MITSUBISHI ELECTRIC
Changes for the Better

Automating the World

FreeFlow

Advanced Anti-Clogging Pump Panel System

FreeFlow

Mitsubishi Electric Automation's FreeFlow is a pre-engineered panel system, created as a cost-effective solution for the water/wastewater, oil & gas, and deep well irrigation industries. FreeFlow is designed to solve issues associated with aging infrastructure, frequent pump failures and the need to reduce energy consumption by 30% to 70% in most applications.

Designed with ease-of-use, implementation, and superior functionality in mind, FreeFlow utilizes Mitsubishi Electric's FR-F800 Series VFD, FX5 Series PLC and GT2500 Series HMI to enable advanced pump system control. Freeflow is available with a wide range of options and can be configured and customized to meet rigorous application demands. With a standard horsepower range of 5 to 250HP, FreeFlow can be built in single or dual drive configurations and is available with a multitude of communication and accessory options that are common across the target industries.

Sustainabilty Benefits

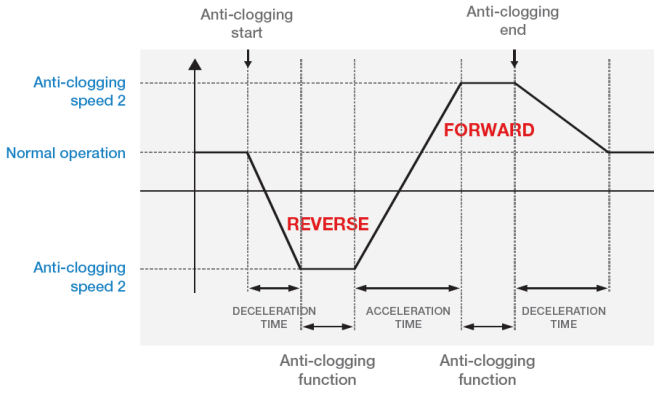
FreeFlow is built with sustainability in mind. Its high-quality components can increase the system's life span by providing reliable, and energy-efficient control. This prolongs the time before the components become e-waste and reduces CO_2 emitted into the Earth's atmosphere.

Advanced Pump Control

Anti-Clog Features Built-in

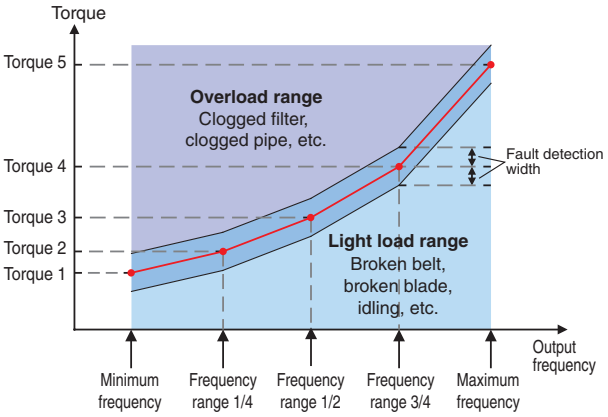
FreeFlow users have the ability to pre-program the anti-clogging feature on the FR-F800 Series VFD. This feature eliminates the need for manual cleaning by performing a sub routine that detects clogs in the pump and alternates pump shaft rotation to free the impeller of foreign debris.

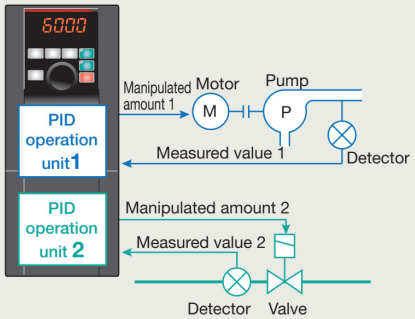
FR-F800 VFDs come standard with auto-tuning and load detection. Auto-tuning reduces time spent programming by determining the most efficient parameter savings for the system. Once auto-tuning is complete, the FR-F800 will automatically create a fault when overload or under-load conditions exist. These valuable features reduce commissioning time and system downtime by proactively setting up the ideal parameters and alerting when system conditions fall outside of ideal settings.

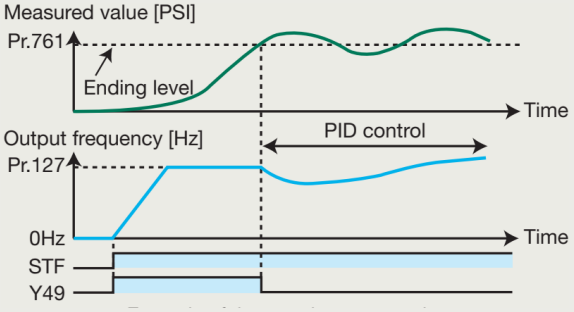


Independent PID Loops

Independent PID loops enable simultaneous control of electric motor operation and external equipment. This important feature eliminates removes the need of an external PID controller to manage auxiliary equipment or critical sensing devices required to ensure proper system operation.







◀ Example of the pre-charge operation (Ending the pre-charge operation based on the measured value)

Additional Features & Benefits

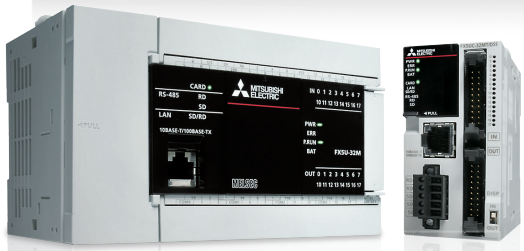
Easy-to-use Interface

All FreeFlow panel systems come standard with Mitsubishi Electric's GT2500 Series HMI to allow:

- Visualization of all critical system parameters
- Data logging of all system faults, alarms, and cleaning cycles
- System troubleshooting
- Programming and parameter setting
- Dedicated monitor screens
- Storage of all manuals and guides

Advanced Control

All FreeFlow panel systems incorporate Mitsubishi Electric's FX5 Series PLC as a standard feature. FX5 enables advanced pump control by facilitating the ability to process external inputs and outputs beyond the capability of the VFD. This feature is critical for systems that have redundancy and require the need to activate a back-up pump should the main pump fail.



Start-up Services

Mitsubishi Electric Automation offers on-site start-up services for all FR-F800 Series VFDs. Our factory trained technicians ensure your drive is commissioned properly. Customers using this service realize value through a start-up that is done quickly and safely, providing a faster return on investment. Furthermore, all FR-F800 Series VFDs commissioned by Mitsubishi Electric Automation receive extended warranty coverage for manufacturer defects for 5 years. VFDs covered under extended warranty are eligible for immediate replacement. You will not have to wait to be approved for replacement product.

FreeFlow How-to-Order Code

The following should be used to configure a given FreeFlow panel to the application requirements.

FF ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Symbol	Configured Panel
FF	FreeFlow

Symbol	Enclosure Type & Display
2	NEMA 12: 10.1" HMI
3	NEMA 3R: 7" HMI

Symbol	Disconnect Type
C (*2)	UL 489 circuit breaker
F	Fused disconnect (65kA SCCR)

Symbol	Input Voltage
2*	200–240V
4	440–480V
6	550–600V

* Limited to 100 HP maximum

Symbol	Drive Quantity
1 (*1)	(1) VFD
2 (*1)	(2) VFD

Symbol	HP Rating
005	5 HP
007	7.5 HP
010	10 HP
015	15 HP
020	20 HP
025	25 HP
030	30 HP
040	40 HP
050	50 HP
060	60 HP
075	75 HP
100	100 HP
125	125 HP
150	150 HP
200	200 HP
250	250 HP

Symbol	Bypass Type
N	Non-bypass
M	Manual bypass
A	Auto bypass

Symbol	Network Options
R	Modbus® RTU
B	BACnet® MSTP
E	EtherNet/IP™
P	PROFINET®

Symbol	Options: Multiple or all can be selected
Blank	No options selected
A	3-contactor bypass with overload and manual control
B (*3)	3-contactor bypass with overload and auto control
C	Manual cleaning switch, door mounted
D	5% AC input reactor (under 150 HP)
E	AC output reactor
F	DC Bus Choke (below 55Kw or 75 HP)
G	Enclosure heater (-20°C ambient applications only)

Additional Ordering Information

Standard front of panel switches include:

- Hand/off/auto switch (HOA)
- Start and stop button
- Speed potentiometer
- VFD bypass (VOB)
- Emergency stop push button

Code Notes

***1. Drive Quantity Option(s):**

- Up to 40 HP limited to (1) VFD for auto-bypass and non-bypass option
- 50HP and above can be ordered with (2) VFDs. (1) VFD for non-bypass

***2. C Option Disconnect Type:**

- **240V:** 15 HP not available in manual or auto bypass option. Use fused disconnect option
- **460V:** 5 and 7.5 HP options use 35kA for circuit breaker, 65kA for fused disconnect option
- **460V:** 150 HP and 250 HP not available in manual or auto bypass option. Use fused disconnect option

***3. B Option:**

- Up to 40 HP utilizes a 3-contactor bypass standard
- 50 HP and above utilize a 4-contactor bypass standard
- No overload included, VFD acts as the overload protection device

Contact Mitsubishi Electric Automation to achieve more energy efficient and sustainable water/wastewater operations.

Automating the World

For a Sustainable Future.

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e-F@ctory

e-F@ctory Alliance

Mitsubishi Electric's e-F @ctory concept utilizes both FA and IT technologies, through collaboration with e-F@ctory Alliance Partners, to reduce the total cost of development, production, and maintenance, with the aim of achieving manufacturing that is a "step ahead of the times".

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