

Specification DataFile

- **Widest flow range, highest accuracy**
 - measures minimal night and peak day flows
- **Lowest ‘Cost of Ownership’**
- **Rugged construction with no moving parts**
 - ensures long, maintenance-free life
- **Battery operation**
 - 3-year life
 - no external power supply required, facilitates installation in remote locations
- **AC powered with optional battery backup**
 - continuous measurement even during power-down
- **‘Fit and Flow™’**
 - foolproof installation; no on-site setup
- **Integral or Remote Electronic Display Unit**
 - all user display requirements in a single unit
- **Submersible sensor and Electronic Display Unit**
 - facilitates installation in all locations including flooded pits
- **Buriable sensor**
 - eliminates chamber and ensures fast, low cost installation
- **Bi-directional as standard**
 - accurate measurement under all operational conditions



AquaMaster™ – the next generation electronic, new technology water meter for Bulk Revenue, District Metering, Trunk Mains and Treatment Works

The Next Generation Commercial Water Flow Meter

AquaMaster™, available in sizes 15 to 600 mm (1/2 in. to 24 in.), is the total solution for flow measurement in the water industry. Outstanding performance, innovative features and user benefits, coupled with low cost of ownership ensures that AquaMaster™ is the first choice for District Metering, Bulk Revenue, Trunk Mains and Treatment Works applications.

AquaMaster™ has been designed specifically for the water industry in response to its stringent demands for enhanced metering capability; enabling ever more efficient and cost effective operation and compliance with increasing legislative requirements.

Based on ABB proven technology, AquaMaster™ is supported by the expertise of ABB Instrumentation – the world's leading flowmeter manufacturer with many pioneering advances in water flow metering over the last decade e.g. AquaMag™, MagMaster™, AquaProbe™, CalMaster™ etc. ABB operates national and internationally accredited flow calibration facilities in the UK, USA, Australia and India. We also offer comprehensive, locally-based before- and after-sales support and service.



No External Power Required for Remote Locations

- No external power supply (2 internal batteries)
- 3-year battery life
- Site-replaceable batteries
- Unique battery management system gives a battery replacement window in excess of 1 year, with no flat-battery interruption to measurement.

AquaMaster™ is the ideal solution for locations where there is no external power. Two user-replaceable internal batteries provide a 3-year battery life, thus eliminating the high cost of providing a mains supply to the meter.

AquaMaster's extended battery life is achieved through new technology design.

AC-powered units have optional battery backup to ensure no loss of flow measurement during power down periods.

New Performance Standards for Flow Measurement

Widest flow range, optimum accuracy and long term stable calibration mean that AquaMaster™ sets new performance standards in the water industry.

This unique low flow rate capability enables previously unrecordable minimal night flow rates to be metered; particularly important for bulk revenue and district metering applications.

The performance specification for an 80 mm (3 in.) a.c. powered unit (Figs. 1 and 2) demonstrates how AquaMaster™ significantly better the ISO 4064 Class B and Class C standards for both accuracy, maximum flow rate and minimum flow rates (Q_{max} and Q_{min}).

The clear bore of the AquaMaster™ eliminates the possibility of damage by particulate matter and the absence of moving and wearing components ensures that this unique level of performance is maintained long term.

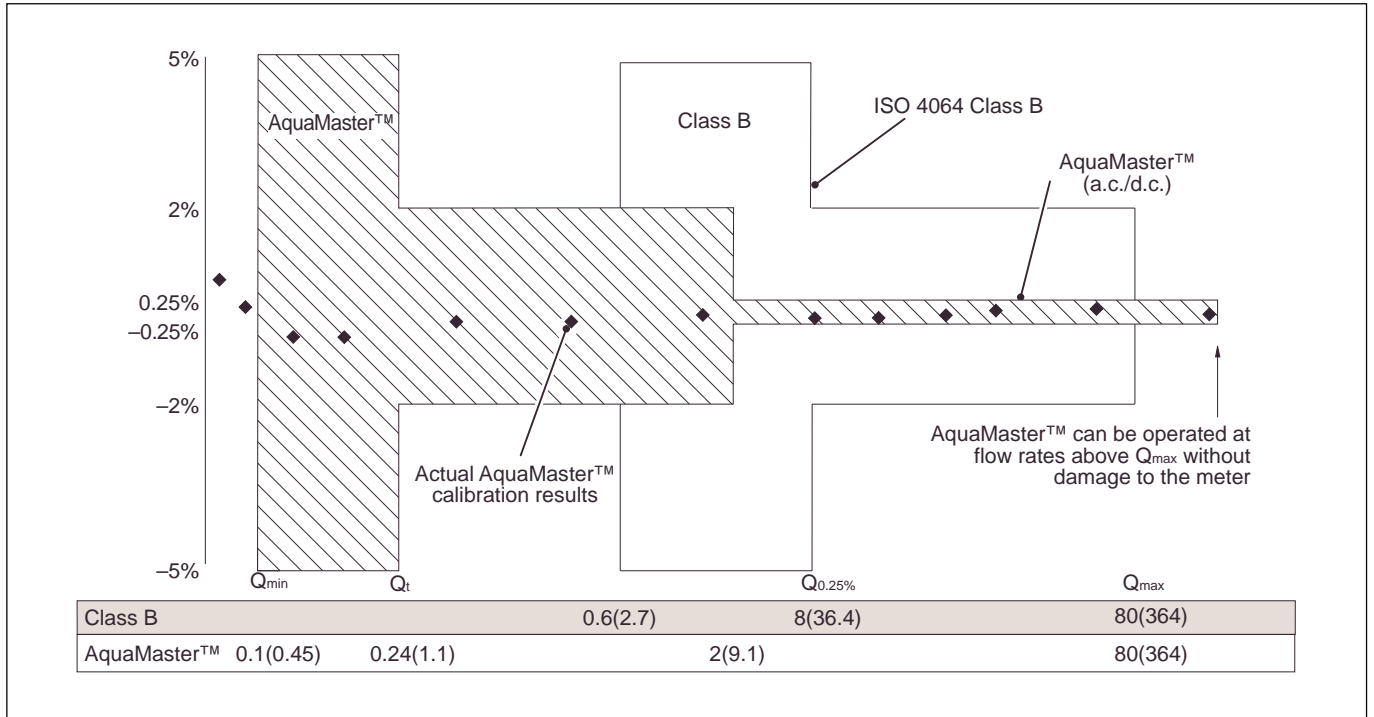


Fig. 1 Comparison of 80mm (3 in.) AC Performance Specification m^3/h (gal/min) with ISO 4064 Class B

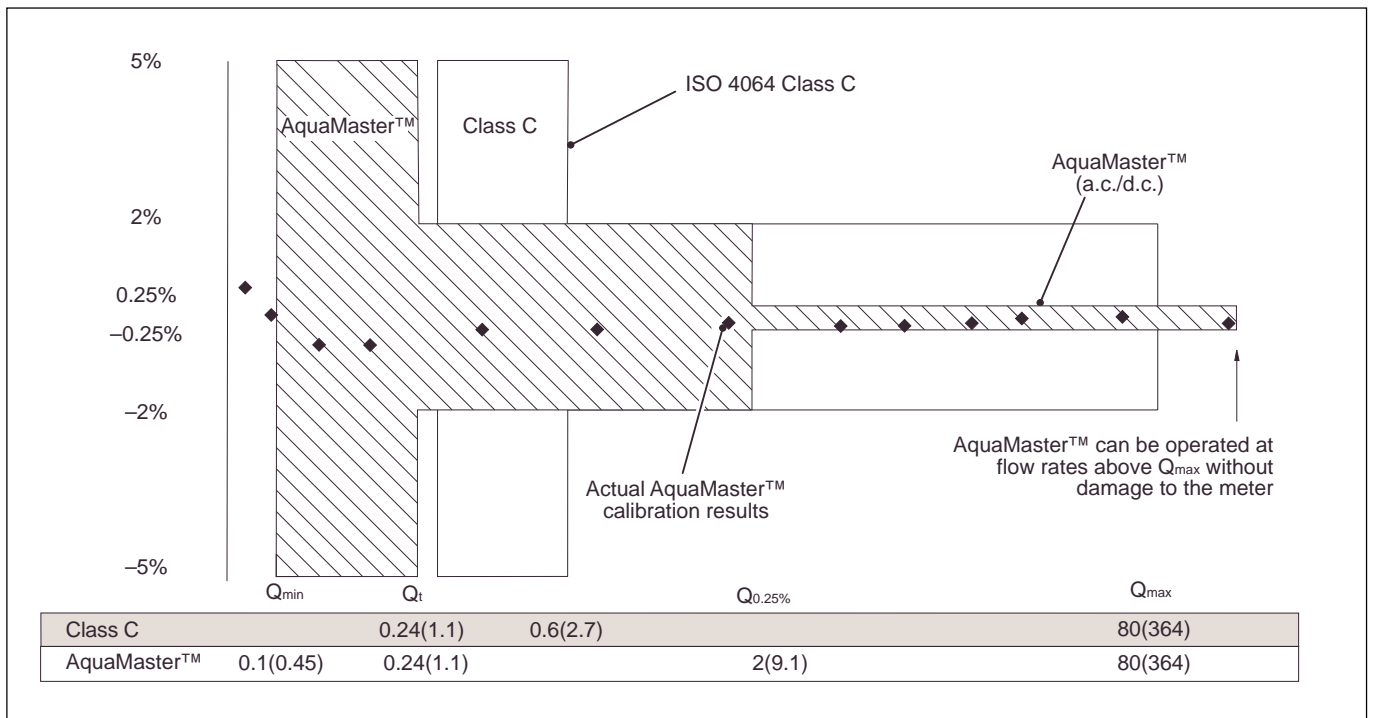
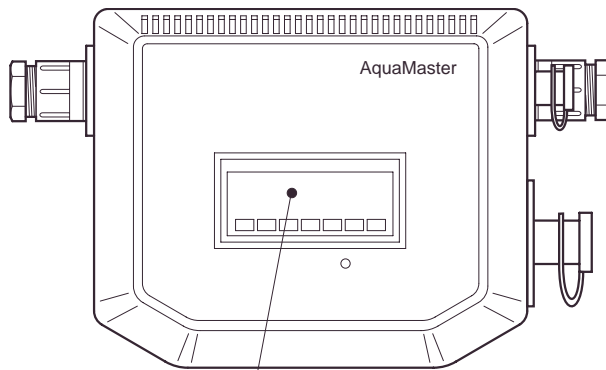


Fig. 2 Comparison of 80mm (3 in.) AC Performance Specification m^3/h (gal/min) with ISO 4064 Class C

Electronic Display Unit

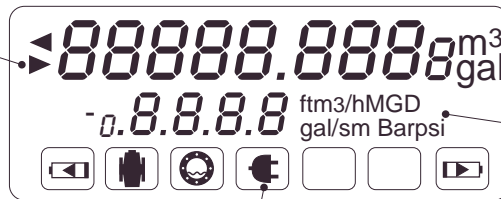
- Comprehensive display
- Submersible for use in flooded chambers
- Resettable or secure totals
- 5 mm high displays for Totals (exceeds ISO4064 requirement)
- Total security:
 - 2 user security levels
 - Anti-tamper seals
- 2 outputs (forward and reverse pulse, or pulses, and direction)

The AquaMaster™ Electronic Display Unit provides the most comprehensive range of flow data and information currently available to the water industry. If all the data is not required, the unit can be configured so that only the required values are displayed, thus ensuring simple reading with no superfluous data. Likewise, the display is available for top or side viewing, depending on the location of the meter, for easy reading in all locations.



9 Digit LCD Display

- Cyclic display*
- 5mm High
 - Forward total
 - Reverse total
 - Net total
 - Date



Choice of Flow Units

to match user requirements

5-Digit LCD Display

- Cyclic display*
- Flow rate
 - Pressure (Optional)
 - Time
 - Velocity

Status Indicators

- Battery A low
- Fault
- Empty pipe
- Loss of power
- Battery B low

* Can be programmed to display required values only

Easy, Low Cost Installation

No matter what the location or installation requirements, AquaMaster™ provides a cost-effective solution.

Both the sensor and the Electronic Display Unit are fully submersible, enabling installation in flooded chambers.

In addition, the sensor is buriable, thus eliminating the need for a chamber. Installation merely involves excavating to the pipeline, fitting the sensor and back filling the hole, to ensure very fast, low cost installation. The associated Electronic Display Unit is then located in the most convenient position for the user.

The elimination of bypasses and ancillary items such as strainers, enables the installation cost to be kept to an absolute minimum.

These factors, together with the innovative 'Fit and Flow™' system, ensure foolproof installation with total user confidence.

'Fit and Flow™'

- No need to match sensor and Electronic Display Unit
- Fast, reliable installation
- Foolproof, no errors
- Sensor stores all calibration factors, site settings, serial numbers, etc.
- Volume totalizer values backed-up in sensor for total security



Typical District Metering AquaMaster™ Installation



Underground Installation of AquaMaster™

General Specification

Metric Sizes, Flow Rates and Accuracies (under reference conditions)

Pipe Sizes in millimetres, Flow Rates in cubic metres/hour

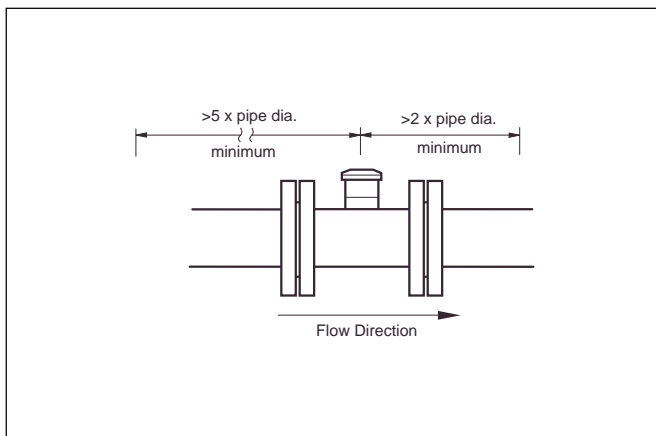
| Size | | Q _{max} | Q _n | AC Powered Meters | | | Battery Powered Meters (inc. standby battery) | | |
|------|------|------------------|----------------|-------------------|----------------------|------------------------|--|---------------------|------------------------|
| mm | in. | | | Q (±0.25%) | Q _t (±2%) | Q _{min} (±5%) | Q (±0.5%) | Q _t (2%) | Q _{min} (±5%) |
| 15 | 0.5 | 3 | 1.5 | 0.08* | 0.009 | 0.004 | 0.225 | 0.023 | 0.009 |
| 20 | 0.75 | 5 | 2.5 | 0.13* | 0.015 | 0.006 | 0.375 | 0.038 | 0.015 |
| 25 | 1.0 | 7 | 3.5 | 0.18* | 0.021 | 0.009 | 0.525 | 0.053 | 0.021 |
| 40 | 1.5 | 20 | 10 | 0.5 | 0.06 | 0.025 | 1.5 | 0.15 | 0.06 |
| 50 | 2 | 30 | 15 | 0.75 | 0.09 | 0.038 | 2.25 | 0.23 | 0.09 |
| 65 | 2.5 | 50 | 25 | 1.25 | 0.15 | 0.063 | 3.75 | 0.38 | 0.15 |
| 80 | 3 | 80 | 40 | 2 | 0.24 | 0.10 | 6 | 0.6 | 0.24 |
| 100 | 4 | 120 | 60 | 3 | 0.36 | 0.15 | 9 | 0.9 | 0.36 |
| 150 | 6 | 300 | 150 | 7.5 | 0.9 | 0.38 | 22.5 | 2.3 | 0.9 |
| 200 | 8 | 500 | 250 | 12.5 | 1.5 | 0.63 | 37.5 | 3.8 | 1.5 |
| 250 | 10 | 800 | 400 | 20 | 2.4 | 1.0 | 60 | 6.0 | 2.4 |
| 300 | 12 | 1200 | 600 | 30 | 3.6 | 1.5 | 90 | 9.0 | 3.6 |
| 350 | 14 | 1600 | 800 | 40 | 6.4 | 2.8 | 120 | 12 | 4.8 |
| 400 | 16 | 2000 | 1000 | 50 | 8 | 3.5 | 150 | 15 | 6 |
| 450 | 18 | 2600 | 1300 | 65 | 10.4 | 4.6 | 195 | 20 | 8 |
| 500 | 20 | 3000 | 1500 | 75 | 12 | 5.3 | 225 | 23 | 9 |
| 600 | 24 | 5000 | 2500 | 125 | 20 | 8.8 | 375 | 38 | 15 |

* Accuracy for sizes 15, 20 and 25 is ±0.35%

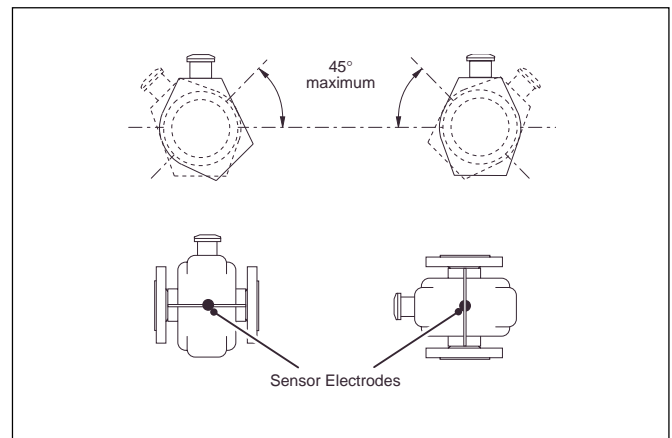
Pressure Loss

| Flow Rate | Pressure Loss (bar) |
|-------------------|---------------------|
| Q _{max} | 0.3 |
| Q _n | 0.075 |
| Q _n /2 | 0.019 |

Pipe Conditions



Mounting



Wetted Materials

Screw End Meters

Brass and PPS

Flanged meters

Lining – Elastomer (UKWFBS listed)

Electrodes – Stainless steel 316L

Pressure Limitations

As flange rating

Conductivity

>50µS/cm

End Connections

Thread End Connections

15mm – G 3/4 in. B 1/2 in. – 1/2 in. NPT

20mm – G 1 in. B 3/4 in. – 3/4 in. NPT

25mm – G 1 1/4 in. B 1 in. – 1 in. NPT

40 to 300mm (1.5 to 12 in.) Flanged

BS4504/ISO 7005 – PN16, PN10

ANSI B16.5 1.5 Class 150

AS 2129 Tables C, D and E

AS 4087/14

JIS to BS2210, 5k, 10k and 30k

BS10 Tables D and E

350 to 600mm (14 to 24 in.) Flanged

BS4504/ISO 7005 – PN6, PN10, PN16

BS10 Table D

AS 2129 Tables D and E

AWWA C207 Class B and D

ANSI B16.5 1.5 Class 150 (≤24 in.)

Electronic Display Unit

Integral with sensor or up to 200m (650 ft) remote

Power Supply

| Type | Voltage Range (V) Absolute Rating | Frequency (Hz) | VA |
|---------|--------------------------------------|----------------|-----|
| a.c. | 85 to 265 | 47 to 440 | <10 |
| Battery | 3.6 (Lithium) | – | – |

Battery Life

Typically 3 years (2 batteries) 15 to 300mm
1.2 years (1 battery) (0.5 to 12 in.)

2 years (2 batteries) 350 to 600mm
0.8 years (1 battery) (14 to 24 in.)

Operational Temperature Limits of Battery (for above specified battery life)

0 to 50°C (0 to 122°F)

Pulse Outputs

Two bi-directional solid state switches with common Isolation

±35V d.c. 50mA.

Output 1 – Forward only, or forward plus reverse pulses

Output 2 – Reverse pulses, or direction indicator

Pulse output – 50Hz maximum, 50% nominal duty cycle

Serial Data Communications

Local Port – RS232 compatible via ABB lead (Option)

Remote Port (Option) – RS232 with RI, RTS and CTS handshaking

Response Time (Programmable)

AC units <1s, default 3s

Battery units – 15s

Enclosure

Aluminium alloy, glass window

Electrical Connections

20mm glands (plastic or armored), or accepts 0.5 in. NPT threaded or military style plug and socket

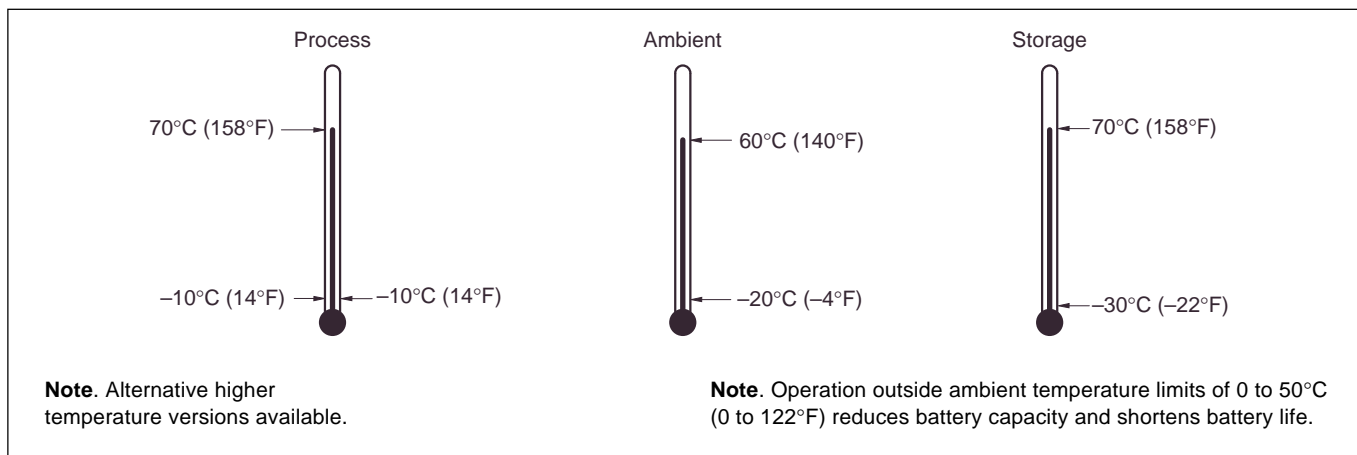
Sensor Cable

ABB supplied as standard – 80m (260 ft) maximum separation

Special – 200m (650 ft) separation (on application)

Armored cable also available

Temperature Ranges



...General Specification

Options

Power Supply Options

| Option | Power Source | Number of Batteries |
|--------|--------------------------|---------------------|
| L | a.c. | None |
| A | a.c. plus battery backup | One |
| B | Battery | Two |

Serial Communications Options

| Local RS232 Serial Comms | Standard * |
|--------------------------|------------|
| Remote serial comms. | Optional |

* Requires ABB lead (option)

Transmitter Unit Location & Display Orientation Options

| Option | Transmitter Unit Location | Display Orientation |
|--------|---------------------------|---------------------|
| 3 | Remote | Vertical |
| 2 | Integral | Vertical |
| 1 | Integral | Horizontal |

Environmental Protection Options

| Unit | IP68 NEMA 6P | Buriable | Potting |
|--------------------------|--------------|----------|---------------------------------------|
| Sensor | Yes | Yes | As standard |
| Transmitter Display Unit | Yes | No | Optional extra (for added protection) |

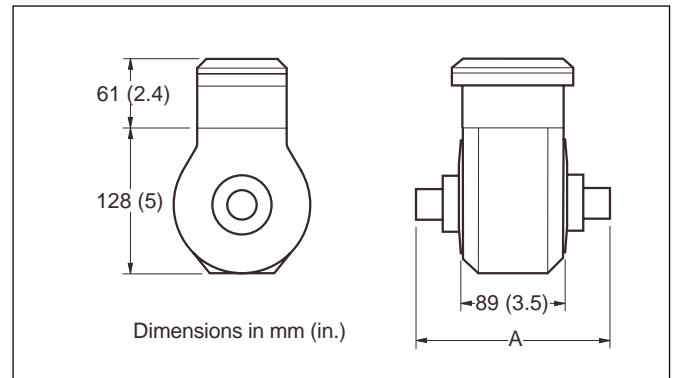
Cable Entry Options

| Option | Sensor Cable Gland | Cable Type | Sensor Cable Fitted & Potted to Sensor | Electronic Display Unit Cable Glands | |
|--------|-------------------------|------------|--|--------------------------------------|---------------------|
| | | | | Output Connection | AC Power Connection |
| 1 | 20mm plastic | Standard | No | 20mm plastic | 20mm plastic |
| B | 20mm plastic | Standard | Yes | 20mm plastic | 20mm plastic |
| 2 | 20mm armored | Armored | No | 20mm armored | 20mm armored |
| C | 20mm armored | Armored | Yes | 20mm armored | 20mm armored |
| 5 | MIL connector (Tx only) | Standard | Yes | 20mm plastic | 20mm plastic |
| 6 | MIL connector (Tx only) | Standard | Yes | 19-way MIL connector | 20mm plastic |
| 3 | 1/2 in. NPT | Standard | No | 1/2 in. NPT | 1/2 in. NPT |

Sensor Specification (nominal dimensions)

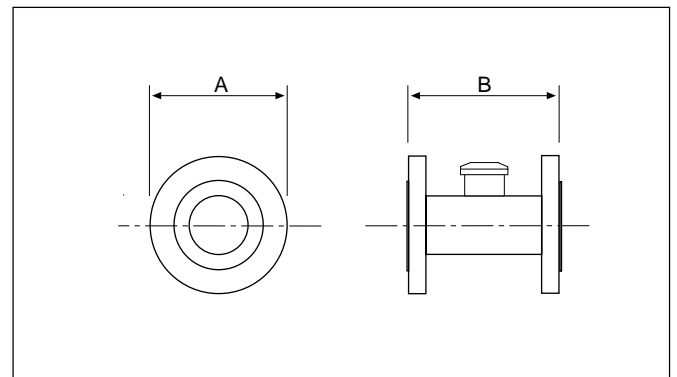
15 to 25mm (0.5 to 1 in.) – Screw Ends

| Meter Size | | Dimensions mm (in) | Connection | Approx. Weight | |
|------------|------|--------------------|----------------------------|----------------|----|
| mm | in. | A | | kg | lb |
| 15 | 0.5 | 119 (4.7) | G 3/4 in. B or 1/4 in. NPT | 2.5 | 5 |
| 20 | 0.75 | 127 (5) | G 1 in. B or 3/4 in. NPT | 2.5 | 5 |
| 25 | 1.0 | 127 (5) | G 1 1/4 in. B or 1 in. NPT | 2.5 | 5 |



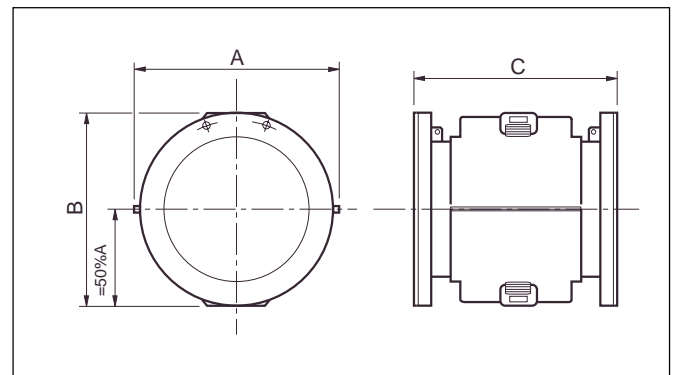
40 to 300mm (1.5 to 12 in.) – Flanged

| Meter Size mm (in.) | Dimensions mm (in.) | | Approx. Weight | |
|---------------------|---------------------|------------|----------------|-----|
| | A | B | kg | lb |
| 40 (1.5) | 176 (7) | 200 (7.9) | 9 | 20 |
| 50 (2) | 176 (7) | 200 (7.9) | 10 | 23 |
| 65 (2.5) | 219 (8.6) | 200 (7.9) | 18 | 40 |
| 80 (3) | 219 (8.6) | 200 (7.9) | 18 | 40 |
| 100 (4) | 230.5 (9.8) | 250 (9.8) | 24 | 54 |
| 150 (6) | 281 (11.8) | 300 (11.8) | 38 | 84 |
| 200 (8) | 402 (15.8) | 350 (13.8) | 37 | 81 |
| 250 (10) | 440 (17.3) | 450 (17.7) | 60 | 132 |
| 300 (12) | 480 (18.9) | 500 (19.7) | 70 | 154 |

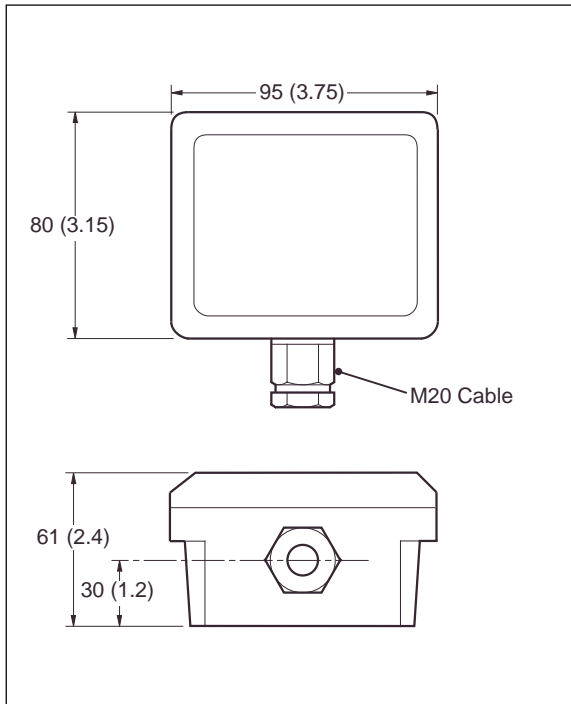


350 to 600mm (14 to 24 in.) – Flanged

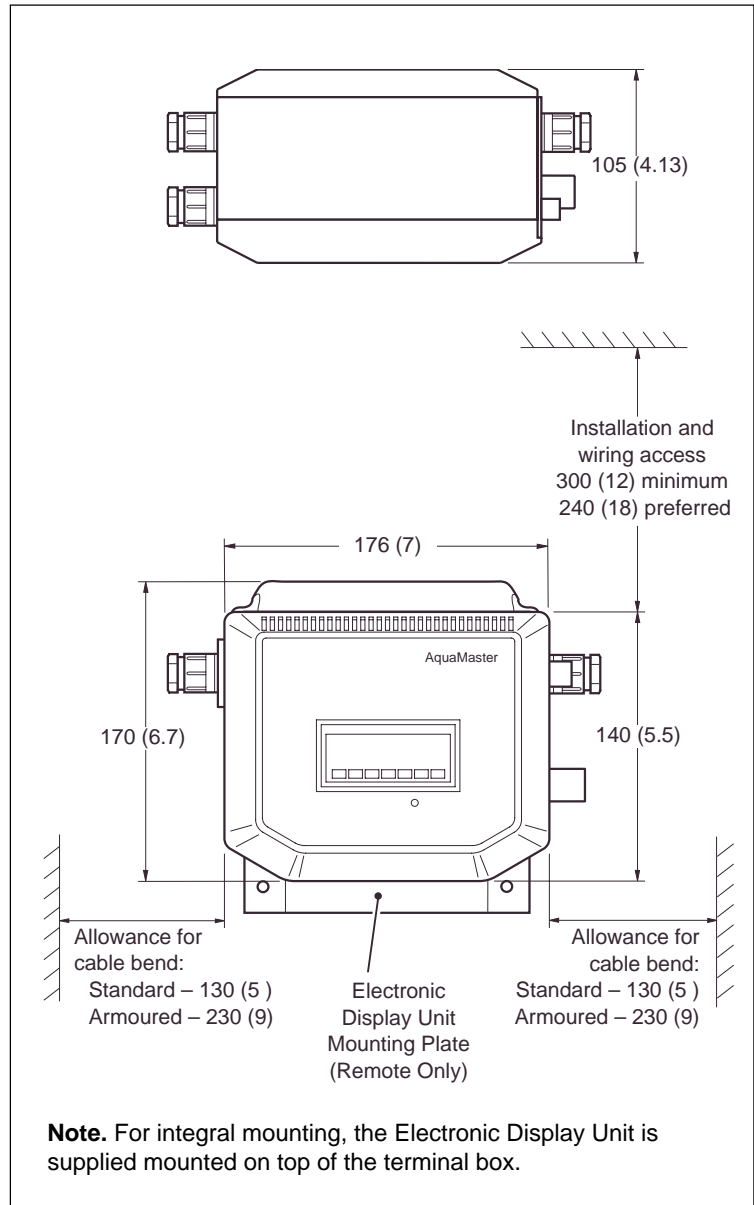
| Meter Size | | Dimensions mm (in.) | | | Approx. Weight | |
|------------|-----|---------------------|------------|------------|----------------|-----|
| mm | in. | A | B | C | kg | lb |
| 350 | 14 | 513 (20.2) | 520 (20.5) | 550 (21.7) | 100 | 220 |
| 400 | 16 | 570 (22.4) | 576 (22.7) | 600 (23.6) | 115 | 253 |
| 450 | 18 | 632 (24.9) | 627 (24.7) | 698 (27.5) | 160 | 352 |
| 500 | 20 | 686 (27.0) | 679 (26.7) | 768 (30.2) | 217 | 455 |
| 600 | 24 | 772 (30.4) | 770 (30.3) | 918 (36.1) | 315 | 693 |



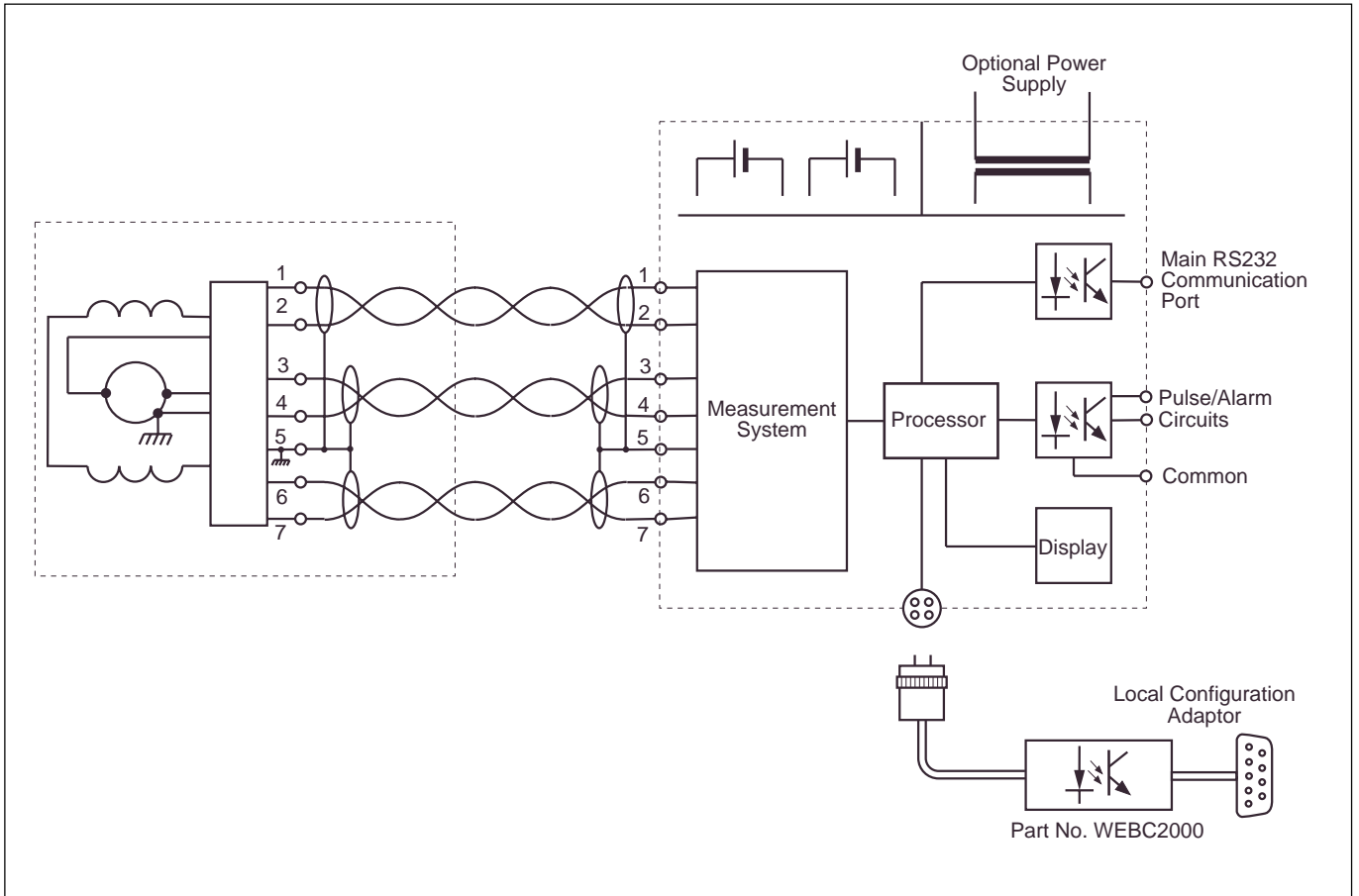
Terminal Box Dimensions – Sensor Mounted



Electronic Display Unit Dimensions



Connection Information





The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

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