R290 / R1270

FLEXY

FLEXY

AIR-COOLED WATER CHILLER

Natural refrigerant: Propane (R290) **or** Propylene (R1270)

Cooling capacity range[1]:

from 150 kW to 1020 kW



EN 378
compliant
enclosed housing

[1] Ambient air temperature 35°C; Evaporator inlet/outlet water temperature 12/7 °C

FRIGOPLUS
NATURAL COOLING & HEATING

R290 R1270

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NATURAL COOLING & HEATING

AIR-COOLED WATER CHILLERS

Air-cooled chillers are used for indirect cooling for air conditioning of buildings, industrial processes, logistics centers for food retail, precision cooling of data centers etc. Cooling medium can be water, mixture of water and ethylene/propylene glycol or some other cooling medium.

An air-cooled chiller is packaged in a single housing and all the components of the refrigerant circuit are built into the unit. Thus, chillers are compact and easy to install on site.

A microprocessor controls the operation of the unit and optimizes parameters in order to achieve as high efficiency as possible.

SAFETY & QUALITY

- All units are designed in accordance with the highest safety standards and follow EN 378 for refrigerants from group A3.
- Units are tested according to EN 14511
- ISO 9001 : 2015
- Module A2 - Monitoring of Final Assessment, according to Directive 2014/68/EU

NATURAL REFRIGERANTS

Propane – R290 with GWP_{100} = 0,02 is suitable for temperature range from -25 to 20 °C

Propylene – R1270 with GWP_{100} = 0 is suitable for low temperature applications.

Both refrigerants are exempted from the restrictions prescribed by the F-gas Regulation (EU) 2024/573.

ECOLOGY AND ENERGY EFFICIENCY

Thanks to the ideal thermodynamic characteristics of the natural refrigerants and the optimal selection of the key components of the refrigeration circuit, FLEXY units have high energy efficiency and meet the applicable ECODESIGN requirements.

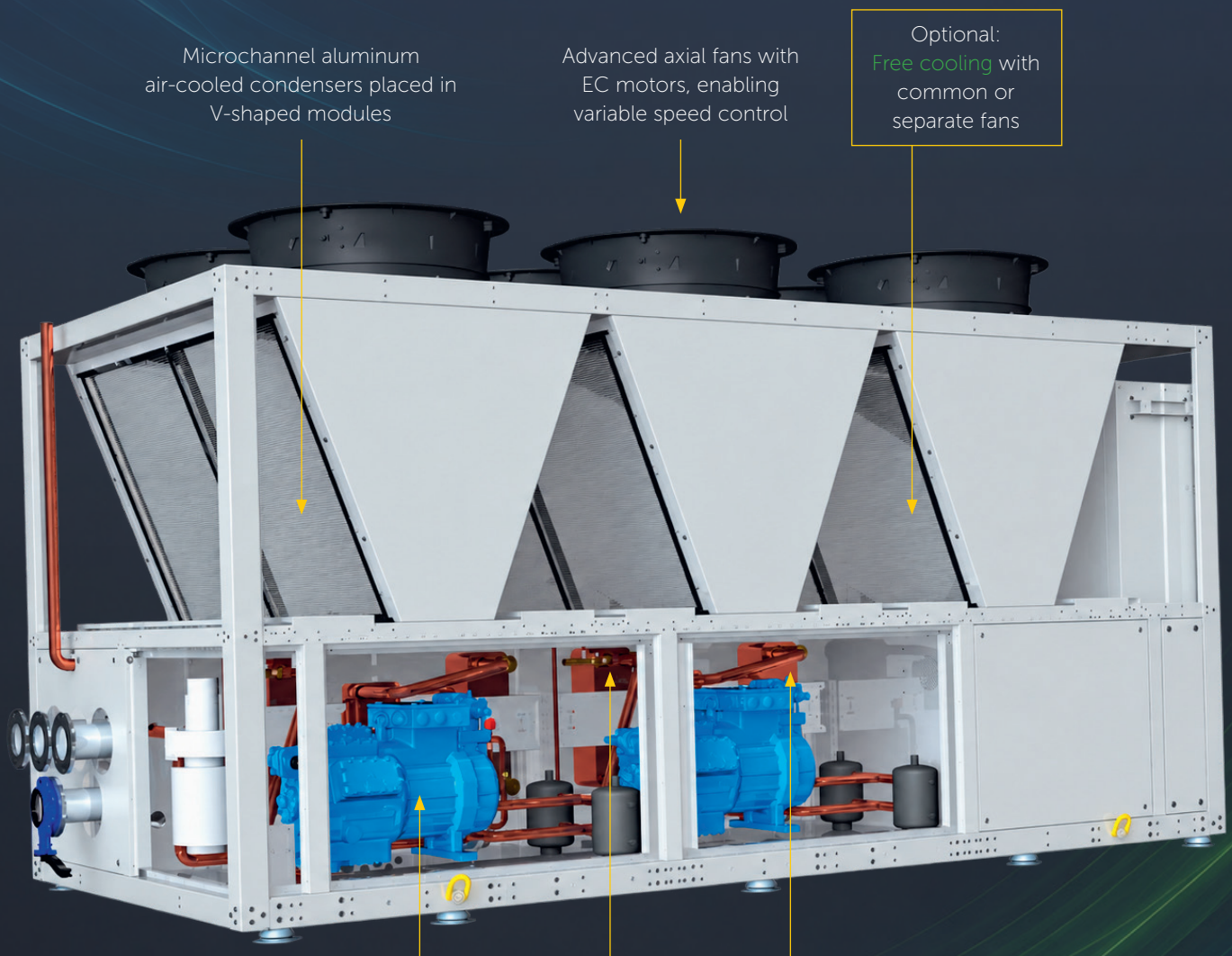


FLEXY

Cooling | Reciprocating compressor | Free cooling | Heat recovery

AIR-COOLED WATER CHILLER

FLEXY series consists of high-efficiency air-cooled water chillers offering a high degree of configurability and a wide cooling capacity range. Extensive configuration options make FLEXY a reliable, high-quality solution for medium and large industrial and commercial cooling systems. All FLEXY units are designed for outdoor installation.

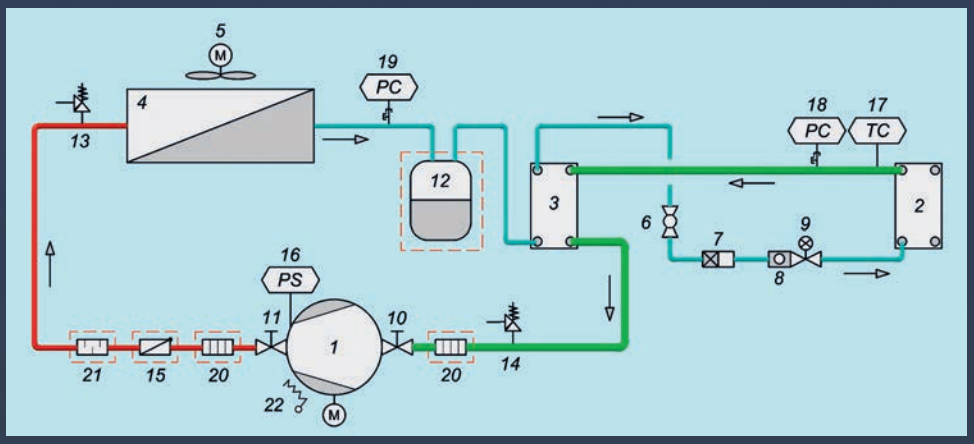


EN 378 compliant:

- ✓ Enclosed housing - All refrigerant circuit components installed inside the housing
- ✓ Safety strategy: refrigerant gas leak detector + differential air pressure switch + ATEX fan

SIMPLIFIED REFRIGERATION CIRCUIT P&ID

The FLEXY unit consists of 2 to 4 independent refrigeration circuits



Pos.	Part name
1	Compressor
2	Evaporator (BPHE)
3	Subcooler (BPHE)
4	Air-cooled condenser
5	Fan
6	Shut-off ball valve
7	Filter drier
8	Sight glass
9	El. expansion valve
10	Rotalock valve LP
11	Rotalock valve HP
12	Receiver
13	Safety valve HP
14	Safety valve LP
15	Check valve
16	Pressure switch
17	Temperature probe
18	Pressure probe LP
19	Pressure probe HP
20	Anti-vibration tube
21	Muffler
22	Crankcase heater



Asymmetric heat exchangers

Reduced refrigerant charge and brine pressure drop, combined with improved heat transfer



Subcooler

Compact plate heat exchanger for additional liquid subcooling to increase unit efficiency

ADAPTING THE REFRIGERATION CIRCUIT

Depending on the application, the refrigerant circuit can be adapted to suit specific needs.

HVAC – Solutions for comfort applications with standardized components for seasonal operation

Standard equipment: subcooler

Industrial – for process applications, year-round operation (summer + winter)

- Liquid receiver
- Compressor oil temperature control
- Additional thermal insulation
- Optional:
  - Suction line separator with internal heat exchanger
  - Monitoring of oil pump pressure differential

'Heavy duty' – specialised case-to-case approach for most demanding applications

- Incorporation of active oil return + oil separator
- 3-year warranty

TEMPERATURE RANGE

LT	-25 °C	-15 °C
MT	-15 °C	2 °C
HT	2 °C	20 °C

GENERAL CHARACTERISTICS

- Compressor with two Rotalock valves, crankcase oil heater and oil sight glass
- Thermal protection of motor windings with electronic protection module
- HP pressure switch connected directly to the compressor, before the Rotalock valve
- Anti-vibration tubes for 2- and 4-cylinder compressors
- Service ball valve before filter dryer and sight glass
- Schrader service valves on the HP and LP side
- Economizer for increased refrigeration circuit efficiency
- Thermal insulation of the LP side of the refrigeration circuit
- Safety valve on HP and LP side
- Electronic expansion valve with protection against excessive evaporation pressure

HOUSING

- Housing made of powder-coated galvanized sheet metal
- Stainless steel screws, nuts and rivets
- Guard grille at the axial fan outlet
- Lockable panels for the compressor and hydronic compartments

ELECTRICAL COMPONENTS

- High-quality electrical components from Siemens and Phoenix Contact
- Clearly structured and professionally assembled electrical cabinet
- All electrical wires individually labeled with durable printed wire markers
- Complete identification of electrical components and wiring according to the electrical schematic
- Main isolator switch integrated into the electrical cabinet
- Automatic chiller restart after power failure
- UV-resistant electrical cables for outdoor installation
- Secure cable fixation and strain relief for the main power supply cable
- Electrical cabinet fully tested before delivery

FLEXY P4



COOLING CAPACITY:

150 kW	W7 °C / A35 °C	350 kW	HT
130 kW	B-8 °C / A35 °C	270 kW	MT
70 kW	B-25 °C / A35 °C	150 kW	LT

Quantity of independent refrigerant circuits: 2

Note: each refrigerant circuit is equipped with one compressor

Quantity of air-cooled heat exchangers: 4

Dimensions:

- Length, without connections: 3532 – 6392 mm
- Width: 2352 mm
- Height: 2715 mm

Note: Unit length depends on the hydronic circuit configuration. If separate heat exchangers for free cooling are installed, the unit length increases above given values.

FLEXY P6



COOLING CAPACITY:

320 kW	W7 °C / A35 °C	570 kW	HT
230 kW	B-8 °C / A35 °C	380 kW	MT
110 kW	B-25 °C / A35 °C	230 kW	LT

Quantity of independent refrigerant circuits: 2 or 3

Note: each refrigerant circuit is equipped with one compressor

Quantity of air-cooled heat exchangers: 6

Dimensions:

- Length, without connections: 4962 – 8537 mm
- Width: 2352 mm
- Height: 2715 mm

Note: Unit length depends on the hydronic circuit configuration. If separate heat exchangers for free cooling are installed, the unit length increases above given values.

FLEXY P8



COOLING CAPACITY:

400 kW	W7 °C / A35 °C	700 kW	HT
300 kW	B-8 °C / A35 °C	520 kW	MT
150 kW	B-25 °C / A35 °C	300 kW	LT

Quantity of independent refrigerant circuits: 2 or 4

Note: each refrigerant circuit is equipped with one compressor

Quantity of air-cooled heat exchangers: 8

Dimensions:

- Length, without connections: 4962 – 9967 mm
- Width: 2352 mm
- Height: 2715 mm

Note: Unit length depends on the hydronic circuit configuration. If separate heat exchangers for free cooling are installed, the unit length increases above given values.

FLEXY P10



COOLING CAPACITY:

380 kW	W7 °C / A35 °C	520 kW	HT
300 kW	B-8 °C / A35 °C	360 kW	MT
140 kW	B-25 °C / A35 °C	165 kW	LT

Quantity of independent refrigerant circuits: 2

Note: each refrigerant circuit is equipped with one compressor

Quantity of air-cooled heat exchangers: 10

Dimensions:

- Length, without connections: 7822 mm
- Width: 2352 mm
- Height: 2715 mm

Note: Unit length depends on the hydronic circuit configuration. If separate heat exchangers for free cooling are installed, the unit length increases above given values.

FLEXY P12



COOLING CAPACITY:

590 kW	W7 °C / A35 °C	960 kW	HT
400 kW	B-8 °C / A35 °C	680 kW	MT
210 kW	B-25 °C / A35 °C	320 kW	LT

Quantity of independent refrigerant circuits: 3 or 4

Note: each refrigerant circuit is equipped with one compressor

Quantity of air-cooled heat exchangers: 12

Dimensions:

- Length, without connections: 9252 – 9967 mm
- Width: 2352 mm
- Height: 2715 mm

Note: Unit length depends on the hydronic circuit configuration. If separate heat exchangers for free cooling are installed, the unit length increases above given values.

FLEXY P16



COOLING CAPACITY:

770 kW	W7 °C / A35 °C	1020 kW	HT
540 kW	B-8 °C / A35 °C	700 kW	MT
270 kW	B-25 °C / A35 °C	320 kW	LT

Quantity of independent refrigerant circuits: 4

Note: each refrigerant circuit is equipped with one compressor

Quantity of air-cooled heat exchangers: 16

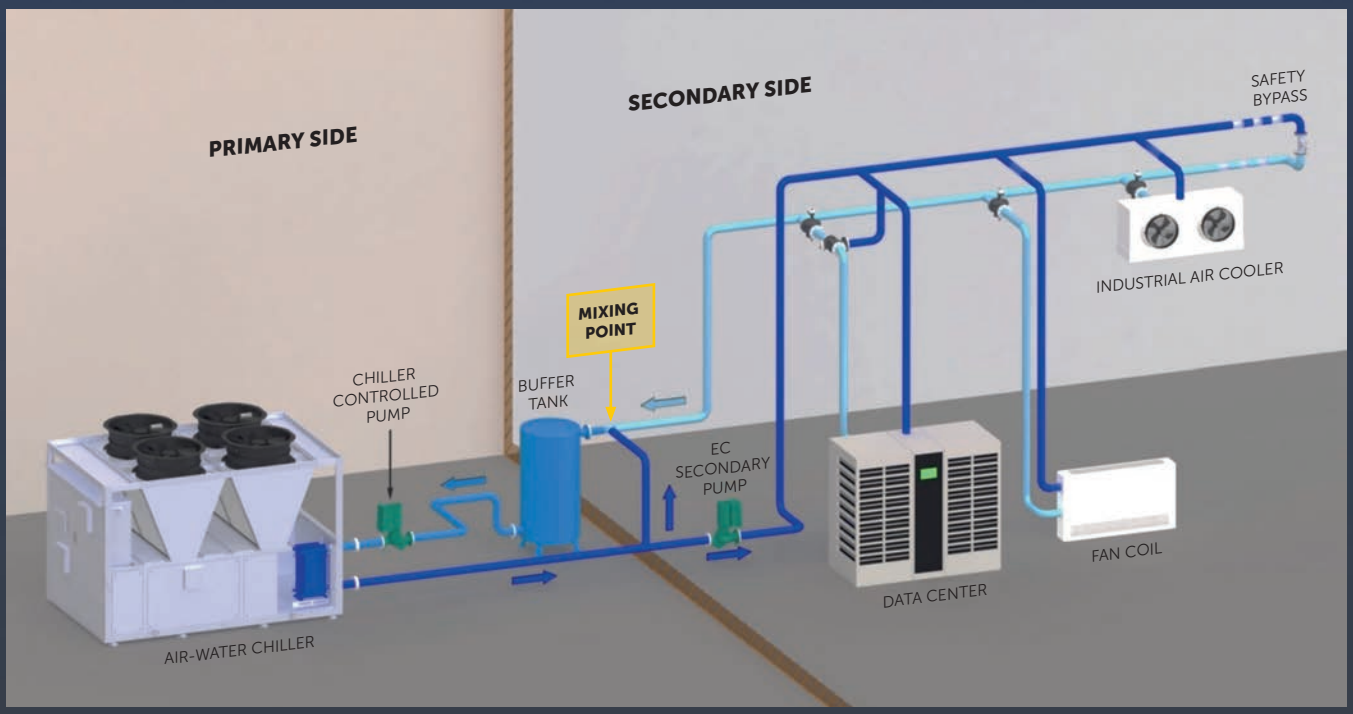
Dimensions:

- Length, without connections: 12827 mm
- Width: 2352 mm
- Height: 2715 mm

Note: Unit length depends on the hydronic circuit configuration. If separate heat exchangers for free cooling are installed, the unit length increases above given values.

INTEGRATION INTO HYDRONIC SYSTEMS

The following example illustrates one of the recommended ways to properly integrate a FLEXY chiller into a complex hydronic system.



PRIMARY SIDE: CONSTANT FLOW RATE

- **Flow rate control:** primary side pump operates continuously and is controlled by the chiller.
- The primary side total flow rate must be higher than secondary side flow rate at all times.
- The hydraulic separation line compensates for the flow difference between the primary and secondary sides.
- The mixing point is located in the return pipe, before the buffer tank inlet.

SECONDARY SIDE: VARIABLE FLOW RATE

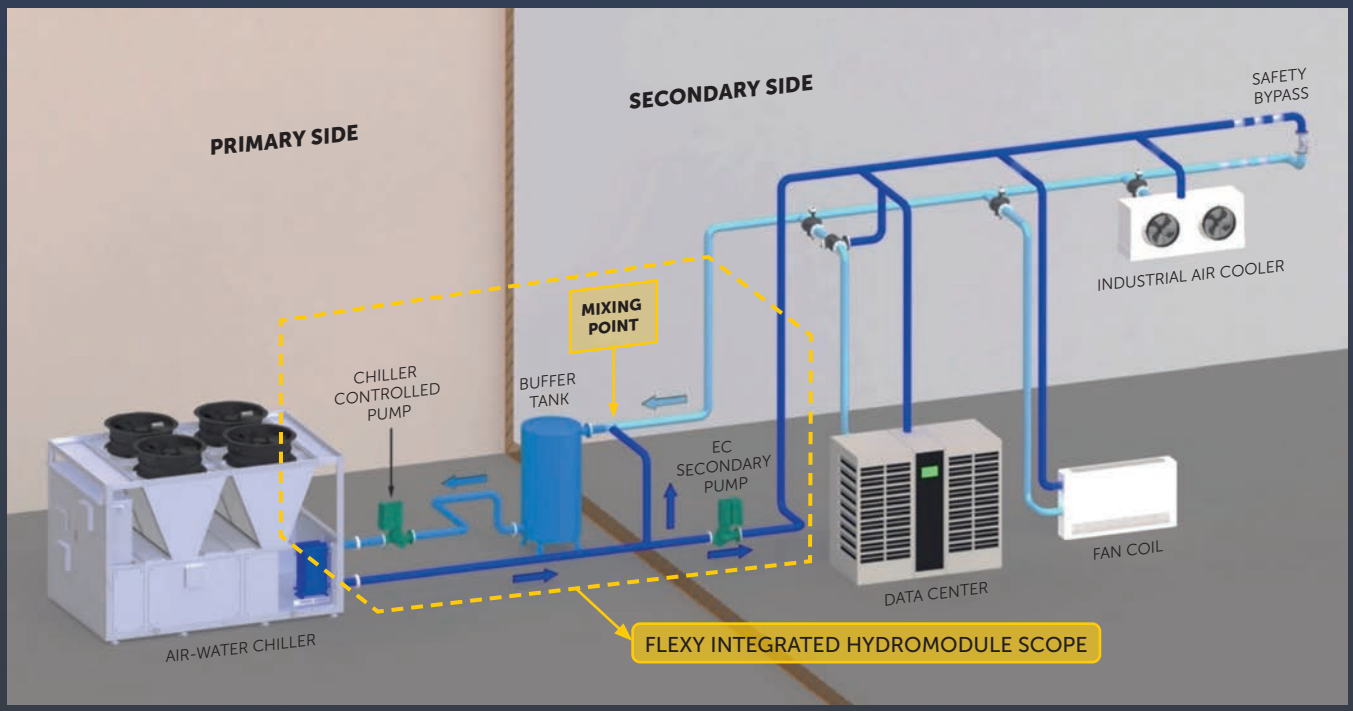
- Secondary side pump operates in constant differential pressure mode (constant Δp mode).
- For hydraulic balancing and flow limitation, a pressure-independent control valve (PICV) on each terminal unit is installed.

** For other recommendations and guidelines, see 'Hydronic System Recommendations For Air-cooled Chillers' on our website or contact Frigo Plus directly.*

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INTEGRATED HYDROMODULE CONFIGURATIONS

FLEXY units support various integrated hydromodule configurations, providing a complete hydronic solution with all key hydronic components housed within the unit. This factory-assembled design simplifies installation, reduces on-site piping and wiring, and enables seamless integration into hydronic cooling systems.



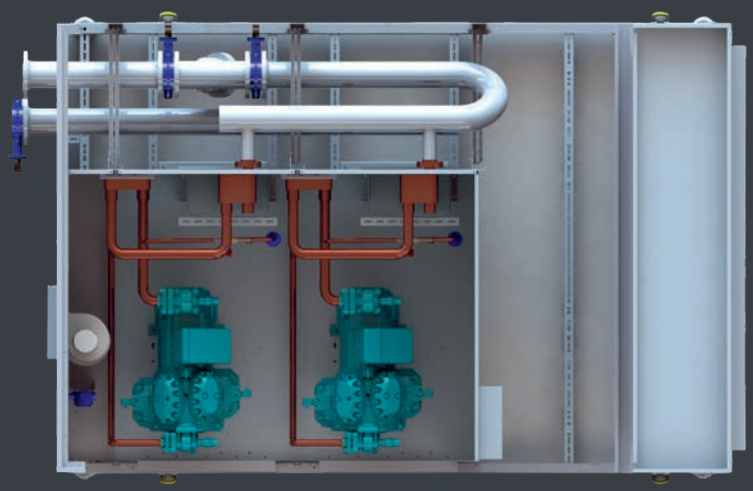
A1 ONLY COLLECTOR PIPES

Standard equipment:

- Mechanical flow switch
- Safety valve
- Automatic air-vent valves
- Drain valves
- Thermal insulation

Optional equipment:

- Flow meter
- Expansion vessel
- Y-strainer
- Closing valves



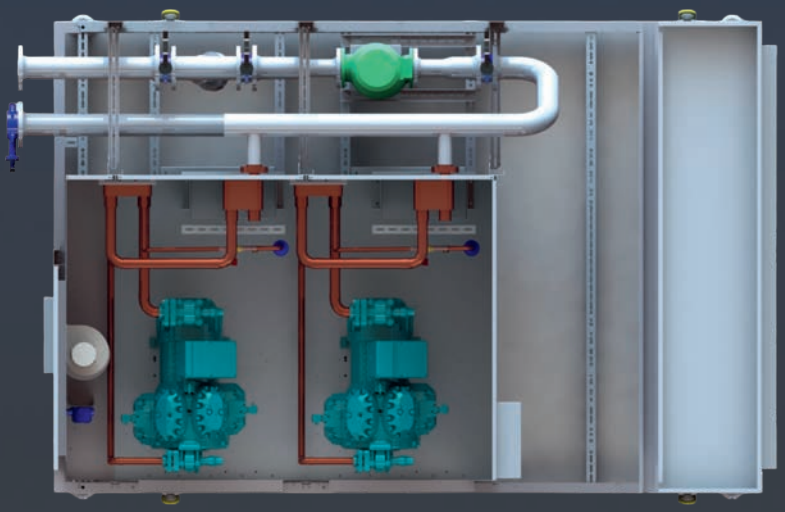
A2 PRIMARY CIRCULATION PUMP

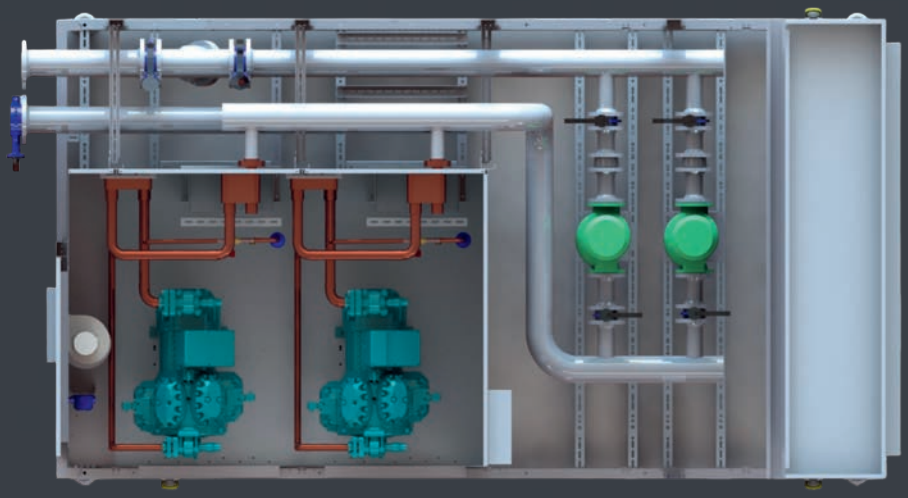
Standard equipment:

- One or two primary circulation pumps (duty+standby)
- Mechanical flow switch
- Pressure gauge
- Safety valve
- Automatic air vent valves
- Drain valves
- Closing valves
- Y-strainer
- Thermal insulation

Optional equipment:

- Flow meter
- Expansion vessel
- Pressure transmitter for pump protection





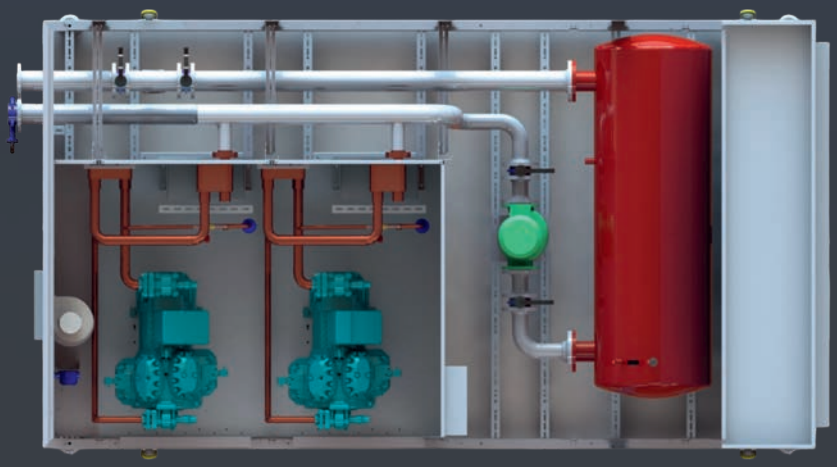
A3 PRIMARY PUMP, BUFFER TANK, SECONDARY PUMP

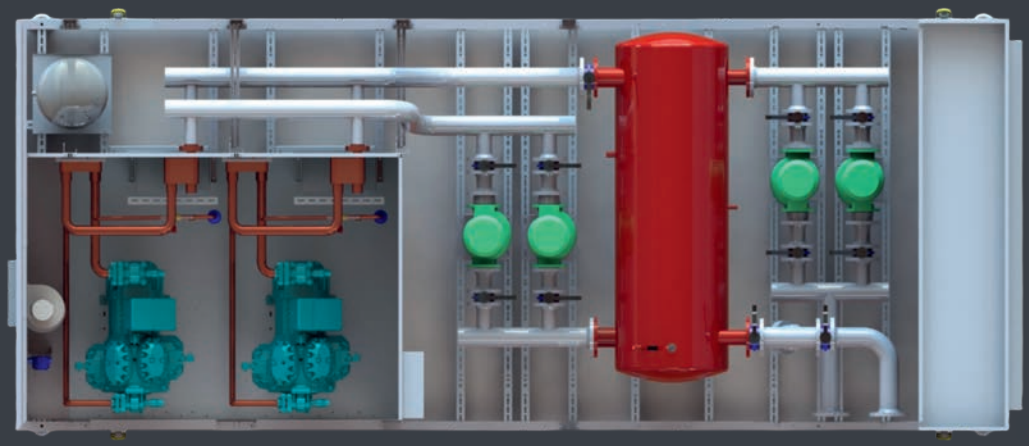
Standard equipment:

- One or two primary side circulation pumps (duty+standby)
- Buffer tank
  - 2 connections
  - 4 connections (hydraulic separator)
- One or two secondary circulation pumps (duty+standby)
- Mechanical flow switch
- Pressure gauge
- Temperature probes
- Safety valve
- Automatic air vent valves
- Drain valves
- Closing valves
- Y-strainer
- Thermal insulation

Optional equipment:

- Flow meter
- Expansion vessel
- Pressure transmitter for pump protection





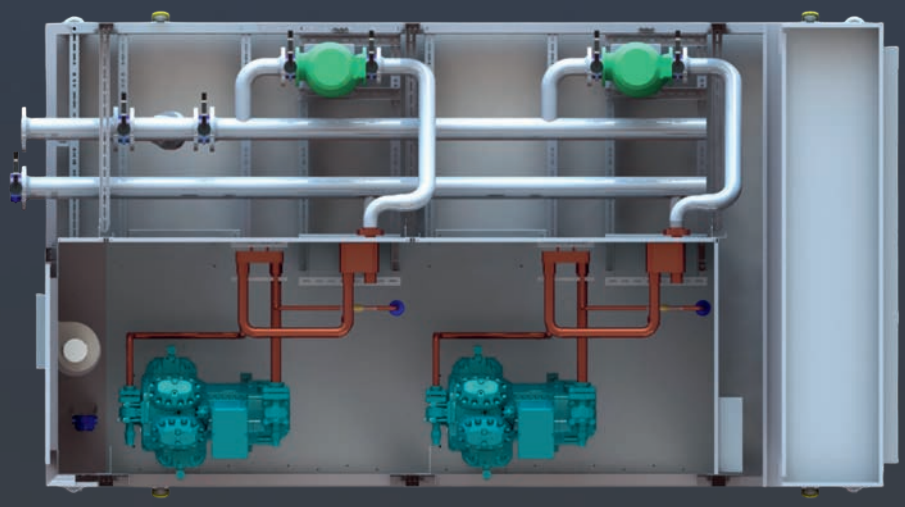
A4 PRIMARY CIRCULATION PUMP PER CIRCUIT, BUFFER TANK

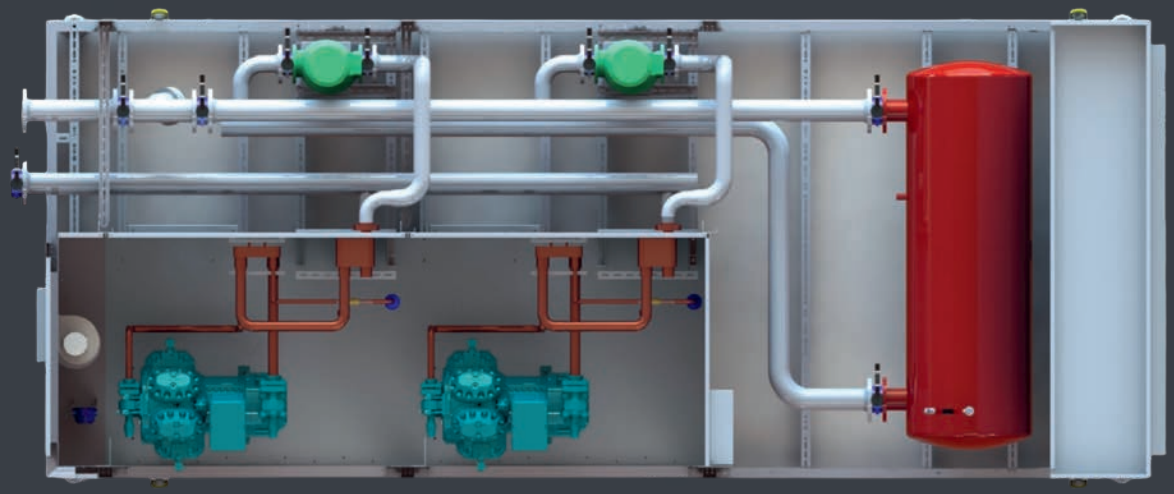
Standard equipment:

- Primary circulation pump per circuit
- Non-return valve per pump
- Mechanical flow switch per pump
- Buffer tank – 2 connections
- Pressure gauge
- Temperature probes
- Safety valve
- Automatic air vent valves
- Drain valves
- Closing valves
- Y-strainer
- Thermal insulation

Optional equipment:

- Flow meter
- Expansion vessel
- Pressure transmitter for pump protection





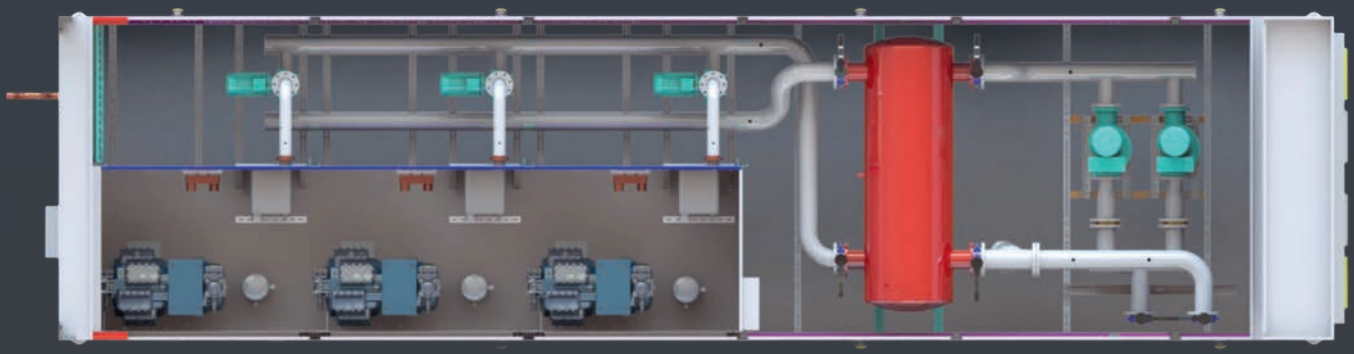
A5 SPECIAL CONFIGURATION: PRIMARY PUMP PER CIRCUIT, BUFFER TANK AND SECONDARY PUMP

Standard equipment:

- Primary circulation pump per circuit
- Non-return valve per pump
- Mechanical flow switch per pump
- Buffer tank – 4 connections (hydraulic separator)
- One or two secondary circulation pumps (duty+standby)
- Pressure gauge
- Temperature probes
- Safety valve
- Automatic air vent valves
- Drain valves
- Closing valves
- Y-strainer
- Thermal insulation

Optional equipment:

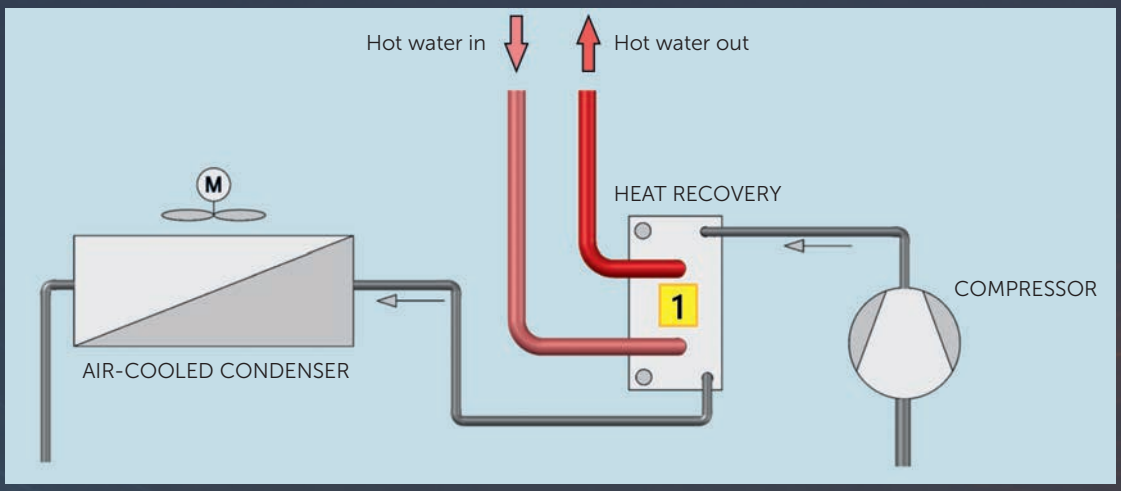
- Flow meter
- Expansion vessel
- Pressure transmitter for pump protection

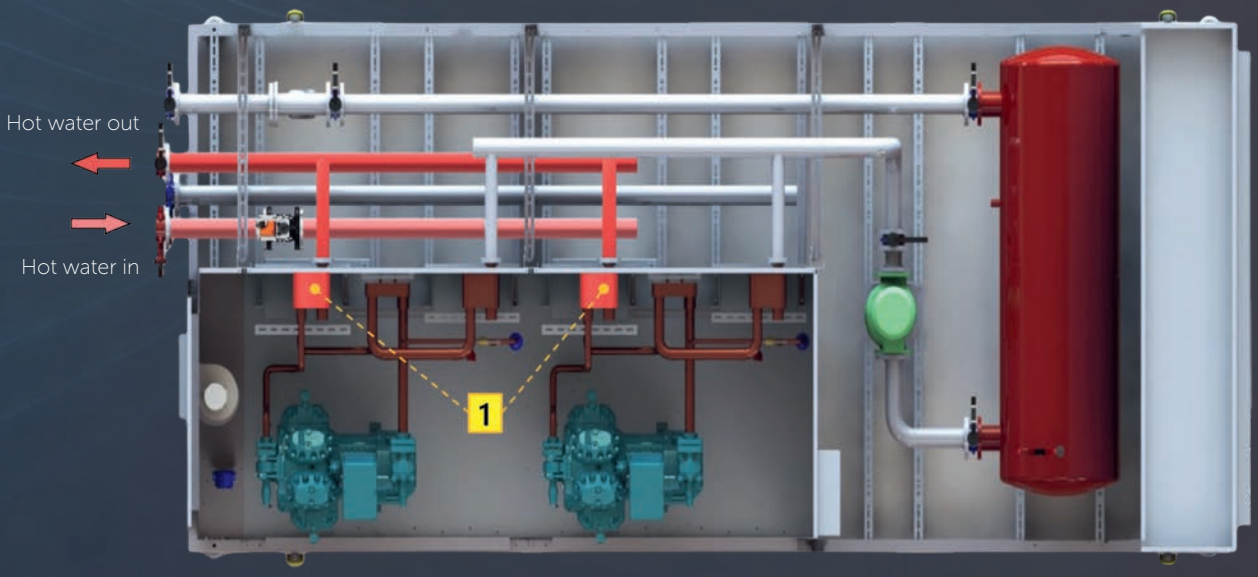


HEAT RECOVERY

Heat recovery

Waste heat recovery is an optional feature available in FLEXY configurations. During chiller operation, thermal energy that would otherwise be rejected through the condensers is recovered using a plate heat exchanger integrated into the refrigeration circuit between the compressor and condenser. This recovered heat can then be used for various heating applications, improving overall system efficiency and reducing energy consumption.



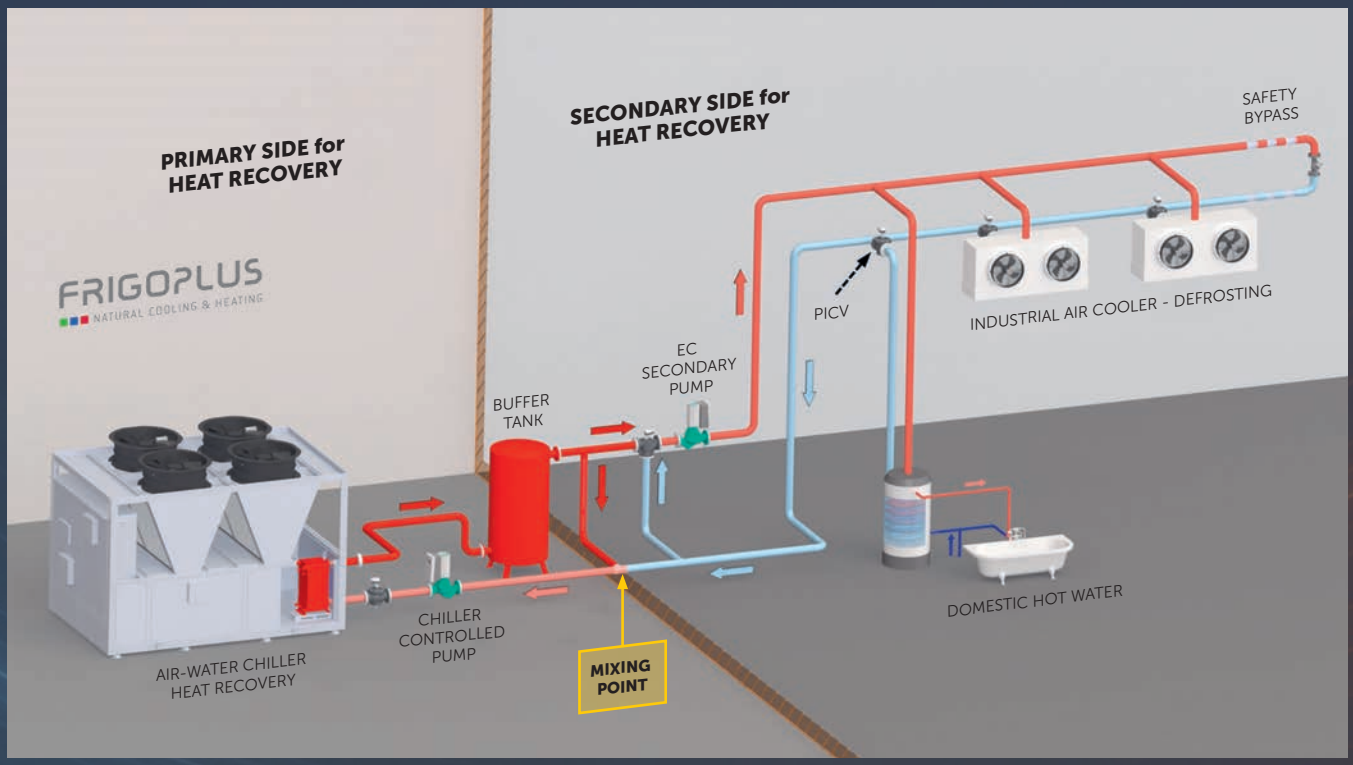


DESUPERHEATER

Alternatively, waste heat can be recovered using a desuperheater installed between the compressor and condenser. It utilizes only the heat of superheated refrigerant. This heat exchanger has relatively smaller heating capacity compared to the condensing capacity of the unit, but allows water heating at a relatively high temperature – up to 65°C.

HEAT RECOVERY INTEGRATION

The following example illustrates one of the recommended ways about how to properly integrate a FLEXY chiller equipped with heat recovery into a complex hydronic system.



EQUIPMENT FOR HEAT RECOVERY

• Circulation pump OR modulating two-way valve for precise flow control

HEAT RECOVERY ADVANTAGES

✓ Reduced operating costs – Recovered condenser heat can be reused for heating.

✓ Higher overall system efficiency – Cooling and useful heating are produced simultaneously from the same refrigeration cycle.

✓ Lower heating energy consumption – Reduces the heating demand of other external heat sources.

✓ Improved sustainability – Makes better use of otherwise wasted heat and can reduce overall building energy consumption.

FREE COOLING

Free cooling

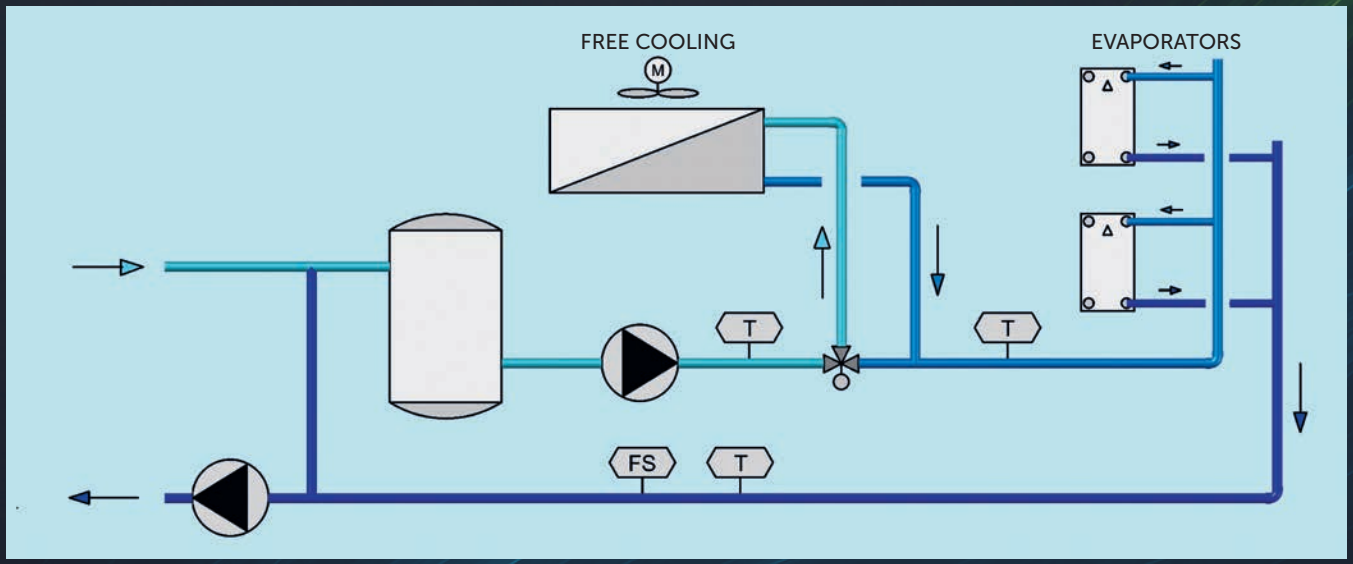
Free cooling is an optional feature available for use in FLEXY chillers. It is used for direct cooling of water (cooling medium) using cold ambient air. When the ambient air temperature is below the required outlet water temperature (T set), the water can be cooled by additional air heat exchangers. Free cooling can be utilized while the compressors are turned off or operating at a low load.

Free cooling can be implemented using integrated heat exchangers, separate heat exchangers, or a combination of both and is controlled by the unit's controller.



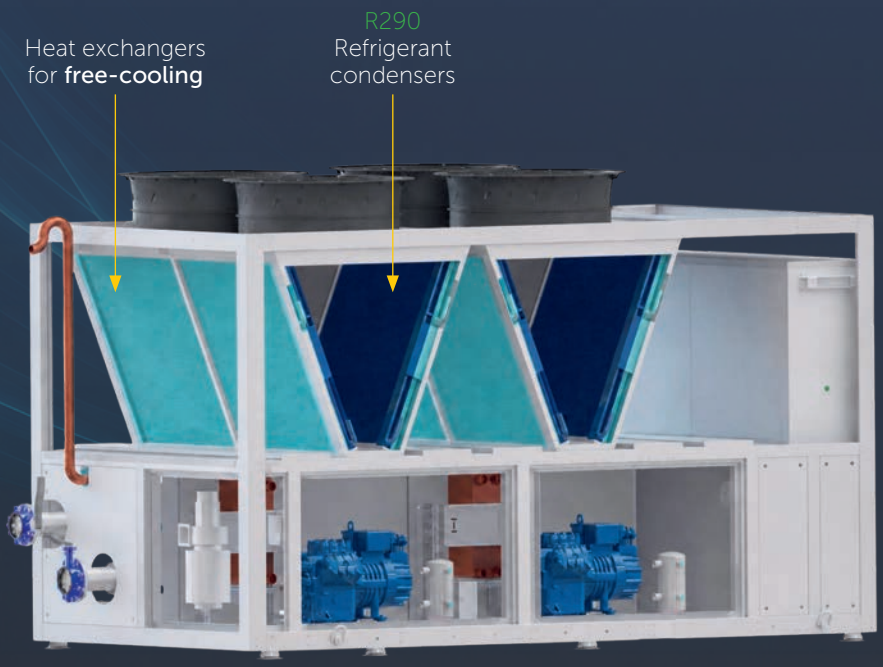
- ✓ Lower compressor runtime – Extended lifespan of equipment
- ✓ Significant energy savings
- ✓ Reduced operating costs
- ✓ Sustainability and efficiency

SIMPLIFIED P&ID



FREE COOLING – COMMON FANS

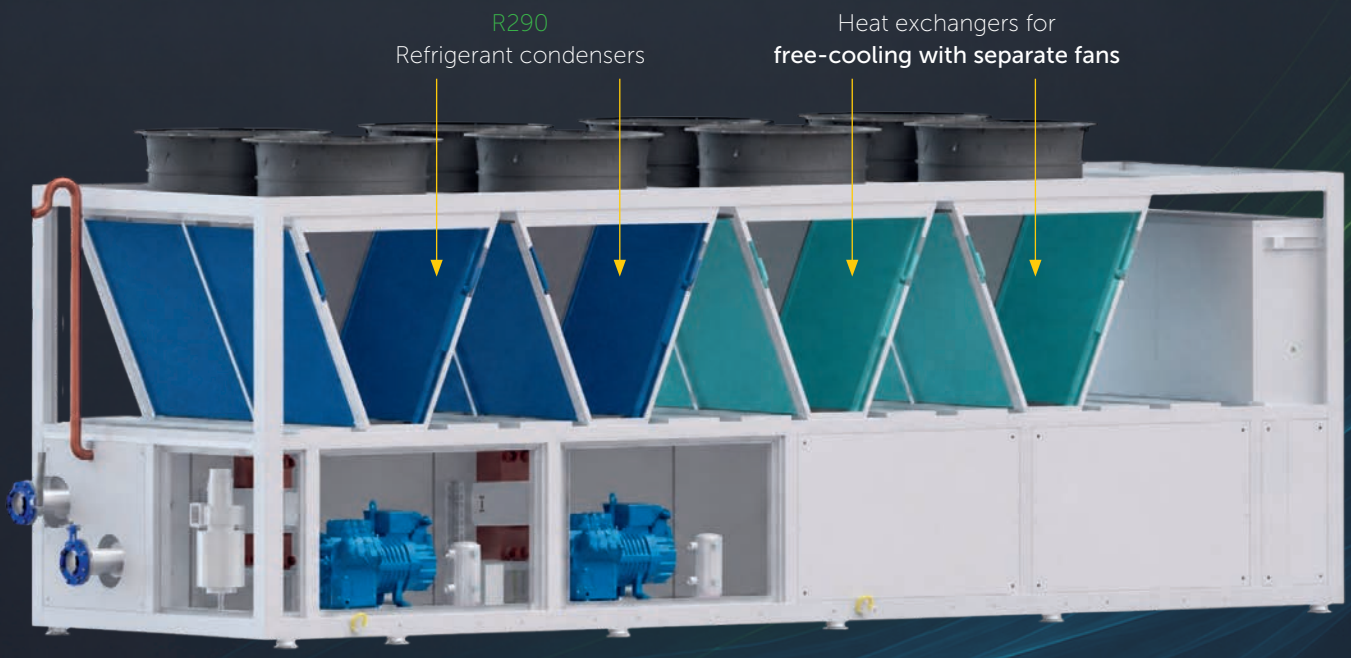
Heat exchangers for free cooling are installed inside the air-cooled condenser modules, adjacent to the refrigerant condensers, allowing both to use the same (common) fans.



- ✓ Factory-integrated solution
- ✓ Reduced installation footprint
- ✓ Simplified system integration

FREE COOLING – SEPARATE FANS

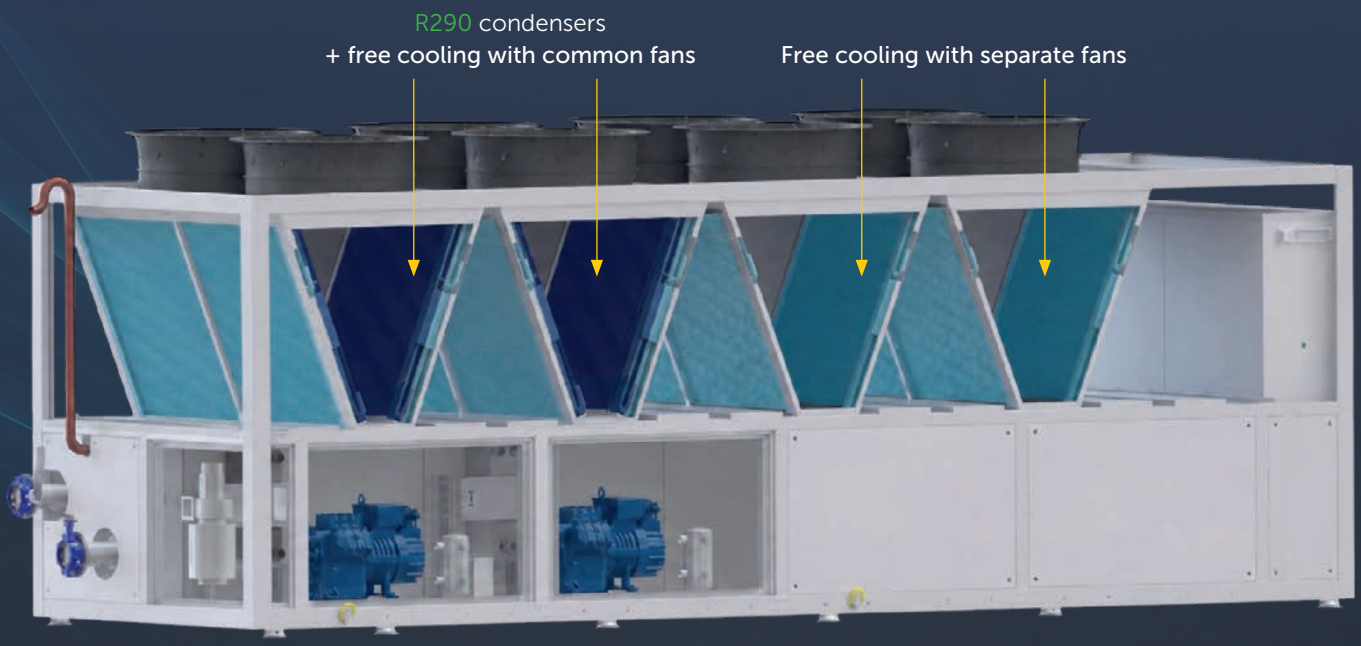
Heat exchangers for free cooling are installed in separate V-shaped modules equipped with their own fans.



- ✓ Greater flexibility in free cooling sizing
- ✓ Space for additional hydronic equipment
- ✓ Independent fan operation
- ✓ Adaptation to site-specific layouts

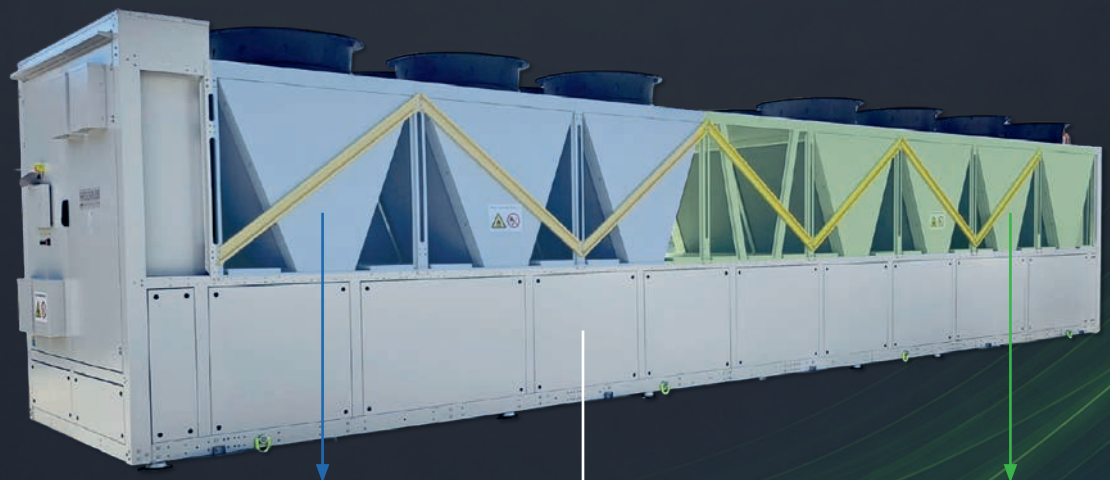
FREE COOLING – COMMON + SEPARATE FANS

Some of the heat exchangers for free cooling are installed in separate V-shaped modules equipped with their own fans, while the others are installed inside the condenser V-shaped modules



- ✓ Greater flexibility in free cooling sizing
- ✓ Space for additional hydronic equipment
- ✓ Independent fan operation
- ✓ Adaptation to site-specific layouts

FLEXY P8 + Free Cooling



Additional space inside the unit housing for hydronic equipment:

- Circulation pump for free-cooling
- Buffer tank
- Primary and secondary pumps

MONITORING, CONNECTIVITY AND REMOTE SERVICE

Local and remote monitoring that makes FLEXY systems easier to operate, manage and maintain.

LOCAL ACCESS

- Intuitive touch screen
- Operating status overview
- Active components
- Alarms and history
- Operating modes and setpoints
- Service parameters
- Access levels

CLOUD MONITORING

- Live data tracking
- Device overview
- Data archive (up to a year)
- Process variable comparison
- Alarms and notifications



COMMUNICATION MODULE

- Separate BMS and remote access network via dedicated communication module.

BMS INTEGRATION

Isolated network

Connect to BMS using one of the communication protocols:

- BACnet
- Modbus
- OPC - UA

REMOTE ACCESS NETWORK

Isolated network

INTHOUSE APP

WEB HMI

CLOUD

- INTHOUSE APP – remote access on PC and mobile
- WEB HMI – WEB access from any browser
- SIEMENS CLOUD – Secure Siemens Cloud platform
- ALARMS / NOTIFICATIONS – active alarms, alarm history, email alerts
- SERVICE INSIGHT – faster diagnostic, analysis and performance review

ADVANCED CONTROL AND REGULATION

Siemens Climatix-based software coordinates all key FLEXY functions – from a single chiller to a multi-unit plant.

Operation control:

- Variable-speed compressor staging and frequency regulation
- Fan speed modulation
- Superheat control
- Primary and secondary circuit pump regulation
- Duty / standby rotation

Additional software functions:

- Serial heat recovery or desuperheater
- Free cooling
- Night mode
- Dynamic setpoint via ambient temperature or external signal
- Energy meter



Climatix touch-screen

CONTROLLER by
SIEMENS



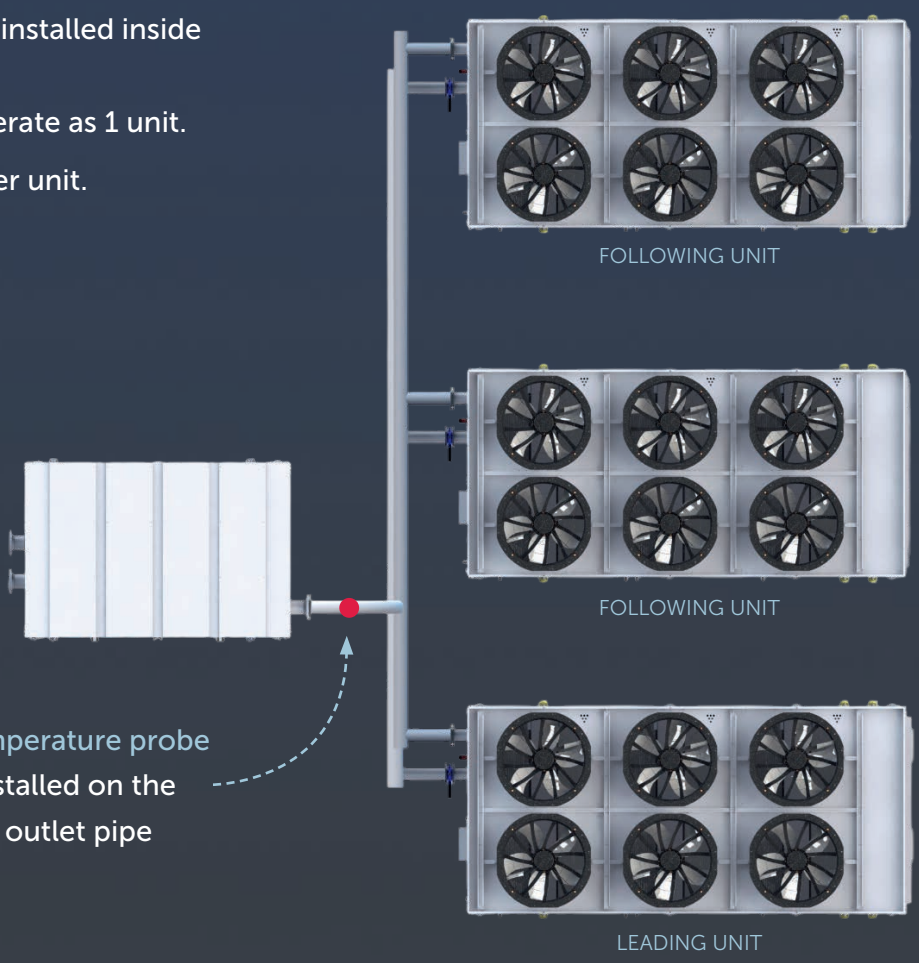
PARALLEL CONFIGURATION OF UNITS

Parallel configuration (known as 'leading-following') system control is available with Siemens CLIMATIX programmable controller. It enables communication between leading and following units and regulates operation by managing various equipment.

Siemens CLIMATIX controller is installed inside the leading unit.

- Maximum of 3 units which operate as 1 unit.
- Maximum of 4 compressors per unit.

CONTROLLER by
SIEMENS







Producing natural cooling and heating systems since 2002.

FRIGOPLUS

NATURAL COOLING & HEATING

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