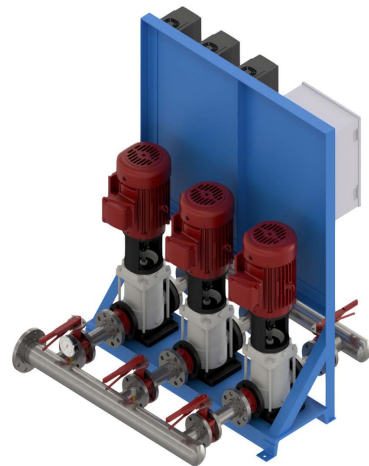
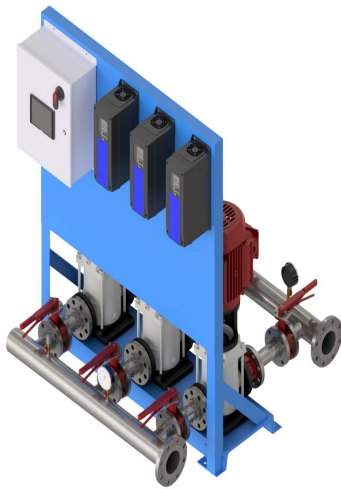




Installation, Operation & Maintenance Manual Pressure Booster System

PRESSURE BOOSTER SYSTEM WITH HMI



IMPORTANT! - Read all instructions in this manual before operating or servicing a pump.

Before installation, read the following instructions carefully. Failure to follow instruction and safety information could cause serious bodily injury, death and/or property damage. Each Flo Fab product is carefully inspected to insure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

⚠ DANGER "Danger" indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠ WARNING "Warning" indicates an imminently hazardous situation which, if not avoided, MAY result in death or serious injury.


⚠ CAUTION "Caution" indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.


IMPORTANT! - Flo Fab Pumps is not responsible for losses, injury or death resulting from failure to observe these safety precautions, misuse, abuse or misapplication of pumps or equipment.

ALL RETURNED PRODUCTS MUST BE CLEANED, SANITIZED, OR DECONTAMINATED PRIOR TO SHIPMENT, TO INSURE EMPLOYEES WILL NOT BE EXPOSED TO HEALTH HAZARDS IN HANDLING SAID MATERIAL. ALL APPLICABLE LAWS AND REGULATIONS SHALL APPLY.

⚠ WARNING Installation, wiring, and junction connections must be in accordance with the National Electric Code and all applicable state and local codes. Requirements may vary depending on usage and location.

⚠ WARNING Installation and servicing is to be conducted by qualified personnel only.

 Keep clear of suction and discharge openings. Do not insert fingers in pump with power connected; the impeller can cause serious injury.

 Always wear eye protection when working on pumps. Do not wear loose clothing that may become entangled in moving parts.

⚠ DANGER Pumps build up heat and pressure during operation. Allow time for pumps to cool

before handling or servicing the pump or any accessory items associated with or near the pump. Do not block or restrict the discharge pipe/hose.

⚠ WARNING Do not pump hazardous materials (flammable, caustic, etc.) or use these pumps in water over 160 °F. Do not exceed manufacturers recommended maximum performance, as this could cause the motor to overheat.

⚠ DANGER This system can only be used for drinking water and domestic hot water

⚠ DANGER Risk of electric shock. To reduce risk of electric shock, always disconnect the power source before handling any aspect of the pumping system. **Lock out power and tag.**

⚠ DANGER Do not lift, carry or hang pump by the electrical cables. Damage to the electrical cables can cause shock, burns or death. **Never** handle connected power cords with wet hands. Use appropriate lifting device.

⚠ DANGER Failure to permanently ground the pump, motor and controls before connecting to power can cause shock, burns or death.

⚠ WARNING Do Not operate in an enclosed building or area where exhaust gases can accumulate, or near a building where gases can seep inside; always take provisions for adequate ventilation.

⚠ WARNING Do not breathe exhaust fumes when working in the area of the engine. (Exhaust gases are odorless and deadly poison.)

WARNING Carefully Read instruction manuals supplied with system before operating or servicing.

IMPORTANT! - Prior to installation, record Model Number, Serial, Amps, Voltage, Phase and HP from pump name plate for the future reference. Also record the Voltage and Current Readings at Startup:

System Models	
Amps:	Volts:
3 Phase Models	
Amps L1-2:	Volts L1-2:
Amps L2-3:	Volts L2-3:
Amps L3-1:	Volts L3-1:

Model Number: _____

Serial: _____

PHASE: _____ HP: _____

Unpacking

Flo Fab pressure booster system are thoroughly inspected before shipment to assure they meet with your order requirements. After removing the packaging used for shipping, make sure the equipment is in good order and that all components are received as called for on the packing list. Any shortages or damage should be reported immediately. Use extreme care in handling the unit, placing slings carefully so that stress will not be imposed on the integrated controls, pump or motor. Never place cable slings around the pump shaft or integrated controls. The eye bolts or lifting lugs on the motor are intended for lifting only the motor and not the complete unit.

Safety

These operating instructions contain basic information concerning the installation and commissioning of the system and should be read by the service technician and responsible operator prior to proceeding. Observe the special safety instructions and understand the danger symbols throughout this document.

Inproper Use

The operating safety of the supplied pump/unit is only guaranteed for conventional use in accordance with the operating instructions. The limit values must never fall below or exceed those specified.

Personnel qualifications

The installation personnel must have the appropriate qualifications for this work.

Safety instructions for inspection and installation work

The operator must ensure that all inspection and installation work is carried out by authorized and qualified personnel, who are sufficiently informed from their own detailed study of the operating instructions. Work on the pump/unit should only be carried out when the unit is powered down, and lock-out/tag-out procedures are followed.

Storage

Any product that is stored for a period longer than three (3) months from the date of purchase should be inspected prior to installation. Every month the rotating elements must be rotated. At installation ensure that all bolts and nuts are tightened.

At any time exceeding six (6) months, the equipment must be stored in a controlled area, keeping it away from contact with rain, dust, etc., and the temperature is maintained between 43-104 °F. If there is a possibility of high humidity (coastlines, etc.), the system must be sprayed with antioxidant liquid.

► Installation location

Adequately dimensioned floor drainage must be provided in the installation room. Location must be free from harmful or combustible vapors. Adequate space must be provided for maintenance work and the installation should be freely accessible from at least two sides. The installation surface must be horizontal and flat. The system is designed for an ambient temperature range of 32°F to 104°F with a relative atmospheric humidity of 50%. Installation and operation should be in a secure space, away from living and sleeping quarters

► Storage

Any product that is stored for a period longer than three (3) months from the date of purchase should be inspected prior to installation. Every month the rotating elements must be rotated. At installation ensure that all bolts and nuts are tightened

At any time exceeding six (6) months, but no more than twenty four (24), the equipment must be stored in a controlled area, keeping it away from contact with rain, dust, etc., and the temperature is maintained between 43-104 °F. If there is a possibility of high humidity (coastlines, etc.), the entire unit must be sprayed with antioxidant liquid.

► Hygiene

When used for potable water applications, the complete potable water supply system has to be transferred to the operator in a perfectly hygienic condition, flushing if necessary and also disinfecting under some circumstances.

► Foundation

The Flo Fab Boosters are constructed for installation on flat concrete floors. The base frame is mounted on height-adjustable vibration dampers to prevent structure-borne noise.

► Hydraulic connection

When connecting to the public potable water main, the requirements of the local water supply company must be met. Perform all the welding or soldering work and then flush the system. If necessary, disinfect the piping system and the boosting system before connecting the system. The system pipework must be free of pipe strain. Flexible connector lines are recommended to avoid stress on the pipe connections and to minimize the transmission of system vibration to the building installation. In order to prevent the transmission of structure-borne noise to the building, do not secure the pipe clamps to the Flo Fab Booster manifolds. The connection is made either on the right or left of the system, depending on the site conditions. It may be necessary to move blind flanges or thread caps that are already fitted. The flow resistance of the suction pipe must be minimized through ample diameter and straight, short, pipe runs, in order to prevent low suction pressure faults during high-volume pumping.

Observe NPSH requirements of the system.

► Flushing

Isolation of the discharge manifold from the downstream piping system will be needed in order to properly flush the Flo Fab Booster correctly before start-up for potable water applications. Flo Fab recommends that either a ball valve or butterfly valve (depending on manifold connection size) be placed directly between the discharge manifold and upstream piping system. For the simple flushing of the system prior to start-up, Flo Fab recommends removing the plug on the top of the discharge manifold of the Flo Fab Booster and connecting a garden hose connection ($\frac{3}{4}$ " MNPT x $\frac{3}{4}$ " male garden hose adaptor), to drain the water to the nearest floor drain or waste water system during the flushing process.

Contaminated potable water is a health hazard! Flushing the pipes and the system reduces the risk of adversely affecting the potable water quality. The water must be completely replaced after a long period of system standstill.

► **Dry-running protection system and protection against low water**

Every Flo Fab Booster pressure booster system can be supplied with a suction transducer that has a .4% accuracy across its full span (0-150 PSI) which equates to a +/- 0.6 PSI deviation. To fit an alternate, dry-running, switch protection system. It is very rare for a problem to arise using the Flo Fab Booster supplied suction transducer when a storage tank is used. Regardless of this rarity, issues with low water conditions when utilizing a storage tank can occur and a digital switch (option) can be used in lieu of the transducer in the form of a tank float or low water probe. Please refer to the HMI operation, described later in this document for detailed instructions to use a digital switch in lieu of the Flo Fab suction transducer.

► **Diaphragm pressure vessel (optional accessory)**

The hydropneumatic tank should be installed on the discharge manifold, adjacent to the pressure transducer, and it should be charged with pressure to equal 70% of the system constant pressure setpoint. For example, if the constant pressure setpoint is 80 PSI, the tank should be charged to 56 PSI (80 x 70%).

► **Electrical connection**

Risk of fatal injury! The electrical connection must be made in accordance with the local and national electrical code regulations by a qualified electrician!

The Flo Fab Booster can be equipped with different variances of current and voltage. To make the electrical connection, the corresponding installation and operating instructions and attached electrical circuit diagrams must be observed. General points to be considered are listed below:

Every Flo Fab Booster single point connection panel is supplied with a current overload sized for each pump motor amperage (circuit breakers). The type of current and voltage of the main connection must comply with the details on the wiring diagram of the single point connection panel. The electrical connection line must be adequately sized according to the total power of the Flo Fab Booster. External protection must be provided according to local and national electrical codes. As a protective measure, the Flo Fab Booster must be wired to ground in accordance to local and national electrical codes. The connections intended for this purpose are identified accordingly (see wiring diagram). Further measures are referenced in the wiring diagram of the control panel.

► **Commissioning**

General preparations and checking

Make sure the system is de-energized and wait 5 minutes to allow any capacitance voltage to discharge.

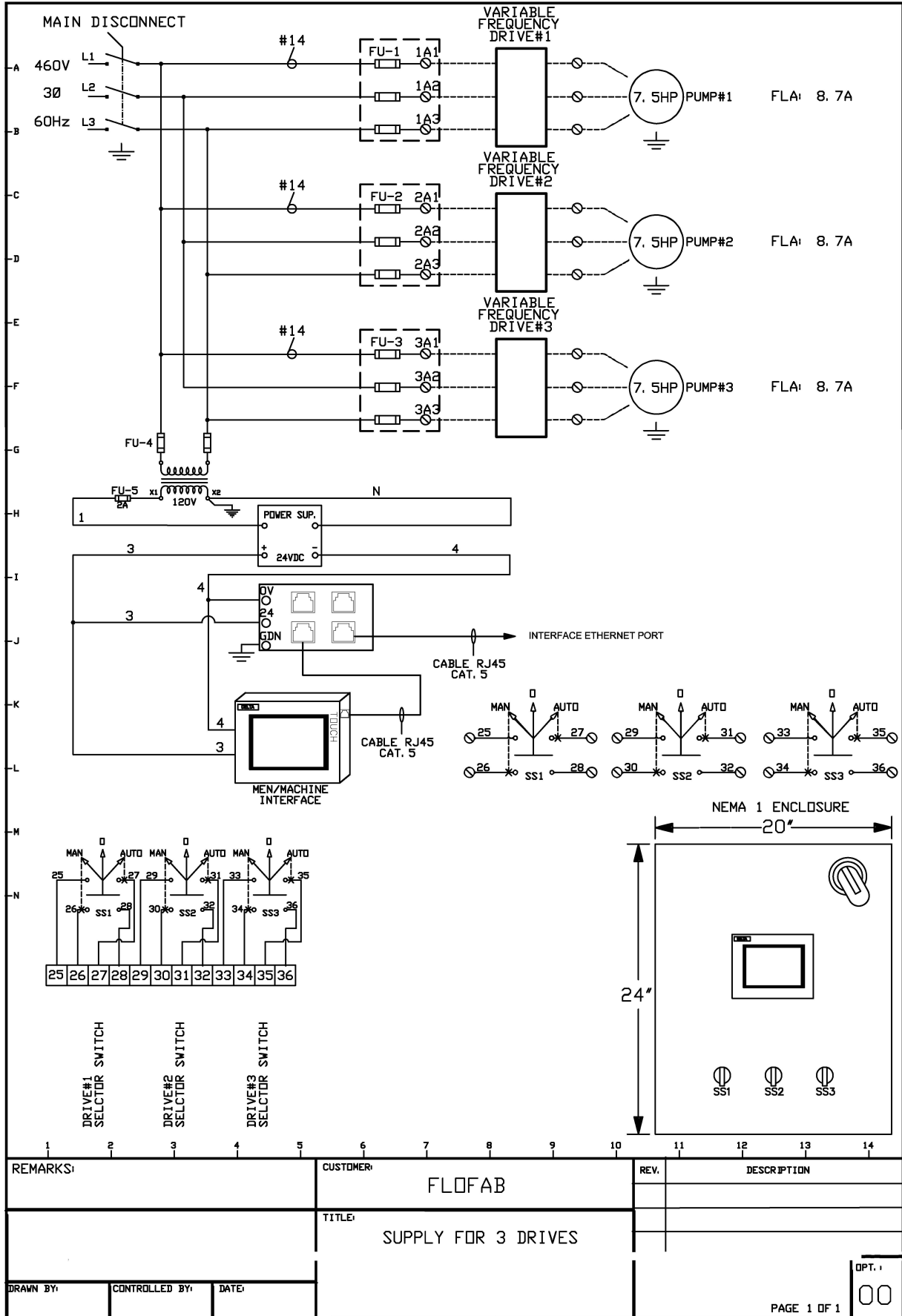
Before energizing the system for the first time:

Check that onsite wiring and grounding of the electrical panel is correct. Check that the pipe joints are stress-free. Fill the system and check visually for leakage. Open the pump vent screws and slowly fill the pumps with water so that the air can escape.

Risk of damage! Do not allow the pump to run dry. Dryrunning destroys the axial face seal of the Pump.

► **DANGER!**

Risk of fatal injury! Always refer to the wiring diagram of the onsite Wilo-WiBooster ONLY! References and examples of wiring diagrams in this document are not official wiring diagrams for the onsite unit in the single point panel.



REMARKS:				CUSTOMER: FLOFAB				REV.		DESCRIPTION			
				TITLE: SUPPLY FOR 3 DRIVES									
DRAWN BY:		CONTROLLED BY:		DATE:								OPT. 1	
										PAGE 1 OF 1		00	

Warning: The present document has been produced with a Duplex System. The same procedures apply for a Simplex, Triplex, Quadruplex or Quintuplex pump system.

1.0 SCREEN DEFINITION:

MAIN SCREEN



1.1 Main screen:

The main screen giving access the system when you press "LOCKED" (#4)

#1 "AUTO" choose if you want to put P1 in automatic mode or manual mode.

#2 "AUTO" choose if you want to put P2 in automatic mode or manual mode.

#3 "SETTING" giving access for all systems settings

#4 "LOCKED" security access button. Need to press for accessing HMI System

#5 "SYSTEM OK" define if the system is up and running and give access on the alarm page

#6 "EMERGENCY STOP" press it when you want to stop the system in emergency mode

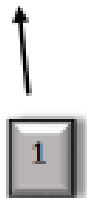
#7 "SCALE" graphic scale of pressure in process

#8 "SETPOINT" setpoint setting that you determine in PSI

#9 Digital displaying pressure in process

2.0 FIRST STEP: UNLOCK YOUR SCREEN:

2.1 Need to press "LOCKED" to function:



2.2 Press "2222" (1) to unlock the function and press "ENT" (2)



2.3 Access to your HMI System:

After unlocking the HMI, you will see that the status is "UNLOCKED" (1)



Now, it's time to configure your system

3.0 CONFIGURE YOUR HMI SYSTEM:

3.1 Go to setting (1):



3.2 On the first page of the settings:

The screenshot shows a control panel interface for 'Multi-pumps configuration 1/2'. At the top, there is a warning message: 'Unproper changes made in this page could affect system performance. All drives should be stopped before sending new values otherwise these may not be saved correctly. If enabled, the "EMERGENCY STOP" button below can be use as a shortcut to this step.' The interface includes several adjustable parameters:

- ACCEL. TIME:** Set to 1.0 s (Callout 1)
- DECEL. TIME:** Set to 1.0 s (Callout 2)
- SLEEP FREQUENCY:** Set to 20 Hz (Callout 3)
- SLEEP DELAY:** Set to 20 s (Callout 4)
- WAKE-UP DIFFERENTIAL:** Set to 0 (Callout 5)
- WAKE-UP LEVEL:** Set to 0 FT

On the right side, there are two 'Drive operating time' sections for Drive #1 and Drive #2, each with a refresh button and a time breakdown (0 yr(s), 0 day(s), 0 hr(s), 0 min(s)). Below these are system status indicators: 'Emergency button ENABLED' (highlighted with a green box) and 'Display scale' set to 0.0 FT. A vertical sidebar on the far right contains options for 'SAVE parameters to picture', 'Touch calibration', 'Date & Time', 'Enter password', and 'Password Manager'. At the bottom, there is a navigation bar with buttons for 'HOME', 'PREVIOUS', 'NEXT', 'SYSTEM OK', and 'EMERGENCY STOP'. Callout 7 points to the 'HOME' button, and callout 6 points to the 'NEXT' button.

3.3 Setting definition

#1 "ACCEL. TIME" enter the seconds that you need for acceleration

#2 "DECEL. TIME" enter the seconds that you need for deceleration

#3 "SLEEP FREQUENCY" enter the Hertz for the sleep frequency

#4 "SLEEP DELAY" enter the seconds for sleep delay

#5 "WAKE-UP DIFFERENTIAL" enters the number of feet for wake-up differential

#6 After finishing, click "NEXT"

#7 Return to home page

3.4 Settings second section:

The screenshot shows a control panel interface for 'Multi-pumps configuration'. At the top, there is a warning message: 'Unproper changes made in this page could affect system performance. All drives should be stopped before sending new values otherwise these may not be saved correctly. If enabled, the "EMERGENCY STOP" button below can be use as a shortcut to this step.' Below this, the title 'Multi-pumps configuration 2/2' is displayed. The main area contains several settings:

- PID MIN FREQUENCY:** A red input field with a '#' symbol and 'Hz' unit. Callout 1 points to the field.
- PID MAX FREQUENCY:** A red input field with a '#' symbol and 'Hz' unit. Callout 2 points to the field.
- AUTOCHANGE INTERV:** A red input field with '0.0' and 'Hr(s)' unit. Callout 3 points to the field.

To the right of these settings is a table with two columns labeled 'F1' and 'F2'. The rows are:

- Nominal power: 0.00 HP
- Nominal voltage: 0 V
- Nominal frequency: 0 Hz
- Nominal speed: 0 RPM
- Nominal current: 0.00 A

At the bottom of the screen is a navigation bar with buttons: HOME, PREVIOUS, NEXT, SYSTEM OK, and EMERGENCY STOP. Callout 4 points to PREVIOUS and callout 5 points to HOME.

On the right side, there is a vertical menu with the following items:

- SAVE parameters to picture (red button)
- Touch calibration (Callout 6)
- Date & Time (Callout 7)
- Enter password (Callout 8)
- Password Manager (Callout 9)
- Emergency button ENABLED (Callout 10)
- Display scale (Callout 11)

3.5 Second section definition

#1 "PID MIN FREQUENCY" enter the number of Hertz for minimum frequency

#2 "PID MAX FREQUENCY" enter the number of Hertz for maximum frequency

#3 "AUTOCHANGE INTERV. Enter the hours and minutes for auto-change interval

#4 You can click "PREVIOUS" if you want to return to the first page of settings

#5 You can click "HOME" to return on the main page

#6 For calibration, touch your screen

#7 Changing the date and time on the system

#8 To enter your password if it's required

#9 For managing your password

#10 Enable or disable, touch button emergency

#11 Display scaling the bar graph of 250 psi or 500 psi

4.0 EMERGENCY STOP

When you press Emergency Stop button (1), see next page the status:

