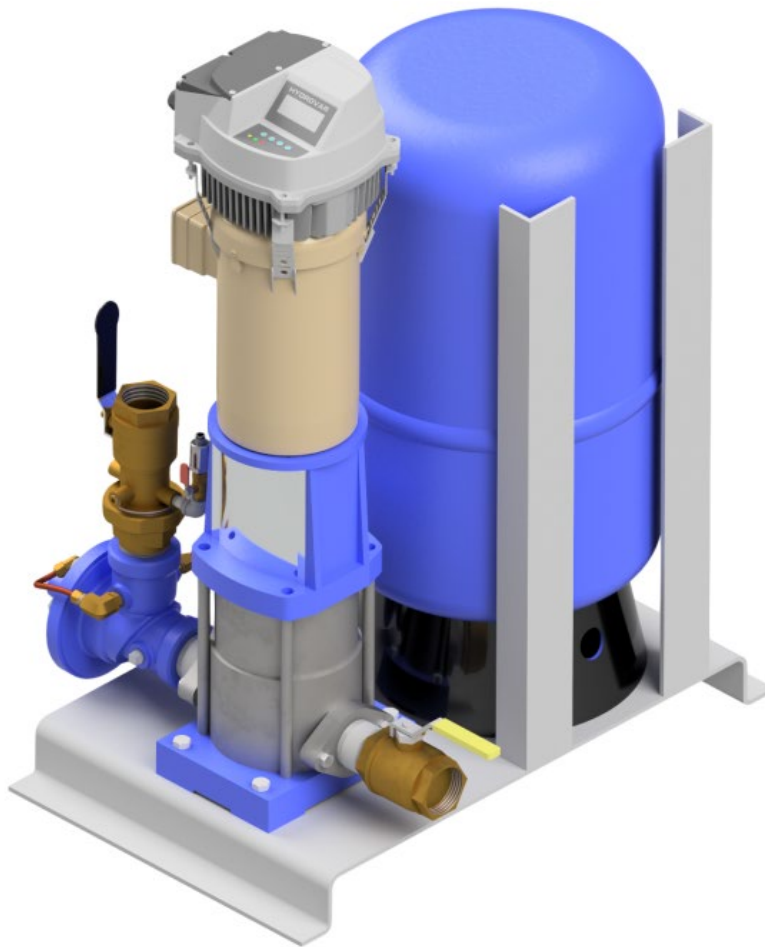




eMVPjr

Variable Speed Pressure Boosters





Installation, Operation & Maintenance


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1. Safety Instructions

	IMPORTANT
	Read all safety information prior to installation of the eMVPjr. Important safety symbols are introduced below.


	DANGER
	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.

	WARNING
	Indicates an imminently hazardous situation which, if not avoided, may result in serious injury or death.

	CAUTION
	Indicates a potentially hazardous situation which, if not avoided, may result in injury.

CAUTION
Used without a safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

NOTICE
Indicates special instructions which are very important and must be followed.

	CAUTION: HAZARDOUS PRESSURES MAY OCCUR
	Pump and motor combinations supplied with this system can create hazardous pressures. Select pipe and fittings accordingly per your pipe suppliers' recommendation. Consult local codes for piping requirements

NOTICE

All operating instructions must be read, understood and followed by the operating personnel. HYFAB accepts no liability for damages or operational problems which are the result of a failure to comply with the operating instructions

This manual is intended to assist in the installation, operation and repair of the system and must be kept with the system.

Installation and maintenance **MUST** be performed by properly trained and qualified personnel.

Review all instructions and warnings prior to performing any work on the system.

Any safety decals **MUST** be left on the controller and pump.



DANGER

The system **MUST** be disconnected from the main power supply before attempting any operation or maintenance on the electrical or mechanical part of the system. Failure to disconnect electrical power before attempting any operation or maintenance can result in electrical shock, burns or death.



WARNING

When power is applied to unit, the motor and pump could start unexpectedly and cause serious injury.



CAUTION


Do not operate above fixture pressure ratings.

2. Additional references

Detailed Installation, operation and maintenance manuals and parts manuals for serviceable components listed below are available at the HYFAB website www.hyfabco.com

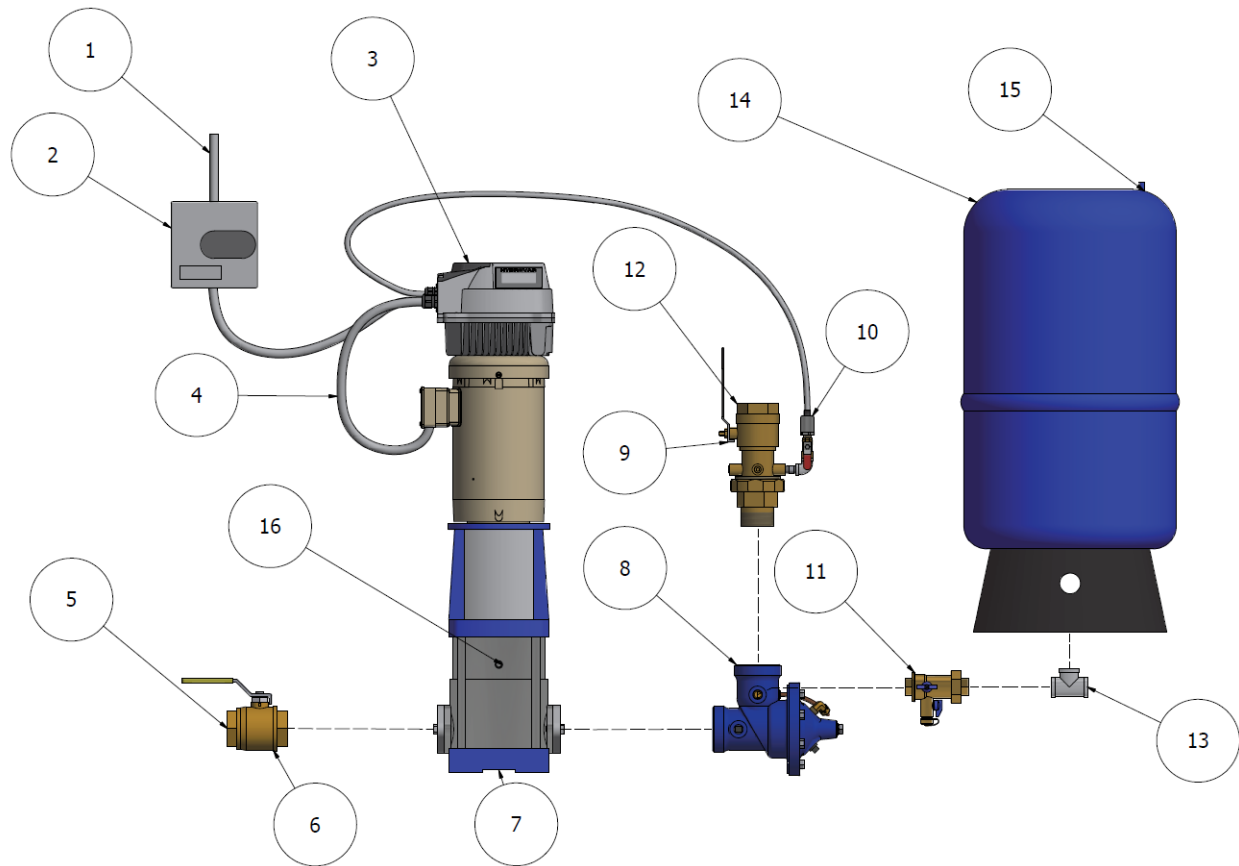
1. Hydrovar Installation, Operation and Maintenance. Includes full parameter listing and programming flowcharts.
2. eSV Multistage Pump Installation, Operation, and Maintenance
3. eSV Multistage Pump Parts Manual
4. Cla-Val 81-01 Check Valve Installation, Operation, and Maintenance

3. System Components and Connections

	NOTICE Verify power available matches booster input power requirements before making any connections. Returned units which have plumbing or electrical connections made will be subject to restocking fees to cover inspection, testing and repair costs.
---	---

Review the eMVPjr diagram to become familiar with components and required connections. Confirm all the parts are installed and become familiar with their names. Be sure to inspect all components for shipping damage.

The diagram on the following page depicts the major components and power and water connections for an eMVPjr. Becoming familiar with the components will help ensure a successful installation.



1. Power in – single or three phase - See section 8 for input power requirements
2. Fused disconnect or circuit breaker
3. Variable speed motor and system controller
4. Power from controller to motor – factory installed
5. Water inlet
6. Inlet isolation valve
7. Centrifugal pump
8. Pilot operated check valve
9. Discharge isolation valve
10. Discharge pressure sensor
11. Tank Isolation and drain valve
12. Water outlet
13. Tapping for field installed relief valve
14. Hydropneumatic tank
15. Hydropneumatic tank air charge valve
16. Vent port

4. eMVPjr Installation Checklist

	Y	N	N/A	
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verify power supply available matches unit requirement
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verify environmental conditions at installation site are within specified limits
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Install booster on suitable foundation and anchor to structure
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Connect inlet piping. Support piping to prevent load on booster inlet. Refer to Section 6.
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Connect discharge piping. Support piping to prevent load on booster outlet. Refer to Section 6.
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Install safety relief valve, and pipe discharge to safe location. Refer to Section 7.
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Charge hydropneumatic tank to 85 to 90 percent of desired operating pressure. Refer to section 7
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Connect power from disconnect with appropriate circuit protection. Refer to Section 8.
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Open inlet valve.
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Open vent valve at top of pump impeller stack. Vent until no air is detected.
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verify that pressure sensor and gauge isolation valves are open.
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Close disconnect. Warning: Pump may start immediately if a demand exists.
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adjust setpoint at operator interface if the desired operating pressure is different than the factory setting using the up or down arrows.
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Set P06 DATE to the current date. Note time and date are used to date stamp faults. Refer to section 11.
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Set P07 TIME to the current time. Note time and date are used to date stamp faults. Refer to Section 11.

5. Location

Choose a location that will allow access for service and or removal of any component to allow for future maintenance and repair. Pay particular attention to the check valve access.

Environmental conditions required are:

- Maximum ambient temperature not exceeding 122°F.
- Maximum humidity: 95% at 104°F non-condensing.

The unit must be installed on a flat and level surface and must be attached to the structure using the mounting holes in the base.

A high mass foundation, such as a concrete housekeeping pad, will help mitigate transmission of noise and vibration.

A minimum clearance of 24 inches is recommended on the pump and check valve sides of the unit to permit parameter adjustment and service of the check valve without removal.

6. Piping



NOTICE

All plumbing work must be performed by a qualified technician in compliance with applicable local and state codes.



CAUTION: HAZARDOUS PRESSURES MAY OCCUR


Pump and motor combinations supplied with this system can create hazardous pressures. Select pipe and fittings accordingly per your pipe suppliers' recommendation. Consult local codes for piping requirements.


All inlet and outlet piping must be supported from the structure in a manner that does not transmit any load to the eMVPjr. Allowing weight on inlet or outlet connections may result in damage to the booster, and water leaks. Damage due to improper installation is not covered under warranty. Inlet water piping should be no smaller than the booster connections. Avoid the use of unnecessary fittings to minimize friction losses.

Use care when applying PTFE tape or other thread sealant to prevent excess sealant getting inside fittings. Any contamination inside the unit may result in unsafe operation due to plugging of the pressure sensor or impeller. Contamination may also prevent the check valve from closing which will cause the unit to run continuously.

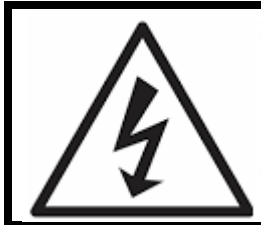
7. Hydropneumatic Tank

The hydropneumatic tank reduces system pressure variation in periods of rapidly fluctuating demand and during startup and shutdown. Precharge the tank with compressed air to 85 to 90 percent of the desired operating pressure. Most standard controllers are preset for 50 psi at the factory. For this operating pressure, a 42-45 psi tank precharge is required. Use the higher tank pre-charge setting if the system drifts over 5 psi at a constant flow rate.

	NOTICE
	Precharge the tank before filling with water to ensure accurate pressurization and to prevent possible damage to tank diaphragm. Drain the tank before subsequent pressure adjustments or recharging. Tank should be drained periodically to assure correct air charge.

	WARNING
	Maximum allowable working pressure of an eMVPjr tank is 125 psi. Do not exceed pressure ratings of fixtures. A field installed relief valve is required by the International Plumbing Code to prevent over pressurization of the tank and the connected plumbing system, should a malfunction occur. The relief valve must discharge by gravity to a safe place of disposal.

8. Power Supply and Wiring



WARNING

Installation and maintenance MUST be performed by properly trained and qualified personnel. Always follow the National Electric Code or Canadian Electric Code, as well as all local, state and provincial codes when wiring the booster.

Most installations will require power supply wiring only. Motor and standard control wiring are factory installed and tested. Additional, field installed control wiring is required only for the addition of remote enable/disable and/or low water cutoff/dry run sensor. Wiring of these optional features is covered in the next section.

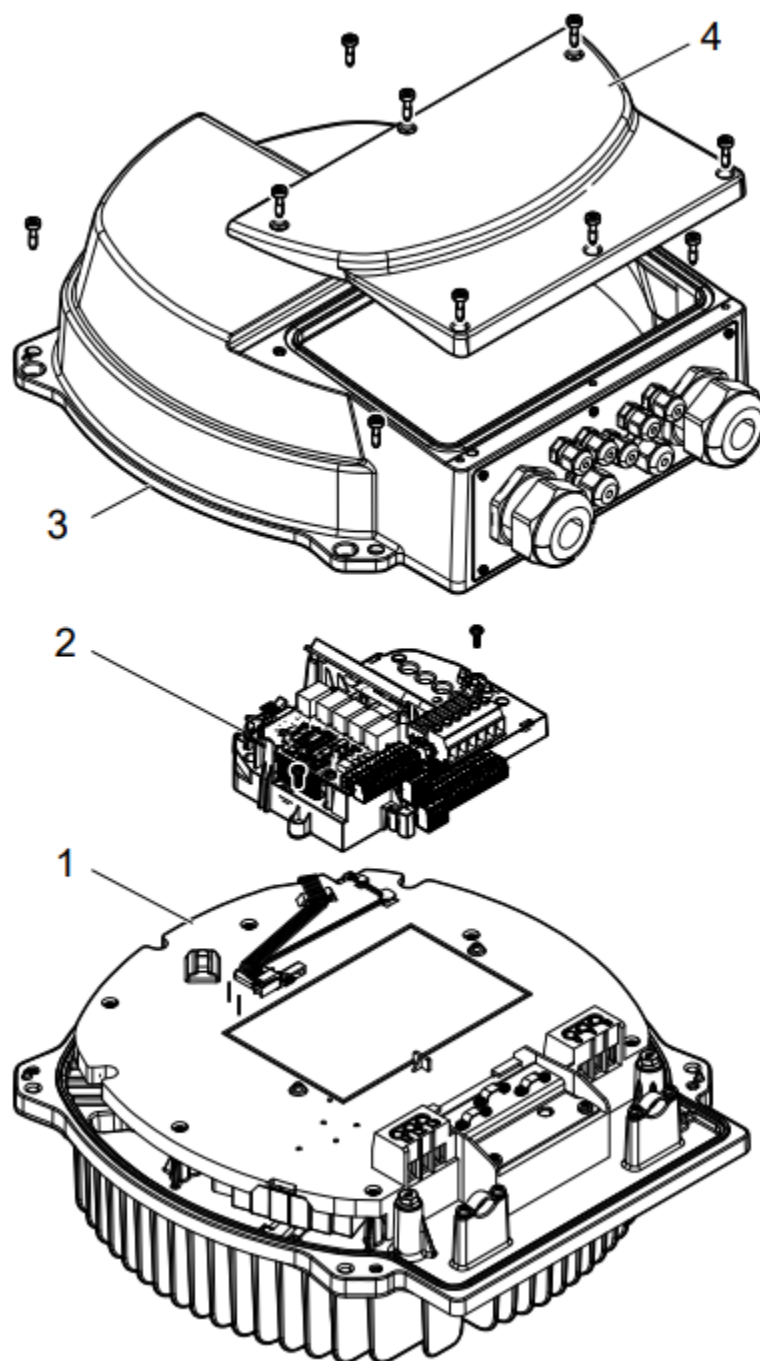
Power supply wiring to all HYFAB eMVPjr boosters must be installed with a disconnecting means and circuit protection per the National Electric Code (NFPA-70.) Input power requirements and ampacities for standard eMVPjr models are listed below.

eMVPjr Model No.	Input Voltage/Phase	Input Ampacity
eMVPjr-1-L-21	208-240/1	11.6
eMVPjr-2-L-21	208-240/1	11.6
eMVPjr-3-H-21	208-240/1	15.1
eMVPjr-3-H-23	208-240/3	9.1
eMVPjr-3-H-43	380-460/3	5.3
eMVPjr-3-L-21	208-240/1	15.1
eMVPjr-3-L-23	208-240/3	9.1
eMVPjr-3-L-43	380-460/3	5.3
eMVPjr-5-H-21	208-240/1	27.6
eMVPjr-5-H-23	208-240/3	16.5
eMVPjr-5-H-43	380-460/3	10.1

Notes:




- 1 Single phase input models have three phase output driving three phase motors.
- 2 Drive maximum output ampacity exceeds motor nameplate ampacity for some models
- 3 Maximum output current is set at HYFAB. A controller change requires verification and may require adjustment of the output current. See section 11 for information on setting maximum output current.

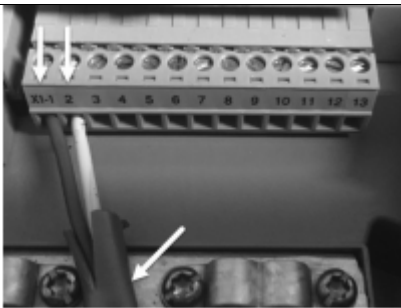
To access the electrical connections, remove the terminal cover, 4 as shown below.



1	Power board, heatsink, EMC filter
2	Control board
3	Top housing
4	Electrical connection access cover

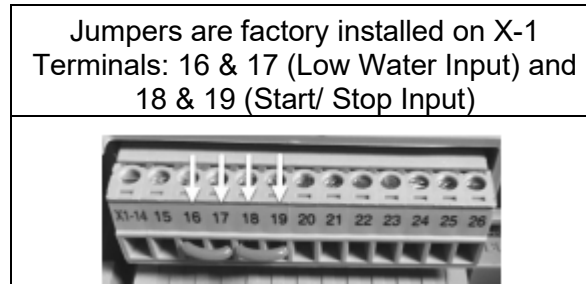
Using copper conductors, connect incoming power to the units as indicated below:

For single phase units (230V) use L1, L3/N and Ground	For Three phase units (208V or 460V) use L1, L2, L3, and Ground	Motor is factory wired to U, V, and W and ground
		


Pressure sensor is factory wired to X1 Terminal: Brown #1 (24VDC,) White #2 (Analog Input #1) and the cable shield is terminated on the chassis

9. Optional Control Features

Standard units are shipped with remote enable and low water cut-out disabled via jumper installation as below:

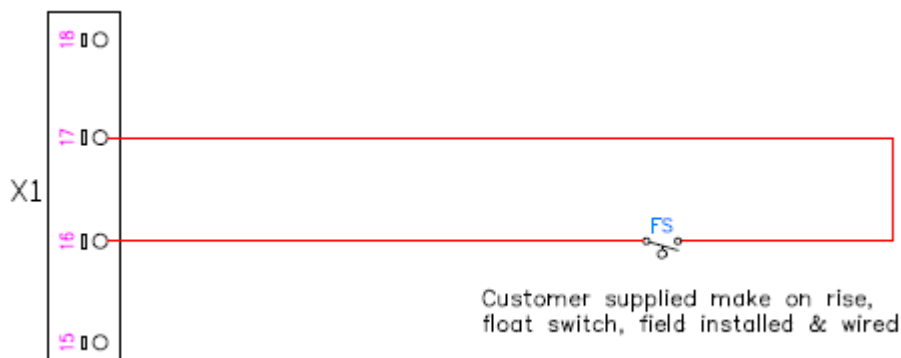


REMOTE ENABLE

If remote enable is required, remove the jumper from X-1 18 and 19 and replace with a potential free contact. When the contact is closed, the booster will start when a system demand exists.

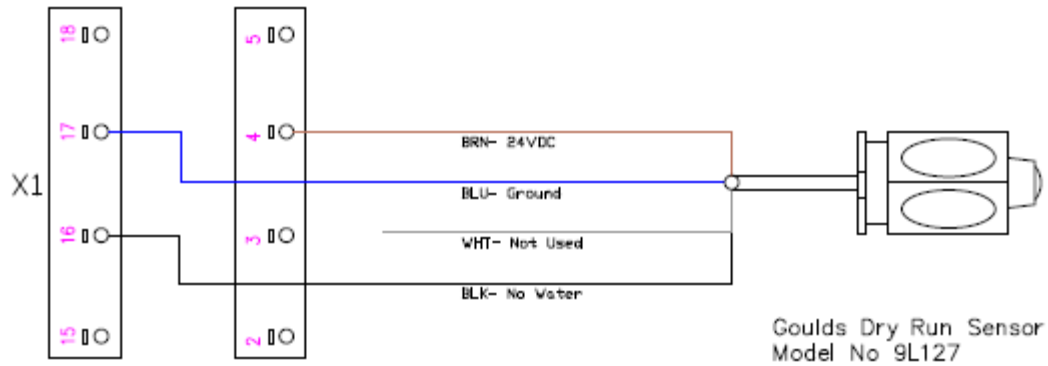
LOW WATER CUT-OUT

In installations subject to supply water interruptions, such as pumping from an open tank, dry run protection is required. The eMVPjr controller has a digital input to which a customer supplied device, such as a float switch, with a normally closed, potential-free contact, may be connected. Wiring is per the diagram below. The factory installed jumper must be removed.



DRY RUN PROTECTION SENSOR

HYFAB also offers an optional dry-run sensor which may be installed in place of the filling cap at the top of the eSV pump housing and wired to the controller per the following diagram. The factory installed jumper between X1-16 & 17 must be removed.



When a low water/dry run protection device is installed, and a loss of prime occurs, the controller will stop the eMVPjr after the time value in parameter P610, as described in Section 11, Parameter Navigation.

REMOTE ALARM CONTACT

A contact is available which may be configured to close when a booster fault occurs.




This contact must be configured by setting parameter P715 as described in Section 11, Parameter Navigation.

10. Unit Startup

Confirm that inlet, outlet, pressure sensor and gauge valves are all open, and that water is available at the booster inlet. Open the vent/drain plug at the top of the stack until a steady stream of water is present.

Confirm that the available power supply matches the requirement of the unit.


Ensure that optional equipment wiring, if present, matches the installation application

	WARNING
	<p>The booster may start immediately after power is applied. The controller, motor, and any driven equipment must be in operational readiness. Failure to comply could result in death, serious injury, equipment, or property damage. Ensure that booster operation will not result in injury or property damage prior to closing the disconnect.</p>

Ensure that all operator and start enable devices are in the OFF position.

Close and secure controller cover.

Close the disconnect and apply power to the unit. Confirm that the input phase voltages are balanced within 3%. If not, correct voltage imbalance before proceeding. Repeat this procedure after the voltage correction.

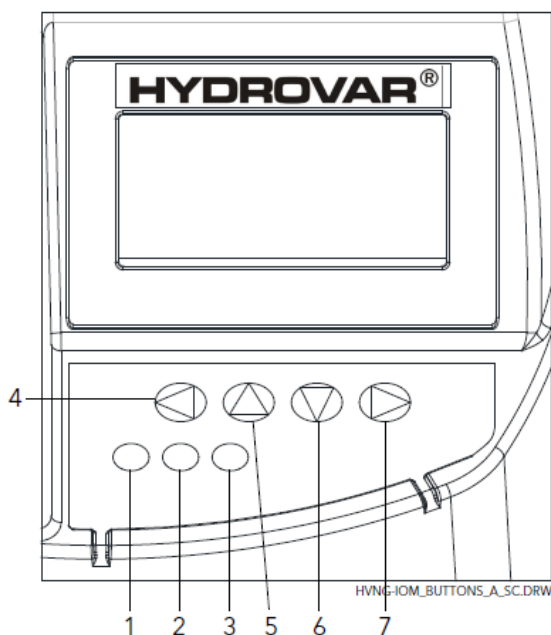
	HIGH VOLTAGE
	<p>Frequency converters contain high voltage when powered. Installation, start-up and maintenance must be performed by qualified personnel only. Failure to comply could result in death or serious injury.</p>

11.Parameter Navigation



NOTICE

Read and follow the operating instructions carefully before changing parameters. Incorrect settings may result in malfunction and possible equipment damage. All modifications must be made by a qualified technician.



1. Power
2. Run
3. Error
4. Left
5. Up
6. Down
7. Right

Push button	Description
▲	Start of the unit in the 1 st window.
▼	Stop of the unit in the 1 st window.
◀ and ▶	Reset: press both buttons simultaneously for 5 seconds.
▲	Increase of a value / selection of the submenu.
▼	Decrease of a value / selection of the submenu.
▲ + short ▼	Change to faster scrolling up of a value.
▼ + short ▲	Change to faster scrolling down of a value.
Short press ▶	Enter submenu / change to next parameter in the menu.
Short press ▶	Leave submenu / change to previous parameter in the menu.
Long press ▶	Change back to main menu.

HYFAB programs and tests each eMVPjr prior to shipment. Values that are changed from controller manufacturer's default are listed below. A complete parameter list is available in the Goulds Hydrovar IOM which can be downloaded from the Goulds website.

Parameter Number	Parameter Description	Manufacturer Setting	HYFAB Setting	Notes
P61	Password	66	0000	
P605	Minimum Threshold	Disabled	Disabled	1
P610	Delay Time	2 sec.	2 sec.	2
P1110	Factory Set	Europe	USA	
P1302	Motor Nominal Power	Varies with controller capacity	Motor Nameplate HP	
P1303	Motor Nominal Voltage	Varies with controller capacity	Motor Nameplate Voltage	
P1305	Motor Nominal Current	Varies with controller capacity	Motor Nameplate Current	
P1306	Motor Nominal Speed	3500 rpm	Motor Nameplate rpm	
P1315	Required Value (Setpoint)	50.1	50 (psi)	
P1321	Autostart	Off	On	
P1322	Startup Completed	No	Yes	


The following parameter requires adjustment for optional features described above


P715	CONF.REL .1	Running.	Running.	3
------	----------------	----------	----------	---

Notes:


1. If discharge pressure fails to exceed this setting after P610 time value elapses, the unit will stop.
2. Delay time applies to Minimum Threshold (P605) and loss of water input contact opening.
3. Setting P-715 to Error activates control relay 1 upon a fault.


12.Maintenance


	WARNING – ELECTRICAL HAZARD
	<p>Booster controllers contain capacitors that can remain charged even when the unit is not powered. To avoid electrical hazards, disconnect power and allow 15 minutes for capacitors to discharge completely before performing any service or repair work.</p>

	WARNING
	<p>When an eMVPjr controller is replaced, it MUST have the motor parameters set per the motor nameplate values. Some controller models have power output capacities in excess of the driven motor. Failure to set these parameters may result in loss of motor protection and motor failure by overheating.</p>

Motor rotation is verified on all eMVPjr boosters prior to shipment. If the controller or motor are replaced, rotation must be verified. It is possible for the pump to maintain constant pressure at low flow, or a high suction head even if the pump is rotating backwards. **DO NOT** confuse the flow arrows, stamped on the pump body, with the rotation arrows on the coupling and motor adapter. Consult the eSV pump manual for additional details.

	WARNING
	<p>If motor rotation is incorrect, a qualified electrician may open the disconnect, wait fifteen minutes for the capacitors to discharge, and swap any two motor leads at the motor or the controller to correct rotation.</p>

	CAUTION
	<p>During normal operation the heat sink may become very hot. Use caution to avoid contact when operating or maintaining the unit.</p>

	WARNING
	<p>Never close any valves on the booster before disconnecting main power. Operation of the booster with any valve closed may result in property damage, serious injury or death.</p>

An eMVPjr properly installed in a clean location, complying with the specified environmental requirements, typically does not require any special maintenance. Items on the following checklist below should be periodically observed.

Check list

1	<input type="checkbox"/>	Verify environmental conditions are within specified limits
2	<input type="checkbox"/>	Verify the cooling fan and the heat sink are free from dust and lint. HEAT SINK MAY BE VERY HOT.
3	<input type="checkbox"/>	Verify there are no water leaks.
4	<input type="checkbox"/>	Check the error code history in parameters P26 – P30 on a regular basis. A summary of the errors is included in the following section. For more information about the parameters, consult the complete Hydrovar manual, available on the HYFAB website.

13.Troubleshooting

Warnings and errors are shown on the display and/or by the red LED. • When a warning is active and the cause is not remedied within 20 seconds, an error is displayed and, for some warnings, the unit stops.

All errors are shown in plain text and saved in the error memory including date and time when the error occurred.

An automatic error-reset can be activated in P600 SUBMENU ERRORS to automatically reset most errors five times. For more information about this function, see P615 ERROR RESET.

For more information, see P715 CONF REL 1 and P720 CONF REL 2. The errors can be reset automatically (depending on the setting in parameter P615 ERROR RESET) or manually in the following ways:

Disable the power supply for more than 60 seconds.

Press ◀ and ▶ simultaneously for 5 seconds.

No error message on the display.

Error	Cause	Remedy
No AUTO-START after the power failure.	Parameter P08 AUTO-START is set to OFF.	Check parameter P08 AUTO-START.
The system pressure is not steady.	Pressure higher than the START VALUE or REG. MODE has been changed to Inverse.	Check parameter P04 START VALUE and/or P320 REG. MODE.

Error message on the display

OVERCURRENT ERROR 11	Power limit exceeded - too high motor current (fast rise detected)..	Check the following: • <ul style="list-style-type: none"> The connection terminals of the unit The connection terminals of the motor and the motor cable The winding of the motor Make sure all the connections, cables, and windings are OK and reset the error by disabling the power for more than 60 seconds
OVERLOAD ERROR 12	Power limit exceeded - motor current too high (slow rise detected). •	Is the parameter P215/P220 RAMP 1/RAMP 2 too short and P265 BOOST too low? • Do the cables and connection work? • Is the pump is blocked? • Does the motor rotate in the wrong direction before running (non-return valve defect)? Not allowed operation point or P245 MAX.FREQ. is too high, also check the P265 BOOST value.
OVERVOLTAGE ERROR 13	The voltage is too high.	Is the parameter P220 RAMP 2 too fast? • Is the power supply too high? • Are the voltage peaks too high? If the error is power or voltage-related, line filters, line inductors, or RC-elements can be installed to resolve the issue.

INVERT. OVERHEAT ERROR 14	The temperature inside the unit is too high. •	Is the unit properly cooled? • Are the units motor vents contaminated? • Is the ambient temperature too high?
PHASELOSS ERROR 16 •	One phase of the power supply does not work.	The power supply under full load • If phase failure occurs at the input. • The circuit breakers • And visually inspect the points at the input terminals
UNDERVOLTAGE	The voltage is too low.	• Is the supply voltage too low? • Is there phase failure at the input? • Is there asymmetry between the phases?
COMM LOST.	The communication between the power unit and the control board does not work correctly	Is the connection between the control board and the power unit correct?
LACK OF WATER ERROR 21. •	The low water sensor connection, terminals X3/11-12, is opened. The sensor is only active when the pump runs	The incoming pressure or minimum water level values are set too low, then change the settings. • The error only happens for a short time, then adjust parameter P610 DELAY TIME. If a sensor is not used, then the terminals X3/11-12 must be bridged. ¹
MIN. THRESHOLD ERROR 22 •	The defined value of parameter P605 MIN.THRESH. was not reached during the preselected P610 DELAY TIME.	Stop the booster and adjust the parameter P610 DELAY TIME. • Set the parameter P615 ERROR RESET set to ON, to enable five restarts in the empty system.
FAILURE SENSOR 1, ACT. VAL. SENSOR 1 ERROR 23 •	Sensor signal on terminals X3/2 is less than 4 mA which an active sensor must deliver.	The Actual value signal from the pressure transducer is faulty. <ul style="list-style-type: none"> • The connection is faulty. • The sensor or cables are faulty. • Check the configuration of the sensors in P400 SUBMENU SENSOR

Internal error, on display or red LED is on

ERROR 1	EEPROM-ERROR, data block malfunction	Reset the unit. If the error message repeats then change control board.
ERROR 4	Button error, for example a jammed key	Check and make sure that the push buttons are OK. If the push buttons are faulty, then change the display-board.
ERROR 5	EPROM-ERROR, checksum error	Reset the unit. If the error message repeats then change control board.
ERROR 6	Program error: Watchdog error	Reset the unit. If the error message repeats then change control board.
ERROR 7 Reset the unit.	Program error: Processor pulse error	If the error message repeats then change control board.
CODE ERROR.	Code error: invalid processor command	Verify: • <ul style="list-style-type: none"> • Installation of the cables, connection of the screen and potential equalization is correct. • • Ground is correctly installed. • • Signal is strong enough, if not, install additional ferrite inductances to boost the signal.

14.Parts List

<i>eMVPjr Parts List</i>						
	<u>eMVPjr 1L21</u>	<u>eMVPjr 2L21</u>	<u>eMVPjr 3H21</u>	<u>eMVPjr 3H23</u>	<u>eMVPjr 3H43</u>	<u>eMVPjr 3L21</u>
VFD	10073L1AAUS	10073L1AAUS	10073L4AAUS	10073L8AAUS	10073LFAAUS	10073L4AAUS
Motor	VEM3545	VEM3555	VEM3559	VEM3559	VEM3559	VEM3559
Pump	5SV3TA30	10SV2TA30	10SV3TA30	10SV3TA30	10SV3TA30	22SV1TA30
Mechanical Seal	10K168	10K169	10K169	10K169	10K169	10K169
Inlet Valve	77FLF-108-01	77FLF-108-01	77FLF-108-01	77FLF-108-01	77FLF-108-01	77FLF-108-01
Check Valve	81-12-1F	81-12-1F	81-12-1F	81-12-1F	81-12-1F	81-12-1F
Check Valve Repair Kit	91698-05A	91698-05A	91698-05A	91698-05A	91698-05A	91698-05A
Discharge Valve	98500	98500	98500	98500	98500	98500
Pressure Sensor	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q
Tank Valve	3422AB	3422AB	3422AB	3422AB	3422AB	3422AB
Tank	V60	V60	V60	V60	V60	V60
	<u>eMVPjr 3L23</u>	<u>eMVPjr 3L43</u>	<u>eMVPjr 5H21</u>	<u>eMVPjr 5H23</u>	<u>eMVPjr 5H43</u>	
VFD	10073L8AAUS	10073LFAAUS	10073L4AAUS	10073L8AAUS	10073LFAAUS	
Motor	VEM3559	VEM3559	VEM3613	VEM3613	VEM3613	
Pump	22SV1TA30	22SV1TA30	15SV3TB30	15SV3TB30	15SV3TB30	
Mechanical Seal	10K169	10K169	10K169	10K169	10K169	
Inlet Valve	77FLF-108-01	77FLF-108-01	77FLF-108-01	77FLF-108-01	77FLF-108-01	
Check Valve	81-12-1F	81-12-1F	81-12-1F	81-12-1F	81-12-1F	
Check Valve Repair Kit	91698-05A	91698-05A	91698-05A	91698-05A	91698-05A	
Discharge Valve	98500	98500	98500	98500	98500	
Pressure Sensor	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q	XMLP300PD230Q	
Tank Valve	3422AB	3422AB	3422AB	3422AB	3422AB	
Tank	V60	V60	V60	V60	V60	

15. Warranty



HYFAB PACKAGED SYSTEMS WARRANTY

HYFAB warrants for a period of eighteen (18) months from date of shipment from its factory or one (1) year from date of installation, whichever occurs first, that all Products furnished by HYFAB are free from defects in materials and workmanship.

HYFAB's liability for any breach of this Warranty shall be limited solely to replacement or repair, at the sole option of HYFAB, of any part or parts found to be defective during the Warranty period provided the Product is properly installed and is being used as originally intended. Buyer must notify HYFAB of any breach of this Warranty within the aforementioned Warranty period: defective parts must be shipped by Buyer to Seller with transportation charges prepaid.

IT IS EXPRESSLY AGREED THAT THIS SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER. UNDER NO CIRCUMSTANCES SHALL HY-FAB BE LIABLE FOR ANY COSTS, LOSS EXPENSE DAMAGES, SPECIAL DAMAGES, INCIDENTAL DAMAGES OR CONSEQUENTIAL DAMAGES ARISING DIRECTLY OR INDIRECTLY FROM THE DESIGN, MANUFACTURE, SALE, USE OR REPAIR OF THE PRODUCT WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE OR STRICT LIABILITY. IN NO EVENT WILL LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT. THE WARRANTY AND LIMITS OF LIABILITY CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS WARRANTY.

HYFAB neither assumes nor authorizes any person to assume for it, any other Warranty obligation in connection with the sale of the Product. This Warranty shall not apply to any Product or parts of Products which (a) have been repaired or altered outside of HYFAB's facilities; or (b) have been subject to misuse, negligence or accident; or (c) have been used in a manner contrary to HYFAB's instructions.

In the case of products not manufactured by HYFAB, there is no warranty from HYFAB, but HYFAB will extend to the Buyer any Warranty of Seller's supplier of such products.

HYFAB

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