



# Fluid Coolers



Every detail, even the smallest one,  
is designed to achieve  
the best Fluid Coolers solution  
which meets our customers' needs.





# ThermoKey offers over 180,000 Fluid Cooler solutions

- More than 7,000 models
- 12 types of wiring
- More than 12 different types of fins and tubes material
- More than 40 fan types
- A wide range of fin spacing (from 6 FPI to 24 FPI)
- Various fin thickness

## Our Archimede Software Selects the Best Fluid Cooler Solution

(range from 2 to 630 tons of cooling)



### YOU CAN DOWNLOAD THE SOFTWARE

scan the QR code or use the website link  
[www.thermokey.com/download/software](http://www.thermokey.com/download/software)

# TKArchimede Precision and Reliability

## CALCULATION FUNCTION

Entry working conditions (requested capacity, temperature and type of fluid, noise level, and eventually other plant restrictions).

## VERIFY FUNCTION

It is possible to verify the performances of each unit in one or more specific working conditions.

## TK-ARCHIMEDE SELECTS THE UNITS ACCORDING TO THE PARAMETERS:

- Main **fluids** present on the market;
- **Altitude, humidity, inlet air temperature;**
- **Fin** thickness (automatic adjustment of capacity);
- Wide range of **accessories** available such as:

*Wiring in the junction box, EC electrical panel, electrical panel with on/off fans regulation, step -or inverter- cut phase speed controller, repair switches, shock absorbers, flanges, casing with a specific colour, threaded or flanged connections and innovative adiabatic cooling systems.*



## TKArchimede uses the climate data of 537 cities in the world to offer

- Economic analysis: to check the pay-back time on investment (running costs).
- Energy analysis: to verify the energy consumption and the noise levels.

# Every detail is designed to guarantee the best performances

## LIFTING HOOKS

ThermoKey has designed the lifting hooks to ensure a correct and **easy handling of the fluid cooler** in compliance with safety standards.

## CROSS AND LONGITUDINAL SECTIONS OF EACH PART

Each fan module is separated from the other with panels to **avoid air by-pass** and to **optimize the efficiency of the heat exchanger**. This way, the correct and **proportional functioning of each module** is granted.

## PANELS ON HEADERS AND RETURN BEND SIDES

A protection panel on the headers side and an end panel on the return bend side of the coil **avoid any damage** even to the most fragile parts.

## PAINTED FRAME

Standard painted frame with C4 protection-class, designed in galvanized steel which is oven-painted with polyurethanic resins to guarantee a **perfect durability over time**.

## NITROGEN FILLING WITH FLANGE AND COUNTERFLANGE

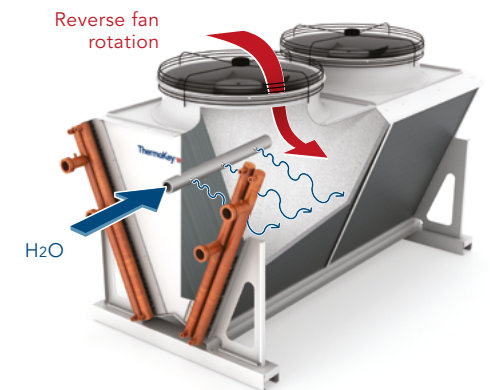
In order to **verify the correct pressure of the circuit**, the unit is supplied with nitrogen charge of approximately 40 psi, which can be checked on the manometer mounted in factory.

## [OPTIONAL] SELF-DRAINING SYSTEM

ThermoKey has designed a reliable self-emptying drainable system during winter time to **avoid freezing risk of the finned pack**.

## [OPTIONAL] SCS SPRAY J CLEANING SYSTEM

On V-type units, ThermoKey has designed a Cleaning System with internal nozzles which sprays water from the inside to the outside in order to clean the heat exchanger.



## [OPTIONAL] THERMOKEY ADIABATIC COOLING SYSTEMS: HIGH EFFICIENCY TO MEET THE MOST DEMANDING CONDITIONS

### AFS AIR FRESH SYSTEM

ThermoKey adiabatic cooling system equipped with special high-pressure nozzles and filtration for peak hot ambient temperatures.

### WFS WET FIN SYSTEM

ThermoKey hybrid cooling system which allows a complete flexibility of operation, working at low pressure (30 to 40 psi) and for a very high number of hours per year (up to 1000).

### EPS EVAPORATIVE PANEL SYSTEM

The evaporative panel system completes ThermoKey's offer for adiabatic cooling. Thanks to a homogeneous and adjustable distribution of water on the panels, this system is able to reach a high saturation level and therefore an efficient capacity increase with low water consumption (hours per year 8000).



# Fluid Coolers Range



## POWER-LINE FLUID COOLERS (1 FAN ROW)

- Performance range:

Capacity from 2 to 255 tons of cooling \*
- Fans

Diameter Ø 500, 630, 800, 900, 1000 mm, AC or EC motor
- Benefits

High efficiency geometry  
Modular design, 1-10 fans  
8 sound levels  
Piping in copper or stainless steel AISI 304 or AISI 316L  
Finned pack available in a wide range of materials  
Complete range of accessories  
Frame in galvanized steel, powder-coated



## POWER-LINE FLUID COOLERS (2 FAN ROWS)

- Performance range

Capacity from 10 to 320 tons of cooling \*
- Fans

Diameter Ø 500, 630, 800, 900, 1000 mm, AC or EC motor
- Benefits

High efficiency geometry  
Modular design, 2-16 fans  
8 sound levels  
Piping in copper or stainless steel AISI 304 or AISI 316L  
Finned pack available in a wide range of materials  
Complete range of accessories  
Frame in galvanized steel, powder-coated



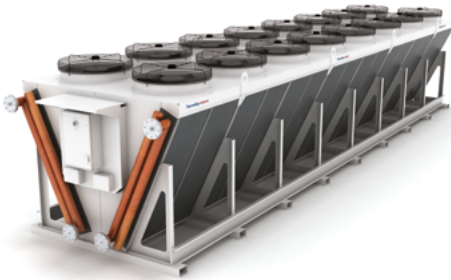
## POWER-J FLUID COOLERS (1 FAN ROW)

- Performance range

Capacity from 20 to 275 tons of cooling \*
- Fans

Diameter Ø 800, 900, 1000 mm, AC or EC motor
- Benefits

High efficiency geometry  
Modular design, 2-7 fans  
8 sound levels  
Piping in copper or stainless steel AISI 304 or AISI 316L  
Finned pack available in a wide range of materials  
Complete range of accessories  
AFS (Air Fresh System) o WFS (Wet Fin System), available upon request  
Frame in galvanized steel, powder-coated



## POWER-J FLUID COOLERS (2 FAN ROWS)

- Performance range

Capacity from 35 to 450 tons of cooling \*
- Fans

Diameter Ø 800, 900, 1000 mm, AC or EC motor
- Benefits

High efficiency geometry  
Modular design, 4-16 fans  
8 sound levels  
Piping in copper or stainless steel AISI 304 or AISI 316L  
Finned pack available in a wide range of materials  
Complete range of accessories  
AFS (Air Fresh System), WFS (Wet Fin System) available upon request  
Frame in galvanized steel, powder-coated

(\*) **Standard conditions** - 35% Ethylene Glycol, T in = 104° F, T out = 95° F, T amb = 25° F



SUPER POWER-J FLUID COOLERS (2 FAN ROWS)

|                   |  |
|-------------------|--|
| Performance range | Capacity from 80 to 630 tons of cooling *  |
| Fans              | Diameter Ø 800, 900, 1000 mm, AC or EC motor   |
| Benefits          | Maximum performance, minimum footprint<br>High efficiency geometry<br>Modular design, 8-20 fans<br>8 sound levels<br>Piping in copper or stainless steel AISI 304 or AISI 316L<br>Finned pack available in a wide range of materials<br>Complete range of accessories<br>AFS (Air Fresh System) o WFS (Wet Fin System), available upon request<br>Frame in galvanized steel, powder-coated |

POWER-J (V-TOWER) FLUID COOLER

|                   |   |
|-------------------|---|
| Performance range | Capacity from 80 to 630 tons of cooling *   |
| Fans              | Diameter Ø 800, 900, 1000 mm, AC or EC motor  |
| Benefits          | EPS (Evaporative Panel System)<br>Maximum performance, minimum footprint<br>High efficiency geometry<br>Modular design, 8-20 fans<br>8 sound levels<br>Piping in copper or stainless steel AISI 304 or AISI 316L<br>Finned pack available in a wide range of materials<br>Complete range of accessories |

TKMICRO H<sub>2</sub>O MODULAR LIQUID COOLER

|                   |   |
|-------------------|---|
| Performance range | Capacity for each module up to 35 tons of cooling *   |
| Fans              | Diameter Ø 800 mm, AC or EC motor   |
| Modules           | From 1 module on  |
| Benefits          | Modularity<br>Compactness (maximum length of 89 in)<br>Low installation costs<br>Regulation or partialization of the whole unit<br>Lower enviromental impact<br>Less weight<br>Less fluid use<br>Easy-to-clean microchannel core<br>Core coating possibility in case of extreme ambient |

(\*) **Standard conditions** - 35% Ethylene Glycol, T in = 104° F, T out = 95° F, T amb = 25° F

Adiabatic systems

- AFS

Air Fresh System
- WFS

Wet Fin System
- EPS

Evaporative Panel System

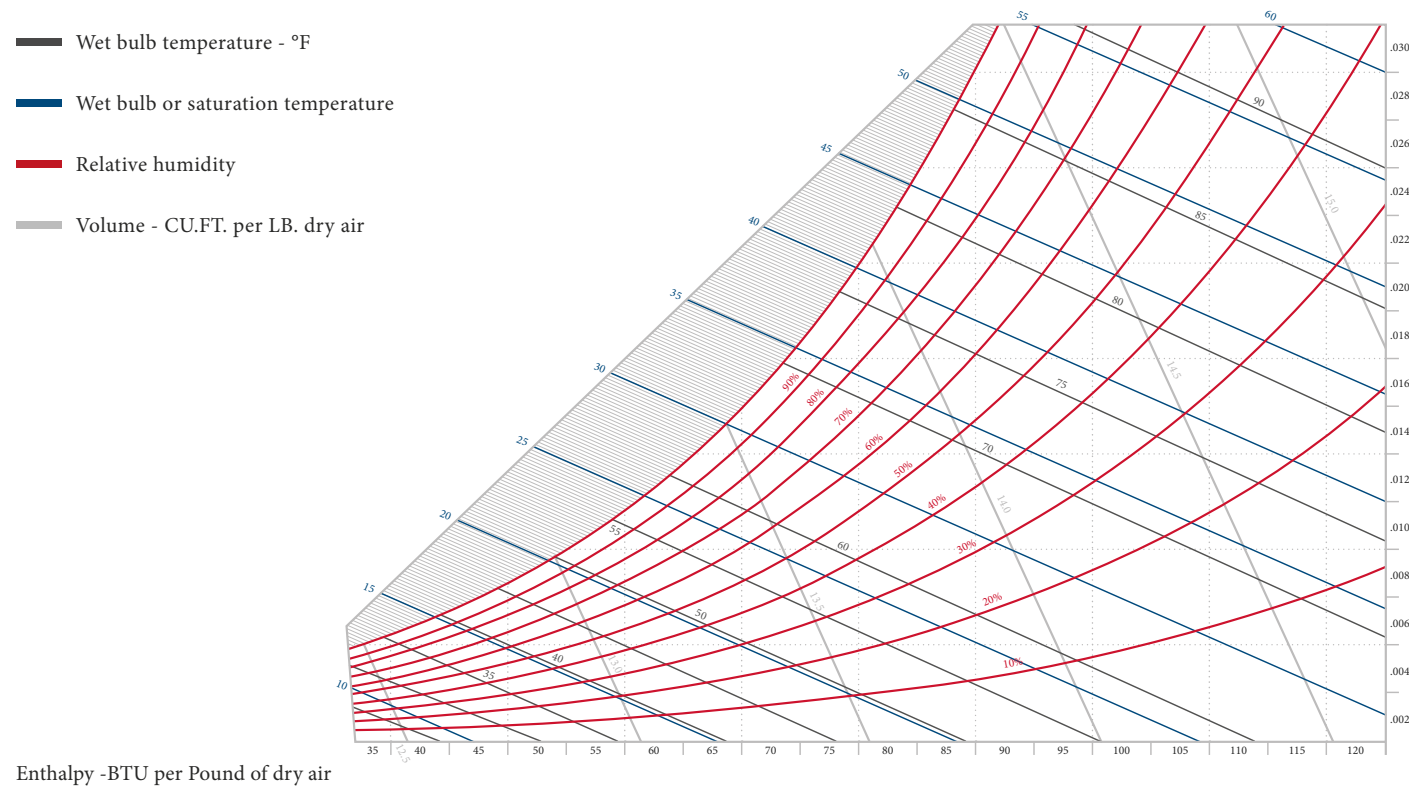
The adiabatic system installed in Fluid Coolers and large Remote Condensers are activated in order to increase the air relative humidity that passes through the heat exchanger. This reduces the temperature and increases the heat exchange.

The physical principle is the latent heat of evaporation: when evaporating, the water absorbs heat from the air entering the heat exchanger and lowers its temperature.

ThermoKey has developed different adiabatic systems to be effective and efficient under various environmental conditions.



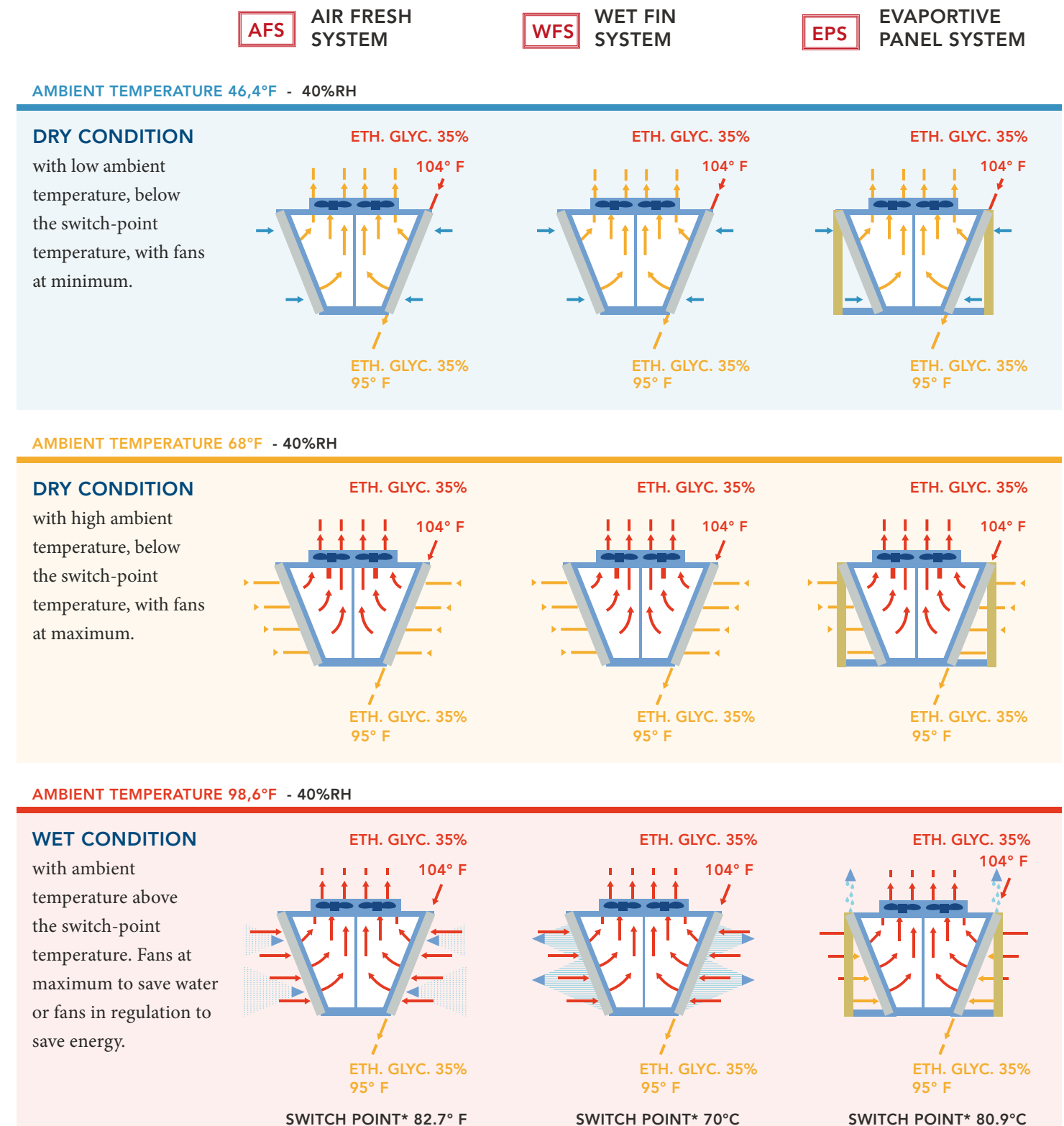
## Psychrometric Diagram



## Comparison chart

|                                    | AFS             | WFS          | EPS           |
|------------------------------------|-----------------|--------------|---------------|
| MOIST AIR SATURATION               | 80%             | 100%         | 90%           |
| STANDARD AIR TEMPERATURE REDUCTION | 12.6° F         | 18° F        | 14.4° F       |
| WATER CONSUMPTION                  | LOW             | MEDIUM       | LOW           |
| WATER TREATMENT                    | OCCASIONAL      | REQUIRED     | NOT REQUIRED  |
| DIRECT ENERGY CONSUMPTION          | LOW             | LOW          | LOW           |
| ENVIRONMENTAL IMPACT               | LOW             | LOW          | LOW           |
| COIL PROTECTION                    | HYDROPHOBIC     | DOUBLE-LAYER | NOT NECESSARY |
| MAINTENANCE COSTS                  | LOW             | LOW          | LOW           |
| CERTIFICATION                      | LEGIONELLA FREE | HYGIENIC     | HYGIENIC      |

## Operating Modes of the Adiabatic Systems



(\*) Fans at 1.100 RPM (Super J-Series for fans 910 mm)

# Anti-Legionella and Hygiene Certificate

## LEGIONELLA

Legionella is a gram-negative bacillus, responsible for a severe infective disease called Legionnaires' disease. Legionella survives in water and mud and it is transmitted by air. Moreover it has been ascertained its transmission by the air conditioning central system.

The Legionnaires' disease is a pulmonary infection caused by the Legionella pneumophila bacterium, which name means exactly "Legionella lover of the lungs". The name Legionella was coined in 1976, after an epidemic which had spread throughout the participants to a gathering of the American legion at Bellevue Stratford Hotel in Philadelphia. In this occasion 221 people contracted this kind of previously unknown pneumonia and 34 of them died. The source of the contamination was identified in the air conditioning system of the hotel.

## OUR SOLUTIONS TO PREVENT LEGIONELLA

Our solutions satisfy the requirements of the Standard VDI 2047 Part 2 (securing hygienically-sound operation of evaporative cooling systems), this standard lists the structural, technical and organizational requirements pertaining to hygienically sound operation; these requirements concern the planning, installation, and operation including the required maintenance of evaporative cooling systems. Risks posed by, e.g. legionella, for employees and third parties will be minimized if these requirements are met.

ThermoKey has developed a system on "V-type Fluid Coolers" and/or "V-Condensers" to work with an adiabatic system.

The AFS method employed makes use of adiabatic cooling with low water consumption by means of special nozzles developed to work with very high water pressures. The physical phenomena of the adiabatic cooling consists of creating an even diffusion of micro drops of water (misting effect) through which a current of air passes through that will be cooled by the evaporation of the water.

### Water side:

The quality of the water supplied to the adiabatic system is tap water (according drinking water regulation). The special nozzles in the "AFS" combined with the high pressure of the water produce micro drops that are completely evaporated by the flow of air without leaving residues of water on the heat exchanger coils; no water is present in equipment and above all on the discharge of the fans or on the ground.

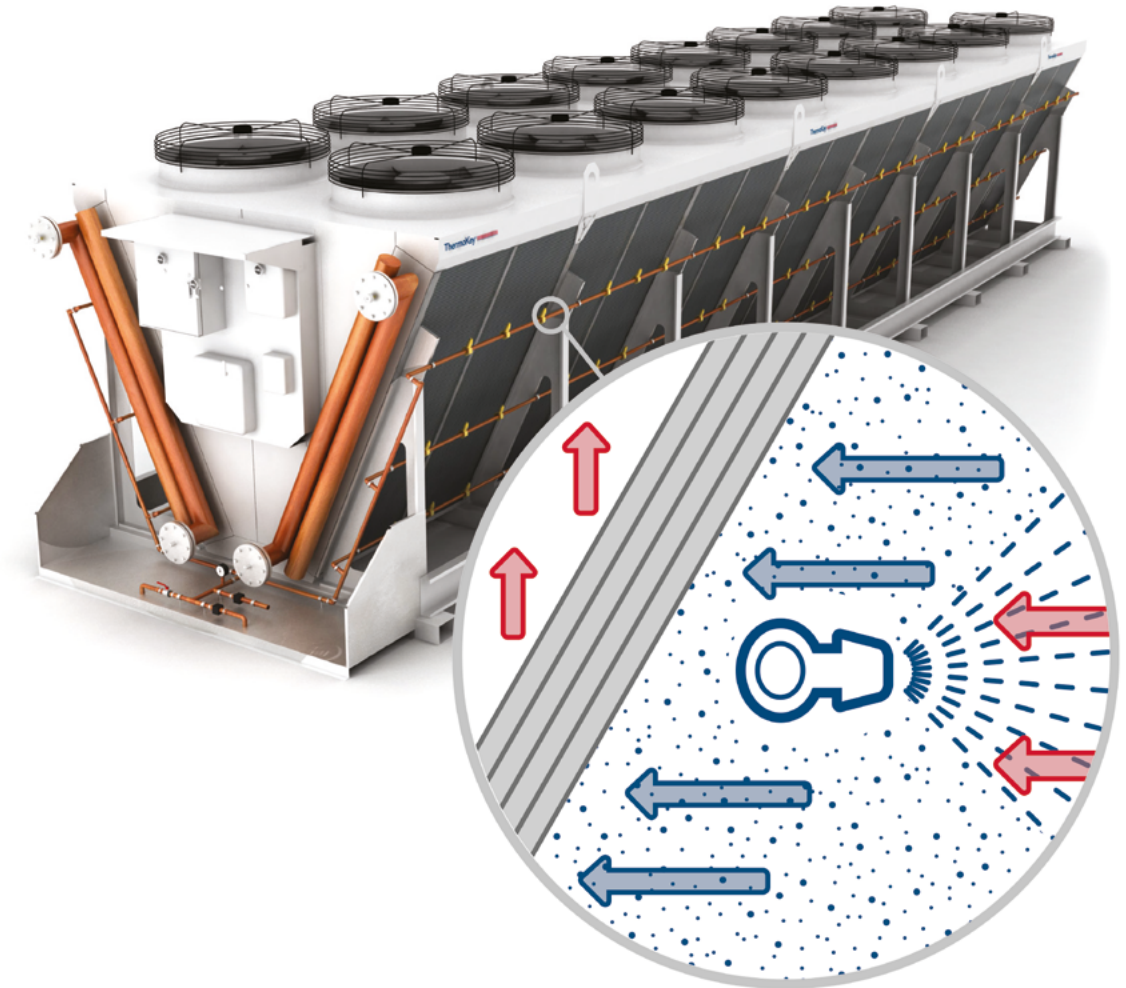
Water is present in the water distribution nozzles only during the "AFS" operation, the water distribution nozzles are emptied each time the "AFS" is not in use.

Taking this into account, there is no growth of legionella bacteria.

### Air side:

The air inlet from the unit is going back to the ambient and is not used anyway for supplying air. Therefore no risk can be seen during operation.

# AFS Adiabatic System Certification



## TÜV SÜD CERTIFIED

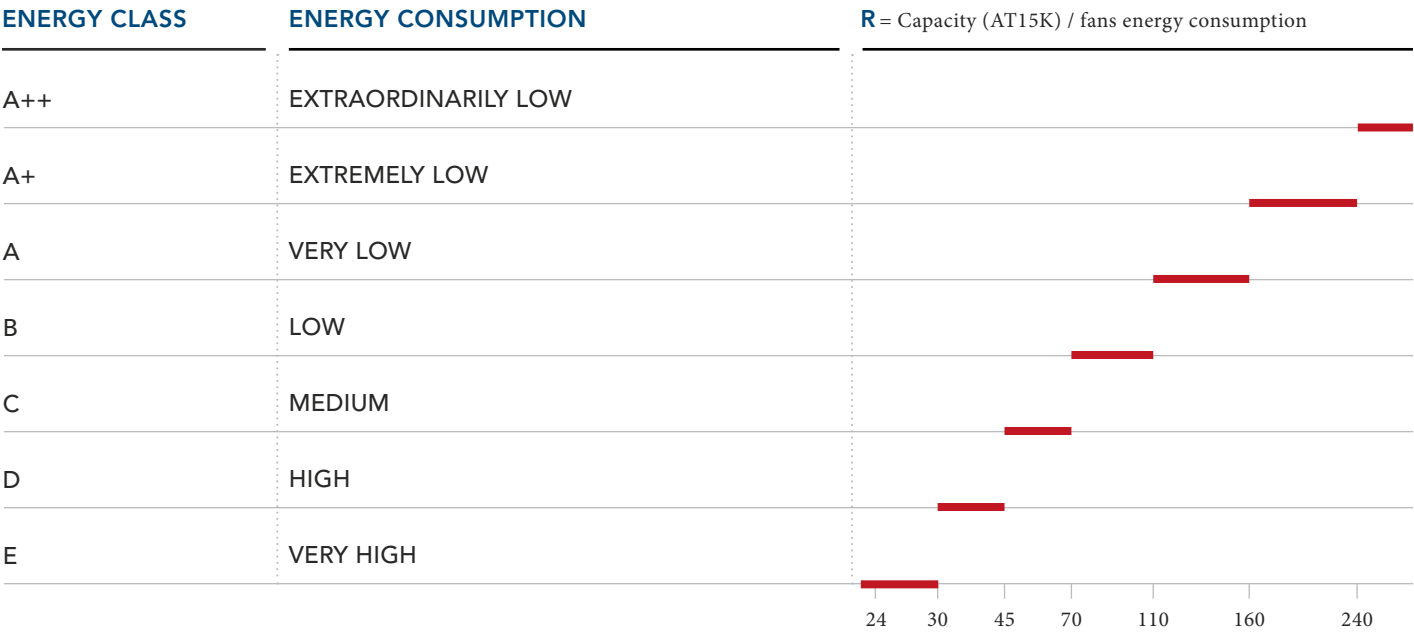
"With this "AFS" there is no standing water during continuous operation. Working according to the instruction manual we can state that ThermoKey "Air Fresh System" carries no danger in correlation with the risk of legionnaires' disease."



## Flexibility in Energy Management

ThermoKey range of dry coolers gives the opportunity to select units with energy class up to A ++.

With ThermoKey Adiabatic System (AFS) or even better with ThermoKey Hybrid System (WFS) the customer can choose whether to privilege the consumption of water or electricity or vice versa.



### FRAME AND FAN STACK

**APPLICATION:** to guarantee **maximum strength, solidity**, and **resistance** to the external environment paying particular attention to the high-efficiency fan stack use in order to reduce noise and electric fans cosumption.

The casing is provided in galvanized steel (FeZn 275) which is oven painted with polyurethanic resins (standard RAL 7035).

### ACCESSORIES RANGE

A complete set of accessories is available on request including:

- cut phase speed controller, step speed controller, and inverter speed controller;
- standard and special electrical panels which can be customized for specific applications;
- fins in different materials (aluminium, copper, double layer and hydrophobic);
- copper tubes and stainless steel pipe in AISI 304 or 316L for special applications;
- special motors: single phase for diameters 500 and 630 mm, with power at 60Hz, at different voltages and for high or low air temperature.

Heat Exchange Solutions

ThermoKey

\* Characters always present in the code

• CONFIGURATION

- One-coil dry cooler

J Double-coil dry cooler

SJ Super double-coil drycooler

JV Double-coil dry cooler suitable for container loading

• PRODUCT SERIES

W Fluid Cooler with 32 and 42 geometry coils

G Fluid Cooler with 46 geometry coils

• SOUND LEVEL

H High

L Low

Q Quiet

R Residential (ultra quiet)

• NUMBER OF FAN ROWS

• NUMBER OF FANS PER ROW

• FAN DIAMETER

50=500mm, 63=630mm, 80=800mm, 90=900mm, 10=1000mm

• CAPACITY LEVEL

A, B, C

• MODULE

- Fluid Coolers with fans Ø 500 - Ø 630 - Ø 800

N Fluid Coolers standard module

X Fluid Coolers extended module

Z Fluid Coolers super extended module

• FAN-MOTOR CONNECTION

D Delta

Y Star

M Singlephase

- EC working point (1, 2, 3, 4, 5, 6)

• NUMBER OF TUBES PER CIRCUIT

• AIR FLOW DIRECTION

H Horizontal

V Vertical

• WIRING

E Junction box (for AC fans)

W1E Electrical box (for EC fans)

W2E Electrical box and switches – 1x2 - (for EC fans)

W3E Electrical panel and fan fuse protection (for EC fans)

W Electrical panel built to customer's specifications (for AC fans)

Q Electrical panel and CE marking (for AC fans)

Q1E Electrical panel and automatic switches (for EC fans)

Q2E Electrical panel, automatic switches + speed controller (for EC fans)

Q3E Electrical panel, automatic switches, speed controller + heaters (for EC fans)

Q4E Electrical panel, automatic switches, speed controller + mounted switches 1x2- (for EC fans)

• REPAIR SWITCH

I (available 3Pole, 6Pole and main switches)

• SPEED CONTROLLER WITH PROBE

R Cut phase fan speed controller

G Step fan speed controller

Z Inverter fan speed controller

P Special cut phase fan speed controller (on demand)

Eb EC BASIC speed controller

Ep EC PLUS speed controller

• SHOCK ABSORBERS

• ALUMINIUM PN10 SLIP-ON FLANGES

(stainless steel PN16 flanges available on request)

• FAN TYPE

- AC fans

[EC] EC fans

SJ\*H\*2\*3\*80\*A\*-Y04\*VEIRAF(EC)

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# Applications



## HVAC

used as external units in HVAC contribute to the optimization of air-conditioning systems in data centre, hospitals, hotels, theatres, etc.



COOLING

## Data centre

The Dry Coolers have been specifically designed to provide the best and most efficient solution.

**NEED** controlling precisely the temperature of data centre servers to improve their efficiency.  
**CAPACITY REQUIRED** total 6.1 MW.  
**SOLUTION** 18 Dry Coolers model JGH2390CZ2/6QIEMAF(EC)(AFS)S and 2 V-Type model JWQ1290A3/8QIEMAF(EC)(AFS)S with electronic fans, adiabatic and self-cleaning system.



COOLING

## Hospital

The Spital Thun hospital is part of a Switzerland hospital centre which provides medical assistance to 150,000 people among residents and tourists.

**NEED** cooling / climatisation hospital with low sound impact. Specific hygienic standards.  
**CAPACITY REQUIRED** total 1,520KW very low noise.  
**SOLUTION** 4 Superjumbo Dry Coolers model SJGR2790C3/4 EC ZAPLUS.



AIR  
CONDITIONING

## Hospital

Hospital in New Caledonia, with 82,000 m2 area, 635 rooms, 8 surgery rooms and 1 hall. Opening in 2015.

**NEED** perfect air-conditioning of the hospital under every weather condition.  
**CAPACITY REQUIRED** total 13,056 kW, Sound pressure 64dB(A) a 10m.  
**SOLUTION** 12 pcs Power-J Dry cooler model JGH21090CQAF(EC)S with 20 fans for each unit, CE electrical panel, shock absorbers, flanges and double layer fins for aggressive environment.



AIR  
CONDITIONING

## University clinic

The University of Klagenfurt is an innovative university in Klagenfurt which hosts more than 11,600 students.

**NEED** Dimensional restrictions for the installation of the units on the clinic's roof and low-noise plant.  
**CAPACITY REQUIRED** total capacity 1,419,000 m3/h. Cooling capacity: 6000 kW.  
**SOLUTION** 6 Super Power J Dry Coolers with Wet Fin System (WFS) and AxiTops.



AIR  
CONDITIONING

## Stadium

"Mordovia Arena" in Saransk guarantees additional comfort to organizers, sportsmen, participants and spectators during sport competitions.

**NEED** equipping the stadium technical rooms with air conditioning: medical stations, refreshment points, press conference rooms, mixed areas, children play rooms, toilets and changing rooms.  
**CAPACITY REQUIRED** total 6184 kW.  
**SOLUTION** 8 pcs model JGH2590BZDQPAS.

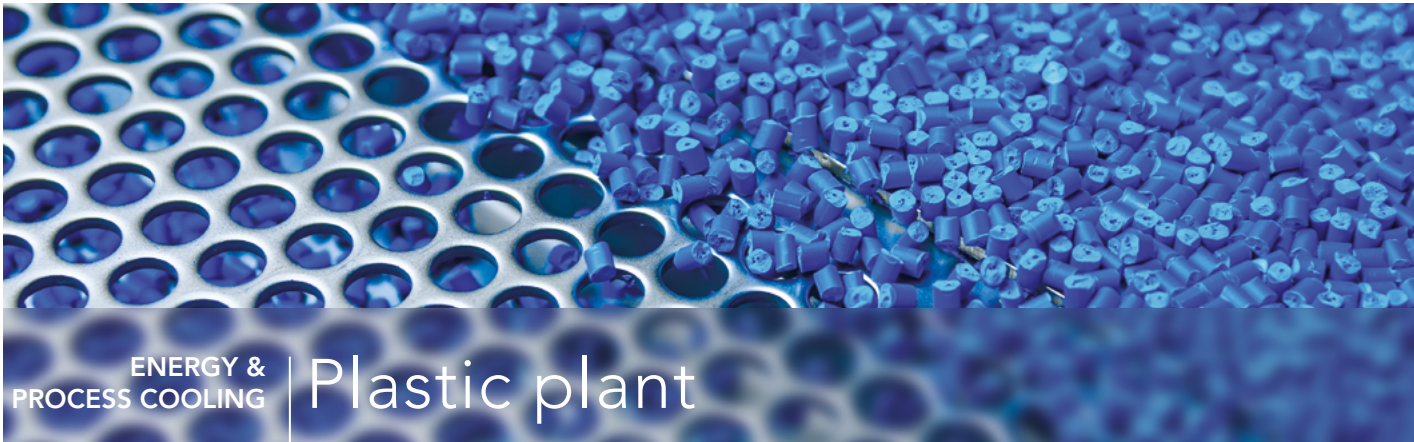


# Applications



## INDUSTRIAL

Through the ambient air and a closed circuit - without wasting water - dry coolers dissipate the heat generated and unusable by production processes, power plants, engines and molds.



ENERGY &  
PROCESS COOLING

## Plastic plant

Plastic Plant Group specialized in the production of pipes in Russia.

**NEED** control of the temperature during the production of pipes.  
**CAPACITY REQUIRED** total 425 tons of cooling.  
**SOLUTION** 2 pcs Dry coolers GH2490BZDVQRAFS. Added value: short delivery time and high-quality Dry coolers.

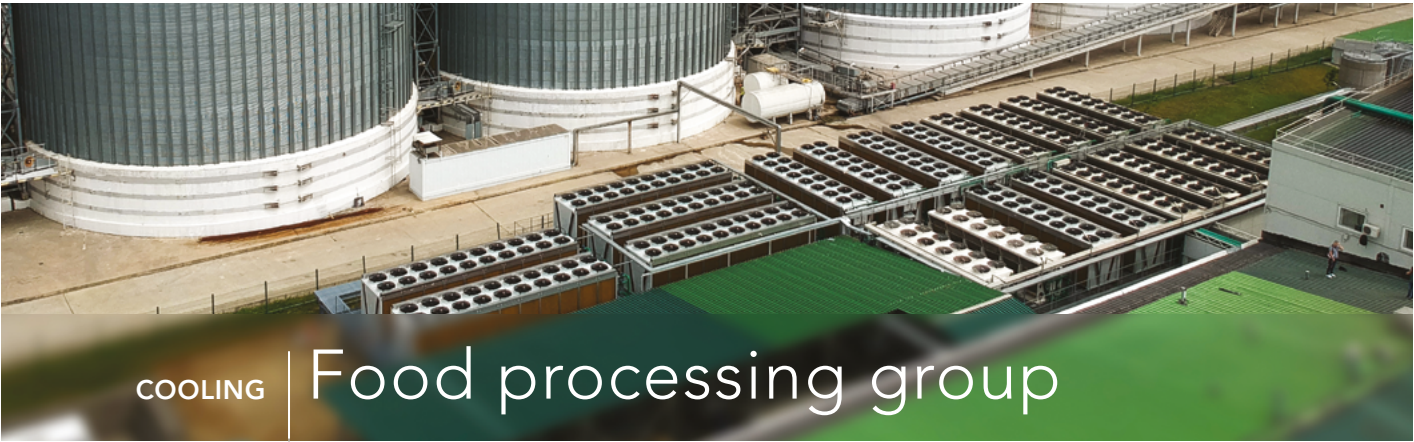


ENERGY &  
PROCESS COOLING

## Steelworks

Steelworks in the Middle East planned to produce 1.500.000 t/y of billets and placed in a desert area.

**NEED** cooling down the fume treatment plants. Water consumption: 660 gpm.  
**CAPACITY REQUIRED** total 30,000 tons of cooling.  
**SOLUTION** 30 pcs Super Power-J Fluid cooler model SJGH2910CDQF(INK)S with self-emptying drainable configuration, CE electrical panel and flanges.



COOLING

## Food processing group

International group leader in the processing of food products.

**NEED** guarantee the fluid temperature control at the requested maximum temperature thanks to adiabatic system (EPS). Specific hygienic standards.  
**CAPACITY REQUIRED** total 4,700 tons of cooling.  
**SOLUTION** 5 pcs SJGH21090CN/04Q2EAF(EC)(EPS)S – 6 pcs SJGH2890C1/04Q2EAF(EC)(EPS)



ENERGY &  
PROCESS COOLING

## Power plant

Seven Power is a new 234,000 tons of cooling gas-fired generation station at Usk-mouth, near Newport South Wales. Contractor: Siemens

**NEED** cooling down auxiliary circuits of Seven Power, a natural gas-fired power plant  
**CAPACITY REQUIRED** total 4,700 tons of cooling.  
**SOLUTION** ThermoKey has provided SPX with 40 Fluid coolers V-Shape, model JGL1690BY/4EIFS



ENERGY &  
PROCESS COOLING

## Thermonuclear industry

ITER (International Thermonuclear Experimental Reactor) is a nuclear fusion experimental reactor.

**NEED** to dispose 16/17 MW of thermal power and subsequent auxiliary systems by cooling down the glycoled water with a fluid delta temperature from 96.8° F to 69.8° F at 50° F environment temperature.  
**SOLUTION** 8 units model SJGL2790CD/4AFS of 2125kW each at the service of the cooling plant for the experiments.





## We design customized products to meet every need

We at ThermoKey know that specific environments require specific solutions, and we are happy to help you to identify the best solution for your needs.



## Our technicians assist customers with the selection proce

Our technical staff is at your complete disposal to identify the best heat exchanger for you. We individually analyze your specific needs and the environment in which the heat exchanger will be installed.



## After sales

ThermoKey stays at your side throughout the product life cycle for spare parts replacement and technical assistance.



## ThermoKey®

Heat Exchange Solutions

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