



DIN-RAIL MOUNTABLE

Model HSM 12-84

The Kepco HSM series comprises a group of ten models, seven 1000 watt power supplies with outputs from 3.3 volts to 48 volts and three 1500 watt power supplies with outputs from 24 to 48 volts. All models feature current sharing for parallel operation and redundancy applications. Kepco's 1000W HSM have a wide-range input (90-277V a-c). The 1500W models operate 180-277V a-c. Both incorporate power factor correction to meet EN61000-3-2. These modern power supplies operate at 100KHz using current mode control to provide rapid response to source and load changes and tight stabilization.

HSM may be remotely controlled over the range 20% to 110% of their rated voltage by means of an external voltage (2-11V) or resistance (by a 10K variable resistance).

HSM have optional built-in "or-ing" diodes for redundancy paralleling. These are specified by appending the suffix "R" to the model number.

FEATURES

- Remote sensing.
- Control/programming of the voltage channel, current limit, overvoltage set point.
- Current "walk in" circuit.
- 5V auxiliary floating supply, 100mA.
- Status indicator and flags (isolated relay) for POWER, DC FAIL, OVERTEMP, FAN FAIL.



HSM MODEL TABLE

| MODEL | OUTPUT VOLTAGE | | OVP SETTING | RATED OUTPUT CURRENT | | | RIPPLE | | NOISE | EFFICIENCY |
|-------------------------|----------------|------------------|------------------|----------------------|------|------|------------|---------------|---------------|-------------------------|
| | Volts | | Volts | Amps | | | mV p-p | | mV p-p | Percent |
| | Factory Set | Adjustment Range | Factory Setpoint | 50°C | 60°C | 71°C | Source max | Switching max | (Spike) 20MHz | 100% Load Nominal input |
| 1000 WATT MODELS | | | | | | | | | | |
| HSM 3.3-230 | 3.3 | 2.3-3.6 | 4.29 | 230 | 173 | 105 | 20 | 30 | 100 | 71 |
| HSM 5-200 | 5 | 3.5-5.5 | 6.5 | 200 | 150 | 95 | 20 | 30 | 100 | 72 |
| HSM 12-84 | 12 | 8.4-13.2 | 15.6 | 84 | 63 | 40 | 20 | 40 | 120 | 73 |
| HSM 15-66 | 15 | 10.5-16.5 | 19.5 | 66 | 49.5 | 31.4 | 20 | 40 | 150 | 76 |
| HSM 24-42 | 24 | 16.8-26.4 | 31.2 | 42 | 31.5 | 20 | 20 | 60 | 240 | 77 |
| HSM 28-36 | 28 | 19.6-30.8 | 36.4 | 36 | 27 | 17 | 20 | 60 | 280 | 78 |
| HSM 48-21 | 48 | 33.3-59.2 | 62.4 | 21 | 16 | 10 | 20 | 60 | 480 | 80 |
| 1500 WATT MODELS | | | | | | | | | | |
| HSM 24-60 | 24 | 16.8-26.4 | 31.2 | 60 | 45 | 28.6 | 20 | 60 | 120 | 77 |
| HSM 28-53 | 28 | 19.6-30.8 | 36.4 | 53 | 39.8 | 25.2 | 20 | 60 | 140 | 78 |
| HSM 48-30 | 48 | 33.3-59.2 | 62.4 | 30 | 22.5 | 14.3 | 20 | 60 | 240 | 80 |

HSM are designed in accordance with EN 60950 and UL 1950 and have been approved by UL/CSA/VDE. A built-in conducted EMI filter attenuates the noise reflected back onto the mains below the limits of FCC, level A and CISPR, Class A. HSM are capable of sustaining full load operation through the loss of one full mains cycle at any source voltage and without indication of failure. If the mains power is lost for more than one cycle, HSM provides a flag a minimum of 5 milliseconds before the output loses regulation. They meet the ANSI C62.41 guidelines for withstanding surges on the mains. HSM are modular designs for OEM mounting.

HSM output is fully protected for any overload including a short circuit. The normal overload protection mode is continuous current limiting. A switch selectable option will latch the power off after 30 seconds to avoid damage to load wires. An overvoltage protector latches the power off whenever the output exceeds a user-set limit.

Remote control of the HSM is provided via one of two isolated TTL-level signals, one normally high, the other normally low. An internal 5V supply powers this circuit and provides an auxiliary 5V, 100mA output on all models. This voltage is available whenever source power is applied whether or not the output is inhibited. The output is normally ON if no remote logic is applied. The main output voltage is remotely trimmable by resistance.

Both output voltage and current limit are adjustable via remote analog programming (0-10V).

HSM are similar to the HSP power supply family but they are mechanically configured as modular units without the plug-in hot swap feature.

HSM can be individually installed or may be combined into a custom power assembly for multi-output requirements. Please see pages 131-135 for details on Kepco's Power Assembly Program.



HSM INPUT CHARACTERISTICS

| SPECIFICATIONS | | RATING/DESCRIPTION | CONDITION |
|-----------------------------|----------|------------------------------------|--|
| a-c Voltage 1000W models | nominal | 100-250V a-c | Single phase |
| | range | 90-277V a-c | Wide range |
| a-c Voltage 1500W models | nominal | 200-250V a-c | Single phase |
| | range | 180-277V a-c | Wide range |
| d-c Voltage ⁽¹⁾ | 1000W | 125-420V d-c ⁽¹⁾ | Polarity insensitive |
| | 1500W | 250-420V d-c ⁽¹⁾ | Polarity insensitive |
| Brownout Voltage | 1000W | 75V a-c | |
| | 1500W | 150V a-c | |
| Source Frequency | | 47-440Hz | >63Hz, input leakage current exceeds tabulated value |
| Source Current | 120V a-c | 1000W: 11.0A rms | Typical |
| | 240V a-c | 1000W: 5.5A rms 1500W: 8.0A rms | |
| Power Factor | Typical | 0.99 | Any source 25% to 100% load |
| | Minimum | 0.96 | |

(1) Safety approval is for a-c operation only.

HSM CURRENT HARMONICS, SOURCE TRANSIENTS AND EMI SPECIFICATIONS

| PARAMETER | DOCUMENT | SPECIFICATION |
|-------------------------------|-------------------|--|
| IMMUNITY⁽¹⁾ | | |
| Radiated RF (Ampl. mod.) | EN61000-4-3 | 10V/m, 80-1000MHz |
| Radiated RF (Pulse mod.) | EN61000-4-3 | 10V/m, 900MHz |
| Magnetic Field | EN61000-4-8 | 30A/M, 50Hz |
| Electrostatic Discharge | EN61000-4-2 | 4KV (contact) 8KV (air) |
| Conducted RFI | EN61000-4-6 | 10Vrms, 0.15-80MHz |
| Electrical Fast Transient | EN61000-4-4 | 2KV, Tr/Th = 5/50ns |
| Surge (CM, DM) | EN61000-4-5 | 4KV (CM) Tr/Th = 8/20µs 2KV (DM) Tr/Th = 8/20µs |
| EMISSIONS | | |
| Conducted RF | FCC, Class A | 0.45-30MHz |
| | CISPR 22, Class A | 0.15-30MHz |
| Current Harmonics | EN61000-3-2 | 0-2KHz |

(1) All immunity levels meet the requirements for heavy industrial applications per EN50082-2 using Criteria A (no operational effect).



HSM OUTPUT CHARACTERISTICS

| SPECIFICATIONS | | RATING/DESCRIPTION | CONDITION |
|--|------------|---|---|
| Output Setting Range | | 70% - 110% ⁽¹⁾ | Of nominal output |
| | | 70% - 125% ⁽¹⁾ | 48V Models only |
| Source Effect | typ | 0.05% | Nominal ± 15% |
| | max | 0.1% | |
| Load Effect | typ | 0.05% | 5%-100% load (operation between 0-5% load results in increased ripple and degraded transient response) |
| | max | 0.1% | |
| Temperature Effect | typ | 0.01% | Per degree C (0 to 50°C) |
| | max | 0.02% | |
| Combined Effect (source, load temperature & time) | typ | 0.15% | |
| | max | 0.3% | |
| Time Effect (drift) | typ | 0.05% | 0.5-8.5 hours |
| | max | 0.1% | |
| Start Up Time | max | 1 second | Any source/load |
| Recovery Characteristics | Excursion | <3% of nominal output | 50-100% load |
| | Recovery | 1000W: 100 µsec 1500W: 300 µsec | Return to 1% of setting |
| Ride Through | min | 21.5 Milliseconds | From loss of source to flag signal |
| Hold Up Time | min | 5 Milliseconds | After signal flag |
| Overshoot | turn on | +3% max | Any source, 5%-100% load |
| | turn off | none | |
| Error Sense | 3.3 & 5V | 0.25V | Voltage allowance per wire |
| | All others | 0.4V | |
| Series Connection (output floats) | | 500V | Maximum voltage off ground |
| Parallel Connection (for redundancy) | | Current shares within 5% of rated load | 5-100% load |
| Selective Overvoltage Shutdown | | Adjustable 100-140% of nominal; factory set to 130% | Latched, reset by cycling source power off |
| Current Limiting | | Constant current mode Factory set 110% of I _q max | Optional shutdown mode with 20 second delay |
| Remote On/off | RC-1 | Normally high | Isolated form C or TTL |
| Remote On/off | RC-2 | Normally low | Isolated form C or TTL |
| Overtemperature | | Thermostat, auto re-start | With hysteresis |

(1) When remotely controlled by voltage or resistance, the HSM may be controlled over a range of 20%-110% of rated output. 20% to 125% for 48V models.

HSM GENERAL SPECIFICATIONS

| SPECIFICATIONS | | RATING/DESCRIPTION | CONDITION |
|----------------------|--------------|--|---|
| Temperature | | -20° to +71°C (see model table) | Operating |
| | | -40° to +85°C | Storage |
| Humidity | | 0 to 95% RH | Non-condensing operating & storage |
| Shock | | 20g 11msec ±50% half sine | Non-operating 3-axes 3 shocks each axis |
| Vibration | | 5-10Hz 10 mm double amplitude | Non-operating 1 hour each axis |
| | | 10-55Hz 2g | |
| Altitude | operating | Sea level to 10,000 ft | |
| | storage | Sea level to 160,000 ft | |
| Isolation | Output-case | 500V d-c | 25°C, 65%-RH |
| Withstand Voltage | Input-output | 3000V a-c rms | 25°C, 65%-RH |
| | Input-case | 1500V a-c rms | |
| Safety | | UL 1950; VDE EN 60950; CSA 22.2 No. 60950-00 | Information Technology Equipment |
| Modular Construction | | Enclosed, bolt-down style | Stand alone or rack mountable into RA-58 series |
| Cooling | | Internal d-c fan | Exhaust to rear |

FEATURES

- Safety Agency Approvals: UL recognized (SELV) - UL 1950; CSA certified (SELV) - CSA 22.2 No. 234-M90 (Level 5); VDE recognized (SELV) - EN60950/IEC 950.
- HSM are capable of sustaining full load operation through the loss of one full mains cycle at any source voltage without indication of failure. If mains power is lost for more than one cycle, HSM provide a flag a minimum of 5 milliseconds before the output loses regulation.
- HSM meet ANSI C62.41/EN61000-4-5 guidelines for withstanding surges on the mains.
- HSM are 5" x 5" x 13.75" bolt down modules that easily mount in a user's equipment or in a 3U power assembly rack.



HSM are CE marked per the Low Voltage Directive (LVD), EN60950.

Accessory Housings for HSM Models

RA 58 (3) HSM Modules independent slots, hardwire
 English 19"W x 5.25"H x 16.4"D
 Metric 483 x 133 x 417 mm

RA 61 (4) HSM Modules independent slots, hardwire
 English 24"W x 5.25"H x 16.4"D
 Metric 610 x 133 x 417 mm

Accessories for HSM Models

- 118-0776** line cord set with NEMA 5-20P termination (125V/20A)
- 142-0381** source power entry mating connector
- 142-0422** I/O mating connector
- 108-0203** I/O connector jackposts (set of two)
- 108-0294** I/O connector shell
- 101-0159** screw for mounting I/O connector shell

CompuMess Elektronik GmbH

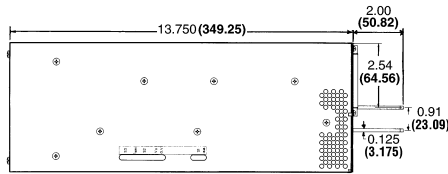
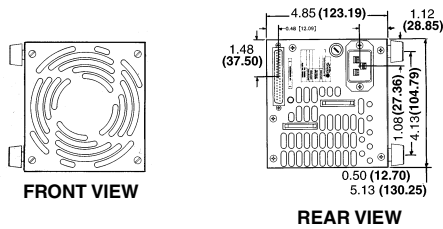
Lise-Meitner-Str.1, 85716 Unterschleissheim

Tel 089-321501-0 Fax 089-321501-11

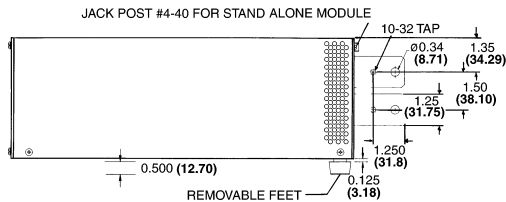
<http://www.compumess.de> oder <http://www.netzteile.de>

OUTLINE DIMENSIONAL DRAWINGS

Fractional dimensions in light face type are in inches,
dimensions in bold face type are in millimeters.
 Tolerance: $\pm 1/64"$ (**0.4**) between mounting holes
 $\pm 1/32"$ (**0.8**) other dimensions



TOP VIEW



SIDE VIEW

HSM SIGNALS AND FLAGS

| SPECIFICATIONS | RATING/DESCRIPTION | | CONDITION |
|---|--------------------|---|---|
| Status Flags (Form C dry relay contacts) | POWER | Indicates low source voltage signal asserted 5 msec prior to loss of output voltage | Both NO and NC available |
| | OUTPUT | Indicates normal operation | |
| | OVER TEMP | Over temperature shutdown | |
| | FAN FAIL | Failure of internal fan | |
| Auxiliary Voltage (isolated) | | 4.5-5.5V d-c isolated 0-100 milliamperes | Present whenever housekeeping supply is operating |

HSM CONTROL

| SPECIFICATIONS | RATING/DESCRIPTION | | CONDITION |
|---|--------------------|---|---|
| Voltage set programming (mode selected by internal switches isolated) | Internal | Multiturn potentiometer | The DCOK/DCFAIL fault detect window tracks the programmed output voltage, OVP trip unaffected |
| | External 1 | Resistance 0-10K = 100-50% of rated output voltage | |
| | External 2 | Voltage 2-11V = 20-110% of rated output voltage, 20-125% for 48V models | |
| Current limit programming (mode selected by internal switches) | Internal | Multiturn potentiometer | |
| | External | Voltage 2-10V = 20-100% of rated output current | |
| Remote ON/OFF | Normal H | TTL level | Isolated 5V, 100mA internal pull up supply |
| | Normal L | TTL level | |
| Forced load share | | Single wire connection between modules | 0-5.5V signal indicates each module's current |

HSM PHYSICAL CHARACTERISTICS

| SPECIFICATIONS | RATING/DESCRIPTION | | CONDITION |
|-------------------|--------------------|---------------------------------------|----------------------------------|
| Dimensions | English | 5.38" x 5.22" x 13.75" | Excluding terminals |
| | Metric | 137 x 133 x 349 mm | |
| Weight | English | 18lbs | |
| | Metric | 8.2Kg | |
| Source connection | | 3 pin IEC connector | Compatible with molded line cord |
| Load connection | | Two bus bars 1.25" x 0.125" x 2.5" | |
| Signal connection | | 37 Pin D-subminiature connector | |

