

INSTRUCTION MANUAL
TIPPING BUCKET RAIN GAUGE
MODEL TB6 SERIES II



QUALITY SYSTEM
ISO:9001
CERTIFIED

HYQUEST SOLUTIONS PTY LTD
PO BOX 332, LIVERPOOL B.C NSW 1871, AUSTRALIA
Phone:(Int.) 612 9601 2022 Fax: :(Int.) 612 9602 6971
Phone:(Nat.) (02) 9601 2022 Fax: :(Nat.) (02) 9602 6971
Email: sales@hyquestsolutions.com.au
Web: www.hyquestsolutions.com.au

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TIPPING BUCKET RAIN GAUGE MODEL TB6 SERIES II

I GENERAL

The HyQuest Solutions Pty Ltd Tipping Bucket Rain Gauge (TB6 SERIES II) is recognised as the standard for measuring rainfall and precipitation in remote and unattended locations.

The TB6 Series II Rain Gauge operates on the tipping bucket principle. A receiver of 200mm diameter collects the rainfall which is strained by a gauze before being passed to the tipping bucket measuring system. Tips of the bucket occur with each 0.2mm, 0.5mm, 0.01inch or 1.0mm of precipitation collected and a reed switch detects these events and produces a momentary contact closure signal for:

- logging in our Rainfall Data Logger iRIS Undercover and using 4G to transmit the rainfall data.
- logging in our Rainfall Data Logger ML1A-FL
- transmission by our Rainfall Internet of Things (ML-IoT) to Kisters Cloud

II UNPACKING YOUR TB6 Series II RAIN GAUGE

This package should contain:

- TB6 Series II Rain Gauge
- TB311/5 5 metre connecting lead

Please verify you have received these items and that the Tipping Bucket Rain Gauge resolution is as ordered.

To prepare the Tipping Bucket Rain Gauge for installation:

- lift the unit from the carton and place on secure surface
- remove polythene bag
- loosen the three enclosure securing screws and back them off until screw head is clear of the enclosure.
- lift the enclosure from the gauge
- carefully remove the elastic band/support pad from the bucket.

Your Tipping Bucket Rain Gauge is now ready for installation.

III SPECIFICATION

Receiver:	200 mm \pm 0.3 diameter heavy duty cast aluminium, Powder coated for 0.2mm, 0.01", 0.5mm and 1.0mm
	282.84 \pm 0.3 mm diameter heavy duty cast aluminium, Powder coated for 0.1mm
Bucket capacity:	ABS: 0.1mm, 0.2 mm, 0.5 mm or 0.01 inch of rainfall. Metal: 1.0 mm of rainfall.
Sensitivity:	one tip.
Maximum intensity:	700 mm / hr.

Calibration accuracy 0.2mm and 0.01":

50mm per hour ; better than +/-1%
100mm per hour ; better than +/-4%
125mm per hour ; better than +/-5%
150mm per hour ; better than +/-6%
200mm per hour ; better than +/-7%

Calibration accuracy 0.5mm and 1.0mm:

0 to 100mm/hr +/-2%
100 to 150mm/hr +/-4%
150 to 200mm/hr +/-5%

Long term stable calibration.

Humidity:	0 to 100 %
Temperature:	- 20 to +70°C
Contact system:	dual reed switches potted in soft silicon rubber with varistor protection.
-Max Capacity:	0.5 amp, 24 Volts
- Resistance:	Initial contact resistance 0.1 OHMS
- M.T.B.F:	10 ⁸ to 10 ⁹ Operations
Syphon:	Straight through (No syphon)
Bucket:	Two types of buckets, synthetic ceramic coated brass bucket balanced to + 0.05 gms for 1mm bucket only, and injection moulded non hydroscopic Teflon impregnated UV stabilised balanced + 0.05gms for 0.2mm, 0.5mm and 0.01".
Base:	injection moulded non-hydroscopic ASA plastic UV stabilised.
Level:	bulls eye level fitted to base.
Mounting holes:	three slots 20mm L x 10mm W equispaced @ 244 mm PCD in feet moulded to outside diameter of base.

Drain fittings:	to attach 12 mm inside diameter tubing, to catch rainfall after passing through buckets.
Bucket pivot system:	ground Sapphire Pivots with tough 316g stainless steel shaft.
Insect covers:	in-built mesh in the base and stainless steel mesh on the enclosure covering all openings to prevent insects and ants entering gauge.
Outer enclosure:	keyed to enable the release of the outer enclosure without the need for the removal of the three securing screws.
Height:	330mm
Weight:	2.2 kg
Packed Dimensions:	24cm L x 24cm W x 42cm H x 5 kg (0.03m ³)

IV INSTALLATION

(i) Site Selection

Rainfall measurements are intended to be representative of the actual rain falling on a given area. Some of the more important factors which influence the representativeness of a gauge are as follows:

- Site the gauge on level ground where possible. Avoid sloping sites.
- Site should have adequate protection from strong winds.
- Site should be free of large obstructions such as buildings and trees.
- Provide suitable ground surface to avoid splashing into the gauge.

(ii) Setting up

- Install the gauge on the foundation. A suggested foundation is shown in Diagram 1.
- Loosen the three enclosure securing screws and the enclosure.
- The gauge is provided with a bull's eye level. Adjust the nuts on mounting bolts until gauge is level.
- Connect lead to the Rain Gauge terminals, refer to Diagram 7 page 11, and to the recording device, in accordance with manufacturer's instructions.

Floor Mount:

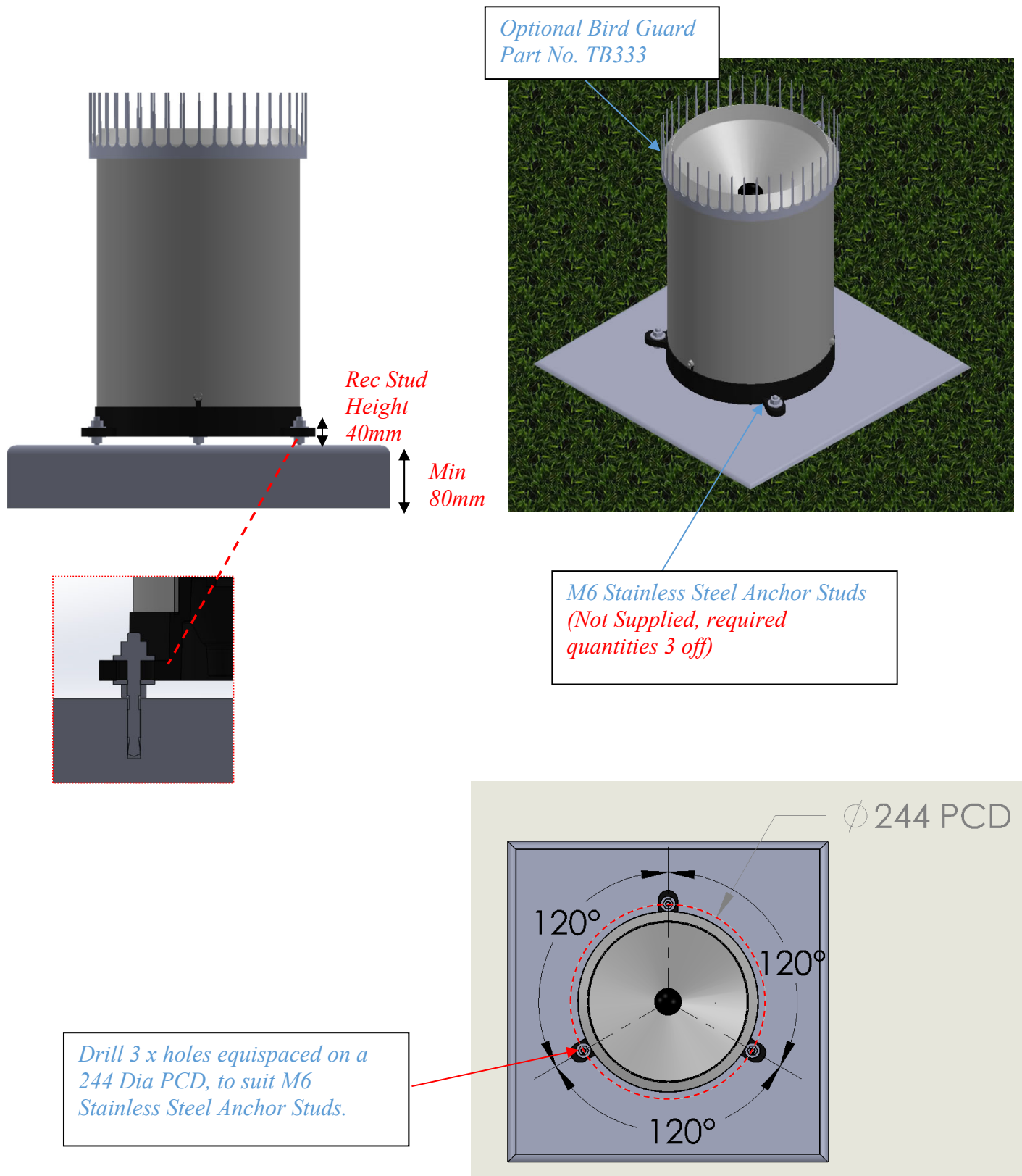


Diagram 1

Pole Mount:

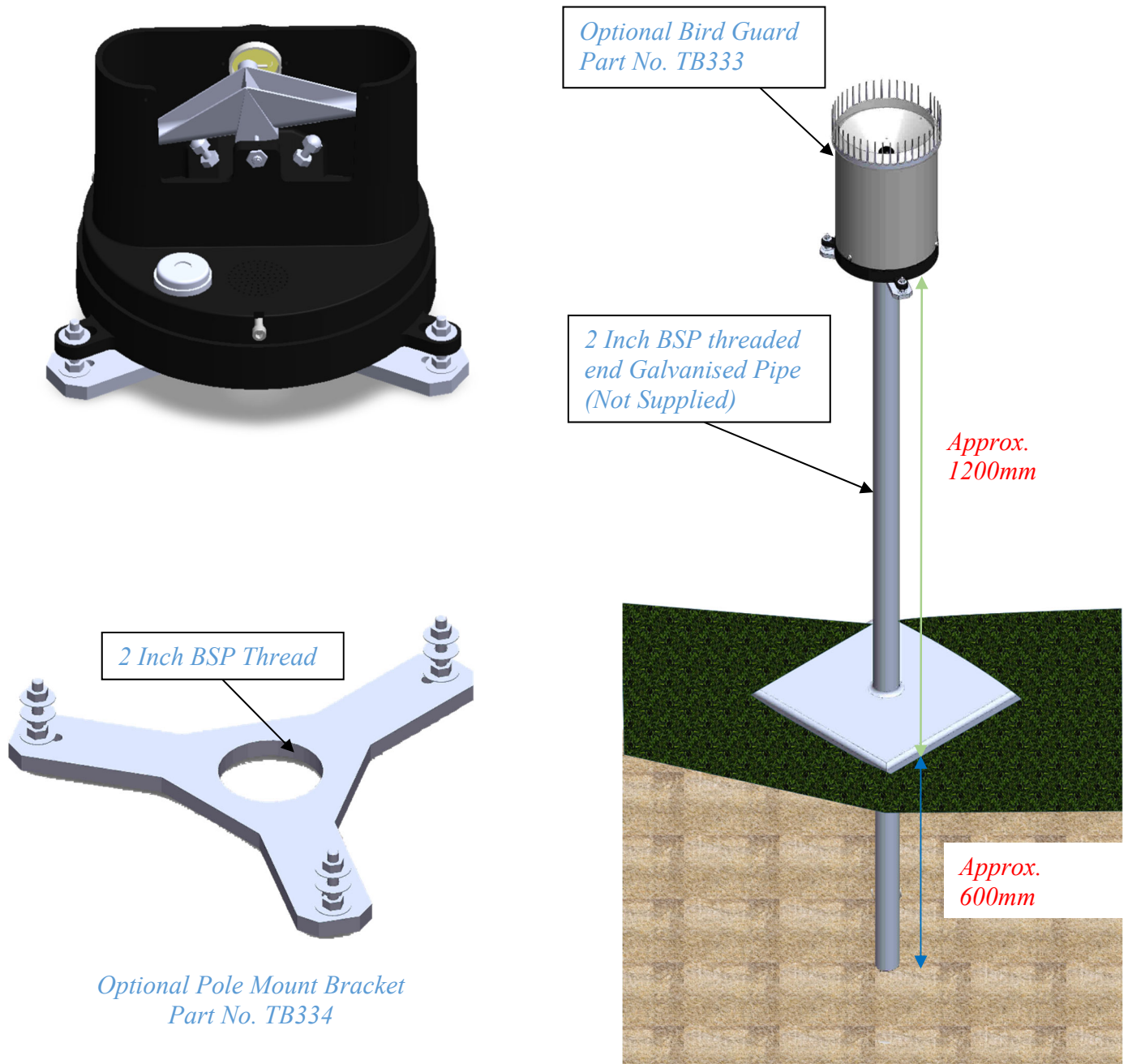


Diagram 2

Roof Mount:

The Rain Gauge can also be mounted on a pitched roof with maximum angle of 15 degrees.

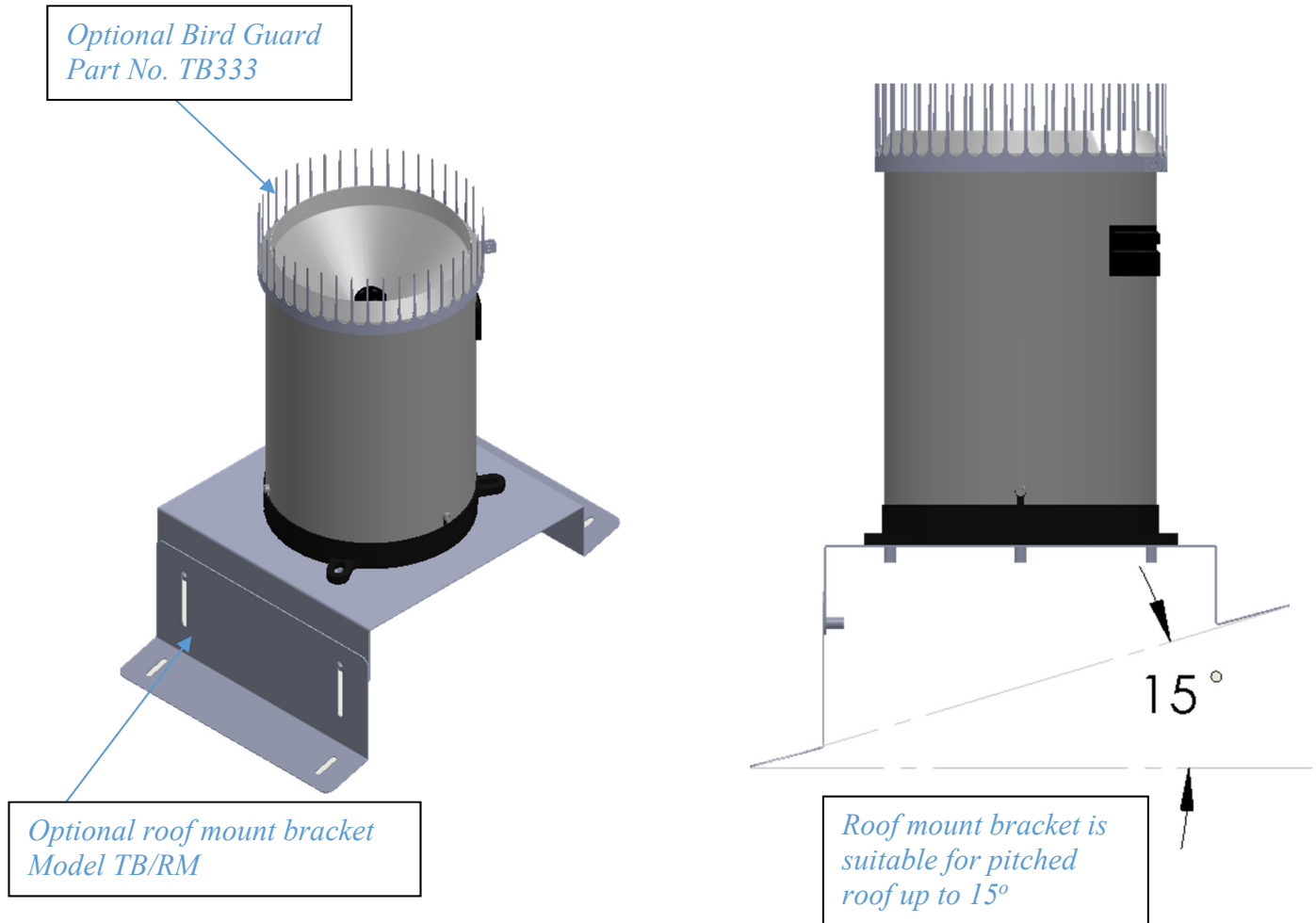


Diagram 3

V TEST OPERATION

- Manually tip the bucket a number of times, ensuring that each tip is being recorded and that the tilting mechanism is operating freely.
- Replace and secure the enclosure.

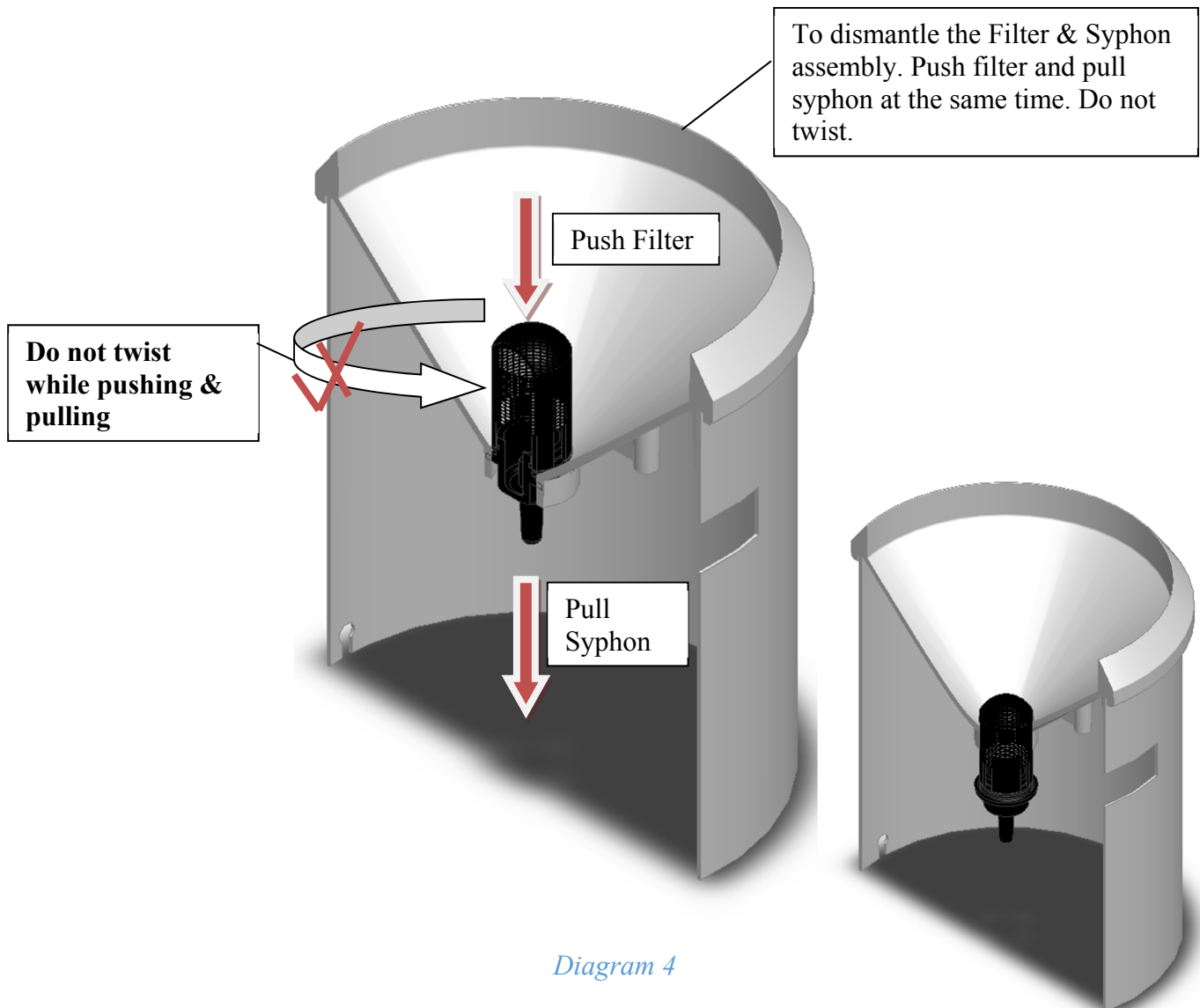
VI MAINTENANCE

The only routine maintenance required is cleaning. The following items should be checked regularly for cleanliness:

- **Catch filter**
- **Straight through syphon (refer diagram 5)**
- **Interior of bucket**
- **Top surface of adjusting screws**
- **Enclosure locking screws - lightly lubricate after cleaning**
- **All insect screens**

i. Dismantle Details

- (a) Push filter in and pull straight through syphon out
- (b) Clean filter
- (c) Clean straight through syphon



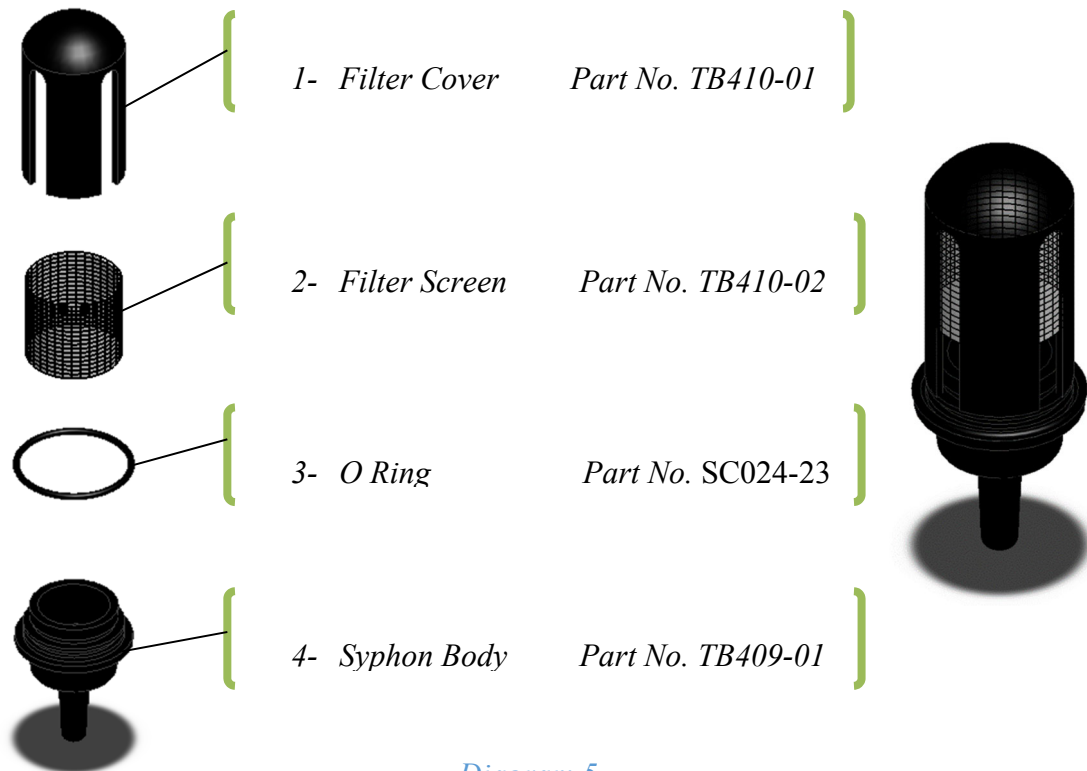


Diagram 5

ii. Assembly Details

- (a) Assemble filter to straight through syphon body
- (b) Push assembly into funnel

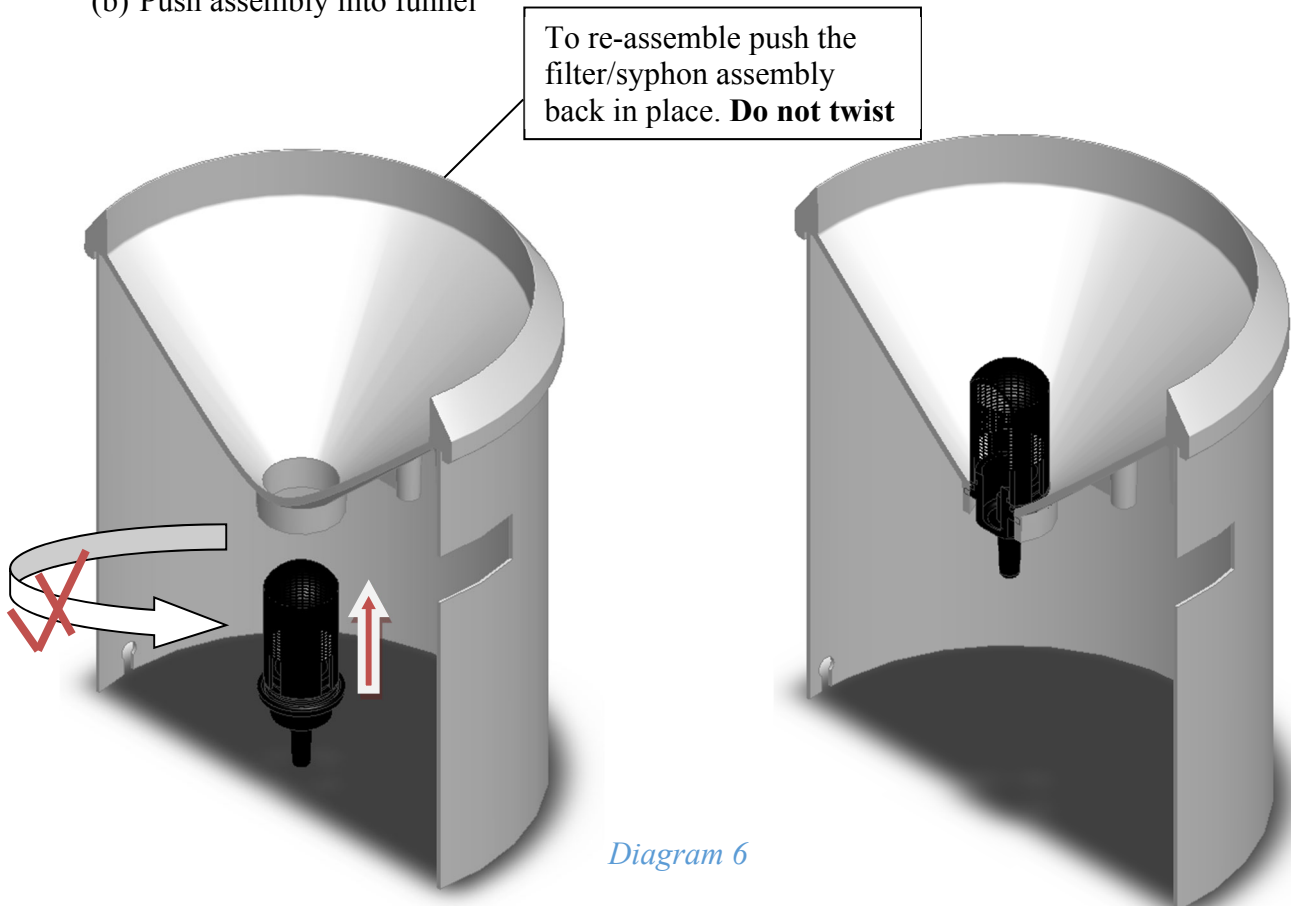


Diagram 6

VII ELECTRICAL

Dual reed switches are provided for several reasons:

- Two isolated switches permit the control of two separate circuits; e.g. a local counter and a telemetry circuit.
- Parallel connection of both switches increases the current carrying capacity of the contact system if required.
- Parallel switch operation confers a degree of redundancy in locations where data from the Rain Gauge is critical to flood warning etc.

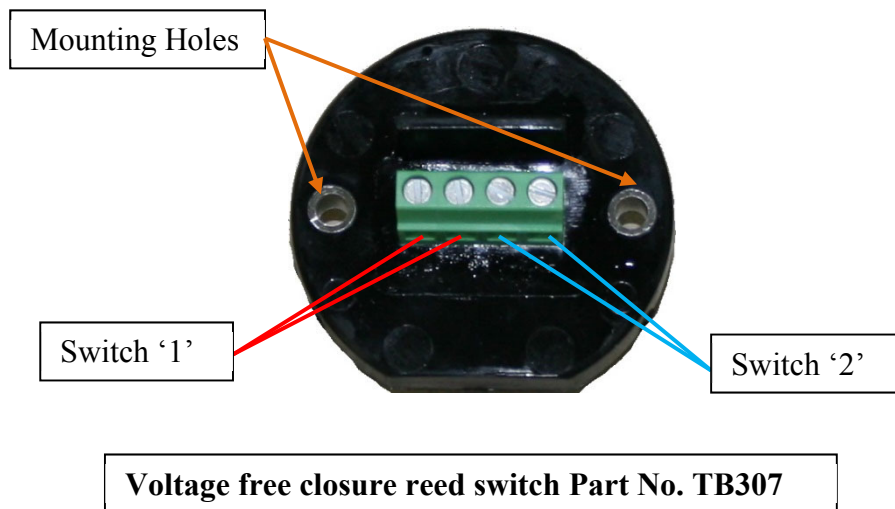


Diagram 7

VIII CALIBRATION

All gauges have been calibrated by HyQuest Solutions Pty Ltd, prior to despatch.
The following products and services are available from HyQuest Solutions Pty Ltd:

- Field Calibration Device, Model FCD, for routine field check calibrations, supplied with operating instruction sheet refers to page 17.
- Laboratory Calibration Unit, Model TB340A, for calibration after servicing in workshops, supplied with operating manual.
- Recalibration Service at HyQuest Solutions' factory.

Please contact either HyQuest Solutions Pty Ltd or our local distributor for further information.

IX TB6 Series II Part List

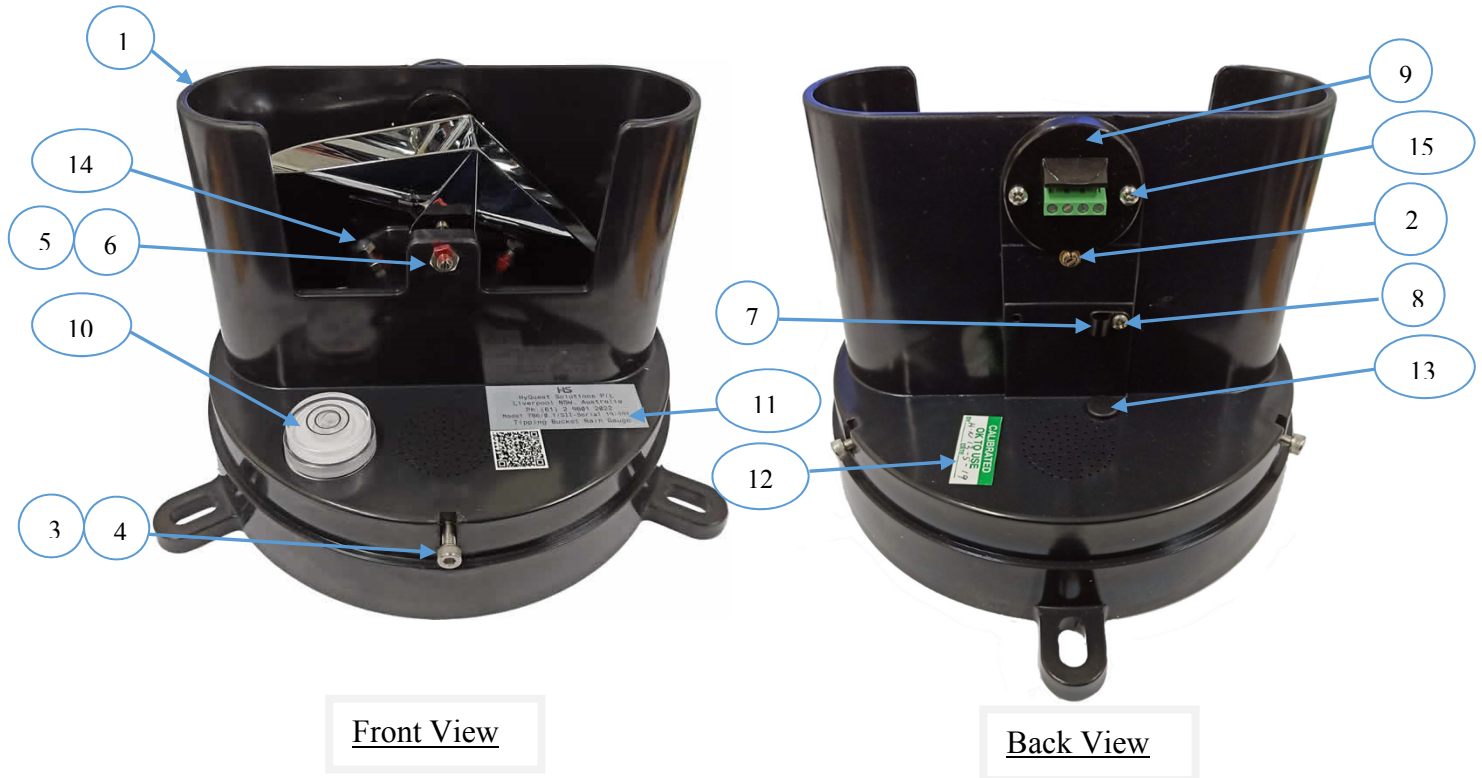


Note:

The TB6 Series II Rain Gauge is ordered with a synthetic ceramic coated brass bucket for 1mm size bucket only or chrome plated injection moulded non hydroscopic plastic ABS for the 0.1mm, 0.2mm, 0.5mm or 0.01”.

Rain Gauge Part No.	Rain Gauge Description
TB6/0.1/Series II	Tipping Bucket Rain Gauge, bucket capacity 0.1mm, bucket type chrome plated injection moulded non hydroscopic plastic ABS UV stabilised
TB6/0.2/Series II	Tipping Bucket Rain Gauge, bucket capacity 0.2mm, bucket type chrome plated injection moulded non hydroscopic plastic ABS UV stabilised
TB6/0.01/Series II	Tipping Bucket Rain Gauge, bucket capacity 0.01inch, bucket type chrome plated injection moulded non hydroscopic plastic ABS stabilised
TB6/0.5/Series II	Tipping Bucket Rain Gauge, bucket capacity 0.5mm, bucket type chrome plated injection moulded non hydroscopic plastic ABS stabilised
TB6/1.0/M/Series II	Tipping Bucket Rain Gauge, bucket capacity 1.0mm, bucket type synthetic ceramic coated brass

TB6 Series II Base Part List



REFERENCE	PART_ID	DESCRIPTION	QTY_PER
1	TB701-01	BASE-INJECTION MOULDED	1
2	TB701-03	BRASS INSERT	2
3	SC008-29	M5x0.8 SS304 HEX NUT	3
4	SC045-21	SOC HD CAPSCREW M5x0.8x12 SS304	3
5	TB301-05	PIVOT SCREW	2
6	TB301-06	PIVOT SCREW LOCK NUT	2
7	SC006-12	MINIATURE P CLIP #20-PTC 6.4B	1
8	SC022-114	6GA x 1/4 SELF TAPPING SCREW 304 PAN HD PHILLIPS STAINLESS STEEL	1
9	TB307	MODEL TB3 RAIN GAUGE 24V REED SWITCH ASSEMBLY	0.5
10	SC023-09	BULL'S EYE LEVEL	1
11	SC100-09	SERIAL PLATE	1
12	SC100-06	CALIBRATED LABEL	1
13	SC040-58	SPFM10 10MM FINNED SNAP IN PLUG BLACK	1
14	TB312	ADJUSTING SCREW ASSEMBLY	2
15	SC022-116	6GA x 1/2 SELF TAPPING SCREW 304 PAN HD PHILLIPS STAINLESS STEEL	2

TB6 Series II Bucket Part List

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Part no: TB304/0.2P
Descript: Bucket (0.2mm, 0.01")
or
Part no: TB304/0.5P
Descript: Bucket (0.5mm)

Quantity: 1



ABS UV
Stabilised
Plastic Bucket

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Part no: TB304-03
Descript: Bucket Axle
Quantity: 1

OR

18

Part no: TB306
Descript: Bucket (1.0mm)

Quantity: 1



Metal Bucket
1mm only

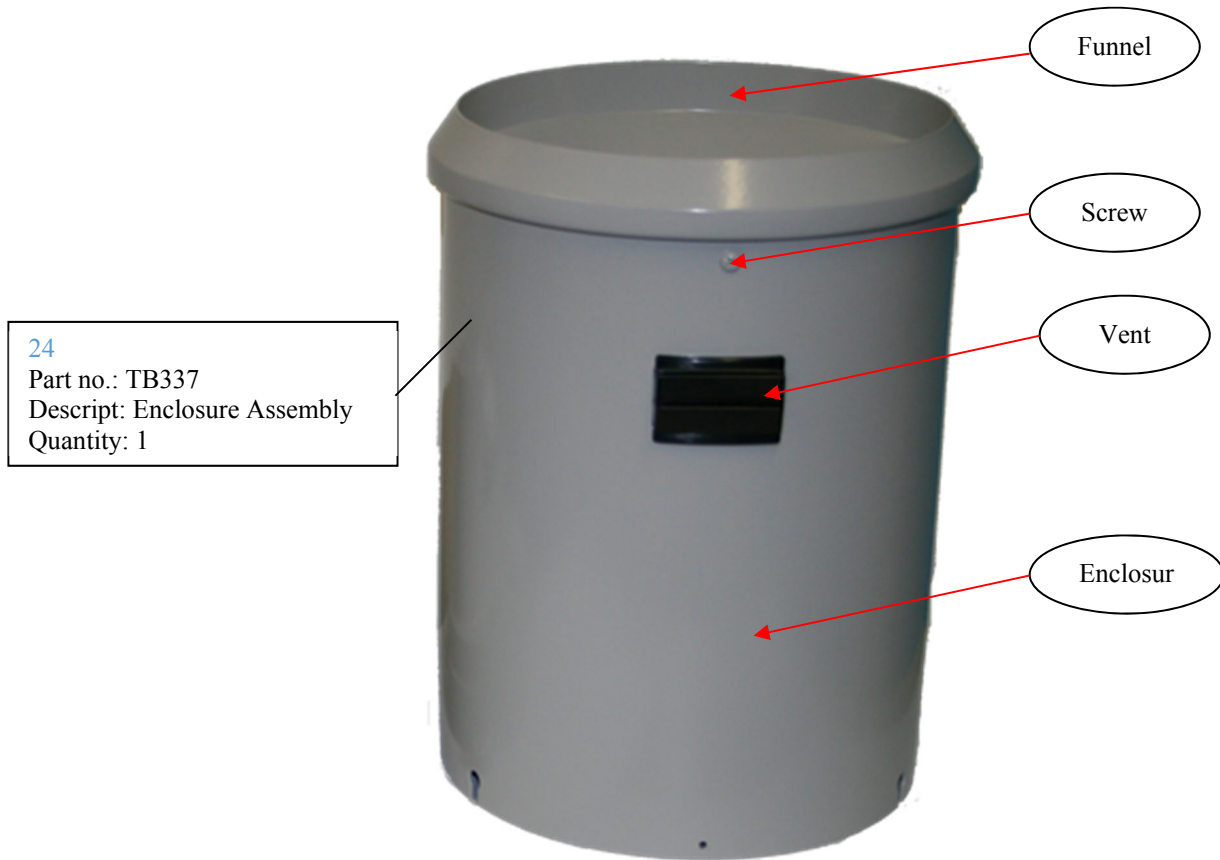
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Part no: TB304-03
Descript: Bucket Axle
Quantity: 1

Filter/Syphon Part List



Enclosure Part List

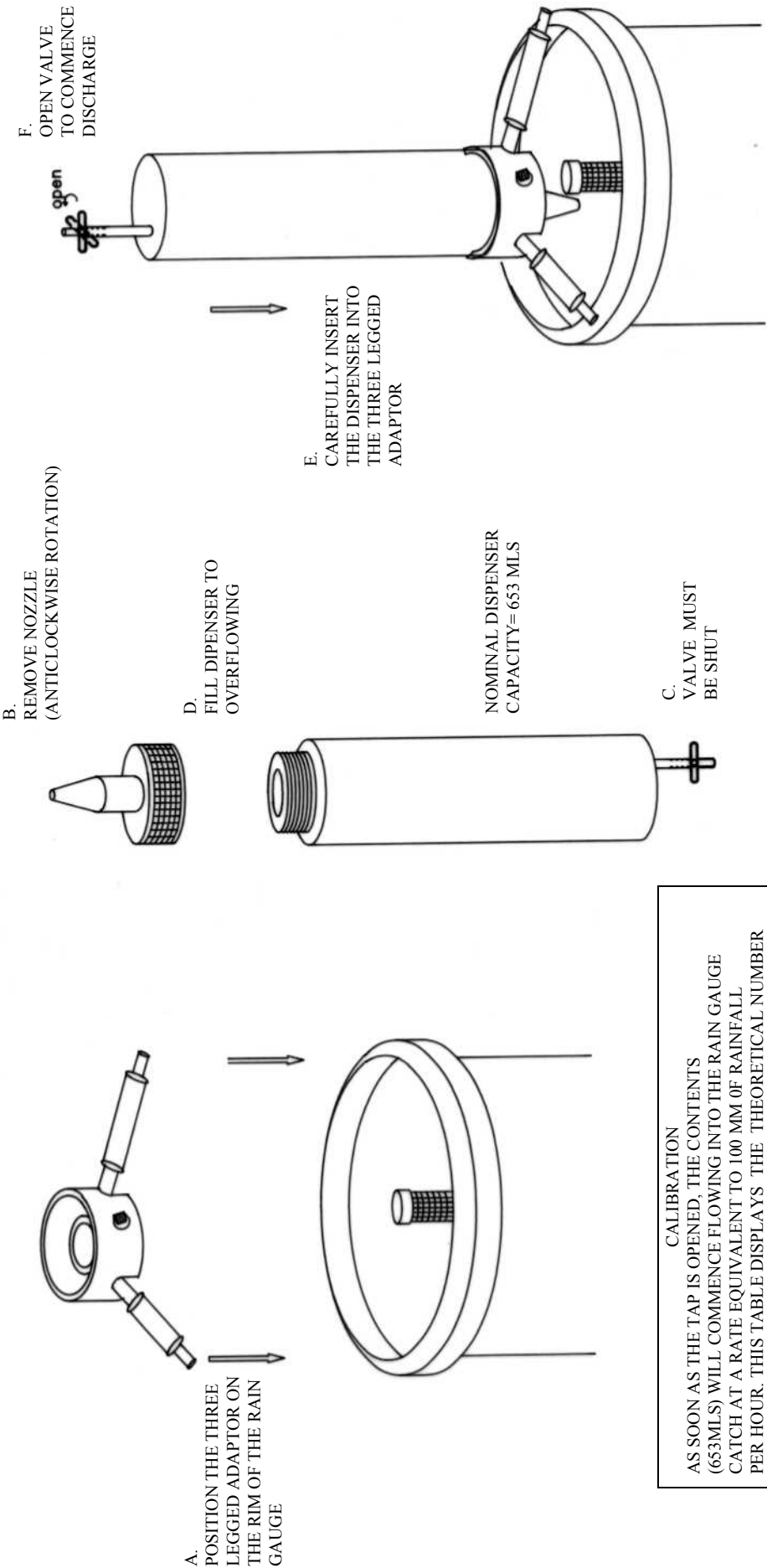


Part no.	Description	Quantity
TB337-01	Funnel	1
TB337-02	Enclosure	1
TB418-06	Vent	1
SC022-72	Screw	3

TB337 breakdown assembly

NOTE: PLEASE WET RAIN GAUGE PRIOR TO CALIBRATION

X FIELD CALIBRATION DEVICE



CALIBRATION			
AS SOON AS THE TAP IS OPENED, THE CONTENTS (653MLs) WILL COMMENCE FLOWING INTO THE RAIN GAUGE CATCH AT A RATE EQUIVALENT TO 100 MM OF RAINFALL PER HOUR. THIS TABLE DISPLAYS THE THEORETICAL NUMBER OF BUCKET TIPS THAT SHOULD BE ACHIEVED.			
THEORETICAL NUMBER OF TIPS			
BUCKET SIZE	200 MM CATCH	203 MM (8") CATCH	
0.2 MM	103.9	100.9	
0.5 MM	41.6	40.4	
0.01 INCH	81.8	79.4	
IF THE OBSERVED RESULTS ARE UNACCEPTABLE THEN REFER TO THE RAIN GAUGE INSTRUCTION MANUAL FOR APPROPRIATE ADJUSTMENTS			

INSTRUCTION FOR TIPPING BUCKET
RAIN GAUGE FIELD CALIBRATOR (FCD)