



WATER METERING CODE

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FORWARD

This Water Metering Code sets out the rights and responsibilities of customers and the Power and Water Authority (PAWA) in relation to the metering of potable water and recycled effluent.

The Metering Code implements the requirements of PAWA's licence and has been approved by the Utilities Commission. Sections of the Metering Code may be amended from time to time following a specific request from a customer, the Utilities Commission, or as deemed appropriate by PAWA. The Utilities Commission must approve all amendments to the Metering Code.

The Water Metering Code provides customers with confidence that they are being fairly and equitably charged for water or recycled effluent.

1 INTRODUCTION

The purpose of the Water Metering Code is to set out the rights and obligations of customers, and PAWA, in relation to the metering of water and sewerage services in the Northern Territory. The Metering Code applies to all users where potable water or recycled effluent is metered for retail sale.

The Metering Code defines the standards for the installation, testing, maintenance and replacement of these metering points.

2 LEGAL BASIS

PAWA is licensed by the Utilities Commission under the *Water Supply and Sewerage Services Act* to provide services in the Northern Territory. Section 72 of the Act requires all licensees to develop and implement a Metering Code setting out the arrangements and conditions for installing, testing and maintaining its metering installations. The same Section requires this metering Metering Code be approved by the Utilities Commission.

This Metering Code implements those requirements.

3 SCOPE

This document identifies national standards and requirements for water meters, addresses PAWA's installation requirements, and specifies its testing and meter replacement policies. The Metering Code also outlines the responsibilities of PAWA and its customers in relation to the supply, installation and maintenance of equipment, and PAWA's rights of access to metering points.

The Water Metering Code applies to all meters used to measure potable water or recycled effluent supplied for retail sale.

4 COMPLIANCE WITH THE METERING CODE

4.1 Compliant Installations

A metering installation is compliant with this Metering Code when it meets all of the following requirements:

- the installed meter(s) are of a pattern that is approved by the National Standards Commission for use in Australia;

- meters and ancillary equipment are approved and installed in accordance with the relevant PAWA specifications and the Water Supply and Sewerage Standard Drawings;
- access to the metering installation is readily available to authorised PAWA officers; and
- the installation is maintained and meters are replaced and tested in accordance with the schedules at Attachment A.

Metering points installed prior to the introduction of this Metering Code shall be deemed to comply with the Metering Code, provided they fully comply with the requirements of the day. However, where an existing installation is upgraded, it is to be made fully compliant as would be the case if it were a new installation.

4.2 Non-compliant Installations

Where an installation is found to be non-compliant with the Metering Code and that non-compliance is the responsibility of PAWA, the installation will be made compliant within 28 days.

Where the non-compliance is the responsibility of the customer, the customer will be advised in writing and required to rectify the non-compliance within 90 days. Failure to do so may result in disconnection of supply.

PAWA will make appropriate adjustments to customers' accounts to take account of any metering data errors resulting from non-compliance.

5 RESPONSIBILITY FOR METERING INSTALLATIONS

5.1 Supply and Installation of Equipment in New Installations

PAWA is responsible for the supply and installation of all meters in new installations. Customers and property developers are responsible for supply and installation of all ancillary fittings and pipework beyond the meter (refer to PAWA standard drawings for further details). Customers and developers are also responsible for ensuring that both equipment and installation work meet all of the relevant requirements of this Metering Code.

5.2 Maintenance of Existing Installations

PAWA is responsible for the maintenance and replacement of water meters and supply side stop valves in existing installations, and for the supply side upstand. Customers are responsible for the maintenance and replacement of all other components including the upstand on the customer side of the meter.

5.3 Meter Testing and Routine Replacement

PAWA is responsible for ensuring that water meters in use are accurate, in line with the requirements of the National Standards Commission. This can be done either through on-site testing of meters or through a program of routine meter replacement.

Because of the difficulties associated with on-site testing, PAWA has implemented a routine replacement program as its preferred option. Schedules for this replacement program are shown at Attachment A.

As part of its replacement program PAWA will also implement an ongoing sample-testing program for removed meters to ensure that the scheduled replacement interval for each type of meter is appropriate.

6 METROLOGICAL REQUIREMENTS FOR WATER METERS

In 1999 the National Measurement Act was amended to provide mandatory metrological controls for utility meters. In response to that legislative change a pattern-approval document for water meters has been developed by the National Standards Commission and will come into effect during 2002.¹ Until that date, PAWA water meters are required to comply with the current Australian Standard for water meters (AS 3565).

When the approved pattern requirement comes into effect it will be an offence under the Trade Measurement Act for any utility to use a meter for trade measurement purposes that is not of an approved type.

Meters already in place when the new National Standard is implemented are deemed to be of an approved type while they remain in service, but will lose that exemption once they are removed from their original installation point.

PAWA will ensure that all meters which it installs meet the required standards.

7 METERING INSTALLATION ARRANGEMENTS

7.1 Standard Meter Types

¹ NSC R 49 - Water Meters Intended for the Metering of Cold Potable Water

Each meter will be capable of measuring and displaying the flow of potable water or recycled effluent in kilolitres. The size and type of meter will be appropriate for the individual customer's overall consumption and maximum flow rates.

PAWA's current policy is to use displacement type water meters for meter sizes of between 20 mm to a 50 mm diameter, because of their durability and long term performance, and to use turbine type meters, from 80 mm to 150 mm, where displacement meters are not readily available.

Attachment B provides a list of standard PAWA water meter types and Attachment C descriptions of displacement and turbine meters.

7.2 Combination Meters

Where a high maximum demand flow rate is required, but the typical average flow rate is significantly lower, a combination type meter will be used. See Attachment D for a description of combination meters.

7.3 Portable Meters

Meters are normally located at a specific site to record consumption at a specified property. However, portable meters may be issued to nominated users, particularly in the construction sector, whose consumption is intermittent and occurs at a number of locations over time.

No water may be taken from PAWA's infrastructure unless it has been measured by an appropriate meter as the basis for an account. In the construction sector work may commence which requires access to the mains water supply, before a water meter has been provided for the property concerned. In these circumstances, the developer may obtain and draw water from PAWA's infrastructure through a portable meter.

The terms and conditions on which portable meters will be issued are set out at Attachment E. The key elements are:

- a meter is issued to and may only be used by a nominated individual or business;
- a non-refundable application fee applies for the issue of a portable meter;
- a deposit is required for the issue of the meter. This deposit will be refunded provided the meter is returned in good working order. The costs of any repairs required to the meter will be deducted from that deposit;

- each meter must be presented to a PAWA Office at a specified interval, or at the completion of the work, to be tested and the relevant account confirmed;
- the charge for water metered through a portable meter is prescribed from time to time in the Pricing Order issued by the Minister.

7.4 Ancillary Components

All meters shall have a stop valve on the supply side of the meters, for the purpose of isolation and maintenance, that is capable of isolating the flow through that connection point.

Depending on the size and type of installation, metering points may also include:

- Manifolds for servicing more than one metering point or customer;
- Backflow prevention devices;
- Non-return valves;
- Air valves;
- Dirt boxes;
- Remote read-out displays and electronic outputs;
- Protective meter covers;
- Meter boxes or pits; and
- Protective barriers.

7.5 Installation Requirements

Details of PAWA's requirements for all installations can be found in its Technical Specifications and Standard Drawings, and all equipment used is to be approved for use by PAWA (Refer to PAWA's Approved Products Manual).

8 TESTING AND REPLACEMENT OF METERS

As a licensed supplier of water and sewerage services, PAWA recognises the need for accurate and reliable meters to ensure it receives the proper revenue for the services it supplies and for the equitable distribution of costs. In addition to using only meters that are approved for use by the National Standards Commission, PAWA has also implemented a routine replacement program to ensure that meters are removed from service prior to their performance and accuracy being adversely effected by age and wear.

8.1 Meter Replacement Program

The program involves the replacement of meters up to 50 mm, and the replacement of calibrated measuring element in meters larger than 50 mm. The interval at which each meter or measuring element is replaced is based on either time-in-service or on a maximum total integrated flow through the meter, whichever level is first reached. A replacement schedule for each meter type is shown at Attachment A.

In the case of smaller meters (up to and including 25 mm) a sample of the removed meters are periodically tested to ensure that the replacement criteria for that type of meter is appropriate. As PAWA does not have facilities to test larger water meters, it is its policy to replace those meters or measuring elements at intervals based on the manufacturer's guaranteed operational life.

8.2 Special Meter Tests

PAWA also offers a meter testing service to customers who wish to have their meter tested. PAWA will arrange for all such tests within five days of the customer's request. The customer is responsible for paying for this test, however, the fee is refundable if the meter is found to have been running faster than the permissible error for that type of meter.

Customers are encouraged to look for other reasons as to why their water costs are high, as water meters are very rarely found to run fast. PAWA publishes a number of brochures describing ways in which water costs can be reduced, and a simple method of checking the accuracy of a meter using a large bucket of known volume.

Where a customer wishes to proceed with a test, the customer's meter will be replaced with a new meter and arrangements will be made with an independent NATA accredited test facility to have an accuracy test carried out on the removed meter. Arrangements will be made for that facility to send a copy of the test report for the meter directly to the customer as well as to PAWA. PAWA's approved fees for water meter tests are set out in the Minister's current pricing order.

9 SPECIAL REQUIREMENTS FOR RECYCLED EFFLUENT METERS

Metering installations for recycled effluent have a number of additional requirements, over and above those required for potable supply. These are:

- The need for signage indicating that the installation is for recycled effluent;

- The painting of meters lilac, in colour, which is the Australian Standard colour for recycled effluent; and
- The inclusion of a dirt box in the installation to protect the mechanical components of the meter. These dirt boxes also need routine inspection, maintenance and cleaning.

10 PROTECTION AND SECURITY OF METERING INSTALLATIONS

10.1 Physical Protection of Meters

Water meters are calibrated measurement devices and require some degree of protection against physical shock, maltreatment and tampering. In order to provide this protection PAWA may require that one or more of the following measures be incorporated into the installation by the customer or property developer:

- the installation to be positioned at a location approved by PAWA's Land Development Group;
- the incorporation of protection barriers, or the enclosure of the installation in a meter box with a hinged lid, or located in a pit with a removable cover (Refer to PAWA's Water Supply and Sewerage Standard Drawings).

10.2 Security of Meters Against Tampering

In addition to physical protection, meters also need to be kept secure against tampering. PAWA uses a number of sealing and locking devices to protect against meter tampering or disclose that it has occurred. These approaches include a master keyed metering lock system, a high security meter sealing system and lockable meter covers.

PAWA also employs an authorised inspector who, as part of his duties, investigates suspected cases of meter tampering, and may refer these to PAWA's prosecutor for further action.

11 ACCESS TO METERING INSTALLATIONS

Authorised PAWA officers require unfettered access, at any reasonable time, to all metering points located on customer's premises for the purposes of reading, maintaining and replacing meters.

11.1 Personal Identification

When entering a customer's property, authorised PAWA officers will carry a current identification card at all times and are required to produce that card on request. For the purposes of access, authorised contractors are also considered employees of PAWA and are subject to the same requirements.

11.2 Locked Premises

Where a customer wishes to lock a gateway or other means of access then that locking is to be done with a PAWA metering master key locking system. These locks are available through PAWA Retail offices on payment of a deposit.

11.3 Access to Meters : Buried and Overgrown Meters

Customers must ensure that PAWA has easy access to any meter on their property. Customers are required to ensure that water meters do not become buried by garden dressing or fill, covered by concrete or paving, or become inaccessible from overgrowth by trees and plants.

Where any such obstruction prevents access to the meter, then PAWA may require the customer to remove the obstruction. Failure to remove such an obstruction may result in prosecution or in PAWA undertaken the necessary work and billing the customer for the costs involved

12 CUSTOMER COMPLAINTS

All customer complaints are referred, in the first instance, to PAWA's customer services staff. Where that complaint is related to meter performance or accuracy, and a satisfactory resolution to the complaint cannot be achieved by customer services staff, the complaint may be referred to PAWA Technology Services for further investigation. This may involve one or more of the follow actions:

- The removal and testing of the meter in question by an independent accredited test facility;
- The temporary installation of a check meter;
- The installation of logging equipment and the collection and analysis of consumption data over a period of time; and/or
- Site audits and inspections.

Any complaint will be handled in line with the procedures set out in PAWA's Customer Contract.

ATTACHMENTS

A Replacement Schedule for Meters

Provided that meters do not suffer external damage, willful interference or stoppage due to chokage or damage by suspended matter. Meters will be replaced when the register quantities of water or effluent exceed an amount predetermined by PAWA.

Meters are to be tested in accordance with the metrological requirements of the National Measurement Act.

The following meter replacement intervals should always be considered as guidelines for the purpose of replacing and maintaining accurate metering devices.

Meters

1. Remove and randomly batch test ten percent of the meters in the suburb in accordance with registers reading values listed in Schedule 1. If batch test fails replace all meters of this size exceeding these registration quantities. Record test results for future comparative analysis;
2. Replace all meters in suburb with register readings exceeding values listed in Schedule 1. Randomly batch test five percent of removed meters and record test results for future comparative analysis;
3. Replace all meters in suburb which exceed an operational life of ten years. Randomly batch test five percent of removed meters and record test results for future comparative analysis;
4. Replace all non-standard meters of current model type.

Schedule 1

Meter Size (mm)	Meter Model	Random Test Interval Reading Range (kL)	Meter Replacement Reading Range (kL)
20	PSM-T	4000 – 4500	> 7000
25	PSM-T	6000 – 7000	> 12000
30	PSM-T	13000 – 15000	> 27000
40	PSM-T	20000 – 25000	> 40000
50	KG2000	30000 – 40000	> 60000
50	HELIX	50000 – 60000	> 95000
80	HELIX	65000 - 85000	> 135000
100	HELIX	110000 - 130000	> 215000
150	HELIX	180000 - 230000	> 385000

B Standard Meter Types

Meter Model	Meter Size	Meter Type
PSM-T*	15	Positive Displacement
PSM-T*	20	Positive Displacement
PSM-T	25	Positive Displacement
PSM-T*	30	Positive Displacement
PSM-T	40	Positive Displacement
KG2000	50	Positive Displacement
HELIX 3000	40	Helical Vane Turbine
HELIX 3000	50	Helical Vane Turbine
HELIX 3000	80	Helical Vane Turbine
HELIX 3000	100	Helical Vane Turbine
HELIX 3000	150	Helical Vane Turbine
HELIX 4000	40	Helical Vane Turbine
HELIX 4000	50	Helical Vane Turbine
HELIX 4000	80	Helical Vane Turbine
HELIX 4000	100	Helical Vane Turbine
HELIX 4000	150	Helical Vane Turbine
HELIX 3000C	50/15	Helical Vane Turbine
HELIX 3000C	80/20	Helical Vane Turbine
HELIX 3000C	100/20	Helical Vane Turbine
HELIX 3000C	150/30	Helical Vane Turbine

* - Indicates that this meter type is also used on combination meters

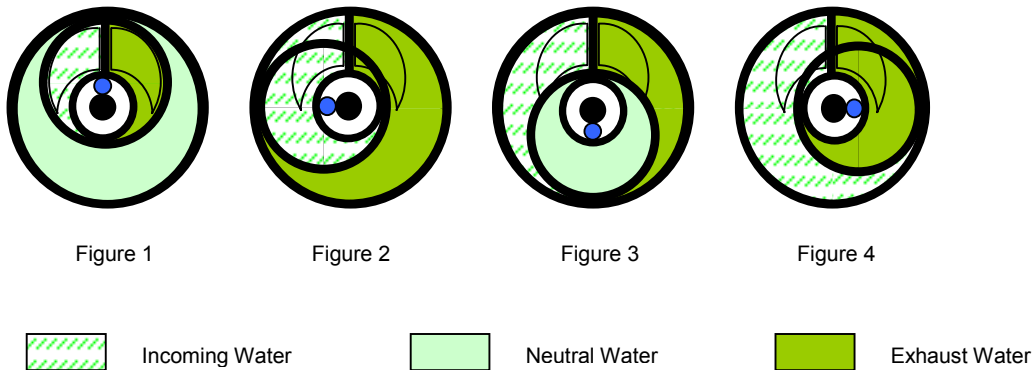
C Displacement and Turbine Meters

PAWA utilises two main types of meters within its infrastructure, these are:

Positive Displacement Meters (Volumetric)

This type of meter utilises a piston rotating within a volumetric outer chamber. The outer chamber is ported so that the inner piston rotates around the periphery of the outer chamber. The pressure differential between the two chambers causes the inner piston to rotate. As the piston completes each revolution, a measurable amount of water is displaced. By coupling the inner piston to a counter via a transmission system, the total volume of water passing through the meter can be recorded – Refer to figures 1, 2, 3 and 4.

Positive displacement water meters cannot be calibrated, they rely on the precision of manufacture to obtain initial accuracy. Any undue clearances between the piston and the outer chamber in which it rotates, allows uncontrolled by-passing of water from the inlet to the outlet which is not registered on the counter. Long term accuracy of these meters is affected by natural wear and tear which increases the clearances. Impure water supplies can cause jamming, and also have a tendency to increase the rate of wear, which in turn accelerates the occurrence of inaccurate registration on the counter.



Helical Vane Turbine Meter

This type of meter has a multi-bladed impeller/ turbine with helical blades, positioned in the water flow with the axis of rotation aligned with the flow. The movement of the water as it passes through the impeller blades causes rotation of the impeller, which, via a magnetic coupling moves a rotary counter to record the volume passed.

Helical vane meters are factory calibrated by aligning a small guide vane, either, with the angle of the impeller blades, which increases the rate of impeller movement, or an opposing angle which decreases the rate of impeller movement. This increase or decrease is reflected in the movement of the counter.

D Combination Meters

This type of meter utilises a combination of helical vane bulk flow meter (for high flow) and a positive displacement by-pass meter (for low flows), hence its namesake. Combination meters are designed for installation in areas where a wide variation in flow can be expected, such as schools, hospitals, offices and all other places where both very low and very high flows can occur. These wide flow ranges are measured by using a built-in changeover device.

Low flows are directed through the by-pass meter only. When the flow is increased, the changeover device opens due to the increase in flow and differential pressure across the meter. With the changeover valve open, flows are measured by both meters.

Flows will pass through the main and by-pass meters in the forward direction only, and as long as the differential pressure is sufficient, both meters will register flows. Only when the differential pressure and the flow reduces does the changeover device close, again directing all flow through the by-pass meter.

E Portable Meters: terms and conditions

1. Payment of a deposit fee which is to be not less than the current value of the meter to be supplied;
2. Cost of repairs to the meter if discovered damaged at any time to be deducted from the deposit fee;
3. If the meter is lost, stolen or misplaced, the deposit fee will be forfeited, and if another meter is required, a further deposit fee is required to be paid;
4. On safe return of the meter, the deposit will be refunded;
5. If the meter is attached to a water cart or tanker, this will be presented for inspection to a PAWA representative at a mutually agreed time and place;
6. Pipework on the tanker shall be so arranged such that backflow siphonage cannot occur;
7. Where a meter is to be connected to a hydrant for uses other than filling a tanker, a non return valve is to be supplied and fitted by the operator;
8. All pipes and fittings for attaching to the meter to enable hydrant to tanker connections shall be supplied and fitted by the operator;
9. No meter larger than 25mm diameter shall be connected directly to a hydrant and for meters of a larger size, a flexible hose shall be used for connecting hydrants directly to the tanker through the meter;
10. Failure to return the within one month on demand will result in forfeiture of deposit, withdrawal of all metering facilities and possible legal action;
11. The cost of replacement or repair of any PAWA pipes and fittings, which may be damaged while drawing water in accordance with this agreement;
12. Construction/ Portable meters must not be taken or used outside the Water Supply District in which they are issued unless approval has been granted.