

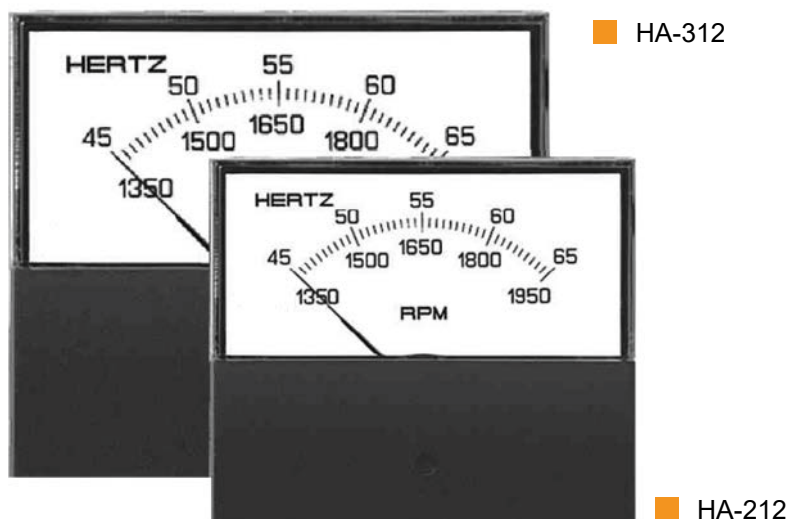


HA Series Meter

Analog Panel Meters

Technical Data Sheet

HA-212 and HA-312 Series



The HA Series range of analog panel meters offers accurate measurement and indication of most electrical and electronic parameters in industry standard sizes. This innovative design features a detachable lower fascia plate which allows the flexibility of either surface or window mounting. The fascia is simply unclipped to achieve the completely flush panel appearance of panel window mounting.

Special Features

- Measuring and indication of AC amps, volts, frequency and DC volts and amps signals.
- Surface or window mounting, 2 sizes available.
- High torque pivot and jewel movement.
- True RMS measurement meters.
- AC and DC inputs.
- Up to 40A DC direct connected.
- Up to 50A AC direct connected.



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Application

The HA range of analog panel meters offers accurate measurement and indication of most electrical and electronic parameters in industry standard sizes. This innovative design features a detachable lower fascia plate which allows the flexibility of either surface or window mounting. The fascia is simply unclipped to achieve the completely flush panel appearance of panel window mounting.

The HA Series in 2 1/2" and 3 1/2" meters offers AC and DC ammeters, voltmeters and frequency meters utilizing a high torque scale value and features a rear zero adjuster screw for tamperproof installation. AC moving iron meters provided high accuracy true RMS measurement of 1.5%.

Applications

- Marine
- Switchgear
- Distribution systems
- Control panels
- Embedded generation
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor monitoring

Benefits

- AC moving iron and moving coil mechanisms.
- Reduced inventory.
- ANSI standard case sizes.
- Detachable lower fascia plate.

Compliant With

- ANSI C39.1
- IEC 51
- UL 3111-1

Applicable Standards

Nominal case and cutout dimensions for indicating electrical instruments.	DIN 43700
Scale and pointer for electrical measuring instruments.	DIN 43802
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads	DIN 46200/46282

Clamp straps for connections.	DIN 46282
Safety requirements and protective measures for Electrical indicating instruments and their accessories.	DIN 40050 / 8-70 VDE 0110 / 11-72 VDE 0410 / 10-76 IEC 529, IEC 1010
Performance specifications for direct acting indicating analogue electrical measuring instruments & their accessories	IEC 51/DIN EN 60051 DIN 43701
Environmental conditions	VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions.	DIN 43718
UL Compatibility Class	UL 94 V-0
Technical conditions of delivery for electrical instruments.	DIN 43701
Mechanical strength (Free fall test, vibration test)	VDE 0411, part I, Sec.43/44, IEC 1010
E M C compliance as per following standards	E N 50081-2, EN 50082-2, N 55011/ CISPR 11, EN 60555-2, IEC 555-2 EN 61000-4-4/IEC 1000-4-4, EN 61000-4-2/IEC 1000-4-2, EN 61000-4-5/IEC 1000-4-5, ENV 50140.

Comply with following European directives:

2004 / 108 / EC (EMC directive) , 2006 / 95 / EC (low voltage directive) & amendment 93/68/EEC, For **CE** Marking.

Applications

Accuracy	
DC Ammeters and Voltmeters	1.5% 0 to 100% of full scale deflection
AC Ammeters and Voltmeters	Moving Iron: 1.5% 10 to 100% of full scale deflection
Frequency Meters	0.5% of end scale value



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Input Ratings	
DC Moving Coil Ammeters	50mA to 50A
DC Moving Coil Voltmeters	50 mV to 600V
AC Moving Coil Ammeters (VQ)	1mA to 10A
AC Moving Coil Voltmeters (VQ)	6V to 600V
AC Moving Iron Ammeters (EQ)	100mA to 60A
AC Moving Iron Voltmeters (EQ)	6V to 600V
Burden	20 to 500V AC. Standard 900ohms/volt
Frequency Meters	45-55-55Hz, 55-60-65Hz, 45-55-65Hz
Overload	continuous
Voltmeters	2 times for 0.5 sec : 9 overloads 2 times for 5 sec : 1 overload
Ammeters DC Center Zero Voltmeter	10 times for 0.5 sec:9 overloads 10 times for 5 sec : 1 overload

Enclosure

Movement	High torque pivot and jewel moving coil and moving iron
Scale Balance	Within 1% of scale length
Relative Humidity	25% to 80%nominal range of use
Operating Temperature	0° C to +40° C
Storage Temperature	20° C to +55° C
Enclosure Code	IP 42
Case and Cover	Matte black Case UL94V0 Polycarbonate Cover
Bezel	Matte Black
Window	Shatterproof polycarbonate
Fixing	Surface mounting: 4 corner studs 4-40 UNC Rear of panel mounting: 2 through hole mounts
Terminals	011-8-32 UNC 012-1/4"-28 UNC

Compliant With

Performance	ANSI C39.1 and IEC 51
Manufacture	UL3111-1
Scaling	ANSI C39.1
Safety	IEC61010-1 (LVD) and BS EN 61326:(EMC)
Vibration	ANSI C39.1 cl. 5.13

Operation

Moving Coil Meter

These meters offer a center cored, self shielding moving coil movement using pivots, hairsprings and sprung jewels. Variations in movement are limited by design. All DC voltmeters are 1000 ohms per volt, moving coil rectified products run at 900 ohms per volt. Millivolt meters are 5 milliamps/50mV resistance.

Moving Iron Meter

This clapper type repulsion design utilizes a pivot, hairspring and jewel movement. The bottom jewel is oil filled to provide damping while the top is sprung for resilience. All voltmeters are manufactured with internal voltage dropper resistors.

Frequency Meter

Frequency meters use a 1mA/350ohm movement driven by an EMC hard frequency conversion circuit.feature a highly repeatable flattened are scale shape, ensuring consistently accurate measurement reading. Dials are interchangeable between the challenger range of products using the same input within the published specification of the meter. Options for non standard customer specific dials are available upon request.

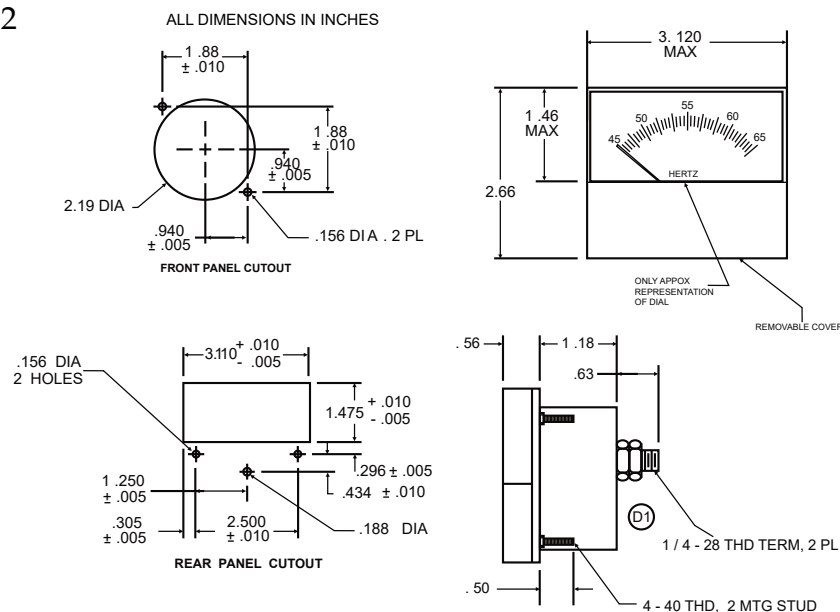


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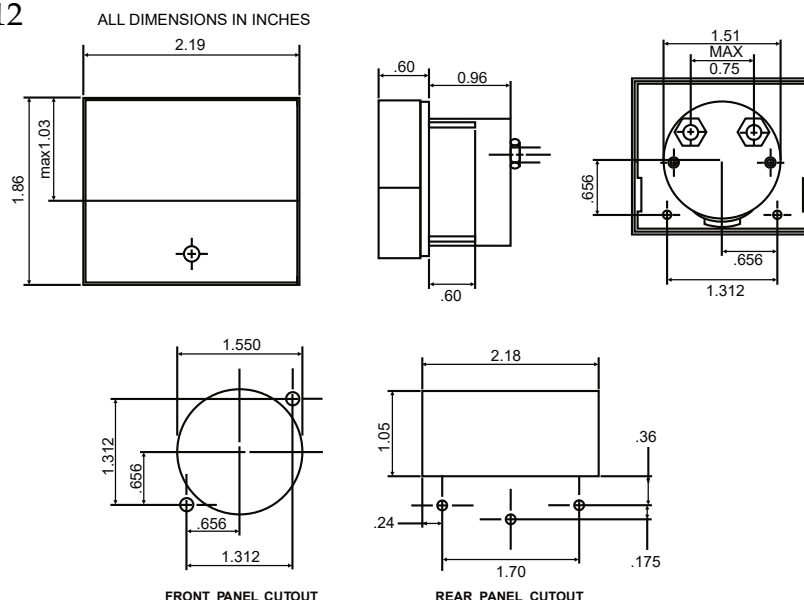
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Dimension Details

HA-312



HA-212





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Ordering Information- Only For Representative Products

HA-312 AC Meter

Part No.	Description	Class
HA-312-30VAC-30VAC	012, 30V AC	CL-1
HA-312-150VAC-150VAC	012, 150V AC	CL-1
HA-312-300VAC-300VAC	012, 300V AC	CL-1
HA-312-500VAC-500VAC	012, 500V AC	CL-1

Part No.	Description	Class
HA-312-5AAC-5AAC	012, 5A AC	CL-1
HA-312-10AAC-10AAC	012, 10A AC	CL-1
HA-312-15AAC-15AAC	012, 15A AC	CL-1
HA-312-25AAC-25AAC	012, 25A AC	CL-1

HA-312 DC Meter

Part No.	Description	Class
HA-312-10VDC-10VDC	012, 10V DC	CL-1
HA-312-15VDC-15VDC	012, 15V DC	CL-1
HA-312-30VDC-30VDC	012, 30V DC	CL-1
HA-312-50VDC-50VDC	012, 50V DC	CL-1

Part No.	Description	Class
HA-312-1MADC-1MADC	012, 1mA DC	CL-1
HA-312-5ADC-5ADC	012, 5A DC	CL-1
HA-312-10ADC-10ADC	012, 10A DC	CL-1

HA-312 Frequency Meter

Part No.	Description
HA-312-HZ-45-65-2	45-55-65 Hz, 240V
HA-312-HZ-45-65-1	45-55-65 Hz, 120V
HA-312-HZ-45-65-4	45-55-65 Hz, 480V

Part No.	Description
HA-312-HZ-55-65-2	55-60-65 Hz, 240V
HA-312-HZ-55-65-1	55-60-65 Hz, 120V
HA-312-HZ-55-65-4	55-60-65 Hz, 480V

HA-212 DC Meter

Part No.	Description	Class
HA-212-10VDC-10VDC	011, 10V DC	CL-1
HA-212-15VDC-15VDC	011, 15V DC	CL-1
HA-212-30VDC-30VDC	011, 30V DC	CL-1
HA-212-50VDC-50VDC	011, 50V DC	CL-1

Part No.	Description	Class
HA-212-1MADC-1MADC	011, 1mA DC	CL-1
HA-212-5ADC-5ADC	011, 5A DC	CL-1
HA-212-10ADC-10ADC	011, 10A DC	CL-1