

Variable Frequency Drives

3A4793B

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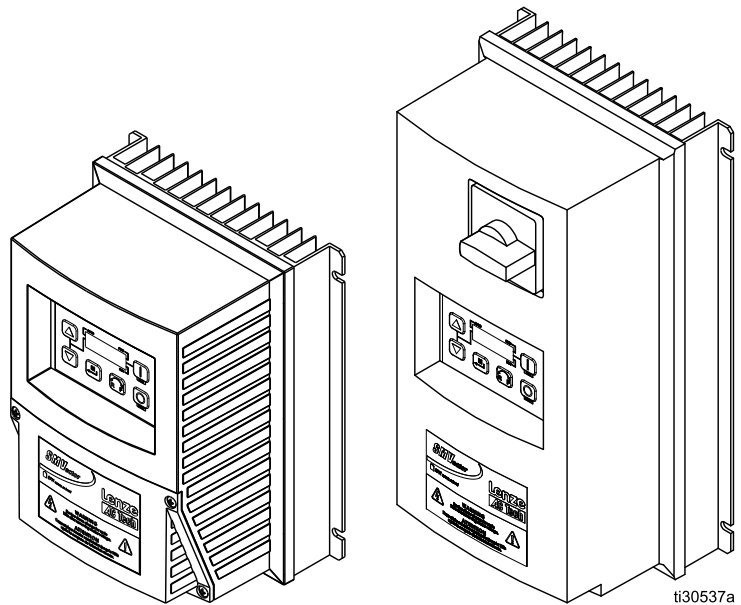
Variable frequency drives (VFDs) to power and control electric motor driven agitators. For professional use only.
Not approved for use in explosive atmospheres or hazardous locations. For indoor use only.



Important Safety Instructions

Read all warnings and instructions in this manual and all related manuals. Save all instructions.

See page 3 for a complete list of model descriptions and part numbers.



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Models

Table 1 Models with Electrical Disconnect

VFD Part No.	HP	Input Voltage	Output Voltage (all 3 phase)
17N041*	1.0	120 VAC (90–132 VAC) (1 phase), 240 VAC (170–264 VAC) (1 phase), 48–62 Hz	0–230 VAC
17N042*	1.0	240 VAC (170–264 VAC) (1 phase), 240 VAC (170–264 VAC) (3 phase), 48–62 Hz	0–230 VAC
17N043*	1.0	480 VAC (340–528 VAC) (3 phase), 48–62 Hz	0–400/460 VAC
17R875	1.0	120 VAC (90–132 VAC) (1 phase), 240 VAC (170–264 VAC) (1 phase), 48–62 Hz	0–230 VAC
17R876	1.0	240 VAC (170–264 VAC) (1 phase), 240 VAC (170–264 VAC) (3 phase), 48–62 Hz	0–230 VAC
17R877	1.0	480 VAC (340–528 VAC) (3 phase), 48–62 Hz	0–400/460 VAC

* Includes RS-485 Modbus Communications Module. Modbus can be ordered separately from Graco, Part Number 17R189.

Table 2 Models without Electrical Disconnect

VFD Part No.	HP	Input Voltage	Output Voltage (all 3 phase)
17R878	1.0	120 VAC (90–132 VAC) (1 phase), 240 VAC (170–264 VAC) (1 phase), 48–62 Hz	0–230 VAC
17R879	1.0	240 VAC (170–264 VAC) (1 phase), 240 VAC (170–264 VAC) (3 phase), 48–62 Hz	0–230 VAC
17R880	2.0	480 VAC (340–528 VAC) (3 phase), 48–62 Hz	0–400/460 VAC

NOTE: If the VFD is not used on an agitator, refer to the operator manual for the relevant product being used.

Related Manuals

Manual Number	Title
3A4548	Electric Back-Gear Drum Agitators
3A4553	Electric Direct Drive Agitators
3A4030	Intelligent Paint Kitchen: Overview & Touch Screen 25A693, Supervisor 25A843
SV01N_13418587	Lenze AC Tech, SMVector-Frequency Inverter Operating Instructions
P/N 4054	Leeson Electric Corporation, General Installation and Operating Instructions
Numero: UM-3.1	Cemp, Electric Motors, Instructions for use and maintenance

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

DANGER



HIGH VOLTAGE ELECTRIC SHOCK HAZARD

This equipment uses high voltage power. Improper contact with high voltage equipment will cause death or serious injury.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment.
- This equipment must be grounded. Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
- Wait five minutes after disconnecting power before servicing large capacitor units.

WARNING



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

Overview

This manual gives general installation and operation instructions for Graco supplied variable speed drives (VFDs). For complete instructions, see the equipment manufacturer's manuals listed in [Related Manuals, page 3](#).

Installation

Mounting the VFD

For full instructions on mounting the VFD, see the VFD manufacturer's manual. See [Technical Specifications, page 7](#) for VFD dimensions.

Connecting the VFD to the Motor

Follow the instructions in the motor manufacturer's manual provided with the motor to connect the VFD to the motor. Wire size, fuse size, and other electrical devices must comply with all local codes and regulations.

Follow the instructions in the VFD manufacturer's manual for connecting the input power to the VFD.

For models without electrical disconnect, provide separate disconnect capability in accordance with local codes.

NOTICE

To avoid equipment damage, do not plug the motor directly into a wall socket. The motor must be wired to a VFD.

Installing the RS-485 Modbus Communication Module

For installation and wiring information, consult the manual included with the RS-485.

Grounding the VFD

Follow instructions in the VFD manufacturer's manual for grounding requirements.

Operation

General Operation

Use the VFD to start, stop, and adjust the agitator speed. See the agitator manual for more information.

VFD Control Panel

NOTE: For complete information about the VFD, see the manufacturer's instructions supplied with the VFD.

- The control panel display shows the status of the motor. It also shows the direction of motor rotation: FWD (forward) or REV (reverse).
- The green RUN key starts the motor.
- The red STOP key stops the motor.
- Use the arrow keys to speed up or slow down the motor.
- The blue R/F key changes the motor rotation (see [Reverse Motor Direction, page 6](#)).
- The blue M key accesses the VFD menu. See the manufacturer's instructions for menu descriptions and information.

NOTE: If the M key is pressed, use the arrow keys to scroll through the VFD menu.

Factory Settings

VFD settings are preset by the manufacturer. See instructions below to change the default settings as needed to suit your needs.

Initial Configuration

For initial setup, review the following menus to configure the system to suit your particular needs. See the VFD manufacturer's manual for detailed information about each menu option and default settings.

1. VFD Parameter P103 controls the maximum frequency (the top end of manual speed) of running the agitator motor. This setting is NOT your operating frequency. It is the maximum limit of operating frequency.
2. VFD Parameter P108 controls motor overload. Set so that the VFD cannot supply more current to the motor than it can handle. The formula for the set value is:
 $X = \text{Motor current rating} \times 100 / \text{VFD output current rating}$

3. VFD Parameter P171 controls the absolute current limit. It is set to allow for momentary spikes in current above the limit set in P108. This parameter is usually set for 2 to 3 times the value on menu P108, which was calculated in the previous step.
4. VFD Parameter P112 enables the operator to change rotational direction.
 - a. Press the M key to access the VFD menu.
 - b. Scroll to P112 using the arrow keys.
 - c. Press the M key again.
 - d. The screen will display "00." Use the arrow keys to set the display to 01. This allows both forward and reverse rotation.
 - e. Press the M key again to return to the operation menu.
5. VFD Parameter P167 sets the base frequency. Set at 60 for 60 Hz motors or 50 for 50 Hz motors.
6. VFD Parameter P104 (optional) controls the rate at which the motor will ramp up to the set speed
7. VFD Parameter P166 (optional) allows for adjustment to the noise that the motor creates. Each setting changes the tone.
8. VFD Parameter P199 gives options for resetting defaults.
9. VFD Parameter P121 should be set to 9 to enable the network to function (if configured). Jumper wires are required from Terminals 4 to 13A and Terminals 1 to 4.
10. VFD Parameter P122 should be set to 21. This parameter controls the motor thermo overload switch to trip open, stopping the VFD. See the agitator manuals for wiring the motor thermostat leads to the VFD.

Reverse Motor Direction

NOTE: VFD Parameter P112 (see above) allows the operator to change rotation. P112 must be set to "01" before following the next steps. Motor rotation direction is specified in the agitator manuals.

1. Verify VFD is in stop mode.
2. Press the blue R/F key. The LED for Opposite Rotation Direction will blink.
3. Press M within four seconds to confirm the change. The blinking Direction LED will turn on, and the other LED will turn off.

Adjust the Speed

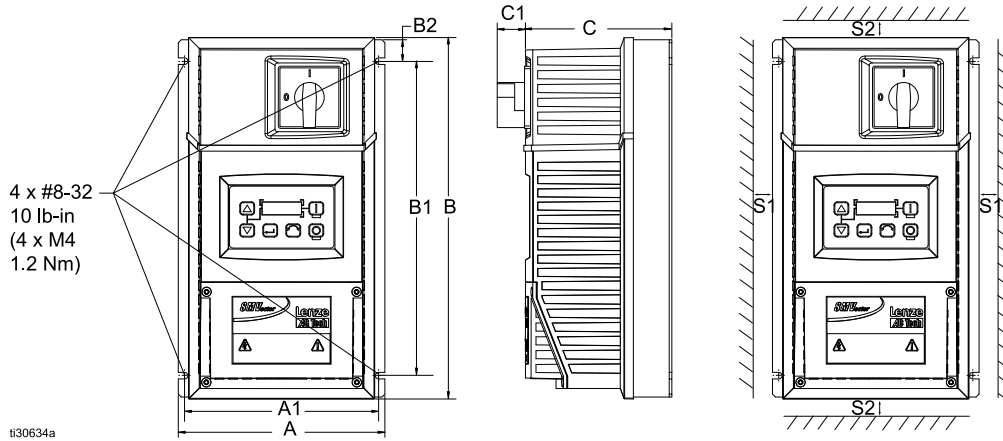
Use the arrow keys on the VFD control panel to increase or decrease the motor speed.

Technical Specifications

See the Technical Data section in the VFD manufacturer's manual for standards and application conditions.

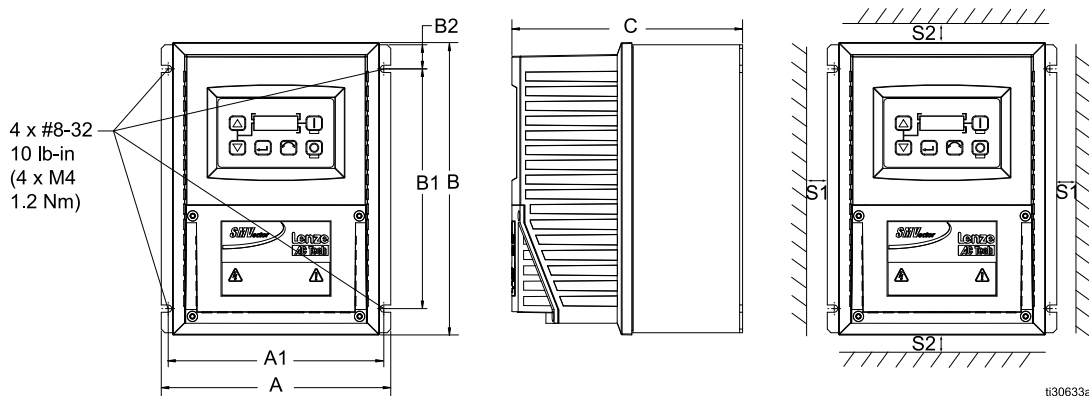
See Technical Data section in the electric agitator manuals for standards and application conditions.

NEMA 4X (IP65) Models with Disconnect Switch



Part No.	a	a1	b	b1	b2	c	c1	s1	s2	m
	in (mm)									
17N041										
17N042										
17N043	6.28	5.90	10.99	9.54	0.66	4.47	.86 (22)	2.00	2.00	4.7
17R186	(160)	(150)	(279)	(242)	(17)	(114)		(51)	(51)	(2.13)
17R187										
17R188										

NEMA 4X (IP65) Models without Disconnect Switch



Part No.	a	a1	b	b1	b2	c	s1	s2	m	
	in (mm)									
16K907	6.28	5.90	8.00	6.56	0.66 (17)	4.47	2.00 (51)	2.00 (51)	3.6	
16K908	(160)	(150)	(203)	(167)		(114)			(1.63)	
16K912	6.28	5.90	8.00	6.56	0.66 (17)	6.31	2.00 (51)	2.00 (51)	5.9	
	(160)	(150)	(203)	(167)		(160)			(2.68)	

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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All written and visual data contained in this document reflects the latest product information available at the time of publication.

Graco reserves the right to make changes at any time without notice.
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