intarCUBE R-290 | Chillers

- Natural refrigerant R-290.
- High energy efficiency.
- Easy installation.

Water or glycol chiller for commercial and industrial refrigeration applications with reduced R-290 load, in vertical footprint construction with optional built-in hydraulic unit.

Features

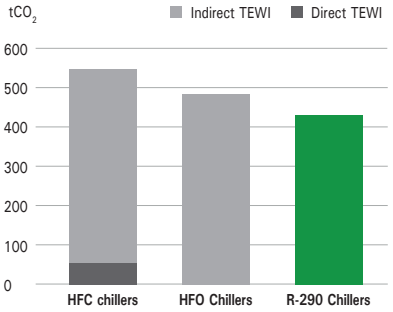
- 400V 3N 50Hz power supply. Available in 60Hz. Others voltages by request.
- R-290 refrigerant.
- Self-supporting body made of galvanised steel sheet with polyester paint for outdoor use, with thermo-acoustic insulation of elastomeric foam. Side panels that can be opened around the entire perimeter.
- Separate compressor compartment with leak detector and ATEX extraction fan.
- Tandem or trio of scroll compressors for R-290 with acoustic insulation; or tandem of semihermetic compressors for R-290 with capacity control and unloaded start, with crankcase unloaded, with crankcase heater.
- Refrigerating circuit made of annealed copper tube with soldered joints, filter drier, pressure filter drier, ATEX high and low pressure switches, pressure transducers and temperature probes.
- Condenser coil of copper microtube and aluminium fins.
- Electronic fans.
- Electrical control and power panel with magneno-thermal and differential protection independent of compressors, fans and pumps.
- Stainless steel plate evaporator with electronic expansion valve.
- Economiser by means of internal heat exchanger.
- Programmable Emerson electronic control unit with refrigeration control, condensing fan control with floating set point, pump control, etc.
- Threaded hydraulic connections.
- Glycerine pressure gauges.

Natural refrigerant R-290

R-290 or propane is naturally occurring in the environment with virtually zero greenhouse effect (GWP = 0.02 according to IPCC AR6).

R-290 has excellent thermodynamic properties and high efficiency in refrigeration production.

The TEWI or overall global warming impact of R-290 chiller is 20 % lower than that of HFC, not only because of the zero direct effect, but also due to the higher energy efficiency.



TEWI over a 15-year life cycle of a 100 kW refrigeration chiller. Calculation of electricity consumption according to Ecodesign. Annual leakage rate of 5 %. Emission factor 0.15 kg CO_2/kWh.

Reduced refrigerant charge

intarCUBE chillers are designed with a reduced R-290 charge of less than 5 kg, respecting the refrigerant charge limits in publicly accessible premises.

Safety measures against the risk of explosive atmospheres are incorporated. R-290 is a flammable refrigerant, class A3, which is confined in a ventilated envelope in compliance with EN 378 standard.

400V 3N 50Hz | High temperature | Scroll or semihermetic compressor | R-290

Refrigerant	Compressor	Series / Model	Compressor HP	Compressor Model	Cooling capacity (kW) [1] I/O water temperature 12/7 °C	Input power (kW)	Ecodesign SEPR [3]	Max. input current (A)	Condenser Fan Ø (mm)	Condenser Air flow (m³/h)	Water flow (m³/h)	Hydraulic connection	Weight (kg)	SPL dB(A) [4]
R-290	2x Scroll	AWV-SD-6 0502	8	2x ZB25KCU	19.7	6.0	6.7	19	2x Ø 450	9 000	3.4	1 1/2"	400	31
		AWV-SD-6 0742	12	2x ZB37KCU	27.6	9.1	6.7	26	2x Ø 450	9 000	4.7	2"	410	32
		AWV-SD-6 0982	16	2x ZB49KCU	33.3	11.9	6.3	34	2x Ø 450	9 000	5.7	2"	430	36
	3x Scroll	AWV-SD-7 0753	12	3x ZB25KCU	29.7	8.8	7.1	27	3x Ø 450	14 400	5.1	2"	550	32
		AWV-SD-7 1113	18	3x ZB37KCU	41.7	13.0	7.2	38	3x Ø 450	14 400	7.1	2"	570	34
		AWV-SD-7 1473	24	3x ZB49KCU	50.4	17.1	6.6	50	3x Ø 450	14 400	8.6	2 1/2"	640	38
	2x Semih.	AWV-KD-8 0242	24	2x S12-42AXH	64.5	21.5	7.0	45	2x Ø 630	20 000	11.0	2 1/2"	909	47
		AWV-KD-8 0302	30	2x S15-52AXH	74.7	26.9	6.8	59	2x Ø 630	20 000	12.8	2 1/2"	924	49
		AWV-KD-8 0402	40	2x S20-56AXH	79.7	31.0	6.4	73	2x Ø 630	20 000	13.6	2 1/2"	936	51

400V 3N 50Hz | Positive temperature | Scroll or semihermetic compressor | R-290

Refrigerant	Compressor	Series / Model	Compressor HP	Compressor Model	Cooling capacity (kW) [2] I/O 35 % propylene glycol temperature -2/-8 °C	Input power (kW)	Ecodesign SEPR [3]	Max. input current (A)	Condenser Fan Ø (mm)	Condenser Air flow (m³/h)	Glycol flow (m³/h)	Hydraulic connection	Weight (kg)	SPL dB(A) [4]
R-290	2x Scroll	MWV-SD-6 0502	8	2x ZB25KCU	11.9	5.4	3.6	19	2x Ø 450	9 000	1.8	1 1/4"	400	31
		MWV-SD-6 0742	12	2x ZB37KCU	17.3	7.5	3.8	26	2x Ø 450	9 000	2.6	1 1/2"	410	32
		MWV-SD-6 0982	16	2x ZB49KCU	21.2	9.5	3.8	34	2x Ø 450	9 000	3.2	1 1/2"	430	36
	3x Scroll	MWV-SD-7 0753	12	3x ZB25KCU	17.9	8.0	3.8	27	3x Ø 450	14 400	2.7	1 1/2"	550	32
		MWV-SD-7 1113	18	3x ZB37KCU	25.8	11.1	4.1	38	3x Ø 450	14 400	4.0	2"	570	34
		MWV-SD-7 1473	24	3x ZB49KCU	31.8	13.8	4.1	50	3x Ø 450	14 400	4.9	2"	640	38
	2x Semih.	MWV-KD-8 0242	24	2x S12-42AXH	38.9	17.0	4.0	45	2x Ø 630	20 000	6.0	2"	909	47
		MWV-KD-8 0302	30	2x S15-52AXH	45.4	20.1	4.0	59	2x Ø 630	20 000	7.0	2"	924	49
		MWV-KD-8 0402	40	2x S20-56AXH	48.5	22.9	3.9	73	2x Ø 630	20 000	7.4	2"	936	51

Options

- Machine room version with EC radial fans for exhaust air ducting.
- Anti-corrosion treatment based on polyurethane coating for the condensing coil.
- Electronic control and spare driver.
- Silentblocks for equipment installation.
- Heat recovery (20 or 80 % heat from the condenser) for hot water generation.
- Built-in hydraulic group made of copper pipe with threaded connections, with glycol circulating pump with stainless steel body and impeller, and optional backing pump, expansion vessel, safety valve, mesh filter, thermometers and pressure gauges, air vent and drainage inlet (except 8 series and units with heat recovery).
- External hydraulic group.

[1] Nominal performance high temperature: 35 °C ambient temperature with water inlet/outlet at 12/7 °C.

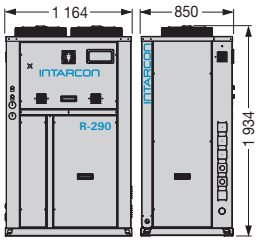
[2] Nominal performance positive temperature: 35 °C ambient temperature with glycol inlet/outlet at -2/-8 °C, with a propylene glycol concentration of 35 %.

[3] Seasonal performance factor (SEPR) according to Commission Regulation (EU) 2015/1095 and (EU) 2016/2281.

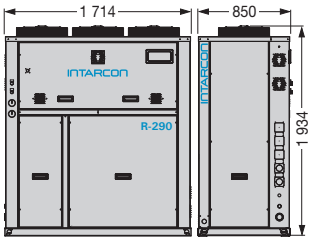
[4] Sound pressure level of the condenser referred to dB(A) sound pressure level, measured in the open field at 10 m distance.

Dimensions

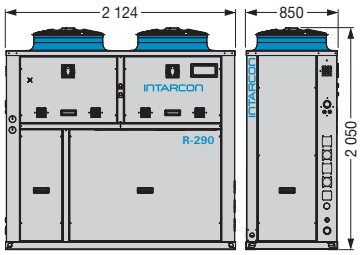
6 series - axial



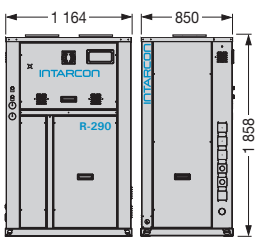
7 series - axial



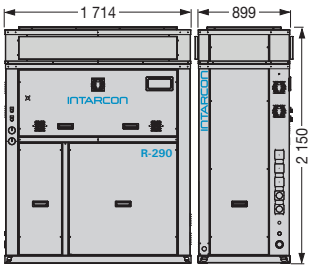
8 series - axial



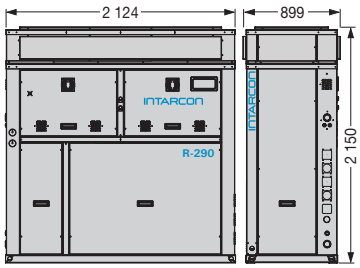
6 series - radial



7 series - radial



8 series - radial



Dimensions in mm.

Pump sets for WV series

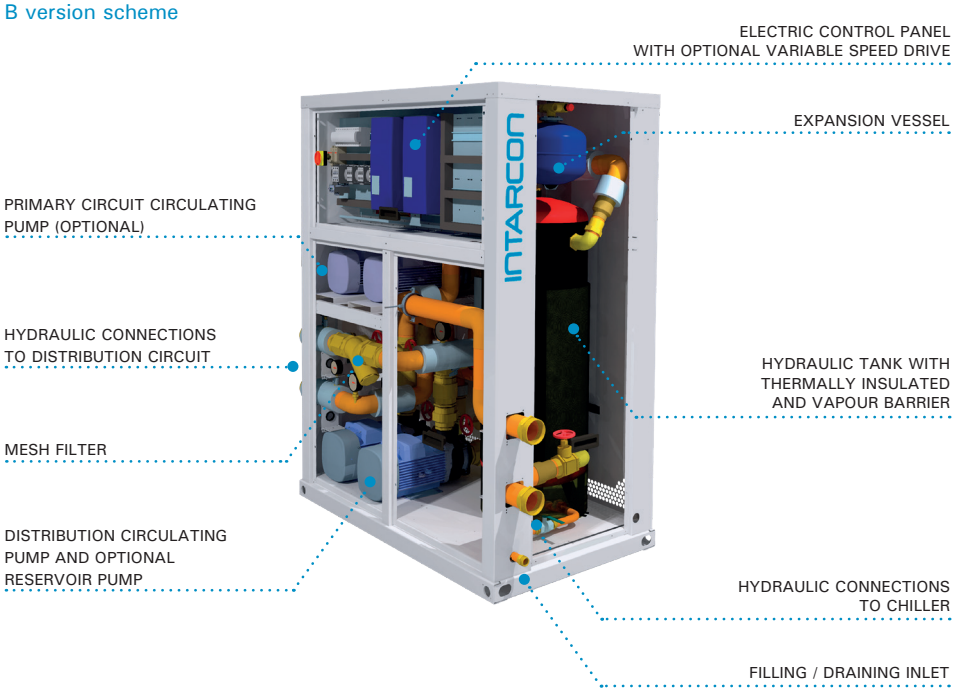
- Easily integrated modular construction.
- Optimised water and glycol assemblies.
- Reduced footprint.

Closed-circuit pump sets glycol, assembled in galvanised sheet steel bodywork and structure with polyester paint for outdoor installation.

Features

- 400V 3N 50Hz power supply. Available in 60Hz. Others voltages by request.
- Glycol circulating pump with stainless steel impeller and optional back-up pump.
- Buffer tank with high density polyurethane foam insulation and vapour barrier (AH-2 and B series).
- Closed membrane expansion tank and safety valve calibrated to 4 bar.
- Mesh filter.
- Glycerine thermometers and pressure gauges.
- Air vent.
- Drain connection.
- Threaded hydraulic connections.
- Electrical control and power panel with magneto-thermal protection and independent differential for each pump, and electronic control unit for the management and rotation of secondary circuit pumps.

B version scheme

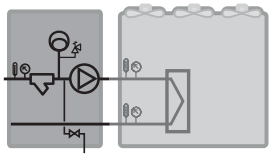


Versions

- A version

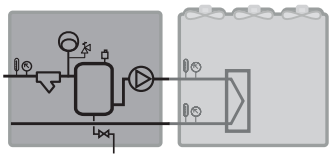
GV-AH-1: Primary pump set

Simple hydraulic unit with circulating pump, mesh filter and expansion vessel.



GV-AH-2: Primary pump set unit with buffer tank

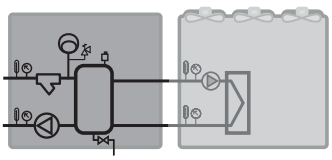
Pump set with medium or high pressure circulating pump at constant flow rate, for connection to one or more chillers.



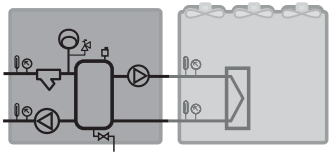
- B version

GV-BH-2: Secondary circuit pump set

Secondary circuit hydraulic unit, with buffer tank and medium or high pressure circulating pump at constant or variable flow rate (optional), for connection to one or more chiller equipped with primary circuit pump.



Optional: low-pressure primary pump in hydraulic unit, for connection to a chillers.



400V 3N 50Hz | High temperature | Water

	Series / Model	Water flow (m^3/h) 7 °C [1]	Main pump (kW)	Available pressure (kPa) [3]	Inertia tank except 1 series (litres)	Expansion vessel (litres)	Hydraulic connection	Auxiliary primary pump B version (kW)	Service weight (kg)
WATER	AGV-AH-2 006 AGV-BH-2 006	3 to 6	1.1	300 to 200	100	5	2"	0.65	655
	AGV-AH-2 009 AGV-BH-2 009	6 to 9	1.5	250 to 200	100	5	2"	0.65	670
	AGV-AH-2 012 AGV-BH-2 012	9 to 12	1.5	230 to 160	100	5	2 1/2"	0.65	680
	AGV-AH-2 015 AGV-BH-2 015	12 to 15	2.2	280 to 230	200	8	2 1/2"	0.65	800
	AGV-AH-2 020 AGV-BH-2 020	15 to 20	2.2	270 to 180	200	8	3"	1.10	805
	AGV-AH-2 025 AGV-BH-2 025	20 to 25	4.0	240 to 170	200	15	3"	2.20	860

400V 3N 50Hz | Positive temperature | Glycol

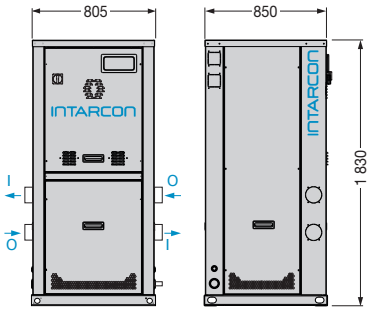
	Series / Model	Flow MPG 35 % (m^3/h) -8 °C [2]	Main pump (kW)	Available pressure (kPa) [3]	Inertia tank except 1 series (litres)	Expansion vessel (litres)	Hydraulic connection	Auxiliary primary pump B version (kW)	Service weight (kg)
GLYCOL	MGV-AH-2 003 MGV-BH-2 003	2 to 4	0.65	220 to 150	100	5	1 1/2"	0.46	600
	MGV-AH-2 004 MGV-BH-2 004	2 to 4	1.1	320 to 230	100	5	1 1/2"	0.46	615
	MGV-AH-2 005 MGV-BH-2 005	4 to 6	1.1	270 to 150	100	5	2"	0.65	650
	MGV-AH-2 006 MGV-BH-2 006	4 to 6	1.5	290 to 230	100	5	2"	0.65	675
	MGV-AH-2 008 MGV-BH-2 008	6 to 9	1.5	240 to 150	100	8	2"	0.65	680
	MGV-AH-2 009 MGV-BH-2 009	6 to 9	2.2	290 to 220	100	8	2"	0.65	690
	MGV-AH-2 012 MGV-BH-2 012	9 to 12	2.2	270 to 200	200	15	2 1/2"	1.10	800
	MGV-AH-2 015 MGV-BH-2 015	12 to 15	4.0	230 to 200	200	15	2 1/2"	1.10	840

Options

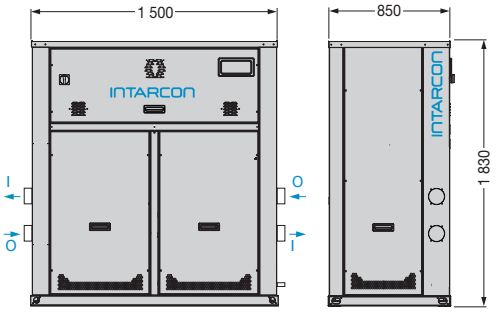
- Back-up main pump.
- Variable speed drive on main pump.
- Auxiliary back-up pump.
- Electronic control for heat recovery.

Dimensions

1 series



2 series



Dimensions in mm.

[1] Performance calculated for pumping water at 7°C.

[2] Performance calculated for pumping 35 % propylene glycol concentration at -8°C.

[3] Hydraulic pressure available for the distribution circuit and the chiller.

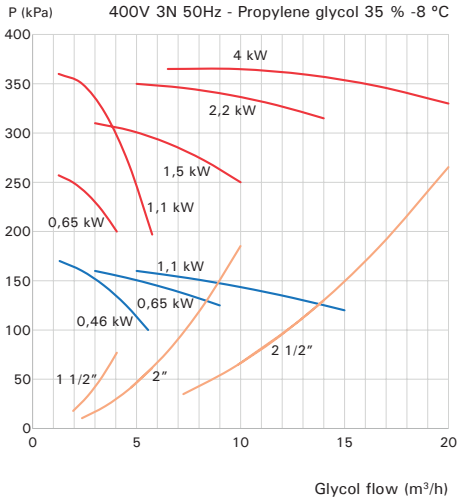
Primary circuit auxiliary pump

Auxiliary pump in the primary circuit is a low-pressure pump sized with an available pressure of about 100 kPa, enough to overcome the pressure drop of he exchanger of the chiller and a small section of piping.

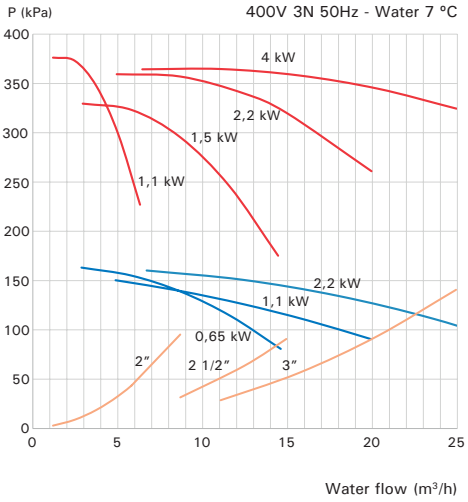
Pump sets

Characteristic curves

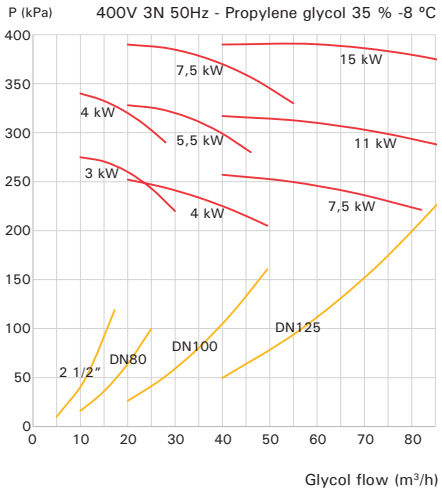
MWV series



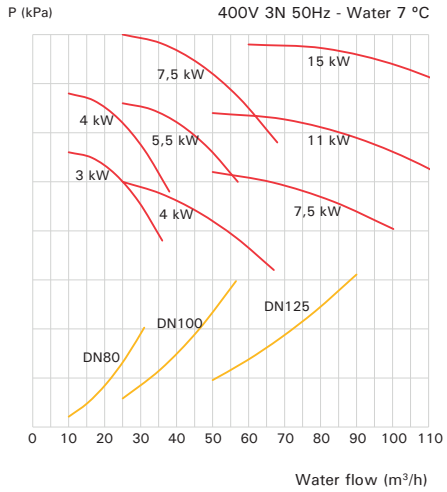
Serie AWV



MWW series



AWW series



— Main pump.

— Primary circuit booster pump.

— Pressure drop characteristic of the hydraulic unit.

The attached curves allow the operating point of the system to be checked on the basis of the pump characteristic curve and taking into account the internal pressure drop curve of the hydraulic unit.

In pump set with primary and secondary circuit (GV-BH and GW-BH versions), the hydraulic resistor of the chiller is compensated by the primary circuit pump.

For units with a single pumping unit (GV-AH and GW-AH version), the heater of the chiller must be taken into account and added to the available pressure required for the distribution circuit. The following values are recommended:

- WV series: 30-40 kPa.
- WW series: 40-50 kPa.

Example of selection

It is intended to select a pump set to be combined with the 35 % propylene glycol chiller, model MWW-FD-3 1503, with a cooling capacity of 260 kW at a temperature range of -2/-8 °C, it a glycol flow rate of 47.5 m³/h and an available pressure for the distribution circuit of 200 kPa.

For the required flow rate we are looking for the pump that results in a water column of 20 m between the characteristic curves of the pump and the DN100 pipe pump set, which corresponds to the hydraulic connections of the chiller. The 7.5 kW pump and DN100 connections characterise the pump set model MGW-BH-1 050.

Optionally, this hydraulic unit can be equipped with a primary circuit pump.