Power Protection Systems
Critical Power Protection

C&I Power Systems

"Reliable Power Always"

STACO ENERGY PRODUCTS CO.

DELTA

XTREME Power Conversion®

GILLETTE GENERATORS

ASCO Power Technologies™

THOMSON POWER SYSTEMS

HIPOWER® A YANMAR COMPANY

PQ PROTECTION

power temp systems INC.

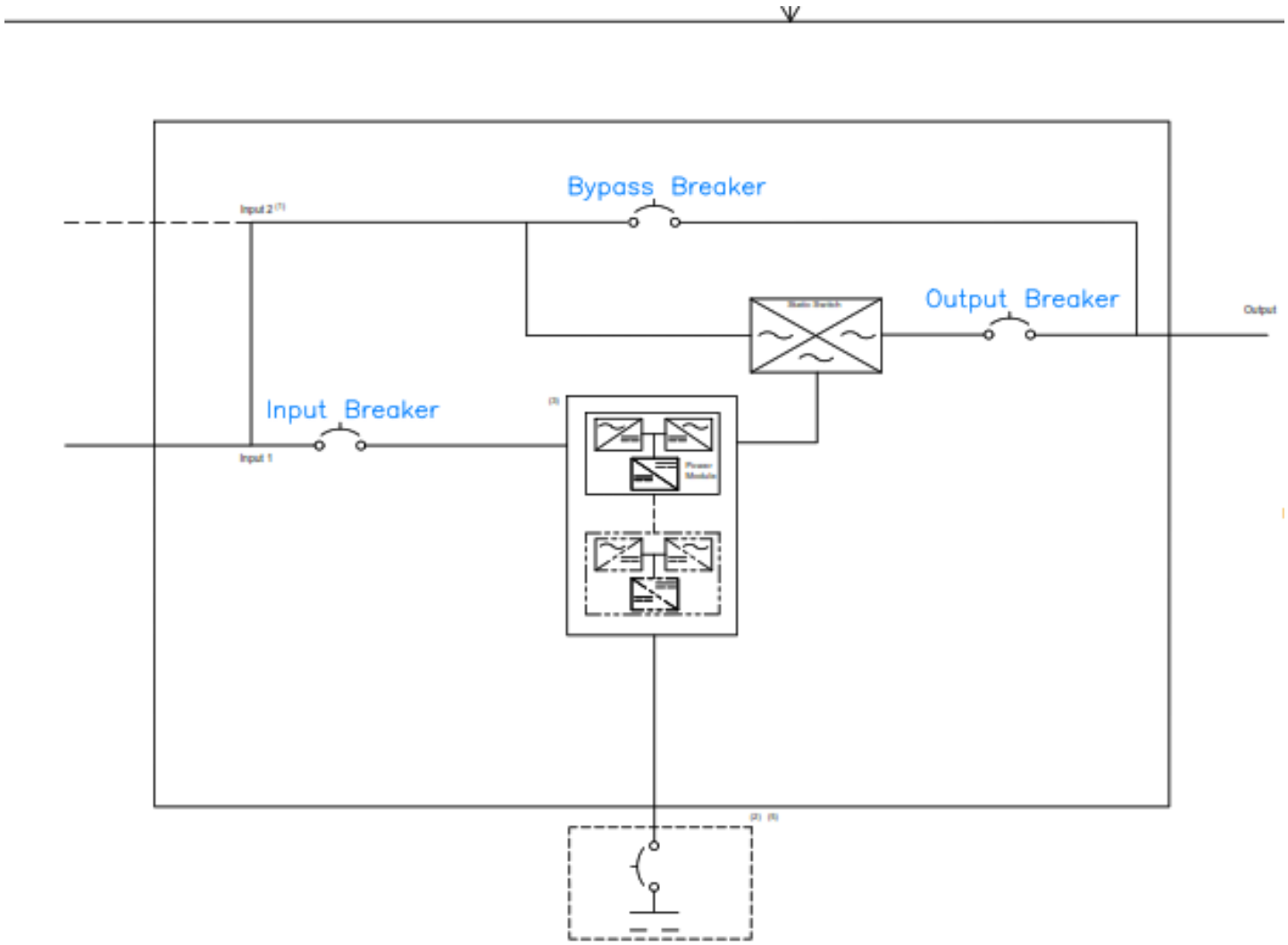
WE PUT THE POWER WHERE YOU NEED IT™

KRATOS INDUSTRIES

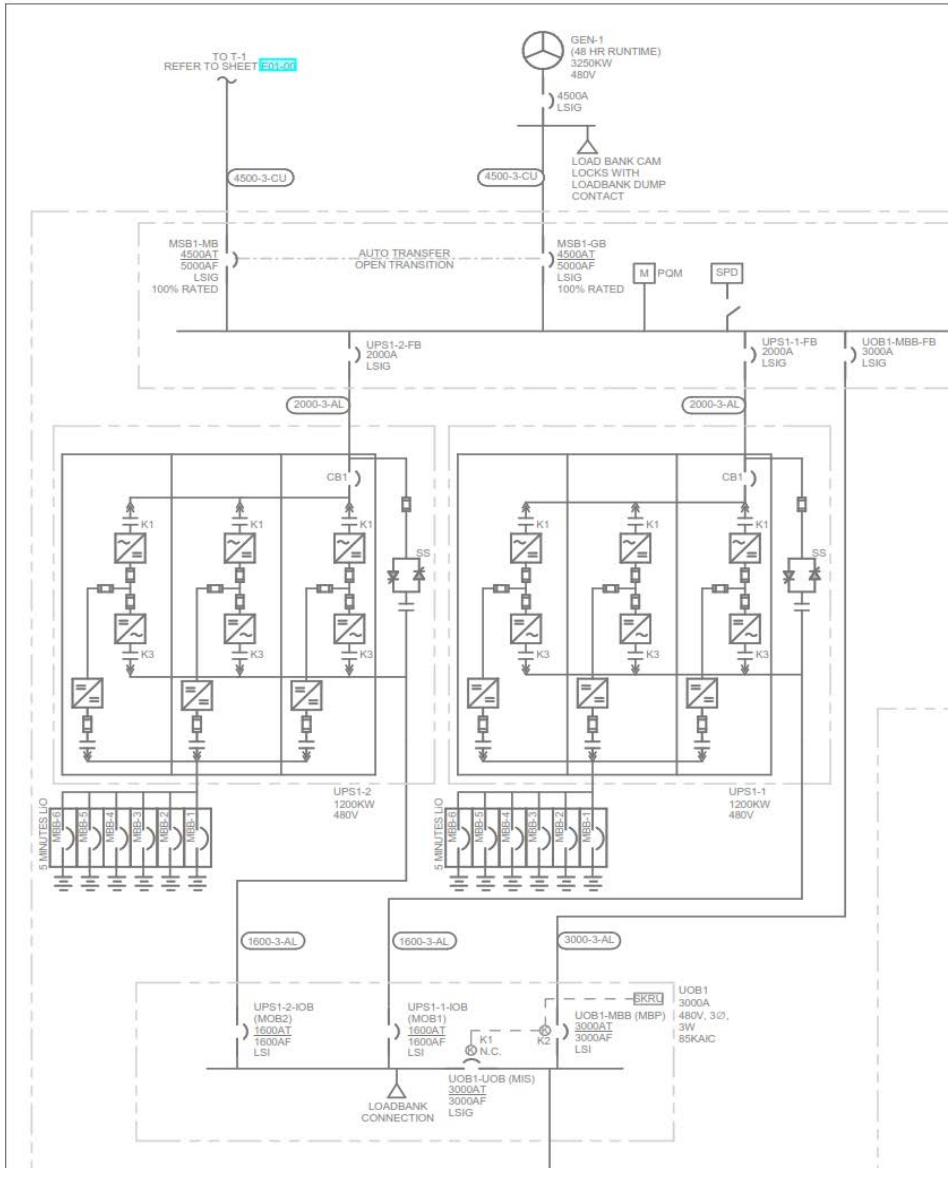
Power Protection Solutions

- **Modular/Scalable/Redundant UPS 6 KVA to 9600 KVA**
- **Battery Systems Lithium Ion, Nickel Zinc, VRLA, Flooded Cell, NiCad**
- **Track Busway “BR Series” 250 – 1600 Amps**
- **Track Busway “BL Series” 400 – 6400 Amps**
- **Energy Storage Systems (ESS)**
- **Edge Computing Solutions, PODS, Containerized Data Center/Power**
- **Diesel Fueled Generator Systems 30 KW – 2000 KW**
- **Natural Gas / Propane Generator Systems 25 KW – 1050 KW**
- **Automatic Transfer Switches (3 Pole, 4 Pole & Bypass Isolation Types)**
- **Generator Docking Stations to 4000 Amps, Custom Transfer Schemes**
- **UL 924 Emergency Lighting Inverters (1000 Watts to 160 KW)**
- **Industrial UPS Power Systems (Harsh Environment & 25 Year+ Designs)**
- **Modular and Non-Modular Surge Protection Devices (SPD/TVSS)**
- **Power Conditioners / Voltage Regulators up to 3000 KVA**
- **MIL/AERO/MFG 400 HZ Power Systems / Frequency Converters 50/60 HZ**
- **Leak Detection, Facility Monitor Systems and Computer Room Flooring**

UPS Single Module One Line



UPS Multi-Module Single Line



M90S Product Overview 6 – 60 KVA/KW Single Phase

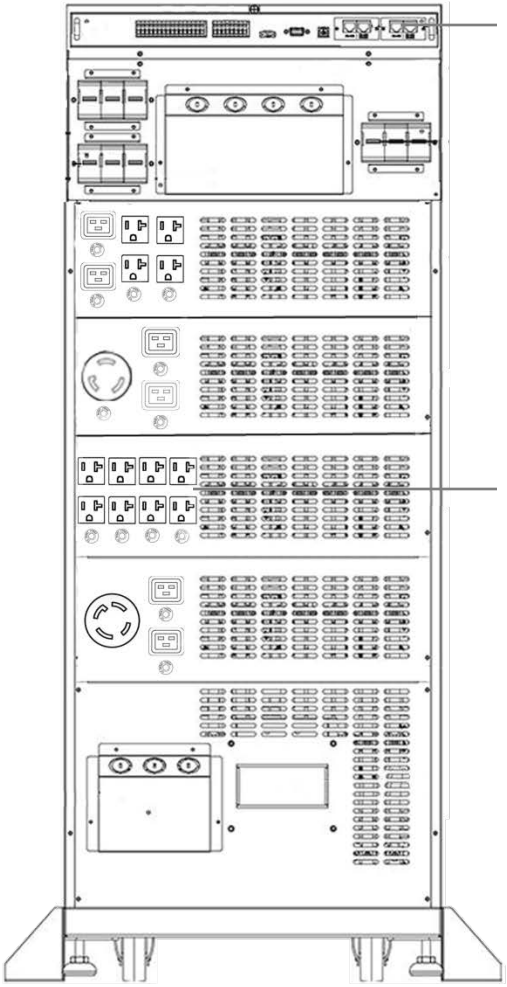
Large LCD Display
5.7” display – 4 and 6 slot enclosures include system level graphic display

Maintenance Bypass Switch
Accessible from front

6kVA/6kW Power Module
Includes module LCD display, static switch, PFC rectifier, battery charger, 3-level inverter and control circuits

Battery Module
Includes 16 pieces of 12V 580W batteries

M90S front view



M90S rear view

Communications Module
provides system level dry contacts, EPO, RS-232 and two SNMP/Modbus/AS400 cards

Receptacle Modules
Optional Modules provide wide range of 120V and 208V receptacle choices

XTREME Power Conversion®

XTREME POWER
M9080 Modular 208V UPS
15 KVA/KW – 80 KVA/KW

XTREME POWER
M90U140K Modular 208V UPS
20 KVA – 140 KVA

Modular 208V UPS 140 KVA/KW

Maintenance bypass
front mounted MBP switch transfers critical loads from UPS power to utility power, enabling maintenance

Up to 8 Battery Strings
Strings each protected with 125A breaker

Battery Module
hot swappable module

Top Feed Cable Entry
provides easy installation acess

10" Touch LCD Display

STS Module
static switch with redundant power supplies

20kW or 15kW Power Module
up to 8 modules for up to 140kVA capacity or 120kVA N+1

MBC-140 front view

XTREME POWER
X90 Modular 480V UPS
50 - 700 KVA/KW

Modular 480V UPS 700 KVA/KW

Touch LCD Display

Maintenance bypass (door removed)

X90-105 700kW UPS (door removed)

XTREME Power Conversion®

Modulon DPH Series Overview

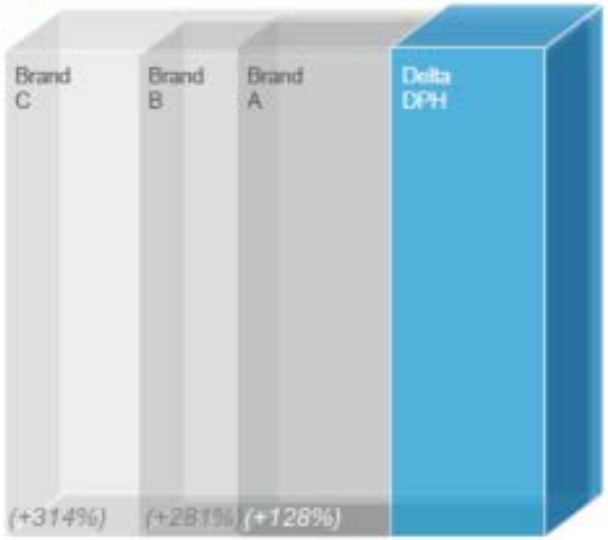
DPH 480V		
Topology	On-line double conversion Three Phase In, Three Phase Out	
Power Rating	100, 150, 200, 250, 300 kVA 100, 150, 200, 250, 300 kW	300, 350, 400, 450, 500 kVA 300, 350, 400, 450, 500 kW
Dimensions (W*D*H)	23.6" x 33.5" x 78.7"	55.1" x 33.5" x 78.7" 55.1" x 43.3" x 78.7" *
Voltage	480 (3-phase, 3-wire + G)	
AC-AC Efficiency	Up to 97%	
Backfeed Protection	Inbuilt backfeed contactor	
Short circuit withstand current	65kA	
Compliance	UL, FCC Class A, Energy Star 2.0, GR63 Zone 4	

* With exhaust fan cabinet for against the wall application.

Best Space Utilization

- Delta's advanced technology achieves the world's highest power density in a single rack.
- Site space utilization is maximized and more space is reserved for revenue-generating IT racks.

The ***smallest footprint*** *compared to equivalent 300 kVA models on the market*

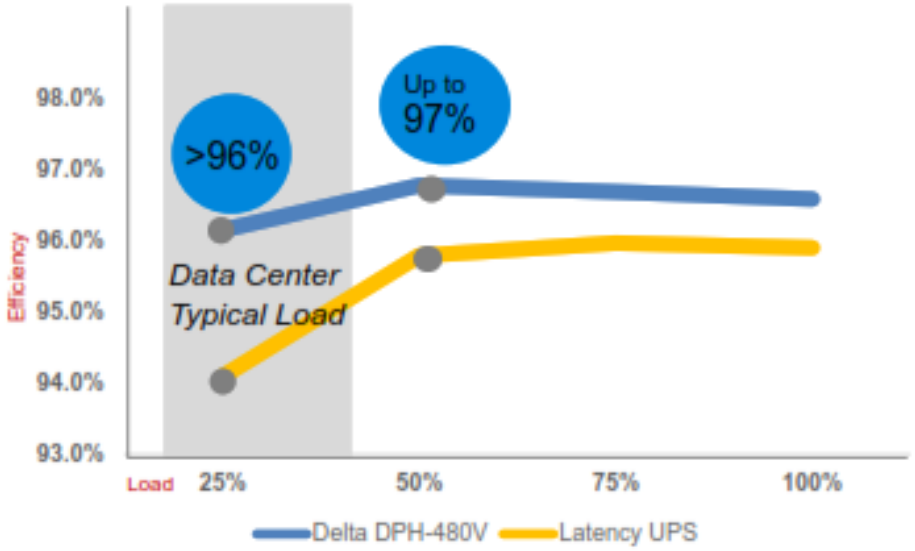


The ***most powerful 300kVA*** *in a single rack*

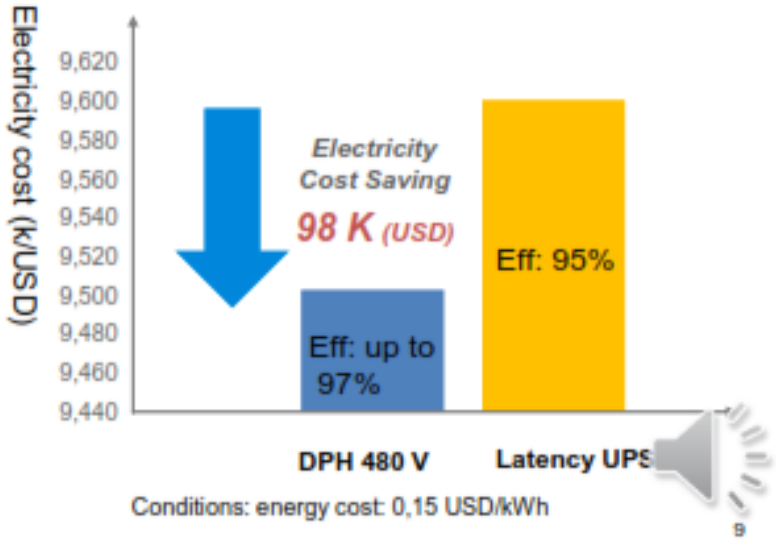
(*Reference Model : DPH 300kVA*)

High Energy Efficiency

- AC-AC peak efficiency up to **97%** saves on operational cost (OPEX)
- Efficiency **> 96%** at light load 20%
- Efficiency 99% in ECO mode



For 1 MW data center, it saves more than **98 K USD** in electricity costs over 7 yrs.



Conditions: energy cost: 0,15 USD/kWh

DPM Series Product Portfolio

Large power ratings
for MW datacenter applications

500 kVA / 500 kW

750 kVA / 750 kW

1000 kW / 1000 kW

1250 kVA / 1250 kW

Delta Ultron DPM series UPS

Model	DPM Series	
Topology	On-line double conversion Three Phase In – Three Phase Out	
Power Rating	500kVA / 750kVA / 1000kVA / 1250kVA 500kW / 750kW / 1000kW / 1250kW	
Voltage	480 Vac, 3P3W	
Efficiency	AC-AC Online Mode Robust Mode	96% maximum 98.5% maximum
Overload Capability	106% ~ 125% : 10 minutes 126% ~ 150% : 1 minute >150% : 1 second	
Parallel	Up to 8 units	
Safety	UL1778, cUL	

VRLA Battery Cabinet

BC55 Battery Cabinet

Top Terminal Battery Cabinet

FEATURES:

- ►Unique design allows for easy battery maintenance
- ►Breaker and fuse options for single or multiple string
- ►Hinged, locking front door for easy and secure access
- ►Welded, heavy gauge steel construction
- ►Factory assembled and fully tested
- ►Listed to UL 1778 and CE Mark authorized for the EU market
- ►Zone 4 approved
- ►Seismic Certified options available

Gen3 Lithium Ion Battery Cabinet

Delta UPS Battery Solution

Delta UZR Gen3 Series

- Safe & reliable Lithium-ion battery solution
- UL1973 certificated & UL9540A tested
- Up to 470kW power and 62kWh in single cabinet
- 45% reduction of space and weight, 2-3x life longer to compare with conventional battery
- Front access only to line up against the wall
- Total cost of ownership reduction

Gen3 Lithium Ion Battery Comparison

Lithium-ion Battery for UPS to serve Mission Critical Infrastructure

Featuring long operation life, safety, easy maintenance, and TCO reduction, the Li-ion battery is a crucial and innovative energy storage solution for critical infrastructure in IT industry

Why to choose Delta Lithium-ion Battery Solution?

2–3x Longer Life

2–3x longer life brings it in line with the replacement cycle of IT equipment.

1/3 Footprint

Only 1/3 of a general UPS footprint is needed, allowing users to reserve more space for IT equipment.

10x Faster

Up to 10x faster charging performance for improved charge times.
(2C vs. 0.2C)

45% Lighter

45% lighter than VRLA battery makes installation and maintenance much easier.

Higher Safety

Safety oriented design in hardware and BMS integration. UL1973 certificated and UL9540A tested

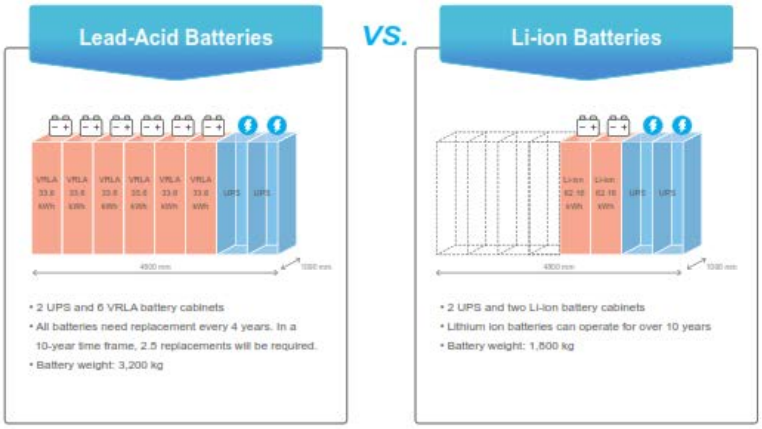
Lower OPEX

Less self-discharge and heat dissipation saves OPEX and improves efficiency.

Li-ion Battery vs. Lead-Acid Battery

Example

- IT load: 100kW
- Backup time: 30 minutes
- Battery redundancy: 1+1 sets
- Data center's years of use: 10 years minimum



Modular Data Center POD

924

EMERGENCY LIGHTING INVERTERS

PARALLELABLE | DOUBLE-CONVERSION | ON-LINE UPS | 100% LED COMPATIBLE

Our UL-924 Emergency Lighting products offer a wide range of applications from single phase to small and medium 3 phase markets. These products can be configured for always on or always off applications, supplying energy for the emergency lighting during critical moments. Each product can be configured as a standard UL-924 or as an UL-924 OUST product providing energy for 90 minutes or as desired by the end user.

UNISTAR SCLI924

350W - 21 KW

SINGLE-PHASE

- Advanced Circuitry and Battery Protection
- High AC to AC Efficiency

FIRSTLINE PLT 924

9 - 54 KW

THREE-PHASE

- Advanced Circuitry and Battery Protection
- High AC to AC Efficiency
- User-Friendly Mimic Panel
- Available in 208 & 480 Voltages

FIRSTLINE P 924

58.5 - 225 KW

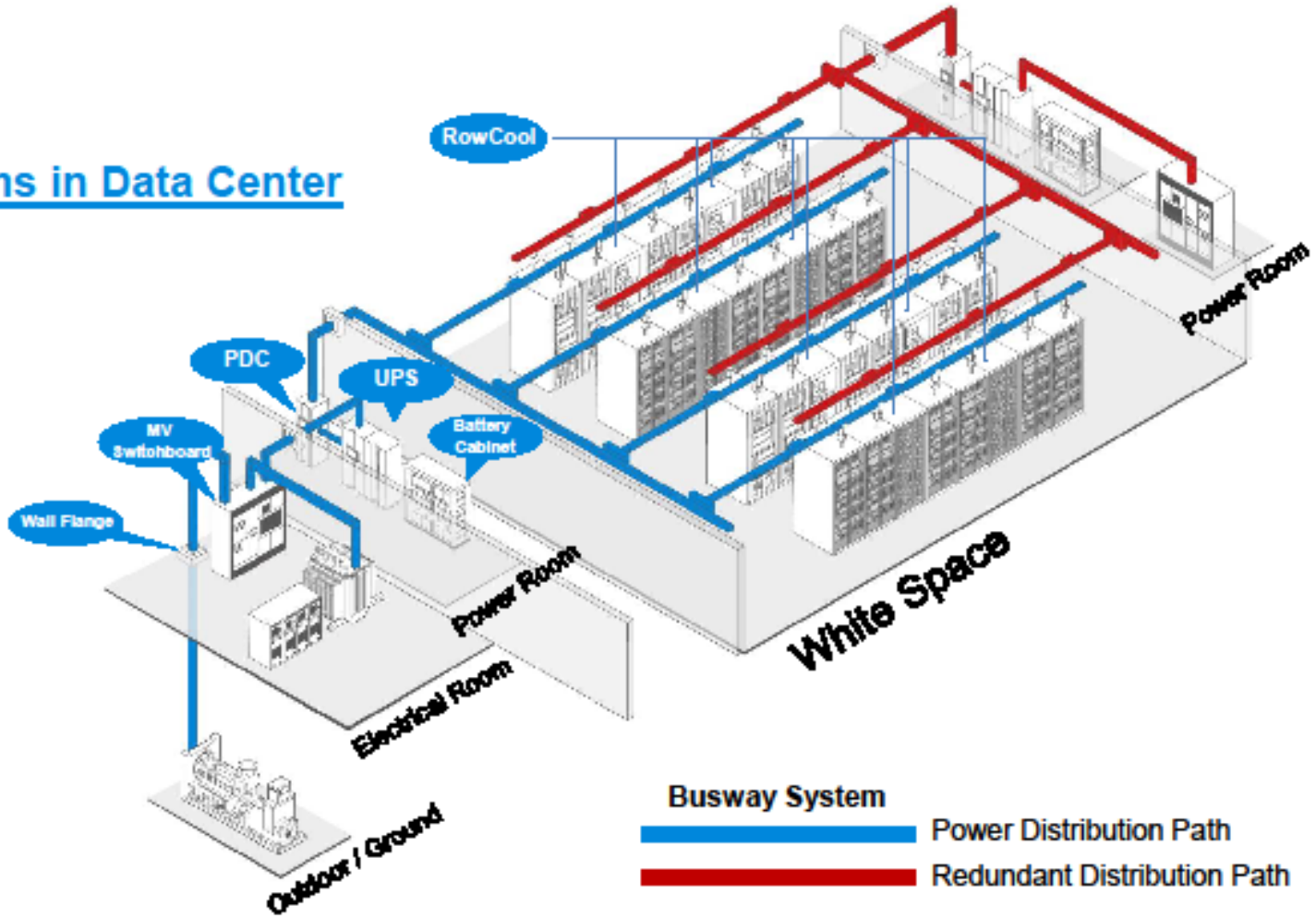
THREE-PHASE

- Advanced Circuitry and Battery Protection
- Cost Effective, High Reliability Design
- Supports all connected lighting loads
- Monitoring and Communications
- Available in 208 & 480 Voltages
- Customizable Battery Times

STACO ENERGY PRODUCTS CO.

Track Busway System 250 Amp – 1600 Amp

Busway Systems in Data Center



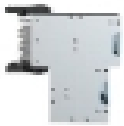
Product Specification

Busway BR Series

- Insulation material : Epoxy Cast Resin (Class F 155°C)
- Conductor : Copper
- Rated voltage : 1000V
- Rated current : 250/400/600/800/1000/1250/1600A
- Length : 1m to 6m or customized
- Ingress rating : IP20, IP55(optional)
- Fully insulated busway enclosed in Aluminum housing
- Continuous plug-in openings (pitch: 100mm)

Plug-In Units

Rv type



Rh type

- Rated voltage : 1000V
- Rated current : 16/32/63/125/250/400A
- Ingress rating : IP42
- Customizable to include breaker, power meter, phase selector switch and Socket-outlets, length of power cord, etc.
- Optional branch circuit monitoring (BCMS) or DCIM

End Feed Box

- Rated voltage : 1000V
- Rated current : 250/400/630/1250/1600A
- Ingress rating : IP42
- Pluggable
- Optional breaker, power meter, over-temperature detection system (OTDS)

Track Busway Horizontal Mount Color Options

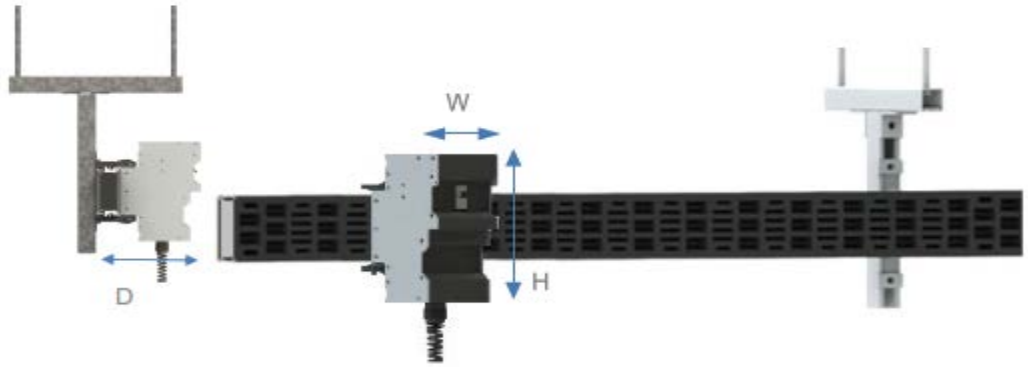
Colors

	Black (Std.)	Dark Blue	Light Blue	Warm Red	Yellow
Pantone Color	Pantone Black C	Pantone 2146 C	Pantone 18-4535 TPG	Pantone 7621 C	Pantone Yellow C

	Grayish White	Bright White	Blue Green	Orange	Gray
Pantone Color	Pantone 13-4104 TPG	Pantone 11-0601 TCX	Pantone 7717 C	Pantone 7577 C	Pantone 7535 C

Vertical Mounted Busway

Plug-in Unit (Rh Type)



Rh type

Ratings		16A	32A	63A	125A	250A	400A
Height	mm	250	250	250	250	250	250
Depth	mm	243	243	243	243	243	243
Width	mm	100	100	100	200	300	300
IP Rating		IP42	IP42	IP42	IP42	IP42	IP42
Weight	kg	3	3	5	12	20	26

Busway Configuration

Feeder section

Plug-in section

Flatwise elbow

Edgewise elbow

Flatwise Tee

Edgewise Tee

Flatwise Offset

Edgewise Offset

Flat to Edge Elbow

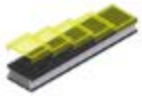
Edge to Flat Elbow

BL-BR plug-in section

BL-BR Plug-in section w/ PIU

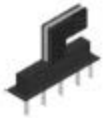
Flatwise Tee

Edgewise Tee

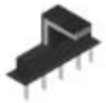


Slot Cover

Flange End



Flange End w/ Edgewise Elbow

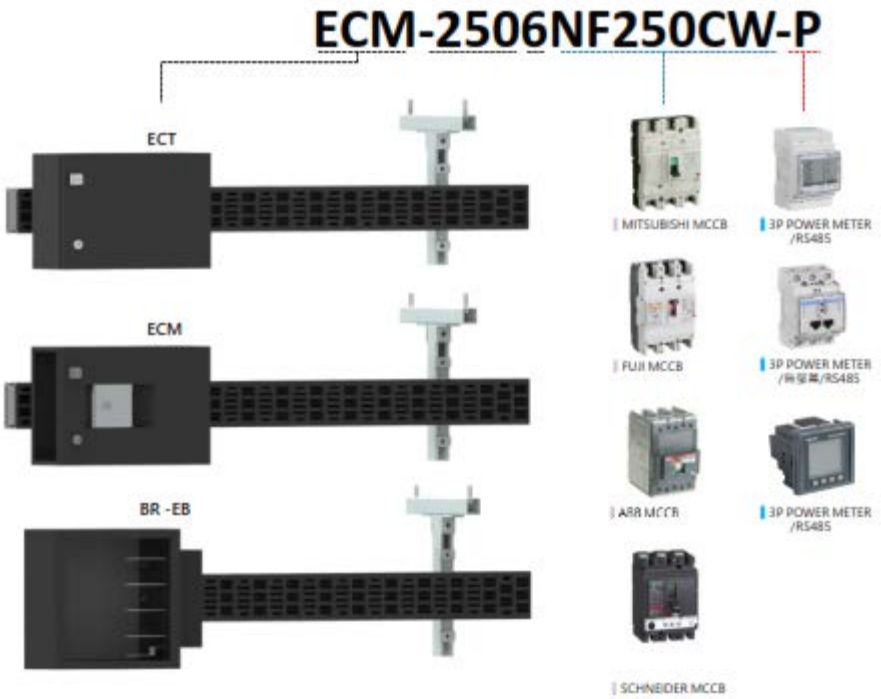


Flange End w/ Flatwise Elbow

Spring Hanger

Wall/ Floor flange

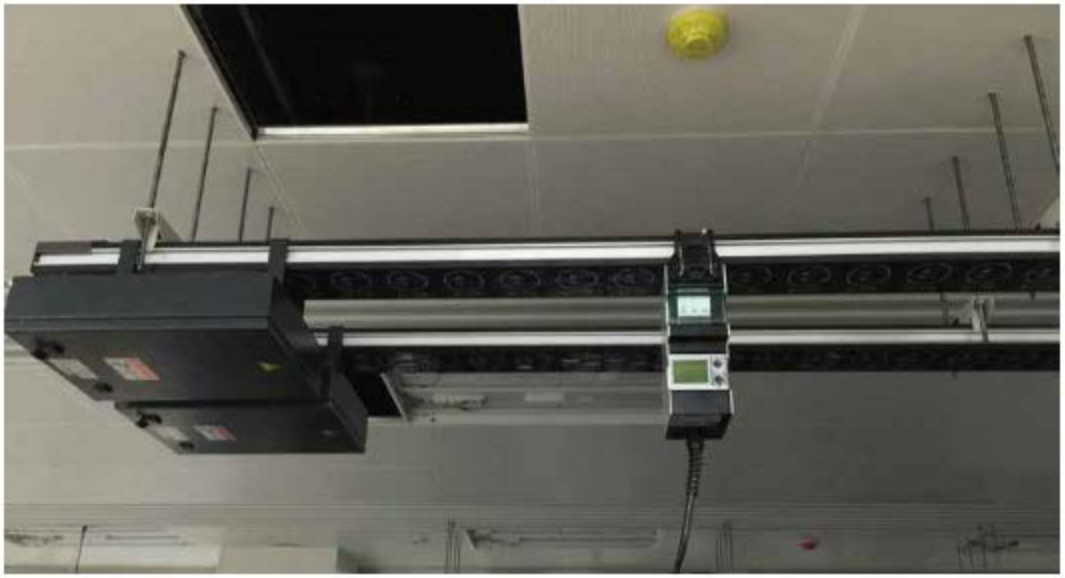
End Feed Box / End Cable Box



Ratings		250A		400A		630A		800A	1000A	1250A	1600A
Model (Type)		ECM-250 MCCB	ECT-250 Terminal	ECM-400 MCCB	ECT-400 Terminal	ECM-630 MCCB	ECT-630 Terminal	BRC066EB Terminal	BRC106EB Terminal	BRC126EB Terminal	BRC166EB Terminal
W	mm	450	430	450	430	450	430	500	500	500	500
H	mm	300	300	300	300	300	300	650	650	650	650
D	mm	240	160	240	160	240	160	220	233	260	300
IP Rating		IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP42
Weight	Kg	17	15	19	15	20	17	35	36	45	55

Monitoring Module

The plug-in unit can fit within the monitoring module. The power information can be displayed or transmitted to the monitoring system via RS485.



InfraSuite Manager
Data Center Infrastructure Management (DCIM)

Delta InfraSuite Manager is the fully featured Data Center Infrastructure Management (DCIM) software solution to deliver automation and visibility into the data center and increase the ease of management on a comprehensive platform. InfraSuite Manager optimizes the performance and life cycle management of the data center.

Delta Lithium-ion Battery Energy Storage Container

- **MWh class Energy Storage**
- **High Power Delivery Ability**
- **Long Service Life & Easy Maintenance**

Product Specification		
	20ft Container	40ft Container
Maximum Capacity	362 KWh/ 456 KWh	1 MWh/ 1.16 MWh
System DC Voltage	647 Vdc ~ 804 Vdc 716 Vdc ~ 918 Vdc	
System Contents	• Battery Cabinet • Battery Management System • Fire Extinguish System	• Electrical Distribution Panel • HVAC system • System Controller

- **Flexible Design**

Custom design available with standard unit: DBS48V50S

DELTA
Smarter. Greener. Together.

DOC. NO. DELTA-ESD-B-CONTAINER-E-20170410-01

Delta Lithium-ion Battery Energy Storage Container

Renewable Energy Utilization

- Smoothing
- Time Shifting
- Maximum availability

Support Ancillary Service for Grid

- Frequency Reglation
- PV/Wind Smoothing
- Spinning Reserve

- High Power
- Long Cycle Life
- Easy Set-up
- Safe Operation

Smart Energy for Off-grid Sites

To optimize power utilization and lower fuel energy cost

- Oil Drilling Site
- Mining Site

Micro Grid Energy Storage

Energy storage support for communities, remote sites & islands, universities, hospitals, shopping centers, etc.

..... Delta's energy solution can support your business.

Delta Electronics,Inc.
Energy Storage Device BD
EMail:ESDBD@deltaww.com
www.deltaww.com

DOC. NO. DELTA-ESD-B-CONTAINER-E-20170410-01

DELTA
Smarter. Greener. Together.

HEAVY DUTY INDUSTRIAL DIESEL STANDBY SERIES

Designed and engineered to ensure the highest level of performance and quality standards.

HIPOWER®
A YANMAR COMPANY

Heavy Duty Industrial Diesel Standby Product Line

Introducing HIPOWER's newly redesigned and reengineered HEAVY DUTY INDUSTRIAL (HDI) Diesel Standby product line, specifically tailored to meet the needs of the stationary market in North America. Our product line offers reliable power solutions for various commercial, industrial, and life-critical applications, ranging from 60 kW to 2000 kW. The HDI series comes equipped with a rich range of innovative standard features, and industry-leading configurable and engineered options. Our HDI series meets tough industry testing and quality standards, including UL 2200, ISO, and CSA certifications for models up to 2000 kW, ensuring that the HDI series can meet even the most demanding requirements.

STANDARD FEATURES

ENCLOSURE
- Rust-Proof Fastener with rubber washers to protect finish
- High Performance Sound-Absorbing Material
- Gasketed Doors
- Air Discharge Hoods for Radiators-Upward/Downward Pointing
- Lift Off Door Hinges
- Stainless Steel Lockable Handles
- Textured Polyester Powder Coat + Primer

ENGINE SYSTEM
- Oil Drain Extension w/valve
- Air Cleaner
- Fan Guard
- Factory Filled Oil
- Battery Charging Alternator

ELECTRICAL SYSTEMS
- Battery
- Battery Cables
- Battery Tray
- DSE 7410 Controller

ALTERNATOR SYSTEM
- 6 leads (HDI-1250 to 2000)
- 12 leads (Up to HDI-1000)
- Class H Insulation Material
- Vented Rotor 2/3 Pitch
- Full Load Capacity Alternator
- Protective Thermal Switch
- Permanent Magnet Excitation (On HDI250 + Higher Models)
- Skewed Stator

FUEL SYSTEM
- Primary Fuel Filter

COOLING SYSTEM
- Factory-Installed Radiator
- Radiator Drain Extension w/valve
- 50/50 Ethylene Glycol Antifreeze

GENERATOR SET
- Internal Genset Vibration Isolation
- Separation of Circuits – High/Low Voltage
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Yrs./2,000 Hrs. (Whichever occurs first) parts & labor.
- Silencer Mounted in the Discharged Hood (Enclosed Models Only)

CONFIGURABLE OPTIONS

ENCLOSURE
- Open Skid
- Level 1 Sound Attenuation
- Level 2 Sound Attenuation
- Level 1 Sound Attenuation (Aluminum Enclosure)
- Level 2 Sound Attenuation (Aluminum Enclosure)
- Snow Hood (Only with L2)

ENGINE SYSTEM
- Oil Heater
- 120V-1ph Water Jacket Heater (with Isolation Valves)

FUEL TANK
- ULC142 Fuel Tank 12 hrs. (HDI 800-2000 only)
- ULC142 Fuel Tank 24 hrs.
- ULC142 Fuel Tank 48 hrs.

ALTERNATOR SYSTEM
- Anti-condensation Heater
- Rheostat
- PMG with MX341 AVR or MX321 AVR

ELECTRICAL SYSTEM
- Battery Warmer
- Battery Charger
- 10 Positions Load Center (100 Amps)
- Remote ESTOP with N3R Break Glass
- 120V GFCI Receptacle
- 10A Relay Common Alarm
- 10A Run Relay
- Control Panel Heater
- 8, 16 & 24 Leds Remote Annunciator on Surface Mounted Box
- DSE8610 Parallel Controller + Motorized Bkrs. (On HDI400 + Higher Models)
- AC/DC Enclosure Lighting Kit w/Timer
- Enclosure Heater

GENERATOR SET
- Extended Test
- Extended Warranty
- Custom Testing

CONTROL SYSTEM
- Spare Inputs (x4) / output (x4)
- DSE2130 - DSENet Input Expansion Module
- DSE2157 - DSENet Output Expansion Module
- DSE2520 - Remote Display Module

CIRCUIT BREAKER OPTIONS
- LSI Electronic Trip 80% and 100% Rated
- LSIG Electronic Trip 80% and 100% Rated
- Second Main Line Circuit Breaker
- Shunt Trip
- Auxiliary Contacts for MLCB
- Auxiliary Contacts for Secondary Breaker
- Mechanical Lugs

CERTIFICATIONS
- IBC Certification

ENGINEERED OPTIONS

ENCLOSURE
- Air Outlet Gravity Dampers
- Air Inlet Motorized Dampers (Only with L2)

ENGINE SYSTEM
- Fluid Containment Pan
- 208V-3ph Water Jacket Heater (With Isolation Valves)

CIRCUIT BREAKER OPTIONS
- 3rd Breaker System
- Shunt Trip on 3rd Breaker
- Auxiliary Contact on 3rd Breaker

FUEL TANK
- ULC142 Fuel Tank 72 hrs.*
- ULC142 Fuel Tank 96 hrs.*
- Multiple Fuel Tank Accessories

ELECTRICAL SYSTEMS
- 240V Twist Lock Receptacle

ALTERNATOR SYSTEM
- Bearing RTD's on Alternator
- Main Stator RTD's on Alternator (2 per Phase)
- Tropical Coating
- Alternator Up-sizing

*For HDI 800-2000, review with sales for feasibility.

		HDI 60	HDI 80	HDI 100	HDI 130	HDI 160	HDI 180	HDI 200	HDI 230	HDI 250	HDI 300	HDI 350
Performance	**Units**											
Rated standby power 1ø	kW	60	80	100	130	160	N/A	N/A	N/A	N/A	N/A	N/A
Rated standby power 3ø	kW	60	80	100	130	160	180	200	230	250	300	350
Rated standby power 3ø	kVA	75	100	125	162.5	200	225	250	287.5	312.5	375	437.5
Amp capacity @480V	A	90.2	124.8	150.4	194.6	248.1	278.2	300.7	345.8	388.6	449.0	525.5
Amp capacity @208V	A	209.2	298.3	347.0	450.9	569.0	645.4	694.0	798.0	901.6	1031.7	1200.5
Amp capacity @600V	A	72.2	99.8	120.3	155.6	198.5	216.5	240.6	276.7	300.7	355.4	421.3
Max. sound pressure level (LPA) @23' @100% Load (L2)	dB(A)	68.5	68.5	72	72	72	72	71	71	71	73	73
Ambient Temp Capability	°F /°C	113/45	113/45	113/45	113/45	113/45	113/45	113/45	113/45	113/45	113/45	113/45
Fuel Consumption												
Fuel consumption at full load (STANDBY)	gal/h	4.99	6.76	7.65	9.76	12.1	13.3	15.5	16.7	18.5	21.8	25.8
Alternator												
Model (480V)		UCI224F	UCI274C	UCI274D	UCI274F	UCI274G	UCI274H	UCDI 274J	UCDI 274K	S4L1D-D	S4L1D-E	S4L1D-F
Automatic voltage regulator (+/-0.5%)		SX460	SX460	SX460	SX460	SX460	SX460	SX460	SX460	MX341	MX341	MX341
Insulation		Class H	Class H	Class H	Class H	Class H	Class H	Class H	Class H	Class H	Class H	Class H
Temperature Rise	°F /°C	125/40	125/40	125/40	125/40	125/40	125/40	125/40	125/40	125/40	125/40	125/40
Engine												
Manufacturer		FPT	FPT	FPT	FPT	FPT	FPT	FPT	FPT	FPT	FPT	FPT
Model		N45 SM2X	N45 TM2X	N67 TM1X	N67 TM1X	N67 TE2X	N67 TE2X	C87 TE1D	C87 TE1D	C87 TE1D	C10 TE1D	C13 TE3X
EPA Certified		Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Nominal Power	HP	89.8	127.7	188.3	188.3	268.1	268.1	375.3	375.3	375.3	425.1	497.5
Dimensions and Weight												
Dimensions | L x W x H | Level 1	inches	113.9 x 46.3 x 60.1		142.1 x 46.3 x 60.1				160 x 55.0 x 68.1			173 x 55.0 x 70.1	
Weight | Level 1	lbs.	3050	3161	4420	4520	4650	4720	6440	6440	6540	7700	7830

Specifications and designs are subject to change. Estimate weight, actual weight varies depending on options selected. Single phase available from HDI60 to HDI160. Other voltage configurations available upon request.

HIPOWER SYSTEMS is committed to delivering robust and reliable Heavy Duty Industrial Diesel Standby generators to the power generation industry throughout North America. We stand behind every machine we make. That is why all our generators come with a standard 2 years or 2,000 hours (whichever occurs first) parts and labor limited warranty.

PICTURED - HDI600/LEVEL 1 & HDI80/LEVEL 2

		HDI 400	HDI 515	HDI 600	HDI 800	HDI 1000	HDI 1250	HDI 1600	HDI 2000
Performance	**Units**								
Rated standby power 3ø	kW	399	515	600	800	1000	1250	1600	2000
Rated standby power 3ø	kVA	499	644	750	1000	1250	1563	2000	2500
Amp capacity @480V	A	599.9	774.3	902.1	1203	1504	1879	2406	3007
Amp capacity @208V	A	1387.9	1786.9	2081.9	2776	N/A	N/A	N/A	N/A
Amp capacity @600V	A	481.1	619.5	721.7	962	1203	1504	1925	2406
Max. sound pressure level (LPA) @23' @100% Load (LZ)	dB(A)	75	76	77	75	75	78	81	83
Ambient Temp Capability	°F / °C	113/45	113/45	113/45	113/45	113/45	113/45	113/45	113/45
Fuel Consumption									
Fuel consumption at full load (STANDBY)	gal / h	27.9	35.8	42.31	65	72.5	97.2	124.5	155
Alternator									
Model (480V)		HCI534C	HCI534E	HCI534F	S6L1D-C	S6L1D-E	S6L1D-H	S7L1D-D	S7L1D-G
Automatic voltage regulator (+/-0.5%)		MX341	MX341	MX341	MX341	MX341	MX341	MX341	MX341
Insulation		Class H	Class H	Class H	Class H	Class H	Class H	Class H	Class H
Temperature Rise	°F / °C	125/40	125/40	125/40	125/40	125/40	125/40	125/40	125/40
Engine									
Manufacturer		VOLVO	VOLVO	VOLVO	MHI	MHI	MHI	MHI	MHI
Model		TAD 1353GE	TAD 1641GE	TWD 1644GE	S12A2-Y2PTAW-2	S12H-Y2PTAW-1	S12R-Y2PTAW-1	S16R-Y2PTAW-1	S16R-Y2PTAW2-1
EPA Certified		Tier 3	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
Nominal Power	HP	585	748	876	1207	1528	1881	2346	2923
Dimensions and Weight									
Dimensions | L x W x H | Level 1	inches	186 x 68.5 x 84	207 x 68.5 x 93.1		230 x 94 x 115		252 x 106 x 129	282 x 110 x 145	
Weight | Level 1	lbs.	13000	14000	15000	21200	25400	33025	40050	42475

Specifications and designs are subject to change. Estimate weight; actual weight varies depending on options selected. Single phase available from HDI60 to HDI160. Other voltage configurations available upon request.

HEAVY DUTY INDUSTRIAL SPARK-IGNITED STANDBY SERIES

Designed and engineered to ensure the highest level of performance and quality standards.

HIPOWER®
A YANMAR COMPANY

HDI SPARK-IGNITED STANDBY SERIES

TECHNICAL SHEET

HNI-80 - HNI-200

Genset Model	HNI-80	HNI-100	HNI-125	HNI-150	HNI-200
NG Standby Rating @ 480V (kW/kVA)	80/100	100/125	125/156	150/187.5	**200/250**
Engine Model	PSI 5.7LT	PSI 5.7LTCAC	PSI 8.8LT	PSI 8.8LTCAC	**PSI 8.8LTCAC HO**
Standard Controller Model	DSE 7410 MKII	DSE 7410 MKII	DSE 7410 MKII	DSE 7410 MK II	**DSE 7410 MKII**
Standard Alternator Model @ 480V	Stamford UCI224G	Stamford UCI274C	Stamford UCI274E	Stamford UCI274F	**Stamford UCI274H**
Sound Level Full Load dBA @ 23 ft (Level 1 Enclosure)	75	78	78	78	**80**
Level 1 Enclosure Dimensions (in.)	120.9"L x 46.3"W x 60.1"H	133.8"L x 50.3"W x 60.1"H	133.8"L x 50.3"W x 60.1"H	133.8"L x 50.3"W x 60.1"H	**154"L x 55"W x 61"H**
Level 1 Enclosure Weight (lbs.)	3250	4350	4350	4350	**6540**
Motor Starting @ 30% V Dip	270	340	440	540	**725**
Fuel Consumption (At Full Load) cf/h	1100	1361	1520	1940	**2431**
Available LP or Dual Fuel Option	-	✓	-	✓	-

STANDARD FEATURES

ENCLOSURE
- Rust-Proof Fastener with rubber washers to protect finish
- High Performance Sound-Absorbing Material
- Gasketed Doors
- Air Discharge Hood for Radiators (Upward/Downward Pointing)
- Lift Off Door Hinges
- Stainless Steel Lockable Handles
- Textured Polyester Powder Coat + Primer

ENGINE SYSTEM
- Oil Drain Extension w/ Valve
- Air Cleaner
- Fan Guard
- Factory Filled Oil

ELECTRICAL SYSTEMS
- Battery
- Battery Cables
- Battery Tray

ALTERNATOR SYSTEM
- 12 Leads
- Class H Insulation Material
- Vented Rotor 2/3 Pitch
- Full Load Capacity Alternator
- Protective Thermal Switch
- Skewed Stator

COOLING SYSTEM
- Factory-Installed Radiator
- Radiator Drain Extension w/ Valve
- 50/50 Ethylene Glycol Antifreeze

GENERATOR SET
- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Yrs./2,000 Hrs. (Whichever comes first) parts & labor.
- Silencer Mounted in the Discharged Hood (Enclosed Models Only)

CONFIGURABLE OPTIONS

ENCLOSURE
- Open Skid
- Level 1 Sound Attenuation
- Level 2 Sound Attenuation
- Level 1 Sound Attenuation (Aluminum Enclosure)
- Level 2 Sound Attenuation (Aluminum Enclosure)
- Snow Hood (Only w/ L2)

ENGINE SYSTEM
- Oil Heater
- 120V-1ph Water Jacket Heater (w/ Isolation Valves)

ALTERNATOR SYSTEM
- Anti-Condensation Heater
- Rheostat
- PMG w/ MX341 AVR or MX321 AVR

ELECTRICAL SYSTEMS
- Battery Warmer
- Battery Charger
- 10 Positions Load Center (100 Amps)
- Remote ESTOP w/ N3R Break Glass
- 120V GFCI Receptacle
- 10A Relay Common Alarm
- 10A Run Relay
- Control Panel Heater
- 8, 16, & 24 Leds Remote Annunciator on Surface Mounted Box
- AC/DC Enclosure Lighting Kit w/ Timer
- Enclosure Heater

GENERATOR SET
- Extended Test
- Extended Warranty
- Custom Testing

CONTROL SYSTEM
- Spare Inputs (x4) / Output (x4)
- DSE2130 - DSENet Input Expansion Module
- DSE2157 - DSENet Output Expansion Module
- DSE855 - DSENet USB to Ethernet ModBus TCP/IP Comm. Module
- DSE892 - DSENet USB to Ethernet ModBus TCP/IP-SNMP Comm. Module

CIRCUIT BREAKER OPTIONS
- LSI Electronic Trip 80% and
- LSIG Electronic Trip 80% and 100% Rated 100% Rated
- Second Main Line Circuit Breaker
- Shunt Trip
- Auxiliary Contacts for MLCB
- Auxiliary Contacts for Secondary Breaker
- Mechanical Lugs

ENGINEERED OPTIONS

ENCLOSURE
- Air Outlet Gravity Dampers
- Air Inlet Motorized Dampers (Only w/ L2)

GENERATOR SET
- Seismic Mounts

CIRCUIT BREAKER OPTIONS
- 3rd Breaker System
- Shunt Trip on 3rd Breaker
- Auxiliary Contact on 3rd Breaker

ELECTRICAL SYSTEMS
- 240V Twist Lock Receptacle

ALTERNATOR SYSTEM
- Bearing RTD's on Alternator
- Main Stator RTD's on Alternator (2 per phase)
- Tropical Coating
- Alternator Up-Sizing

HIPOWER SYSTEMS is committed to delivering robust and reliable natural gas standby generators to the Power Generation Industry throughout North America. We stand behind every machine we make. That is why all our generators come with a standard 2 years or 2000 hours (whichever occurs first) parts and labor limited warranty.

	Units	HNI450	HNI500	HNI650	HNI800	HNI1000
Rated standby power 3ø	kW	450	500	650	800	1040
Rated standby power 3ø	kVA	562.5	625	812.5	1000	1300
Engine manufacturer		PSI	PSI	PSI	PSI	PSI
Engine Model		22L	22L HO	32L	40L	53L
Nominal Power	Hp	684	764	966	1234	1603
Alternator		Stamford	Stamford	Stamford	Stamford	Stamford
Ambient Temp Capability	°F / °C	122/50	122/50	122/50	122/50	125/40
Amp capacity @208V	A	1556	1735	2255	2845	3539
Amp capacity @480V	A	674	752	977	1203	1563
Amp capacity @600V	A	542	602	782	963	1251
Max. sound pressure level (LPA) @23' @100% Load (L1)	dB(A)	74	74	73	73	TBD
Temperature rise	°F / °C	125/40	125/40	125/40	125/40	125/40

	Dimensions (L x W x H | Inches)	Weight (Lbs)
HNI450 & HNI500	240" x 97" x 103"	14,430
HNI650	240" x 102" x 112"	18,500
HNI800	240" x 102" x 112"	26,500
HNI1000	300" x 102" x 112"	31,000

Specifications and designs are subject to change. Estimate weight; actual weight varies depending on options selected.

The HNI series is designed to be used in stationary and specifying markets with options ranging from fuel types, enclosures, enclosure accessories, I/O expansions, and breaker types, along with many other options creating an almost unlimited number of combinations to be able to meet any engineering specification.

ROBUSTNESS & SAFETY

UL CERTIFIED · ANSI CERTIFIED · CSA CERTIFIED

NFPA110 COMPLIANT* · ISO CERTIFIED · EPA CERTIFIED

APPLICATIONS & USE

CONSTRUCTION · OIL/GAS · MINING

DATA MGMT. · ENTERTAINMENT · HEALTHCARE

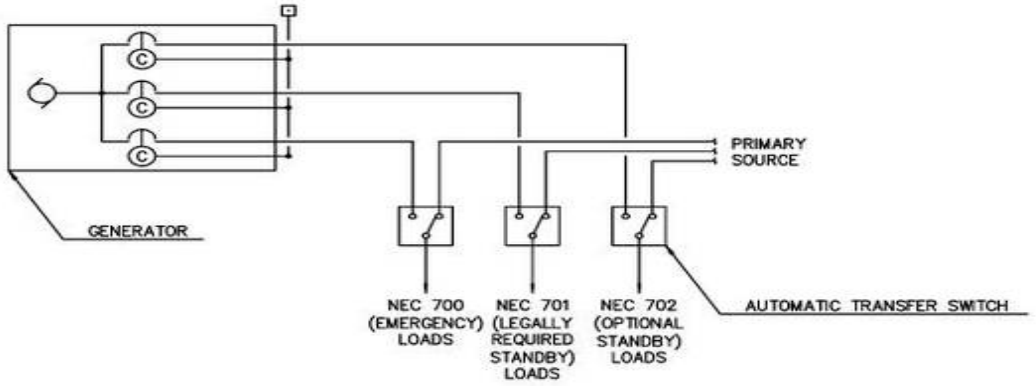
FUEL SYSTEM FLEXIBILITY

NATURAL GAS** · LP/LPV · DUAL FUEL

Understanding Transfer Switch Operation

Standby System Types

- Emergency Systems (NEC Article 700)
- Legally Required Standby Systems (NEC Article 701)
- Optional Standby Systems (NEC Article 702)



Understanding Transfer Switch Operation

Emergency Systems (NEC Article 700)

Emergency systems are defined by the NFPA as "intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination **essential for safety to human life."** These systems may include fire detection and alarm systems, elevators, fire pumps, and egress lighting.

Transfer equipment, including transfer switches, are required to be automatic, identified for emergency use, and approved by the authority having jurisdiction (AHJ). Transfer equipment shall be designed and installed to prevent inadvertent, simultaneous connection of primary and secondary supplies of power. Transfer equipment shall supply only emergency system loads. Power must be transferred to the secondary source in 10 sec or less.

Understanding Transfer Switch Operation

Legally Required Standby Systems (NEC Article 701)

Legally required standby systems are defined by the NFPA as "intended to automatically supply power to selected loads (other than those classified as emergency systems) in the event of failure of the normal source." These systems may include heating and refrigeration systems, communications systems, ventilation and smoke removal systems, and other processes that, when stopped in the event of primary source interruption, could create hazards or hamper rescue or firefighting operations.

Transfer equipment, including transfer switches, are required to be automatic, identified for standby use, and approved by the AHJ. Transfer equipment shall be designed and installed to prevent inadvertent, simultaneous connection of primary and secondary supplies of power. Power must be transferred to the secondary source in 60 sec or less.

Understanding transfer switch operation

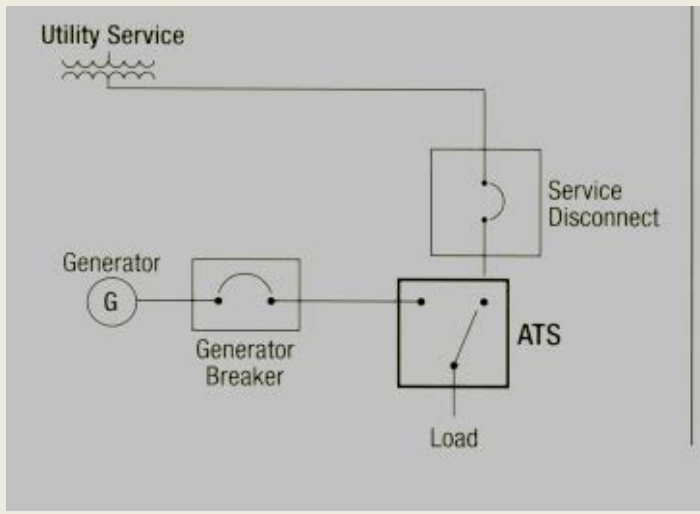
Optional Standby Systems (NEC Article 702)

Optional standby systems are defined by the NFPA as "intended to supply power to public or private facilities or property where life safety does not depend on the performance of the system." These systems may include data processing and communication systems, and mission critical systems that are not legally required by the AHJ.

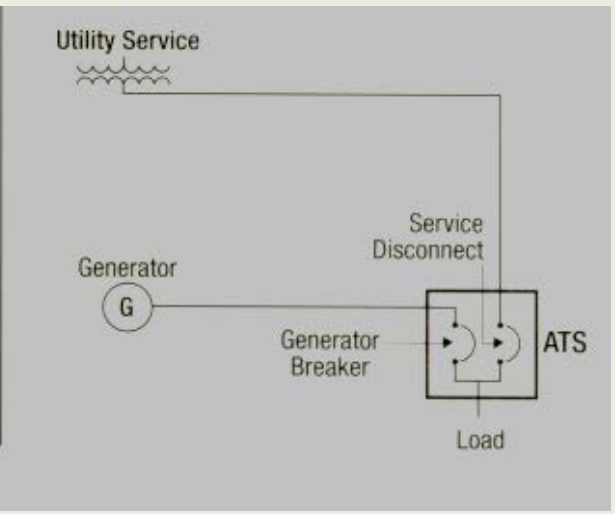
Transfer equipment, including transfer switches, for optional standby systems are not restricted to the same requirements as emergency and legally required system transfer equipment. However, transfer equipment shall be designed and installed to prevent inadvertent, simultaneous connection of primary and secondary supplies of power. There are no code requirements for power to be transferred to the secondary source within a certain time frame.

Standard vs Service Entrance Transfer Switch

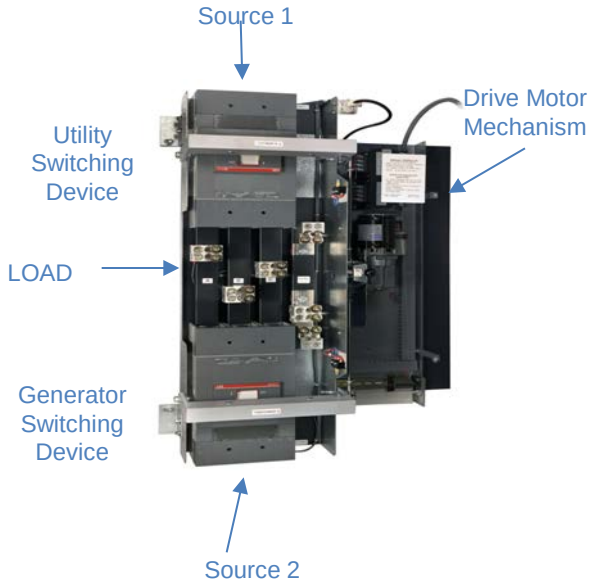
Standard ATS - Single Line



Service Entrance ATS - Single Line

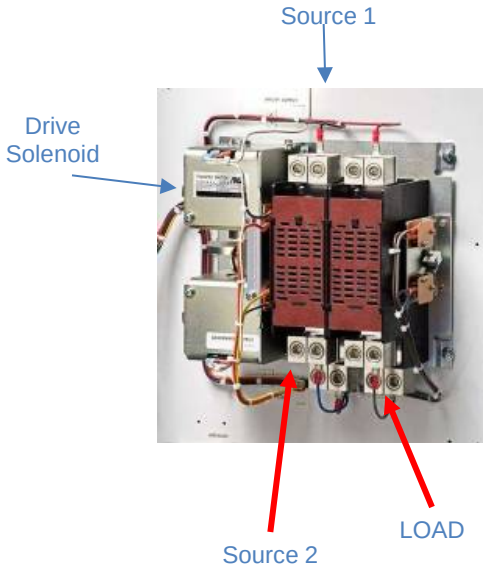


Breaker Technology



- UL489 Certified Breakers
- Sealed
- 4 key parts: 2 Breakers, Drive Mechanism, bus connections.
- Does not require upstream breakers
- kA Rating not specific to external components
- Integral Neutral position to isolate load (SE)
- UL 1008 & CSA 178 Standards

Power Contactor Technology



- Integral Switch
- Open to air
- 2 key parts: Contactor Switch & Solenoid
- Faster transfer time
- Must have upstream breaker/disconnects
- kA Rating dependent on upstream (spec) breakers.
- Neutral position optional
- UL 1008 & CSA 178 Standards

THOMSON™
POWER SYSTEMS

SERIES TS 970 • 100 - 1200 AMP
AUTOMATIC TRANSFER SWITCHES
TSC 7320 CONTROLLER

COMMERCIAL & INDUSTRIAL

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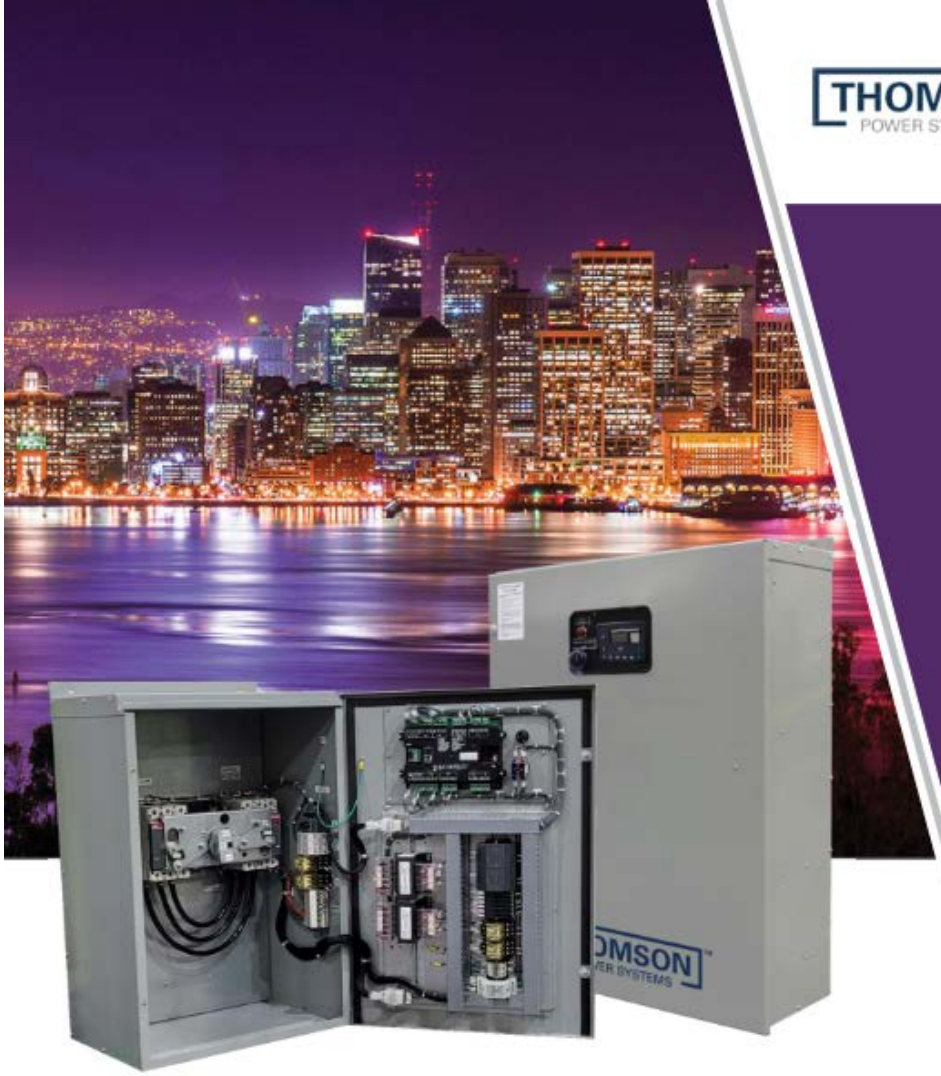


SERIES TS 870 • 100 - 1200 AMP
AUTOMATIC TRANSFER SWITCHES

COMMERCIAL & INDUSTRIAL

REGAL®

STANDARD FEATURES

- 2.3" back-lit LCD text display for monitoring 3 Phase Utility/Generator voltage, system frequency, operation status and alarms
- Five key menu navigation
- Front panel editing with PIN protection
- Customizable status screens
- Load on Utility & Load on Generator indication
- Utility & Generator Source available indication
- 3 Phase Voltage sensing on Utility & Generator Sources
- Generator AC frequency sensing
- Utility under voltage control setpoint 50 - 95% (adjustable)
- Generator under voltage control setpoint 50 - 95% (adjustable)
- Generator under frequency control setpoint 70 - 90% (adjustable)
- Engine warmup timer 0-60 min. (adjustable)
- Utility return timer 0-60 min. (adjustable)
- Engine start (Mains transient) delay timer 0-30 sec. (adjustable)
- Engine cooldown timer 0-60 min. (adjustable)
- Neutral position delay timer 0-120 sec. (adjustable)
- Load Disconnect Contact (LDC) for pre/post transfer control to signal external building systems such as elevators during transfer operations
- Up to 16 different date and time schedules for On-load or Off-load Generator Exercising
- Real-time clock provides accurate event logging
- Data logging
- Ten outputs total. Two programmable outputs are rated at 2A, 24VDC resistive, two user programmable outputs rated 15A, 24VDC resistive, and one programmable relay output rated at 8A, 250VAC resistive. Remaining contacts are for ATS functionality. The user programmable outputs can be changed to 20 different functions including: Load on Utility, Load on Gen, Load Disconnect Contact (LDC), Fail to Transfer (FTT), Utility Power Available (UPA), Generator Power Available (GPA), Utility Power Fail, ATS Not in Auto, and ATS in Auto.
- The Transfer Switch controller is pre-programmed with the following outputs enabled:
  - Load on Utility
  - Load on Gen
  - Load Disconnect Contact (LDC)
  - Fail to Transfer (FTT)
  - ATS Not in Auto

- Local and Remote utility power fail simulation test
- Engine start contact (8A, 120/250VAC resistive max.)
- Automatic force transfer to alternate supply should load voltage become de-energized
- 24VDC control power
- Remote Load Test/Peak Shave Input
- NEMA 1 Enclosure
- Solid Neutral on 4 Wire Systems
- Configurable System Voltage Type (3 wire delta or 4 wire Wye capable without additional sensing transformers)
- ATS Generator Bus Power Metering Capability (Amp, Volt, Freq, kW, kVA, PF)*
- Under/Over Frequency Protection - Utility and Generator Sources
- 3 Phase Over Voltage Protection - Utility and Generator Sources
- Phase Sequence and Phase Rotation Protection for Utility and Generator Sources
- Voltage Phase Loss/Unbalance Protection
- Programmable Inputs (Quantity 8 Digital Input-voltage free input)
- Optional Remote Input module DSE2130 (Quantity 8 Digital inputs)
- Optional Remote Output module DSE2157 (Quantity 8 relay contacts)
- RS485 Modbus Remote Communication Port (Modbus™ Serial RTU)
- Optional Ethernet Modbus Remote Communication Port DSE855 (Modbus™ TCP)
- Optional Remote Annunciator DSE2548
- Support up to Three Remote Display Units DSE2520
- Serviceable Plug-in Connectors

**Power Metering requires Current Transformer Option Kit*

SERVICE ENTRANCE ATS (For U.S. Market Only)

Thomson Power Systems TS 870 Service Entrance (SE) Automatic Transfer Switches incorporate an isolating mechanism and over current protection on the utility supply thereby removing the need to have a separate, upstream circuit breaker/disconnect switch. This unique Service Entrance Rated Automatic Transfer Switch design is incorporated into a standard sized Automatic Transfer Switch enclosure.

Standard features of the Service Entrance Rated Automatic Transfer Switch include a NEMA 1 rated enclosure, pad-lockable Service Disconnect control switch and status indications.

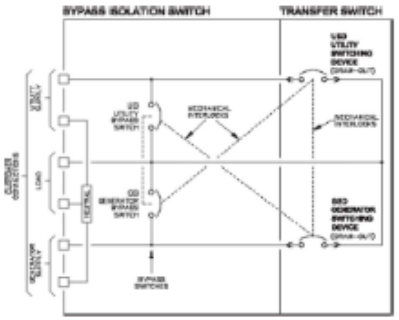
TS 870 SE Service Disconnect operation ensures a high level of safety for system maintenance personnel. Normal operation and performance of the Automatic Transfer Switch is unaffected by the Service Entrance ATS feature. The TS 870 SE Automatic Transfer Switch is rated for the system load and requires upstream over current protection on the generator supply.

The TS 870 SE Automatic Transfer Switches use a type TSC 7320 microprocessor based controller.

BYPASS ISOLATION ATS

Note: TS870 400 to 800A 4 Breaker bypass configuration ATS is implemented using the TS870 with TSC900 controller. Refer to the TS870 Commercial & Industrial ATS datasheet CL062 for details.

1000 / 1200A TS870 Bypass, 4 breaker configuration



1000A - 1200A Molded Case Bypass/Isolation Automatic Transfer Switch TYPICAL SINGLE LINE DIAGRAM

Thomson Power Systems TS 870 Bypass / Isolation Automatic Transfer Switches employ an interlock power switching mechanism that provides an easy and safe procedure for system maintenance personnel to manually isolate and bypass an Automatic Transfer Switch. The Bypass/Isolation switch is manually operated and allows either generator or utility source to be bypassed to maintain power to the load, while the Automatic Transfer Switch is tested for maintenance procedures as required. The bypass/isolation procedure allows a fast, simple, and reliable method of isolating and bypassing the Automatic Transfer Switch through a "make-before-break" bypass design. The interlocking mechanism ensures that the utility and generator sources cannot be paralleled under any circumstance and the transfer switch may be bypassed to either source.

The TS 870 Bypass/Isolation Automatic Transfer Switch is supplied as a single complete assembly with all power conductors provided between the bypass mechanism and the transfer switch. Provisions for all external power cabling for the utility, generator and load conductors are provided for in the bypass/isolation compartment of the switch. The Bypass/ Isolation Switch and Transfer Switch are mounted in separate barriered compartments.

For transfer switches rated 1000A through 1200A using molded case power switching devices, the bypass/isolation mechanism consists of two electrically interlocked power switch devices and draw-out transfer power switching devices. Utilizing independent switching units provides a high degree of both reliability and redundancy not available in other switches.

TS 870 Bypass/Isolation Automatic Transfer Switches are specifically designed and certified to UL 1008 and CSA 22.2 No. 178 Safety Standards.

All TS 870 Bypass/Isolation Automatic Transfer Switch models have been 3 cycle withstand current tested in accordance with UL 1008 and CSA 22.2 No. 178.

The standard TS 870 Bypass/Isolation Automatic Transfer Switch is rated for 100% system load and requires upstream over current protection.

Note: Automatic Transfer Switch units rated 1000A - 1200A utilizing molded case power switching units with a closed transition option may be operated in a "make-before-break" sequence at the operator's direction.

THOMSON™
POWER SYSTEMS

SERIES TS 880 • 800 - 4000 AMP
AUTOMATIC TRANSFER SWITCHES

MISSION CRITICAL, INDUSTRIAL

REGAL®

THOMSON

THOMSON POWER SYSTEMS TS 880 AUTOMATIC TRANSFER SWITCHES OFFER THE FOLLOWING:

ENCLOSED CONTACT POWER SWITCHING UNITS

- Fully enclosed silver alloy contacts provide high withstand rating & 100% continuous current rating
- 3 and 30-Cycle short circuit current withstand tested
- Completely separate utility and generator side power switching units
- Not damaged if manually switched while in service
- Safe manual operation permits easy operation

SUPERIOR SERVICEABILITY

- All mechanical and control devices are visible and readily accessible

CONTROL FEATURES

- TSC 7320 Microprocessor Based Controller with comprehensive features
- Isolation plug permits disconnecting control circuits from all power sources

PRODUCT DATA

- Models available from 800 - 4000A continuous
- Available 3 or 4 Pole
- All models 50/60Hz rated
- Voltage range 208 - 600V
- 3 Phase, 3 or 4 wire systems

QUALITY ASSURANCE

- ISO 9001 Registered

SEISMIC CERTIFICATION

TS 880 is certified for installation and operation per the following requirements:

- IBC 2012 – Section 13, Occupancy Category IV
- ASCE7 - 05 Region 3 (minimum SS=200%)
- OSHPD Certified

SAFETY STANDARDS

- UL 1008
- CSA C22.2 No. 178 Automatic Transfer Switches

WARRANTY

- 2 year limited warranty included

Thomson Power Systems TS 880 Automatic Transfer Switches employ two mechanically interlocked power switching units with a microprocessor based controller to automatically start a generator and transfer system load to a generator supply in the event of a utility supply failure. System load is then automatically retransferred back to the utility supply following restoration of the utility power source to within normal operating limits. All load transfer sequences are open transition (i.e. break-before-make) with adjustable neutral position delay unless the closed transition option is supplied with the transfer switch. The optional 30-Cycle rated ATS utilizes insulated case switch power switching devices in ratings 800A through 4000A, up to 600VAC.

The standard TS 880 Automatic Transfer Switch is rated for 100% system load. The TS 880 design allows for optional use of integral over current trip elements within the power switching units. All TS 880 Automatic Transfer Switches use a TSC 7320 microprocessor based controller which provides all necessary control functions for fully automaticoperation. The controller is equipped with 2.3" back-lit LCD display which provides operating status and controls. All parameters and configurations are entered without opening the front door.

TS 880 Automatic Transfer Switches are specifically designed and certified to CSA C22.2 No. 178 & UL 1008 Standards. All TS 880 application and options are available for the 3 and 30-Cycle designs including:

- Closed Transition
- Bypass Isolation Automatic Transfer Switch
- Service Entrance
- CSA Type B with integrated over current protection and ground fault protection

The TS 880 30-Cycle shares the same design as Thomson Power Systems UL 1558 LV Power Circuit Breaker Switchgear; therefore it can be seamlessly integrated into a Parallel Generation Switchgear package.

SERVICE ENTRANCE ATS (For U.S. Market Only)

Thomson Power Systems TS 880 Service Entrance (SE) Automatic Transfer Switches incorporate an isolating mechanism and over current protection on the utility supply, thereby removing the need to have a separate, upstream circuit breaker/ disconnect switch. This unique service entrance rated automatic transfer switch design is incorporated into a standard sized automatic transfer switch enclosure.

The Service Entrance Rated ATS feature is a standard option that can be applied to any TS 880 model of Thomson Power Systems Transfer Switch.

Standard features of the Service Entrance Rated Automatic Transfer Switch include a NEMA 1 rated enclosure, padlockable Service Disconnect control switch and status indications.

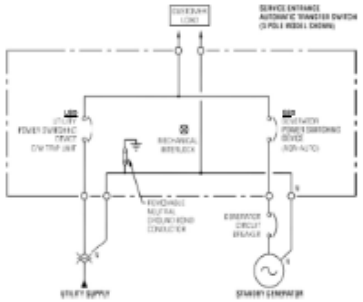
TS 880 SE service disconnect operation is simple and ensures a high level of safety for system maintenance personnel. Normal operation and performance of the Automatic Transfer Switch is unaffected by the Service Entrance ATS feature.

TS 880 SE Automatic Transfer Switches are specifically designed and certified to the UL 1008 Standard as well as complying with NEC and NFPA requirements. TS 880 SE Automatic Transfer Switches are for use in emergency power system applications such as commercial, industrial or government institutions that require automatic standby power.

All TS 880 SE Automatic Transfer Switch models have been 3 or 30-Cycle withstand current tested in accordance with UL 1008 and CSA 178, which allow high current rating and use of nonseries rated upstream protective devices. The TS 880 SE Automatic Transfer Switch is rated for the system load and requires upstream over current protection on the generator supply.

The TS 880 SE Automatic Transfer Switches use a type TSC 7320 microprocessor based controller.

TYPICAL SINGLE LINE DIAGRAM



OPERATION MODE

Service Entrance Automatic Transfer Switch Operation Mode	Utility Power Switching Device Position	Generator Power Switching Device Position	ATS Load
Normal Conditions (Utility Power Supplying Load)	Closed	Open	Energized
Utility Power Failure (Generator Supplying Load)	Open	Closed	Energized
Service Disconnect Mode	Open (Mechanically & electrically interlocked)	Open (Mechanically & electrically interlocked)	De-Energized

CLOSED TRANSITIONS ATS (MOMENTARY)

Thomson Power Systems TS 880 Closed Transition Automatic Transfer Switches (CTTS) employ two electrically interlocked insulated case power switching units and a TSC 7320 microprocessor based controller to automatically allow a closed transition load transfer when both utility and generator sources are available. All closed transition transfer sequences ensure both sources of power are in synchronism prior to transfer and load is transferred without power interruption. Automatic control & protection circuits ensure the generator and utility supplies are only in parallel for a maximum of 100 ms to permit an uninterrupted load transfer.

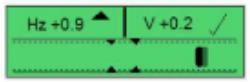
In the event of a utility supply failure, the TS 880 CTTS will automatically revert to an open transition load transfer sequence to transfer system load automatically to the generator supply. System load is then automatically retransferred back to the utility supply utilizing a closed transition transfer sequence following restoration of the utility power source to within normal operating limits. All closed transition transfer sequences will be inhibited when only one source of power is available. The closed transition feature is a standard option that can be applied to TS 880 models of Thomson Power Systems Transfer Switches 800A and above.

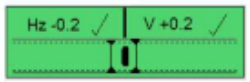
TS 880 CTTS are specifically designed and certified to UL 1008 Standards. For use in emergency power systems applications such as commercial, industrial, or government institutions that require automatic standby power and minimal power interruptions to the load.

All TS 880 CTTS models have been 3 or 30-Cycle withstand current tested in accordance with UL 1008.

The standard TS 880 Automatic Transfer Switch is rated for 100% system load and requires upstream over current protection. The TS 880 CTTS designs allows optional use of integral over current trip elements within the power switching units, thus eliminating the need for external, upstream protective devices.

The TS 880 CTTS use the TSC 7320 controller, with built in sync check relay which contains adjustable voltage/slip frequency threshold limits. The paralleling time is less than 100 ms. A timer monitors the closed-transition period, and will isolate, should the closed-transition time exceed the setting of the timer. If the device fails to open within 100 ms an additional Extended Paralleling Protection is provided to ensure isolation by opening the other source within 500 ms.





BYPASS ISOLATION ATS

Thomson Power Systems TS 880 Bypass/Isolation Automatic Transfer Switches employ an interlock power switching mechanism that provides an easy and safe procedure for system maintenance personnel to manually isolate and bypass an Automatic Transfer Switch. The Bypass/Isolation switch is manually operated, and allows either generator or utility source to be bypassed to maintain power to the load while the Automatic Transfer Switch is tested for maintenance procedures as required. The Bypass/Isolation procedure allows a fast, simple and reliable method of isolating and bypassing the Automatic Transfer Switch through a break-before-make bypass design. The mechanical interlocking mechanism ensures that the utility and generator sources cannot be paralleled under any circumstance and the transfer switch may be bypassed to either source.

Note: Automatic Transfer Switch units rated 800A - 4000A utilizing insulated case power switching units with a closed transition option may be operated in a make-before-break sequence at the operators' direction.

The TS 880 Bypass/Isolation Automatic Transfer Switch is supplied as a single complete assembly with all power conductors provided between the bypass mechanism and the transfer switch. Provisions for all external power cabling for the utility, generator and load conductors are provided for in the bypass/isolation compartment of the switch. The Bypass/Isolation Switch and Transfer Switch are mounted in separate barriered compartments.

Transfer switches rated 800A - 4000A using insulated case power switching devices, the bypass/isolation mechanism consists of two mechanically interlocked power switch devices and drawout transfer power switching deviceswith key interlock mechanism. Utilizing independent switching units provides a high degree of reliability and redundancy not available in other switches.

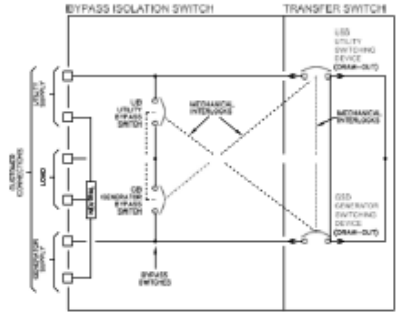
The bypass isolation mechanism consists of two mechanically interlocked power switching devices and drawout transfer power switching devices with key interlock mechanism. Utilizing independent switching units provides a high degree of reliability and redundancy not available in other switches.

TS 880 Bypass/Isolation Automatic Transfer Switches are specifically designed and certified to UL 1008 and CSA 22.2 No. 178 Safety Standards.

The standard TS 880 Bypass/Isolation Automatic Transfer Switch is rated for 100% system load and requires upstream over current protection.

TYPICAL SINGLE LINE DIAGRAM

800A - 4000A Insulated Case
Bypass/Isolation Automatic Transfer Switch



power temp systems INC.

WE PUT THE POWER WHERE YOU NEED IT™

Quick Connect Docking Systems

Integrating Portable Power into Permanent Installations

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Docking Panels

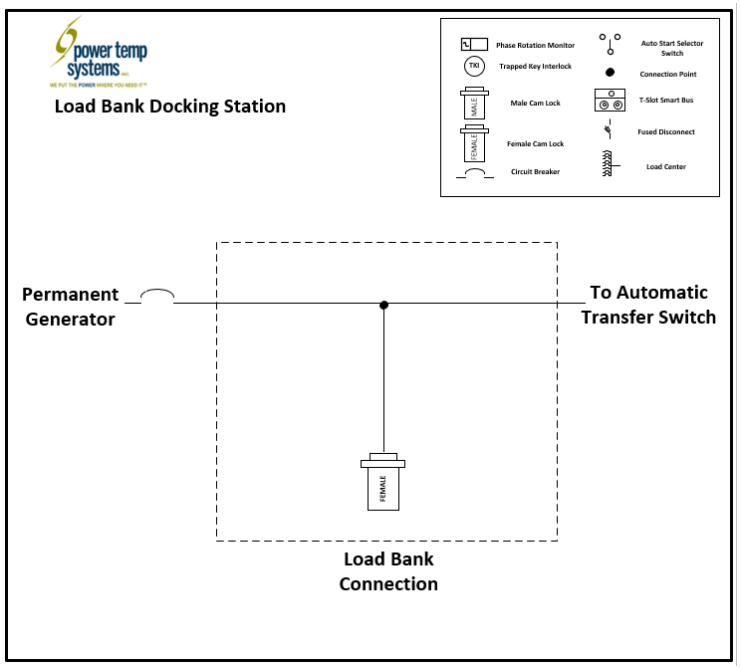
power temp systems INC.
WE PUT THE POWER WHERE YOU NEED IT™

Prevent this……..with this!

Load Bank Docking Station Basic – Spec Grade – Pad Mount

Allows for a Permanent Generator to be load banked while still physically connected to building infrastructure.

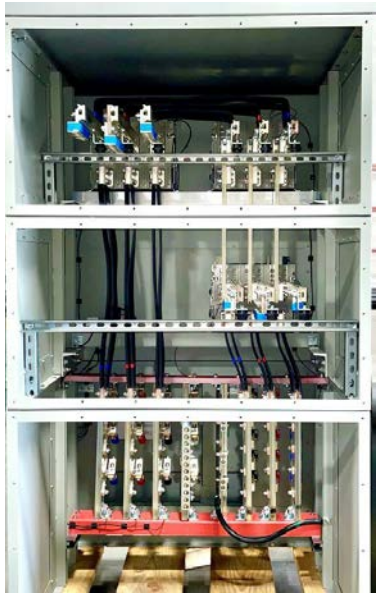
Equipped with a load bank dump receptacle if generator is called for during a utility outage.



Cutting Edge Innovations

power temp systems INC.
WE PUT THE POWER WHERE YOU NEED IT™

Adaptable enclosure systems from simple Add-On Panels and Wall Mounts, to Modular Pad Mounts.



Basic Wall Mount

Quick Connect Docking Panel

The Basic Wall Mount Series allows for a simple and safe means of connecting either a portable generator or a load bank to an existing generator, ATS, or utility service with 16 Series Cam only connection points.

Standard Features:

- NEMA 3RX aluminum construction with quarter-turn latches and powder-coated finish.
- Completely sealed when not in use.
- Tamper-resistant while in use via cable slots and pad-lockable latches.
- Standard phase rotation monitor.
- Color-coded 16 Series Cam input/output connectors.
- Color matching and printed 16 Series Cam feeder cable assemblies.

Optional Features:

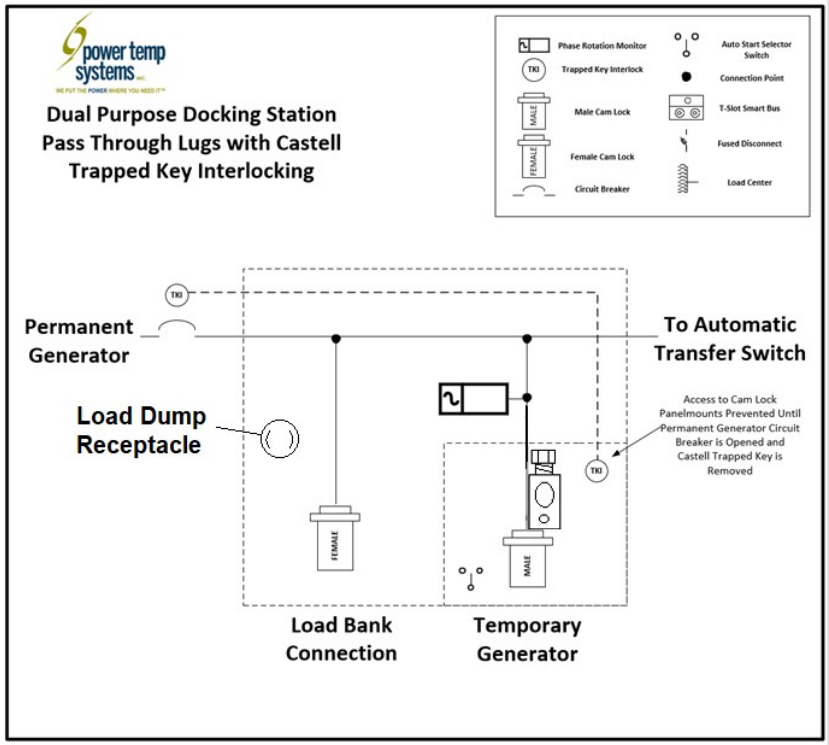
- Optional Trapped Key Interlock available.
- Rotary or ATS transfer option up to 400A.
- Main circuit breaker options available in 100A - 1200A models.
- Available with 2 wire autp start terminals.

Applications:

- 100A - 1200A Tap Box for portable generator or load bank connections.
- 100A - 400A RTS/ATS for portable geneator connnections.

Dual Purpose – Non-Simultaneous Trapped Key Interlock Access

Meets 700.3F but does not allow load testing with portable generator connected.



Spec Grade Wall Mount

Quick Connect Docking Panel

The Spec Grade Wall Mount Series is a versatile solutions that can be a simple connection cabinet, and also allows for hardwire connections in addition to the 16 Series Cams. This added feature is perfect for situations where 16 Series Cams are not available. 100A - 800A models come with our patented Smart Lug making hardwire connections even easier. In addition, the Spec Grade Wall Mount also allows for bottom conduit access and dual purpose applications such as portable generator and load bank connections. Also, it can utilize RTS, ATS, trapped key interlocks and output breakers to supply a complete "All In One" package, reducing space requirements by eliminating the need for multiple enclosures, conduit, and labor.

Standard Features:

- NEMA 3RX aluminum construction with quarter-turn latches and powder-coated finish
- Completely sealed when not in use
- Tamper-resistant while in use via cable slots and pad-lockable latches
- Standard phase rotation monitor
- Color-coded 16 Series Cam input/output connectors
- Hardwire Access. (Smart Lugs up to 800A)
- Dual Purpose. (Load Bank & Portable Generator)
- Trapped Key Access

Optional Features:

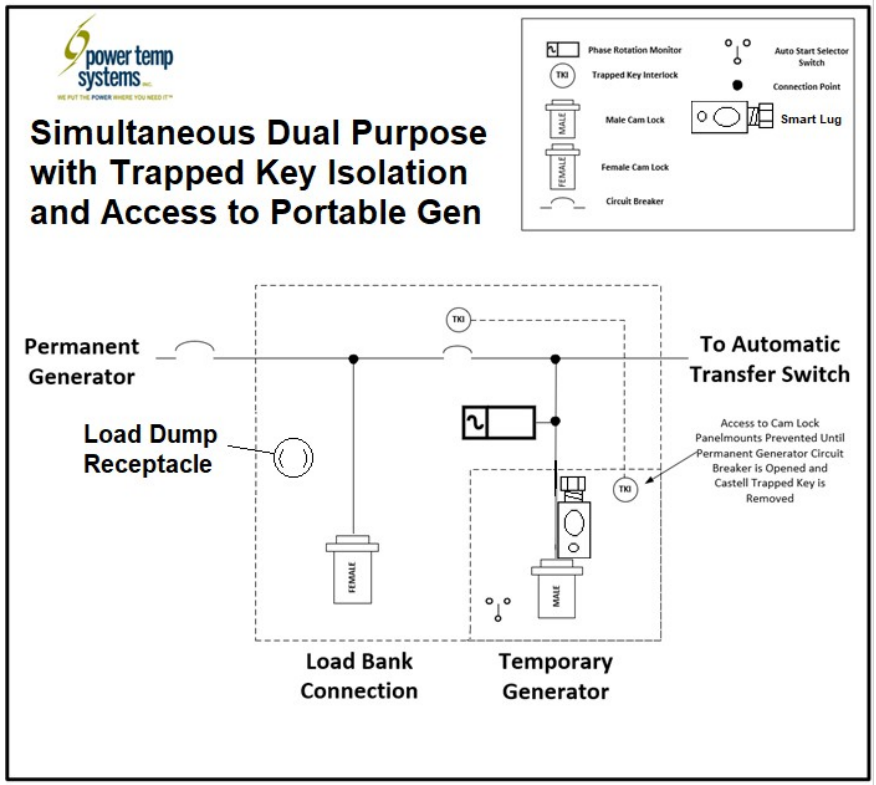
- Transfer switch (Manual or Automatic)
- Load Bank Breaker w/ Shunt Trip
- Output Breakers
- 20A, 30A & 50A Receptacles
- Heater w/ Thermostat
- Matching 16 Series Cam Cable Assemblies
- Leg Kit

Applications:

- Connection cabinet for portable generator, load bank or both
- When bottom conduit access is required
- When output breakers are required
- When combination uses are required ie. ATS, RTS, Multiple Breakers

Dual Purpose
Trapped Key Interlock and Isolation Breaker

Meets 700.3F AND allows Simultaneous load banking of permanent generator with portable generator connected



Modular Pad Mount

Quick Connect Docking Panel

The Pad Mount Series Quick Connect System allows for everything from a simple single tier cam-lok connection cabinet to a 3 Tier side-by-side multi-function unit with integrated transfer switch, portable generator and load bank connections, input, load bank, and ATS distribution breakers, paralleling common buss and any of the listed accessories.

Standard Features:

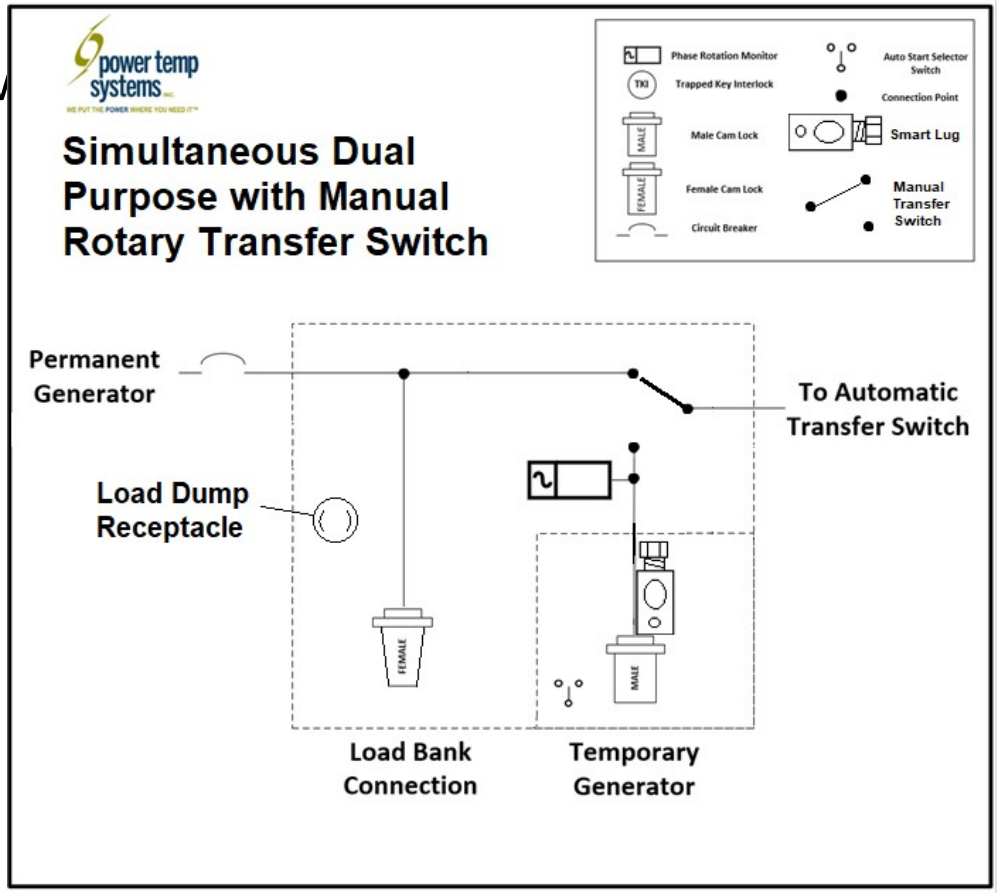
- NEMA 3RX aluminum construction with quarter-turn latches and powder-coated finish.
- Completely sealed when not in use.
- Tamper-resistant while in use via cable slots and pad-lockable latches.
- Standard phase rotation monitor.
- Color-coded 16 Series Cam input/output connectors.
- 100 kA plated copper smart T-slot buss.
- Two wire auto start terminal with signal destination switch.
- Hardwire (Smart Lugs)
- Transfer switch. (Manual or Automatic)
- Dual Purpose. (Load Bank & Portable Generator)
- Trapped Key Access.
- Load Bank Breaker w/ Shunt Trip.
- Output Breakers.
- 20A, 30A & 50A Receptacles.
- Heater w/ Thermostat.
- Matching 16 Series Cam Cable Assemblies.
- Riser Box

Applications:

- 800A to 6000A connection for portable generator, load bank or multi-funtion cabinets to combine some or all of the required switches, breakers, bussing, and other emergency power requirements.

Dual Purpose
Rotary Transfer Sw

Meets 700.3F AND allows Simultaneous load banking of permanent generator with portable generator connected



Pad Mount Dual Purpose Simultaneous with Trapped Key, Rotary or ATS

power temp systems INC.
WE PUT THE POWER WHERE YOU NEED IT™

500 KW Diesel

400 KW Natural Gas


GILLETTE
GENERATORS


NO
PARKING

400 KW Diesel Level-2 Enclosure w/ Sub-Base Tank

PSI Engine Factory Wood Dale, IL

150 KW Natural Gas
Level-2 Enclosure


GILLETTE
GENERATORS


$196.00
WARNING
UNAUTHORIZED VEHICLES WILL BE TOWED
PHILLIPS TOWING SERVICE, INC.
1168 N. HALSTED
NO PARKING
UNAUTHORIZED VEHICLES WILL BE TOWED AT OWNERS EXPENSE
SILVERSMITH
ONLY
GILLETTE GENERATORS

StacoAVR™

VOLTAGE REGULATORS & POWER CONDITIONERS

Staco Energy Products offers a wide range of Voltage Regulators and Power Conditioners in the form of Variable Transformer (StacoAVR), Tap-Switch (StacoTAP), and Electronic (FirstLine PPC) Technology, depending on the client's needs. These voltage regulators are designed with maximum safety, ease of installation and efficiency in mind. They are continuously rated constant output voltage devices, regardless of typical input voltage variations from +10% to-20%. They're applied to provide stabilized voltage to industrial, commercial and public infrastructure applications where devices need continuous stable electrical supply. Examples include: Reducing voltage to large HVAC systems to reduce high energy cost, or stabilizing the incoming power to a large production facility so equipment operates efficiently, or supplying precise voltage to a single piece of equipment like medical MRI, production CNC, or broadcast Transmitters.

MODULAR POWER CONDITIONING SYSTEM

VOLTAGE REGULATION

- 120-600VAC, up to 2000kVA
- 1% or better Continuous Voltage Regulation
- 97-99% Efficient
- Flexible Design

StacoTAP

VOLTAGE REGULATOR OR POWER CONDITIONING SYSTEM

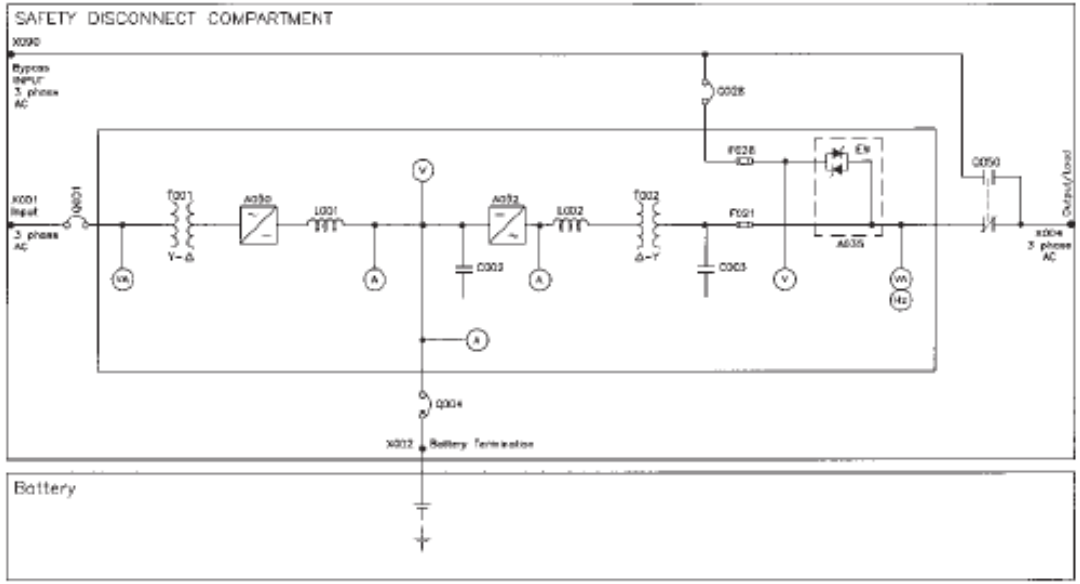
TAP SWITCH

- 120-600VAC, up to 500kVA
- Electronic, Microprocessor controlled
- 1-2 cycle correction
- Minimal Maintenance
- Input Circuit Breaker

STACO ENERGY PRODUCTS CO.

INDUSTRIAL UPS

- **480 Volt – 120/208 Volt Input and Output**
- **5 KVA - 250 KVA Ratings**
- **VRLA, Flooded Cell and NiCad Battery Plants**
- **External Maintenance Bypass w/ Kirk Key**
- **NEMA 3R, 4, 12 Enclosure for Harsh Environment**
- **Encapsulated Board Design**
- **Robust Design for 25+ Year Life Expectancy**



Outdoor Power Pedestal

PQ Products SPD

PQLA
SURGE PROTECTION DEVICE

2.75"H X 4.75"W X 3"D

PQC50
SURGE PROTECTION DEVICE

6"H X 3.25"W X 3"D

PQC100
SURGE PROTECTION DEVICE

6"H X 3.25"W X 3"D

PQC200
SURGE PROTECTION DEVICE

10.9"H X 3.25"W X 3"D

PQM100
SURGE PROTECTION DEVICE

9.45"H X 3.25"W X 3"D

PQM200
SURGE PROTECTION DEVICE

9.45"H X 5.2"W X 3"D

PQS300
SURGE PROTECTION DEVICE

10.31"H X 10.31"W X 3.25"D

PQS400
SURGE PROTECTION DEVICE

10.31"H X 10.31"W X 3.25"D

RLE Technologies Product Lines -

SeaHawk

Designed and engineered to protect facilities and equipment from catastrophic damage specifically from fluid leaks, SeaHawk leak detection equipment detects liquid leaks reliably and efficiently.

Falcon

Supervise environmental conditions and the status of equipment in critical areas with our robust remote data acquisition equipment. With both wired and wireless solutions available, RLE can customize a solution for any infrastructure.

Raptor

Raptor solutions simplify signal convergence and alarm annunciation for current monitors and other building automation and monitoring systems.

TRIAD

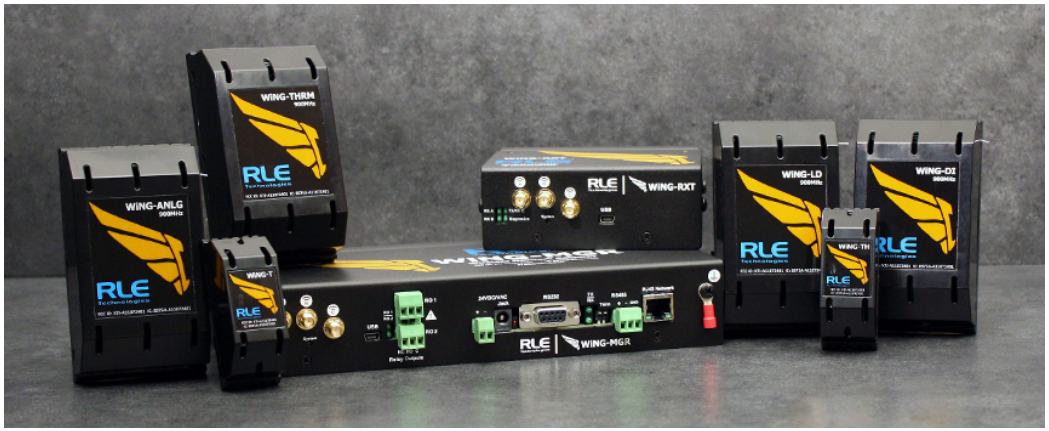
Complete raised flooring systems available for data center and cleanroom environments.

Falcon

Alarm Monitoring & Notification Products

September 24, 2024

WiNG – Overview



- Simplifies sensor deployment by eliminating the need to run sensor wiring
- Allow sensors to be easily relocated when the needs arise
- Provides direct alarm notification when conditions exceed establish acceptable limits
- Integrates with existing management system with SNMP, Modbus and BACnet protocols

WiNG – System Components

- 868MHz & 900MHz options
- *WiNG-MGR* (Wireless Network Gateway)
- Sensors
  - Temperature *(WiNG-T)*
  - Temperature / Humidity *(WiNG-TH)*
  - Leak Detection *(WiNG-LD, WiNG-LDM & WiNG-SPOT)*
  - Digital Input *(WiNG-DI)*
  - Analog Inputs; 0-20mA, 0-5 & 0-10VDC *(WiNG-ANLG)*
  - Thermistor Input *(WiNG-THRM)*
- Sensor auto-discovery simplifies installation

WiNG-MGR – Includes

- *WiNG-MGR* (868 MHz or 900MHz)
- Power Supply
  - PSWA-DC-24 110-240 VAC input
  - Includes type A outlet blade*
- Antennas (qty 3)
  - For use with the 868MHz and 900MHz *WiNG-MGR's*
  - Magnetic base
  - Length: 13.1 ft (4 m)
- RJ-45 network cable
- Rack Mount Brackets
  - For mounting in a 19 in (48.2 cm) rack or cabinet

* *WiNG-MGR-868* includes type C, G and I outlet blades

WiNG – Sensor Features

- Mounting Options
  - Magnets (included)*
  - 15mm mini DIN rail*
  - Screw
  - Zip ties

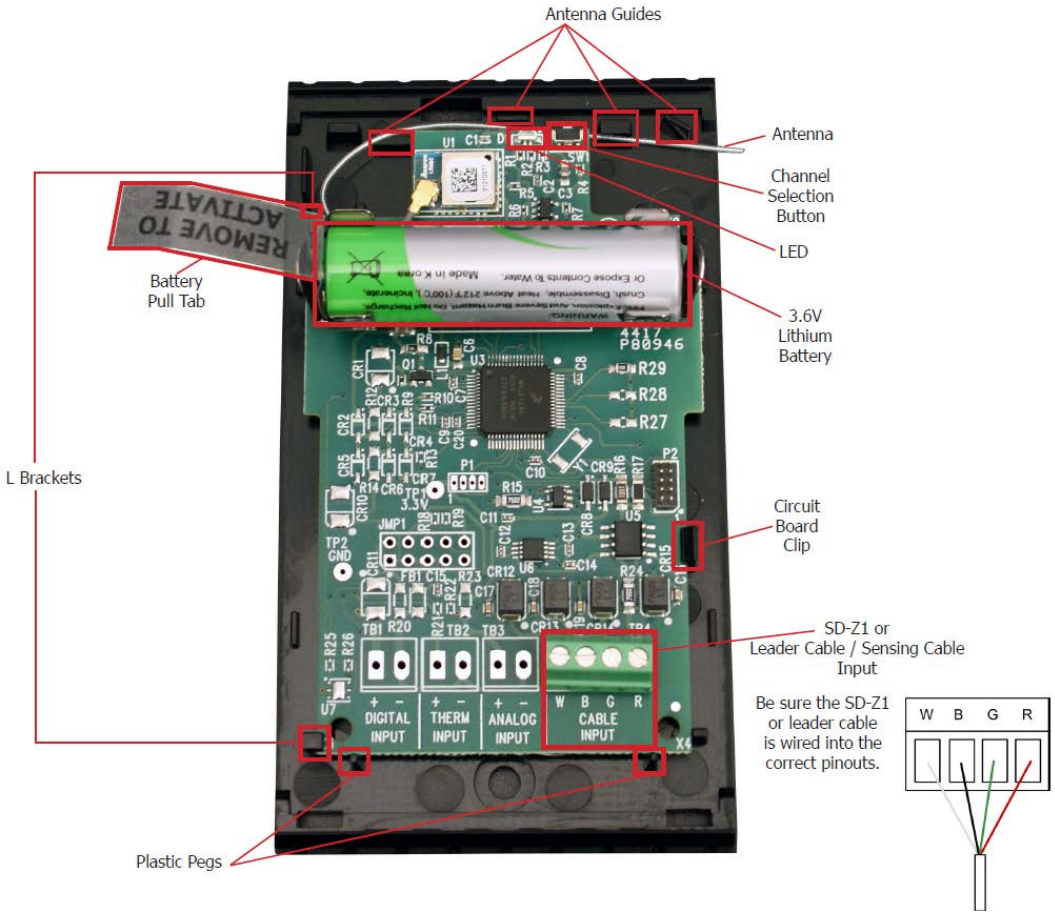
- Operating Distance
  - 100ft (30.5m) through multiple walls
  - 270ft (82.3m) through one wall
  - 600 ft (183m) direct line of sight
  - Greater distances achieved by incorporating a *WiNG-RXT*

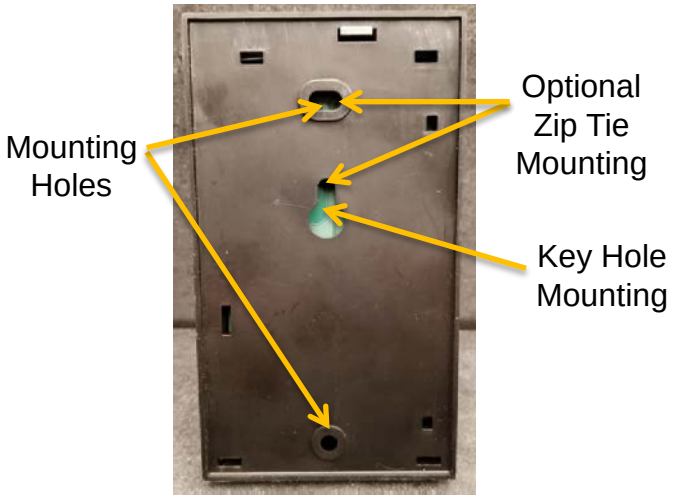
* Only available with the *WiNG-T* and *WiNG-TH*

WiNG – Sensor Features

- Significantly Longer Battery Life
  - Replaceable 3.6V AA lithium battery
  - Up to 12 year battery life at room temperature
  - Up to 8 year battery life at temperatures up to 140°F (50°C)
  - Up to 5 year battery life when system spans the full operating temperature range -13°F to 185°F (-25°C to 85°C)
- Selectable Channel Pairs improve reliability
- Random transmission intervals between 10 to 20 seconds

WiNG – Sensor Features

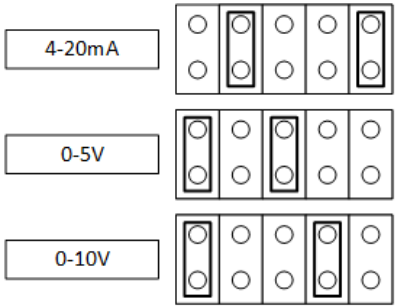




WiNG – Sensor Features

Analog, Digital Input & Thermistors

Configuration Jumpers



Input Terminal Block for Analog
(0-5V, 0-10V or 4-20mA) Input connection

Input Terminal Block for Digital (Dry Contact) Input connection

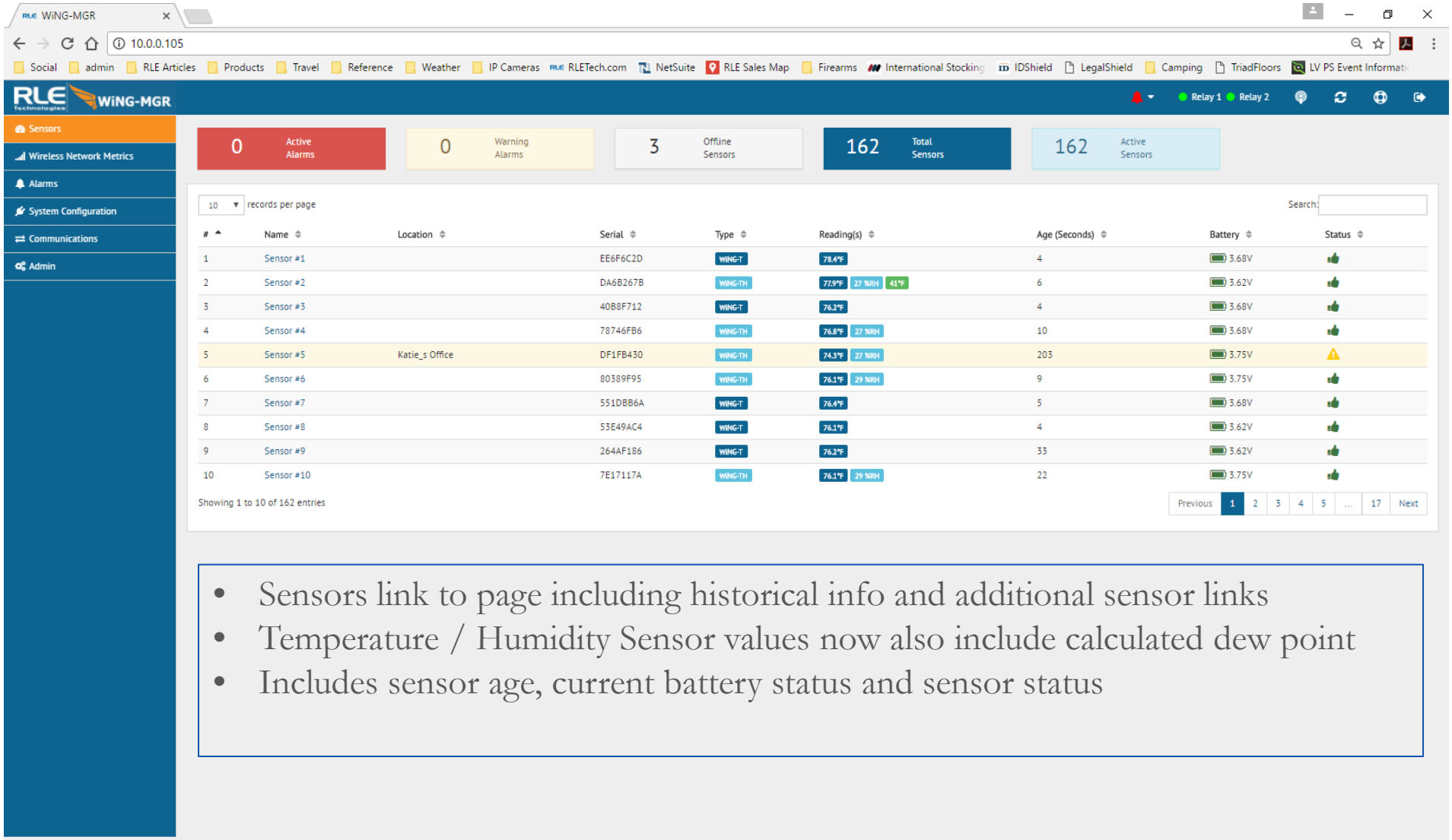
Input Terminal Block for 10K Thermistor connection

WiNG-RXT – Range Extender

- Adds up to another 1,000 ft (304.8 m) distance between the *WiNG-MGR* and sensors
- Selectable Channel Pairs
- PoE option

WiNG – System Architecture

WiNG Web Interface – Home page



- Sensors link to page including historical info and additional sensor links
- Temperature / Humidity Sensor values now also include calculated dew point
- Includes sensor age, current battery status and sensor status

Falcon *F200 & FMS*

Falcon products are used to provide visibility to sensors and equipment at anytime, from anywhere and provide direct alarm notification when conditions exceed acceptable limits.

- NO SOFTWARE REQUIRED
- Configured and viewed with a web browser
- Connect it to a network
- Connect sensors and equipment
- Establish acceptable limits
- Identify who gets notified when conditions exceed acceptable limits
- Pass critical information up to a management system through standard communication protocols. (SNMP | Modbus | BACnet)

What Can Falcon Products Monitor?

Any device that provides any of the following output signals:

…SNMP, Modbus & BACnet

<u>Existing Sensors & Equipment including:</u>

- Computer Room Air Conditioners (CRAC's)
- Power Distribution Units (PDU's)
- Power Meters
- Uninterruptable Power Supplies (UPS's)
- Branch Circuit Monitors (BCM's),
- Automatic Transfer Switches (ATS's)
- Transient Voltage Surge Suppressors (TVSS's)
- IP Cameras
- Generators
- Fire Panels
- Security Systems

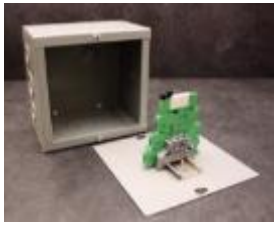
Protocol Converter

- Simplifies the issue of convergence and integrating signals into a NMS / BMS
- Inputs and Outputs SNMP, Modbus & BACnet protocols
- Accepts signals from 32 units / groups / nodes with a maximum of 1,024 registers / OID's / instances

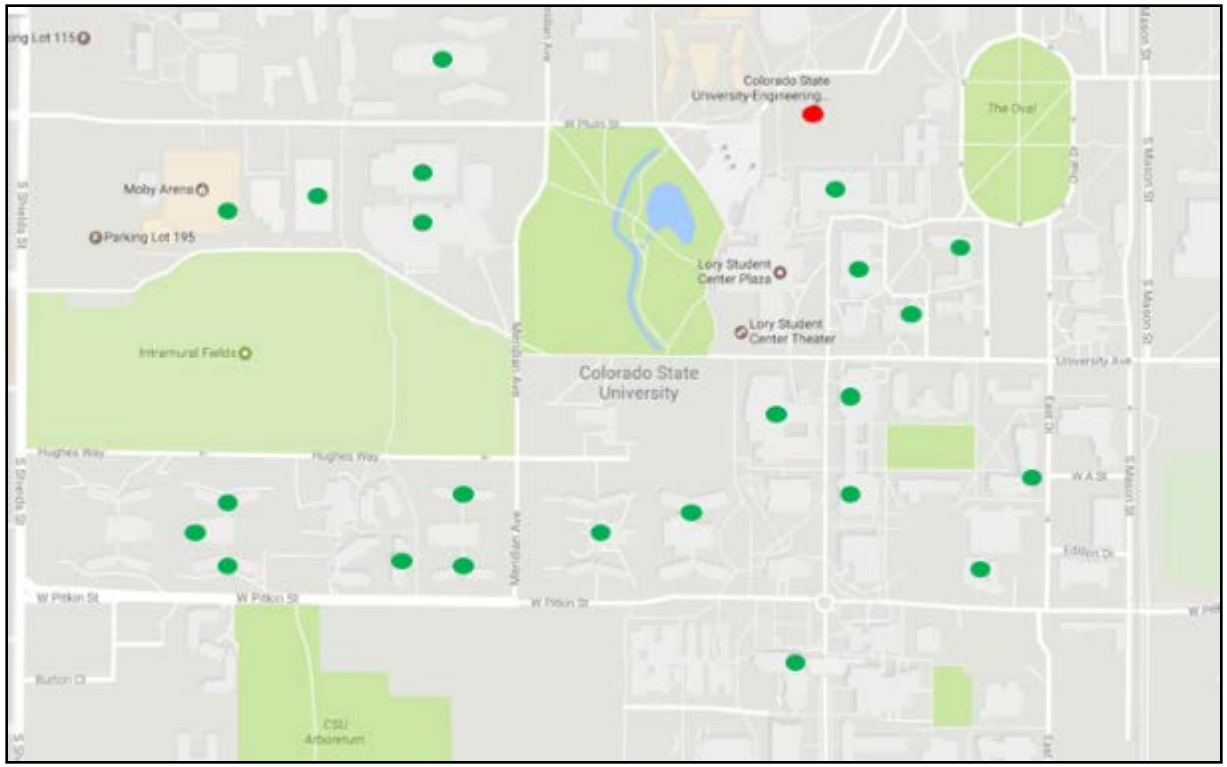
Building / Network Management System

Integration Solutions

- Relay Replicators *(RA1x2 / RR10x20 / RR20x40)*
  - Dry Contact splitter
  - Electrically isolates signals
- Alarm Status Panels *(RA1x2 / LDRA6)*
  - Alarm annunciators
  - Latched and non-latched
- Power Fail Monitors *(PFM)*
  - Senses loss of power to an outlet
  - Form “C” output relay
- Ground Fault Monitor *(GFM)*
  - Monitors a floating battery string
  - Alarms when approaching a grounded condition



Falcon *FMS* – Delta View Nest

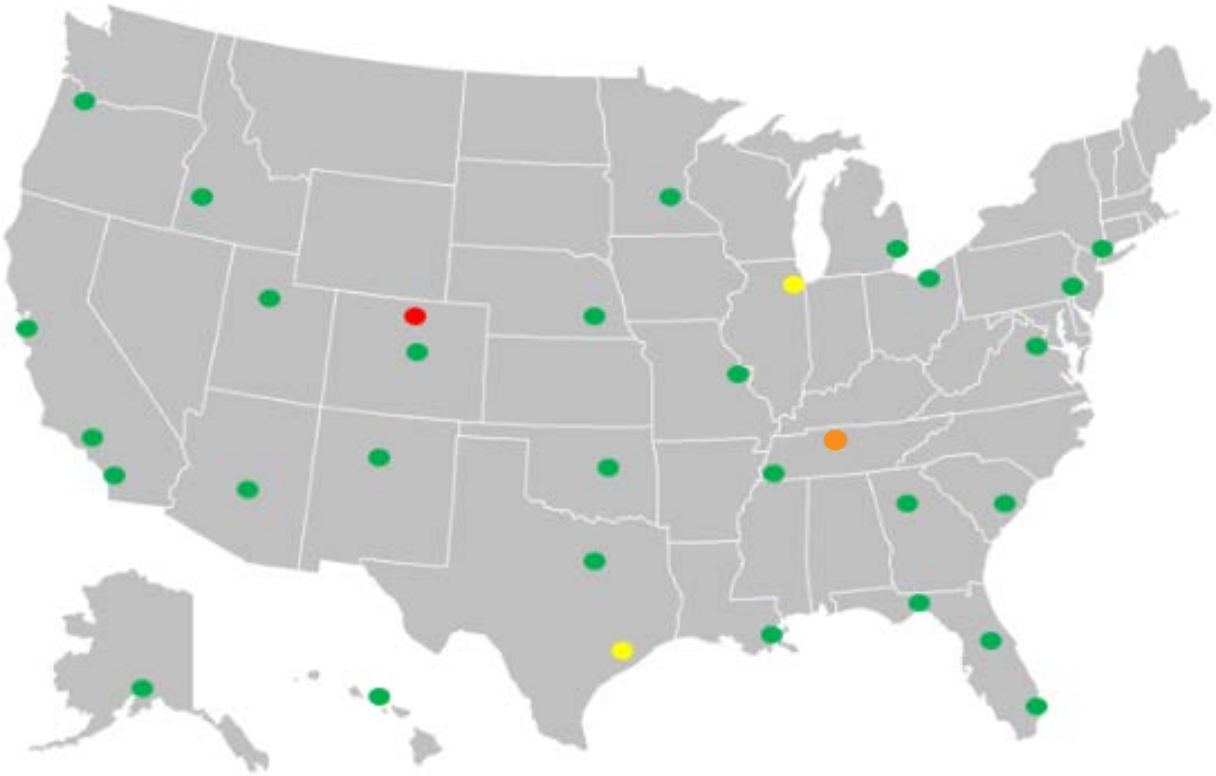


(Colorado State University Campus Map)

A *.jpg* image (map) can be uploaded as a background image to display up to 32 integrated RLE products

- Each dot represents an integrated RLE product
- The color identifies the summary status of the integrated products
- The dot is a link to the product

Falcon *FMS* – Delta View Nest



A *.jpg* image (map) can be uploaded as a background image to display the summary status of up to 32 RLE product "Nests"

- Each dot represents an "Nest" of integrated RLE products
- The color identifies the summary status of the "Nest"
- The dot is a link to the "Nest"
- Information from as many as 1032 integrated RLE products can be viewed with only two clicks from the summary page!

SeaHawk

Leak Detection

September 24, 2024

Spot Detectors

- Used for detecting conductive fluids in confined areas
- Adjustable probes
- Corrosion resistant, no exposed metal
- Potted electronics = submersible design!
- No visible or audible annunciation

Spot Detectors

	SD-RO1	SD	SD-Z	SD-Z1
Detects	Conductive fluids	Conductive fluids	Conductive fluids	Conductive fluids
Power	**24V AC/DC*** (isolated)	**Falcon FMS**	**SeaHawk controller**	**SeaHawk controller or Falcon F200**
Audible	-	-	-	-
Output	Form C output relay	12-36VAC	To any SeaHawk controller**	To SeaHawk Zone controllers
Leader Cable	5-wire 14ft / 4.27m	2 wire 14ft / 4.27m	Mating connectors 10in / 0.25m	4 wire 14ft / 0.25m
Primary use:	Integration	Falcon products	SeaHawk controllers	SeaHawk controllers

* When using DC power, power must be removed to reset the sensor

** Adds 50ft/15.24m of simulated distance when used with a SeaHawk controller

Leak Detection Cable *(SC & SC-C)*

- Patented design helps eliminate false alarms
- Plenum rated – CL2P
- Quick dry / quick reset

Zone Controllers

	LD310	LD1000	F200*	LDRA6*
Enclosure	Plastic	Metal	Metal	Metal
Power requirements	**5VDC** (isolated)	**24V AC or DC** (isolated)	**5VDC (Included)**	**24V AC or DC** (isolated)
Max. Sensing Cable	300ft / 91m	1,000ft / 305m	200ft / 61m	6 inputs 1,000ft / 305m per input
Relay outputs (form C)	Leak and Fault	Leak and Fault	Summary	Summary relay and one for each input
Audible	Yes	Selectable (on/off)	Selectable per input	Yes
Adjustable sensitivity	High/medium /low (jumper)	25uA to 250uA (dial)	-	Yes
Adjustable alarm delay	-	10 seconds or 2 minutes	-	Yes

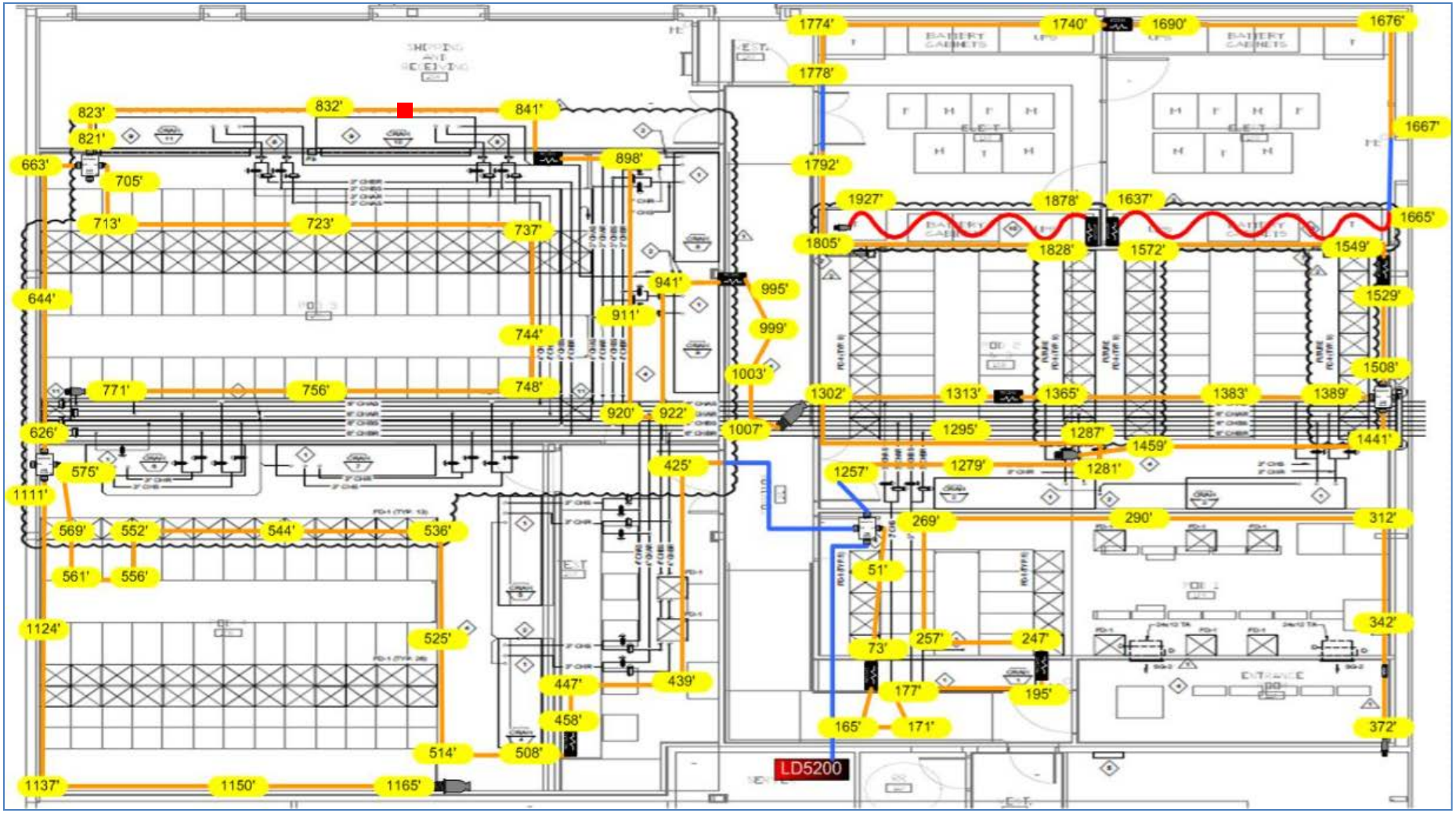
* Multi-functional controller

Distance-Read Controllers

	SeaHawk 10K	LD1500	LD2100	LD5200
Power requirements	**12-24V AC/DC** (isolated)	**24V AC/DC** (isolated)	**24V AC/DC** (isolated)	**120/230-240VAC**
Max. Sensing Cable	10,000ft / 3,048m	1,500ft / 457m	5,000ft / 1,524m	10,000ft / 3,048m
Local Display	LED's & 4 character LED	Bi-color LED	Bi-color LED, Dot matrix LED	480x272 pixel LCD color touch screen
Integrated maps (uploaded)	-	-	2	10
Audible annunciation	Yes	-	Yes	Yes
HTML (web) interface	-	Yes	Yes	Yes
Direct email notification	-	-	Yes	Yes
Virtual / Physical zones (Master/Slave)	-	-	32 selectable	32 / 128
Output protocols	Modbus RTU, N2	SNMP, Modbus, N2, BACnet	SNMP, Modbus, N2, BACnet	SNMP, Modbus, N2, BACnet
Communications:				
Relay output(s) (form C)	Summary	-	Summary	Two leak, Two Fault
4-20mA output	-	-	-	Yes
EIA-232 port	-	Yes	Yes	Yes
EIA-485 port(s)	One	1	1	3
RJ-45 / Ethernet jack	-	Yes	Yes	Yes

LD2100 & LD5200 – Delta View

(patented)



SeaHawk

RLE Leak Detection Controller Product Matrix

RLE Technologies produces a wide variety of leak detection products, each with their own unique features.
Our sales and support staff is always available to help you choose the system that's best suited for your application.

	LD310	LD1000	LDRA6	10K	LD1500	LD2100	LD5200	F200	WiNG-LD with WiNG-MGR
Zone Leak Detection	1 Zone	1 Zone	6 Zones					1 Zone	1 Zone per WiNG-LD
Distance-Read Leak Detection				✓	✓	✓	✓		
Maximum Sensing Cable	300ft 91m	1,000ft 305m	1,000ft per zone 305m per zone	10,000ft 3,048m	1,500ft 457m	5,000ft 1,524m	10,000ft 3,048m	200ft 61m	100ft per WiNG-LD 30.5m per WiNG-LD
Compatible Spot Detectors	SD-Z, SD-Z1	SD-Z, SD-Z1	SD-Z, SD-Z1	SD-Z	SD-Z	SD-Z	SD-Z	SD-Z, SD-Z1	SD-Z, SD-Z1
Audible Alarm	✓	✓	✓	✓		✓	✓	✓	
Local Display	1 tri-color LED	3 single-color LEDs	1 power LED 1 Tri-color status LED per zone	4-character LED; 6 status LEDs	Bi-color status LED	Alphanumeric Dot Matrix LED; Bi-color status LED	Full Color Touch Screen LCD	1 Multi-color LED	1 Multi-color LED
Web Interface					✓	✓	✓	✓	✓*
Adjustable Sensitivity	✓	✓	✓	✓	✓	✓	✓	✓	✓*
Adjustable Alarm Delay		✓	✓	✓	✓	✓	✓		✓*
Email Notification						✓	✓	✓	✓*
Interactive Leak Detection Maps						2	10		
Logging					✓	✓	✓	✓	✓*
Physical & Virtual Zones						32 Selectable	127 Physical 32 Virtual		
Communications Protocols		Modbus	Modbus	Modbus, N2	Modbus, N2, SNMP, BACnet	Modbus, N2, SNMP, BACnet	Modbus, N2, SNMP, BACnet	Modbus, SNMP	Modbus, SNMP, BACnet*
Relay Output (Form C)	1 Leak, 1 Fault	1 Leak, 1 Fault	1 Summary 6 Leak/Fault	1 Summary		1 Summary	2 Leak, 2 Fault 1 Maintenance	1 Summary	2 Summary*
4-20mA Output							✓		
EIA-485 Ports			1	1	1	1	3		1*
Ethernet					✓	✓	✓	✓	✓*
Power Supply	5VDC sold separately	24VAC/VDC sold separately	24VDC sold separately	12-24VAC/VDC sold separately	24VAC/VDC sold separately	24VAC/VDC sold separately	100-240VAC	USB - 5VDC included	3.6V AA Lithium Ion Battery
Enclosure	Plastic	Metal	Metal	Plastic	Metal	Metal	Metal	Metal	Plastic

*Included in WiNG-MGR

SeaHawk Accessories

- Non-Sensing Cable *(NSC-xx & NSC-xx-M)*
  - Used between lengths of sensing cable
  - Does not add resistance
  - *NSC-xx* for use with *SC*
  - *NSC-xx-M* for use with *SC-C*

- J-clips *(JC-xx & JC-C-xx)*
  - Secures cable, recommended every 3ft / 1m
  - Self adhesive backing
  - *JC-xx* for use with *SC*
  - *JC-C-xx* for use with *SC-C*

- Cable Caution Tags *(SC-T)*
  - Used to identify the cable
  - Recommended every 10ft / 3m
  - Each *SC-T* contains QTY 10 tags

SeaHawk Accessories

- Weighted Cable Connector (WCCS-50)
  - Creates distinct separation between lengths of Sensing Cable
  - Simulates 50ft / 15.2m of Sensing Cable
  - *WCCS-50* for use with *SC*

- Cable Splitter *(X-CON)*
  - Single input, three outputs
  - Does not effect the accuracy of a Distance-Read system
  - Simulates 150ft / 45.7m of Sensing Cable (3 x 50ft / 15.2m)
  - *X-CON* for use with *SC*
  - Includes two End-of-Line connectors (EOL's)

- Enclosures *(LD-ENC & LD-ENC-NP)*
  - Commonly used with the *LD1500* and *LD2100*
  - *LD-ENC* includes 100-240VAC to 24VDC power adaptor

SeaHawk Accessories

- Framed Reference Map *(FM1114)*
  - Created for Distance-Read systems
  - Generally hangs next to the controller and used as a reference to identify the location of the leak
  - Initial product shipment includes the frame with instructions for the installer on how to create the draft that we use to create the final map
  - Final *printed* map is provide after installation
  - Final *image file* is also provided that can be uploaded to the *LD2100* or *LD5200* to be viewed through the web interface

Integration Solutions

September 24, 2024

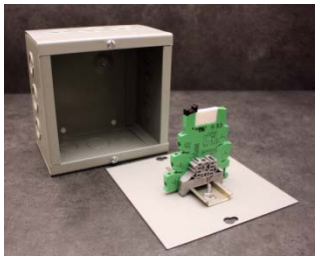
Raptor Integration Solutions

- Are there any issues with convergence of protocols?
  - What protocols will the existing management system accept?
  - Is there equipment that cannot be integrated due to protocol issues?
- Do dry contact signals need to be routed to multiple monitoring systems?
- Are there any monitoring needs that cannot be met with currently available products?
- Are there needs for custo

Raptor Integration Solutions

- The **Protocol Converter** accepts SNMP, Modbus and BACnet signals from up to 32 devices and translates the signals to SNMP, Modbus and BACnet for integration.

- Unique application may require specialty products



Protocol Converter

- Inputs and Outputs: SNMP, Modbus BACnet
- 32 units / groups / nodes
- 1024 registers / OID’s / instances

Building / Network Management System

Custom Panels and Enclosures

- Certified UL 508a manufacturer
- Years of experience creating custom panels
- We engineer, assemble, test, and package custom panels to meet your specifications
  - Annunciation panels
  - Control panels