifting it out using the handles built into the top ring of the bag. Before inserting the new filter bag, inspect the cover plate and o-ring for damage or deformation and replace if necessary. Insert the new filter bag.

4. Reinstall the filter cover plate, inlet hose, and cover panel.

Finger tighten the 6 bolts, then tighten bolts with an allen wrench in a star pattern to ensure a proper seal. Close the cover panel.

Top cover panel

Filter cover plate removal

Filter removal

MAINTENANCE

Changing the oil

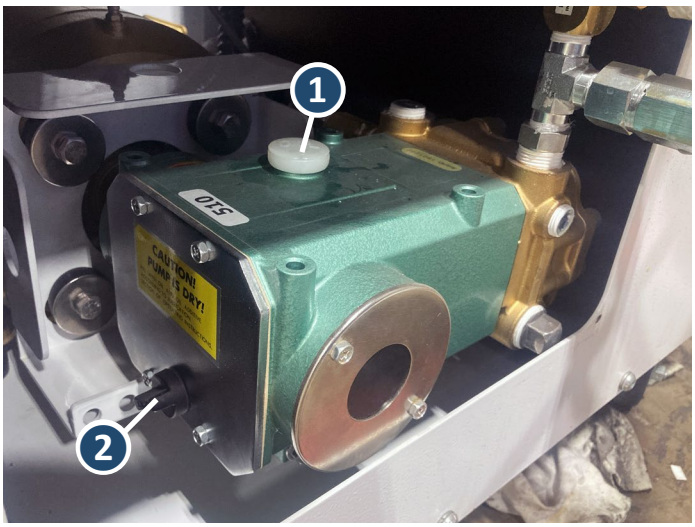
The 8x2 system has two pumps. Oil will need to be changed on both pumps.

1. Remove the oil dipstick.
2. Place a small container or pan underneath the oil drain plug.
3. Remove the oil drain plug and completely drain oil.
4. Replace oil drain plug and fill with Genuine pump oil until oil level is between the marks on the dipstick. Use genuine pump oil (part # 8571982).

CAUTION! Do not overfill or underfill, as it will damage the pump.

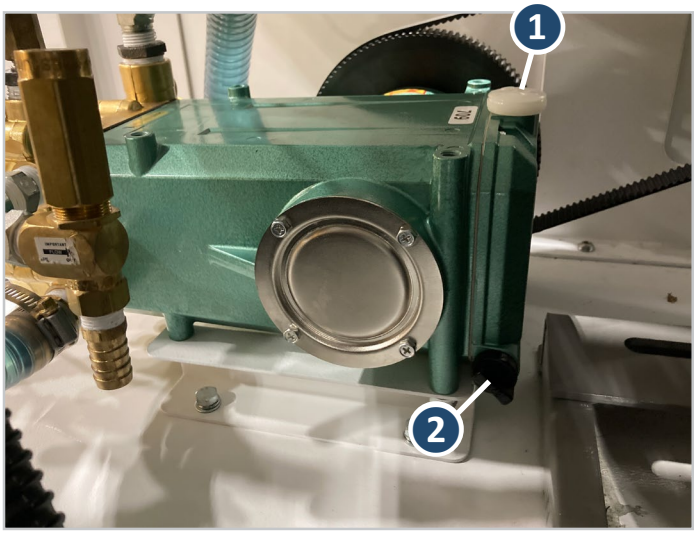
System: 8x1, 8x2

Drain plug on back of pump



System: 16x1

Drain plug on side of pump



1 *oil dip stick* 2 *drain plug*

MAINTENANCE

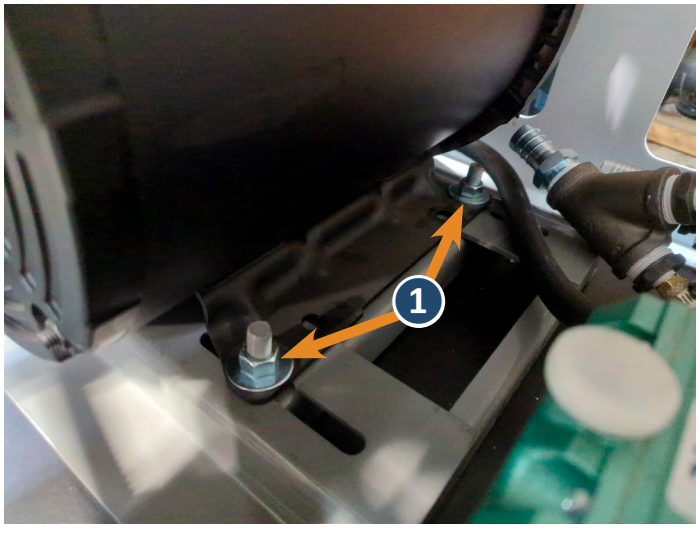
Adjusting belt tension

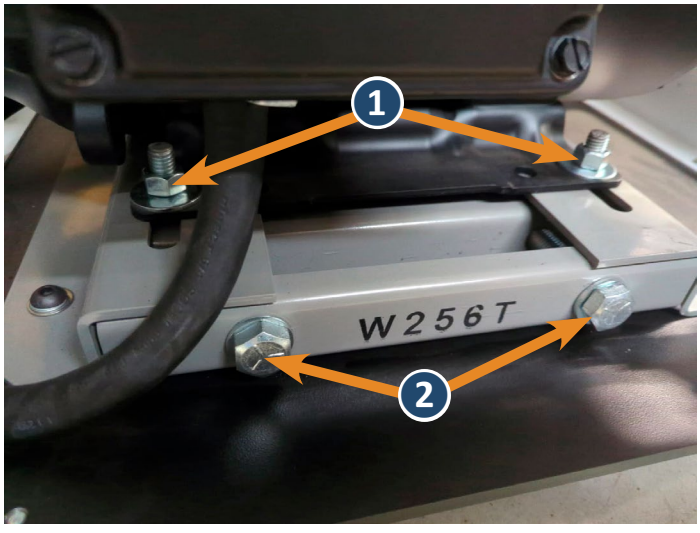
16x1 system only

1. Remove rear and left side cover panels.
2. Inspect the belt tension using a belt tension gauge. If belt is too tight or too loose, continue with steps below.

Belt Type	Minimum tension	Maximum tension
	at 7/32" deflection	
New belt	11 lbf	12 lbf
Used belt	8 lbf	9 lbf

3. Loosen the four mounting bolts on the motor (❶).
4. Use the adjuster bolts to set adjust the belt tension (❷):
   Increase tension: Turn the adjustment clockwise
   Decrease tension: Turn the adjustment bolt counter-clockwise
5. Tighten the mounting bolts (❶) and verify the belt tension is correct.





❶ *mounting bolts* ❷ *adjuster bolts*

PARTS LIST

Universal parts (8x1, 8x2, 16x1)

Part #	Description
880.19008.0066	Touchscreen
880.19008.0054	UltraFlow PLC
885518	Bag filter basket
881406	Feed pump
885523	Bag filter element (10 micron)
885550	Bag filter element (5 micron)
885524	Bag filter housing o-ring
880.27000.0011	Run relay (230V)
880.27008.0035	Run relay (120V)
880.27000.0013	Run relay (24V)

8x1

Part #	Description
880.18030.0000	5 HP VFD, 230VAC
881404	High pressure pump assembly
	High-pressure pump seal kit (sold as kit with parts below)
8571949	Inlet valve (x3)
8571950	Outlet valve (x3)
8571951	Seal (x3)

8x2

Part #	Description
880.18030.0000	5 HP VFD, 230VAC
881404	High pressure pump assembly
	High-pressure pump seal kit (sold as kit with parts below)
8571949	Inlet valve (x3)
8571950	Outlet valve (x3)
8571951	Seal (x3)

16x1

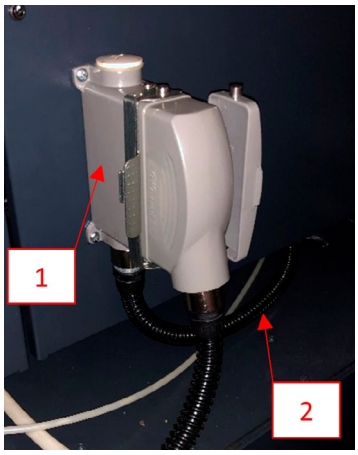
Part #	Description
880.18030.0002	15 HP VFD, 230VAC
881437	Motor (15 HP)
881430	Pump (16 GPM)
870917	Belt (motor to pump)
Contact Hennig	**High-pressure pump seal kit**

WIRING EXAMPLE

Machine: Okuma Genos M460-VE
UltraFlow system: 8x1

This is an example of how to wire the power, control signal, alarm circuit and four additional m-code signals to control four different pressure settings on the UltraFlow.

1. Find a suitable location to mount the female connector housing included in the install kit. This should be close to the main electrical cabinet of the CNC while also close enough to the UltraFlow.



2. Route the flexible conduit/wires into the CNC's electrical cabinet.

3. Mount the supplied 3-pole breaker near the CNC's coolant pump contactors.

4. Using the supplied black, 12ga wiring/crimp connectors, source 3-phase, 208/220 VAC from the top of one of the CNC's coolant contactors/overloads and connect to the top of the 3-pole breaker.

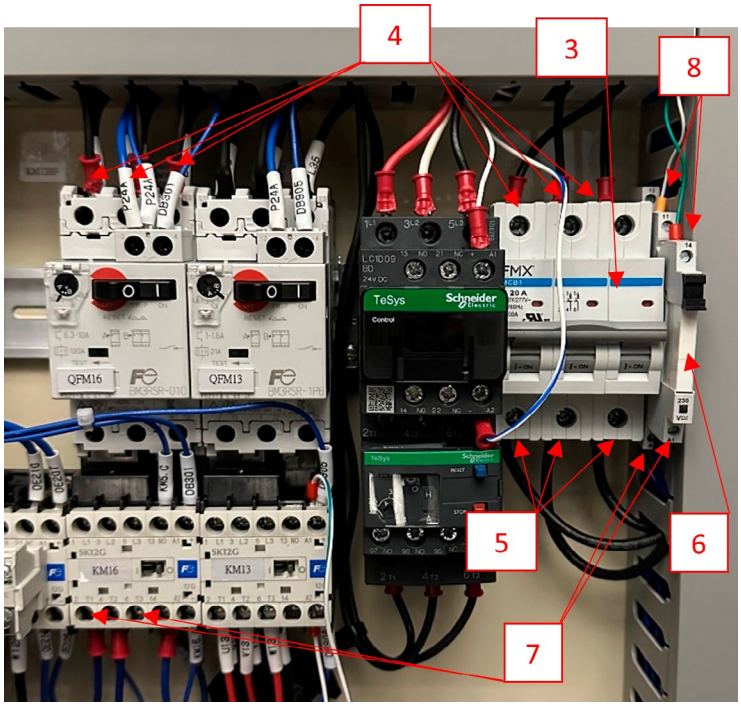
5. Connect the three 12ga black wires from the UltraFlow female plug whip to the bottom of the 3- pole breaker.

6. Mount the supplied 24vdc relay next to the 3-pole breaker.

7. Using the supplied wire, connect relay coil terminals A1 and A2 to two of the contactor outputs to the OEM high pressure pump (labeled T1 and T3 in the sample picture. Disconnect the OEM high pressure pump if applicable.

8. Connect the blue wires (+24 VDC, 1520) from the UltraFlow female plug whip to the Normally Open terminals (11 and 14) of the supplied relay.

9. Connect the blue wires (A-SIG, A-COM) from the UltraFlow female connector whip IN SERIES with one of the CNC's overload alarm signals (9). See pages 7-8 to ensure correct outputs from the PLC.



TROUBLESHOOTING

Symptom	Issue	Solution
UltraFlow does not come on when machine tool calls for high pressure coolant.	▪ UltraFlow disconnect switch is off ▪ Machine tool is off ▪ UltraFlow "Run relay" is not functioning	▪ Turn on UltraFlow disconnect switch ▪ Turn on machine tool ▪ Replace "Run relay"
UltraFlow creates too much pressure	The pressure relief valve is adjusted incorrectly	Using a tool with small orifice size, turn the UltraFlow on and adjust the pressure to factory setting of 1,000 psi.
UltraFlow doesn't create enough pressure	▪ The orifice size in the tool is too big to create the desired pressure ▪ The pressure relief valve is adjusted incorrectly	▪ Use a tool with a smaller orifice size ▪ Using a tool with small orifice size, turn the UltraFlow on and adjust the pressure to factory setting of 1,000 psi.
UltraFlow comes on for a few seconds and then shuts off with an alarm	▪ Filters are clogged ▪ UltraFlow has lost prime	▪ Replace the filter. See page 17 for replacement instructions. ▪ Prime the system. See page 14 for priming instructions.
UltraFlow does not stay primed	▪ Machine tool's coolant level is low ▪ Foot valve is not working properly ▪ Fill pump is not working properly	▪ Add coolant to the machine tool ▪ Take apart and clean the foot valve, or replace if necessary. ▪ Check fill pump switch ▪ Check tank float function ▪ Replace fill pump

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9900 North Alpine Road
Machesney Park, IL 61115
815.636.9900

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