R 290

PROBOX

PROBOX

WATER-COOLED CHILLER / HEAT PUMP

Indoor installation

Natural refrigerant: Propane (R 290)

Maximum flow temperature[1]: 65 °C (75 °C)

Cooling capacity range[2]:

from 30 kW to 70 kW

Heating capacity range[3]:

from 39 kW to 87 kW



ATEX key components

EN 378 compliant enclosed housing

[1] Up to 75 °C available on request

[2] Evaporator intlet/outlet water temperature 15 / 10 °C

[3] Condenser intlet/outlet water temperature 40 / 45 °C

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NATURAL COOLING & HEATING

R290

PROBOX

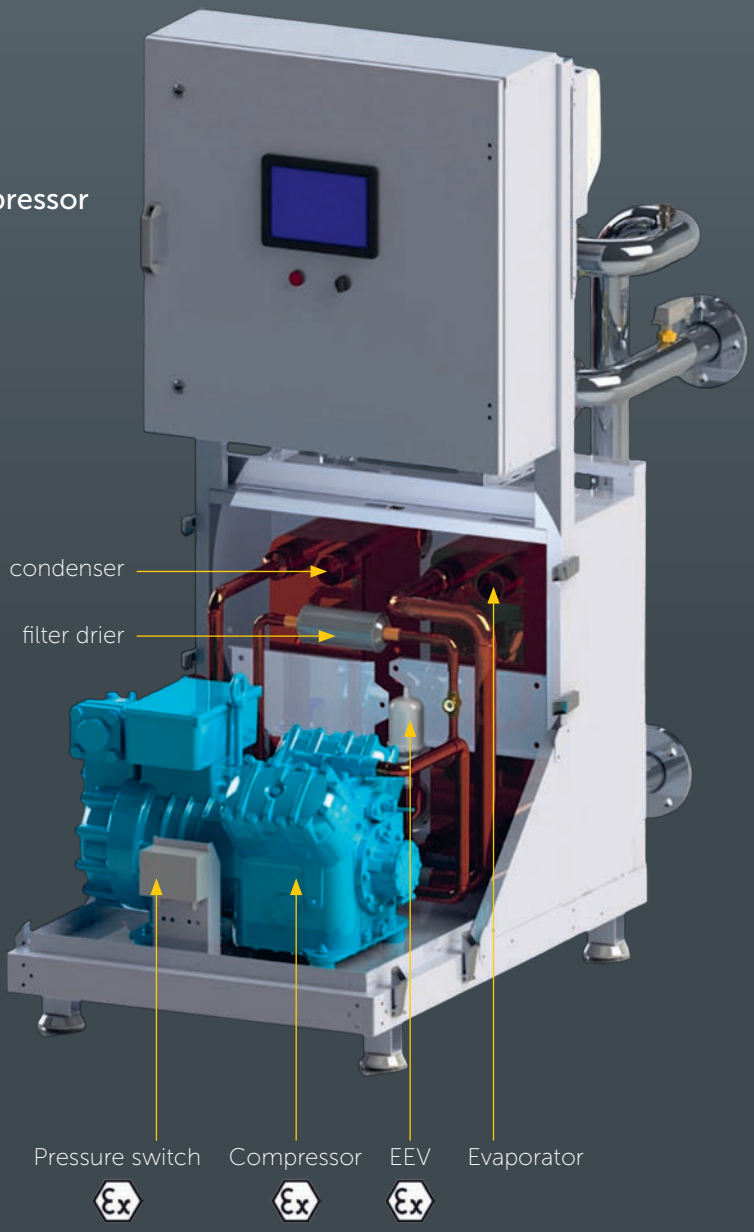
WATER-COOLED CHILLER / HEAT PUMP

PROBOX series consists of high-efficiency, water-cooled units featuring a very compact design, intended for indoor installation. They are designed to cover heating or cooling demands ranging from small to medium capacity systems, but allow for parallel configuration in order to increase total capacity.

REFRIGERATION CIRCUIT

ATEX-Certified components:

- Semi-hermetic reciprocating compressor
- Pressure switch
- Electronic expansion valve (EEV)



- The evaporator and condenser (brazed plate heat exchangers) are of highest quality and performance, requiring less refrigerant charge
- Powder-coated, galvanized steel housing, corrosion and weather resistant, standard color RAL 7035

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EN 378 compliant:

✓ Enclosed housing - All refrigerant circuit components installed inside the housing

✓ Safety strategy: refrigerant gas leak detector + differential air pressure switch + ATEX fan

✓ Refrigerant charge below 4,9 kg

HYDRONIC CIRCUIT

Standard equipment:

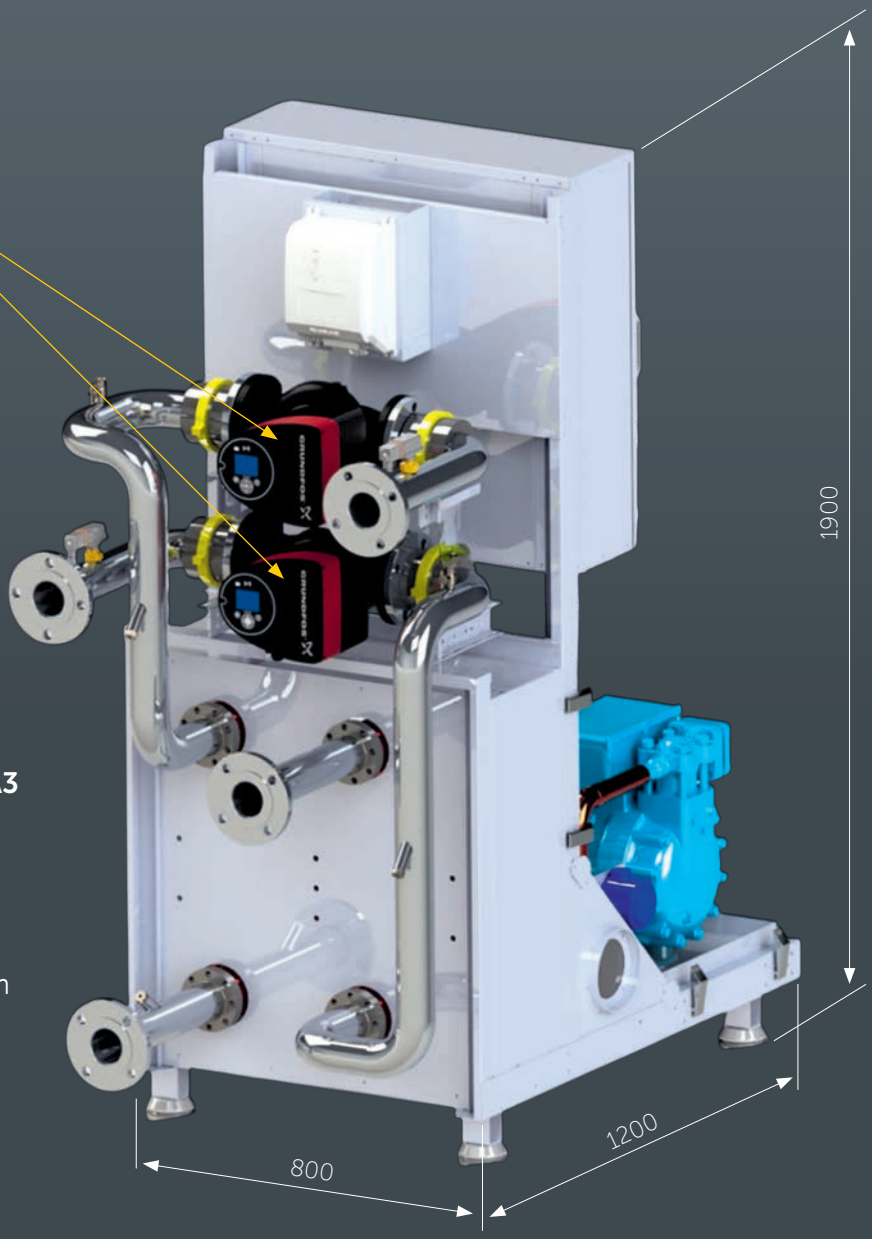
- Stainless steel piping with thermal insulation
- Flow switches
- Air vent valves
- Drain valves
- EC pumps

ELECTRICAL CABINET

- Factory-integrated pump power supply and control signals
- 4-pole main switch
- GSM router
- Lamp with socket for electrical cabinet
- For heat pump use:
  - 0-10 V analog output for external heat source control
  - Regulation of a 3-way valve via dry contacts for DHW



FLOW UNDER CONTROL ✓



Factory-installed **Grundfos MAGNA3** EC pumps provide benefits:

- ✓ Stable evaporator flow under all operating conditions
- ✓ Lower pumping energy consumption
- ✓ Faster commissioning
- ✓ Simplified installation

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		PB33	PB42	PB52	PB63	PB71
Cooling capacity (1)	kW	30	42	52	62	70
EER (1)	-	3,61	4,11	4,08	3,62	3,88
Heating capacity (2)	kW	39	53	65	79	87
COP (2)		4,61	5,11	5,08	4,62	4,88
Compressor		Semi-hermetic reciprocating				
Compressors / circuits	n°	1/1	1/1	1/1	1/1	1/1
Evaporator (cooling side)		Brazed plate heat exchanger				
Water flow rate	m^3/h	5,3	7,3	9,0	10,7	12,0
Head loss	kPa	up to 60 kPa				
Type of connection	Flange	DN 40	DN 65	DN 65	DN 65	DN 65
Condenser (heating side)		Brazed plate heat exchanger				
Water flow rate	m^3/h	6,9	9,3	11,3	13,8	15,2
Head loss	kPa	up to 60 kPa				
Type of connection	Flange	DN 40	DN 65	DN 65	DN 65	DN 65
Noise levels (3)						
Sound power lev.	dB(A)	70	71	73	75	74,5
Sound pressure lev. @10m in open space	dB(A)	38,4	39,4	41,4	43,4	42,9
Dimensions						
Length (+connections)	mm	1200 (+380)				
Width	mm	800				
Height	mm	1900				
Operating weight (est.)	kg	540	600	610	630	680
Electrical characteristics						
Power supply	-	TN-S (400/3/50 + PE + N)				
Maximum current	A	21	22	29	38	38
Recommended dim. of power supply cable	mm^2	5x4	5x4	5x6	5x10	5x10
Capacity						
Heating capacity, B0/W45	kW	32	47	52	63	68
Heating capacity, B0/W55	kW	29	39	46	55	59

(1) - Evaporator inlet/outlet water temperature 15/10°C. Values in accordance with EN 14511.

(2) - Condenser inlet/outlet water temperature 40/45°C. Values in accordance with EN 14511.

(3) - Sound data is based on 7/40 °C operation and compressor frequency of 50 Hz.

ECOLOGY

Natural refrigerant: propane - R290

It belongs to the group of hydrocarbons with GWP_{100} = 0,02 which is completely exempted from the restrictions prescribed by the F-gas Regulation (EU) 2024/573.

ENERGY EFFICIENCY

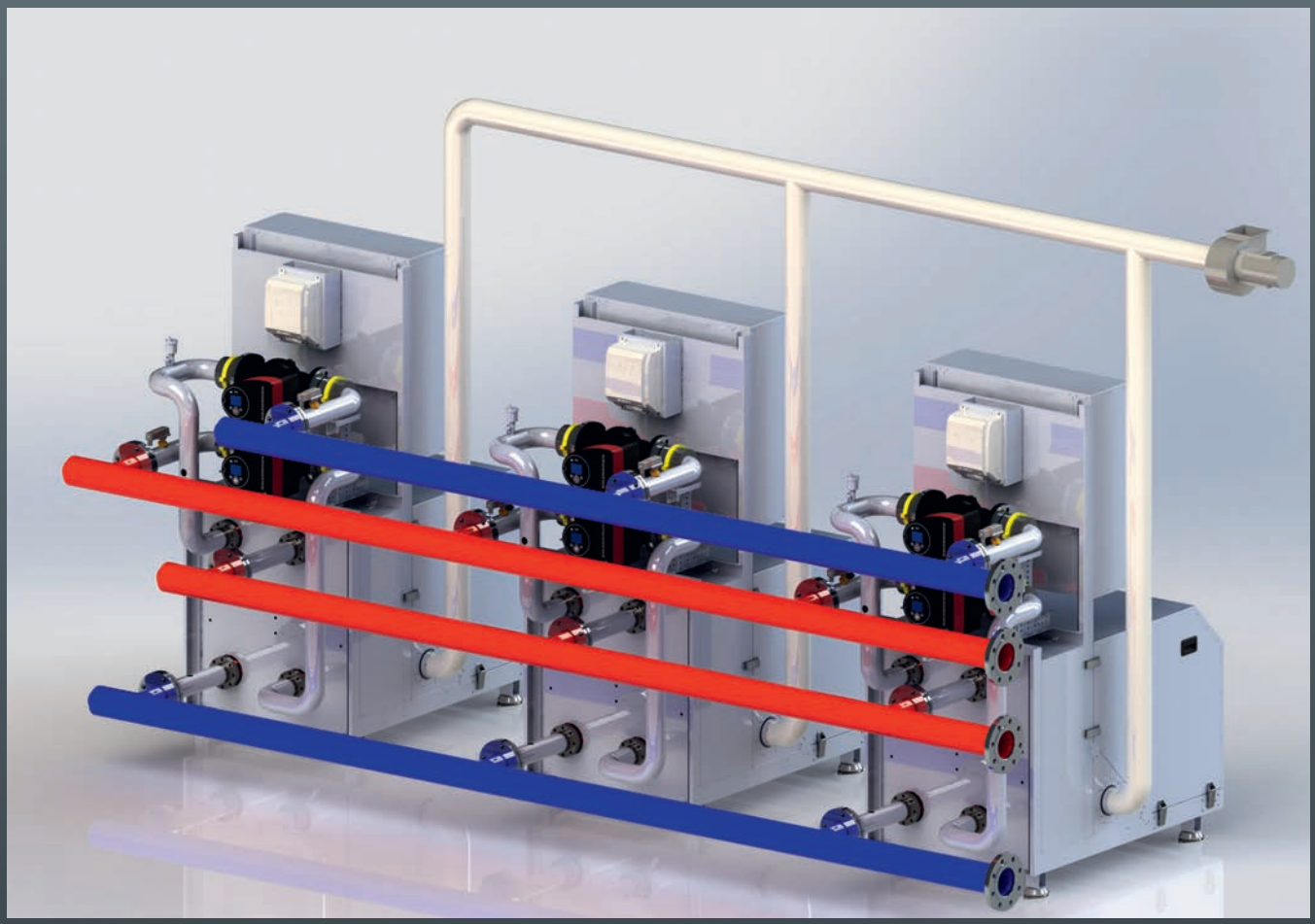
Thanks to the ideal thermodynamic characteristics of the R290 refrigerant and the optimal selection of the key components of the refrigeration circuit, PROBOX units have high energy efficiency and meet the requirements of ECODESIGN REGULATIONS.

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PARALLEL CONFIGURATION

PROBOX units support parallel configuration, enabling scalable capacity, with the compact design further enhancing flexibility and efficiency of system layout.



WHY PARALLEL?

SCALABLE CAPACITY
Capacity can be increased by simply adding units.

BUILT-IN REDUNDANCY
System remains operational even if one unit is unavailable.

HIGH PART-LOAD EFFICIENCY
Only the required number of units operates, saving energy.

EASY SERVICE & MAINTENANCE
Individual units can be serviced with minimal impact on the system.

KEY FEATURES

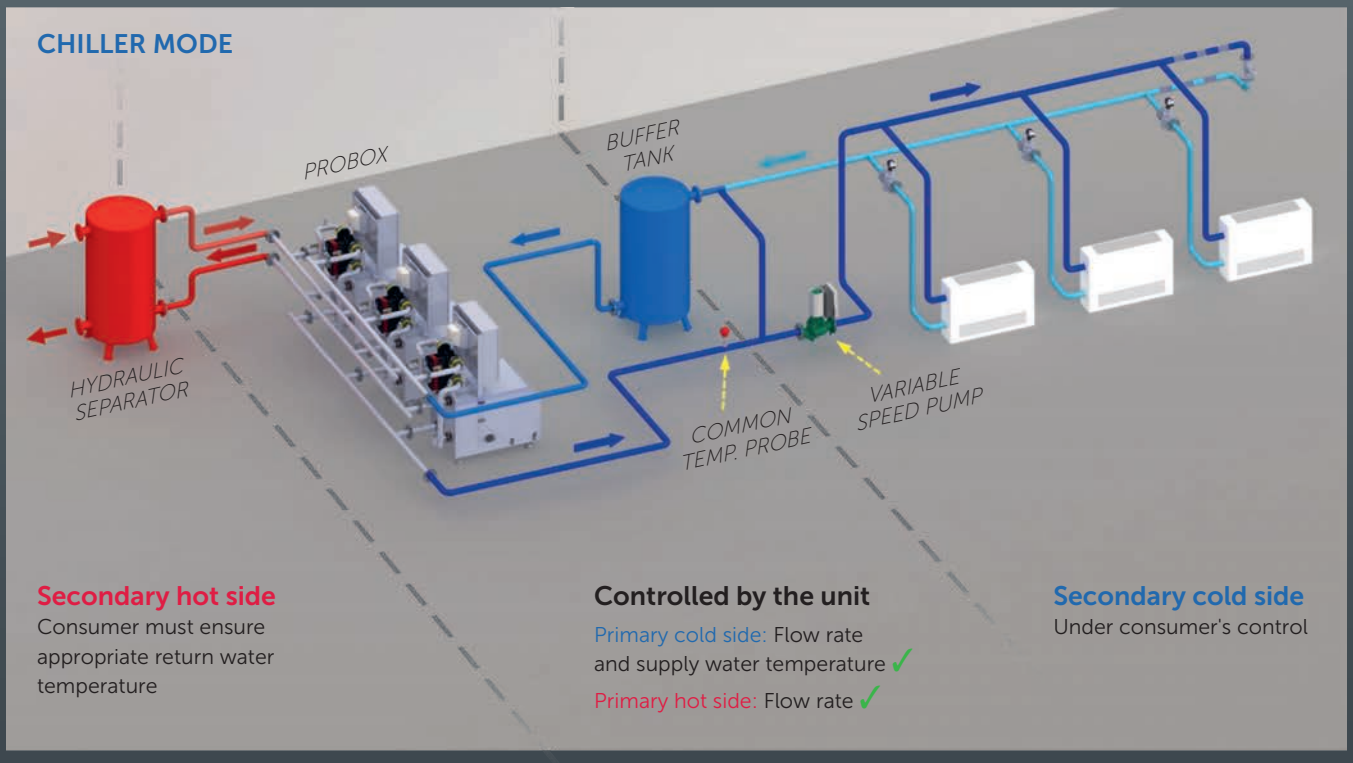
- Lead/follow control strategy
- Automatic unit staging ON/OFF
- Variable-speed compressors for maximum efficiency
- Compact design saves space in the plant room
- Easy future expansion

INTEGRATION INTO HYDRONIC SYSTEMS

PROBOX units connected in parallel can be easily integrated into hydronic systems using common headers and a buffer tank installed in the return line.

Whether the system consists of one or multiple units, the integrated controller regulates the supply temperature and flow rate on the controlled (i.e. regulated) side. The return temperature on the opposite side (hot side in chiller mode, cold side in heat pump mode) must be maintained by the external system within the unit's specified operating range.

CHILLER MODE

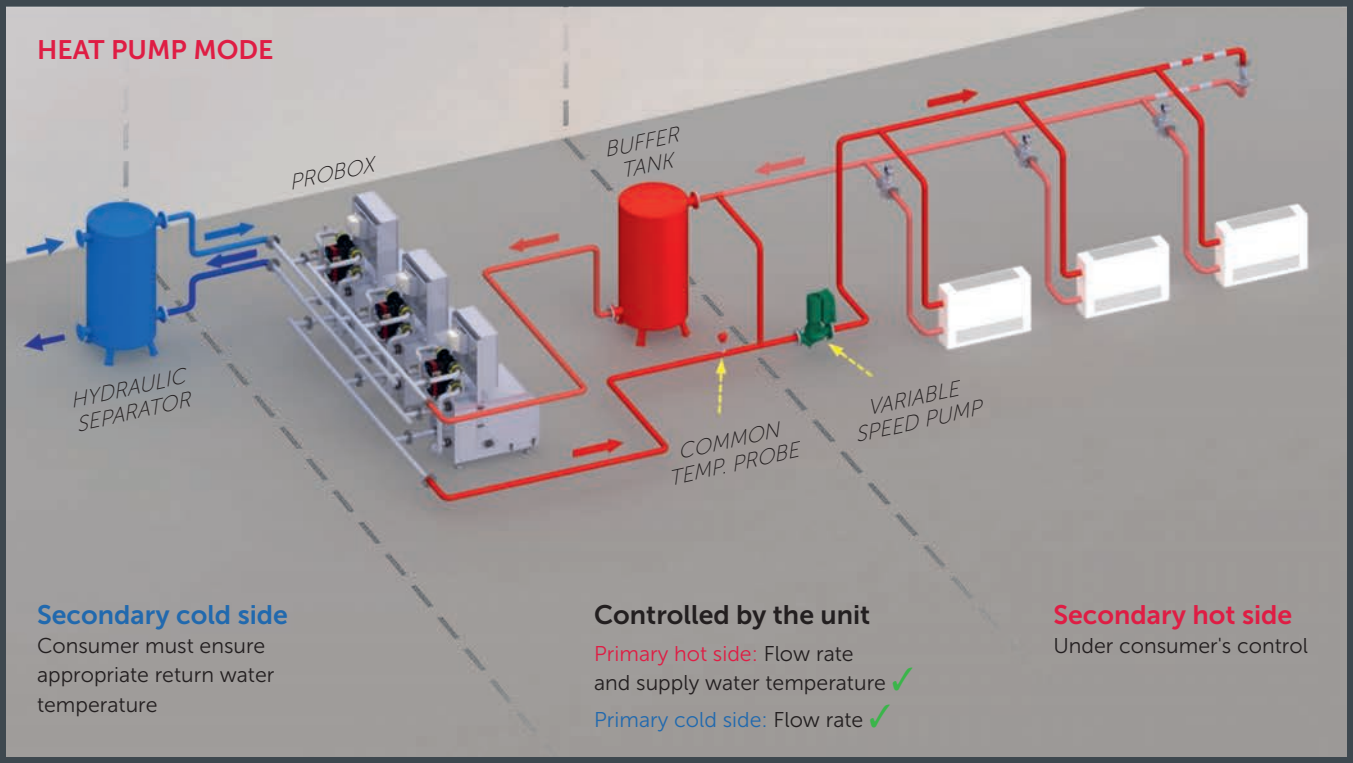


Secondary hot side
Consumer must ensure appropriate return water temperature

Controlled by the unit
Primary cold side: Flow rate and supply water temperature ✓
Primary hot side: Flow rate ✓

Secondary cold side
Under consumer's control

HEAT PUMP MODE

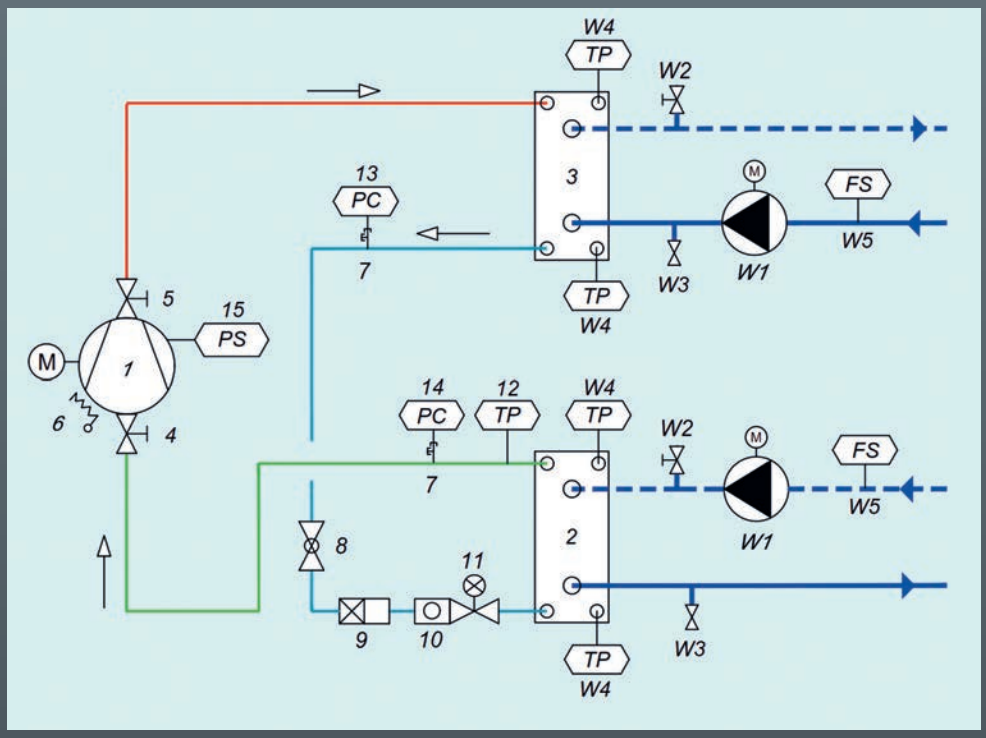


Secondary cold side
Consumer must ensure appropriate return water temperature

Controlled by the unit
Primary hot side: Flow rate and supply water temperature ✓
Primary cold side: Flow rate ✓

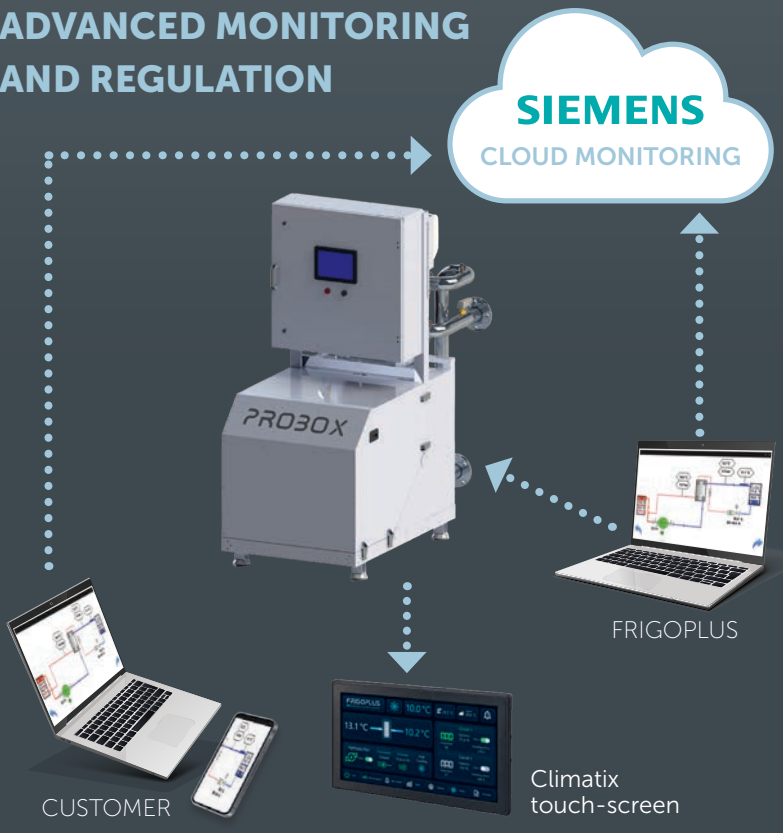
Secondary hot side
Under consumer's control

SIMPLIFIED P&ID



Pos.	Part name
1	Compressor
2	Evaporator (BPHE)
3	Condenser (BPHE)
4	Rotalock valve LP
5	Rotalock valve HP
6	Crankcase heater
7	Tee access fitting
8	Shut-off valve
9	Filter drier
10	Sight glass
11	El. expansion valve
12	Temperature probe
13	Pressure probe HP
14	Pressure probe LP
15	Pressure switch
W1	Pump
W2	Air vent valve
W3	Drain valve
W4	Temperature probe
W5	Flow switch

ADVANCED MONITORING AND REGULATION



SIEMENS controller:

- Intuitive and user friendly touch-screen
- Advanced compressor frequency regulation depending on the required water temperature regime
- Electronic expansion valve & superheat control
- Primary circuit pump regulation
- Easy connectivity with standard MODBUS or BACnet protocols
- Unit protection and alarm management for safe and reliable operation

SIEMENS cloud:

- Live data tracking
- Data archiving
- Process variable comparison
- Alarm monitoring & diagnostics

SAFETY & QUALITY

All units are designed in accordance with the highest safety standards and follow EN 378 for refrigerants from group A3.

- Units tested according to EN 14 511
- ISO 9001 : 2015
- Module A2 - Monitoring of Final Assessment, according to Directive 2014/68/EU

WATER COOLED CHILLERS / HEAT PUMPS

Water-cooled units are used for indirect cooling or heating for air conditioning of buildings, industrial processes, logistic centers for food retail, precision cooling of data centers etc. Heat transfer fluid can be water, mixture of water and ethylene/propylene glycol or some other secondary heat transfer fluid.

Refrigerant is propane (R290), which due to its excellent thermodynamic properties allows the use of the unit in the temperature range from -25 °C to 20 °C.

Producing natural cooling and heating systems since 2002.

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NATURAL COOLING & HEATING

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