MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow

Data Center Main Trends

Eilat, November 7th 2018

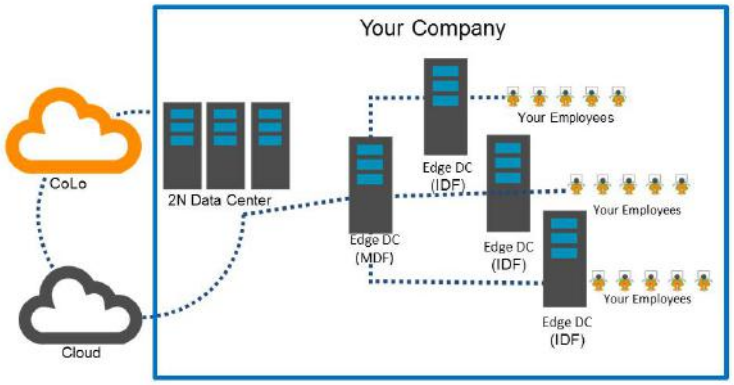
Fabio Gamalero, Melcohit IT Cooling Sales Manager

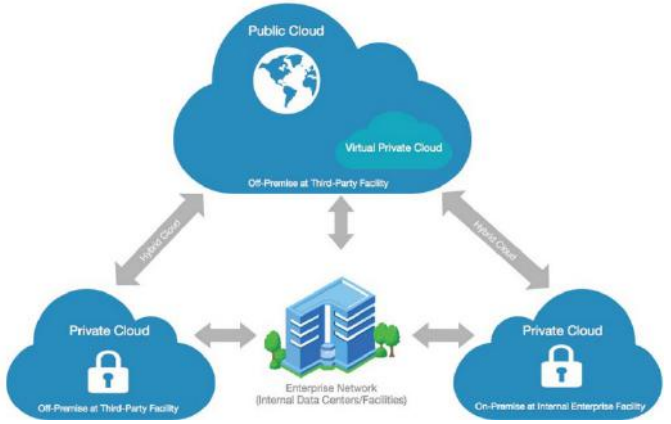
Most important Data Center mega trends

Most important Data Center mega trends

- **Edge Data Center**, to decentralize compute power placing it close to the point where data is generated. Not replacing the cloud, but complementing cloud services. Today 10% of the generated data are processed outside cloud or traditional DC, they will be 50% by 2022.

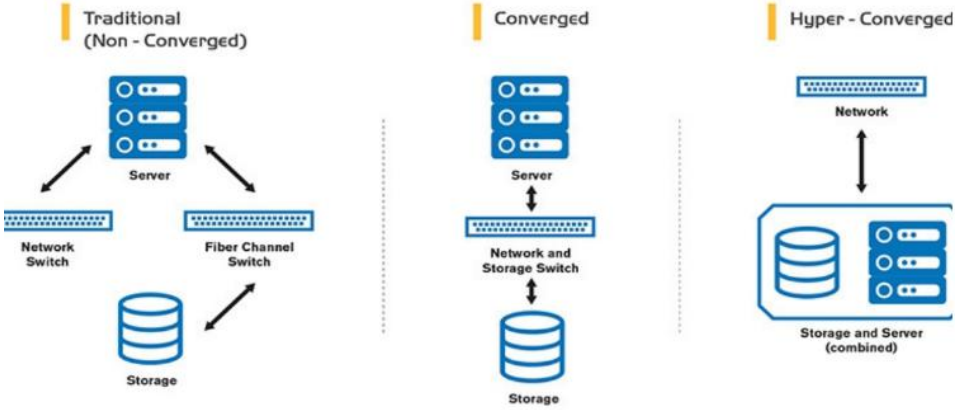
- **Hybrid IT technology Data Center**, the use of both in-house and cloud based services to complete the entire pool of IT resources getting benefits from the cost effectiveness and flexibility offered by cloud vendors while still having full control over certain resources that they might not want to expose to the cloud.





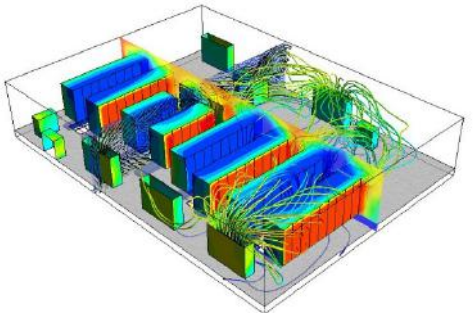
Data Center Mega Trends

- **Converged Infrastructure (CI)** brings the four core aspects of a data center -- compute, storage, networking and server virtualization -- into a single chassis; **Hyper Converged Infrastructure (HCI)** adds tighter integration between more components through software.



- **All-flash solutions (SSD)**, replacing legacy spinning disks storage allowing savings in power and cooling. Today 10% of DC are using SSD (solid state drive) storage technology; they will be 50% by 2021

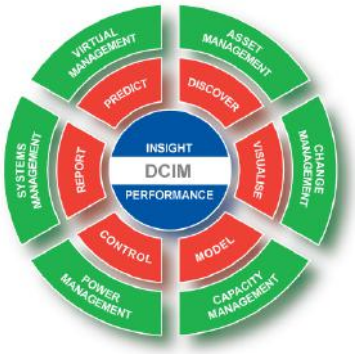
Data Center Mega Trends



More investments in increasing the efficiency of existing Data Center:

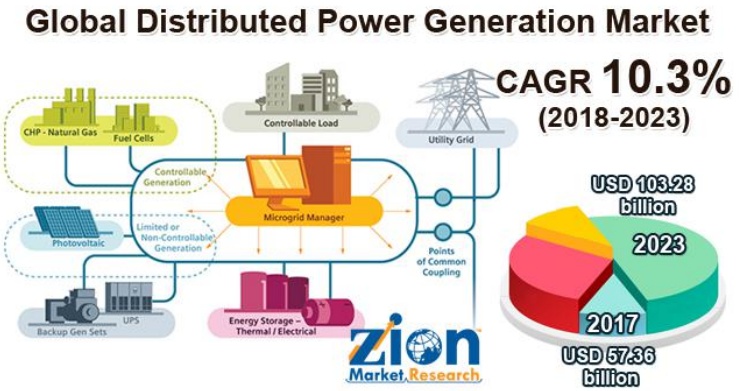
Air Flow Management (AFM), using CFD analysis

Data Center Infrastructure Management (DCIM), software



Liquid based cooling technologies, showing 16% CAGR from now to 2020

Microgrids, small-scale localized power station working as back-up power or to bolster the main power grid during periods of heavy demand



Source for Mega Trends: article by Bill Cleyman from www.datacenterknowledge.com

Main Trends in Data Center Cooling Technologies

Enterprise sector in general is investing more heavily in M&E, than co-location

HPC – Ultra High Temperatures

Modular continues to be on the rise, but is still a small proportion of the overall market – 3-5%.
Facebook DC modules might become popular and go mainstream through Open Compute

New DC/ Modular DC

Legacy

Legacy Data Centres undergo cheaper retrofit options from aisle airflow management to the utilisation of free cooling retrofit options

50 C

>40 C C

35-40 C

25-27 C to 31-35 C

18-21 C to 25-27 C

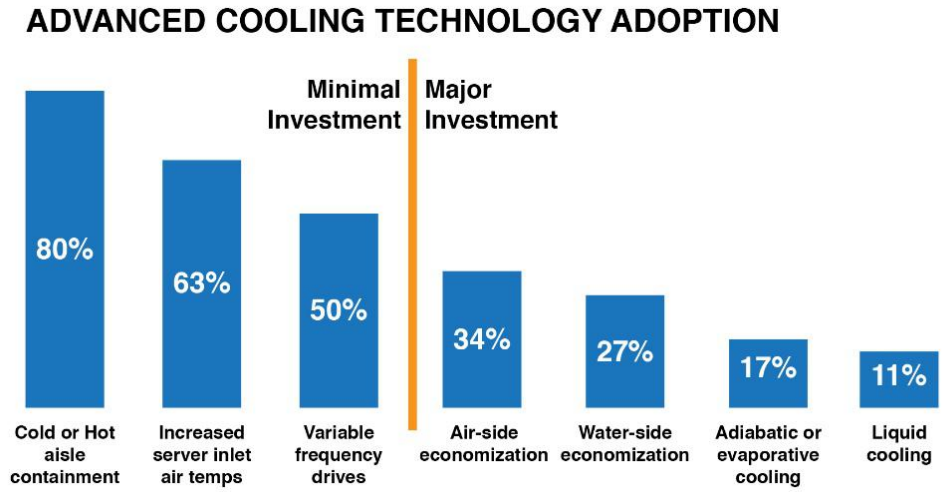
Average temperature in most DC is ~ 24 C

Source: BSRIA

Main Trends in Data Center Cooling Technologies

Increased DC temperatures for low energy consumption and low PUE
Retrofit options driven by aisle containment, free cooling, VSD
New DC massively look to free cooling and adiabatic technologies
Modular DC and liquid cooling still small, but growing: CAGR 16% for liquid cooling until 2020
Average DC temperature: 24 °C
Average DC size: 1.500 sqm, 500 kW, growing
Micro DC will grow from 2.7 Billion US$ (2017) to 8.5 Billion US$ (by 2022) with CAGR 26% (*)

(*) source: www.marketsandmarkets.com



Data Center Mega Trends

Final Considerations

The data center provider industry is expected to continue to thrive regardless of the pace of macroeconomic growth.

In addition to growth in the hyper-scale cloud provider sector, reasons for the continued health in the data center market include **the edge and hybrid cloud trends**. Organizations increasingly understand that centralizing everything within a full public cloud model just doesn't make sense.

New trends, new opportunities for IT COOLING !

MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow

The Air Conditioning Systems for IT Cooling by MEHITS

MITSUBISHI ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.

The available systems for IT Cooling

- **CHILLED WATER** for high or medium-high loads > 500 kW;
- **DIRECT EXPANSION** for low or medium-low loads < 200 kW;
- **ADIABATIC FREE-COOLING AHU's**
  for high or medium-high loads > 500 kW under specific climate & operating conditions

The available systems for IT Cooling: chilled water

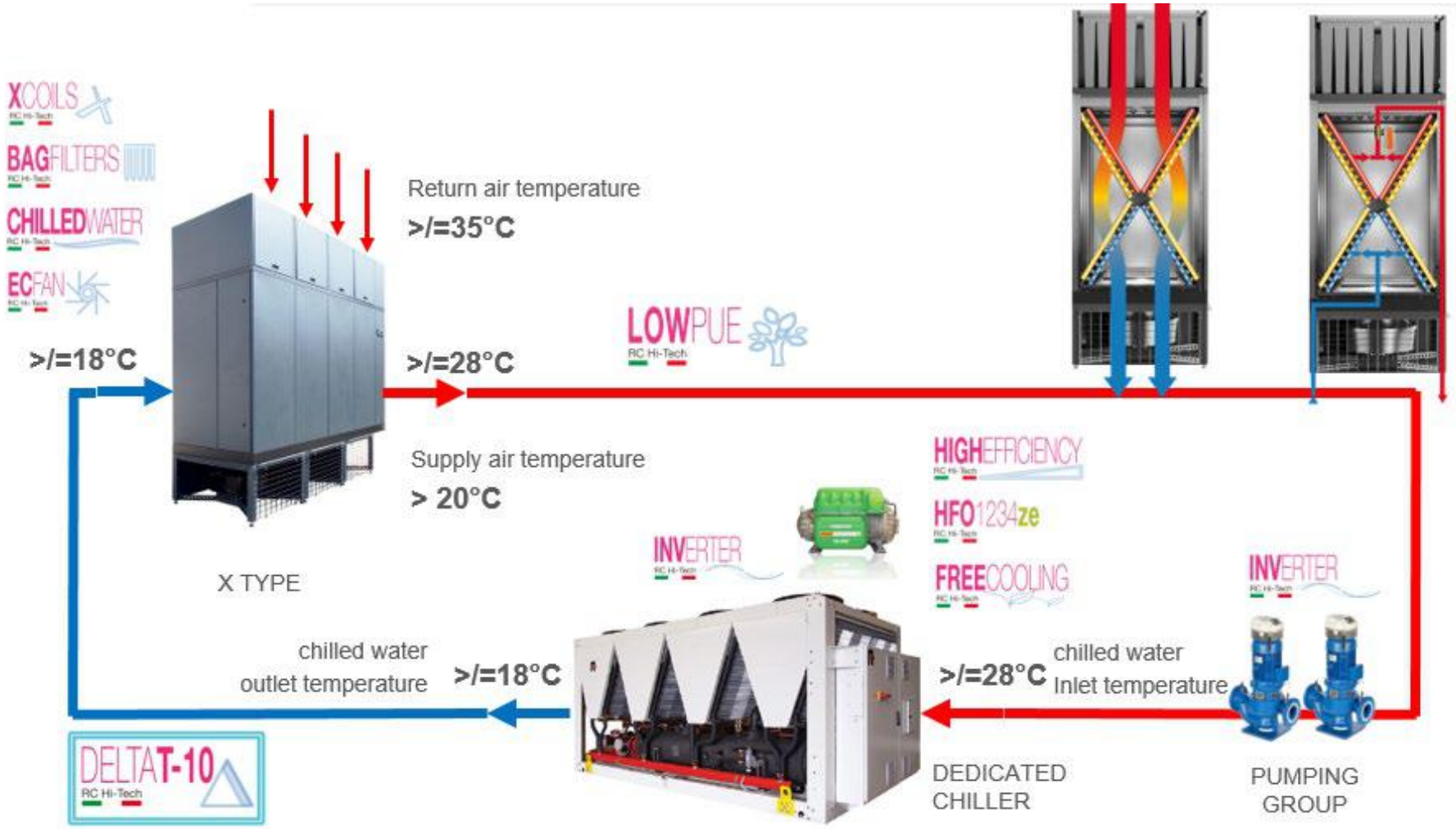
Chilled Water System mainly consisting of:

Room units: with CHW coil & valve, fans, microprocessor control system

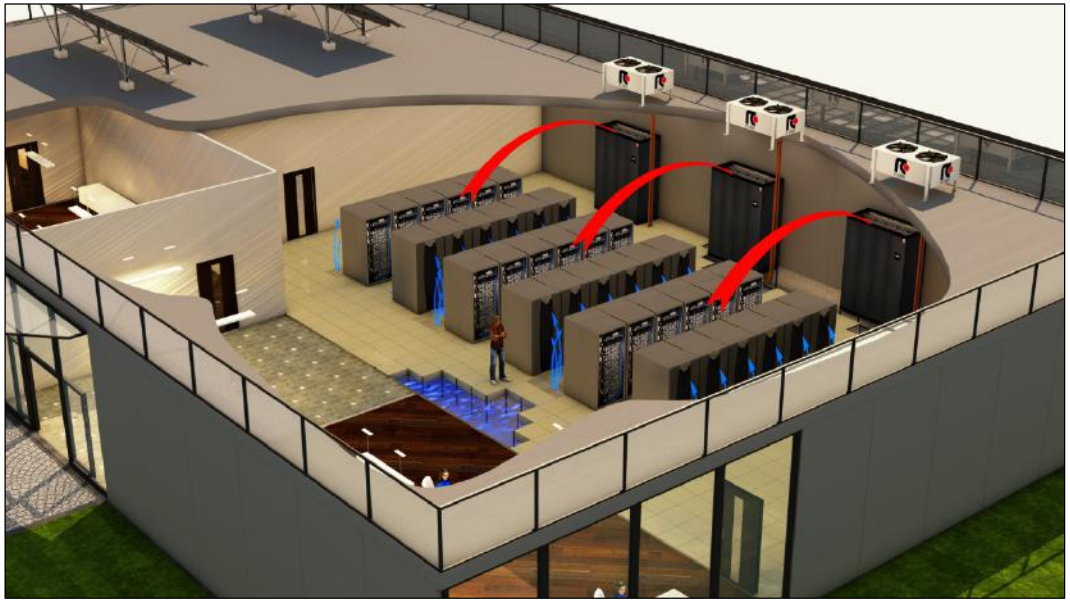
Liquid chillers: air cooled conventional of free-cooling; water cooled

Pumping group: chiller built-in, or separately installed

The available systems for IT Cooling : chilled water



The available systems for IT Cooling: direct expansion

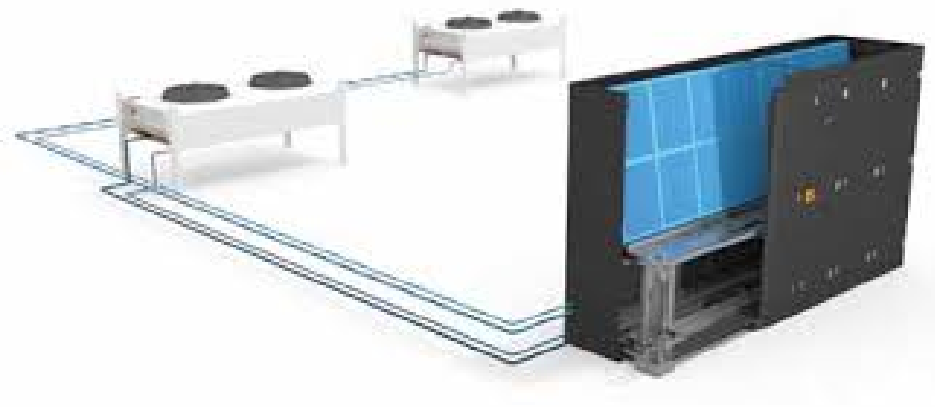


Direct Expansion System mainly consisting of:

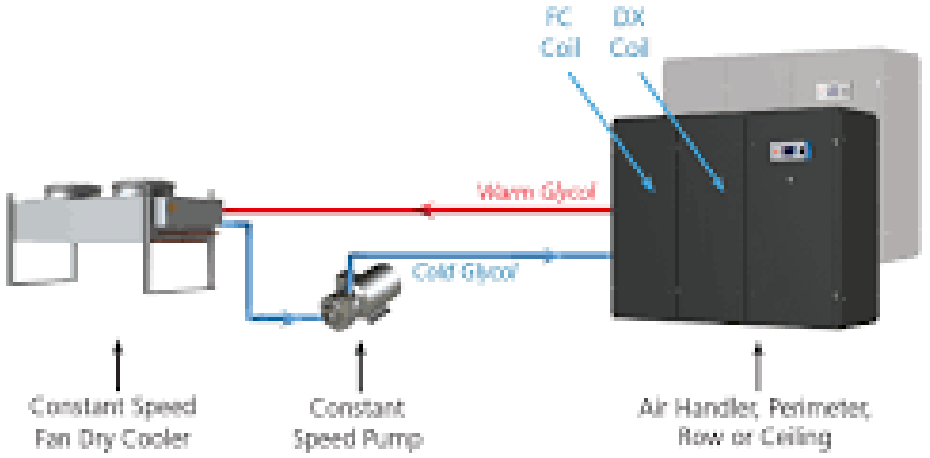
Room units: with DX coil, refrigerant compressor, expansion valve, fans, microprocessor control system. Available in air cooled version for matching with a remote condenser, or water cooled with built-in condenser for matching to a remote dry cooler / cooling tower / other cooling system;

Remote condensers / Dry coolers: with axial or plug fans to dissipate the heat rejection

The available systems for IT Cooling: direct expansion



DX Air Cooled Double Circuit



DX Water Cooled Single Circuit with Free-Cooling

Details on MEHITS room units: for perimeter installation

Air conditioners are placed along walls in Data Center or in aisle or technical space out of the data hall. The latter solution allows control and maintenance operations without entering the IT area.

Upflow or Horizontal air delivery if no raised floor, Downflow with raised floor

Details on MEHITS room units: for in-row/in-rack installation

Air conditioners are installed between a rack and another with air supply in the cold aisle and air return from the hot aisle (in-row installation), or with air supply and return directly inside the rack (in-rack installation). This solution is commonly used in data centers with “Hot Spot” (concentrated thermal loads); as the cooling unit is placed between the server cabinets in a row, can provide cool air to the server equipment more effectively.

The available systems for IT Cooling: adiabatic free-cooling AHU's

Adiabatic Free Cooling AHU System mainly consisting of:

Air Handling Units: with adiabatic free cooling system (cross-flow heat exchangers + high pressure water spraying) for normal operation, mechanical cooling system for emergency operation, fans, microprocessor control system.

MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow

MEHITS proposal for adiabatic free-cooling AHU's

GOGREEN innovative solutions

ADIABATIC RC Hi-Tech COOLING

ALUMINUM RC Hi-Tech

pPUE 1,025

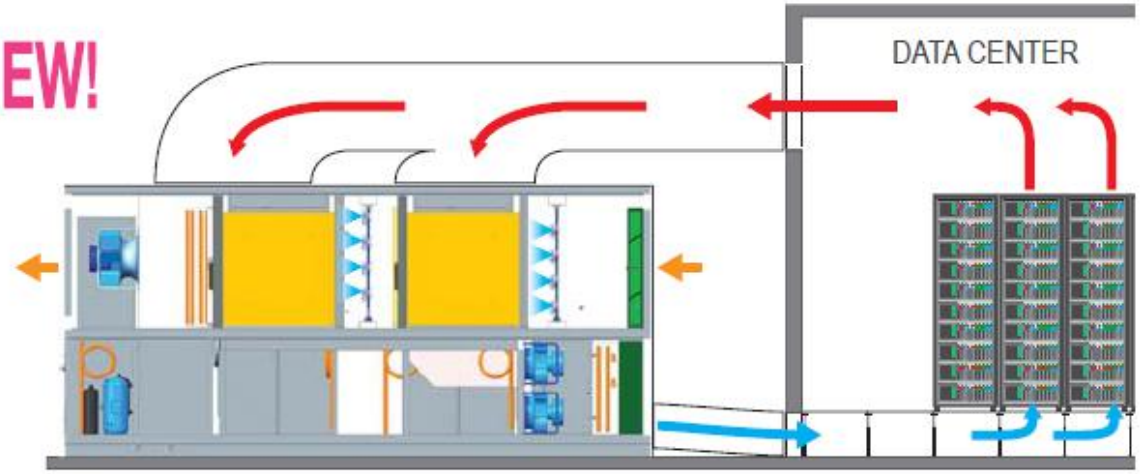
20 YEARS WARRANTY
on cabinet

SIVIS

2 stages indirect adiabatic cooling system

INDIRECT ADIABATIC COOLING SYSTEM

NEW!



SIVIS

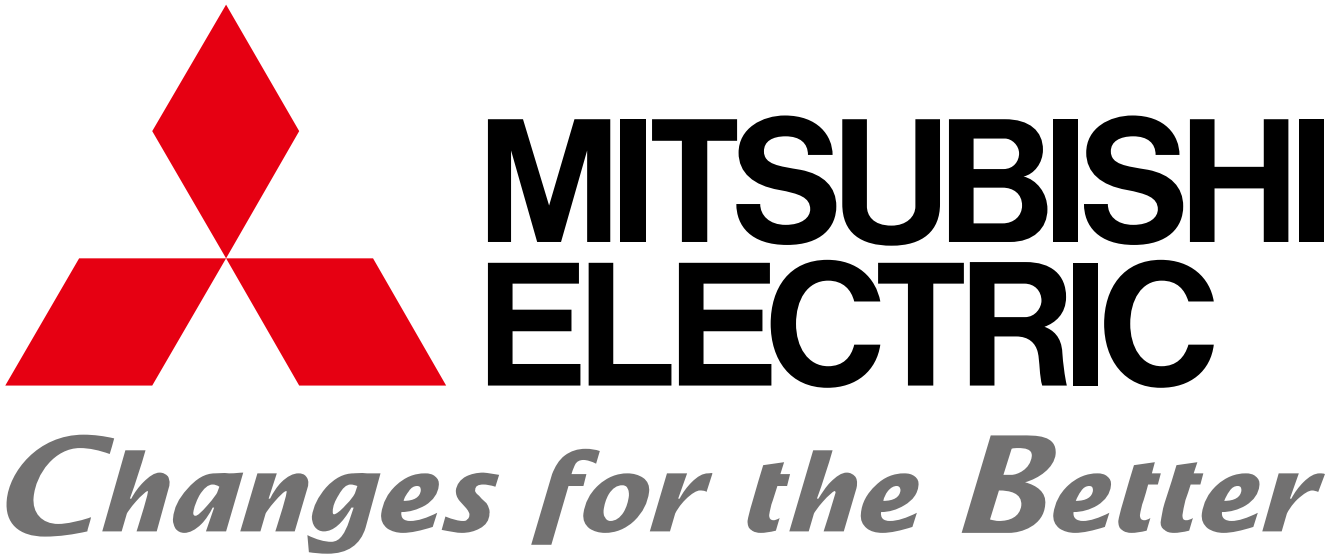
WHY the IT COOLING systems by MEHITS

Single Source Responsibility (SSR): same supplier for top class precision air conditioners and liquid chillers with a complete range covering all needs of the most demanding users.

Long experience: since 1963 in IT Cooling market

Top technologies:
- full inverter precision air conditioners
- control on both supply & return air temperatures
- conventional & evaporating free-cooling

State of the art in terms of components: first class worldwide suppliers for all components


MITSUBISHI
ELECTRIC
Changes for the Better