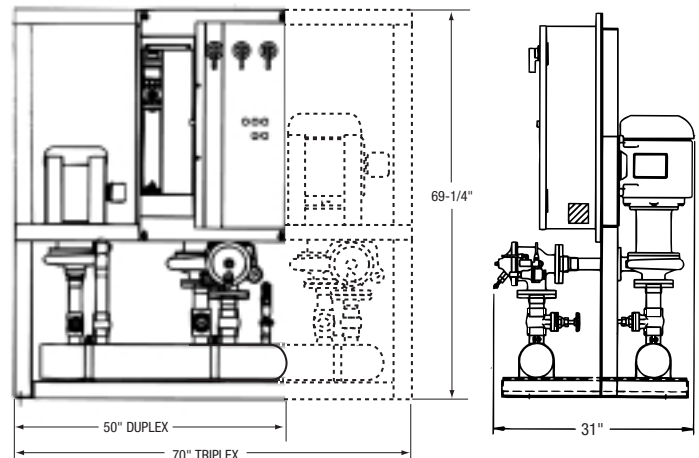
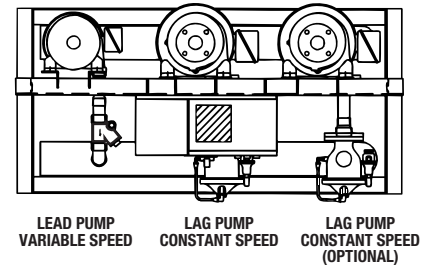


VARIABLE SPEED PUMPING SYSTEMS
SUBMITTALTECHNOLOGIC PUMP
CONTROLLERS**70X Series**
Pressure Booster System**TWO OR THREE PUMP SYSTEMS,
UP TO TWO ZONES**

The Bell & Gossett® 70X is a unique pressure booster package designed to utilize the Technologic 500X, a combination variable frequency drive and pump logic controller capable of staging and controlling up to two additional constant speed pumps for a total of three pumps in parallel.

STANDARD FEATURES

- 2 or 3 Pump Configuration
- Lead Pump Check Valve / Lag Pump(s) PRV(s)
- NEMA 1 Enclosure
- Individual Fused Door Interlocked Disconnects
- UL and CUL Listed, CE Marked
- Local-Off-Remote Switch
- Contactors for Constant Speed Pumps
- Motor Overload Protection
- Diagnostic Display
- Automatic Alternation of Constant Speed Pumps (Available with Triplex unit only)
- Auto Start of Lag Pump upon Lead Pump Failure
- 2 Discrete Analog Inputs for Zone Sensors
- 1 Analog Input for Flow Sensor
- High System Cutout
- No Flow Shutdown
- Serial Communication via RS-485 utilizing Johnson Controls Metasys N2
- Single Point Power Connection



Maximum dimensions for a duplex/triplex unit 460/3/60, 20 HP motors with 6" Headers. Consult Factory for dimensions of larger systems.

OPTIONAL FEATURES

- NEMA 12 Enclosure
- Low Suction Cutout Switch
- Flow Readout
- Master Drive Failure Protection

70X Series Pressure Booster System

The unit shall be constructed with type L copper headers and all copper inter-connecting piping. Unit shall be rated for 150 psig working pressure.

The unit shall be complete with Bell & Gossett Series 1531 vertically mounted, bronze fitted pumps. Pumps shall be rated for a minimum of 175 psig working pressure. Casings shall have gauge ports and vent and drain ports at top and bottom of casing. Motors shall meet NEMA specifications and shall be of the size, voltage, and enclosure called for on the plans. The pump manufacturer will be one in the same as the pressure booster manufacturer to ensure single unit source responsibility. The manufacturer will have in place a quality assurance program and shall be ISO 9001 certified. The manufacturer shall be in the business of manufacturing pressure boosters for a minimum of 30 years and shall have minimum product liability insurance of \$5,000,000 per occurrence. Proof of certification and insurance shall be provided at time of submittal.

A check valve shall be installed on the lead pump with dedicated variable speed capability. An angle pattern, combination pressure reducing (PRV) and check valve assembly shall be installed on each constant speed lag pump discharge. The valve shall have an epoxy coated body with a bronze disc. The valve pilot shall be a direct acting, adjustable, spring-loaded, normally open diaphragm valve. Isolation valves shall be provided for each pump/PRV set. Pressure gages shall be installed on the suction and discharge headers. (Option: A pressure transmitter shall be mounted on the pump skid and wired to controller to indicate the process variable.)

Pumps shall be protected from thermal buildup, when running at no-flow, by a common thermal relief header.

Pump Logic Controller

The Technologic 500 Pump Logic Controller shall be provided and is to be a combination variable / constant speed pump controller with the capability to stage and control up to three pumps in parallel.

The Technologic pump logic controller assembly shall be listed by and bear the label of Underwriter's Laboratory, Inc. (UL) and Canadian Underwriter's Laboratory (CUL). The controller shall be specifically designed for mixing variable and constant speed pumps for pressure boosting applications.

The controller shall function to a proven program that safeguards against damaging hydraulic conditions including:

- a. Pump flow surges
- b. Hunting
- c. System over pressure

The pump logic controller shall be microcomputer based and hold its software in EPROM. On-line field modified data entries, such as setpoint, shall be stored in EEPROM. EEPROM memory storage shall prevent accidental loss of data due to voltage surge or spike. In the event of a complete power outage, all factory preset values remain stored and shall be able to be recalled by the operator.

The pump logic controller shall be capable of receiving up to two discrete analog inputs from zone sensor / transmitters indicated on the plans. It will then select the analog signal that has deviated the greatest amount from its setpoint. This selected signal will be used as the command feedback input for a hydraulic stabilization function to minimize hunting. Each input signal shall be capable of maintaining a different set point value. Controller shall be capable of controlling up to three pumps in parallel.

The pump logic controller shall have an additional analog input for a flow sensor.

The scan and compare rate that selects the command setpoint and process variable signal shall be continuous and automatically set for optimum operation. Each sensor shall be scanned every 20 milliseconds.

All external transmitters furnished by ITT Bell & Gossett shall be powered by the Technologic pump logic controller through an quality integral 24 volt power supply. Overvoltage and short circuit protection shall be on board.

The hydraulic stabilization program shall utilize a proportional integral derivative control function. The proportional, integral and derivative values shall be user adjustable over an infinite range.

The pump logic controller shall be self prompting. All messages shall be displayed in plain English. The operator interface shall have the following features:

- a. Multi-fault memory and recall
- b. Red fault light, Yellow warning light, and Green power on light.
- c. Soft-touch membrane keypad switches.

The display shall have four lines, with 20 characters on three lines and eight large characters on one line. Actual pump information shall be displayed indicating pump status.

The Technologic pump controller will vary the speed of the lead pump to maintain set point. If the setpoint cannot be satisfied by the variable speed pump alone, the pump logic controller will initiate a timed sequence of events to stage on the constant speed lag pump(s) as needed.

Upon decrease in building load when less pumps are required to meet setpoint, the pump logic controller will initiate a timed sequence of events to destage the constant speed lag pump(s). The pump controller will then vary the speed of the lead pump to maintain setpoint.

Alternation of the constant speed lag pumps is automatic based on running hours. (Available with Triplex unit only.)

Controller shall be capable of performing the following pressure booster functions:

- a. Low suction pressure cut-out to protect the pumps against operating with insufficient suction pressure.
- b. High system pressure cut-out to protect the piping system against high pressure conditions.
- c. No Flow Shut Down to turn the pumps off automatically when system demand is low enough to be supplied by the hydro-pneumatic tank. No Flow Shutdown shall not require any external flow meters, flow switches, or pressure switches to determine when a No Flow condition exists.

The following communication features shall be provided to the BAS:

- a. Remote system start / stop non-powered digital input.
- b. Failure of any system component. The output closes to indicate alarm condition.
- c. One 4-20 mA output with selectable output of:
 1. Frequency
 2. Process Variable
 3. Output Current
 4. Output Power

The following communication features shall be provided to the Building Automation System via an RS-485 port utilizing Johnson Controls Metasys N2 protocol:

1. Individual Analog inputs
2. Individual zone setpoints
3. Individual Pump/AFD on/off status
4. System Percent speed
5. System Start/Stop command
6. System Operation mode
7. System flow, when optional flow sensor is provided



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