SERIES **MST**

Card cage with 8 MST units and 1 MST 488-27 adapter

MST power modules are a group of programmable power supplies that are compatible with Kepco's single address, multiple instrument serial control bus. The MST provide precision interactive control in the 200 Watt power class. The housings for MST, RA 55 and CA 400 contain a slot to accommodate an IEEE 488.2 adapter. If not used, an additional MST power module may be plugged into that slot.

Kepco's MST employ switching technology for high efficiency and high power density combined with linear stabilization techniques for accuracy and resolution. The switching front end is an advanced current mode controller with power factor correction. A power factor of better than 0.98 ensures that the MST meets EN 61000-3-2. A wide-range a-c input accepts any mains voltage from 88 to 264V a-c. MST are packaged in a 4U, 7" high 1/9th rack-width plug-in module that mounts in a special housing called RA 55. MST modules plug in from the front and may be unplugged and removed without shutting down the entire power system. N+1 redundancy is provided with forced current sharing when like modules are mounted together and wired in parallel. Eight different modules are offered from a 0-6V/20A unit to a 0-150V/1.2A rating. The RA 55 housing may be filled with either 9 power modules or with 8 power supply units, with the ninth slot devoted to the IEEE 488.2 interface, MST 488-27.

MST MODEL TABLE

SPECIFICATION	OUTPUT VOLTAGE	OUTPUT CURRENT			RIPPLE		EFFICIENCY
UNIT		Amps			mV p-p		Percent
CONDITION	Adjustment Range	45°C	55°C	65°C	Source max	Switching max (1)	100% Load 120V a-c
200 WATT PLUG-IN MODELS							
MST 6-20M	0-6	20	16	12.0	2.5	5	51%
MST 15-12M	0-15	12	9.6	7.2	5	10	61%
MST 25-8M	0-25	8	6.4	4.8	5	10	62%
MST 36-5M	0-36	5	4.0	3.0	5	10	63%
MST 55-3.5M	0-55	3.5	2.8	2.1	5	10	64%
MST 75-2.5M	0-75	2.5	2.0	1.5	7.5	15	64%
MST 100-2M	0-100	2	1.6	1.2	7.5	15	66%
MST 150-1.2M	0-150	1.2	1.0	0.7	7.5	20	66%

(1) Includes spike noise to 20MHz.

FEATURES

- Plug-in construction.
- Up to nine 200-watt power supplies in a 4U housing.
- Optional GPIB interface connects (8) eight MST modules to a single GPIB (IEEE 488.2) address with the capacity to control up to 19 additional power supplies.
- Switch-mode conversion, linear post regulator.
- Wide range a-c input: 88-264V a-c with built-in power factor correction (PFC).
- Forced current sharing for N+1 redundancy connection.

This KEPCO product is backed by a firm **5-YEAR WARRANTY**

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Power mit System

MST INPUT CHARACTERISTICS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
a-c Voltage	nominal	100-240V a-c	Single phase
	range	88-264V a-c	Wide range
Frequency	nominal	50-60Hz	>63Hz, input leakage current exceeds spec
	range	47-63Hz (400Hz)	
Current	maximum	3.6A rms	88V a-c input
Power Factor	min	0.98	All source conditions full load
Efficiency	min	See model table	100% load 120V a-c
Current Harmonics		Within EN60555-2 limits and EN61000-3-2	
EMI		Meets FCC and CISPR 22	Class A Class A
EMC		Complies with IEC 61326-1	Class A
Leakage Current	120V a-c	<0.5mA	Source frequency in 47-63Hz range
	240V a-c	<1.0mA	
Circuit type		Forward converter, current mode, linear post regulator	
Switching Frequency	typ	88KHz 65KHz	Load PFC

MST GENERAL SPECIFICATIONS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Temperature		-20° to +45°C (1) (see model table)	Operating; derate above 45°C
		-40° to +85°C	Storage
Humidity		0 to 95% RH	Non-condensing operating & storage
Shock		20g 11msec ±50% half sine	3-axes 3 shocks each axis
Vibration		5-10Hz 10mm double amplitude	Non-operating 1 hour each axis
		10-55Hz 2g	
Altitude		Sea level to 10,000 ft	
Isolation	Output-case	500V d-c	25°C, 65%RH
Type of Construction		Enclosed, plug-in style includes status LEDs two digital meters, handle on/off switch	RA 55 accommodates 9 plug-in units; CA 400 accommodates 4 plug-in units
Cooling		Internal d-c cooling fans	Exhaust to rear

(1) MST will start at temperatures as low as -20°C. When self heating warms them to 0°C and above, the published specifications will be guaranteed.

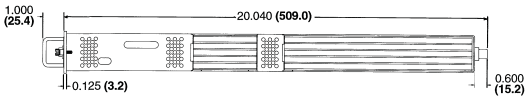
Each module contains a single address, multiple instrument serial port. It is a 2-wire serial bus operating at 375KHz that can address as many as 27 separate modules of either the MST or MAT design. This bus can interface directly to a PC or to a GPIB controller. Model TMA PC-27 plugs into a PC's half card slot to drive MST and MAT directly. A GPIB controller can interface through either the plug-in MST 488-27 or the stand alone TMA 4888-27. A path to a VXI cage is provided by Kepco's model TMA VXI-27.

MST features built-in relays to enable/disable the output and to allow polarity reversal. Disabling the MST as a voltage source means opening the connection between the power module and its load. Disabling the MST as a current source means shorting the power module's output terminals. The polarity reversal relays provide for two-quadrant operation.

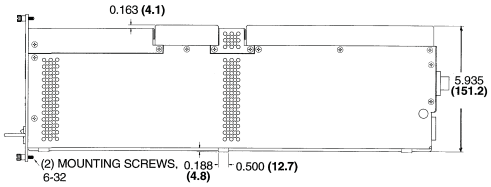
MST are CE marked per the Low Voltage Directive (LVD), EN61010-1.

OUTLINE DIMENSIONAL DRAWINGS

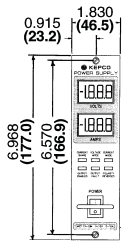
Fractional dimensions in light face type are in inches, **dimensions in bold face type are in millimeters.**
Tolerance: ± 1/64" **(0.4)** between mounting holes
± 1/32" **(0.8)** other dimensions



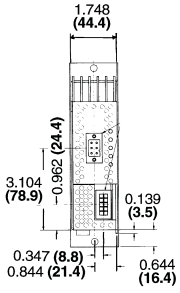
TOP VIEW



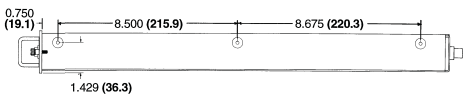
SIDE VIEW



FRONT VIEW



REAR VIEW



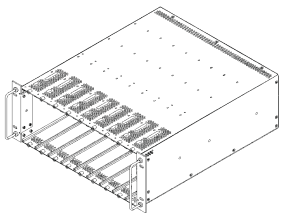
BOTTOM VIEW

Programming Accessories for MST Models

MST 488-27 occupies the left slot of an RA 55

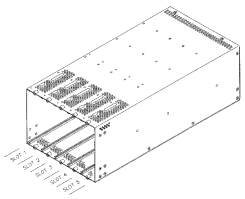
MST 488-27 is a GPIB, IEEE 488.2 interface from the MST's internal single address, multiple instrument serial bus. It can drive all eight remaining slots in the RA 55 plus 19 more power supplies.

Rack Adapters for MST Models



RA 55

RA 55 accommodates nine (9) plug-in MST power supplies. Each power module can produce up to 200 watts, so that the total for the rack can be 1800 watts.



CA 400
Housing for (5) MST modules

CA 400 accommodates up to (5) MST power modules. The left most slot can accommodate the MST 488-27 interface that will allow the remaining four (4) MST modules to be fully programmed via the IEEE 488.2 instrumentation bus.

MST OUTPUT CHARACTERISTICS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Source Effect	Voltage	0.001%	Nominal ± 15% mains voltage
	Current	0.005%	
Load Effect	Voltage	0.002% (1)	10% to 100% load
	Current	0.005% (2)	
Temperature Effect	Voltage	0.01%	Per degree C (0 to 50°C)
	Current	0.02%	
Time Effect (drift)	Voltage	0.01%	0.5-8.5 hours
	Current	0.02%	
Programming Resolution	Voltage	0.025%	12 bits
	Current	0.025%	12 bits
Data Read Back Accuracy	Voltage	0.1%	Of max voltage
	Current	0.12%	Of max current
Display	Voltage	3.5 digit LED, red	Front panel
	Current	3.5 digit LED, red	Front panel
Status Indicators		Voltage mode	Green LED
		Current mode	Amber LED
		Current share	Amber LED
		Output enabled	Green LED
		Polarity reversed	Green LED
		Output fault	Red LED
Output Enable		Built-in power & sense relay	
Polarity Reverse		Built-in power & sense relay	
Transient Recovery Time		100 microseconds	50-100% load return to within stabilization band
Overshoot		None	Turn on/off
Error Sense		0.5V d-c	Voltage allowance per wire
Series Connection (output floats)		500V d-c	Maximum voltage off ground
Parallel Connection		N+1 redundancy, forced current share	Currents divide equally
Over Voltage Protection		Tracks output setting power shutdown	Latched, reset by cycling source Power off
Over Temperature		Thermostat	
Open Sense Wire		Automatic detection with power shutdown	
Backup Current Limit		Tracks output current at 110%	

(1) Or 0.5mV, whichever is greater (MST 6-20M load effect, voltage mode: 0.004%).
(2) Plus a 0.015% settling effect.

MST PHYSICAL CHARACTERISTICS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Dimensions/ Module	English	7" x 1.83" x 20"	Excluding front switch & handle
	Metric	178 x 46.5 x 509mm	
Dimension RA 55	English	7" x 19" x 20.89"	Mounts in 24" deep cabinet
	Metric	178 x 483 x 531mm	
Dimension CA 400	English	7" x 9.6" x 20.89"	Mounts in 24" deep cabinet
	Metric	178 x 244 x 531mm	
Weight/ Module	English	9.0lbs.	
	Metric	4.1Kg	
Source Connection RA 55		Two 3 contact terminal blocks	Two line cords split the input power
Load Connection		Each module mates with a 6-pin connector containing ± output sense, ground and current share	At the rear of the RA 55
Programming Connections		Two control bus connectors allow racks to be "daisy-chained"	At the rear of the RA 55

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