



**DESIGN
ENVELOPE**



Vertical In-Line Retrofit

SOLUTION OUTLINE

FILE NO: 100.19UK
DATE: MARCH 2017

SUPERSEDES: NEW
DATE: NEW

FORWARD THINKING | RETROFIT

Armstrong's Design Envelope Vertical In-Line Retrofit is a unique retrofit solution that replaces all of the moving parts of a pump, but leaves the existing casing in place.

It's a solution that lets building owners with Armstrong Vertical In-Line pumps revitalize their HVAC system and get all the benefits of Armstrong's industry-leading Design Envelope Sensorless technology at a reduced first cost.

**ENERGY
SAVINGS**

UP TO 70%

Design Envelope technology combines the largest, high-efficiency operating range with sensorless, demand-based control for optimal performance. Upgrading an HVAC system from constant flow to variable flow using Design Envelope can reduce pump operating costs by up to 70%. Even in constant speed HVAC systems, using design envelope technology to maintain the exact flow rate required can reduce pumping costs by 15 to 20%.

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**All the value of Design Envelope
at an even lower first cost**

Cut out the cost of a new casing, new insulation and required pipe pressure testing. The retrofit installation takes less time and reduces the impact on your building operation.

Armstrong Design Envelope pumps also eliminate the need for separate wiring to a drive on the wall. Sensorless technology is embedded in the Design Envelope controller so you avoid the costs for purchase, installation and wiring of differential pressure sensors. Sensorless technology also provides accurate flow monitoring ($\pm 5\%$).

Flexible performance

Standard variable speed controllers can't match the performance efficiency and flexibility of a Design Envelope solution.

Performance management services

Pump Manager is available for all connected pumps as a cloud-based service

Improved reliability

Design Envelope pumps deliver longer motor life through soft starts and reduced operating speeds (20–30%). Sensorless technology also eliminates long-term costs associated with sensor location, accuracy drift and maintenance.

PERFORMANCE PACKAGES

FUNCTIONS INCLUDED



Sensorless Bundle
(standard)

- Sensorless Control
- Flow Readout
- Constant Flow
- Constant Pressure



Parallel Sensorless Bundle

- Parallel Sensorless Control



Energy Performance Bundle (requires Sensorless Bundle)

- Auto-Flow Balancing
- Maximum Flow Control



Protection Bundle (requires Sensorless Bundle)

- Minimum Flow Control
- Bypass Valve Control



Zone Optimization

- 2 Sensor Control



Dual Seasonal Setup

- Dual Seasonal Setup

KEY FEATURES

Sensorless technology calculates precise flow-rates to monitor and control motor speed

Exact match of rotating components to existing casing

Factory testing and calibration of every individual Design Envelope pump

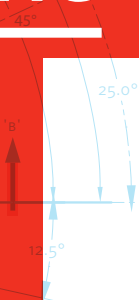
Precise demand-based control of pump speed

Built-in WiFi connectivity

Optional Performance Management services

KEEP THE CASING

ADD THE INTELLIGENCE



TORONTO

23 BERTRAND AVENUE
TORONTO, ONTARIO
CANADA
M1L 2P3
+1 416 755 2291

BUFFALO

93 EAST AVENUE
NORTH TONAWANDA, NEW YORK
U.S.A.
14120-6594
+1 716 693 8813

BIRMINGHAM

HEYWOOD WHARF, MUCKLOW HILL
HALESOWEN, WEST MIDLANDS
UNITED KINGDOM
B62 8DJ
+44 (0) 8444 145 145

MANCHESTER

WOLVERTON STREET
MANCHESTER
UNITED KINGDOM
M11 2ET
+44 (0) 8444 145 145

BANGALORE

#59, FIRST FLOOR, 3RD MAIN
MARGOSA ROAD, MALLESWARAM
BANGALORE, INDIA
560 003
+91 (0) 80 4906 3555

SHANGHAI

NO. 1619 HU HANG ROAD, XI DU TOWNSHIP
FENG XIAN DISTRICT, SHANGHAI
P.R.C.
201401
+86 21 3756 6696

SÃO PAULO

RUA JOSÉ SEMIÃO RODRIGUES AGOSTINHO,
1370 GALPÃO 6
EMBU DAS ARTES
SAO PAULO, BRAZIL
+55 11 4781 5500

For more information, contact your
Armstrong representative or visit us at
[ArmstrongFluidTechnology.com/en-gb/
help-and-support](http://ArmstrongFluidTechnology.com/en-gb/help-and-support)



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