



**BUILD YOUR  
PLANT**

**DESIGN  
ENVELOPE**

**Integrated Plant  
Package (IPP)**



**SELECTION GUIDE**

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# MAKING ENERGY MAKE SENSE™

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## System connections

To improve flexibility and lower installation costs, the Design Envelope IPP system has standard grooved piping connections on each side of the plant to accommodate connection to double sided chilled water, tower water, free cooling, emergency chiller and drain lines.

## Instrumentation and sensors

For best practice the Design Envelope IPP incorporates instrumentation and sensors that deliver to the most stringent industry tolerances and comply with monitoring LEED standards of +/- 0.5% accuracy on efficiency calculations for the plant, by employing technologies such as magnetic flow meters.

## Water-cooled chillers

For best efficiency and lowest lifecycle cost, the Design Envelope IPP system has oil-free magnetic bearing compressors. This design builds redundancy, lowers noise, and reduces plant size. For reliability of operation the Design Envelope IPP uses flooded heat exchangers and expansion valves.

## Weather-proof enclosure

The optional weather-proof enclosure reduces project risk and construction costs. The enclosure meets mechanical and design standards including ASHRAE standard 15. Construction details include air conditioning, heating, lighting, refrigerant leak detection, emergency exhaust, ventilation, service doors, satin coated, galvanized steel 16 gauge walls, 150 mph wind rating and seismic zone D rating.

## Fluid flow equipment

System components are carefully selected to optimize efficiency, minimize maintenance, improve reliability and ensure performance at commissioning. Intelligent variable speed (IVS) pumps, variable flow inertia based Dirt and Air Separator (DAS), variable primary flow bypass valve, suction guides with strainers, and butterfly shut off valves all operate at peak efficiency throughout the performance range of each Design Envelope IPP.

## Integrated plant controls

The Design Envelope IPP is integrated for best performance employing the Hartman LOOP™ control sequencing. This integrated control philosophy optimally synchronizes all components for peak efficiency. The award-winning performance levels of the Armstrong Design Envelope IPP are 30 to 60% better than other best-in-class solutions.

## Electrical gear

Electrical component construction includes: liquid tight conduit, NEMA type 12 / IP 52 enclosures, 104°F (40°C) operating design, all necessary disconnects, lockout points and circuit breakers, fed off an external single point power supply. Selections of this quality ensure compliance with state and local electrical codes.

## Cooling tower

When selected as an option, the cooling towers are integrated to maximize plant efficiency using variable speed pumps and variable speed fans. The counter-flow cooling towers are capable of operating efficiently at low turndown ratios (50% or more of full design flow). Each tower includes either one or two fans, fill and interconnected basin.

## Pedestal kit

Available only with the cooling tower and weather-proof enclosure, the pedestal kit simplifies installation and reduces project risk. It includes a tower water treatment system, interconnecting piping, electrical and side stream separator with basin sweeper. When selected, the pedestal kit includes a ladder and a pipe kit. A cold-weather package is also available as an option.

# Configuring a chilled water plant for your facility involves only a few key decisions.

This selection guide will help you through every step.

**A**rmstrong Design Envelope Integrated Chilled Water Plant Packages are offered as complete chilled water plant solutions that provide industry-leading value.


- Easy Installation, reliability and risk reduction
- Flexibility to accommodate change
- Lowest installed cost and lowest lifecycle cost
- Configurations to fit almost any project
- Professional project management
- After-sale support

Armstrong Design Envelope Integrated Chilled Water Plant Package units are configurable to meet the needs and wants of a wide range of customers. The process of configuring DE IPP CHW will show you the many options available.

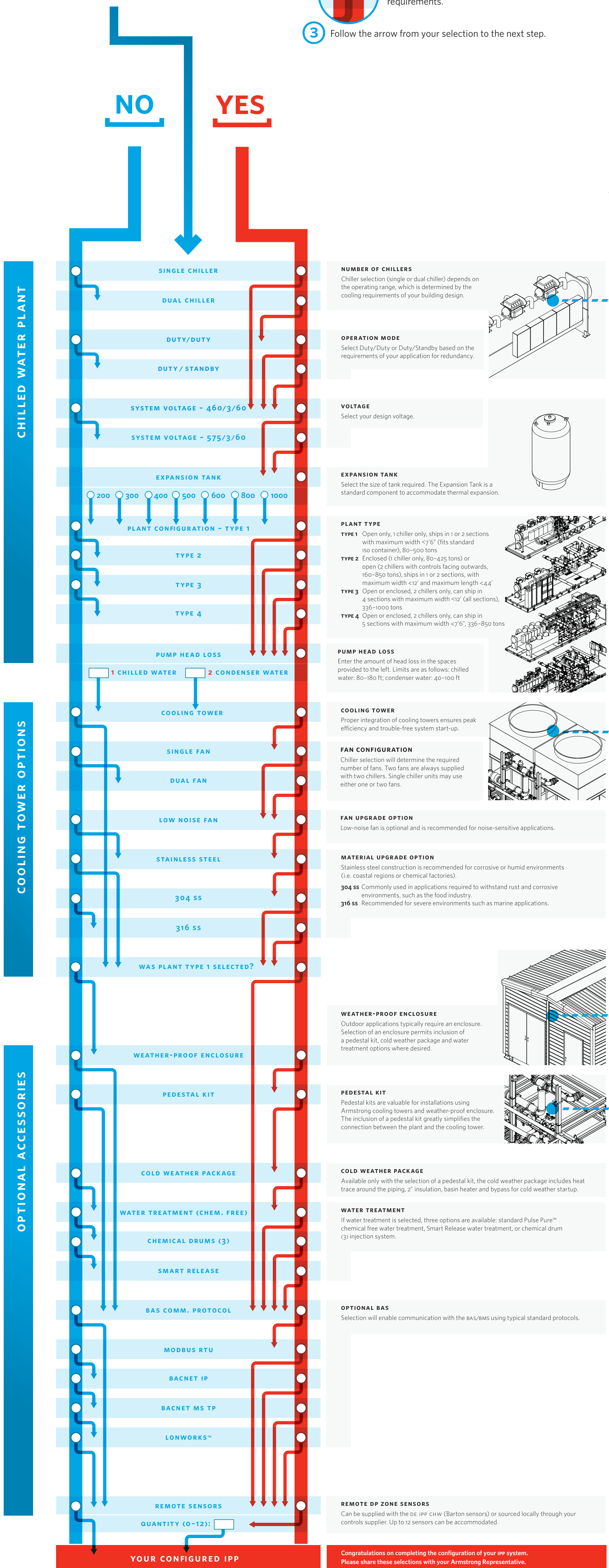
For your next commercial building project from 80 to 2000 tons, your choice of an Armstrong Design Envelope Integrated Chilled Water Plant Package represents the best business decision that you could make.

# BUILD YOUR PLANT

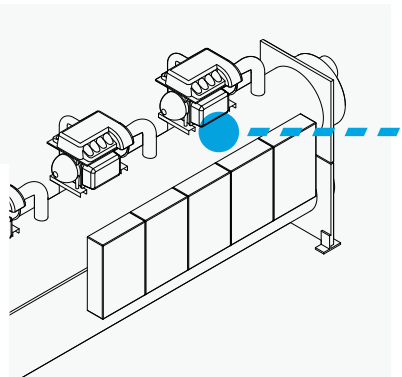
1 Working with your Armstrong Representative, start at the top and follow the tracks down the page.

2  At each step choose the components that will suit your design requirements.

3 Follow the arrow from your selection to the next step.

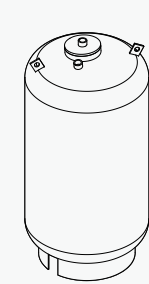


**NUMBER OF CHILLERS**  
Chiller selection (single or dual chiller) depends on the operating range, which is determined by the cooling requirements of your building design.



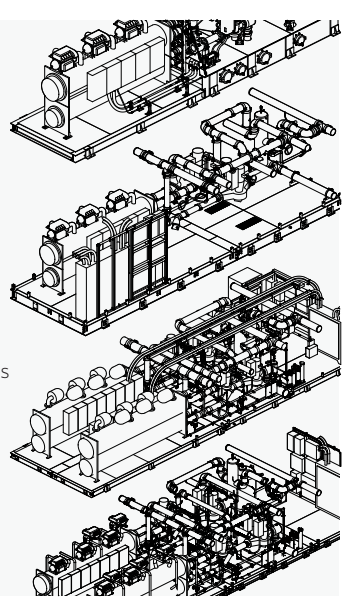
**OPERATION MODE**  
Select Duty/Duty or Duty/Standby based on the requirements of your application for redundancy.

**VOLTAGE**  
Select your design voltage.



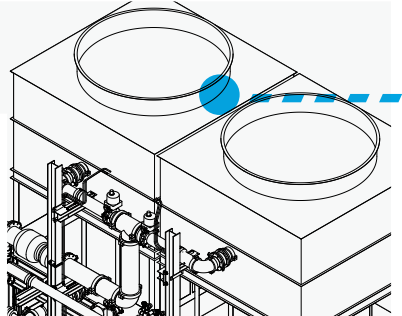
**EXPANSION TANK**  
Select the size of tank required. The Expansion Tank is a standard component to accommodate thermal expansion.

**PLANT TYPE**  
**TYPE 1** Open only, 1 chiller only, ships in 1 or 2 sections with maximum width <7'6" (fits standard iso container), 80-500 tons  
**TYPE 2** Enclosed (1 chiller only, 80-425 tons) or open (2 chillers with controls facing outwards, 160-850 tons), ships in 1 or 2 sections, with maximum width <12' and maximum length <44'  
**TYPE 3** Open or enclosed, 2 chillers only, can ship in 4 sections with maximum width <12' (all sections), 336-1000 tons  
**TYPE 4** Open or enclosed, 2 chillers only, can ship in 5 sections with maximum width <7'6", 336-850 tons



**PUMP HEAD LOSS**  
Enter the amount of head loss in the spaces provided to the left. Limits are as follows: chilled water: 80-180 ft; condenser water: 40-100 ft

**COOLING TOWER**  
Proper integration of cooling towers ensures peak efficiency and trouble-free system start-up.

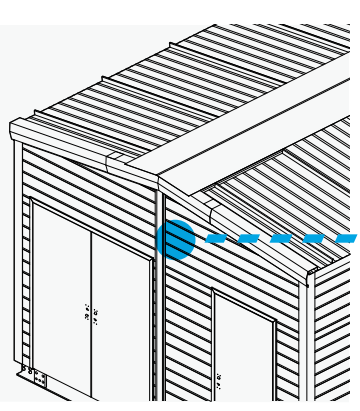


**FAN CONFIGURATION**  
Chiller selection will determine the required number of fans. Two fans are always supplied with two chillers. Single chiller units may use either one or two fans.

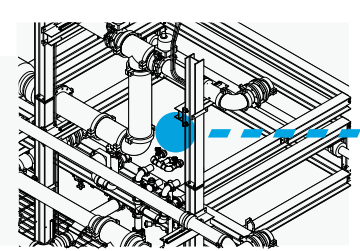
**FAN UPGRADE OPTION**  
Low-noise fan is optional and is recommended for noise-sensitive applications.

**MATERIAL UPGRADE OPTION**  
Stainless steel construction is recommended for corrosive or humid environments (i.e. coastal regions or chemical factories).  
**304 SS** Commonly used in applications required to withstand rust and corrosive environments, such as the food industry.  
**316 SS** Recommended for severe environments such as marine applications.

**WEATHER-PROOF ENCLOSURE**  
Outdoor applications typically require an enclosure. Selection of an enclosure permits inclusion of a pedestal kit, cold weather package and water treatment options where desired.



**PEDESTAL KIT**  
Pedestal kits are valuable for installations using Armstrong cooling towers and weather-proof enclosure. The inclusion of a pedestal kit greatly simplifies the connection between the plant and the cooling tower.



**COLD WEATHER PACKAGE**  
Available only with the selection of a pedestal kit, the cold weather package includes heat trace around the piping, 2" insulation, basin heater and bypass for cold weather startup.

**WATER TREATMENT**  
If water treatment is selected, three options are available: standard Pulse Pure™ chemical free water treatment, Smart Release water treatment, or chemical drum (3) injection system.

**OPTIONAL BAS**  
Selection will enable communication with the BAS/BMS using typical standard protocols.

**REMOTE DP ZONE SENSORS**  
Can be supplied with the DE IPP CHW (Barton sensors) or sourced locally through your controls supplier. Up to 12 sensors can be accommodated.

Congratulations on completing the configuration of your IPP system. Please share these selections with your Armstrong Representative.