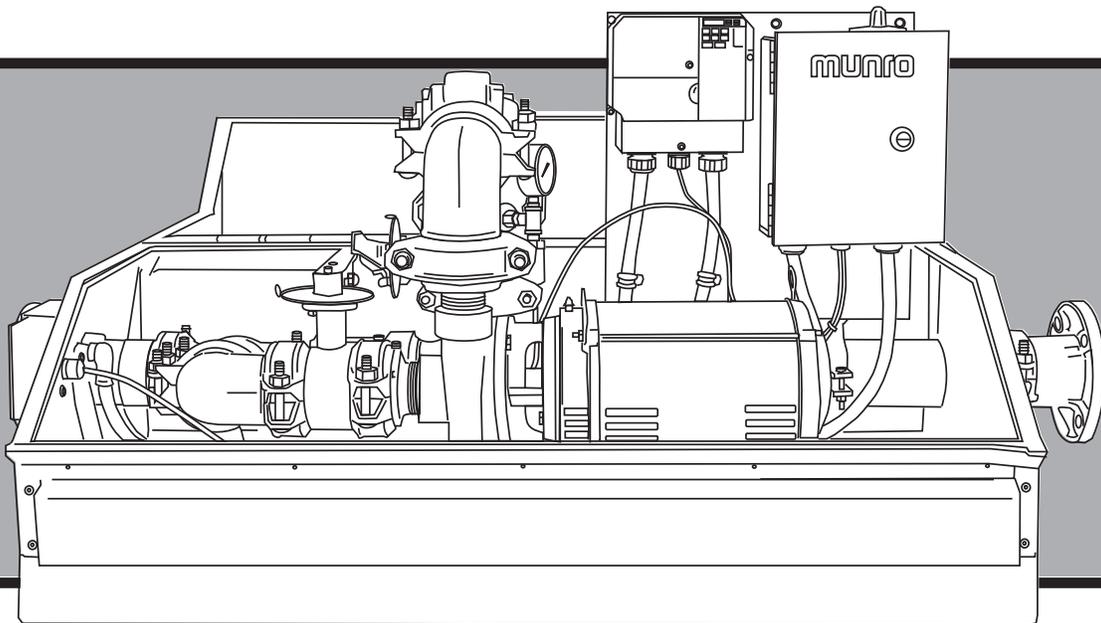# OWNER'S MANUAL
MUNRO SIMPLICITY

Operation - Programming - Maintenance

1.800.942.4270
msy@munropump.com
www.munropump.com

munro®

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Phone-in Start-up Assistance and Technical Support
Contact the Munro team to schedule and access
phone-in start up assistance and technical support.
1-800-942-4270 or msy@munropump.com

1. SYSTEM OPERATION OVERVIEW

The Munro Simplicity is a low-maintenance, self-contained pumping station with simple, user-friendly controls. The system is controlled using a toggle switch and a digital keypad for modifying settings.

The small toggle switch on the front of the VFD labeled "HAND/OFF/AUTO" can be set to one of the three positions: left= HAND, center= OFF, and right= AUTO.

- Hand Mode simply runs the pump at a constant speed.
- Auto Mode uses feedback from the pressure transducer to automatically start and stop the pump and control the speed in order to maintain constant pressure in the system.

When in Auto Mode, the pump can be started using either the Pressure Start Method or the Clock Start Method.
- With Pressure Start, the pump starts when the pressure in the system drops below a set threshold.
- With Clock Start, an external run signal from an irrigation controller can be used to start and stop the system.

For information about modifying settings, refer to sections 3 and 4.

2. HAND/OFF/AUTO MODE DESCRIPTIONS

OFF Mode:

- The VFD stops the pump using the stopping method set in parameter B1-03.
- The pump remains off until switch is moved from the OFF position.

Hand Mode:

- Sends a 24VDC signal to VFD terminals S3-S4.
- Forces the VFD into the "Run" state.
- The pump runs at the speed set in parameter D1-01.
- The Start Method and Sleep Function are ignored.

When in Hand Mode, the functions marked below are enabled:

Function	Hand Mode
Sleep Function	
Pid Control	
Prime Loss Detection	✓
Overload Detection	✓
Clock Start	
Pressure Start	

Auto Mode:

- Sends a 24VDC signal to VFD terminal S2.
- The VFD waits idly until the designated start conditions have been met.
  - Pressure Start: the system pressure drops below the pressure set in parameter Q1-01.
  - Clock Start: an external 24VAC signal is received across the wires in the external junction box which closes the Time Clock Relay and sends a 24VDC signal to VFD terminal S1.
- Utilizing feedback from the pressure sensor, the VFD uses PID control to adjust the speed of the pump in order to achieve the pressure setpoint set in parameter B5-19.

- If using Clock Start, the pump runs until the external 24VAC signal is removed.
- If using Pressure Start, the pump runs until the conditions of the designated Sleep Type have been met (see Figure 1).

   Frequency: the pressure setpoint has been achieved and the pump's proportional speed is less than the percentage set in parameter Q1-02 for the time set in parameter Q3-01.
   Current: The pressure setpoint has been achieved and the pump's proportional current is less than percentage set in parameter Q1-02 for the time set in parameter Q3-01.
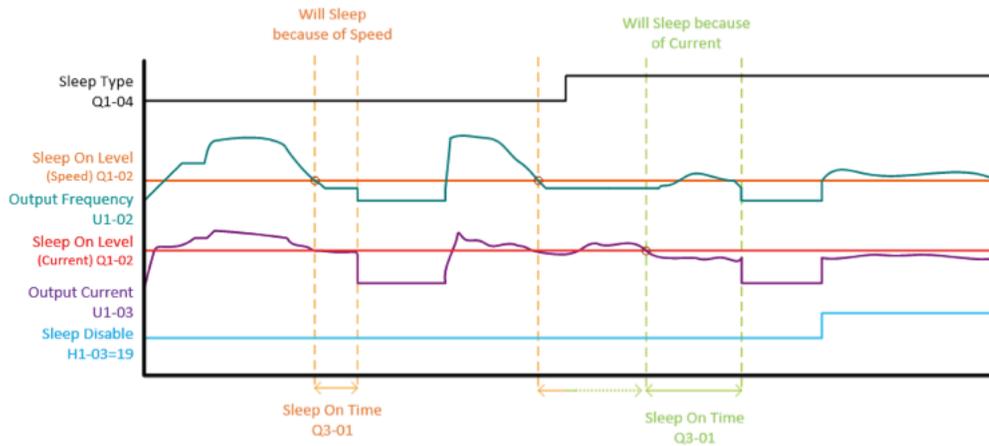

Figure 1 - Timing diagram of the Sleep Function illustrating both Sleep Types

When in Auto Mode, the functions marked below are enabled:

Function	Hand Mode
Sleep Function	✓
Pid Control	✓
Prime Loss Detection	✓
Overload Detection	✓
Clock Start	✓
Pressure Start	✓

VERY IMPORTANT READ CAREFULLY | Note: Pump station is default programmed for pressure start. If 24VAC start is required, connect 24VAC signal to red and black wires located in j-box (labeled 24VAC connection) outside station enclosure. Program parameter Q1-02 tu 001.00%.

3. USING THE DIGITAL OPERATOR

This section describes the basic settings for your Munro Simplicity pump station. Virtually all of the settings that control the pump station are managed by the VFD parameters. The parameters can be modified directly on the VFD using its buttons and digital display, or by using the much more user-friendly Yaskawa JVOP-180 Digital Operator keybad included with your Munro Simplicity (see Figure 2). To use the Digital Operator, simply connect it to the VFD using a Cat5e Networking Cable.

Yaskawa JVOP-180 Digital Operator

Key Pad to VFD Connection (see Figure 6)
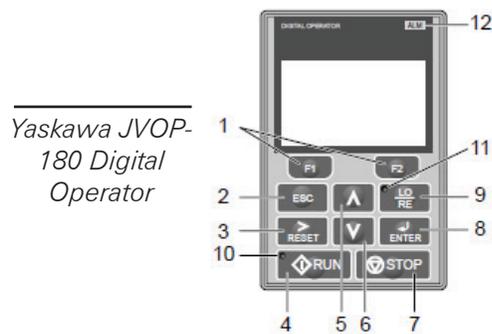
No.	Display	Name	Function
1	F1 F2	Function Key (F1, F2)	The function assigned to F1 and F2 vary depending on the currently displayed menu The name of each function appears in the lower half of the display window
2	ESC	ESC Key	• Returns to the previous display if there are no spaces to move to the left • Moves the cursor one space to the left • Pressing andholidng this button will return to the Frequency Reference display
3	RESET	RESET Key	• Moves the cursor to the right • If an alarm is active, turns off alarm; When programming, resets the drive to factory presets
4	RUN	RUN Key	Starts the drive
5	∧	Up Arrow Key	Scrolls up to display the next item, selects parameter numbers, and increments setting values
6	∨	Down Arrow Key	Scrolls down to display the previous item, selects parameter numbers, and decrements setting values
7	STOP	STOP Key[1]	Stops drive operation
8	ENTER	ENTER Key	• Enters parameter values and settings • Selects a menu item to move between displays
9	LO/RE	LO/RE Selection Key[2]	Switches drive control between the operator (LOCAL) and an external source (REMOTE) for the Run command and frequency reference
10	RUN	RUN Light	Lit while the drive is operating the motor. Refer to page 117 of the Yaskawa V1000 manual for details
11	LO/RE	LO/RE Light	Lit while the operator is selectted to run the drive (LOCAL mode). Refer to page 117 of the Yaskawa V1000 manual for details
12	ALM	ALM LED Light	Refer to ALARM (ALM) LED Displays on page 117 of the Yaskawa V1000 manual

[1]The STOP key has highest priority. Pressing the STOP key will always cause the drive to stop the motor, even if a RUN command is active at any external RUN command source. To disable the STOP key priority, set parameter o2-02 to 0.
[2]The LO/RE key can only switch between LOCAL and REMOTE when the drive is stopped. To disable the LO/RE key to prohibit switching between LOCAL and REMOTE, set parameter o2-01 to 0.

Figure 2 - Digital Operator Key Functions

To modify a parameter, follow the steps shown below in figure 3. This example explains changing parameter C1-02 (Deceleration Time 1) from 10.0 seconds (default) to 20.0 seconds.

No.	Step		Display/Result
1	Turn on the power to the drive. The initial display appears.	→	- MODE - DRV Rdy / FREF (OPR) / U1-01= 0.00Hz / U1-02= 0.00Hz LSEQ / U1-03= 0.00A LREF / JOG FWD FWD REV
2	Press ∧ or ∨ until the Parameter Setting Mode screen appears,	→	- MODE - PRG / Programming / HELP FWD DATA
3	Press ENTER to enter the parameter menu tree.	→	-PRMSET- PRG / Initialization / A1-00= 0 / Select Language / FWD
4	Press ∧ or ∨ to select the C parameter group.	→	-PRMSET- PRG / Basic Setup / C1-01= 10.0 sec / Accel Time 1 / FWD
5	Press ENTER two times.	→	-PRMSET- PRG / Accel/Decel / C1-01= 10.0 sec / Accel Time 1 / FWD → -PRMSET- PRG / Accel Time 1 / C1-01= 10.0Sec / (0.0~6000.0) / "10.0 sec" / FWD
6	Press ∧ or ∨ to select parameter C1-02.	→	-PRMSET- PRG / Decel Time 1 / C1-02= 10.0Sec / (0.0~6000.0) / "10.0 sec" / FWD
7	Press ENTER to view the current setting value (10.0 s). The leftmost digit flashes.	→	-PRMSET- PRG / Decel Time 1 / C1-02=0010.0Sec / (0.0~6000.0) / "10.0 sec" / FWD
8	Press F1, F2 or > RESET until the desired number is selected "1" flashes.	→	-PRMSET- PRG / Decel Time 1 / C1-02=0010.0Sec / (0.0~6000.0) / "10.0 sec" / FWD
9	Press ∧ and enter 0020.0.	→	-PRMSET- PRG / Decel Time 1 / C1-02=0020.0Sec / (0.0~6000.0) / "10.0 sec" / FWD
10	Press ENTER to confirm the change.	→	Entry Accepted
11	The display automatically returns to the screen shown in Step 4.	→	-PRMSET- PRG / Decel Time 1 / C1-02= 20.0Sec / (0.0~6000.0) / "10.0 sec" / FWD
12	Press ESC as many times as necessary to return to the initial display.	→	- MODE - DRV Rdy / FREF (OPR) / U1-01= 0.00Hz / U1-02= 0.00Hz LSEQ / U1-03= 0.00A LREF / JOG FWD FWD REV

Figure 3 - how to modify a parameter using the Digital Operator

4. PARAMETER LIST

No.	Parameter Name	Function	Range	Default
B5-19	RUNNING PRESSURE (PID Setpoint)	Sets the operating pressure setpoint for Auto Mode. The value is set as a percentage of the range of the pressure transducer.	0-100%	40%
Q1-01	START PRESSURE (Custom Parameter 1)	Sets the pressure that the system must fall below for the pump to exit sleep mode. It is typically set to 10 psi below the running pressure. The value is set as a percentage of the range of the pressure transducer.	0-100%	35%
Q1-02	SLEEP THRESHOLD (Custom Parameter 2)	Sets the value at which either the pump's speed or current (depending on Q1-04) must fall below in order to activate the sleep mode. The value is set as a percentage of either max speed (60Hz) or the rated current of the VFD.	0-100%	84%
Q1-03	START METHOD (Custom Parameter 3)	Determines which Start Method is used for Auto Mode. **0.00: Pressure Start Method:** the VFD will start the pump when the pressure drops below the level set in Q1-01. **1.00: Clock Start Method:** the VFD will start the pump when it receives a 24VAC signal from an external source.	0.00 or 1.00	0.00
Q1-04	SLEEP TYPE (Custom Parameter 4)	Determines if the VFD will monitor the pump's speed or current to trigger to sleep function. **0.00: Speed** **1.00: Current**	0.00 or 1.00	0.00
D1-01	FREQUENCY REFERENCE (Reference 1)	Sets the speed the pump will run at while in Hand Mode. This value is set as a percentage of the maximum speed, 60Hz.	0-100%	100%
L6-02	PRIME LOSS DETECTION LEVEL (Torq Det 1 Lvl)	Sets the threshold for the Prime Loss Detection Function. If the pump is running at 100% speed (60 Hz) and the proportional current falls below this value for the amount of time set in L6-03, the VFD will shut off the pump to prevent it from being damaged and display Fault Code UL5. This value is set as a percentage of the rated output current of the VFD.	0-100%	43%

5. PARAMETER DETAILS

The VFD parameters are organized with a numbering system using one letter and two numbers, e.g., "A0-00". The letter represents the parameter group, the first number represents the sub-group, and the number after the dash represents the specific parameter. This section covers the main, applicable parameters. The rest of the parameters and their descriptions can be found in the V1000 Quick Start Guide*.

No.	Parameter Name	Digital Operator Display	Range	Default
B5-19	RUNNING PRESSURE	PID Setpoint	0-100%	40%

Parameter B5-19 sets the pressure setpoint that the system tries to maintain when in Auto Mode. This value is entered as a percentage of the range of the pressure transducer used in the system.

To calculate the value to enter for running Pressure, use the following equation or see Figure 4 for typical values.

$$entered\ value = \frac{desired\ pressure(psi) + 20}{2}$$

EXAMPLE: If you want the system to maintain the pressure at 60 psi, substitute 60 into the above equation: $\frac{60+20}{2} = 40$, enter 40 into parameter B5-19.

· ·

No.	Parameter Name	Digital Operator Display	Range	Default
Q1-01	START PRESSURE	(Custom Param 1)	0-100%	35%

Parameter Q1-01 sets the pressure that will cause the pump to start when using the Pressure Start Method in Auto Mode. If the pressure in the system falls below this setting, the VFD will exit sleep mode and run the pump. It is typically set to 10 psi below the Running Pressure. This value is set as a percentage of the range of the pressure transducer used in the system. To calculate the value to enter for Start Pressure, use the following equation or see Figure 4 for typical values.

$$entered\ value = \frac{desired\ pressure(psi) + 20}{2}$$

EXAMPLE: if you want the pump to start when the pressure drops below 50 psi, substitute 50 into the above equation $\frac{50+20}{2} = 35$, enter 35 into parameter Q1-01.

0-200 psi Transducer			
Running Pressure (psi)	B5-19 (%)	Wake Pressure (psi)	Q1-01 (%)
40	30	30	25
45	32.5	35	27.5
50	35	40	30
55	37.5	45	32.5
60	40	50	35
65	42.5	55	37.5
70	45	60	40
75	47.5	65	42.5
80	50	70	45
85	52.5	75	47.5
90	55	80	50
95	57.5	85	52.5
100	60	90	55

NOTE: The above equation used for the pressure parameters is derived from the equation:

$$X = \frac{pressure(psi) + .1r}{r} * 100$$

Where "x" is a percentage of the range of the pressure transducer and "r" is the range of the pressure transducer (in psi). The Munro Simplicity uses a 0-200 psi, 1-11V Pressure transducer, but the analog input on the VFD used for PID feedback reads a 0-10V signal, so the 10% offset in the equation compensates for the 1V difference. If the pressure transducer is replaced with one with a different pressure range, substitute the new range into the above equation to calculate the correct values to enter into the parameters.

Figure 4 - A table showing typical Running and Start Pressures and their corresponding parameter values.

No.	Parameter Name	Digital Operator Display	Range	Default
Q1-02	SLEEP THRESHOLD	(Custom Param 2)	0-100%	84%

Parameter Q1-02 sets the threshold for the Sleep Function. The value entered in this parameter depends on the setting of the SLEEP TYPE Parameter Q1-04:

Q1-04 =0: If the running pressure is being maintained and the proportional speed falls below this value for the amount of time set in Q3-01, the VFD will activate the Sleep Function. This value is set as a percentage of the maximum speed, 60Hz.

> EXAMPLE: If you want the pump to go to sleep when the speed drops below 50Hz:
> $$\frac{50Hz}{60Hz} = 84\%, \text{ enter 84 into parameter Q1-02}$$

Q1-04 =1: If the running pressure is being maintained and the proportional current falls below this value for the amount of time set in Q3-01, the VFD will activate the Sleep Function. This value is set as a percentage of the rated output current of the VFD. The rated output current of the VFD is printed on the top of the VFD, near the model number and serial number.

> EXAMPLE: If you want the pump to go to sleep when the current drops below 7A:
> $$\frac{7A}{17.5A} = 40\%, \text{ enter 40 into parameter Q1-02}$$

•••••••••••••••••••••••••••••••••• •

No.	Parameter Name	Digital Operator Display	Range	Default
Q1-03	START METHOD	(Custom Param 3)	0.00-1.00	0

The Q1-03 parameter determines if the VFD will use the Pressure Start Method or Clock Start Method.

0.00: Pressure Start Method: When in Auto Mode, the VFD will start the pump when the pressure drops below the level set in Q1-01.
1.00: Clock Start Method: When in Auto Mode, the VFD will start the pump when it receives a 24VAC signal from an external source (e.g. an irrigation controller).

•••••••••••••••••••••••••••••••••• •

No.	Parameter Name	Digital Operator Display	Range	Default
Q1-04	SLEEP TYPE	(Custom Param 4)	0.00 or 1.00	0

The Q1-04 parameter determines if the VFD will monitor the pump's speed or current to trigger the sleep function.

0.00: Speed
1.00: Current

• •

No.	Parameter Name	Digital Operator Display	Range	Default
D1-01	FREQUENCY REFERENCE	(Reference 1)	0-100%	100%

Parameter D1-01 sets the speed the pump will run while in Hand Mode.
This value is set as a percentage of the maximum speed, 60Hz.

> EXAMPLE: If you want the pump to run at 54 Hz while in Hand Mode:
> $$\frac{54Hz}{60Hz} = 90\%, \text{ enter 90 into parameter D1-01}$$

• •

No.	Parameter Name	Digital Operator Display	Range	Default
L6-03	PRIME LOSS DETECTION TIME	(Torq Det 1 Time)	0.0 or 10.0 sec	10.0 sec

Parameter L6-02 sets the threshold for the Prime Loss Detection Function. If the pump is running at full speed (60 Hz) and the proportional current falls below this value for the amount of time set in L6-03, the VFD will shut off the pump to prevent it from being damaged and display Fault Code UL5.

The value is set as a percentage of the rated output current of the VFD. The rated output current of the VFD is printed on the top of the VFD, near the model number and serial number. The Prime Loss Detection Level is set and tested at the factory, so it is unlikely that it will need to be adjusted. This value is typically set at 43% (60% of the pump's FLA), in most systems. Increasing this value will make the system more sensitive to Prime Loss Detection (see figure 5).

> EXAMPLE: If you want the VFD to trigger a Prime Loss fault when the pump is at max speed and the current drops below 8A:
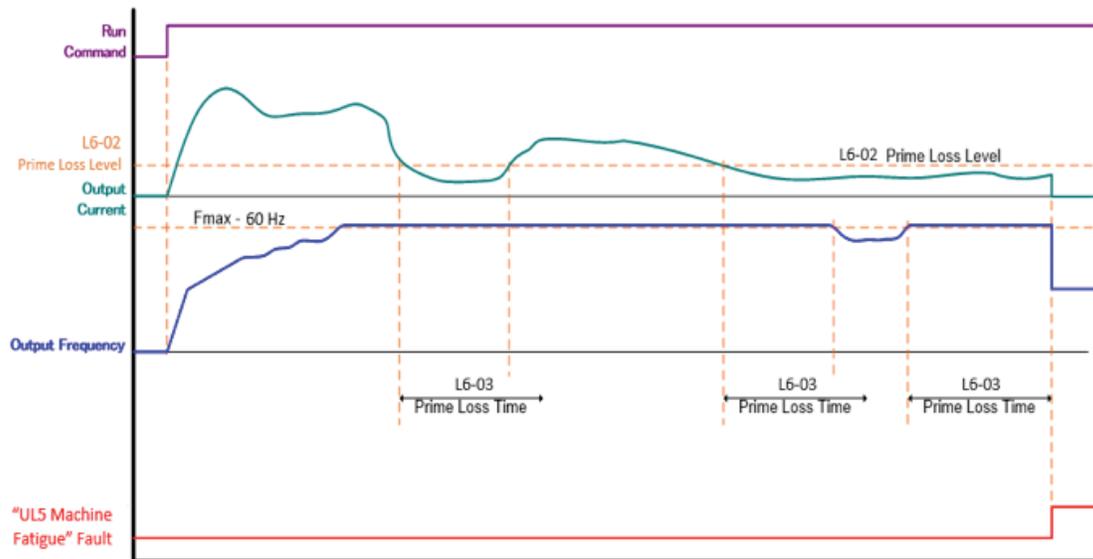> $$\frac{8A}{17.5A} = 45.67\%, \text{ enter 45.7 into parameter L6.02}$$

Figure 5 - Timing diagram of the Prime Loss Detection Function

Figure 6 - A photo showing where the rated output current is printed on the VFD. The VFD shown here is rated for 30.0A/25.0A.
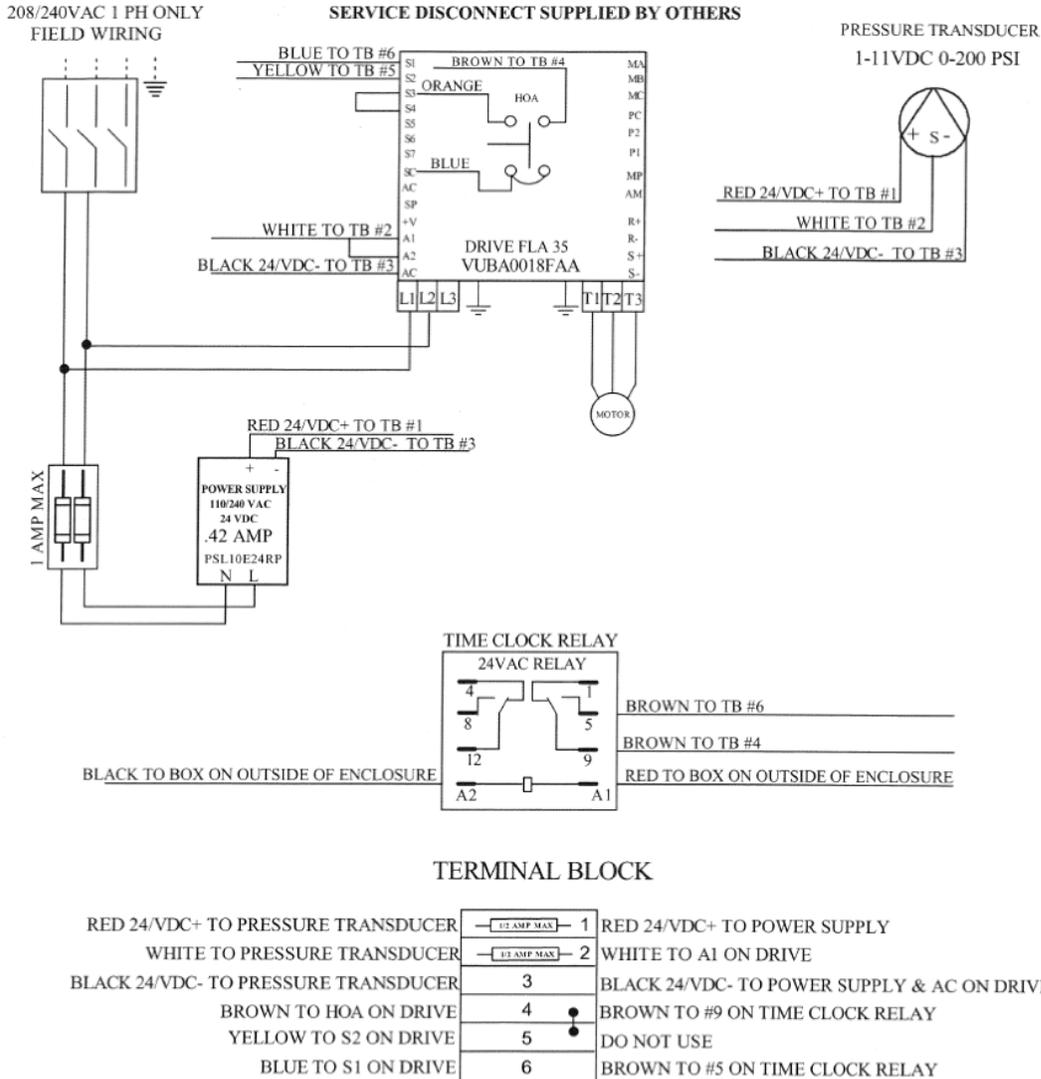
6. FAULTS & ALARMS

When the VFD has an active alarm, the "ALM" LED will blink red and the digital display (or the digital operator if it's connected) will display the alarm code. When the VFD has an active fault, the "ALM" LED will be solid red and the digital display (or the digital operator if it's connected) will display the fault code. Fault and Alarm code descriptions can be found in the V1000 Quick Start Guide*.

To resolve a Fault or Alarm:
1. Move the HOA switch to the OFF position.
2. Connect the Digital Operator and identify the displayed fault/alarm.
3. Look up the fault/alarm code in the V1000 Quick Start Guide.
4. Resolve the issue triggering the fault/alarm.
5. Place the HOA switch in the OFF position.
6. Push the RESET button on the Digital Operator to reset the fault/alarm.

*Find on "Other Info" tab www.munropump.com/simplicity-pump-stations

208/240VAC 1 PH ONLY FIELD WIRING

SERVICE DISCONNECT SUPPLIED BY OTHERS

BLUE TO TB #6
YELLOW TO TB #5
BROWN TO TB #4
ORANGE
HOA
BLUE
WHITE TO TB #2
BLACK 24/VDC- TO TB #3

DRIVE FLA 35
VUBA0018FAA

S1 S2 S3 S4 S5 S6 S7 SC AC SP +V A1 A2 AC
L1 L2 L3
MA MB MC PC P2 P1 MP AM R+ R- S+ S-
T1 T2 T3

MOTOR

PRESSURE TRANSDUCER
1-11VDC 0-200 PSI

+ S -

RED 24/VDC+ TO TB #1
WHITE TO TB #2
BLACK 24/VDC- TO TB #3

RED 24/VDC+ TO TB #1
BLACK 24/VDC- TO TB #3

+ -
POWER SUPPLY
110/240 VAC
24 VDC
.42 AMP
PSL10E24RP
N   L

1 AMP MAX

TIME CLOCK RELAY
24VAC RELAY

4   1
8   5
12   9
A2   A1

BROWN TO TB #6
BROWN TO TB #4
RED TO BOX ON OUTSIDE OF ENCLOSURE

BLACK TO BOX ON OUTSIDE OF ENCLOSURE

TERMINAL BLOCK

RED 24/VDC+ TO PRESSURE TRANSDUCER	1/2 AMP MAX — 1	RED 24/VDC+ TO POWER SUPPLY
WHITE TO PRESSURE TRANSDUCER	1/2 AMP MAX — 2	WHITE TO A1 ON DRIVE
BLACK 24/VDC- TO PRESSURE TRANSDUCER	3	BLACK 24/VDC- TO POWER SUPPLY & AC ON DRIVE
BROWN TO HOA ON DRIVE	4	BROWN TO #9 ON TIME CLOCK RELAY
YELLOW TO S2 ON DRIVE	5	DO NOT USE
BLUE TO S1 ON DRIVE	6	BROWN TO #5 ON TIME CLOCK RELAY

VERY IMPORTANT READ CAREFULLY | Note: Pump station is default programmed for pressure start. If 24VAC start is required, connect 24VAC signal to red and black wires located in j-box (labeled 24VAC connection) outside station enclosure. Program parameter Q1-02 to 001.00%.

Phone-in Start-up Assistance and Technical Support
Contact the Munro team to schedule and access
phone-in start up assistance and technical support.
1-800-942-4270 or msy@munropump.com

8. PRE-START UP CHECKLIST

Use the below checklist to prepare for a successful pump station start up. If scheduling a start up date with Munro, either in person or over the phone, this document must be completed and returned to Munro at least 48 hours prior to scheduled start up date.

PROJECT NAME_____

Scheduled Start up date_____

MECHANICAL INSTALLATION
- ☐ Verify all mechanical components were received and installed properly.
- ☐ Verify suction screens are properly attached to pumps and flush lines are connected.
- ☐ Verify suction piping and foot valve installation.
- ☐ Verify all fasteners are tight, including motor bolts, piping connections and panel supports.
- ☐ Verify skid is properly leveled and secured.

ELECTRICAL INSTALLATION
- ☐ Verify the electrical power is connected and installed per NEC, including grounding, bonding, and neutral. Connect wiring to motors, when applicable.

  Verify incoming power is +/- 10% of specified voltage.
- ☐ Specified voltage_____

  Phase A to Ground_____ Phase B to Ground_____ Phase C to Ground_____

  A to B_____ B to C_____ A to C_____
- ☐ Verify pump, skid, and pipes, are sufficiently grounded to prevent electrolysis and premature wear. Use of ground rods and/or CEE (Concrete Encased Electrode) is recommended.
- ☐ Verify 24 VAC signal from clock is installed, as well as any other remote signal source, or monitor, when applicable.

HYDRAULIC INSTALLATION
- ☐ Verify pump station has water.
- ☐ Verify inlet water pressure is within spec.
- ☐ Verify distribution system is ready to accept water. (Example: all sprinkler heads installed.)

PERSONNEL AVAILABILITY
If scheduling a start up with Munro, either in person or over the phone, please confirm that relevant personnel are available at time of start up, including installer and end user personnel. Installer and end user personnel are scheduled to be available on site during start up.

Pump station is installed and ready for start up. All listed checklist items have been completed and verified. I understand that if Munro's Authorized Service Provider arrives at the job site and finds that the pump station is not ready to start up, any required subsequent visits will incur hourly fees (up to $150/hr.) and travel expenses.

Customer Name_____

Customer Signature_____ Date_____

PHONE-IN START-UP ASSISTANCE AND TECHNICAL SUPPORT
Contact the Munro team to schedule and access phone-in start up
assistance and technical support.
1-800-942-4270 or msy@munropump.com

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THIS DOCUMENT MUST BE COMPLETED AND RETURNED TO MUNRO IF YOU WOULD LIKE TO SCHEDULE A PHONE-IN OR IN-PERSON START UP

Start up must be scheduled at least two weeks prior to requested start up date regardless of type of start. Dates are not guaranteed until confirmed by Munro. Start ups requested with less than two weeks notice may not be possible to accommodate and may incur additional expense.

Optional in-person start ups will incur additional charges if desired, please contact Service Manager at 970.270.0400 and provide PO# here:_____

Prior to start up date, job site must be ready to start up pump station. If Munro's Authorized Service Provider arrives at the job site and finds that the pump station is not ready to start up, any required subsequent visits will incur hourly fees and travel expenses.

PROJECT NAME_____

    Serial #_____ Distributor_____

    Contractor_____ End User_____

    Site Location_____

    City_____ State_____

    Site Contact_____ Phone_____

    Date of pump station installation_____ Requested start up date_____

Simplicity: ☐Vertical ☐Horizontal ☐Submersible

Notes:

Station Orientation and Training Provided with In-Person Startups Only

If you elect to purchase an in-person start-up, the Munro Authorized Service Provider will provide training for the end user. When training is provided, end-user maintenance personnel should be present for the last 2-3 hours of station start up.

9. START UP CHECKLIST

Complete this helpful tool as a record of your start up. If Munro completes the start up, we will complete a start up checklist.

PROJECT NAME_____

Serial #_____Distributor_____

Contractor_____End User_____

Site Location_____

City_____State_____

Site Contact_____Phone_____

Start-Up Date_____

Pump Station Type: ☐Boost   ☐Flooded suction   ☐Lift
Pump Station Warranty Period: ☐2 year ☐5 year - based on _____
Starting method: ☐Clock/relay start ☐Pressure start   Irrigation controller model: _____

		INITIAL
1.	All bolts and hardware tightened	_____
2.	All panel wiring tight and correct according to schematic	_____
3.	All piping and equipment mounted securely, thrust blocking in place	_____
4.	Motor lugged and taped properly, and verify no wires are pinched under t-box cover	_____
5.	Service wire size = _____	_____
6.	Service protection size = _____	_____
7.	Voltage tested prior to start L1-L2_____, L2-L3_____, L1-L3_____	
	L1-gnd_____, L2-gnd_____, L3-gnd_____	_____
8.	Valved opened and system primed, air bled from top of pump stacks,	_____
9.	Direction of rotation correct DOR #1_____gpm,_____psi,_____a	
	DOR #2 _____gpm,_____psi,_____a	_____
10.	Perform Autotune on all pumps with VFDs and note on back	_____
11.	Test run system under all expected site conditions (min and max flows)	_____
12.	Perform full load tests on each pump and note on back	_____
13.	Record set point, sleep speed/current, wake up level, and delay (on second page)	_____
14.	Check for leaks	_____
15.	Back-up parameters saved to key pad (03-01)	_____
16.	Start up date noted on sticker inside panel	_____
17.	Switches back in AUTO and site secured prior to leaving (do not leave doors unsecured)	_____

Notes:

1. Record all other data (repairs/modifications required, unusual/site conditions) on second page provided.
2. The pages of this form must be completed and submitted with invoicing in order to expedite payment.
3. Amps/horsepower rule of thumb if no name plate data:
   - *3 PHASE: 1.2 amps/HP for 480 volt, 2.4 amps/HP for 230 volt*
   - *1 PHASE: 8.4 amps/HP for 120 volt, 4.2 amps/HP for 230 volt*

Station Data _____gpm @ _____psi with _____, suction pressure (or lift ft), Using ☐CP, or ☐RS

Pump = _____hp, _____kw, _____fla _____ rpm, _____ nla ☐ AutoTune

100% deadhead = _____psi, _____hz, _____a | Set LOP at _____% (_____a)

40hz deadhead (Line Fill Speed) = _____psi, _____a | Set FPL current at _____% (_____a)

Stpt deadhead = _____psi @ _____hz & _____a | Set Slp Spd at _____hz, or _____% (_____a)

Using set point of ____% (____psi), Wake of ____% (____psi) with Wake Delay of ____s

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Full load tests (note test conditions – example: Zone 1 = _____Hz, _____ AMPS @ _____PSI)

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10. MAINTENANCE CHECKLIST

These are basic guidelines for recommended maintenance. Quarterly maintenance is recommended. Maintenance is not provided by Munro.

MOTOR:
- ☐ Voltage unloaded
- ☐ Voltage loaded
- ☐ Amperages loaded
- ☐ Megger readings (Not if attached to a VFD)
- ☐ Check t-box connections
- ☐ Check t-box gasket condition
- ☐ Change oil
- ☐ Grease bearings

PUMP:
- ☐ Exercise valves
- ☐ Inspect mechanical seals
- ☐ Check flush lines

PANEL:
- ☐ Check/tighten connections
- ☐ Check Control voltage
- ☐ Check/clear transducer port (insulating pressure transducer)
- ☐ Check level sensors (low level safety transducer - probes)

VFD:
- ☐ Check connections
- ☐ Check fans/filters
- ☐ Record user data, (runtime, bus voltage, fault history)

COOLING:
- ☐ Check vents and remove any blockages

PRV:
- ☐ Check valve operation/ setting. (25 PSI over setpoint)
- ☐ Clean y-strainer
- ☐ Exercise valves

FLOW METER:
- ☐ Check connections

PUMP SKID:
- ☐ Clean
- ☐ Controls back in auto

⚠ WARNING

⚠ When in doubt, call a licensed electrician. High voltage can shock, burn, or cause death.