

Industrial Chiller

Air Cooled Water Chiller - MRM

MRM industrial grade water chillers are available in cooling capacity range from 63 a 595 kW, with water working temperatures ranging from 5°C to 25°C and suitable for indoor or outdoor installation. The standard configuration is designed for an ambient temperature up to 45°C (for higher temperatures, consult the MRT range with R134a refrigerant).

These units are equipped with up to four hermetic rotary Scroll compressors in one or two refrigeration circuits with ozone-friendly refrigerant R410A, axial-flow fans and microchannel full-aluminium condenser.

The MRM range offers a large number of model variations that covers all process cooling requirements and climate conditions.



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
 - ▶ **N:** no pumps and tanks
 - ▶ **M:** with evaporator pump only
 - ▶ **P:** with tank and process pump



Scroll & Tandem-Scroll

Advantages

- ▶ Maximum efficiency and reliability, at full load and part loads, by using multi-circuit and multi compressor systems
- ▶ Accurate multi-step management of the cooling capacity in multi-compressors/circuit models, in order to precisely meet the most demanding needs of the industrial applications
- ▶ Wide operating ambient temperature range, operating versatility and high flexibility of installation thanks to a large number of variations and accessories available
- ▶ Plug & play and modular design for easy installation and future expandability, thanks to the integrated hydronic group version
- ▶ Reduced refrigerant volume and easy to clean aluminium microchannel condensers
- ▶ Last generation microprocessor control with touch screen interface and ready to be connected to the digital supervisor system (MiNDTM)
- ▶ Easy service thanks to the recording in the local memory of the operating status, working conditions and alarm history



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Technical Features

Chiller System

- ▶ Scroll & Twin Scroll compressors
- ▶ 1 or 2 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
 - ▶ Engineered with long-life aluminium alloys
- ▶ Low cost
 - ▶ Lower refrigerant charge
 - ▶ Optimised material cost
- ▶ Factory equipped with the standard pollen filter
 - ▶ Galvanised metal frame and protective grill
 - ▶ Aluminium filament filter material

Fan Type

- ▶ AC: asynchronous on-off fans
 - ▶ For temperatures greater than +5°C
- ▶ EC: brushless fans with variable speed
 - ▶ For ambient temperatures greater than -15°C
- ▶ EH: high head EC fans
 - ▶ Suitable for ducting on indoor installations (heat recovery)
 - ▶ For ambient temperatures greater than -15°C

Evaporator

- ▶ BP: brazed plates
 - ▶ All configurations available
 - ▶ SS316L copper brazed plates
 - ▶ Oversized exchange surface
 - ▶ Reduced dimensions and high-efficiency herringbone pattern
- ▶ S&T: shell & tube
 - ▶ Available with N and M configurations only
 - ▶ Gas and water low approach
 - ▶ Carbon steel body and copper pipes
 - ▶ Anti-corrosion extra thick design



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Frigel U:

System Interface

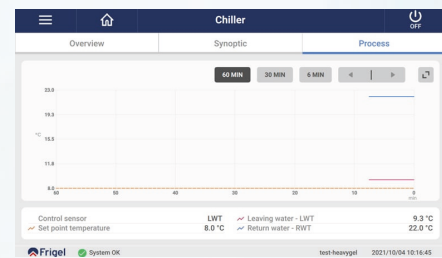
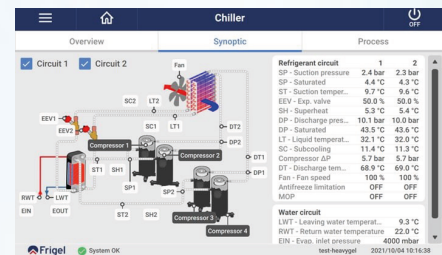
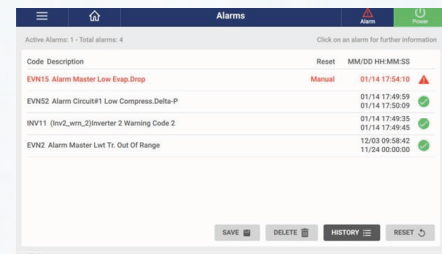
The chillers of the Heavygel range are equipped with a digital touch screen interface for human-machine interaction (HMI). The 7" TrueFlat display, integrated in the machine front dashboard, allows interaction, monitoring and programming of process progress. Thanks to the software for managing parameters, displaying performance, faults and alarms, the entire machine can be supervised in real time and in a fully comprehensible way.



Main User Screen

The working conditions of the chiller are displayed in real time:

- ▶ **CHILLER STATUS:** display of the temperature set point and the status of the unit. The status bar changes colour according to the conditions (on, off, alarm and warning).
- ▶ **SET POINT:** The chiller set point temperature is displayed in the status bar, which can be easily changed by clicking on the screen.
- ▶ **REFRIGERATING CAPACITY:** the refrigerating power required and actually expressed by the machine is displayed.
- ▶ **WATER TEMPERATURE:** indication of chiller outlet water temperature (LWT) and return water temperature (RTW).
- ▶ **EVAPORATOR ΔP:** large dashboard showing the real-time value of the evaporator differential pressure (ΔP evaporator), in the form of an analogue gauge for faster reading and understanding.

Code	Description	Reset	MM/DD HH:MM:SS
EVN15	Alarm Master Low Evap Drop	Manual	01/14 17:54:10
EVN52	Alarm Circuit#1 Low Compress.Delta-P		01/14 17:49:09
INV11	(inv2_wm_2)Inverter 2 Warning Code 2		01/14 17:49:35
EVN2	Alarm Master Let Tr. Out Of Range		12/03 09:58:42

Current System Configuration Screen

- ▶ The cooling circuit of the unit is drawn in schematic form with reference to the machine configuration.
- ▶ Display of readings and status of sensors and components related to refrigerant circuit control in real time.

Process Screen

- ▶ Last 60 minutes shown on screen.
- ▶ Flow, temperature and setpoint temperature represented graphically.
- ▶ Counting of the time of use of the process pump (if present).

Alarm and Maintenance Screen

- ▶ The alarm screen allows the user to understand and manage alarms and warnings resulting from automatic process controls.



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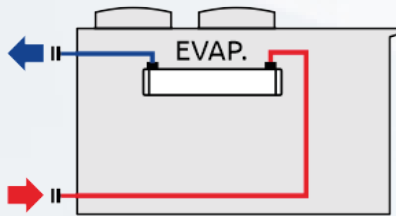
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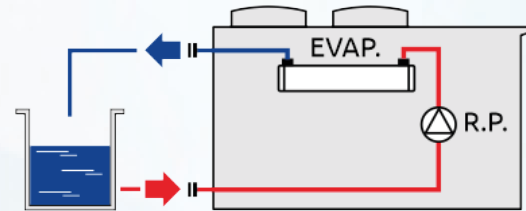
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Technical Features

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



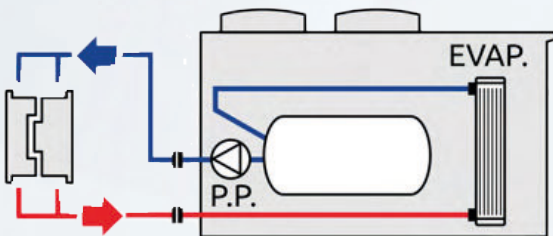
N: without pumps and tank



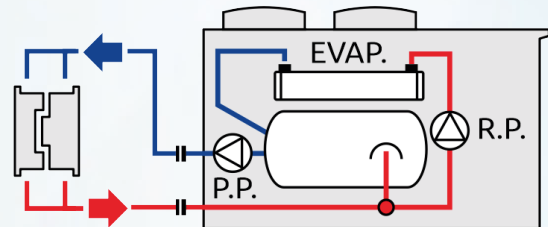
M: with evaporator's pump only

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

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



P: with tank and process pump



S: with tank, recirculating and process pump

Mirror HMI Remote Panel



Direct Connection



Connection through access point

Options

- ▶ Cold Climate for no glycol systems when $T_{amb} < 0^{\circ}C$
- ▶ Electrical cabinet heater for glycol systems when $T_{amb} < 0^{\circ}C$
- ▶ Electronic thermostatic valve (included on MRM402 & MRM404 models)
- ▶ Remote control with double display
- ▶ Y water filters
- ▶ Optional feet for ground support



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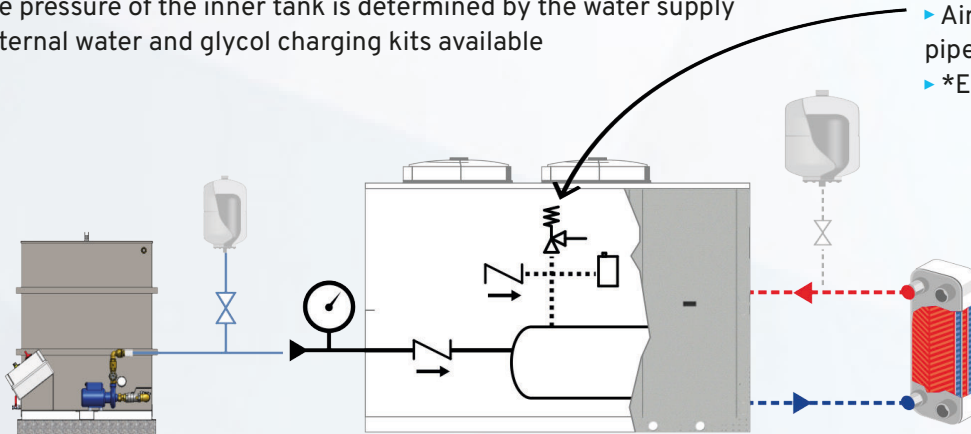
Hydraulic Supply

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

Devices needed with pressurised system to be added

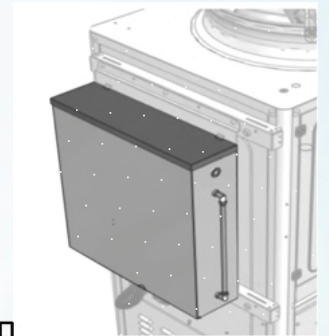
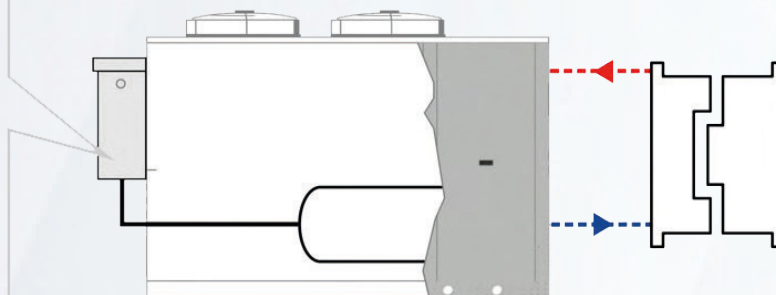
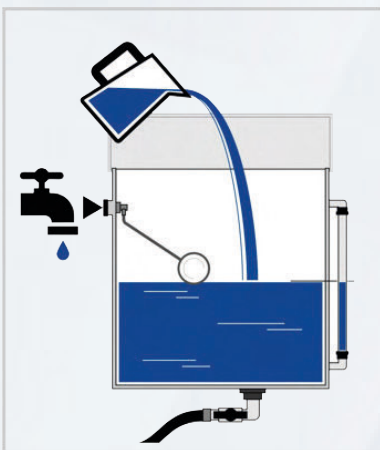
- ▶ Air bleeder valve (on the higher pipes point)
- ▶ *Expansion tank



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

Models with internal tank "P" & "S", 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



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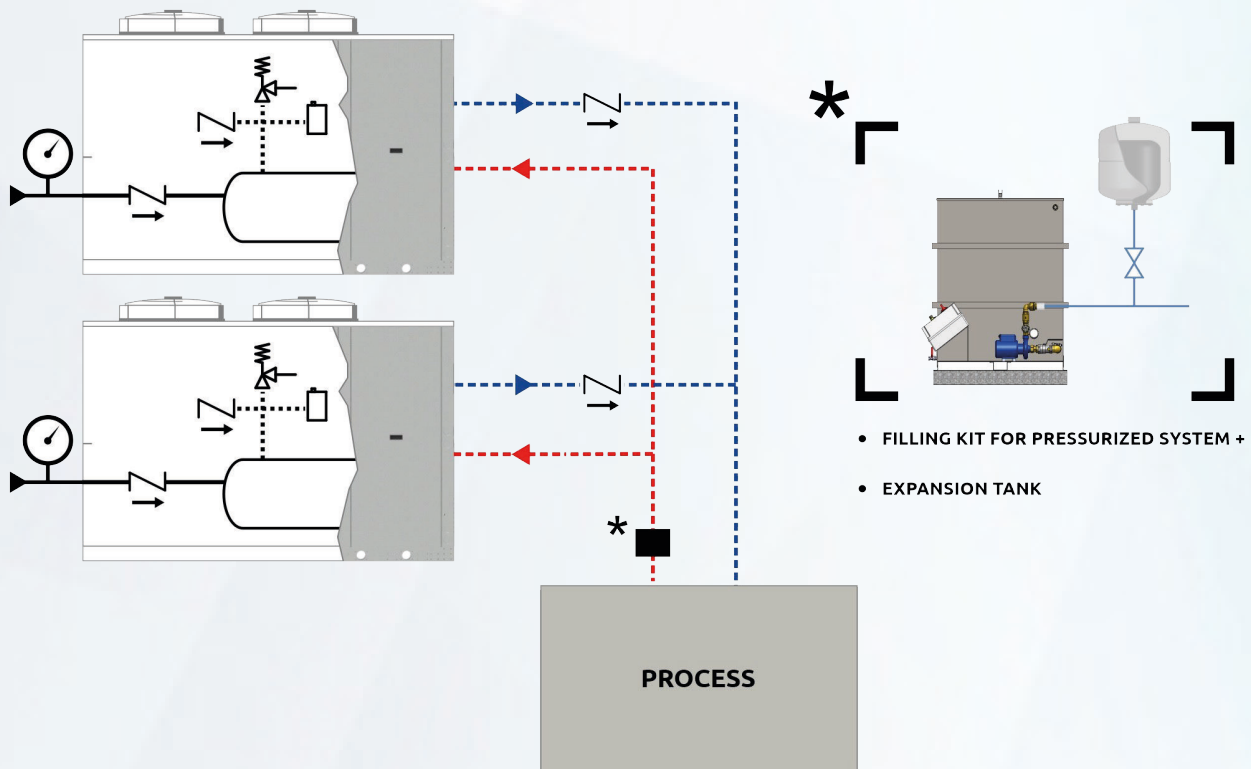
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Parallel Chiller Configuration

Devices needed with pressurised 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)



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



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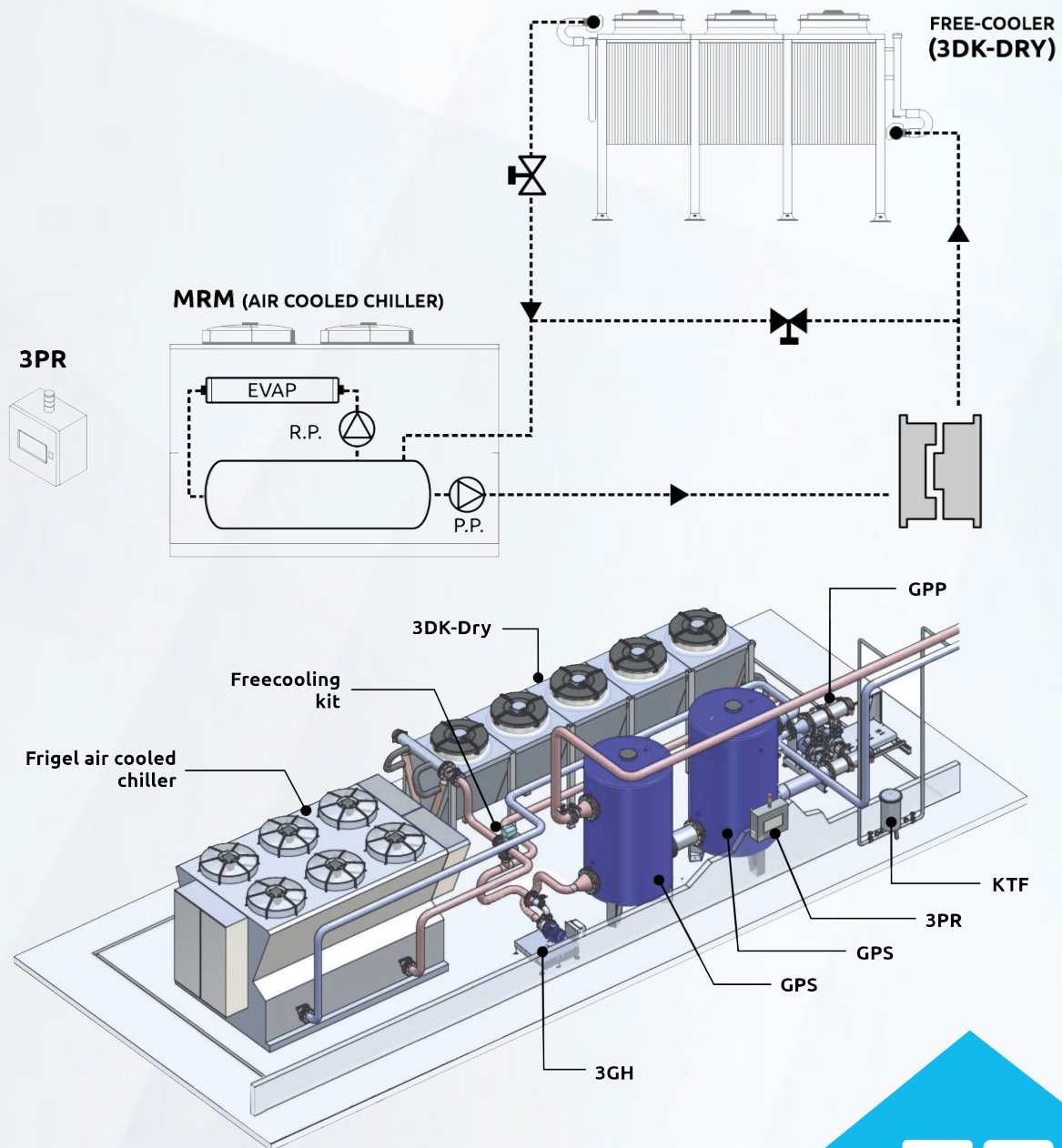
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Free Cooling Option

Through the control panel, it is possible to combine an air/water cooler to the refrigerating unit to create a free cooling system. Using the ambient air, the system allows to cool the water return from the process, by shutting down, partially and/or completely, the refrigerating unit, with consequent energy saving.



The above scheme is for illustrative purposes only



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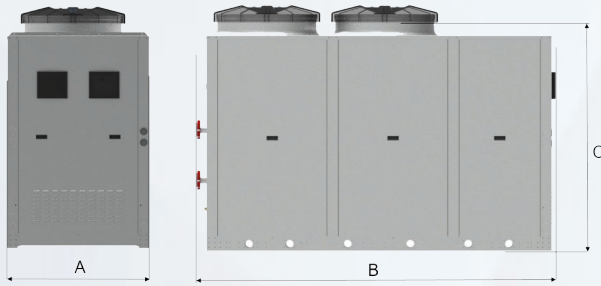
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Dimensional Technical Data

Model		201	251	301	311	401	202	252	302	312	402	204	254	304	314	404
A	mm	1.165	1.165	1.165	1.165	1.165	1.165	1.165	1.165	1.165	1.165	2.137	2.137	2.137	2.137	2.137
B		2.875	2.875	2.875	3.800	3.800	4.545	4.545	4.545	5.470	5.470	4.545	4.545	4.545	5.470	5.470
C		1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975	1.975

dimensions refer to units in basic configuration, without added options



Ordering Codes

N M R M 2 0 1 0 A P P 0 0

Product name

201	311	252	402	304
251	401	302	204	314
301	202	312	254	404

Size

Assembly revision

A = AC fans – on-off fans
 C = EC fans – brushless fans
 H = EH fans – high pressure brushless fans

Fans

P = Brazed plate
 T = Shell & tube

Evaporator type

N = not present
 M = chiller + evaporator pump
 P = chiller + process pump + tank
 S = chiller + evaporator pump + process pump + tank

Water configuration

0 = Not installed
 C = Installed

Cold climate

0 = 400V-50Hz
 1 = 460V-60Hz
 3 = 380V-60Hz
 5 = 460V-60Hz UL electrical panel

Power supply as voltage/frequency combination

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We have 30+ years experience controlling temperature for the world's most demanding industries.



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