WEATHER INSTRUMENTS

International Meteorological Services Division

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I. INTRODUCTION

Sierra/Misco, Inc. manufactures, installs and services Real Time "EVENT REPORTING" Telemetry Systems (known in the United States as "ALERT" Systems), and a complete line of meteorological instruments and systems. Sierra/Misco Systems are ideally suited for monitoring rapidly changing field conditions from remote locations. Flash flood forecast and warning systems have been the most popular application of Sierra/Misco technology.

More than 75 installations around the world are now served by Sierra/Misco technology in a variety of applications. Sierra/Misco systems are recognized as state-of-the-art. A flood warning system supplied to Harris County, Texas by Sierra/Misco was cited as one of the ten "Outstanding Engineering Achievements in the United States in 1984." This award was given to the Harris County Flood Control District by the National Society of Professional Engineers.

Sierra/Misco is dedicated to maintaining its leadership role in providing high quality instrumentation for automated real-time environmental data acquisition, analysis, forecast, warning, and control applications.

II. COMPANY BACKGROUND

Sierra/Misco, Inc. was formed in 1978 as the result of combining Microchemical Specialities Company (Misco) with a newly acquired company, Sierra Weather Instruments Corporation. Misco produced a line of air sampling instruments and laboratory products. Sierra Weather Instruments manufactured meteorological sensors and environmental equipment. After this acquisition, Sierra/Misco began the development of real-time event reporting telemetry systems for the meteorological and hydrological markets. Sierra/Misco now is the recognized leader in the fast-growing, new field of automated, real-time data collection.

As the telemetry market expanded both domestically and internationally, Sierra/Misco began to specialize in data collection systems. These systems consist of meteorological and hydrological sensors interfaced with electronic instruments for data transmission by VHF/UHF radio or satellite to a base station computer. The complete system allows accurate real-time assessments of rapidly changing environmental conditions.

In 1983, International Hydrological Services (IHS) was formed as a wholly owned subsidiary of Sierra/Misco. IHS has developed the Enhanced ALERT Software Package for real-time environmental data acquisition and control. The software is a complete data base management system which performs data quality control, manages the continuously current database and provides alarms, analysis, forecast, and control functions. The addition of this powerful and flexible software to Sierra/Misco's existing systems capability opened up new turnkey system applications.

The company has established an outstanding reputation for the quality, reliability, economy and service of these systems.

DATA COLLECTION SYSTEMS

UHF & VHF Radio Telemetry

- Simplex
- Duplex

Phone Modems
Voice Synthesizer
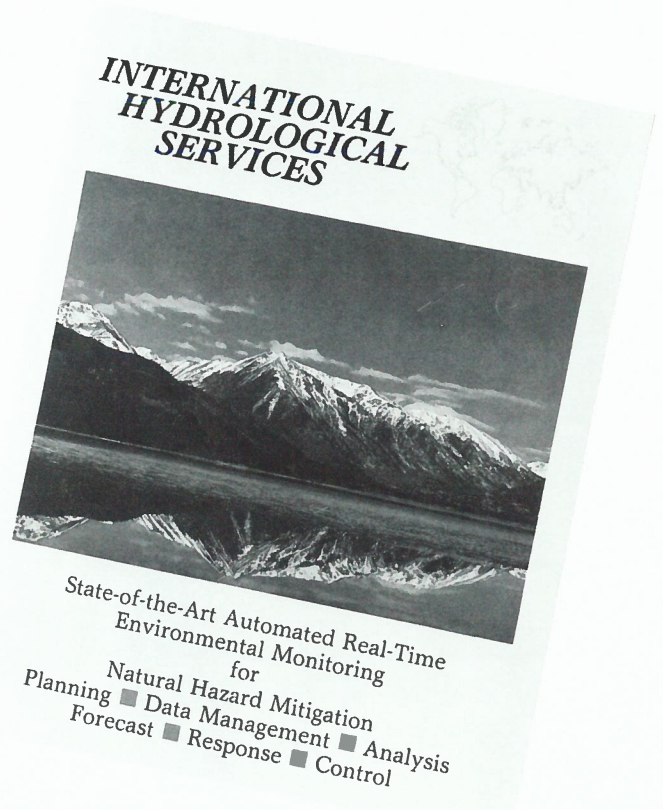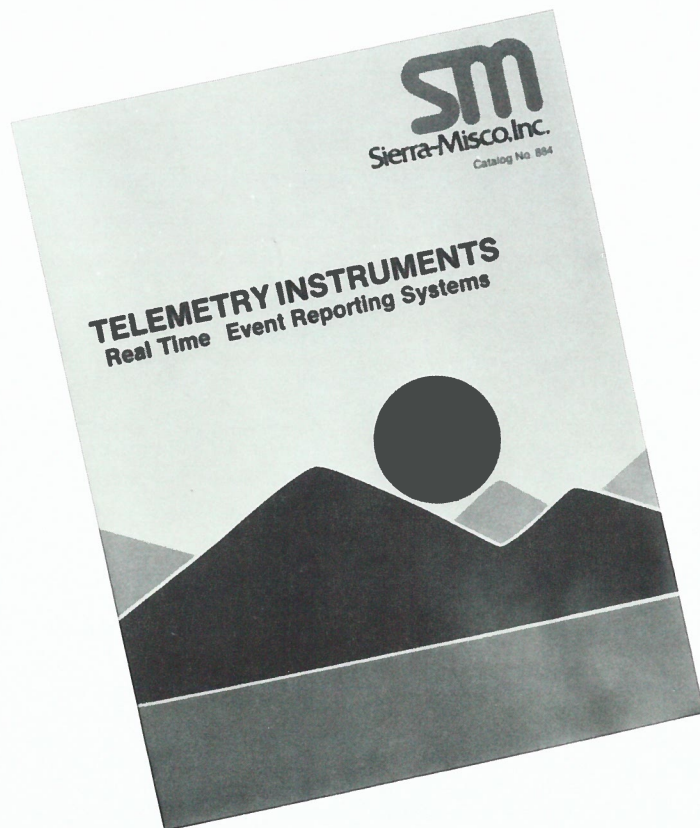
SENSOR TYPES

Wind Speed
Wind Direction
Temperature
Humidity
Barometric Pressure
Rainfall
River Level
Solar Radiation
Evaporation

SENSOR INPUTS

11 Inputs Include:

Analog: Voltage
       Resistance
       Current

Digital: Status
      Voltage
      Contact Closure

COMPULOGGER

Battery Power Supply
Serial Output

Optional

Solar Panel
Relay Outputs
Contact Closure Outputs

SENSORS

DATA

COMPULOGGER

PORTABLE COMPUTER

CONTROL OUTPUTS

Weather Sensors

CompuLogger

ON SITE STORAGE FEATURES

- Low Power
- Easy to Use
- Factory Programmed
- 11 Inputs
- Low Cost
- 8 Control Outputs
- System Software

SYSTEM FEATURES

- High Quality Sensors
- Low Power Datalogger
- Flexible Data Communication
- Powerful Software
- Long Term Data Storage
- Data Analysis & Alarms
- Forecasting

TRANSPORTATION

Infrared Data Telemetry
- Simplex
- Duplex
- Microwave
- Hardwire

TRANSPORTATION

```
                  ┌─────────────────────┐
                  │                     │
──────────────────│   MICRO COMPUTER    │
                  │    BASE STATION     │
- - - - - - - - - │                     │
                  └─────────────────────┘
                    │                 │
          ┌──────────────┐      ┌──────────────┐
          │              │      │              │
          │  PERIPHERALS │      │  SOFTWARE    │
          │              │      │              │
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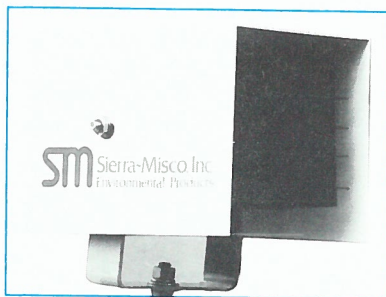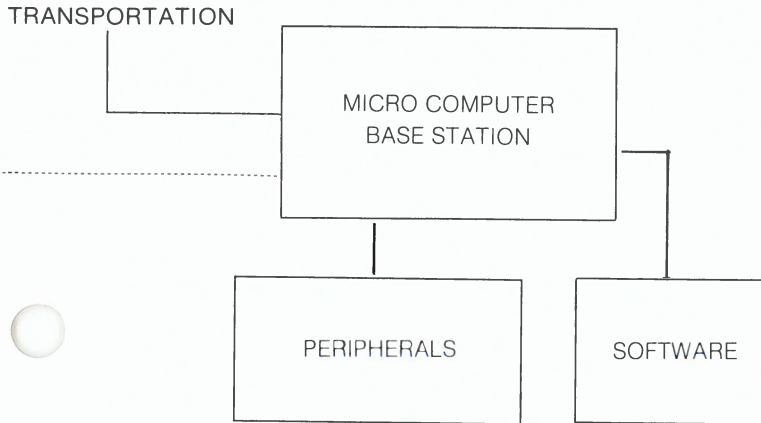

Infrared Data Link

APPLICATIONS
- Stream Gauge Monitoring
- Portable Weather Stations
- Fire Weather
- Evaporation Systems
- Irrigation Control
- Water Quality
- Air Quality

DATA ANALYSIS

MICROCOMPUTER BASE STATION
- Multitasking Operating System
- Real Time Data Collection
- Control Functions
- Communications

ACCESSORIES
- Modems
- Printers
- Plotters
- UPS

METEOROLOGICAL SOFTWARE
- Data Analysis
- Graphic Displays
- Statistics, Averages
  Maximums & Minimums
- Forecasting Events
- Modeling
- Data Archiving
- Communications

IBM-XT Microcomputer
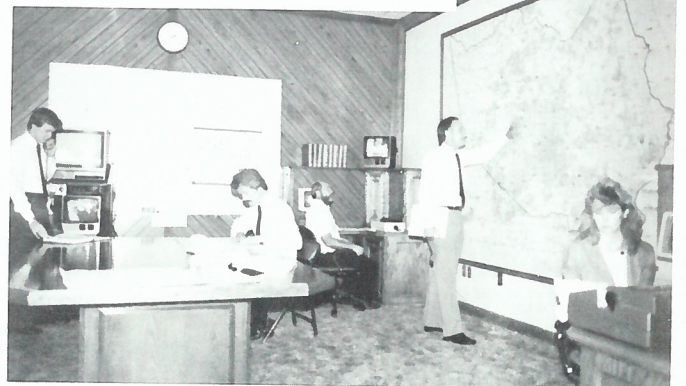
Harris County, Texas, Base Station

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Model 6500
COMPULOGGER
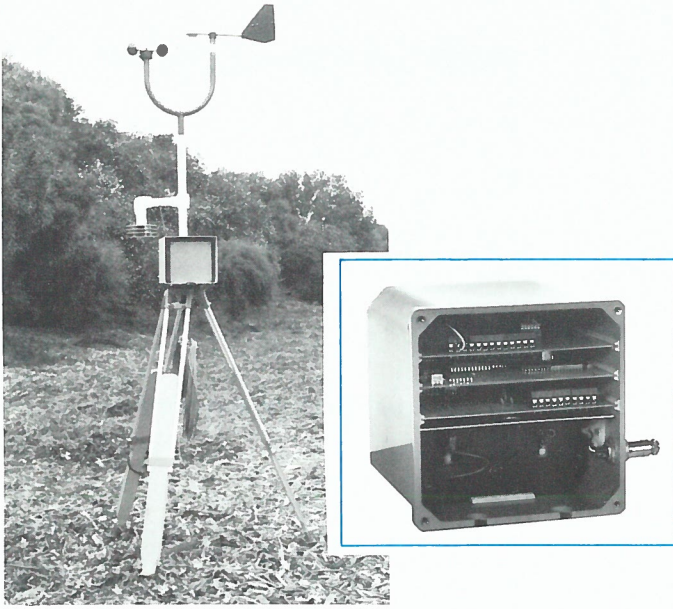
CompuLogger with Wind Speed, Wind Direction, Temperature and Humidity.

The 6500 Series CompuLoggers are used to collect and store analog and digital data for long unattended periods. They have been designed for extremely simple operation. No field programming or adjustments are necessary. The input board has a maximum of 11 inputs which may include a combination of 10 analog sensors and 6 digital (contact closure) sensors. Setting up the unit is as simple as plugging in the sensors connecting the internal battery and pushing a button to start recording data. All sensor signal conditioning and custom programming are done at the factory.

The Model 6502 and 6508 have 2K RAM and 8K RAM data storage respectively. The basic CompuLogger is supplied with 4 inputs, any combination of analog or digital specified at the time of the order. The user specifies these inputs and the recording period which is pre-programmed in multiples of 3.6 minutes. The CompuLogger is powered by an internal 4 ampere hour battery which will last a year without recharging. This is based on 4 sensors with a 3.6 minute recording interval.

The CompuLogger has eight optional control output channels that can be pre-programmed to turn on alarms, pumps, etc. For example, if a temperature goes above a pre-programmed level, an output can be automatically activated. When the CompuLogger is configured with duplex radio, telephone, or IR Links the optional control output channels can be controlled from the remote base station.

Data can be retrieved from the CompuLogger by using the Model 5071PX8 Portable Computer or automatically transferred to a base station by using IR links, VHF/UHF transmission or telephone lines. The data from many remote CompuLogger field stations can be collected by use of either the RAM or on-board cassette on a 5071PX8 portable computer and then transferred to a printer or to a master base computer for further processing. The CompuLogger can also collect and transfer data automatically in real time to a master base computer by the addition of VHF/UHF transmission links, phone modems, or for short distances, IR Links. It can also be set up to operate in an interrogation mode.

FEATURES

- Inexpensive
- Simple to set up and operate
- Solid State Data Storage — up to 8000 records
- No field programming or calibration required
- User Defined Inputs (11 total)
- Control Outputs
- Internal battery — low power consumption
- Small, Weatherproof Enclosure
- Radio, Telephone and Infrared Telemetry interfaces available
- Portable and Personal Computer Data Processing Software Available

SPECIFICATIONS

Standard Sensitivity: 0-70mv or higher
Analog Inputs: Any input with 70 millivolt full scale reading can be programmed (10 maximum)
High Sensitivity: 0-10mv
Digital Inputs: Status, Voltage, or Contact Closures (6 maximum)
Recording Interval: 3.6 minutes or any multiple thereof
Outputs: Standard — Serial (0-12V levels) will drive most IBM PC-XT compatible computers.
· Optional — RS232C, needed when interfacing with equipment requiring true RS232
Control outputs: Optional — ½ Amp Current Sink (8 maximum)
Optional — 10 Amp relay drivers (driven by ½ amp heat sink)
Power: 12 VDC via internal 4AH Gel Cell Battery at 250mA (when recording), 50 micro amps quiescent
Operating Temperature: –30 to +70°C
Size: 6" x 6" x 6"
Weight: 11 lbs with 4 ampere hour battery

OPTIONAL COMMUNICATION CONFIGURATIONS

Sierra/Misco provides a complete line of data telemetry Instruments. Complete turnkey systems are available including system design and installation.

When configured with communication links it can be set up to operate in four different modes: Event, Timed, Timed & Event Combinations and Interrogated.

Event Mode — There are two event modes available; 1) event mode channels (digital inputs) will transmit data whenever a change in status is monitored. This is independent of the other analog timed channels; 2) timed/event mode channels store event changes and make transmissions on a timed basis.

Timed Mode — Analog inputs are transmitted in the timed mode. These inputs transmit in pro-programmed timed intervals which are multiples of 3.6 minutes. Analog inputs may also be programmed to transmit on selected step sizes. This allows the CompuLogger to transmit information whenever the programmed step size has been exceeded or met.

Interrogated — The CompuLogger may also be operated in the interrogated mode by using tranceivers at the remote sites. Event reporting and analog timed reporting combined with interrogation may be supplied. This provides consistent data gathering with the option of interrogation of the remotes site upon demand.

When radio communication is used or when the sensors require additional power, Models 5033-0.4 Solar Panels and 5030-8 AC Trickle Chargers are also available.

VHF-UHF RADIO DATA LINKS

Radio Simplex and Duplex Telemetry may be used between the CompuLogger remote station and the base station. Repeaters, such as Model 5252, can be used to extend the coverage of a radio telemetry system. Frequencies used are generally in the VHF-UHF range. See catalog page 13.

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INFRARED DATA LINKS

Infrared Telemetry may be used when distances between sites are less than 1 mile and no obstructions exist between transmitters. Coverage can be extended by daisy-chaining signals from one site to another. Infrared signals are an inexpensive solution for data telemetry systems which eliminate long cable runs or replace the more expensive radio telemetry components. See catalog page 10.

TELEPHONE DATA LINKS

Telephone telemetry may be used where easy access to commercial phone lines exist. It eliminates the concern for obstacles to line-of-sight telemetry. Remote stations using telephone modems are readily accessible from any compatible modem unit. See catalog page 10.

COMPULOGGER ORDERING INFORMATION

Model 6502 CompuLogger with 2K RAM, 4 inputs — specify sensors to be used, range and time interval

Model 6508 CompuLogger with 8K RAM, 4 inputs — specify sensors to be used, range and time interval

Model 6500-AI Additional Inputs Each, Analog or digital (7 Maximum) — specify sensors to be used, range and time interval

Model 6500-CO-H 4 4½ Amp current Sink Control Outputs — Hardware only

Model 6500-CO-S Software to control Control Outputs

Model 6500-CO-R Relay driver, 4 drivers/card

Model 6500-7 Sun Shield and Mounting Enclosure

Model 6500-8 RS232C Output

Model 6500-9 Spare Program ROM

Model 6500-5 Phone Modem

OPTIONAL COMMUNICATION HARDWARE

6500-IR Infrared communications link, see page 10

5071TM-AAAD Phone modem for telephone line, see page 10

R1-VHF VHF Communication Links, see page 13

T8-VHF VHF Communication Links, see page 13

R2-UHF UHF Communication Links, see page 13

T4-UHF UHF Communication Links, see page 13

VHF Radio System with CompuLogger

Model 5071PX
PORTABLE COMPUTER
Portable Field Operable Data Storage and Transfer Device
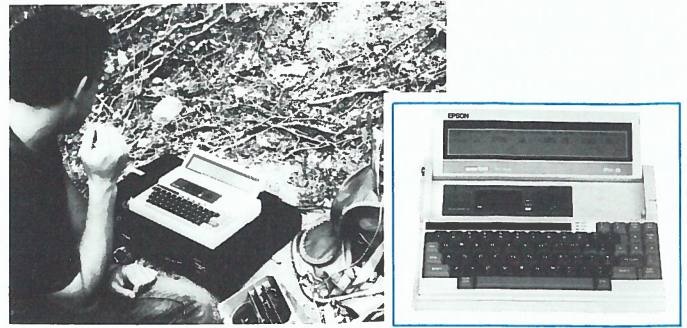
Reading CompuLogger with 5071PX Portable Computer

The 5071PX is used to observe and analyze data from Sierra/-Misco's CompuLogger remote stations in the field and is also used to transfer data from these field stations to a base station computer. Data for the CompuLogger is transferred into the memory of the 5071PX prior to overwriting the CompuLogger's memory. It comes with 128K of RAM. Data can be transferred to the micro cassette cartridge for long term storage.

Time is assigned to the data by the 5071PX Real-Time-Clock. The CompuLogger's binary data is transformed into engineering units and placed into ASCII files for ease of data manipulation, evaluation and transfer.

The basic data retrieval and transfer program, when used with the 5071PX, allows convenient data readout in engineering units in the field. Using this program allows field calibration checks and monitoring of the remote station operation. As data is received from the CompuLogger, it is simultaneously recorded in RAM and displayed on the screen. Data can be transferred to a master microcomputer for archiving or other data base operations.

FEATURES

- LCD matrix screen, 40 columns wide by 8 lines
- Microcassette cartridge
- Battery backed RAM for long term storage
- RS232C serial interface
- Serial interface
- Rechargeable NiCd battery power supply

SPECIFICATIONS

Memory: 128K
Keyboard: 72 keys
Size: 15" W x 8½" D x 1½" H
Weight: 6½ lbs.

ORDERING INFORMATION

Model 5071PX Portable Data Retrieval Computer
Model 5071PX-1 Printer Cartridge
Model 5071PX-2 Portable Floppy Disk Drive, 3½" single disk drive, 360K capacity
Model 5071PX-3 Modem Cartridge
Model 5071PX-4 Acoustic Coupler
Model 5071PX-TC Micro Tape Cassettes

PACKAGED COMPULOGGER SYSTEMS
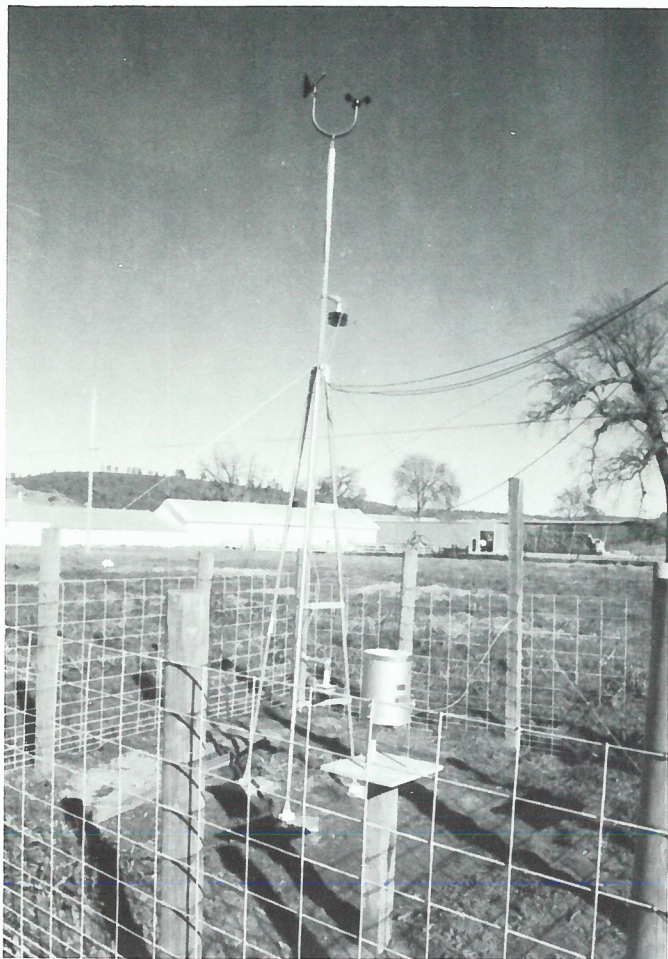
Guenoc Winery Weather Station

Model 6500-WS PORTABLE WEATHER STATION

The Portable Weather Station includes:
Model 6508 CompuLogger
Model 1036HM Wind Speed and Direction Sensors
Model 2040P-T Relative Humidity Sensor and Temperature Sensor
Model 4551 Solar Radiation Shield
Model 2501 Tipping Bucket Rain Gauge
Model 9000-20 Tripod, 20 ft.

The CompuLogger portable weather station consists of a lightweight, sturdy tripod assembly with wind, temperature, relative humidity, solar radiation and precipitation sensor mounted on it. Data is stored in the CompuLogger until retrieved by the portable computer. Data is recorded every 30 minutes or at any other specified interval. If recorded in 30 minute intervals, the memory will hold approximately 25 days of data.

Other packaged stations are available for other applications. For example, irrigation control, frost warning, fireweather (see page 16). For your special applications, please contact the factory.

Model 6500-EV PORTABLE EVAPORATION STATION

The Automatic Evaporation Station includes:
Model 6508 CompuLogger
Model 3003 Evaporation Gauge with Analog Output
Model 3005 Evaporation Pan
Model 3005WS Wooden Support for 3005
Model 3540P Air and Water Temperature Probes (2)
Model 1005C Anemometer
Model 2500 Precipitation Gauge

Sensors to measure evaporation pan levels, air and water temperatures, precipitation and wind run parameters are supplied with the CompuLogger for recording evaporation data. Hourly readings will enable the CompuLogger to store 65 days of data before overwriting the initial data. The evaporation data is transferred to a portable computer according to a set schedule. Then data is printed out or transferred into the master microcomputer for input into a model.

Model 6500-LL PACKAGED STREAM GAUGE

The Stream/Tide Gauge includes:
Model 6508 CompuLogger
Model 5050PT Pressure Transducer (specify range)

Stream data is logged every thirty (30) minutes. The data is accurately stored in the CompuLogger on a timed basis. The 8K RAM will last for 165 days (5+ months). The system will withstand harsh environments and is small enough to pack-in. The data should be transferred to the portable computer before the initial data starts to be overwritten.

Model 6500-SN SNOWFALL/AVALANCHE STATION

The Snowfall/Avalanche Monitor includes:
Model 6508 CompuLogger
Model 5058 Snow Pillows (4)
Model 5050PT Pressure Transducer
Model 3540P Temperature Sensor
Model 4551 Solar Radiation Shield

The snow and avalanche data is logged hourly. The CompuLogger is capable of operation in cold mountainous areas. The pressure transducer will be connected to the snow pillows for measurements of the water content in the snow. The temperature sensor will measure the ambient air temperature. Battery requirements for the CompuLogger with 2 parameters being recorded is very low and the battery will last approximately one season (one year) without recharging. The 8K RAM will last for 165 days with hourly recording of the two (2) parameters before data starts to be overwritten.

ORDERING INFORMATION

Model 6500WS Portable Weather Station
Model 6500EV Portable Evaporation Station
Model 6500LL Packaged Stream Gauge
Model 6500SN Snowfall/Avalanche Station

Model 5073AMS
AUTOMET SOFTWARE

Enhanced AUTOMET Menu

Sensors Plotted Graphically

The base station software is a powerful state-of-the-art package called AUTOMET which has been specifically designed for the real-time user. With AUTOMET software and the QNX operating system, users create a complete data collection, analysis, and control system. The power of the AUTOMET software package brings users mainframe power at microcomputer prices.

OPERATION: Incoming data from Sierra/Misco weather sensors is received, decoded and then delivered to the computer. After being checked for quality and any alarm conditions, the data is permanently stored in the database. Once in the database, the data is immediately available for display or use in application programs.

The AUTOMET software programs are menu driven, responding to simple keystroke commands for fast and easy data retrieval and display. Data in tabular format may be displayed from single sensors or user defined sensor groups. Graphical displays allow the user to display data plots of up to four sensors simultaneously on the screen.

The user has the capability of defining base values and conversion factors for converting raw data into engineering units. Any type of non-standard sensor may be entered by the user into the data base. The user may define alarm criteria for individual sensors or groups of sensors. When alarm criteria are met, a visual/audio alarm is activated at the CRT. An optional output is available for remote alarms. Other optional control features include pumps, gates, wall maps, and voice synthesized messages.

Automated analysis in real-time is possible and forecast models are available to automatically use the real-time data to estimate future conditions and operational possibilities.

FEATURES/SPECIFICATIONS

- Event, timed, and/or interrogated data collection
- Automated and/or manual data entry
- Alarms (user defined)
- External control options
- Color graphics and map displays
- Automated analysis
- Full multi-user, multi-tasking operating system
- Automatic data recovery, formatting and filing
- Automatic error checking
- Unlimited sensor expansion capability
- National Weather Service interface
- Remote use communications (e.g., telephone)
- Text file transfer
- Inter-computer communications capability
- Menu-driven operation
- Data base utilities and editing
- Powerful full-screen data base editor
- Data displays
    Single station
    Sensor group summaries
    Data plots
- Precipitation maps
- External control capability
- Audio/visual alarm
- Complete line printer output of all graphics

ORDERING INFORMATION

5073AMS AUTOMET Starter System
5073AMS-E Enhanced AUTOMET Software Package
5073AMS-QNX QNX Utilities Upgrade
5073AMS-MU Multi-User Upgrade
5073INT Enhanced ALERT Interrogation Package
5073AD Auto-Dial Alarm Program
5073MD Map Display Interface Software
5073AEC-AC External Alarm Switch Control
5073AEC-DC External Alarm Switch Control

Model 5071
CENTRAL SITE DISPLAY

Base Station Computer and Printer

Powerful microcomputers are dedicated to collecting, analyzing, and displaying data at the base station. Base station software packages are available for the 5071-XT, 5071-AT, and the 5071-286 microcomputers.

These 16 bit microcomputers run enhanced software packages under the QNX operating system (a UNIX look-alike). The QNX system is a full multi-user system that allows one console user and up to 10 serial port users to work on the system simultaneously. Enhanced software packages will execute in the microcomputer background allowing the operator to run programs in the foreground.

Color monitors are provided for the display of color graphics. A black and white copy of the color graphics is available with the addition of a dot-matrix printer to the system.

Additional microcomputer memory, disk drives, communication ports, video displays and peripheral equipment are available for these models.

The enhanced software packages are highly portable. Contact Sierra/Misco about possible applications on other microcomputer systems.

IBM-AT Base Station

MODEL #   DESCRIPTION

5071-XT   IBM PC/XT microcomputer base station
5071-AT   IBM PC/AT microcomputer base station
5071-286   Compaq DeskPro 286 microcomputer base station

MICROCOMPUTER BASE STATION SPECIFICATIONS:

	5071-XT	5071-AT	5071-286
Processor	8088	80286	80286
CPU size	16 bits	16 bits	16 bits
Data bus size	8 bits	16 bits	16 bits
Memory supplied	512K bytes	1M bytes	1M bytes
Memory limit	640K bytes	16 Mbytes	16 Mbytes
CPU speed	4.77 MHz	1 MHz	8 MHz
Math-Coprocessor	8087	80287	80287
Battery Calendar Clock	AST	AT	AT
Disk Drives			
5¼" Floppy	360 Kbyte	1.2 Mbyte	1.2 Mbyte
Hard disk	10 Mbyte	20 Mbyte	30 Mbyte
Serial Ports	2	2	2
Parallel Ports	1	1	1
Video Display	12" Color	12" Color	12" Color
Video Resolution	640/200 High B/W	320/200 Medium B/W	4 Colors B/W
Keyboard	Detached with Edit keys, 10 Function keys and separate numeric keypad		
Operating System	QNX Development system		

MICROCOMPUTER BASE STATION OPTIONS:

• Memory Upgrades:

5071M/128K — 128K bytes (5071-XT only)
5071M/1MB — 1 Mbytes increments (5071-AT and 5071-286 only), increases computer multi-user capability

• Extra Disk Drives:

5071FD/360 — 5¼" Floppy 360 Kbyte
5071FD/1200 — 5¼" floppy 1.2 Mbyte (5071-AT and 5071-286 only), floppy drives can be used for diskette copies
5071HD/10 — Additional 10 Mbyte fixed disk for 5071-AT, increases program and data storage capability
5071ATHD/20 — Additional 20 Mbyte fixed disk for 5071-AT, increases program and data storage capability
5071ATHD/40 — Additional 40 Mbyte fixed disk for 5071-AT, increases program and data storage capability
5071HD/20REM — 2 Removable 10 Mbyte cartridges, provide high speed removable disk backup capability

• Serial Ports:

5071MUX/4 — 4 additional serial ports (total = 6 ports)
5071MUX/8 — 8 additional serial ports (total = 10 ports), used for modems, terminals, plotters

• Parallel Ports:

5071PP2 — 1 additional parallel port (total = 2 ports), used for additional printers or external alarm switch

PERIPHERALS:

- Terminals:

5071CRT — Monochrome Video Terminal (local or remote use) additional user video terminal (no graphics)

5071CRT-C — Color Graphics Video Terminal (local or remote use) additional user video terminal including graphics display

5071RT — Printer Terminal (local or remote use) hard copy terminal (no graphics)

5071PORT — Portable Terminal with battery pack and carrying case for portable remote monitoring

5071PORT-P — Paper for 5071PORT (12 rolls/case)

- Printers:

5071P-DM — Dot-matrix graphics printer 80 columns, will copy color graphics

5071P-DM-2 — Dot-matrix graphics printer 132 columns, will copy color graphics

- Plotter:

5071XY — HP7476 6 pen XT plotter with software interface, plots high quality graphics in up to 6 colors through a serial interface. Useful in addition to the system printer which is needed to print text.

- Uninterruptible Power Supplies:

Will keep system operating during loss of power using batteries. Includes power filter to prevent power surges and spikes from disturbing system operation. Length of operating period on batteries depends on attached equipment and its power usage. Size of UPS depends on equipment to be attached. Additional batteries may increase operating period.

5071UPS-40060 — Uninterruptible Power Supply, 400W/120V/60Hz, includes 1 12 Volt battery (battery acid not included)

5071UPS-60060 — Uninterruptible Power Supply, 600W/120V/60Hz, includes 2 12 Volt batteries (battery acid not included)

5071UPS-80060 — Uninterruptible Power Supply, 800W/120V/60Hz, includes 2 12 Volt batteries (battery acid not included)

5071UPS-B — Additional battery for UPS

- Additional floppy diskettes:

5071FD-XT — 5¼″ Floppy diskettes for PC/XT 360K byte drive, 10/Box Double Sided/Double-Density/Soft-Sectored, 40 Tracks/Side, 48 Tracks/Inch. Certified Error Free

5071FD-AT — 5¼″ Floppy diskettes for PC/XT and 286, 1.2M byte drive, 10/Box Double Sided/High-Density/Soft-Sectored, 80 Tracks/Side, 96 Tracks/Inch. Certified Error Free

5071FD-CLEANER — 5¼″ Floppy disk drive cleaner kit. Includes cleaning disks and solution

- Telephone Modems:

5071TM-A — 300 baud auto/answer modem allows remote user access to system

5071TM-AAAD/1200 — 300/1200 auto/answer-auto/dial programmable modem allows remote user access and auto-dial by computer for interrogation or warning

5071TM-AAAD/2400 — 300/1200/2400 auto/answer-auto/dial programmable modem allows remote user access and auto-dial by computer for interrogation or warning.

5071P-DM Printer

5071UPS-20060

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Model 5071TM-A
Model 5071TM-AAAD
TELEPHONE MODEMS

Model 5071TMA-AAAD

GENERAL DESCRIPTION

The Telephone Modems are used to enable communications between computers over telephone lines. Two models are offered: 5071TM-A Auto Answer and Model 5071TM-AAAD Auto Answer and Auto Dial.

The 5071TM-A Auto Answer Modem allows any 5071 Central Site Display to be accessed from a remote location using another computer or portable terminal, for example, a Model 5071-PX8.

The 5071TM-AAAD, is used at remote sites and base stations to allow two way communication via telephone lines.

SPECIFICATIONS

	5071TM-A	5071TM-AAAD
Baud Rate:	300	300/1200
Impedance:	600 Ohms	600 Ohms
Connections:	RS232	RS232
Power:	Telephone Line	120 V 50/60 Hz
Cable:	Supplied	Supplied
Size:	6" x 10" x 1"	2" x 6½" x 7½"
Weight:	1.1 lbs.	2 lbs.

OPTION

5071C-TM Cable RS2332 Computer to Phone Modem

ORDERING INFORMATION

5071TM-A — 300 baud Auto/Answer Telephone Modem
5071TM-AAAD/1200 — 300/1200 Auto/Answer-Auto/Dial Telephone Modem
5071TM-AAAD/2400 — 300/1200/2400 Auto/Answer-Auto/Dial Telephone Modem

Model 6500-IR
INFRARED DATA
COMMUNICATION LINK
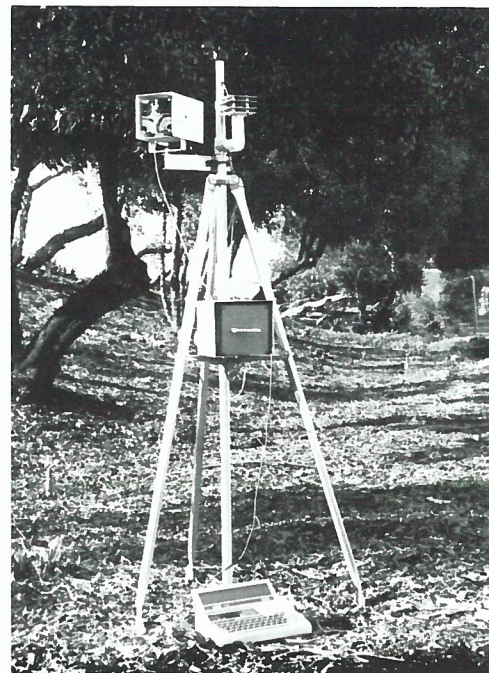
Infrared Transmitting Weather Station

Infrared (IR) links are used for data communications. These simplex and duplex infrared systems are supplied for short range, high speed, line-of-sight data transmission applications. The infrared links are used as individual units or combined with the CompuLogger. Serial data and status contact closures are transmitted and reproduced at a base station for filing in a microcomputer, portable field computer or for activating an alarm or pumping system.

GENERAL OPERATION

IR communication requires true line of sight with a maximum distance of 1 mile between the links. No trees, buildings or other obstacles may be between the IR transmitter and receiver. Aligning the transmitter and receiver is easily done by looking through the attached sight and pointing the links at each other. Infrared links may be daisy-chained together for transmission distances longer than 1 mile. An IR simplex repeater is created simply by connecting the output of the receiver to the input of a transmitter.

Pole mounting brackets with U-bolts are supplied for installation on 2" diameter pipe. The infrared unit is supplied with a sunshield and 15' of signal cable. The Model 6500IRP battery power supply is required when used without the CompuLogger.

IR Links can be configured to transmit serial data in full duplex (both directions at the same time) between computers by use of an IR transceiver at each site. A full duplex repeater is required for IR paths which are not line of sight or longer than one mile.

IR simplex links transmit serial data in one direction for data input into a storage device. Sensors or data loggers with serial data outputs may be used with IR data links.

Contact closures are transmitted by IR links to a receiver for activation of a relay or light. This provides a reliable and inexpensive way of transmitting status conditions as a remote monitor. Applications include the monitoring and control of tank levels and flows, pump operation, valve status and other industrial equipment status conditions.

FEATURES

- Economical
- Low power consumption
- No FCC licensing required
- Immune to radio and other electrical noise
- Suitable for use in hazardous environments
- Simplex and Duplex Operation
- Wireless

SPECIFICATIONS

- Baud rate: 2400 standard, programmable from 300 to 2400 baud
- Distance: 1 mile for single link, unlimited using daisy-chain configuration
- Operating Temperature: –30° to 70° C
- Operating Humidity: 0 to 100%

- Transmitter, Model 6500IR-TX

Optical transmission: 25 mW, 940 nM wavelength
Input Signal: Serial or RS232C Data; Contact Closures
Power: 12 VDC, 20 uAmp standby, 0.5 mAmp operating
Size with sunshield: 6″ x 7.5″ x 5.5″
Weight: 2 lbs.
       with mounting hardware and shield: 7 lbs.
Shipping Weight: 15 lbs.

- Receiver, Model 6500IR-RX

Output: Serial data: 0 and 12 Volt levels standard; Contact Closure (Relay Optional)
Power: 12 VDC 1.5 mAmps
Size: 4″ x 4″ x 6″
       with shield and mounting hardware: 7 lbs.
Shipping Weight: 15 lbs.

- Transceiver, Model 6500IR-TR Transceiver

Transmitter specifications, same as 6500IR-TX
Receiver specifications, same as 6500IR-RX
Receiver is wired for input into CompuLogger/microcomputer
Input: Supplied by CompuLogger/microcomputer
Weight: 15 lbs. total
Shipping Weight: 25 lbs.

- Repeater, Model 6500IR-RT Simplex Repeater
Repeater, Model 6500IR-RT/D Duplex Repeater

Transmitter specifications, same as 6500IR-TX
Receiver specifications, same as 6500IR-RX
Weight: 30 lbs.
Shipping Weight: 40 lbs.

- Power Pack, Model 6500IRP

Power: 12 VDC 4 ampere hour with enclosure
Size: 6″ x 6″ x 4″

Model 6500IR-TX Infrared Transmitter

ORDERING INFORMATION

Model 6500IR-TX Simplex Transmitter link with sunshield, 2″ pipe mounting, and 15 ft. cable
Model 6500IR-RX Simplex Receiver with sunshield, 2″ pipe mounting and 15 ft. cable
Model 6500IR-RT Simplex Repeater includes transmitter and receiver, battery power pack, 2 sunshields, 2″ pole mounting hardware and 15 ft. interconnecting cable
Model 6500IR-TR Remote Site Transceiver includes IR transmitter and receiver, 2 sunshields, 2″ pole mounting hardware and 15 ft. interconnecting cable
Model 6500-IR-BTR Base Station Transceiver (same as IR-TR) wired for data transfer to base station
Model 6500IR-RT/D Duplex Repeater includes 2 transmitters, 2 receivers with sunshields, 2″ pole mounting hardware, 15 ft. of interconnecting cable and battery power pack
Model 6500RXR Receiver Relay
Model 5031-4 12 VDC 4 ampere hour battery
Model 5031-9.5 12 VDC 9.5 ampere hour battery
Model 5033-0.4 400 mA solar panel for remote battery charging
Model 5030-8F AC float charger for 4 or 9.5 ampere hour battery

Model 5051R/DE
RECEIVER/DECODER

Model 5051R/DE Receiver/Decoder

GENERAL DESCRIPTION

The Model 5051R/DE Receiver/Decoder receives transmitted data from field transmitters or repeater stations, decodes the data and provides an RS232C output for computer input. The receiver and decoder are separated into two units so that the receiver can be located near the antenna tower and the decoder can be located in the central office near the computer. This reduces the amount of coaxial cable needed, minimizing the signal loss, and increasing the strength of the received signal. The receiver/decoder is supplied with 15 feet of interconnecting cable.

The receiver is operated by 12 VDC battery or 110 VAC. To eliminate the loss of data during power outages, Sierra/Misco recommends the use of a battery for standby power. The decoder may also be battery operated, however, when a UPS is included for the computer it is normally operated by 110 VAC and is backed up by the computer's UPS.

The base station receiver should be used with a high gain omni receive antenna. This will increase the incoming signal strength for remote sites which have marginal radio paths.

RECEIVER FEATURES

- Low power consumption
- Entirely automatic during operation, requires no manual supervision
- No external controls, eliminating accidental adjustments

DECODER FEATURES

- The decoder has tone filters to eliminate noise and interference from possible adjacent voice channels. This assures accurate inputs to the computer
- Two RS232C output ports standard
- 12 VDC battery operated or 110 VAC operated

SPECIFICATIONS

Receiver:

VHF Frequency Range: 135-174 Mhz
UHF Frequency Range: 400-512 Mhz
Sensitivity: 0.25 Microvolts Min. (12 dB Sinad)
UHF Sensitivity: 0.35 Microvolts Min. (20 dB Quieting)
Frequency Stability: $\pm$ .001% (-30 to 60° C)
Channels: 1
Modulation Acceptance: $\pm$ 5.0 KHz Nominal
Power Required: 12 VDC, 50ma unsquelched, 25ma squelched
Temperature Range: -40 to 60° C
Duty Cycle: Continuous
Weight: Encased Unit: 3 lbs.
Size: Encased Unit: 7¼" W x 2¾" H x 9" D
Antenna Input Impedance: 50 ohms

50501DE Decoder:

Power Required: 110 VAC/60 Hz or 12 VDC
Current Drain: 50 milliamps
Operating Temperature Range: -30 to 60° C
Output: 2 channels RS232C with standard RS232C connector
Weight: 3 lbs.

OPTIONS

5051U-R/DE UHF receiver and decoder
5051R-C-51DE Additional Cable with connectors (receiver to decoder). 15 feet is supplied as standard
5051R VHF receiver only
5051RU UHF receiver only
5051DE Decoder only
5051R-C-B Receiver Battery Cable with connectors, 15 feet standard
5031-9.5 Battery

MICROWAVE APPLICATIONS

5051DE/MW Decoder without radio receiver. This option is used in microwave systems to accept the signal from the microwave line and transfer this signal to the computer. A 600 ohm matching impedance circuit is supplied as part of the decoder.
5051R/MW VHF Radio Receiver without decoder. This option is used in microwave systems to receive signals from one or more transmitters at the microwave site and feed this data into the microwave system. A 600 ohm impedance match is supplied.
5051RU/MW UHF receiver with microwave interface.

ORDERING INFORMATION

Model 5051R/DE Receiver and Decoder with 15' interconnecting cable and AC trickle charger for receiver

RADIO SYSTEMS

Modular Radio Links are available for serial data communications. These links can be configured at remote sites in existing weatherproof enclosures in simplex (one way communication) or as a transceiver for interrogation, or monitoring and control applications. Serial data and status contact closures are transmitted and reproduced at a base station for filing in a microcomputer, portable field computer or for activating an alarm or pump.

MODEL R1-VHF and R2-VHF RECEIVER SPECIFICATIONS

Frequency Range: VHF: 135-174 MHz
                 UHF: 400-512 MHz
Frequency Stability: ± .001% (–30 to 50° C)
Sensitivity: 0.25 Microvolts Min (12 dB Sinad)
UHF Sensitivity: 0.35 Microvolts Min (20 dB Quieting)
Spurious Response: –80 dB Minimum
Adjacent Channel Rejection: –80 dB Min (25 KHz Ch.)
Noise Squelch Sensitivity: 0.25 Microvolts
Modulation Acceptance: ± 5 KHz Nominal, ± 7.5 KHz Maximum
Temperature Range: –40 to 70° C
RF Input Impedance: 50 Ohms Nominal
FCC Approved

MODEL T8-VHF and T4-UHF TRANSMITTER SPECIFICATIONS

Frequency Range: VHF 132-174 MHz
                 UHF 406-420 MHz
                 UHF 450-470 MHz

Power Out: VHF 8 watts
           UHF 4 watts
Frequency Stability: ± .0005% (–30 to 60° C)
Emission Type: 16F3
Audio Distortion (Max): 6% @ 60% rated system deviation with 1 KHz modulation
- Spurious and Harmonics: 55 dB below carrier
- FCC Approved

OPTIONS

5050PA-VHF Power Amplifier (20 watt), VHF
5050PA-UHF Power Amplifier (25 watt), UHF

ORDERING INFORMATION

Model T8-VHF VHF Transmitter, specify frequency
Model T4-UHF UHF Transmitter, specify frequency
Model R1-VHF VHF Receiver, specify frequency
Model R1-UHF UHF Receiver, specify frequency

Model T4-UHF Radio Transmitter

Model 5081 Radio Reporting Weather Station

Model 5252   REPEATER

Model 5252 Repeater

GENERAL DESCRIPTION

The Model 5252 Smart Repeater is designed to receive data transmissions, check the data for validity, eliminate any noise or voice interference and retransmit the valid data. The Model 5252 can be used as a single frequency repeater with one antenna or as a standard two frequency repeater. The repeater is programmed to accept user specified identification numbers (ID) while rejecting all other random noise and unauthorized ID numbers. Only validated transmissions are sent to the base station along with daily battery check signals and activity reports. The Model 5252 also eliminates all intermodulation between the transmitter and receiver since simultaneous operation does not occur.

FEATURES

- No degradation in the receiver sensitivity
- Requires only a single frequency
- During standby periods, random noise is eliminated which allows real data transmissions to be received and retransmitted without distortion and unwanted ID numbers to be rejected
- Low power drain
- No increase in transmitter turn on time is required for single or multiple repeaters in the system
- Daily report includes activity statistics (total interrupts = noise + date)
- Automatic low battery report
- Antenna placement is not critical
- FCC type approved

GENERAL SPECIFICATIONS

Antenna Connector Single Frequency: BNC
Antenna Connectors: Two Frequencies: Receive: PL259 Female, Transmit: BNC Female
Size: 8" D x 22" H
Weight: 8.3 lbs. without battery
Battery Charger Connector: 5 Pin MS Female
Power Required: 12 VDC 55 mA Standby, 5 Amps Transmitting

RECEIVER SPECIFICATIONS

Frequency Range: VHF 135-174 MHz, UHF 400-512 MHz
Frequency Stability: $\pm$ .001% (-30 to 50° C)
Sensitivity: 0.25 Microvolts Min (12 dB Sinad)
UHF Sensitivity: 0.35 Microvolts Min (20 dB Quieting)
Spurious Response: -80 dB Minimum
Adjacent Channel Rejection: -80 dB Min (25 KHz Ch)
Noise Squelch Sensitivity: 0.25 Microvolts
Modulation Acceptance: $\pm$ 5 kHz Nominal, $\pm$ 7.5 kHz Maximum
Temperature Range: -40 to 70° C
RF Input Impedance: 50 Ohms Nominal
FCC Approved

TRANSMITTER SPECIFICATIONS

Frequency Range: VHF 132-174 MHz, UHF 406-420 MHz, UHF 450-470 MHz
Power Output: Adjustable to 20 Watts
Frequency Stability: $\pm$ .0005% (-30 to 60° C)
Emission Type: 16F3
Audio Distortion (Max): 6% @ 60% rated system deviation with 1 kHz modulation
Spurious and Harmonics: 55 dB below carrier
FCC Approved

OPTIONS

Model 5252M Rack Mounted Repeater
Model 5252LP Lightning Protection (in coaxial line)

ORDERING INFORMATION (specify frequency or frequencies)

Model 5252 VHF Single Frequency Repeater
Model 5252P VHF Packaged Single Frequency Repeater
Model 5252S VHF Repeater Spare Parts Kit (Rx, Tx and Logic board)
Model 5252-2 VHF Dual Frequency Repeater
Model 5252-2P Packaged Dual Frequency Repeater, VHF
Model 5252-U UHF Single Frequency Repeater
Model 5252—UP UHF Packaged Single Frequency Repeater
Model 5252—US UHF Repeater Spare Parts Kit
Model 5252-2U UHF Dual Frequency Repeater
Model 5252-2UP Packaged Dual Frequency Repeater

Packaged Repeater Station with Rain Gage in the background, Philippines

TELEMETRY SYSTEMS

Real Time Event Reporting Telemetry, known in the United States as the ALERT System (Automated Local Evaluation in Real Time), is a proven, cost effective and highly reliable method to automatically collect meterological data.

Sierra/Misco is the leader in Real Time "Event Reporting" Telemetry and Automatic Timed Reporting of Data. Sierra/Misco pioneered the development of hardware for the ALERT system in cooperation with the National Weather Service, U.S. Department of Interior, and the California Department of Water Resources. The concept is very simple. In the event mode critical data is automatically and instantaneously transmitted to the base station computer for filing and processing. The user has available in the computer a continuously current data base.

This method of data collection is extremely reliable and cost effective since a receiver at the remote site required for polling systems has been eliminated.

The system is so simple and reliable that interrogation systems are frequently replaced by ALERT equipment based on the reduction of maintenance costs alone.

Model 5050 TRANSMITTER

The Sierra/Misco Data Transmitter automatically transmits data from a remote location to the central receiving station. The electronics are microprocessor based and use low power CMOS components. This enables the transmitter to operate for one year (20,000 transmissions) without a battery charge.

Each transmitter has the capability of 20 inputs (16 analog and 4 digital) with 2 digital inputs being standard. The digital channels are event actuated and transmit automatically when the parameter measured changes status. The analog channels are transmitted automatically on a timed basis or event basis.

FEATURES

- MTBF (Mean Time Between Failure): greater than 15 years
- 8,091 Sensor ID Numbers Available
- Short transmission time allows over 8,000 reports per hour on the same frequency with effective data reception
- An internal accumulator prevents loss of data from blocked transmissions
- Crystal clock is set for regular check signals which verify its operation during periods of inactivity
- An automatic regulator prevents the transmitter from remaining on and jamming a radio frequency channel
- Multiple sensor capability - 16 analog, 4 digital

SPECIFICATIONS

Sensor Input Signals:

1. Digital (incremental): SPDT Switch Contacts (Form C)
2. Analog: 0-5 VDC Signal
   Transmitted Code: Binary
   Analog Sensor Turn on Time: 1 millisecond
Standby Current: 15 ua
RF Transmitter: Refer to page 13
Transmission Modes:
1. Digital Channels
   a. Count up or down with automatic roll over - Binary (0 to 2047)
   b. Digital channels automatically transmit stored accumulator number to assure transmitter operation twice per day
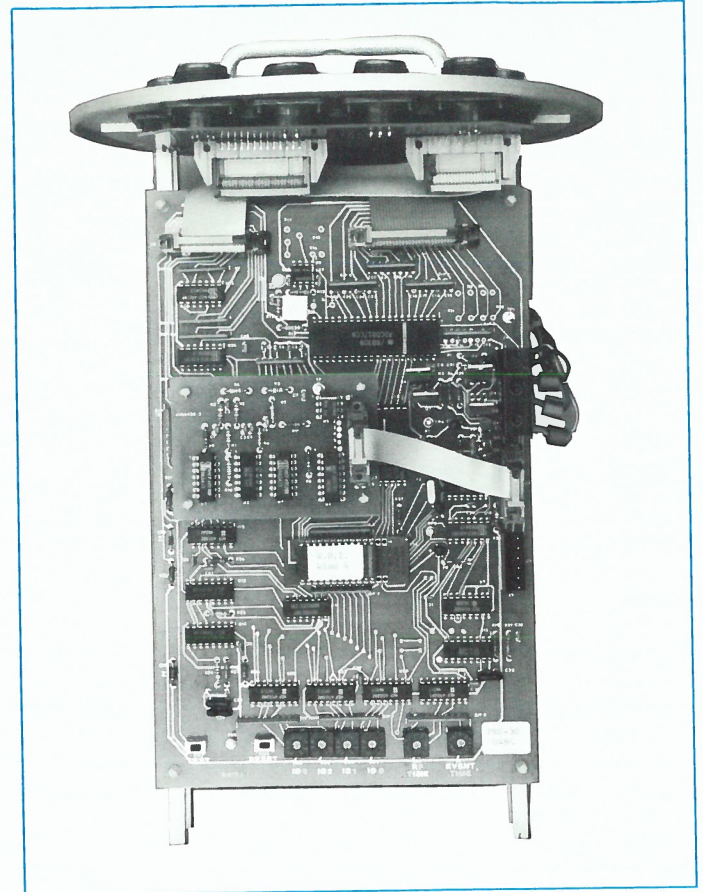
Model 5050 Transmitter

2. Analog Channels
   a. Timed: Automatic reporting from 3.6 minutes to 12 hours (switch selectable)
   b. Event: Every 3.6 minutes the analog sensors are scanned for the current reading. If there is an incremental change from the previous reading, the transmitter transmits the new data for that particular channel. The increment size is switch selectable: A) $\pm$ 0.4%, B) $\pm$ 0.8%, C) $\pm$ 1.6%

Transmitter Link: VHF Frequencies: 132-174 MHz
UHF Frequencies: 406-430, 450-470 MHz
Battery: One 9.5 ampere hour gel cell, 12 VDC; Wt. = 7.8 lbs.
Size: 8" D x 22" H
Weight: 17 lbs. with battery

OPTIONS

5031-12 Extra Battery with Connector for 40,000 transmissions per year.
5050U UHF Data Transmitter
5050CP Connector Package 2 digital 4 analog
5050CP-1 Connector Package 4 digital 2 analog
5050CP-6 Connector Package for 7 to 20 inputs (requires Nema 4 enclosure)
5050AO Analog Option
5050MW Transmitter without radio, with microwave interface (600 ohm impedance match)
5050PA-VHF Power Amplifier (20 watt), VHF
5050PA-UHF Power Amplifier (25 watt), UHF
Antenna and Cable (See Antenna Section of catalog)

ORDERING INFORMATION

5050 Transmitter VHF: Specify frequency
5050U Transmitter UHF: Specify frequency

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Model 5081
SELF-REPORTING
WEATHER STATION

Model 5081

The 5081 Real Time Event Reporting Weather Station is a packaged weather station used to automatically report weather data from remote sites on an event and/or timed basis to a central site. The 5081 Weather Stations are being used for automatic frost warnings, crop irrigation schedules, agricultural applications, marine weather forecasts and pollution dispersion studies.

The Weather Station is totally self-contained. Sensors are supplied complete with cables and connectors. Assembly and installation takes less than 4 hours in the field. The main housing acts as the sensor support, antenna tower and weather proof housing for the transmitter.

The standard Model 5081 Weather Station consists of wind, temperature, humidity, barometric pressure, and precipitation sensors, a 5050 transmitter, solar panel, interconnecting cables and antenna. Weather stations can be supplied with up to 16 analog and 4 digital sensors.

A station ID# is selected in the transmitter which automatically assigns ID numbers to each sensor. Two types of sensor inputs operate the transmitter: digital input sensors and analog input sensors.

For more detailed operational information refer to the Model 5050 Transmitter.

FEATURES
- Self-contained system with small built-in solar panel
- Transmits data automatically from remote sites by VHF or UHF radio
- Alarms are individually set in the computer
- Interfaces with meteorological and environmental sensors
- Low maintenance - requires one visit per year

SPECIFICATIONS
The 5081 standard sensor package includes:
  Wind speed/wind direction, Model 1036WS and 1036WD
  Temperature/relative humidity, Model 2042
  Precipitation, Model 5050P
  Barometric pressure, Model 1520
  One spare analog (0-5 VDC) channel
  One spare digital channel
Some available optional sensors:
  Soil Moisture, Model 3051 with 90880 Signal Conditioning
  Evaporation, Model 3003 with 90870 Signal Conditioning
  Solar Radiation, Model 4015 with 90862 Signal Conditioning
 Temperature, Model 3540P with 90830 Signal Conditioning

APPLICATIONS
- Industrial monitoring
- Local weather reporting
- Fire weather
- Marine weather
- Agricultural weather
- Irrigation control
- Airport monitoring
- Water quality monitoring

ORDERING INFORMATION
Model 5081 Self-Reporting Weather Station, VHF (specify frequency)
Model 5081U Self-Reporting Weather Station, UHF (specify frequency)
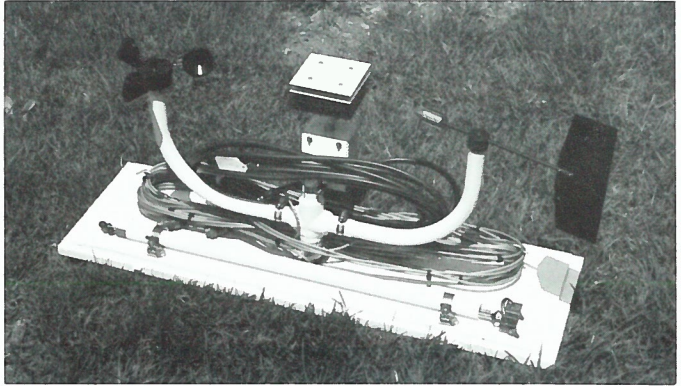
Model 5240 Sensors

Model 5240
PORTABLE FIRE
WEATHER STATION

Sierra/Misco's Model 5240 Portable Fire Weather Station transmits and stores meteorological data automatically to either a portable base station or directly to a fixed base station, for example at a fire control command center. Temperature, Relative Humidity, Fuel Moisture, Fuel Temperature, Precipitation, Wind Speed and Wind Direction reports are transmitted to the base computer for immediate evaluation of the area's fire weather conditions. The easily assembled station is placed in strategic locations for monitoring the weather conditions prior to a controlled burn or during a wild fire. Forrest and Fire Managers receive a continuous flow of data to assist in making fire control decisions. The Model 5240 meets the National Fire Danger Rating System requirements for weather stations.

The Model 5240 Portable Fire Weather Station consists of a Model 5240-6508 Modular CompuLogger with connector package in Nema 4 Enclosure, radio transmitter, sensors, sensor signal conditioning, lightweight portable tripod with a 20 foot mast, carrying case, mounting hardware, cable and antenna. The remote station is installed in approximately 15 minutes, ready for transmissions to a fixed or Portable Base Station Computer.

Normally, one or two locations are selected where specific weather observations are needed. Wind patterns, temperature profiles, humidity conditions and fuel moisture can be observed, utilized in prescription burns and recorded for future study. Existing radio or microwave telemetry links can be used to expand the territory covered by the Model 5240.

The Model 5240F is a fixed, or stationary, version of the Model 5240. The Model 5240F utilizes the same components as the portable station but replaces the tripod mast with a free standing 20' triangular steel tower.

BASE STATIONS
Fixed Base Stations, refer to Model 5071, page 8

Model 5240-6508

Fire Weather Station
in the Field

EQUIPMENT SUPPLIED

Model 5240-6508 CompuLogger with inputs programmed for temperature, humidity, fuel moisture, fuel temperature, wind speed, wind direction and precipitation, T8-VHF 8 watt transmitter mounted in weatherproof Nema 4 box with ms connectors and 5031-9.5 battery.
Model 1036HM Wind speed and direction sensor
Model 2040P-T Humidity and temperature sensor
Model 2501 Tipping bucket rain gauge
Model 5240-9000-20 Tripod assembly with sensor mounting and cabling
Model 5050ANT Antenna with coaxial cable
Model 5240CC Carrying Case

MODEL 5240 SPECIFICATIONS

Models 5240 and 5240F:

Temperature range: –40 to 60° C
Moisture range: 0-100% RH (Non-condensing)
Power supply: 12 VDC 4 Ampere Hour Gel Cell Battery
Power consumption: < 50 microamps quiescent, 1.50A transmitting
Solar panel option: Model 5033-0.4 12 VDC, 400 mA
Mast: Model 5240: 20' tripod (2 sections)
        Model 5240F: 20' free standing steel triangular tower (2 sections), hinged base plate, see page 19
Antenna: +3 dB Omni
Communication: VHF/UHF Event Reporting
Model 5240CC Transport case size: 3' L x 2' W x 2' H; weight: 25 lbs.

For detailed specifications, refer to the following:

Model T8-VHF or T4-UHF Radio Transmitters, page 13
Model 6508 CompuLogger, page 4
Model 1036HM Wind Speed and Wind Direction, page 20
Model 2040P-T Temperature and Relative Humidity, page 30
Model 4550 Radiation Shield, page 58
Model 2051 Fuel Moisture Sensor, page 34
Model 2051T Fuel Moisture/Temperature Sensor, page 34
Model 2501 Rain Gauge, page 44
Model 9000-20 Tripod, page 19
System weight, total: Model 5240, 95 lbs; Model 5240F, 145 lbs.

ORDERING INFORMATION

Model 5240 Portable Fire Weather Station, VHF
Model 5240-U Portable Fire Weather Station, UHF
Model 5240F Fixed Fire Weather Station, VHF
Model 5240U-F Fixed Fire Weather Station, UHF

Model 5240-5071PX
PORTABLE BASE STATION
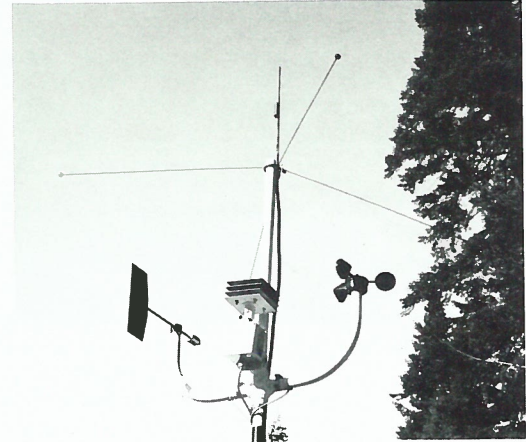
Fire Weather Sensors

The Portable Base Station consists of Computer Model 5071-PX, combined with the battery operated Model 5051R/DE-DC Receiver and Decoder, antenna and cables. The portable base station receives and stores the real time data being transmitted by the Portable Fire Weather Station. The portable base station is supplied with its own carrying case.

APPLICATIONS

- Wild Fires
- Prescription Burns
- Forest Management
- Fire Behavior Modeling
- Real Time Data plus Simultaneous Data Logging

FEATURES

- Lightweight, Compact Size
- Highly Portable
- Reliable and Rugged
- Battery Operation
- Automatic Meteorological Measurements
- VHF/UHF/Microwave Telemetry

MODEL 5240-5071PX8 PORTABLE BASE STATION SPECIFICATIONS

Equipment Supplied

Model 5071-PX Portable Computer with software and 124K operating memory
Model 5051R/DE-DC Battery operated receiver decoder
Model 5050ANT Omni Antenna with 20 feet of coaxial cable, interconnecting cables and connectors
Model 5240 TC Transport Case

For detailed specifications refer to the following pages in the catalog:
Model 5071-PX, page 5
Model 5051R/DE, page 12
Model 5050ANT, page 62

ORDERING INFORMATION

Model 5240-5071PX VHF Portable Base Station complete, specify frequency
Model 5240-5071PX-U UHF Portable Base Station complete, specify frequency

MODULAR DATA ACQUISITION SYSTEMS

Modular data acquisition systems allow the user to acquire specific sensors and data acquisition devices to complete a custom automatic monitoring system which will satisfy almost any data gathering requirement. Signal conditioning boards provide a simple means for making system changes at any time by adding or subtracting sensors and appropriate modular circuit cards. Future expansion can be designed into the system at its inception to facilitate expansion, postpone expense to meet budget restrictions, and offer ultimate flexibility. Maintenance costs and system down time are minimized with modular electronics. Only that portion of a system that needs repair must be taken out of service. Spare sensors or electronics can be plugged-in to the system to eliminate gaps in data. Solid state electronics with easily accessible calibration adjustments are provided on all modular circuits. Analog outputs of 0-5 VDC or 0-1 mA are standard. Modular card files hold 10 circuit boards and a power supply. Power required is either 110/220 VAC, 50/60 Hz or 12 VDC.

The output of the signal conditioning boards may be connected to existing telemetry or data logging devices to perform system upgrades. New components may be selected from this catalog to complete the system. VHF, UHF, infrared, telephone and hard wire telemetry digital displays are available options. Data loggers and personal computers can be supplied by Sierra/Misco, with appropriate software, which can be tailored to meet special needs. Our subsidiary, International Hydrological Services, specializes in writing software for today's modern data gathering systems. For more software information, refer to pages 000 in this catalog.

FEATURES

- Flexible
- Wide choice of sensors
- Field calibration available

GENERAL SIGNAL CONDITIONING CARD SPECIFICATIONS

Output voltage: 0-5 VDC
Output current: 0-1 mA
Calibration adjustments: Zero, Span
Operating temperature range: -40 to +140° F, -40 to +60° C
Power requirement: 110/220 VAC, 50/60 Hz, or 12 VDC
Power consumption: depends on the sensor; average is 4 mA per module at 12 VDC
Size: 4" x 4"
Weight: 0.3 lbs.
Shipping Weight: 1.0 lbs.

EQUIPMENT SUPPLIED

Sensor	Page	Model #	Range
• Wind Speed/Direction			
1005LED-360/540	Page 26	90820	0-100 mph, 0-360/540°
1005DC-360/540	Page 26	90821	0-100 mph, 0-360/540°
1005SW-360/540	Page 26	90822	0-100 mph, 0-360/540°
1010	Page 27	90824	0-100 mph, 0-360°
1016	Page 24	NR	0-134 mph, 0-360/540°
1016	Page 24	90823	0-100 mph, 0-360°
1036HM	Page 20	90825	0-100 mph, 0-360°

Other wind speed ranges on request - specify wind direction and range.

Sensor	Page	Model #	Range
• Barometric Pressure			
1520	Page 42	NR	Any 100 mb span between 600 and 1065 mb
1521	Page 42	90850	28.50 to 31.05" HG 965.1 to 1051.5 mb
• Humidity/Temperature			
2040P	Page 30	90840	0-100% @ -40 to +140° F
2040P-T	Page 30	90841	0-100% @ -40 to +140° F
2042-HT	Page 31	NR	0-100% RH Any temperature range between -40 and +140° F (-40 to +60° C)
• Dew Point			
2044	Page 35	90890	10.7 to 30° C
• Fuel Moisture			
2051	Page 34	NR	
• Precipitation			
Model 2500/2501	Page 44	90100	0-100 counts/auto reset counts represent calibration of sensor
• Evaporation			
Model 3003	Page 51	90870	0-8 inches
• Soil Moisture			
3051	Page 35	90880	0.2 bars to 15 bars
• Temperature			
3540P	Page 36	90830	Any range between -40 and +140° F or -40 and +60° C
• Solar Radiation			
4010	Page 54	90860	
4011	Page 55	90861	
4015	Page 55	90862	
• Water Level			
5050LL-FT	Page 49	90100	
5050LL-PT	Page 48	NR	
5050PT	Page 48	90101	
• Current Driver		90420	Provides 8 channels of either 0-1 mA or 4-20 mA (specify)
• Card File Chassis		90710	19" W x 5.25" H x 12" D
• Front Panel		90720	Custom made per requirement
• Power Supply		90700	110/220 VAC, 50/60 Hz to 12 VDC ± 0.1 VDC
• Nema 4 Enclosure		90730	Weatherproof enclosure for 6 channel card files; AC or DC power; solar panel input, etc.
• Range Doubling		XXX-RD	Adds dual range capability to any circuit card ordered with suffix

NR = Not Required

TOWERS AND MASTS
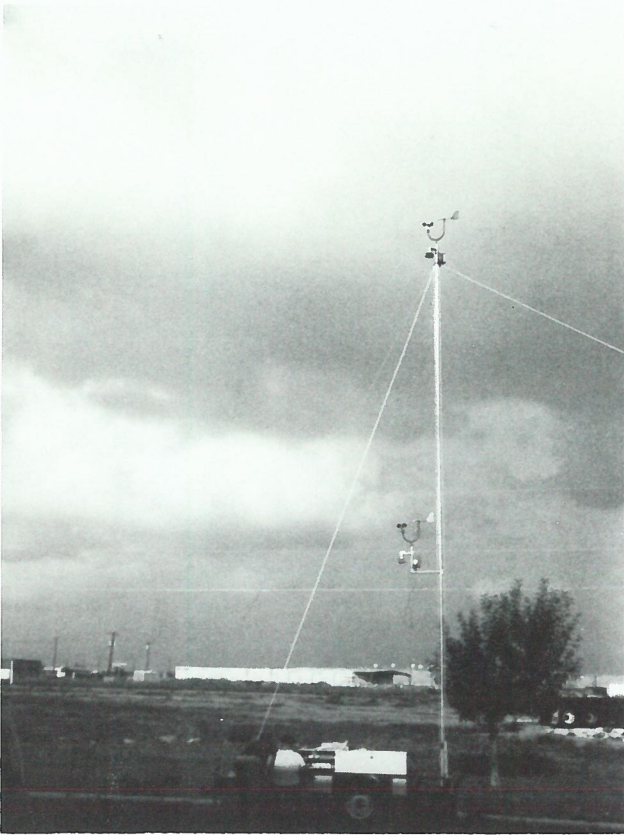
Modular data acquisition systems can be installed on existing masts or you can order a tripod mast, telescoping mast or triangular tower. Instrument elevators, sensor booms and all mounting hardware are available for both portable and fixed towers. Lightning protection kits can be provided for tower, sensor and power line protection. Towers meeting FAA Specifications for painting and lighting are available on special order. Turnkey installation also available on request.

ORDERING INFORMATION

- Tripod Masts

Tripod masts are offered for installations that require heights up to 10 meters. All models are portable, folding compactly into small bundles and feature a universal clamp for securing the instrument mast. Installation is simple and fast using lag screws in the base feet. Tripods are made with 1.25 inch tubular steel legs.

Model 9000-10 Tripod, 5 foot, with mast to 10 feet: Weight 15 lbs.
Model 9000-20 Tripod, 10 foot, with mast to 18 feet; Weight 30 lbs.
Model 9000-30 Tripod, 10 foot, with mast to 30 feet; Weight 50 lbs.

- Telescoping Masts

Telescoping masts are recommended for use with a single sensor such as the 1056 Totalizing Anemometer or 3540P Temperature Sensor. Available in heights up to 50 feet, they are supplied with all guying hardware. The base is ordered separately.

Model 9010-20 20-foot Mast; Weight 14 lbs.
Model 9010-30 30-foot Mast; Weight 22 lbs.
Model 9010-40 40-foot Mast; Weight 30 lbs.
Model 9010-50 50-foot Mast; Weight 39 lbs.
Model 9011-M Universal Base for all telescoping masts; Weight 31 lbs.

- Triangular Towers

Triangular towers are used primarily in fixed installations. Equilaterial triangular designed sections with Z-bracing are hot-dip galvanized for rust prevention. All steel sections bolt together for simple installation. All seams and joints are welded. Towers up to 10 meters have 1.25 inch tubular steel legs and are spaced 12.5 inches on a side. Consult factory for technical information about towers taller than 10 meters.

Model 9020-9 Top Section and Mast Support, 9 foot; Weight 30 lbs.
Model 9020-10 Tower Section, 10 foot; Weight 30 lbs.
Model 9020CBP Concrete Base Plate; Weight 13 lbs.
Model 9020HCBP Hinged Concrete Base Plate; Weight 21 lbs.
Model 9020FRM Flat Roof Mount; Weight 24 lbs.
Model 9020-GK Guying Kit, 10 meter tower, includes 3-5 foot screw earth anchors, 3 turnbuckles guy ring, 3 sets guy wires
Model 9020-LP Lightning Protection, 10 meter tower, includes 8 foot copper lightning rod, 8 foot copper ground rod, 2/0 copper cable, 10 cable standoffs, 2 ground clamps

Model 9020-9
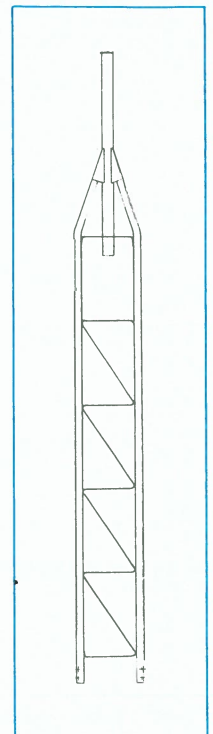
Model 9020-9

19

STRIP CHART RECORDERS

Model 9051 Dual Channel Strip Chart Recorder

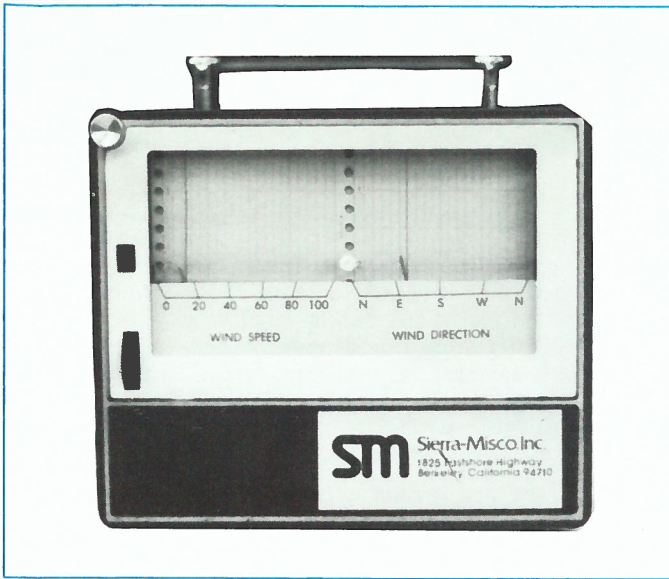Sierra/Misco supplies Rustrak Strip Chart Recorders that are recognized for accuracy, dependability, simplicity of design and high quality. These recorders can be used to record the outputs of the sensors shown in this catalog such as wind speed and direction, temperature, humidity, rainfall, solar radiation, barometric pressure, etc.

Rustrak recorders are available in single channel, dual channel and three channel models. Data is recorded on 2-5/16" wide pressure sensitive chart paper. The chart tear off or re-roll feature makes chart paper easily changed by the user. Standard chart speed is 1" per hour, which permits a 30-day recording period. The access window slides open so notations can be made on the chart. Recorders can be ordered to operate on 110 VAC, 220 VAC or 12 VDC.

SPECIFICATIONS

Inputs: 0-1 mA DC
Accuracy: ± 2% F.S.
Response Time: Less than 1.0 sec.
Chart 2-5/16" width per channel, standard chart speed 1"/hr, 30-day duration (other speeds available, consult factory)
Power: 110 VAC, 60 Hz, 5 watts; 220 VAC, 50 Hz, 12 VDC (current requirements, 12 mA/channel, time base accuracy ± 0.5%)
Size: Single Channel - 3⅝" x 5⅝" x 5¾"
      Dual Channel - 6⅝" x 5⅝" x 6¾"
      Three Channel - 5⅝" x 11" x 6¾"
Weight: Dual Channel 13 lbs.
Shipping Weight: 24 lbs.

ORDERING INFORMATION

Model 9050AC Single Channel Recorder, 110 VAC
Model 9050DC Single Channel Recorder, 12 VDC
Model 9051AC Dual Channel Recorder, 110 VAC
Model 9051DC Dual Channel Recorder, 12 VDC
Model 9052AC Three Channel Recorder, 110 VAC
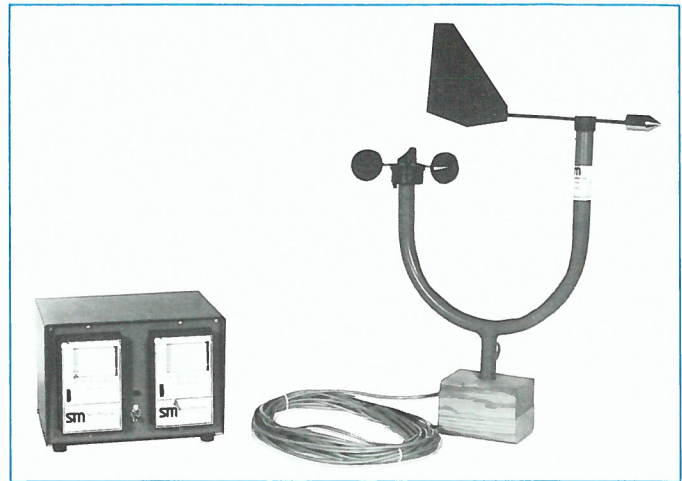Model 9052DC Three Channel Recorder, 12 VDC
Model 9050C Chart Paper, Single Channel
Model 9051C Chart Paper, Dual Channel
Model 9052C Chart Paper, Three Channel
Model 9050-220 Add per recorder for 220 V 50 Hz operation

Model 1036
RECORDING WIND SPEED AND DIRECTION SYSTEMS

Model 1036 Recording Wind System

The Model 1036 General Purpose Wind System provides an economical means of continuously monitoring wind speed and wind direction. The sensors consist of a rugged 3-cup anemometer for wind speed and a balanced vane for wind direction. They are mounted on a "U" shaped crossarm made of aluminum. The 1036 sensors are combined with strip chart recorders, digital displays or telemetry electronics to monitor wind speed and/or wind direction applications.

The Model 1036AC uses 2 each single channel 9050 recorders and the 1036DC uses a single two-channel recorder. The recorder receives the electrical signals via a five-conductor cable and records the information continuously on a pressure sensitive, dual-channel 6" chart. The chart is intermittently marked by the galvanometer needle making a closely spaced series of dots which appear as a continuous trace. Grid width is 58mm (2.3") for each channel providing better than 2% signal resolution.

FEATURES

Sensors:
- Low moment of inertia
- Unique bearings that permit rapid response to gusts and lulls
- Thermal properties that resist icing
- Easily mounted on 1" pipe

Recorder:
- Chart speed 25mm (1")/hour
- 31 day record/chart
- Sliding access window permits operator to make chart notations
- 115 V/60 Hz (230 V/50 Hz and 12 VDC optional)

Optional Digital Display:
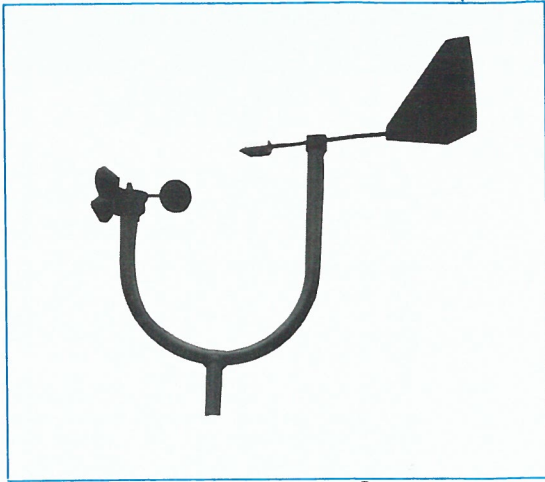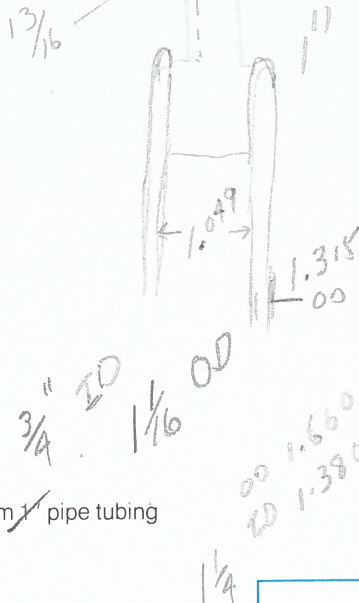- ½" - 3.5 Digit (Red LED) in attractive enclosure

SPECIFICATIONS

Recorder:
See Models 9050AC and 9051DC, page 20, for specifications on recorder

Sensors:
- Wind Speed - Model 1036WS Sensor
  Range: 0-100 mph

Accuracy: ± 1% FS
Cup Diameter: 2″ (turning radius 3.75″)
Distance Constant: 10 feet of air
Material: Black Lexan
Sensor: AC generator
Starting speed: 1 MPH

- Wind Direction - Model 1036WD Sensor
Range: 0-360°
Distance constant: 4.8 ft.
Damping ratio: 0.5 ft.
Vane: counterbalanced, 15¼″ L x 6¼″ H
Sensor: potentiometer, 360° - 1K ohm
Dead span: 3°
Linearity: 0.5%
Accuracy: 5°
Threshold: 1 mph
Mounting Tube: U-assembly, anodized aluminum 1″ pipe tubing
   - sensors 11″ apart

ORDERING INFORMATION

Model 1036AC Wind Speed and Direction Recording System complete with 50′ of sensor cable, 115 V/60 Hz
Model 1036DC Same as above except 12 VDC
Model 1036C-WS Chart paper for 1036AC Wind Speed
Model 1036C-WD Chart paper for 1036AC Wind Direction
Model 1036C-DC-WS/WD Chart paper for 1036DC Wind Speed and Direction
Model 1040C Additional lead-in cable
Model 5031-9.5 12 VDC - 9.5 ampere hour rechargeable battery
Model 5030 Battery charger
Model 1036HM WS and WD Sensors with U-crossarm mounting and 50′ of cable
Model 1036WS Cup anemometer with 50′ of cable
Model 1036WD Wind Direction Vane with 50′ of cable
Model 1011U U-crossarm for sensor mounting

WS and WD Sensors on Crossarm

Model 1036WDD Digital WS and WD Indicator System

Model 1036WSI
DIGITAL WIND SPEED INDICATOR
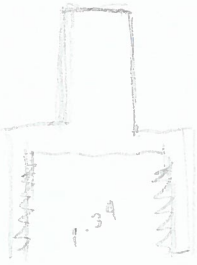
Model 1036WSI Digital Wind Speed Indicator is used in applications where easy to read current wind speed readings are required. The unit consists of a cup anemometer, indicator console, AC power cord, 50′ lead-in cable and mount. Wind speed is indicated on a bright red LED display.

SPECIFICATIONS

Display: ½″ Red LED, 3.5 digit
Range: 0-100 mph
Sensor: 3 cup anemometer with AC generator - Model 1036WS, for specifications see page 20
Accuracy: ± 1 digit
Power: 110 VAC/60 Hz
Dimensions of Indicator: 5″ W x 7″ D x 3″ H
Weight: 3 lbs.
Shipping Weight: 5 lbs.

ORDERING INFORMATION

Model 1036WSI Digital Wind Speed Indicator System with sensor and 50 ft. of cable
Model 1036C Additional Lead-in Cable

Model 1036WDI
DIGITAL WIND DIRECTION INDICATOR

Model 1036WDI Digital Wind Direction Indicator is used in applications where easy to read current wind direction readings are required. The unit consists of a wind vane, indicator console, AC power cord, 50′ lead-in cable and mount. Wind direction is indicated on a bright red LED display.

SPECIFICATIONS

Display: ½″ red LED, 3.5 digit
Range: 0-360°
Sensor: Directional vane coupled to precision linear potentiometer, Model 1036WD, for specifications see page 20
Accuracy: 5°
Sensor Mount: ½″ pipe with set screw
Power: 110 VAC/60 Hz
Dimensions of Indicator: 5″ W x 7″ D x 3″ H
Weight: 3 lbs.
Shipping Weight: 5 lbs.

ORDERING INFORMATION

Model 1036WDI Digital Wind Direction Indicator System with sensor and 50 ft. of cable
Model 1036C Additional Lead-in Cable
Model 1036WDD Digital WS and WD Indicator System with sensors and 50′ of sensor cable
Model 1036DD Digital Display Indicator, replacement

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Model 1046
SELECTRONIC WEATHER STATION

Model 1046

The Model 1046 Selectronic Weather Station is a low cost, selectable, precalibrated system. The heart of the system is a 1046SC Multiple Signal Conditioning Board which is programmed at the time of order for the sensors you select. The standard system consists of sensors to measure wind speed, wind direction, temperature, relative humidity and precipitation. Sensors are provided with 50 feet of cable, solar radiation shield and all mounting hardware. They can be installed on any mast or tower.

The output is selected to: 1) drive a computer, 2) be connected to digital displays, 3) drive recorders, or 4) by using current drivers, to supply 4-20 mA for existing systems. Signal conditioning electronics are provided in either a desk-top 1046CAB or weatherproof 1046 enclosure. Up to 8 analog and 2 digital sensor inputs can be accommodated. Outputs available are 0-1 VDC, 0-5 VDC, 0-1 mA, and 4-20 mA. In addition, an RS232C interface can be provided for direct input to a modem or computer. Input power can be supplied from 110 VAC or 12 VDC. Software to run most popular computers with the Selectronic Weather Station is available.

SPECIFICATIONS

- Sensors:

Wind Speed/Direction, Model 1036HM, page 20
Relative Humidity and Temperature, Model 2040P-HT, page 31
Solar Radiation Shield, Model 4551, page 56
Precipitation, Model 2501, page 44
Barometric Pressure, Model 1521, page 42
Optional Sensors: refer to various sensors in catalog

- Signal Conditioning:

Multichannel Circuit Card, Model 1046SC,
Provides signal conditioning for 8 analog and 2 digital inputs
Multichannel Current Driver, Model 90420, page 18
Provides 8 channels of 4-20 mA current drive from 0-5 V signals,
   power supply, 110 VAC/60 Hz, 220 VAC/50 Hz, or 12 VDC
Enclosure, desk-top or weatherproof (specify)

- Displays:

Digital: 3.5 or 4.5 digit, ½" red LED, desk top enclosure or panel.
   Please specify.

ORDERING INFORMATION

Model 1046 Selectronic Weather Station with 1036HM Wind Speed and Direction, 2040P-T Relative Humidity and Temperature, 2501 Precipitation and 1521 Barometric Pressure Sensors, 1046SC Signal Conditioning Card, specify desk top or outdoor enclosure and power 115 VAC, 220 VAC or 12 VDC
Model 1046CAB Desk-top enclosure
Model 1046NEMA Weatherproof Enclosure
Model 1046-232 RS232C Output
Model 1046DD-TM Standard Digital Display Table Mount
Model 10466DD-RM Standard Digital Display Rack Mounted
Model 1046-C Extra sensor cable
Note: Maximum cable length for the 2040P-T is 50 ft.
Model 1046C-D Shielded cable to connect displays, 500' maximum; for greater lengths, consult factory
Note: for masts and towers, see catalog page 19
      for telemetry and computer components, see pages 8-17
      for software information, see page 7
Custom 1046 Selectronic Weather Stations and compatible computer software can be provided to meet your exact requirements. Please consult factory for details.

Model 1032
WIND SPEED AND DIRECTION INDICATING WEATHER STATION

Model 1032 Wind Speed and Direction System

The Model 1032 Wind Speed and Direction Indicating Weather Station is the same as the Model 1033 without the outdoor temperature measurement.

SPECIFICATIONS

Sensor: Same as Model 1036WS and 1036WD, see page 20
Panel: 15½" x 7½" x 4½"
Wind Speed Range: 0-100 mph standard; 0-100 kph optional
Wind Direction Range: 0-360°
Weight: 5.4 lbs.
Shipping weight: 11 lbs.

ORDERING INFORMATION

Model 1032 Wind Speed and Direction Indicating Weather Station
Model 1032C Additional Lead-in Cable
Model 1032-100KM Optional 100 kph Wind Speed Range
Model 1040M Sensor Mounting Kit

Model 1033
WIND SPEED/DIRECTION AND TEMPERATURE INDICATING WEATHER STATION

Model 1033 Wind Speed, Direction and Temperature System

The Model 1033 uses the same components as the Model 1045 Weather Station without indoor temperature, relative humidity or barometric pressure. Wind speed, wind direction and outside temperature are individually displayed on 4″ panel meters. Includes 50 feet of cable for wind speed and direction sensors and 20 feet for remote temperature probe.

SPECIFICATIONS

Wind Sensors: Same as Model 1036WS and 1036WD, see page 20.
Panel: 22½″ x 7¾″ x 4½″
Wind speed range: 0-100 mph; 0-100 kph optional
Wind direction range: 0-360°
Temperature Sensor Range: –20 to +120° F
Shipping weight: 10 lbs.

ORDERING INFORMATION

Model 1033 Wind Speed/Direction and Temperature Indicating
  Weather Station
Model 1033C Additional lead-in cable
Model 1040M Sensor Mounting Kit
Model 1033-100KM Optional wind speed range, 0-100 kph

Model 1039
HAND HELD WIND MEASURING SET

Model 1039 Hand Held Wind Measuring Set

The Model 1039 Hand Held Wind Measuring Set is used in applications where spot wind speed and direction measurements are required. The unit is rugged and reliable and operates on 3 "D" cell batteries for up to one year. An optional carrying case can be provided for use in the field.

SPECIFICATIONS

Anemometer: See Model 1036WS, page 20
Vane: See Model 1036WD, page 29
Readout: 4″ meter
Range: 0-100 mph standard; 0-100 kph optional
Power: 3 "D" cell batteries
Overall Size: 19″ H x 13″ W x 5″ D
Instrument Weight: 7 lbs.
Shipping Weight: 12 lbs.

ORDERING INFORMATION

Model 1039 Hand Held Wind Set
Model 1039C Carrying Case
Model 1039-100KM: 0-100 kph range

Model 1045
INDICATING WEATHER STATION

Model 1045

Model 1045 Weather Station features six measurements: wind speed and direction, indoor temperature, outdoor temperature, barometric pressure and indoor relative humidity. The wind speed and direction and outdoor temperature are displayed on 4″ panel meters while the other parameters are displayed on 2¾″ round dials. The wall mounted decorative display panel frame (14¼″ x 13½″ x 3½″) is made of hand rubbed maple. Roof mounted precision wind speed and direction sensors are supplied with 50 feet of cable. The unit is easy to install. Power is supplied by three "D" cell batteries.

SPECIFICATIONS

Sensor: Same as Model 1036WS and 1036WD, see page 20
Wind Speed Range: 0-100 mph; 0-100 kph optional
Wind Direction Range: 0-360°
Temperature Range:
   Outdoor: –20 to +120° F (–30 to +50° C)
   Indoor: 0 to 120° F (–20 to 50° C)
Pressure: 28 to 31″ Hg, 950 to 1050 MB
Humidity: 10 to 100%
Power: 3 each "D" cell batteries, battery life approximately 1 year
Dimensions: Panel: 14″ H x 15½″ W x 4¼″ D
Weight: 10 lbs.
Shipping Weight: 20 lbs.

ORDERING INFORMATION

Model 1045 Weather Station
Model 1045C Additional lead-in cable for wind speed and direction sensors or outside temperature probe
Model 1045-100KM Optional wind speed range, 0-100 kph
Model 1040M Sensor Mounting Kit (contains adapters for easy mounting of sensor crossarm on roof, TV antenna, or side wall)

Model 1016
PROPVANE WIND SPEED AND DIRECTION SENSOR

Model 1016

The Model 1016 Propvane is a rugged wind sensor originally developed for use on ocean buoys. The propvane is ideally suited for use in harsh environments and remote sites where maximum reliability is required.

The wind speed sensor is a helicoid shaped propeller molded of polypropylene plastic. Rotation of the propeller produces an AC sine wave voltage signal with the frequency directly proportional to wind speed. The AC voltage signal is induced in a centrally mounted coil by a six pole magnet mounted on the propeller shaft. The coil is located on the non-rotating central portion of the main mounting assembly, eliminating the need for slip rings and brushes.

The wind direction sensor is a precision conductive plastic potentiometer located in the center of the main housing just below the wind speed transducer coil. With a regulated voltage applied to the potentiometer element, the output signal is an analog voltage directly proportional to azimuth angle.

The tail assembly is thermoformed of rigid plastic and the main housing nose cone assembly and other internal parts are injection molded plastic. Propeller shaft bearings and vertical shaft bearings are stainless steel precision grade.

All sensor leads terminate in a junction box on the mounting post. A sensor interface circuit card which mounts in the junction box is available for adapting the wind speed signal to an analog DC recorder or data logger.

A line driver circuit is available for driving lines longer than 900m up to several km. Signal error due to line drop is less than 1% over a temperature range of –40 to +40° C.

FEATURES

- Heavy duty wind monitor
- No slip rings or brushes
- Rugged, lightweight
- Low maintenance
- Good dynamic response, excellent signal linearity
- Highly reliable components
- Designed for use in remote and severe environments

SPECIFICATIONS

Wind Speed Range: 134 mph
Survival Speed: 180 mph
Azimuth: 360° mechanical, 355° electrical (5° open)
Threshold Sensitivity of Propeller: 1.6 mph
Threshold Sensitivity of Vane: 1.8 mph
Distance Constant: 63% recovery of propeller: 10.5 ft.
Delay Distance (50% recovery) of Vane: 4.3 ft.
Damping Ratio of Vane: 0.23
Signal Output: Wind speed, magnetically induced AC volts, three sine wave voltage pulses per propeller revolution. 1800 rpm (90 Hz) = 19.7 mph
Azimuth: Analog DC voltage from precision low torque conductive plastic potentiometer (requires regulated excitation voltage). Resistance 10K ohms, linearity 0.25%, life expectancy 20 million revolutions.
Power Required: 5 to 15 VDC regulated supply voltage recommended for potentiometer excitation. Sensor interface and line driver circuits require 12 VDC (nominal)
Size: Overall height 14.6", overall length of main housing including vane and propeller 21.7"
Fin Size: 9.4" H x 5.5" L
Propeller Diameter: 7.1"
Diameter of Main Housing: 2.0" - mounts on standard 1" pipe, outside diameter 1.34"
Weight: 3.2 lbs.
Shipping Weight: 5.5 lbs.

ORDERING INFORMATION

Model 1016 Propvane
Model 1016C Sensor cable with spade lug termination, 65 ft.
Model 1016E Sensor interface circuit*
Model 1016F Line driver circuit, 360 Azimuth*
Model 1016G Line driver circuit, 540 Azimuth*

*Specify wind speed scaling: mph, m/s, knots; mph will be supplied if not specified)

Model 1016A
36-POINT WIND TRACKER
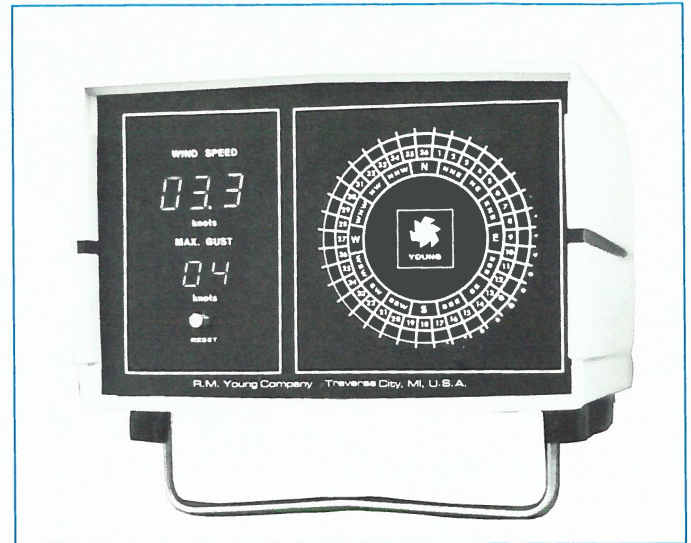
Model 1016A

The Model 1016A provides an easy to read visual display of wind speed and direction for use with the propvane. The three digit display for wind speed resolves values to 0.1 mph and updates every two seconds. A second two-digit display indicates and holds the highest wind speed until manually reset with a push button on the front panel.

Wind direction with a resolution within 10° is displayed by means of 36 LEDs mounted in a circular compass pattern with North in the conventional top position. The outer scale is marked with 36 segments numbered 1 through 36.

An optional wind variability display is available which indicates the total wind sector through which the vane is swinging. This display consists of a second concentric set of 36 LEDs mounted around the instantaneous display. Each segment lights as the vane swings through its compass position and stays lit for approximately one minute, slowly fading in brightness.

FEATURES

- Easy to read visual display
- Indicates maximum wind speed
- Optional voltage output for recorder or data logger

SPECIFICATIONS

Wind Speed Range: 0-100 mph
Wind Direction Range: 0-360°
Speed Resolution: 0.1 mph/2 sec
Direction Resolution: 10 degrees
Output Voltage Option: 0 to 1 volt DC full scale
Input Connection: Spade lug terminal strip
Power: 115 VAC/50-60 Hz
Size: 4.5" H x 8.5" W x 9" D
Weight: 5 lbs.
Shipping Weight: 7 lbs.

ORDERING INFORMATION

Model 1016A 36-Point Wind Tracker
Model 1016AV Same as above except with Wind Variability Feature
Model 1016VO 0-1 VDC voltage output for recorder or data logger
Model 1016A-FB Flush mounting bracket
Model 1016A-RB Rack mounting bracket

Model 1016B
PROPVANE DIGITAL WIND INDICATOR

Model 1016B

The Model 1016B Propvane Digital Wind Speed/Wind Direction Indicator is used with the Model 1016 Propvane Wind Sensor to give a continuous LED digital display of wind speed and direction. Two separate LED digital panel meters indicate wind speed 0-100 mph, 0-100 knots, or 0-50 m/s and wind direction 0-360 degrees. Parallel voltage outputs are available from a terminal strip on the rear panel for a recorder or data logger.

FEATURES

- Portable case with tilt-up bail
- Flush panel or 19″ enclosure with rack mounting panel

SPECIFICATIONS

Wind Speed: 0-100 mph standard; 0-100 knots or 0-50 m/s optional
Wind Direction: 0-360°
Wind Speed Resolution: 0.1 digit
Wind Direction Resolution: 1 degree
Input Connections: Spade lug terminal strip
Output Voltages: Normally 0 to 1 VDC full scale
Size: 8″ W x 2.5″ H x 6.2″ D
Power: 115 V/50-60 Hz (230 V/50-60 Hz optional)
Weight: 6 lbs.
Shipping weight: 9 lbs.

ORDERING INFORMATION

Model 1016B Wind Speed/Wind Direction Indicator
Model 1016BDC Same as above except 12 VDC battery operated
Model 1016B-FB Flush Mounting Bracket
Model 1016B-RB Rack Mounting Bracket

Models 1005 and 1010
WIND SENSORS

Model 1005 Sensitive Anemometer

Sensitive Wind Sensors are used to provide highly accurate wind speed and direction information. The sensors consist of a cup anemometer to measure wind velocity and a counterbalanced vane to measure wind direction. The Crossarm Mounting Assembly complies with EPA Ambient Guideline #450/4-80-012 para. 5.2, and NRC Regulatory Guide 1.23 Sec. C2. Signal conditioning is available to allow use with almost any analog or digital recorder, digital or analog display and telemetry or computer system. For signal conditioning and displays, refer to Modular Data Acquisition Systems, page 18.

Model 1005
ANEMOMETER

The cup housing and rotor are made from anodized aluminum to prevent corrosion. Internal shafts and bearings are stainless steel, permanently lubricated and shielded for long life. Standard cups are molded from LEXAN. Stainless steel models are available for use in corrosive environments. Three wind speed configurations are available:

- DC Generator:
Model 1005DC for standard use. The DC generator provides a linear output voltage proportional to the wind speed. Output is 5 VDC at 150 mph.

- High Frequency Tachometer:
Model 1005LED for the lowest starting speed. A nearly frictionless anemometer which utilizes an optical switch — an infrared light emitting diode — that activates a phototransistor through a slotted disk attached to the sensor shaft. Rotation of the cups provides a pulsed output that is proportional to wind velocity.

- Contact Closure:
Model 1005C for switch closure (wind run) output. A sealed magnetic reed switch is activated by a magnet attached to the sensor shaft. The output is a series of contact closures that provides a frequency proportional to the wind speed.
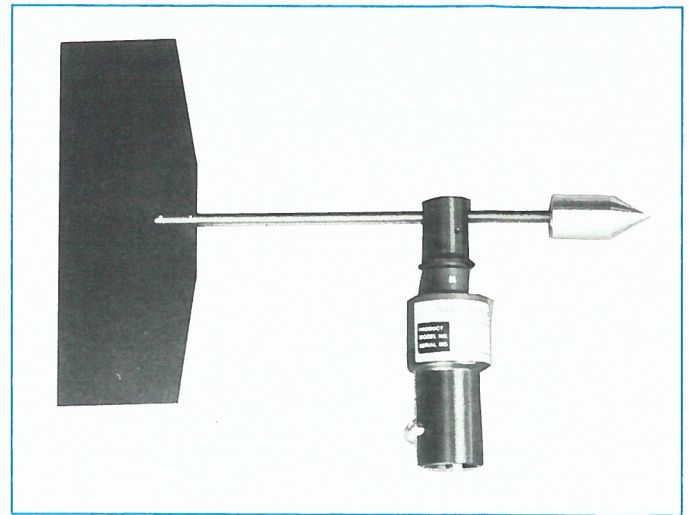
Model 1010 VANE

The vane is coupled to a precision potentiometer that provides a voltage output signal proportional to the wind direction when properly oriented. The small surface area of the vane above the body of the instrument prevents induced turbulence and is sufficiently light in weight to maintain a direction overshoot of less than 14%. The housing and shaft are made of anodized aluminum. Internal bearings are stainless steel. This unit is available in an all stainless steel model for corrosive environments.

FEATURES

- Sensitive, starting speed under 1 mph
- Accuracy meets or exceeds EPA and NRC requirements
- NBS Traceable calibration
- 360° or 540° wind direction vane
- LED, DC Generator or Contact Closure anemometer
- Stainless steel models available

SPECIFICATIONS

- Sensitive Anemometer, general, Model 1005
  Range: 0-100 mph
  Temperature Range: –40 to +140° F
  Accuracy: ± 1%
  Size (overall): 5½″ H x 7″ D
  Weight: 12 oz.
  Shipping weight: 5 lbs.

- DC Generator, Model 1005DC
  Output: Linear, 0-5 VDC = 0-150 mph
  Threshold: 0.75 mph
  Distance Constant: 7 feet

- High Frequency Tachometer, Model 1005LED
  Output: Square wave signal, frequency proportional to wind speed
  Threshold: 0.5 mph
  Distance Constant: 5 feet

- Magnetic Reed Switch, Model 1005C
  Output: Contact closures, frequency proportional to wind speed
  Threshold: < 1 mph
  Distance Constant: 8 feet

- Sensitive Vane, Model 1010
  Accuracy: ± 2°
  Threshold: 0.5 mph
  Range: Model 1010-360, 0-360 Azimuth
         Model 1010-540, 0-540 Azimuth
  Linearity: 0.5%
  Resolution: < 1°
  Temperature Range: –40 to +140° F
  Potentiometer: 1 K ohm
  Damping Ratio: 0.4
  Distance Constant: 3.8 ft.
  Size: 15″ L x 12″ H
  Weight: 1 lb.
  Shipping weight: 2 lbs.

- Crossarm Mounting Assembly, Model 1011C
  Complies with EPA Ambient Guideline 450/4-80-012 para. 5.2 and NRC Regulatory Guide 1.23 Sec. C2.


Model 1010 Sensitive Wind Vane

ORDERING INFORMATION

- Sensitive Anemometer Sensors: Include 50′ cable
Model 1005DC DC Generator
Model 1005LED High Frequency Tachometer
Model 1005C Reed Switch
Model 1005SSA Stainless Steel Anemometer Body
Model 1005LC Standard Lexan Cup Assembly
Model 1005SSC Stainless Steel Cup Assembly

- Sensitive Wind Direction Transmitters: Include 50′ cable
Model 1010-360 360 Azimuth range
Model 1010-540 540 Azimuth range
Model 1010-360SS 360° range, Stainless Steel
Model 1010-540SS 540° range, Stainless Steel
Model 1010V Replacement Vane Assembly
Model 1010VSS Replacement Vane Assembly, Stainless Steel

- Accessories
Model 1011C Crossarm Mounting Assembly, prewired
Model 1010BB Replacement Bearing Set for either Anemometer or Vane

Model 1055
TOTALIZING/INDICATING ANEMOMETER
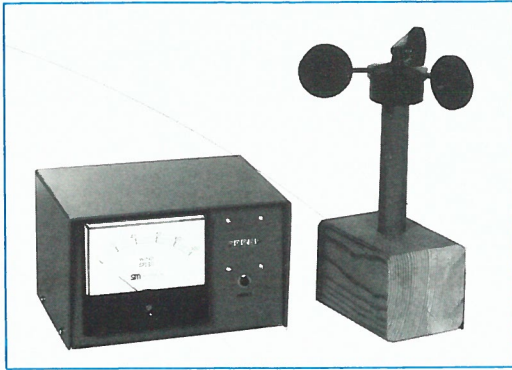
Model 1055

Model 1055 Totalizing/Indicating Anemometer is used in applications where it is desirable to know the current wind speed and also record the total wind passage over a period of time. The anemometer is a rugged, reliable and highly accurate unit that has a low moment of inertia and unique bearings that permit very rapid response to gusts and lulls. The black Lexan cup assembly has thermal properties that resist icing more effectively than metal assemblies. The instrument readout consists of a 4-inch panel meter for display of wind speed (and optional wind direction) and a five-digit display for recording wind passage. This instrument can be supplied with a switch and vane for wind direction readings. Shipped complete with 50 feet of connecting cable.

FEATURES

- Rugged
- Low cost
- Low maintenance
- Indicates current wind speed and total wind run
- Easy to install and operate

SPECIFICATIONS

- Anemometer, Model 1036WS
  (refer to pages 20-21 for sensor specs)
  Mounting: ½" pipe

- Readout Unit
  Power: 115 VAC, 60 Hz standard; 12 VDC @ 6 mA optional
  Operating Temperature Range: –40 to +140° F
  Wind Speed: 0-100 mph
  Wind Run: 1 mile standard; 1/60 mile, 1 km, or 1/60 km optional, specify at time of order

- Size
  Panel: 9" W x 6½" H x 7" D
  Head: 5½" H x 7" D
  Weight: 8 lbs.
  Shipping Weight: 10 lbs.

ORDERING INFORMATION

Model 1055 Totalizing/Indicating Anemometer with 50' cable (1 mph range will be supplied unless alternate specified)
Model 1055C Additional lead-in cable
Model 1055WD Anemometer with Wind Direction option
Model 1055-100KM Optional 0-100 kph range
Model 9000-10 10 ft. Mast and Tripod
Model 9010-30 30 ft. Telescoping Mast
Model 5031-9.5 Battery
Model 5030-8 Battery Charger

Model 1056
TOTALIZING ANEMOMETER
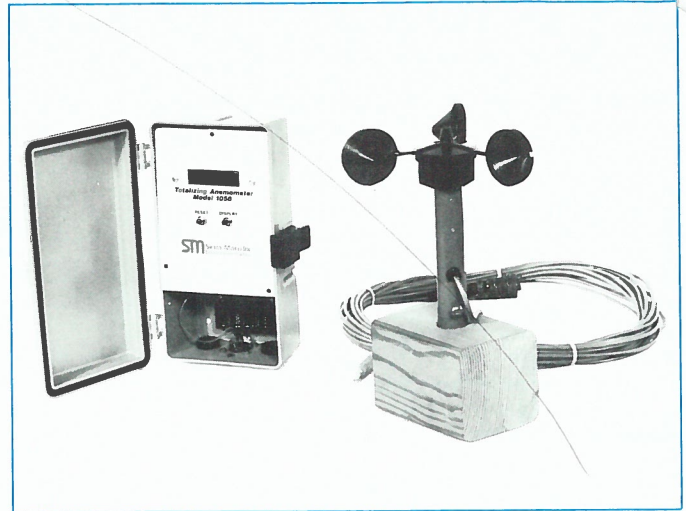
Model 1056

The Model 1056 Totalizing Anemometer is a low cost instrument that stores wind run data in its memory and displays it on a 9 digit LED display. It is an excellent unit for performing wind site analysis, wind energy studies, and for use in evaporation stations. By recording the time between readings, the user can calculate the average wind speed for any location for that period of time. The 1056 is supplied with 50 feet of connecting cable, and 3 "C" size long life batteries, which allow wind data to be recorded over periods of up to 1 year.

SPECIFICATIONS

- Anemometer, Model 1036WS
  (refer to pages 20-21 for sensor specs)
  Accuracy: ± 1 increment
  Reset: Momentary push button switch
  Readout: Momentary push button switch

- Readout Unit
  Power: 3 size "D" Alkaline Batteries
  Case Material: Fiberglass
  Display: 9 digit LED
  Operating Temperature Range: –40 to +140° F
  Size: Panel: 6" W x 9½" H x 3½" D
      Head: 5½" H x 7" D
  Weight: 2 lbs.
  Shipping Weight: 5 lbs.
  Standard Calibration: 1 mile
  Optional Calibration: 1/60 mile, 1 km or 1/60 km

ORDERING INFORMATION

Model 1056 with 50 ft cable (specify calibration)
Model 1056C Additional cable
Model 1056-100KM Optional 0-100 kph range
Model 9000-10 10 ft. mast and tripod
Model 9010-30 30 ft. telescoping mast

Model 1070
WIND DIRECTION CONTROL
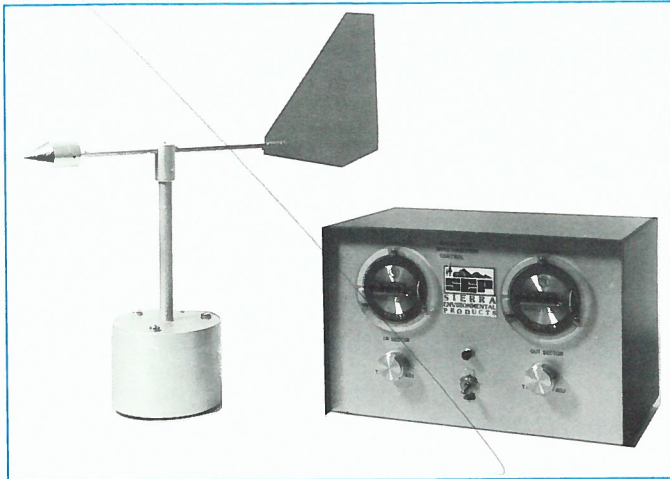
Model 1070

The Model 1070 consists of two basic components: a wind direction head and a control console. It can be used to turn on and off equipment such as high volume air samplers and exhaust fans when the wind is from a certain direction.

The wind direction sensor is a weather vane connected to an adjustable cam and micro-switch mounted inside the head. The cam can be adjusted for an in-sector switch actuation setting of up to 180 (the out-sector setting is the difference between 360 and the in-sector setting).

The control module has two running time meters which accumulate the in-sector and out-sector time, two time delay relays, and two power out connectors.

Equipment connected to the power out terminals is turned on and off by the vane. As the vane goes into the selected sector, power is directed to the selected sector time-delay relay. After the preset delay is completed, the relay picks up and power is supplied to operate the sampling instrument which is connected to the selected sector power out plug.

SPECIFICATIONS

- Vane, Model 1036WD
  Distance Constant: 10 ft.
  Sector Adjustment: From 0 to 180°
  Accuracy: 5°
  Reproducibility: 1°
  Dimensions: 10″ H x 3″ W x 15″ L
  Cable Length: 50 ft.
  Weight: 2 lbs.
  Shipping Weight: 7 lbs.

- Control Console
  Time Delay: 0.5 to 20 sec.
  Power: 110 VAC 1 Watt
  Running Time Meters: 9999.9 minutes
  Timer: Minute or hour
  Contacts Rated at: 110 V 15 amp
  Dimensions: 10″ W x 8″ H x 6″ D
  Weight: 6 lbs.
  Shipping weight: 9 lbs.

ORDERING INFORMATION

Model 1070 Wind Direction Control Complete with 50 ft. of cable
Model 1070C Additional Cable

Model 1071
WIND SPEED CONTROL/ALARM

Model 1071

The Model 1071 Wind Speed Control is used to provide a contact closure which can activate audible alarms or other equipment when wind speeds reach a preset point. The unit can be set to give the contact signal anywhere within the indicated range (0-100 mph standard). The 4½ inch meter permits easy reading of the wind speed and setting of the alarm. The instrument can be used for high or low wind speed alarms. For example, for control of remote equipment such as irrigation systems, air samplers, signs, etc. The unit operates on 110 VAC or 12 VDC power and is supplied with 50 feet of cable between the wind speed sensor and the control console.

SPECIFICATIONS

- Wind Speed Sensor, Model 1036WS
  (refer to Model 1036, page 20)
  Mounting: ½″ pipe

- Control Console
  Size: 5″ x 8″ x 6½″
  Power Required: 110 VAC 1 Watt or 12 VDC 80 mA
  Readout: 4″ panel meter
  Calibration: 0-100 mph standard; 0-100 kph optional, specify at time of order

- Controls
  Front Panel: On/off switch, alarm set knob and switch
  Back Panel: Alarm on/off switch, power connection, optional relay terminals
  Output: Current sink 0.1 amp, 12 VDC
  Weight: 8 lbs.
  Shipping Weight: 10 lbs.

ORDERING INFORMATION

Model 1071 Wind Speed Control/Alarm complete with 50' of connecting cable
Model 1071C Additional cable
Model 1071R Relay for control of remote equipment (10 amp 115 VAC non-inductive contact closure)
Model 1071-100KM Optional 0-100 kph range
Model 5031 9.5 Battery
Model 5030-8 Battery charger

Model 2040
ELECTRONIC HYGROMETER

Model 2040

The Model 2040 Series Electronic Hygrometers are composd of the Model 2040P Humidity Sensor and either an indicating or recording console. The sensing element is an electronic hygrometric circuit which detects changes in relative humidity by changes in impedance. The instrument is available as an indicating system that uses a 3.5 digit red ½" LED display or a recording system that permanently records on a 2-5/16" wide pressure sensitive chart. A 0-5 VDC output is provided to interface with other data handling equipment. A combination sensor for measurement of temperature and relative humidity, Model 2040P-T, is also available. Note: The maximum cable length for this sensor is 50 ft.

SPECIFICATIONS

- Sensor, Relative Humidity Model 2040P
  Humidity Range: 0-100%
  Temperature Range: –40 to +140° F
  Response Time: 30 seconds for a 63% change in RH
  Hysteresis: 1% RH
  Temperature Coefficient: 0.2%° F
  Accuracy:

Humidity Range	Accuracy
0-15 %	Not Recommended
15-30 %	± 3%
30-90 %	± 1%
90-100%	± 3%

- Sensor, Humidity and Temperature Model 2040P-T
  Temperature Sensor: Mounted with Model 2040P Relative Humidity Sensor
  For specifications of temperature sensor, refer to 3540P, page 36

- Indicator Console Model 2040I
  Size: 5" x 6" x 8"
  Power: 110 VAC or 12 VDC
  Display: 0 tp 100% relative humidity; –40 to 120° F; ½" digital display
  Range: 0-100% RH; –40 to 120° F
        0-100% RH; –40 to 50° C
  Weight: 4 lbs.
  Shipping Weight: 6 lbs.
- Recording Console — For recorder specifications, single channel humidity only, refer to Model 9050AC or 9050DC, page 20, dual channel humidity and temperature, Model 9051AC or 9051DC, page 20

ORDERING INFORMATION

Model 2040H-I Indicating Humidity System with Model 2040P Probe, 2040I Indicator and 50' cable

Model 2040R Recording Humidity System with Model 2040P Probe, 9050AC Recorder and 50' of cable

Model 2040R-DC Recording Humidity System with Model 2040P Probe, 9050DC Recorder and 50' of cable

Model 2040T-I Indicating Temperature and Humidity System with Model 2040P-T Probe, (2) 2040I Indicators and 50' of cable

Model 2040T-R Recording Temperature and Humidity System with Model 2040P-T Probe, 9051AC Recorder and 50' of cable

Model 2040T-R-DC Recording Temperature and Humidity System with Model 2040P-T Probe, 9051DC Recorder and 50' of cable

Model 2040P Relative Humidity Sensor with 50' cable, spade lug termination

Model 2040P-T Combination Relative Humidity and Temperature Sensor with 50' cable, spade lug termination

Model 2061
HUMIDITY CALIBRATION
CHAMBER

Model 2061

The Model 2061 Calibration Chamber ensures reliable calibration of humidity probes by means of lithium chloride and potassium sulphate saturated salt solutions. Bottles for the salt solutions are enclosed in a metal box which provides temperature stabilization. The box is equipped with a thermometer. A humidity and temperature scale for each salt is printed on the box lid.
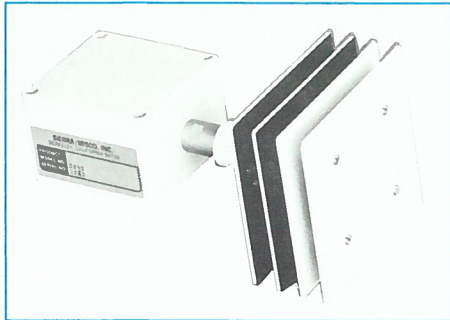
SPECIFICATIONS

Size: 5" x 6½" x 4¾"
Weight: 3 lbs. (empty)
Shipping weight: 5 lbs.

ORDERING INFORMATION

Model 2061 Humidity Calibration Chamber

Model 2042-HT
RELATIVE HUMIDITY
AND TEMPERATURE SENSOR

Model 2042-HT with 4550 Radiation Shield

The Model 2042-HT Humidity Sensor is used in applications where accurate wide range measurements of relative humidity are required. The solid state relative humidity sensor is based upon the capacitance change of a polymer thin film capacitor. A one micron thick dielectric polymer layer adsorbs water molecules through a thin metal electrode and causes capacitance change proportional to relative humidity. The response time is very short, less than one second to read 90% of the final value of relative humidity. The sensor responds to the full range from 0-100% relative humidity. Its response is essentially linear, with small hysteresis and negligible temperature dependence.

The output of the probe is linear from 0-100% relative humidity. The probe body is water tight and made of anodized aluminum.

The unit is supplied with a 37 micron sintered brass filter for protection of the sensor. This filter increases the response time to approximately 30 seconds.

The Model 2042-HT is the same unit as the Model 2042-H with the added feature of a thermistor temperature sensor. For outdoor use, the unit should be mounted in a radiation shield such as the 4550 or 4551, see pages 58 and 56.

SPECIFICATIONS

- Humidity Sensor
  Output: 0-5 VDC
  Range: 0-100% relative humidity
  Temperature Range: –40 to 80° C
  Response Time: 1 second to 90% of humidity change @ 20° C (without sintered filter)
  Accuracy: ± 2% 0 to 80%, ± 3% 80 to 100%
  Hysteresis: Less than 1% from 0 to 80% RH
  　　　　　　2% from 80 to 100% RH
  Temperature Coefficient: 0.057% per ° C

- Temperature Sensor
  Sensing Element: Thermistor YSI 44018
  Range: –40 to +80° C
  Accuracy: ± 0.5° C
  Size: 3¼" x 2¼" x 7½"
  Weight: 1 lb.
  Shipping Weight: 2 lbs.

ORDERING INFORMATION

Model 2042-H Relative Humidity Sensor, includes 6' cable
Model 2042-HT Relative Humidity and Temperature Sensor
Model 2042C Additional cable
Model 2042-SF-37 Replacement Sintered Brass Filter, 37 micron (response time approx. 30 sec.)
Model 4550 Radiation Shield and mount (see page 58)
Model 4551 Radiation Shield and mount (see page 56)

Model 2004
HYGROTHERMOGRAPH
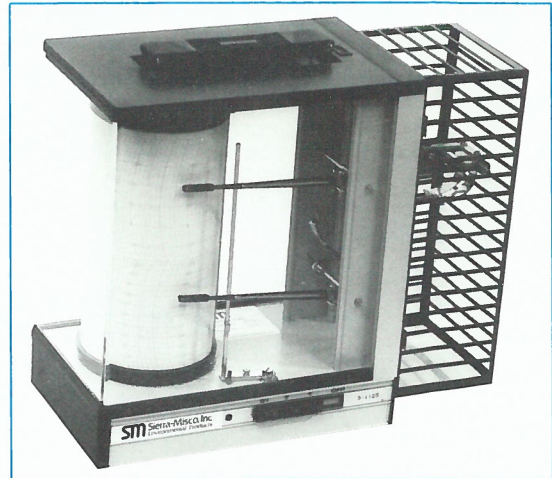
Model 2004

The Model 2004 Electronic Hygrothermograph is used to record ambient temperature and relative humidity simultaneously on a single chart.

Temperature is measured by variations in an aged bimetal strip, and humidity is measured by the contraction and expansion of a hair element. The results are continuously traced with a cartridge pen or optional v-point pen. The electronic clock is powered with 2 "C" batteries for approximately one year's operation.

FEATURES

- 1, 7 or 31 day recording, selectable
- Electronic chart drive (accuracy ± 14 min/wk)
- Simple calibration adjustments
- Portable

SPECIFICATIONS

Temperature Range: 0 to 100° F (–15 to +40° C)
Humidity Range: 0 to 100%
Temperature Accuracy: ± 1° F, ± 0.5° C
Humidity Accuracy: ± 1% mid-scale, ± 3% extremes
Temperature Sensor: Aged bimetal strip
Humidity Sensor: Hair bundle
Temperature Graduation: 1° C, 2° F
Humidity Graduation: 1%
Power: 2 "C" cell batteries
Size: 13" W x 11" H x 6" L
Weight: 7 lbs.
Shipping Weight: 13 lbs.

ORDERING INFORMATION

Model 2004 Hygrothermograph with cartridge pen and 1 pack of charts
Model 2004DC Chart Paper, Daily, 0-100%, –15 to 40° C, 400/Pack
Model 2004DF Chart Paper, Daily, 0-100%, 0 to 100° F, 400/Pack
Model 2004WC Chart Paper, Weekly, 0-100%, –15 to 40° C, 55/Pack
Model 2004WF Chart Paper, Weekly, 0-100%, 0 to 100° F, 55 Pack
Model 2004MC Chart Paper, Monthly, 0-100%, –15 to 40° C, 14/Pack
Model 2004MF Chart Paper, Monthly, 0-100%, 0 to 100° F, 14/Pack
Model 9950 Cartridge pen
Model 9960 V-Point pen

Model 2015
SLING PSYCHROMETER
(Weather Bureau Type)
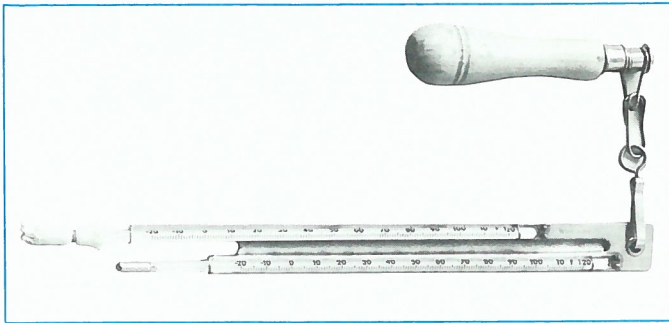
Model 2015

Model 2015 Sling Psychrometer is a compact and durable instrument for determining relative humidity quickly and accurately. U.S. Weather Bureau type heavy gauge rigid stainless steel frame holds two matched, precision 9½″ etched stem thermometers. Staggered bulb position prevents moisture from influencing dry bulb measurement.

SPECIFICATIONS

Thermometer Range: –20 to +120° F or –30 to +50° C
Accuracy: 0.5° F, 0.25° C
Shipping Weight: 1 lb.

ORDERING INFORMATION

Model 2015 Sling Psychrometer: –20 to +120° F
Model 2015C Sling Psychrometer: –30 to +50° C
Model 2015TF Replacement Thermometer, Fahrenheit
Model 2015TC Replacement Thermometer, Centigrade
Model 2015 W Replacement Wicks, package of 12
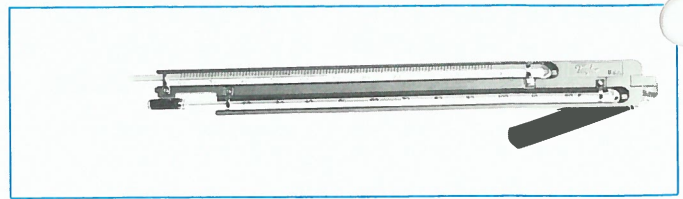
Model 2018
PSYCHROMETRIC SLIDE RULE
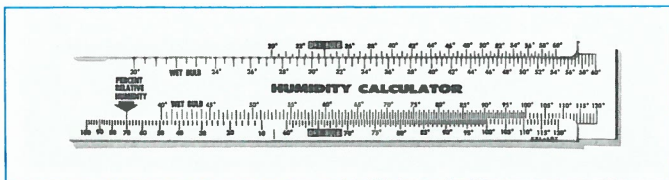
Model 2018

Model 2018 Psychrometric Slide Rule is a plastic, pocket slide rule for use with a sling psychrometer. Accurate relative humidity is quickly determined from readings taken with the wet and dry bulbs of the sling psychrometer. Shipping weight: 6 oz.

ORDERING INFORMATION

Model 2018 Psychrometric Slide Rule, Fahrenheit
Model 2018C Psychrometric Slide Rule, Centigrade

Model 2016
SLING PSYCHROMETER

Model 2016

The correct scientific method for determining relative humidity is employed by this sling psychrometer. Recessed 9″ thermometer tubes are mounted in a metal frame with a folding swivel handle. It comes complete with spare wicks and instructions.
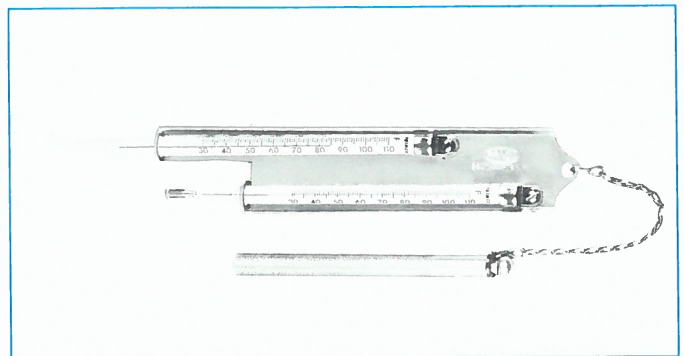
SPECIFICATIONS

Range: +20 to +120° F or –5 to +50° C
Graduation: 1° F or 0.5° C
Shipping weight: 2 lbs.

ORDERING INFORMATION

Model 2016 Sling Psychrometer +20 to +120° F
Model 2016C Sling Psychrometer –5 to +50° C
Model 2016AF Spare Thermometer Tube, Fahrenheit
Model 2016AC Spare Thermometer Tube, Centigrade
Model 2016W Extra Wicks (package of 12)

Model 2017
POCKET SLING
PSYCHROMETER

Model 2017

Model 2017 Pocket Type Sling Psychrometer is furnished with two 5″ mercury filled etched-stem thermometers attached to a metal back with handle for whirling. The handle folds out of the way when not in use. Supplied with humidity tables, wick and pocket case.

SPECIFICATIONS

Range: +20 to +110° F
Graduation: 1° F
Shipping Weight: 1 lb.

ORDERING INFORMATION

Model 2017 Pocket Sling Psychrometer +20 to +110° F
Model 2017A Replacement Thermometer
Model 2017W Extra Wicks (package of 12)

Model 2014
BATTERY POWERED
PSYCHROMETER

A completely portable instrument which indicates wet and dry bulb temperatures for relative humidity and dew point temperatures. The instrument is designed to meet Weather Bureau Spec. No. 405.8113. It consists of a pair of matched precision 8" long mercury thermometers, a permanent magnet fan motor, a plastic water bottle with a 2 oz. capacity, and an illuminating lamp. The unit operates on three "D" cells with a battery life of 1000 operations. Also provided with this unit is an instruction manual, a humidity calculator slide rule and spare parts kit consisting of extra wicking and a lamp bulb. The instrument and accessories are supplied in a rugged high impact plastic carrying case.

SPECIFICATIONS

Accuracy: ± 0.3° F, ± 0.2° C
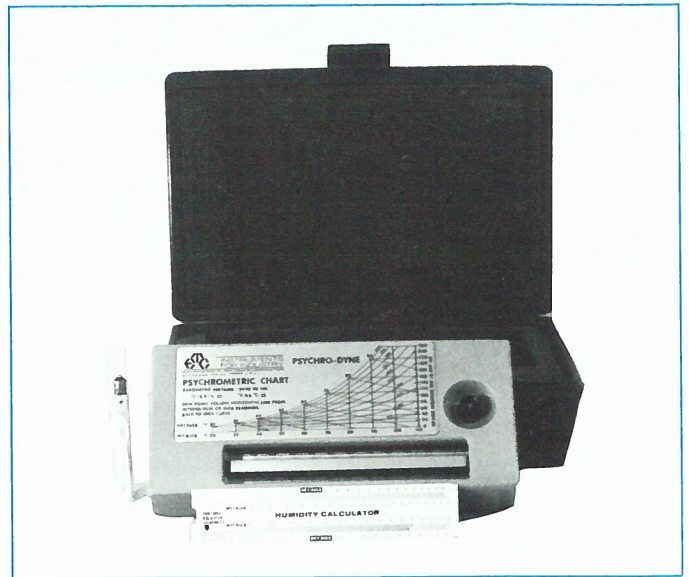Size: 4½" x 10" x 2"
Weight: 2 lbs.
Shipping Weight: 5 lbs.

ORDERING INFORMATION

Model 2014 Battery Operated Psychrometer, 10 to 120° F
Model 2014C Battery Operated Psychrometer, –15 to 45° C
Model 2014TF Spare Thermometer Tube, 10 to 120° F
Model 2014TC Spare Thermometer Tube, –15 to 45° C

Model 2014

Model 2030
FAN PSYCHROMETER

The Model 2030 Fan Psychrometer is used for determination of dew point and relative humidity. It consists of 9½" dry and wet bulb thermometers mounted on a common back, a water bottle, fan, motor and six volt battery. It is easier to read and provides more consistent results than a conventional sling psychrometer.

The components are mounted on a wooden base. The bulb of the lower thermometer is covered with a close fitting tubular muslin wick. When the fan is turned on for a period of 2-3 minutes, water is evaporated from the wick-covered thermometer. The wet bulb and dry bulb temperatures are recorded and the humidity is determined by use of the chart provided, or, with the 2018 Psychrometric Slide Rule. Thermometer range is –20 to +120° F. The unit comes complete with battery, humidity chart and instructions.

SPECIFICATIONS

Temperature Range: –20 to +120° F or –30 to +50° C
Size: 7" W x 5½" W x 14½" H
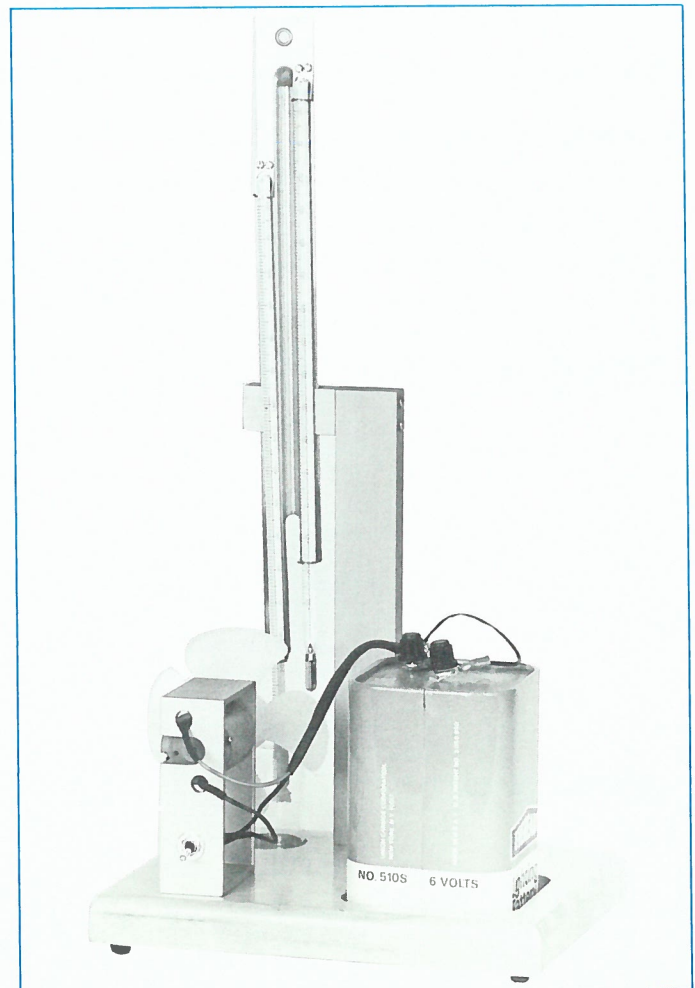Shipping weight: 5 lbs.

ORDERING INFORMATION

Model 2030 Fan Psychrometer — Fahrenheit
Model 2030A Replacement Thermometer
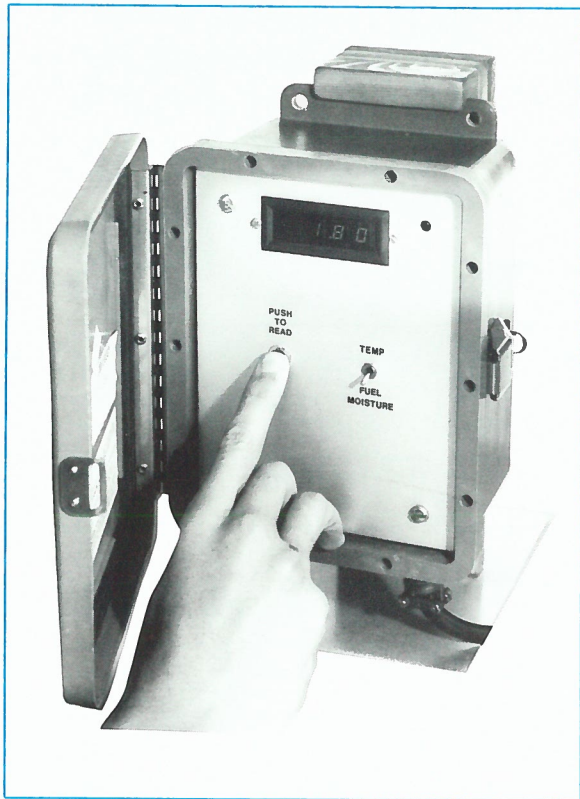Model 2030B Replacement Battery
Model 2030C Replacement Wicks (package of 12)
Model 2018 Psychrometric Slide Rule

Model 2030

Model 2051
FUEL MOISTURE SENSOR

Model 2051

The Sierra/Misco Model 2051 Fuel Moisture Sensor electronically measures the moisture content of the standard fuel moisture stick normally used to manually calculate fuel moisture in forests. The voltage output of the sensor is calculated to a fuel moisture value comparable to the weight of the fuel sticks measured in grams as follows: a set of 4½" diameter Ponderosa Pine Sapwood Dowels is spread ¼" apart on two hardwood pins. The stick assembly is 2¾" wide and 20" long and has an oven-dry weight of 100 grams. After exposing in the field until equilibrium is reached, the sticks are weighed. The weight (in grams) in excess of the oven-dry weight is attributable to fuel moisture.

The Sierra/Misco automated fuel moisture sensor utilizes a single ½" diameter Ponderosa Pine Sapwood Dowel fuel moisture stick coupled to an extremely sensitive electronics sensor that detects minute changes in the length of the stick due to changes in the moisture content. The signal conditioning circuit produces a 0-5 volt output that represents fuel moistures of between 3 and 25 percent. This output can be read on the digital display in the instrument or coupled to a 6500 CompuLogger or 5050 Transmitter for onsite or telemetered data acquisition. The instrument is temperature compensated to minimize the effect of temperature changes on the readings.

Model 2051T incorporates a sensitive AD590IC temperature sensor imbedded in the fuel stick to provide fuel temperature along with the fuel moisture measurement.

FEATURES

- Simulates response of standard pine fuel sticks
- Low power — low maintenance
- Low cost
- Direct digital readout
- Fuel temperature reading in same sensor

ORDERING INFORMATION

Model 2051 Fuel Moisture Sensor and Electronics with 25' connecting cable
Model 2051S Fuel Moisture Stick for Calibration
Model 2051T Fuel Moisture/Fuel Temperature Sensor with Electronics and 25' cable

SPECIFICATIONS

Power Required: 12 VDC, 18 mA
Output: 0-5 volts
Turn-on Time: Less than 10 ms
Accuracy: ± .5 grams
Range: 3-25%
Sensor Size: 10" H x 4" W x 8" L
Electronics Housing Size: 7" x 10" x 4"
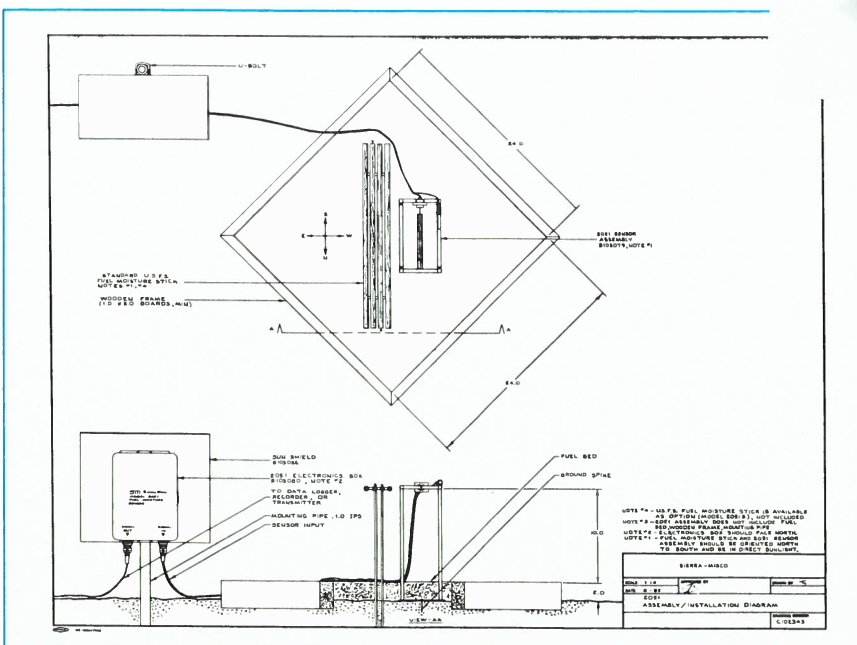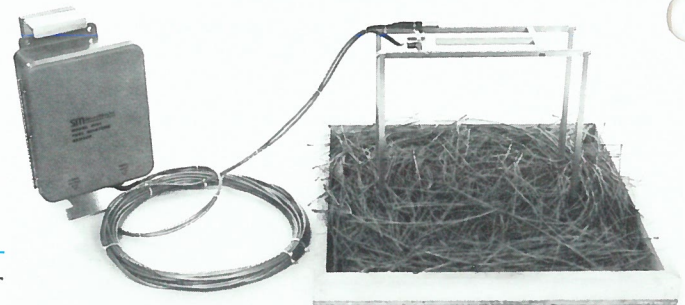
Fuel Moisture Installation

Model 2044 Series
DIGITAL TEMPERATURE/DEW POINT/DELTA T INDICATING SYSTEM

Model 2044, a low cost instrument used to measure dew point, ambient and delta temperatures, includes an indicator-translator, a high impact plastic case, temperature and dewpoint sensors with their own naturally ventilated radiation shields, and 50 feet of cable for each sensor. The indicator provides bright LED digital displays of ambient temperature and dew point temperature, or delta temperature. Parallel voltage output signals of 0-1 VDC are available on the back panel for use with a recorder or data logger. A mounting bracket is available for installing the chassis flush behind a panel. A rack mount panel is also available for mounting one or two units in a standard 19″ wide electronic enclosure. One flush mount bracket is required for each unit in the rack panel.

A 1000 ohm platinum RTD element is used as the temperature sensor. Linearization and lead wire compensation are accomplished by circuits in the indicator-translator.

The dewpoint sensor consists of a thermistor surrounded by a lithium-chloride impregnated fiberglass wick. The conductivity of the wick depends on the amount of moisture absorbed from surrounding air. Current passing through electrodes wound on the wick generate heat in proportion to conductivity. Moisture evaporates from the wick until an equilibrium temperature — directly related to the dewpoint — is reached. Improved accuracy is achieved by circuits which compensate for ambient temperature conditions and approximate the National Bureau of Standards DW10 Curve.

FEATURES

- 0.1° resolution
- Highly visible LED digital display
- Stainless steel sheath for temperature sensor
- Dewcell wet start protection
- Compact size
- Low maintenance solid state design

ORDERING INFORMATION

Model 2044 Temperature/Dewpoint Indicator — ° F, includes sensors, radiation shields (Model 4551) and 50′ cables with spade lugs

Model 2044C Same as above except ° C

Model 2044A Temperature/Delta temperature — ° F, includes sensors, radiation shields (Model 4551) and 50′ cables with spade lugs

Model 2044AC Same as above except ° C

Model 2044B Temperature 1/Temperature 2 Indicator — ° F, includes sensors, radiation shields (Model 4551) and 50′ cables with spade lugs

Model 2044BC Same as above except ° C

Model 2044MB Flush Mounting Bracket

Model 2044RP1 Rack Mount Panel for 1 unit

Model 2044RP2 Rack Mount Panel for 2 units

Model 2044LC Lithium Chloride Solution

Model 2044DP Dewpoint Sensor

Model 2044TP Temperature Sensor, 1000 Ohm Platinum RTD

Model 2044SS Switchable Celsius/Fahrenheit Scale Selector

Model 2044C Additional Sensor Cable

Model 4551 Radiation Shield

Model 2044

SPECIFICATIONS

Temperature Range: –50.0° to +50.0° C
  –58.0° to +122.0° F
Dewpoint Range: –10.7° to +30.0° C
  –12.7° to +86.0° F
Dewpoints outside this range are measured at reduced accuracy
Temperature Accuracy: ± 0.5° C, ± 0.9° F
Dewpoint Accuracy: ± 0.9° C, ± 1.6° F
Voltage Outputs: 0 to 1 VDC corresponds to –50 to +50° C or –50 to +150° F
Power Requirements: 115 VDC/60 Hz; 12 watts
Case Size: 8″ W x 6.2″ D x 2.5″ H
Weight: 7 lbs.
Shipping Weight: 12 lbs.

Model 3051
SOIL MOISTURE SENSOR

The Model 3051 Soil Moisture Sensor provides a direct analog output proportional to soil moisture. It is normally used for irrigation studies and other agri-business interests. The sensor consists of a gypsum block which is moisture sensitive. Electrodes measure the electrical resistance of the gypsum block. This resistance is proportional to the amount of moisture absorbed by the gypsum block. Sensor lead wires are twenty-five feet long to allow for flexibility of installation depth. Sensor output can be connected to the Sierra/Misco 6500 CompuLogger, 5050 Event Reporting Transmitter or with appropriate signal conditioning, to other recording devices.

FEATURES

- Small size
- Inexpensive
- Simple to install and operate

SPECIFICATIONS

Type: Gypsum Block
Range: 0.2 bars to 15 bars of tension water
Accuracy: Depends upon type of soil
Sensor Size: 1″ D x 1.5″ L
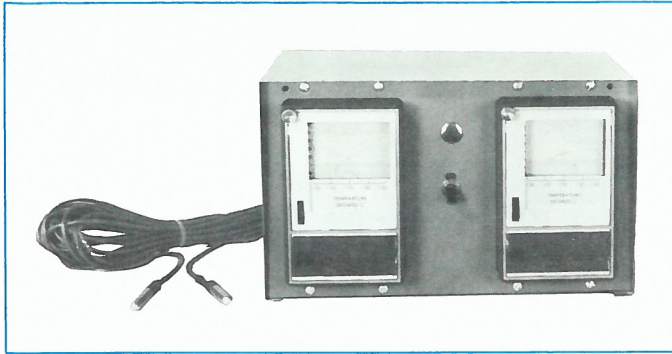Shipping Weight: 3 lbs.
Cable Length: 25′, 50′ maximum

ORDERING INFORMATION

Model 3051 Soil Moisture Sensor, 25 ft. cable
Model 3051C Extra cable
Model 90880 Signal Conditioning card, see page 18

Model 3540 Series
ELECTRONIC TEMPERATURE SYSTEM

Model 3540 -2

The Model 3540 Series Electronic Temperature System is a family of instruments that offers either digital indication or strip-chart recording of one or two temperatures. These temperatures may be measured in air, soil, or water. Indicating systems are used where only a quick reading of the temperature is required. If remote recording of data is necessary, select either a single or dual channel temperature recorder, AC or battery powered. An indicator and recorder can be used in combination to provide temperature readings in one location and strip-chart recording in another. Small size, solid-state components and flexibility make this system extremely useful as well as easy to operate and maintain.

The Model 3540A Digital Temperature Indicator provides an easy to read 3.5 digit red LED with sign to display one or two temperatures. Unit consists of an indicator with probe selector switch, display "on-off" switch and one temperature probe with 50' cable. An analog output of 0-5 VDC is also included for either one or two probes to drive a remote recorder or to connect to telemetry or data logging equipment.

Strip chart temperature recorders are available in either single or dual channel models. Each recorder is supplied with one temperature probe with 50' of cable and one roll of recorder paper. An analog output of 0-5 VDC is provided on both the single and dual channel recorder models to allow operation of a remote indicator or connection to telemetry or data logging equipment. Recorders are powered by either 110 VAC/60 Hz or 12 VDC.

The Model 3540P Temperature Probe is a solid state two terminal integrated circuit. Specific models are available for air, soil and water temperature measurement. Covering a range of −40 to +140° F (−40 to +60° C), they produce an output current proportional to temperature. The Model 3540P acts as a high impedance constant current regulator. Internal thin film resistors are laser trimmed to calibrate each sensor's output. Sensors are all supplied with 50' of cable. Longer cable lengths may be used with no appreciable effect on the probe's accuracy since its high impedance current output design is insensitive to the resistance of long cables. The Model 3540P Probe is used for air temperature measurements and should be mounted in a solar radiation shield such as Model 4550 or Model 4551. See pages 58 and 56. Model 3540PS and Model 3540PW probes are designed for use in soil or water respectively. These probes are mounted in a stainless steel casing for protection.

FEATURES

- Solid-state
- Digital display with Power-Saver
- Wide Range — C or F
- Inkless Recording
- AC or DC power
- One or two Probes
- Air, Soil and Water Probes

SPECIFICATIONS

- Indicator
  Display: ½" Red LED, 3.5 digit with sign
  Range: −40 to +140° F or −40 to +60° C
  Resolution: 0.1° F or C
  Accuracy: ± 0.5% full scale
  Control: Display ON/OFF
  Sensor Input: Model 3540P Series, one or two probes
  Sensor Selector: Two position switch
  Analog Output: 0-5 VDC/Channel
  Power: 12 VDC; 110 VAC/60 Hz with Battery Eliminator Power Supply
  Size: 7.25" W x 2.75" H x 9" D
  Weight: 3 lbs.
  Shipping Weight: 6 lbs.

- Recorder
  For recorder specifications see Model 9050 Series, page 18

- Sensor, Model 3540P Series
  Transducer: Two terminal integrated circuit
  Theory of Operation: High impedance constant current regulator
  Output: Current proportional to absolute temperature, 1 mA/° K for supply voltage between +4 and +30 V
  Internal Calibration: Laser trimmed thin film resistors
  Range: −40 to +140° F (−40 to +60° C)
  Accuracy: ± 1° F (± 0.5° C)
  Probe Sheath: Air temperature — potted plastic
  Water/Soil temperature — potted stainless steel
  Size: ¼" D x 2" L
  Weight: 0.25 lbs. (no cable); 5 lbs. (with cable)
  Shipping Weight: 1.0 lb. (no cable); 6 lbs. (with cable)

ORDERING INFORMATION

Model 3540A Electronic Temperature Indicator with Digital Display, one Model 3540P Temperature Probe with 50' cable and Battery Eliminator 110 VAC/60 Hz Power Supply

Model 3540A-2 Same as above but with two Model 3540P Temperature Probes each with 50' cable

Model 3540 Single Channel Inkless Temperature Recorder, 110 VAC/60 Hz, one Model 3540P Temperature Probes with 50' cable, on roll chart paper

Model 3540DC Same as above but for 12 VDC

Model 3541 Dual Channel Inkless Temperature Recorder, 110 VAC/60 Hz, and two Model 3540P Temperature Probes each with 50' cable, one roll chart paper

Model 3541DC Same as above but for 12 VDC

Model 3540P Solid State Temperature Probe for Air Temperature Measurements, includes 50' cable

Model 3540PS Same as above but for Soil Temperature Measurements

Model 3540PW Same as above but for Water Temperature Measurements

Model 3540PC Additional Probe Cable, per foot

Model 9050C Chart Paper, single channel, per roll

Model 9051C Chart Paper, dual channel, per roll

Model 4550 Solar Radiation shield for Model 3540P Probe

Model 4551-P1/2 Solar Radiation shield for Model 3540P Probe

Specify Farenheit or Centigrade calibration and desired calibration range at time of order.

Model 3501
ELECTRONIC THERMOGRAPH
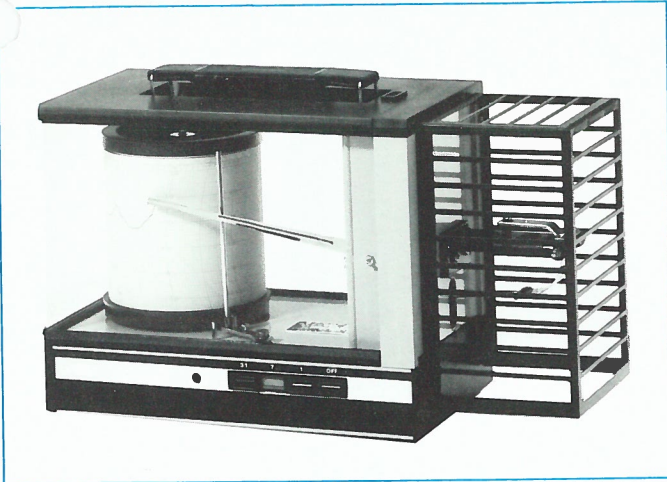
Model 3501

The Model 3501 Electronic Thermograph is used to measure and record temperature indoors or outdoors. The instrument employs as its sensing element a bi-metal strip of two dissimilar metals whose coefficient of expansion when subject to temperature change produces a linear bend. The temperature is then transferred to the cartridge pen through a precision linkage system.

When the Model 3501 Thermograph is used outside, it should be installed in an instrument shelter. (See page 59.)

FEATURES

- 1, 7 and 31 days recording interval, selectable Electronic Chart Drive
- Easy to read and maintain

SPECIFICATIONS

Range: –15 to 40° C
Accuracy: ± 0.5° C
Sensor: Aged bi-metal strip
Graduation: 1° C
Power: 2 "C" cell batteries
Size: 10.5″ W x 8″ H x 6″ D
Weight: 5.5 lbs.
Shipping Weight: 8 lbs.

ORDERING INFORMATION

Model 3501 Thermograph with cartridge pen and 1 pack of charts
Model 3501 CD Chart paper, daily
Model 3501 CW Chart paper, weekly
Model 3501 CM Chart paper, monthly
Model 9950 Cartridge pen

Model 3536
RECORDING THERMOGRAPH

Model 3536

The Model 3536 records temperatures permanently over periods up to 24 hours or up to 168 hours. Available in various ranges, this instrument is ideally suited for use in areas requiring a controlled temperature monitor. Particular applications include refrigerators, cold rooms, dairies, drying sheds, greenhouses, etc. This unit can be mounted in any position. The spring wound clock movement is dust and moisture protected.

SPECIFICATIONS

Size: 3-15/16″ D x 3″ H
Chart size: 3⅝″ Dia.
Ranges/Times:
 –30 to +70° F, 24 hours or 168 hours (7 days)
 0 to 100° F, 24 hours or 168 hours (7 days)
 20 to 120° F, 24 hours or 168 hours (7 days)
 –40 to +160° F, 24 hours or 168 hours (7 days)
 –35 to 20° F, 24 hours or 168 hours (7 days)
 –15 to +40° C, 24 hours or 168 hours (7 days)
 –5 to +50° C, 24 hours or 168 hours (7 days)
 –40 to +70° C, 24 hours or 168 hours (7 days)
Weight: 14 oz.
Shipping Weight: 3 lbs.

ORDERING INFORMATION

Model 3536 Recording Thermograph with 100 charts (specify range/time)

- Weekly Charts
  3536CW-1: –30 to +70° F
  3536CW-2: 0 to 100° F
  3536CW-3: 20 to 170° F
  3536CW-4: –40 to 160° F
  3536CW-5: –35 to +20° C
  3536CW-6: –15 to +40° C
  3536CW-7: –5 to +50° C
  3536CW-8: –40 to +70° C
- Daily Charts
  3536CD-1: –30 to +70° F
  3536CD-2: 0 to 170° F
  3536CD-3: 20 to 120° F
  3536CD-4: –40 to 160° F
  3536CD-5: –35 to 20° C
  3536CD-6: –15 to +40° C
  3536CD-7: –5 to +50° C
  3536CD-8: –40 to +70° CC

Models 3510 and 3510D ELECTRONIC REMOTE ONE-POINT AND TWO-POINT THERMOGRAPH

Model 3510 Series

The all new Model 3510 Electronic Remote One-Point and Two-Point Thermographs provide a continuous 1, 7, or 31-day recording of temperatures of air, soil or water. The probe, or probes, can be placed 16 feet or 32 feet from the thermograph depending on the probe length selected. The temperature variations are measured by the expansion and contraction of mercury in the stainless steel capillary which creates an internal pressure that produces a corresponding movement in the coiled Bourdon tubes. The degree of movement is transmitted by a bimetal linkage system to the cartridge pen or optional V-point pen.

The electronic clock runs on 2 "C" cell batteries and the speed can be easily selected by pushing a button on the front of the case.

FEATURES

- 16' or 32' Capillary length
- Easy to read
- Electronic clock: 1, 7 or 31 day push button recording, selectable
- Accurate mercury filled sensor
- Portable

SPECIFICATIONS

Range: –15 to +50° C
Accuracy: ± 0.5° C
Graduation: 1° C
Sensor: Mercury in stainless steel capillary
Power: 2 "C" cell batteries
Size: 13" W x 11" H x 6" D
Weight: 7 lbs. with 16' probe; 10 lbs. with 32' probe
Shipping Weight: 15 lbs. (16') or 20 lbs. (32')

ORDERING INFORMATION

Model 3510-16-S Single Point Thermograph complete with 16' Capillary, pen and one package of weekly charts
Model 3510-32-S Single Point Thermograph complete with 32' Capillary, pen and one package of weekly charts
Model 3510-16-D Dual Point Thermograph complete with 2-16' capillaries cartridge pen and one package of weekly charts
Model 3510-32-D Dual Point Thermograph complete with 2-32' capillaries, cartridge pen and one package of weekly charts
Model 3510-D Chart paper - daily
Model 3510-W Chart paper - weekly
Model 3510-M Chart paper - monthly
Model 9950 Cartridge Pen

Model 3520 STANDARD MERCURY THERMOMETER
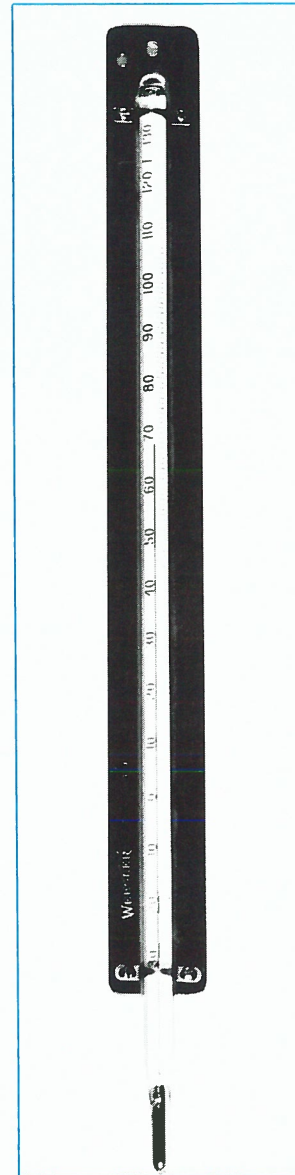
Model 3520

Model 3520 Standard U.S. Weather Bureau Mercurial Thermometer has one degree graduations etched on a 10.5" glass tube. It is mounted on a stainless steel back.

SPECIFICATIONS

Range: –38 to +130°F or –38 to +55° C
Shipping Weight: 1 lb.

ORDERING INFORMATION

Model 3520 Standard Mercury Thermometer, Fahrenheit
Model 3520C Standard Mercury Thermometer, Centigrade
Model 3520B Brass Support for Mounting

Model 3521
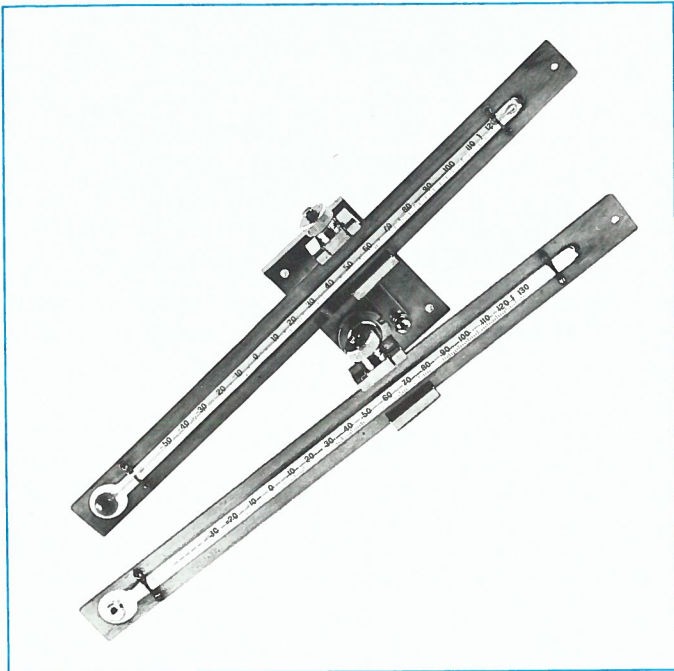## U.S. WEATHER BUREAU PATTERN MAXIMUM/MINIMUM THERMOMETERS

Model 3521

A set of maximum/minimum thermometers on stainless steel backs is mounted on Townsend Support. The support holds the thermometers in the correct position for reading and resetting. Installation is in Model 4525 Cotton Region Type Instrument Shelter.

SPECIFICATIONS

Range:
Fahrenheit: Max –40 to +120° F
Min –40 to +110° F
Celsius: Max –15 to +60° C
Min –40 to +40° C
Minimum Increment: 1° F, ½° C
Weight: 1 lb.
Shipping Weight: 3 lbs.

ORDERING INFORMATION

Model 3521 Maximum/Minimum Thermometers and Townsend Support, Fahrenheit
Model 3521C Maximum/Minimum Thermometers and Townsend Support, Centigrade
Model 3522 Minimum Thermometer on Stainless Steel Back, Fahrenheit
Model 3522C Minimum Thermometer on Stainless Steel Back, Centigrade
Model 3522A Tube only for Minimum Thermometer, Fahrenheit
Model 3522AC Tube only for Minimum Thermometer, Centigrade
Model 3523F Maximum Thermometer on Stainless Steel Back, Fahrenheit
Model 3523C Maximum Thermometer on Stainless Steel Back, Centigrade
Model 3523A Tube only for Maximum Thermometer, Fahrenheit
Model 3523AC Tube only for Maximum Thermometer, Centigrade
Model 3524 Townsend Support

Model 3580
MAXIMUM-MINIMUM THERMOMETER
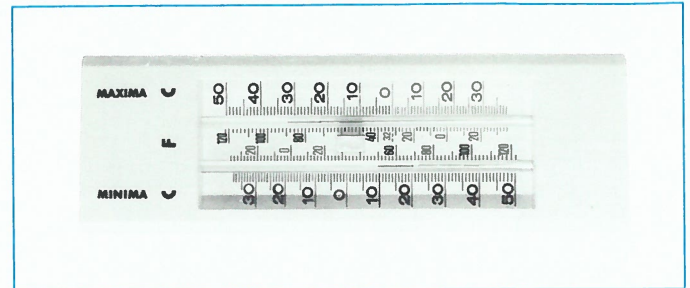
Model 3580

Model 3580 is a "U" shaped thermometer which registers maximum and minimum temperature for any period as well as the current temperature. Handy push button reset returns the indicating needles to the top of the mercury.

Featuring dual fahrenheit and centigrade scales, this instrument covers a full range from –40 to 120° F, and –40 to +50° C.

SPECIFICATIONS

Size: 9″ x 2¼″ x 1″
Accuracy: ± 1° F; ± 0.5° C
Shipping Weight: 1 lb.

ORDERING INFORMATION

Model 3580 Maximum/Minimum Thermometer

Model 1500
MICROBAROGRAPH

Model 1500
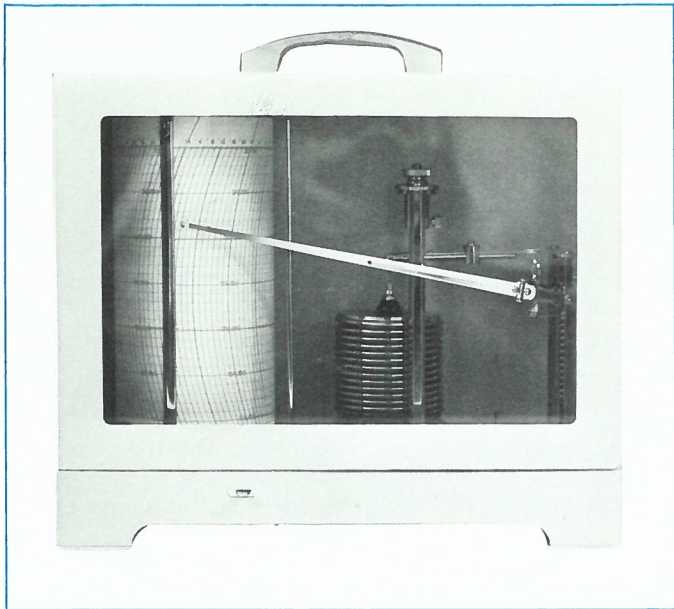
The Model 1500 Microbarograph is an ultrasensitive instrument with an accuracy of ± 0.15mb over the entire range of 945 to 1045mb or 27.9 to 31″ Hg. The atmospheric pressure is measured by a 14 cell aneroid which responds to the slightest change. A large knurled knob located on the bellows support permits coarse calibration adjustments for altitudes 1,000 ft. below to 12,000 ft. above sea level. Fine adjustment is made on the pen pivot arm. An aged bi-metal strip is incorporated in the linkage for temperature compensation. The spring wound brass clock is supplied with change gears for 1 or 7 day rotation. Optional 1½ VDC (2 "D" cell batteries) electric clock is also available.

FEATURES

- Precision Microbarograph
- Drum rotation of 26 or 176 hours to prevent overwriting on chart clip
- Wide altitude range

SPECIFICATIONS

Recording range: 945 to 1045mb or 27.9 to 31″ Hg
Operating Range: –1,000 to 12,000 ft.
Accuracy: 0.15mb (0.005″ Hg)
Graduation: 0.2mb or .005 Hg
Sensor: 14 cell, 2½″ dia. aneroid
Magnification: 2:1 inches of Hg
Chart Size: 11½″ L x 7″ H x 6″ D
Weight: 10 lbs.
Shipping Weight: 13 lbs.

ORDERING INFORMATION

Model 1500 Microbarograph complete with 1-7-day clock, pen, ink and 1 package weekly charts
Model 1500DC Same as above with battery-operated clock
Model 1500CWMB Charts 945 to 1045mb, 55 ea, weekly
Model 1500CWHG Charts 27.9″ to 31.0″ Hg, 55 ea, weekly
Model 1500CDMB Charts 945 to 1045mb, 400 ea, daily
Model 1500CDHG Charts 27.9″ to 31.0″ Hg, 400 ea, daily
Model 9950 Cartridge Pen

Model 1502
BAROGRAPH
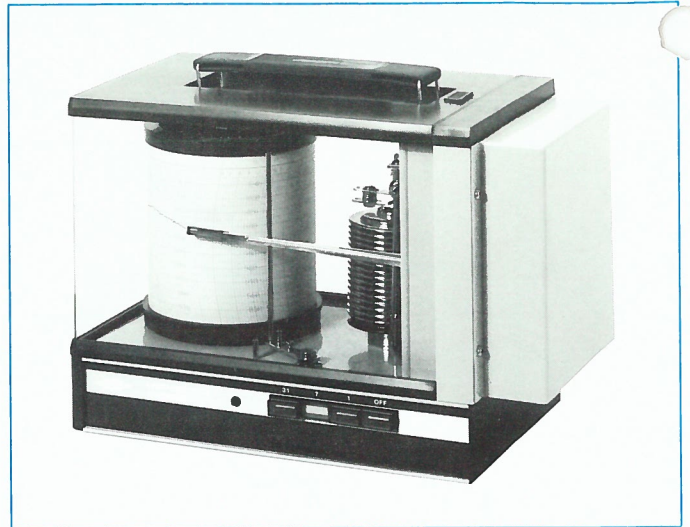
Model 1502

The Model 1502 Electronic Barograph provides a continuous and accurate recording of barometric pressure over selectable periods of 1, 7 or 31 days. The barograph sensor is a bellows assembly that expands and contracts with variations in atmospheric pressure. A bi-metal strip is used to compensate for changes in temperature. A cartridge pen is standard and a V-point pen is optional. The clear plastic cover provides easy readability. This instrument is primarily for use indoors.

FEATURES

- Select 1, 7 or 31 day operation with push button on front panel
- Electronic chart drive (accuracy ± 14 min/wk)
- Measuring range 940 to 1045mb
- Easy to read and maintain

SPECIFICATIONS

Range: 940 to 1045mb
Accuracy: ± 1.0mb
Graduation: ± 1mb
Sensor: Aneroid bellows with bi-metal strip for temperature compensation
Range: 0-1,650′ (0-500m) standard; 0-5,000 and 0-13,000 ft. high altitude models available
Power: 2 "C" cell batteries
Size: 10½″ x 8″ x 6″
Weight: 5½ lbs.
Shipping weight: 8 lbs.

ORDERING INFORMATION

Model 1502 Barograph with cartridge pen and 1 package of weekly charts
Model 1502CD Chart Paper, daily, package of 400
Model 1502CW Chart Paper, weekly, package of 55
Model 1502CM Chart Paper, monthly, package of 13
Model 9950 Cartridge pen
Model 1502HA-5 Similar to Model 1502 but for use at elevations between sea level and 5,000 ft.
Model 1502HA-13 Similar to Model 1502 but for use at elevations between sea level and 13,000 ft.
Model 1502HA-C Charts for high altitude barographs, specify daily, weekly, or monthly

Models 1510 FULL RANGE MERCURIAL BAROMETER

Model 1510

The Model 1510 Full-Range Mercurial Barometer is used in the laboratory or lecture room. The precise calibrations are traceable to the National Bureau of Standards. This instrument reads by vernier to 0.01 inch or 0.1 millimeter of mercury or 0.1 millibar. This barometer is completely assembled with mercury in tube and reservoir and ready for use. Fortin-type cistern allows mercury to expand and contract during shipment without admitting air to the tube. White plastic reflectors on mounting panel aid observations of cistern level and mercury column.

Other features include curved stainless-steel inch and millimeter scales with vernier on the same plane to avoid relections and parallax. This barometer meets all specifications of the Purchase Guide for Programs in Science and Mathematics (No. 0305) prepared by the Council of Chief State School Officers. Shipped ready to use with mounting panel, hanging bracket, centering ring and detailed instruction booklet with tables of temperature and gravity corrections.

FEATURES

- Dual scale, Celsius and Fahrenheit thermometer
- Dual recording range — 20 to 31 inches and 508 to 790mm or 677 to 1050mb
- Precise calibration traceable to the National Bureau of Standards

SPECIFICATIONS

Pressure Recording Range: 20 to 31" or 508 to 790mm (670 to 1050mb)
Temperature Scale: Celsius and Fahrenheit
Graduation: 0.01 inch Hg, 0.1mm Hg, 0.1mb
Operating Range: –1,000 to 10,000 ft.
Size: 3.5" W x 42" H
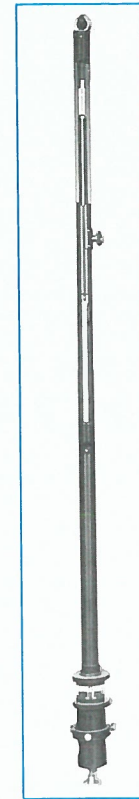Shipping Weight: 11 lbs.

ORDERING INFORMATION

Model 1510 Full Range Mercurial Barometer with inches Hg and mm Hg scale, mounting panel, hanging bracket, centering ring and detailed instructions
Model 1510B Same as above except scales in mb and mm Hg

Model 1511 MERCURIAL BAROMETERS

Model 1511

The Sierra/Misco U.S. Signal Corps type mercurial barometers are scaled for use between sea level and a maximum of 3,000 or 12,000 feet depending on which model you select. Scales are marked for vernier reading to 0.01" Hg, 0.1mm Hg, or 0.1mb. With the aid of white reflectors the mercury level and zero point are clearly visible in the cylindrical glass cistern. The ¼" glass tube provides a constant capillary depression of the mercury column.

The instruments are factory adjusted for zero scale error after temperature and gravity corrections are applied. They are provided with verniers operated by rack and pinion with a large knurled adjustment knob.

FEATURES

- Fortin type cistern provides precise operation and long life
- Calibration traceable to National Bureau of Standards
- Accurate dual scale celsius-fahrenheit thermometer to assist in temperature corrections
- Brass casing and fittings

SPECIFICATIONS

Size: 3.5" W x 42" H (8.9 x 106.7cm)
Shipping Weight: 11 lbs.

ORDERING INFORMATION

Model 1511A Mercurial Barometer, for altitudes to 3,000 ft. Dual scales 25.5 to 31" Hg, 646 to 800mm Hg.
Model 1511B Same as above with dual scales in 861 to 1060mb and 646 to 800mm Hg.
Model 1511C High Altitude Barometer similar to above but for use at altitudes to 12,000 feet, dual scales 16.7 to 31" Hg, 425 to 800mm Hg

Model 1520
BAROMETRIC PRESSURE SENSOR
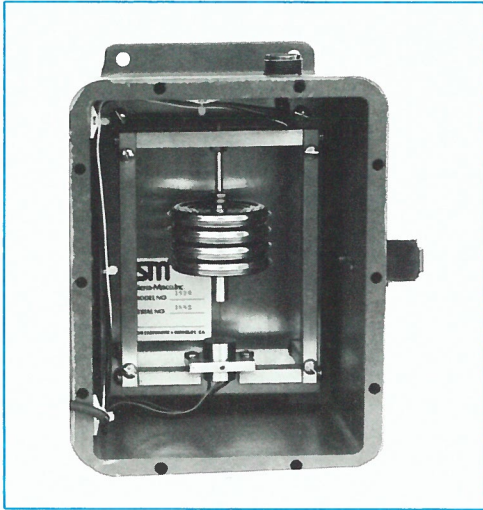
Model 1520

The Model 1520 Electronic Barometer provides a voltage linearly proportional to atmospheric pressure over any 85 or 100 millibar range from 600 to 1065mb (17.7 to 31.45 in Hg). The unit consists of a multicell aneroid sensor coupled to the core of a linear variable differential transformer (LVDT). It is factory calibrated for operation at sea level. For operation at different elevations the zero setting is adjusted in the field by repositioning the LVDT with respect to the aneroid. The aneroid is made of NISPAN-C and has a thermal expansion coefficient of zero. The analog output is used for data loggers, indicators, strip chart recorders or Sierra/Misco's Real Time Telemetry System. Housed in a weatherproof box, the 1520 is shipped with 50' of cable.

PRESSURE ALTITUDE EQUIVALENTS

mb	in. hg.	altitude
813	24.0	5974
830	24.5	5425
847	25.0	4886
864	25.5	4356
880	26.0	3824
897	26.5	3320
914	27.0	2814
931	27.5	2315
948	28.0	1824
965	28.5	1340
982	29.0	863
999	29.5	392
1013	29.9	std sea level
1016	30.0	–73
1033	30.5	–531

SPECIFICATIONS

Accuracy: ± 0.5mb
Range: 600 to 1065mb
Span: 85mb minimum, 200mb maximum
Output: 0-5 V standard, 0-1 V, 0-1 mA, and 4-20 mA optional
Turn-on Time: Less than 10 milliseconds
Operating Temperature Range: –20 to +60° C
Power: 115 VAC, 3 Watts; or 12 VDC @ 18 mA
Size: 10" H x 8" W x 5" D
Weight: 7 lbs.
Shipping Weight: 9 lbs.

ORDERING INFORMATION

Model 1520 Barometric Pressure Sensor, 12 VDC with 50' combination power and signal output cable. 85mb span supplied as standard.
Model 1520AC Barometric Pressure Sensor, 115 VAC with power cable and 50' output cable. 100mb span supplied as standard

OPTIONS

Outputs: 0-5 V standard, 0-1 V, 0-1 mA or 4-20 mA optional, specify at time of order
Span: 85mb, 100mb, 200mb, specify at time of order

Model 1521
SOLID STATE BAROMETRIC PRESSURE SENSOR

Model 1521

The Model 1521 Solid State Barometric Pressure Sensor is a low cost, highly reliable fixed span barometric pressure sensor. A calibration potentiometer is included to allow zero of the span to any station elevation. The output of the sensor is conditioned to provide a 0-5 VD or 0-1 mA signal.

SPECIFICATIONS

Range: 600 to 1045mb
Span: 100mb
Output: 0-5 VDC
Power: 12 VDC, 10 mA
Accuracy: ± 1mb
Turn-on Time: Less than 10 milliseconds
Operating Temperature: –40 to +60° C
Cable Length: 25'
Size: 7½" H x 5½" W x 5" D
Weight: 3 lbs.
Shipping Weight: 5 lbs.

ORDERING INFORMATION

Model 1521 Barometric Pressure Sensor
Model 1521C Extra Cable

Model 2300
METEOROGRAPH

The Electronic Meteorograph Model 2300 represents the latest technology for measuring and recording simultaneously ambient temperature, relative humidity and barometric pressure on a single chart. The recording speed for 1, 7 or 31 day operation is easily selected by pushing the appropriate button on the front panel.

Sensors consist of an aged bi-metal strip for temperature, treated hair for humidity and premium aneroid bellows with bi-metal strip temperature compensation for barometric pressure. Measurements are transferred to the pen arm through a precision linkage which features easy calibration adjustment, linearized recording and polished pivots for fast response.

The electronic clock operates on 2 "C" cell batteries for approximately one year. The clear plastic cover slides off for each chart replacement. A cartridge pen is standard.

FEATURES

- Select 1, 7 or 31 day recording speed by push button on front panel
- Easy to read and maintain
- Electronic chart drive (accuracy ± 14 min/wk)
- Portable
- Install in shelter outdoors, see page 59

SPECIFICATIONS

Temperature range: –15 to +40° C
Humidity range: 0 to 100%
Pressure range: 940 to 1045mb
Temperature accuracy: ± 0.5° C
Humidity Accuracy: ± 1% mid-scale, ± 3% extremes
Pressure Accuracy: ± 1.0mb
Temperature Sensor: Aged bi-metal strip
Humidity Sensor: Hair Bundle
Pressure Sensor: Aneroid bellows with bi-metal strip for temperature compensation. Operating range 0-1650'.
Temperature Graduation: 1° C
Humidity Graduation: 1%
Pressure Graduation: 1mb
Power: 2 "C" cell batteries
Size: 12.5" W x 14" H x 6" D
Weight: 10 lbs.
Shipping Weight: 13 lbs.
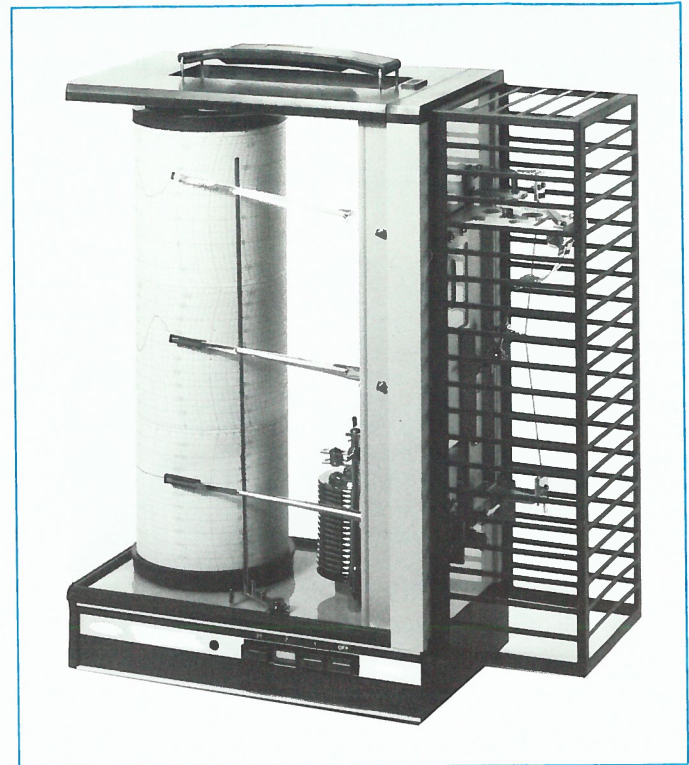
Model 2300

ORDERING INFORMATION

Model 2300 Meteorograph with cartridge pen and 1 pack of weekly charts
Model 2300CD Chart Paper, daily, package of 400
Model 2300CW Chart Paper, weekly, package of 55
Model 2300CM Chart Paper, monthly, package of 13
Model 9950 Cartridge pen
Model 2300HA-5 High altitude barograph, for use at elevations from sea level to 5,000 ft., spring wound, 7-day clock mechanism
Model 2300HA-13 High altitude barograph, for use at elevations from sea level to 13,000 ft., spring wound, 7-day clock mechanism

Model 2500
TIPPING BUCKET RAIN GAGE

Model 2500

The Model 2500 Rain Gage is a high quality accurate instrument used for measuring precipitation. Rainfall entering the 8″ or 12″ funnel collector is directed to the tipping bucket assembly. When an incremental amount of precipitation has been collected, the bucket assembly tips and activates a magnetic reed switch. The sample is discharged through the base of the gage. A momentary electrical contact closure is provided for each increment of rainfall. The use of a magnetic reed switch is a major improvement over the older glass encased mercury switches. Wires attached to the bucket which affect calibration are eliminated. This contact closure is used to operate the Model 2517 Event Recorder or other data acquisition systems. A collection assembly can be provided which houses containers for retention of the rainfall for analysis.

The bucket is made from stainless steel. All parts used are corrosion resistant. The funnel is anodized aluminum and has two screens for preventing leaves and other debris from entering the gage. A level is provided on the base for correct positioning of the unit. 50′ of cable is included.

FEATURES

- High quality, accurate
- Corrosion resistant materials used throughout
- Green exterior
- Sensitive tipping bucket design

SPECIFICATIONS

Orifice: Model 2500 — 8″ (20 cm) standard
        Model 2500-12 — 12″ (30 cm)
Accuracy: ± 1% for rates of 1″ to 3″/hr, ± 3% for rain rates of 0 to 6″/hr

Switch: Standard	Optional:
Magnetic Reed Switch	Mercury Wetted Reed Switch
SPDT	SPST
Rating: 10 watts	60 watts
12 VA	72 VA
2000 VDC	1000 VDC
0.5 Amp Max	30 Amp Max

Size: 8″ dia. — 8¼″ x 17″
      12″ dia. — 12¼″ x 19″
Weight: 8″ — 7 lbs., 12″ — 13 lbs.
Shipping Weight: 8″ — 12 lbs., 12″ — 18 lbs.

ORDERING INFORMATION

Model 2500 Rain Gage with 8″ orifice, includes 50′ cable
Model 2500-12 Rain Gage with 12″ orifice, includes 50′ cable
Model 2500CA Collection Assembly
Model 2500C Additional Cable
Model 2500MS Mercury-Wetted Reed Switch Option
Specify calibration, .01″ standard; alternate calibrations must be specified at the time of order

Model 2501
TIPPING BUCKET RAIN GAGE

Model 2501

The 2501 Rain Gage was designed for the National Weather Service as a low cost tipping bucket rain gage. Its simplicity of design assures trouble free operation yet provides accurate rainfall measurements. The unit has an 8-inch orifice and is manufactured of anodized aluminum and stainless steel. The funnel has a screen to prevent debris from plugging it up. It is shipped complete with 50 feet of two conductor cable and mounting brackets. The tipping bucket mechanism activates a sealed reed switch that produces a contact closure for each 1mm or .01″ of rainfall.

SPECIFICATIONS

Contact Rating: 3 watts, 28 VAC, 0.25 amps, 120 VAC
Dimensions: 8″ D x 15″ H
Shipping Weight: 8 lbs.

ORDERING INFORMATION

Model 2501 Rain Gage with .01″ calibration
Model 2501-MM Rain Gage with 1mm calibration
Model 2501C Additional cable

TIPPING BUCKET RAIN GAGE CALIBRATION TABLE

Calibration	8.0″ Orifice	12.0″ Orifice
0.01 inch	8.24 ml	18.53 ml
1 mm	32.43 ml	72.96 ml
0.5 mm	16.215 ml	36.48 ml
0.25 mm	8.11 ml	18.24 ml
0.2 mm	6.48 ml	14.6 ml

Model 2500E
ELECTRIC HEATED
RAIN/SNOW GAGE

Model 2500E

The Model 2500E Electric Rain/Snow Gage is used where 115 V power is available and precipitation is often in the form of snow. A heating kit has been added to the basic 2500 Rain Gage to provide the capability for measuring snowfall. Heating is accomplished by a fire-rod heating element that supplies heat to the base plate to avoid freezing of the drains and at the funnel area of the gage. This gage is available with either an 8″ or 12″ orifice. It includes 25′ of power cable and 50′ of sensor cable for recorder hookup.

SPECIFICATIONS

Gage: Same as Model 2500 Rain Gage
Heating Unit:
   Power: 115 VAC, 50/60 Hz, 250 Watts
   Thermostat: Instantaneous response, adjustable from 0 to 100°
       F; factory set at 35° F
Weight: 8″ — 9 lbs., 12″ — 15 lbs.
Shipping weight: 8″ — 14 lbs., 12″ — 20 lbs.

ORDERING INFORMATION

Model 2500E Electric Snow Gage, 8″ orifice, includes 25′ power
   cable and 50′ recorder hookup cable, specify calibration
Model 2500E12 Same as above with 12″ orifice, specify calibration
Model 2500C Additional recorder hookup cable
Model 2500CP Additional power cable
Specify calibration from table on page 44

Model 2500P
PROPANE HEATED
RAIN/SNOW GAGE

Model 2500P

The Model 2500P Propane Heated Rain/Snow Gage was designed for use in remote locations where electric power is not available. The basic rain gage unit is the same as the Model 2500. A self-contained catalytic heating unit housed in a compartment below the gage provides constant heat to the base and funnel area of the gage. This unit has an efficient Venturi to accelerate the propane gas into the catalyst, thus reducing fuel consumption while maintaining an even temperature. After starting, the gage operates flameless. A regulator is supplied to adjust the pressure to the heater. 50′ of cable is included for connecting to recording equipment.

SPECIFICATIONS

Gauge: Same as Model 2500 Rain Gage
Heating Unit: Catalytic type
Catalyst: Platinum ceramic pellets (approx. 3 year charge supplied)
Regulator: Adjustable high pressure regulator
Operating Pressure: Approximately 1 psi, adjustable
Propane Connection: ¼″ tube, male
Dimensions: 12″ D x 20″ H
Weight: 15½ lbs.
Shipping Weight: 22 lbs.

ORDERING INFORMATION

NOTE: If altitude at which gage is to be used and minimum temperature at which it snows are specified at the time of the order, an orifice will be supplied to fit your requirement. If not specified, the gage will be supplied to operate at a maximum of 6,000 ft. at temperatures no lower than 10° F.
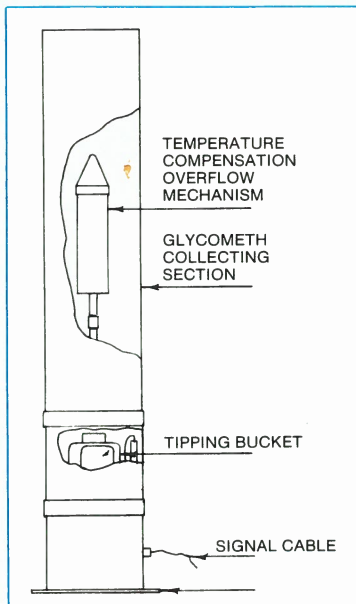
Model 2500P Propane Heated Rain/Snow Gage, 8″ Orifice,
   includes 50′ cable
Model 2500P-12 Propane Heated Rain/Snow Gage, 12″ Orifice,
   includes 50′ cable
Model 2500C Additional cable
Specify calibration from table on page 44

Model 5057S
RAIN AND SNOW GAGE

Model 5057S

The Model 5057S Rain and Snow Gage is an overflow type glycometh solution tipping bucket precipitation gage. This gage is used when AC power is not available and propane is considered a fire hazard.

The 5057S provides accurate precipitation measurements by use of an anti-freeze solution (glycometh), temperature compensator and tipping bucket sensor. Snow, sleet and rain are mixed with the glycometh in the 4 foot tall by 12″ diameter assembly. As the precipitation is mixed with the glycometh solution, the overflow drains through the orifice of the temperature compensator into the tipping bucket for measurement. The temperature compensator adjusts for liquid expansion and contraction and keeps the orifice closed during inactive periods.

The tipping bucket is calibrated for 1mm per tip and provides a contact closure for each 1mm of precipitation. This sensor is generally used in snow areas of 10 inches or less water equivalent precipitation. The output of the sensor is compatible with radio telemetry systems, satellite (DCP) platforms and on site recorders like the CompuLogger.

The 5057S Rain and Snow Sensor includes a three piece assembly, temperature compensator, tipping bucket and 50 feet of signal cable. The top section houses the temperature compensator and glycometh solution, the middle section contains the tipping bucket assembly and the lower section is a stand with a 16″ square base.

A glycometh solution consisting of 60% methanol alcohol and 40% ethylene glycol with a specific gravity of approximately 0.9 is normally mixed with one equal part water. Snow, having a specific gravity of .96, is heavier and proceeds to sink to the bottom. As it sinks, it mixes with the antifreeze. A small layer of oil is placed on the top of the glycometh solution to reduce evaporation. The solution is good to –40° C.

ORDERING INFORMATION

Model 5057S (Glycometh) Rain and Snow Gage including 5057S-SA and 5050P
Model 5057S-SA Sensor Standpipe Assembly
Model 5050P Tipping Bucket
Model 5057GS Glycometh Solution
Model 5057CA Collection Assembly for environmentally critical areas

Model 5050P Tipping Bucket

FEATURES

- No power is required
- Uses accurate tipping bucket sensor
- Temperature compensated
- Interfaces with CompuLogger for long term storage
- Used with radio and satellite systems

SPECIFICATIONS

Model 5050P Tipping Bucket
Calibration: 1mm
Accuracy: ± 3% for precipitation rates from 0 to 6 inches/hour
Weight: 1 lb.

Model 5057S-SA Sensor Standpipe Assembly
Size: 6′ H x 12″ D
Weight: 65 lbs.
Shipping Weight: 80 lbs.

Model 2525
WINDSHIELD

Model 2525

The Model 2525 Windshield is used in areas of heavy snowfall or when precipitation gages are located in open exposed areas which are subject to strong and gusty winds. It is used to minimize wind-caused loss in precipitation catch.

Model 2525 consists of 32 free swinging galvanized metal leaves suspended from a rigid galvanized rod in a 48″ dia. circle. Each leaf is fabricated from prime quality sheet metal (22 gage), 16″ long, 3″ wide at the top, and 2″ wide at the bottom. The windshield is furnished with upright supports designed to locate the leaves ½″ above the orifice when used with Model 2500 or 2501 Rain Gages. It also may be used with Model 2500E or 2500P Snow Gages.

The NWS Alter Type Windshield is similar to the above except it is provided with an access gate and extended mounting posts.

SPECIFICATIONS

Shipping Weight: 73 lbs.

ORDERING INFORMATION

Model 2525 Windshield, complete as pictured
Model 2525A Windshield complete, NWS Alter type
Model 2525B-12 Bracket for mounting to 12″ diameter standpipes, specify type of standpipe (brackets differ)

Model 2517
EVENT RECORDER

Model 2517

The 2517 Event Recorder was designed primarily to be used to record precipitation data but can also be used with other instruments that provide switch closure outputs, such as totalizing anemometers. The pen is advanced by a stepping motor with each switch closure — typically 0.01″ precipitation — 100 steps up the recorder chart. It then drops to the base line of the chart and repeats. The drum clock is a high quality movement supplied with 1-day and 7-day rotation.* The recorder can be used indoors, or outdoors in an instrument shelter. See page 59 for shelter.

*It operates on 2 "C" cell batteries for approximately one year.

FEATURES

- Used with tipping bucket rain gages and contact anemometers
- 1-day and 7-day clock
- Electronic 31 day clock optional

SPECIFICATIONS

Input: Contact closure
Range: 0-100 counts, continuously recycling
Pen Control: Electromagnet-activated ratchet and cam
Coil Operating Voltage: 3.0 to 6.0 VDC
Coil Resistance: Approx. 30 ohms
Chart Size: 4.9″ H x 13.5″ L, 50 graduations, 2 events per graduation
Size: 13″ L x 5.75 W x 9.25″ H
Weight: 9 lbs.
Shipping Weight: 13 lbs.

ORDERING INFORMATION

Model 2517 Event Recorder, includes selectable 1-day and 7-day battery powered clock, cartridge pen and pack of charts
Model 2517M Same as above except 31 day electronic clock (2 "D" cells)
Model 2517CW Chart paper, weekly, 55 each
Model 2517CD Chart paper, daily, 55 each
Model 2517CM Chart paper, monthly, 13 each
Model 9950 Cartridge pen

Model 2520

Model 2510
U.S. WEATHER BUREAU RAIN AND SNOW GAGE

Model 2510

Model 2510 is an all aluminum rain gage with a total capacity of 20 inches of rainfall. The upper portion of the funnel is cylindrical in shape and is turned to a sharp edge. Rainwater falling into the funnel is delivered into the receiver. The ratio of the area of the orifice to the area of the receiver is 10 to 1, so that 1″ of rainfall delivers 10″ of water to the receiver and can be read to 0.01″. The capacity of the receiver is 2″ of rainfall. Any excess overflows into the outer chamber where it can be measured after the quantity in the receiver has been removed using the funnel.

When used as a snow gage, the receiver and funnel are detached and the snowfall is measured directly. Furnished with black lamacoid measuring stick.

SPECIFICATIONS

Range: English, 20″; Metric, 500mm
Minimum Reading: English, .01″; Metric, .025mm
Dimensions: 8¼″ D x 27″ H (overall)
Weight: 3 lbs.
Shipping Weight: 6 lbs.

ORDERING INFORMATION

Model 2510 Rain and Snow Gage includes measuring stick, specify English or metric units
Model 2510S Tripod Support for 2510
Model 2510M-E Measuring Stick English for 2510
Model 2510M-M Measuring Stick Metric for 2510

Model 2520
FOREST RAIN GAGE

Model 2520 is an 8″ diameter all aluminum rain gage with a total capacity for 7″ of rainfall. It is similar in construction to Model 2510. It meets USFS Specifications No. 5100-451B. It includes a lamacoid measuring stick.

SPECIFICATIONS

Range: English, 7″; Metric, 175mm
Minimum Reading: English, .01″; Metric, .025mm
Size: 9″ x 27″ (overall)
Shipping Weight: 7 lbs.

ORDERING INFORMATION

Model 2520 Rain Gage includes measuring stick, specify English or metric units
Model 2520S Support for 2520 Rain Gage
Model 2520M-E Measuring Stick English
Model 2520M-M Measuring Stick Metric

Models 5050LL-PT and 5050PT PRESSURE TRANSDUCER LIQUID LEVEL SENSORS
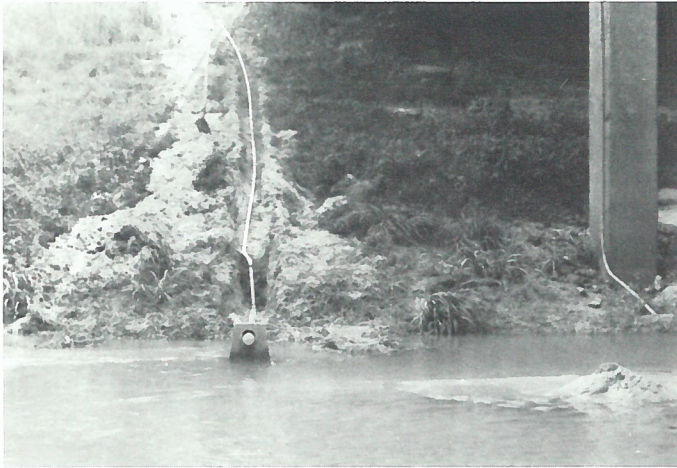
Model 5090 Self-Reporting Package Pressure Transducer Station

The 5050LL-PT Liquid Level Sensor uses a solid state pressure transducer to sense pressure changes. It can be used for river level and lake level measurements and also can be used to monitor the pressure of snow pillows. The pressure transducer is either supplied with a temperature compensated, built in current amplifier for long cable runs, 5,000 ft. maximum, Model 5050LL-PT, or without a built in current amplifier, Model 5050PT for short cable runs, 100 ft. maximum.

This instrument is used for measuring river levels where installation of a standpipe and stilling well is a problem and where a highly accurate device is not required. The overall accuracy is 0.5 to 1%, depending on the temperature conditions encountered. Resolution is 0.4%.

The Pressure Transducer is supplied with 50 feet of signal cable and a calculated amount of ½" flexible, waterproof carflex tubing (10 feet over the calibrated pressure range). The carflex tubing is used as a vent to automatically compensate for barometric pressure changes.

Model 5050PT

SPECIFICATIONS

Model 5050LL-PT	Model 5050-PT		
With Signal Conditioning	Without Signal Conditioning	Calibration Range	Maximum Range (ft. of water)
5050LLPT-1	5050LLPT-1	0-1 psi	0-2.3' of water
5050LLPT-5	5050PT-5	0-5 psi	0-11.5' of water
5050LLPT-15	5050PT-15	0-15 psi	0-34.6' of water
5050LLPT-30	5050PT-30	0-30 psi	0-69.3' of water

COMMON SPECIFICATIONS

Accuracy: Overall ± 1% full scale
Resolution: 0.4%
Power: 12 VDC, 10 ma
Operating Temperature: −30 to +60° C
Repeatability and hysteresis: ± 0.15%
Housing: PVC
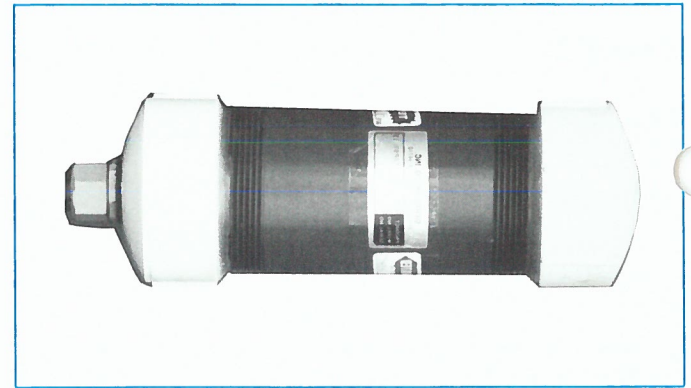Housing Size: 5050LL-PT 4" D x 10" L
           5050PT 2½" D x 7½" L
Signal Output: 5050LL-PT 0-5 VDC; 5050PT 1-6 VDC
Ranges: Each pressure transducer is factory calibrated to meet the customer's specific requirements
Response Time: 100 milliseconds to hydraulic changes
Turn-on Time: Less than 1 millisecond
Over Pressure: 100% rated

Model 5050LL-PT

ORDERING INFORMATION (Specify Calibration Range)

Model 5050LL-PT-1 Pressure Transducer Liquid Level Sensor, 0-1 psi, includes 50' cable
Model 5050LL-PT-5 Pressure Transducer Liquid Level Sensor, 0-5 psi, includes 50' cable
Model 5050LL-PT-15 Pressure Transducer Liquid Level Sensor, 0-15 psi, includes 50' cable
Model 5050LL-PT-30 Pressure Transducer Liquid Level Sensor, 0-30 psi, includes 50' cable
Model 5050PT-1 Pressure Transducer Liquid Level Sensor, without Signal Conditioning Electronics, 0-1 psi, includes 50' cable
Model 5050PT-5 Pressure Transducer Liquid Level Sensor, without Signal Conditioning Electronics, 0-5 psi, includes 50' cable
Model 5050PT-15 Pressure Transducer Liquid Level Sensor, without Signal Conditioning Electronics, 0-15 psi, includes 50' cable
Model 5050PT-30 Pressure Transducer Liquid Level Sensor, without Signal Conditioning Electronics, 0-30 psi, includes 50' cable
NOTE: Specify Liquid Level Units, i.e., feet, meters, etc.

Model 5050LL-FT
FLOAT TYPE
LIQUID LEVEL SENSOR

The Model 5050LL-FT Liquid Level Sensor consists of a float, counterweight, beaded chain and switch mechanism. This basic sensor is used for fluid measurements including stream and lake level, irrigation, and sewage. The float method of liquid level measurement is the least expensive and has the highest overall accuracy. The accuracy is ± 1 increment of sensitivity regardless of the range desired. This instrument is totally passive and requires no power for operation.

The 5050LL-FT is normally installed in conventional stilling well applications. As the float rises or falls in a stilling well, a set of magnetic reed switches senses each incremental change while another set of switches operating off the same shaft senses the level rising or falling.

The 5050LL-FT interfaces with the 6500 CompuLogger, 5050 transmitter and can drive a 9050 strip chart recorder when used with the 90100DA Digital to Analog converter.

It can be slaved to existing servo manometer bubbler systems or to any rotating shaft end and used as a shaft encoder.

SPECIFICATIONS

Standard Float Size: 4″ diameter stainless steel ball
Standard Pulley Circumference: 375mm
Force (Torque) to Operate: 5″ oz.
Cable: 50′ standard length of 5 conductor shielded, maximum length 500′. Cable runs over 500′ not recommended due to high probability of physical damage to cable.

Model	Increment Size
5050LL-FT	5, 15mm
5050LL-FT-2.5	2.5mm
5050LL-FT-10	10, 30mm (includes 750mm circumference pulley)
5050LL-FT-E	0.025, 0.050, 0.1 ft.

Signal Output: Increments alternate momentary form "C" contacts, SPDT contact closure
Housing: 4″ W x 10″ D x 7″ H
Weight: 10 lbs.

OPTIONS

Model 5050LL-FT-D: Hydraulic damping device attaches to drive pulley and used to dampen excess rotation fluctuations due to poor quality stilling well
Model 5050LL-FT-SI: Servo interface; 2 sprockets with ladder chain for interfacing to rotating shaft of Servo Manometer
Model 5050LL-FT-2.5: 5050LL-FT with 2.5mm sensitivity
Model 5050LL-FT-10: 5050LL-FT with 750mm drive pulley for 10mm increment size
Model 5050LL-FT-E: 5050LL-FT English increments 0.025, 0.050, 0.1 ft.

ORDERING INFORMATION

Model 5050LL-FT Liquid Level Sensor 5mm increment, 4″ float, 375mm pulley (or 0.025 ft. — specify increment). Float Line: 40 ft. of standard beaded 0.04″ dia. beads crimped at uniform intervals to match recesses in float pulley
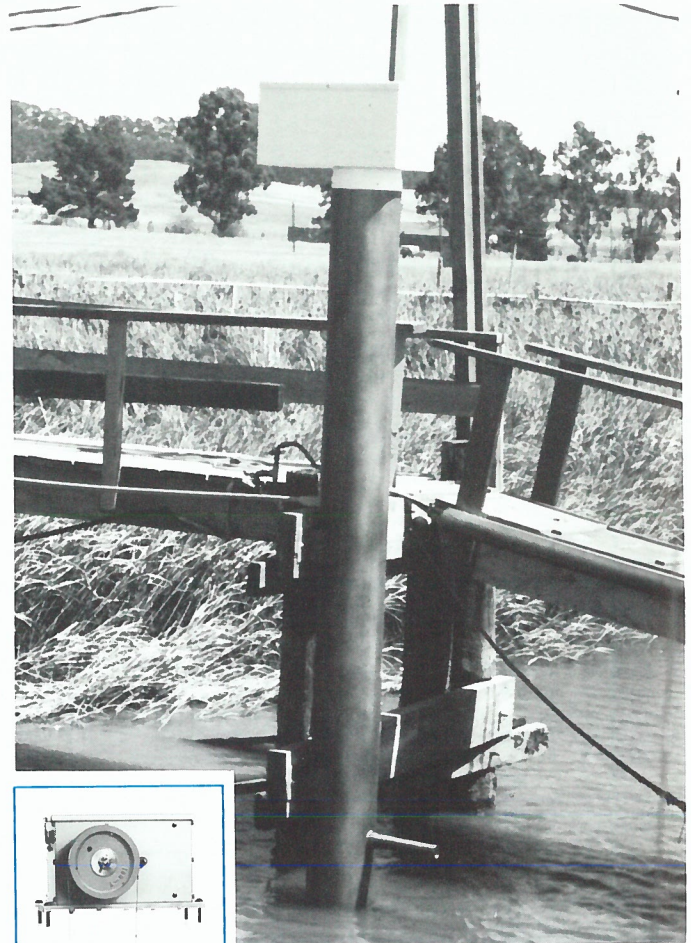Model 5050LL-FT-C Additional 5 Conductor Shielded Signal Cable
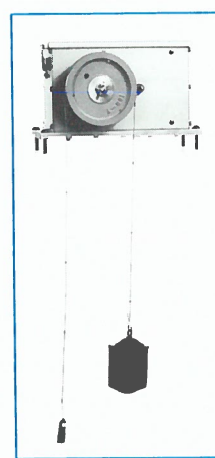Model 5050LL-FT-BC Additional Float Cable
Model 5050LL-FT-10F 10″ Diameter Float
Model 5050LL-FT-3F 3″ Diameter Float

Model 5088
STILLING WELL

Self-Reporting Stilling Well Liquid Level Station, Lakeport, CA

Model 5050LL-FT

The Model 5088 is a low cost, packaged stilling well. The unit consists of a top section which houses the 5050LL-FT float type liquid level sensor, and can house a recording device such as a 6500 CompuLogger or 5050 radio transmitter, and the 12″ diameter aluminum stilling well. It is ideally suited for installations where a concrete abutment (such as a bridge pier) is already in place and where silt loading is minimal. The stilling well pipe has two 2″ diameter inlets. A port as well as a removable bottom are provided for easy cleaning. A special hydraulic damping device attached to the 5050LL-FT pulley effectively eliminates the small fluctuations in the well.

The 5088 can be supplied for streams with ranges up to 30 feet.

ORDERING INFORMATION

Model 5088 Stilling Well Assembly. Specify: Location of mounting brackets and number and type of brackets; length of well.

Model 5058
SNOW PILLOW
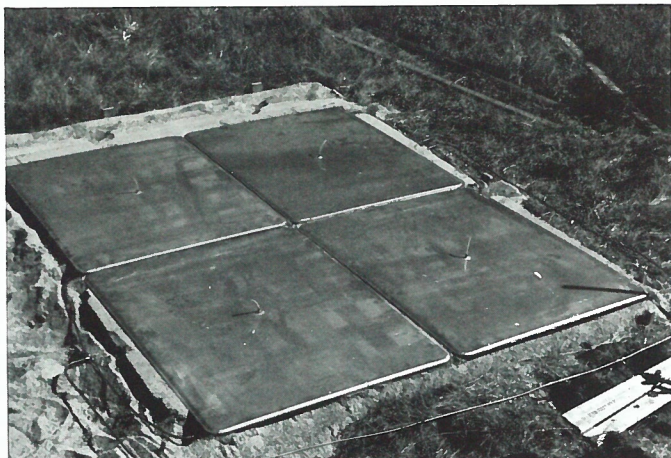
Model 5058

Snow pillows are used to measure the water content in snow by weight displacement. The snow pillow is filled with a glycometh solution mixed to a density of 1 which is displaced from the pillow as the weight of the snow accumulates on the pillow. The pressure of this displacement is measured by either a 5050LL-PT Pressure Transducer or 5050LL-FT Float Type Liquid Level Sensor in a standpipe. Since the glycometh solution has the same density as water, the pressure is directly proportional to the water content of the snow.

The pillows are made of stainless steel, welded construction and are air tight. These tanks are animal and rodent proof, use one fourth the amount of glycometh as alternate types, and require much less time to install. Four pillows should be used in parallel for reliable operation and to minimize the possibility of ice bridging.

SPECIFICATIONS

Pillow Dimensions: 4' W x 5' L x ½" thick
Volume: 12 gallons approximately
Weight: 53 lbs., not filled
Material: Stainless steel

OPTIONS

Model 5050LL-PT Specify maximum snow water content to be measured during snow season
Model 5050LL-FT Float type liquid level sensor
Model 6500 CompuLogger

ORDERING INFORMATION

Model 5058 Snow Pillow

Model 3004
EVAPORATION RECORDER

Model 3004

The Model 3004 Evaporation Recorder was designed as a portable self-contained instrument for providing continuous evaporation measurements. The instrument utilizes a wick and wetted filter paper connected to a water filled chamber. A float in the chamber is connected by linkage to the pen arm. The 7" chart height provides a range corresponding to 30mm of water surface evaporation. The extended range feature insures operation for up to one-week period except in extremely hot, dry climates. A smaller orifice is available which provides an extended range of 100mm. The instrument is calibrated using the National Weather Service Class A Evaporation Pan. The standard clock is a 7 day, 8 hour (176 hours) movement. Change gears for 1 day rotation are also available. All internal metal parts are stainless steel. Pivots are mounted in olive hole jewel bearings to reduce friction and maintain accuracy. 50 charts are included.

FEATURES

- White case
- 7 day, 8 hour movement (176 hours)
- 0-30mm or 0-100mm range

SPECIFICATIONS

Calibration: 0-30mm or 0-100mm
Accuracy: ± 1%
Sensor: Wetted Filter Paper
Clock: Spring wound, 11 jewel level escapement
Chart Size: 11-9/16" L x 7" H
Inking System: Felt-tip pen cartridge, optional stainless steel pot pen available, specify at time of order
Size: 13" L x 5¼" W x 11½" H
Weight: 12 lbs.
Shipping Weight: 16 lbs.

ORDERING INFORMATION

Model 3004 Evaporation Recorder, 30mm range, 50 charts, felt tip pen
Model 3004-100 Extended Range Recorder, 0-100mm range, 50 charts, felt tip pen
Model 3004-C30 Chart paper 0-30mm, package of 50
Model 3004-C100 Chart paper 0-100mm, package of 50
Model 3004F Filter paper, box of 10
Model 3004CG Change Gears for 1 day clock rotation
Model 9970 Stainless Steel Pot Pen

Model 3003
EVAPORATION GAGE
WITH ANALOG OUTPUT

Model 3003 Analog Output Evaporation Gage is used to determine the evaporation rate by measuring the changing water level in an evaporation pan. It is recommended for use with a standard Class A National Weather Service Evaporation Pan (Sierra/Misco 3005, page 62).

The instrument consists of a float, pulley and counter-weight attached to a precision 1000 ohm potentiometer mounted in a housing. The housing has a base plate with adjustable leveling screws and bubble level. The potentiometer produces a resistance output in relation to the position of the float and can be monitored on site with a data logger or strip chart recorder. It can also be used in conjunction with the Sierra/Misco Model 5050 Radio Transmitter or other telemetry equipment to gather real-time evaporation data from remote locations.

The instrument is connected to the pan by using ½" diameter pipe. The Model 3003 should be placed where it will not create a shadow on the pan which could affect the evaporation process.

Model 3003

FEATURES

- Weatherproof enclosure for electronics
- Operates in remote locations
- Automates manual evaporation stations
- Allows for telemetry interface
- Low power consumption

SPECIFICATIONS

Height: 27½"
Range: 8½"
Diameter: 8"
Base Dimensions: 16" triangle with leveling screws and bubble level
Float: 5" diameter stainless steel
Cable and Connector: 25' 3-conductor cable with 3-pin ms connector
Total System Resolution: .03"

- Potentiometer
  Accuracy: 1%
  Rotation: Continuous
  Resistance: 1000 ohms
  Operating Temperature: –50 to 125° F
  Linearity: 0.25%
  Range: 0-8"
 Water Input Port: ½" NP coupling, female
  Weight: 7½ lbs.
  Shipping Weight: 15 lbs.

ORDERING INFORMATION

Model 3003 Evaporation Gage with 1000 ohm potentiometer
Model 90870 Signal Conditioning Card for 0-5 V or 0-1 mA output, includes mounting adaptor
Model 3003P/F 10' Connecting Pipe and Fittings for attaching to Evaporation Pan
Model 3003C-TX 25' Cable and Connectors for attaching to telemetry transmitter
Model 3003C Additional cable, per foot
Evaporation pans and other accessories, see pages 52-53

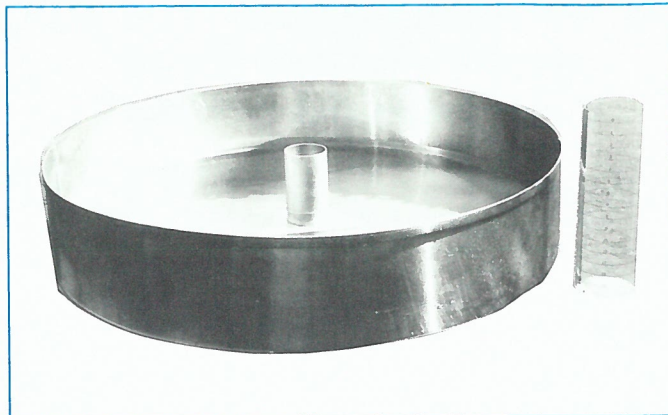# Model 3020
CLASS A
EVAPORATION STATION
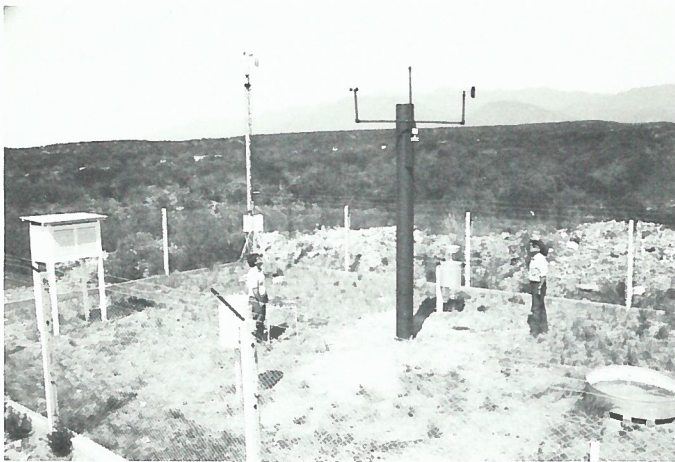
Self-Reporting Weather Station with Evaporation, Argentina

Model 3020 Class A Pan Evaporation Station consists of components selected to meet the National Weather Service Observing Handbook #2 Guidelines. The components are as follows:

Model 3005 or 3005SS Evaporation Pan
Model 3005-WS Wooden Support for Pan
Model 3006 Stilling Well
Model 3007 Micrometer Hook Gage
Model 3008 Submersible Thermometer for Water Temperature
Model 3009 Replacement Graduate
Model 3010 Floating Maximum/Minimum Thermometer
Model 1056 Totalizing Anemometer
Model 2510 8″ Precipitation Gage
Model 2500 Tipping Bucket Rain Gage
Model 2517 Event Recorder
Model 4525ML Cotton Region Type Instrument Shelter with Metal Legs
Model 3521 Maximum/Minimum Thermometer

The 3020 Class A Pan Evaporation Station can be used by utility companies, agri-business, climatologists, universities and various other agencies to determine evaporation in accordance with National Weather Service Standards. Data can be recorded manually or automatically by using a Model 3003 Evaporation Gage with appropriate recorder such as CompuLogger Model 6508 or 9050 Series Strip Chart Recorder.

Model 3005

ORDERING INFORMATION

Model 3020 Class A Evaporation Station
Model 3020A Same as above but with analog output
Model 3005-SS Class A Pan, Stainless Steel
Model 3005 Class A Pan, Galvanized Steel
Model 3005-WS Wood Support for Class A Pan
Model 3006 Still Well with Fixed Point
Model 3007E Micrometer Hook Gage, English
Model 3007M Micrometer Hook Gage, Metric
Model 3008 Submersible Maximum/Minimum Thermometer
Model 3010 Floating Maximum/Minimum Thermometer
Model 3521 NWS-Type Maximum/Minimum Thermometer
Model 3009 Replacement Graduate
Model 1056 Totalizing Anemometer
Model 1056S Totalizing Anemometer Mounting Device
Model 2500 Rain Gage, 8″ orifice, Tipping Bucket
Model 2517 Event Recorder
Model 2510 NWS-Type Manual Rain Gage, 8″ orifice
Model 4525 Instrument Shelter, NWS Cotton Region Type
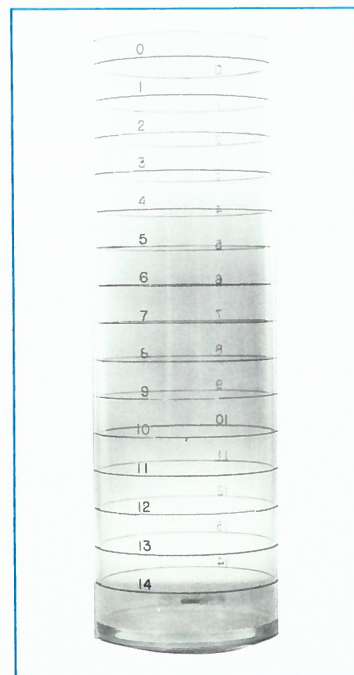
Model 3009

COMPONENT SPECIFICATIONS

- Evaporation Pans
Class A Evaporation Pans are 47.5″ diameter by 10″ deep.

Stainless Steel Model 3005SS   Galvanized Steel Model 3005

Weight: 48 lbs	42 lbs.
Shipping Weight: 55 lbs.	49 lbs.

- Wooden Support
Model 3005WS for Pan - 4′ . 4′ . 6″ Support for Pan and Totalizing Anemometer

- Stilling Well
The Stilling Well allows calibrated measurements of evaporation to be made using a companion Micrometer Hook Gage or Built-in Fixed Point and Replacement Graduate.

- Model 3006 Stilling Well
Height: 8⅝″
Diameter: 3½″
Base Dimensions: 12″ triangle
Weight: 8 lbs.
Shipping Weight: 10 lbs.

- Micrometer Hook Gage
The Micrometer Hook Gage is used with a stilling well to locate the water surface in the stilling well. When the gage contacts the water surface, water loss is read on the micrometer. This reading is compared to the previous one to determine evaporation rate for the period.
    Model 3007E English or 3007M Metric
Graduation: English — 0.002″ and readable to 0.001″ of water
                Metric — .1mm and readable to .02mm of water
Weight: 2 lbs.
Shipping Weight: 3 lbs.

- Thermometers
Submersible Max/Min, Floating Max/Min and NWS Type Max/Min Thermometers are available for use with the "Class A" Pan.

Model 3010 Floating	Model 3008 Submersible
Maximum/minimum	Maximum/Minimum
Thermometer complete	Thermometer complete
With plastic holder and float	With plastic holder and handle
Range: +20 to +110° F or	Range: +20 to +118° F or
−40 to +50° C	−40 to +50° C
Weight: 1 lb.	Weight: 1 lb.
Shipping Weight: 2 lbs.	Shipping Weight: 2 lbs.

See page 39 for specifications on 3521 National Weather Service Maximum/Minimum Thermometer.

- Replacement Graduate Model 3009
A transparent, plastic tube used to add a precise amount of water back into "Class A" Pan. The amount of water added represents evaporation.
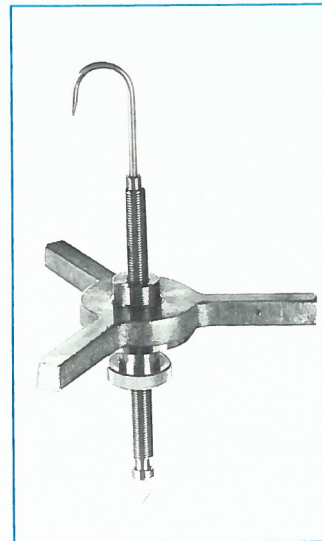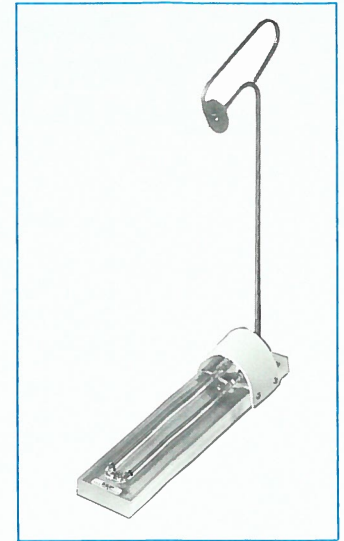Graduation: 1″
Accuracy: ± 0.01″
Weight: 1 lb.
Shipping Weight: 2 lbs.

- Anemometer
A Totalizing Anemometer is used near the water surface to determine air flow in vicinity of "Class A" pan. See page 28 for specifications of Model 1056.

Model 3007

Model 3008

- Instrument Shelter
A Cotton Region Type Shelter is used to provide proper exposure for Max/Min Thermometer or recording instruments used with "Class A" pan.

See page 00 for specifications of Model 4525.

- Rain Gage
Either recording or non-recording rain gages can be used. See page 44 for models and specifications.

Model 3006

Model 4001
PYRANOGRAPH

Model 4001

Sierra/Misco Model 4001 Pyranograph is an excellent self-contained survey type instrument. It provides a continuous record of the intensity of the direct and diffused solar radiation from which daily totals can be calculated. It works on the principle of the difference between the temperature of two parallel white coated bi-metal strips and two identical black coated bi-metal strips. The temperature difference is proportional to the intensity of radiation and is independent of ambient temperature.

The black bi-metal strips absorb the radiation and are distorted relative to the white strips which reflect radiation. Each pair of bi-metal strips is attached to the instrument case while the adjacent ends of the black strips are connected to the pen arm through a lever system. Temperature gradients within the instrument case are compensated for by placing the white strips on each side of the black strips.

Ninety percent of the radiation in the 0.36 to 2-micron range is transmitted through the glass hemisphere to the measuring elements. All components of the linkage are made from chrome-plated brass and stainless steel. Gasket seals and a desiccant chamber prevent condensation from forming on the inside of the glass hemisphere. The lag coefficient is approximately 5 minutes. The brass spring wound clock is selectable for 1 day/7 day.

FEATURES

- Measures and records intensity of global solar radiation
- Weatherproof
- White case to reflect radiation and prevent internal heating
- Compact and sturdy
- Portable

SPECIFICATIONS

Sensing Elements: Black and white bi-metal strips
Calibration: gm cal/cm min
Scale Divisions: 0.05 gm cal/cm min
Full Scale: 2.5gm cal/cm min
Spectrum Sensed: 0.36 to 2.0 micron 90% transmission
Lag Coefficient: Approximately 5 min
Drum Rotation: 1 day/7 day, selectable
Clock Drive: Spring wound
Clock Drive Accuracy: ± 14 min/wk
Chart Size: 11½" x 3½"
Site Leveling: 3 adjustable legs and bulls eye level
Color: White
Size: 13" L x 7.87" W x 11¼" H
Weight: 14 lbs.
Shipping Weight: 25 lbs.

ORDERING INFORMATION

Model 4001 Mechanical Pyranograph spring wound 1 day/7 day clock, pen, ink and pack of weekly charts
Model 4001M Mast with mounting plate, facilitates installation; mast 5' x 1¼" dia. with 8" x 12" mounting plate
Model 4001K Spare Parts Kit includes cartridge pen tip (2), pen arm rubber gasket, and spare glass dome
Model 4001CW Chart paper, weekly, 0-2.5 ly/min, 55 charts

Model 4010
BLACK AND WHITE
PYRANOMETER

Model 4010

Model 4010 Black and White Pyranometer is used for the measurement of Global (total sun and sky) Radiation. The spectral response of this model is similar to that of the junction type pyranometers as the reflectance of Barium Sulfate is essentially identical to that of Magnesium Oxide over the solar range of wave lengths. The Schott WG7 glass is transparent from about 280 to 2800 nm. This hemispherical envelope has a weather-proof seal but is readily removable for instrument repair. The chromed brass case carries a circular spirit level and adjustable leveling screws.

SPECIFICATIONS

Sensitivity: 7.5 mv/gm cal/cm² min (approx)
Impedance: 300 ohms
Temperature Dependence: ± 1.5% constancy from −20 to +40° C
Linearity: ± 1% from 0 to 2.0 gm cal/cm² min
Response Time: 3 to 4 seconds
Cosine Response: ± 2% from normalization, 10-90°
Orientation: No effect on instrument performance
Weight: 8 lbs.
Shipping Weight: 12 lbs.

ORDERING INFORMATION

Model 4010 Black and White Pyranometer

54

Model 4015
SOLAR RADIATION
(PYRANOMETER) SENSOR
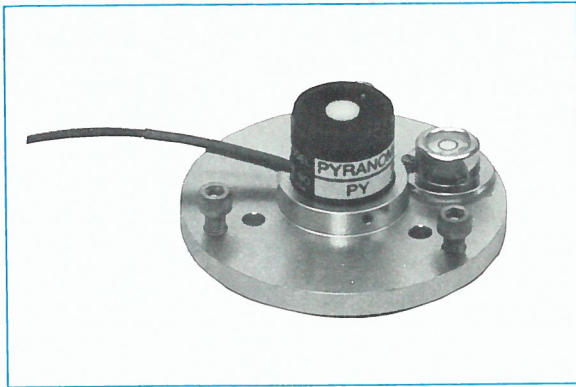
Model 4015

The Model 4015 Sensor is used for field measurements in solar, meteorological, agricultural and hydrological studies. It features a silicon photovoltaic detector mounted in a fully cosine corrected miniature head. It can be mounted in any position without affecting its performance. For clear, unobstructed daylight conditions the pyranometer compares favorably with thermopile type instruments at a fraction of the cost. The spectral response does not cover the full range of the solar spectrum, but the error induced is less than ± 5% under conditions of natural daylight. The instrument should not be used under vegetation or artificial lights. A calibrated millivolt adapter is included which gives a readout of 10.0 mV per 1000 Wm^2 on dataloggers or strip chart recorders. Cable lengths up to 1000 ft. are available.

SPECIFICATIONS

Sensitivity: 10 millivolts per 1000 W/m^2
Linearity: Maximum deviation of 1% up to 3000 Wm^2
Stability: Less than 2% change over a 1 year period
Response time (10-90%): 10 microseconds
Temperature dependence: ± 0.15% per degree C
Cosine Correction: Cosine corrected by up to 80° angle of incidence
Azimuth Error: Less than 1% over 360° at 45° elevation
Sensor: Silicon photovoltaic detector
Tilt: No error induced from orientation
Sensor Case: Weatherproof anodized aluminum case with diffuser and stainless steel hardware
Size: 0.94″ x 1.0″
Mounting: ¾″ OD Aluminum sleeve
Weight: ½ lb.
Shipping Weight: 1 lb.

ORDERING INFORMATION

Model 4015-5 Solar Radiation Sensor with 5 ft. cable
Model 4015-10 same as above with 50 ft. cable
Model 4015M Mounting and leveling fixture (3″ dia.)
Model 4015TM Mounting for crossarm

Model 4011
SILICON CELL
PYRANOMETER

Model 4011

Model 4011 Silicon Cell Pyranometer is a low cost, rugged, weatherproof solar radiometer intended for use under the most severe field conditions. It is completely self-contained and does not require any external power supply. It uses a silicon photovoltaic cell as a sensor. The spectral response is from 0.35 to 1.15 microns. One hundred percent response to a change in signal takes less than one millisecond. It is calibrated for the entire solar spectrum by comparison with thermopile type radiometers in bright sunshine on clear days. Cosine effect and air-mass effect corrections are made during calibration. Standard temperature compensation is from +40 to 140° F. Each instrument is furnished with a certificate of calibration showing radiation in both English and Metric units. Special filters and other modifications are available on special order.

FEATURES

- Measures total radiation from both sun and sky
- Waterproof
- Completely self-contained
- Factory calibration certificate

SPECIFICATIONS

Sensor: Silicon photovoltaic cell
Spectral Response: 0.35 to 1.15 microns
Standard Sensitivity: 50mV per gm cal/cm^2 min
Accuracy: ± 5%
Temperature Compensation: 40 to 140° F
Full Scale Response Time: Less than 1 millisecond
Standard Cable: 10 ft., 2 conductor for meter, recorder, etc.
Size: 5″ dia.
Mounting: On Model 4011M Mounting and Leveling Fixture with ¾″ O.D. Aluminum Sleeve
Shipping Weight: 1½ lbs.

ORDERING INFORMATION

Model 4011 Silicon Cell Pyranometer with 10 ft. of 2-conductor cable
Model 4011SB Shadow Band for measurement of diffuse sky radiation 0-60° north or south latitudes
Model 4011C 2-conductor, 20 AWG Shielded Cable
Model 4011M Mounting and Leveling Fixture
Model 4011TM Mounting for crossarm on tower

Model 4551
MULTI-PLATE/FREE FLOW RADIATION SHIELDS

Model 4551

Model 4551 Multi-Plate/Free-Flow Radiation Shields are naturally ventilated shields designed for either ambient temperature or dew point temperature sensors. The temperature shield will accommodate most commercially available thermocouple, resistance wire, or thermistor type sensors. The dew point shield will accommodate most dew point and relative humidity sensors. Twelve white opaque plastic molded discs permit easy air passage through the shield.

The shields were originally developed for rugged use on drifting buoys and have now been adapted for land use. Wind tunnel tests under artificial radiation indicate this new shield design has lower heating errors than the best naturally ventilated shields tested by the Canadian Atmospheric Environment Service.

The support studs extend below the sensor to the shield base which has a female pipe coupling for mounting on standard threaded pipe.

FEATURES

- Light weight
- Easy air passage with positive radiation blockage

SPECIFICATIONS

Overall Dimensions: 10.6″ H x 4.7″ Dia.
Plates: .08″ thick x 0.44″ spacing
Sensor Clearance:
    Model 4551-P1/2 0.7″ dia. x 4.7″ long
   Model 4552-P1 1″ dia. x 5.1″ long
    Model 4552-T1 1.3″ dia. x 6″ long

ORDERING INFORMATION

Model 4551-P1/2 Multiplate/free flow temperature shield with ½″ NPT (use with 3450P temperature sensor)
Model 4552-P1 Multiplate/free flow humidity and dew point shield with 1″ NPT (use with 2044 series and 2042-HT series sensors)
Model 4552-T1.3 Multiplate/free flow humidity and dew point shield with 1.3″ tube (use with 2044 series and 2042-HT series sensors)

Model 4540
VANE ASPIRATED RADIATION SHEILD
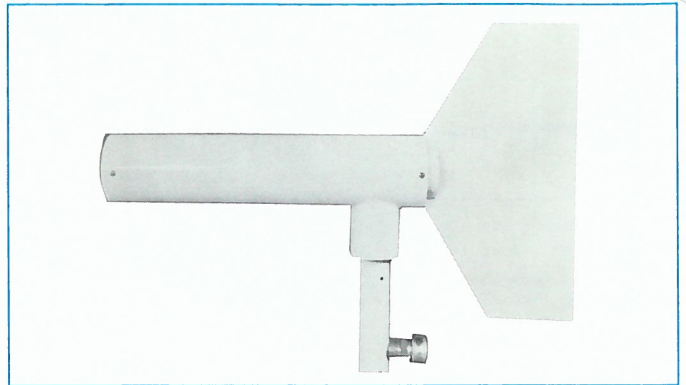
Model 4540

Model 4540 Radiation Shield provides protection for temperature and humidity sensors from solar radiation. Designed for use where power is not available and more than passive sensor aspiration is desired, the large tail section of the shield directs the air inlet into the prevailing wind to supply the necessary flow of ambient air over the sensors.

Two concentric tubes separated by spacers insure maximum protection from radiated heat. It is constructed of aluminum and painted a highly reflective white enamel. Bearings are double shielded for maximum life and low threshold performance. Maximum sensor size is ¾″ diameter. A waterproof sensor output cable strain relief is located on the side of the main mounting tube.

SPECIFICATIONS

Mounting: 1.3″ outside diameter aluminum tubing sits 1.3″ inside diameter scaffold fitting
Weight: 1½ lbs.
Shipping Weight: 4 lbs.

ORDERING INFORMATION

Model 4540 Vane Aspirated Radiation Shield for Temperature sensor (3540P)

Model 4560
MOTOR ASPIRATED
SOLAR-RADIATION SHIELD

Model 4560 Motor Aspirated Solar-Radiation Shield is designed to provide maximum sensor protection from incoming short-wave solar radiation as well as outgoing long-wave radiation, and to provide high heat transfer from the ambient air to the sensor. Most commercially available thermocouple, resistance wire, or thermistor type temperature sensors can be accommodated.

The sensor shield portion of the instrument employs concentric intake tubes for thermal separation and isolation of the sensor. A specially constructed shield assembly of white opaque thermoplastic is mounted with the open intake facing downward. The temperature sensor is mounted vertically within the shield. Intake air flows between the inner and outer shield tubes as well as across the sensor. This construction eliminates heat transfer from outer to inner surfaces while providing a low conduction, high reflection outside surface.

The temperature sensor is mounted about 2" up inside the shield intake. A continuous duty 24VAC-12 watt blower is located at the opposite end of the assembly. It draws ambient air across the temperature sensor at approximately 3 m/s (10'/sec). A blower flow switch can be connected to an indicator and actuated when anything impedes the flow of air through the system.

An Aspirated Temperature-Dew Point Radiation Shield, Model 4561, is also available. It provides two separate shields located side by side at the end of the mounting cross-arm with 8" separation. A single blower aspirates both shields. The dew point shield will accommodate most moisture sensors.

FEATURES

- Highly reflective white outside surface
- Continuous duty low power motor
- Reduced air flow for dew point sensor
- Can be used with most commercial sensors
- Excellent for lapse rate measurements
- Universal mounting brackets are provided
- Blower flow switch
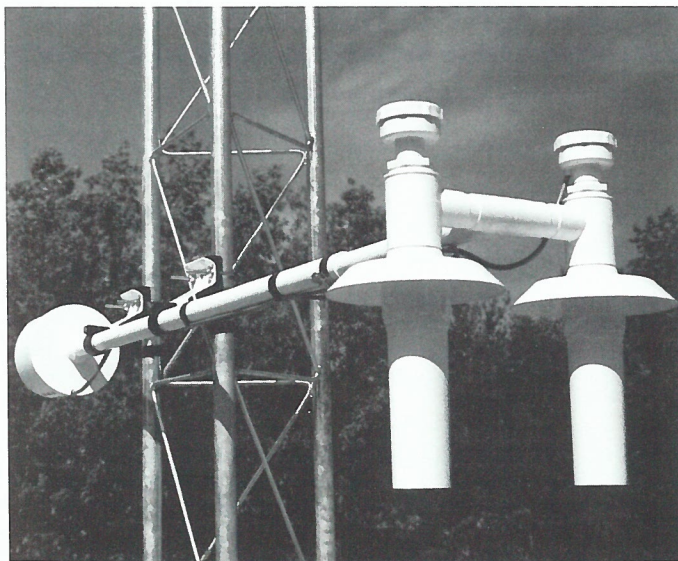
Model 4561
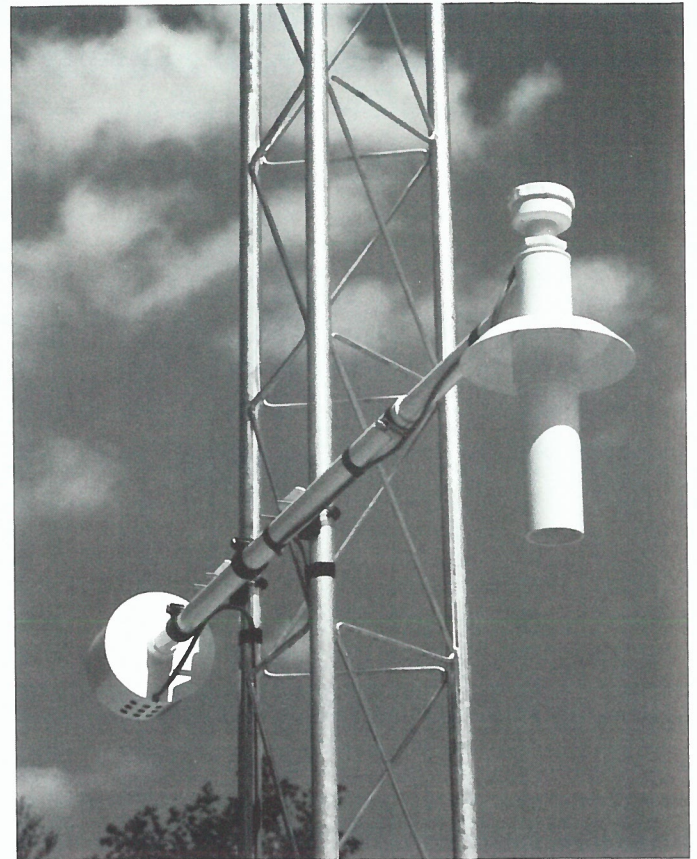
Model 4560

SPECIFICATIONS

Dimensions:
Length: 43"-75" adjustable blower housing 6.3" dia. x 5.1"   long
Shield: 2.0" OD x 7.8" long
Sensor Clearance:
Model 4560 0.7" dia. x 7.8" long (temp)
Model 4561 1.1" dia. x 7.8" long (dew pt.)

- Sensor Mounting
Model 4560 ½" NPT threaded fitting (temp)
Model 4561 1" NPT threaded fitting (dew pt.)
Power: 24 VAC/50-60 Hz/12 watts for blower motor
Transformer supplied with 115 V/230 V primary

- Mounting
Universal brackets for tower mounting — U-bolts fit vertical leg or horizontal brace to 2" dia.
Weight: Less sensors and cables 7.5 lbs.
Shipping Weight: 18 lbs.

ORDERING INFORMATION

Model 4560 Motor Aspirated Solar-Radiation Shield for temperature, includes mounting brackets
Model 4561 Motor Aspirated Solar-Radiation Shield for temperature and dewpoint or humidity, includes mounting brackets
Model 4560PC Power Cable, 3 conductor shielded, specify length

Model 4550
PASSIVE RADIATION SHIELD
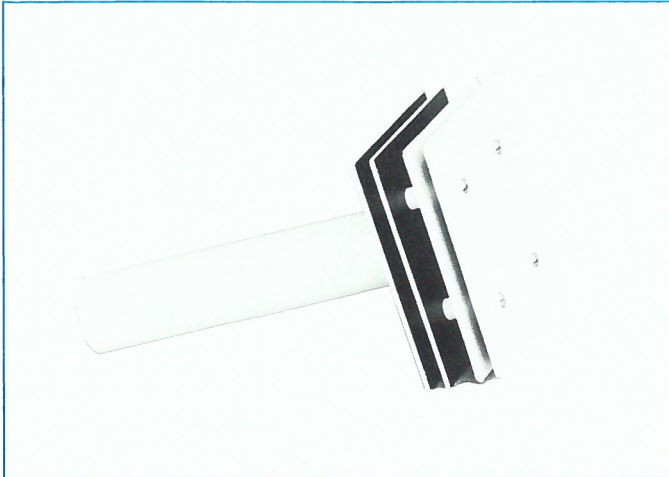
Model 4550

The Model 4550 Solar Radiation Shield protects temperature and humidity sensors from solar radiation. The unit, with no moving parts, consists of four thermally reflecting plates. Surfaces receiving direct radiation are painted white to reflect the energy while the other surfaces are painted black to absorb the radiant heat that accumulates. The passive design allows exposure to ambient air flow while protecting the sensors.

SPECIFICATIONS

Weight: ¾ lb.
Shipping Weight: 1½ lbs.

ORDERING INFORMATION

Model 4550 Passive Radiation Shield with 1" NPT coupling for temperature
Model 4550M Passive Radiation Shield for 2040 humidity sensor
Model 4550RS Passive Radiation Shield for 2042 temperature and humidity sensors
Model 4550T Passive Radiation Shield with 1" tube for temperature

Model 4541
SOLAR POWERED FAN ASPIRATED SENSOR RADIATION SHIELD
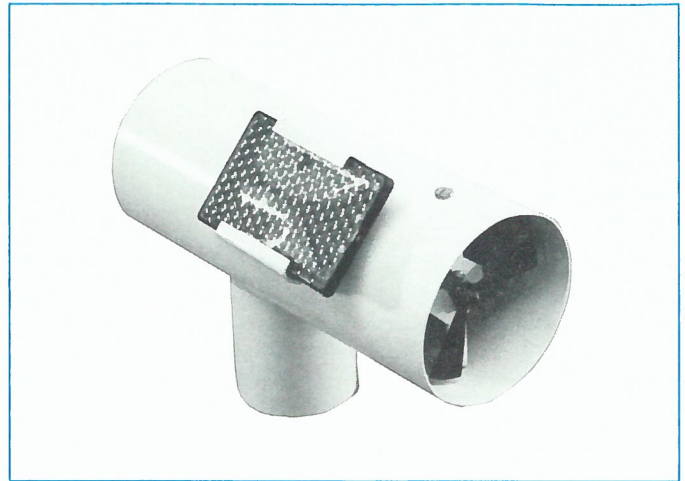
Model 4541

The Model 4541 Solar Powered Fan Aspirated Radiation Shield for temperature and humidity sensors prevents incorrect temperature readings induced by solar, roof or ground radiation. It is completely self-contained and does not require any external power.

FEATURES

- Reduces wind loading on mast
- Rugged and inexpensive
- Solar powered
- Retrofits existing system

SPECIFICATIONS

Power: Photovoltaic cell
Material: Aluminum; Finish: White epoxy
Shield Diameter: 3"
Housing Diameter: 2"
Housing Length: 9"
Mounting: 1" outside diameter aluminum tubing mates with standard 1" inside diameter scaffold fitting
Weight: 1.2 lbs.
Shipping Weight: 4 lbs.

ORDERING INFORMATION

Model 4541 Solar Powered Fan Aspirated Solar Radiation Shield for Temperature (3540P)
Model 4541HT Radiation Shield for Temperature and Humidity 2042-HT

Model 4530
THERMOMETER SHELTER

Model 4530 is a small shelter for housing thermometers such as the Model 3580 Maximum/Minimum or Model 3520 Standard. Louvers in the sides and front provide ventilation to the thermometers. Pre-drilled holes in top or bottom are provided for mounting. This thermometer shelter features a locking door.

SPECIFICATIONS

Dimensions: 10″ W x 6″ D x 20″ H
Shipping Weight: 10 lbs.

ORDERING INFORMATION

Model 4530 Thermometer Shelter

Model 4535
SMALL INSTRUMENT SHELTER

Model 4535 is manufactured to conform to U.S. Weather Bureau Specifications No. 450.0614 and is ideally suited for housing thermographs, hygrothermographs and other recording instruments. Weather resistant white finish. Shipped assembled.

SPECIFICATIONS

Dimensions: 18″ W x 13″ D x 20″ H
Shipping Weight: 18 lbs.

ORDERING INFORMATION

Model 4535 Small Instrument Shelter

Model 4525
INSTRUMENT SHELTER

The Model 4525 Instrument Shelter is a U.S. Weather Bureau "cotton region" medium-size type. It has louvered sides with a double roof designed to protect instruments from precipitation and solar radiation. The louvered construction permits air to circulate freely through the shelter. A fixed board near the center inside is provided for properly mounting thermometers and other sensors. The shelter is shipped knocked down. Pilot holes for screws are pre-drilled so it can be easily assembled in less than 30 minutes. Wooden or metal legs are available. Metal legs are recommended for permanent low maintenance installations.

FEATURES

- Large enough to house several recording instruments
- Weather Service Type
- Double roof
- Locking door

SPECIFICATIONS

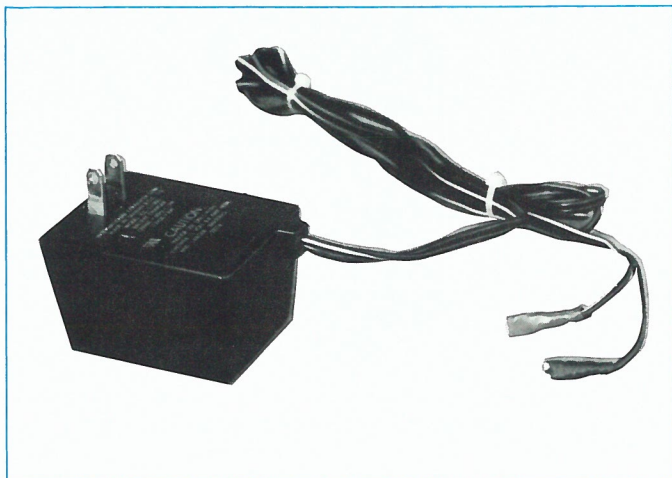Size: 32″ H x 30″ W x 20″ D
Shipping Weight: 100 lbs. (with legs)

ORDERING INFORMATION

Model 4525KD Instrument Shelter, no legs, knocked down
Model 4525KD-WL Instrument Shelter, wooden legs, knocked down
Model 4525KD-ML Instrument Shelter, metal legs, knocked down
Model 4525GL Metal legs only

Model 4530

Model 4535

Model 4525

Model 5030
BATTERY CHARGERS

Model 5030-8

Sierra/Misco's Model 5030 Battery Chargers have been designed specifically to charge various 5031 Gel Cel batteries.

For each battery there are two chargers available: 1) a trickle or float charger used where AC power is available which keeps the battery charged without overcharging it, and 2) a taper or quick charge charger which is used to charge batteries overnight which have been discharged. The use of a taper charger over a longer period will overcharge the battery and damage it so it is important to use the correct charger for the correct battery and application.

SPECIFICATIONS

Connector: Push-on lugs to mate with 5031 batteries, 5 pin ms connector, or 3 pin ms connector as specified by Model Number
Power: 115 VAC 50/60 Hz, unless otherwise specified
Output: Approximately 14.4 volts peak, current rating depends on Model Number
Size: Approximately 2⅛" x 3" x 1¾"
Weight: Approximately 1 lb.
23 AH Chargers Size: 6" W x 5½" H x 4" D
24 AH Chargers Weight: 5½ lbs.

ORDERING INFORMATION

Model 5030-4 For Quick Charging 4 AH Gel Cell Battery with Mating Battery Connector
Model 5030-4F For Float Charging 4 AH Gel Cell Battery with Mating Battery Connector
Model 5030-8 For Quick Charging 8 to 12 AH Gel Cell Battery with Mating Battery Connector
Model 5030-8F For Float Charging 8 to 12 AH Gel Cell Battery with Mating Battery Connector
Model 5030-8F/3AC For Float Charging 8 to 12 AH Gel Cell Battery with 3 Pin MS Connector
Model 5030-8F/5AC For Float Charging 8 to 12 AH Battery with 5 Pin MS Connector
Model 5030-23 Heavy Duty Charger with switch for long term float charging and quick charging, recommended for international use.

Model 5031 Series
RECHARGEABLE 12 VOLT
GEL CELL BATTERIES
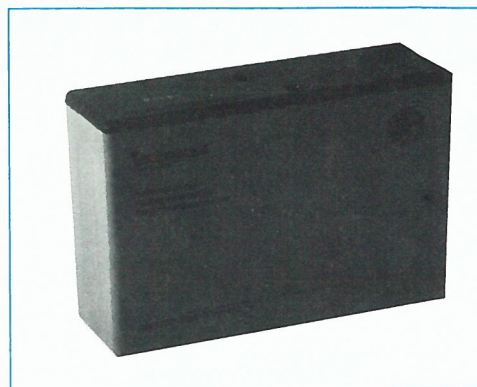
Model 5031-9.5

The Model 5031 batteries are general purpose rechargeable batteries of the lead gel type. These batteries have been found to be the most reliable and cost effective when properly charged and operated in the temperature range specified. The battery's sealed case is made of high impact polystyrene which allows the battery to be operated or stored in any position without leakage. These batteries can be operated in parallel for applications which require more power.

SPECIFICATIONS

Nominal Capacity: Rated at 70° F and 0.5 amp load with 10.5 volt end point voltage
Temperature Range: –40 to 60° C
Terminals: Positive ¼" push on, negative 3/16" push on
Service Life: Nominal 5 years provided not discharged below 10 V
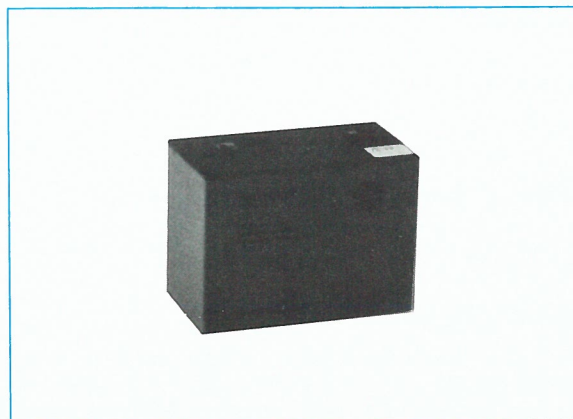Self-Discharge Rate: Approximately 8%/month at 70° F

Model	Capacity	Size	Weight
5031-4	4 Amp Hour	5"x3½"x2½"	5 lbs.
5031-9.5	9.5 Amp Hour	8.4"x5½"x2.8"	10 lbs.
5031-12	12 Amp Hour	8.4"x5½"x2.8"	11 lbs.

ORDERING INFORMATION

Model 5031-4 12 Volt 4 Ampere Hour Gel Cell Battery
Model 5031-9.5 12 Volt 9.5 Ampere Hour Gel Cell Battery
Model 5031-12 12 Volt 12 Ampere Hour Gel Cell Battery

Model 5031-4

Model 5032
BATTERY DISCHARGER

Model 5032

The Model 5032 Battery Discharger is used to discharge batteries after they have been recharged to determine if they still meet their original specifications. When Gel Cel Batteries are used over extended periods, for example one year, they may require charging and discharging 2 or 3 times before holding a full charge.

The Battery Discharger automatically loads the battery, measures the discharge time, monitors the current, and disconnects the battery when it falls below 10 VDC to protect the battery from a deep discharge. The battery discharger is a convenient instrument when testing the ability of the battery to accept a full charge prior to placing it in the field.

SPECIFICATIONS

Power: 115 VAC, 60 Hz (the 5032 can be used on 50 cycles; the timer will read 5/6 of the actual discharge time)
Meter: 0-5 amps full scale
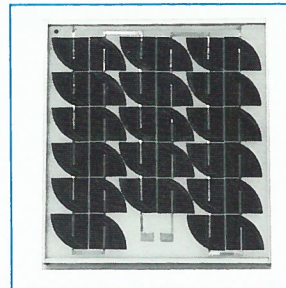Running Time Meter: Resettable 5 digits, minutes and tenths of a minute
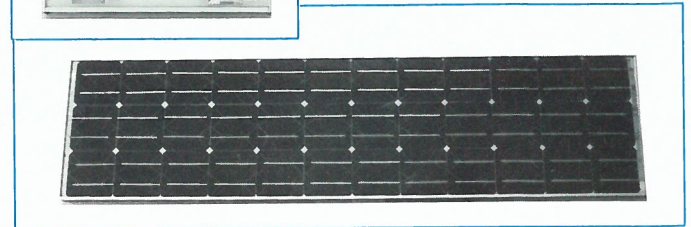Size: 8" W x 6⅝" H x 8" D
Weight: 6 lbs.

ORDERING INFORMATION

Model 5032 Battery Charger

Models 5033-0.4 and 5033-2.5
SOLAR PANELS

Model 5033-0.4

Model 5033-2.5

The Models 5033-0.4 and 5033-2.5 Solar Panels are used for maintaining battery charge at sites that have high power requirements such as transceiver sites, 6500 CompuLogger Weather Stations, 5252P Repeater Stations or at sites where over 40,000 transmissions are expected in a year. The panels come complete with blocking diodes and regulator circuits designed to allow effective charging of Model 5031 Gel Cell Batteries without overcharging or discharging.

SPECIFICATIONS

Model 5033-0.4 Solar Panel
    Maximum Output: 0.4 Amps
    Regulated Voltage Output: 14.5
Model 5033-2.5 Solar Panel
    Maximum Output: 2.5 Amps
    Regulated Voltage Output: 14.5

OPTIONS

Model 5033-0.4MB Mounting Bracket
Model 5033-2.5MB Mounting Bracket
Model 5033C-3P Cable with 3 Pin ms connector for connecting to transmitter, 25' standard length
Model 5033C-5P Cable with 5 Pin ms connector for connecting to repeater, 25' standard length

ORDERING INFORMATION

Model 5033-0.4 Solar Panel, 400 mA, 12 VDC
Model 5033-2.5 Solar Panel, 2.5 Amp, 12 VDC

ANTENNAS

Model DB224

The Antennas listed below are extremely rugged and are fabricated of light weight, high strength aluminum alloys. All the antennas listed are designed to survive 100 mph winds. Further specifications are available on request.

The antennas selected for transmitting from remote sites and receiving at the base station or repeater can improve the signal strength where long distances and marginal radio path conditions exist. High gain directional antennas should be used at low sites or sites where the radio path is determined to be marginal. They can also be used on the receiver of a repeater or at a receive site when the signals coming into the site are directional.

High gain omni antennas are normally specified for the base station and for repeater sites which are installed on existing towers.

You will save on the power required to operate the remote site transmitter and extend the battery life by using good, high gain antennas instead of higher transmission power.

The following table summarizes the characteristics of the VHF and UHF antennas Sierra/Misco recommends:
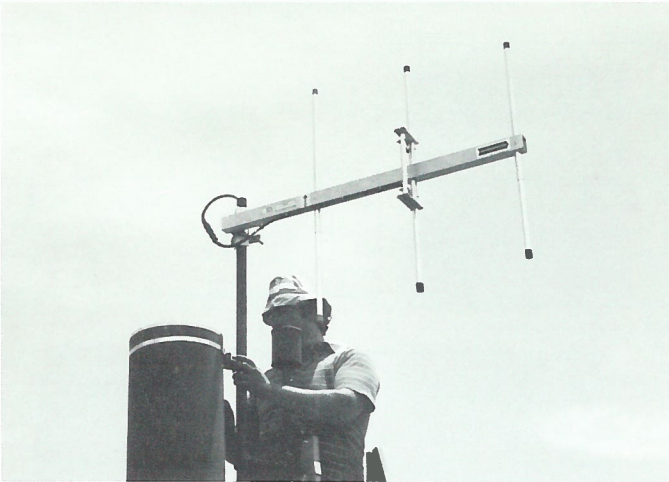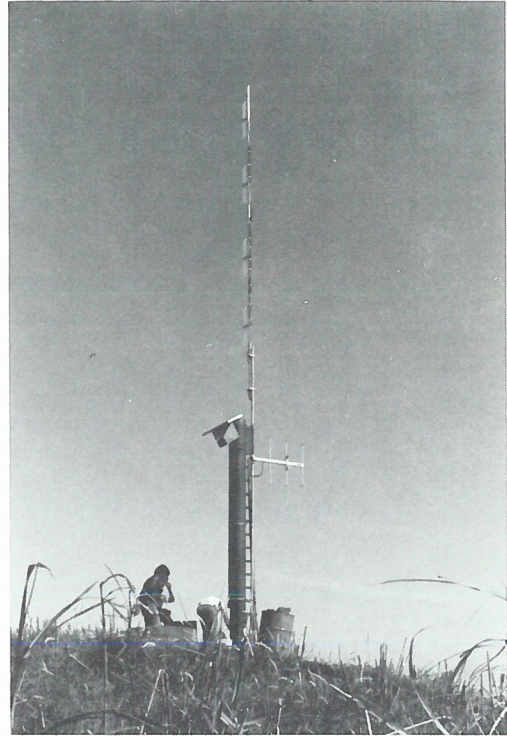
ANTENNA MOUNTING BRACKETS

The DB224, DB408 and DB420 Antennas are supplied with clamps for top mounting. If side mounting is required the respective side mount should be ordered.

These heavy duty side mount kits include all brackets, clamps and hardware to mount the antenna to a tower leg.

ORDERING INFORMATION

Model DB5001 Side Mount Kit for use with DB224
Model DB5012 Side Mount Kit for use with DB408 and DB420

Model DB230

ORDERING INFORMATION

Model No.	Type	Gain	Radiation	Mounting Brackets
5050ANT	Omni (VHF or UHF)	3 DB	360 Degrees Size: Length Approximately 2', Width 3'	U-Bolt to 1⅝"
DB224	VHF-OMNI	6 DB	360 Degrees Size: Length Approximately 20', Width 1½'	Bracket for 2½" top mounting, side mounting available
DB230	VHF-DIR	7 DB	60 Degrees Size: Length approximately 3½', Width 3'	Bracket for 2" pipe
DB292	VHF-DIR	9.5 DB	60 Degrees Size: Length approximately 6', Width 3'	Bracket for 2½" pipe
DB408	UHF-OMNI	6.6 DB	360 Degrees Size: Length approximately 9½', Width 1½'	Bracket for 2½" top mounting, side mounting available
DB420	UHF-OMNI	9.5 DB	360 Degrees Size: Length approximately 18', Width 1½'	Bracket for 2½" top mounting, side mounting available
DB436	UHF-DIR	10 DB	40 Degrees Size: Length approximately 3', Width 2'	Bracket for up to 3" pipe

Ordering Information

PRICES

All prices are F.O.B. Berkeley, California, U.S.A. in U.S. dollars. Applicable federal, state and local taxes are extra. Prices are subject to change without notice.

TERMS

½% 20 days, net 30.

DISCOUNTS

Quantity discounts are available when placed in a single order. Consult factory for applicable discounts. Most Sierra-Misco products are covered by GSA contract for which an appropriate Federal Government discount applies. Government supply schedule contract information is available upon request.

RETURNS

When returning products, consult the factory for a return authorization and shipping instructions.

WARRANTY

Sierra-Misco warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment from our factory. Sierra-Misco's obligations under this warranty are limited to replacing or repairing, at its option, any of the products determined to be defective. This warranty shall not apply to any equipment that has been repaired or altered, except by Sierra-misco, or which has been subjected to misuse, negligence, or accident. In no case shall Sierra-Misco's liability exceed the original purchase price.

Specifications are subject to change without notice.

SM **Sierra-Misco, Inc.**
Environmental Products

1825 Eastshore Highway
Berkeley, California 94710
Telephone (415) 843-1282

Sierra/Misco Inc. is located in Berkeley, California and offers a complete line of environmental products to monitor and measure data on Wind Speed and Direction, Temperature, Humidity, Precipitation, Water Level, Snow Level, Evaporation, Atmospheric Pressure and Air Sampling Instruments for measuring particulate matter and gases.

Write or call collect (415) 843-1282 or Telex 275945 SMBK UR
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