DAIKIN

HERO
PRO EDGE

DAIKIN *HERO* PRO EDGE

CLOUD-BASED CENTRAL CONTROLLER

The **Daikin** *HERO* **Pro Edge** is a **cloud-based** *VRV* **central controller** that offers real-time remote control and monitoring, advanced analytics, and dashboard.

Daikin *HERO* Pro Edge

The Daikin *HERO* Pro Edge is a cloud-based *VRV* central controller that offers real-time remote control and monitoring, advanced analytics, and dashboard. The Daikin *HERO* Pro Edge can monitor and control the Daikin *VRV* system, Mini/Multi-split units, Daikin Applied Rooftop Units and ancillary equipment. The *HERO* Cloud Services has the ability to visualize each building's connected systems via the *HERO* Pro Edge. Daikin *HERO* Cloud Services is based upon a recurring license fee to access site information. The Daikin *HERO* Pro Edge includes first-year access to Daikin *HERO* Cloud Services for monitoring and control, licenses can be renewed in 1-year, 3-year or 5-year increments.

Easy Operation

» Remote monitoring for Daikin *VRV* outdoor and indoor unit operation data across multiple sites

» Accessible any time and from anywhere through the Daikin *HERO* Cloud Services web page or app

» Intuitive, customizable dashboard provides quick status of connected units and sites

» Animated piping diagram based on system mode of operation

Advanced Control Logic

» Independent cool and heat setpoints or single setpoint in the occupied period

» Independent setback setpoints in the unoccupied period

» Weekly schedule with optimum start and timed override

» Auto changeover with configurable methods

Operational Data

» Operation data is stored in the Daikin *HERO* Cloud in 1 minute intervals and stored for 5 years with the Daikin *HERO* Pro Edge activation.

– Indoor unit and outdoor unit operation data

– BACnet™ Client objects

– WAGO® I/O system data

» Operation data can be viewed in the Daikin *HERO* Cloud or downloaded as CSV files

Mini BMS Solution with Software and Hardware Options

» Auto changeover, interlock, schedule and emergency stop for facility management.

» DI, DO, AI, AO points integrated via the *WAGO*® *I/O* System

» *BACnet* points (AI, AO, AV, BI, BO, BV, MSI, MSO, MSV) integrated with the Daikin *HERO* Pro Edge *BACnet* Client Option

Facility Management and Billing

» Remote web or app access

» Continuous commissioning by remotely adjusting the outdoor unit field settings

» Tenant billing with the Daikin *HERO* Pro Edge Power Proportional Distribution (PPD) option

» Demand control capabilities to set setpoint shift, control thermo-on/off or outdoor unit capacity based upon schedule setting

Prediction logic and Notifications

» Utilizes predictive algorithms to alert users of potential failures

» Prediction alerts can be accessed on the Daikin *HERO* Cloud dashboard and are also distributed through email

HERO
CLOUD SERVICES

Internet

BACnet / IP

DOAS and other
third-party system

3 DO

Fan

8 Di

kWh meter

Remote
monitoring

RS485

WAGO I/O

Lighting   Fan

Pump   Sensor

Up to 64 indoor units /
7 outdoor units

Up to 64 indoor units /
7 outdoor units

Add up to 6 additional
DIII-Net systems. Each
DIII-Net system can
support up to a
maximum of 64 indoor
units / 7 outdoor units.

512 indoor units / 56 outdoor units

Features

» View all equipment from a single portal.

» High level overview of all units on site, Offline Units, Error, Warnings, Cautions and Predictions.

» Be aware of current equipment alarm states and operational condition.

  – Access to detailed alarm information through the Alarm tab

» The licenses widget displays a list of site names along with their license terms, emphasizing those sites that have an expiration date within the next 30 days or have already expired.
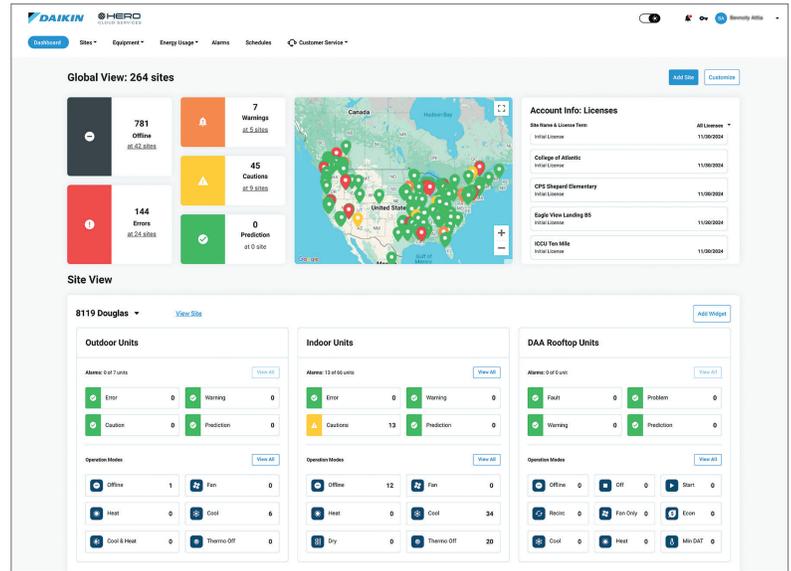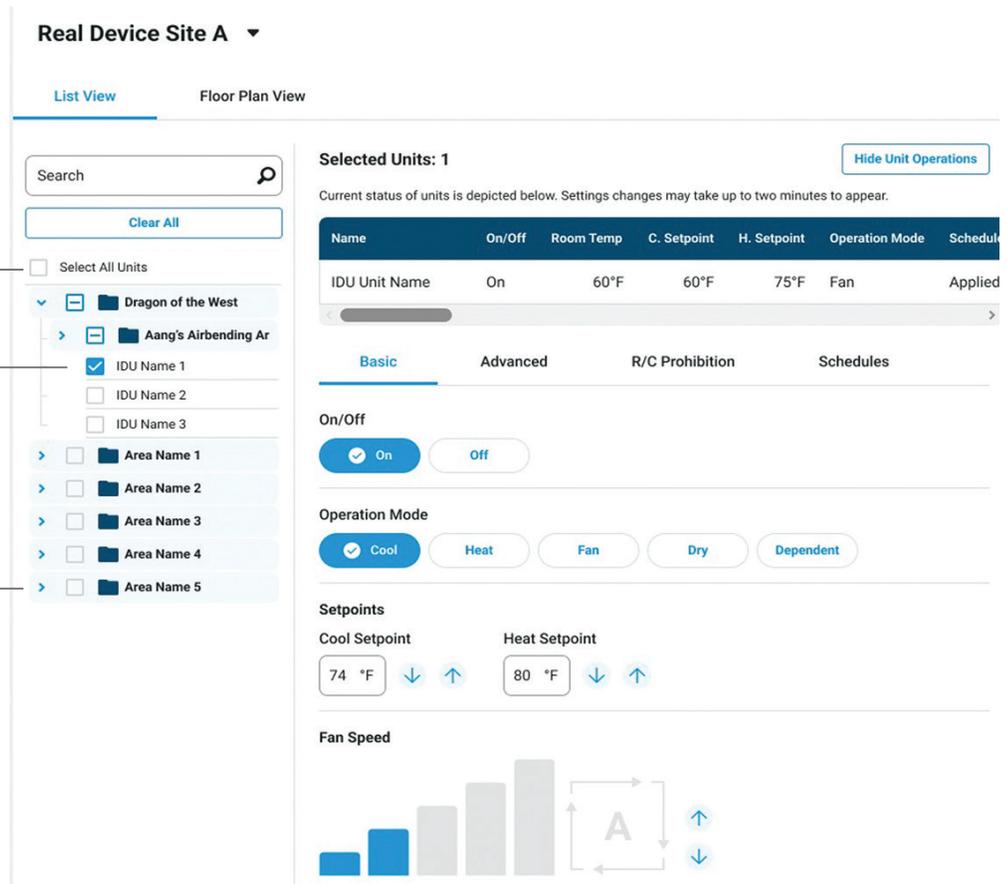

Equipment Control

The intuitive menu will enable even a novice user to be proficient in managing the Daikin *VRV* system and non-*VRV* connected equipment.

Global Control
Perform global controls on all equipment at a site

Unit Control
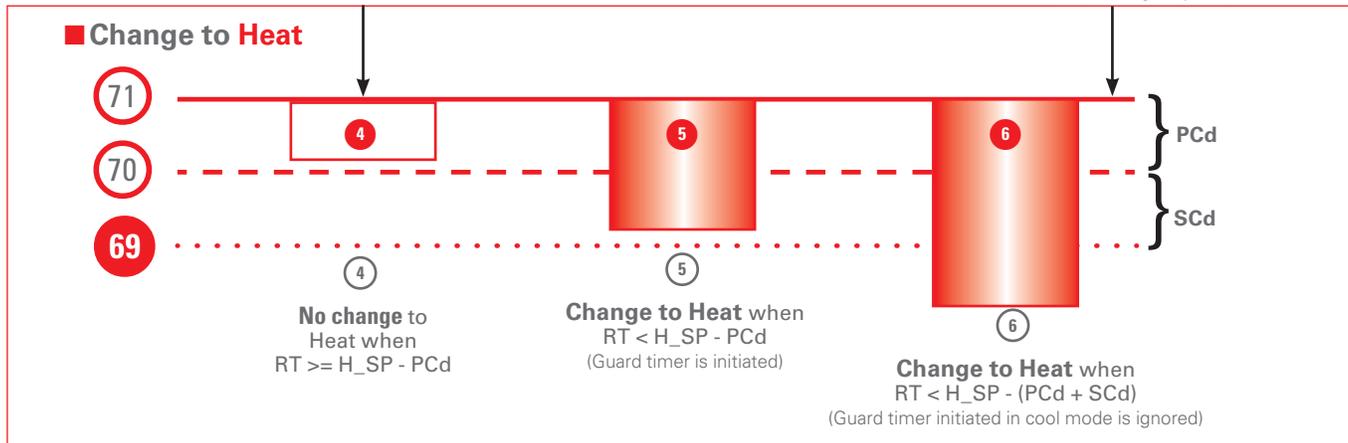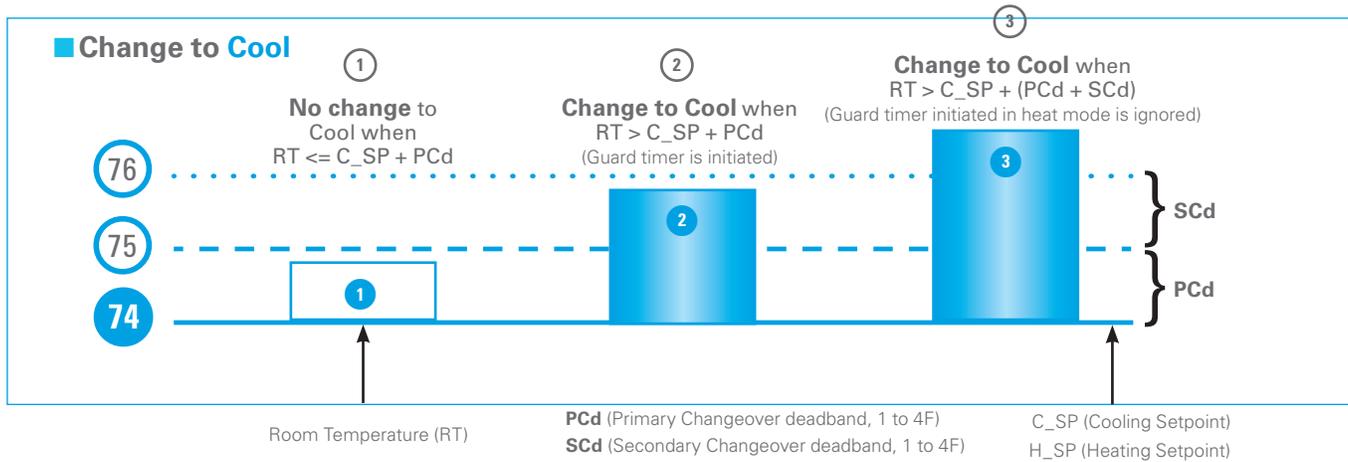Perform unit controls on an individual unit at a site

Zone Control
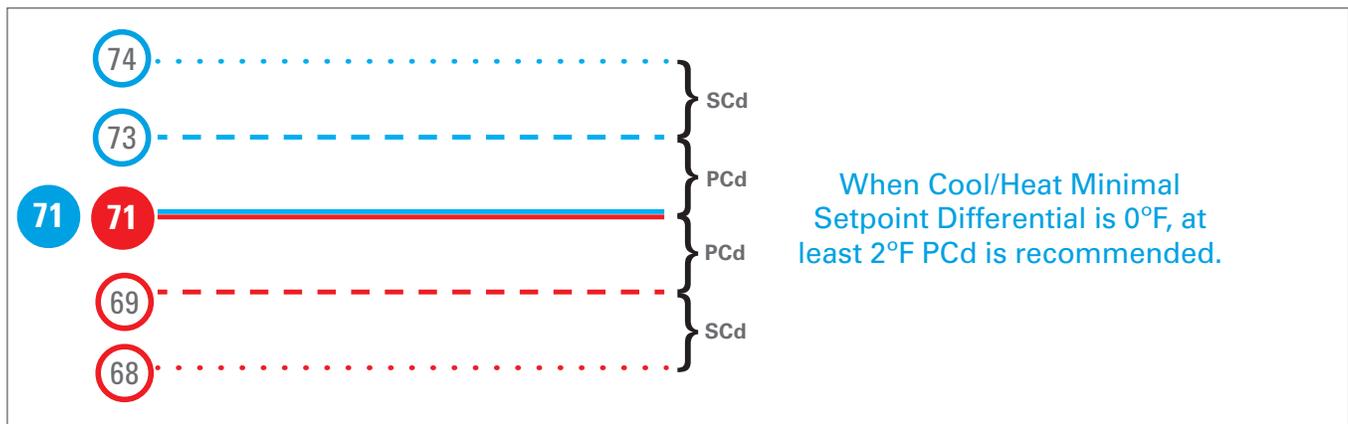Perform unit controls on a group of units at a site

The Daikin *HERO* Pro Edge extends the Auto Changeover capabilities based on cooling or heating demand.

The changeover is evaluated by how much the room temperature has deviated from the cooling or heating setpoint. For example, when the room temperature exceeds the primary changeover deadband from the cooling setpoint, *iTM* initiates a change from the heating mode to the cooling mode.

The changeover deadbands can be configured to the minimum of 1˚F or to a maximum of 4˚F.

■**Change to Cool**

① No change to Cool when RT <= C_SP + PCd

② **Change to Cool** when RT > C_SP + PCd (Guard timer is initiated)

③ **Change to Cool** when RT > C_SP + (PCd + SCd) (Guard timer initiated in heat mode is ignored)

76
75
74

} SCd
} PCd

Room Temperature (RT)

PCd (Primary Changeover deadband, 1 to 4F)
SCd (Secondary Changeover deadband, 1 to 4F)

C_SP (Cooling Setpoint)
H_SP (Heating Setpoint)

■**Change to Heat**

71
70
69

} PCd
} SCd

④ **No change** to Heat when RT >= H_SP - PCd

⑤ **Change to Heat** when RT < H_SP - PCd (Guard timer is initiated)

⑥ **Change to Heat** when RT < H_SP - (PCd + SCd) (Guard timer initiated in cool mode is ignored)

» The guard timer prevents another changeover for 15, 30 or 60 minutes (configurable).

» When the setpoint is changed manually or by the schedule, the guard timer is not active.

74
73
71 71
69
68

} SCd
} PCd
} PCd
} SCd

When Cool/Heat Minimal Setpoint Differential is 0ºF, at least 2ºF PCd is recommended.

Auto Changeover is applicable to both Daikin *VRV* Heat Pump and Heat Recovery systems.

The Daikin *HERO* Pro Edge provides four changeover methods to meet a variety of expectations in your project. Fixed, Individual, Average or Vote methods can be specified in the changeover group with targeted indoor units as well as Primary / Secondary Changeover deadbands.

Fixed method

» Changeover is evaluated with the representative indoor unit.

» Changeover affects all indoor units.

» Good for prioritizing the representative indoor unit for the Heat Pump system (or multiple units on the same port of the BS Box in Heat Recovery system).

Individual method

» Changeover is evaluated with, and affects each indoor unit individually.

» Good for Hotel / Nursing home application with the Heat Recovery system.

Average method (Weight 0 to 3 on each indoor unit is multiplied in averaging)
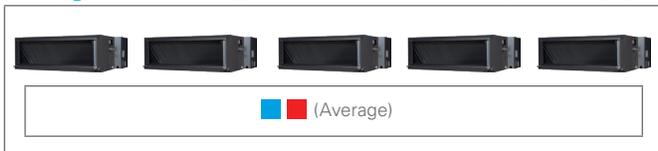
(Average)

■ = **Cool Mode**   ■ = **Heat Mode**

» Changeover is evaluated with the average of room temperature and setpoints.

» Changeover affects all indoor units.

» Good for Open office application with Heat Pump system (or multiple units on the same port of the BS Box in Heat Recovery system).

Vote method (Weight 0 to 3 on each indoor unit is multiplied for the demand)
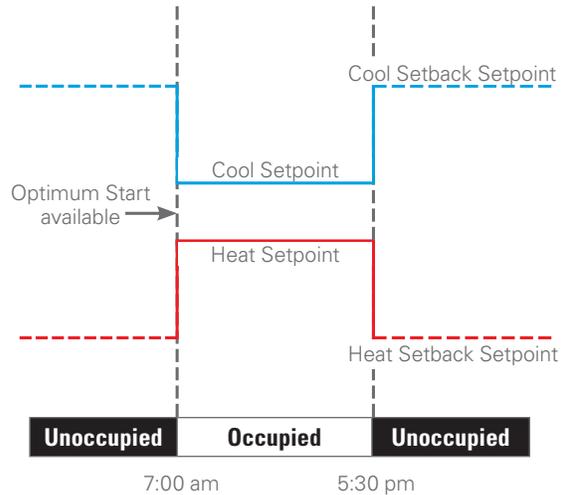
Cool demand
No demand
Cool demand
Heat demand
Heat demand
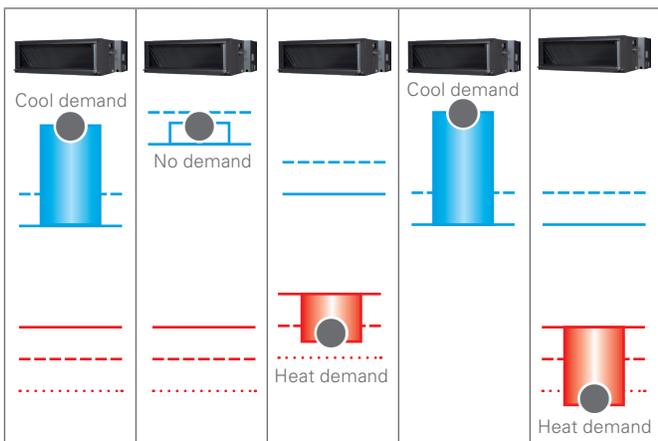
» Option available for heating override if there is an indoor unit which the heating demand exceeds (H_SP – (PCd + SCd))

» Changeover is evaluated based upon total cooling demand and total heating demand. If the total cooling demand is greater than the total heating demand (like the figure left), the *iTM* changes the indoor units in the changeover group to cooling mode.

» When the changeover group is in cooling mode the total cooling demand will be decreased, at that point the total heating demand may become greater than the cooling demand and change the mode to heating (a guard timer applies).

» The setpoints can be different in each indoor unit within the changeover group. The demand is calculated based on the setpoints in comparison to room temperature for each indoor unit. The demand within the Primary Changeover deadband (PCd) is considered as no demand.

» Good for the Heat Pump system (or multiple units on the same port of the BS Box in Heat Recovery system) as pseudo simultaneous cooling and heating operation.

» A weight (0-3) can be added to each indoor units demand in the changeover group. The default is 1.

Weekly Schedule with dual setpoints for the occupied period and Setback setpoints for the unoccupied period provides year-round schedule programming.

- » **Control Event –** used to set on/off, mode, setpoints, etc.
- » **IDU Energy Savings Event –** Reduce energy usage of the IDU by adjusting setpoint to meet Critical Peak Pricing events.
- » **Exception day programmin**g can be specified on calendar as a specific day (like Jan 1st) or a floating day (like 1st Monday in September).
- » **Timer Extension** offers 30 to 180 minutes (configurable) Override in the unoccupied period.

Typical Weekday Office Schedule

Cool Setback Setpoint

Cool Setpoint

Optimum Start available →

Heat Setpoint

Heat Setback Setpoint

| **Unoccupied** | **Occupied** | **Unoccupied** |

7:00 am   5:30 pm

Schedules

[Add Schedule]

Real Device Site 1 ▾

View Schedule For: [Area ▾]   [Area A ▾]

[Today]   ‹   ›   **6/08/2023** ▾   [Week ▾]

▮ Controls Event   ▮ IDU Energy Savings Event   ▮ Exception

Sunday 8

Events: ▮ 1   ▮ 1   ▮ 1

Timezone: Central Time

12 AM 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM

Schedule_Name: IDU Energy Savings Event

Schedule_Name: Controls Event

Monday 9

Events: ▮ 1   ▮ 1   ▮ 1

Timezone: Central Time

12 AM 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM

Schedule_Name: Controls Event

Schedule_Name: IDU Energy Savings Event

» The Daikin *HERO* Cloud enables remote management for the Daikin *VRV* system with other general equipment integrated into the Daikin *HERO* Pro Edge so they can be accessed from the daikinhero.com or the Daikin *HERO* Cloud Services App.

» The Daikin *HERO* Cloud Service is a powerful remote service tool where the Daikin *VRV* operation data stored in the cloud for the last 5 years can be downloaded through the web function. Trend graphs of the system operation can be created allowing the service technicians to analyze and diagnose the system without visiting the job site. This feature will provide the service technician with a view into the Daikin *VRV* system operation and performance prior to or after an abnormal issue has occurred.

» Automatic Alert/Error e-mail enables prompt response by service personnel based on timely and precise knowledge of what happened in the system at the remote site.

» Access to data prior to and after alarm generation as the error marker with time stamp indicates when the error occurred. Also, the trend charts have the ability to trend up to 40 data points at a time for easy diagnostics.

Outdoor Unit Piping Diagram
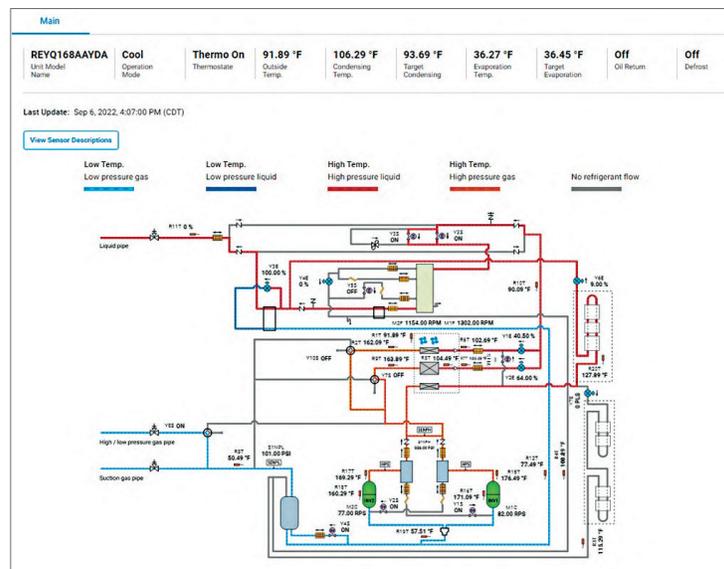
Trend Graph Data
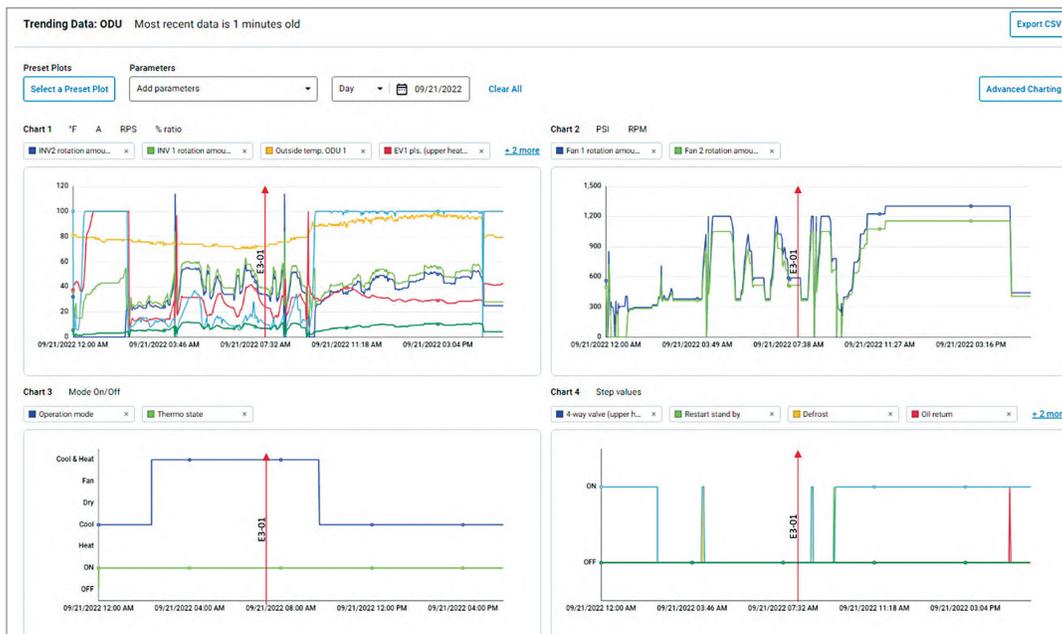
The PPD (Power Proportional Distribution) option records all the operation duration, room temperature, electronic expansion valve opening ratio data, etc. Based on the recorded data, the energy consumption of the Daikin *VRV* system is proportionally calculated for each indoor unit. The calculated data can be used for tenant billing.

Features

» PPD data can be downloaded using the Daikin *HERO* Cloud Service

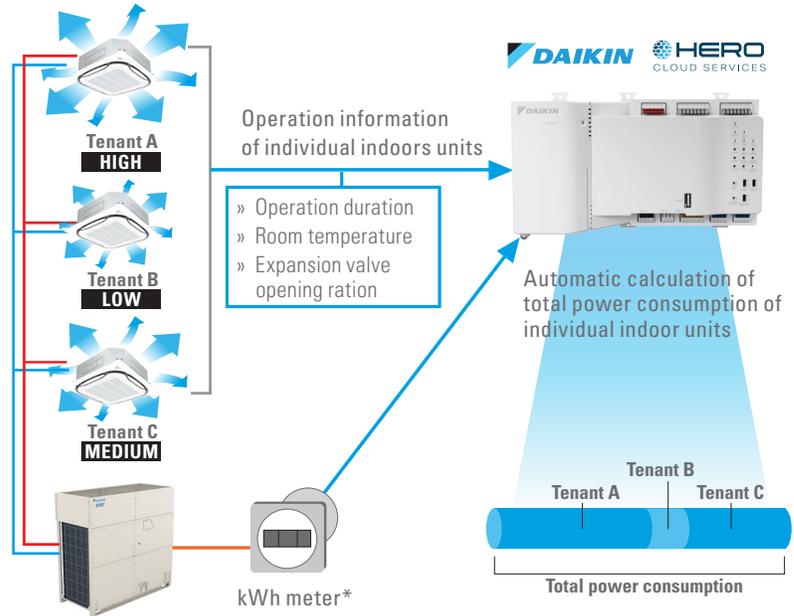» Automated Tenant reporting with smart notification to the facility manager

» Configure output of the Tenant Reports

   – Allows for company logo and info to be added.

   – Selectable start and end period

   – Provide cost per kWh, admin fees and determine if heating usages should be excluded from billing.

   – Separated cooling and heating energy calculation.

   – Select the type of file output.

» Send the tenant report by email.

Operation information of individual indoors units

» Operation duration
» Room temperature
» Expansion valve opening ration

Automatic calculation of total power consumption of individual indoor units

Tenant A — Tenant B — Tenant C

Total power consumption

kWh meter*

* Pulse power meter that provides an output of 1 pulse per 1 kw and has a width of 40-400 milliseconds.

Tenant	Associated IDUs	% ODU usage	% Meter	Heating Hours	Cooling Hours	Total Thermo On Hours	Monthly kWh	Sub-total Cost	Fees	Taxes	Total Cost
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
Apt. 204	4	26%	15%	450	2	452	1000	$150.00	$7.00	$999,999.00	$9,999,999.00
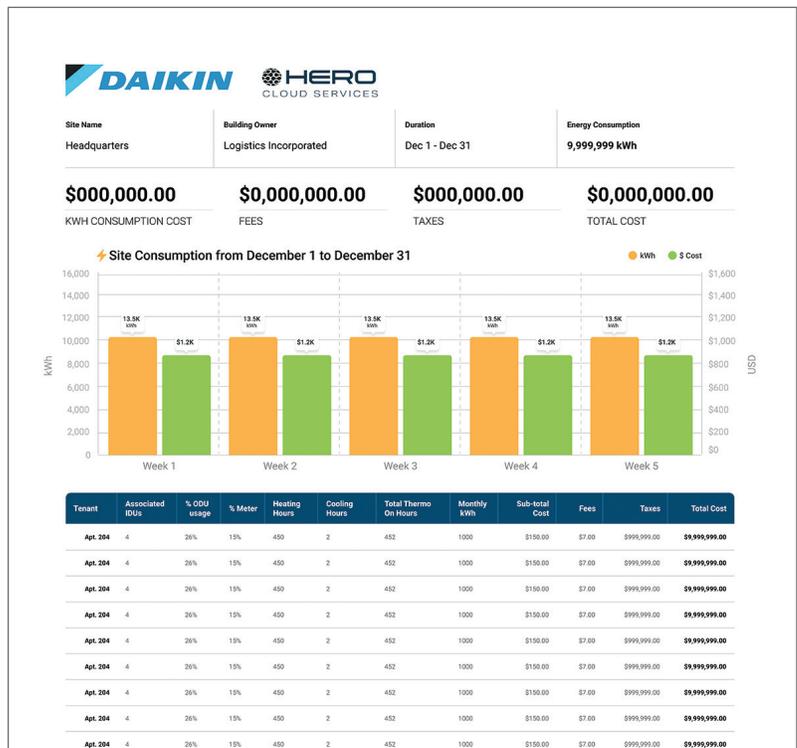
General equipment can be integrated with the Daikin *HERO* Pro Edge by using the WAGO® I/O modules. The general equipment can be monitored and controlled via interlock, manual operation, and schedule. The *WAGO* I/O Modules provide Digital Inputs (Di) for monitoring equipment status and alarms, Digital Outputs (Do) for On/Off control, Analog Outputs (Ao) for step control of fan speeds and damper opening and Analog Inputs (Ai) for temperature, humidity and CO_2 monitoring.

» ON/OFF operation and status monitoring

» Get Alert/Error e-mail upon malfunction

» Remote management using web function

Max. 64 indoor unit groups

Max. total length 1640 ft.   Max. 30 nodes

WAGO Node   *WAGO* Node

Lighting   Pump   Fan   Sensor   AHU, RTU

Web access via Internet

Interlock Variety

The Daikin *HERO* Pro Edge offers monitoring and control that extends beyond simply starting and stopping connected units. It also enables the *iTM* to control the HVAC and ancillary equipment through interlock control such as occupancy control and demand control ventilation.

Demand Control Ventilation

HVAC interlock based upon room occupancy status

Key control systems and occupancy sensors are employed to detect room occupancy status and automatically perform setback or stop operations for unoccupied rooms depending on settings.

Example 1

Key card status

Stop signal

Stop signal

Ventilation control

Ventilation equipment is controlled depending on the indoor CO_2 levels. Air conditioning losses attributed to unnecessary ventilation are reduced while maintaining appropriate indoor air quality and enabling energy savings.

Example 2

CO_2 level is low

CO_2 level is high

Ventilation fan speed is reduced

Ventilation fan speed is increased

Demand Control (Power Limit Control)

COMING 2025

Demand Control (Power Limit Control) is intended to limit power consumption of outdoor unit.

This function allows the control of *VRV* power consumption by combining indoor unit temperature setting shift control, indoor unit forced thermo-off, and outdoor unit capacity control to reduce energy consumption while minimizing impact on the controlled environment.

3rd party demand controller

Outdoor unit capacity control

Indoor unit setpoint shift

Indoor unit force thermo off

Emergency stop for localized fire protection areas

The Daikin *HERO* Pro Edge offers options to select areas or the whole system to interlock with the fire alarm system and to perform an emergency stop.

Fire alarm signal

Stops all indoor units

Or

Stops all indoor units in localized fire protection areas

BACnet Client Option

The Daikin *HERO* Pro Edge offers an advanced and cost-effective solution for Building Management Systems (BMS) applications. The *BACnet* Client Option provides more flexibility to enhance the Daikin *HERO* Pro Edge's function as a mini BMS. With this option, the Daikin *HERO* Pro Edge is able to manage third party DOAS and other third party equipment through the *BACnet* / IP protocol. By registering equipment connected to a *BACnet* server as management points in the Daikin *HERO* Pro Edge, you can now monitor and control the equipment from the Daikin *HERO* Cloud Service.

Features and Benefits:

» Cost-effective BMS solution

» Direct connection on Daikin *HERO* Pro Edge using the *BACnet*/IP Protocol

» Integrated control on Daikin *VRV* system and Daikin Applied System

» Monitors and controls third party equipment

» Daikin Light Commercial rooftop units (RTU) with *iLINQ* controller.Monitor and control Daikin Light Commercial rooftop units (RTU) with *iLINQ* controller.

» Monitors and controls third party equipment

BACnet Client (DGE009A71) can manage up to 10 *BACnet* devices; while the BACnet Client DGE009A72 can manage up to 50 *BACnet* devices.

MicroTech III   DOAS System   Oxygen8

Third Party *BACnet* Server

Pump   Lighting   Fan   Sensor

DIII-Net

Ethernet (*BACnet*/IP)

VRV System

DNA RTU with *iLINQ* controller

Object Types

» Analog Input, Analog Output, Analog Value

» Binary Input, Binary Output, Binary Value

» Multi-State Input, Multi-State Output, Multi-State Value

Applications

» Sensors, Pumps, Lights, Fans

» AHU, Alarms, DOAS, Elevator

» The *iTM* can integrate with the *WAGO BACnet*/IP Controller (750-832) using the *BACnet* Client Option

Specifications

		DAIKIN *HERO* PRO EDGE	PLUS ADAPTOR	PLUS ADAPTOR SLOT
Model		DGE601A71	DGM601A72	DGE601A53
Power supply		AC 24V 60Hz	AC 24V 60Hz	Powered by DGE601A72
Power consumption		23W maximum	23W maximum	N/A
Operating conditions	Surrounding temperature	14°F to 122°F	14°F to 122°F	14°F to 122°F
	Humidity	85% RH or less (w/o condensation)	85% RH or less (w/o condensation)	85% RH or less (w/o condensation)
Dimensions	H x W x D (inch)	9-3/64 x 3-13/64 x 5-3/4	3-13/16 x 3-13/64 x 5-3/4	63/64 x 3-13/64 x 5-3/4
Capacity	Max. number of indoor unit	128 addressed indoor unit groups (maximum 256 indoor units)	64 addressed indoor unit groups (maximum 128 indoor units)	64 addressed indoor unit groups (maximum 128 indoor units)
	Max. number of outdoor unit	14	7	7
Interface	F1F2 (Daikin *DIII-NET* communication)	2	1	1
	100Base-TX (Ethernet communication)	2 (RJ-45)	-	-
	RS-485 (for *iTM* Plus Adaptor connection)	1 (2-wire polarity sensitive)	1 (2-wire polarity sensitive)	N/A - Slot to DGE601A72
Input terminals	Di (Digital input for forced shutdown)	1	1	1
	Di/Pi (Digital/Pulse input)*	8	4	4
	Do (Digital Output)	3	-	-
EMC certification		FCC Class B	FCC Class B	FCC Class B

* Pulse input from KWh meter requirements: 1 pulse to 1kWh or 10kWh. Pulse width must be between 40-400 msec. Non voltage, normally open semi-conductor type.

Summary of Functions

CATEGORY	FUNCTION	REMARKS
Connectivity	Plus Adaptor	Maximum number of adaptors: 6
	Management points	Maximum number of management points:1000
		Maximum number of indoor unit management points: 512
		Maximum number of outdoor unit management points: 56
Automatic Control	Schedule	Maximum number of programs: 25
		Up to 20 actions/day can be set
	Interlock	Maximum number of programs: TBD
	Emergency Stop	Maximum number of Programs: TBD
		Automatic DST adjustment
	Auto changeover	Maximum number of changeover groups: 512
	Temperature Range Limitation	Independent cooling and heating setpoint range limitation
		Set between 60-90°F
	Timer Extension	Selectable from 30, 60, 90, 120, and 180 minutes
	Power Limit Control	Schedule compressor demand limit and low noise operation. Energy saving functions that can be interlocked with digital input signals Indoor unit set-point shift control, indoor unit forced thermo-off, Indoor unit on/off control and outdoor unit's capacity demand limit control
	Setback	Independent heating and cooling setback setpoint
		Setback recovery temperature range: 2-10°F
Data Control	History	Up to 5 years of data in 1 minute increments events are recorded in history including malfunctions, operations, automatic control, and system information
	Operation data history	Daikin *VRV* operational data collected once per minute based upon a change of value and stored for 5 years in the Daikin *HERO* Cloud, *BACnet* Client management data points, and *WAGO* IO system data
	Power proportional distribution	Up to TBD months of hourly power proportional distribution results are recorded
		PDF and CSV format data output are supported
	Operation data download	Operation data for every minute in the last 5 years can be downloaded from Web access
	Email Alert	Email Alert will send to the user when error occur
Daikin *HERO* Cloud Services	Internet Connection	Required
	Compatible Browsers	*Google Chrome*™ and *Safari*® browsers**
	Compatible Devices	PC, MAC®, Smartphones and Tablet with Internet Connectivity
	Requires License (Recurring)	Yes
	URL	www.Daikinhero.com

** *Google Chrome* is a trademark of Google LLC / *Safari* and *Mac* are registered trademarks of Apple Inc.

Options for Daikin *HERO* Pro Edge

ITEM	MODEL	DESCRIPTION
Optional Software	DCM601B71	Power Proportional Distribution (PPD) [1]
	DGE009A71	**BACnet**™ IP Client Option - Monitor up to 10 *BACnet* Devices
	DGE009A72	*BACnet* IP Client Option - Monitor up to 50 *BACnet* Devices
Interface Adaptors	KRP928BB2S	For connection to Daikin Mini-Split system (connect to Indoor Unit)

[1] The power proportional distribution (PPD) feature supplies the user with a reasonably calculated apportionment of the total power consumption by the Daikin *VRV* system. Because input to the PPD includes measured pulses in the refrigerant system and because the Daikin *VRV* system includes several variables, including the operating temperatures and pressures, piping lengths, heat exchange rates, and so forth, no meter-type apportionment of individual user consumption can be made. However, the PPD feature provides an apportionment methodology that uses highly advanced technology and is applied to the many variables in the Daikin *VRV* system.

WAGO® I/O System

MODULE		PART NUMBER	DESCRIPTION
Basic Kit		60359653	Bus Coupler, Connector, 24 VDC Power Supply, and End Module
Digital Input	2 Channel DI	750-400	2 Channel Digital Input Module, 24 VDC
	4 Channel DI	750-432	4 Channel Digital Input Module, 24 VDC
	8 Channel DI	750-430	8 Channel Digital Input Module, 24 VDC
Digital Output	2 Channel DO	750-513/000-001	2 Channel Digital Output Module, without power jumper
	4 Channel DO	750-504	4 Channel Digital Output Module, 24 VDC
Analog Input	2 Channel AI	750-454	2 Channel Analog Input Module, 4-20 mA, Differential Inputs
		750-479	2 Channel Analog Input Module, ± 10 VDC, Differential Measurement Input
		750-461/020-000	2 Channel Analog Input Module, NTC 20k Ohm
	4 Channel AI	750-455	4 Channel Analog Input Module, 4-20 mA, single-ended
		750-459	4 Channel Analog Input Module, 0-10 VDC, single-ended
		750-464/020-000	4 Channel Analog Input Module, NTC 20k Ohm/ NTC 10k Ohm, configurable
Analog Output	2 Channel AO	750-554	2 Channel Analog Output Module, 4-20 mA
		750-550	2 Channel Analog Output Module, 0-10 VDC
	4 Channel AO	750-555	4 Channel Analog Output Module, 4-20 mA
		750-559	4 Channel Analog Output Module, 0-10 VDC
Internal System Power Supply		750-613	24 VDC Bus Power Supply Module, required for use after every 32 contact points connected in a node
Passive Power Supply		750-602	24 VDC Power Supply Module, passive
Field Set Connection Module		750-603	Field Set Connection Module for 8 channel DI module

SCAN FOR AN OVERVIEW OF
DAIKIN *HERO* CLOUD SERVICES.

About Daikin:

Daikin Industries, Ltd. (DIL) is a Fortune 1,000 company with more than 96,337 employees worldwide and a leading indoor comfort solutions provider. Daikin Comfort Technologies North America, Inc. (DNA) is a subsidiary of DIL, providing Daikin, Goodman, Amana® and Quietflex brand products. DNA and its affiliates manufacture heating and cooling systems for residential, commercial and industrial use and are sold via independent HVAC contractors. DNA engineering and manufacturing is located at Daikin Texas Technology Park near Houston, TX. For additional information, visit www.northamerica-daikin.com

ADDITIONAL INFORMATION

Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost, or energy efficiency rating that is available from your retailer.

Learn more at www.daikinac.com

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DAIKIN

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