Product Description

The FD60 LMR Controllers utilize an autotransformer that is inserted in the power supply to the motor to reduce the voltage at the motor terminals and to provide a smooth acceleration. The main contactor by-passes the autotransformer after a short acceleration time and applies full voltage to the motor terminals. Starting line current is 28% of the across-the-line starting inrush for controllers 60HP and up; 45% of across-the-line starting inrush for controllers 50HP and smaller. The FD60 can be programmed for either fully automatic or semi-automatic operations.

The use of an embedded web page for retrieving diagnostics and history reports, along with USB and Ethernet communication ports for downloading data, make the LMR Plus Series of controllers easy to troubleshoot and maintain. As well, critical information can be easily accessed and used for report generation and analysis, which aids in providing effective, reliable fire protection.

Product Features

Logic Controller Board
Communication
The controller can be ordered with the option to display and output current values and status, on command, from various software protocols through the appropriate port(s).

Embedded Web Page
The web page is a multifunction tool that allows the user to view the controller's current status, data values, programmed set points and history. It is accessed using the optional ethernet port.

Ethernet Port
An optional Ethernet port can be used for direct connection to a computer for data transfer.

RS485 Serial Port
An optional RS485 serial port can be provided for communication to various external software programs.

USB Port / USB Drive
The logic controller board is equipped with a USB port that can be used to transfer data to and from a portable USB Drive device (memory stick).

Buzzer
A buzzer is mounted on the logic board which will operate if Fail to Start, Hardware Malfunction or any Common Alarm condition exists.

Power I/O Board
Transformers
Incoming line voltage is run directly to the I/O board from the incoming lines. The I/O board will accept voltage inputs between 100 and 600V.

Customer Connection Terminals
Connection terminals for external customer connections, are located at the top of the Power I/O board.

Output Relays
Five, 8 Amp, 2 Form - C (DPDT) output relays are provided standard on each power I/O board. They are designated for: Common Alarm, Phase Failure, Phase Reversal, Pump Run and Future #1. Each socket has an LED mounted on the I/O board which indicates each relay's coil status.

Optional Output Relay Boards
There is provision to add up to eight additional relay outputs, via optional relay output boards. Each board contains a maximum of 2 additional relays. The Power I/O Board will accept a maximum of 4 optional boards which mount in a snap-on configuration.
Each board provides an area for the user to label the terminal number and relay name.

Drain Valve Solenoid
All LMR Plus electric controllers are equipped with a drain valve solenoid used for weekly test purposes.

USB External Drive
General
When using an external USB Drive, the drive should conform to the following specifications:

Min: 128mb
Max: 2 Gig FAT16 protocol
USB 1.0 or 2.0

NEMA 2 Enclosures
All LMR controllers come standard with NEMA 2 enclosures unless otherwise ordered. Available options include: NEMA 3R, 4, 4X, 12.

Emergency Start Operator
A mechanically operated emergency start handle activates the motor contactor independent of any electrical control circuits or pressure switch input.

Membrane Keypad
Door Mount
The membrane keypad is accessible from the front door of the controller.

NEMA Rating
The standard membrane keypad is rated for NEMA 2, 3R, 4, 4X and 12.

Alarm & Status LED's
A total of 20, (10 Status - 10 Alarm) LED's provide indication on the membrane keypad.

Status LED's	Alarm LED's
Power On	Phase Reversal
Pump Running	Phase Failure
Local Start	Fail To Start
Remote Start	Undervoltage
Deluge Valve	Overvoltage
Emergency Start	Low Room Temperature
Interlock On	Locked Rotor Trip
Low Pressure	Low Suction Pressure
Auto Shutdown Enabled	Source 2 Disconnected
Programmable LED # 1	Programmable LED # 2

Silence Button
A silence pushbutton on the membrane can be used to silence the buzzer. When an alarm condition exists, the alarm buzzer will sound. If the Silence Alarm button is pressed, the alarm buzzer will turn off. If a subsequent alarm condition occurs after the silence button is pressed, the buzzer will re-sound. Pressing the Silence Alarm button again, will silence the buzzer.

Motor Test Button
The motor test button on the membrane can be used to simulate an automatic start.

Automatic Shutdown Enabled
When the Automatic Shutdown function is enabled, a Green LED will indicate on the controller membrane.

Standards & Certification

The LMR Plus Electric Fire Pump Controllers meet or exceed the requirements of Underwriters Laboratories, Underwriters Laboratories Canada, Factory Mutual, the Canadian Standards Association, New York City building code, CE mark and U.B.C / C.B.C. Seismic requirements, and are built to NFPA 20 standards.
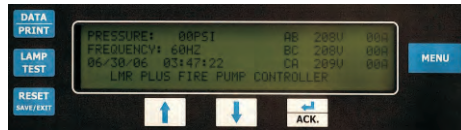
Product Features

Main Display

General
The main display will show the current system pressure, time and date, voltage and amps reading for all three phases, the system frequency and any custom messages, alarms or timers.

Programmed Set-Point
The set-point display will show programmed pressure start point, pressure stop point and weekly test timer setting.

Statistics
The statistics display will allow the user to scroll through all of the measured statistics stored in memory. Refer to LMR Plus operation manual IM05805020K for specific details.

Diagnostics
The diagnostics display allows the user to scroll through various diagnostic points to assist with troubleshooting the system.

Message History
The user will be able to scroll through all of the messages stored in the memory of the controller with the most recent message being displayed first.

PRINT Menu

Description
All fault and alarm information is sent to the USB and optional printer on demand, as well as the status of each output. The LMR Plus will store up to 10K events which are time and date stamped. All information can also be retrieved and displayed on the LCD display.

Saving to USB Drive
The controller will save four separate text files, one CSV file and the embedded webpage to the USB external drive. The files, at maximum size, can be saved multiple times on one 128MB USB drive.
Files to be saved are: Status Report, Diagnostics Report, Statistics Report, Configuration File and Last 10K Messages.

Print Menu
The optional printer menu is accessed in order to select the desired print function.
Functions include: Print Messages, Last XX Messages, Date & Time, Status Report, Diagnostics Report and Statistics Report.

Custom Messages
When this item is selected, custom messages can be cleared from memory or downloaded from the USB external drive.

Firmware Update
Firmware revisions are updated from an external USB drive. All previously programmed settings will remain intact when updating is completed. Should there be an update failure, the controller will automatically revert back to the previous version of firmware.

Embedded Web Page

General
The embedded web page is a multifunction tool that will allow the user to view the current status of the controller as well as display all current readings, set points, and history. An external computer can be connected via the optional Ethernet port to access the page. When connected, the controller set points can be programmed via the webpage.

Multiple Pages
There are 5 viewable pages that show the Main Display, Statistics, Diagnostics, History and Programmed Set Points.

Pressure Points
The pressure reports recorded in memory can be graphed and/or sorted based on date and time.

Programmed Set Points
All of the programmed set points and their current status can be viewed via the webpage.

Custom Messages
Users can create custom messages on a computer and upload to the controller using a USB Drive (memory stick). Up to 10 custom messages of up to 100 characters each, will continuously scroll across the fourth line of the LCD display once triggered.
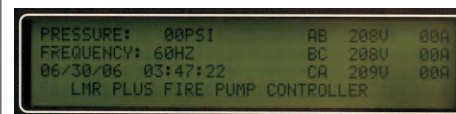
Trigger Points
The message can be programmed to appear at specific trigger points such as specific date and time, specific number of operations, specific number of hours run or at any individual alarm point.
All of the trigger points can be selected as And/Or values.

Programming Menu

General
The LMR Plus programming menu is divided into 8 different sub-menus. Each sub-menu contains information relative to it's particular function. Following is a brief description of each sub-menu.

Language
The language sub-menu allows the user to select English, French, Spanish or Other languages to be viewed on the LCD Display. Several other languages can be uploaded into the controller. Contact the factory for details.

Regional
Regional settings include the ability to program the date by adjusting the Month, Day, Year and Day of Week. As well, the Current Time can be adjusted on the 24 hour clock.

Pressure
A variety of pressure settings can be programmed in the pressure sub-menu. These settings include disabling the pressure transmitter; setting of the start point, stop point, low pressure alarm, high pressure alarm, stop mode, proof pressure switch (for foam units), low suction shutdown (low foam shutdown), pressure deviation and hourly pressure recording. Refer to the LMR Plus operation manual IM05805020K for details.

Timers
Timers in the LMR Plus that can be programmed include: Run Period Timer (RPT), RPT Start Mode, Acceleration Timer (AT), Weekly Test Timer, Fail to Start Timer (FST) and Sequential Start Timer (SST). Refer to the LMR Plus operation manual IM05805020K for details.

Alarm Set Points
There are five settable alarm points that can be programmed by the user. They include: Phase Rotation, Over Voltage (OV), Under Voltage (UV), Over Frequency (OF) and Under Frequency (UF). Refer to the LMR Plus operation manual IM05805020K for details.

Custom Inputs / Outputs
There is provision on the Power I/O Board to accept up to 9 additional inputs and 9 additional outputs. Each of the inputs can be labeled using one of 11 pre-set input descriptions or assigned a custom description that is programmed by the user. The optional outputs can be programmed to indicate up to 25 output conditions. As well, two optional alarm LED's can be programmed for up to 12 alarm conditions.
All optional inputs, outputs and LED's can be linked, as required.
Inputs can be programmed to energize the common alarm output, link to relays and optional LED's and latch until reset by the user.
Outputs can be programmed for fail safe and latch until reset by the user.
Optional inputs and outputs can be programmed with time delay functions.

System Configuration Menu
The system configuration menu section is password protected and contains settings such as system voltage, frequency, CT ratio etc. Refer to Technical Bulletin PU05805035K/D for details.

Main Menu Password
A password can be programmed by the user to protect access to the Main Menu. Refer to the LMR Plus Operation Manual IM05805020K for details.