





Set Up Instructions for DVFP

Inspect the packaging of the equipment to confirm that nothing was damaged during shipping.

Remove the system from the packaging. Make sure everything is included and without damage. Below is a checklist with everything you should have received. The system will already be assembled and should arrive in one piece.

- _____ 1) Pump (Figure 1)
- _____ 2) Variable Frequency Drive (VFD) (Figure 2)
- _____ 3) Pressure Tank (Figure 3)
- _____ 4) Plumbing



Figure 2: Pump



Figure 1: VFD



Figure 3: Pressure Tank

Call Diamond H2O right away if anything is missing. Contact the freight company immediately if anything is damaged. Diamond H2O will not be liable for any damage received after shipping.

Packaged By: _____ Date: _____

Received By: _____ Date: _____

Table 1: System Specifications

Model	HP	Suction	Discharge	Flow @45 psi
DVFP-70	3	2"	1.5"	70 gpm
DVFP-100	5	2"	1.5"	100 gpm
DVFP-140	5	2"	2"	140 gpm

1. AWG will change depending on length of wire (values are for a max 300ft from input). **10 AWG (6 mm²)** wire can be used for any system using less than 100ft of wire from power supply.
2. With properly-sized circuit breakers, the Drive is protected from short circuit on the input and the output. **35A UL Class T (600V)** fuses are recommended.



Contents

DVFP-140 Part Breakdown..... 4

Warnings 5

Warnings continued..... 5

Setup Instructions 6

1. Place the System near a water source and a power source..... 6
2. Connect the Pump to the Water Source..... 6
3. Connect the variable frequency drive (VFD) to the circuit breaker..... 7
4. Set the Pressure Tank Pressure..... 12
5. Program the DVFP..... 12

Troubleshooting..... 15

How to reset..... 15

Fault history 15

Alarm messages 15

Fault Codes..... 17

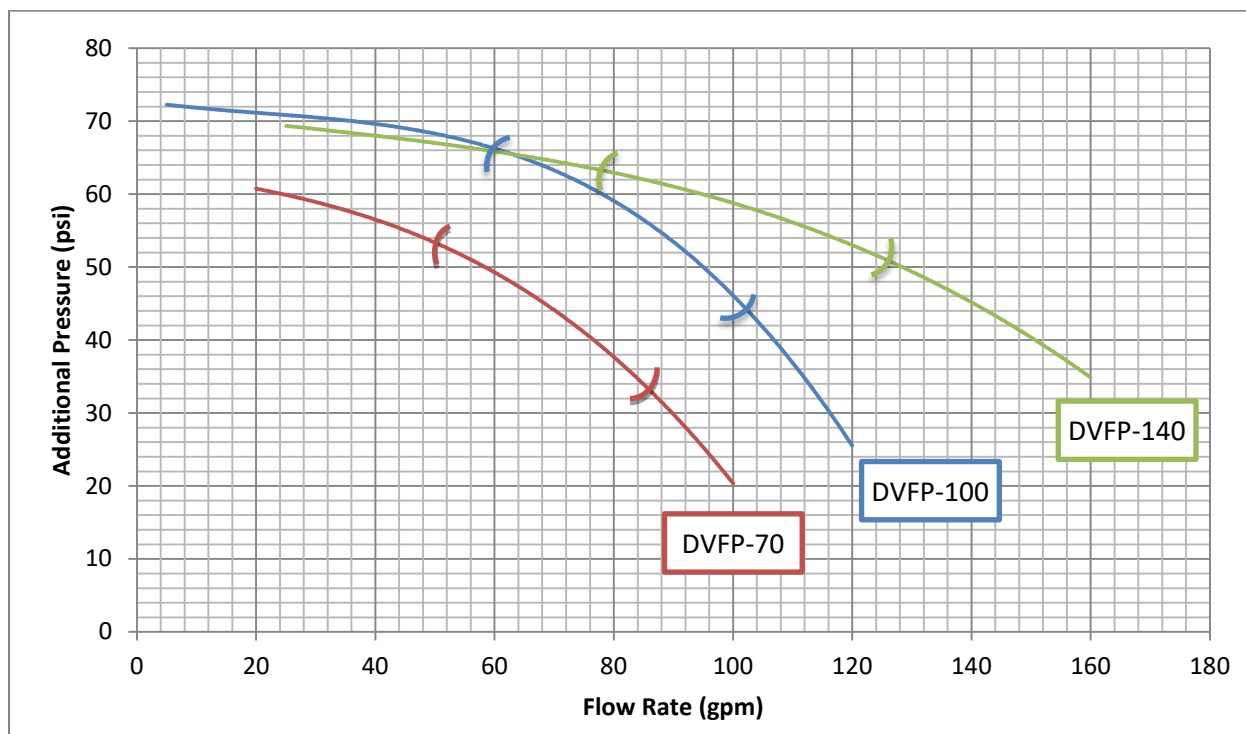
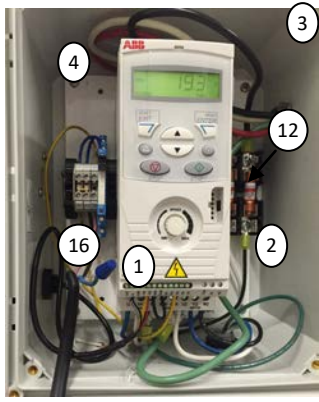


Figure 4: DFVP Sizing Recommendations



DVFP-140 Part Breakdown



460V Box

Key	Part Number	Description
1	40-0032-XX	460V Drive/Controller
2	118-0014-XX	Fuse, 600 Volt, 10 Amp

230V Box

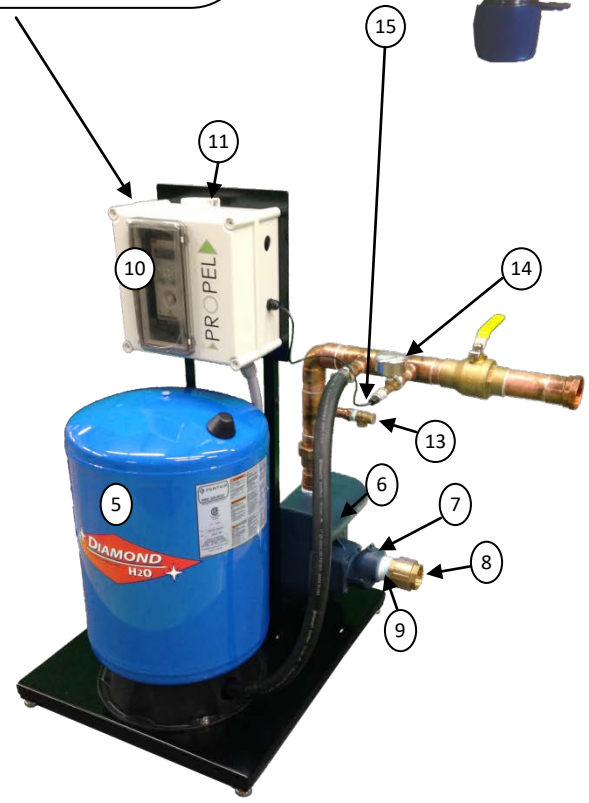
Key	Part Number	Description
1	40-0031-XX	230V Drive/Controller
2	118-0015-XX	Fuse, 600 Volt, 20 Amp

460V Controller Shown



460/230V

Key	Part Number	Description
3	109-0016-XX	Enclosure, 11x11x6
4	24-0036-ST	Sub Panel, 9.4x9.4
5	41-0103-XX	19 Gallon Pressure Tank
6	15-0086-XX	5HP Pump, 140gpm
7	115-004-XX	Flange, 2", needed with pump
8	51-0168-XX	Check Valve, 2", brass, needed with pump
9	26-0037-BR	Nipple, Close, 2", Brass, needed with pump
10	109-0015-PC	Enclosure Inspection Window
11	109-0013-XX	Enclosure Air Vent
12	118-0013-XX	Fuse Block
13	51-0087-XX	Pressure Relief Valve, 3/4"
14	61-0002-XX	Pressure Gauge
15	57-0003-XX	Oil Filled Pressure Transmitter
16		External Shutoff Block





Warnings

- All installation, service work, and inspections must be done by a **qualified electrician**. Risk of high-voltage electrical shock from EMI/RFI filter inside drive. Can shock, burn or kill if the front cover of the PENTEK INTELLIDRIVE is open or removed while power is connected to the Drive or the Drive is running. The front cover of the Drive must be closed during operation.
- Make all wiring connections, then close and fasten the cover before turning on power to drive.
- NEVER open the box when power is connected to Drive.
- **Before doing any service or maintenance inside Drive or when connecting or disconnecting any wires inside Drive:**
 - A. DISCONNECT power.
 - B. WAIT 5 minutes for retained voltage to discharge.
 - C. Open box.
- Before starting any wiring or inspection procedures, check for residual voltage with a voltage tester.
- **NEVER...**
 - connect power wiring to Drive before mounting the box.
 - handle or service Drive with wet or damp hands. Always make sure hands are dry before working on Drive.
 - reach into or change the cooling fan while power is applied to Drive.
 - touch the printed circuit board when power is applied to Drive.

Warnings continued...

- Do not modify equipment.
- Do not use power factor correction capacitors as they will damage both motor and PENTEK INTELLIDRIVE.
- Do not remove any parts unless instructed to do so in Owner's Manual.
- Do not use a magnetic contactor on Drive for frequent starting/stopping.
- Do not install or operate Drive if it is damaged or parts are missing.
- Before starting Drive that has been in storage, always inspect it and test operation.
- Do not carry out a megger (insulation resistance) test on the control circuit of the Drive.
- Do not allow loose foreign objects which can conduct electricity (such as screws and metal fragments) inside Drive box at any time. Do not allow flammable substances (such as oil) inside Drive box at any time.
- Ground Drive according to the requirements of the National Electrical Code Section 250, IEC 536 Class 1, or the Canadian Electrical Code (as applicable), and any other codes and ordinances that apply.

Setup Instructions

1. Place the System near a water source and a power source.

Decide where you would like to place the system. Ideally, it should be very close to the water source and within 25 feet of a circuit breaker. The VFD should be mounted on the wall with a few inches of clearance on every side of the VFD. This will allow free air flow to the unit.

2. Connect the Pump to the Water Source

System piping should be at least one commercial pipe size larger than pump connections and flow velocity should not exceed eight (8) feet per second. In pool installation, flow velocity should not exceed six (6) feet per second. The inlet of the pump is shown in Figure 4.

Follow all local codes.

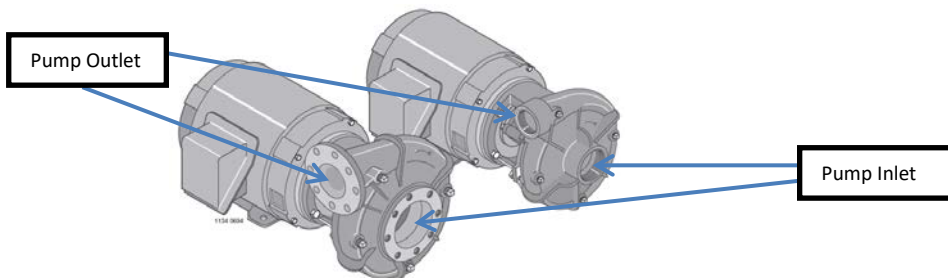


Figure 5: Pump Diagram

- A. Pipe or tube a line from the Water Source to the Pump Inlet.
 - a. Take Care to align piping with pump case. Misalignment or excessive pipe strain can cause distortion of pump components resulting in rubbing, breakage, and reduced pump life.
- B. Make sure there is no pressure on the connections.
 - a. Support the pipe so it doesn't affect the connection to the pump.
 - b. Check the pump alignment.
- C. Follow the recommendations in Figure 6 when attaching the piping.

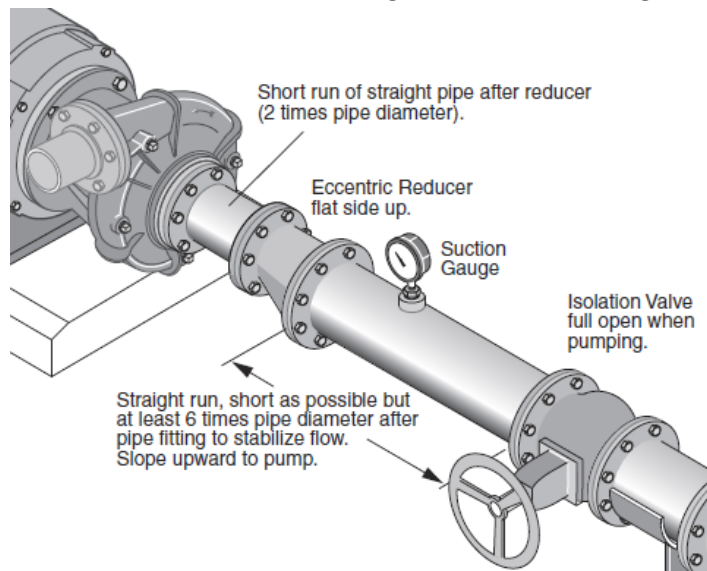
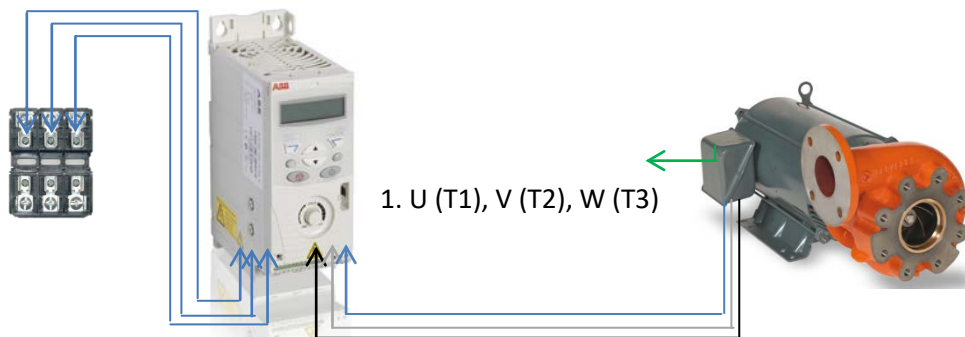


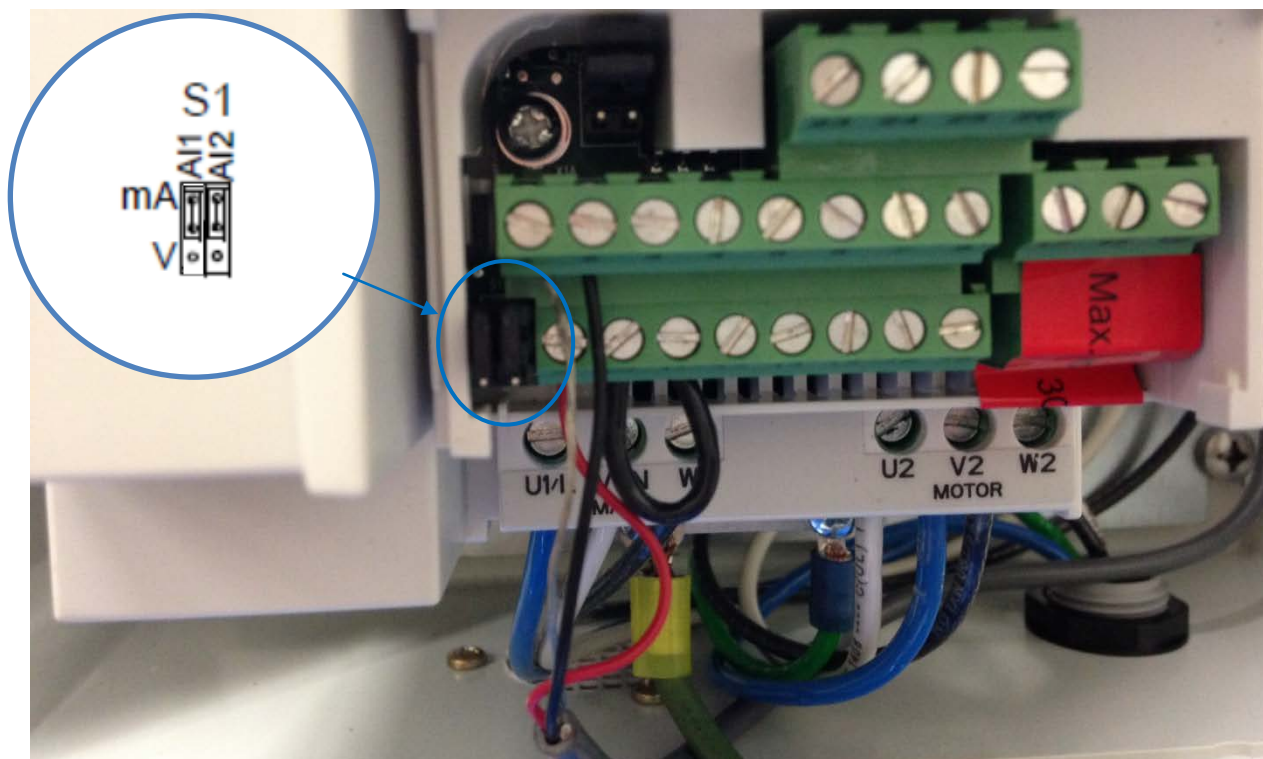
Figure 6: Plumbing recommendations

3. Connect the variable frequency drive (VFD) to the circuit breaker.

1. Carefully remove the cover from the VFD Enclosure
2. Inspect the system to verify the wiring is set up correctly.
 - I. Check that the pump is wired to the U, V, and W lines of the VFD controller.
 - II. Check that three wires are connected from the R, S, and T lines of the VFD Controller to the Fuse block.



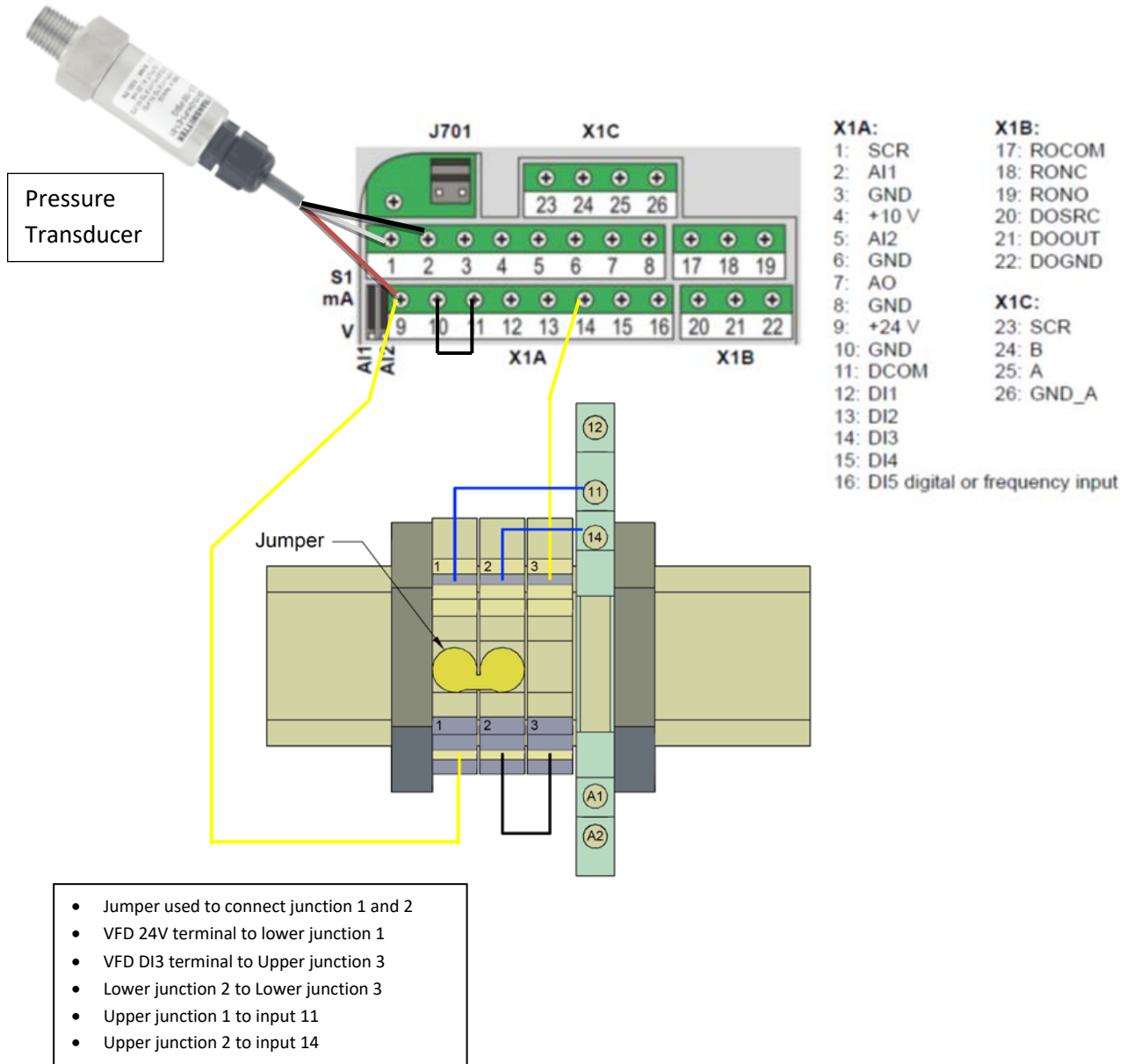
3. Connect the positive (red, DIN terminal 9) wire of the pressure transducer to the 24V terminal of the VFD, the negative (black, DIN terminal 2) wire to the AI terminal of the VFD, and the screen wire of the pressure transducer to SCR (metallic, DIN terminal 1).
4. Verify that S1 has both jumpers set to mA as shown below.



5. Verify the following wiring connections (One of the four following options should be installed).

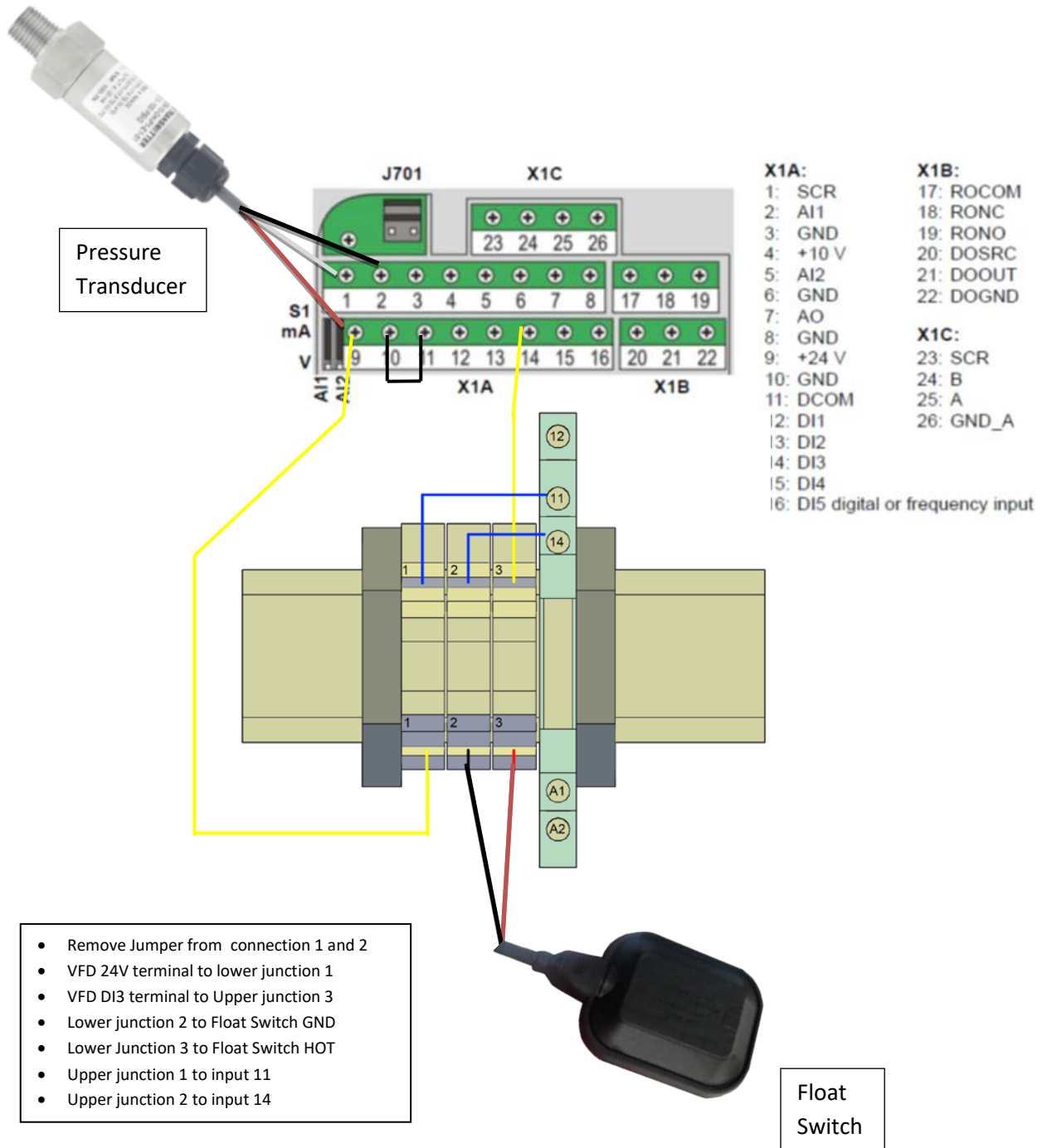
I. **Default:**

System is controlled by pressure signal alone. The system will start when pressure is below internal set point and will stop when system reaches the set point.



II. Float Switch Control:

The system is still activated and stopped by pressure signal as in the default setting. An additional float switch is also used to stop the system from drawing water when the water source is low.



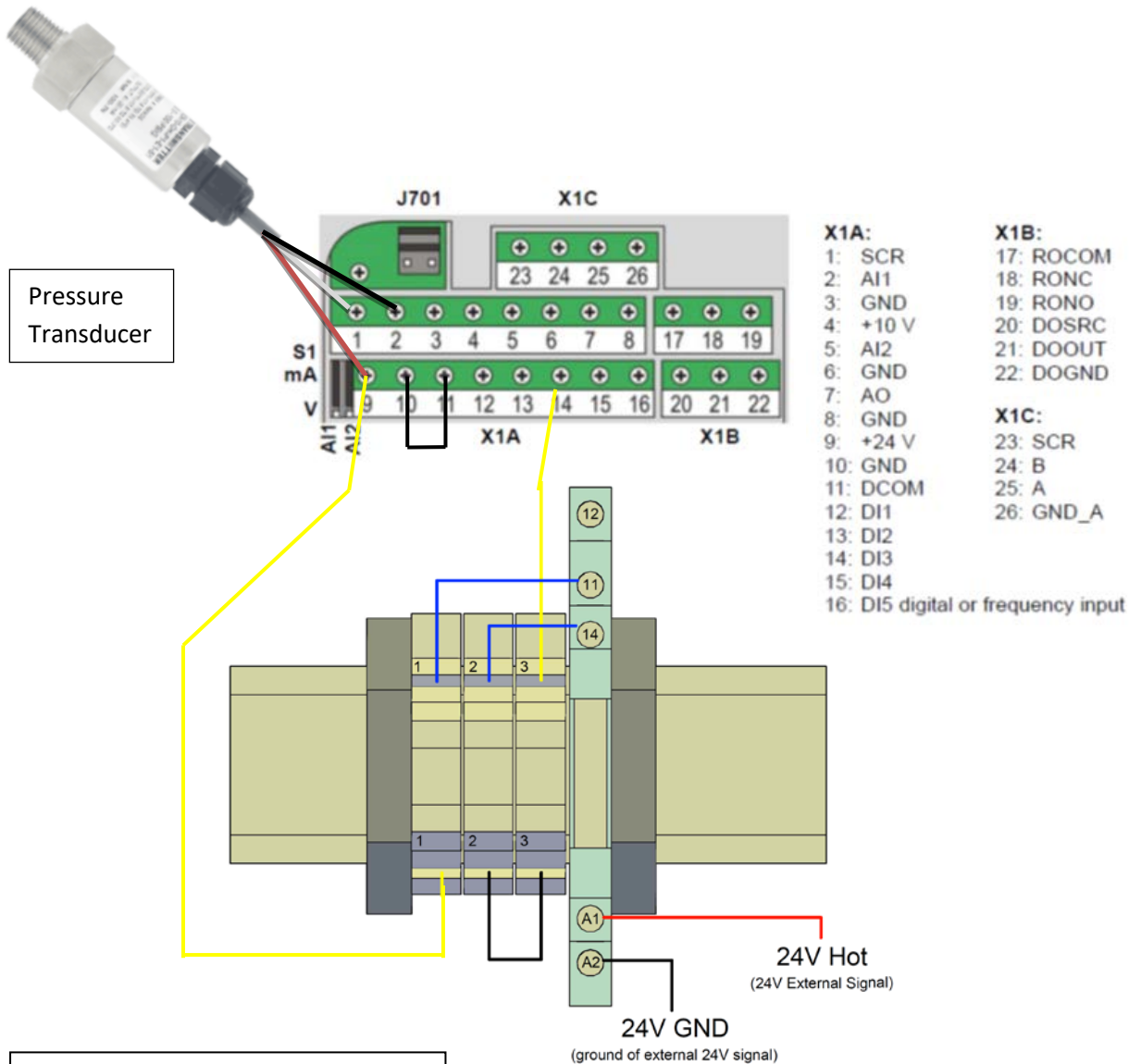
- Remove Jumper from connection 1 and 2
- VFD 24V terminal to lower junction 1
- VFD DI3 terminal to Upper junction 3
- Lower junction 2 to Float Switch GND
- Lower Junction 3 to Float Switch HOT
- Upper junction 1 to input 11
- Upper junction 2 to input 14

Float Switch



III. 24V AC or DC Power Signal:

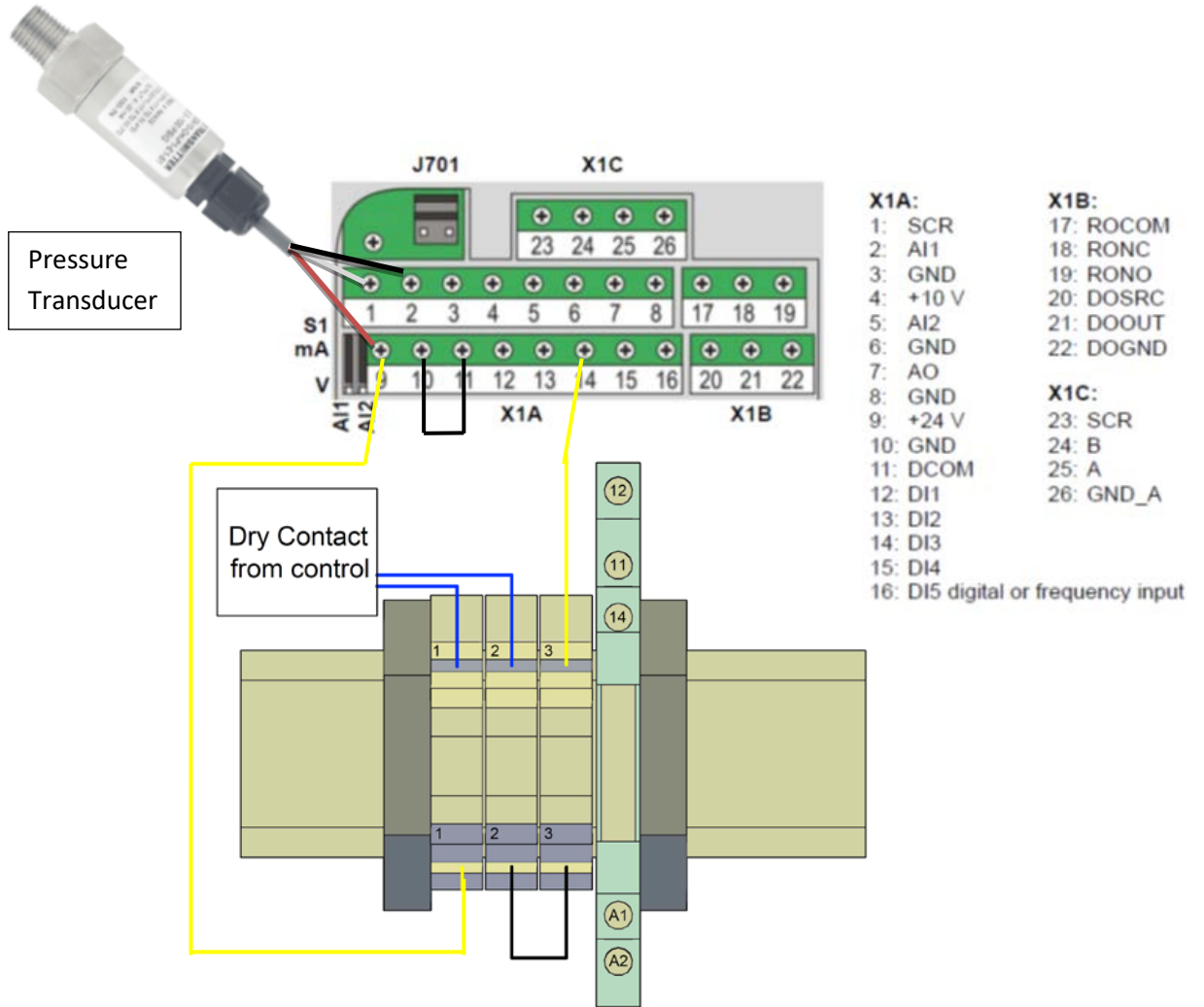
The system is still activated and stopped by pressure signal as in the default setting. An external 24V AC or DC signal can be used to shut the system down.



- Remove Jumper from connection 1 and 2
- VFD 24V terminal to lower junction 1
- VFD DI3 terminal to Upper junction 3
- Lower junction 2 to Lower junction 3
- Upper junction 1 to input 11
- Upper junction 2 to input 14
- 24V External Signal Hot to input A1
- 24V External Signal Ground to input A2

IV. Contact Closure

The system is still activated and stopped by pressure signal as in the default setting. An external contact closure or switch can be used to shut down the system manually or automatically. A closed contact allows the system to run and an open contact shuts system down



- Remove Jumper from connection 1 and 2
- VFD 24V terminal to lower junction 1
- VFD DI3 terminal to Upper junction 3
- Lower junction 2 to Lower junction 3
- Upper junction 1 to input 11
- Upper junction 2 to input 14
- 24V External Signal Hot to input A1
- 24V External Signal Ground to input A2

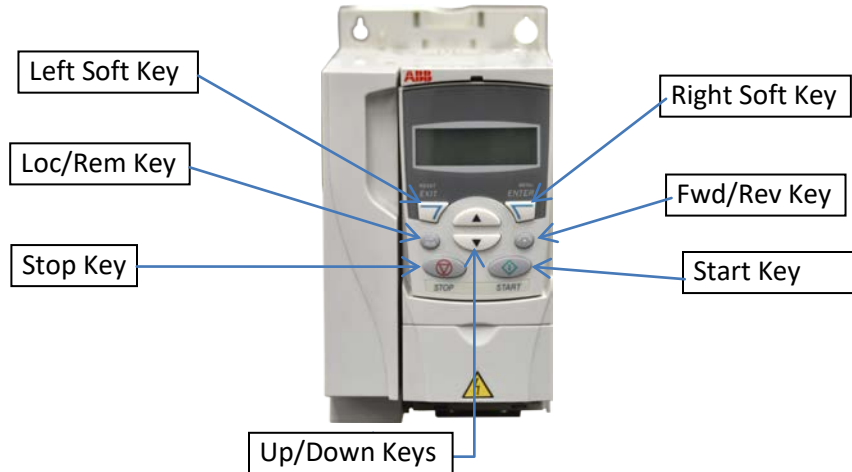
6. Connect the power to the VFD.

4. Set the Pressure Tank Pressure

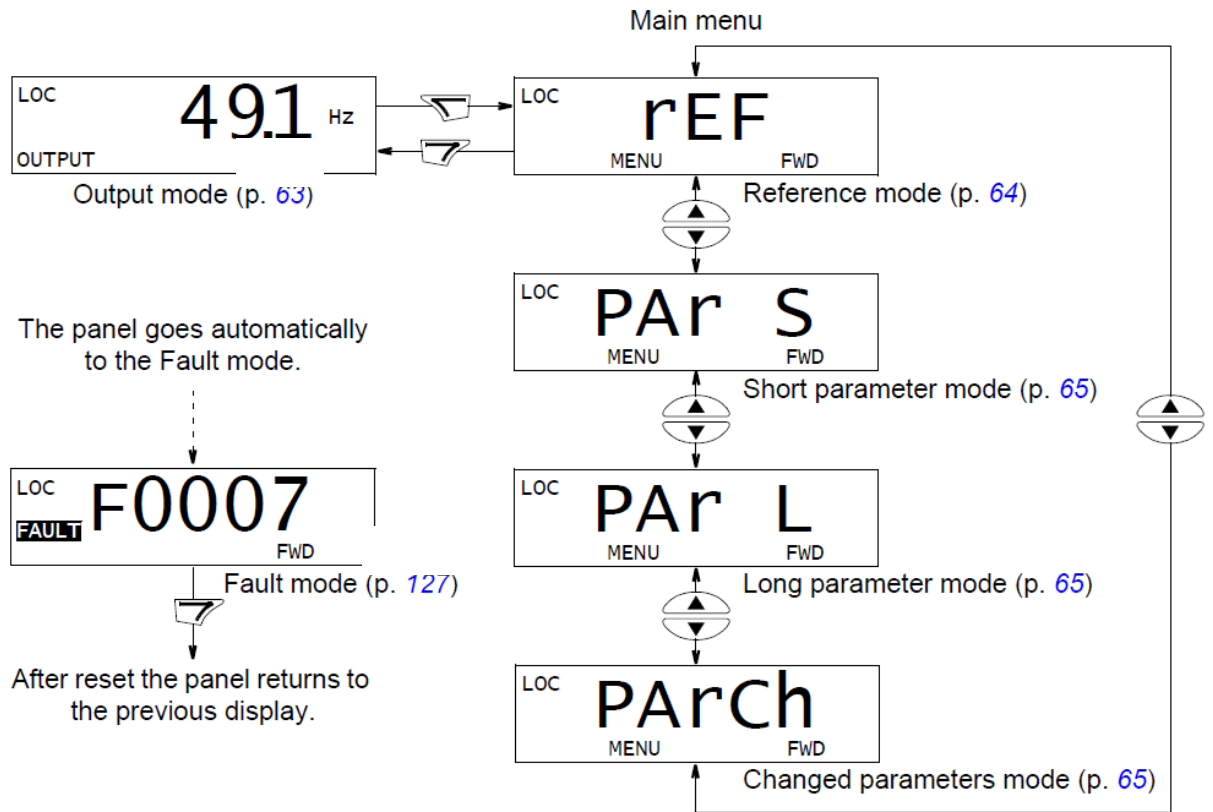
The pressure tank should be set to 70% of the desired line pressure.

For example, if the desired pressure was 60psi, the pressure tank should be set to 42psi.

5. Program the DVFP



The flow chart below displays how to navigate through the different modes of the VFD.





Startup

A. Program PID Control Data

1. From Output Mode, press the (right soft key) to enter the main menu.
2. Use the / keys until the display shows “Par L” and press .
3. From here, you should be able to cycle through parameters in the “long menu” using the / keys.
4. Set each parameter in Table 3 to the corresponding values. For each parameter:
 1. Use the / keys to select the parameter
 2. Press and hold (right soft key) until the value is show and **SET** is displayed
 3. Use the / keys to edit the value
 4. Save the value by pressing (right soft key)

Table 2: Mandatory Programming/Verification

Parameter (White cell is factory default)	DVFP-140 230V 5HP	DVFP-100 460V 5HP	DVFP-70 460V 3HP	Description
9902	6	*	*	Application Macro (Set to PID)
9905	230	*	*	Motor Nominal Voltage
9906	12	*	7.4	Motor Nominal Current
9907	60	*	*	Motor Nominal Frequency
9908	3400	*	3450	Motor Nominal Speed (rpm)
9909	5	*	3	Motor Nominal Power (kW/hp)
1001	1	*	*	EXT1 Commands (Set to DI1)
1002	8	*	*	EXT2 Commands (Set to Keypad)
1003	1	*	*	Motor Direction (1=forward, 2=reverse, 3=request)
1101	1	*	*	Keypad Ref Select (1=Hz, 2=%)
1102	7	*	*	EXT1/EXT2 SEL (7=EXT2 active)
1103	1	*	*	REF1 Select (1=AI1, analog input 1)
1104	0	*	*	REF1 MIN (min value, Hz, for ref1)
1105	60	*	*	REF1 MAX (max value, Hz)
1106	19	*	*	REF2 Select (selects signal source for REF2, 19=PID1OUT)
1107	0	*	*	REF2 Min (min ref2 value, 0-100%)
1108	100	*	*	REF2 Max (max ref2 value, 0-100%)
1109	0	*	*	Loc Ref Source (0=potentiometer)
1201	0	*	*	Constant Speed Select (Selects constant speed signal, 0=not selected)
1202	6	*	*	Constant speed 1
1203	12	*	*	Constant speed 2
1301	20	*	*	Minimum AI1 (0-100%)
1302	100	*	*	Maximum AI1 (0-100%)
1303	0.1	*	*	Filter time constant AI1 (0.0-10.0s)
1401	3	*	*	Relay Output1 (3=inverted fault)
1404	0	*	*	RO 1 ON DELAY
1405	0	*	*	RO 1 OFF DELAY



DVFP Series – Variable Frequency Drive - Product Manual

1601	3	*	*	RUN ENABLE (0=not selected)
1602	1	*	*	PARAMETER LOCK (1=open)
1603	0	*	*	PASS CODE
1604	0	*	*	FAULT RESET SEL (0=keypad)
1606	0	*	*	LOCAL LOCK (0=not selected)
1607	0	*	*	PARAM SAVE (0=done)
1610	0	*	*	DISPLAY ALARMS (0=none)
1611	1	*	*	PARAMETER VIEW (1=flashdrop)
1801	0	*	*	FREQ INPUT MIN (0 Hz)
1802	1000	*	*	FREQ INPUT MAX (1000 Hz)
1803	0.1	*	*	FILTER FREQ IN (0.0-10.0 s)
3401	120	*	*	Changes Display 1 to AI 1 (transducer signal)
3405	4	*	*	Displays %
3415	103	*	*	Changes Display 2 to Output Frequency
3419	3	*	*	Displays Hz
4001	2	*	*	GAIN (High gain may cause speed oscillation)
4002	0.5	*	*	INTEGRATION TIME (seconds of integration time)
4003	0	*	*	DERIVATION TIME (seconds of derivation time)
4004	1	*	*	PID DERIV FILTER (filter time constant in seconds)
4005	0	*	*	ERROR VALUE INV (0=no)
4006	4	*	*	UNITS (4=%)
4007	1	*	*	UNIT SCALE
4008	0	*	*	0% VALUE
4009	100	*	*	100% VALUE
4010	19	*	*	SET POINT SEL (19=internal)
4011	60	*	55	INTERNAL SETPNT (desired pressure set point in %, equivalent to psi)
4012	0	*	*	SETPOINT MIN
4013	100	*	*	SETPOINT MAX
4014	1	*	*	FBK SEL (1=ACT1)
4015	0	*	*	FBK MULTIPLIER
4016	1	*	*	ACT1 INPUT (1=AI1)
4017	1	*	*	ACT2 INPUT (1=AI1)
4018	0	*	*	ACT1 MINIMUM (%)
4019	100	*	*	ACT1 MAXIMUM (%)
4020	0	*	*	ACT2 MINIMUM (%)
4021	100	*	*	ACT2 MAXIMUM (%)
4022	7	*	*	SLEEP SELECTION (7=internal)
4023	60	*	59	PID SLEEP LEVEL (unit will go to sleep when pump runs less than 45Hz)
4024	10	*	10	PID SLEEP DELAY (time pump needs to run below sleep level before controller goes to sleep)
4025	10	*	*	WAKE-UP DEV (When the pressure drops below this %, controller wakes up)
4026	0.5	*	*	WAKE-UP DELAY (seconds)

* Parameter is equivalent to DVFP 140 460V 5HP

A detailed description of all of the parameters can be found in the ABB manual.

- B. Start the System, verify that the pump is primed, the wires are installed correctly.
 1. Press the Run Key.
 2. If pump impeller is not running in correct direction, press forward/reverse key.



Troubleshooting

Safety WARNING! Only qualified electricians are allowed to maintain the drive. Read the safety instructions in chapter Safety on page 11 before you work on the drive.

An alarm or fault message on the panel display indicates abnormal drive status. Using the information given in this chapter most alarm and fault causes can be identified and corrected. If not, contact an ABB representative.

How to reset

The drive can be reset either by pressing the keypad key on the control panel, through digital input, or by switching the supply voltage off for a while. When the fault has been removed, the motor can be restarted.

Fault history

When a fault is detected, it is stored in the fault history. The latest faults are stored together with a time stamp.

Parameters 0401 LAST FAULT, 0412 PREVIOUS FAULT 1 and 0413 PREVIOUS FAULT 2 store the most recent faults. Parameters 0404...0409 show drive operation data at the time the latest fault occurred.

Alarm messages

For blue page numbers/parameters not included in this manual, refer to the user manual: EN_ACS150 UM_rev C_A4

Code	Alarm	Cause	Action
A2001	OVERCURRENT (programmable fault function, parameter 1610 DISPLAY ALARMS)	Output current limit controller is active.	Check motor load. Check acceleration time (parameters 2202 ACCELER TIME 1 and 2205 ACCELER TIME 2). Check motor and motor cable (including phasing). Check ambient conditions. Load capacity decreases if installation site ambient temperature exceeds 40 °C. See section Derating on page 138 .
A2002	OVERVOLTAGE (programmable fault function, parameter 1610 DISPLAY ALARMS)	DC overvoltage controller is active.	Check deceleration time (parameters 2203 DECELER TIME 1 and 2206 DECELER TIME 2). Check input power line for static or transient overvoltage.
A2003	UNDERVOLTAGE (programmable fault function, parameter 1610 DISPLAY ALARMS)	DC under voltage controller is active.	Check input power supply.
A2004	DIRLOCK	Change of direction is not allowed.	Check parameter 1003 DIRECTION settings.
A2006	AI1 LOSS (programmable fault function, parameters 3001 AI<MIN FUNCTION, 3021 AI1 FAULT LIMIT)	Analog input AI1 signal has fallen below limit defined by parameter 3021 AI1 FAULT LIMIT.	Check fault function parameter settings. Check for proper analog control signal levels. Check connections.
A2009	DEVICE OVERTEMP	Drive IGBT temperature is excessive. Alarm limit is 120 °C.	Check ambient conditions. See also section Derating on page 138 . Check air flow and fan operation. Check motor power against drive power.



A2010	MOTOR TEMP (programmable fault function, parameters 3005...3009)	Motor temperature is too high (or appears to be too high) due to excessive load, insufficient motor power, inadequate cooling or incorrect start-up data.	Check motor ratings, load and cooling. Check start-up data. Check fault function parameter settings. Let motor cool down. Ensure proper motor cooling: Check cooling fan, clean cooling surfaces, etc.
A2011	UNDERLOAD (programmable fault function, parameters 3013...3015)	Motor load is too low due to, for example, release mechanism in driven equipment.	Check for problem in driven equipment. Check fault function parameter settings. Check motor power against drive power.
A2012	MOTOR STALL (programmable fault function, parameters 3010...3012)	Motor is operating in stall region due to, for example, excessive load or insufficient motor power.	Check motor load and drive ratings. Check fault function parameter settings.
A2013	AUTORESET	Automatic reset alarm	Check parameter group 31 AUTOMATIC RESET settings.
A2017	OFF BUTTON	Drive stop command has been given from control panel when local control lock is active.	Disable the local control mode lock by parameter 1606 LOCAL LOCK and retry.
A2018	PID SLEEP	Sleep function has entered the sleeping mode.	See parameter group 40 PROCESS PID SET 1.
A2023	EMERGENCY STOP	Drive has received emergency stop command and ramps to stop according to ramp time defined by parameter 2208 EMERG DEC TIME.	Check that it is safe to continue operation. Return emergency stop push button to normal position.
A2026	INPUT PHASE LOSS (programmable fault function, parameter 3016 SUPPLY PHASE)	Intermediate circuit DC voltage is oscillating due to missing input power line phase or blown fuse. Alarm is generated when DC voltage ripple exceeds 14% of nominal DC voltage.	Check input power line fuses. Check for input power supply imbalance. Check fault function parameter setting.

Code	Cause	Action
A5011	Drive is controlled from another source	Change drive control to the local control mode.
A5012	Direction of rotation is locked.	Enable change of direction. See parameter 1003 DIRECTION.
A5013	Panel control is disabled because start inhibit is active. Start from the panel is not possible.	Reset the emergency stop command or remove the 3-wire stop command before starting from the panel. See section 3-wire macro on page 72 and parameters 1001 EXT1 COMMANDS, 1002 EXT2 COMMANDS and 2109 EMERG STOP SEL.
A5014	Panel control is disabled because of drive fault.	Reset drive fault and retry.
A5015	Panel control is disabled because the local control mode lock is active	Deactivate the local control mode lock and retry. See parameter 1606 LOCAL LOCK.
A5019	Writing non-zero parameter value is prohibited.	Only parameter reset is allowed.
A5022	Parameter is write protected.	Parameter value is read-only and cannot be changed.
A5023	Parameter change is not allowed, when drive is running.	Stop drive and change parameter value.
A5024	Drive is executing task.	Wait until task is completed.
A5026	Value is at or below minimum limit.	Contact your local ABB representative.
A5027	Value is at or above maximum limit.	Contact your local ABB representative.
A5028	Invalid value	Contact your local ABB representative.
A5029	Memory is not ready.	Retry.
A5030	Invalid request	Contact your local ABB representative.
A5031	Drive is not ready for operation, for example, due to low DC voltage.	Check input power supply.
A5032	Parameter error	Contact your local ABB representative.



Fault Codes

Code	Fault	Cause	Action
F0001	OVERCURRENT	Output current has exceeded trip level. Overcurrent trip limit for drive is 325% of drive nominal current.	Check motor load. Check acceleration time (parameters 2202 ACCELER TIME 1 and 2205 ACCELER TIME 2). Check motor and motor cable (including phasing). Check ambient conditions. Load capacity decreases if installation site ambient temperature exceeds 40 °C. See section Derating on page 138 .
F0002	DC OVERVOLT	Excessive intermediate circuit DC voltage. DC overvoltage trip limit is 420 V for 200 V drives and 840 V for 400 V drives.	Check that overvoltage controller is on (parameter 2005 OVERVOLT CTRL). Check brake chopper and resistor (if used). DC overvoltage control must be deactivated when brake chopper and resistor are used. Check deceleration time (parameters 2203 DECELER TIME 1 and 2206 DECELER TIME 2). Check input power line for static or transient overvoltage. Retrofit frequency converter with brake chopper and brake resistor.
F0003	DEV OVERTEMP	Drive IGBT temperature is excessive. Fault trip limit is 135 °C.	Check ambient conditions. See also section Derating on page 138 . Check air flow and fan operation. Check motor power against drive power.
F0004	SHORT CIRC	Short circuit in motor cable(s) or motor	Check motor and motor cable.
F0006	DC UNDERVOLT	Intermediate circuit DC voltage is not sufficient due to missing input power line phase, blown fuse, rectifier bridge internal fault or too low input power.	Check that undervoltage controller is on (parameter 2006 UNDERVOLT CTRL). Check input power supply and fuses.
F0007	AI1 LOSS (programmable fault function, parameters 3001 AI<MIN FUNCTION , 3021 AI1 FAULT LIMIT)	Analog input AI1 signal has fallen below limit defined by parameter 3021 AI1 FAULT LIMIT .	Check fault function parameter settings. Check for proper analog control signal levels. Check connections.
F0009	MOT OVERTEMP (programmable fault function, parameters 3005...3009)	Motor temperature is too high (or appears to be too high) due to excessive load, insufficient motor power, inadequate cooling or incorrect start-up data.	Check motor ratings, load and cooling. Check start-up data. Check fault function parameter settings. Let motor cool down. Ensure proper motor cooling: Check cooling fan, clean cooling surfaces, etc.
F0012	MOTOR STALL (programmable fault function, parameters 3010...3012)	Motor is operating in stall region due to, for example, excessive load or insufficient motor power.	Check motor load and drive ratings. Check fault function parameter settings
F0014	EXT FAULT 1 (programmable fault function, parameter 3003 EXTERNAL FAULT 1)	External fault 1	Check external devices for faults. Check fault function parameter setting.
F0015	EXT FAULT 2 (programmable fault function, parameter 3004 EXTERNAL FAULT 2)	External fault 2	Check external devices for faults. Check fault function parameter setting.



F0016	EARTH FAULT (programmable fault function, parameter 3017 EARTH FAULT)	Drive has detected earth (ground) fault in motor or motor cable.	Check motor. Check motor cable. Motor cable length must not exceed maximum specifications. See section Motor connection data on page 144 . Note: Disabling earth fault (ground fault) may damage drive.
F0017	UNDERLOAD (programmable fault function, parameters 3013...3015)	Motor load is too low due to, for example, release mechanism in driven equipment.	Check for problem in driven equipment. Check fault function parameter settings. Check motor power against drive power.
F0018	THERM FAIL	Drive internal fault. Thermistor used for drive internal temperature measurement is open or short-circuited.	Contact your local ABB representative.
F0021	CURR MEAS	Drive internal fault. Current measurement is out of range.	Contact your local ABB representative.
F0022	INPUT PHASE LOSS (programmable fault function, parameter 3016 SUPPLY PHASE)	Intermediate circuit DC voltage is oscillating due to missing input power line phase or blown fuse. Fault trip occurs when DC voltage ripple exceeds 14% of nominal DC voltage.	Check input power line fuses.
			Check for input power supply imbalance.
			Check fault function parameter setting.
F0026	DRIVE ID	Internal drive ID fault	Contact your local ABB representative.
F0027	CONFIG FILE	Internal configuration file error	Contact your local ABB representative.
F0035	OUTP WIRING (programmable fault function, parameter 3023 WIRING FAULT)	Incorrect input power and motor cable connection (that is input power cable is connected to drive motor connection). Fault can be erroneously declared if drive is faulty or input power is delta grounded system and motor cable capacitance is large.	Check input power connections.
F0036	INCOMPATIBLE SW	Loaded software is not compatible.	Contact your local ABB representative.
F0101	SERF CORRUPT	Corrupted Serial Flash chip file system	Contact your local ABB representative.
F0103	SERF MACRO	Active macro file missing from Serial Flash chip	Contact your local ABB representative
F0201	DSP T1 OVERLOAD	System error	Contact your local ABB representative.
F0202	DSP T2 OVERLOAD		
F0203	DSP T3 OVERLOAD		
F0204	DSP STACK ERROR		
F0206	MMIO ID ERROR	Internal I/O Control board (MMIO) fault	Contact your local ABB representative.
F1000	PAR HZRPM	Incorrect speed/frequency limit parameter setting	Check parameter settings. Following must apply: 2007 MINIMUM FREQ < 2008 MAXIMUM FREQ, 2007 MINIMUM REQ/ 9907 MOTOR NOM FREQ and 2008 MAXIMUM FREQ/ 9907 MOTOR NOM FREQ are within range.
F1003	PAR AI SCALE	Incorrect analog input AI signal scaling	Check parameter group 13 ANALOG INPUTS settings. Following must apply: 1301 MINIMUM AI1 < 1302 MAXIMUM AI1.