INTARCON



# Waterloop system

## Indirect condensation system

Complies with Ecodesign

VRC multiservice version

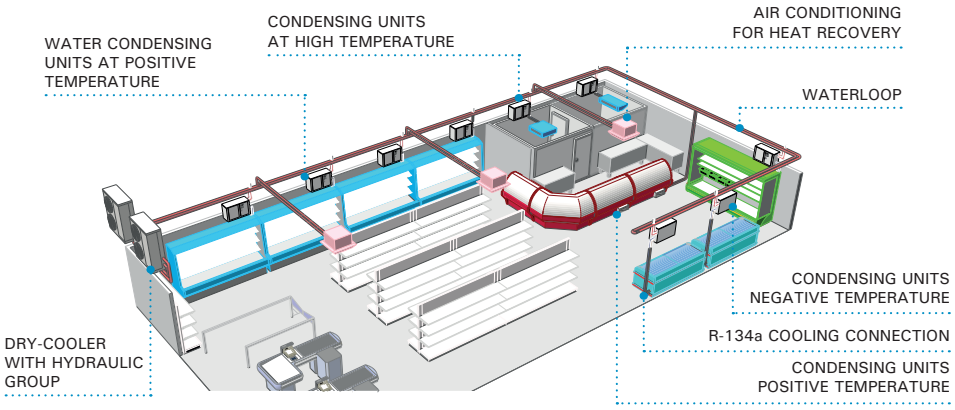
Low noise construction

# Waterloop system

**Waterloop** is a commercial refrigeration system, consisting of: DX cooling units distributed, with indirect condensation by a water circuit; and one or more units in parallel air-cooler connected to the condensation heat dissipation.

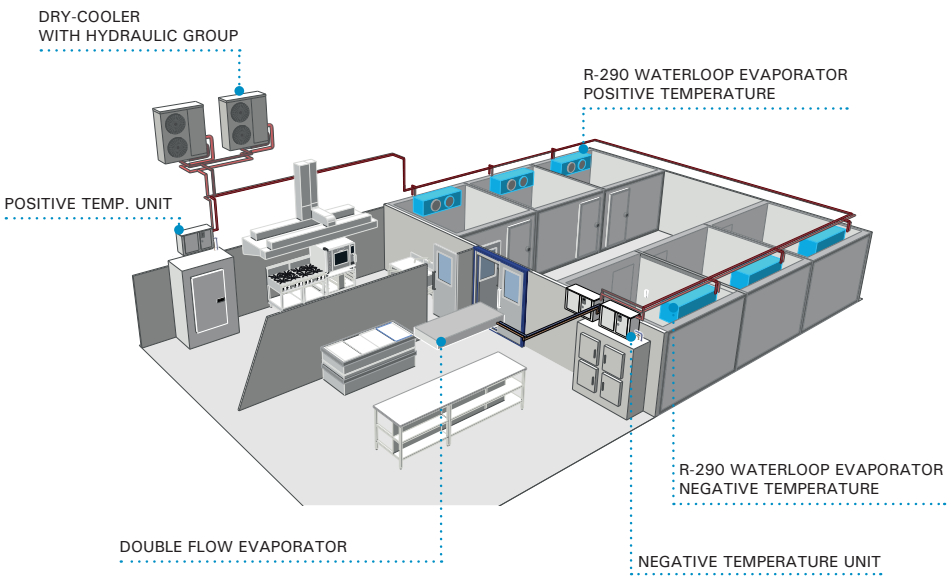
## Supermarkets and food stores applications

Waterloop system allows distributed cooling production at different temperatures, with a single condensing water loop. Condensation heat recovery from the cooling units can easily be carried out in air conditioners or fan coils.




## Application in industrial kitchens

Waterloop system makes possible to centralise a set of cold rooms and process rooms. The use of compact R-290 waterloop units in cold rooms and process rooms is a 100 % ecological solution free of greenhouse gases.




### Ecology

Distributed cooling production allows to reduce and fractionate the load of HFC refrigerant in the installation, so that the risk of leakage is reduced.

### Safety

Decentralization of the cooling production contributes a greater operation security of the installation, that guarantees a high availability of the system when faced with the isolated failure of a single unit.

The installation of a double air-cooler or dry-cooler in parallel, provides a greater operational security.

The condensation water loop contains only closed-circuit water working at low hydraulic pressure.

### Simple installation

Waterloop system is very easy to install, thanks to its condensed water units pre-charged with refrigerant, and air-coolers or dry-coolers with inbuilt hydraulic unit/circuit.

### Precision

Distributed cooling production allows adaptation of working temperatures to the needs of each service, thus obtaining an adequate degree of humidity for the best preservation of each product, and optimizing the performance of the systems.

### Energy saving

Condensing units incorporate high-efficiency scroll compressors with R-134a or R-449A refrigerant for positive temperature, and R-449A for negative temperature.

Air-coolers or dry-coolers incorporate hydraulic group with electronic pump of variable flow, that adapts its functioning speed to the demand of the installation. Motor fans are equipped with speed regulators to reduce their consumption in low ambient temperatures or low load.

### Versatility

Waterloop system is applicable both in new installations and in existing centralized direct expansion facilities, where the update of refrigeration plant is desired. In fact, existing refrigerating displays are usable and easily converted to new refrigerants.

### Easy and flexible installation

Refrigeration units are supplied with service valves and factory refrigerant pre-load with service keys.

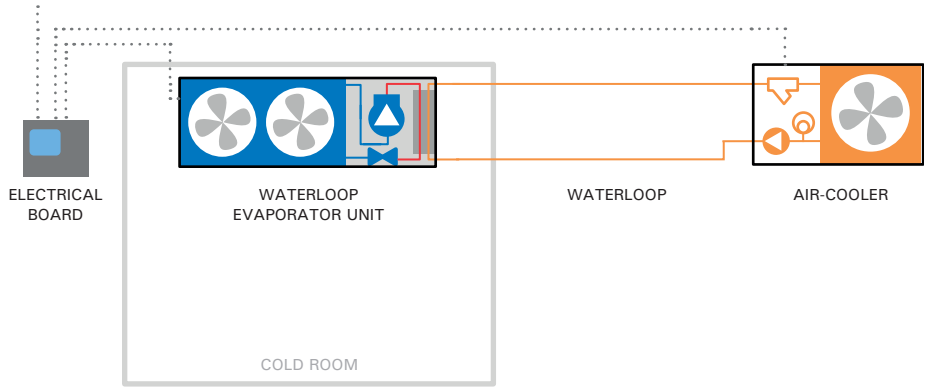
The waterloop can be made with polypropylene pipe without insulation, with service valves in each refrigeration unit, thus providing great flexibility in modifying the installation.

### Tropicalised design

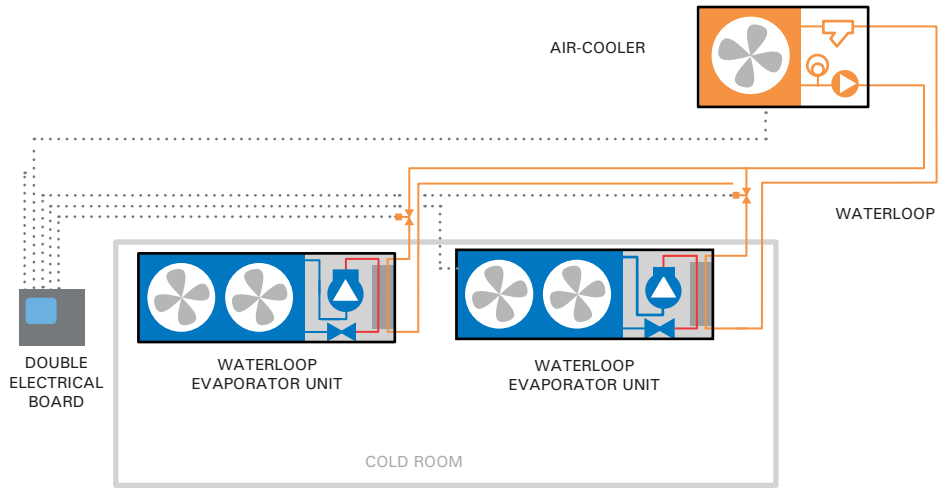
Unlike other systems on the market, the waterloop system is designed to work properly even with extreme ambient temperatures of up to 45 °C, with condensation water temperatures of up to 55 °C, and without the need to incorporate additional cooling equipment.

**Waterloop** system allows different configurations from a simple cold room up to a set of rooms and other refrigeration services at different temperatures.

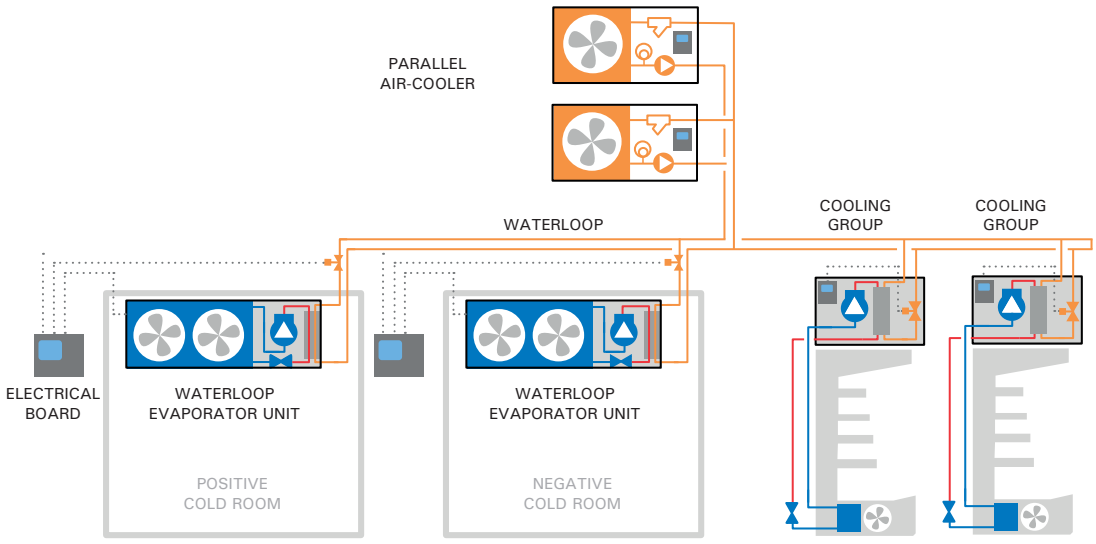
## Simple intallations example 1 + 1




## Twin intallations example




## Multi intallations example




### Product range

Evaporator units with built-in compressor, condensed by water, and with external panel. Designed for positive or negative cold rooms temperature.

Refrigeration units condensed by water, with external panel. Designed to service refrigerated cabinets and displays.


Aero condensers with built-in hydraulic unit, at constant or variable flow, with water loop temperature control.

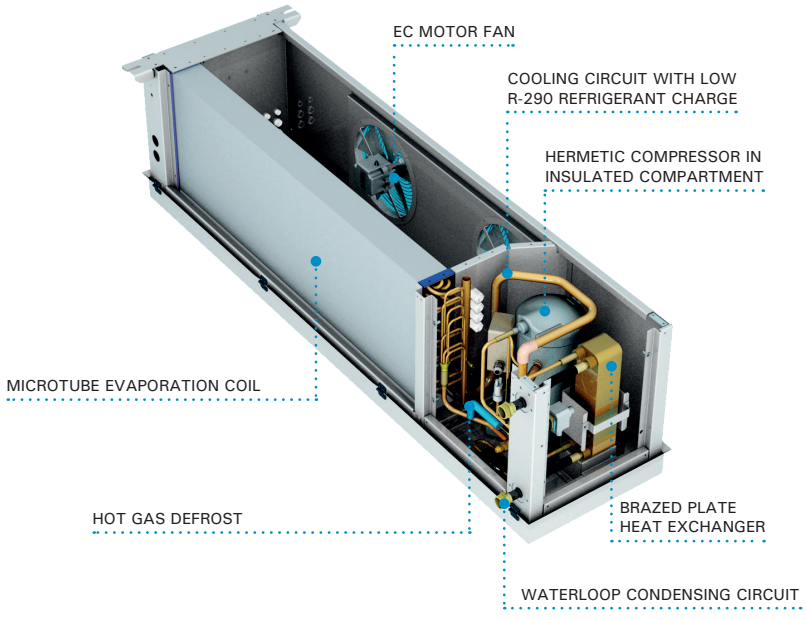
# Waterloop evaporating units

- Compact unit condensed by water.
- Minimal R-290 refrigerant charge.
- Easy and safe installation with connection to the condensation water circuit.

Waterloop evaporator units with compressor are compact units for installation inside small cold rooms, designed with natural refrigerant R-290 and waterloop condensed.

## Features

- 230 V-I-50 Hz power supply. Others voltages by request.
- R-290 refrigerant charge low than 0.15 kg.
- Bodywork in aluminium sheet and structure in galvanised steel lacquered in polyester paint.
- Hemertic compressor integrated in thermally insulated compartment, with crankase heater.
- Refrigeration circuit in annealed copper tube, with high pressure switch, filter drier and load valve.
- Evaporation coil in copper pipes and aluminium fins, thermostatic expansion valve and hot gas defrost.
- EC motor fans.
- Brazed plates heat exchanger.
- Threaded hydraulic connections.
- Control panel in white lacquered sheet metal cabinet, with MCB protection and multifunction electronic regulation.
- 3 m interconnection cable.




### Installation

Installation of a closed loop water evaporator unit with an air cooler and general electrical panel:

### Compact R-290 system

The waterloop evaporator units are hermetically sealed compact systems with a minimum charge of R-290, exempt from the application EN 378.

They have a minimum R-290 refrigerant charge lower than the practical limit of the refrigerated volume.

### Electrical board

Electrical power and control board for outside installation.

- MCB protection of compressor and manoeuvre.
- Electronic control with temperature control and recording of maximum and minimum temperatures.
- Jet Cool function.
- Energy saving function.
- Optional air condenser management with water loop temperature control and frost protection.

# MCC / BCC series

## 230 V-I-50 Hz / 400 V-III-50 Hz | Positive temperature | R-290

| | | Series / Model | Compressor HP | Compressor Power supply | Cooling capacity / cold room volume (W) [1] 0 °C W | 0 °C m³ | Input power (kW) | Max. current (A) | Evap. air flow (m³/h) | Conden. water flow (l/h) | PdC kPa [2] | Hydraulic connection | Refrigerant charge (kg) [3] | Weight (kg) | Drycooler model [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-290 | 1x H | MCC-ND-1 017 | 3/4 | 230 V-I | 1 400 | 12 | 0,8 | 4,9 | 1 600 | 350 | 20 | 3/4" | < 0,10 | 50 | CWF-0 |
| | | MCC-ND-1 034 | 1 1/2 | 230 V-I | 2 230 | 24 | 1,4 | 9,3 | 1 600 | 600 | 40 | 3/4" | < 0,10 | 59 | CWF-0 |
| | 1x Sc | MCC-SD-1 012 | 1 1/2 | 400 V-III | 2 830 | 33 | 1,4 | 4,8 | 1 600 | 750 | 50 | 3/4" | < 0,15 | 62 | CWF-1 |
| | | MCC-SD-2 017 | 2 | 400 V-III | 3 850 | 51 | 2,0 | 5,9 | 1 700 | 1 000 | 40 | 1" | < 0,20 | 72 | CWF-2 |

## 230 V-I-50 Hz / 400 V-III-50 Hz | Negative temperature | R-290

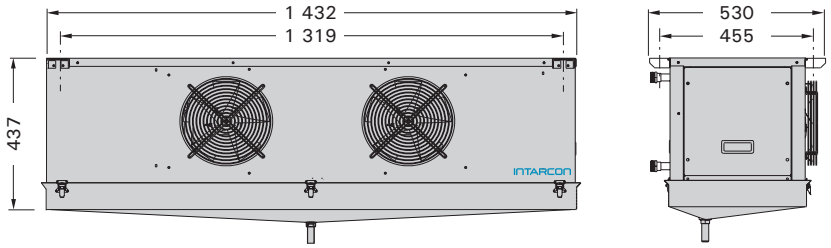
| | | Series / Model | Compressor HP | Compressor Power supply | Cooling capacity / cold room volume (W) [1] -20 °C W | -20 °C m³ | Input power (kW) | Max. current (A) | Evap. air flow (m³/h) | Conden. water flow (l/h) | PdC kPa [2] | Hydraulic connection | Refrigerant charge (kg) [3] | Weight (kg) | Drycooler model [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-290 | 1x H | BCC-ND-1 034 | 1 | 230 V-I | 970 | 9 | 1,4 | 8,8 | 1 600 | 350 | 20 | 3/4" | < 0,10 | 59 | CWF-0 |
| | 1x Sc | BCC-SD-1 012 | 1 1/2 | 400 V-III | 1 420 | 15 | 1,4 | 4,3 | 1 700 | 500 | 20 | 3/4" | < 0,15 | 68 | CWF-0 |
| | | BCC-SD-2 017 | 2 | 400 V-III | 1 900 | 24 | 1,8 | 5,8 | 1 700 | 750 | 40 | 1" | < 0,20 | 72 | CWF-1 |

## Options

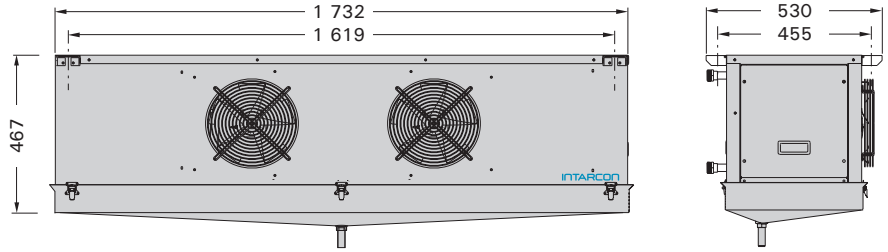
- Electrical board for two units in the same cold room.
- Water solenoid valve for multi-equipment waterloop installation.

## Dimensions

### 1 series




### 2 series




Measuring mm.

[1] Nominal performances refer to operation with cold room temperatures of 0 °C (PT) and -20 °C (NT) and water inlet condensation temperature of 40 °C. Estimated cold room volume according to conditions of the calculation bases (page 8).

[2] Condenser pressure drop in the water circuit.

[3] A3 refrigerant charge less than 0.5 kg, units exempt from, Regulation (EU) No 517/2014.

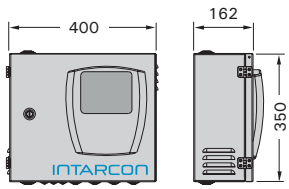
[4] Recommended air cooler model to combine with the evaporator unit.

### Electrical interconnections

For the electrical interconnection from the electrical panel to the unit and to the air condenser (optional), the following interconnection cables must be provided:

| Evaporator power supply | 230 V-I-50 Hz | 400 V-III-50 Hz |
|---|---|---|
| Compressor | 1 x 1.5 mm² + N + T | 3 x 1.5 mm² + N + T |
| Manoeuvre | 4 x 1 mm² | 4 x 1 mm² |
| Probes | 4 x 1 mm² | 4 x 1 mm² |
| Dry-cooler power supply | 230 V-I-50 Hz | |
| Manoeuvre | 2 x 1 mm² + N + T | |
| Probes | 2 x 1 mm² | |

### Electrical board dimensions



# Waterloop

*water-cooled condensing units*

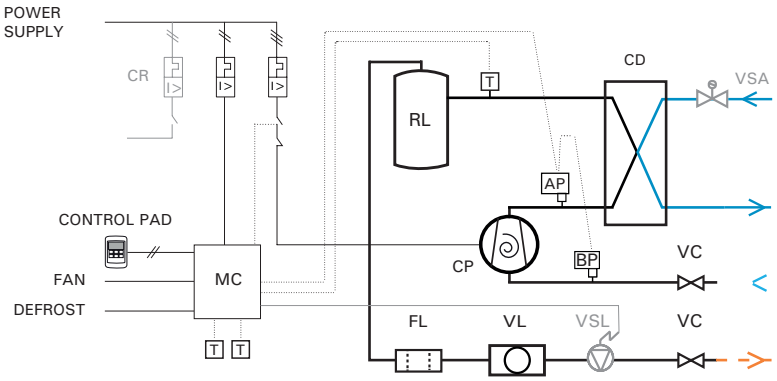

- Indirect condensation by a water circuit.
- Low noise level.
- Simple installation.
- Reduced refrigerant load.
- According to F-Gas.

Water-cooled condensing units for positive temperature refrigeration, with very compact size and quiet operation, designed for on-wall or floor installation.

## Features

- 230 V-I-50 Hz or 400 V-III-50 Hz power supply. Others voltages by request.
- Casing in pre-painted galvanized steel sheet, with noise insulation, with removable front panel for access to the compressor and the electrical panel.
- Acoustically insulated Scroll compressor, mounted on shock absorbers.
- Rotary compressor (MDM-P / BDM-P).
- Stainless steel brazed plates heat exchanger. Cooling circuit with ceramic dryer filter, sight glass, HP and LP and services valves.
- Hydraulic condensation circuit made of copper pipe with threaded connections.
- Electrical control panel with differential thermomagnetic protection.
- Liquid injection system for negative temperature models with R-449A.

## Refrigeration and electrical sheme

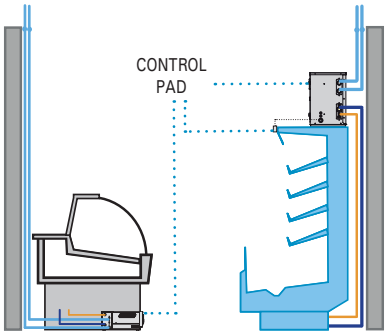



STANDARD
AP: HIGH PRESSURE SWITCH
BP: LOW PRESSURE SWITCH
CD: HEAT EXCHANGER
CP: COMPRESSOR
FL: FILTER
MC: MICRO-CONTROLLER
RL: LIQUID VESSEL
T: PROBE
VC: SHUT-OFF VALVE
VL: SIGHT GAUGE

OPTIONAL
CR: DEFROST CONTACTOR
VSA: WATER SOLENOID VALVE
VSL: LIQUID SOLENOID VALVE
OPTIONAL WITH ELECTRONIC CONTROL
MC: ELECTRONIC MICRO-CONTROLLER

### Installation

Waterloop series motor condensers can be installed on the furniture, on the floor or anchored at the wall.




### Rotary compressors

Hermetic rotary compressors provide greater reliability, lower noise and maximum design flexibility.

### Very quiet compressors

Scroll compressors Copeland, are characterized by their great robustness and reliability of operation, and being cooled exclusively by the refrigerant gas, allow effective soundproofing.

### Calculation of hydraulic connections

Visit our easy and intuitive online software to calculate the hydraulic pipes of the system.

https://intarcon.calcooling.com/

# MDM / BDM series

## 230 V-I-50 Hz / 400 V-III-50 Hz | Positive temperature | Rotary compressor - Scroll compressor | R-134a / R-449A

| | | Series / Model | Compressor HP | Compressor Model | Compressor Power supply | Cooling capacity (W) [1] Evaporation temperature 0 °C | -5 °C | -10 °C | Input power (kW) | Max. current (A) | Condensing flow (l/h) | Hydraulic connection | Pressure drop (m.c.a) | Liq-Gas cooling connection | Weight (kg) | SPL dB(A) [2] 1 m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-134a | 1x Rotary | MDM-PY-0 005 | 3/8 | HGA-4450Y | 230 V-I | 820 | 690 | 570 | 0.4 | 4 | 150 | 3/4" | 0.5 | 3/16"-3/8" | 20 | 36 |
| | | MDM-PY-0 007 | 1/2 | HGA-4476Y | 230 V-I | 1 220 | 1 020 | 850 | 0.5 | 5 | 250 | 3/4" | 0.5 | 3/16"-1/2" | 25 | 45 |
| | 1x Scroll | MDM-SY-1 009 | 1 1/4 | ZS09 | 400 V-III * | 1 840 | 1 540 | 1 270 | 0.7 | 3 | 350 | 3/4" | 0.5 | 1/4"-5/8" | 34 | 40 |
| | | MDM-SY-1 015 | 2 | ZB15 | 400 V-III * | 2 810 | 2 350 | 1 940 | 1.1 | 5 | 500 | 3/4" | 0.5 | 1/4"-5/8" | 43 | 37 |
| | | MDM-SY-1 021 | 3 | ZB21 | 400 V-III * | 4 200 | 3 500 | 2 890 | 1.5 | 7 | 750 | 3/4" | 0.5 | 1/4"-3/4" | 53 | 40 |
| | | MDM-SY-1 029 | 4 | ZB29 | 400 V-III | 5 200 | 4 340 | 3 590 | 2.0 | 10 | 950 | 1" | 0.5 | 3/8"-7/8" | 53 | 40 |
| | | MDM-SY-1 038 | 5 | ZB38 | 400 V-III | 7 060 | 5 890 | 4 860 | 2.5 | 13 | 1 250 | 1" | 0.5 | 3/8"-7/8" | 68 | 53 |
| | | MDM-SY-1 045 | 6 | ZB45 | 400 V-III | 8 250 | 6 890 | 5 700 | 2.9 | 13 | 1 500 | 1" | 0.5 | 3/8"-1 1/8" | 70 | 43 |
| | | MDM-SY-1 057 | 8 | ZB57 | 400 V-III | 10 500 | 8 760 | 7 240 | 4.1 | 16 | 1 950 | 1 1/4" | 0.5 | 3/8"-1 1/8" | 75 | 50 |
| R-449A | 1x Rotary | MDM-PG-0 006 | 1/2 | HGA-4467Z | 230 V-I | 1 190 | 960 | 765 | 0.5 | 5 | 200 | 3/4" | 0.5 | 3/16"-3/8" | 22 | 38 |
| | | MDM-PG-0 010 | 1 | HGA-4512Z | 230 V-I | 2 000 | 1 610 | 1 290 | 0.8 | 7 | 350 | 3/4" | 0.5 | 1/4"-1/2" | 27 | 41 |
| | 1x Scroll | MDM-SG-1 009 | 1 1/4 | ZS09 | 400 V-III * | 2 790 | 2 250 | 1 840 | 1.2 | 2 | 500 | 1" | 0.5 | 1/4"-5/8" | 34 | 40 |
| | | MDM-SG-1 015 | 2 | ZB15 | 400 V-III * | 4 320 | 3 640 | 3 050 | 1.7 | 5 | 800 | 1" | 0.5 | 3/8"-5/8" | 43 | 37 |
| | | MDM-SG-1 021 | 3 | ZB21 | 400 V-III * | 6 330 | 5 340 | 4 460 | 2.4 | 7 | 1 200 | 1" | 0.5 | 3/8"-3/4" | 53 | 40 |
| | | MDM-SG-1 029 | 4 | ZB29 | 400 V-III | 7 787 | 6 580 | 5 510 | 3.1 | 10 | 1 500 | 1/4" | 0.5 | 3/8"-7/8" | 53 | 40 |
| | | MDM-SG-1 038 | 5 | ZB38 | 400 V-III | 10 500 | 8 870 | 7 430 | 3.9 | 13 | 1 950 | 1/4" | 0.5 | 3/8"-7/8" | 68 | 53 |
| | | MDM-SG-1 045 | 6 | ZB45 | 400 V-III | 13 100 | 11 200 | 9 420 | 5.6 | 13 | 2 500 | 1/4" | 0.5 | 3/8"-1 1/8" | 70 | 43 |

## 230 V-I-50 Hz / 400 V-III-50 Hz | Negative temperature | Rotary compressor - Scroll compressor | R-449A

| | | Series / Model | Compressor HP | Compressor Model | Compressor Power supply | Cooling capacity (W) [1] Evaporation temperature -20 °C | -25 °C | -30 °C | -35 °C | Input power (kW)* | Max. current (A) | Condensing flow (l/h) | Hydraulic connection | Pressure drop (m.c.a) | Liq-Gas cooling connection | Weight (kg) | SPL dB(A) [2] 1 m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-449A | | BDM-PG-0 004 | 1 | HGA-2446Z | 230 V-I | 890 | 680 | 510 | 370 | 0.5 | 5 | 150 | 1/2" | 0.5 | 3/16"-1/2" | 23 | 45 |
| | 1x Scroll | BDM-SG-1 006 | 2 | ZF06 | 400 V-III * | 2 240 | 1 840 | 1 500 | 1 210 | 1.6 | 5 | 550 | 3/4" | 0.5 | 1/4"-5/8" | 45 | 39 |
| | | BDM-SG-1 009 | 3 | ZF09 | 400 V-III | 3 120 | 2 560 | 2 080 | 1 660 | 2.0 | 6 | 700 | 3/4" | 0.5 | 3/8"-3/4" | 54 | 44 |
| | | BDM-SG-1 011 | 3 1/2 | ZF11 | 400 V-III | 3 843 | 3 180 | 2 580 | 2 070 | 2.4 | 8 | 850 | 3/4" | 0.5 | 3/8"-3/4" | 55 | 45 |
| | | BDM-SG-2 013 | 4 | ZF13 | 400 V-III | 4 320 | 3 560 | 2 900 | 2 340 | 2.7 | 9 | 950 | 1" | 0.5 | 3/8"-7/8" | 55 | 47 |
| | | BDM-SG-2 015 | 5 | ZF15 | 400 V-III | 5 400 | 4 440 | 3 600 | 2 890 | 3.5 | 10 | 1 200 | 1" | 0.5 | 3/8"-7/8" | 73 | 47 |
| | | BDM-SG-2 018 | 6 | ZF18 | 400 V-III | 6 460 | 5 300 | 4 300 | 3 450 | 4.1 | 14 | 1 500 | 1" | 0.5 | 3/8"-1 1/8" | 78 | 47 |
| | | BDM-SG-2 025 | 8 | ZF25 | 400 V-III | 8 060 | 6 640 | 5 390 | 4 330 | 4.5 | 16 | 1 750 | 1 1/4" | 0.5 | 3/8"-1 1/8" | 78 | 47 |

## Options

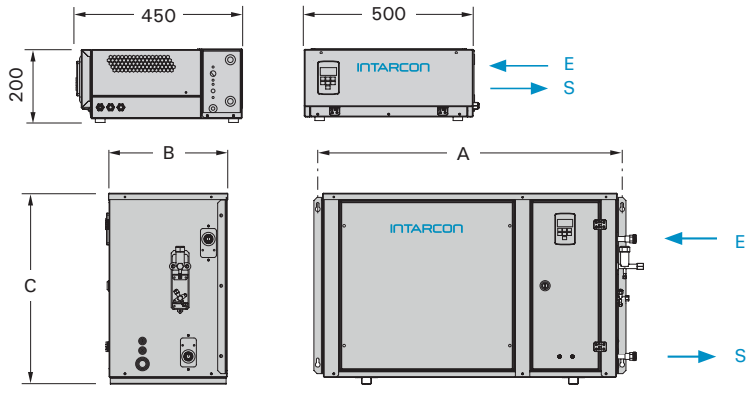
- Change to 230 V-I-50 Hz power supply.
- Electronic control for evaporator and compressor with temperature probes and control suitable for local or remote control.
- Refrigerant pre-load for 5 m piping.
- Built-in liquid solenoid valve with body and coil.
- Water solenoid valve.
- Flow regulation manual valve.
- Hot gas defrost.

[1] Cooling capacity at nominal performances refer to operation at evaporation temperature -10 °C (PT) and -30 °C (NT), water temperature of 40 °C, 10 K super-heating and 3 K sub-cooling.

[2] Sound pressure in dB (A) in open field at 1 m from the unit.

* Available units with 230 V-I-50 Hz power supply.

## Dimensions




Measuring mm.

# Waterloop

*drycooler with built-in hydraulic group*


- ❄ Low sound level with double acoustic insulation.
- ❄ Tropicalised design for ambient temperature up to 45 °C as standard.

Dry-coolers with built-in hydraulic group, in a low-noise construction, designed for heat dissipation of the refrigeration equipment condensation waterloop.

## Features

- Axial EC motor fans (except CWF-0 and CWF-1).
- High efficiency water coils with copper pipes and aluminium fins.
- Hydraulic group with variable flow electronic pump, expansion valve, security valve, filter, thermomanometers and auto-fill valve included.
- Threaded hydraulic connections.
- Electric power panel with protection of hydraulic pump, fan motor and speed regulator (except CWF-0 and CWF-1).

### Electronic control

Waterloop dry-coolers (CWF-2 up to 8) incorporate an electronic control with the next functions:

- Variation of the water pump flow adapting to the demand, depending on the impulsion pressure.
- Waterloop temperature control by fan speed variation, with floating set-point.
- Frost protection.

**230 V-I-50 Hz | Positive temperature | Water**

| | Series / Model | Flow control | Exchange capacity (W) [1] | Air flow ($m^3/h$) | Fan (N x Ø mm) | Water flow (l/h) | Input power (kW) | Max. current (A) | Pressure drop kPa [2] | Hydraulic connection | Weight (kg) | SPL dB(A) [3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | **CWF-0** | Constant | 3 000 | 1 700 | 1x Ø 360 | 500 | 0.14 | 1.1 | 100 | 3/4" | 76 | 30 |
| | **CWF-1** | Constant | 4 700 | 3 200 | 1x Ø 450 | 750 | 0.22 | 1.8 | 100 | 3/4" | 79 | 26 |
| | **CWF-2** | Variable | 6 000 | 3 700 | 1x Ø 450 | 1 000 | 0.24 | 2.0 | 100 | 1" | 81 | 26 |
| | **CWF-3** | Variable | 10 000 | 6 500 | 2x Ø 450 | 1 500 | 0.44 | 3.6 | 100 | 1" | 101 | 29 |
| | **CWF-4** | Variable | 12 000 | 7 000 | 2x Ø 450 | 2 000 | 0.48 | 3.9 | 100 | 1 1/4" | 113 | 29 |
| | **CWF-6** | Variable | 20 000 | 13 000 | 4x Ø 450 | 3 000 | 0.88 | 7.0 | 100 | 1 1/2" | 160 | 32 |
| | **CWF-8** | Variable | 24 000 | 14 000 | 4x Ø 450 | 4 000 | 0.96 | 7.5 | 100 | 1 1/2" | 185 | 32 |

## Options

- Water coil anti-corrosion polyurethane coating.
- Coil protection grille:
  Series 0 up to 4.
  Series 6 and 8.

[1] Estimated heat exchange power with air temperature of 35 °C, and water inlet / outlet temperature of 45 / 40 °C.

[2] Available circuit pressure.

[3] Sound pressure in dB (A) in open field at 10 m from the unit.

## Dimensions

| Dimensions (mm) | A | B | C |
|---|---|---|---|
| 0 and 1 series | 1 030 | 375 | 580 |
| 2 series | 1 080 | 415 | 830 |
| 3 series | 1 150 | 480 | 1 100 |
| 4 series | 1 150 | 480 | 1 350 |
| 6 series | 1 745 | 480 | 1 100 |
| 8 series | 1 745 | 480 | 1 350 |