



## **MCHILL WATER PROCESS CHILLERS**

Manufacturing Forward





Mikropor began its journey in 1987 with a passion to create “Tomorrow’s Technology” and has become one of the leading manufacturers of atmospheric air filtration solutions and compressed air treatment systems for a variety of industries.

By closely following the latest developments in technology, Mikropor’s “Best in Class” products and solutions are appreciated by customers in more than 140 countries.

The company’s sustainable growth has been provided by its passion for innovation and commitment to quality, as well as its dedication to technology. Mikropor is an environmentally conscious company that values people, while developing products that extend the needs and expectations of customers.

With this mission, Mikropor continues to become one of the most recognized brands in the world by expanding its global penetration in the field of technological filtration and contributes to a healthier planet.

[www.mikropor.com](http://www.mikropor.com)

# MCHILL WATER PROCESS CHILLERS

Mikropor's MCHILL Water Process Chillers are designed to meet the needs of many applications that require stable working conditions with maximum quality and cleanliness of the cold process fluid.

MCHILL, Mikropor's compact, robust and reliable Water Chiller is designed for industrial applications and manufactured with the highest quality and safety standards. MCHILL is not only extremely compact and easy to use but also ensures an accurate control of water temperature.

## Highly Engineered & Compact Design



### Refrigeration Circuit

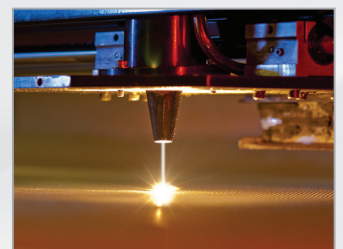
- Chiller Control Management
- EC Fan Motor Fan Speed Control
- Microchannel Aluminium Condenser
- Hermetic Scroll Compressor
- Thermostatic Expansion Valve
- R410A Refrigerant Gas
- High and Low-Pressure Gauge
- Primary Water Pressure Gauge
- Stainless Steel Brazed Plate Heat Exchanger
- Sight Glass

### Process Water Circuit

- High Performance Stainless Steel Water Pump
- Storage Tank

## Applications

- **Food & Beverage** - Wineries, Dairies, Breweries, Bottling, Storage
- **Plastics** - Injection, Extrusion, Blow Molding, Thermoforming
- **Laser** - Cutting, Welding, Profiling, Optics, Medical
- **Chemical & Pharmaceutical** - Natural Gas, Jacketed Vessels, Polyurethane, Laboratories, Healthcare, Petrochemical, Temperature Control
- **Metal Works** - Machine Tools, Welding, Cutting, Profiling, Polishing, Rolling, Presses, Hydraulic Control-Oil Cooling, Heat Treatment



## MCHILL WATER PROCESS CHILLER ADVANTAGES

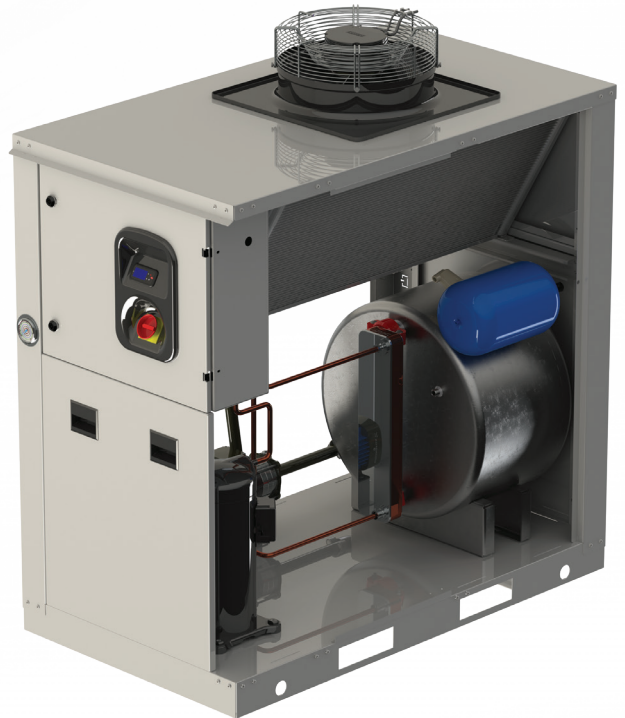
### Easy Installation “Plug & Play”

MCHILL can be easily installed during an “active process”. The innovative design enables users to integrate with minimal pipe rework and associated labors.

### Optimizes Process Application

MCHILL Process Chillers work with a principle called “Close Circuit”. With this working principle, the following advantages can be realized:

- Highly precise water temperature control regardless of external conditions/factors
- Constant operating conditions by responding to sudden changes.
- Immediate response to sudden consumption changes quickly with closed loop and suitable pump & tank components.
- Constant/Cyclical use of water-avoids waste entering the “water loop system” that can cause health problems caused by waterborne bacteria.



### Best Components

All components of MCHILL (compressors, condensers, evaporators, tank, pump etc.) are “Best in Class” and specially designed with the right equipment to consume the lowest energy.

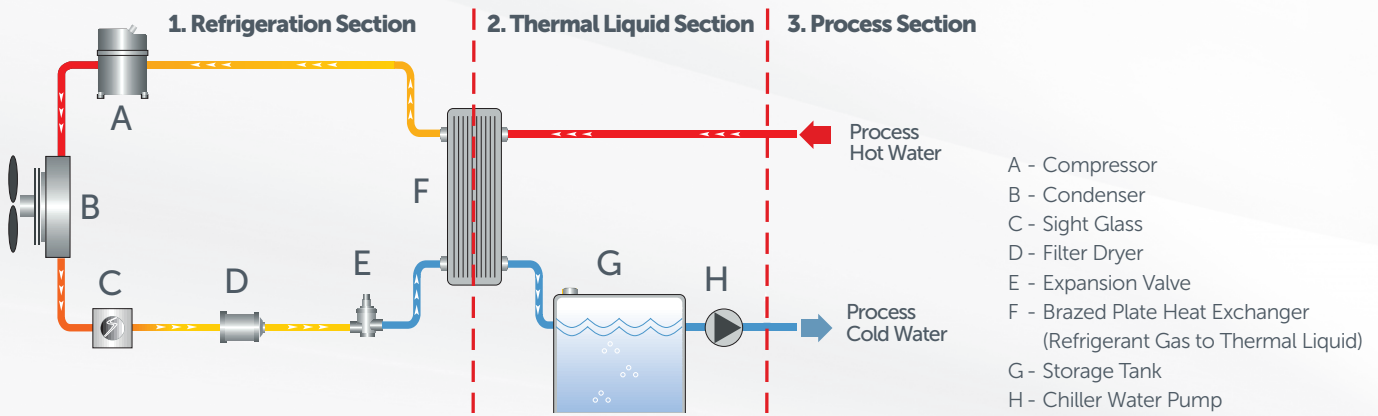
### Optimum Energy Efficiency

MCHILL is designed by a group of skillful and professional engineers to provide maximum energy savings.

- More efficiency and reduced production cycle time
- Minimized production costs and reduced waste.
- Less maintenance and downtime during production.
- Highly engineered
- Wide operating conditions related to both inlet and outlet water temperature.
- Thanks to the “Global Design”, the MCHILL can even operate in the highest ambient temperature conditions around the world.
- A wide range of optional accessories that allow MCHILL to be customized for various special applications.
- A fully packaged and easy-to-use solution with integrated pumps, tanks and safety systems which make it perfectly suitable to the needs of industrial processes.

# MCHILL – WORKING PRINCIPLE / HOW IT WORKS?

## The MCHILL Process Chillers includes 3 sections:

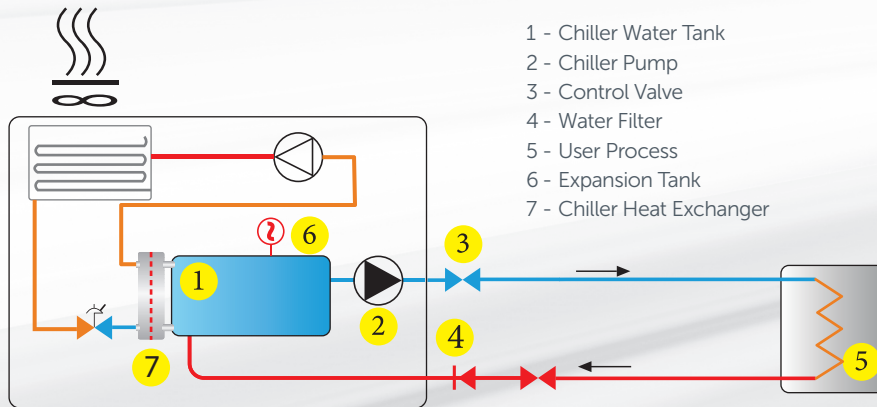


## How it works?

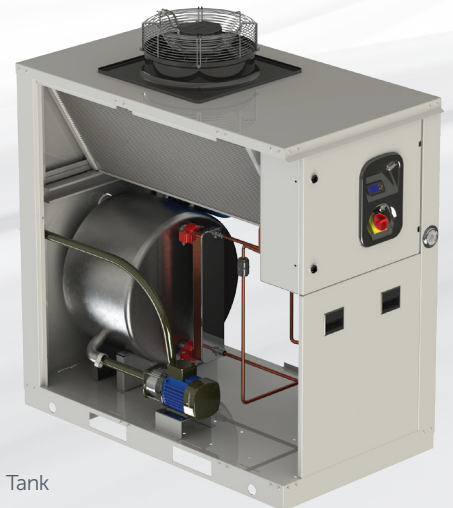
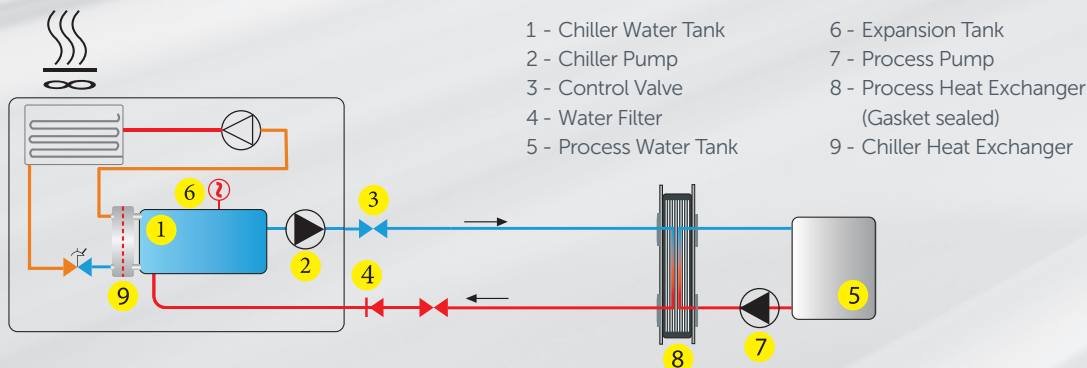
As illustrated in the picture, the Thermal Liquid loop section operates as a closed circuit. The generated cold water is delivered to the user's process application by the water pump in MCHILL. Once the cooling is completed, the cold water is heated and returns to MCHILL. Thereafter, the process water continues circulating through the pressurized system.

## Water System - Equipment and Process

### Closed Circuit Process



### Open Circuit Process (Optional)



# MCHILL STANDARD FEATURES

## Refrigerant Circuit - Main Components

### Scroll Refrigerant Compressors



- Hermetic Scroll Compressor
- Durable and Long-Life Compressor Models
- Single or Multiple Compressor Configurations

### R410A Refrigerant



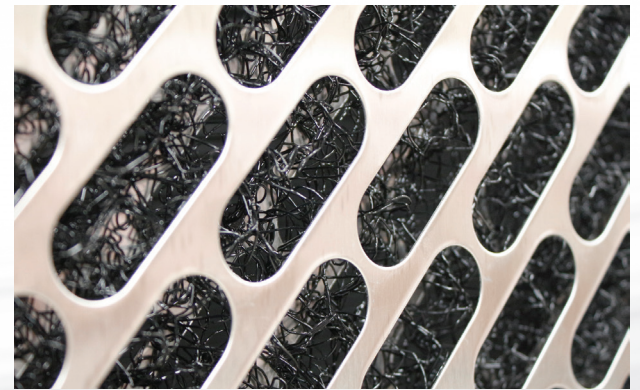
- R410A Refrigerant Gas
- Environmentally Friendly
- High Thermodynamic Properties
- Environmentally Considerate

### New Technology, Aluminium Microchannel Refrigerant, Condenser



- Less Energy Loss with Low Pressure Drop
- High Heat Transfer Capacity
- Surface Coating to Protect Against Corrosive Environments
- Less Amount of Refrigerant Gas
- Resistant to Galvanic Reaction and Corrosion

### Cleanable Condenser Pre-Filters



To protect the condensers all MCHILL chillers include progressive composite fiber mesh filters which can be easily removed for service and cleaning. Stainless steel frame avoids corrosion even when the filter is washed with water or other washing fluids.

### EC Fan Motor-Variable Speed Motor



- Leading Fan Motor Brands
- EC - Variable Speed Fan Motor
- Durable and Long-Life Fan Motor Models
- Lower Energy Consumption
- Low Noise Level

### Evaporator



- Brazed Plate Stainless Steel
- Extremely Efficient
- High Heat Transfer Surface Area
- Compact Size

# MCHILL STANDARD FEATURES

## Refrigerant Circuit - Main Components

### Protection of the Evaporator



- Electronic Control to Prevent Freezing
- No/Low Flow Differential Pressure Switch
- Mechanical Water Filtration

### Thermostatic Expansion Valve



- Ensures Stable and High Cooling Performance
- Proven/Industry Leading Refrigerant Valves

## Water Circuit - Main Components

### Expansion Tank



#### Pressurized (Standard)

When cooling water temperature increases the water expands. To ensure proper operational pressure, an expansion tank is integral to the design.



#### Atmospheric (Optional)

An Atmospheric Expansion Tank is also available for open circuits

### Integrated Cold Storage Tank

The MCHILL cold water storage tank is heat insulated and made of carbon steel material. The following equipment are included with the storage tank in the MCHILL system.



- Expansion Tank
- Inlet-Outlet Manual Valve
- Safety Valve
- Automatic Venting Valve
- Level Sensor
- Water Filter
- Drain Valve
- Water Pressure Gauge

### Integrated Water Pump - 3 bar



- Stainless Steel Body
- High Resistant Seals for Process Fluids
- High Capacity Centrifugal Pump
- Long Lasting, Maintenance-Free Operation
- High Efficiency- Stainless Steel Impeller

### For maximum control

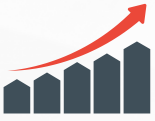


A large water storage tank is placed after the heat exchanger water outlet to limit the temperature fluctuations during the sudden load changes. The tank's generous volume ensures stable water temperature.



# MCHILL STANDARD FEATURES

## For Sudden Consumption



Large liquid storage tank provides constant and precise liquid outlet temperature even at sudden consumptions.

## For Energy Efficiency



When developing the MCHILL, Mikropor's professional engineers have optimized the Cold Storage Tank and Cooling Capacity ratio to provide maximum energy savings by minimizing switch on/off rates of compressors.

## For System Protection



Volumetric changes in the system are compensated by the unique MCHILL Control Logic. The result is a constant cold-water circulation within the process circuit.

## Control and Safety Groups - Main Components

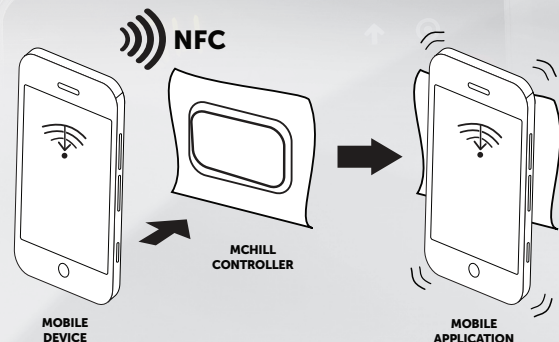
### Electronic Controller

All MCHILL models have a standard microprocessor which offers;

- Ease of Use
- Precise Control
- Reliable Operation
- Remote Control
- Free Cooling Control
- NFC via Mobile Device
- High Quality Microprocessor Controller
- High Efficient Control Algorithm
- User Interface On Graphic Terminal
- Compact Size
- Interaction With Mobile Devices



"MCHILL Application" app can be used to configure the controller on a mobile device (smartphone, tablet), by NFC (Near Field Communication). Users can both configure the commissioning parameters and set groups of preset parameters according to their own particular needs.



# MCHILL STANDARD FEATURES

## Refrigerant Gas Pressure Gauges



All MCHILL models have a standard refrigerant gas high and low-pressure gauges.

## Temperature and Pressure Sensor Control Methodology

In all MCHILL systems, pressure and chilling temperatures are measured electronically. The measured data is processed continuously by the Microprocess Controller to ensure the safest and most efficient operating conditions within the system. Moreover, the temperature or pressure of both high- and low-pressure manifolds and water in the storage tank can also be constantly measured along the system's cooling section. Additionally, Mikropor also offers the following options for the cold water loop system of MCHILL to provide decent and higher quality cold water when required (Options are model dependent). For more information, do not hesitate to contact Mikropor Sales Team.

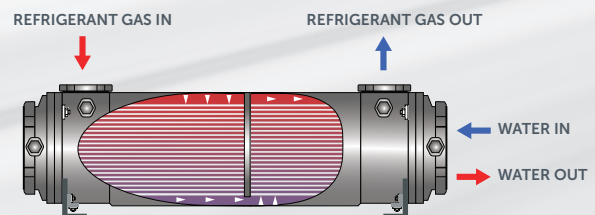
## Process Evaporator Option

- High efficiency, low energy loss
- Easy to Install
- External heat exchanger specially recommended for processes delivering dirt from the process to the water chiller
- External Water pump to be used with External heat exchanger.



## Water Cooled Option

In some cases or applications where air-cooled models cannot be used or where warm water supply is required, MCHILL offers water-cooled models that include a Water Cooled Condenser and a Presostatic water control valve.



## High Pressure Water Pump Option

In some applications more pressurized cooled water may be required. In these cases, a 5 bar water pump can be offered as an option (3 bar is standard)



## Other Option Features

- Atmospheric Pressure Kit Option
- Low Ambient Temperature Option
- High Corrosive Environments Option
- Non Ferrous Design Option
- Heater For Storage Tank Option
- Automatic Filling Kit Option

# MCHILL STANDARD FEATURES

		MCHILL 7	MCHILL 9	MCHILL 15	MCHILL 20	MCHILL 29	MCHILL 34	MCHILL 41	MCHILL 50	MCHILL 65	MCHILL 80	MCHILL 92	MCHILL 100	MCHILL 114	MCHILL 129	MCHILL 145	MCHILL 160	MCHILL 186	MCHILL 212	
Cooling Capacity*	kW	6,5	8,52	15	19,55	29	33,8	40,5	49,8	64,5	80,2	92,1	99,6	114,3	129	144,7	160,4	186	212	
	kcal/h	5600	7300	12900	16800	21900	29000	34800	42800	55500	69000	79200	85600	98300	111000	124400	138000	160000	182300	
	Tons	1,9	2,4	4,3	5,6	8,2	9,6	11,5	14,2	18,3	22,8	26,2	28,3	32,5	36,7	41,1	45,6	52,9	60,3	
Cooling Capacity**	kW	4,9	6,3	11,05	14,8	22	25,7	30,8	37,8	49	61,5	75,6	82	86,8	98	110,5	123	141,3	159,6	
	kcal/h	4200	5400	9500	12700	18900	22100	26500	32500	42150	52900	65000	70500	76600	84200	95000	105700	121500	137200	
	Tons	1,4	1,8	3,1	4,2	6,3	7,3	8,8	10,7	13,9	17,5	21,5	23,3	24,7	27,9	31,4	35,0	40,2	45,4	
Total Power Input*	kW	1,9	2,3	3,9	5,3	7,5	8,6	9,9	13,0	15,5	19,2	22,6	25,2	27,1	30,4	34,1	39,9	45,8	52,2	
Total Absorbed Current*	A	4,97	5,86	8,33	12,22	17,46	20,5	22,59	29,46	32,56	39,07	48,18	57,47	58,34	62,72	69,33	79	91,38	101,62	
Power Supply*	-	400V / 3 / 50 Hz																		
Compressor Input Power*	kW	1,58	2	3,33	4,54	6,4	7,5	8,75	11,2	13,65	17,35	20,72	22,4	24,85	27,3	31	34,7	40,75	46,8	
Number of Compressors	-	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	
Fan Input Power*	kW	0,13	0,13	0,416	0,416	0,763	0,763	0,858	1,5	1,5	1,5	1,5	1,857	2,406	2,655	2,655	4,666	4,572	4,862	
Number of Fans	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	
Fan Air Flow*	m <sup>3</sup> /h	2400	2400	4600	4600	8000	8000	9000	14800	14800	20000	20000	23000	24000	32000	32000	36000	43000	48000	
Pump Input Power*	kW	0,5	0,5	0,75	1,1	1,1	1,5	1,5	1,5	2,2	2,2	2,2	3	3	4	4	4	5,5	5,5	
Pump Pressure*	bar	3,19	3,29	3,6	3,56	3,19	3,66	3,45	3,14	3,49	3,21	3,02	3,4	3,07	3,28	3,06	2,92	3,35	3,05	
Water Flow*	m <sup>3</sup> /h	1,3	1,8	3,3	4,2	5,9	7,4	8,6	10,1	13,8	16,4	18	21	22,9	26,7	28,9	31,4	38,9	42,3	
Refrigerant Gas	-	R410																		
Compressor Type	-	Hermetic / Scroll																		
Evaporator Type	-	Brazen Plate Stainless Steel																		
Condenser Type	-	Aluminium Microchannel																		
Noise Level***	dB(A)	< 80																		
Protection Class	-	IP 54																		
Storage Tank Capacity	lt	112,5	112,5	157,5	157,5	210	210	247,5	247,5	345	345	345	435	435	435	525	525	645	645	
Expansion Tank Capacity	lt	5	5	5	5	8	8	8	8	12	12	12	12	12	12	19	19	24	24	
Water Connections	Rp	1"	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
<b>Dimensions</b>																				
Height	mm	1590	1590	1590	1590	1730	1730	1630	1770	1770	1900	1900	1900	1900	2410	2410	2410	2410	2410	
	inch	63	63	63	63	68	68	64	70	70	75	75	75	75	95	95	95	95	95	
Width	mm	815	815	815	815	900	900	900	900	900	1000	1000	1000	1000	1310	1310	1310	1310	1310	
	inch	32	32	32	32	35	35	35	35	35	39	39	39	39	52	52	52	52	52	
Length	mm	940	940	940	940	1760	1760	1505	1750	1750	2075	2075	2075	2075	2530	2530	2530	2530	2530	
	inch	37	37	37	37	69	69	59	69	69	82	82	82	82	100	100	100	100	100	

\* Evaporator water inlet/outlet temperature 20/15 °C, external air temperature 25 °C;

\*\* Evaporator water inlet/outlet temperature 12/7 °C, external air temperature 25 °C;

\*\*\* Average value obtained in free field on a reflective surface at a distance of 10 m from the condensate side of the machine and at a height of 1.6 m from the unit support base.

# MCHILL WATER PROCESS CHILLERS



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