

# AquaMaster3 Electromagnetic flowmeter

The high value, precision solution for remote water metering and irrigation applications

Measurement made easy



#### Battery power supply options for lowest cost site preparation and energy usage

- external long-life battery pack
- solar / wind-power

#### Optional built in multi-sampling rate, pressure and flow data logger

- integrated, all-in-one solution
- high resolution flow and pressure data logger
- three instruments for the price of one – no need to purchase a separate pressure transmitter or data logger

#### Wireless communication via optional built in GSM modem

- access and download all logged data remotely
- remote diagnostics
- reduces the requirement for costly and time-consuming site visits

#### Peace of mind with class leading, fully potted, IP68 electronic package

- zero water ingress, even during flood conditions
- military specification IP68 plug and socket connections
- sealed-for-life = zero maintenance

#### Compatible with ABB's full range of industry-leading flow sensors

- full-bore series for general-purpose water metering and irrigation applications
- sensors are available with buriable design, eliminating the need for costly chamber construction – a significant site preparation saving

# AquaMaster3 Electromagnetic flowmeter

## Specification

### AquaMaster3 specification to OIML R49 Class 1

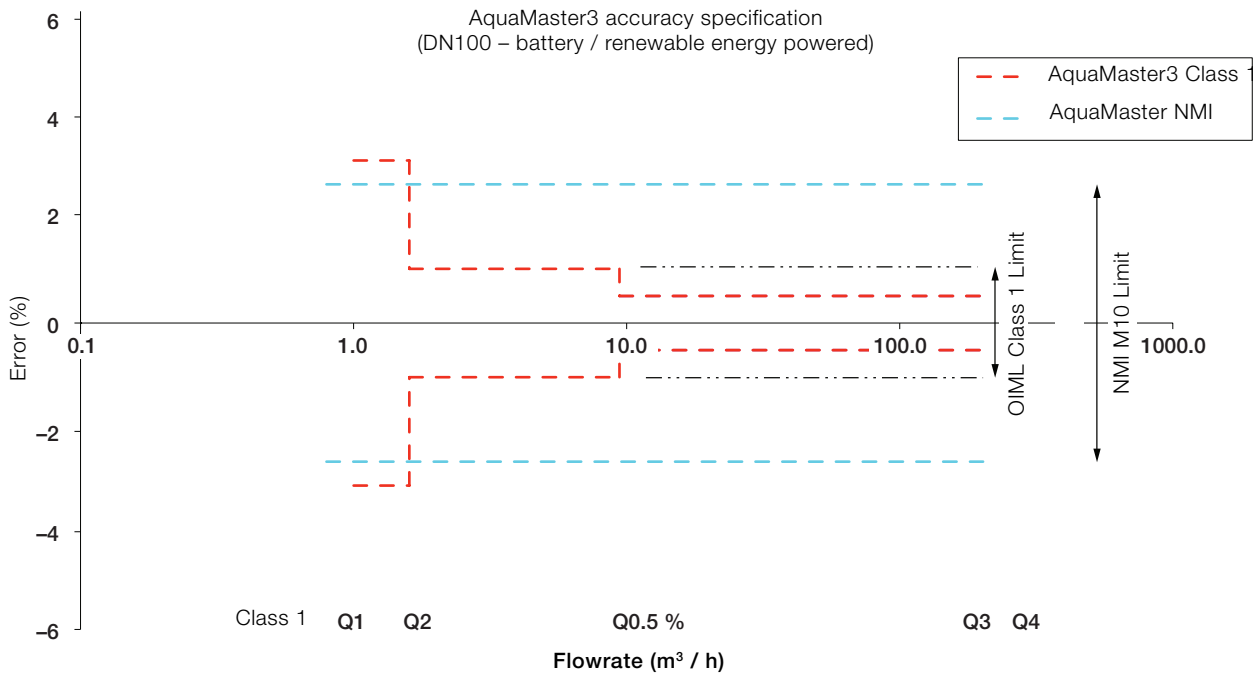


Fig. 1: AquaMaster3 specification to OIML R49 Class 1 and NMI M10

## AquaMaster3 specification to OIML R49 Class 2

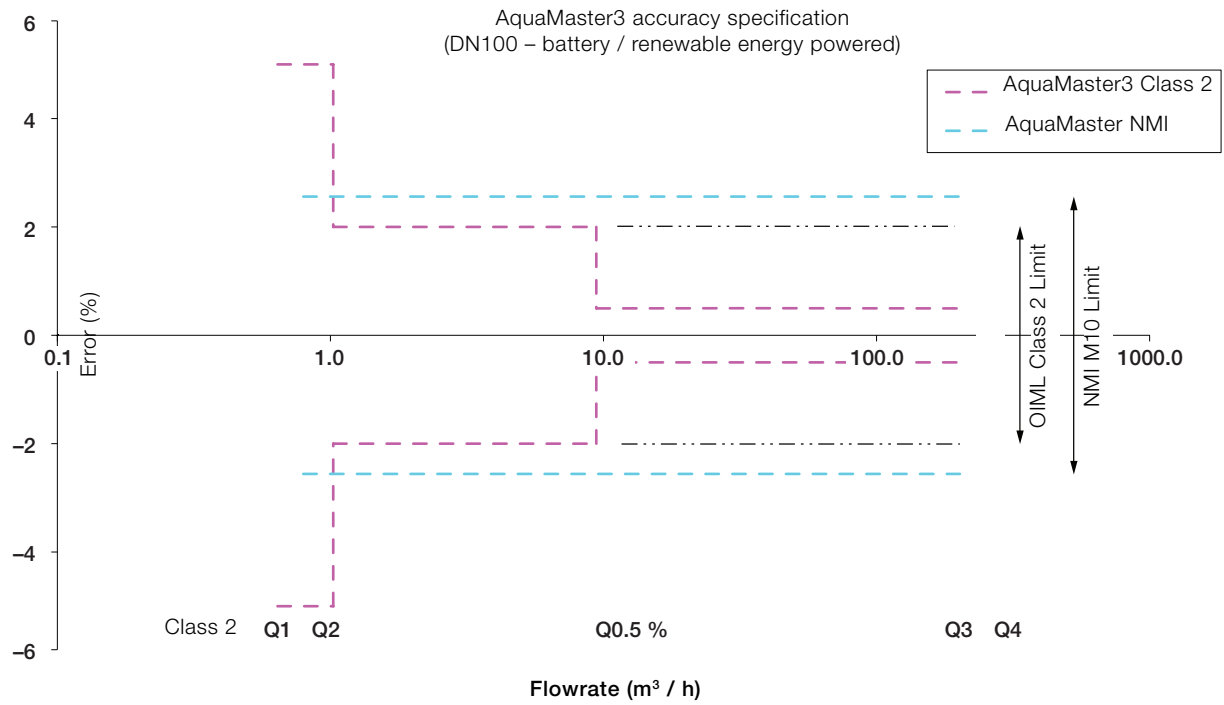


Fig. 2: AquaMaster3 specification to OIML R49 Class 2 and NMI M10

# AquaMaster3

## Electromagnetic flowmeter

### Battery- or renewable energy-powered full-bore meters (FEW) – flow specifications

| Size |     | Class 2 specification              |                                    |                                    |                                    |                                    | Class 1 specification |                                    |                                    |     |
|------|-----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------|------------------------------------|------------------------------------|-----|
| mm   | in. | Q <sub>4</sub>                     | Q <sub>3</sub>                     | Q <sub>0.5 %</sub>                 | Q <sub>2</sub>                     | Q <sub>1</sub>                     | R                     | Q <sub>2</sub>                     | Q <sub>1</sub>                     | R   |
|      |     | m <sup>3</sup> / h<br>(Ugal / min) | m <sup>3</sup> / h<br>(Ugal / min) | m <sup>3</sup> / h<br>(Ugal / min) | m <sup>3</sup> / h<br>(Ugal / min) | m <sup>3</sup> / h<br>(Ugal / min) |                       | m <sup>3</sup> / h<br>(Ugal / min) | m <sup>3</sup> / h<br>(Ugal / min) |     |
| 250  | 10  | 2000 (8810)                        | 1600 (7045)                        | 107 (471)                          | 16 (70.45)                         | 10 (44)                            | 160                   | 26 (114)                           | 16 (70.45)                         | 100 |
| 300  | 12  | 3125 (13760)                       | 2500 (11007)                       | 167 (735)                          | 25 (110)                           | 15.6 (68.68)                       | 160                   | 40 (176)                           | 25 (110)                           | 100 |
| 350  | 14  | 5000 (22014)                       | 4000 (17610)                       | 267 (1175)                         | 40 (176)                           | 25 (110)                           | 160                   | 64 (282)                           | 40 (176)                           | 100 |
| 375  | 15  | 5000 (22014)                       | 4000 (17610)                       | 267 (1175)                         | 40 (176)                           | 25 (110)                           | 160                   | 64 (282)                           | 40 (176)                           | 100 |
| 400  | 16  | 5000 (22014)                       | 4000 (17610)                       | 267 (1175)                         | 40 (176)                           | 25 (110)                           | 160                   | 64 (282)                           | 40 (176)                           | 100 |
| 450  | 18  | 7875 (34670)                       | 6300 (27740)                       | 420 (1850)                         | 63 (277)                           | 39 (172)                           | 160                   | 101 (445)                          | 63 (277)                           | 100 |
| 500  | 20  | 7875 (34670)                       | 6300 (27740)                       | 420 (1850)                         | 63 (277)                           | 39 (172)                           | 160                   | 101 (445)                          | 63 (277)                           | 100 |
| 600  | 24  | 12500 (55030)                      | 10000 (44030)                      | 667 (2937)                         | 100 (440)                          | 64 (282)                           | 160                   | 160 (704)                          | 100 (440)                          | 100 |
| 700  | 28  | 20000 (88058)                      | 16000 (70446)                      | 1600 (7045)                        | 160 (704)                          | 100 (440)                          | 160                   | 406 (1788)                         | 254 (1118)                         | 63  |
| 750  | 29  | 20000 (88058)                      | 16001 (70446)                      | 1600 (7045)                        | 160 (704)                          | 100 (440)                          | 160                   | 406 (1788)                         | 254 (1118)                         | 63  |
| 760  | 30  | 20000 (88058)                      | 16001 (70446)                      | 1600 (7045)                        | 160 (704)                          | 100 (440)                          | 160                   | 406 (1788)                         | 254 (1118)                         | 63  |
| 800  | 32  | 20000 (88058)                      | 16002 (70446)                      | 1600 (7045)                        | 160 (704)                          | 100 (440)                          | 160                   | 406 (1788)                         | 254 (1118)                         | 63  |
| 900  | 36  | 31250 (137590)                     | 25000 (110072)                     | 2500 (11007)                       | 250 (1101)                         | 156 (687)                          | 160                   | 635 (2796)                         | 397(1748)                          | 63  |
| 1000 | 40  | 31251 (137590)                     | 25001 (110072)                     | 2500 (11007)                       | 250 (1101)                         | 156 (687)                          | 160                   | 635 (2796)                         | 397(1748)                          | 63  |
| 1050 | 42  | 31252 (137590)                     | 25002 (110072)                     | 2500 (11007)                       | 250 (1101)                         | 156 (687)                          | 160                   | 635 (2796)                         | 397(1748)                          | 63  |
| 1200 | 48  | 50000 (220143)                     | 40000 (176115)                     | 4000 (17610)                       | 400 (1761)                         | 250 (1101)                         | 160                   | 1016 (4473)                        | 635 (2796)                         | 63  |
| 1400 | 56  | 78750 (346726)                     | 63000 (277381)                     | 6300 (22738)                       | 630 (2274)                         | 394 (1735)                         | 160                   | 1600 (7045)                        | 1000 (4430)                        | 63  |
| 1500 | 60  | 78750 (346726)                     | 63000 (277381)                     | 6300 (22738)                       | 630 (2274)                         | 394 (1735)                         | 160                   | 1600 (7045)                        | 1000 (4430)                        | 63  |
| 1600 | 64  | 78750 (346726)                     | 63000 (277381)                     | 6300 (22738)                       | 630 (2274)                         | 394 (1735)                         | 160                   | 1600 (7045)                        | 1000 (4430)                        | 63  |
| 1800 | 72  | 125000 (550358)                    | 100000 (440287)                    | 10000 (44030)                      | 1000 (4430)                        | 625 (2752)                         | 160                   | 2530 (11139)                       | 1580 (6957)                        | 63  |
| 2000 | 80  | 125000 (550358)                    | 100000 (440287)                    | 10000 (44030)                      | 1000 (4430)                        | 625 (2752)                         | 160                   | 2530 (11139)                       | 1580 (6957)                        | 63  |
| 2200 | 88  | 200000 (880574)                    | 160000 (704459)                    | 16000 (70446)                      | 1600 (7045)                        | 1000 (4430)                        | 160                   | 4060 (17876)                       | 2540 (11183)                       | 63  |
| 2400 | 96  | 200000 (880574)                    | 160000 (704459)                    | 16001 (70446)                      | 1600 (7045)                        | 1000 (4430)                        | 160                   | 4060 (17876)                       | 2540 (11183)                       | 63  |

## Specification – AquaMaster3 transmitter

### Mounting

Remote up to 200 m (650 ft)

### Housing

IP68 (NEMA 6P), <2 m (6 ft.)

Stainless steel housing in a thermoplastic outer cover with window, encapsulated with polyurethane-based resin.

### Electrical connections

IP68 plug and socket, mains cable

### Sensor cable

ABB cable supplied as standard

SWA cable available (via adaptor box) on application

### Renewable power

Solar or wind

Input voltage: 6 to 22 V DC @ <5 W

**Note.** Renewable energy generators do not operate at maximum capacity, for example, low wind speed, coating of the solar panel, short daylight periods. As a consequence, some installations require generators with a capacity greater than the specified 5 W minimum.

Max. current: 200 mA

Backup power time up to 21 days or 9 days

(FEW221, DN500-DN2400)

(dependent on operating conditions)

### External battery pack

IP68 (NEMA 6P)

Manganese alkaline battery life @ 0 to 45 °C (32 to 113 °F):

Nominal 10 or 4 (FEW221, DN500-DN2400) years (standard)\*

Lithium battery pack (optional, order code WABC2102) with

nominal 10 or 4 (FEW221, DN500-DN2400) years

### Battery changeover backup time

Approximately 2 minutes

### Pulse and alarm outputs

Three, bidirectional, solid-state switches with common isolation

±35 V DC 50mA

Output 1 – forward only or forward plus reverse pulses

Output 2 – reverse pulses or direction indicator

Output 3 – alarm indicates any problem with measurement or with power

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

### Communications options

Serial data communications

Local Port RS232

**Note.** On battery and renewable energy versions frequent use of the RS232 or RS485 port considerably reduces battery / standby life.

RS485 MODBUS

MODBUS RTU slave

Baud rates:

1200, 2400, 4800, 9600 or 19200

RS485:

2-wire + ground signalling

Low power shut-off mode after 10 s of inactivity

### Encoder interface / scancode / scanreader (non-logging versions only)

Function – remote reading of totalizer and serial number

Connections:

2-wire for inductive pads

(max. cable length 80 m [260 ft])

3-wire for AMR

Compatible readers:

Severn Trent Services Smart reader

ABB or Elster SR100 and SR50

Logicon Versaprobe

Itron ERT

Compatible inductive pads:

Starpad

\*Battery life is shorter with GSM, depending on how frequently it is used and for what period. For example, used once per day for SMS automated reporting of data logged at 15 minute intervals, the life of a battery pack would be typically reduced by 5 %. Battery life is shorter at extremes of temperature.

# AquaMaster3

## Electromagnetic flowmeter

### Specification – FEW sensor

#### Functional specification

##### Pressure limitations

As per flange rating – non approved

##### Pressure equipment directive 97/23/EC

This product is applicable in networks for the supply, distribution and discharge of water and associated equipment and is therefore exempt.

##### Temperature limitations

| Code | Lining    | Flange material | Medium temperature °C<br>(°F) |          |
|------|-----------|-----------------|-------------------------------|----------|
|      |           |                 | Minimum                       | Maximum  |
| FEW  | Elastomer | Carbon steel    | -5 (23)                       | 80 (176) |
|      |           | Stainless steel | -5 (23)                       | 80 (176) |

##### IP rating

IP68 (NEMA 6) to 7 m (20 ft.) depth

##### Buriable (sensor only)

FEW – DN450 to 2400 (18 to 96 in. NB)

to 5 m (16 ft.) depth

Buriable design for FEW DN15-DN400 is available with special request please contact with your local sales for details

##### Conductivity

>5µS cm<sup>-1</sup>

##### Transmitter mounting

Remote

##### Electrical connections

IP68 plug and socket

##### Sensor cable

ABB cable supplied as standard

Maximum length 200 m (660 ft.)

#### Physical specification

##### Wetted parts

##### Electrode material

Stainless steel 316 L / 316 Ti

##### Potential equalizing rings

Minimum of 1 recommended

##### Lining material / potable water approval

| Code | Size Range                         | Liner     | Potable Water Approvals |              |     |      |     | AZ/<br>NZN<br>4020 |
|------|------------------------------------|-----------|-------------------------|--------------|-----|------|-----|--------------------|
|      |                                    |           | WRAS                    | WRAS<br>60°C | ACS | DVGW | NSF |                    |
| FEW  | DN40 – 2400<br>(1½ – 96 in.<br>NB) | Elastomer | ✓                       |              |     |      |     | ✓*                 |

\*AZ/NZS 4020 certificate is available for FEW Sensor in WaterMaster model code

##### Lining protection plates

Not required

##### Installation conditions (recommended)

Straight pipe requirements

Upstream      Downstream

FEW              5 x DN          2 x DN

##### Pressure loss

Negligible at Q3

All full bore meters

## Ordering guide – AquaMaster FEW221 electromagnetic flowmeter

|                         | AquaMaster | F | E | 3  | 4 | 5+6 | 7,8,9 | 10 | 11 | 12 | 13 | 14,15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | Options |  |
|-------------------------|------------|---|---|----|---|-----|-------|----|----|----|----|-------|----|----|----|----|----|----|----|----|----|----|----|----|---------|--|
| <b>Sensor type</b>      |            |   |   |    |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| Full bore               |            |   |   | W  |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| <b>Transmitter type</b> |            |   |   |    |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| AquaMaster3 transmitter |            |   |   | 2  |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| <b>Design</b>           |            |   |   |    |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| Remote                  |            |   |   | 21 |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| Remote – sensor only    |            |   |   | 81 |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| <b>Bore diameter</b>    |            |   |   |    |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN250 (10 in.)          |            |   |   |    |   | 250 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN300 (12 in.)          |            |   |   |    |   | 300 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN350 (14 in.)          |            |   |   |    |   | 350 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN400 (16 in.)          |            |   |   |    |   | 400 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN450 (18 in.)          |            |   |   |    |   | 450 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN500 (20 in.)          |            |   |   |    |   | 500 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN600 (24 in.)          |            |   |   |    |   | 600 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN700 (28 in.)          |            |   |   |    |   | 700 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN750 (29 in.)          |            |   |   |    |   | 750 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN760 (30 in.)          |            |   |   |    |   | 760 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN800 (32 in.)          |            |   |   |    |   | 800 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN900 (36 in.)          |            |   |   |    |   | 900 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1000 (40 in.)         |            |   |   |    |   | 001 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1050 (42 in.)         |            |   |   |    |   | 051 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1100 (44 in.)         |            |   |   |    |   | 101 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1200 (48 in.)         |            |   |   |    |   | 201 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1350 (54 in.)         |            |   |   |    |   | 351 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1400 (56 in.)         |            |   |   |    |   | 401 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1500 (60 in.)         |            |   |   |    |   | 501 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1600 (64 in.)         |            |   |   |    |   | 601 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1650 (66 in.)         |            |   |   |    |   | 651 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1800 (72 in.)         |            |   |   |    |   | 801 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN1950 (78 in.)         |            |   |   |    |   | 951 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN2000 (80 in.)         |            |   |   |    |   | 002 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN2100 (84 in.)         |            |   |   |    |   | 102 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN2200 (88 in.)         |            |   |   |    |   | 202 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| DN2400 (95 in.)         |            |   |   |    |   | 402 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| Others                  |            |   |   |    |   | 999 |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| <b>Liner material</b>   |            |   |   |    |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| Elastomer               |            |   |   |    |   |     |       | K  |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |
| Others                  |            |   |   |    |   |     |       | Z  |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |

# AquaMaster3

## Electromagnetic flowmeter

| AquaMaster  | F | E | 3 | 4 | 5+6 | 7,8,9 | 10 | 11 | 12 | 13 | 14,15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | Options |   |
|---|---|---|---|---|-----|-------|----|----|----|----|-------|----|----|----|----|----|----|----|----|----|----|----|----|---------|---|
| <b>Electrode design</b>   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Standard  |   |   |   |   |     |       |    | 1  |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Others  |   |   |   |   |     |       |    | 9  |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| <b>Measuring electrodes material</b>                                    |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Stainless steel 316Ti / 316L  |   |   |   |   |     |       |    |    | S  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Others  |   |   |   |   |     |       |    |    | Z  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| <b>Grounding accessories</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Without   |   |   |   |   |     |       |    |    | 0  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Standard  |   |   |   |   |     |       |    |    | 1  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| 1x potential equalizing ring – stainless steel, mounted on one side     |   |   |   |   |     |       |    |    | 3  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| 2 x potential equalizing rings – stainless steel, mounted on both sides |   |   |   |   |     |       |    |    | 4  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Others  |   |   |   |   |     |       |    |    | 9  |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| <b>Process connection type</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges ASME B16.47 series B / B16.5 Class 150                          |   |   |   |   |     |       |    |    |    |    | A1    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges ASME B16.47 series B / B16.5 Class 300                          |   |   |   |   |     |       |    |    |    |    | A3    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges ASME B16.47 series A Class 150                                  |   |   |   |   |     |       |    |    |    |    | B1    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges ASME B16.47 series A Class 300                                  |   |   |   |   |     |       |    |    |    |    | B3    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AWWA C207 Class B   |   |   |   |   |     |       |    |    |    |    | C1    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AWWA C207 Class D   |   |   |   |   |     |       |    |    |    |    | C2    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AWWA C207 Class E   |   |   |   |   |     |       |    |    |    |    | C3    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AWWA C207 Class F   |   |   |   |   |     |       |    |    |    |    | C4    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges JIS 10K   |   |   |   |   |     |       |    |    |    |    | J1    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges JIS 5K  |   |   |   |   |     |       |    |    |    |    | J2    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AS 4087 PN 16   |   |   |   |   |     |       |    |    |    |    | E1    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AS 2129 Table E   |   |   |   |   |     |       |    |    |    |    | E4    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AS 2129 Table D   |   |   |   |   |     |       |    |    |    |    | E5    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Flanges AS 4087 PN 35   |   |   |   |   |     |       |    |    |    |    | E8    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| ISO 7005 PN 6 EN 1092-1   |   |   |   |   |     |       |    |    |    |    | S0    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| ISO 7005 PN 10 EN 1092-1  |   |   |   |   |     |       |    |    |    |    | S1    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| ISO 7005 PN 16 EN 1092-1  |   |   |   |   |     |       |    |    |    |    | S2    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| ISO 7005 PN 25 EN 1092-1  |   |   |   |   |     |       |    |    |    |    | S3    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| ISO 7005 PN 40 EN 1092-1  |   |   |   |   |     |       |    |    |    |    | S4    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Others  |   |   |   |   |     |       |    |    |    |    | Z9    |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| <b>Process connection material</b>                                      |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Carbon steel flanges  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         | B |
| Stainless steel flange  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         | D |
| Others  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         | Z |
| <b>Usage certifications</b>   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |   |
| Standard (without PED)  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         | 1 |



|  | F | E | 3 | 4 | 5+6 | 7,8,9 | 10 | 11 | 12 | 13 | 14,15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | Options |  |   |   |
|--|---|---|---|---|-----|-------|----|----|----|----|-------|----|----|----|----|----|----|----|----|----|----|----|----|---------|--|---|---|
| <b>Calibration type</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Standard Class 2 factory calibration – standard accuracy             |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Standard Class 1 factory calibration – enhanced accuracy             |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Enhanced Class 2 factory calibration                                 |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Enhanced Class 1 factory calibration                                 |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Class 2.5 – NMI  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Installation temperature range / ambient temperature range</b>    |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Standard design –20 to 60 °C (–4 to 140 °F)                          |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Name plate</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Adhesive label   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Signal cable length and type</b>                                  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Without signal cable   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| 5 m (16.4 ft)  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| 10 m (32.8 ft)   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| 20 m (65.6 ft)   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| 30 m (98.4 ft)   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| 50 m (164.0 ft)  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| 80 m (262.5 ft)  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Others   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Explosion protection certification</b>                            |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Without  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Protection class transmitter / protection class sensor</b>        |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| IP68 (NEMA 6P) / IP68 (NEMA 6P) – cable not fitted and not to sensor |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| IP68 (NEMA 6P) / IP68 (NEMA 6P) – cable fitted and potted to sensor  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Cable conduits</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| MIL style  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Power supply</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| Battery powered – battery not fitted (AquaMaster transmitter)        |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| External renewable energy (AquaMaster transmitter)                   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| <b>Input and output signal type</b>                                  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   |   |
| MODBUS   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  | M |   |
| Mobile communication   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   | H |
| ScanReader   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   | S |
| Without ( <b>Note.</b> Pulse outputs and RS232 are always present)   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |         |  |   | Y |

# AquaMaster3

## Electromagnetic flowmeter

| AquaMaster   | F | E | 3 | 4 | 5+6 | 7,8,9 | 10 | 11 | 12 | 13 | 14,15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27  | Options |
|--|---|---|---|---|-----|-------|----|----|----|----|-------|----|----|----|----|----|----|----|----|----|----|----|-----|---------|
| <b>Configuration type / diagnostics type</b>                                 |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| Parameters set to factory defaults – standard diagnostic functions activated |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | 1   |         |
| <b>Options – add to order code</b>   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| <b>Accessories</b>   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| Configuration lead   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | AC  |         |
| Standard battery pack  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | AD  |         |
| Modbus lead  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | AT  |         |
| Lithium battery pack   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | AE  |         |
| <b>Other Usage Certifications</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| NMI  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | CM3 |         |
| <b>Potable water and Food &amp; Beverage approvals</b>                       |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| WRAS - Cold water approval   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | CWA |         |
| Without  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | CWY |         |
| <b>Mobile communication</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| Without  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | G0  |         |
| Integral (850 / 900 / 1800 / 1900 MHz)                                       |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | G3  |         |
| Remote 1 m (850 / 900 / 1800 / 1900 MHz)                                     |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | G6  |         |
| Remote 5 m (850 / 900 / 1800 / 1900 MHz)                                     |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | G7  |         |
| Remote 10 m (850 / 900 / 1800 / 1900 MHz)                                    |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | G8  |         |
| <b>Lay length</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| ISO Lay Length (DN10-DN600)  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | JB  |         |
| 1.3 D Lay Length (DN700-DN2400)  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | JK  |         |
| <b>Logger and protocol</b>   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| ABB Logger with Capula / BVS Protocol  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP2 |         |
| ABB Logger with Hydreka Protocol   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP5 |         |
| ABB Logger with QTech Protocol   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP6 |         |
| ABB Logger with Areal Topkai Protocol  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP7 |         |
| ABB Logger with EcoTech Protocol   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP8 |         |
| ABB Logger with Autochart I+P Protocol                                       |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP9 |         |
| ABB Logger with HydroComp Protocol   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LPA |         |
| ABB Logger with ABB Generic Protocol (e.g. LogMaster)                        |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LPB |         |
| ABB Logger with ABB AC800M System Protocol                                   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LPC |         |
| ABB Logger with Zeepaard Protocol  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LPE |         |
| ABB Logger with Agua Ambiente Servicios Integrales SA                        |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LPF |         |
| Not Required / No Logger   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LP0 |         |
| Others   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | LPZ |         |
| <b>Documentation language</b>  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |     |         |
| English – standard   |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | M5  |         |
| Chinese  |   |   |   |   |     |       |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    | M6  |         |

| <b>Pressure span</b>              |  |     |
|-----------------------------------|--|-----|
| 1000 kPa / 10 bar / 145 psi       |  | PS1 |
| 1600 kPa / 16 bar / 232 psi       |  | PS2 |
| 2000 kPa / 20 bar / 300 psi       |  | PS3 |
| Without – standard                |  | PS0 |
| Others                            |  | PSZ |
| <b>Pressure transducer</b>        |  |     |
| Remote, no transducer             |  | PT2 |
| Remote, cable length 1 m (3 ft)   |  | PT3 |
| Remote, cable length 5 m (15 ft)  |  | PT4 |
| Remote, cable length 10 m (33 ft) |  | PT5 |
| Remote, cable length 20 m (65 ft) |  | PT6 |
| Without                           |  | PT0 |
| Others                            |  | PTZ |
| <b>Number of testpoints</b>       |  |     |
| 1 Point                           |  | T1  |
| 3 Points                          |  | T3  |
| 5 Points                          |  | T5  |
| <b>Verification type</b>          |  |     |
| Without fingerprint               |  | V0  |
| CalMaster                         |  | V2  |

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