DSE

Digitally Controlled Ferroresonant UPS

INDUSTRIAL UNINTERRUPTIBLE
POWER SUPPLY SYSTEM
SINGLE PHASE

AMETEK®

SOLIDSTATE CONTROLS

PROVIDING CONTINUITY OF ELECTRICAL POWER

DSE

Digitally Controlled Ferroresonant Industrial Uninterruptible Power Supply System

SINGLE PHASE 3-50 kVA

The DSE Uninterruptible Power Supply (UPS) system from AMETEK Solidstate Controls combines the best of both worlds:

(1) The reliability and robust design of a Ferroresonant UPS

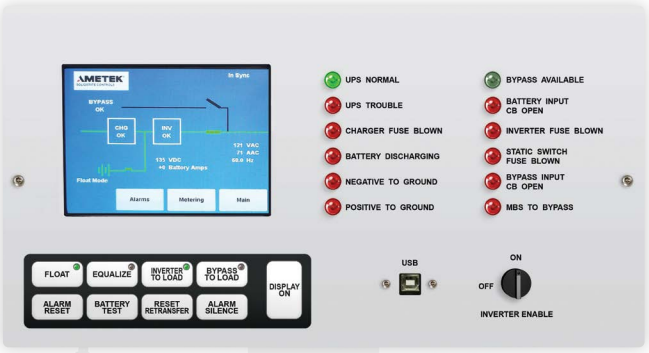
(2) The digital control and communications typically found only in Pulse Width Modulation products

The DSE is a true on-line, double conversion UPS system that provides continuous, clean, regulated power for critical AC loads. Designed specifically for process control and harsh industrial applications, the DSE combines digital control for enhanced communications, monitoring, control and diagnostics capabilities with proven ferroresonant transformer design. The DSE also includes the LCD panel and user-friendly touch screen display found in our Digital ProcessPower systems for the ultimate in user control.

Benefits of the DSE:

- Exceeds 205,000 hours MTBF
- Vacuum pressure impregnated (VPI) magnetics with 200°C epoxy insulation (Class N)
- Unique crest factor circuitry provides full capacity for non-linear loads
- All components are front accessible with no side or back clearance required
- Integral system event recording for diagnostics (logs last 500 events)
- Microprocessor based alarms
- 6 or 12 pulse charger available
- Available in single phase, 3-wire output for split phase

The Power Behind the Process



PROCESSPOWER UPS SYSTEM

LCD AND TOUCH SCREEN USER PANEL

Shown with optional indicator lights

Keypad Controls and Switches

- Float/Equalize Initialization with Light
- Battery Test Initialization
- Inverter to Load with Light
- Bypass to Load with Light
- Static Switch Reset Retransfer
- Latching Alarm Reset
- Audible Alarm Silence
- Display On

*Standard LED Indicators: UPS Normal and UPS Trouble

Standard LCD Panel Indicators

- Equalize Time Remaining
- Charger Status (OK/Fail)
- Float/Equalize Status
- Inverter Status (OK/Fail)
- Synchronism Status (In/Out of Sync)
- Static Switch Position (Inverter or Bypass)
- Manual Bypass Position (Normal or Bypass)
- Bypass Status (OK/Fail)

General Specifications – Standard Features

System Measurements (Displayed on LCD Panel)
Total Number of Battery Discharges
Total Operational Time on Batteries
Average Time on Battery per Discharge
Historical Min/Max Battery Voltage
Recent Min/Max Battery Voltage
Total Operation Time on UPS
Total Operation Time on Bypass
Total Operation Time on Inverter
Metering (Displayed on LCD Panel)
DC Voltage
DC Battery Current (+/-)
AC Output Voltage
AC Output Current
AC Output Frequency
Charger/Rectifier Output Current
Circuit Breakers
AC Input (14 kAIC, minimum)
Battery Input (10 kAIC, minimum)
Bypass Input (14 kAIC, minimum)
Alarms (Displayed on LCD Alarm Panel)
Fan Failure
Charger Failure
Low DC Voltage
Low DC Disconnect
Battery Breaker Open
ST/SW Retransfer Blocked
Battery Discharging
Overload Shutdown
Bypass Supplying Load
ST/SW Bridge Over Temperature
Inverter Bridge Over Temperature
ST/SW SCR Failure
Bypass Failure
Inverter Failure
System Diagnostics (Displayed on LCD Alarm Panel)
Loss of System Communication(s)
Power Supply Failure(s)
Relay Controls
The following alarms also include one set of normally open and normally closed relay contacts rated for 120 VAC at 8 amps (30 VDC at 8 amps):
UPS Trouble (Summary) Bypass Supplying Load UPS Communications Failure (Summary)

Applicable Standards, Codes and Regulations
NEMA PE-1
ANSI
ANSI/NFPA 70
IEEE
UL/C-UL (UL1778)
ISO9001 Certified Facility

General Specifications – Optional Features

Metering and System Measurements	(Option #)
AC Input Power (Voltage, Frequency, Current)	(111)
Bypass Input Frequency	(112)
Bypass Input Voltage	(113)
Output Power (kVA, kW, Power Factor)	(114)
% Inverter Loading	(115)
Inverter Output Voltage	(117)
Analog Meters	(196)
Circuit Breaker	**(Option #)**
65 kAIC AC Input and Bypass Input	(82/85)
Inverter Output (Non-Automatic)	(17)
AC Output	(18)
Battery High Interrupt Breaker	(86)
Communications	**(Option #)**
Modbus RTU (RS485 Connection)	(187)
Ethernet Webpage	(187)
Modbus TCP	(187)
SCI-Link	
Consult Factory for Additional Communication Options	
Miscellaneous	**(Option #)**
Rectifier Configuration	(34)
Charger Output Blocking Diode	(29)
Charger Output Ripple Filter	
Cascade Redundant Configuration	
12 Pulse Charger (10% Reflected Harmonics)	
Additional Relay Contacts (Max of 13 available)	
Additional LED Indicators (1 green, 9 red available)	
Remote External MBS[1]	

Miscellaneous – Continued	(Option #)
Latching Alarms	(28)
Lamp Test	(35)
Alarm Relay Test	(132)
Alarms	**(Option #)**
Charger Overload	(119)
High DC Disconnect	(2)
Positive/Negative to Ground (2 relays)	(3)
High/Low Bypass Source Voltage	(7/6)
High/Low AC Output Voltage	(9/8)
AC Power Failure	(26)
AC Output Overload	(48)
High/Low Inverter Output Voltage	(41/42)
Out-of-Sync	(43)
Inverter Fuse Blown	(44)
Inverter Off Frequency	(45)
Bypass Off Frequency	(46)
Rectifier/Charger Fuse Blown	(67)
Battery Near Exhaustion	(60)
Low AC Input Voltage	(68)
High DC Voltage	(5)
Rectifier/Charger Failure	(69)
MBS to Bypass	(78)
AC Input CB Open	(101)
Bypass Input CB Open	(103)
AC Output CB Open	(104)

General Specifications – Performance

Battery Charger/Rectifier	
AC Input	
Nominal Voltage[2]	208, 480: 3-phase/ 3-wire
Input Range	± 10% (- 15% without discharging)
Frequency	60 Hz ± 5%
DC Output	
DC Bus Voltage(s)	120, 240 VDC
Regulation	± 1%
Ripple Voltage	< 2% with battery connected
Capacity	Sized to recharge a 30 minute battery to 95% of its rated capacity within 8 hours, while simultaneously supplying power to a fully loaded inverter
Float/Equalize	± 5% Adjustability

Inverter	
DC Input	
Nominal Voltage Range/ # of Cells (Lead Acid Type)	120 V/60 (105-140 VDC) 240 V/120 (210-280 VDC)
AC Output	
Inverter/UPS Ratings	3 - 50 kVA
Power Factor Range	0.8 - 1.0
AC Output Voltage[2]	120: Single phase, 2 wire 120/240: Single phase, 3 wire
Regulation	± 2%
Frequency	60 Hz; ± 0.1%
Crest Factor	3:1
Total Harmonic Distortion (THD)	100% linear load < 5%
Transient Response	23% for ½ cycle 2% after 50 milliseconds
Recovery Time	< 50 millisecond to ± 1%
Overload Capacity	120% - continuous 125% - 10 minutes 150% - 1 minute

Static Switch	
Bypass Voltage	120 Single Phase, 2-wire 120/240 Single Phase, 3-wire
Switch Type	Inversely paired set of SCRs (one set per leg)
Failure Mode	Automatically fails to bypass
Transfer Time	Make Before Break
Sync Capture Range	0.5% to 0.8% adjustable
Slew Rate	1 Hz/sec to 10 Hz/sec (adjustable)
Overload Capability	125% continuous 150% for 10 minutes 200% for 1 minute 1,000% for 1 cycle

Manual Bypass Switch[1]	
Voltage	120: Single phase, 2 wire 120/240: Single phase, 3 wire
Mounting	Inside UPS/Inverter Enclosure
Positions	Two
Construction	600 VAC, rotary drum, make-before-break type
Transfer Time	Zero in both directions
Overload Capacity	125% continuous 150% for 10 minutes 200% for 1 minute 1,000% for 1 cycle

Environmental	
Ambient Temperature	32 to 104°F (0 to 40°C)
Relative Humidity	0-95% non-condensing
Operating Altitude	10,000 feet (3,048 meters)
Audible Noise[3]	65-72 dB(A) @ 4.9 feet (1.5 meter) typical
Cooling	Aided Convection or Forced Air, depending on kVA rating and design (fans standard for 30 kVA units and above)
Cable Entry	Top and Bottom Entry Standard
Mean Time Between Failure (MTBF)	> 205,000 Hours
Cabinet Rating	NEMA 1 / IP-20 (IP-21 with addition of optional drip shield)

[1] Internal Manual Bypass Switch is normally removed when a Remote Manual Bypass Switch is selected
[2] Custom Input and Output Voltages available – Consult Us
[3] Addition of drip shield may increase the noise by 1-3 dB(A)

ISO 9001:2008 CERTIFICATION
Intertek ™

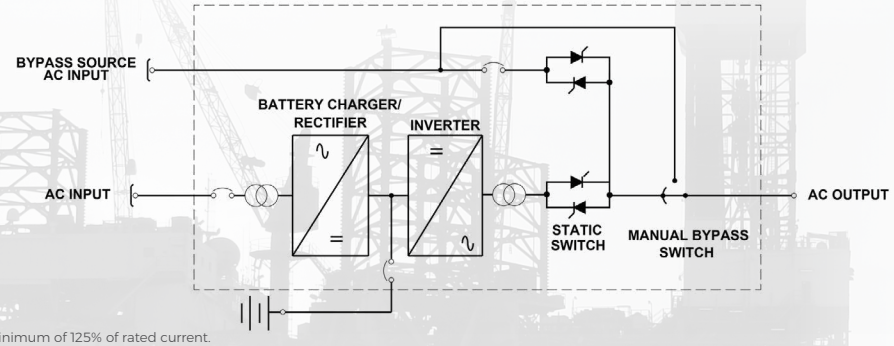
120 VDC (60 Lead Acid Battery Cells)																		
Model Number	Rated Output Power		Efficiency		AC Amps per Phase[1] (AC Input/Freq)		Max DC Current	AC Output Amps[1]		UPS Cabinet Style	AC I/P Circuit Breaker		Battery I/P Breaker	Bypass Breaker		Weight		Heat Loss (BTU)
	kVA	kW	AC-DC	DC-AC	480/60	208/60	@ 1.75 VPC	120	240		208	480	120	120	120/240	lb	kg	
DSE003-[2]	3	3	91%	83%	10	23	34	25	13	GTD1X	30	15	50	35	20	885	402	3,316
DSE005-[2]	5	5	91%	85%	12	29	56	42	21	GTD1X	35	15	70	60	30	885	426	4,996
DSE007-[2]	7.5	7.5	91%	85%	19	43	84	63	31	GTD1X	60	25	100	80	40	1,100	500	7,493
DSE010-[2]	10	10	92%	85%	24	56	112	83	42	GTD1X	70	30	125	125	60	1,325	602	9,512
DSE015-[2]	15	15	93%	86%	36	83	166	125	63	GTD1X	125	50	200	175	80	2,050	932	12,811
DSE020-[2]	20	20	93%	86%	48	111	221	167	83	GTD1X	150	60	250	225	110	2,100	955	17,081
DSE030-[2]	30	30	94%	87%	72	165	328	250	125	GTD2X	225	90	400	350	175	2,650	1,205	22,805
DSE040-[2]	40	40	94%	88%	96	220	432	333	167	GTD2X	300	125	500	500	225	3,050	1,386	28,510
DSE050-[2]	50	50	94%	88%	120	275	541	417	208	GTD2X	400	150	600	600	300	3,700	1,682	35,638

240 VDC (120 Lead Acid Battery Cells)																		
Model Number	Rated Output Power		Efficiency		AC Amps Per Phase[1] (AC Input/Freq)		Max DC Current	AC Output Amps[1]		UPS Cabinet Style	AC I/P Circuit Breaker		Battery I/P Breaker	Bypass Breaker		Weight		Heat Loss (BTU)
	kVA	kW	AC-DC	DC-AC	480/60	208/60	@ 1.75 VPC	120	240		208	480	240	120	120/240	lb	kg	
DSE003-[2]	3	3	91%	84%	11	23	17	25	13	GTD1X	30	15	25	35	20	885	402	3,155
DSE005-[2]	5	5	91%	87%	12	29	27	42	21	GTD1X	35	15	40	60	30	885	426	4,489
DSE007-[2]	7.5	7.5	91%	88%	20	46	41	63	31	GTD1X	60	25	50	80	40	1,100	500	6,366
DSE010-[2]	10	10	92%	88%	24	56	54	83	42	GTD1X	70	30	70	125	60	1,325	602	8,024
DSE015-[2]	15	15	93%	88%	36	84	81	125	63	GTD1X	125	50	100	175	80	2,050	932	11,357
DSE020-[2]	20	20	93%	88%	48	111	108	167	83	GTD1X	150	60	125	225	110	2,100	955	15,142
DSE030-[2]	30	30	94%	88%	72	165	162	250	125	GTD2X	225	90	200	350	175	2,650	1,205	21,383
DSE040-[2]	40	40	94%	88%	96	220	217	333	167	GTD2X	300	125	250	500	225	3,050	1,386	28,510
DSE050-[2]	50	50	94%	88%	120	275	270	417	208	GTD2X	400	150	350	600	300	3,700	1,682	35,638

Cabinet Dimensions Inches Millimeters		
Style	H x W x D	H x W x D
GTD1X	79 x 32 x 36	2,007 x 813 x 914
GTD2X	79 x 54 x 36	2,007 x 1,372 x 914

Model Coding				
"DD"	"EE"	"FF"	"GG"	"I"
AC Input Volts (code)	DC Bus Volts (code)	AC Output Volts (code)	Freq (code)	Charger Design (code)
480 – (48)	120 – (12)	120 – (12)	60 – (60)	6-Pulse – (S)
208 – (20)	240 – (24)	120/240 - (24)		12-Pulse – (T)

STAND-ALONE UPS CONFIGURATION



[1] Circuit Breakers are sized at a minimum of 125% of rated current.

[2] A complete model number includes the AC input voltage, DC bus (link) voltage, AC output voltage and system frequency. To "build" a model number, use the "code" in the matrix shown above, following the example format: DSE020-DD-EE-FF-GG-I; where DD=AC Input Voltage; EE=DC bus voltage; FF=AC Output Voltage; GG=System Frequency; I=6(S) or 12(T) Pulse Charger design.

For Example: A 20 kVA with 480 VAC input; 120 VDC bus voltage; 120 VAC output; 60 Hz; 6-pulse charger design; would have the following model number: DSE020-48-12-12-60-S.

For 120/240 VAC output units, add "2" before DSE model number

For custom systems and for units which do not have a configurable model number, insert a 'C' in the model number as follows: DSE020C

Specifications are subject to change.
Top mounted cooling fans require 0.5 in (13 mm) additional height.
Certain optional features and/or combinations may require larger cabinets.

WORLD HEADQUARTERS
875 Dearborn Drive
Columbus, Ohio 43085
Phone: +1-614-846-7500
Toll Free: +1-800-635-7300
Fax: +1-614-885-3990

GLOBAL OFFICES LOCATED IN
Mexico
Asia Pacific
Brazil
Middle East
India
Argentina

WEBSITE
www.solidstatecontrolsinc.com

EMAIL
SCI.sales@AMETEK.com

AMETEK®
SOLIDSTATE CONTROLS

THE PURPOSE OF OUR BUSINESS IS TO PROVIDE CONTINUITY OF ELECTRICAL POWER TO KEEP BUSINESSES IN BUSINESS.

WE DO THIS BY HELPING CLIENTS SOLVE THEIR POWER PROBLEMS AND BY CREATING THE MOST ECONOMICAL LONG-TERM RESULTS.

REV 12/2025