MILLTRONICS

PROCESS CONTROLS FOR INDUSTRY

SPECIFICATION SHEET 610

level measuring systems

*AccuRanger Controlling Grain Level on Conveyor

AccuRanger

The Milltronics AccuRanger determines the level of liquids and solids in bins, vats, hoppers or on conveyor belts without contacting the material.

By measuring the total time needed for an ultrasonic pulse to complete a round trip from the transducer face to the sensed material, highly accurate and reliable level indication can be obtained.

The AccuRangers' sophisticated circuitry, combined with Milltronics' patented ultrason™ transducer, guarantees the ultimate in short range level measurement, with resolution in the order of 20/1000" (.5 mm). Numerous installed systems are controlling critical process levels to better than ± 1 mm.

The AccuRanger can be installed and operating in as little as 30 minutes. Field adjustments are limited to zero and span. Recalibration is never required. The non-contacting principle guarantees zero maintenance — saving you time and money.

The built in temperature compensation circuitry associated with the AccuRanger assures precise level indication or control over an extended temperature range.

A true current output (4-20 mA) is provided for remote recording and/or control purposes.

Hi-Low alarm contacts are available as an option via our unique Satellite Alarm Module.

The AccuRanger is available in an industrially rugged Nema 12 (dust tight) enclosure complete with L.C.D. meter or in a Nema 4 (oil, water and dust tight) enclosure complete with L.C.D. meter.

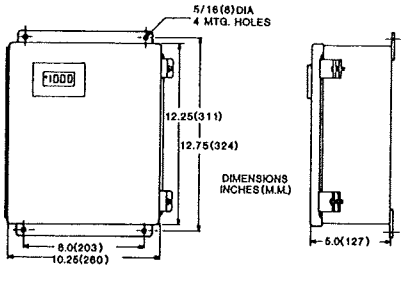
NOTE: The Nema 4 enclosure is required if the optional Satellite Alarm Module is used.

For short range level measurement or control — specify the Milltronics AccuRanger — the most accurate ultrasonic level measuring system available.

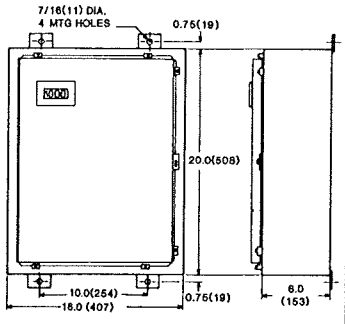
SPECIFICATIONS

Power Required:	115/230 VAC + 10% 50/60 Hz @ 6 V.A.
Maximum Range:	7 ft (2.1 m)
Minimum Range:	2.0 ft (0.6 m)
Minimum Span:	4" (10 cm)
Operating Temperatures:	Electronics -20°C to +60°C (-5°F to 140°F) Transducer -40°C to +93°C (-40°F to 200°F)
Outputs:	1. Meter — 0-100% 3-1/2 Digit L.C.D. standard 2. Current — 4-20 mA D.C. into 750 ohms max. 3. Optional Alarm Contacts 10 A-115 V non-inductive
Accuracy:	+0.25% level
Temperature Comp. Linearity:	+ 0.2% (-30°C to +50°C)
Range Error:	+0.01% per °C
Enclosure:	Nema 12 or Nema 4 Nema 4 enclosure required when satellite alarms utilized
Transducer:	Barium Titanate element in C.P.V.C. outer housing with polyurethane radiating face. Optional face materials and flange mountings available for corrosive environments.
Weight:	Transducer — 2 lbs. (0.9 kg) Electronics — 10 lbs. (4.5 kg)
Cable Required:	RG62U Coaxial
Separation:	Up to 600 ft (183 m)

ENCLOSURES

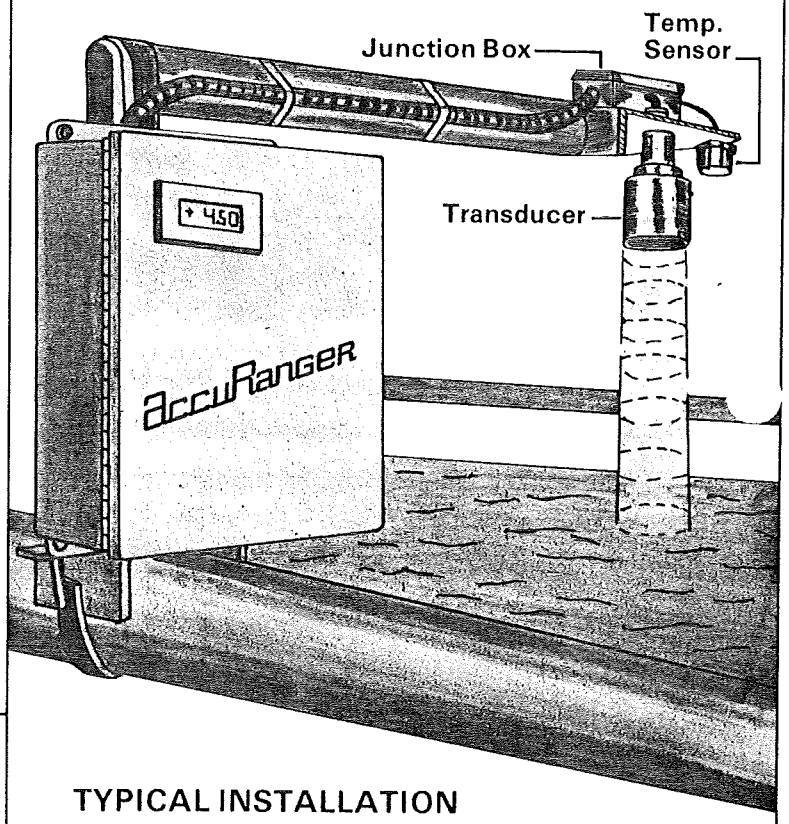


NEMA 12



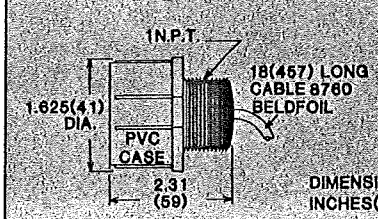
NEMA 4

— Used when additional alarms are specified

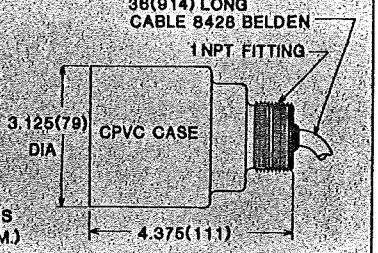


TYPICAL INSTALLATION

TEMPERATURE SENSOR



TRANSDUCER



CSA Certified Class I Groups A, B, C and D; Class II Groups F and G.
FM Approved Class 2 Div. 1 Groups E, F and G.

Milltronics

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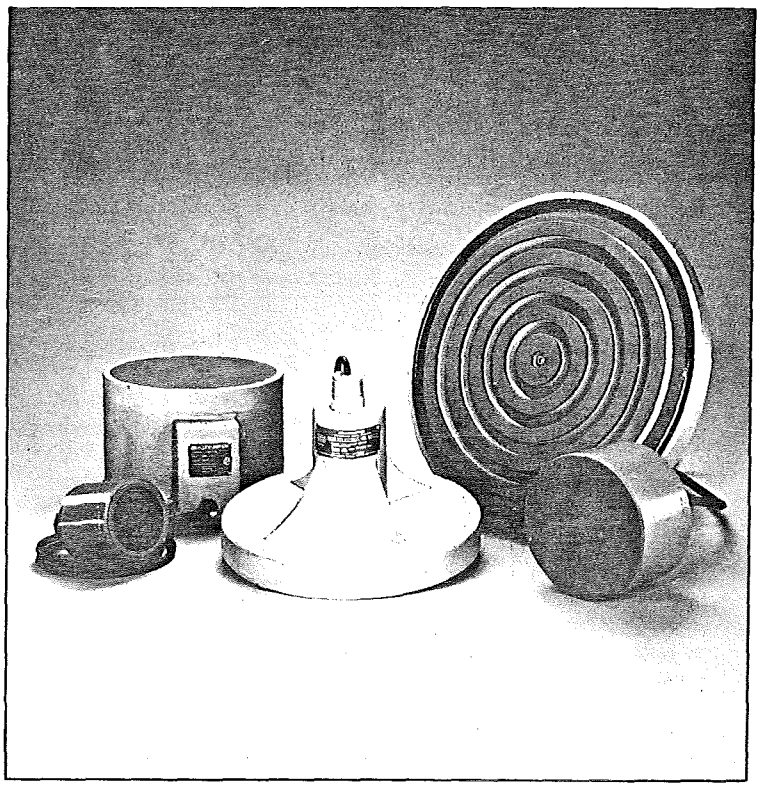
Ultrasonic Level Measuring Systems

Ultrasonic Transducers

- ☐ Innovative patented design
- ☐ Highest efficiency available
- ☐ Reliable from 2 to 200 feet (0.6 - 61 m)
- ☐ Non-contacting
- ☐ Self-cleaning
- ☐ Totally enclosed - no moving parts
- ☐ Maintenance-free
- ☐ Immune to dusty, steamy, turbulent environments
- ☐ Approved for hazardous locations



Purpose

Non-contacting ultrasonic transducers are the most efficient and reliable way to determine a level of material in depths from 4 inches to 200 feet (10 cm - 61 m). Because of their patented design, Milltronics' transducers operate effectively on solids, liquids, slurries and resins with absolute reliability. These cost-effective devices are the most powerful and efficient transducers available; and even in dusty, steamy, corrosive environments they are self-cleaning and maintenance-free. All Milltronics transducers are approved for use in hazardous areas. For especially hostile environments, they can be faced with protective material and flange mounted to assure continuous service.

How It Works

The non-contacting, solid state transducer fires a high frequency ultrasonic pulse in a narrow beam toward the material to be measured, and receives the reflected echo. The two way transit time is converted electronically to provide an analog output proportional to the distance between the transducer and the material being measured. The efficiency of the sonic pulse is a crucial factor in providing reliable measurement. The Ultrason ST series crystal array transducer maximizes its sonic pulse with an impedance matching design, which provides up to 54x more power than conventional transducers. These transducers provide outstanding reliability from a span of 4 inches to 100 feet (10 cm - 30.5 m). For power that will handle the 200 ft. (61 m) range, we have developed the most technologically advanced transducer yet, the flexural mode (FM). The FM series transducer has a unique construction which ensures a high ratio of return-to transmit signal - up to 400x more than conventional transducers. This unmatched operating efficiency enables the ST and FM series transducers to operate without troublesome reflector cones, or external pre-amplifiers. Consequently, they cost less and are easy to install.

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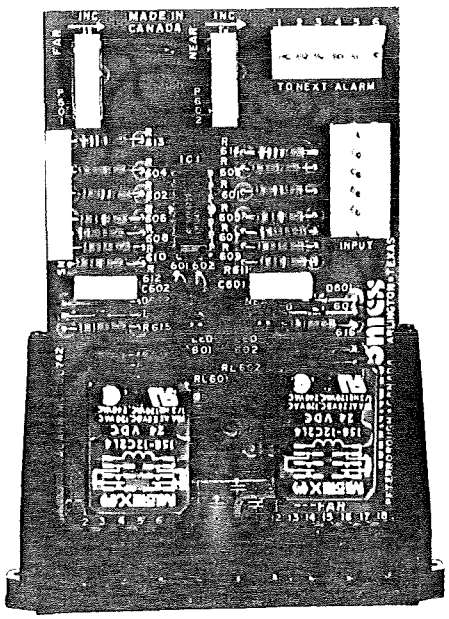
level measuring systems

OPTIONAL ADD-ON MODULES

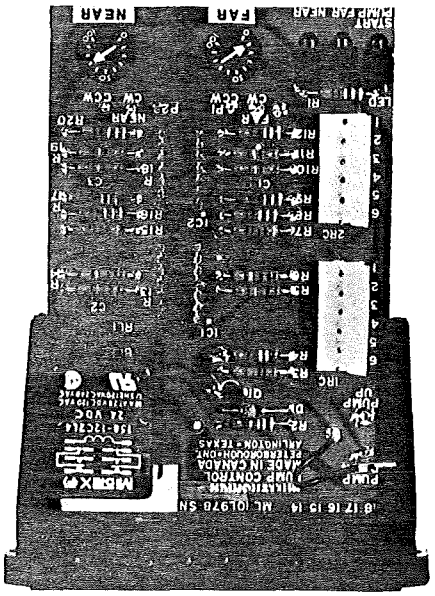
Milltronics has developed peripheral devices which enable us to meet the exact requirements of any application, thereby enhancing the wide range of Ultrasonic Level Measurement Systems used in over 12,000 applications world-wide.



SATELLITE ALARM CARD

Provides two independently adjustable alarm set points (one near, one far) which can be set anywhere within the calibrated span of the level instrument.

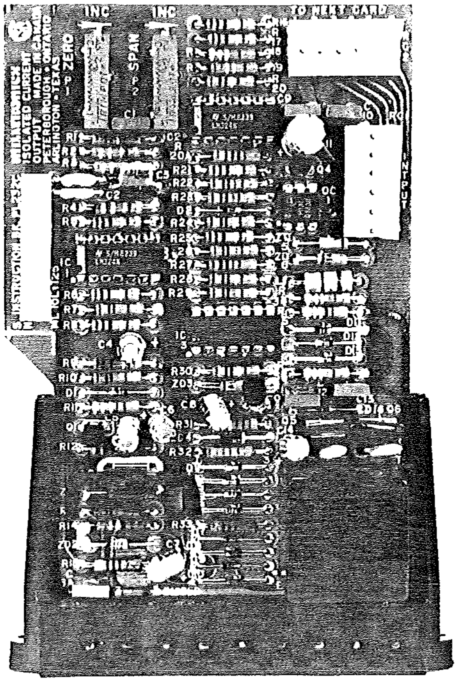
- ☐ Umbilical connection for easy add-on to all level instruments except Level Genie.
- ☐ Two D.P.D.T. contacts per set point - 10A at 115 VAC Non-inductive.
- ☐ Relay status LEDs. The relay de-energizes on alarm for fail-safe operation.
- ☐ Deadband: 2% Standard, 5% Optional.



PUMP MODULE

For control of one pump per module. A relay latches in between adjustable START/STOP set points.

- ☐ START/STOP set points are independently adjustable through calibrated span of level instrument.
- ☐ Umbilical connection for easy add-on to all level instruments except Level Genie.
- ☐ Calibrated Set Point dials for one step set-up. There is no need to simulate Transducer to target distances, set-point is simply set by % of span.
- ☐ Two D.P.D.T. contacts - 10A at 115 VAC Non-inductive.
- ☐ Relay status LEDs and set-point status LEDs.



ISOLATION MODULE

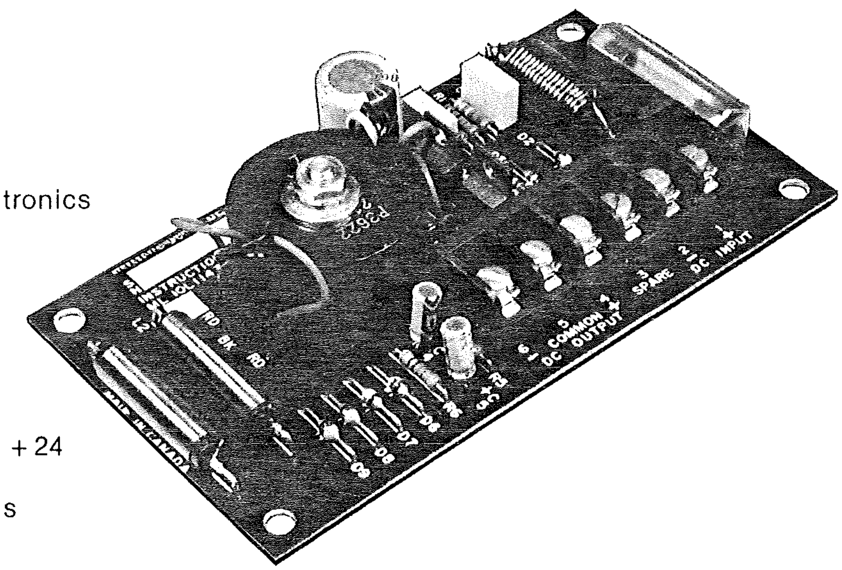
Provides isolated 0-20mA or 4-20mA (into 750 ohm maximum) floating output.

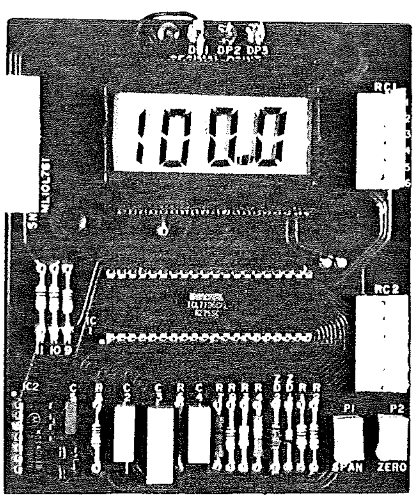
- ☐ Positive or Negative side of output may be grounded.
- ☐ Umbilical connection for easy add-on to all level instruments except Level Genie without the need for external power-supply.
- ☐ Input/Output isolation: 300 VAC 50/60 Hz.
- ☐ Accuracy: ± 1% of input over full temperature and input-supply ranges.

D.C. ADAPTOR MODULE

Factory installed option on selected Milltronics Level instruments. Provides operation from DC sources.

- ☐ 12 VDC unit - For operation from Lead/Acid battery over 11 to 14 VDC range.
- ☐ 24 VDC unit - For operation from fixed d.c. rail (24 VDC ± 10%).
- ☐ Output power: 12.5W max. total from +24 and −24 VDC busses.
- ☐ Input power: Approximately 3.6W plus output power.
- ☐ Fused to protect source.





LIQUID CRYSTAL DISPLAY (LCD METER)

Factory installed option on selected Milltronics' level systems to provide digital indication of level condition.

- ☐ 4 Digit display, large 13mm characters.
- ☐ Umbilical connection for ease of add-on to all level instruments except Level Genie. Mounts on enclosure for easy viewing.
- ☐ Tap selectable decimal point placement.
- ☐ Potentiometer adjustable for readout in most engineering units for custom calibration.
- ☐ Custom window and bezel assembly provided to retain enclosure's NEMA rating.

MILLTRONICS

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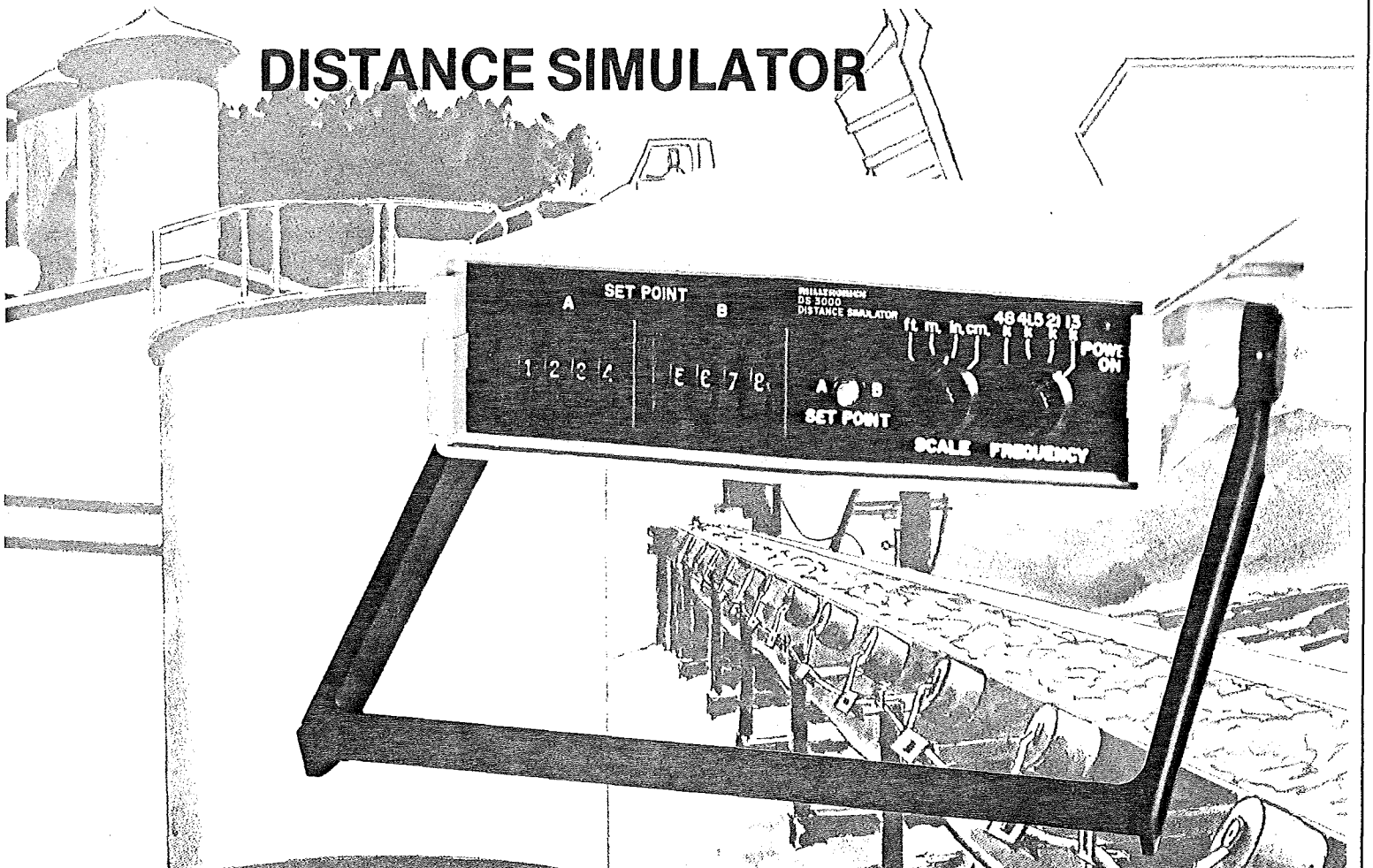
MILLTRONICS

PROCESS CONTROLS FOR INDUSTRY

SPECIFICATION SHEET 525

level measuring systems

DISTANCE SIMULATOR



- ☐ Quick and accurate calibration of Milltronics Ultrasonic Level Measurement systems.
- ☐ Switch selectable frequencies, scales and setpoints with 4 digit thumbwheel switches.
- ☐ No AC input power required.

DS3000 DISTANCE SIMULATOR

The Distance Simulator has been developed to ensure quick and accurate calibration of Milltronics' Ultrasonic/Sonic Level Measurement systems. In most level measuring applications, the lengthy time taken to change from an empty bin to a full bin makes direct system calibration using the material level very difficult and time consuming.

The Milltronics DS3000 solves calibration problems by providing an output very similar to that of an actual transducer. During calibration, two adjustable setpoints that can be used as EMPTY/FULL or LOW/HIGH alarms are easily set with 4 digit thumbwheels.

SPECIFICATIONS

INPUT POWER:
+ 15 Volts DC from Milltronics level measuring system through cable connectors*.
*All systems except Level Genie.

OPERATING TEMPERATURE:
-20 to + 60°C (0 to 140°F)

OPERATING FREQUENCIES:
Switch selectable to match system being calibrated
48 KHz for Open Channel Metering (OCM) and AccuRanger
41.5 KHz for Dual Pump Controller (DPC), MicroRanger, MiniRanger and AiRanger (when used with ST25 or ST50 Transducer)
21 KHz for MidRanger and AiRanger (when used with ST100 or LR-21-FM transducers)
13 KHz for AiRanger used with LR-13-FM transducer

OPERATING RANGE:
Switch selectable scales, 4 digit (one decimal) value thumbwheel switches.
2.0 to 200.0 feet
0.6 to 60.0 metres
24.0 to 999.9 inches
60.0 to 999.9 centimetres

SETPOINT:
Two switch selectable set points, A and B.

INDICATOR:
Power "ON" light.

ACCURACY:
Within ± 1% at any value on scale in feet
Within ± 1% at any value on scale in metres
Within ± 0.15% at any value on scale in inches
Within ± 0.15% at any value on scale in centimetres

TEMPERATURE CO-EFFICIENT:
Less than 0.03%/°C

PHYSICAL CHARACTERISTICS:
ABS plastic case with adjustable handle
Case size — 8.5"w x 2.4"h x 9.25"d
21.6 cm x 6.1 cm x 23.5 cm
Weight — Approximately 3 lbs. (1.3 kg)

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