APS Manual

SYSTEM DESCRIPTION

The AngleStar Protractor Systems are economical angle measurement devices. A system consists of a compact gravity-referenced clinometer connected to an associated liquid crystal, (LCD) readout.

The AngleStar clinometer is a precision measurement sensor that provides wide angular range with good linearity. Its small size and rugged construction make it adaptable to the most difficult installations. The readout contains a standard nine-volt battery, which provides power for the sensor and display system. Clinometer angular position is displayed digitally to within 0.1 or 0.01 of a degree. The readout may be remotely located up to 200 feet from the sensor, making the system ideal for a wide variety of applications.

Note: Clinometers and readout units are matched at factory calibration and final test to yield performance specifications noted. Mixing clinometers and readout units without recalibrating them will result in a sub-standard performance.

PREPARATION FOR USE

The AngleStar Protractor System can be powered by either an internal or an external power supply. A 9-volt battery is included to excite the system internally. To access the battery compartment, snap apart the readout housing at the groove around the edges by inserting and twisting a coin in the groove below the display window. After replacing the battery, reassemble the readout halves. The system may be externally powered via the external power plug on the side of the unit. The system will operate from 9-15 VDC. A power cord with a mating 2.5 x 5.5mm female jack can be sourced from a local electronics store.

CLINOMETER INSTALLATION

Prepare a clean, flat, vertically oriented mounting plane with two vertically aligned holes for No. 6 (.138 inch diameter) screws spaced at 2.275 inches. Attach clinometer to mounting plane snugly with two No. 6 screws and flat washers. Insert sensor cable plug into clinometer connector receptacle. Press the power switch on the display unit. This will apply system power and activate the readout. Rotate the clinometer about its upper mounting screw until 00.0 is displayed on the LCD. Secure clinometer-mounting screws and recheck for 00.0 display on the LCD.

READOUT UNIT MOUNTING

If it is desirable to mount the readout, select a flat surface at least 4.5 inches wide by 1.75 inches high. Any orientation is satisfactory. Snap apart the readout at the edge groove. Mount the readout back cover tightly to the chosen surface with four No. 6 screws through the small holes in the back cover ads. Reassemble unit halves.

CABLE ROUTING

Route and retain the clinometer cable so that it does not interfere with moving parts where the unit is mounted.

SYSTEM OPERATION

The clinometer is aligned to vertical, or gravity, reference. The readout will display a minus (-) sign for counterclockwise clinometer rotations from the reference position. No sign will be presented for clinometer rotations clockwise from the zero reference. Allow a few seconds after the clinometer comes to a rest at a new position for the readout to stabilize.

ALTERNATE ZERO REFERENCE

When it is desired to display clinometer angles directly from a reference position other than vertical, follow the procedure outlined below. Rotate the object on which the clinometer is mounted to the alternate reference position. Record the displayed angle. Port and install the supplied ZERO thumb wheel in the readout unit. Rotate the knob until the readout unit LCD displays 00.0.

Clinometer rotations from this new “ZERO”, or alternate reference position, may be read directly on the LCD. Minus (-) readings indicate counterclockwise clinometer rotations from the alternate reference. Readings with no signs indicate clockwise clinometer rotations. To return the readout display to the original “ZERO”, first rotate the object that your measuring until the display reads 00.0. Then install the Zero thumbwheel and rotate it until the LCD displays the previously recorded alternate reference angle.

1. For alternate reference measurements, the system linear range is offset by the alternate reference angle. As an example, using the APS +/- 45 degree with an alternate reference angle of 20 degrees clockwise from vertical, the system linear range from this angle is 25 degrees clockwise and 65 degrees counterclockwise.

2. The linearity a specification applies only to vertically aligned clinometers and vertically referenced readout units.

3. When the system is operated in the presence of electromagnetic radiation, such as radio transmitters or walkie -talkies, the angle data shown on the readout LCD may be in error. Accuracy will be regained when the radiation is stopped.

4. If the battery voltage drops below the level required for accurate system operation, the legend “LoBat” will appear in the upper left field of the readout unit LCD.

5. Change the battery as described in the ‘Preparation for Use’ section.

SYSTEM SPECIFICATIONS

STANDARD (P/N 02160001-000)

Linear Range:	± 45°
Threshold & Resolution:	0.1°

HIGH RESOLUTION (P/N 02160003-000)

Linear Range:	±19.99°
Threshold & Resolution:	.01°

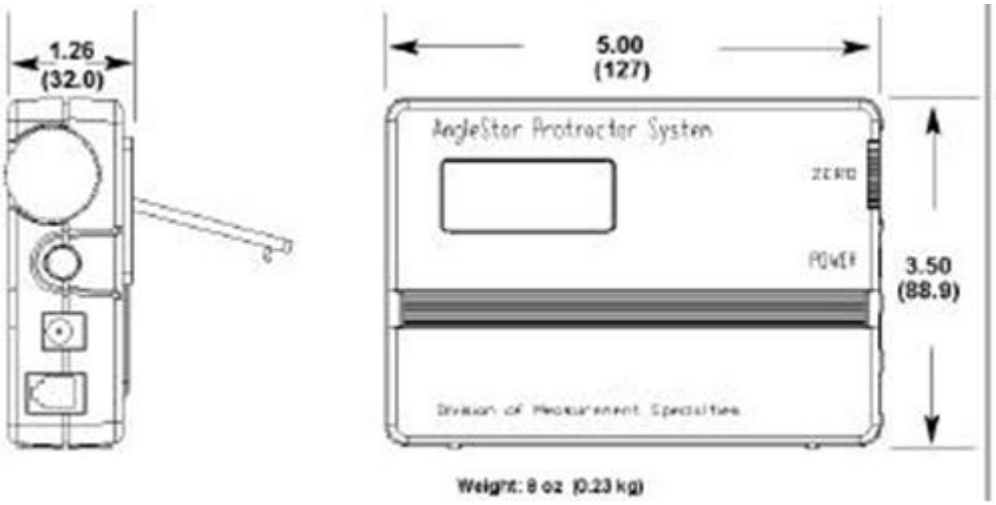
90 DEGREE (P/N 02160005-000)

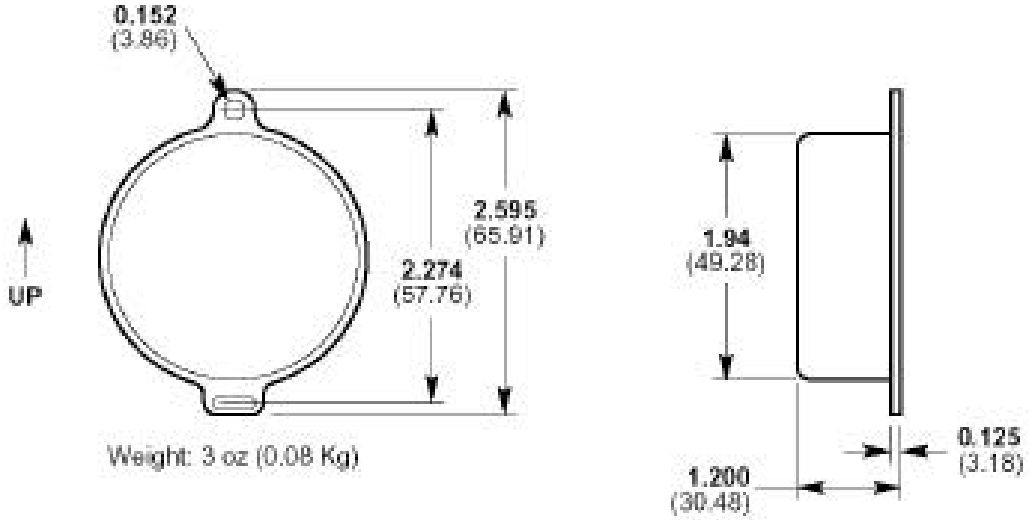
Linear Range:	0 – 90°
Threshold & Resolution:	0.1°

COMMON SPECIFICATIONS

Linearity	
Null to 10 deg:	±0.1°
10 to 45 deg:	±1% of reading
Null Repeatability:	±0.1°
Cross Axis Error:	1% of reading
Sensor Time Constant:	0.3 second
Sensor Frequency Response:	0.5 Hz
Voltage Supply:	9-Volt Battery
Battery Life (approx):	1000 hrs.
External Power:	9-15Vdc, 1mA
Temperature Range:	0 to 130°F (-18 to 55°C)
Interconnect Cable:	26 AWG, 4 conductor, PVC
Standard Length:	4 feet (1 meter)
Maximum Length:	200 feet (61 meters)

***NOTE:** Linearity Specification applies to Standard and High Resolution systems only





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