

**DESIGN
ENVELOPE®**

Fire Pump

Self Regulating Variable Speed
Fire Pump Technology

In compliance with NFPA 20, 2022 Edition

SOLUTION OUTLINE

FILE NO: F100.10
DATE: JANUARY 2024

SUPERSEDES: F100.10
DATE: JULY 2021

THE HEART OF FIRE SAFETY NOW HAS A BRAIN

A

DESIGN ENVELOPE TECHNOLOGY®

Armstrong, the leader in intelligent pumps, offers innovative solutions that reduce costs dramatically, improve the safety of your tenants and protect your property and assets.

Design Envelope Fire Pumps

reduce the design, installation, materials and maintenance costs for fire sprinkler systems. They also improve building safety and maximize available space.

Armstrong Design Envelope Fire Pumps are a complete solution for fire suppression systems

Integration of perfectly matched components :

controls, pumps, variable speed controller and safety auto bypass

Design Envelope demand-based technology meets the required flow demand of sprinklers.





FIRE PUMP MANAGER

Fire Pump Manager ensures reliable performance in fire suppression systems.

Ensure the safety of building occupants through fully transparent testing

Optional notifications of every operating instance and any issues, both existing and predicted

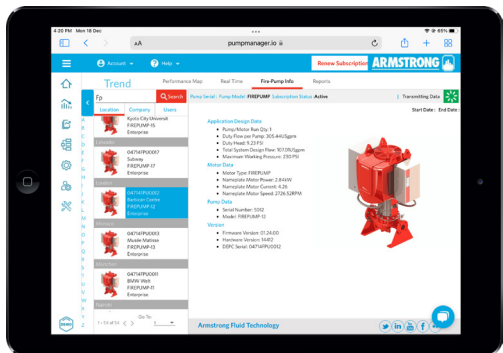
Easy access to test results and performance dashboards

Convenient review of data - at the pump, or remotely

Internet connection facilitated by an Armstrong Connectivity kit (included)

Reminders and notifications regarding scheduled tests

Added safety for building occupants through fully transparent testing



Step up to Active Performance Management

Fire Pump Manager is a secure cloud-based subscription service that connects to existing BAS, CMMS and EMS systems. Fire Pump Manager leverages deep analytics to assess pump status and identify trends.

Detailed performance insights and early diagnostic warnings

Reduced pump maintenance costs through predictive maintenance

Clear, accessible reports showing Suction, Boost & Discharge pressures, flow and motor rpm

30% INSTALLED COST SAVINGS

on your total fire pump system and PRV costs

Design Envelope Fire Pumps bring designers and contractors savings opportunities far beyond standard variable speed control solutions supplied with constant speed fire pumps.

Design Envelope Fire Pumps save on installed costs with:

Smaller fire pump controllers: with soft-start features included in the onboard frequency converter

Precise control of pressure and flow eliminates the need for PRVs on select floors

Complete solution including pump, bypass and adjustable speed drive at a fraction of the price of a traditional wall mounted AFD - Adjustable Frequency drive controllers

Design Envelope Fire Pumps include the NFPA SRVSFP unit function of

Auto bypass

Adjustable frequency drives

motor

Pump assembly

User interface display

Pressure transducers

Speed control logic

NFPA 20 compliant

Design Envelope Fire Pump comply with NFPA 20 as Self-Regulating Variable Speed Fire Pump Units

Project example of cost savings with Design Envelope Fire Pump



In high rise applications, sprinkler system designers can eliminate drain line piping parts and installation labour related to PRVs in branch lines, plus annual service for all those components.

ON FLOORS WHERE PRVS ARE ELIMINATED

Case Study for High Rise Building - 14 Story Building

1000GPM @ 150PSI

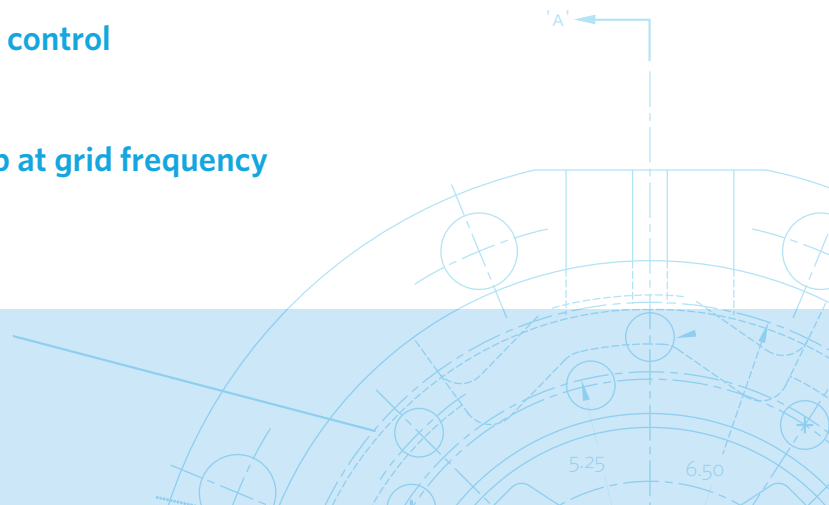
Suction Pressure Range: 50 - 80PSI

Fire Pump Controller: **Soft Start with Transfer Switch**

3 standpipe (Sprinklers), 3 wet risers (Fire Hose Cabinet), assuming 1 PRV | Level of floor | riser

THREE OPERATING MODES FOR IMPROVED SAFETY AND SYSTEM PRESSURE CONTROL

- 1 Principal operating mode**
Constant discharge pressure speed control
- 2 Ancillary operating mode**
Constant boost pressure speed control
- 3 Bypass operating mode**
Auto bypass operates the pump at grid frequency





Cascading Installation Savings

A Design Envelope Fire Pump reduces installed cost by eliminating the need for PRVs on select building floors.

Your fire pump installation can also use a smaller, less expensive controller.

The smaller controller may also reduce the cost for electrical infrastructure.

Contractor

//////////
\$53,000

Building owner

//////////
\$12,500

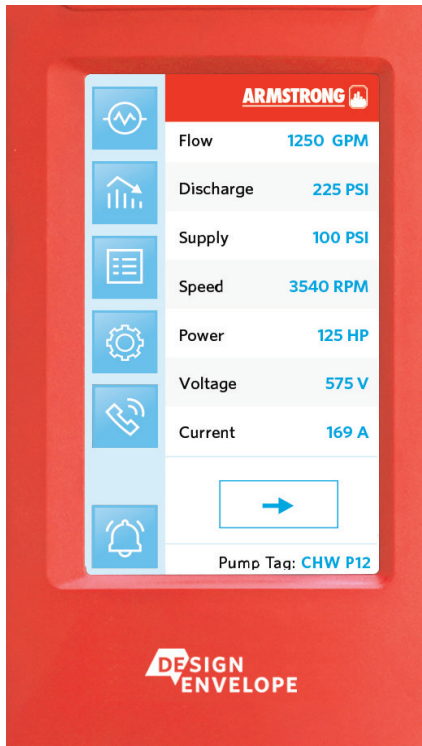
ANNUAL SAVINGS - TYPICAL INSTALLATION

SERVICE DESCRIPTION	CONSTANT SPEED FIRE PUMP	DESIGN ENVELOPE FIRE PUMP
MONTHLY TEST	ON SITE	OPERATING DATA CLOUD CAPTURE
PRV QUARTERLY INSPECTION	\$9,750	\$750
PRV REPLACEMENT	\$3,900	\$300
PUMP FLOW TEST	\$750	\$1,000
TOTAL COST	\$14,400	\$2,050
SAVINGS		\$12,350

Savings may vary according to location, material costs and number of building floors.



VALUE PROPOSITION



More flexibility in piping system ratings and sizes

Reduction of PRVs and associated drain lines

Increased safety by reducing failure points

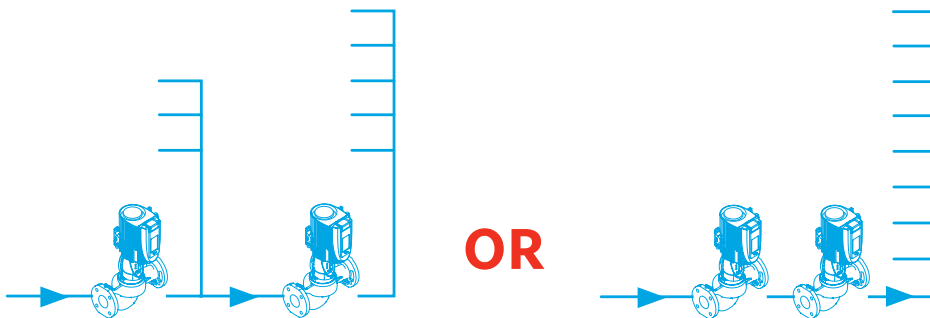
New self-diagnostic capability

Simpler installation with a fully factory integrated fire pump unit

Reduced site work scope for power cabling

Flow and boost pressure readings at the pump for easy reference during annual flow testing

More operating modes prior to reverting to constant speed, further protecting the sprinkler system



Design Envelope Fire Pumps, installed in series, typically require smaller driver sizes than single hsc pumps. This design change reduces the floor space requirement by up to 30%.

Design Envelope Fire Pumps are pre-engineered to work in series configurations for the needs of today's taller buildings, with ratings up to 360 PSI

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