

CHILLER DATA

Presented



Delta Electronics (Thailand) PCL.

SITE DETAIL

PROJECT NAME: Machine Data System

CUSTOMER: Delta Electronics (Thailand) PCL

LOCATION: 741 Soi E5, Moo 4, Bangpoo Industrial Estate, Tambon Prakasa, Amphur Muang-samutprakarn, Samutprakarn Province 10280 Thailand.

RESULT/OVERVIEW

*Detail

- 1. Detail Of Project
- 2. -
- 3. -
- 4. -
- 5. -
- 6. -
- 7. -
- 8. -
- 9. -
- 10. -

Note. (Checklist)

- 1.
- 2.
- 3.
- 4.
- 5.

SERVICE/CONTACT

MANAGER

SOPARK.K
MOBILE. 081 841 8624.
EMAIL.

ON SITE SERVICIE

KHOMKRIT.CH
MOBILE. 099 335 3353.
EMAIL.

PRESENTED BY

.....
(.....)
Date...../...../.....
C.N. INFINITE ENGINEERING CO LTD.

APPROVED BY

.....
(.....)
Date...../...../.....
DELTA ELECTRONICS (THAILAND) PCL.

Contents

	Page
1 Overview System Architecture	3
2 Drawing	4 - 6
2.1 Gateway Panel	4
2.2 Flow Water Sensor Panel – Condenser Supply	5
2.3 Flow Water Sensor Panel – Cooler Supply	6
3 Graphic Monitoring System	7 - 9
3.1 Real-time Data Monitoring & Control Manual Mode	7
3.2 Real-time Data Monitoring & Control Auto Mode	7
4 Reports Data Logging System	10 - 18
4.1 Login Reports	11
4.2 Chiller Performance Data Reports	14
4.3 Chiller Raw Data Reports	15
4.4 Chiller Flow Water Data Reports	16 - 17
4.5 Chiller Pressure Data Reports	18
5 Installation & Hardware Detail	19 - 35

Project Detail

Overview System Architecture

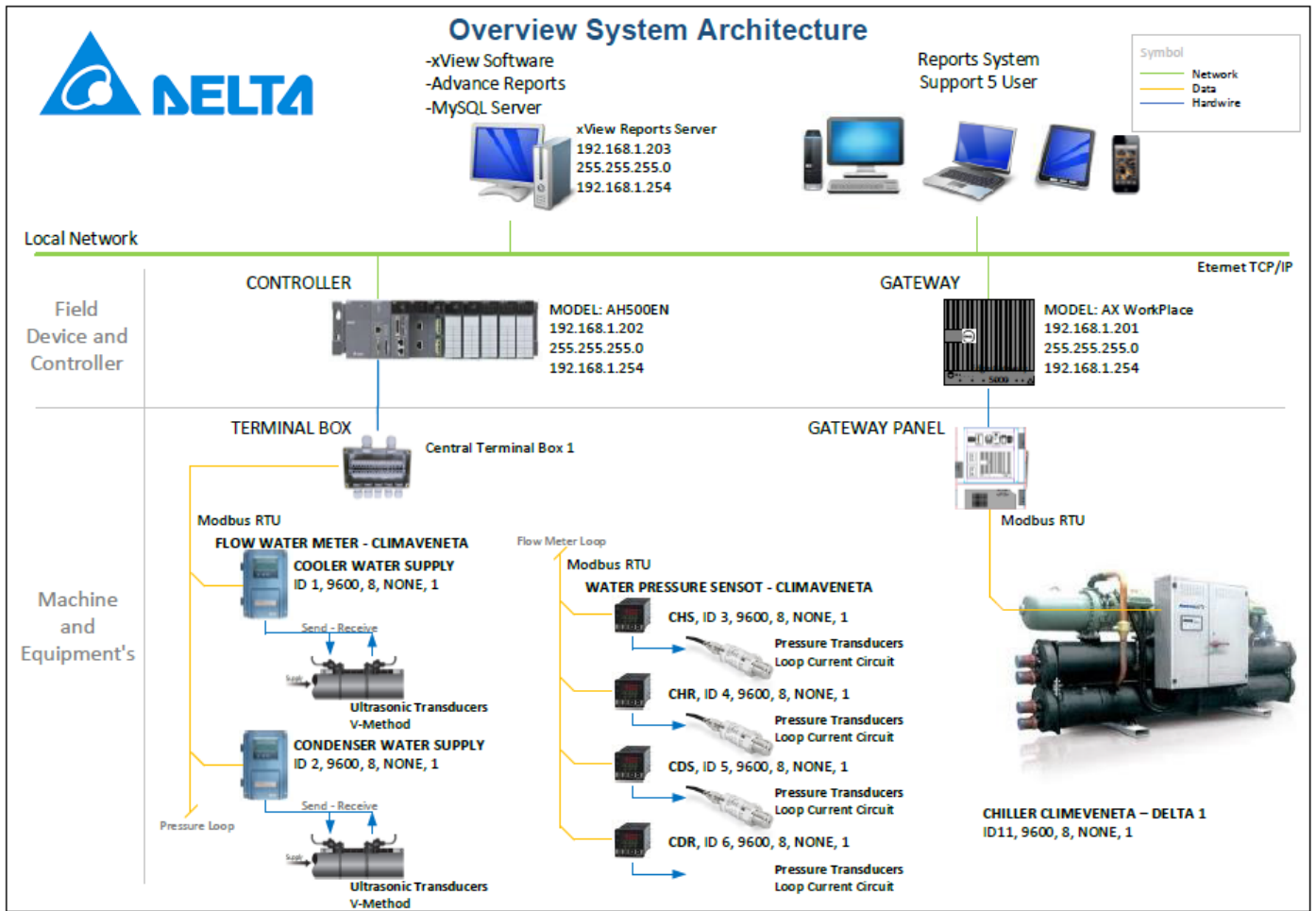
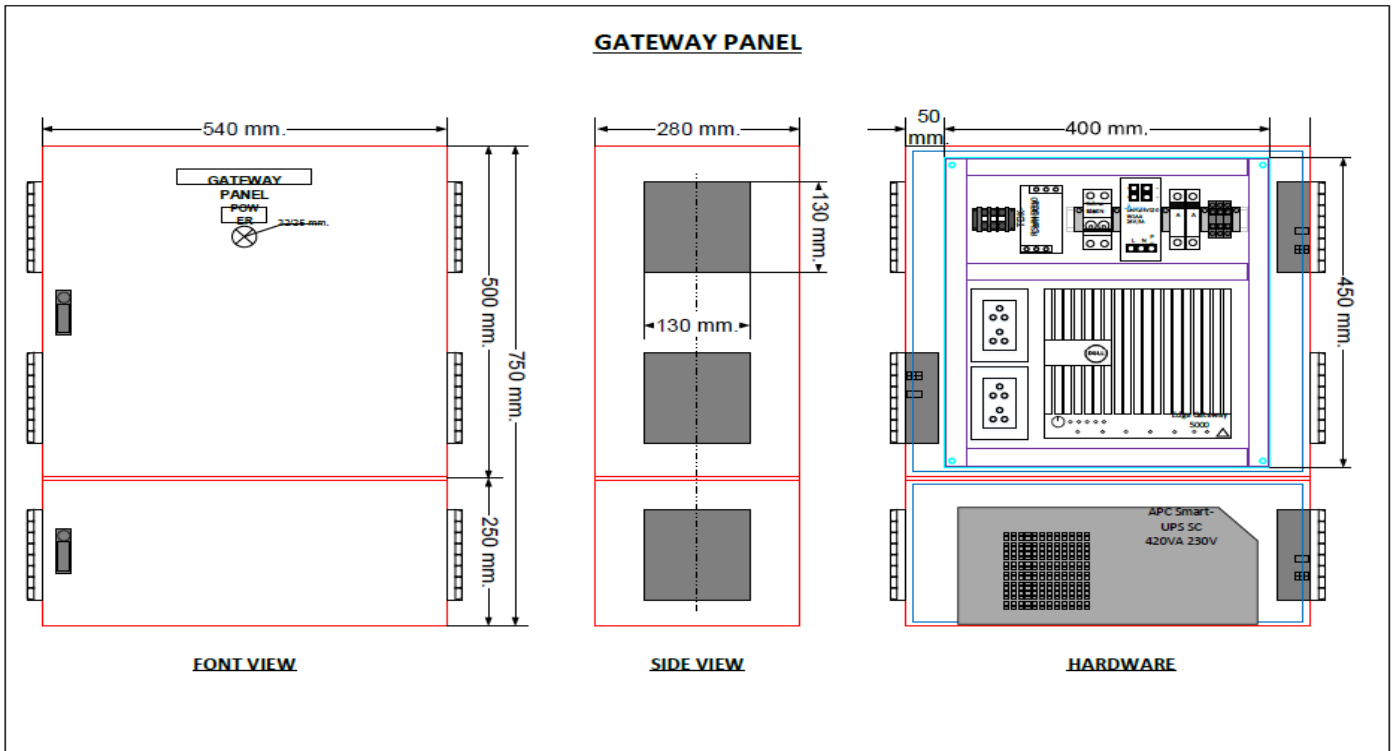


Table 1: Detail Scope of supply

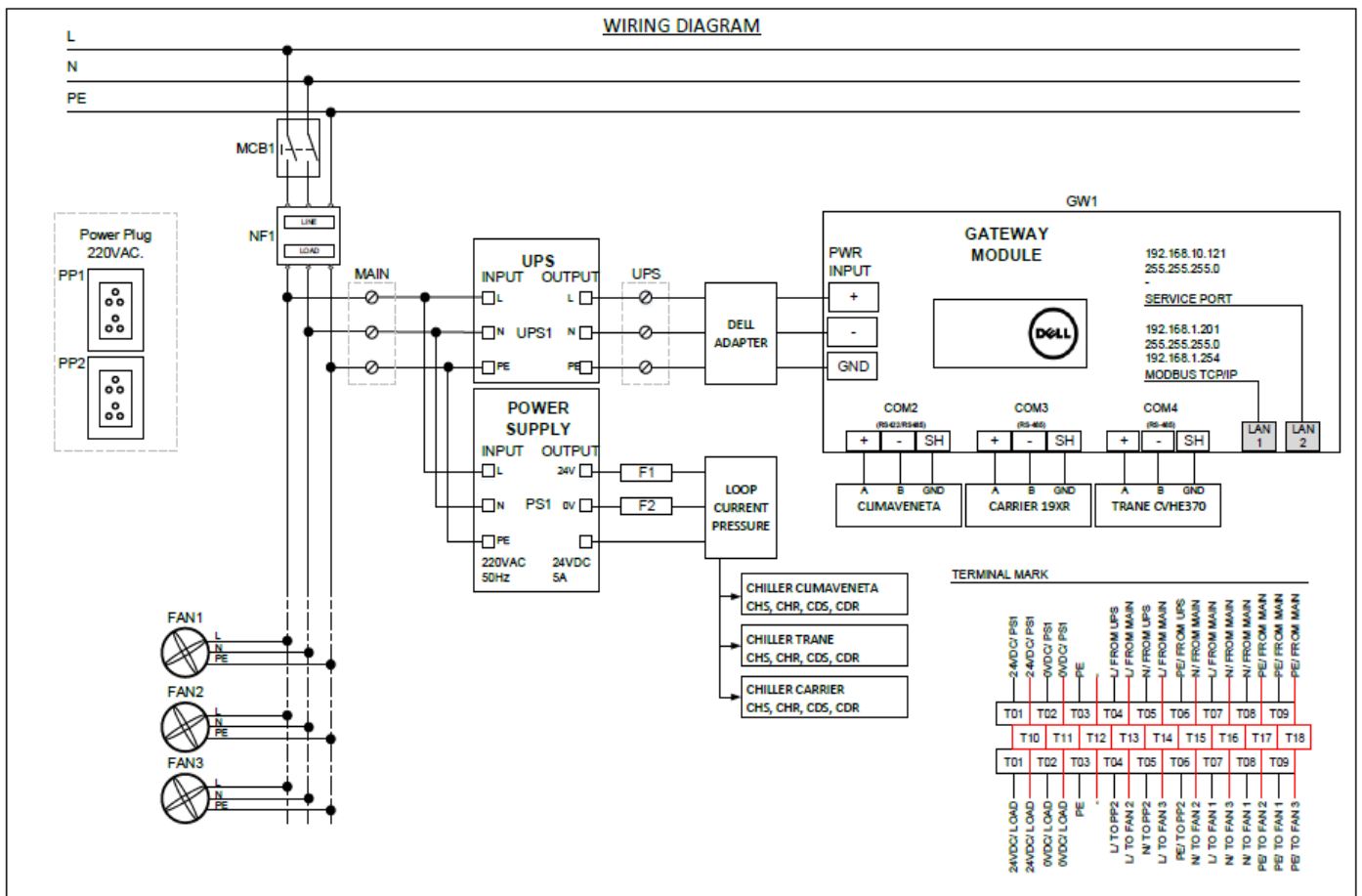
NO.	DESCRIPTIONS	Q'TY	UNIT	NOTE
1	INSTALL GATEWAY FOR CHILLER CLIMAVENETA	1	SET	
2	LINK DATA CHILLER CLIMAVENETA	1	SET	
3	FLOW WATER METER – COOLER SUPPLY	1	SET	
4	FLOW WATER METER – CONDENSER SUPPLY	1	SET	
5	PRESSURE SENSOR – CHS	1	SET	
6	PRESSURE SENSOR – CHR	1	SET	
7	PRESSURE SENSOR – CDS	1	SET	
8	PRESSURE SENSOR – CDR	1	SET	
9	PLC AH500	1	SET	
10	PC WORKSTATION	1	SET	

Project Detail

Drawing: Chiller Gateway Panel Delta 1



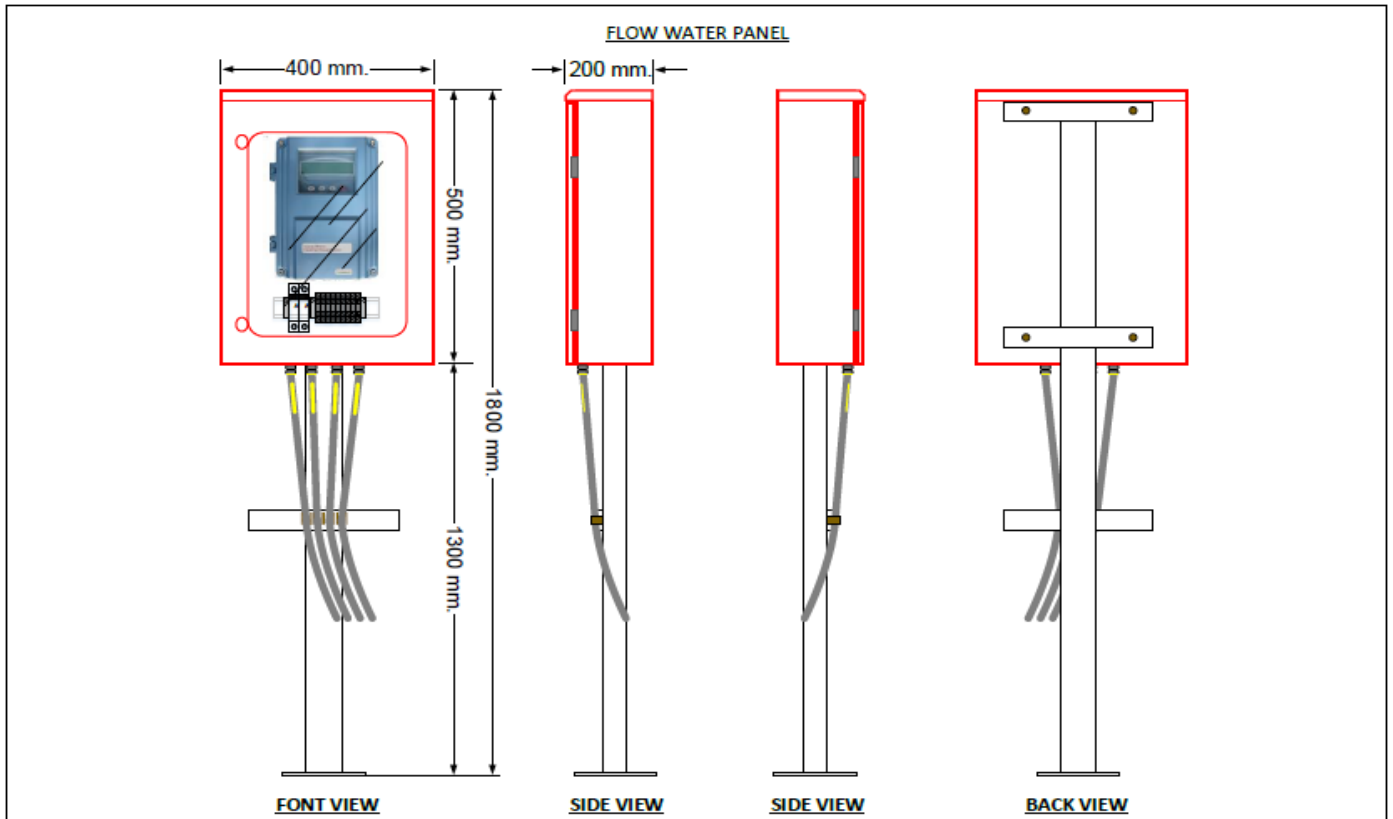
	PROJECT: GATEWAY CHILLER DELTA	DESIGNED: KHOMKRIT.CH	REVISED			JOB NO.: CHILLER DET 1	SHEET: A1 : 1
	CUSTOMER NAME: DELTA ELECTRONICS (THAILAND)PCL	DRAWN: KHOMKRIT.CH	NO.	DATE	BY	SCALE: 1:3	
	LOCATION: BANGPOO INDUSTRIAL ESTATE/SAMUTPRAKARN	CHECKED: SOPARK.K	REV.1	03/30/2019	KHOMKRIT.CH	DRAWING NO.: SHOP FOR DRAWING	FILE: --
		APPROVED: KHUN KRITSADA.SEEH	REV.2				



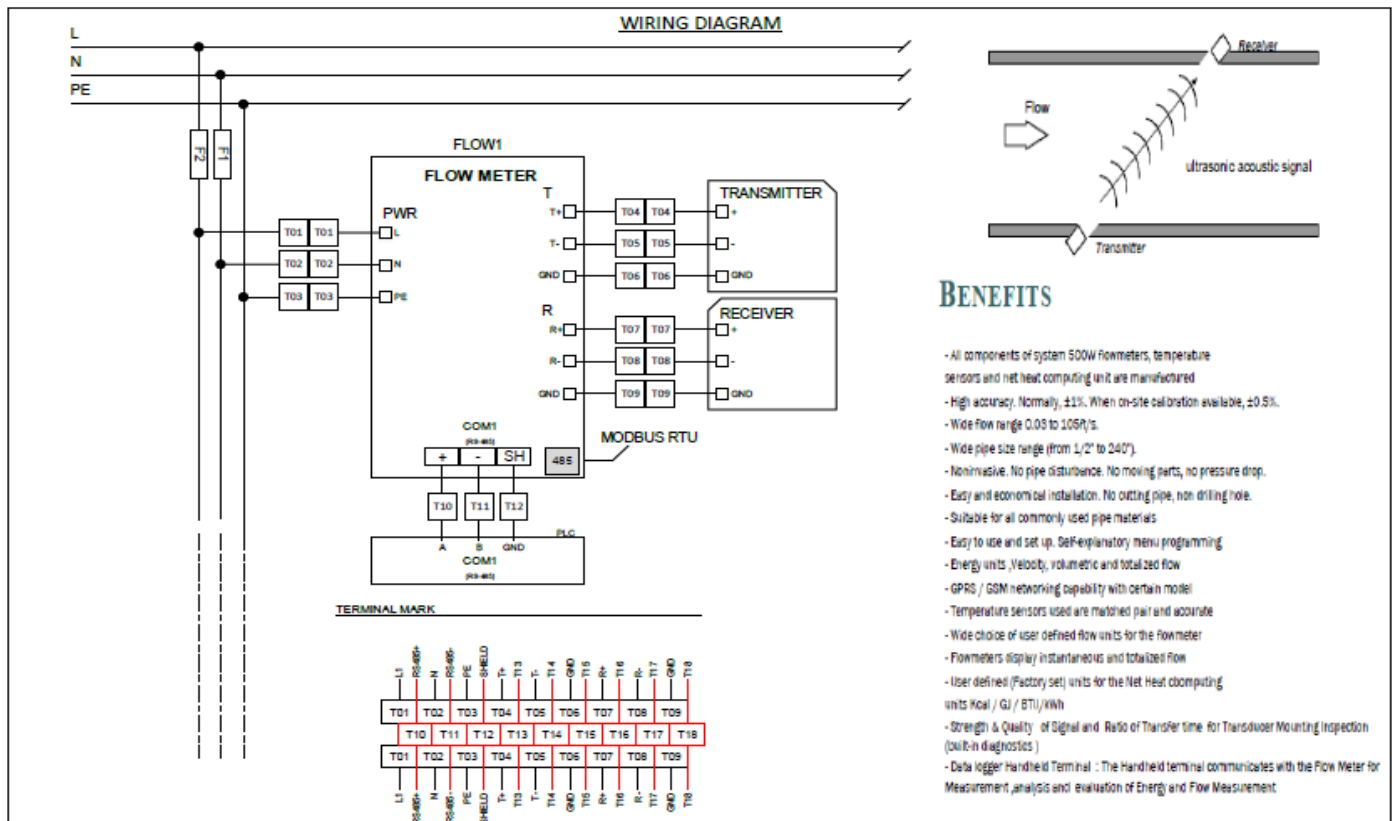
	PROJECT: GATEWAY CHILLER DELTA	DESIGNED: KHOMKRIT.CH	REVISED			JOB NO.: CHILLER DET 1	SHEET: A1 : 1
	CUSTOMER NAME: DELTA ELECTRONICS (THAILAND)PCL	DRAWN: KHOMKRIT.CH	NO.	DATE	BY	SCALE: 1:3	
	LOCATION: BANGPOO INDUSTRIAL ESTATE/SAMUTPRAKARN	CHECKED: SOPARK.K	REV.1	06/01/2019	KHOMKRIT.CH	DRAWING NO.: WIRING DIAGRAM - DT1	FILE: --
		APPROVED: KHUN KRITSADA.SEEH	REV.2				

Project Detail

Drawing: Flow Water Meter Chiller Panel Delta 1 (CONDENSER SUPPLY)



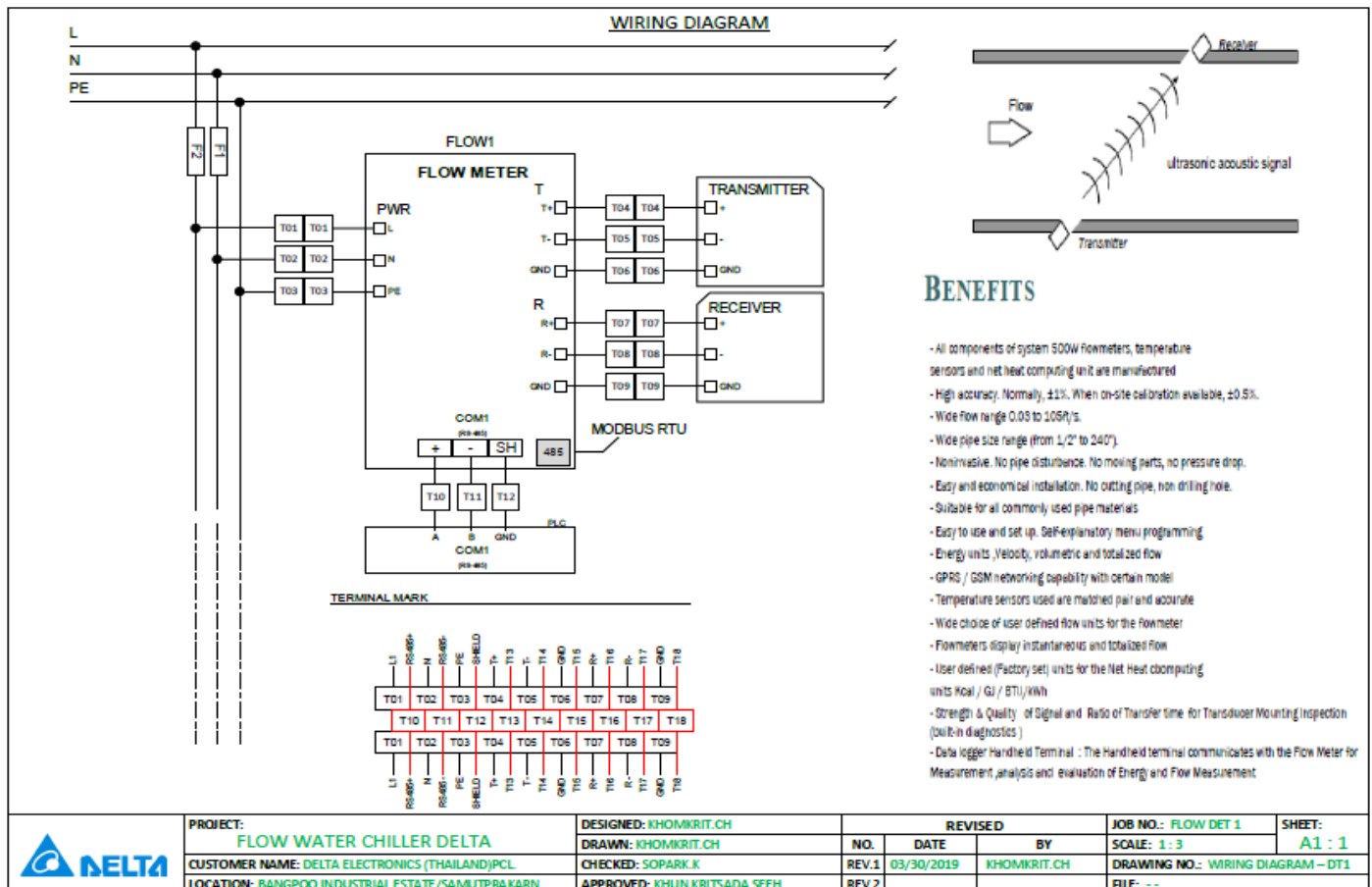
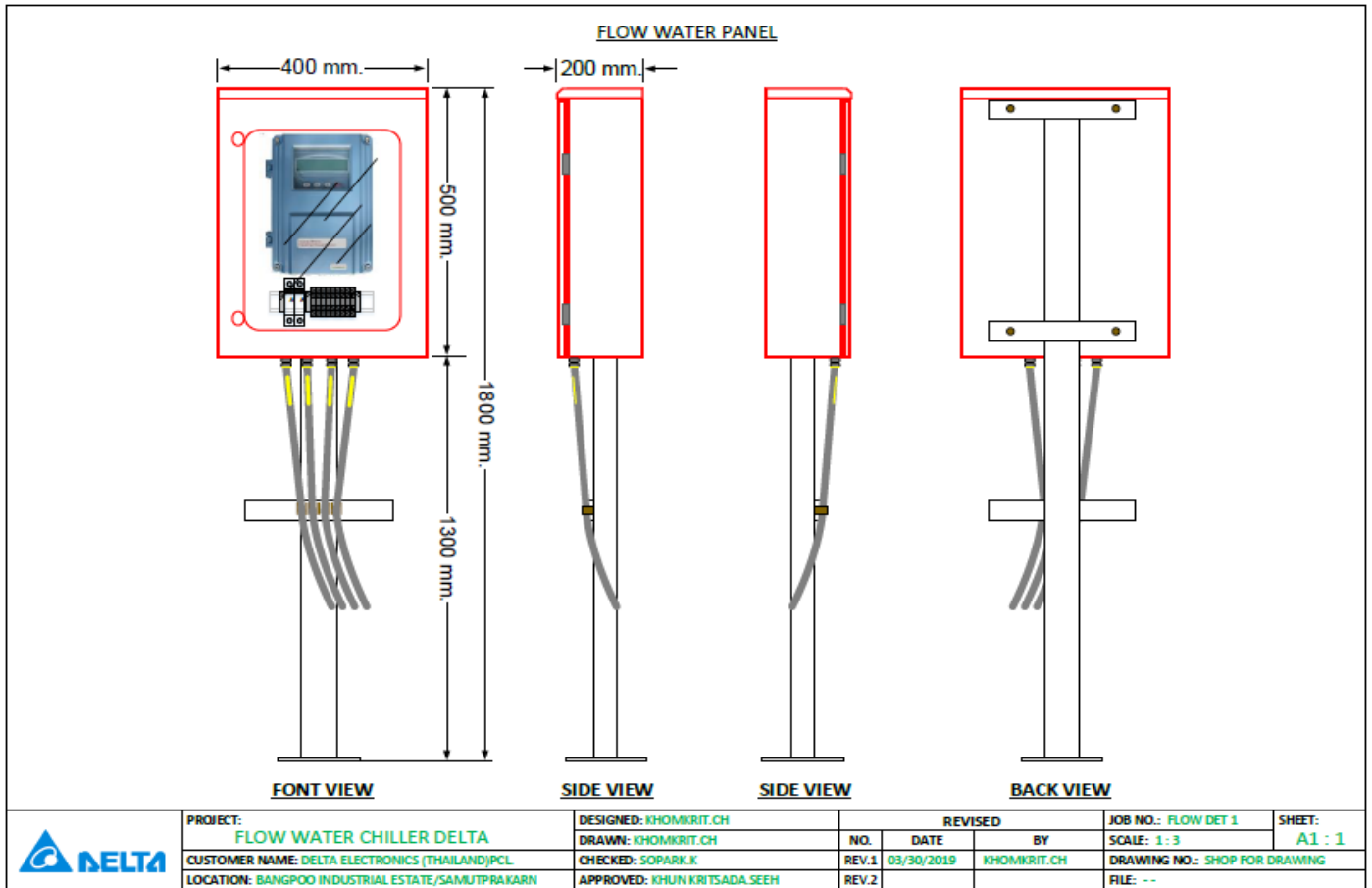
	PROJECT: FLOW WATER CHILLER DELTA	DESIGNED: KHOMKRIT.CH	REVISED	JOB NO.: FLOW DET 1	SHEET:
	CUSTOMER NAME: DELTA ELECTRONICS (THAILAND)PCL	DRAWN: KHOMKRIT.CH	NO.	DATE	BY
	LOCATION: BANGPOO INDUSTRIAL ESTATE/SAMUTPRAKARN	CHECKED: SOPARK.K	REV.1	03/30/2019	KHOMKRIT.CH
	APPROVED: KHUN KRITSADA.SEEH	REV.2			DRAWING NO.: SHOP FOR DRAWING
					FILE: --



	PROJECT: FLOW WATER CHILLER DELTA	DESIGNED: KHOMKRIT.CH	REVISED	JOB NO.: FLOW DET 1	SHEET:
	CUSTOMER NAME: DELTA ELECTRONICS (THAILAND)PCL	DRAWN: KHOMKRIT.CH	NO.	DATE	BY
	LOCATION: BANGPOO INDUSTRIAL ESTATE/SAMUTPRAKARN	CHECKED: SOPARK.K	REV.1	03/30/2019	KHOMKRIT.CH
	APPROVED: KHUN KRITSADA.SEEH	REV.2			DRAWING NO.: WIRING DIAGRAM - DT1
					FILE: --

Project Detail

Drawing: Flow Water Meter Chiller Panel Delta 1 (COOLER SUPPLY)



Project Reference

Graphic Monitoring: Chiller Climaveneta Data – Delta 1



Image 1: Running Normal Status & Manual Control Mode



Image 2: Running Normal Status & Auto Control Mode

Project Reference

Graphic Monitoring: Chiller Climaveneta Data – Delta 1



Image 3: Stop Status



Image 4: Alarm Status

Project Reference

Graphic Monitoring: Chiller System – Delta 1

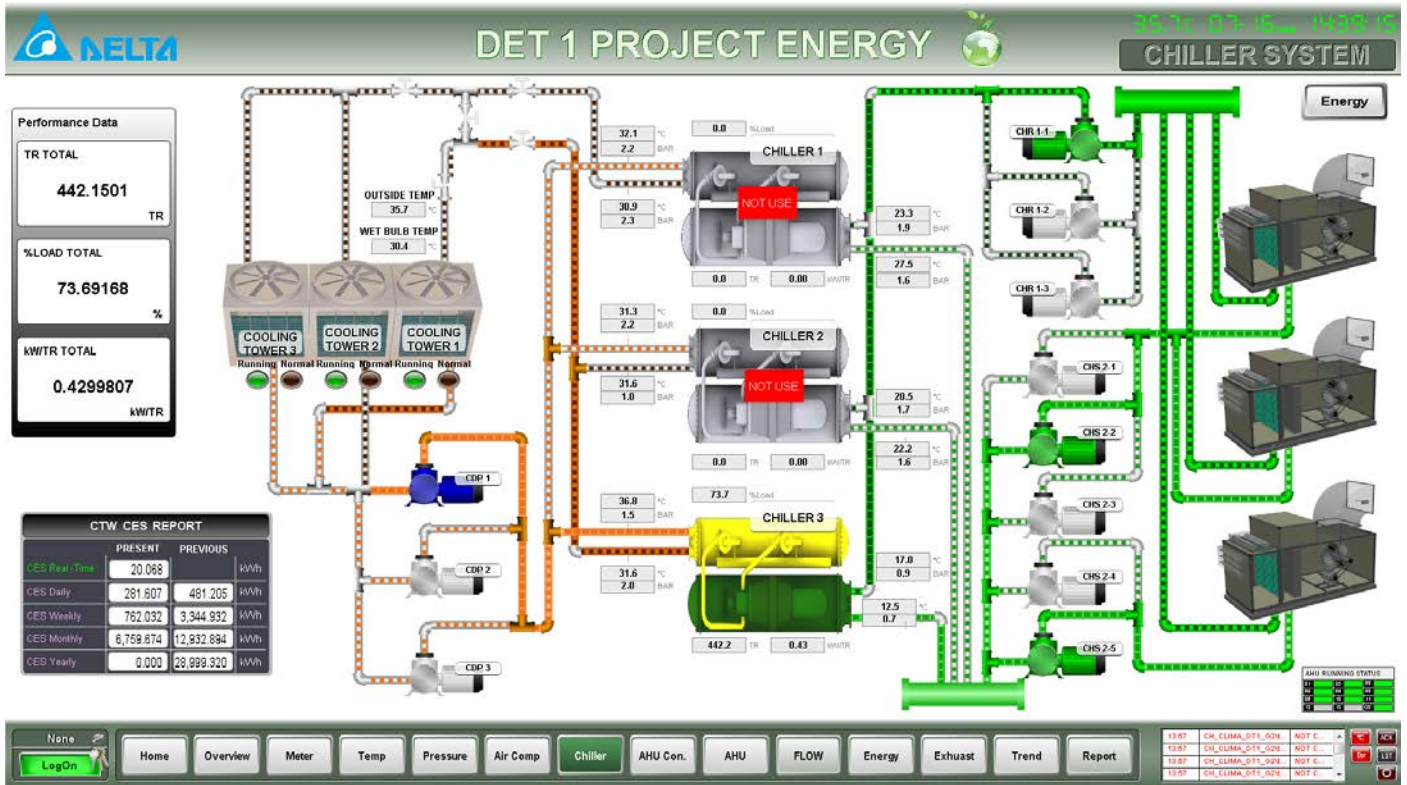
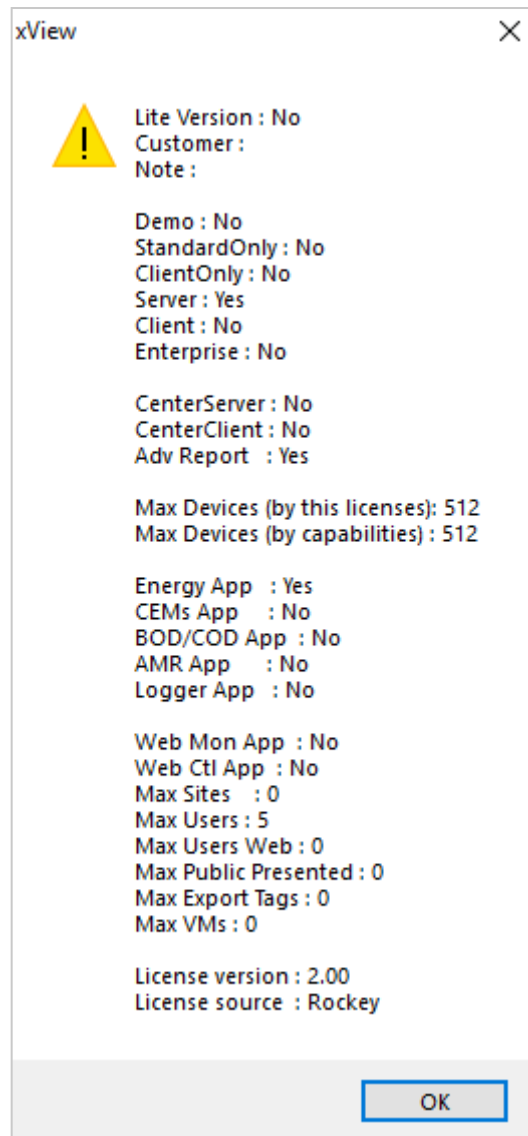


Image 5: Overview Process Chiller System – Delta 1

Project Reference

Data Reports System: Reports License



Reports License: for 512 Devs.

Project Reference

Data Reports System: System Login

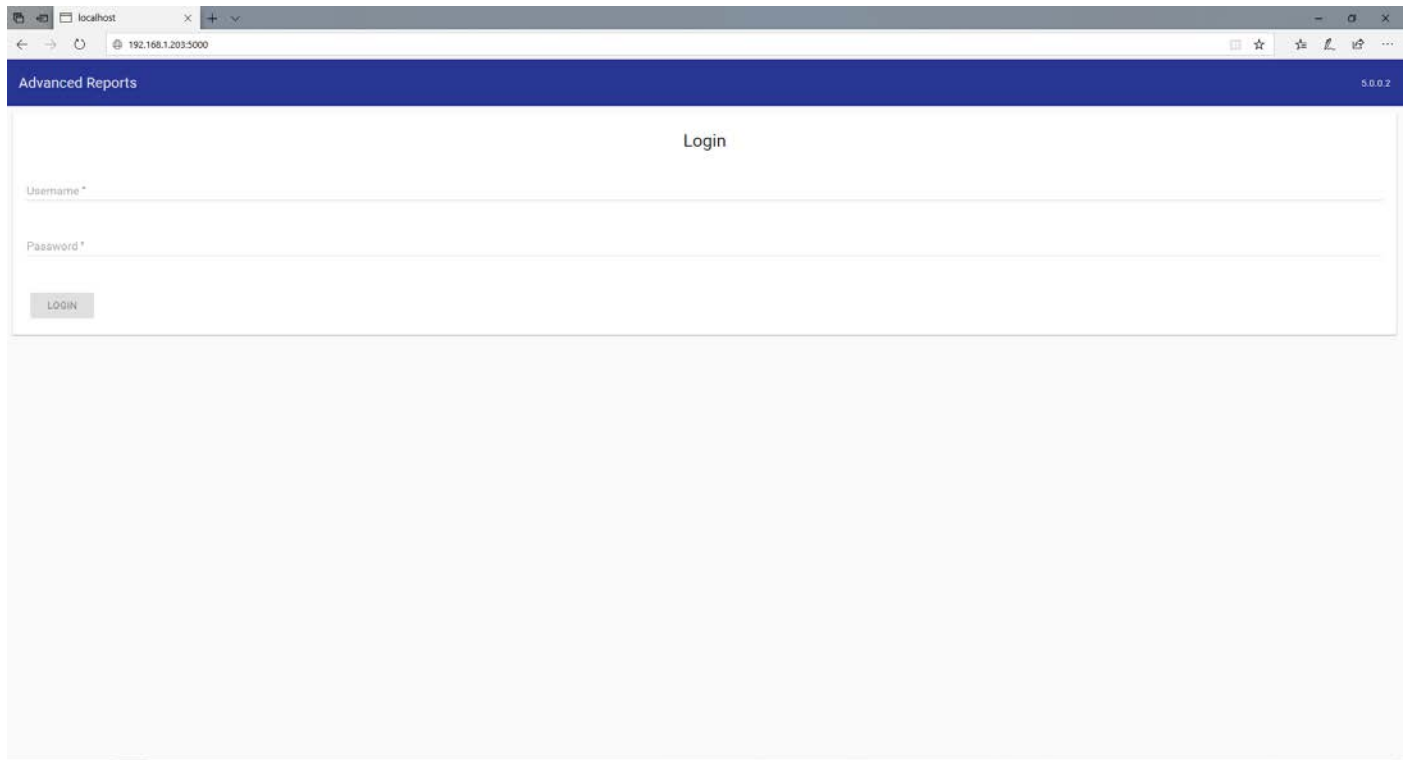


Image 1: Login Reports System

Server IP Address: 192.168.1.203:5000/

Account: 1 accounts

1. Username: delta1, Password: clima1

Project Reference

Data Reports System: Reports Category

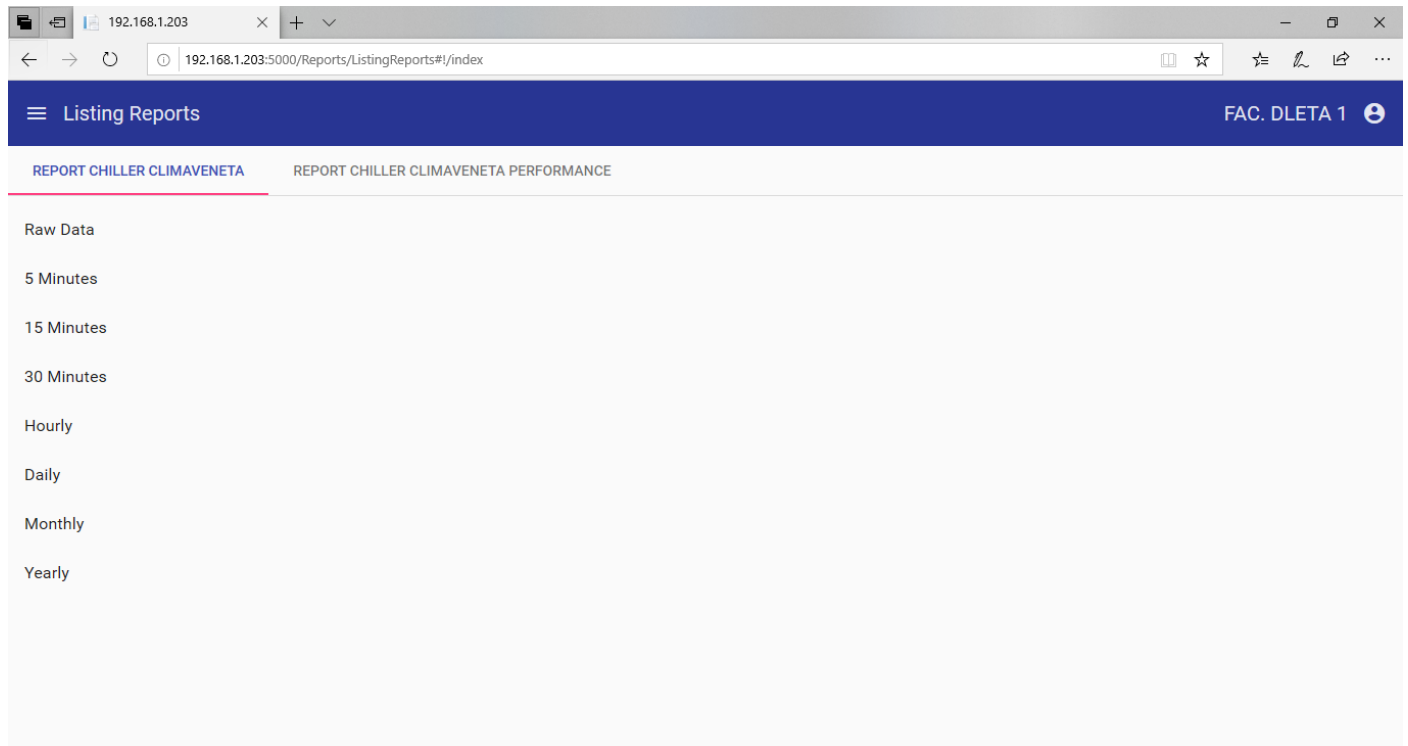


Image 2: Category Reports System

Category 1: **RAW DATA REPORT – CLIMAVENETA DELTA 1**

Category 2: **CHILLER PERFORMANCE REPORT – CLIMAVENETA DELTA 1**

Project Reference9

Operation Guide: Reports System



Image 1: Function in reports 1

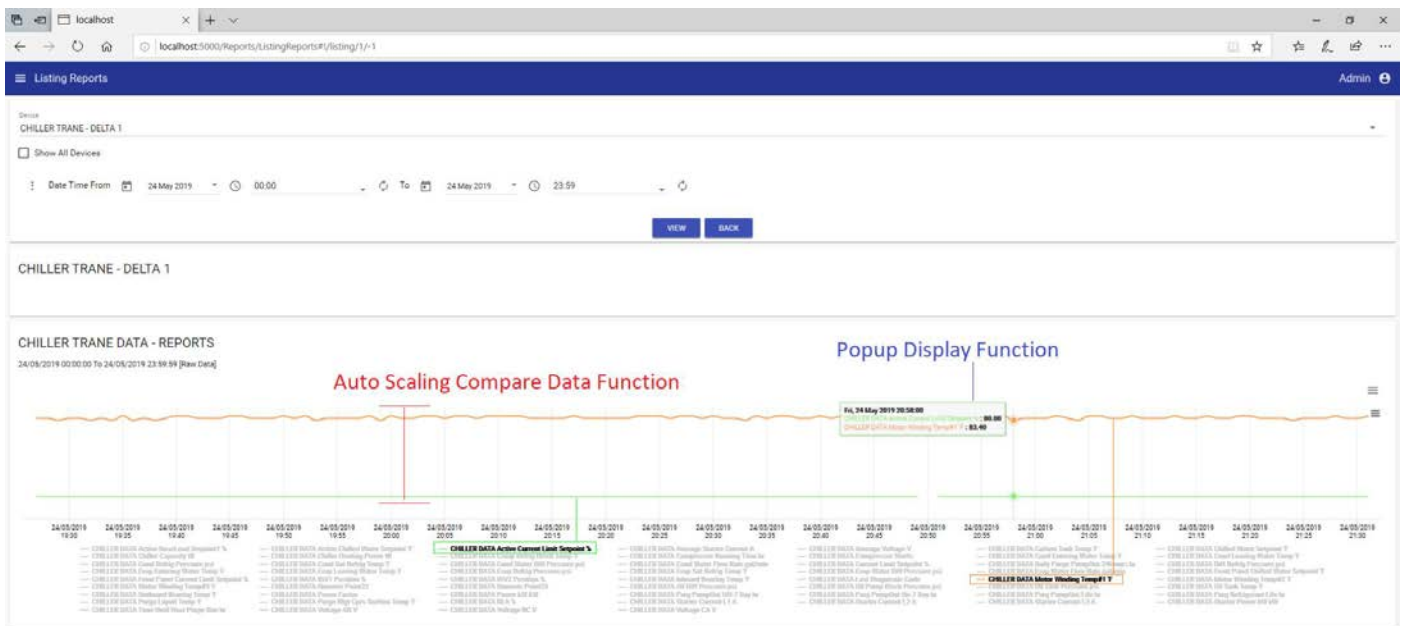


Image 1: Function in reports 2

Project Reference

Data Reports System: Chiller Performance Climaveneta – Delta 1

Listing Reports FAC. DLETA 1

Device: CHILLER NO.3 CLIMAVENETA - DELTA 1

Show All Devices

Month: June Year: 2019

[VIEW](#) [BACK](#)

CHILLER NO.3 CLIMAVENETA - DELTA 1

REPORT CHILLER CLIMAVENETA PERFORMANCE

01/06/2019 To 30/06/2019 [Daily]

Date Time	Chiller Number of operating	New Chiller Compressor 1		New Chiller Compressor 2		New Chiller Compressor 3		New Chiller Compressor 4		New Chiller CONDENSER				COND T		COND P		New Chiller COOLER				COOL T		COOL P	Flow Cond. Spec 1,700G/M	Flow Cool. Spec 1,430G/M	Noise %Load	Set Point Temp	RT	Power Consump (kW)	Heat Balance	kW/RT							
		Power Consump (kW)	Current (A)	Power Consump (kW)	Current (A)	Power Consump (kW)	Current (A)	Power Consump (kW)	Current (A)	T1	T2	T3	T4	T3-T1	LMTD1	LMTD2	P1-P2 (bar)	T4	T9	T5	T10	T6	P3 (bar)	P4 (bar)									T4-T6	LMTD1	LMTD2	P3-P4 (bar)			
03/06/2019		74.5	118	74.8	119	78	123	78	123	30.9	34.7	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	87.09	10	525.32	10	1.07	0.41

Image 1: Data Table Chiller Performance Reports Climaveneta

REPORT CHILLER CLIMAVENETA PERFORMANCE

CHILLER NO.3 CLIMAVENETA - DELTA 1

03/06/2019 00:00:00 To 03/06/2019 23:59:59 [Raw Data]

Date Time	Chiller Number of operating	Chiller Compressor 1		Chiller Compressor 2		Chiller Compressor 3		Chiller Compressor 4		New Chiller CONDENSER				COND T		COND P		New Chiller COOLER				COOL T		COOL P	Flow Cond. Spec	Flow Cool. Spec	Noise %Load	Set Point Temp	RT	Power Consump	Heat Balance	kW/RT								
		Power Consump	Current	Power Consump	Current	Power Consump	Current	Power Consump	Current	T1	T2	T3	T4	T3-T1	LMTD1	LMTD2	P1-P2 (bar)	T4	T9	T5	T10	T6	P3 (bar)	P4 (bar)									T4-T6	LMTD1	LMTD2	P3-P4 (bar)				
03/06/2019 19:40:21	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	87.09	10	525.32	10	1.07	0.41
03/06/2019 19:41:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	86.37	10	519.25	10	1.06	0.41
03/06/2019 19:42:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	85.73	10	514.05	10	1.06	0.42
03/06/2019 19:43:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	85.73	10	515.97	10	1.06	0.42
03/06/2019 19:45:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	86.38	10	519.43	10	1.07	0.41
03/06/2019 19:46:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	86.38	10	519.43	10	1.07	0.41
03/06/2019 19:49:28	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	85.1	10	509.21	10	1.04	0.39
03/06/2019 19:50:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	88.13	10	525.49	10	1.07	0.37
03/06/2019 19:51:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	85.52	10	513.15	10	1.04	0.37
03/06/2019 19:52:00	3	74.5	118	74.8	119	78	123	78	123	30.9	34.9	32.4	37.5	36.8	8.5	7.8	5.9	0.02	0.36	0.7	10.1	11.7	12.9	8.9	14.9	3.4	3	4.8	0.26	0.19	0.4	10	10	0	84.32	10	506.96	10	1.03	0.37

Image 2: Export (Excel file) Chiller Performance Reports Climaveneta

Project Reference

Data Reports System: Raw Data Reports Chiller Climaveneta – Delta 1

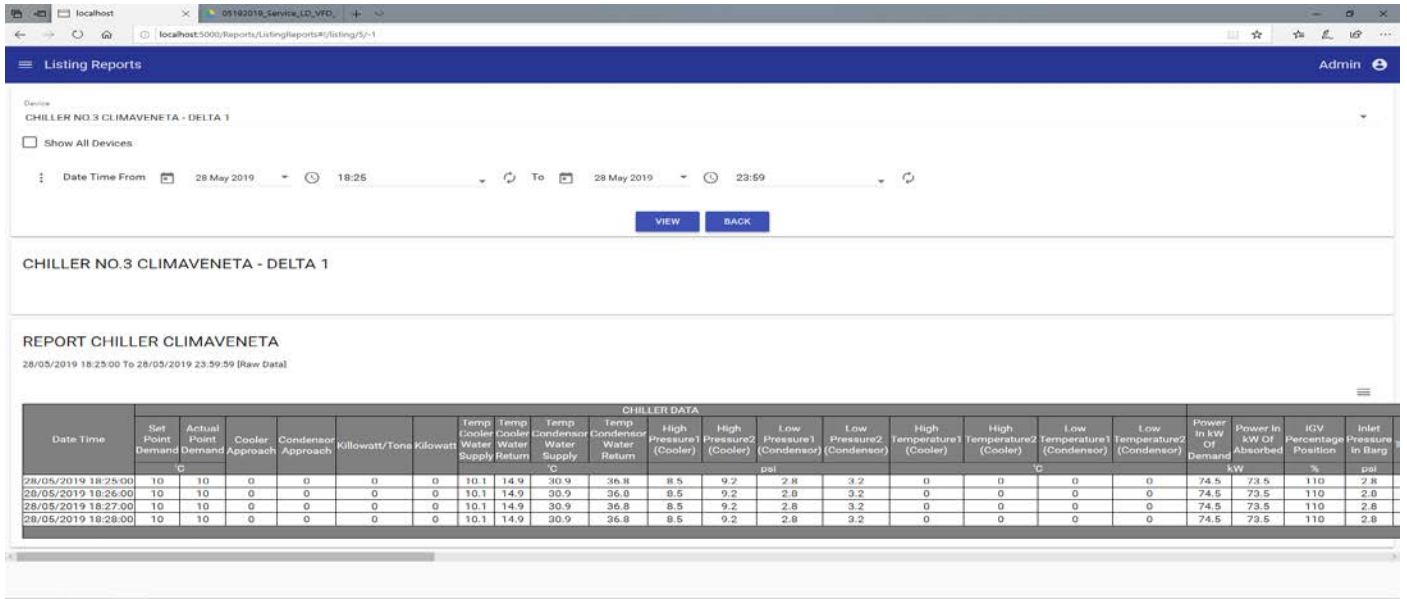


Image 1: Data Table Reports Chiller Climaveneta

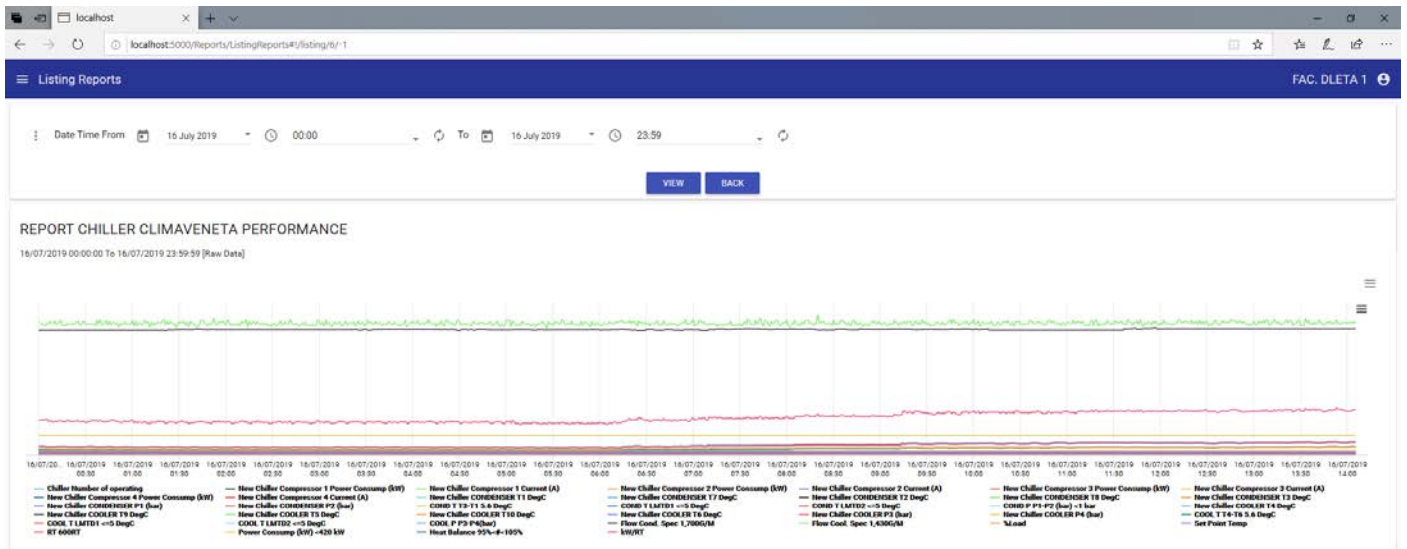


Image 2: Trend/Chart Data Chiller Climaveneta

Project Reference

Data Reports System: Reports Flow Water – Delta 1

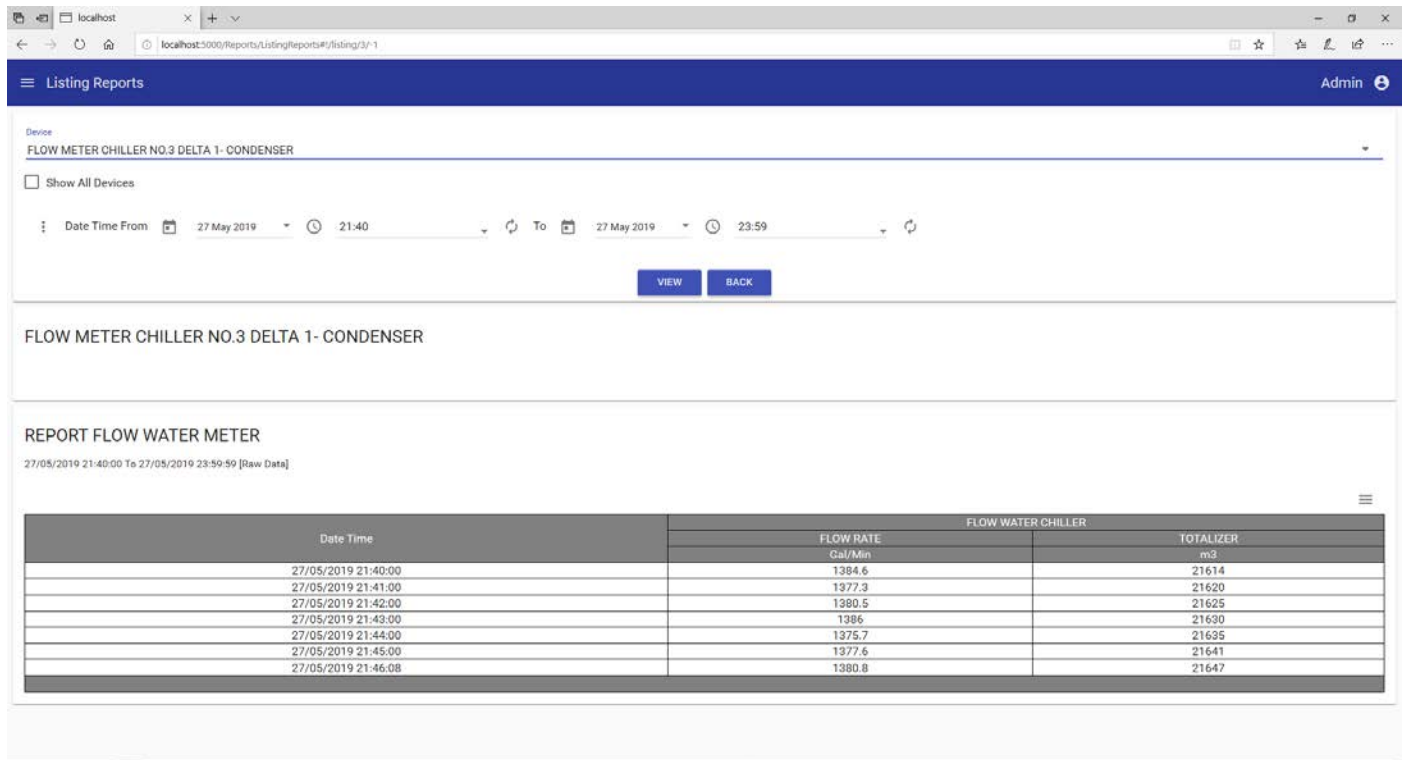


Image 1: Flow Condenser Data Table

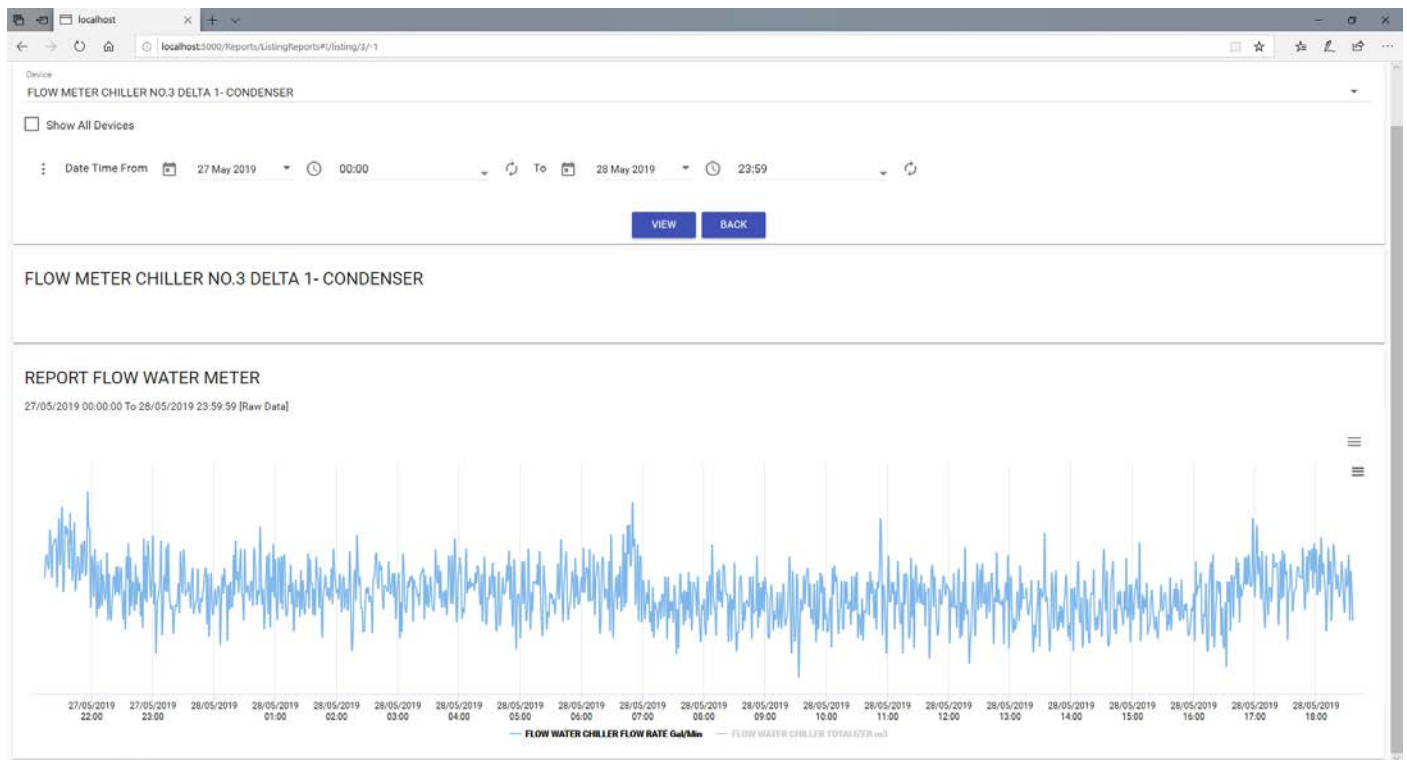


Image 2: Flow Condenser Chart Data

Project Reference

Data Reports System: Reports Flow Water – Delta 1

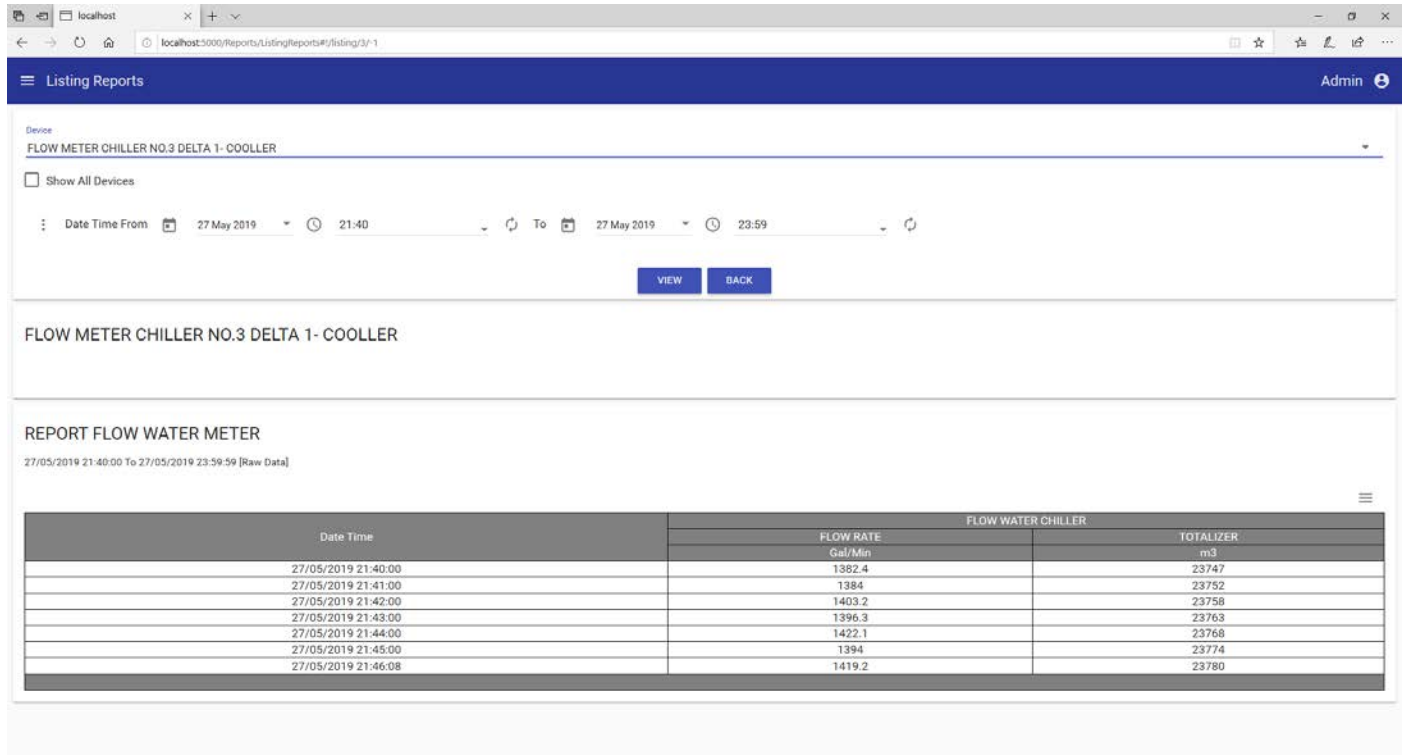


Image 1: Flow Cooler Data Table

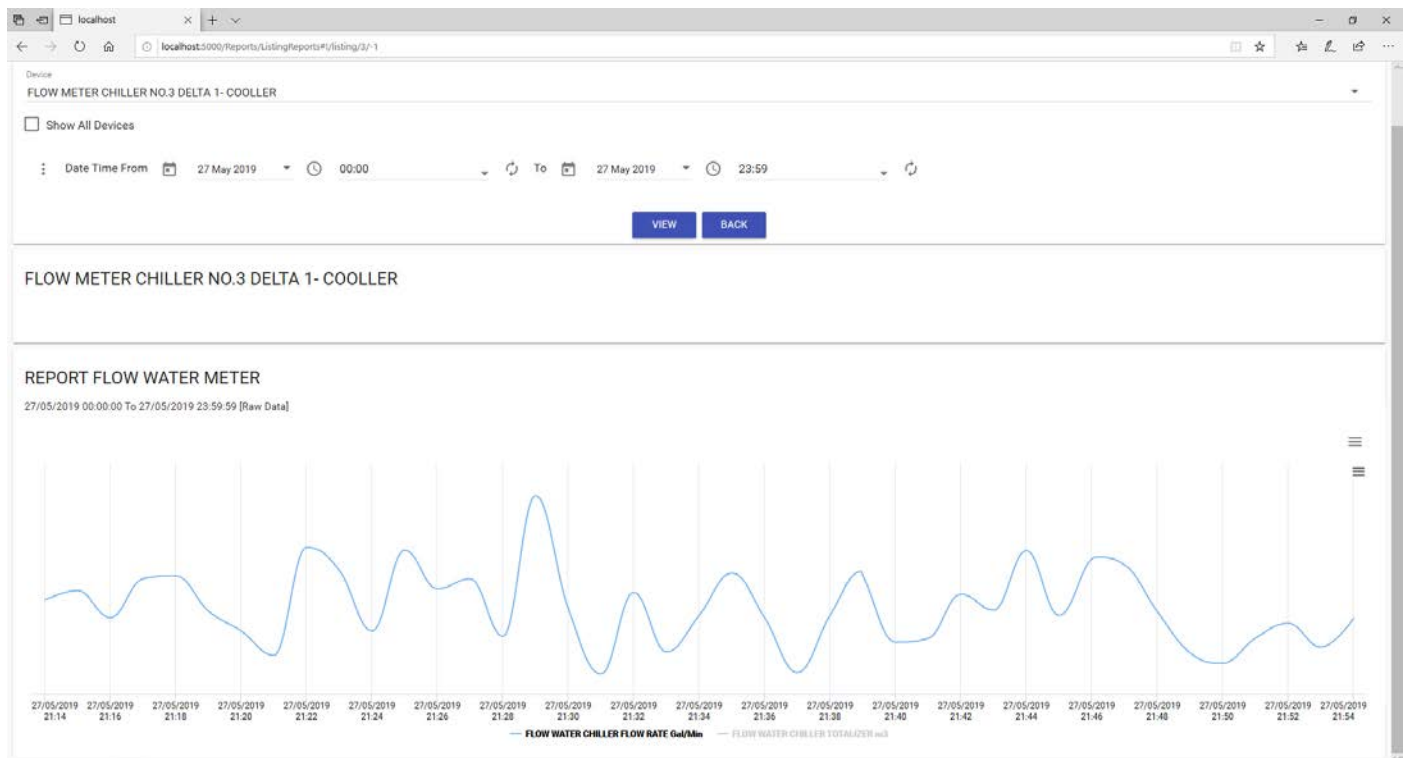


Image 2: Flow Cooler Chart Data

Project Reference

Data Reports System: Reports Pressure Sensor – Delta 1

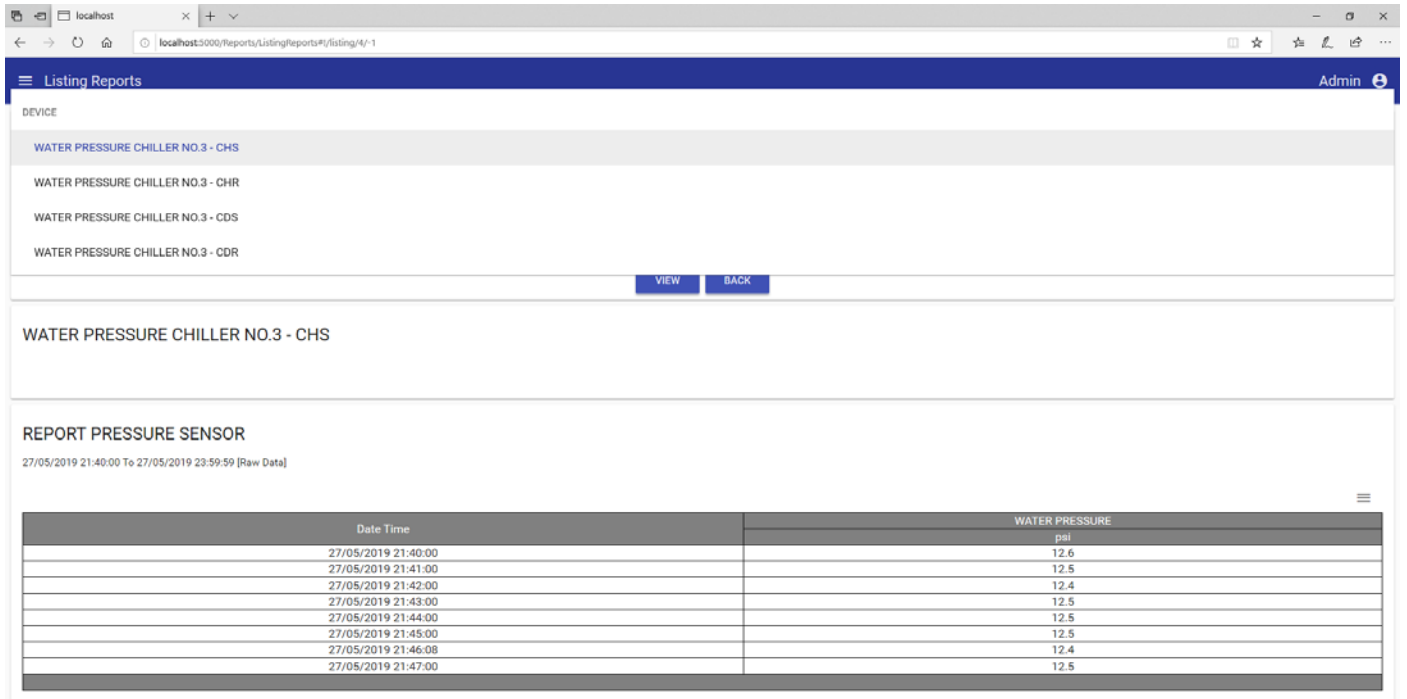


Image 1: Pressure Sensor Data Table

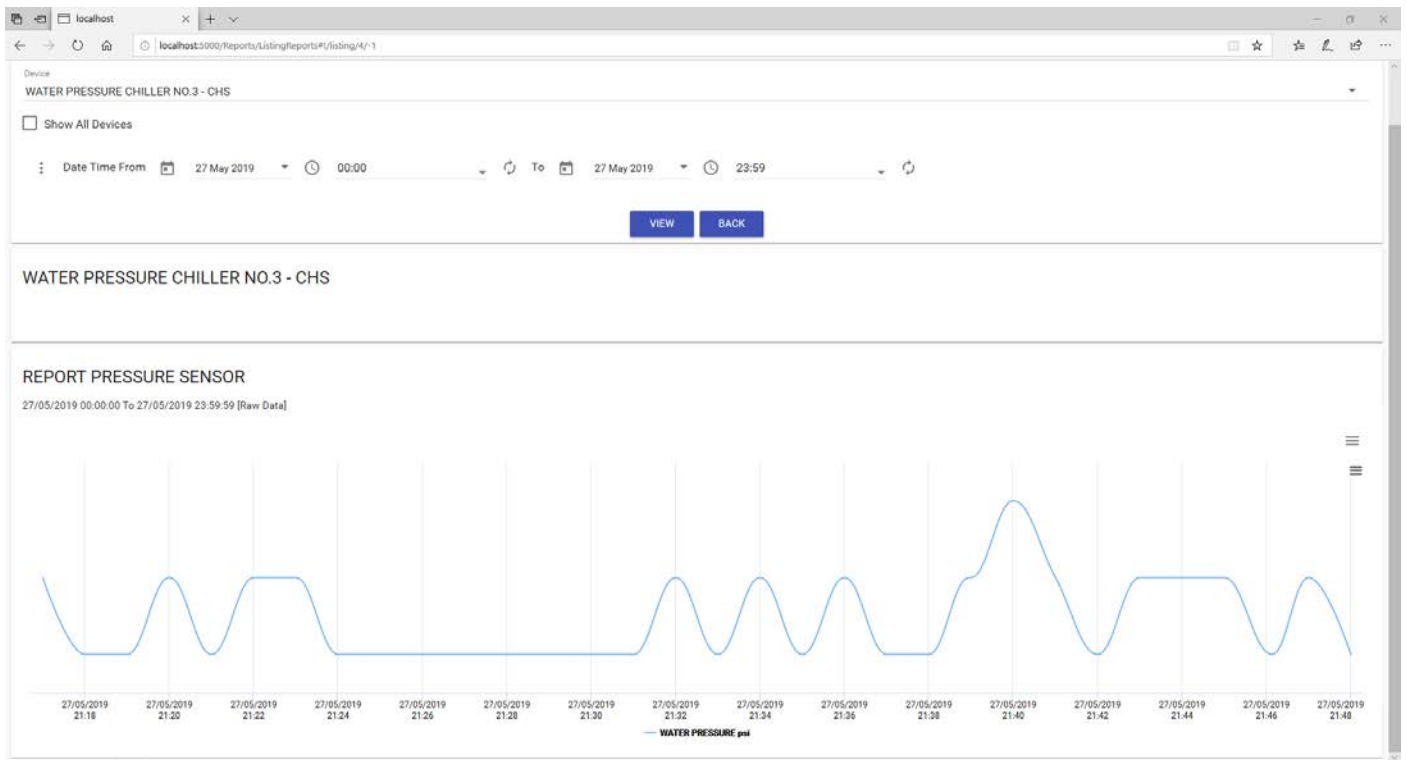


Image 2: Pressure Sensor Data Chart

Project Reference

Installation & Hardware Unit: Gateway Panel – Delta 1

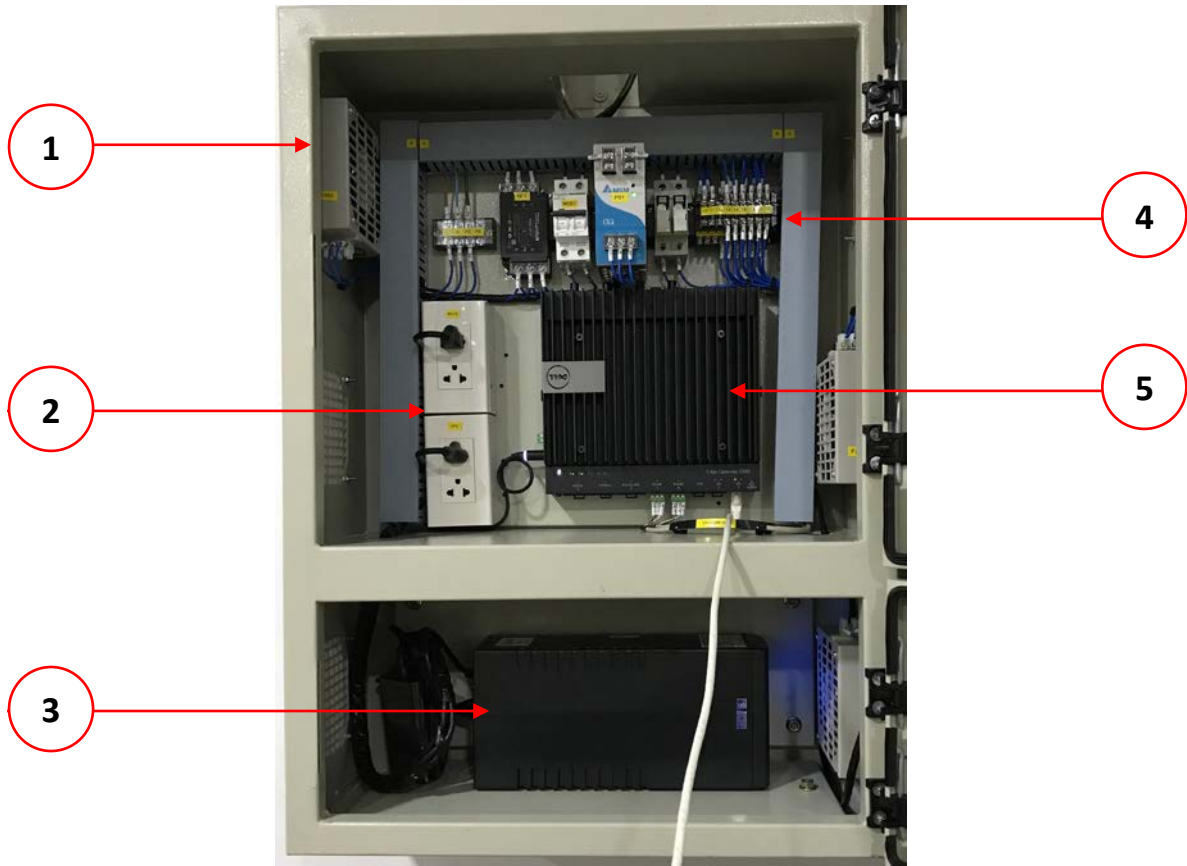


Image 1: Gateway Panel

Table 2: Hardware Section Gateway Panel

Number	Hardware Section Detail	Note
1	Ventilating Fan & Filter Panel	
2	Power Plug	
3	UPS Power Storage	
4	Main Terminal & Circuit Protection System	
5	Gateway Module for Chiller Data & Communication Link	

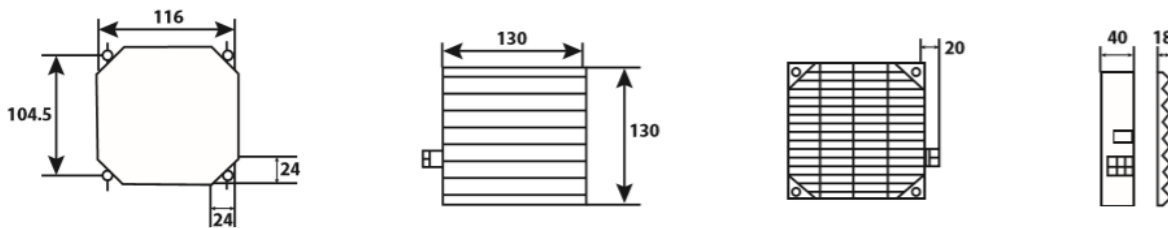
Hardware Detail

[1] Ventilating Fan & Filter Panel

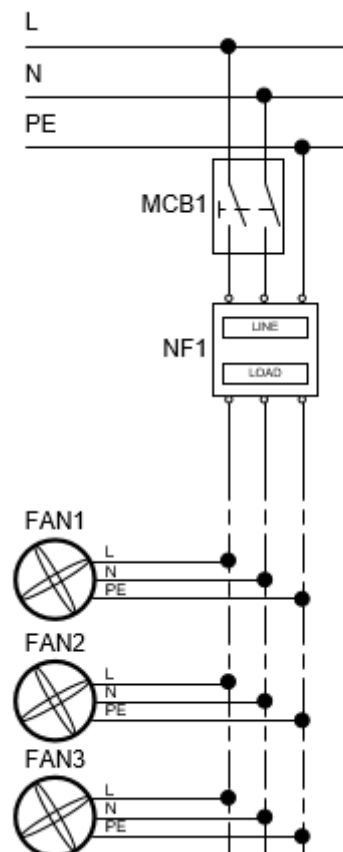
Technical Data

	แรงดัน/ความถี่ (V/Hz)	กินไฟ (W/A)	อุณหภูมิ การใช้งาน	ระดับความดัง (dB)	ปริมาตรลม (CFM)	ปริมาตรลม (m ³ /h)
	<ul style="list-style-type: none"> • 220VAC/50Hz 	16/0.13	-10 to 70 °C	47-53	78	133

Dimensions



Circuit Diagram



Hardware Detail

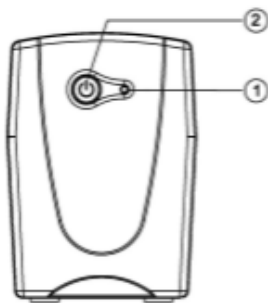
[2] Power Plug & [3] UPS Power Storage

Technical Data

Model	Value1000E1	Input		Output	
Capacity (VA)	1000VA	Frequency Range	47~63Hz(Auto Sensing)	On Battery Output Voltage	Simulated Sine Wave at 230Vac +/-5%
Capacity (Watts)	550W				
On Battery Output Frequency	50/60 Hz +/-1%			Physical	
Overload Protection	On Utility: Fuse, On Battery: Internal Current Limiting			Total # of UPS Receptacles	2
Maximum Dimensions	140mm(H)*100mm(W)*300mm(D)			Operating Temperature	0°C to 40°C
Weight	5.42 kg			Operating Relative Humidity	0 to 90%
Battery	12V / 9AH x1	Typical Recharge Time	8 Hours		

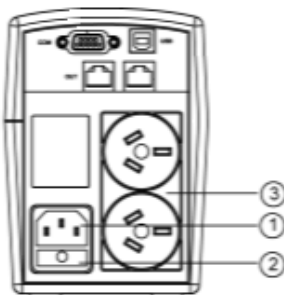
Basic Operation

FRONT PANEL DESCRIPTION



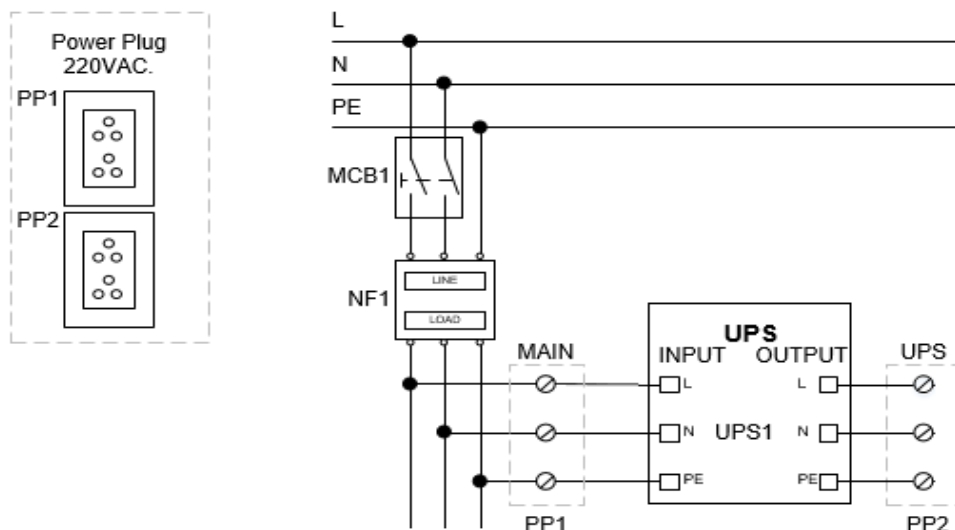
- 1. Power On Indicator**
This LED is illuminated when the utility condition is normal and the UPS outlets are providing "clean power", free of surges and spikes.
- 2. Power Switch**
Press the power switch to turn the UPS ON or OFF.

REAR PANEL DESCRIPTION



- 1. AC Inlet**
Connect to utility power through the input power cord.
- 2. Input Fuse**
The fuse provides optimal overload protection.
- 3. AC outlet**
The UPS provides outlets for connected equipment to insure temporary uninterrupted operation during a power failure and against surges and spikes.

Circuit Diagram



Hardware Detail

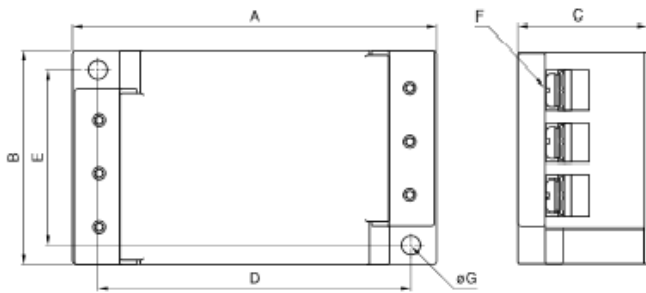
[4] Main Terminal & Circuit Protection System

4.1 EMI Filters

Technical Data

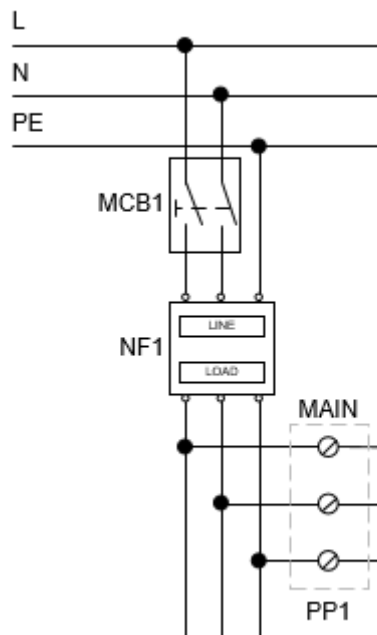
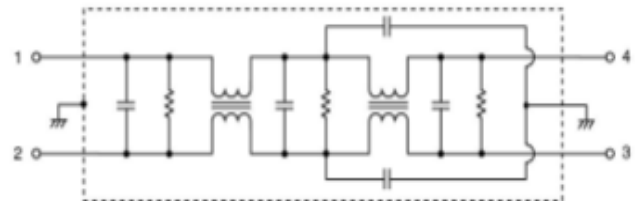
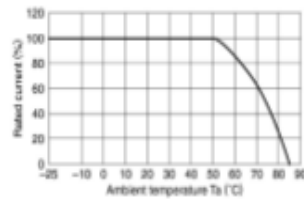
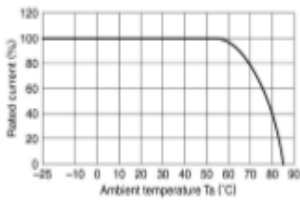
Model	RSHN-2010		Withstand Voltage	V	Terminals to Case: 2500VAC (1 Minute)
Rated Voltage (AC, DC)	V	250V	Isolation Resistance	MΩ	100MΩ minimum (500VDC, 1 Minute)
Rated Current	A	10A	Leakage Current (max)	A	RSHN-20xx 1mA; RSHN20xxL 100uA (250VAC, 60Hz)
DC Resistance (total)	mΩ	60	Operating Temperature	°C	-25 to +85°C (Derate above 50 / 55°C, see derating curve)

Dimensions



A	B	C	D	E	F	G	Recommended clamping torque
98	52	35	86	43	M4	4.5	1.27N m

Circuit Diagram



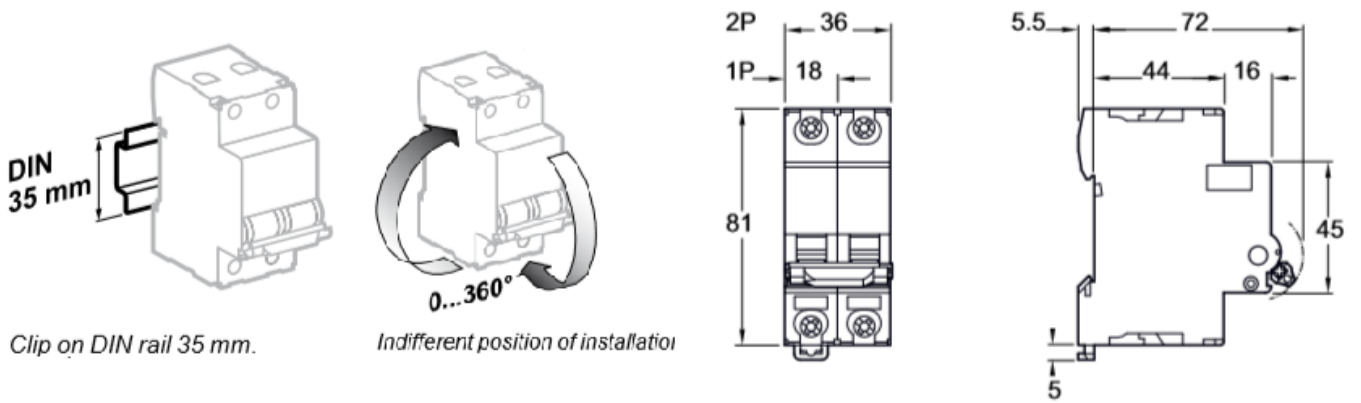
Hardware Detail

4.2 Miniature Circuit Breaker

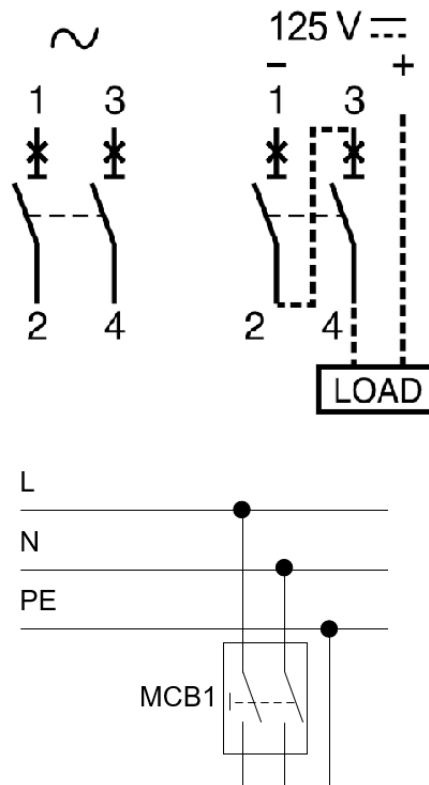
Technical Data

Poles description	2P	Heat dissipation	5.4 W 415 V 6 A	Relative humidity	95 % (55 °C)
Number of protected poles	2	temperature for operation	-30...70 °C	Network type	AC
[In] rated current	6 A at 50 °C conforming to EN/IEC 60947-2			Network frequency	50/60 Hz
Trip unit technology	Thermal-magnetic	Curve code	C	Height	81 mm
		Width	36 mm	Depth	72 mm
Breaking capacity	Icu 15 kA at 415 V AC 50/60 Hz between phases conforming to EN/IEC 60947-2				

Dimensions



Circuit Diagram



Hardware Detail

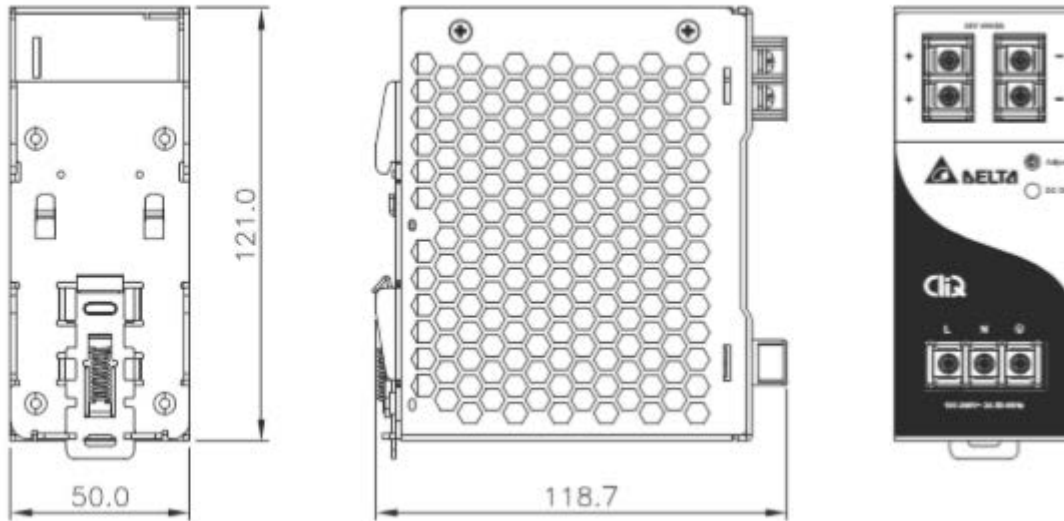
4.3 Power Supply Unit

Technical Data

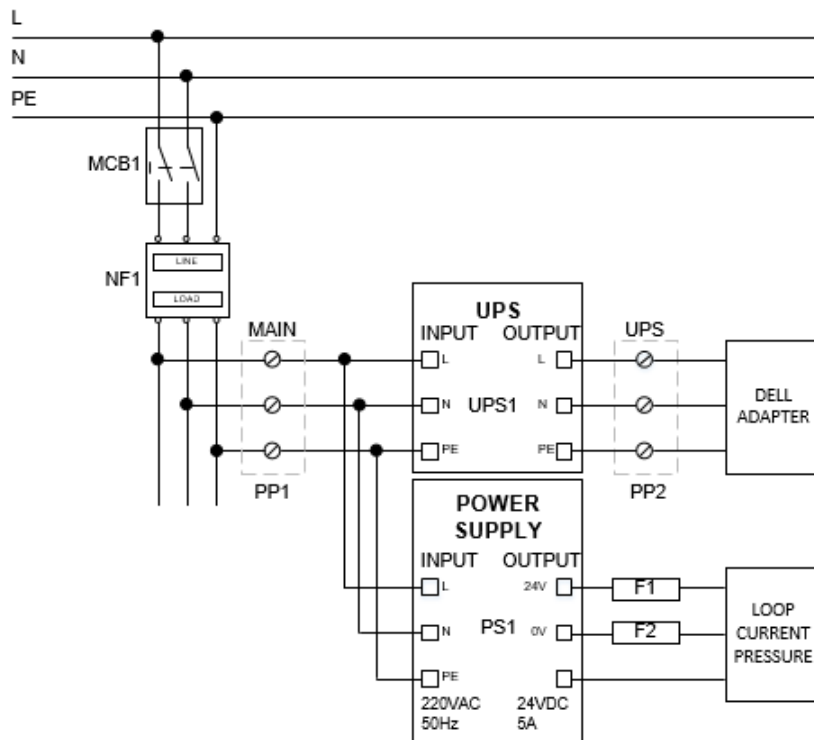
Nominal Input Voltage	100-240Vac	Nominal Output Voltage	24Vdc
Input Voltage Range	85-264Vac	Factory Set Point Tolerance	24Vdc ± 2%
Nominal Input Frequency	50-60Hz	Output Voltage Adjustment Range	22-28Vdc
Input Frequency Range	47-63Hz	Output Current	5.00A (continuously operating at 24V) 7.50A (Power Boost for 3 seconds at 24V, refer to the details in the Functions section)
DC Input Voltage Range*	120-375Vdc	Output Power	120W (continuously operating at 24V) 180W (Power Boost for 3 seconds at 24V, refer to the details in the Functions section)
Input Current	< 1.40A @ 115Vac, < 0.80A @ 230Vac	Dimensions (L x W x D)	121 x 50 x 118.7 mm (4.76 x 1.97 x 4.67 inch)
Efficiency at 100% Load	> 86.0% @ 115Vac, > 87.0% @ 230Vac	Unit Weight	0.54 kg (1.19 lb)
Max Inrush Current (Cold Start)	< 80A @ 115Vac, < 150A @ 230Vac		
Power Factor at 100% Load	> 0.98 @ 115Vac, > 0.87 @ 230Vac		
Leakage Current	< 1mA @ 240Vac		

Dimensions

L x W x D: 121 x 50 x 118.7 mm (4.76 x 1.97 x 4.67 inch)



Circuit Diagram



Hardware Detail

[5] Gateway Module for Chiller Data & Communication Link

Technical Data

The Dell Edge Gateway 5000/5100 series allows you to connect to network enabled devices wired or wirelessly, and manage them remotely in your existing network ecosystem. The system can also be mounted on the wall using the Dell approved wall mount kit or mounted into your existing rack infrastructure using the DIN-rail mounting bracket. The system runs on Windows 10 Enterprise, Ubuntu Snappy, or the Wind River Linux operating systems. As part of a complete interoperable building automation system, the Edge Gateway provides precise monitoring and control of connected points. The I/O expansion module provides the Edge Gateway with extra inputs and an output module. The power expansion module provides the Edge Gateway with power redundancy options by allowing you to connect a 24V AC/DC, a 19.5V DC, and a battery back up simultaneously.

If the Edge Gateway is set up as a web server, it offers the capability for configuration from a web browser. Configure I/Os, set up objects, and monitor present values from a browser.

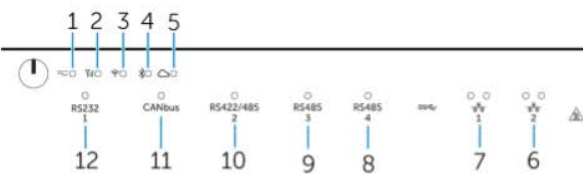
Dimensions

Dimensions and weight

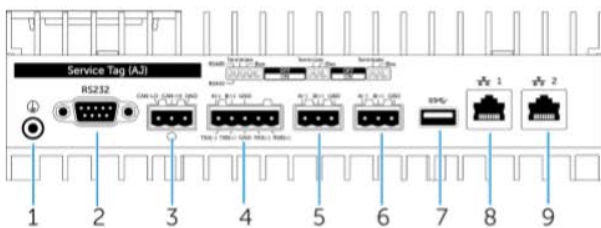
Height: 8.5" (216 mm)| Width: 9" (229 mm)| Depth: 2.5" (64 mm)
 Weight: Starting at 3.0kg



Module Operations



- | | | |
|---|--|--|
| <ol style="list-style-type: none"> 1 2 3 4 5 6 7 8 9 10 11 12 | <ol style="list-style-type: none"> Power status LED Mobile broadband status LED Wireless status LED Bluetooth status LED Cloud connection status LED Network status LED Network status LED RS485 port status LED RS485 port status LED RS422/485 port status LED CANbus port status LED Serial port status LED | <p>Indicates the power-state of the system.</p> <p>Indicates the mobile broadband status and network activity.</p> <p>Indicates the wireless connectivity status and network activity.</p> <p>Indicates the Bluetooth status and activity.</p> <p>Indicates the cloud connection status.</p> <p>Indicates the connectivity status and network activity.</p> <p>Indicates the connectivity status and network activity.</p> <p>Provides the status of the RS485 port connections.</p> <p>Provides the status of the RS485 port connections.</p> <p>Provides the status of the RS422/485 port connections.</p> <p>Provides the status of the CANbus port connection.</p> <p>Provides the status of the serial port connection.</p> |
|---|--|--|



- | | | |
|---|--|---|
| <ol style="list-style-type: none"> 1 2 3 4 5 6 7 8 9 | <ol style="list-style-type: none"> Earth ground Serial port CANbus port RS422/485 port RS485 port RS485 port USB 3.0 port Network port Network port | <p>Connect the grounding cable to the system.</p> <p>Connect to a serial port enabled device such as a printer.</p> <p>Connect to a CANbus port enabled device or dongle.</p> <p>Connect a RS422/485 device.</p> <p>Connect a RS485 device.</p> <p>Connect a RS485 device.</p> <p>Connect a USB 3.0 device.</p> <p>Connect an Ethernet (RJ45) cable from a router or modem for network or internet access.</p> <p>Connect an Ethernet (RJ45) cable from a router or modem for network or internet access.</p> |
|---|--|---|

NOTE: For more details about the DIP switches on the bottom of the system, see [DIP switches](#).

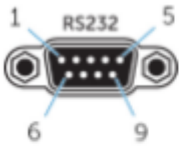
NOTE: For RS422 and RS485:

- Termination is 120-ohms between the members of the differential pair when enabled.
- Bias is 4.7k pull-up (5V) / pull-down (Gnd) when enabled.

Hardware Detail

Module Operations

Serial port (RS232) connector mapping



Pin	Signal	Pin	Signal
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

NOTE: This is a standard serial port connector.

RS485 connector mapping



Pin	Signal
1	A(-)
2	B(+)
3	GND

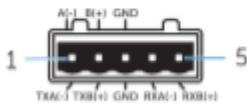
Manufacturer part number

Molex 359530-5503

<https://www.molex.com/>

NOTE: This part number is for reference only and is subjected to change.

RS422/485 connector mapping



Pin	Signal
1	TXA(-) / A(-)
2	TXB(+)
3	GND
4	RXA(-)
5	RXB(+)

Manufacturer part number

Molex 359530-5505

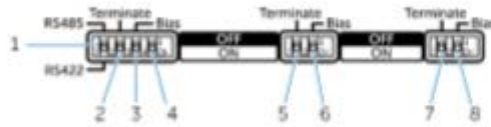
<https://www.molex.com/>

NOTE: This part number is for reference only and is subjected to change.

Hardware Detail

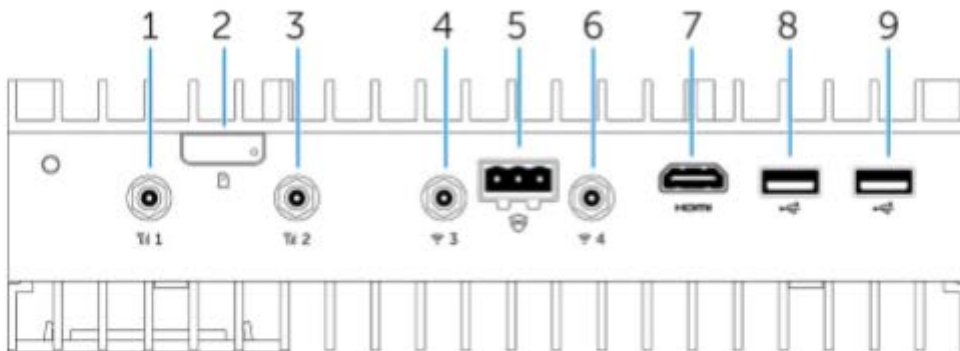
Module Operations

System—Bottom (DIP switches)



Feature

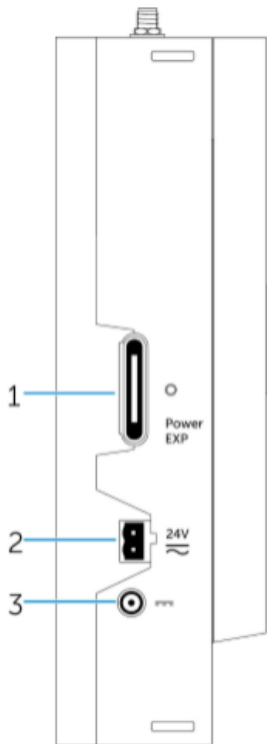
1	RS422/RS485 port toggle switch	Toggle between RS422 or RS485 standard.
2	RS422/RS485 port resistor switch	Enable/disable the differential termination resistor.
3	RS422/RS485 port bias resistor switch	Enable/disable the bias resistor for the RS422/RS485 port.
4	ePSA diagnostic switch	When the position of the switch changes, the system starts in ePSA (Enhanced Preboot System Assessment) mode on the next start.
5	RS485 port resistor switch	Enable/disable the differential termination resistor for RS485.
6	RS485 port bias resistor switch	Enable/disable the bias resistor for the RS485 port.
7	RS485 port resistor switch	Enable/disable the differential termination resistor for RS485.
8	RS485 port bias resistor switch	Enable/disable the bias resistor for the RS485 port.



1	Mobile broadband antenna port (port one)	Connect an antenna to increase the range and strength of the mobile broadband signals.
2	Micro-SIM card slot	Insert a micro-SIM card to connect to a mobile broadband network.
3	Mobile broadband antenna port (port two)	Connect an antenna to increase the range and strength of the mobile broadband signals.
4	Wi-Fi antenna port (port three)	Connect an antenna to increase the range and strength of Wi-Fi signals.
5	Intrusion detection connector	Connect an intrusion detection switch to detect any intrusion into the optional Rugged Enclosure.
6	Wi-Fi antenna port (port four)	Connect an antenna to increase the range and strength of Wi-Fi signals.
7	HDMI port	Connect a monitor or other HDMI device. Provides video and audio output. Hot-plugging is supported on Windows 10 and Ubuntu only.
8	USB 2.0 port	Connect a USB 2.0 device.
9	USB 2.0 port	Connect a USB 2.0 device.

Hardware Detail

Module Operations



Features

1	Power module expansion port	Connect an external power module for increased power options.
2	24 V AC/DC power Phoenix connector	Connect an 24 V AC/DC power connector to provide power to your system.
3	19.5 V DC power adapter port	Connect a 19.5 V DC power adapter connector to provide power

24 V AC/DC power port

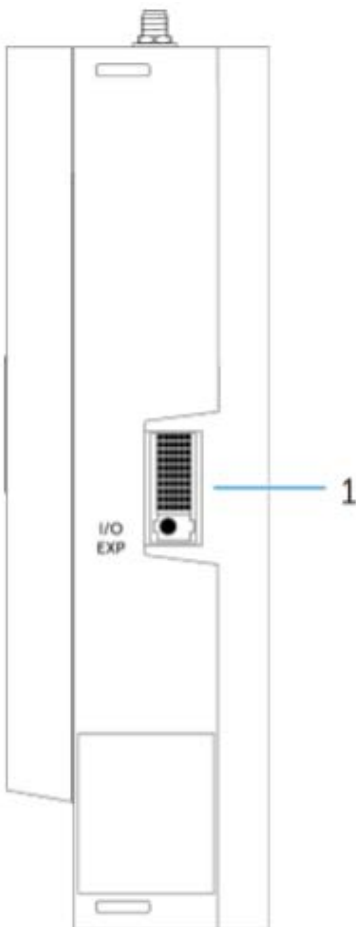


Pin	Polarity
1	AC/DC-IN
2	Positive/Negative

19.5 V DC power adapter port



Pin	Polarity
1	DC Negative
2	DC Positive



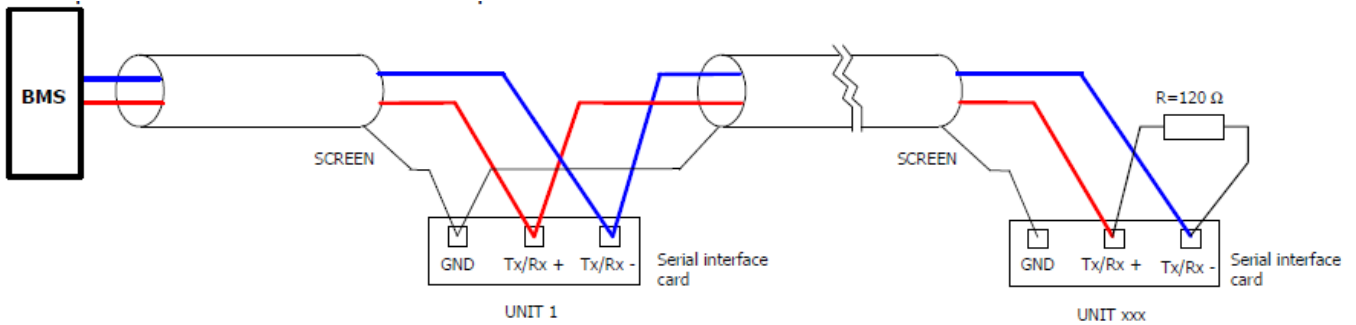
Features

1	IO expansion port	Connect an external expansion module for additional IO ports.
---	-------------------	---

Hardware Detail

[5] Gateway Module for Chiller Data & Communication Link

Communication Link



BMS/Modbus Module

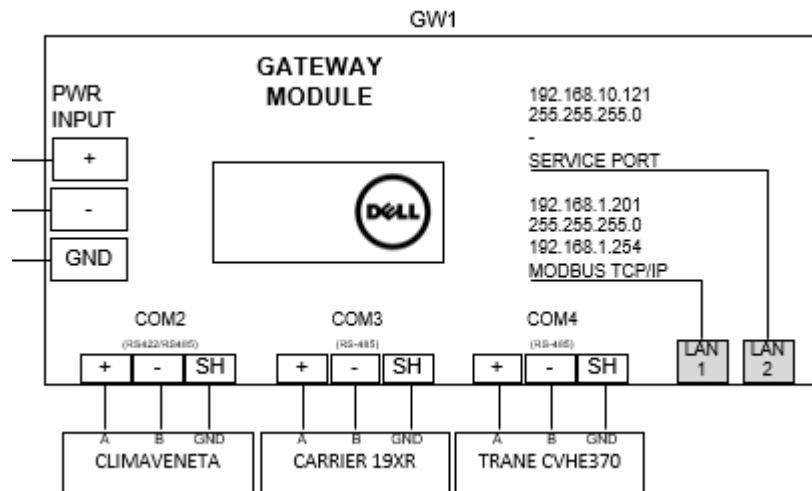


Parameters Setting

<p>En. from dig. input: On/Off: N Chiller/HP: N</p>	<p>Enables external signals.</p>
<p>Serial line configuration: Supervision</p>	<p>Communication towards a supervisor system <u>must</u> be enabled.</p>
<p>Superv. enable: On/Off: Y Operating mode: Y</p>	<p>Selects the on/off status and changes the operating mode of the unit through a supervision system. Supervisor enables <u>must</u> be set as shown to the left:</p> <ul style="list-style-type: none"> On/off enable: Yes Operating mode enable Yes
<p>Serial setting Protocol Modbus Speed 9600 baud ID 011</p>	<p>Protocol: Modbus / Standard Communication speed: from 1200 baud to 19200 baud Unit ID: from 001 to 200</p>

Hardware Detail

Circuit Diagram



Data Register

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
001	000	B		NOT MANAGED
002	001	B	OUT	Unit status (0:Off - 1:On)
004	003	B	OUT	Evaporator pump 1 status (0:Off - 1:On)
005	004	B	OUT	Evaporator pump 2 status (0:Off - 1:On)
006	005	B	OUT	Recuperator pump status (0:Off - 1:On)
007	006	B	OUT	Condenser pump status (0:Off - 1:On)
008	007	B	OUT	Status of secondary pump for water/water unit with water side reversal (0:Off - 1:On)
009	008	B	IN / OUT	On/Off command from supervisor (0:Off - 1:On)
010	009	B	IN / OUT	System clock modification. If this bit is set to 1, the system clock is updated with the content of the whole variables at address 25 and 26-
011	010	B	IN / OUT	Enable time band settings from supervisor
012	011	B	OUT	Enable operating mode change from supervisor

Hardware Detail

Data Register

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
40001	000	A		NOT MANAGED
40002	001	A	IN / OUT	Chiller temperature setpoint
40003	002	A	IN / OUT	Heat pump temperature setpoint
40004	003	A	IN / OUT	Recovery setpoint
40005	004	A	IN / OUT	Temperature adjustment band
40006	005	A	IN / OUT	Recovery adjustment band
40007	006	A	OUT	Evaporator inlet temperature
40008	007	A	OUT	Evaporator outlet temperature (average)
40009	008	A	OUT	Condenser inlet temperature
40010	009	A	OUT	Condenser outlet temperature (average)
40011	010	A	OUT	Recuperator inlet temperature
40012	011	A	OUT	Recuperator outlet temperature
40013	012	A	OUT	High pressure transducer 1
40014	013	A	OUT	High pressure transducer 2
40015	014	A	OUT	High pressure transducer 3
40016	015	A	OUT	High pressure transducer 4
40017	016	A	OUT	Low pressure transducer 1
40018	017	A	OUT	Low pressure transducer 2
40019	018	A	OUT	Low pressure transducer 3
40020	019	A	OUT	Low pressure transducer 4
40021	020	A	OUT	External air temperature
40022	021	A	OUT	Optional temperature
40023	022	A	OUT	Freecooling inlet temperature
40041	040	A	OUT	Percentage of demand (x10) to centrifuge compressor 1
40042	041	A	OUT	Percentage of demand (x10) to centrifuge compressor 2
40043	042	A	OUT	Percentage of demand (x10) to centrifuge compressor 3
40044	043	A	OUT	Percentage of demand (x10) to centrifuge compressor 4
40045	044	A	OUT	Power in KW of demand (x10) to centrifuge compressor 1
40046	045	A	OUT	Power in KW of demand (x10) to centrifuge compressor 2
40047	046	A	OUT	Power in KW of demand (x10) to centrifuge compressor 3
40048	047	A	OUT	Power in KW of demand (x10) to centrifuge compressor 4
40049	048	A	OUT	Power in KW absorbed (x10) to centrifuge compressor 1
40050	049	A	OUT	Power in KW absorbed (x10) to centrifuge compressor 2
40051	050	A	OUT	Power in KW absorbed (x10) to centrifuge compressor 3
40052	051	A	OUT	Power in KW absorbed (x10) to centrifuge compressor 4
40053	052	A	OUT	IGV percentage position (x10) of centrifuge compressor 1
40054	053	A	OUT	IGV percentage position (x10) of centrifuge compressor 2
40055	054	A	OUT	IGV percentage position (x10) of centrifuge compressor 3
40056	055	A	OUT	IGV percentage position (x10) of centrifuge compressor 4
40057	056	A	OUT	Inlet pressure in barg (x10) inside centrifuge compressor 1
40058	057	A	OUT	Inlet pressure in barg (x10) inside centrifuge compressor 2
40059	058	A	OUT	Inlet pressure in barg (x10) inside centrifuge compressor 3
40060	059	A	OUT	Inlet pressure in barg (x10) inside centrifuge compressor 4
40061	060	A	OUT	Inlet temperature (x10) of centrifuge compressor 1
40062	061	A	OUT	Inlet temperature (x10) of centrifuge compressor 2
40063	062	A	OUT	Inlet temperature (x10) of centrifuge compressor 3
40064	063	A	OUT	Inlet temperature (x10) of centrifuge compressor 4
40065	064	A	OUT	SCR temperature (x10) of centrifuge compressor 1

Hardware Detail

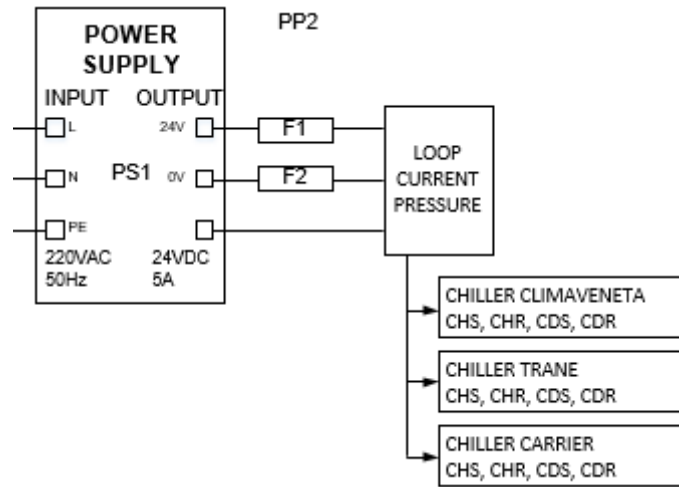
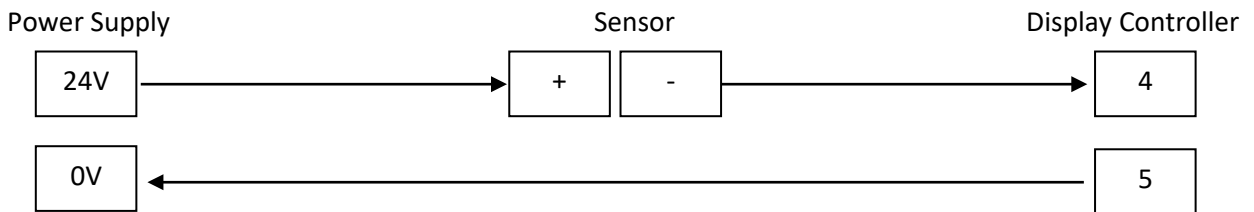
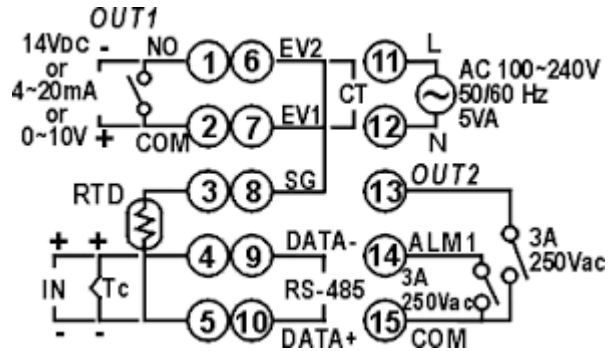
Data Register

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
40066	065	A	OUT	SCR temperature (x10) of centrifuge compressor 2
40067	066	A	OUT	SCR temperature (x10) of centrifuge compressor 3
40068	067	A	OUT	SCR temperature (x10) of centrifuge compressor 4
40069	068	A	OUT	Outlet temperature (x10) of centrifuge compressor 1
40070	069	A	OUT	Outlet temperature (x10) of centrifuge compressor 2
40071	070	A	OUT	Outlet temperature (x10) of centrifuge compressor 3
40072	071	A	OUT	Outlet temperature (x10) of centrifuge compressor 4
40073	072	A	OUT	Cavity temperature (x10) of centrifuge compressor 1
40074	073	A	OUT	Cavity temperature (x10) of centrifuge compressor 2
40075	074	A	OUT	Cavity temperature (x10) of centrifuge compressor 3
40076	075	A	OUT	Cavity temperature (x10) of centrifuge compressor 4
40077	076	A	OUT	Inverter temperature (x10) of centrifuge compressor 1
40078	077	A	OUT	Inverter temperature (x10) of centrifuge compressor 2
40079	078	A	OUT	Inverter temperature (x10) of centrifuge compressor 3
40080	079	A	OUT	Inverter temperature (x10) of centrifuge compressor 4
40081	080	A	OUT	Compression ratio (x10) of compressor 1 (absolute HP of transducer / LP of compressor)
40082	081	A	OUT	Compression ratio (x10) of compressor 2 (absolute HP of transducer / LP of compressor)
40083	082	A	OUT	Compression ratio (x10) of compressor 3 (absolute HP of transducer / LP of compressor)
40084	083	A	OUT	Compression ratio (x10) of compressor 4 (absolute HP of transducer / LP of compressor)

Hardware Detail

Pressure Sensor Diagram

Circuit Diagram



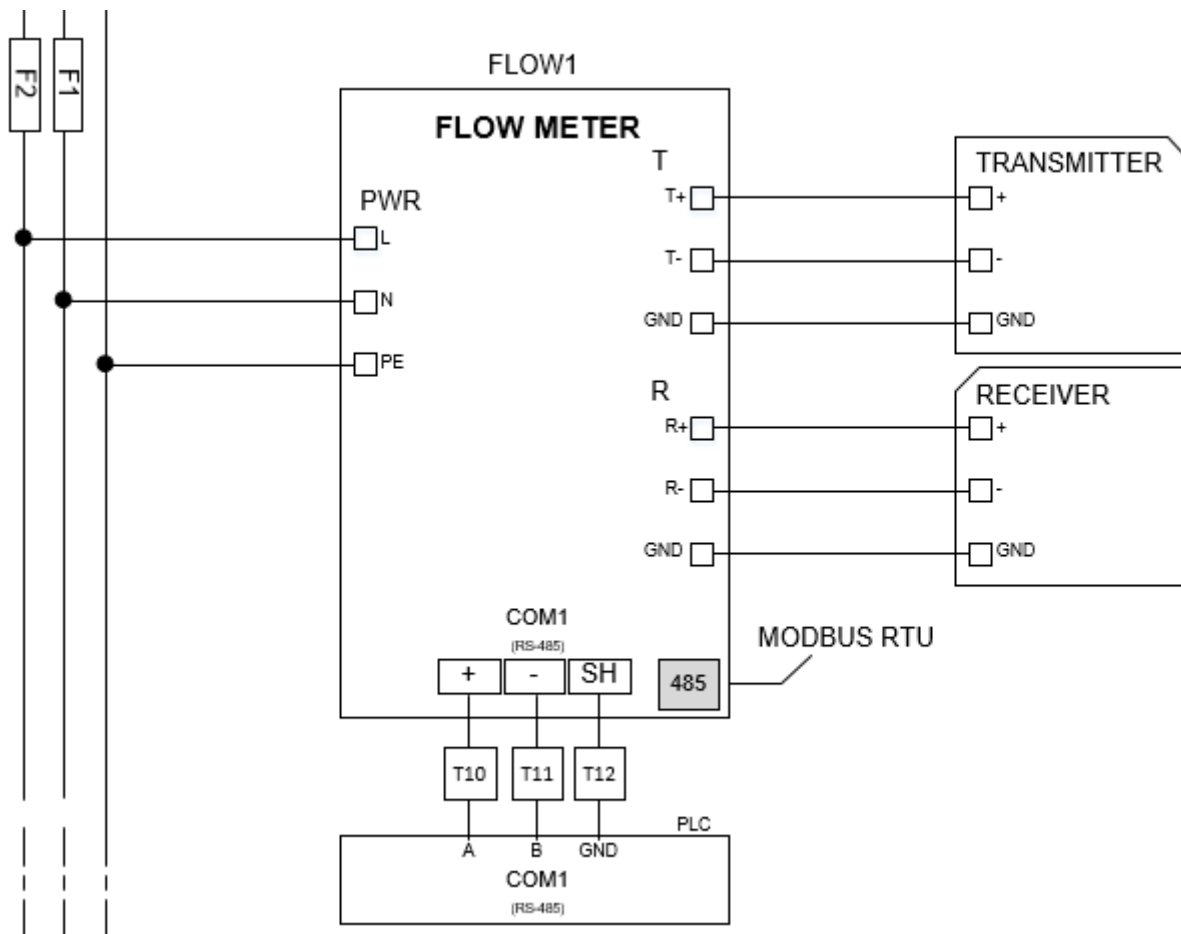
Hardware Setup



Hardware Detail

Flow Water Meter Diagram

Circuit Diagram



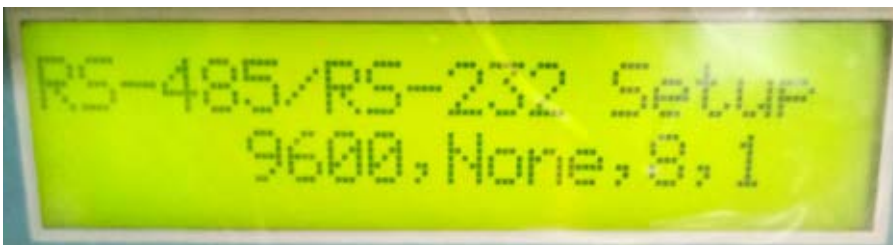
Data Register

MODBUS register address table

register	Numbe rs of register	Variable name	Data type	discription
0001-0002	2	Instant flow rate	REAL4	unit: m ³ /hour
0009-0010	2	positive totaliser flow	LONG	all the flow totalisers that use long integers,its measure is controlled by M32(REG1438)

Hardware Detail

Hardware Setup



NOTE*

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

- THANK YOU -