**Introduction:**
Precision low temperature thermogravimetric analysers are available in 8 different regular models apart from tailor made solutions virtually covering all industrial and research applications meeting all electrical, thermal, mechanical, and environmental specifications. Complete package consist of programmable micro-kelvin measurement/ power supply, and ultra precision mass measurement system with facility to alter temperature, humidity and other thermo-chemical parameters. These analysers are first choice for online monitoring of ultra low Mass dynamic measurement with respect to variation in heat, humidity and other simulated climate parameters in static/dynamic mode. These finds applications in polymers, electrical, bio-technology, composite, chemical, railway, and avionics and solid state physical application like dielectrics characterization, switch gears, MEMS and many research and development activities. These precision instruments are able to simulate/measure/record with very high degree of accuracy/repeatability/reliability and are available in different constructional material like ceramic-coated MS. poly carbonate cabinets. 

**Benefits:**
- High input impedance/Low input biased current /higher accuracy.
- 5-1/2 & 6-1/2 digit display /consistent performance.
- ce over large temperature/humidity range (70°C and 80 % RH).
- Scaled directly in milli/micro kelvins with repeatable accuracy.
- Auto/manual zero offset without drift.
- Auto drift tracking
- RS-32 interface/high sample rate – 10,000 sample/second.
- Feed back current measurement technique.

**General electrical/mechanical specifications:**
Operating voltage: 220 volt A.C. (50-20,000 Hz)/ 12 volts D.C.
Measurement range (full scale): as above in different model.
Temperature signal: 10^-9/10^-4 °C static/dynamic (optional) /differential point mode
Thermal source: 0-40/0-100/0-500 degree cel- (static/dynamic/pulse mode H.T)-optional
Input thermal capacitance: 100 cal/sec/kg/degree k 10^-4
Response time: 1,000 sample/sec
Burden: less than 100 micro/millisecond /full scales current or better
Accuracy: 0.5/1.0/2.0°/full scales reading
Repeatability: 100 of reading
Resolution: 1/2/5/10 °C or optional and may be altered based on time behaviour of signal
Range (°C): 10^-9/10^-4 °C or optional resolution/accuracy
Thermal lead count: 5.0 micro°C/5.0 mili °C
Linearity adjustment: up to 1,000 micro/mili °C
Input impedance: ultra low (0.01 micro VC/burden),
Filtering: low pass (adjustable)
Offset: variable up to 10,000 micro/mili °C (manual/auto)
CMMR: >80 db at 10-15 thermal Hz
Isolation: > 100 giga ohm
Connector: BNC-9 pinx2 and BNC-25 pinx2
Size: 5X8X8 inches/rack mounted or portable
Interface: RS-232

**NOTES:**
- The numeral after product code indicates the (ampere meter) range and last digit corresponds to size (5x5x8, 8x8x12)
- These specifications or part thereof may be modified to meet any tailor made solutions.
- **MOTORON SEMICONDUCTORS CORPORATION**
11, Shri Nagar Colony, Shakti Nagar Extension, Delhi-110052 .Tel: 011-23648181/23655454
motronenergy@hotmail.com
Introduction:
MHCLS series of precision current/voltage supplies are available in (150 to 5000 watts), more than 20 different models working in constant voltage/current mode virtually offering solutions to precision measurement, electrochemical, corrosion, petrochemical industry, organic/inorganic chemical, heavy electrical/mechanical industries, non-conventional energy, solids state physics application and many uncountable defense/nuclear applications. Updated design topology ensures better controllability and efficiency with additional integrated power/voltage and frequency control/protection. These power supplies may operate in parallel to make it more redundant. Company offers tailor made solution to custom requirement.

Benefits:
Much lower current/voltage ripple (available in nano/pico range).
Faster control action.
Better repeatability/reproducibility.
Better electrical stability
Serial interface
Five/Six digit display

## SPECIFICATIONS OF CONSTANT VOLTAGE POWER SOURCE

**POWER RANGE<200**

<table>
<thead>
<tr>
<th>Model</th>
<th>Watts</th>
<th>Vmax</th>
<th>Imax</th>
<th>Resolution rate in case of pulse/sec x10</th>
<th>Ripple</th>
<th>Accuracy %-reading</th>
<th>Zout 10^-</th>
<th>Step down range</th>
<th>cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHCLS-012002</td>
<td>0.24</td>
<td>1.2</td>
<td>0.02</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-012004</td>
<td>0.48</td>
<td>1.2</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-012008</td>
<td>0.96</td>
<td>1.2</td>
<td>0.08</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025005</td>
<td>0.50</td>
<td>2.5</td>
<td>0.02</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025010</td>
<td>0.10</td>
<td>2.5</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025020</td>
<td>0.20</td>
<td>2.5</td>
<td>0.08</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025032</td>
<td>0.32</td>
<td>2.5</td>
<td>0.15</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-050020</td>
<td>0.20</td>
<td>5.0</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-050040</td>
<td>0.40</td>
<td>5.0</td>
<td>0.08</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-100010</td>
<td>0.10</td>
<td>10.0</td>
<td>0.01</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-100020</td>
<td>0.20</td>
<td>10.0</td>
<td>0.02</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-200040</td>
<td>0.40</td>
<td>20.0</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-400020</td>
<td>2.00</td>
<td>40.0</td>
<td>0.05</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
</tbody>
</table>

## SPECIFICATIONS OF CONSTANT CURRENT POWER SOURCE

**POWER RANGE<400**

<table>
<thead>
<tr>
<th>Model</th>
<th>Watts</th>
<th>Vmax</th>
<th>Imax</th>
<th>Resolution rate in case of pulse/sec x10</th>
<th>Ripple</th>
<th>Accuracy %-reading</th>
<th>Zout 10^-</th>
<th>Step down range</th>
<th>cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHCLS-021000</td>
<td>0.24</td>
<td>1.2</td>
<td>0.02</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025005</td>
<td>0.50</td>
<td>2.5</td>
<td>0.02</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025010</td>
<td>0.10</td>
<td>2.5</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025020</td>
<td>0.20</td>
<td>2.5</td>
<td>0.08</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-025032</td>
<td>0.32</td>
<td>2.5</td>
<td>0.15</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-050020</td>
<td>0.20</td>
<td>5.0</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-050040</td>
<td>0.40</td>
<td>5.0</td>
<td>0.08</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-100010</td>
<td>0.10</td>
<td>10.0</td>
<td>0.01</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-100020</td>
<td>0.20</td>
<td>10.0</td>
<td>0.02</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-200040</td>
<td>0.40</td>
<td>20.0</td>
<td>0.04</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
<tr>
<td>MHCLS-400020</td>
<td>2.00</td>
<td>40.0</td>
<td>0.05</td>
<td>100-10000</td>
<td>5 nV/50A</td>
<td>0.0000001%</td>
<td>&lt; 10</td>
<td>1:100000</td>
<td>Air</td>
</tr>
</tbody>
</table>

Three numerals x 100 after MHCLS indicates voltage of power supply and last three digit indicates current. All dimensions are in inches.
Constant voltage/ current power source specification:

Operating voltage: 220 volts, 1phase, 40-60 Hz
Output current/voltage: as in data sheet(linear/pulse)
Voltage/current control accuracy: 99.9999% of set point or better for CC/CV
Ripple: 0.000001% of set point for voltage/0.000001% for CC or optional/amended

Resolution: 1/5 nV & 1/5 nano amps or 1/5 nV & 1/5 pico-amp or optional and may be altered based on time behaviour of signal
Range (V/I): Voltage: 10^6 - 10^0 volt/10^4 - 10^+1 volt least count- 5.0 nano volt
Current: 10^-12 - 10^-7 amp/10^-2 - 10^+1 amp least count- 5.0 pico ampere or optional
Accuracy: 0.0000001% of set volts for (CV mode)/0.0000001% of set current (CC mode)
Interface Signal: 0.0-12.0 volts D.C. (proportional to Voltage/current control range)
Step down ratio: 0-1000000 or option
Temperature coefficient of variation: < 10^-12 ppm
Control options: 1. cascade feedback control with soft start
2. Constant voltage mode with external adjustment.
Display: 5½ & 6½ digit LED display
OTHER OPTION: DC/AC/PULSE (100-10000 PULSE/SEC)
Protection: over voltage/short ckt
Option: These power supplies may offer in pulse mode.
Interface: RS-232/U.S.B.

Constant voltage/current power source dimension:

MHCLS-006050 08X06X06  MHCLS-050150 14X12X12
MHCLS-012050 10X06X06  MHCLS-050200 16X14X14
MHCLS-012100 12X08X08  MHCLS-100025 18X16X16
MHCLS-025025 12X10X10  MHCLS-100050 20X18X18
MHCLS-025050 12X10X10  MHCLS-100100 20X18X18
MHCLS-025100 12X10X10  MHCLS-100150 20X18X18
MHCLS-025200 08X06X06  MHCLS-100200 14X12X12
MHCLS-050050 10X06X06  MHCLS-100400 16X14X14
MHCLS-200050 18X16X14  MHCLS-200100 18X16X16

Three numerals x 100 after MHCLS indicates voltage of power supply and last three digit indicates current. All dimensions are in inches.
ULTRA-PRECISION BALANCE MACHINE INBUILT CONTROLLED CHAMBERS

Semi-active suspension/pulse electromagnetic technology
MCPM BASED

Introduction: MCPM range of Pulse base ultra-precision balance machine is available in 10 different regular models apart from tailor made solutions to offer fine resolution measurement upto 100 nano- gram all industrial and research applications requirement like electrical, thermal, mechanical, and environmental specifications. These machines are used in metallurgy, heavy electrical engineering industries, defense, process control, sugar, milk, chemical, fuel, petrochemical industrial electronics, railway, bio-chemical, medicine, Polymer composites and avionics and many research and development activities.

Operating Principle: These ultraprecision weighing scales are working on Fleming principle of electromagnetic force, where a current (I) carrying conductor of length (L) experience force (F) when placed in a magnetic field (B). This force is balanced by incremental weight under measurement using sensitive feedback controlled D.S.P. system and is converted into equivalent display. These measurement systems are immune to any climatical, mechanical, tribological, rheological, chemical constraints and displays very consistently with high level of accuracy.

Company provides dedicated solution meeting specific requirement.

General electrical/mechanical specifications:
Operating voltage: 12 volts D.C. /220 Volts A.C./option
Max Weighing range: 2.0 m.g./200 m.g./200 gms/5.0 gms/10.0 gms/20.0 gms/50.0 gms/100.0 gms/100.0 gms
Max weight: as above
Eccentric load deviation: 25 times the least count
Linearity:0.1/0.2/0.3% of F.S.
Null voltage:0.5/1.0/1.5% of F.S.V.
Position offset/Gain: programmable
Operating Temperature range: 60/100/200 Degree cel
Temperature coefficients of measurement: 10x10+ppm/degree cel
Power consumption: 5.0 V.A [max]
Accuracy: 0.5/1.0/2.0 % reading
Repeatability: deviation of +/ -1.3 average count over 30 minute for 25 degree variation temperature over amb
Resolution: 1.0 nano/micro gram or as in data sheet
Accuracy: restricted to least count
Standard deviation: 2nd
Differential Standard deviation: SQRT (8 x [10-14] g R_nt)
Step down range: 1:10.00.00
Stabilization time: 3-10 sec
Temperature range/Rh: 0-70 degree cel/0-80%
Range: four range (programmable)
Control: control against three different set point
Interface: RS-232/0-5 volt D.C/ proportional to weight
Pan size/weight: Size: 213 x 342 x 90 mm/8.4 x 13.5 x 3.54 inch (pan size: 190 x 204 mm / 7.4 x 8.0 in)
NOTES: The Four numeral after product code indicates the displacement in m.m., and last digit corresponds AC/DC excitation [1-A.C., 2-D.C., 3-PULSE]

MOTORON SEMICONDUCTORS CORPORATION
11, Shri Nagar Colony, Shakti Nagar Extension, Delhi-110052 .Tel: 011-23654818/23991188
motoronenergy@hotmail.com
**Introduction:**
MHCT/MHTT/MHPT series of D.C. precision heater/coolers (tubular/planar) are available in many sizes and shapes virtually offering solutions to biotechnology, electrical measurement/protection, telecom, power systems, general industrial electronic utilities, process industries, public transportation, public/industrial load carriage, non conventional energy management applications, nuclear and defense, polymers and many other research & applications. Company also offers signal conditioners compatible with precision heater/coolers (tubular/planar).

**Feature:**

- **Material:** Eureka/in e home/tungsten (heater)/thermoelectric (coolers)
- Compact with high tolerance
- Low TCR with large peak current carrying capacity
- Large pulse current/weight ratio, large surface temperature < +/- 400 degree cel

**Electrical specifications of Thick Film PLANAR Heater**

<table>
<thead>
<tr>
<th>Model</th>
<th>Surface °C</th>
<th>Voltage AC/DC</th>
<th>Power watts</th>
<th>Size m.m [L/B/H/D/H]</th>
<th>Model</th>
<th>Surface °C</th>
<th>Voltage AC/DC</th>
<th>Power watts</th>
<th>Size m.m [L/B/H/D/H]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTFH-0001</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>1.0</td>
<td>Tailor specs</td>
<td>MTFH-0200</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>200</td>
<td>Tailor specs</td>
</tr>
<tr>
<td>MTFH-0005</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>5.0</td>
<td>Tailor specs</td>
<td>MTFH-0400</td>
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<td>400</td>
<td>Tailor specs</td>
</tr>
<tr>
<td>MTFH-0020</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>20.0</td>
<td>Tailor specs</td>
<td>MTFH-0800</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>800</td>
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</tr>
<tr>
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<td>100-400</td>
<td>12/24/110/220</td>
<td>50.0</td>
<td>Tailor specs</td>
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<td>12/24/110/220</td>
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<td>Tailor specs</td>
</tr>
<tr>
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<td>100-400</td>
<td>12/24/110/220</td>
<td>100.0</td>
<td>Tailor specs</td>
<td>MTFH-2000</td>
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<td>12/24/110/220</td>
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<td>MTFH-0150</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>150.0</td>
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<td>MTFH-5000</td>
<td>100-400</td>
<td>12/24/110/220</td>
<td>5000</td>
<td>Tailor specs</td>
</tr>
</tbody>
</table>

Three numerals x 100 after MHCT indicate current of precision heater/coolers (tubular/planar). Company offers battery/main operated precision heater/coolers (tubular/planar) motor controllers.