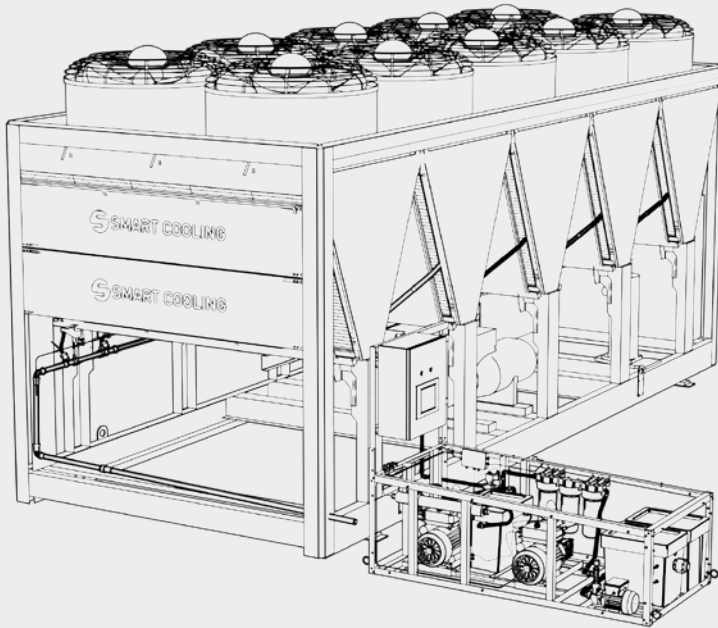


13 July 2021

# TEST REPORT 156



**SMART COOLING™** PRO10 SYSTEM

# DU Al Qudra

Test Participants:

Project name: **DU AL QUDRA** Location: **Dubai, UAE**

Condor Building Contracting Engineer: **Sanal Kumar**

Gerab Energy Engineer: **Ali Soufan**

Swiss Integrated Energy Technologies: **Armands Mucenieks**

## Table of Contents

Introduction: .....	3
Main components: .....	4
Measuring instruments: .....	5
Testing procedures .....	6
Testing results: .....	8
Testing Summary: .....	9
Review Of Air Entering Condenser Coils .....	9
Conclusion: .....	10
Annex: .....	12

## Introduction:

**Type of structure:** DU Al Qudra Broadcasting Center, Dubai, United Arab Emirates

**Cooling units:** Air cooled water chiller **McQuay ATS 160 x3** and **DAIKIN EWAD660 x1**

**Chiller booster:** *Smart Cooling™ PRO 10*, adiabatic technology with condenser protection.

Chillers were retrofitted with the **intelligent adiabatic *Smart Cooling™*** system to **reduce their electricity consumption** and **increase COP (Coefficient of Performance) efficiency**.

The intelligent adiabatic *Smart Cooling™* system combines an **adiabatic evaporative pre-cooling process** and **condenser protection with mechanical air filtration**. The intelligent adiabatic *Smart Cooling™* 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 within the cooling circuit.

**Smart Cooling™ ensures 100% condenser protection from direct contact with water.**

## Main components:

*Smart Cooling*™ comprises the following key components: protective membranes, water treatment and recirculation systems, high-pressure water pump, control unit, high-pressure nozzle panels, fasteners, and fixings.

- **Protective membranes** cover the condenser surface, preventing direct water contact.
- **Water system** purifies and sterilizes water to prevent mineral buildup and bacteria.
- **Pump** provides 70 bar pressure.
- **Control unit** regulates operation via real-time data (temperature, humidity, chiller parameters).
- **Nozzles** spray 5–40 µm droplets.
- A set of **fasteners and fixings** ensure the compatibility of the equipment with the chiller.



## Measuring instruments:

An *Enscope Analytics energy monitoring equipment* (BEST) was used to measure electricity consumption



*Chiller with Smart Cooling™ system*



*Chiller without Smart Cooling™ system*

- **Equipment tested:** Air-cooled water chillers.



## Testing procedures

Testing has been carried out on the following chillers:

- Chiller 1 **McQuay ATS 160**
- Chiller 2 **McQuay ATS 160**
- Chiller 3 **McQuay ATS 160**
- Chiller 4 **DAIKIN EWAD660**

Testing period: 06/07/2021 to 06/14/2021 – adiabatic system *Smart Cooling™* switched **OFF**

Testing period: 06/21/2021 to 06/28/2021 – adiabatic system *Smart Cooling™* switched **ON**

### Enscope:



- **Step 1**

A data logger is installed on the subject *HVAC equipment* to collect all applicable real-time energy consumption and unit performance information. Data is collected by using an *Enscope Analytics temperature sensor*.

- **Step 2**

*Smart Cooling™* system is switched **OFF**

- **Step 3**

During the period between 06/07/2021 and 06/14/2021, the test measured electricity usage data by the chillers with the intelligent adiabatic *Smart Cooling™* system in operation.

During this period, the chiller consumed **44.520 MW/h** of electricity, while water consumption was 0 m<sup>3</sup>, and the average temperature during the period was **35° C**.

- **Step 4**

*Smart Cooling™* system is switched **ON**

- **Step 5**

During the period between *06/21/2021* and *06/28/202*, the test measured electricity usage data by chillers with the intelligent adiabatic *Smart Cooling™* system turned **ON**

During this period, the chiller consumed **38.889 MW/h** of electricity, while water consumption was **40 m³** and the average temperature during the period was **38° C**.

**Temperature Sensors:**

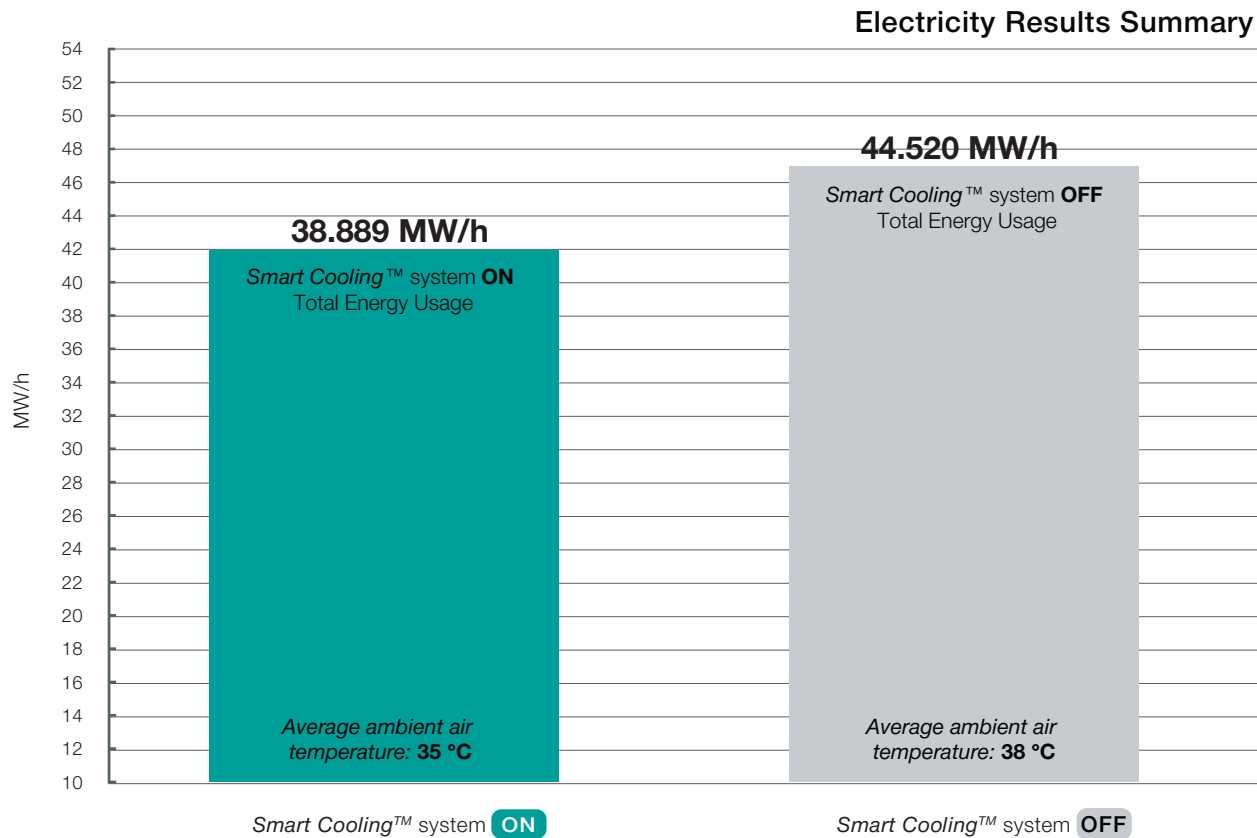


*Condenser Air Inflow Sensor*



*Ambient Condition Sensor*

## Testing Results



Post-analysis of data monitoring shows the electricity savings generated by the *Smart Cooling™* system in 8 operation days is **5.63 MW/h** of electricity.

Within these 10 days, the customer **saved 5631 kW/h of electricity**.

At an electricity rate of **AED 0.45 per kW/h**, the total savings amount to **AED 2,534**.

To achieve this result, **54 m³ of water were used**, with water expenses of AED 10 per m³.

In total, **AED 400** were spent on water.



## Testing Results

Smart Cooling™ Test Report: Al Baywa Greenhouse, Alain, UAE				Electrical Consumption	
Status of Smart Cooling™	ON		OFF		15%
Test Duration	7 Days		7 Days		
	From	To	From	To	
	15.06.2021	21.06.2021	23.06.2021	29.06.2021	
Average Ambient Temperature	42 °C		41 °C		
Total Electrical Consumption	257,155 kW/h		295,236 kW/h		
Average Electrical Consumption Per Hour	1,531 kW/h		1,757 kW/h		
Total Water Consumption	280.0 m³		0.0 m³		

### Chiller Operation During The Test:

*\*During the test, a single chiller was mostly in operation. Thus, the ROI Calculation is based on the Daikin EWAD660MZP chiller, as it is the unit with the highest operational hours during the test period (117 hours out of 192 hours).*

Chillers Operating	Hours
1 Chiller out of 4	153 Hours
2 Chillers out of 4	17 Hours
3 Chillers out of 4	22 Hours
4 Chillers out of 4	0 Hours
Test Duration (8 Days)	192 Hours

### ROI:

	kW/h	AED	Summary
Actual Chiller savings in 8 Days	5,631 kW/h	0.45	2,534
	m³	AED	Summary
Actual water consumption in 8 Days	40 m³	10	400
	kW/h	AED	Summary
Projected Chillers savings per season (240 days)	168,941	0.45	76,023
	m³	AED	Summary
Projected water consumption per season (240 days)	1,200 m³	10	12,000
	QTY	AED	Total
Maintenance per year	1	6,460	6,460

- Net savings after all running costs for 1 Chillers: **AED 57,563**
- Cost of 1 adiabatic Smart Cooling™ delivered & installed: **AED 100,371**
- ROI Period (in calendar years, after all running costs for 1 Chillers): **1.74 year**
- Reduction of CO2 Emissions for 1 Chillers: **71 Ton**

*\*Note: For more details about test please refer to the supported document (Excel file).*

## Review Of Air Entering Condenser Coils

Temperature Sensor recording the temperature entering Condensers was installed on chiller Number 3

DATE	AMBIENT CONDITION		TEMPERATURE ENTERING CONDENSERS	CHILLER 3 RUNNING STATUS	SMART COOLING STATUS	TEMPERATURE DROP
	T °C	H %				
Monday - 21/06/2021 00:00	33.1	14.1	31.3	OFF	OFF	
Monday - 21/06/2021 01:00	33.4	14.9	31.3	OFF	OFF	
Monday - 21/06/2021 02:00	32.4	25.8	30.9	OFF	OFF	
Monday - 21/06/2021 03:00	30.7	28.6	28.8	OFF	OFF	
Monday - 21/06/2021 04:00	30.8	34.8	28.8	OFF	OFF	
Monday - 21/06/2021 05:00	30.7	33.7	28.8	OFF	OFF	
Monday - 21/06/2021 06:00	30.8	23.0	28.8	OFF	OFF	
Monday - 21/06/2021 07:00	34.3	16.2	30.9	OFF	OFF	
Monday - 21/06/2021 08:00	37.9	25.4	37.3	OFF	OFF	
Monday - 21/06/2021 09:00	40.4	24.8	40.0	OFF	OFF	
Monday - 21/06/2021 10:00	43.4	21.5	27.7	ON	ON	16
Monday - 21/06/2021 11:00	45.9	17.8	40.4	OFF	OFF	
Monday - 21/06/2021 12:00	47.3	15.5	47.1	OFF	OFF	
Monday - 21/06/2021 13:00	47.9	13.8	48.0	OFF	OFF	
Monday - 21/06/2021 14:00	47.9	13.0	48.4	OFF	OFF	
Monday - 21/06/2021 15:00	47.6	19.1	48.1	OFF	OFF	
Monday - 21/06/2021 16:00	45.3	23.7	33.2	ON	ON	12
Monday - 21/06/2021 17:00	43.9	26.1	27.3	ON	ON	17
Monday - 21/06/2021 18:00	40.6	32.9	26.8	ON	ON	14
Monday - 21/06/2021 19:00	40.4	29.4	25.7	ON	ON	15
Monday - 21/06/2021 20:00	37.6	42.4	25.9	ON	ON	12
Monday - 21/06/2021 21:00	36.1	46.8	27.1	ON	ON	9
Monday - 21/06/2021 22:00	34.4	51.1	29.0	OFF	OFF	
Monday - 21/06/2021 23:00	33.3	59.7	30.0	OFF	OFF	
Tuesday - 22/06/2021 00:00	32.5	65.2	32.3	OFF	OFF	
Tuesday - 22/06/2021 01:00	31.2	67.9	30.0	OFF	OFF	
Tuesday - 22/06/2021 02:00	30.2	65.5	29.5	OFF	OFF	
Tuesday - 22/06/2021 03:00	29.6	66.0	29.2	OFF	OFF	
Tuesday - 22/06/2021 04:00	29.1	70.3	28.6	OFF	OFF	
Tuesday - 22/06/2021 05:00	28.1	68.9	26.8	OFF	OFF	
Tuesday - 22/06/2021 06:00	30.0	44.2	26.8	OFF	OFF	
Tuesday - 22/06/2021 07:00	34.0	29.4	30.9	OFF	OFF	
Tuesday - 22/06/2021 08:00	38.5	24.7	36.4	OFF	OFF	
Tuesday - 22/06/2021 09:00	40.7	23.0	40.6	OFF	OFF	
Tuesday - 22/06/2021 10:00	42.9	20.0	43.6	OFF	OFF	
Tuesday - 22/06/2021 11:00	44.8	18.2	46.0	OFF	OFF	
Tuesday - 22/06/2021 12:00	47.3	15.2	48.1	OFF	OFF	
Tuesday - 22/06/2021 13:00	48.2	13.5	48.5	OFF	OFF	
Tuesday - 22/06/2021 14:00	47.0	23.2	46.6	OFF	OFF	
Tuesday - 22/06/2021 15:00	45.3	30.2	32.1	ON	ON	13
Tuesday - 22/06/2021 16:00	43.3	34.1	29.0	ON	ON	14
Tuesday - 22/06/2021 17:00	43.7	28.2	27.0	ON	ON	17
Tuesday - 22/06/2021 18:00	41.7	23.4	28.2	OFF	OFF	
Tuesday - 22/06/2021 19:00	40.7	22.9	23.5	ON	ON	17
Tuesday - 22/06/2021 20:00	39.7	22.5	24.7	OFF	OFF	
Tuesday - 22/06/2021 21:00	38.9	23.1	36.0	OFF	OFF	

Tuesday - 22/06/2021 22:00	37.7	25.8	35.3	OFF	OFF	
Tuesday - 22/06/2021 23:00	36.3	34.8	34.0	OFF	OFF	
Wednesday - 23/06/2021 00:00	35.9	42.9	28.2	ON	ON	8
Wednesday - 23/06/2021 01:00	34.7	47.0	26.2	ON	ON	8
Wednesday - 23/06/2021 02:00	33.7	51.1	26.0	ON	ON	8
Wednesday - 23/06/2021 03:00	33.2	49.5	25.2	ON	ON	8
Wednesday - 23/06/2021 04:00	33.0	42.1	24.1	ON	ON	9
Wednesday - 23/06/2021 05:00	31.8	41.4	23.0	ON	ON	9
Wednesday - 23/06/2021 06:00	31.8	37.3	22.5	ON	ON	9
Wednesday - 23/06/2021 07:00	34.4	33.2	23.2	ON	ON	11
Wednesday - 23/06/2021 08:00	39.2	22.5	26.7	ON	ON	12
Wednesday - 23/06/2021 09:00	41.5	19.3	27.6	ON	ON	14
Wednesday - 23/06/2021 10:00	43.4	17.5	24.1	ON	ON	19
Wednesday - 23/06/2021 11:00	45.8	15.4	24.9	ON	ON	21
Wednesday - 23/06/2021 12:00	47.0	14.7	23.7	ON	ON	23
Wednesday - 23/06/2021 13:00	47.3	13.9	23.7	ON	ON	24
Wednesday - 23/06/2021 14:00	48.0	12.8	23.4	ON	ON	25
Wednesday - 23/06/2021 15:00	48.5	14.9	22.7	ON	ON	26
Wednesday - 23/06/2021 16:00	48.5	19.2	26.5	ON	ON	22
Wednesday - 23/06/2021 17:00	45.5	19.4	26.2	ON	ON	19
Wednesday - 23/06/2021 18:00	45.1	19.0	25.6	ON	ON	20
Wednesday - 23/06/2021 19:00	42.1	19.4	34.5	OFF	OFF	
Wednesday - 23/06/2021 20:00	40.5	21.1	25.5	ON	ON	15
Wednesday - 23/06/2021 21:00	39.3	22.6	23.3	ON	ON	16
Wednesday - 23/06/2021 22:00	37.8	23.2	24.3	OFF	OFF	
Wednesday - 23/06/2021 23:00	36.1	24.8	29.9	OFF	OFF	
Thursday - 24/06/2021 00:00	34.9	25.5	33.2	OFF	OFF	
Thursday - 24/06/2021 01:00	33.8	27.2	21.1	ON	ON	13
Thursday - 24/06/2021 02:00	33.0	28.0	21.8	ON	ON	11
Thursday - 24/06/2021 03:00	31.6	29.2	20.7	ON	ON	11
Thursday - 24/06/2021 04:00	31.1	30.5	20.3	ON	ON	11
Thursday - 24/06/2021 05:00	30.6	31.7	20.6	ON	ON	10
Thursday - 24/06/2021 06:00	31.4	30.6	20.8	ON	ON	11
Thursday - 24/06/2021 07:00	34.7	27.0	21.2	ON	ON	13
Thursday - 24/06/2021 08:00	40.0	22.5	29.0	ON	ON	11
Thursday - 24/06/2021 09:00	42.3	19.0	29.3	ON	ON	13
Thursday - 24/06/2021 10:00	43.9	17.5	28.9	ON	ON	15
Thursday - 24/06/2021 11:00	45.4	15.0	26.1	ON	ON	19
Thursday - 24/06/2021 12:00	46.7	14.2	23.6	ON	ON	23
Thursday - 24/06/2021 13:00	48.2	12.2	23.3	ON	ON	25
Thursday - 24/06/2021 14:00	48.7	15.5	23.0	ON	ON	26
Thursday - 24/06/2021 15:00	47.1	21.2	27.5	ON	ON	20
Thursday - 24/06/2021 16:00	45.7	28.7	28.4	ON	ON	17
Thursday - 24/06/2021 17:00	41.1	37.0	28.1	ON	ON	13
Thursday - 24/06/2021 18:00	40.7	33.1	26.6	ON	ON	14
Thursday - 24/06/2021 19:00	38.7	34.5	27.8	OFF	OFF	
Thursday - 24/06/2021 20:00	38.1	34.5	25.6	ON	ON	13
Thursday - 24/06/2021 21:00	36.4	38.6	25.8	ON	ON	11
Thursday - 24/06/2021 22:00	34.8	40.6	27.3	OFF	OFF	
Thursday - 24/06/2021 23:00	33.5	43.3	24.8	ON	ON	9
Friday - 25/06/2021 00:00	32.3	45.3	25.5	OFF	OFF	
Friday - 25/06/2021 01:00	31.9	45.4	25.1	OFF	OFF	
Friday - 25/06/2021 02:00	31.5	47.4	26.8	OFF	OFF	
Friday - 25/06/2021 03:00	31.1	49.7	28.6	OFF	OFF	
Friday - 25/06/2021 04:00	30.7	50.0	28.3	OFF	OFF	

Friday - 25/06/2021 05:00	30.9	41.6	28.2	OFF	OFF	
Friday - 25/06/2021 06:00	31.8	32.3	28.4	OFF	OFF	
Friday - 25/06/2021 07:00	34.5	28.4	32.1	OFF	OFF	
Friday - 25/06/2021 08:00	38.1	26.2	36.0	OFF	OFF	
Friday - 25/06/2021 09:00	40.7	22.5	40.0	OFF	OFF	
Friday - 25/06/2021 10:00	42.8	19.3	42.6	OFF	OFF	
Friday - 25/06/2021 11:00	44.9	15.9	35.8	ON	ON	9
Friday - 25/06/2021 12:00	47.0	12.9	25.8	ON	ON	21
Friday - 25/06/2021 13:00	48.2	12.2	47.8	OFF	OFF	
Friday - 25/06/2021 14:00	45.8	24.4	46.2	OFF	OFF	
Friday - 25/06/2021 15:00	44.4	27.5	45.0	OFF	OFF	
Friday - 25/06/2021 16:00	43.2	27.8	44.3	OFF	OFF	
Friday - 25/06/2021 17:00	41.3	33.8	41.6	OFF	OFF	
Friday - 25/06/2021 18:00	39.1	43.9	38.1	OFF	OFF	
Friday - 25/06/2021 19:00	35.5	55.4	34.4	OFF	OFF	
Friday - 25/06/2021 20:00	34.4	58.6	33.6	OFF	OFF	
Friday - 25/06/2021 21:00	33.4	61.4	32.0	OFF	OFF	
Friday - 25/06/2021 22:00	32.0	62.4	31.0	OFF	OFF	
Friday - 25/06/2021 23:00	31.3	64.4	30.0	OFF	OFF	
Saturday - 26/06/2021 00:00	29.9	65.4	28.5	OFF	OFF	
Saturday - 26/06/2021 01:00	29.2	65.6	28.2	OFF	OFF	
Saturday - 26/06/2021 02:00	28.5	65.4	27.2	OFF	OFF	
Saturday - 26/06/2021 03:00	27.5	66.2	26.4	OFF	OFF	
Saturday - 26/06/2021 04:00	27.4	64.7	26.4	OFF	OFF	
Saturday - 26/06/2021 05:00	27.3	62.3	26.0	OFF	OFF	
Saturday - 26/06/2021 06:00	29.1	43.6	26.7	OFF	OFF	
Saturday - 26/06/2021 07:00	33.6	28.1	30.1	OFF	OFF	
Saturday - 26/06/2021 08:00	37.4	23.9	36.2	OFF	OFF	
Saturday - 26/06/2021 09:00	40.1	22.6	39.7	OFF	OFF	
Saturday - 26/06/2021 10:00	42.1	21.7	42.6	OFF	OFF	
Saturday - 26/06/2021 11:00	44.2	19.0	44.8	OFF	OFF	
Saturday - 26/06/2021 12:00	45.6	16.7	46.1	OFF	OFF	
Saturday - 26/06/2021 13:00	46.7	15.5	47.1	OFF	OFF	
Saturday - 26/06/2021 14:00	46.4	16.2	47.5	OFF	OFF	
Saturday - 26/06/2021 15:00	45.5	14.4	46.9	OFF	OFF	
Saturday - 26/06/2021 16:00	44.4	17.6	45.2	OFF	OFF	
Saturday - 26/06/2021 17:00	42.9	19.2	43.3	OFF	OFF	
Saturday - 26/06/2021 18:00	41.1	22.6	40.4	OFF	OFF	
Saturday - 26/06/2021 19:00	38.2	30.4	36.9	OFF	OFF	
Saturday - 26/06/2021 20:00	36.3	32.1	34.9	OFF	OFF	
Saturday - 26/06/2021 21:00	34.6	31.1	33.4	OFF	OFF	
Saturday - 26/06/2021 22:00	33.6	29.7	32.4	OFF	OFF	
Saturday - 26/06/2021 23:00	32.5	27.3	31.0	OFF	OFF	
Sunday - 27/06/2021 00:00	31.5	26.1	30.4	OFF	OFF	
Sunday - 27/06/2021 01:00	31.9	24.2	30.8	OFF	OFF	
Sunday - 27/06/2021 02:00	31.9	23.1	31.1	OFF	OFF	
Sunday - 27/06/2021 03:00	31.5	25.9	30.5	OFF	OFF	
Sunday - 27/06/2021 04:00	32.6	28.5	31.4	OFF	OFF	
Sunday - 27/06/2021 05:00	33.7	28.2	32.8	OFF	OFF	
Sunday - 27/06/2021 06:00	33.9	31.8	33.6	OFF	OFF	
Sunday - 27/06/2021 07:00	34.9	33.5	34.3	OFF	OFF	
Sunday - 27/06/2021 08:00	36.7	31.8	36.3	OFF	OFF	
Sunday - 27/06/2021 09:00	38.9	28.9	38.9	OFF	OFF	
Sunday - 27/06/2021 10:00	40.8	25.3	41.2	OFF	OFF	
Sunday - 27/06/2021 11:00	43.0	22.0	43.7	OFF	OFF	

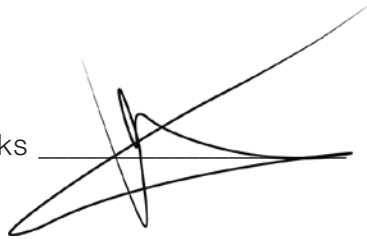
Sunday - 27/06/2021 12:00	44.6	20.0	45.5	OFF	OFF	
Sunday - 27/06/2021 13:00	45.7	18.2	46.2	OFF	OFF	
Sunday - 27/06/2021 14:00	45.9	17.2	47.0	OFF	OFF	
Sunday - 27/06/2021 15:00	46.0	17.1	47.1	OFF	OFF	
Sunday - 27/06/2021 16:00	45.0	17.4	46.8	OFF	OFF	
Sunday - 27/06/2021 17:00	43.9	17.9	44.1	OFF	OFF	
Sunday - 27/06/2021 18:00	42.4	17.8	42.4	OFF	OFF	
Sunday - 27/06/2021 19:00	40.2	18.4	39.1	OFF	OFF	
Sunday - 27/06/2021 20:00	37.6	21.7	36.7	OFF	OFF	
Sunday - 27/06/2021 21:00	35.8	24.0	34.7	OFF	OFF	
Sunday - 27/06/2021 22:00	34.5	25.9	33.8	OFF	OFF	
Sunday - 27/06/2021 23:00	34.8	28.3	33.8	OFF	OFF	
Monday - 28/06/2021 00:00	34.9	25.0	34.2	OFF	OFF	
Monday - 28/06/2021 01:00	33.4	26.6	32.3	OFF	OFF	
Monday - 28/06/2021 02:00	32.3	28.2	31.6	OFF	OFF	
Monday - 28/06/2021 03:00	31.7	29.9	31.0	OFF	OFF	
Monday - 28/06/2021 04:00	31.9	33.8	30.9	OFF	OFF	
Monday - 28/06/2021 05:00	32.4	40.5	32.1	OFF	OFF	
Monday - 28/06/2021 06:00	32.2	46.5	32.0	OFF	OFF	
Monday - 28/06/2021 07:00	32.8	46.6	32.5	OFF	OFF	
Monday - 28/06/2021 08:00	34.2	43.5	33.8	OFF	OFF	
Monday - 28/06/2021 09:00	36.0	39.6	36.0	OFF	OFF	
Monday - 28/06/2021 10:00	38.0	36.1	38.5	OFF	OFF	
Monday - 28/06/2021 11:00	40.1	32.3	41.3	OFF	OFF	
Monday - 28/06/2021 12:00	42.6	28.4	42.9	OFF	OFF	
Monday - 28/06/2021 13:00	44.2	25.4	44.1	OFF	OFF	
Monday - 28/06/2021 14:00	44.6	23.5	45.3	OFF	OFF	
Monday - 28/06/2021 15:00	44.7	24.3	45.3	OFF	OFF	
Monday - 28/06/2021 16:00	43.2	32.9	43.4	OFF	OFF	
Monday - 28/06/2021 17:00	41.8	34.9	41.6	OFF	OFF	
Monday - 28/06/2021 18:00	40.1	36.4	38.8	OFF	OFF	
Monday - 28/06/2021 19:00	37.7	42.5	37.0	OFF	OFF	
Monday - 28/06/2021 20:00	36.8	42.2	36.2	OFF	OFF	
Monday - 28/06/2021 21:00	36.1	41.4	35.5	OFF	OFF	
Monday - 28/06/2021 22:00	35.1	43.7	34.4	OFF	OFF	
Monday - 28/06/2021 23:00	33.8	46.3	33.3	OFF	OFF	



## Conclusion:

Test results data shows that the intelligent adiabatic *Smart Cooling*<sup>™</sup> system decreased the chiller electricity consumption by **14.5%**, on average, during 24 operational hours.

Armands Mucenieks  
July 13, 2021



## Annex:



Riels instruments srl  
Viale Spagna, 16  
35020 Ponte San Nicolò (PD) - ITALY  
Ph. +39 0498961771 | info@riels.it



## RIF600 | Clamp-on Ultrasonic Meter Calibration Report

Pipe diameter	DN80	Date	15/12/2018
Ambient temperature	29°C	Model:	RIF600W
Standard Device before test	Normal		
Standard Device After Test	Normal		
Test result	Qualified		
Measured Medium	Water		
Accuracy	1%		
Signal Strength	UP: 90 DOWN: 90		
Standard device name	Static volumetric method/standard Meter Method Water Flow/Standard Device		
Standard device accuracy	0,20%		

Test	Standard Meter flow		Temperature	Pressure	Tested Meter Flow		Basic Error		Repeatability			
Point	m3/h		°C	Mpa	m3/h		%		%			
Point 1	101,52	101,47	25,0	0,300	102,27	102,10	0,739	0,759	-0,147	0,147		
	101,47		25,0	0,300	102,07		0,591					
	101,42		25,0	0,300	101,97		0,542					
Point 2	71,27	71,27	25,0	0,300	71,75	71,75	0,673		-0,146		0,147	
	71,19		25,0	0,300	71,65		0,646					
	71,34		25,0	0,300	71,86		0,729					
Point 3	26,32	26,36	25,0	0,300	26,51	26,55	0,722		-0,132			
	26,36		25,0	0,300	26,56		0,759					
	26,39		25,0	0,300	26,58		0,720					

Verification Based on JIG 1030-2007 < Ultrasonic flowmeter verification procedures >  
Scale Factor=1

Riels instruments srl | test Report

Pag. 1 di 2



Riels instruments srl  
Viale Spagna, 16  
35020 Ponte San Nicolò (PD) - ITALY  
Ph. +39 0498961771 | info@riels.it



## RIF600 | Test Report misuratore di portata ad ultrasuoni clamp on

Diametro tubazione DN80  
Temperatura ambiente 29°C  
Dispositivo standard prima del test Normale  
Dispositivo standard dop il test Normale  
Risultato del test Qualified  
Liquido Acqua  
Accuratezza 1%  
Potenza dei segnali UP: 90  
DOWN: 90

Date 15/12/2018

Model: RIF600W

Tipo di dispositivo standard Metodo volumetrico statico/Misuratore di portata volumetrico  
Accuratezza del dispositivo standa 0,20%

Test	Misuratore standard	Temperatura	Pressione	Misuratore testato	errore base	Ripetibilità
Punti	m3/h	°C	Mpa	m3/h	%	%
Punto 1	101,52	25,0	0,300	102,27	0,739	-0,147
	101,47	25,0	0,300	102,07	0,591	
	101,42	25,0	0,300	101,97	0,542	
Punto 2	71,27	25,0	0,300	71,75	0,673	-0,146
	71,19	25,0	0,300	71,65	0,646	
	71,34	25,0	0,300	71,86	0,729	
Punto 3	26,32	25,0	0,300	26,51	0,722	-0,132
	26,36	25,0	0,300	26,56	0,759	
	26,39	25,0	0,300	26,58	0,720	

Verification Based on JJG 1030-2007 < Ultrasonic flowmeter verification procedures >  
Scale Factor=1