



DESIGN
ENVELOPE

iFMS
Intelligent Fluid
Management System

SOLUTION OUTLINE

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SUPERSEDES: 81.161EC
DATE: FEBRUARY 2019

Your projects deliver enduring value. Long after the work is finished, a successful building project represents your company and stands as a testament to your commitment to solution quality.

DESIGN ENVELOPE

To make your next project an even greater success, Armstrong offers a solution for both commercial and industrial facilities: the Design Envelope iFMS.

The image shows a large, industrial-grade Armstrong Design Envelope iFMS pump station. It features a prominent red horizontal pipe with two vertical risers on either side. The risers are equipped with blue handwheels for manual operation. Below the main pipe, there are two large red circular components, likely motor bases or control units, with the Armstrong logo and '10' visible. A central grey control cabinet with a digital display and various buttons is mounted on a metal frame. The entire unit is supported by a sturdy metal structure. The background is a light blue gradient with faint technical drawings of mechanical parts.

Serving both chilled water and hot water applications, the Design Envelope iFMS is a prefabricated all-variable pump station that creates value for all members of the community in a new-build or retrofit project.



UP TO
50%
**LOWER LIFE
CYCLE COST**

THE VALUE

THE RESULT

**Simplified mechanical
room design
through drag and
drop of 3-D CAD models**

**Faster design.
Savings on design
time and component
selections**

**Modular construction
approach offering
greater design flexibility**

Project risk reduced

**Fast and easy
installation**

**Lowest installed
cost**

Energy savings

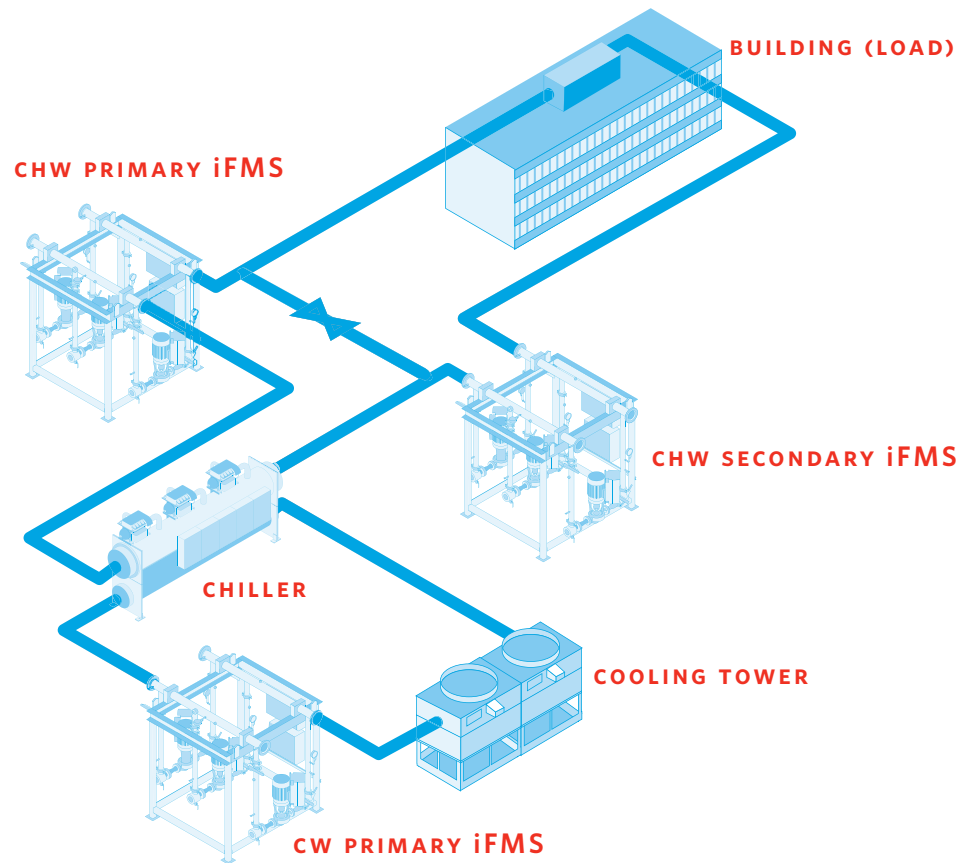
Lowest life cost

**Confidence in
system design and
manufacturing
quality**

**Reduced risk
with ensured quality
and performance**

SYSTEM

INTEGRATION



ENERGY SAVINGS

UP TO **70%**

FOR DETAILS ON

- Design Envelope selections
- Demand-based variable speed operation
- Sensorless technology

please see the [Design Envelope iVS solution outline](#) (FILE NO. 100.11)

DESIGN ENVELOPE

Drawing on Armstrong's Design Envelope technology, the pumps in an iFMS system integrate a perfectly matched Vertical In-Line pump, motor and intelligent controller. Armstrong has re-invented and redesigned pumping solutions to include connectivity and performance management services. Design Envelope pumps deliver optimal lifetime efficiency through:

Expanded performance range and options

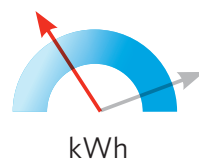
One-touch auto-flow balancing

Pump speed modulation based on an adjustable quadratic control curve for best part-load efficiency

Flow measurement accuracy (+/- 5%)

On-board data and diagnostics to provide performance information

The Design Envelope approach to sizing uses a combination of **OPTIMISED IMPELLER SIZE AND SPEED CONTROL** to establish a range or envelope for most efficient operation.



kWh



	CONTROL CONFIGURATION	SCOPE OF CONTROL	SYSTEM INTEGRATION
①	Design Envelope pumping system, integrated with IPC 9500 controls	All variable speed chiller plant — including multiple pumps, chillers, cooling towers and valves	Advanced chiller plant controller, independent of BMS systems
②	Design Envelope pumping system, integrated with IPS 4000	Optimised control of multiple parallel pumps	Dedicated/Standalone pump controller that easily integrates with major BMS systems
③	Integrated Design Envelope Control	Individual pump control in Sensorless mode	Integration with major BMS systems

① Integrated controls with Design Envelope IPC 9500

The Armstrong Design Envelope Integrated Plant Controller (IPC) 9500 is a dedicated chilled water plant automation system designed for occupant comfort and energy efficiency. The IPC uses patented control technology that allows typical chiller plants to operate at 7.0 cop (0.5 kW/ton) on an annual average basis*.

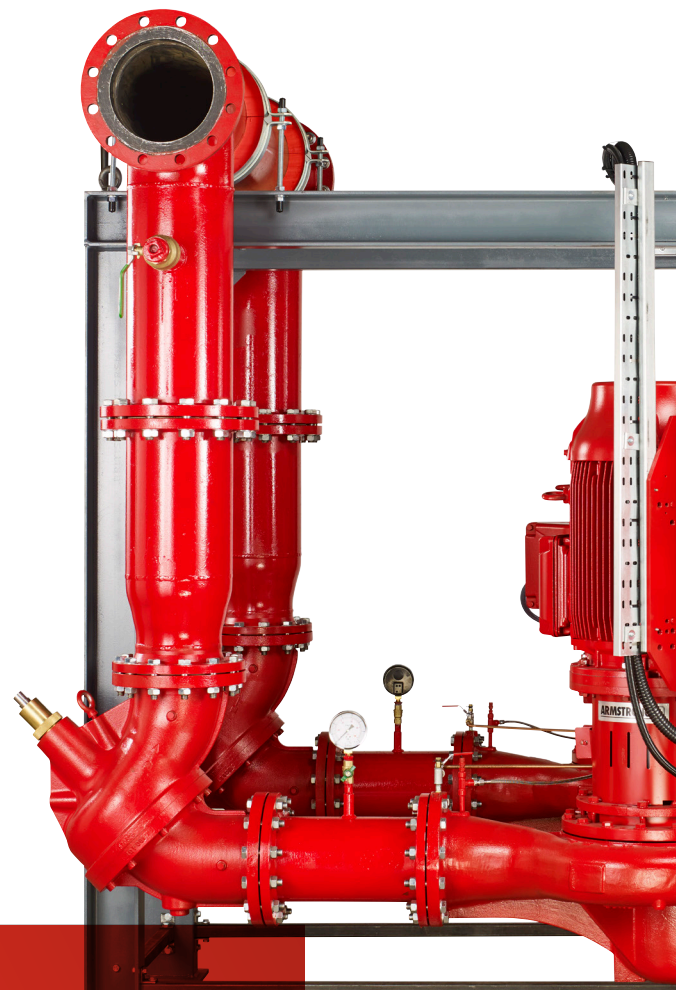
② Integrated controls with Design Envelope IPS 4000

The Armstrong Design Envelope IPS 4000 is a high-value controller solution. The IPS 4000 provides control of multiple parallel pumps in Sensorless mode, optimised pump efficiency and seamless compatibility with major BMS systems.

③ Integrated controls with Design Envelope Sensorless technology

The Sensorless intelligence embedded in Armstrong Design Envelope pumping units can adjust output to meet the immediate load on the HVAC system without relying on external sensors.

* And by including connectivity and performance management services with Eco*Pulse helps your chilled-water plant to maintain optimal operating efficiency and minimize unexpected maintenance costs.



Armstrong Design Envelope iFMS packages provide value far beyond a pumping system assembled from loose components. For savings in design time, installation and related project costs, as well as energy and maintenance costs, talk to your Armstrong representative about the Design Envelope iFMS.

CONSTRUCTION DETAILS

Pipe header system

Goal post structure

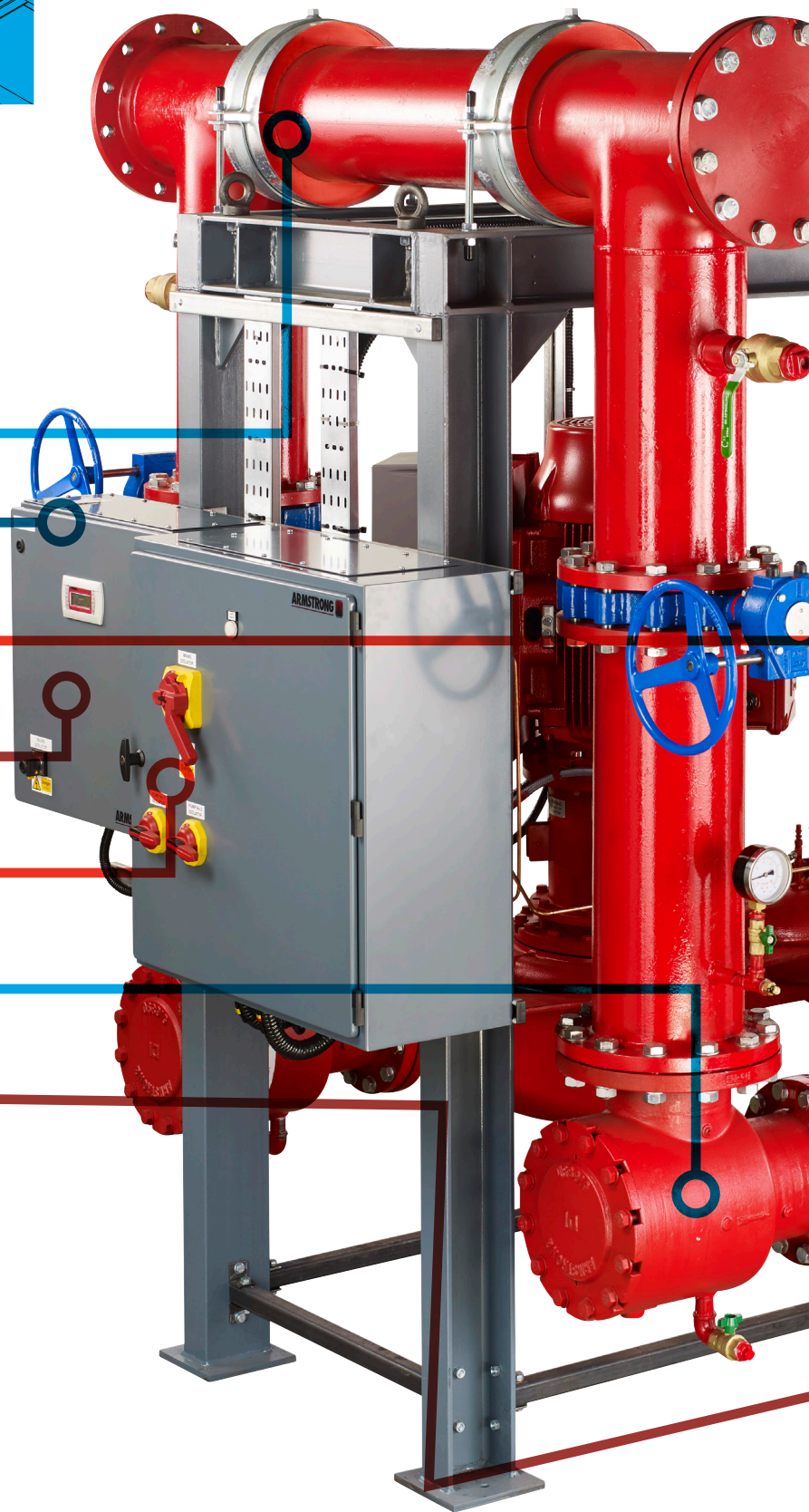
Design Envelope
4300 pumping units

Chiller plant control

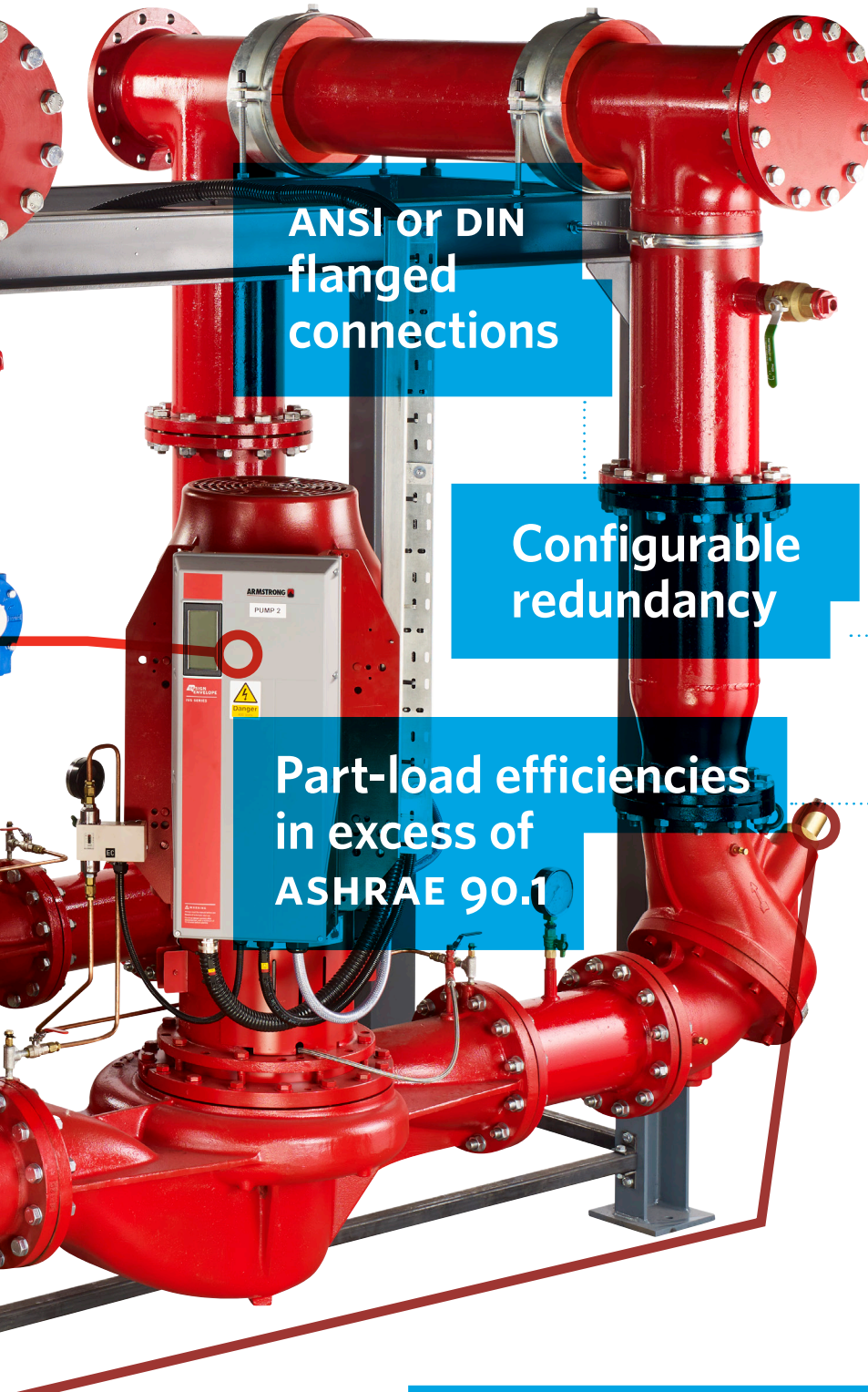
Single point
power panel

Suction guide

Flo-Trex triple
duty valve



KEY FEATURES



ANSI or DIN
flanged
connections

Configurable
redundancy

Part-load efficiencies
in excess of
ASHRAE 90.1

Delivery to site
as a single,
complete unit

Factory functional
tested and
pre-commissioned

Configurations
for indoor or
outdoor use

EN 1090 & IBC
structural
compliance*

Three levels
of control
automation

*Seismic category:
D; occupancy category: II
IBC International Building Code

iFMS APPLICATION RANGE

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ARMSTRONG FLUID TECHNOLOGY
ESTABLISHED 1934

Chilled water systems

Chilled water primary, chilled water
secondary and condenser loop

District cooling

Hot water systems

Hot water distribution loop

District heating

For more information, contact your
Armstrong representative or visit us at
armstrongfluidtechnology.com/ContactUs



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