DSS

Digitally Controlled Ferroresonant Inverter

INDUSTRIAL INVERTER
SINGLE PHASE

AMETEK®
SOLIDSTATE CONTROLS
PROVIDING CONTINUITY OF ELECTRICAL POWER

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

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 – 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 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

Circuit Breakers

DC Input (10 kAIC, minimum)
Bypass Input (14 kAIC, minimum)

Alarms (Displayed on LCD Alarm Panel)

Fan Failure
Low DC Voltage
Low DC Disconnect
DC 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):

- 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

General Specifications – Optional Features

Metering and System Measurements	(Option #)
Bypass Input Frequency	(112)
Bypass Input Voltage	(113)
Output Power (kVA, kW, Power Factor)	(114)
% Inverter Loading	(115)
Inverter Output Voltage	(117)
Analog Meters	(198)

Circuit Breaker	(Option #)
65 kAIC Bypass Breaker	(85)
Inverter Output (Non-Automatic)	(17)
AC Output	(18)
DC 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

Cascade Redundant Configuration
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 #)
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 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)
Battery Near Exhaustion	(60)
High DC Voltage	(5)
MBS to Bypass	(78)
Bypass Input CB Open	(103)
AC Output CB Open	(104)

General Specifications – Performance

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 millisecond
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)

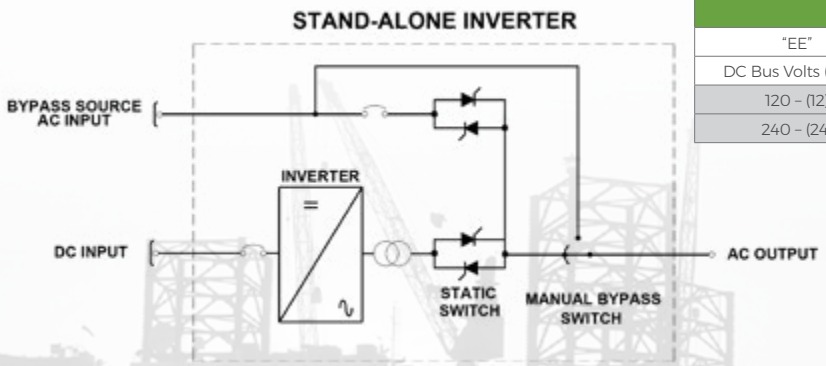
[1] Internal Manual Bypass Switch is normally removed when a Remote Manual Bypass Switch is selected
[2] Custom Input and Output Voltages available - Consult Us
[3] Addition of drip shield may increase the noise by 1-3 dB(A)

ISO 9001:2008 CERTIFICATION™
Intertek

120 VDC (60 Lead Acid Battery Cells)													
Model Number	Rated Output Power		Efficiency	Max DC Current	AC Output Amps[1]		Cabinet Style	DC I/P Breaker	Bypass Breaker		Weight		Heat Loss (BTU)
	kVA	kW	DC-AC	@ 1.75 VPC	120	240		120	120	120/240	lb	kg	
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	GTD1X	125	125	60	1,325	602	6,021
DSS015-[2]	15	15	86%	166	125	63	GTD1X	200	175	80	2,050	932	8,332
DSS020-[2]	20	20	86%	221	167	83	GTD1X	250	225	110	2,100	955	11,109
DSS030-[2]	30	30	87%	328	250	125	GTD1X	400	350	175	2,650	1,205	15,295
DSS040-[2]	40	40	88%	432	333	167	GTD1X	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)													
Model Number	Rated Output Power		Efficiency	Max DC Current	AC Output Amps[1]		Cabinet Style	DC I/P Breaker	Bypass Breaker		Weight		Heat Loss (BTU)
	kVA	kW	DC-AC	@ 1.75 VPC	120	240		240	120	120/240	lb	kg	
DSS003-[2]	3	3	84%	17	25	13	GTD1X	25	35	20	685	311	1,950
DSS005-[2]	5	5	87%	27	42	21	GTD1X	40	60	30	685	311	2,549
DSS007-[2]	7.5	7.5	88%	41	63	31	GTD1X	50	80	40	830	377	3,490
DSS010-[2]	10	10	88%	54	83	42	GTD1X	70	125	60	1,125	511	4,653
DSS015-[2]	15	15	88%	81	125	63	GTD1X	100	175	80	1,455	661	6,979
DSS020-[2]	20	20	88%	108	167	83	GTD1X	125	225	110	1,635	743	9,305
DSS030-[2]	30	30	88%	162	250	125	GTD1X	200	350	175	1,995	906	13,958
DSS040-[2]	40	40	88%	217	333	167	GTD1X	250	500	225	2,240	1,017	18,611
DSS050-[2]	50	50	88%	270	417	208	GTD2X	350	600	300	2,940	1,335	23,264

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		
"EE"	"FF"	"GG"
DC Bus Volts (code)	AC Output Volts (code)	Freq (code)
120 – (12)	120 – (12)	60 – (60)
240 – (24)	120/240 - (24)	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; GG=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
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.

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