



**Bell & Gossett**

a xylem brand

**TECHNICAL BROCHURE**

D-129C

# Technologic® 502 Pump Controller AND VARIABLE FREQUENCY DRIVE

AUTOMATIC BYPASS AND PUMP STANDBY OPTIONS  
TYPE A-1, B-3, C-4 & D-4

**POWERSAV®**

VARIABLE SPEED PUMPING SYSTEMS

Bell & Gossett's automatic bypass option for the Technologic 502 variable speed pump controller provides automatic across the line system back-up, equipment protection and maintenance personnel safety. The automatic bypass is provided in an integral NEMA 1 enclosure wired to the Technologic 502 with an optional drive for pump two mounted on a common backplate. Each of the bypass transfer options can function in automatic or manual mode. In the event of a user-defined drive failure, the Technologic 502 pump logic controller automatically activates the bypass to across the line operation. The bypass can also be activated manually through the drive keypad. All pumps are provided with motor over-load and ground fault protection while running in either constant or variable speed mode.

## Standard Features

- UL and cUL Listed
- 0-40°C (32°-104°F) Ambient Temperature Rating
- Automatic Bypass Upon
  - AFD Fault
  - Pump Controller Fault
  - Pump or Motor Fault, for B-3, C-4, and D-4
- Auto-Off-Bypass Selection
- Local/Remote Selection
- Diagnostic Display
- Auto Start of Lag Pump upon Lead Pump Failure (for multi-pump systems)
- 4 Analog Inputs for Zone Sensors, Flow Sensor, or Suction Sensor
- High System Cutout
- No Flow Shutdown
- Serial Communication Compliant
- Single Point Power Connection
- Main Power Disconnect and Lockable Door Interlock
- Ground Fault Protection
- Motor Overload Protection
- 24 VDC Control Power
- NEMA 1
- 100 kA Short Circuit Current Rating (SCCR)



## Optional Features

- Flow Readout (with optional flow sensor)
- Low Suction Cutout
- NEMA 12

**Packaged Systems Group**

## Pump Logic Controller

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 variable speed pumping applications.

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

- a. Pump flow surges
- b. Hunting
- c. End of curve (flow sensor required)
- d. System over pressure

The pump logic controller shall be capable of receiving up to four 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 four pumps in parallel.

The pump logic controller shall have a configurable analog input for a flow sensor. This input shall serve as the criteria for the end of curve protection algorithm.

The hydraulic stabilization program shall utilize a proportional-integral-derivative (PID) control function. The PID 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 last 10 faults and related operational data.
- 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.

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 hydropneumatic tank. No Flow Shutdown shall not require any external flow meters, flow switches, nor pressure switches to determine when a No Flow condition exists.

The following hardwire communication features shall be provided to the BAS:

- a. Remote system start / stop non-powered digital input
- b. Failure of any system component. 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, Modbus RTU, or Siemens P1 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. Individual Kw signals
8. System flow, when optional flow sensor is provided



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