370D/372D
8” RAIN GAUGE MANUAL

370D-9800, REV A

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1 INTRODUCTION

1.1 About This Manual

This document is organized with the most important information toward the front of the manual. All users should read and understand the sections on setup, operation, and field audits. Toward the back are sections that provide in-depth information on subjects such as diagnostics and accessories. These sections should be consulted as needed.

This manual is periodically revised for maximum accuracy and to incorporate new features or updates. User feedback is welcome. Electronic versions of this manual are available upon request.

1.2 Technical Service

Should support still be required after consulting the printed documentation, contact one of the expert Met One Instruments, Inc. Technical Service representatives during normal business hours of 7:00 a.m. to 4:00 p.m. Pacific Standard Time, Monday through Friday. In addition, technical information and service bulletins are often posted on our website. Please contact us and obtain a Return Authorization (RA) number before sending any equipment back to the factory. This allows us to track and schedule service work and to expedite customer service.

Contact Information:	Tel: + 541 471 7111 Fax: + 541 471 7115 Web: http:/www.metone.com Email: service@metone.com	**Address:**	Met One Instruments, Inc. 1600 Washington Blvd Grants Pass, Oregon 97526 U.S.A.

Please have the instrument serial number available when contacting the manufacturer. On most models manufactured by Met One Instruments, it will be located on a silver product label on the unit, and also printed on the calibration certificate. The serial number will begin with a letter and be followed by a unique five digit number such as X10026.

1.3 Model 370D and 372D 8 Inch Rain Gauges

Figure 1-1 370D

The Model 370D and 372D Tipping Bucket Rain Gauges are virtually the same. The primary difference between them is that the 370D can have multiple calibration rates whereas the 372D is calibrated specifically for 0.5 mm of rainfall per tip. For simplicity, the rest of this manual will only reference model number 370D, except where notable differences occur.

The 370D is an accurate, sensitive, and low-maintenance sensor designed to measure rainfall on a continuous basis. Water is not retained in the sensor. It is drained each time an internal bucket fills with 0.01 inches of rainfall (standard calibration). As the bucket tips over and pours the water out the base of the sensor, a switch closure pulse is sent to a connected translator module or datalogger for counting.

1.4 Signal Cable

The sensor signal cable is part number 1566. It is a vinyl-jacketed two conductor shielded cable that is connected to the sensor via an internal terminal strip. The cable length XX is designated as 1566–XX on each cable part number label. It includes a strain relief that screws into the base of the sensor.

1.5 Specifications

PARAMETER	SPECIFICATION
Measurement Principle:	Tipping bucket
Orifice:	Eight inches
Switch Type:	Magnet & Reed
Switch Specification:	500 mA, 200 VDC maximum*
Operating Temperature:	0 Deg. C to +70 Deg. C Ambient Temperature
Calibration (standard)	0.01 inches per switch closure
Calibration (options)	0.2 mm, 0.25 mm per switch closure
Calibration (372D)	0.5 mm per switch closure
Accuracy:	±1% at 1" per hour at 70°F
Deployed Dimensions:	18-¼" high, 8" diameter not including mounting pads
Mounting:	3 Pads for ¼ "bolts on 9-21/32" (9.66") circle diameter
Weight:	6.7 lbs/ 3 kg without cabling
Shipping Weight:	Approximately 10 lbs with cabling

*Typical applications use approximately 0.5 mA at 5 VDC as lower voltage and current values provide longer switch life.

Specifications may be subject to change without notice.

2 SITE SELECTION and POSITIONING CRITERIA

Choose a site where the height of any nearby trees or other objects above the sensor is no more than about twice their distance from the sensor. A uniform surrounding of objects (such as an orchard) is beneficial as a windbreak. Nonuniform surroundings (such as a nearby building) create turbulence, which affects the accuracy of the sensor.

3 SETUP

Use the following information to correctly assemble, configure, and deploy the 370D Rain Gauge. Installation of the 370D should ideally be performed by personnel familiar with environmental monitoring equipment. There are no special precautions or handling concerns except for the normal level of care required for handling scientific equipment. Refer to the instructions and diagrams on the following pages.

3.1 Unpacking

Unpack the gauge and inspect it. Damage incurred to the equipment during shipping is the responsibility of the carrier. If any damage to the shipment is noticed before unpacking, **a claim must be filed with the commercial carrier immediately**. Follow any special unpacking instructions provided by the carrier as sensor is carefully removed from the container and inspected. It is recommended to document and photograph all damaged packages and items before, during, and after unpacking them. Contact Met One Instruments (see section 1.2 of this manual) to arrange for any replacement items needed.

3.2 Instrument Assembly and Deployment

The 370D is designed for easy setup and deployment. Once the sensor is placed in the desired sample location, the following steps should be performed to properly install the instrument.

3.2.1 Mount the Gauge

Use the following steps to properly mount and prepare the 370D for operation.

1. Remove the outer housing assembly. This will expose the tipping mechanism, terminal block, and built-in level on the base of the gauge. Do NOT remove the shipping restraint securing the tipping bucket in place.

2. Mount the sensor on an appropriate platform or tower. Three ¼” diameter bolts are used to mount the sensor on a 9-21/32” bolt circle. The gauge must be mounted as level as possible. Use washers (customer provided) for shims and the built-in level as an aid. Met One Instruments offers an optional mounting platform (part number 3119) that attaches to a vertical 2" IPS pipe (pipe not included).

3. Remove shipping restraint (this may be tape, a rubber band, or other similar item) from sensor bucket and verify that bucket moves freely and that all adjusting screws are tight.

4. Route the signal cable through the access in the base of the sensor then connect the lugs to terminals 1 and 3 (the outer terminals) of the terminal strip. Polarity is not important.

5. Tighten the included strain relief fitting to secure the cable in place and provide support on the outside of the sensor.

6. Replace the sensor housing assembly making sure to tighten the screws at base. Note that the housing should be positioned between the base and the nylon washers. The screw heads should not press directly against the housing assembly.

7. Remove the upper and lower debris screens from the collection funnel. Remove the security tape (and any residue) from the screens and the collection surface and then place the screens back in position.

8. Route the signal cable to a translator or datalogger and connect it as appropriate. If this rain gauge was purchased as part of a Met One Instruments weather station, refer to System Interconnect Diagram included with the system for connection details.

4 CALIBRATION

The sensor is factory calibrated; recalibration is not required unless damage has occurred or the adjustment screws have loosened. To check or recalibrate, perform the following steps.

1. Remove the outer housing assembly. This will expose the tipping mechanism, terminal block, and built-in level on the base of the gauge.

2. Verify the sensor is level using the built-in level in the base of the sensor.

3. Wet the mechanism and tipping bucket assembly by pouring water (in a controlled manner) through the inner funnel and into the tipping bucket until it tips. Repeat this for the other half of the bucket. Tip the bucket one more time by hand to allow any excess water to drain. ***Do not wipe out or dry off any residual water droplets!***

4. Using a graduated cylinder, slowly pour the measured quantity of water shown in Table 4-1 through the inner funnel to the tipping bucket, which should then tip. Repeat for the alternate bucket. If both buckets tip when filled with the measured quantity of water, the sensor is properly calibrated. If they do not, recalibrate as follows:

    a. Release the lock nuts on the cup adjustments.

    b. Move the adjustment screws down to a position that would place the bucket far out of calibration.

    c. Allow the measured quantity of water to enter the bucket.

    d. Turn the cup adjustment screw up until the bucket assembly tips. Tighten the lock nut.

    e. Repeat steps 3 and 4 for the opposite bucket.

    f. Measure the quantity of water necessary to tip each bucket several times to ensure proper calibration.

    g. After verification or calibration (as needed), replace the sensor housing assembly making sure to tighten the screws at base. Note that the housing should be positioned between the base and the nylon washers. The screw heads should not press directly against the housing assembly.

Tip Calibration	Water Quantity
0.01” (standard)	8.24 milliliters
0.20 mm	6.49 milliliters
0.25 mm	8.11 milliliters
0.50 mm (372D)	16.2 milliliters

Table 4-1 Calibration Quantities

5 MAINTENANCE AND TROUBLESHOOTING

The following maintenance should be performed on the 370D at six-month intervals.*

1. Remove and clean the upper and lower debris screens.
2. Remove the sensor housing assembly and thoroughly clean the collection funnel.
3. Carefully clean both sides of the tipping bucket assembly.
4. Clean the lower drain screen in the base of the sensor.
5. Do **NOT** lubricate the pivot shafts, as any lubricant may attract dust and dirt.
6. Verify the bucket moves freely and that the translator card or datalogger registers 0.01” (or as calibrated) for each bucket tip.

*Based on average to adverse environments.

6 SPARE PARTS and ACCESSORIES

The following parts are available from Met One Instruments for maintenance, replacement, service, and upgrades. If unsure about a part, please contact the Service department and provide the serial number of the rain gauge. Some of these parts may require technical skills or special considerations before use or installation.

Item No.	Part No.	Description
1	10825	Assembly, Tip Bucket (.01”, .2 mm, .25 mm)
1	10837	Assembly, Tip Bucket (0.5mm Model 372D)
2	10840	Pivot Block Assembly
3	340070	Barrier, Strip – 3 pos
4	480210	Nut, Crown, Nylon #8-32
5	2598	Screen, Base
6	2503	Screen, Primary Top
7	480510	Clamp, Liquid-Tight
8	2934	Reed Switch Cartridge
9	2936	Adjustable Magnet Bracket
10	2937	Lightning Protection Diode
11	1566	Standard Cable Assembly
12	2504	Screen, Secondary
13	2831	Assembly, Housing/Funnel 8 inch
14	2516	Foot

Table 6-1 Replacement Parts

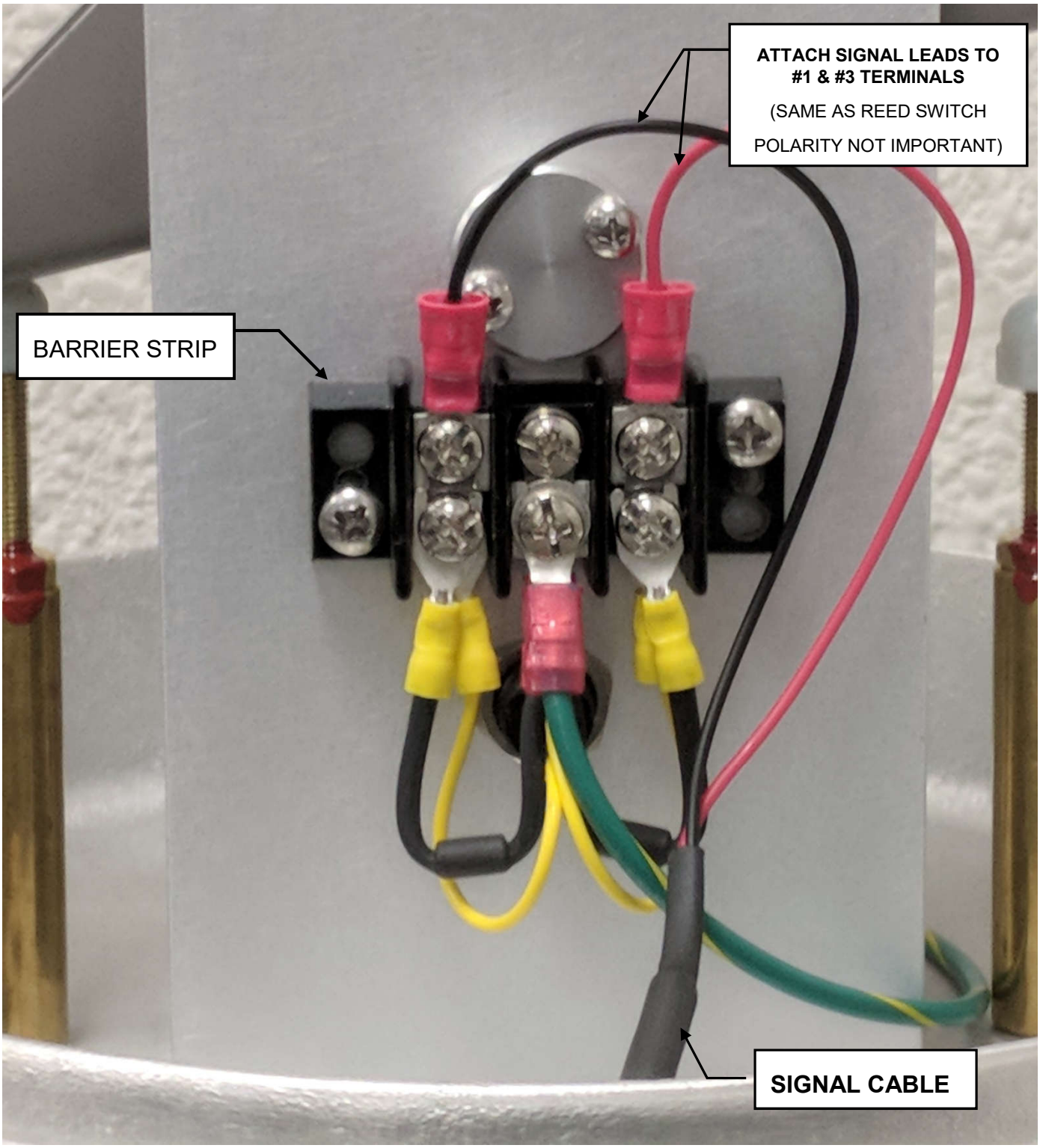

Figure 6-1 370D Internal Wiring

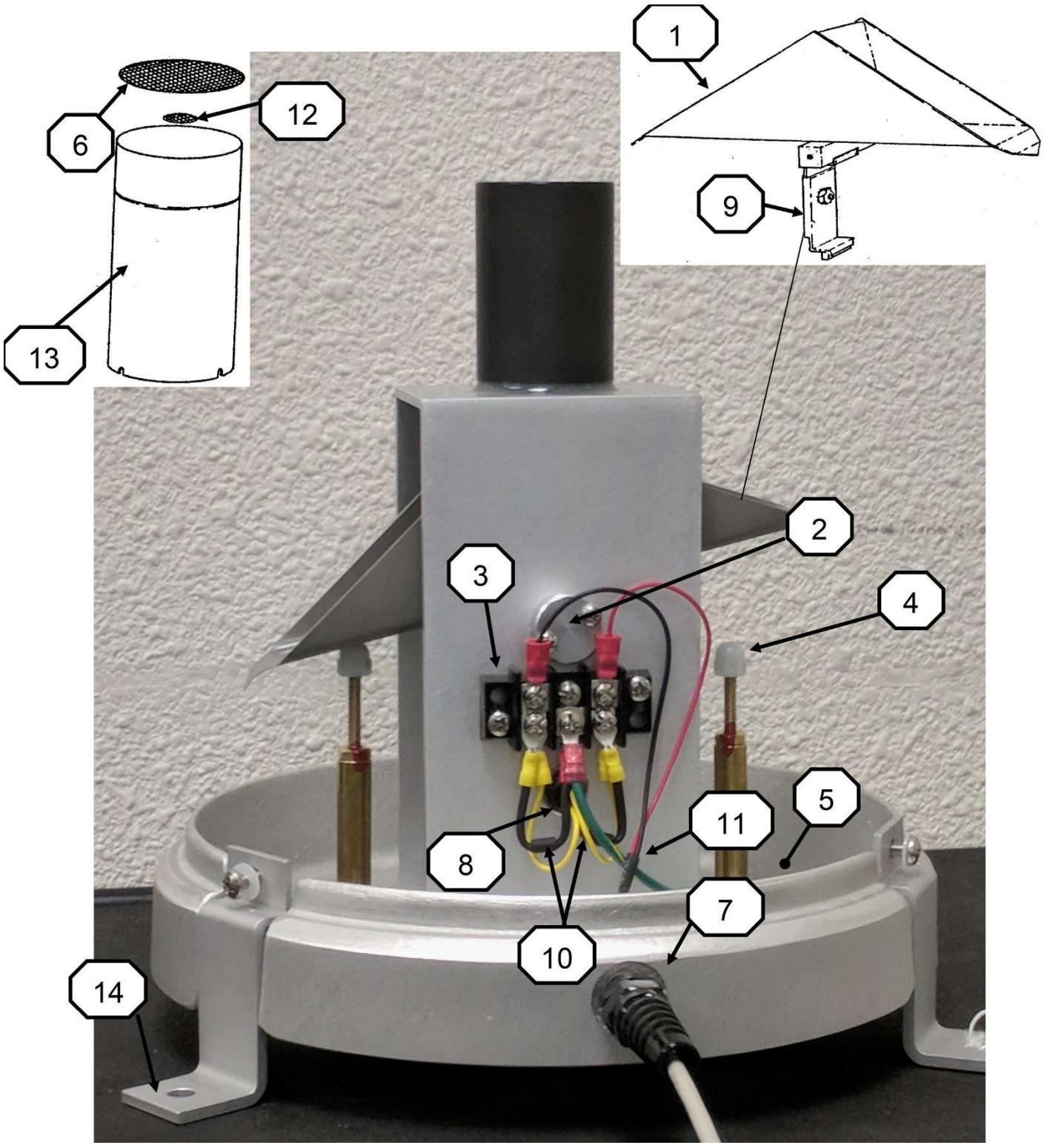

Figure 6-2 370D Parts

Manual Notes: