DSS

Digitally Controlled Ferroresonant Inverter

INDUSTRIAL INVERTER SINGLE PHASE



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DSS Digitally Controlled Ferroresonant Industrial

Inverter

SINGLE PHASE 3-50 kVA

The DSS Inverter from AMETEK Solidstate Controls combines the best of both worlds:

- (1) The reliability and robust design of a Ferroresonant Inverter
- (2) The digital control and communications typically found only in Pulse Width Modulation (PWM) products

The DSS is a true on-line inverter system that provides continuous, clean, regulated power for critical AC loads. Designed specifically for process control and harsh industrial applications, the DSS combines digital control for enhanced communications, monitoring, and diagnostics capabilities with proven ferroresonant transformer design. The DSS 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 DSS:

- 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
- 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

- Inverter to Load
 with Light
- Bypass to Load
 with Light
- Static Switch Reset
 Retransfer
- Latching Alarm Reset
- Audible Alarm Silence
- Display On
 - Display Or

- Standard LCD Panel Indicators
- 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)

* Standard LED Indicators: Inverter Normal and Inverter Trouble



General Specifications -		Genera	ons - Optional Features	l Features			
Standard Features	Metering and System M	easurements	(Option #)	Miscellaneous - Continued	(Option #)		
System Measurements (Displayed on	Bypass Input Frequency	(112)		Latching Alarms	(28)		
LCD Panel)	Bypass Input Voltage	Dower Factor	(113)	Lamp Test	(35)		
Total Number of Battery Discharges	% Inverter Loading	Power Factor)	(114)		(ISZ) (Option #)		
Average Time on Battery per Discharge	Inverter Output Voltage		(117)	High DC Disconnect	(2)		
Historical Min/Max Battery Voltage	Analog Meters		(198)	Positive/Negative to Ground	(2 relays) (3)		
Recent Min/Max Battery Voltage Total Operation Time on Bypass	Circuit Breaker		(Option #)	High/Low Bypass Source Vol	tage (7/6)		
Total Operation Time on Inverter	Inverter Output (Non-Au	Itomatic)	(17)	AC Output Overload	(48)		
Metering (Displayed on LCD Panel)	AC Output		(18)	High/Low Inverter Output Vo	oltage (41/42)		
DC Voltage	DC High Interrupt Break	er	(86)	Out-of-Sync Inverter Fuse Blown	(44)		
AC Output Voltage	Modbus PTU (PS485 Co	nnection)	(187)	Inverter Off Frequency	(45)		
AC Output Current	Ethernet Webpage	intection,	(187)	Bypass Off Frequency	(46)		
AC Output Frequency	Modbus TCP		(187)	High DC Voltage	(5)		
DC Input (10 kAIC minimum)	Consult Factory for Addi	tional Communicatio	on Options	MBS to Bypass	(78)		
Bypass Input (14 kAIC, minimum)	Miscellaneous			AC Output CB Open	(103)		
Alarms (Displayed on LCD Alarm Panel)	Cascade Redundant Co	nfiguration					
Fan Failure	Additional Relay Contac	ts (Max of 13 available rs(1 green 9 red avail	e) Jable)				
Low DC Voltage Low DC Disconnect	Remote External MBS ¹	is(i green, 5 red avail	lable)				
DC Breaker Open		Gen	eral Specific	ations - Performance			
ST/SW Retransfer Blocked		Inverter			tic Switch		
Overload Shutdown	DC Input			Bypass Voltage	120 Single Phase, 2-wire		
Bypass Supplying Load	Nominal Voltage	120 V/60 (105-140 V	/DC)		120/240 Single Phase, 3-wire		
Inverter Bridge Over Temperature	Range/ #of Cells	2/01/20/210 200		Switch Type	Inversely paired set of SCRs (one		
ST/SW SCR Failure	(Lead Acid Type)	240 V/I20 (210-280	VDC)	Eailure Mode	Set per leg)		
Bypass Failure Inverter Failure					, atomatically fails to bypass		
System Diagnostics (Displayed on LCD	AC Output			Transfer Time	Make Before Break		
Alarm Panel)	Inverter/UPS Ratings	3 - 50 kVA		Sync Capture Range	0.5% to 0.8% adjustable		
Loss of System Communication(s)	Power Factor Range	0.8 - 1.0		Slew Rate	1 Hz/sec to 10 Hz/sec		
Relay Controls	AC Output Voltage ²	120: Single phase, 2 120/240: Single pha	2 wire ase 3 wire	Overleed Carebility			
The following alarms also include one set	Desulation	+ 20/		Overload Capability	150% for 10 minutes		
of normally open and normally closed	Frequiation	- 270		-	200% for 1 minute		
I relav contacts rated for IZU VAC at 8 amps	Frequency	(0,0) = (0,0)			1 0 0 0 0 / f 1		
(30 VDC at 8 amps):					1,000% for 1 cycle		
(30 VDC at 8 amps): Inverter Trouble (Summary)	Crest Factor	3:1		Manual I	1,000% for 1 cycle Bypass Switch ¹		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary)	Crest Factor Total Harmonic	3:1 100% linear load < !	5%	Manual I Voltage	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and	Crest Factor Total Harmonic Distortion (THD)	3:1 100% linear load < !	5%	Manual I Voltage	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and Regulations	Crest Factor Total Harmonic Distortion (THD) Transient Response	3:1 100% linear load < 5 23% for ½ cycle 2% after 50 millisec	5% cond	Manual I Voltage	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire 120/240: Single phase, 3 wire		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and Regulations NEMA PE-1	Crest Factor Total Harmonic Distortion (THD) Transient Response Recovery Time	3:1 100% linear load < 5 23% for ½ cycle 2% after 50 millisec < 50 millisecond to	5% cond 	Manual I Voltage Mounting	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire 120/240: Single phase, 3 wire Inside UPS/Inverter		
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(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and Regulations NEMA PE-1 ANSI ANSI/NFPA 70 IEEE UL/C-UL (UL1778) ISO9001 Certified Facility ISO9001 Certified Facility Intertek	Crest Factor Total Harmonic Distortion (THD) Transient Response Recovery Time Overload Capacity	3:1 100% linear load < 1 23% for ½ cycle 2% after 50 millisec < 50 millisecond to 120% - continuous 125% - 10 minutes 150% - 1 minute	5% cond ± 1%	Manual I Voltage Mounting Positions Construction Transfer Time Overload Capacity Envi Ambient Temperature Relative Humidity Operating Altitude Audible Noise ³ Cooling Cable Entry Mean Time Between Failure (MTBF)	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire 120/240: Single phase, 3 wire Inside UPS/Inverter Enclosure Two 600 VAC, rotary drum, make- before-break type Zero in both directions 125% continuous 150% for 1 minutes 200% for 1 minutes 200% for 1 cycle ronmental 32 to 104°F (0 to 40°C) 0-95% non-condensing 10,000 feet (3,048 meters) 65-72 dB(A) @ 4.9 feet (1.5 meter) typical Aided Convection or Forced Air, depending on kVA rating and design (fans standard for 30 kVA units and above) Top and Bottom Entry Standard > 205,000 Hours NEMA 1 / IP-20		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and Regulations NEMA PE-1 ANSI ANSI/NFPA 70 IEEE UL/C-UL (UL1778) ISO9001 Certified Facility ISO9001 Certified Facility Intertek	Crest Factor Total Harmonic Distortion (THD) Transient Response Recovery Time Overload Capacity	3:1 100% linear load < 1 23% for ½ cycle 2% after 50 millisec < 50 millisecond to 120% - continuous 125% - 10 minutes 150% - 1 minute	5% cond ± 1%	Manual I Voltage Mounting Positions Construction Transfer Time Overload Capacity Envi Ambient Temperature Relative Humidity Operating Altitude Audible Noise ³ Cooling Cable Entry Mean Time Between Failure (MTBF) Cabinet Rating	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire 120/240: Single phase, 3 wire Inside UPS/Inverter Enclosure Two 600 VAC, rotary drum, make- before-break type Zero in both directions 125% continuous 150% for 1 minutes 200% for 1 minutes 200% for 1 cycle ronmental 32 to 104°F (0 to 40°C) 0.95% non-condensing 10,000 feet (3,048 meters) 65-72 dB(A) @ 4.9 feet (1.5 meter) typical Aided Convection or Forced Air, depending on kVA rating and design (fans standard for 30 kVA units and above) Top and Bottom Entry Standard > 205,000 Hours NEMA 1 / IP-20 (IP-21 with addition of		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and Regulations NEMA PE-1 ANSI ANSI/NFPA 70 IEEE UL/C-UL (UL1778) ISO9001 Certified Facility ISO9001 Certified Facility Intertek	Crest Factor Total Harmonic Distortion (THD) Transient Response Recovery Time Overload Capacity	3:1 100% linear load < 1 23% for ½ cycle 2% after 50 millisec < 50 millisecond to 120% - continuous 125% - 10 minutes 150% - 1 minute	5% cond ± 1%	Manual I Voltage Mounting Positions Construction Transfer Time Overload Capacity Envi Ambient Temperature Relative Humidity Operating Altitude Audible Noise ³ Cooling Cable Entry Mean Time Between Failure (MTBF) Cabinet Rating	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire 120/240: Single phase, 3 wire Inside UPS/Inverter Enclosure Two 600 VAC, rotary drum, make- before-break type Zero in both directions 125% continuous 150% for 1 minutes 200% for 1 minutes 200% for 1 cycle ronmental 32 to 104°F (0 to 40°C) 0.95% non-condensing 10,000 feet (3,048 meters) 65-72 dB(A) @ 4.9 feet (1.5 meter) typical Aided Convection or Forced Air, depending on kVA rating and design (fans standard for 30 kVA units and above) Top and Bottom Entry Standard > 205,000 Hours NEMA 1 / IP-20 (IP-21 with addition of optional drip shield)		
(30 VDC at 8 amps): Inverter Trouble (Summary) Bypass Supplying Load Inverter Communications Failure (Summary) Applicable Standards, Codes and Regulations NEMA PE-1 ANSI ANSI/NFPA 70 IEEE UL/C-UL (UL1778) ISO9001 Certified Facility ISO9001 Certified Facility Intertek	Crest Factor Total Harmonic Distortion (THD) Transient Response Recovery Time Overload Capacity	3:1 100% linear load < 1 23% for ½ cycle 2% after 50 millisec < 50 millisecond to 120% - continuous 125% - 10 minutes 150% - 1 minute	5% cond ± 1%	Manual I Voltage Mounting Positions Construction Transfer Time Overload Capacity Envit Ambient Temperature Relative Humidity Operating Altitude Audible Noise ³ Cooling Cable Entry Mean Time Between Failure (MTBF) Cabinet Rating noved when a Remote Manua	1,000% for 1 cycle Bypass Switch ¹ 120: Single phase, 2 wire 120/240: Single phase, 3 wire Inside UPS/Inverter Enclosure Two 600 VAC, rotary drum, make- before-break type Zero in both directions 125% continuous 150% for 1 0 minutes 200% for 1 ninute 1,000% for 1 cycle ronmental 32 to 104°F (0 to 40°C) 0.95% non-condensing 10,000 feet (3,048 meters) 65-72 dB(A) @ 4.9 feet (1.5 meter) typical Aided Convection or Forced Air, depending on kVA rating and design (fans standard for 30 kVA units and above) Top and Bottom Entry Standard > 205,000 Hours NEMA 1 / IP-20 (IP-21 with addition of optional drip shield) I Bypass Switch is selected		

120 VDC (60 Lead Acid Battery Cells)																
Model	Rated Po	Output wer	Efficiency	Max DC Current	AC Outp	out Amps ¹	Cabinet Style	Cabinet Style	Cabinet Style	Cabinet Style	DC I/P Breaker	Bypass	Breaker	We	ight	Heat Loss
Number	kVA	kW	DC-AC	@ 1.75 VPC	120	240		120	120	120/240	lb	kg	(BIU)			
DSS003-2	3	3	83%	34	25	13	GTD1X	50	35	20	885	402	2,097			
DSS005-2	5	5	85%	56	42	21	GTD1X	70	60	30	885	402	3,011			
DSS007-2	7.5	7.5	85%	84	63	31	GTD1X	100	80	40	1,100	500	4,516			
DSS010-2	10	10	85%	112	83	42	GTDIX	125	125	60	1,325	602	6,021			
DSS015-2	15	15	86%	166	125	63	GTDIX	200	175	80	2,050	932	8,332			
DSS020-2	20	20	86%	221	167	83	GTDIX	250	225	110	2,100	955	11,109			
DSS030-2	30	30	87%	328	250	125	GTDIX	400	350	175	2,650	1,205	15,295			
DSS040-2	40	40	88%	432	333	167	GTDIX	500	500	225	3,050	1,386	18,611			
DSS050-2	50	50	88%	541	417	208	GTD2X	600	600	300	3,700	1,682	23,264			
240 VDC (120 Lead Acid Battery Cells)																
				24	0 VDC (1	20 Lead	Acid Battery	Cells)								
Model	Rated Po	Output wer	Efficiency	A Max DC Current	0 VDC (1 AC Outp	120 Lead	Acid Battery	Cells) DC I/P Breaker	Bypass	Breaker	We	ight	Heat Loss			
Model Number	Rated Po kVA	Output wer kW	Efficiency DC-AC	Aax DC Current @ 1.75 VPC	O VDC (1 AC Outp 120	Dut Amps ¹ 240	Acid Battery Cabinet Style	Cells) DC I/P Breaker 240	Bypass 120	Breaker 120/240	We	ight kg	Heat Loss (BTU)			
Model Number DSS003-2	Rated Po kVA 3	Output wer kW 3	Efficiency DC-AC 84%	24 Max DC Current @ 1.75 VPC 17	O VDC (1 AC Outp 120 25	20 Lead	Acid Battery Cabinet Style GTD1X	Cells) DC I/P Breaker 240 25	Bypass 120 35	Breaker 120/240 20	We Ib 685	ight kg 311	Heat Loss (BTU)			
Model Number DSS003- ² DSS005- ²	Rated Por kVA 3 5	Output wer kW 3 5	Efficiency DC-AC 84% 87%	24 Max DC Current @ 1.75 VPC 17 27	O VDC (1 AC Outp 120 25 42	20 Lead out Amps ¹ 240 13 21	Acid Battery Cabinet Style GTD1X GTD1X	Cells) DC I/P Breaker 240 25 40	Bypass 120 35 60	Breaker 120/240 20 30	We Ib 685 685	ight kg 311 311	Heat Loss (BTU) 1,950 2,549			
Model Number DSS003- ² DSS005- ² DSS007- ²	Rated Po kVA 3 5 7.5	Output wer kW 3 5 7.5	Efficiency DC-AC 84% 87% 88%	24 Max DC Current @ 1.75 VPC 17 27 41	AC Outp 120 25 42 63	20 Lead out Amps ¹ 240 13 21 31	Acid Battery Cabinet Style GTDIX GTDIX GTDIX	Cells) DC I/P Breaker 240 25 40 50	Bypass 120 35 60 80	Breaker 120/240 20 30 40	We Ib 685 685 830	ight kg 311 311 377	Heat Loss (BTU) 1,950 2,549 3,490			
Model Number DSS003- ² DSS005- ² DSS007- ² DSS010- ²	Rated Po kVA 3 5 7.5 10	Output wer kW 3 5 7.5 10	Efficiency DC-AC 84% 87% 88% 88%	24 Max DC Current @ 1.75 VPC 17 27 41 54	AC Outp 120 25 42 63 83	20 Lead out Amps ¹ 240 13 21 31 42	Acid Battery Cabinet Style GTD1X GTD1X GTD1X GTD1X	Cells) DC I/P Breaker 240 25 40 50 70	Bypass 120 35 60 80 125	Breaker 120/240 20 30 40 60	We Ib 685 685 830 1,125	ight kg 311 311 377 511	- Heat Loss (BTU) 1,950 2,549 3,490 4,653			
Model Number DSS003- ² DSS005- ² DSS007- ² DSS010- ² DSS015- ²	Rated Por kVA 3 5 7.5 10 15	Output wer 8W 3 5 7.5 10 15	Efficiency DC-AC 84% 87% 88% 88% 88%	24 Max DC Current @ 1.75 VPC 17 27 41 54 81	AC Outp 120 25 42 63 83 125	20 Lead out Amps ¹ 240 13 21 31 42 63	Acid Battery Cabinet Style GTDIX GTDIX GTDIX GTDIX GTDIX	Cells) DC I/P Breaker 240 25 40 50 70 100	Bypass 120 35 60 80 125 175	Breaker 120/240 20 30 40 60 80	We Ib 685 685 830 1,125 1,455	ight kg 311 311 377 511 661	Heat Loss (BTU) 1,950 2,549 3,490 4,653 6,979			
Model Number DSS003- ² DSS005- ² DSS007- ² DSS010- ² DSS015- ² DSS020- ²	Rated Por kVA 3 5 7.5 10 15 20	Output wer kW 3 5 7.5 10 15 20	Efficiency DC-AC 84% 87% 88% 88% 88% 88%	24 Max DC Current @ 1.75 VPC 17 27 41 54 81 108	AC Outp 120 25 42 63 83 125 167	20 Lead out Amps ¹ 240 13 21 31 42 63 83	Acid Battery Cabinet Style GTDIX GTDIX GTDIX GTDIX GTDIX GTDIX	Cells) DC I/P Breaker 240 25 40 50 70 100 125	Bypass 120 35 60 80 125 175 225	Breaker 120/240 20 30 40 60 80 110	We Ib 685 685 830 1,125 1,455 1,635	ight kg 311 311 377 511 661 743	Heat Loss (BTU) 2,549 3,490 4,653 6,979 9,305			
Model Number DSS003- ² DSS005- ² DSS007- ² DSS010- ² DSS015- ² DSS020- ² DSS020- ²	Rated Po' kVA 3 5 7.5 7.5 10 15 20 30	Output wer 3 5 7.5 10 15 20 30	Efficiency DC-AC 84% 87% 88% 88% 88% 88% 88%	24 Max DC Current @ 1.75 VPC 17 27 41 54 81 108 162	O VDC (1 AC Out; 120 25 42 63 83 125 167 250	20 Lead out Amps ¹ 240 13 21 31 42 63 83 125	Acid Battery Cabinet Style GTDIX GTDIX GTDIX GTDIX GTDIX GTDIX GTDIX	Cells) DC I/P Breaker 240 25 40 50 70 100 125 200	Bypass 120 35 60 80 125 175 225 350	Breaker 120/240 20 30 40 60 80 80 110 175	We 1b 685 685 830 1,125 1,455 1,635 1,995	ight kg 311 311 377 511 661 743 906	Heat Loss (BTU) 1,950 2,549 3,490 4,653 6,979 9,305 13,958			
Model Number DSS003- ² DSS005- ² DSS007- ² DSS015- ² DSS015- ² DSS020- ² DSS030- ² DSS030- ²	Rated Po kVA 3 5 7.5 10 15 20 30 40	Output wer 8W 3 5 7.5 10 15 20 30 40	Efficiency DC-AC 84% 87% 88% 88% 88% 88% 88% 88% 88%	24 Max DC Current @ 1.75 VPC 17 27 41 54 81 108 162 217	AC Outp 120 25 42 63 83 125 167 250 333	20 Lead 240 13 21 31 42 63 83 125 167	Acid Battery Cabinet Style GTDIX GTDIX GTDIX GTDIX GTDIX GTDIX GTDIX GTDIX	Cells) DC I/P Breaker 240 25 40 50 70 100 125 200 250	Bypass 120 35 60 80 125 175 225 350 500	Breaker 120/240 20 30 40 60 80 110 175 225	We 1b 685 685 830 1,125 1,455 1,635 1,995 2,240	ight kg 311 311 377 511 661 743 906 1,017	Heat Loss (BTU) 1,950 2,549 3,490 4,653 4,653 6,979 9,305 13,958 18,611			

Cabinet Dimensions Inches Millimeters								
Style	H x W x D	НхWхD						
GTDIX	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								
"EE"	"FF"	"GG"						

AC Output Volts (code)

120 - (12)

120/240 - (24)

Freq (code)

60 - (60)

120/240 - (24)



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

² A complete model number includes the 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: DSS020-EE+FF-GG; where EE=DC bus voltage; FF=AC Output Voltage; GC=System Frequency.

For Example: A 20 kVA with 120 VDC bus voltage; 120 VAC output, 60 Hz frequency; would have the following model number: DSS020-12-12-60.

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: DSS020C

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

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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.