



SMART COOLING

NEW GENERATION ADIABATIC
CHILLER PRE-COOLING
BOOSTING SYSTEM



Reduce chiller electricity
consumption by up to 37%



Increase chiller cooling
capacity by up to 41%



Total condenser
protection 100%

FOR ALL TYPES OF AIR-COOLED CONDENSERS AND COOLING EQUIPMENT

**REDUCE ELECTRICITY
CONSUMPTION** BY UP TO

37%

**INCREASE COOLING
CAPACITY** BY UP TO

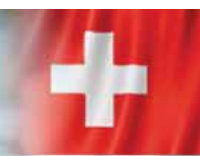
41%

**PROTECT CONDENSERS
AND COMPRESSORS**

100%



SWISS
INTEGRATED
ENERGY TECHNOLOGIES AG



New generation in adiabatic pre-cooling



Smart Cooling[™] stands for performance, safety and technology.

Our chiller boosting new generation adiabatic pre-cooling system intelligently merges with your equipment to increase efficiency, reduce operational costs and protect it from environmental hazards such as corrosion and limescale.

Smart Cooling[™] keeps your condensers safer and cleaner for longer than any other adiabatic device in the market.

We ensure the quality and reliability of each *Smart Cooling*[™] component to boost the efficiency of your chiller.

WHAT IS SMART COOLING™?

Smart Cooling™ reduces chiller electricity consumption by up to 37%, increases the coefficient of cooling performance by up to 37% on condensers and heat exchangers. The new generation adiabatic *Smart Cooling*™ pre-cooling system suits all models of air-cooled chillers, dry-cooling condensers, heat exchangers, rooftop units and refrigeration units.



INTELLIGENT ADIABATIC PRE-COOLING SYSTEM

- *Smart Cooling*™ provides condenser pre-cooling, cools down intake air by using new generation technologies.
- *Smart Cooling*™ reduces gas pressure within the chiller circuit, minimizes compressor load, increases COP and reduces electricity consumption.
- *Smart Cooling*™ protects condensers from rust, dust, direct sunlight and calcium and mineral deposit (limescale).
- Our new generation intelligent controller analyses chiller load, gas pressure, air temperature, air humidity and fan algorithm.
- Four-step water treatment: No mineral deposit on condensers and pipes.
- *Smart Cooling*™ is a modular system and can be easily installed in all chiller models and manufacturers.
- Unique technology ensures minimum water consumption and maximum evaporation efficiency.



Chiller



Smart Cooling™
system



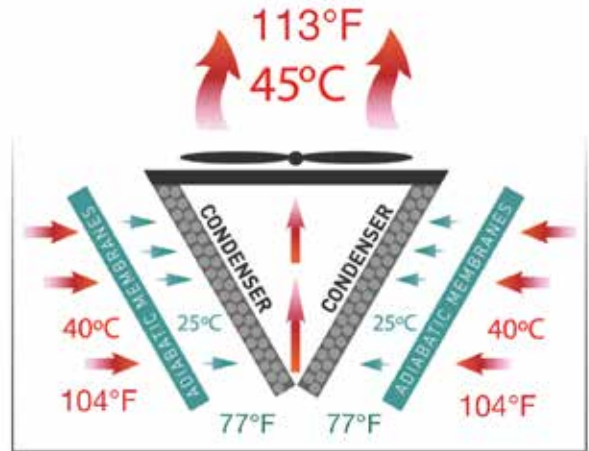
Chiller + *Smart Cooling*™ =
increased efficiency



HOW DOES IT WORK?

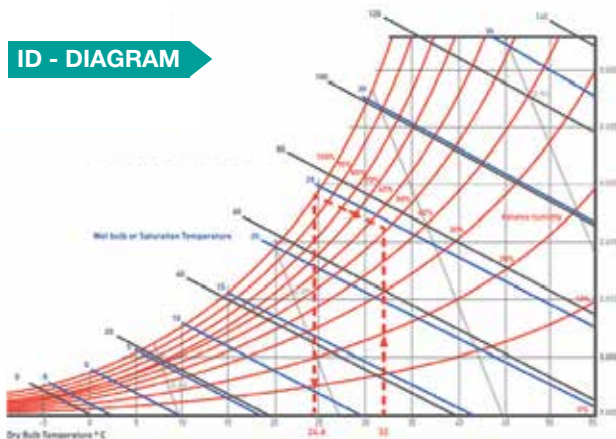
SMART COOLING™ TECHNOLOGY

Chiller booster Smart Cooling™ combines an adiabatic evaporative pre-cooling process and condenser protection with mechanical air filtration. The intelligent Smart Cooling™ adiabatic system is mounted externally in front of the condensers of the cooling equipment. Smart Cooling™ initiates the adiabatic process even before the mechanical cooling kicks in and the equipment receives a temperature-reducing fine mist of processed water that reduces the temperature of condensation within the cooling circuit.



Smart Cooling™ adiabatic membranes

ID - DIAGRAM



“Higher chiller efficiency with lower electricity consumption. The new generation in adiabatic pre-cooling”

30XA FLOODED COOLER PACKAGED AIR-COOLED CHILLER RATINGS TABLE – SI (cond)

LCWT (C)	30XA UNIT SIZE	CONDENSER INTAKE AIR TEMPERATURE (°F)											
		30 / 86°F			35 / 95°F			40 / 104°F			45 / 113°F		
		Cap. kW	Input Power (kW)	Cooler Flow Rate (l/s)	Cap. kW	Input Power (kW)	Cooler Flow Rate (l/s)	Cap. kW	Input Power (kW)	Cooler Flow Rate (l/s)	Cap. kW	Input Power (kW)	Cooler Flow Rate (l/s)
8	080	292.4	88.2	12.6	276.8	93.8	11.0	260.7	99.9	11.2	244.0	106.5	10.5
	090	322.1	90.1	13.8	310.0	97.2	13.3	297.4	105.1	12.8	284.0	113.7	12.2
	100	357.7	102.0	15.4	344.2	110.8	14.8	329.8	120.4	14.2	314.2	130.7	13.5
	110	388.6	112.1	16.7	373.4	121.7	16.0	357.4	132.6	15.4	340.6	144.6	14.6
	120	420.3	122.6	18.1	403.2	133.0	17.3	385.5	145.0	16.6	367.4	158.8	15.8
	140	503.0	138.9	21.6	485.5	151.2	20.9	467.0	164.6	20.1	447.3	179.1	19.2
	160	577.4	162.8	24.8	556.6	176.7	23.9	534.5	192.2	23.0	511.3	209.7	22.0
	180	647.1	179.8	27.8	625.5	195.4	26.9	602.8	212.4	25.9	579.0	230.7	24.9
	200	732.9	204.8	31.5	708.1	221.7	30.4	681.5	240.5	29.3	652.6	261.5	28.0
	220	795.9	228.3	34.2	769.2	246.9	33.1	740.7	267.7	31.8	709.9	291.0	30.5
	240	856.4	254.6	36.8	825.9	275.4	35.5	793.6	298.5	34.1	743.9	307.7	32.0
	260	947.3	285.5	40.7	915.4	288.2	39.3	882.2	313.2	37.9	846.5	341.1	36.4
	280	1012.0	286.1	43.5	977.0	310.3	42.0	940.3	337.3	40.4	901.8	366.9	38.7
	300	1081.5	311.6	46.5	1043.7	337.2	44.8	1003.8	365.6	43.1	947.2	380.2	40.7
	325	1161.2	326.2	49.9	1120.3	355.0	48.1	1078.0	386.8	46.3	1033.0	421.7	44.4
	350	1222.4	356.2	52.5	1179.2	386.9	50.7	1134.3	420.8	48.7	1057.5	444.6	45.4
	400	1442.9	427.5	62.0	1392.0	464.3	59.8	1338.2	505.0	57.5	1222.8	514.2	52.5
	450	1804.2	483.8	68.9	1547.4	526.4	66.5	1473.7	566.4	63.3	1238.9	524.6	52.8
	500	1716.1	527.6	73.7	1654.9	572.2	71.1	1568.1	611.8	67.4	1297.6	550.1	55.3

MAJOR ADVANTAGES

- 1 Reduces chiller electricity consumption by up to 37%
- 2 Increases chiller cooling capacity by up to 41%
- 3 Protects chiller condensers and compressors
- 4 Increases the service life of all chillers
- 5 Minimal water consumption
- 6 Return on investment of 5 to 24 months



Smart Cooling™ in action.

With the intelligent adiabatic pre-cooling system chillers can work in extreme conditions, delivering high efficiency with minimal water consumption.

INTELLIGENT CONDENSER PROTECTION



**CONDENSERS FREE
OF MINERAL DEPOSIT**



**WATER CLEAR OF
LEGIONELLA**



**CONDENSERS 100%
PROTECTED**

Chiller protection is one of the greatest advantages of *Smart Cooling*™.

Smart Cooling™ ensures full condenser protection from calcium and mineral deposit formation (limescale), rust and direct sunlight.

Smart Cooling™ protects condensers and compressors from overheating.

Smart Cooling™ allows the cooling equipment to operate in extreme environments, where ambient air temperatures can reach up to **55°C / 131°F**.

Smart Cooling™ provides the highest efficiency and reduces load on compressors.

Smart Cooling™ ensures the fastest investment return in the industry.

SMART COOLING™ COMPONENTS



1

CHILLER BOOSTER PRO 10 UNIT

The high-pressure chiller booster pro 10 - UV unit provides 70–140 bar (PSI 1015.26 – 2030.53) pressure to the *Smart Cooling*™ system. The pump station houses a specially developed high-pressure pump, valves, ultraviolet lamps and automated operations electronics. Ultraviolet lamps purify and sterilize the water to safeguard against bacteria such as harmful Legionella.



2

HIGH PRESSURE MISTING NOZZLE PANEL

Panels with misting nozzles are mounted externally in front of the condenser. The micro nozzles create a mist wall sprayed in front of the condenser. When water comes into contact with hot air it evaporates instantly (or promptly after settling on the membrane). Water evaporation lowers the temperature of the intake air flowing into the condenser. The cooled air is then fed into the condenser with the cooling fan.



3

CONDENSER PROTECTING MEMBRANE

The membrane (pre-filter) protects the condenser from calcium and mineral (limescale) deposits. The membrane prevents the water mist from coming into direct contact with the condenser. The self-cleaning membrane captures water mist, direct sunlight and dirt. The membrane's special cell material does not create additional resistance to airflow into the condenser.



6

WATER TREATMENT SYSTEM

The water recirculation module ensures 100% of water usage and recirculation.

The recirculation unit accumulates non-evaporated water, re-filters it and returns the water back into the adiabatic system.



4

WATER TREATMENT SYSTEM

This *Smart Cooling*™ component provides four stages of water purification: calcium carbonate and mineral elimination; protection against algae and bacteria including Legionella; fine water treatment of up to five microns. The water purification module ensures pipes and other components are protected from limescale formation and deposit.



NEW

PRO 1

5

PRO 1 CONTROL UNIT INTELLIGENT ADIABATIC SYSTEM PROCESSOR

PRO 1's seven settings of operation enable the system to use water efficiently in varied air and chiller load parameters. The software adapts operating modes to all climatic zones. PRO 1 analyzes chiller load, external air temperature and humidity levels. PRO 1 can process data and activate the adiabatic system to maximize efficiency. The processor controls the operation of the adiabatic system, such as the precise amount of water needed at each stage.



NO CALCIUM AND MINERAL DEPOSIT (LIMESCALE) BUILD-UP IN THE CONDENSER

Water is treated with uniquely developed biochemicals before entering the intelligent adiabatic evaporative Smart Cooling™ pre-cooling system, changing the structure of calcium carbonate molecules and preventing them from adhering to surfaces and depositing as harmful limescale.



WATER MIST FREE OF LEGIONELLA

Smart Cooling™ is equipped with ultraviolet sterilizers that eliminate all bacteria in the water passing through the system, including Legionella.



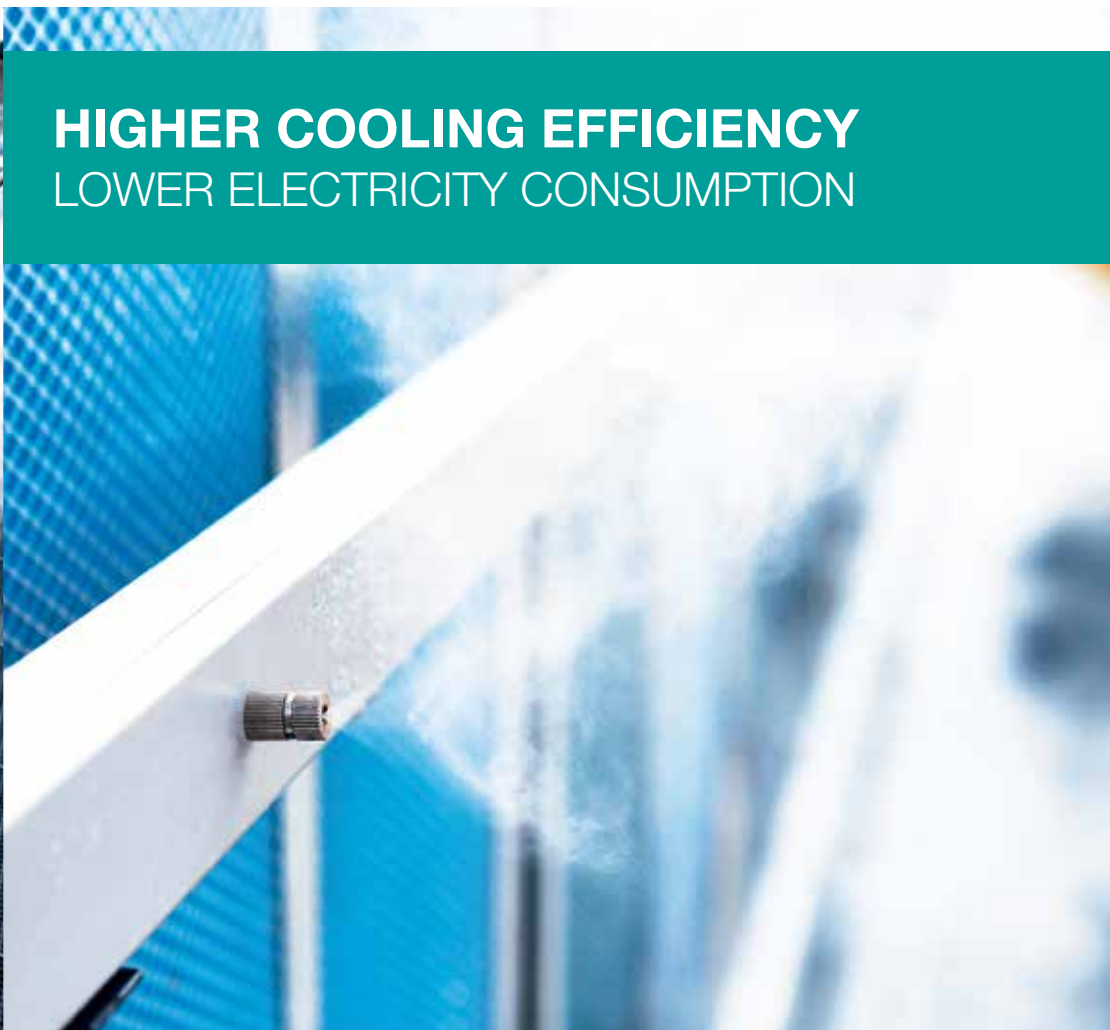
100% CONDENSER PROTECTION

Protecting the condensers from deposits, dirt and direct sunlight is essential for your cooling system. **Smart Cooling™** protective membranes safeguard your condensers with great efficacy. The cleaner the condenser of your cooling equipment, the better heat exchange and removal processes take place. **Smart Cooling™** protective membranes ensure greater longevity and higher efficiency, while the adiabatic panels guarantee air pre-cooling and prevent your equipment from overheating. **Smart Cooling™** means unmatched levels of protection offered by no other adiabatic.



FAN PRESSURE DROP OF ONLY 1% TO 3%

Smart Cooling™ does not reduce airflow and does not increase resistance. Extensive measurement shows fan pressure drops of less than 3%. With cleaner heat-emission radiators, **Smart Cooling™** provides low exit temperatures and reduced pressure in the whole system. The frequency of maintenance service drops considerably, and constant emergency calls become a thing of the past. With **Smart Cooling™**, your cooling equipment will cost less to run and maintain in addition to the boost in safety and durability.



HIGHER COOLING EFFICIENCY LOWER ELECTRICITY CONSUMPTION



EASY TO SET-UP MODULAR SYSTEM

Smart Cooling™ comes as an assembly kit and can be installed on both new and running cooling equipment of any make and model.

Smart Cooling™ is mounted externally in front of the condensers of the cooling equipment without any impact or alterations to the interior of the equipment and no effect on manufacturers' warranties.



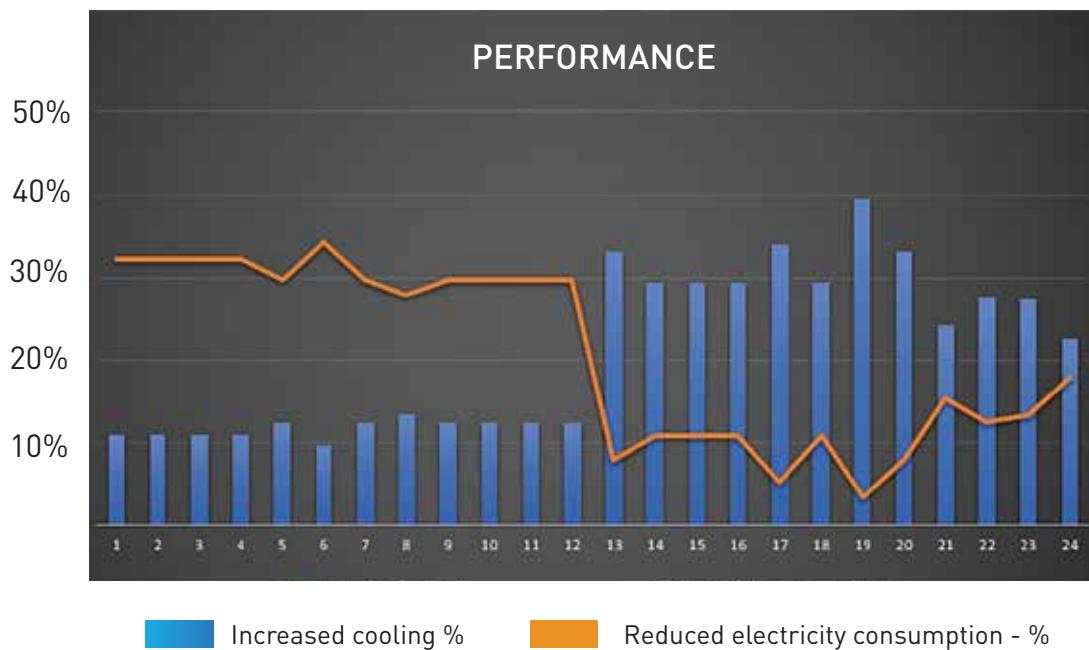
INCREASED EQUIPMENT SERVICE LIFE

In addition to air-cooling, *Smart Cooling*™ decreases the basic pressure within the compressor.

This increases the service life of the compressor.

Smart Cooling™ considerably curtails damaging high discharge pressure and cooling cycle temperatures so the mechanical stress of the system is remarkably lower. Your cooling equipment will require less maintenance and operate more safely.

SMART INNOVATION IN ADIABATIC PRE-COOLING



“Increases chiller performance and reduces electricity consumption”

Using a precision simulation program, we have accurately determined the expected results for every chiller model. Thanks to *Smart Cooling*™ high-precision calculations and hybrid cooling technology, chillers provide the highest Energy Efficiency Ratio and Coefficient of Performance ratings, significantly reducing electricity consumption and costs.



The *Smart Cooling*™ kit suits chiller retrofit and new chillers. Each kit fits all models of air-cooled chillers and condensers.



INTELLIGENT • PROVEN • SAFE

A world map showing the global distribution of Sphagnum species. The map is in grayscale, with landmasses in a darker shade and oceans in a lighter shade. There are 12 green location markers, each containing a white letter 'S', distributed across the continents: one in North America (USA), one in South America (Brazil), one in Africa (North Africa), one in Africa (South Africa), one in Europe (Ireland), one in Europe (UK), one in Europe (Scandinavia), one in Europe (Central Europe), one in Europe (Russia), one in Asia (Russia), one in Australia (southeast), and one in Oceania (New Zealand).

WWW.SMARTCOOLING.US

RECOGNITIONS AND AWARDS



The adiabatic Smart Cooling™ system can be installed on all condensers of all major manufacturers:



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