United Utilities Water
Meter Selection Catalogue

United Utilities
helping life flow smoothly

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Foreword

This document contains a catalogue of water meters which are approved for use by United Utilities Water (UUW) for fiscal use, and these meters may be selected by a new Water Supply Licensee (WSL).

Only water meters contained within this document are available for selection. UUW will not accept the installation of any alternative water meter as a fiscal meter.

All water meters will be provided by UUW. The WSL will have a role in selecting the preferred meter to be used.

This document should be read in conjunction with the following documentation: -

a) Operating Code OC1 – Pulsed Output
b) Operating Code OC2 – Meter Size Change
c) Operating Code OC3 – Meter Testing
d) Operating Code OC4 – Alterations to meter location or housing
e) Operating Code OC5 – Maintenance activity required
f) Operating Code OC6 – Failure of data logging equipment
g) Wholesale Supply Common Contract

This document facilitates Licensee requests to upsize, downsize or exchange existing water meters as described in Section 7; Section 12 of the Wholesale Supply Common Contract.

MOSL Asset Management Standard

As outlined by the National Metering Strategy, please see below for a summary of UUW asset management standards for battery life, connectivity drop out, Smart reading accuracy sampling.

Battery performance

- United Utilities have procured a Meter Warranty across its meters and associated fittings, that will protect any Smart meters installed through AMP8 to ensure longevity of the installed Smart solution across its expected manufactured life. Under the terms of this warranty, any meter or associated fittings, will be eligible for a full exchange if the battery fails within the following period from installation:
    - 15 years for <25mm meters that are installed at Small NHH premises and read at hourly intervals
    - 12 years for > 25mm meters that are installed at Medium & Large NHH premises and read at 15-minute intervals

- If the battery fails outside of the above timescales, then United Utilities will undertake a full meter exchange as part of its reactive work programmes

Connectivity drop out

- United Utilities have set up a metering control centre which, with the support of our Smart Partner, Arqiva, will monitor for individual meter connectivity issues. We have established a meter health process which will be triggered following a set number of days without receiving a successful smart meter read from a previously commissioned and working asset. It will enter a triage period of investigation and resolution either remotely or onsite to complete any necessary work to reconnect the meter to our communication infrastructure*. We will ensure that for NHH meters, we follow market processes, to ensure customers and Retailers are kept informed on any remedial work required

- Whilst the above works are being carried out, if we require a read from the asset, we will have a process in place to instruct an AMR or visual read to be taken

- In the event where we cannot remediate an uncommunicating smart meter, we will notify CMOS of a change in asset status from AMI to AMR in accordance with any existing or future good practice guidelines

Smart reading accuracy sampling

- The meter reading received via our AMI infrastructure should always match any physical meter reading taken visually, however, we will undertake some random spot checks on meters. Our approach will be:
    - Once every year, we will randomly select a volume of sites to physically read and complete a comparison v the Smart reading
    - In the event there is a discrepancy, we will follow the steps outlined as part of our no comms process to exchange the meter under warranty and the asset will be returned to the manufacturer for testing and investigation.

*The number of days before a meter enter this process and the triage period of investigation can change on a case-by-case basis and following ongoing efficiency reviews.

Operating principles of different meter types

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Piston meter (Volumetric). Standard 15/20/25/40mm meters

Piston meters, also known as rotary piston or semi-positive displacement meters, the piston meter operates on the principle of a piston rotating within a chamber of known volume. For each rotation, an amount of water passes through the piston chamber. Through a gear mechanism and, sometimes, a magnetic drive, a needle dial and odometer type display is advanced.

- Accurate at low flow
- Low maintenance
- Horizontal or Vertical Installation

Single jet meter 50mm – 100mm

A single jet meter consists of a simple impeller with radial vanes, impinged upon by a single jet. A magnetic coupling to the register drives directly off the rotor and a needle dial and odometer type display are advanced.

- Low to Medium range meter
- Low head loss across meter
- Horizontal orientation **only** – meter facing upwards

Woltmann meter 50 – 150mm (can go to 250mm for bespoke)

The Woltmann meter comprises a rotor with helical blades inserted axially in the flow, much like a ducted fan; it can be considered a type of turbine flow meter. They are commonly referred to as helix meters and are popular at larger sizes. A magnetic coupling to the register drives directly off the rotor and a needle dial and odometer type display are advanced.

- High flow range meter
- Horizontal or Vertical Installation

Combination Meters 50 – 150mm

Combination meters combined a volumetric meter and a Voltmann meter in one meter body. During periods of low flow, the water is recorded through the volumetric meter. When the flow increases a changeover valve diverts the water through the Voltmann meter.

- Low to high flow range meter
- Suitable for low consumption customers with firefighting facilities
- Horizontal or Vertical Installation

Magnetic flow meters 50mm+ (bespoke sites or Raw Water supplies)

Magnetic flow meters, often called "mag meter's" or "electromag's", use a magnetic field applied to the metering tube, which results in a potential difference proportional to the flow velocity perpendicular to the flux lines. The potential difference is sensed by electrodes aligned perpendicular to the flow and the applied magnetic field. The physical principle at work is Faraday's law of electromagnetic induction.

- Battery or mains powered
- Bidirectional
- Do not require strainers
- No mechanical measuring element
- Suitable for non-potable water
- Horizontal or Vertical Installation

Available Meters

The following are standard meters and are available for selection and accepted by UUW.
Flow ranges are from the Q_1 values & Q_4 values for each meter model.

Size 15mm / 20mm - Diehl ALTAIR, Inline & Concentric (Piston)



- Accurate at low flows
- Supplied with AMR unit attached & paired to meter
- Sizes available – 15mm & 20mm.
- Flow ranges from 6.25 l/hr (15mm) – 5 m^3/hr (20mm)
- Composite meter body
- Pulsed output available on request (requires additional pulse splitter)

Size 25mm / 40mm - Diehl ALTAIR (piston)

- Accurate at low flows
- Supplied with AMR unit attached & paired to meter
- Reliable, low maintenance
- Sizes available – 25mm & 40mm
- Flow range from 40 l/hr (25mm) – 20 m^3/hr (40mm)
- Pulsed output available on request (requires additional pulse splitter)

Size 15mm / 20mm – Sensus 640, Inline & Concentric (Piston)


- Accurate at low flows
- Integrated AMR
- Digital display
- Sizes available – 15mm & 20mm.
- Flow ranges from 6 l/hr (15mm) – 5 m^3/hr (20mm)
- Composite meter body
- **Pulsed output not available**

Size 25mm / 40mm – Sensus iPERL (Electromagnetic)

- Accurate at low flows
- Integrated AMR
- Digital display
- Reliable, low maintenance
- Sizes available – 25mm & 40mm
- Flow range from 7.8 l/hr (25mm) – 20 m^3/hr (40mm)
- **Pulsed output not available**

Size 50mm / 100mm Diehl AQUILA (Single Jet)

- Low – Mid flow rate meter
- Supplied with AMR unit attached & paired to meter
- Low head loss across meter
- Sizes available – 50mm/80mm/100mm
- Flow range from – 80 l/hr (50mm) – 125 m^3/hr (100mm)
- Pulsed output available on request (requires additional pulse splitter)

Size 50mm – 150mm Diehl WESAN (Woltmann)

- High flow rate meter
- Supplied with AMR unit attached & paired to meter
- Sizes available – 50mm/80mm/100mm/150mm.
- Flow range from – 0.63 m^3/hr – 312 m^3/hr
- Pulsed output available on request (requires additional pulse splitter)

Size 50mm – 200mm Diehl HYDRUS 2 (Ultrasonic)

- Large measuring range
- Integrated AMR
- Digital display
- Sizes available – 50mm/80mm/100mm/150mm
- Flow range from 32 litres/hr (50mm) – 500 m^3/hr (200mm)
- Pulsed output available on request (requires additional pulse splitter)

Size 50mm – Sensus MIESTREAM (Woltmann)

- High flow rate meter
- Integrated AMR
- Digital display
- Sizes available 50mm/80mm/100mm/150mm.
- Flow range from 0.25 m^3/hr (50mm) – 500 m^3/hr (150mm)
- **Pulsed output not available**

Size 50mm – 150mm Sensus CORDONEL (Ultrasonic)

- Large measuring range
- Integrated AMR
- Digital display
- Sizes available – 50mm/80mm/100mm/150mm
- Flow range from 0.04 m^3/hr (50mm) – 500 m^3/hr (150mm)
- **Pulsed output not available**

The following meters are non-standard and may be subject to additional charges if requested – these meters are usually limited to extremely large potable supplies and non-potable supplies

Size 50mm – 300mm ABB AquaMaster (Electromagnetic) – Battery powered

- Electromagnetic meter
- Visually Read
- Low head loss across meter
- Low – high flow range
- User defined pulsed output
- Suitable for non-potable water
- Sizes available 50 – 300 mm
- Flow range from 0.10 m^3/hr – 788 m^3/hr

Size 50mm – 500mm ABB WaterMaster (Electromagnetic) – Mains powered

- Electromagnetic meter
- Visually Read
- Low head loss across meter
- Low – high flow range
- User defined pulsed output
- Suitable for non-potable water
- Sizes available 50 – 500 mm
- Flow range from 0.10 m^3/hr – 788 m^3/hr
- Requires fixed electric supply

Flow Data

Flow Data

Size	Operating Type	UU recommended Flow Range (overload flow)	Meters Available	Compliance Standards	Pulse Splitter options
15mm	Piston (in-line)	6.25 l/hr – 3.125 m^3/hr	**Diehl Altair V5** *Alternative – Sensus 640C*	EN14154, OIML R49, ISO 4064, MID	3 way splitter available on Request for Non Household Properties *Sensus Meters – no pulsed output capability*
	Piston (Concentric)	6.25 l/hr – 3.125 m^3/hr	**Diehl Altair V** *Alternative – Sensus 640MC*	EN14154, OIML R49, ISO 4064, MID	
20mm	Piston (in-line)	10 l/hr – 5 m^3/hr	**Diehl Altair V5** *Alternative – Sensus 640C*	EN14154, OIML R49, ISO 4064, MID	
	Piston (Concentric)	10 l/hr – 5 m^3/hr	**Diehl Altair V5** *Alternative – Sensus 640MC*	EN14154, OIML R49, ISO 4064, MID	
25mm	Piston *Alternative - Electromagnetic*	40 l/hr – 7.85 m^3/hr *7.8 l/hr - 7.87m^3/hr*	**Diehl Altair V4** *Alternative – Sensus iPERL*	EN14154, OIML R49, ISO 4064, MID	3 way splitter available on Request *Sensus Meters – no pulsed output capability*
40mm	Piston *Alternative - Electromagnetic*	100 l/hr – 10 m^3/hr (20 m^3/hr) *20 l/hr – 20 m^3/hr*	**Diehl Altair V4** *Alternative – Sensus iPERL*	EN14154, OIML R49, ISO 4064, MID	
50mm	Single Jet	80 l/hr – 15 m^3/hr (30 m^3/hr)	**Diehl Aquila V5**	ISO4064, BS5728 Class C	
	Woltmann *Alternative – Woltman*	0.63 m^3/hr – 40 m^3/hr (50 m^3/hr) *0.25 m^3/hr – 50 m^3/hr*	**Diehl Wesan** *Alternative – Sensus Miestream*	ISO4064/BS5728/EEC specification Class B	
	Ultrasonic *Alternative – Ultrasonic*	31.25 l/hr – 25 m^3/hr (50 m^3/hr) *0.04 m^3/hr – 50 m^3/hr*	**Diehl Hydrus** *Alternative – Sensus Cordonel*	OIML R49, ISO 4064, MID	
	Electromagnetic	0.25 m^3/hr – 40 m^3/hr (50 m^3/hr)	**ABB AquaMaster**	OIML R49	
		0.2 m^3/hr – 63 m^3/hr (79 m^3/hr)	**ABB WaterMaster**	OIML R49, (MID) 2004/22/EC	

Size	Operating Type	UU recommended Flow Range (overload flow)	Meters Available	Compliance Standards	Pulse Splitter options
80mm	Single Jet	200 l/hr – 63 m^3/hr (78 m^3/hr)	**Diehl Aquila V5**	EN14154, OIML R49, ISO 4064, MID	Diehl meter - 3 way splitter available on Request *Sensus Meters – no pulsed output capability*
	Woltmann *Alternative – Woltman*	1 m^3/hr – 100 m^3/hr (125 m^3/hr) *0.32 m^3/hr – 125 m^3/hr*	**Diehl Wesan** *Alternative – Sensus MeiStream*	EN14154, OIML R49, ISO 4064, MID	
	Ultrasonic *Alternative – Ultrasonic*	78 l/hr – 63 m^3/hr (80 m^3/hr) *0.10 m^3/hr – 125 m^3/hr*	**Diehl Hydrus** *Alternative – Sensus Cordonel*	EN14154, OIML R49, ISO 4064, MID	
	Electromagnetic	0.63 m^3/hr – 100 m^3/hr (125 m^3/hr)	**ABB AquaMaster**	OIML R49	
		0.51 m^3/hr – 160 m^3/hr (200 m^3/hr)	**ABB WaterMaster**	OIML R49, (MID) 2004/22/EC	
100mm	Single Jet	317 l/hr – 100 m^3/hr (125 m^3/hr)	**Diehl Aquila V5**	EN14154, OIML R49, ISO 4064, MID	
	Woltmann *Alternative – Woltman*	1.6 m^3/hr – 160 m^3/hr (200 m^3/hr) *0.51 m^3/hr – 200 m^3/hr*	**Diehl Wesan** *Alternative – Sensus MeiStream*	EN14154, OIML R49, ISO 4064, MID	
	Ultrasonic *Alternative – Ultrasonic*	125 l/hr – 100 m^3/hr (120 m^3/hr) *0.16 m^3/hr – 200 m^3/hr*	**Diehl Hydrus** *Alternative – Sensus Cordonel*	EN14154, OIML R49, ISO 4064, MID	
	Electromagnetic	1.0 m^3/hr – 160 m^3/hr (200 m^3/hr)	**ABB AquaMaster**	OIML R49	
		0.79 m^3/hr – 250 m^3/hr (313 m^3/hr)	**ABB WaterMaster**	OIML R49, (MID) 2004/22/EC	
150mm	Woltmann *Alternative – Woltman*	5 m^3/hr – 250 m^3/hr (312 m^3/hr) *0.04 m^3/hr – 500 m^3/hr*	**Diehl Wesan** *Alternative – Sensus MeiStream*	EN14154, OIML R49, ISO 4064, MID	
	Ultrasonic *Alternative – Ultrasonic*	312 l/hr – 250 m^3/hr (300 m^3/hr) *1.0 m^3/hr – 500 m^3/hr*	**Diehl Hydrus** *Alternative – Sensus Cordonel*	EN14154, OIML R49, ISO 4064, MID	
	Electromagnetic	2.5 m^3/hr – 400 m^3/hr (500 m^3/hr)	**ABB AquaMaster**	OIML R49	
		2.0 m^3/hr – 630 m^3/hr (788 m^3/hr)	**ABB WaterMaster**	OIML R49, (MID) 2004/22/EC	