Overview
The **IVSP Industrial Variable Speed Pump** system consists of a 3 phase, high torque, variable speed pump and FM50 variable speed controller.

The FM50 controller is powered by 115 VAC 1 phase and provides 230 VAC 3 phase to power & control the drive motor. Line cord cable to the FM50 and connection cable between the FM50 and motor is supplied.

Features
- FMI's Patented CeramPump® valveless piston pump design
- Rugged, 1/4 HP 3 phase high torque motor ideal for metering viscous fluids
- Space-saving DIN mount controller for installation in process control panels
- Convenient front panel membrane switches with 3 Digit LED to facilitate programming
- Selectable Manual or Analog input (0-10V, 4-20 mA, 0-20 mA) for communication with process instrumentation
- All electronic components

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**SAFETY INSTRUCTIONS**

**Warning!** Fire, electrical shock or explosion may occur if used near combustibles explosive atmosphere, corrosive air, wet environment or submerged in fluid.

- Turn off the electrical power before checking pump for any problems.
- Connect motor, speed controllers, or any other electrical devices based on Fluid Metering Inc. specifications. Any unauthorized work performed on the product by the purchaser or by third parties can impair product functionality and thereby relieves Fluid Metering, Inc. of all warranty claims or liability for any misuse that will cause damage to product and/or injury to the individual.
- Power cables and leads should not be bent, pulled or inserted by excessive force. Otherwise there is a threat of electrical shock or fire.
- Replace any inline fuses only with fuse rating as specified by Fluid Metering, Inc.
- When pump/drive is under operation, never point discharge tubing into face or touch any rotating components of pump. In a power down thermal overload cut-in condition, unplug or turn off power to pump. Always allow a cool down period before restarting; otherwise, injury or damage may occur.
- For 30 seconds after power is removed from pump/drive do not touch any output terminals. Electrical shock may occur because of residual voltage.

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For additional references see manuals FM50, H431, & Q431
**Note:** Prior to applying power to the controller carefully read all warnings and safety precautions in the *Flux Master FM50 Instruction Manual & User Manual*. Failure to adhere to the warning and safety precautions could result in injury and damage to property. **IMPORTANT: DO NOT EXCEED SPEED OF 60 HZ.**

**Note:** The FM50 comes with factory default settings. Care should be taken when changing these values. To restore the drive to the original factory default values see “Restore Factory Default Settings” in this document.

**Quick Start (Initial operation “out of the box”)**

**Initial Use:**
1. Connect cable from motor to controller per FMI outline drawing 600173.
2. Connect AC cord to controller per FMI outline drawing 600173.
3. Plug line cord to 115 VAC 50/60 Hz source.
4. Controller will display 5.0 (150 RPM).
5. Command a RUN by pressing the RUN/STOP button. Motor will spin CW to 150 RPM.
6. Pushing the UP/DOWN buttons will increase/decrease the speed accordingly.
7. Factory default maximum frequency is 60 Hz (1800 RPM). *Care should be taken not allow the maximum frequency to exceed 60 Hz (1800 RPM).*

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![Controller Diagram](image)
Foot Switch Operation (Run/Stop mode):

To use the controller with a standard “dry contact” switch to control Start/Stop and direction the following settings should be made.

1. Set F_10 to 1 ***
2. Connect pin 3 to Pin 5 of TM2. Motor will start to accelerate until set frequency is reached.
3. Direction can be controlled by via TM2 pin 4 to TM2 pin 5.
   a. TM2 pin 4 open spins motor in the Forward direction
   b. TM2 pin 4 connected to TMP2 pin 5 TM2 pin 4 open spins motor in the Reverse direction

Analog Frequency (Speed) Command:

To control the frequency (speed) of the motor via 0 – 10 VDC, 0 – 20 mA or 4 – 20 mA the following settings should be made.

1. Control type setting (F_11) ***
   a. For 0 – 10 VDC / 0 – 20 mA input set F_11 to 1
   b. For 4 – 20 mA set F_11 to 2
2. Input control signal into TM2 pin 9
   a. For FM_11 = 1 use 0 – 10 VDC or 0 – 20 mA
   b. For FM11 = 2 use 4 – 20 mA
3. Command Start via Keypad

Restore Factory Default Settings:

To return the drive to a factory default, perform the following steps.

1. Restore factor fault (F_25) ***
   a. For 50 Hz system set F_25 to 10
   b. For 60 Hz system set F_25 to 20

*** To Change Function (F ) value:

Press [DSP] to get to desired function

Press [ ] to select desired function value

Press [DATA] to select function

Press [ ] to select function value

Press [DATA] to accept value
IVSP1 SPECIFICATIONS

PUMP DRIVE MODULE

COVER PLATE

T1 (INTERNAL) RED

T3 (INTERNAL) BLACK

T2 (INTERNAL) WHITE

COUPLING DRIVE MODULE FOR REFERENCE ONLY

POWER CORD 115VAC INPUT (6 FT LENGTH)

L2 (BLUE)

L1 (BROWN)

GND (GREEN/YELLOW)

SPARE

M4 X 7 TAPPED HOLE FOR GROUND BRACKET

GROUND BRACKET

3X Ø 18 [4.5]

TO CONTROLLER (6 FT LENGTH)

TA

TA

VIEW A-A MOTOR MOUNT

DIN RAIL ADAPTER PLATE (OPTIONAL)

FROM MOTOR

T1 (RED)

T2 (BLACK)

T3 (WHITE)

GND (GREEN)

NOTE: DIMENSIONS ARE IN INCHES [MILLIMETERS] TOLERANCES UNLESS OTHERWISE SPECIFIED:
X = ±0.06 [1.5]  XX = ±0.02 [0.5]

SPECIFICATIONS:
MIN SPEED 60 RPM @ 2Hz
MAX SPEED : 1800 RPM @ 60Hz
INPUT : 115VAC, 50/60 Hz

FMI P/N IVSP1

IVSP1 OUTLINE

5 Aerial Way, Suite 503 Syosset, NY 11791

TITLE

GWG NO

REV

SHT 1 OF 1

600173

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