

POWERSAV™
**VARIABLE SPEED PUMPING SYSTEMS
PRODUCT DATA BULLETIN**
**TECHNOLOGIC® 502 PUMP CONTROLLER
AND VARIABLE FREQUENCY DRIVE
AUTOMATIC BYPASS AND PUMP STANDBY OPTIONS
TYPE A-1, B-3, C-4 & D-4**

ITT 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 prewired 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 overload 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

TYPE A-1 BYPASS

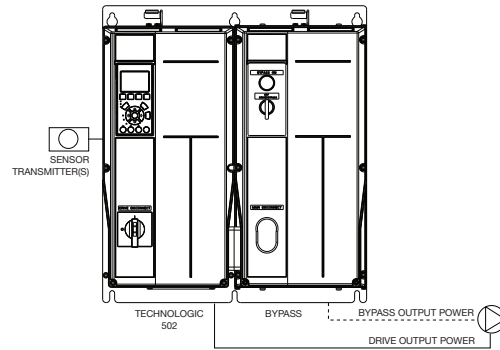
ONE VARIABLE/CONSTANT SPEED PUMP, ONE ADJUSTABLE FREQUENCY DRIVE & AUTOMATIC BYPASS

The pump system utilizing a type A-1 Automatic bypass consists of a Technologic 502 with a main power disconnect and a 3-contactor bypass with motor overload relay. The Technologic 502 and automatic bypass are prewired and mounted on a common backplate. Manual bypass can also be manually engaged through the drive keypad.

The local/remote modes accessible through the drive keypad allow for local or BAS start-stop capability. Drive/Bypass status is displayed on the keypad.

Sequence of Operation:

The system shall consist of one pump and a Technologic 502 combination pump logic controller and AFD, with Type A-1 constant speed bypass. The Technologic 502 pump logic controller shall continuously scan and compare each process variable to its individual set point and control to the least satisfied zone. When in the "AUTOMATIC" mode, the pump shall operate through the AFD which is being controlled by a signal generated by the Technologic pump 502 logic controller. In the event of a system differential pressure failure due to an AFD fault, the pump controller shall automatically initiate



a timed sequence of events to start the pump across the line. The pump shall run at constant speed with motor overload and ground fault protection. Bypass mode will be indicated on the drive keypad. In the event of a system differential pressure failure due to a pump or motor fault, the pump logic controller shall automatically initiate a timed sequence of operation to shut the system down. In the event of an overload fault while in the "BYPASS" mode, the pump shall be locked out of operation.

TYPE B-3 BYPASS

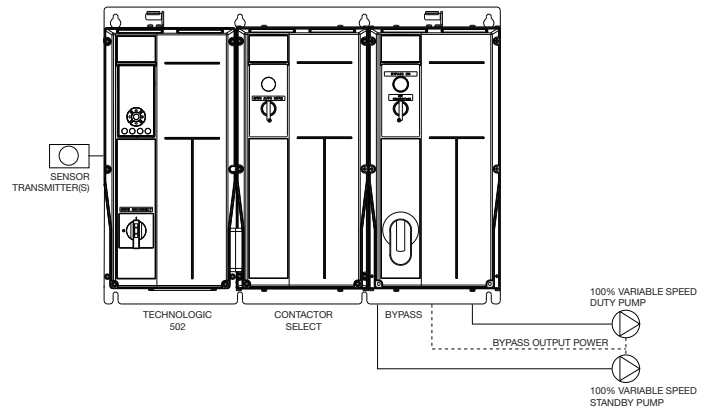
TWO VARIABLE/CONSTANT SPEED PUMPS, ONE ADJUSTABLE FREQUENCY DRIVE & AUTOMATIC BYPASS

The type B-3 bypass consists of a Technologic 502 with main power disconnect, four interlocked contactors, 3 position lead pump selection switch (Pump 1/Auto/ Pump 2) and motor overload relays. The Technologic 502 and automatic bypass are prewired and mounted on a common backplate. Manual bypass can also be manually engaged through the drive keypad.

The local/remote modes accessible through the drive keypad allow for local or BAS start-stop capability. Drive/Bypass status is displayed on the keypad.

Sequence of Operation:

The system shall consist of two pumps, a Technologic 502 combination pump logic controller, AFD, lead pump selection, automatic alternation, and B-3 automatic across the line AFD bypass. The Technologic 502 pump logic controller shall continuously scan and compare each process variable to its individual set point and control to the least satisfied zone. The operation of the standby pump shall be through a Bell & Gossett Type B-3 AFD bypass/pump transfer option. When in the "AUTOMATIC" mode the duty pump shall operate through the AFD which is being controlled by a signal generated by the Technologic 502 pump logic controller. In the event of a system differential pressure failure, due to a pump or overload fault, the pump logic controller will automatically initiate a timed sequence of operation to start the standby pump in the variable speed mode. A message shall be displayed on the



operator interface of the pump logic controller indicating the failure. In the event of a system differential pressure failure, due to an AFD fault, the pump logic controller shall automatically initiate a timed sequence of operation to start the standby pump across the line. A message shall be displayed on the operator interface of the pump logic controller indicating the failure. When in the "BYPASS" mode and the pump selector on "PUMP NO. 1", pump number 1 shall operate across the line at constant speed with motor overload and ground fault protection. A solid red indicator light shall signal this condition. The standby pump shall be locked out. With the pump selector in the "PUMP NO. 2" position, the actions of Pump No. 1 and Pump No. 2 shall be interchanged.

TYPE C-4 BYPASS

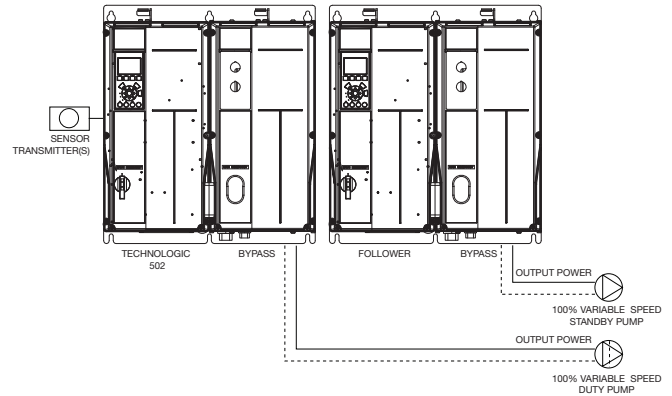
TWO VARIABLE/CONSTANT SPEED PUMPS, TWO ADJUSTABLE FREQUENCY DRIVES & AUTOMATIC BYPASS

The type C-4 bypass consists of a Technologic 502, follower AFD, and an automatic bypass panel, with door mounted lockable disconnect, ground fault protection, each drive with its own 3-contactor bypasses and motor overload relays. Each AFD shall be provided with a dedicated drive disconnect. The Technologic 502, follower AFD and the automatic bypass panel are prewired and mounted on a common backplate. Manual bypass can also be manually engaged through the each drive's keypad.

The local/remote modes accessible through the drive keypad allow for local or BAS start-stop capability. Drive/Bypass status is displayed on the keypad.

Sequence of Operation:

The system shall consist of a Technologic 502 combination pump logic controller/AFD, a follower AFD, and C-4 bypass circuitry for control of one duty and one standby pump. Sequence shall include automatic alternation, automatic transfer to standby pump, and automatic across the line AFD bypass for each pump. The Technologic 502 pump logic controller shall continuously scan and compare each process variable to its individual set point and control to the least satisfied zone. The redundant variable speed pump/drive set shall be started through the pump logic controller via the lag drive. Across the line bypass shall be provided. In the "AUTOMATIC" mode, a pump shall operate through the AFD



being controlled by a signal generated by the Technologic 502 pump logic controller. In the event of a system differential pressure failure, due to a pump, AFD, or overload fault, the pump logic controller shall automatically initiate a timed sequence of events to start the remaining pump/ AFD set in the variable speed mode. Upon subsequent failures a timed sequence of events shall bring on a pump in the across the line mode with motor overload and ground fault protection. Subsequent failure of selected pump or motor shall initiate a timed sequence of events to start standby pump across the line. In the event of an overload fault while in the "BYPASS" mode, the selected pump shall be locked out.

TYPE D-4 BYPASS

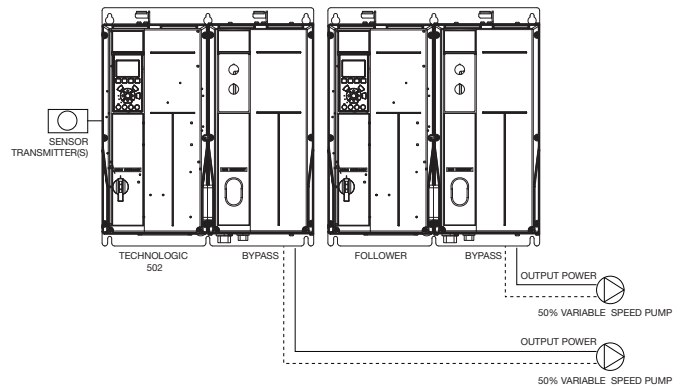
TWO VARIABLE/CONSTANT SPEED PUMPS, TWO ADJUSTABLE FREQUENCY DRIVES & AUTOMATIC BYPASS

The type D-4 bypass consists of a Technologic 502, follower AFD, and an automatic bypass panel, with door mounted lockable disconnect, ground fault protection, each drive with its own 3-contactor bypasses and motor overload relays. Each AFD shall be provided with a dedicated drive disconnect. The Technologic 502, follower AFD and the automatic bypass panel are prewired and mounted on a common backplate. Manual bypass can also be manually engaged through the each drives keypad.

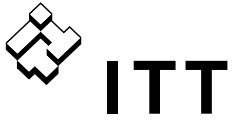
The local/remote modes accessible through the drive keypad allow for local or BAS start-stop capability. Drive/Bypass status is displayed on the keypad.

Sequence of Operation:

The system shall consist of a Technologic 502 combination pump logic controller/AFD, a follower AFD, and D-4 bypass circuitry for control of two pumps in parallel. Sequence shall include automatic alternation, pump staging, and automatic across the line AFD bypass for each pump. The Technologic 502 pump logic controller shall continuously scan and compare each process variable to its individual set point and control to the least satisfied zone. The Technologic 502 pump logic controller shall continuously scan and compare each process variable to its individual set point and control to the least satisfied zone. If the set point cannot be satisfied by the designated lead pump, the pump logic controller shall initiate a timed sequence of events to stage a lag pump. The lag pump shall accelerate resulting in the lead pump decelerating until they equalize in speed. Further change in process variable shall cause the pumps to change speed together. When the set point criteria can be safely satisfied with one pump, the Technologic 502 pump logic controller shall initiate a timed

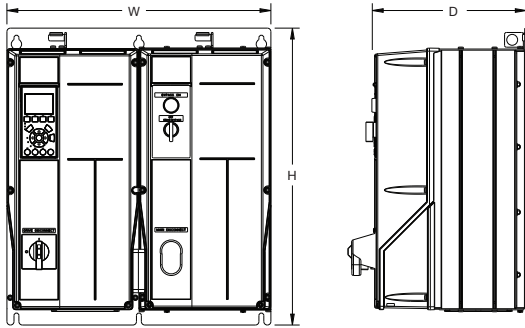


destage sequence and continue variable speed operation. When in the "AUTOMATIC" mode, the pump shall operate through the AFD being controlled by a signal generated by the Technologic 502 pump logic controller. In the event of a system differential pressure failure, due to a pump, AFD, or overload fault, the pump logic controller shall automatically initiate a timed sequence of events to start the remaining pump/AFD set in the variable speed mode. Subsequent failures shall initiate a timed sequence of events to the variable speed mode as determined by user-input setup selections. In the event of all AFD faults, pumps shall be automatically started sequentially across the line. When in the "BYPASS" mode, user selectable number of pumps shall operate across the line at constant speed with motor overload protection. A solid red light shall signal this condition and all pumps shall be locked out of the variable speed mode. In the event of an overload fault while in the "BYPASS" mode, the selected pump shall be locked out.



Dimensional Drawings

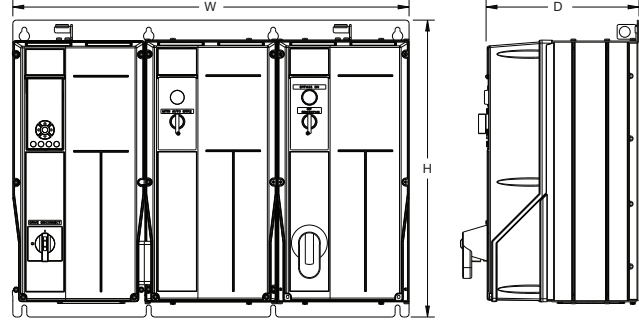
TYPE A-1



208/230V	460V	575V	H	W	D	WT.
2-5 HP	3-10 HP	3-10 HP	31.74	8.27	9.73	68
7.5-15 HP	15-25 HP	15-25 HP	21.48	19.09	12.86	128
20 HP	30-40 HP	30-40 HP	28.17	19.09	12.81	158
25-30 HP	50-75 HP	50-75 HP	29.94	24.37	14.87	227
40-60 HP	100-125 HP	100-125 HP	33.49	29.24	16.22	454

NOTE: All dimensions are in inches, weights are in pounds. All are approximate.

TYPE B-3



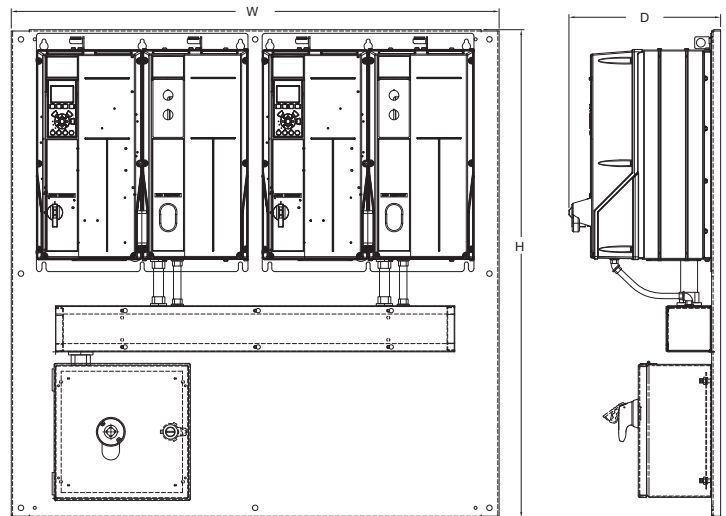
208/230V	460V	575V	H	W	D	WT.
2-5 HP	3-10 HP	3-10 HP	18.86	28.7	10.3	225
7.5-10 HP	15-25 HP	15-25 HP	21.48	28.66	10.3	276
15-20 HP	30-40 HP	30-40 HP	28.17	28.66	12.81	338
25-30 HP	50-75 HP	50-75 HP	29.94	36.63	14.87	383
40-60 HP	100-125 HP	100-125 HP	33.49	43.93	15.67	1000

NOTE: All dimensions are in inches, weights are in pounds. All are approximate.

TYPE C-4 and D-4

208/230V	460V	575V	H	W	D	WT.
2-5 HP	3-10 HP	3-10 HP	38.97	32.97	10.48	180
7.5-15 HP	15-25 HP	15-25 HP	44.0	44.0	13.66	220
20 HP	30-40 HP	30-40 HP	56.0	44.0	13.81	260
25-30 HP	50-75 HP	50-75 HP	44.0	68.0	15.67	280

NOTE: All dimensions are in inches, weights are in pounds. All are approximate.



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