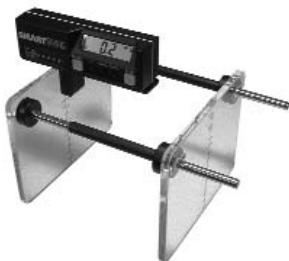


# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## DIGITAL BREAST BRIDGE



The Digital Breast Bridge aids in setting up tangential breast treatment fields. After the borders of the tangential fields are determined place the digital breast bridge to these skin marks. The digital readout will give the angles needed for the gantry. The field separation is determined by the scale on the rails.

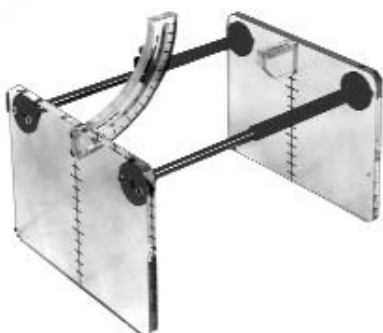
The acrylic plates are 20 cm wide x 15 cm high and have 1 cm inscribed markings.

Separations can be measured from 13 cm to 31 cm.

**Weight:** 3.2 lbs

Item #	Description
270-001	Digital Breast Bridge

## BREAST BRIDGE



The Breast Bridge aids in setting up portals for tangential breast treatment. After the area to be treated has been marked, the bridge is placed on the patient's chest and adjusted to the skin markings, thus, determining the separation of the fields. The angulation of the portals is determined from the ball protractor.

The acrylic plates are 20 cm wide x 15 cm high and have 1 cm inscribed markings.

Separations can be measured from 15 cm to 35 cm.

The ball protractor provides angulation readings from 15° to 80°.

Item #	Description
270-000	Breast Bridge

## BREAST BRIDGE COMPRESSOR



The Breast Bridge Compressor is used to compress the breast, particularly when it is desired to increase the dose to the residual mass at the end of a course of treatment. The aluminum mesh and frame are coated with a smooth blue vinyl plastic for minimum skin dose.

### Specifications

**Treatment Area Size:** 10 cm H x 15 cm W

**Compression Distance:** 1 cm to 13 cm

Item #	Description
272-100	Breast Bridge Compressor

## MAMMORX CALIPER



The MammoRx Caliper is a rugged and accurate caliper designed to provide measurements for breast simulation or as general purpose caliper. Separations can be measured between 7 cm and 45 cm

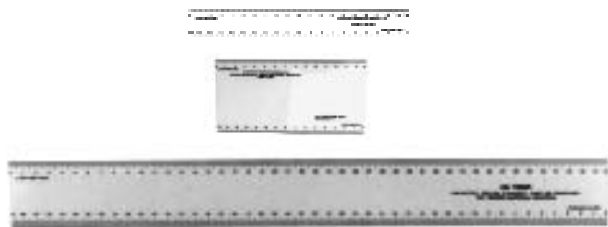
The measurement is locked in position by tightening a twist-lock knob attached to the slide. A bubble level assists in holding the caliper vertically during measurement.

The digital inclinometer measures the angle of a line drawn between the tips of the caliper jaw. The HOLD button freezes the measurement on the inclinometer display. The MammoRx Caliper has an accuracy measurement of  $\pm 0.1^\circ$ .

Item #	Description
705-800	MammoRx Caliper

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

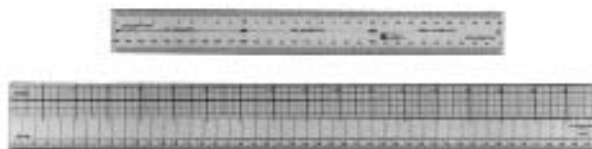
## WHITE RULERS



The white plastic rulers start at zero, and allow easy viewing of the light field edges. Rulers are checked for total accuracy of 1 mm.

Item #	Description	Quantity
720-000	2.9 cm W x 20 cm L Rulers	12
721-000	7.6 cm W x 15 cm L Rulers	12
722-000	5.1 cm W x 45 cm L Ruler	1
722-000-12	5.1 cm W x 45 cm L Rulers	12

## TRANSPARENT PLASTIC RULERS



Item #	Description	Quantity
723-001	30 cm Transparent Plastic Rule	1
723-001-12	30 cm Transparent Plastic Rules	12
723-002	45 cm/18" Transparent Plastic Graph Rule	1
723-002-12	45 cm/18" Transparent Plastic Graph Rules	12

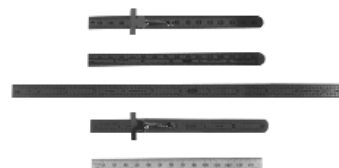
## ALUMINUM RULERS



The Aluminum Rulers are extremely accurate and have large, easy to read black numbers.

Item #	Description	Graduations
723-020	30 cm Aluminum Ruler - 35 mm Wide	1 mm - 1 cm
723-022	60 cm Aluminum Ruler - 35 mm Wide	1 mm - 1 cm
723-024	100 cm Aluminum Ruler - 35 mm Wide	1 mm - 1 cm
723-026	200 cm Aluminum Ruler - 35 mm Wide	1 mm - 1 cm

## STAINLESS STEEL FLEXIBLE RULERS



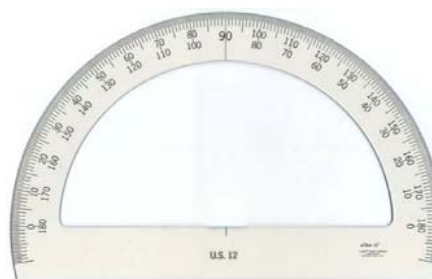
Item #	Description	Graduations
723-030	150 mm Ruler with Pocket Clip	1 mm - .5 mm
723-031	6"/15 cm Ruler w/o Pocket Clip	1/16" - 1 mm
723-032	12"/30 cm Ruler w/o Pocket Clip	1/32"-1/64" & 1 mm - .5 mm
723-033	6" Ruler with Pocket Clip	1/32" - 1/64"
723-034	150 mm Ruler with Plastic Case	1 mm - .5 mm

## METRIC TAPES Graduations in Millimeters



Item #	Description	Scale
723-040	Metric/Inch Measuring Tape	2 m
723-041	Metric Measuring Tape	3 m
723-042	Metric Measuring Tape	5 m
723-044	Wooden Metric/Inch Folding Rule	2 m/78"

## PROTRACTOR



This 12" semi-circular protractor has a beveled outer edge and it centers on the inner edge with 1/2° calibrations that are continued 10° below the base line.

Item #	Description
723-080	12" Protractor

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## TRIANGLES



Item #	Description	Degree
723-010	6" Plastic Triangle	30/60
723-013	12" Plastic Triangle	30/60
723-016	12" Plastic Triangle	45/45

## RADIOLOGIST'S POCKET CALIPER/ANGLE RULE

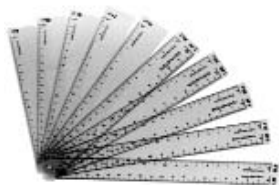


**Inches:** Up to 6.5"  
**cm:** 16 cm closed, 32 cm open  
**mm:** Up to 50 mm  
**Angle:** Measurements

Item #	Description
718-000	Radiologist's Pocket Caliper/Angle Rule

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## MAGNIFICATION RULES



The Magnification Rules includes 15 cm scales (1.0, 1.05, 1.10, 1.15, 1.20, 1.25, 1.30, 1.35, and 1.40) magnified in increments of hundredth from 1.0 to 1.75. One scale will correspond to the magnification of most films to allow direct measurements. All scales are printed on clear mylar and can be superimposed on the area of interest, enabling measurements to be taken directly on the film.

Item #	Description
719-000	Magnification Rules

## CT-MAG RULES

For CT and MRI Images



The CT-Mag Rules consist of 22 point scales (3.5-5, 5.5-6, 6.5-7, 7.5-8, 8.5-9, 9.5-10, 10.5-11, 11.5-12, 12.5-13, and 13.5-14), and can be expanded to 40 cm for use with CT and MRI images.

Item #	Description
719-002	CT-Mag Rules

## D-MAG RULES



The D-Mag Rules consist of 11 scales (0.50, 0.55, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95 and 1.00), graduated in de-magnification from 1 to 0.5 cm.

Item #	Description
719-003	D-Mag Rules

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## HEAD-NECK CALIPER



The Head-Neck Caliper is useful in measurements of either patient diameter or surface to tumor depth. The depth of a tumor or intraoral structure relative to either the lateral or anterior/posterior surfaces can be easily determined.

### Specifications

**Vertical Adjustment:** 23 cm

**Horizontal Adjustment:** 26 cm

Item #	Description
706-000	Head-Neck Caliper

## HEAD AND NECK PLASTIC CALIPER



The Head and Neck Plastic Caliper can be locked tight in any opening. Measurement is accomplished by using a separate scale to measure between the rounded tips.

Item #	Description
704-000	Head and Neck Plastic Caliper

## CURVED STAINLESS STEEL CALIPER

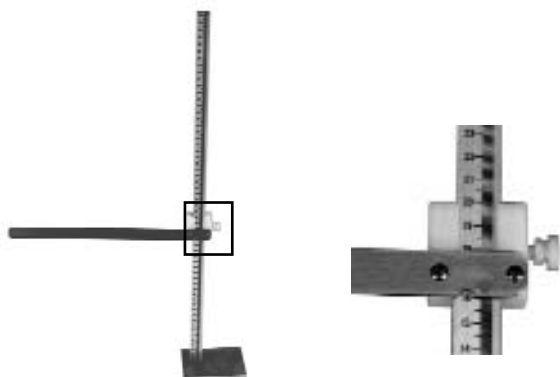
### With Scale



The 45 cm Curved Stainless Steel Caliper with Scale can be locked tight in any opening. Centimeter and inch scales are easy to read. The centimeter scale is checked for calibration from 0 to 40 cm. Scale accuracy is within  $\pm 0.4$  cm.

Item #	Description
704-450	Curved Stainless Steel Caliper

## TABLE TOP CALIPER



The 55 cm Table Top Caliper measures from the table top to the surface of patient.

Item #	Description	Scale
705-660	Table Top Caliper	55 cm

## MITUTOYO DIGITAL CALIPER



- Automatic Shut-off
- Stainless Steel Body
- Easy to read lines and numbers
- IN/MM display options

### Specifications:

**Resolution:** 0.0005" / 0.01mm

**Accuracy:**  $\pm 0.001$ " /  $\pm 0.02$ mm

Item #	Description
723-061	Mitutoyo Digital Caliper

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# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## UNDER/OVER TABLE BODY CALIPER



The 55 cm Under/Over Table Body Caliper measures 6 1/2" from the base plate to the curved blade. The blade is 15 1/2" long.

Item #	Description	Scale
705-700	Under/Over Table Body Caliper	55 cm

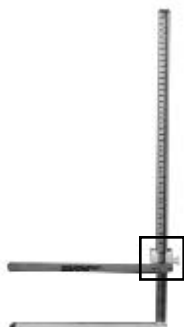
## CURVED BLADE BODY CALIPERS



This lightweight precision Curved Blade Body Caliper has one scale and a non-removable slider which prevents errors caused by reading the wrong scale on a dual scale caliper. The slider can be locked at any position. The rigid leg that slips under the patient is 1/8" thick and 11" long.

Item #	Description	Scale
705-546	Curved Blade Body Caliper	45 cm
705-551	Curved Blade Body Caliper	55 cm

## BODY CALIPER With Flat Blade



The lightweight Body Caliper with flat blade has one scale on a non-removable slider that prevents errors caused by reading the wrong scale on a dual scale caliper. The slider can be locked at any position. The rigid leg that slips under the patient is 1/8" thick and 11" long.

Item #	Description	Scale
705-545	Body Caliper	45 cm
705-550	Body Caliper	55 cm

## DIGITAL CALIPER



View of Digital Scale



This precision digital caliper has a scale on one side and a non-removable slider with a digital display. The caliper is 74.5 cm or 29.3" long. The scale reads to 600mm or 24 in.. The maximum reading of the digital display is 643.0mm / 25.31 in. The slider can be locked at any position. The flat blade base that goes under the patient is 1/8 in thick and 11 in long. Includes a replacement battery.

### Slider Functions:

ON / OFF, ABS / INC, ZERO, mm/in, SET, and HOLD.  
RS232 output for connection via cable to computer.

Cable and software are sold separately from the caliper.

Item #	Description
705-555	Digital Caliper with Curved Blade
705-556	Digital Caliper with Straight Blade
705-557	Digital Caliper with Level and Straight Blade
705-558	RS-232 Output Cable with Software for Digital Caliper

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## RETRACTABLE TAPE MEASURE TRAY



The 3 meter Retractable Tape Measure Tray is used to measure the distance between the source of radiation and the point of interest on a patient. It is very useful in extended field dosimetry, enabling one to obtain an accurate measurement of source to skin distance. It can also be used for setting source to phantom distances for calibration and experimentation.

This measuring device is mounted on a lexan (polycarbonate) tray which slides into the block tray slot. Attached to the center of the tray is a 3 meter tape measure. The tape measure has an adjustable stainless steel end. This can be positioned at any point along the tape, allowing the tape to be cut at the desired length to compensate for the source to tape measure distance.

Item #	Description
701-620	Retractable Tape Measure Tray for Siemens, Screw Coding
701-622	Retractable Tape Measure Tray for Siemens, Digital Coding
701-623	Retractable Tape Measure Tray for Siemens, Coding By-pass
701-631	Retractable Tape Measure Tray for Varian Clinac, No Coding
701-632	Retractable Tape Measure Tray for Varian II, No Coding
701-633	Retractable Tape Measure Tray for Varian III, Optical Coding
701-634	Retractable Tape Measure Tray for Varian III - Wedge Slot
701-635	Retractable Tape Measure Tray for GE Saturne, No Coding

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## INCLINOMETER



The dial of the 10 cm diameter Inclinometer swings 0 to 90 in either direction for fast accurate readings up to 1°. It is constructed of high impact plastic. The pointer and face are enclosed and protected with clear tough plastic. It can magnetically attach itself to the treatment machine or it can be used to set the angle of a film cassette.

Item #	Description
352-118	Inclinometer

## BULLS EYE CIRCULAR LEVEL



The all purpose Bulls Eye Circular Level will show level of any surface in all directions at once.

Item #	Description
352-104	Bulls Eye Circular Level

## PLUMB BOB NICKEL-PLATED WITH LINE



The Plumb Bob can be used to align gantries, couches, laser lights and more. Gantry vertical alignment can be accomplished by marking the cross hair projection spot on the ceiling and floor, then dropping the Plumb Bob line from the ceiling spot to the floor spot. The machine alignment is vertical when the Plumb Bob line intersects with the ceiling and floor spots.

Item #	Description
352-120	Plumb Bob, Nickel-Plated with Line

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## 6 CM LEVEL



The 6 cm Level has a level vial mounted in an anodized hard drawn 3/8" hexagonal aluminum tubing. The bottom surface is perfectly flat for accurate surface leveling.

CE

Item #	Description
352-108	6 cm Level

## POCKET LEVEL



The pen-size, 12 cm Pocket Level comes in a hexagonal aluminum case. The bottom surface is perfectly flat for accurate surface leveling. A large easy to read glass vial is mounted in an anodized hexagonal tube with a black plastic clip.

Item #	Description
352-112	12 cm Pocket Level with Clip

## MAGNETIC GANTRY LEVEL WITH LIGHT



The easy viewing Magnetic Gantry Level with light is 9" long with three lined vials (plumb, level and 45°). It is made of tough shock resistant material. The base utilizes a strong magnetic strip that secures to iron and steel surfaces. Requires 2 AAA batteries - not included.

CE

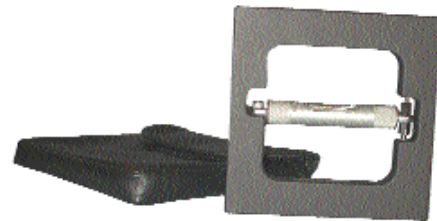
Item #	Description
352-234	Magnetic Gantry Level with /Light

## HIGH PRECISION FOUR-SIDED GANTRY LEVEL

### 1/40 Degree Accuracy

The four-sided High Precision Gantry Level (6" square x 3/4" thick) has a main vial that has graduated divisions of 0.005" per foot per division and is wrench adjustable. The level housing consists of a satin chrome brass tube with a friction fit closing cover to prevent breakage. The level frame is made of aluminum with a black anodized finish, accurately machined and finished on all four sides.

This level is used to check the gantry angle indicators at four locations: 0, 90, 180, and 270 degrees, with accuracy to 1/40 of a degree.



Item #	Description
352-200	High Precision Four-Sided Gantry Level
352-201	Vinyl Case for High Precision Gantry Level

## SMART TOOL

### Electronic Level with or without magnetic holder



352-237



352-238

The °, %, IN/FT button can be used even when the display is in HOLD. This feature is a convenient way to convert angles from one unit to another.

### Display

**Up/Down Arrows:** Left and right indicators point toward level or plumb, whichever is closer - indicators get shorter as Smart Tool gets closer to level (0°) or plumb (90°)

**Low Battery:** Low battery indicator - replace battery within 24 hrs

**Digital Display:** Display readout of current measurement ° %

**IN/FT Modes:** Indicates measurement "mode": degree (°), slope (%) and pitch (IN/FT)

**Power:** 9 V Battery

**Angle Accuracy:** to 1/10 of a degree

Item #	Description
352-237	Smart Tool Electronic Level
352-238	Smart Tool Electronic. Level with Magnetic Holder

### Control

**Hold:** Push to "freeze" and "unfreeze" display readings

**Listen and Level Audio:** Push to activate and deactivate the beeper - beeper will sound at level and plumb

**° % IN/FT:** Push to change the display unit: degree (°), slope (%) and pitch (IN/FT) display units

### Note

Pitch readings are in 1/8 in/ft increments. Plus and minus signs indicate when the pitch is slightly more (+) or slightly less (-) than the pitch shown on the display.

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# MEASURING DEVICES & BAROMETERS/THERMOMETERS



## ELECTRONIC SELF-LEVELING 5-BEAM LASER

### Laser Verification / Setup

- Flashing beam out-of-level sensor
- Fast laser installation
- Five beams at 90°
- Check lasers

This unit has 5 self-leveling, orthogonal (90 degree) beams that provide simultaneous plumb, level and square reference points.

**Electronic Self-Leveling:** Place the laser on any surface and it's electronic servo mechanism does the rest. The electronic self-leveling technology combined with out-of-level detection, eliminates tool status checks, costly errors and set-up time.

**Automatic Out of Level Sensing:** The laser has a built-in-level sensor which causes all five laser beams to immediately begin blinking if it is out of level. If the unit goes out of level for any reason, the user will know right away. Blinking stops when laser completes electronic self-leveling.

### Specifications

**Accuracy:** ± 1/4" over 100'  
**Self-Leveling:** Level range: ± 4° roll (side to side), ± 6° pitch (forward to backward)  
**Recalibration:** End user  
**Tripod Mount:** 5/8" x 11 thread (can be used without tripod)  
**Laser Diode:** Class II, 635nm, less than 1mW  
**Power Supply:** 4 "AA" batteries (not included)  
**Storage Temperature:** -20°C to 70°C  
**Range:** Laser visibility: Up to 100'  
**Low Battery Indicator:** Slow blinking of all 5 beams, 1 blink per every 10 seconds indicates 5 hours of use left  
**Size:** 5.5" x 4.0" x 2.5"  
**Weight:** Approx. 1.2 lbs.  
**Includes:** Unit, multipurpose attachment accessory, targets, laser enhancement glasses and storage case.

Item #	Description
710-850	Electronic Self-Leveling 5 Beam Laser

## DIGITAL CALIPERS



The main body is made of hardened steel and the reference scale is marked with easy to read lines and numerals in millimeter and inches. A thumb screw on top of the caliper locks the display unit in position anywhere along the scale. Flashing digits shows low battery. Uses 1.55 V button cell battery (p/n 357) - included.

**The caliper offers:** Outside, inside, depth measurement  
**Resolution:** 0.01 mm / 0.0005"  
**Accuracy:** ±0.02 mm / 0.001" (<100 mm): ±0.03 mm / 0.001" (>100-200 mm): ±0.04 mm / 0.0015" (>200-300 mm)

Item #	Description	Scale	CE
723-061	Digital Caliper	15 cm/6"	No
723-062	Digital Caliper	20 cm/8"	CE
723-063	Digital Caliper	30.5 cm/12"	CE

### The LCD Display mode functions include:

- "IN/MM" inches or millimeters measurement
- "H" for the HOLD function
- Power On/Off and Zero Setting

## DUAL SCALE VERNIER CALIPER



The Dual Scale Vernier Caliper is made of polished hardened steel with permanent black graduations and comparison scales. It has an automatic thumb lock, and can be used for inside, outside, and depth measurements. The upper bar scale is graduated in mm with vernier to 1/20 mm. The lower bar scale is graduated in inches with vernier to 0.001". Plastic case included.

Item #	Description	Scale
723-060	Dual Scale Vernier Caliper	15 cm/6"

## MICROMETERS



Item 723-050



### Specifications

**Item 723-050** **Item 723-051**  
**Scale:** 25 mm **Scale:** 1"  
**Graduations:** 0.01 mm, 0.5 mm, 1.0 mm **Graduations:** 0.001"

Item #	Description
723-050	Metric Economy Micrometer
723-051	Inch Economy Micrometer
723-052	Digital Micrometer

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## TRACEABLE JUMBO DIGIT STOPWATCH



Largest stopwatch digits ever developed (1/2" high) provides ease in reading. Times to 24 hours. Unit features single-action, time-out, cumulative-split, and continuous timing. Timing resolutions is 1/100 of a second for the first 30 minutes, continues timing to 23 hours, 59 minutes, 59 seconds with a 1-second resolution.

Accuracy is 0.001%. To assure accuracy an individually serial-numbered Traceable Certificate is provided from our ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology). Water-resistant, O-ring sealed, and shock resistant ABS plastic case has non-slip rubber sides. Supplied with a detachable clip for clipping onto notebooks or clipboards. Also comes with Velcro™ for vertical mounting anywhere.

As a chronograph, the unit displays time of day in hours, minutes, seconds, AM/PM, date, and day of the week. It also has a time-of-day alarm. Stopwatch is 3" x 2 1/2" x 7/8" and weighs 2 1/2 ounces. Supplied with Traceable Certificate, 2-year, "always-on" battery, lanyard, and clip.

Item #	Description
469-510	Traceable Jumbo-Digit Stopwatch

## MERCURY-FREE ECO-CELLI BAROMETER / THERMOMETER



The Eco-celli is a new concept in liquid barometers with the precision of a mercury barometer without the mercury hazard. The Eco-celli looks similar to a traditional mercury barometer but the basic principle is completely different, based on the compressibility of gasses instead of the weight of liquid mercury.

The Eco-celli barometer reads altitude adjusted barometric pressure. It does not read absolute or true pressure for altitudes above sea level. If your facility requires altitude adjusted barometric pressure at any altitude or is at or near sea level, then the Eco-celli is the perfect replacement for the mercury barometers you currently use.

The Eco-celli barometer consists of a 64-inch long U-shaped tube filled with a red fluid and gas. The pressure of this red fluid on the gas is principle upon which the barometer operates (Boyles Law). Adjacent to the barometer tube is a 32-inch long blue methyl-alcohol thermometer. A unique scale that slides between the thermometer and barometer compensates for thermal expansion of the fluid and glass tubing due to changes in room temperature and allows for accurate measurement of air pressure. Finally, the barometer scale is four times larger than a mercury barometer, making it much easier to make readings of air pressure. The pressure scale

measures in both millimeters and inches. and is constructed of durable clear acrylic with very easy to read scales. The glass tubes are easily replaceable if broken.

A calibration kit is included to adjust the unit for an altitude above sea level. The frame and glass tubes are packaged separately in the same box and require simple assembly by the final purchaser.

The Eco-celli barometer costs 1/3 to 1/2 less than a comparable mercury barometer. Given the low cost and **non-mercury** operation, replacing mercury barometers now is a sensible option.

The precision thermometer is filled with blue colored methyl alcohol. An increase or decrease in temperature can cause the fluid in the barometer to expand and affect the pressure reading. This is corrected by setting the movable scale, which is attached to both the barometer and thermometer, to the top of the blue fluid in the thermometer and then taking your reading from the red barometer tube. The temperature scale measures in Degrees F and C.

### Specifications

**U-Shaped Tube:** 1.57" W, 32.28" L

**Thermometer Tube:** 32.28" L

**Thermometer Scale:** 32° - 122° F, 0° - 51° C

**Barometer Scale Readings:** 28.80 - 31.00 in, 732 - 782 mm

**Frame Size:** 5.75" W x 36.5" L

Item #	Description
469-002	Eco-celli Barometer

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## THERMOMETERS

### Spirit Filled



Thermometers are accurate to within N.I.S.T tolerances and are individually serialized.

Item #	Description	Length	Degrees	Accuracy	Graduations	Spirit	Immersion
470-206	Pocket Test Thermometer (A)	160 mm / 6.3"	-15°C to 105°C	± 1.5°C	1.0°C	Blue Spirit	Total
470-207	Pocket Test Thermometer (A)	165 mm / 6.5"	+30°F to 120°F	± 2.0°F	1.0°F	Spirit	Total
470-051	Room Thermometer (B)	305 mm / 12"	-35°C to 50°C	± 2.0°C	1.0°C	Blue Spirit	Total
470-121	Room Thermometer (B)	305 mm / 12"	-30°F to 120°F	± 2.0°F	1.0°F	Spirit	Total
470-131	Room Thermometer	400 mm / 15.8"	-1°C to 51°C	± 0.5°C	0.2°C	Blue Spirit	Total
470-132	Room Thermometer (B)	460 mm / 18"	-1°C to 51°C	± 0.5°C	0.1°C	Spirit	Total
470-260	Room Thermometer (B)	305 mm / 12"	-50°C to 50°C	± 2.0°C	1.0°C	Red Spirit	Total
470-266	Room Thermometer (B)	305 mm / 12"	-58°F to 120°F	± 5.0°F	1.0°F	Spirit	76 mm

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## TRACEABLE WORKHORSE THERMOMETER WITH TYPE-K PROBE



High accuracy meter.

Thermometer offers sharp readout in dim or bright light and covers a wide temperature range. Compatible with all Type-K probes.

### Includes:

- Type-K probe
- Bench stand
- 9V Battery with 150 to 200 hours continuous-use life span
- Carrying case

### Specifications:

- Front-panel adjustable offset allows setting of temperature, in-house calibration, or particular sensor for increased accuracy
- HOLD button freezes display to capture current reading
- Range: -58° to +2372°F/-50° to +1300°C
- Accuracy: ±1°C + 0.75% between 0° and 500°C; ±1°C +1% between 500° and 750°C; ±1°C + 2% between 750° and 1000°C; ±3°C + 4% between 1000° and 1200°C; ±2°C at -20°; ±3°C at -40°; ±4°C at -50°
- Resolution: 0.1° between -50° and +200°; (otherwise 1°)
- Dimensions: 2.75" x 5.5" x 1.25" (69 x 138 x 31mm)
- Weight: 6 oz. (0.2kg)
- Probe dimensions: 1/8" dia. x 5" overall length (0.32 x 12.7 cm)
- Cable Length: 40" (101.6 cm)

Certifications: Certificate of traceability to NIST\* standards. Calibrated by an ISO 17025 calibration laboratory accredited by A2LA\*.

Item #	Description
470-315	Traceable Workhorse Thermometer with Type-K Probe

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## DIGITAL THERMOMETER



### Item 470-320 Digital Thermometer includes

- General purpose probe
- Carry case
- Calibration certificate

### Specifications

#### Instrument

**Display:** Four-digit LED, plus decimal point

**Auto Shut-Off:** After 5 minutes of non-use (can be disabled)

**Switchable °F/°C**

**Temperature Range:** -40° to 302°F / -40° to 150°C

**Temperature Accuracy:** ±0.3°F/0.2°C or ±0.5% of Reading which ever is greater

**Resolution:** 0.1°F/°C

**Battery Type:** 9v (2) AAA

**Battery Life:** 1800 hrs

**Housing Material:** ABS plastic

**Dimensions:** 5" x 2" x 10" (12.75 x 5.1 x 25.5 cm)

**Weight:** 5oz (without probe)

**Warranty:** 5 year instrument warranty

**Certifications:** CE, Rohs, NIST, WEEE

#### Probe

**Temperature Accuracy:** ±.4°F

**Max Tip Temperature:** 300°F (149°C)

**Max Cable Temperature:** 200°F (93°C)

**Response Time:** 6 seconds in liquid

**Shaft Length:** 3.75" (9.525cm)

**Shaft Diameter:** 0.140" (.356cm)

**Cable Length:** 6' (1.8 m) uncoiled

**Cable Material:** Polyurethane

**Dimensions:** 7.1" x 1" x 0.7" (18.1 x 2.5 x 1.8 cm)

**Weight:** 1.764 oz (50 g)

**Warranty:** 1 year probe warranty

Item	Description
470-320	Digital Thermometer

For those applications where only one temperature is read at a time, the Digital Thermometer is an industry standard. It features Min/Max memory, hold, auto shut-off. It is housed in a rugged polyethylene storage case with a sealed membrane and has a backlight for dark environments. This hand-held thermometer is a battery powered unit with a detachable immersion probe. Temperature readings appear in Centigrade or Fahrenheit with ± 0.2 °C/0.3 °F or ± 0.5 % of reading, which ever is greater. The LED display eliminates problems that can result from the misreading of stem-type thermometers.

Detachable immersion probes are time savers for x-ray departments that have several film processors. The use of multiple probes, each remaining in a specific tank, also eliminates the possible cross-contamination of chemicals. You can quickly and easily display the lowest and highest temperatures measured by the probe since the unit was turned-on. Our digital thermometer also enables you to "freeze" the current temperature reading on the display. The thermometer display can be easily illuminated, making it perfect for use in the darkroom. You can also program the Digital Thermometer for auto or manual shut-off.

The Digital Thermometer is a shock resistant, solid-state unit that needs no adjustments to maintain accuracy. Calibration is traceable to the National Institute of Standards and Technology (NIST). The unit includes a high-impact plastic case with a recess for storing one probe, and is equipped with a power jack that will accept the optional AC power supply. The jack should be used when the unit will be in use for extended periods of time (in order to prevent battery failure).

## DIGITAL LOLLIPOP™ THERMOMETERS



- **Waterproof**
- **Shockproof**
- **Max/min Temperature Memory**

The new heads-up Lollipop™ Traceable® Waterproof/Shockproof Thermometer replaces hazardous mercury units. Stainless-steel probe is resistant to most laboratory chemicals. Reading updates every second.

### Records minimum/maximum reading

At the touch of a button, memory recalls highest and lowest temperature readings over any time period. Solid-state construction eliminates dangers inherent in breakable glass and toxic mercury thermometers.

### All-weather compatible

Operates without fail in any lab condition-outdoors too. Waterproof construction is ideal for wet labs, wash-down areas, and virtually all field applications. Engineered to be shockproof in drop tests up to 5 feet. Bright 1/4" (0.635 cm) high display is easy to view.

### Traceable to NIST for accuracy

To assure accuracy an individually serial-numbered Traceable® Certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology).

Supplied complete with stainless-steel probe, probe cover, and silver-oxide battery (runs continuously for one year).

### Specifications

**Range:** -58 to 572°F and -50 to 300°C

**Resolution:** 0.1° from -20 to 200°; 1° outside this range

**Stem Diameter:** 0.14"

**Stem Length:** 8"

**Overall Size:** length: 1 3/4" W x 10 1/4"L x 1/2" D

**Weight:** 7/8 oz (0.03 kg)

Item #	Description	Accuracy
470-350	Thermometer, Digital Lollipop, Waterproof	±1°C
470-351	Thermometer, Digital Ultra Lollipop, Waterproof	±0.4°C

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## TRACEABLE® HANDHELD DIGITAL BAROMETER



The Handheld Digital Barometer measures altitude, temperature, and barometric pressure. It also has a stopwatch/time-of-day clock and graphically displays the barometric pressure trend. A Traceable Certificate is provided to indicate instrument traceability to NIST (National Institute of Standards and Technology).

### Barometer

Measures barometric pressure from 15.90 to 31.01 in inches of mercury (inHg) with a resolution of 0.03 inHg and from 400 to 1070 millibars (mbar) with a resolution of 1 mbar. Accuracy is  $\pm 0.1477$  inHG ( $\pm 5$  mbar). Display may be switched to inHg or mbar.

Barometric pressure trend shows present readings and previous 2, 4, 6, 8, 10, and 12 hours in bar-chart format. Barometric pressure reading is updated every 15 minutes.

### Altimeter

The handheld digital unit measures altitude from -500 to 7000 meters and - 1640 to 22,965 feet, with a resolution of 1 meter from - 500 to 1000 meters and a resolution of 2 meters from 1001 to 7000 meters. Altitude is displayed in meters or feet. Reading is updated every 2 seconds. Features a minimum maximum memory for the altitudes reached during any time period, and the altitude trend shows present reading and previous 2, 4, 6, 8, 10, and 12 hours in bar-chart format.

### Thermometer

Thermometer displays from -4.0 to 158.0°F and -20.0 to 70.0°C with a resolution of 0.1°, accuracy is  $\pm 1^\circ\text{C}$ . Temperature display is updated every 10 seconds.

### Stopwatch and clock

Stopwatch times events from 1 second to 99 hours, 59 minutes, 59 seconds. Resolution is 1 second and accuracy is 0.01%. Clock displays the time of day to the minute, and shows the day and month. The clock also features a format of 12-/24 hour timing and an alarm.

Rugged shock-resistant case, compact size (4" x 2 1/2" x 3/4"), and lightweight (3.7 ounces) make this the perfect portable unit. Supplied complete with lanyard, batteries, and instructions.

Item #	Description
469-005	Traceable® Handheld Digital Barometer

## ANEROID PRECISION BAROMETER



- Anti-parallax ring
- Previous setting indicator hand
- Rack and pinion movement
- Extremely accurate  $\pm .76$ mm Hg ( $\pm .03$ " Hg or 1mb)

The Aneroid Precision Barometer comes in a 5" diameter chromed/brass case with an easy to read dial. It has an adjustable previous setting indicator hand and high precision due to the rack and pinion movement.

The dual range is 930 - 1090 hPa and 700 mm to 820 mm Hg. Instrument accuracy is  $\pm .76$  mm Hg. or  $\pm 0.03$ " Hg. This will indicate the actual pressure from 0 to 2000 feet. **MERCURY FREE.**

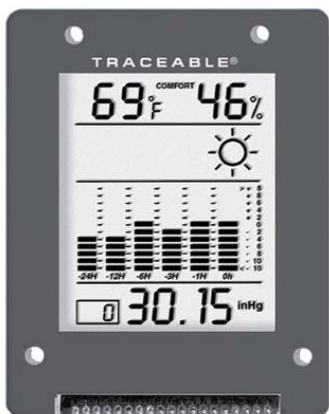
Aneroid barometers operate on the principle of a capsule which changes dimension as barometric pressure rises or falls. This capsule is sealed cell made of special alloys which minimize the effects of temperature. Such barometers are said to be "temperature compensated." The cell expands during periods of low pressure, and contracts with high pressure. A mechanical linkage between the cell and the dial pointer amplifies very small changes in cell dimension into pointer movement.

Calibration instructions are included, for in house calibration.

Item #	Description
469-021	Aneroid Precision Barometer 700mm to 820mm Hg

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## TRACEABLE® DIGITAL BAROMETER MODULE



Module displays barometric pressure from 795 to 1050 mbar, or from 23.45 to 31.01 inHg with a resolution of 0.03 inHg. Accuracy is  $\pm 1\%$  full scale. Barometric pressure trend shows in bar chart format the current and past 1-, 3-, 6-, 12- and 24-hour readings. Barometric readings for every hour of last 24 hours are stored continuously and are available for recall at the touch of a button.

Computer output allows module to be connected to a computer using the accessory Computer Data Acquisition System to capture readings of barometric pressure, temperature, and relative humidity. Switching permits setting in Fahrenheit/Celsius and mbar/inHg. Altitude compensation is -100 to 2500 meters. Supplied complete with instructions and AAA batteries.

### Specifications

**Barometric Pressure Range:** 23.45 - 31.01 inHg or 795 to 1050 mbars (selectable)

**Resolution:** 0.03 inHg (1 mbar)

**Accuracy:**  $\pm 1\%$  full scale

**Temperature Range:** 32 to 131°F or 0 to 55°C (selectable)

**Resolution:** 1°

**Accuracy:**  $\pm 1^\circ\text{C}$

**Relative Humidity Range:** 25% to 95%

**Resolution:** 1% RH

**Accuracy:**  $\pm 5\%$  RH midrange otherwise 10%

**Size:** 4" x 3" x 1" (10.16 x 7.62 x 2.54 cm)

**Weight:** 7 oz (0.2 kg)

Item	Description
469-018	Traceable® Digital Barometer Module

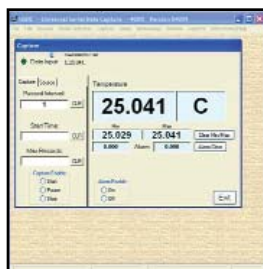
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- Data may be sent to a computer
- May be wall mounted
- 4-Line LCD

The Digital Barometer Module is the perfect unit when there is a need to monitor conditions, check environmental air parameters, and forecast weather. A four-line LCD display continuously and simultaneously shows barometric pressure, temperature, relative humidity, barometric pressure trend, weather forecast, and humidity comfort range.

To assure accuracy an individually serial-numbered Traceable® Certificate is provided from the ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST.

## COMPUTER DATA ACQUISITION SYSTEM



- Capture readings permanently
- Records in intervals from 1 to 10,000 seconds
- Displays min and max readings

Powerful and easy to use computer data capture program works with Traceable® Instruments with computer output. The software allows connecting up to eight instruments all running simultaneously on one computer. The software captures data in the background which enables the user to work on other programs. Records interval readings from 1 to 10,000 seconds; displays minimum/maximum readings; and utilizes an alarm mode

that permits the user to be notified visually, audibly, and by email when an alarm is triggered. Unlimited readings are saved to a file that can be viewed and printed as is, or may be printed in any report or spreadsheet format. Networking server/client capability allows the captured data to be monitored on a remote workstation. Readings may be streamed to cell phones or anywhere via email every minute or in any time interval. 24/7 notification of audible/visual alarms are sent to user's computer, remote computer, via email anywhere, and by email to cell phones. Program automatically installs in less than two minutes. Absolutely no user programming, no user keystrokes, no user entries are required. Simply connect the cable to the instrument and to a USB port (or serial port) and data is captured. Operation is straight forward plug and play. It is that easy. It is designed to work with Windows® 98/Me/NT/2000/XP/Vista/Windows 7. Includes a CD, a 6-foot cable (supplied USB, serial, and instrument connections) cable plugs into the instrument and computer. Multiple accessory extension cables expand cable length to 300 feet.

Item	Description
469-019	Computer Data Acquisition System for 469-018 Barometer with USB Cable

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## HAND-HELD BAROMETER-ALTIMETER



- Easy to use
- Rugged and sensitive
- Highly accurate
- Ideal portable pressure reference for weather station site certification and production process monitoring
- Displays station or sea level pressure
- Altitude in feet or meters
- NIST certificate included
- CE compliant

The Handheld Digital Barometer-Altimeter combines accurate pressure sensing with the power of microprocessor-based computations to provide instantaneous pressure and altitude readings. A combination of small size, digital display, versatility, and high accuracy make it ideal for field measurements or as a portable pressure reference.

Keypad controls provide access to the operating functions. Pressure or altitude may be displayed in a variety of units. The LCD display shows the data output and operating mode. Data logging mode stores up to 240 readings for future recall. The unit is powered by four AA alkaline batteries (included) which provide approximately 100 hours of continuous use.

The Barometer - Altimeter includes features for minimum and maximum (Min/Max) value capture, tare readings, and user selectable engineering units. A selectable altitude function allows users to enter site altitude above sea level in order to display local barometric pressure or barometric pressure corrected to sea level. User referenced altitude (referenced to map or trig markers) or altitude based on US Standard Atmosphere of 1962 can be selected for display. Using the altitude function with the Min/Max and Tare features makes the 230-M202 very useful for accurately measuring changes in altitude.

This instrument measures atmospheric pressure very accurately, to within 0.015" Hg. The 316 stainless steel pressure sensor has extremely low sensitivity to shock, vibration, acceleration, and changes in orientation or temperature, yet features high sensitivity to pressure variations. The device is temperature compensated over its operating temperature range. Each unit comes with a certificate of calibration traceable to NIST.

### Specifications

Units	Full Scale	Accuracy	Resolution
<b>Pressure</b>			
mm Hg	1000	± .015	.1
in Hg	39.37	± .01	.01
mb	1333	± .2	.1
kPa	133	± .02	.01
psi	19.33	± .01	.001
<b>Altitude</b>			
feet	36,000	± 9	1.0
meters	10,973	± 3	1.0

**Approvals:** CE compliant

**Display:** 5 significant digit LCD (0.25" high) 2 line x 16 alphanumeric characters

**NIST traceability:** NIST certificate supplied

**Power:** 4 AA alkaline batteries (included) with user enabled automatic shut-off

**Temperature:**

Storage: -40° to +140° F (-40° to +60° C)

Operating: 23° to +122° F (-5° to +50° C)

**Process connections:** 1.8" female NPT, 316SS

**Enclosure:** 14 ounce (6.5" x 3.6" x 2.25") ABS plastic case

**Media compatibility:** Isolated AI sensor for fluids compatible with 316SS

**Pressure limits:** 77 PSIA (4,000 mm Hg Abs)

**Tare:** Nulls applied pressure to allow measurement of vacuum, gauge pressure, or change in pressure or altitude from a reference point

**Min/Max capture:** Capture speed is equal to the selected damping rate

**Damping rates:** User selectable from 0.1 to 25 seconds

**Backlight:** Green, changes to Red for over pressure

**Engineering unit selection:** mm Hg, PSI, in Hg, mbar, bar, kPa, Torr, feet, meters

**Altitude:** Displayed in feet or meters. Can be set by user based on map or trig marker information or standard altitude uses U.S. Standard Atmosphere of 1962 data

**Contrast Adjustment:** Adjusts display for best viewing

**Accuracy:** (Full Scale = 38.674 PSIA or 2,000 mm Hg Abs)

± 0.015% F.S. from 0-1,000 mm HgA

± 0.025% F.S. 0-1,000 - 2,000 mm HgA

**Field recalibration:** Supported through firmware feature

**Weight/shipping:** 1.6 lb/3 lbs

Item #	Description
469-455	Handheld Barometer - Altimeter

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# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## 705 HANDHELD DIGITAL BAROMETER



- Employs the latest in pressure sensor technology
- Wide range: 0 to 1551 mmHg
- $\pm 0.1\%$  of F.S. accuracy
- 16 pressure units
- Impact resistant, sealed to Type 12/IP54
- Rugged, lightweight handheld design
- Leak test, tare, max/min and filter
- Ambient temperature measurement in  $^{\circ}\text{F}$  or  $^{\circ}\text{C}$

The 705 is a portable digital barometer possessing a combination of handheld calculator size, digital display, high accuracy and wide choice of units, making it ideal as a portable absolute pressure reference. It combines tough and rugged design with accurate and reliable pressure measurement. New materials and technical innovations from over fifteen years experience with portable pressure testers has resulted in this advanced new product. The 705 pressure indicator uses a micro-machined silicon transducer to produce a pressure reading in units of pressure measurement.

Compact, robust and lightweight with a rugged, ABS molded case, the 705 is designed for single handed operation and provides many essential features required for routine maintenance and system troubleshooting. The unit has an integral folding stand.

The 705 features a variety of pressure scales to enable the operator to display the atmospheric pressure in a variety of units, including inHg, mmHg, mb, as the most widely used units in radiation therapy. It also displays ambient temperature in  $^{\circ}\text{C}$  and  $^{\circ}\text{F}$  with one degree resolution.

The 705 operates on three AA alkaline batteries for 300 hours. The Auto-Off automatic timeout prolongs battery life, but the feature can be disabled by holding the LEAK button while pressing the ON-OFF button. The UNITS button sequentially selects up to 16 units of measurement. The LEAK button sequentially selects maximum reading, minimum reading and initiates a 60-second countdown for leak test. The TARE button sets a zero reading for use as reference.

Calibration Standards: Instruments are calibrated against precision pressure calibration equipment, which is traceable to the international standards.

## 740 HANDHELD PRECISION DIGITAL BAROMETER



- Accuracy: 0.02% FS or  $\pm 0.004$  inHg absolute
- 22 - 34 inHg absolute (558 - 863 mmHg)
- 6 Digit resolution LCD display
- Multiple pressure scales and aeronautical units
- Alkaline or rechargeable batteries
- Lightweight hand-held rugged design
- RS232 output
- Ambient temperature measurement in  $^{\circ}\text{F}$  or  $^{\circ}\text{C}$

The 740 is a portable battery powered precision barometer, providing outstanding capabilities in a handheld package. The fundamental sensor technology employed within this instrument is a resonant pressure transducer (RPT). This vibrating element sensor not only provides accuracies of  $\pm 0.004$  inHg ( $\pm 0.15$  mbar) but equally important has a calibration stability of better than 100 ppm per year. The 740 is widely used in laboratory and remote field applications for precision pressure reference.

The 740 precision pressure indicator uses a silicon resonant pressure transducer producing a pressure reading in units of pressure measurement and altitude. The instrument is contained in a moulded enclosure of a composite ABS material and can be used as a hand-held indicator or, using a retractable stand, as a bench instrument. The instrument can also communicate, through a serial RS232 connector, with a compatible computer system or printer.

The 740 barometer has an accuracy of  $\pm 0.02\%$  FS for all pressure ranges including combined non-linearity, hysteresis, repeatability, and temperature effects over an operating temperature range of  $15^{\circ}$  to  $120^{\circ}\text{F}$ .

The 740 barometer is calibrated against precision pressure calibration equipment, which is traceable to National Institute of Standards and Technology (NIST). The 740 barometer can confidently be used as a first-class barometric reference device, with the recommended recalibration period being one year.

# MEASURING DEVICES & BAROMETERS/THERMOMETERS

## BAROMETER COMPARISON

Specifications	Item 469-100 705 Handheld Digital Barometer	Item 469-110 740 Handheld Precision Digital Barometer
<b>Selectable Units</b>	inHg, mmHg, mHg, mbar, bar, Pa, hPa, KPa, MPa, psi, inH <sub>2</sub> O (4°C, 20°C and 60°F), ftH <sub>2</sub> O (4°C, 20°C and 60°F), mH <sub>2</sub> O, Kgf/cm <sup>2</sup> and an optional user defined scale	inHg, mmHg, mHg, mbar, bar, Pa, hPa, kPa, Mpa, psi, inH <sub>2</sub> O <sub>20</sub> , (20°C), inH <sub>2</sub> O <sub>04</sub> , (4°C), ftH <sub>2</sub> O <sub>20</sub> , (20°C), ftH <sub>2</sub> O <sub>04</sub> , (4°C), inH <sub>2</sub> O <sub>60</sub> , (60°F), kgf/cm <sup>2</sup> , kgf/m <sup>2</sup> , , cmHg, mmH <sub>2</sub> O, cmH <sub>2</sub> O, mH <sub>2</sub> O, torr, atm, lbf/ft <sup>2</sup> plus altitude in feet (ft) or meters (m)
<b>Operating Range</b>	0 to 1551 mmHg	22 - 34 inHg absolute(558 - 863 mmHg)
<b>Ambient Temperature</b>	°F and °C reading of local condition ±3°F (±1.5°C)	°F and °C reading of local condition
<b>Accuracy</b>	±0.1% (± 1.55 mmHg) FS non-linearity, hysteresis and repeatability.	±0.02% (±0.0068 inHg; ±0.173 mmHg) FS For all pressure ranges includes: Combined non-linearity, hysteresis, repeatability, and temperature effects over 15°F to 120°F (-10°C to 50°C). Optional Enhanced Accuracy: 0.004 inHg (±0.101 mmHg) Absolute.
<b>Display</b>	5-digit Clear high resolution LCD, 12.7 mm high, with additional unit legends.	6-digit LCD, 0.54 in (13.6 mm) high with additional 16 text characters.
<b>Over Range</b>	Safe to 2 x FS. Display flashes at 110% FS.	
<b>Resolution</b>	0 to 1551 mmHg, 0.1 mmHg 0 to 2068 mb, 0.1 mb 0 to 61 inHg, 0.001 inHg	0.0003 inHg (0.0076 mmHg)
<b>Temperature Range</b>	Operating: 15°F to 122°F (-10°C to 50°C) Storage: -5°F to 140°F ( -20°C to 60°C)	Operating: 15°F to 120°F (-10°C to 50°C) Storage: -40°F to 160°F ( -40°C to 71°C)
<b>Power</b>	Three 1.5 V alkaline AA batteries	Three 1.5 V alkaline AA batteries
<b>Battery Life</b>	300 hours of use, selectable Auto-Off powers down after 10 minutes of inactivity	20 hours nominal continuous operation. Programmable power down prolongs battery life.
<b>Battery Low Indicator</b>	Display symbol	Display symbol
<b>Readout</b>	Max/Min-captures both maximum and minimum readings	Maximum/Minimum, tare and programmable filter available in all operating modes.
<b>Operating Modes</b>		A) Local pressure (QFE) B) Sea level pressure (QFF) from user set height C) Altitude above user set datum
<b>Altitude Range</b>	Infinite	Infinite
<b>Communication Interface</b>		RS232 via six-way LEMO socket
<b>Pressure Connection</b>	6 mm O.D. and 4 mm I.D. hose, G1/8 or 1/8" NPT female thread	Accepts 1/4" OD / 5/32" ID tubing (6 mm OD / 4 mm ID)
<b>Reading Sensor</b>	Micro-machined silicon transducer	Resonant pressure transducer (RPT)
<b>Includes</b>	User guide, carrying case and calibration certificate	Handbook and calibration certificate
<b>Safety Conformance</b>	EN61010, EN50081-1, EN50082-2, CE marked	EN61010, EN50081-1, EN50082-2, CE marked
<b>Dimensions</b>	7.5" x 3.5" x 1.4" (19 x 8.9 x 3.5 cm )	7.5" x 3.5" x 1.4" (19 x 8.9 x 3.5 cm ) nominal
<b>Weight</b>	1.1 lb (0.5 kg)	1.1 lb (0.5 kg) nominal

Item #	Description
469-100	705 Handheld Digital Barometer
469-110	740 Handheld Precision Digital Barometer
469-112	Enhanced Barometric Accuracy Option (±0.004 inHg) for 469-110 Barometer
469-114	Battery Pack and Charger for 469-110 Barometer
469-116	Adapter Lead for RS-232 for 469-110 Barometer
469-118	Transit Case for 469-110