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MS series

Surface Mounted Analog Panel Meters

The Jewell surface mounted MS series analog panel meter is designed with a contemporary concave cover to reduce glare and improve readability. Rugged and durable, this aesthetically pleasing rectangular shape interfaces with today's high technology applications.

Mechanisms/Sizes

T taut band

- Compact self-shielded taut band movement using simplified, frictionless suspension system supporting moving assembly. For applications that do not have severe shock and vibration.
- 1½" (MS1T), 2½" (MS2T), and 3½" (MS3T).

TB taut band

- High performance taut band movement having unique suspension system for shock resistance. Offers variety of ballistics with superior torque and damping capabilities.
- 2½" (MS2TB) and 3½" (MS3TB).

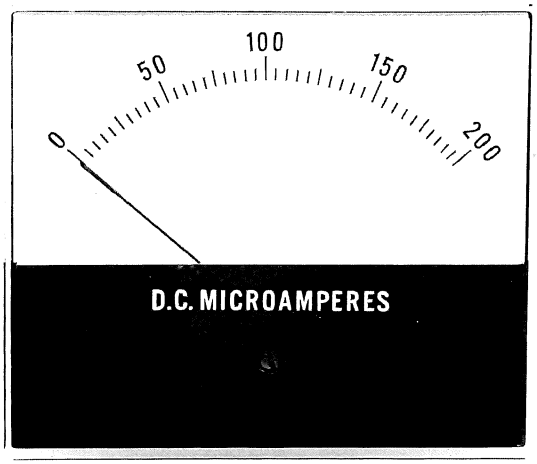
CM core-mag

- Compact, self-shielded D'Arsonval pivot and jewel movement providing excellent damping, repeatability and resistance to shock and vibration.
- 1½" (MS1CM), 2½" (MS2CM), and 3½" (MS3CM).

Pivot & Jewel

- D'Arsonval mechanism offering excellent sensitivity, repeatability and resistance to shock and vibration. Offers variety of ballistics with superior torque and damping capabilities.
- 2½" (MS2) and 3½" (MS3).

Jewell



Specifications

- **Performance** Meets requirements of American National Standard Institute ANSI C39.1.
- **Accuracy** All DC meters ±2% and all AC rectified-type meters ±3% of full scale at 23 degrees celsius.
- **Case** Precision molded, black thermoplastic, one-piece barrel and flange. Lexan material available on special orders.
- **Cover** Optically clear, molded Plexiglass concave cover snaps onto case. Glossy black color and hot-stamped current name is standard. Special colors, hot-stamping, and Lexan material available on special orders.
- **Zero Set** Zero left is standard. Zero center, zero right, and offset zero available upon request.
- **Zero Adjuster** External adjuster on cover is standard on all models with minimum ±3% adjustment range.
- **Dial** White metal dial with sharp division marks, black printed numerals and radial arc. Special dials including mirrored and multicolor available upon request.
- **Pointer** Black lance pointer is standard. Knife edge or tubular pointers and red or white colors available upon request.
- **Deflection** T taut band standard is 100 degrees.
  TB taut band standard is 100 degrees.
  CM core-mag standard is 90 degrees.
  Pivot & Jewell standard is 100 degree for 100 microamp range and above and 90 degrees for below.
- **Terminals** Threaded stud-type terminals is standard. Solder lugs available upon request.
- **Mounting** The 1½" meters are mounted by single mounting ring which screws into case barrel. The 2½" and 3½" meters are available in three-stud and four-stud mountings to ANSI C39.1 drilling plan.
- **Warranty** One year limited warranty.

Specifications subject to change without notice.

MS Series

Ranges and Resistances

Standard Ranges	Standard Resistances MS1T MS2T MS3T	MS2TB MS3TB	MS1CM MS2CM MS3CM	MS2 MS3
MICROAMPERES DC				
0-10	NA	3400	NA	NA
0-20	NA	1710	NA	2200
0-50	2560	1660	NA	1650
0-100	730	450	900	1325
0-200	225	197	500	460
0-500	272	41	200	280
50-0-50	730	450	900	1325
100-0-100	225	197	500	460
500-0-500	77	18	45	45
MILLIAMPERES DC				
0-1	77	18	45	45
0-5	7.9	CF	5	6
0-10	5.9	CF	CF	6
0-25	2	CF	CF	2
0-50	1	CF	CF	1
0-100	0.5	CF	CF	0.5
0-200	0.25	CF	CF	0.25
0-500	0.1	CF	CF	0.1
AMPERES DC				
0-1	0.05	0.05	CF	0.05
0-5	0.01*	CF	CF	0.01
0-10	0.005*	CF	CF	0.005
0-25	0.002*	CF	CF	0.002
0-50	0.001*	CF	CF	0.001

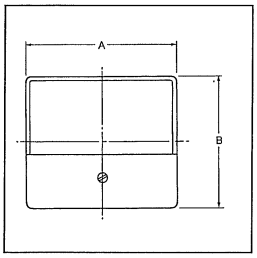
Standard Ranges	Standard Resistances MS1T MS2T MS3T	MS2TB MS3TB	MS1CM MS2CM MS3CM	MS2 MS3
MILLIVOLTS DC				
0-5	NA	20	CF	NA
0-10	NA	40	CF	NA
0-50	50	50	50	10
VOLTS DC (ohms/volt)				
0-1	1000	1000	1000	1000
0-5	1000	1000	1000	1000
0-10	1000	1000	1000	1000
0-15	1000	1000	1000	1000
0-25	1000	1000	1000	1000
0-30	1000	1000	1000	1000
0-50	1000	1000	1000	1000
0-100	1000	1000	1000	1000
0-150	1000	1000	1000	1000
0-200	1000	1000	1000	1000
0-500	1000	1000	1000	1000
VOLTS AC rectified (ohms/volt)				
0-150	1000	1000	1000	1000
0-300	1000**	1000	1000**	1000

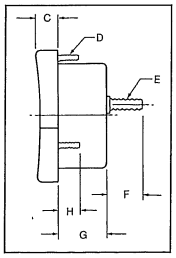
NA – not available CF – consult factory
Standard resistance for all ammeters in ohms ±10% and for all voltmeters in ohms ±5%.
Consult factory for special ranges and resistance.
* Meters 1 1/2" supplied as 50MVDC for use with external shunt (not supplied).
** Not furnished for 1 1/2" meters.

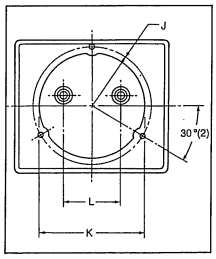
Dimensions

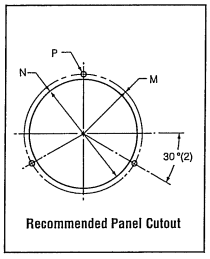
Standard three-stud mounting for 2½" and 3½" meters

MODELS	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MS2	3.15 in	2.73 in	0.46 in	4-40 UNC-2A	10-32 UNF-2A	0.5 in	1.01 in	0.45 in	1.22 in	2.19 in	1 in	1.22 in	2.22 in	0.125 in
MS2TB	80.01 mm	69.34 mm	11.68 mm		on CL	12.70 mm	25.65 mm	11.43 mm	30.99 mm	55.63 mm	25.40 mm	30.99 mm	56.39 mm	3.18 mm
MS2T	3.15 in	2.73 in	0.46 in	4-40 UNC-2A	1/4-28 UNF-2A	0.75 in	1.01 in	0.45 in	1.22 in	2.19 in	1.2 in	1.22 in	2.22 in	0.125 in
MS2CM	80.01 mm	69.34 mm	11.68 mm		0.235 above CL	19.05 mm	25.65 mm	11.43 mm	30.99 mm	55.63 mm	30.48 mm	30.99 mm	56.39 mm	3.18 mm
MS3	4.12 in	3.52 in	0.49 in	6-32 UNC-2A	1/4-28 UNF-2A	0.75 in	1.01 in	0.45 in	1.58 in	2.7 in	1.38 in	1.58 in	2.82 in	0.15 in
	104.65 mm	89.41 mm	12.45 mm		0.43 above CL	19.05 mm	25.65 mm	11.43 mm	40.13 mm	68.58 mm	35.05 mm	40.13 mm	71.63 mm	3.81 mm
MS3TB	4.12 in	3.52 in	0.49 in	6-32 UNC-2A	10-32 UNF-2A	0.75 in	1.01 in	0.45 in	1.58 in	2.7 in	1.38 in	1.58 in	2.82 in	0.15 in
	104.65 mm	89.41 mm	12.45 mm		0.43 above CL	19.05 mm	25.65 mm	11.43 mm	40.13 mm	68.58 mm	35.05 mm	40.13 mm	71.63 mm	3.81 mm
MS3T	4.12 in	3.52 in	0.49 in	6-32 UNC-2A	1/4-28 UNF-2A	0.75 in	1.01 in	0.45 in	1.58 in	2.7 in	1.2 in	1.58 in	2.82 in	0.15 in
MS3CM	104.65 mm	89.41 mm	12.45 mm		on CL	19.05 mm	25.65 mm	11.43 mm	40.13 mm	68.58 mm	30.48 mm	40.13 mm	71.63 mm	3.81 mm



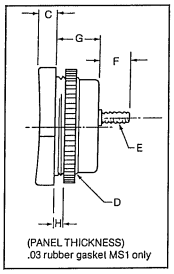






Recommended Panel Cutout

1½" meters



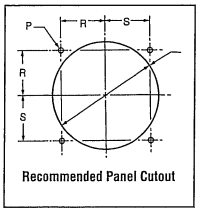
(PANEL THICKNESS)
.03 rubber gasket MS1 only

Single ring mounting for 1½" meter

MODELS	A	B	C	D	E	F	G	H	K	L	M	N
MS1T	1.75 in	1.75 in	0.40 in	1.5-18 UNF-2A	6-32 UNC-2A	0.23 in	1.01 in	0.22 in	1.70 in	0.75 in	1.55 in	1.55 in
MS1CM	44.45 mm	44.45 mm	10.16 mm		0.185 above CL	5.84 mm	25.65 mm	5.59 mm	43.18 mm	19.05 mm	39.37 mm	39.37 mm

Alternate four-stud mounting for 2½" and 3½" meters

MODELS	P	Q	R	S
MS24	0.125 in	2.22 in	0.94 in	0.94 in
MS24TB	3.175 mm	56.39 mm	23.88 mm	23.88 mm
MS24T	0.125 in	2.22 in	0.94 in	0.94 in
MS24CM	3.175 mm	56.39 mm	23.88 mm	23.88 mm
MS34	0.150 in	2.82 in	1.125 in	1.125 in
MS34TB	3.81 mm	71.63 mm	28.575 mm	28.575 mm
MS34T	0.150 in	2.82 in	1.125 in	1.125 in
MS34CM	3.81 mm	71.63 mm	28.575 mm	28.575 mm



Recommended Panel Cutout

Scale and Pointer

METER	scale	pointer
MS1 series	1.29 in	0.741 in
	32.77 mm	18.82 mm
MS2 series	2.37 in	1.36 in
	60.20 mm	34.54 mm
MS3 series	3.33 in	1.91 in
	84.58 mm	48.51 mm

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