



ENPACK

BEYOND BATTERIES
CONTAINERIZED SOLUTION

3.8MWHr 750V For 300KW Load
ENP-3.8M-750-0.1C-X-X-X-40



Version-1 Revision-0
Release Date: 09/09/2024



Introduction

The containerized system generally consists of an energy storage system, a monitoring system, an energy management unit, a dedicated fire protection system, a dedicated air conditioner, an energy storage converter, and an isolation transformer, and is finally integrated in a 20 or 40-foot container. This “turnkey” system is designed to meet the demanding requirements for residential, C&I and utility side applications alike, committed to making the power interconnected reliably. This data sheet references a 3.8MWh ENPACK solution, but each ENPACK is custom-configured and will come with its own customized data sheet.

Scope of work

The scope of work of the proposed container system under design consideration is to support a DC load of 300KW for ~13 hours with a solar capacity of 1200KW.

Feature	Value
Load (KW)	300
Storage Capacity (MWHr)	3.8
Total Backup Time (Hrs)	~13
Solar System Capacity (KW)	1200

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Features



LOW COST

- Advanced integration technology ensures optimal system performance and lower cost
- Plug and play design: >95% pre-assembled



SAFE & RELIABLE

- DC electric circuit safety management includes fast breaking and anti-arc protection
- Multi level battery protection layers formed by discreet standalone systems offer impeccable safety



EFFICIENT & FLEXIBLE

- Intelligent liquid cooling ensures higher efficiency and longer battery cycle life
- Modular design supports parallel connection and easy system expansion
- IP25 outdoor cabinet with anti-corrosion



SMART & ROBUST

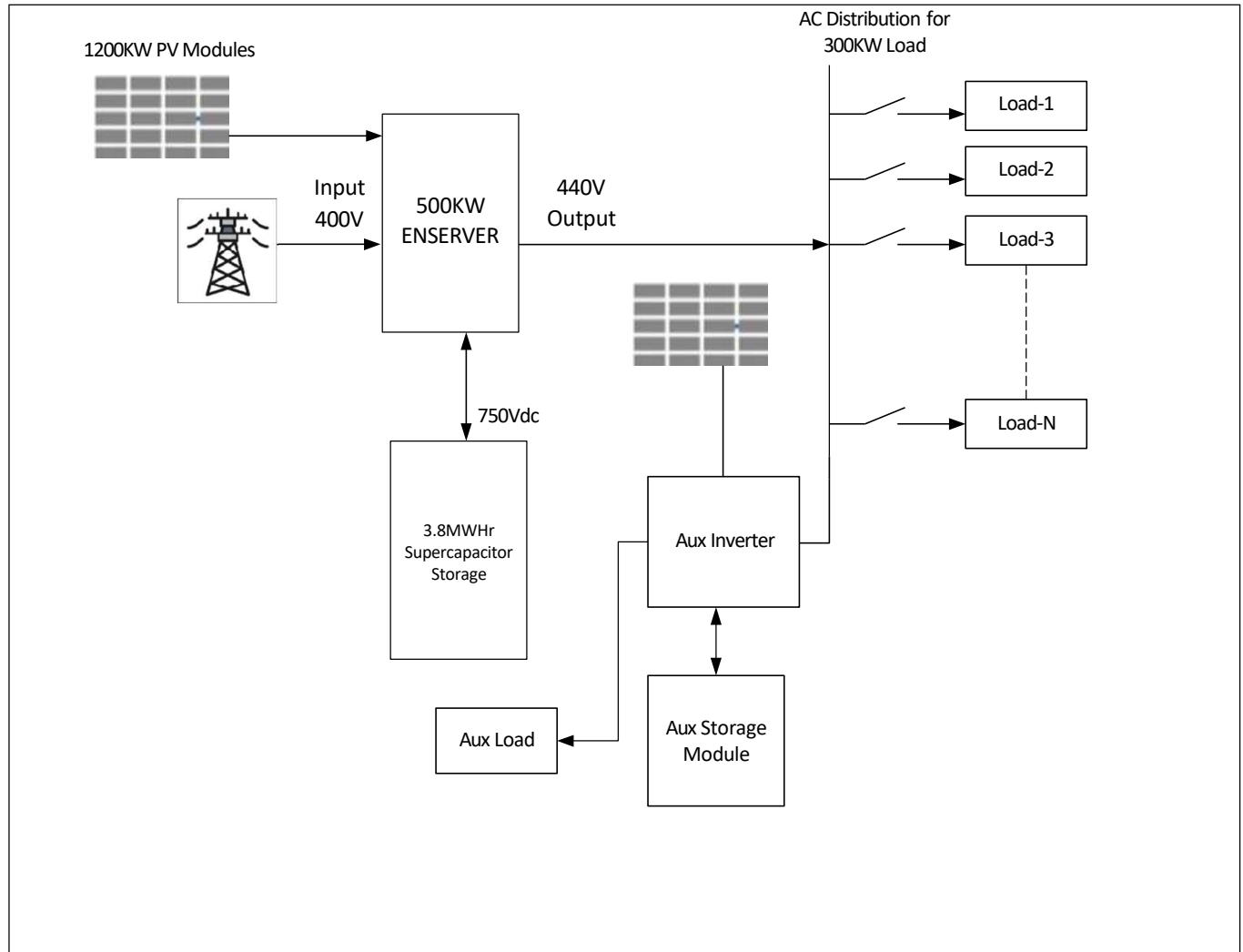
- Fast state monitoring and faults recording and identification
- Integrated battery performance monitoring and logging

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Container Single Line Diagram

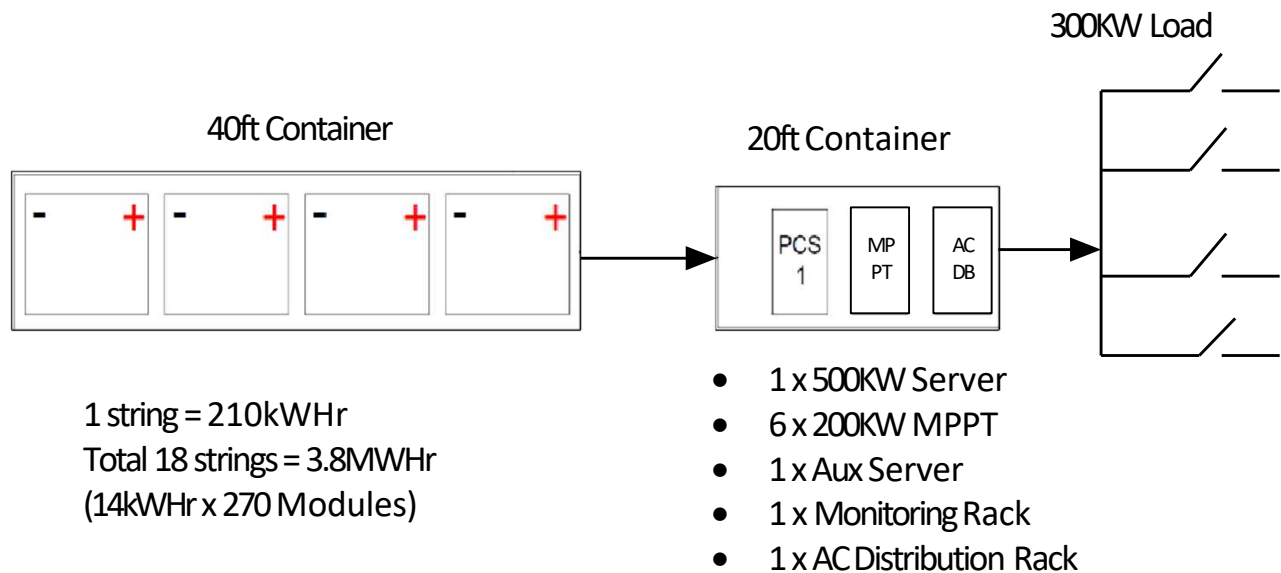


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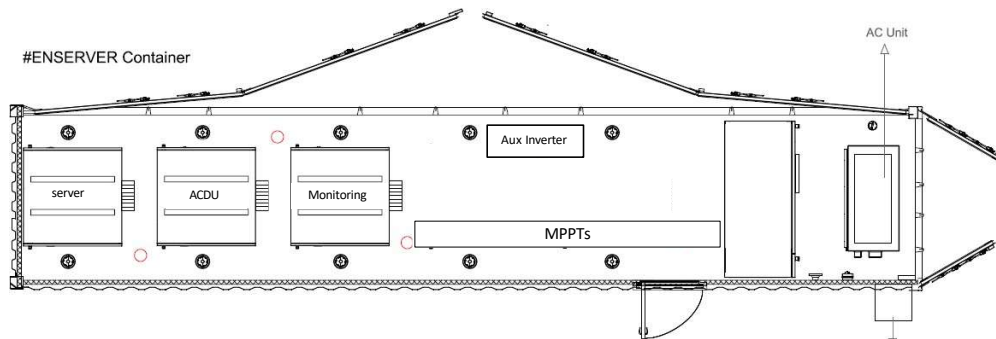
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Project Layout

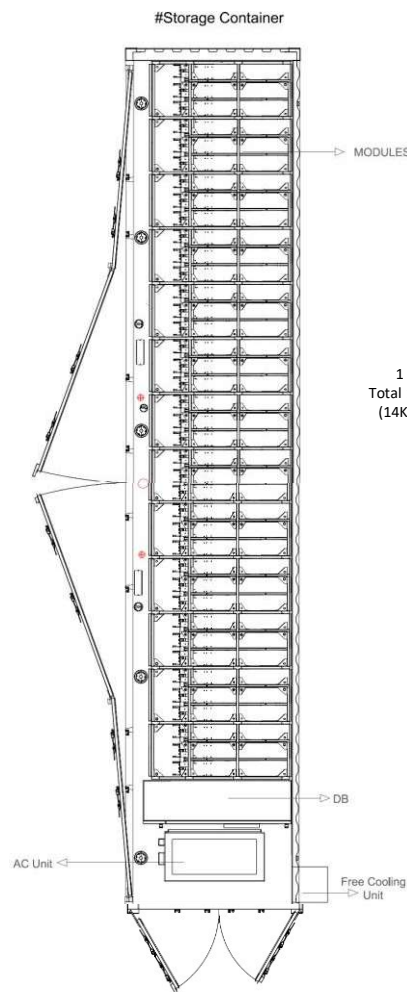


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Containers Layout



- 1 x 500KW Server
- 6 x 200KW MPPT
- 1 x Aux Server
- 1 x Monitoring Rack
- 1 x AC Distribution Rack



1 string = 210KWHr
Total 18 strings = 3.8MWHr
(14KWHr x 270 Modules)

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Container Overview

No.	Item	Description	Qty.
1	40ft Container, High Cube, Side Door open		1
2	20ft Container, High Cube, Side Door open		1
3	Supercapacitor Modules	14KWHr 50V	270
4	DC Distribution Panel		2
5	Module Rack		18
6	CCTV Camera		6
7	Industrial Wifi Router		2
8	Surface Light	18W White	12
9	T&T Infrared Motion Sensor	Roof Mounted	6
10	PVC Wall Switch 1Gang 2-way ,16AX/250V	With Box	6
11	AC Isolator Switch	35A, UKF2, 250V	1
12	Emergency Exit Light		2
13	Environment controller	CC Controller 3000	1
14	Free Cooling Unit		2
15	AC Unit	42000BTU	2
16	Fire Ball		12
17	Fire Extinguisher	Dry Powder	6
18	Automatic Fire Suppression System	Direct Module	4
19	Heat Detector	Wireless	6
20	Main Controller		1
21	Sub Controller		6
22	Contactor Box		18
23	Aux Inverter		1
24	Storage Module for Aux	14KW Module	2
25	Smart Alarm Controller		1
26	ENSERFER	500kW	1
27	MPPT	200kW	6
28	Monitoring Rack		1
29	Industrial PC	19"	1
30	PV Controller		1
31	Main Controller		1



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Container Specifications

PERFORMANCE	
Total Energy	3.8MWh
DC CONTAINER	
Voltage (Nominal)	750Vdc
Maximum Charge Voltage	810 Vdc (Adjustable)
Discharge Cut-Off Voltage	720 Vdc (Adjustable)
Maximum Continuous Charge Current	528A (~0.1C)
Maximum Continuous Discharge Current	417A (~0.08C)
AC CONTAINER	
Voltage	400Vac
Frequency	50/60 Hz
Maximum Current	722A
SMART FEATURES	
Monitoring Data	Temperature, Total Voltage, Current and Energy
Communication and Connectivity	CANBUS
Alarm	Audible alarms in the event of Over/under-Voltage, Over-Current, Over Temperature
ENVIRONMENTAL SPECIFICATIONS	
Cell Operating Temperature	-30 °C to 60 °C
Operating Humidity	Non-Condensing
SAFETY PERFORMANCE	
Over/under voltage	Hardware protection, DC line will be disconnected
Over Current	Hardware protection, DC line will be disconnected
Over temperature	Hardware protection, DC line will be disconnected
COMPLIANCE INFORMATION	
EN55032:2015, EN55024:2010, EN61000-4-2:2009, EN61000, EN61000-4-2:2009, EN61000, EN61000:2008+A2:2010	

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Energy Server 500KW



Features

- Flexible Configuration

Configurable with solar charge controller, bypass cabinet, or stand-alone

- Programmable working mode

Peak-shaving, backup, use the system however you want it

- Scalable

Applicable in MW-level systems by paralleling multiple units

- Touchscreen LCD

More convenient for parameter settings and maintenance

- Dry contact output

Supports remote control of DG

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MODEL 500 KW	
AC (ON-GRID)	
Apparent power	550kVA
Rated power	500kW
Rated voltage	400V
Rated current	722A
Voltage range	360V-440V
Rated frequency	50/60Hz
Frequency range	45~55/55~65Hz
THDI	<3%
PF	0.8 lagging~0.8 leading
AC connection	3/N/PE
AC (OFF-GRID)	
Apparent power	550kVA
Rated power	500kW
Rated voltage	400V
Rated current	722A
THDU	≤3%
Rated frequency	50/60Hz
Overload capability	110%-10 mins 120%-1 min
DC (BATTERY AND PV)	
Rated power	500kW
Current regulation	±1%
Voltage regulation	±1%
Voltage ripple	<3%
Current ripple	<2%
Voltage range	500V-820V
Max. charge/discharge current	917A
GENERAL INFORMATION	
Maximum efficiency	98.50%
Protection degree	IP20

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Noise emission	<65dB(A)@1m
Operating temperature	-25°C~+55°C
Cooling method	Forced air
Relative humidity	0-95% non-condensing
Maximum altitude	6000m (derate above 3000m)
Dimension mm	1200W×1900H×800D
Weight	870kg
Build-in transformer	Yes
Lightning protection	Type II
Transfer between on/off grid	Manual(default) Automatic(optional)≤10ms
COMMUNICATION	
Display	Touch screen
Communication With BMS	RJ45/CAN

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ENCAP Module 14kWhr 50V



FEATURES

1. EFFICIENT

- Highly Efficient: > 95% RTE (Round Trip Efficiency)
- 100% DOD (Depth of Discharge)
- 500,000 Cell Life Cycles

2. SAFE & RELIABLE

- Wide Operating Temperature Range
- Deployable in Various Environments including High Altitudes
- No Thermal Runaway Risk

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● ENP-3.8M-750-0.1C-X-X-X-40

PERFORMANCE SPECIFICATIONS	
DC Energy	14kWh
Voltage Range	48Vdc to 58Vdc
DC Voltage (Nominal)	50Vdc
Internal Resistance	< 4 mili Ohms
CELL SPECIFICATIONS	
Technology	Encapsulated Cell
CHARGE CHARACTERISTICS	
Maximum Continuous Charge Current	300A (~1C)
Charging Method	CC/CP/VP
DISCHARGE SPECIFICATIONS	
Maximum Continuous Discharge Current	300A (~1C)
Discharging Method	CC/CP/VP
EN-CONNECT SOFTWARE	
Module Monitoring	Total Voltage, Individual Cell Voltages, Current, Temperatures, SOC and Energy Consumed
MODULE ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature Range	-10°C~ +55°C
Operating Humidity	Non-Condensing
MECHANICAL SPECIFICATIONS	
Module Casing Material	GI Powdered
Terminal Type	Anderson Connectors
SMART FEATURES	
Communication	CANBUS and UART

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SERVICE LIFE	
Cells Projected Cycle Life ²	500,000 cycles
Cells Projected Calendar Life ³	25 years
Module Projected Shelf Life ⁴	10 years
Warehousing	Can be stored at any SOC without affecting cycle life

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Rack for Modules



Features

- 23 x 14KWHrs Modules can be installed in each Rack
- One Contactor Box can also be installed in each Rack

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ENCONTACTOR



SPECIFICATIONS	
Voltage	200Vdc - 1000Vdc
Charge Control	200A
Discharge Control	200A
DC Bypass for Overload Current	>20A
Pre-charge Current	10A via 200W limiting Resistor
DC Breaker	200A 1Pole
Protection	Short Circuit Protection, High Current (Charging/Discharging) Protection
Manual Bypass Breaker	125A 1Pole
Communication	RJ45 Port (CANBUS Communication)
Dry Contact Control	DB 25 Pin
LED Indicator	Pre-charge, Charge, Discharge, Bypass, Fan
Compatibility	Work only through EN Rack Controller
MECHANICAL SPECIFICATIONS	
Dimensions (W x H x D) mm	453 x 156 x 507
Weight (kg)	18
Material	GI/AL/Plastic

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Sub Controller



SPECIFICATIONS

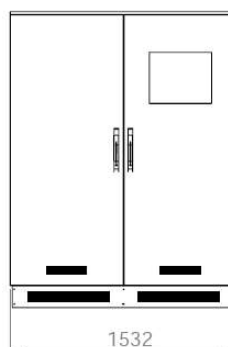
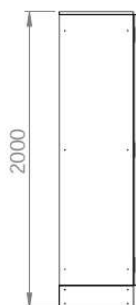
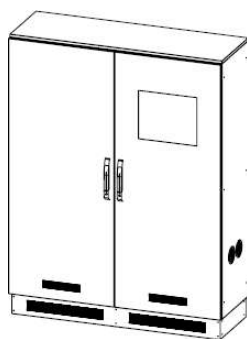
Input Power	432Vdc
Controller	String Charge & Discharge Control, Independent String Communication Control
Protection	Modules Over Voltage, High Current and High Temperature Protection
Communication	RJ45 Port (CANBUS Communication)
Dry Contact Control	DB 25Pin
Internal Power Indication	230Vac Power Indicator, 12Vdc Power Indicator
EMI Filter	250VAC 10A, 50/60Hz

MECHANICAL SPECIFICATIONS

Dimensions (W x H x D) mm	400 x 155 x 369
Weight (kg)	8
Material	GI/AL/Plastic

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Monitoring & Distribution



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Monitoring Rack

Features

1. Embedded NVR
2. 19-inch Industrial PC for monitoring
3. Industrial Wi-Fi router

Embedded NVR DS-7600 Series



Features

1. 4 channel PoE IP camera port
2. Support for 8MP recording and playback
3. Support for 4K video output
4. 1 SATA interface to connect 10TB Hard drive
5. Support for VCA detection alarm
6. Compatible with 3rd party IP camera
7. Support Hikvision ANPR Solution

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Fan-less Industrial PC



PERFORMANCE SPECIFICATIONS

Size	19 inches
Resolution	1280 x 800
Color	Chroma 16.7M
Brightness	300 CD/m ²
Response Time	6.5ms
Screen Type	Resistive Touch Screen
Resolution	500DPI

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Industrial Wi-fi Router



Stable and Reliable

1. Industrial design, metal enclosure, protection class IP30
2. Wide input voltage DC9-36V, with reverse polarity protection
3. ESD, Surge, EFT/Burst protection
4. Hardware and software watchdog, multi-layer link detection mechanism make it self-recovery from unexpected failure and guarantee reliable communication between remote devices and data center
5. Provides comprehensive security protections for sensitive business data, including secure VPN transmission, firewall against network attacks

Flexible Networking

1. Supports 2G/3G/4G network all over the world, supports APN/VPDN private network access
2. Supports automatic detection of cellular network, 4G/3G/2G mode automatic switching
3. Supports fail over between 4G and WAN, ensures automatic switch to alternative backup connection, effectively ensuring uninterrupted data transmission
4. Supports 2.4GHz WiFi, scaling more devices access, support wired and wireless connecting Internet
5. Compatible with 5.8GHz WiFi (optional)

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PERFORMANCE SPECIFICATIONS		
Cellular Interface	Antenna	2xSMA-K
	SIM card	1 x (3V & 1.8V) Standard 2FF SIM, drawer-type sim card slots
Ethernet		1 x WAN port, 10/100 Mbps, compliance with IEEE 802.3, supports auto MDI/MDIX, 1.5KV network isolation transformer protection
		4 x LAN ports, 10/100Mbps, compliance with IEEE 802.3, IEEE 802.3u standards, supports auto MDI/MDIX, 1.5KV network isolation transformer protection
Indicators	LED	<p>PWR: red, always on after powered on</p> <p>Work: green, blinking when the router is ready and working properly</p> <p>WLAN: green, always solid on when WiFi is enabled and working properly</p> <p>USR: user defined.</p> <p>Net indicator:</p> <p>Red always on after connected to 2G network</p> <p>Green always on after connected to 3G network</p> <p>Orange always on after connected to 4G network</p> <p>Signal strength: 3 solid bars, strongest signal</p>
Terminal block	Pinout	<p>V+, V-: 2cores terminal power supply socket, built-in power supply phase-reversal protection</p> <p>GND: ground terminal</p> <p>Tx/B:RS-232/RS485 pin (set up by software)</p> <p>Rx/A:RS-232/RS485 pin (set up by software)</p> <p>DI:2 x Digital input, passive switch</p> <p>DO:2 x Digital open collector output, max output-36V,300mA</p> <p>COM: common terminal, use in conjunction with DOs</p>

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● ENP-3.8M-750-0.1C-X-X-X-40

WiFi Interface	Standards & Frequency	IEEE802.11b/g/n, 2.4GHz, AP mode
	Data speed	IEEE802.11b/g, maximum 54 Mbps. IEEE802.11n, maximum 150Mbps
	Antenna	2xRP-SMA-K
	Transmission distance	80 meters by line of sight. Actual transmission distance depends on environment of the site.
Power Supply	Adapter	DC12V/1A
	Connector	DC Power Jack Barrel Type Female 5.5*2.1mm Round socket or industrial terminal block,reverse polarity protection
	Input voltage	DC9~36V
	Working power	Average 522mA/12V, Maximum 811mA/12V
Serial Interface	RS485/ RS232(alternative)	Industrial terminal block. Note: RS232 default.
	Baud rate(bps)	1200,2400,4800,9600,19200,38400,57600,115200,230400
	Data bits	8
	Stop bits	1,2
	Parity	NONE, ODD, EVEN
Physical Characteristics	Housing	Metal shell, IP30
	Dimensions	125.0*103.0*45.0mm
	Installation method	Ear mounting ,DIN-Rail mounting
	EMC	Static IEC61000-4-2, level 3

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Fire Extinguisher Ceiling Mount



PERFORMANCE SPECIFICATIONS

Capacity	4Kg
Type	Ceiling Mounted
Extinguisher Agent	Dry Chemical Powder
Activation Time	10 to 20 Sec
Coverage Area	3 x 3 m
Test Pressure	35bar 30sec
Operating Pressure	15bar
Bulb Temperature	68 degree C

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FREE COOLING UNIT



FEATURES

1. The CC3000 controller is based on latest technology within embedded microcontrollers.
2. The CC3000 is designed as a single board controller, including all connections needed for supporting free cooling products.
3. It has connection for two flexi box/DFC products, two motorized dampers and two dry contacts for start/stop signal to AC/DC air conditioner.
4. A dry contact for signal to heater unit is also provided.
5. 10 dry contacts for alarming, full configurable.
6. All connections are done with multi connectors using spring loaded terminations.
7. LAN connection is provided for remote monitoring and setup using SNMP protocol.
8. Embedded micro controller is a 32 bit Cortex M3 core.
9. User interface is designed with a 2,4 inch TFT color display.
10. Product configuration and firmware update can be done by use of standard SD card or SNMP over Ethernet / WEB GUI.
11. The CC3000 controller is enclosed in a special designed plastic enclosure, with UL rating 94-V0, dedicated for wall mount.
12. Control circuit is all low voltage and is designed according to EN/UL 60950.

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● ENP-3.8M-750-0.1C-X-X-X-40

PERFORMANCE SPECIFICATIONS	
Model Number	FB900-48V-G4
CAPACITY & PERFORMANCE	
Operational temperature range, min./max.	- 25 to + 55 °C
Cooling capacity at $\Delta t=10^{\circ}\text{C}$, 50/80%	4950 / 7210 W
Maximum cooling capacity at $\Delta t=10^{\circ}\text{C}$, 100%	8140 W
Airflow, maximum	2450 m ³ /h
Electrical connection	Phoenix PC 4/2-STF-7.62
Input voltage range	48VDC (42-57VDC) VDC
Power consumption 50/80/100%	78/239/366 W
Sound level, 50/80%, 3m distance*	47/56 dB(A)
Expected operation life	Min. years 10
*Sound power 50/80%	62/71 dB(A)
SHIPMENT, STORAGE & MOUNTING	
Unit dimensions (height×width×depth)	1260 x 512 x 518 mm
Net weight	45 kg
Storage relative humidity, min./max.	0 to 95 RH %
Storage temperature, min./max.	-40 to +80 °C
Mounting method	Wall-mounted
Filter	Item no. 077164
Filter type	Class Compact G4
Filter area	0.75 m ²
CONTROLLER DETAILS	
Communication interface	Ethernet SNMP
Mounting method	Wall-mounted
CERTIFICATIONS	
Protection according to EN 60529	IP class no.X5
Complies with standards	EN 60950

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AC Unit 4 Ton Duct Type



PERFORMANCE SPECIFICATIONS	
Technology	Inverter
Refrigerant	R32
Power Supply	220-240V/3ph/50-60Hz
COOLING T1 35°C (NOMINAL) 60HZ	
Capacity (Btu/h)	42,000
Capacity (kW)	14.06
EER ((Btu/h) / W)	12.00
PI (kW)	4.000
COOLING T3 46°C 60HZ	
Capacity (Btu/h)	42,000
Capacity (kW)	12.50
EER ((Btu/h) / W)	8.75

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● ENP-3.8M-750-0.1C-X-X-X-40

PI (kW)		4.800
INDOOR UNIT		
Remote Controller		Optional Wired R/C
Control Air Discharge		Ducted with Auto ESP
Dimensions (HxWxD) mm		400 x 1500 x 800
Airflow (H/M/L) CFM		1730/ 1300 / 1015
Sound Pressure Level (H/M/L) dB[A]		45/41/37
Rated ESP (H) Pa		50
Maximum ESP (H) Pa		100
OUTDOOR UNIT		
Dimensions		870 x 1100 x 460
Sound Pressure		56
Compressor Type		Hermetically Sealed Swing Inverter Type
Pipe Connections	Liquid (mm)	12.7
	Gas (mm)	22.2
Piping Lengths	Total (m)	50
	Elevation (m)	30
	Chargless (m)	30
Operating Range (CDB)		52

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LEADING THE CHARGE IN ENERGY STORAGE SOLUTIONS

