

# VARIOSPEED® NI Control Panel

Variable Frequency Drive controller in a NEMA 1 enclosure.

The VARIOspeed® N1 control panel is designed to control a three phase pump in constant pressure control applications including booster pump, deep well submersible pump, and irrigation pump applications.

As flow and head conditions change in the pumping system, the VFD is able to automatically control the pump speed and maintain a constant discharge pressure. The desired set pressure is entered on the door mounted display. The pressure transducer measures the pump discharge pressure. Not for use with sewage pumps.

## VARIOSPEED® NI COMPONENTS

- Enclosure (up to 5 HP)** measures 14 x 8 x 8 inches (35.56 x 20.32 x 20.32 cm) steel NEMA 1 for indoor use with locking latch.  
**Enclosure (above 5 HP)** measures 18 x 10 x 10 inches (45.72 x 25.40 x 25.40 cm) steel NEMA 1 for indoor use with locking latch.  
**Note:** Voltage and amp range selected may change component layout in enclosure.
- Vents** for VFD cooling.
- Variable Frequency Drive**

## DISPLAY FEATURES

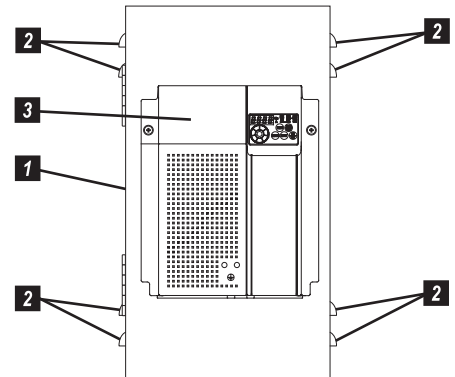
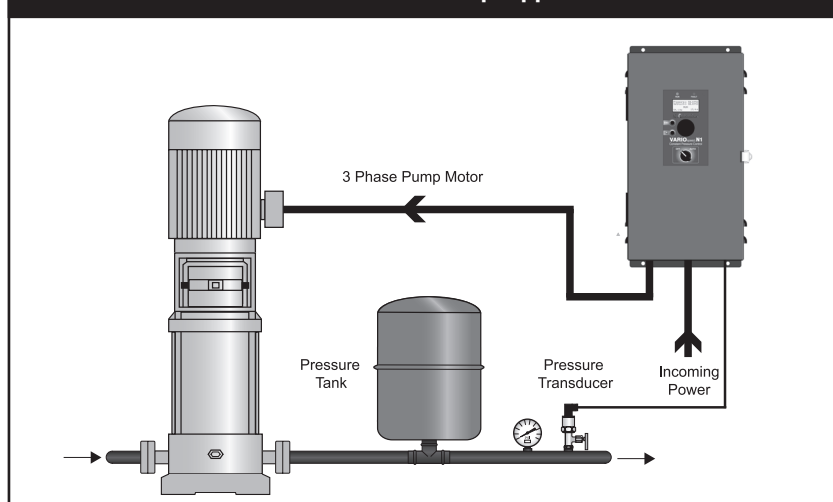
- 4 Line / 20 character display**
- Rotary/Push button** for menu navigation and editing
- Left Arrow button**
- ESC button**
- Run indicator LED**
- Fault indicator LED**
- Off/Auto selector switch**

## FEATURES

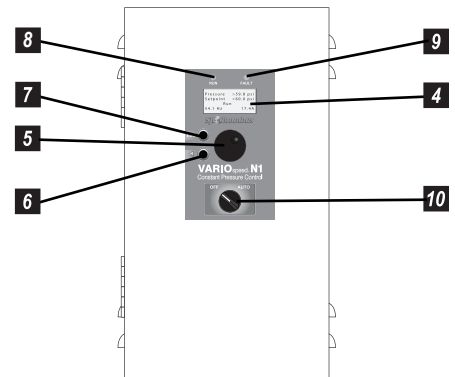
- Run Dry protection (pipe burst or low pressure alarm)
- High Pressure protection
- System Fault Log
- Entire control system (panel and sensor) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes a 0-200 PSI pressure transducer
- Five-year limited warranty
- One-year limited warranty on pressure transducer



### Pressure Booster Pump Application



VARIOspeed® N1 (240V model)



VARIOspeed® N1 door & display

## SPECIFICATIONS

**POWER:** Available HP range  
(208V-240V) 1.5HP - 20HP  
(480V) 7.5HP - 20HP

**CONTROL:**  
PID control  
Adjustable electronic overload  
Auto Start on pressure drop (adjustable)  
Auto Stop on low Hz (No-Flow - sleep mode)

**PRESSURE TRANSDUCER:** 0-200 PSI  
(included) 1/4" NPT Male, NEMA 4X rated  
with 20 ft cable

**ENVIRONMENTAL:**  
Operating temperature: 14°F to 104°F  
(-10°C to 40°C)  
Storage temperature: -4°F to 131°F  
(-20°C to 55°C)  
Altitude: Maximum of 3280 ft (1000m)  
above sea level



**SJE RHOMBUS**

PO Box 1708, Detroit Lakes, MN 56502  
1-888-DIAL-SJE • 1-218-847-1317  
1-218-847-4617 Fax

email: [customer.service@sjerhombus.com](mailto:customer.service@sjerhombus.com)

[www.sjerhombus.com](http://www.sjerhombus.com)

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SEE BACKSIDE FOR ORDERING INFORMATION.  
SEE PRICE BOOK FOR LIST PRICE.

# VARIOSPEED® N1 Control Panel

Variable Frequency Drive controller in a NEMA 1 enclosure.

PART NUMBER	DESCRIPTION	MODEL	OUTPUT AMP	HP	INPUT PHASE	OUTPUT PHASE	SHIP WEIGHT
1041350	VARIOspeed® N1, 240V	VS21-7.0-N1	7.0	1.5	1	3	21 lbs.
1041351	VARIOspeed® N1, 240V	VS21-10.0-N1	10.0	3	1	3	22 lbs.
1041352	VARIOspeed® N1, 240V	VS23-16.5-N1	16.5	5	3	3	21 lbs.
1041353	VARIOspeed® N1, 240V	VS23-31.8-N1	31.8	7.5-10	3	3	31 lbs.
1041354	VARIOspeed® N1, 240V	VS23-45.0-N1	45.0	15	3	3	38 lbs.
1041355	VARIOspeed® N1, 240V	VS23-58.0-N1	58.0	20	3	3	38 lbs.
1041356	VARIOspeed® N1, 480V	VS43-16.0-N1	16.0	7.5-10	3	3	31 lbs.
1041357	VARIOspeed® N1, 480V	VS43-29.5-N1	29.5	15-20	3	3	38 lbs.

**NOTE:** HP rating is based on standard NEMA B 4-pole motor (used for indication only, use nameplate FLA for sizing). The output voltage of the VFD cannot exceed the incoming voltage. Example: 208V in, 208V out (max).

## SELECTING THE CORRECT VFD

1. Determine the voltage available on site.
2. Select a pump with the same voltage (motor must be 3 phase).
3. Check pump motor nameplate Full Load Amps (FLA) for proper VFD sizing.
4. Select a VFD with an output amp rating higher than motor FLA.
5. Use motor Service Factor Amps (SFA) for submersible well pump applications for VFD sizing.

## PHASE CONVERSION\*

It is possible to supply single phase 240V input power to VS23 models. The VFD output amp must be derated by 50%.

Example: The VS23-45.0-N1 will be derated to 22.5A output (max).

\*Use three-phase input power if available. VS23 VFD's are not UL listed with single-phase supply. Always use a 3 phase motor.

## MAXIMUM MOTOR CABLE LENGTHS

For 208V-240V pumps: 400 ft. For cable lengths greater than 400 ft., use a load reactor. Do not exceed 800 ft.

For 480V pumps: 50 ft. For cable lengths greater than 50 ft., use a load reactor. Do not exceed 300 ft.

## LINE/LOAD REACTORS (Indoor/outdoor rated. Supplied separately)

A Line Reactor is connected between the line power and VFD input. It is used for VFD protection and noise reduction.

A Load Reactor is connected between the VFD output and the motor. It is used for motor protection and noise reduction.

Mount reactors as close as possible to the VFD. Reactors will increase voltage drop, and may impact pump performance.

Consult factory for selection.

PART NUMBER	LINE/LOAD REACTORS	USE WITH MODEL	DIMENSIONS (Inches)	ELECTRICAL DATA	SHIP WEIGHT
1041535	LR23-16.5-N3R	VS21-7.0-N1, VS21-10.0-N1, VS23-16.5-N1	12x12x10	18A, 1.5mH	37 lbs.
1041536	LR23-45.0-N3R	VS23-31.8-N1, VS23-45.0-N1	12x12x10	55A, 0.27mH	46 lbs.
1041537	LR23-58.0-N3R	VS23-58.0-N1	12x12x10	83A, 0.17mH	47 lbs.
1041538	LR43-16.0-N3R	VS43-16.0-N1	12x12x10	21A, 1.8mH	38 lbs.
1041539	LR43-29.5-N3R	VS43-29.5-N1	12x12x10	35A, 0.71mH	41 lbs.



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[www.sjerrhombus.com](http://www.sjerrhombus.com)

[customer.service@sjerrhombus.com](mailto:customer.service@sjerrhombus.com)

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