

# Grundfos Variable Speed

## Installation and Operation

Pumps Incorporating the  
(VS) Variable Speed Control  
with Date Code 0838 or higher



**1.** Shipment Inspection

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**3.** Operational Limits

**4.** Pump Installation



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## Grundfos Variable Speed Pump

It has been carefully inspected and tested before shipment. It should give you long, efficient, trouble-free service. For maximum performance and reliability, please follow the simple instructions in this manual.

When installing and using this electrical equipment, basic safety precautions and local code requirements should always be followed, including the following:



**CAUTION:** The installer must ensure that this control and its wiring are isolated and/or shielded from strong sources of electromagnetic noise. Conversely, this Class B digital apparatus complies with

Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Regulations. However, if this control does cause harmful interference to radio or television reception, which can be determined by turning the control off and on, the user is encouraged to try to correct the interference by reorienting or relocating the receiving antenna, relocating the receiver with respect to this control, and/or connecting the control to a different circuit from that to which the receiver is connected.

**CAUTION:** Improper installation and operation of this control could result in damage to the equipment and possibly even personal injury. It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. This electronic control is not intended for use as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit.

**WARNING:** All field wiring to be low voltage. Power for control is provided through the power cord supplying power to the pump. Use copper conductors only. Disconnect all power sources prior to servicing.

**Risk of electric shock:** This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding type receptacle.

# 1. Shipment Inspection

Check the contents of this package. Care should be taken to ensure the pump is NOT dropped or mishandled; **dropping will damage the pump.**

## Grundfos Variable Speed Pump Package Includes:

- One Grundfos UP15-42 or UP26 Variable Speed pump with integral control.
- One 6' line cord with 115V plug, pre-wired into control box.
- Two flange gaskets
- Installation and Operating Instructions.

# 2. General Features

- All minimum and maximum settings are operating, not safety limits. **Necessary auxiliary equipment and safety devices must be added.**
- Offset dial provides fine tuning for input signal.
- Manual % dial provides manual speed control.
- Range of signal is selected through Dip Switch A
- Type of signal used is selected through Dip Switch B
- Minimum speed at 0 or 15% is selected through Dip Switch C
- Speed control from external signal or manual % dial is selected through Dip Switch D.
- Pump Exercising: After every three days of no operation, the control will exercise the pump for 10 seconds. The % Out LED will be on during exercising
- As variable speed output modulates, the control flashes the % out LED **ON** for ¼ second and **OFF** for ¼ to 2 1/2 seconds
- The % output is run at 100% for 3 seconds after power up reset for all modes of operation

# 3. Operational Limits

## Control Signal Input Range Options:

Voltage signal range: 0-10V(DC) or 2-10V(DC)

Current signal range: 0-20mA or 4-20mA

Grundfos Variable Speed pumps are designed to pump liquids compatible with their cast iron pump housing construction. They are recommended for use in closed hydronic systems. **Grundfos Variable Speed pumps are for Indoor Use Only.**

Grundfos Variable Speed Pumps are intended for use with water, or a 50/50 mixture by weight of propylene glycol.

## UP15-42F/VS 115V 60 Hz:

Maximum Fluid Temperature: 205°F (96°C)

Maximum Ambient:

- 107°F (42°C) with control module vertical (Fig. 1).
- 105°F (41°C) with control module on top of pump and horizontal (Fig 1).

Maximum Working Pressure: 145 PSI

Minimum Inlet Pressure: 5 PSI

## UP26-96F/VS 115V 60HZ:

## UP26-64F/VS 115V 60HZ:

Maximum Fluid Temperature: 195°F (90°C)

Maximum Ambient:

- 105°F (40°C) with control module vertical (Fig. 1).
- 92°F (33°C) with control module on top of pump and horizontal (Fig. 1).

Maximum Working Pressure: 145 PSI

Minimum Inlet Pressure: 5 PSI

# 4. Pump Installation

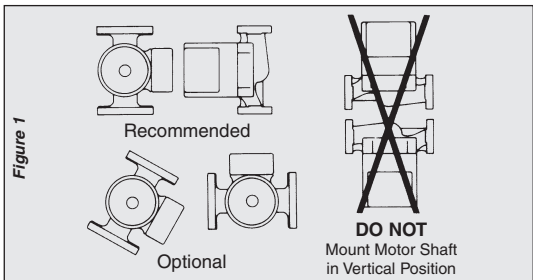


**Warning:** Consult piping manufactures for material selection before installing this pump. Absence of pumping fluid may damage some piping materials.

**Caution:** Thoroughly clean and flush the system prior to pump installation

**For Indoor Use Only**

**Preferred Pump & Terminal Box Orientation:**



If the terminal box position needs to be changed, ensure that the electrical supply is turned off and close the isolation valves before removing the Allen screws.

**To change control box position:**

- Remove the four (4) Allen screws (4 or 5mm wrench) while supporting the stator (motor).
- Carefully separate the stator from the pump chamber and rotate it to the correct terminal box orientation.
- Replace the Allen screws and tighten diagonally and evenly (7 ft. –lb. torque).
- Check that the motor shaft turns freely. Remove the large screw in the middle of the nameplate, insert a small flat blade screwdriver into the end of the shaft, and turn gently.
- If the shaft does not turn easily, repeat the disassembly/reassembly process.

Arrows on the side or bottom of the pump chamber indicate direction of flow through the pump.

The pump must be installed with the motor shaft positioned horizontally. Under no circumstances should the pump be installed with the shaft vertical or where the shaft falls below the horizontal plane (Fig. 1).

- Ensure that water does not enter the terminal box during the installation process.
- **DO NOT START THE PUMP UNTIL THE SYSTEM HAS BEEN FILLED AND CHECKED FOR LEAKS.**
- Do not use the pump to vent the system.
- Never operate the pump dry. The bearings require water lubrication and will be damaged otherwise.
- Fill system with water. This will result in immediate lubrication of the bearings.
- Operate the pump for 5 minutes, when control installation is complete, to purge remaining air from the bearing chamber. This is especially important when installing the pump during the off-season.

## 5. Electrical



**Warning:** All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electrical Code, local codes and regulations.

**CAUTION:** Power must not be applied to any of the wires during the rough-in wiring stage.

**CAUTION:** All field wiring must pass through a suitable listed conduit fitting, to ensure proper strain relief.

**CAUTION:** All field installed wiring should meet or exceed requirements for Class 2 wiring per article 725 of the National Electrical Code rated at 30VAC 250VA. Ensure that enough wiring is in the control box to reach the terminal strip.

**NOTE:** All field wiring shall have insulation stripped exposing 5-7mm of conductor before placement into control box terminal strip.

## Electrical Connections To The Control:



**CAUTION:** The installer should confirm that no current/voltage is present at any of the wires.

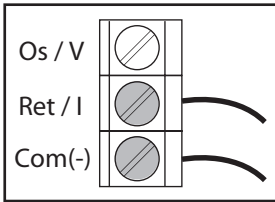
**Note:** Control signal wires must be run through and secured by the strain relief on the terminal board.

**Note:** No speed control signal is necessary if speed is to be regulated using the manual % dial.

### Current Speed Control Signal Connections:

Connect the current signal wires to terminals “Com(-)” and “Ret/I” (Fig 3.).

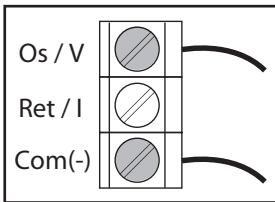
**Figure 3** - Current connections to the (Com(-) & Ret/I) control



### Voltage Speed Control Signal Connections:

Connect the voltage signal wires to terminals “Com(-)” and “Os/V” (Fig 4.).

**Figure 4** - Voltage connections to the (Com(-) & Os/V) control



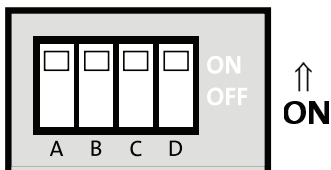
### Test the Speed Control Signal Wiring.

Make sure exposed wires and bare terminals are not in contact with other wires or grounded surfaces. Turn on the control signal and measure the voltage/mA across the leads using a voltmeter to confirm the pump signal is present.

# 6. Settings

## Setting Dip Switches:

Figure 5 -  
Dip Switches



## Dip Switch Settings:

SWITCH	POSITION		
	ON	OFF	DEFAULT
A	mA	(V) DC	mA
B	2-10V 4-20mA	0-10V 0-20mA	2-10V 4-20mA
C	min speed off	min speed 15%	min speed off
D	speed control external	speed control manual % dial	speed control external

### Feature Explanation

**Dip Switch C** - minimum speed off/minimum speed 15%. When dip switch C is in the **ON** position the variable speed of the pump will have a range from minimum speed = off to maximum speed = 100%. When dip switch C is in the **OFF** position the variable speed of the pump will have a range from minimum speed = 15% to a maximum speed = 100%.

**Dip Switch D** - speed control external/speed control maximum % dial. When dip switch D is in the **ON** position an external V(dc)/mA signal will cause the pump speed to vary and the dial on the terminal box will function in the -5% to +5% mode. When dip switch D is in the **OFF** position turning the manual % dial will vary the pump speed. The pump will not respond to an external V(dc)/mA signal even if one is present. The terminal box and the dial will function in the minimum to 100% mode.



## Multi Function Dial On Terminal Box:

### Offset Dial (When dip switch D is ON)

The Offset dial allows the user to fine tune the input signal. The input signal may be varied plus or minus 1-5%. This offset will affect the signal through it's entire range. The factory default is 0. The offset setting cannot increase the output to greater than 100% or less than the selected minimum output of either 0% or 15%.

### Example:

The measured input signal is 2.1-10.1V and as a result the pump does not shut off because the signal doesn't drop to 2V. The dial is set to -5% and the input signal is offset down to 2.0-9.6V. The pump will now shut off, however the pump will not reach the full 10V speed now, due to the offset.

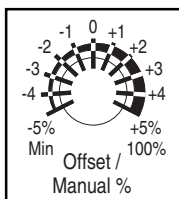


Figure 6 - % Offset

### Manual % Dial (When dip switch D is OFF)

The manual % dial allows the speed of the pump to be manually adjusted and set by the user. The speed of the pump may be manually adjusted anywhere from min to 100%, but once set remains fixed at that speed. The "min" position on the dial will either be equal to "OFF" or "15%" depending on the position of dip switch C. The factory default is 50%.

Install control onto the pump. Insert the 115 V plug on the line cord from the pump into a properly grounded 115 V outlet. This will apply power to the pump/control.

### Performance Indicator LEDs (Fig. 7)

Power ON (green) indicates power is applied.

% Out (Yellow) indicates the speed of the pump by flashing at different rates.

Figure 7 - Performance indicator LEDs



### Before You Leave

- Place this brochure, and all other brochures relating to the installation, in a conspicuous location near the control for future reference.
- It is important to explain the operation of this control within the system to the end user and to anyone else who may be operating the system.

# 7. Quick Reference

## Voltage Speed Control Signal Circuit Rating:

Terminals : Com(-) & Os/V

0-10VDC

5mA Max

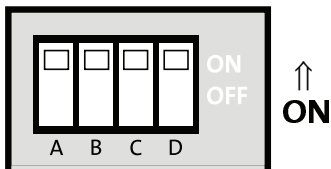
## Current Speed Control Signal Circuit Rating:

Terminals : Com(-) & Ret/I

0-20mA DC

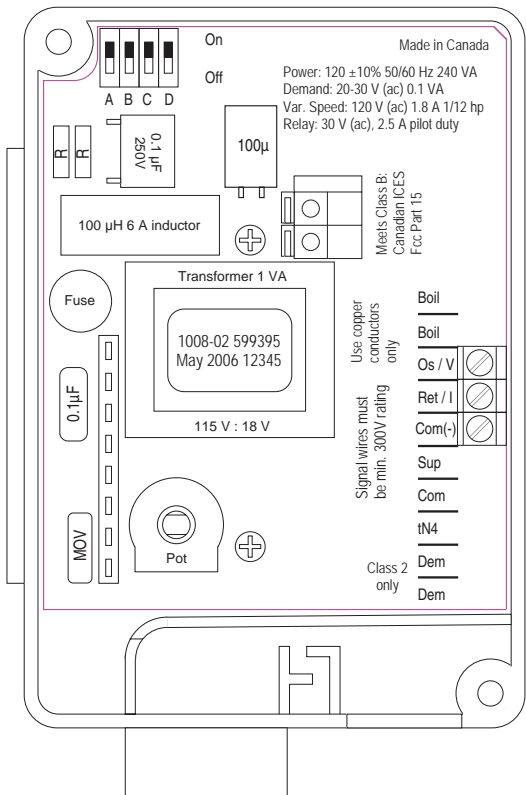
5VDC Max

Dip Switches



SWITCH	POSITION		
	ON	OFF	DEFAULT
A	mA	(V) DC	mA
B	2-10V 4-20mA	0-10V 0-20mA	2-10V 4-20mA
C	min speed off	min speed 15%	min speed off
D	speed control external	speed control manual % dial	speed control external

# Grundfos Variable Speed Control Board



Made in Canada

Power: 120 ±10% 50/60 Hz 240 VA  
 Demand: 20-30 V (ac) 0.1 VA  
 Var. Speed: 120 V (ac) 1.8 A 1/12 hp  
 Relay: 30 V (ac), 2.5 A pilot duty

Meets Class B:  
 Canadian ICES  
 FCC Part 15

Use copper  
 conductors  
 only

Signal wires must  
 be min. 300V rating

Class 2  
 only

## Limited Warranty

Products manufactured by GRUNDFOS PUMPS CORPORATION (GRUNDFOS) are warranted to the original user only to be free of defects in material and workmanship for a period of 24 months from date of installation, but not more than 30 months from date of manufacture. GRUNDFOS' liability under this warranty shall be limited to repairing or replacing at GRUNDFOS' option, without charge, F.O.B. GRUNDFOS' factory or authorized service station, any product of GRUNDFOS manufacture. GRUNDFOS will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by GRUNDFOS are subject to the warranty provided by the manufacturer of said products and not by GRUNDFOS' warranty. GRUNDFOS will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with GRUNDFOS' printed installation and operation instructions.

To obtain service under this warranty, the defective product must be returned to the distributor or dealer of GRUNDFOS products from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact the GRUNDFOS factory or authorized service station for instructions. Any defective product to be returned to the factory or service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Authorization must be included if so instructed.

GRUNDFOS WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE, OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

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