

# Vacuum Pump Control Installation and Instruction Manual

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# Introduction

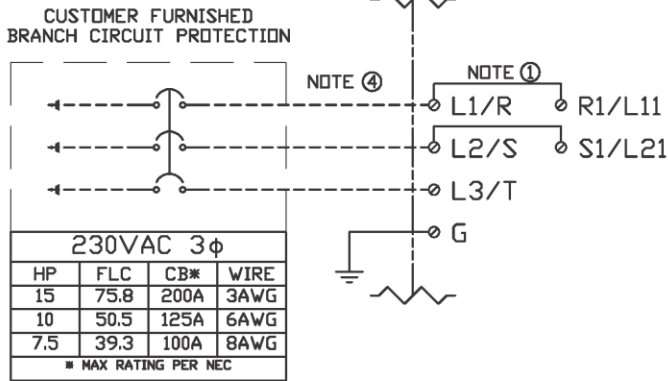
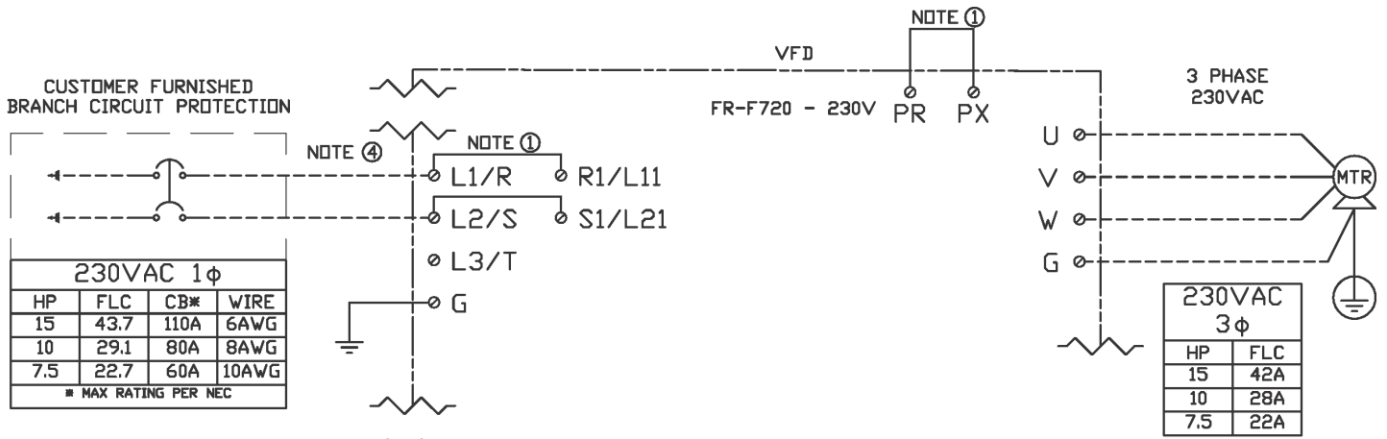
The Vacuum Pump Variable Frequency Drive (VFD) Controller is designed to provide accurate vacuum level control on modern Dairy Farms. The control is programmed to follow a Vacuum level set by the operator of the Dairy. This level is maintained by the use of a Vacuum Transducer mounted in the Vacuum line and connected back to the VFD. This Transducer provides a constant feedback to the VFD which in turn changes the speed based on system demand. Through the operator interface (Keypad), the desired vacuum level (Ex: 13.0" Vacuum) is entered and the VFD is commanded to maintain that reading at all times. During Milking the VFD will vary in speed to keep the set point satisfied. The VFD updates the feedback loop as many as 50 times per second, therefore insuring the rapid response to changes in the vacuum level of the system. Adjustments can be made to increase or decrease the responsiveness of the system. Out of the box factory settings are most common without any changes necessary.

# Available Models

PDC Part Number	Brand	Volts	HP	Description
FR-F720-5-VAC	Mitsubishi	230	5	F720 VFD Nema 1
FR-F720-7.5-VAC	Mitsubishi	230	7.5	F720 VFD Nema 1
FR-F720-10-VAC	Mitsubishi	230	10	F720 VFD Nema 1
FR-F720-15-VAC	Mitsubishi	230	15	F720 VFD Nema 1
FR-F720-20-VAC	Mitsubishi	230	20	F720 VFD Nema 1
FR-F720-25-VAC	Mitsubishi	230	25	F720 VFD Nema 1
FR-F720-30-VAC	Mitsubishi	230	30	F720 VFD Nema 1
FR-F740-7.5-VAC	Mitsubishi	460	7.5	F740 VFD Nema 1
FR-F740-10-VAC	Mitsubishi	460	10	F740 VFD Nema 1
FR-F740-15-VAC	Mitsubishi	460	15	F740 VFD Nema 1
FR-F740-20-VAC	Mitsubishi	460	20	F740 VFD Nema 1
FR-F740-25-VAC	Mitsubishi	460	25	F740 VFD Nema 1
FR-F740-30-VAC	Mitsubishi	460	30	F740 VFD Nema 1
FR-F740-40-VAC	Mitsubishi	460	40	F740 VFD Nema 1

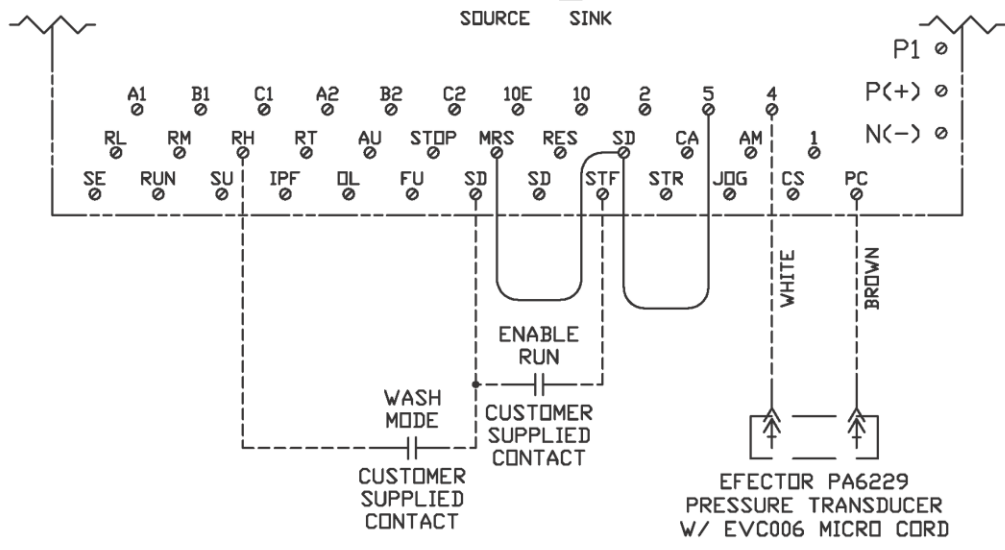
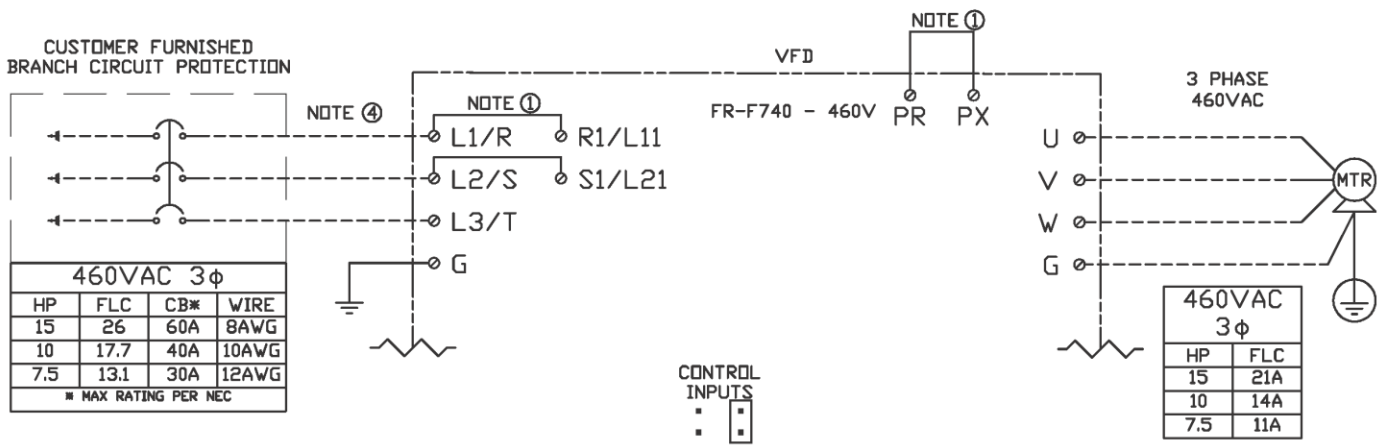
# Simple Wiring Instruction

- ✚ Always check drive nameplate rating to ensure it is compatible with your local power supply
- ✚ Three Phase Power into L1, L2, & L3, Single Phase Power into L1, & L2, Proper grounding is required
- ✚ Motor Connection to T1, T2, T3 ( U,V,W )
- ✚ Vacuum Transducer White Wire to Terminal “4” and Brown Wire to Terminal “PC”
- ✚ Put a Jumper Wire from Terminal “5” to “SD” and a Jumper Wire from Terminal “MRS” to “SD”
- ✚ Drive Run Command needs to be a dry contact (No Voltage present) from Terminal “STF” to “SD”. Opening and closing will Start/Stop the VFD. See program page for setting Vacuum. Default is 13.0”.
- ✚ If your source is a live 120-volt contact, a relay will need to be installed to isolate voltage from the Inverter.
- ✚ To Bypass the Vacuum Transducer if required for Wash, Close a dry contact (No Voltage present) from RH to SD terminals. See program page for setting speed of bypass. Default is 56hz.
- ✚ Refer to manual for complete detail on drive.
- ✚ It is always advised to have a licensed Electrician Install unit.



**NOTES:**

- DO NOT REMOVE FACTORY JUMPERS
- KEEP ALL SIGNAL CABLES 4 INCHES AWAY FROM THE POWER WIRING
- CONTACTS MUST BE SUITABLE FOR SWITCHING LOW LEVEL SIGNAL CURRENTS
- DO NOT SWITCH POWER SUPPLY OR MOTOR SUPPLY ON/OFF WITH CONTACTOR(S) TO START SYSTEM. LEAVE POWERED UP AND TURN ON/OFF VIA DRY CONTACT OF SD TO STF.

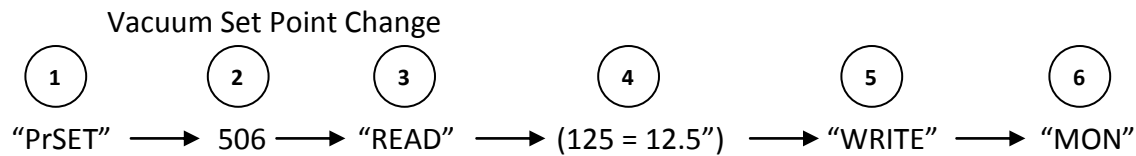


# General Operating Procedures

Easy steps to change any of the listed parameters below:

- 1) Press the "PrSET" key on the VFD keypad.
- 2) Type parameter # from chart below.
- 3) Press the "READ" key. The display screen will show current parameter setting.
- 4) To change the setting, enter the new desired setting.
- 5) Press the "WRITE" key.
- 6) Press the "MON" key to resume normal operation.

## Example:



Parameter	Description	Setting
0	Torque Boost	1
1	Maximum Frequency	56
2	Minimum Frequency	8
4	Multi-Speed Setting (High Speed)	56
7	Acceleration Time	0.2
8	Deceleration Time	0.5
9	Electronic Overload (Motor FLA X S.F.)	Amps
14	Constant/Variable Torque (0=Constant)	0
72	Carrier Frequency (1 to 15 KHZ)	10
*80	Motor KW (See Chart Below)	KW
129	PID proportional band (Response Adjust)	30
130	PID integral time (Response Adjust)	0.1
**506	Vacuum Set Point (Ex:130=13.0" Vacuum)	130
**507	Wash Mode Speed (Ex:5600=56.00hz)	5600
**511	Vacuum Gain (Ex:1000=100.0% of Scale)	1000

*Table for parameters 9 and 80				
PDC VAC #	Basic Drive Item #	HP	KW (*80)	Max VFD Amps (*9)
FR-F720-5-VAC	FR-F720-00340-NA	5	3.70	34A
FR-F720-7.5-VAC	FR-F720-00490-NA	7-1/2	5.5	49A
FR-F720-10-VAC	FR-F720-00630-NA	10	7.5	63A
FR-F720-15-VAC	FR-F720-00770-NA	15	11	77A
FR-F720-20-VAC	FR-F720-00930-NA	20	15	93A
FR-F720-25-VAC	FR-F720-01250-NA	25	18.5	125A
FR-F720-30-VAC	FR-F720-01540-NA	30	22	154A

\*\*Do not use decimal points when entering data in the \*\* parameters above.