Frigel
Intelligent Process Cooling

IndustrialChiller - MRS

Air cooled water chiller

MRS industrial grade water chillers are available in cooling capacity range from 3.5 to 19.5 tons, with water working temperatures range from 32 °F to 77 °F and suitable for indoor or outdoor installation. The standard configuration is designed for an ambient temperature up to 113 °F.

These units are equipped with a hermetic rotary Scroll compressor in one refrigeration circuit with ozone-friendly refrigerant R410A, axial-flow fans and microchannel full-aluminium condenser.

Characterized by very small footprints, these chillers are particularly suited for installation close to processing machines.

Versions:

- **Fan type**
  - **AC:** on-off asynchronous fans
  - **EC:** brushless EC variable speed fans
  - **EH:** high pressure EC fans, suitable for ducting indoor installation
- **Evaporator type**
  - **BP:** brazed-plate
  - **S&T:** shell-and-tube
- **Water configuration type**
  - **M**: with evaporator pump only
  - **P**: with tank and process pump

Scroll

Advantages

- Reduced footprint
- FC version with integrated Free Cooler (saving more than 60% of energy)
- Microchannel condenser and free cooler with low refrigerant charge and with low air pressure drop
- Easily cleanable microchannel condenser using pressure washer

Technical features:

Chiller system:

- Scroll compressor;
- 1 refrigerant circuit;
- R410A refrigerant;
- High and low pressure gauges.

High efficiency microchannel aluminium condenser

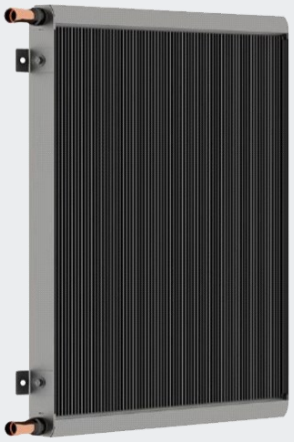
- Higher efficiency and performances
  - heat exchange from +20% to +40% compared with finned tube models;
  - reduction of air-side pressure drops;
  - lower weight and reduced dimensions;
  - thinner profile than finned tube models;
  - 60% lower weight compared to finned tube models.
- Proven reliability
  - robust design and easy to clean with pressurized water;
  - process and materials proven over time;
  - metal air filter on condenser;
  - engineered with long-life aluminium alloys.
- Low cost
  - lower refrigerant charge;
  - optimized material cost.

Fan type

- **AC:** asynchronous on-off fans
  - For temperatures greater than 41 °F
- **EC:** brushless fans with variable speed
  - For ambient temperatures greater than 5 °F
- **EH:** high head EC fans
  - Suitable for ducting on indoor installations (heat recovery)
  - For ambient temperatures greater than 5 °F

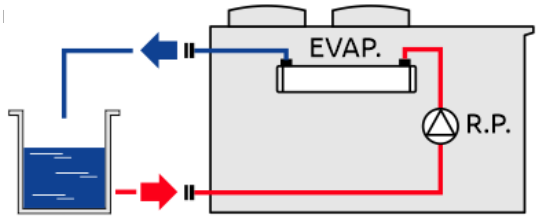
Evaporator

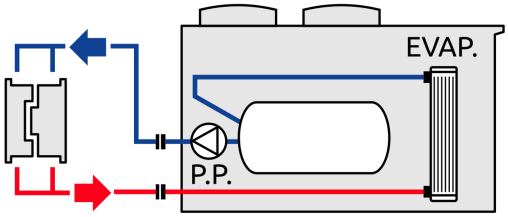
- **BP:** brazed plates
  - all configurations available;
  - SS316L copper brazed plates;
  - oversized exchange surface;
  - reduced dimensions and high-efficiency herringbone pattern.
- **S&T**: shell
  - available on MRS121-161-191 no-tank configuration only;
  - cleanable;
  - gas and water low approach;
  - carbon steel body and copper pipes;
  - anti-corrosion extra thick design.



Technical features:

- Self water-filling
- Chilled-water storage tank pressurized and insulated
- Galvanized steel frame and panels, painted with polyester powders
- Stai





M: with evaporator's pump only

Process pumping stations available on request

for GPP/GPV series, with and without inverters.

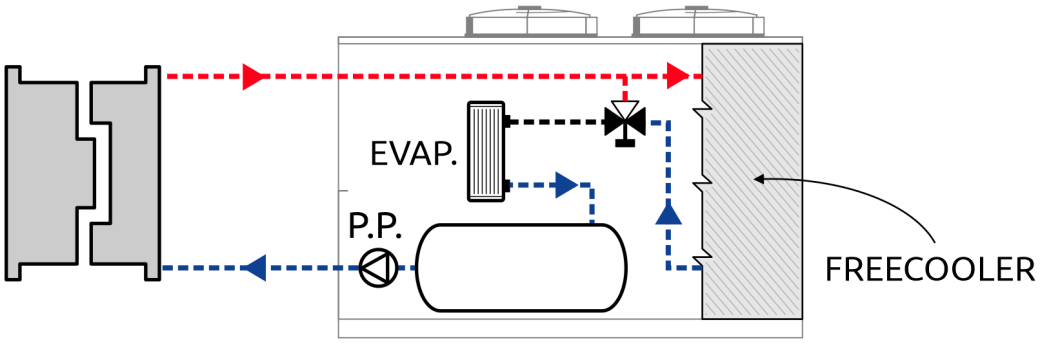
P: with evaporator's pump only

Process pumping stations available on request
for GPP/GPV series, with and without inverters.

Built-in Freecooling option

Some versions are available with built-in freecooler system. This version, using the ambient air, allows to cool the water from the process, by shutting down, partially and/or completely,the refrigerating unit, resulting in energy savings.

MRS (FREE COOLING)



Options

- Cold Climate for no glycol systems when Tamb<32°F
- Electrical cabinet heater for glycol systems when Tamb<50°F
- Remote control with 30m of cable
- Y filters
- Wheels
- Opened loading tank option

Hydraulic supply

Standard models with internal tank "P"

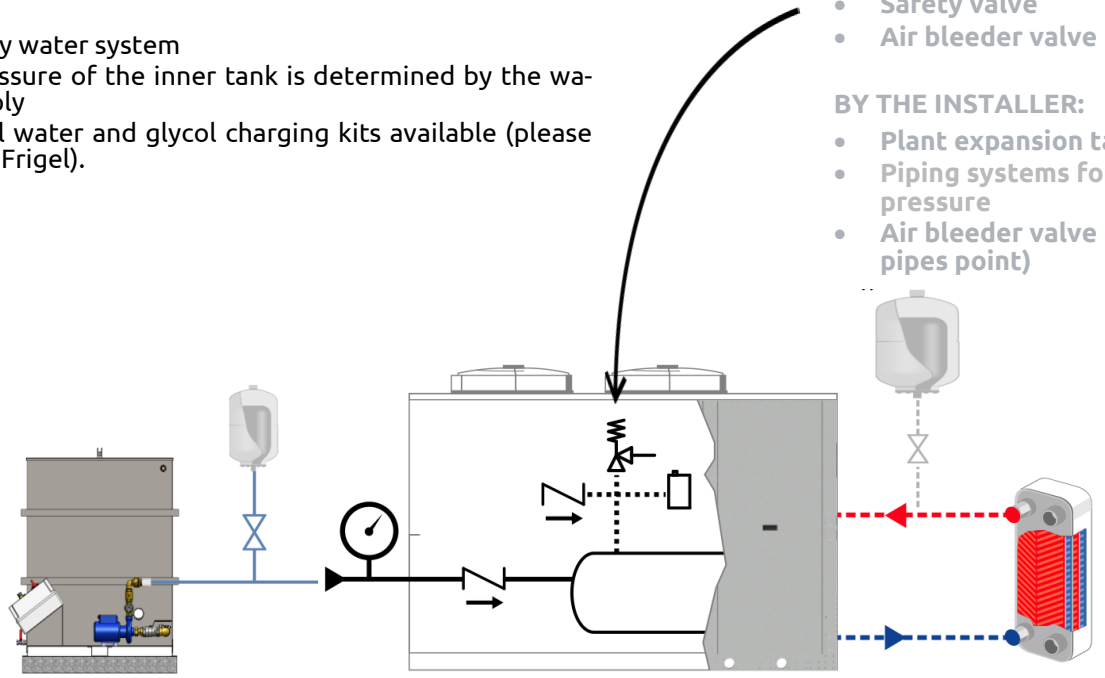
- Filling by water system
- The pressure of the inner tank is determined by the water supply
- External water and glycol charging kits available (please contact Frigel).

DEVICES ALREADY PROVIDED FOR PRESSURISED SYSTEMS:

- Vacuum breaker valve
- Safety valve
- Air bleeder valve

BY THE INSTALLER:

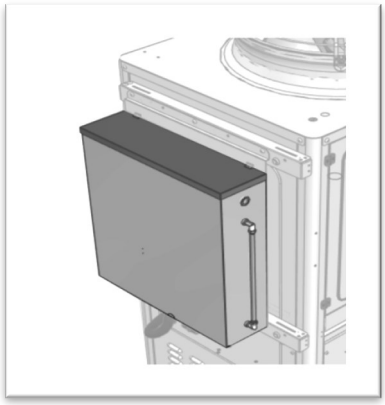
- Plant expansion tank
- Piping systems for fluids under pressure
- Air bleeder valve (on the higher pipes point)

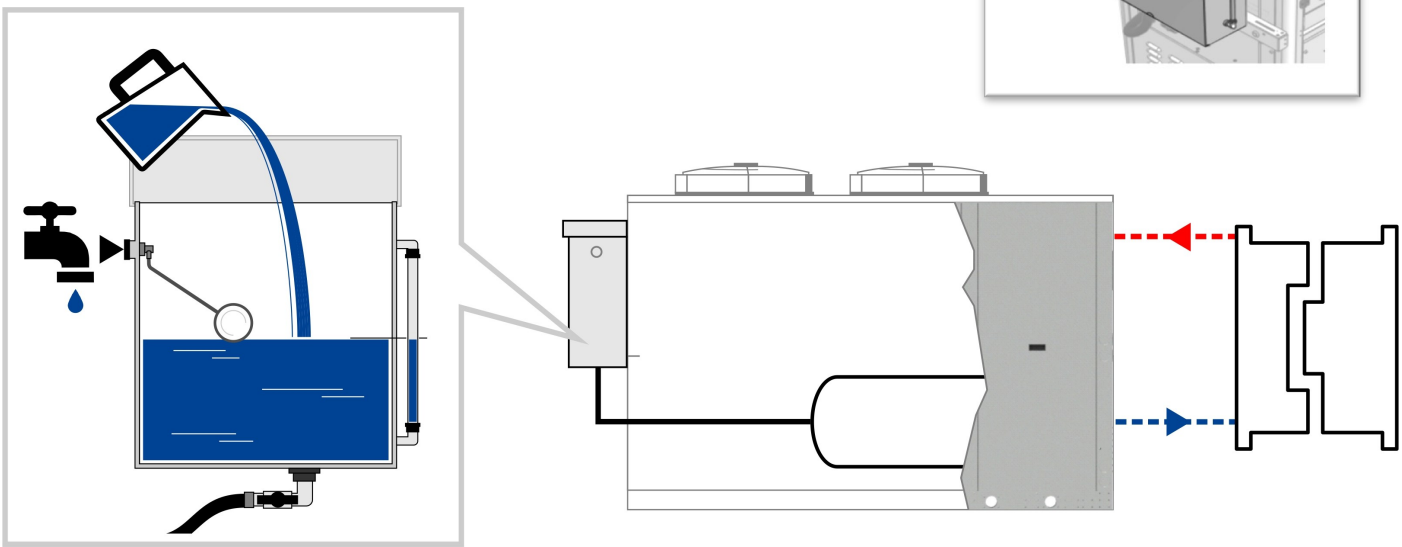


*NOTE: Select according to the total volume of water in the system, temperature variation, and working/precharge pressures.

Models with internal tank "P" and tray for manual loading

- Consisting of a stainless steel tray with flap lid
- Allows manual loading of water, or water-glycol mixture
- Allows automatic loading with float if connected to water system
- Equipped with internal visual level indicator.



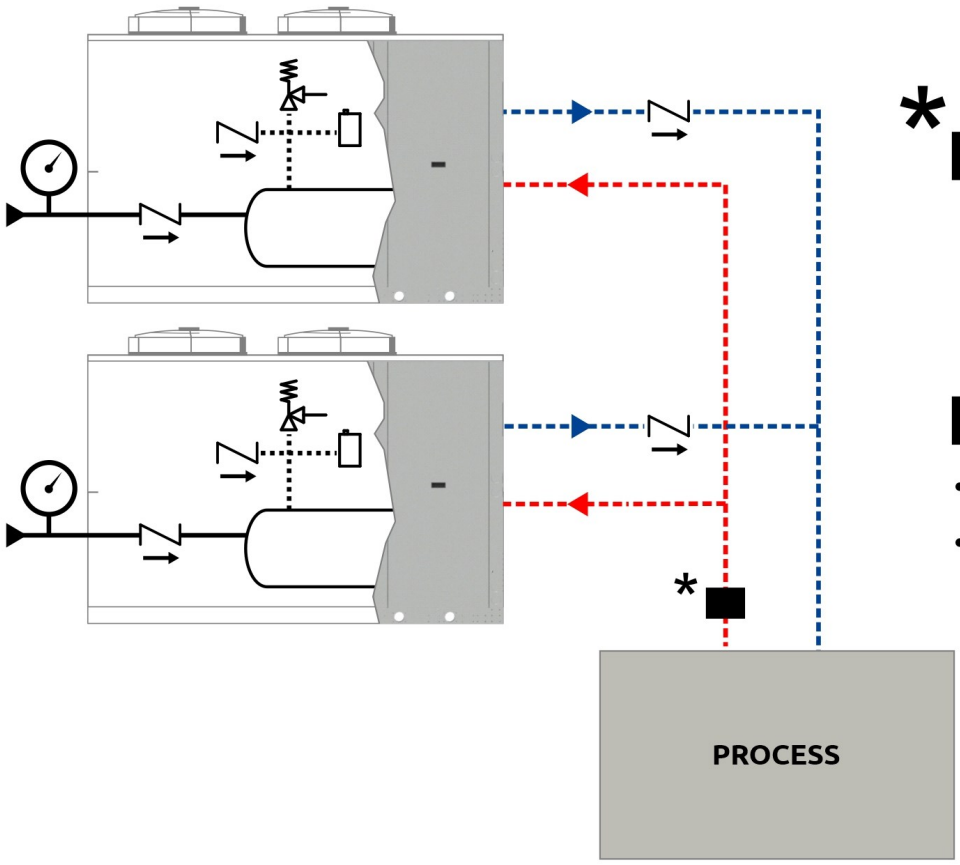


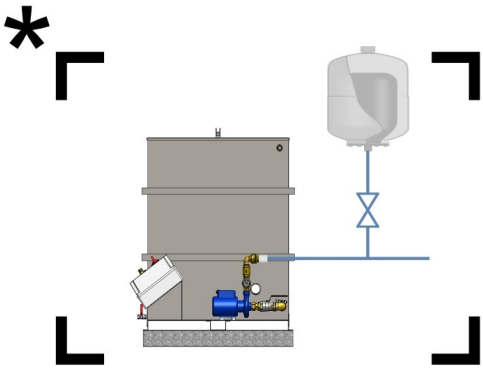
Parallel Chiller configuration

- Filling with external water-glycol filling kits (please contact Frigel)

DEVICES NEEDED WITH PRESSURIZED SYSTEM, TO BE ADDED

- Plant expansion tank and piping systems for fluids under pressure
- Check valve on process supplies
- Air bleeder valve (on the higher pipes point)





- **FILLING KIT FOR PRESSURIZED SYSTEM +**
- **EXPANSION TANK**

*NOTE: Select according to the total volume of water in the system, temperature variation, and working/precharge pressures.

Technical data

60Hz

IndustrialChillerAir - MRS (Heavygel)									
Model			31	51	71	91	121	161	191	201
Power supply voltage and frequency			460V±10%/3/60Hz							
Cooling capacity (R410A)	59°F/77°F (*)	Tons	4.7	6.9	7.7	8.3	11.0	14.0	17.4	19.4
	50°F/95°F	Tons	3.5	5.1	5.9	6.3	8.6	11.0	13.7	15.4
Max set point temp.		°F	77	77	77	77	77	77	77	77
Min set point temp. (no glycol)		°F	50	50	50	50	50	50	50	50
Max ambient temp.		°F	113	113	113	122	122	122	113	113
Compressor	Type		Scroll							
	Capacity control		ON/OFF (0-100%)							
	N°		1	1	1	1	1	1	1	1
	Circuits	N°	1	1	1	1	1	1	1	1
	Motor power	HP	3.0	4.6	5.4	6.0	7.5	10.0	13.0	15.0
Condenser	Type		Microchannel							
	Material		Aluminium							
	Nominal flow rate	CFM	4,220	9,055	9,055	9,055	12,535	12,535	12,535	12,535
Fans (***)	N°		1	2	2	2	2	2	2	2
	AC fan (Axial) (Not ductable)	HP	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		With diffuser	No							
	EC fan (Axial) (Not ductable)	HP	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		With diffuser	No							
	EH fan (Axial high pressure) (Ductable)	HP	1.0	1.0	1.0	1.0	2.5	2.5	2.5	2.5
		With diffuser	Yes							
		Available pressure [InH2O]	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Evaporator (****)	Type		Brazed plate				Brazed plate/Shell and tube			Brazed plate
SP process pump (*****)	Type		Centrifugal							
	N°		1	1	1	1	1	1	1	1
	HP		1.0	1.0	1.5	1.5	3.0	3.0	3.0	3.0
	min	GPM	5	5	13	13	21	21	21	21
	max		21	21	42	42	66	66	66	66
	max	PSI	45.0	45.0	43.5	43.5	52.2	52.2	52.2	52.2
	min		37.7	37.7	34.8	34.8	40.6	40.6	40.6	40.6
Tank	Material		Stainless steel							Galvanized with internal Teflon coating
	Volume	gal	15	21	21	21	34	34	34	53
Process water connections	Type		NPT (460/60Hz) - DIN (380/60Hz)							
	In/out		1"	1"	1"	1 ¼"	1 ¼"	1 ¼"	1 ¼"	1 ½"
Unit FLA	AC fan	Amps @ 460/3/60	12	17	19	19	26	30	36	40
	EC fan		12	16	19	19	26	31	36	40
	EH fan		12	16	18	18	28	33	38	42
Hot Gas Bypass			Yes							
Sound level	dB (A) @ 33 ft		48	50	50	50	51	52	52	58
Refrigerant Charge	Lb		9	12	12	13	16	19	20	20
Net weight	Lb		440	575	615	690	925	990	1,100	1,190
Operating weight (**)	Lb		575	770	810	885	1,245	1,310	1,420	1,665
Protection level			IP44							

- (*) Nominal Cooling capacity (water temperature/ambient temperature°F) with BP evaporator
- (**) Not considering the water in pipes and in exchangers
- (***) AC fans in case of Ambient Temperature > 41°F / Use EC fans in case of Ambient Temperature > 5°F / Use EH fans in case of Ambient Temperature > 5 °F
- (****) The data refers to a temperature difference between the water output to the Free Cooler and the ambient temperature at +50°F
- (*****) If LWT> 39-41°F, the pump starts if the machine is powered and in stand by
- Available supply voltage: 400V±10%/3/50Hz; 460V±10%/3/60Hz; 380V±10%/3/60Hz;
- On request: UL electrical panel for 60Hz versions
- Capacity with process water temperature DeltaT = 9°F
- Altitude limit: 8,500 ft
- Add glycol in case of low ambient <32°F
- Add glycol in case of set point lower than +50°F
- In case of lower set point, contact Frigel
- In case of ambient temperature < 41 °F install electrical cabinet heater
- Pumps rated up to 35% of Glycol
- Glycol percentage: 20% glycol in weight -> from 32°F to the minimum set point temperature / 25% glycol in weight -> from 23°F to 32°F
- In case of setpoint <41 °F, contact Frigel
- Not suitable for DI water
- Max water working pressure: 87 psi

Technical data with Freecooler

60Hz

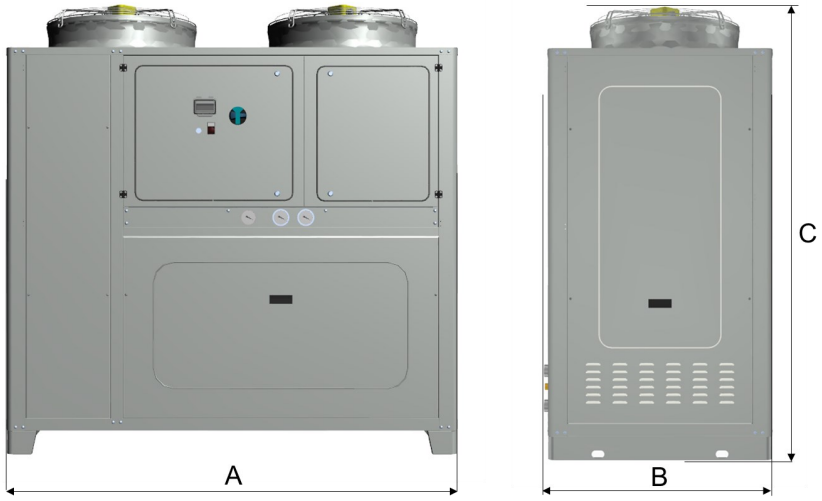
IndustrialChillerAir - MRS/FC (Heavygel)

Model			51	71	91	121	161	191	201
Power supply voltage and frequency			460V±10%/3/60Hz						
Cooling capacity (R410A)	59°F/77°F (*)	Tons	6.8	7.6	8.2	10.9	13.9	17.2	19.3
	50°F/95°F	Tons	5.1	5.8	6.2	8.6	10.9	13.6	15.2
Cooling capacity of the free-cooling (****)	Tons		7	7	7	12	12	12	12
Max set point temp.		°F	77	77	77	77	77	77	77
Min set point temp. (no glycol)		°F	50	50	50	50	50	50	50
Max ambient temp.		°F	113	113	122	122	122	113	113
Compressor	Type		Scroll						
	Capacity control		ON/OFF (0-100%)						
	N°		1	1	1	1	1	1	1
	Circuits	N°	1	1	1	1	1	1	1
	Motor power	HP	4.6	5.4	6.0	7.5	10.0	13.0	15.0
Condenser	Type		Microchannel						
	Material		Aluminium						
	Nominal flow rate	CFM	7,515	7,515	7,515	11,040	11,040	11,040	11,040
Fans (***)	N°		2	2	2	2	2	2	2
	AC fan (Axial) (Not ductable)	HP	1.50	1.50	1.50	1.50	1.50	1.50	1.50
		With diffuser	No						
	EC fan (Axial) (Not ductable)	HP	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		With diffuser	No						
	EH fan (Axial high pressure) (Ductable)	HP	1.0	1.0	1.0	2.5	2.5	2.5	2.5
		With diffuser	Yes						
		Available pressure [InH2O]	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Evaporator	Type		Brazed plate						
SP process pump (*****)	Type		Centrifugal						
	N°		1	1	1	1	1	1	1
	HP		1.0	1.5	1.5	3.0	3.0	3.0	3.0
	min	GPM	5	13	13	21	21	21	21
	max		21	42	42	66	66	66	66
	max	PSI	45.0	43.5	43.5	52.2	52.2	52.2	52.2
	min		37.7	34.8	34.8	40.6	40.6	40.6	40.6
Tank	Material		Stainless steel						Galvanized with internal Teflon coating
	Volume	gal	21	21	21	34	34	34	53
Process water connections	Type		NPT (460/60Hz) - DIN (380/60Hz)						
	In/out		1"	1"	1 ¼"	1 ¼"	1 ¼"	1 ¼"	1 ½"
Unit FLA	AC fan	Amps @ 460/3/60	17	19	19	26	30	36	40
	EC fan		16	19	19	26	31	36	40
	EH fan		16	18	18	28	33	38	42
Hot Gas Bypass			Yes						
Sound level	dB (A) @ 33 ft		50	50	50	51	52	52	58
Refrigerant Charge	Lb		12	12	13	16	19	20	20
Net weight	Lb		615	655	730	990	1.060	1.165	1.255
Operating weight (**)	Lb		815	855	930	1.310	1.380	1.485	1.730
Protection level			IP44						

- (*) Nominal Cooling capacity (water temperature/ambient temperature°F) with BP evaporator
- (**) Not considering the water in pipes and in exchangers
- (***) AC fans in case of Ambient Temperature > 41°F / Use EC fans in case of Ambient Temperature > 5°F / Use EH fans in case of Ambient Temperature >5°F
- (****) The data refers to a temperature difference between the water output to the Free Cooler and the ambient temperature at +50°F
- (*****) If LWT> 39-41°F, the pump starts if the machine is powered and in stand by
- Available supply voltage: 400V±10%/3/50Hz; 460V±10%/3/60Hz; 380V±10%/3/60Hz;
- On request: UL electrical panel for 60Hz versions
- Capacity with process water temperature DeltaT = 9°F
- Altitude limit: 8,500 ft
- Add glycol in case of low ambient <32°F
- Add glycol in case of set point lower than +50°F
- In case of lower set point, contact Frigel
- In case of ambient temperature < 41 °F install electrical cabinet heater
- Pumps rated up to 35% of Glycol
- Glycol percentage: 20% glycol in weight -> from 32°F to the minimum set point temperature / 25% glycol in weight -> from 23°F to 32°F
- In case of setpoint <41 °F, contact Frigel
- Not suitable for DI water
- Max water working pressure: 87 psi

Dimensional technical data

IndustrialChillerAir - MRS (Heavygel)									
Model		31	51	71	91	121	161	191	201
A	in	32	54	54	54	71	71	71	71
B	in	27	27	27	27	35	35	35	35
C	in	64	72	72	72	73	73	73	73



Order Code