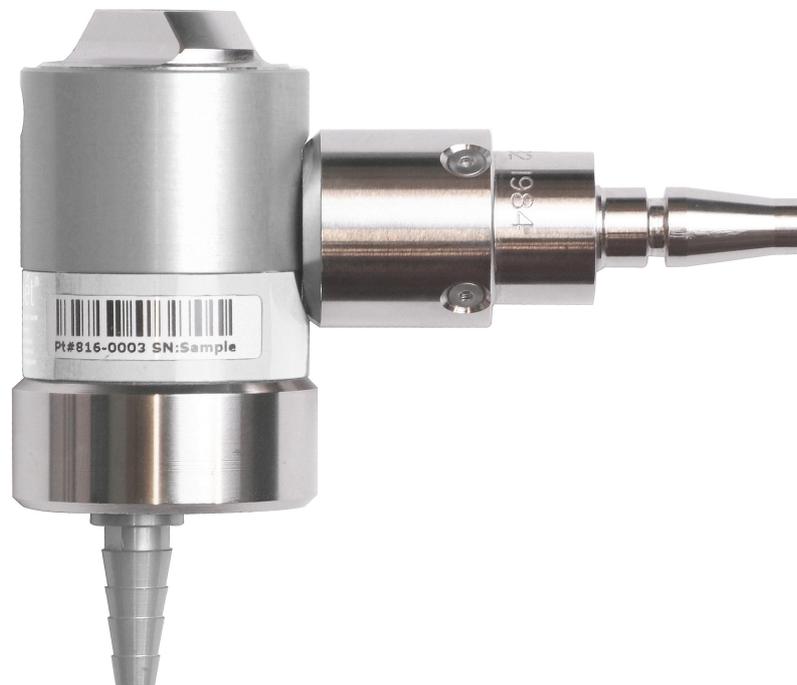


Micro Dial-Flowmeter

Instructions for Use



1. Symbols

Warning! Indicates a potentially hazardous situation which, if not avoided, could result in injury to the patient, the user or others.

Caution! Indicates a potentially hazardous situation which, if not avoided, could result in damage to the equipment or property.



Use no oil



Service due date

2. Warnings and Cautions

2.1. Warnings!

- ▶ Read through this entire instruction manual before using or showing others how to use a Microdial Flowmeter. As with all medical equipment, attempting to use this device without a thorough understanding of its operation may result in patient or user injury.
- ▶ Medical oxygen is or should be considered a drug and should only be used for medical purposes as prescribed by a physician or authorised clinician and in accordance with the medicinal product labelling.
- ▶ The Microdial Flowmeter will deliver zero flow between flow settings. When selecting a new flow setting, ensure that the flow selection dial clicks into place and that a flow is correctly selected. Do not attempt to set it between settings.
- ▶ This flowmeter does not provide an indication that gas is flowing, it only provides an indication that an orifice has been selected for that flow rate.
- ▶ Never administer oxygen while smoking or when near an open flame.
- ▶ Oxygen is not flammable; however an oxygen enriched atmosphere will drastically increase the rate and severity of combustion. Oil and/or grease in the presence of an oxygen enriched atmosphere will become highly combustible. Oxygen must never be allowed to come into contact with oil, grease or other hydrocarbon based substances. Do not use oil or grease on this Microdial Flowmeter.
- ▶ Oxygen therapy may be a critical treatment. The effectiveness of supplemental oxygen therapy can only be determined by continuous monitoring of blood oxygen levels. It is essential that PaO₂ or SpO₂ monitoring is carried out when supplemental oxygen is prescribed for critical treatments.
- ▶ Many hand creams and moisturisers contain paraffin and petroleum bases which are highly flammable and must never be allowed to contact the Microdial Flowmeter. Ensure hands are clean and dry before operating the equipment.
- ▶ Many hand creams and moisturisers contain paraffin and petroleum bases which are highly flammable and must never be allowed to contact the Demand Valve. Ensure hands are clean and dry before operating the equipment.
- ▶ If using a cylinder and regulator, ensure that the device is connected to the regulator and the cylinder valve is open before beginning therapy.

- ▶ Ensure that the medical oxygen supply is sufficient for the proposed therapy and is supplied within the pressure range given in the Device Specification. If the supply is a gas cylinder, check the cylinder contents gauge regularly.
- ▶ Do not submerge a Microdial Flowmeter in any fluid. Ensure that no fluid is allowed to enter ports or vent holes.
- ▶ Do not cover the vent hole in the pre-regulator as this will change the device calibration.
- ▶ Microdial Flowmeters are not MRI compatible.
- ▶ The accuracy of the flowmeter will be affected if the input pressure is other than stated in the specifications.
- ▶ A gas specific connector is fitted to the Microdial Flowmeter. Do not attempt to modify the fittings to suit other gases or connection types.
- ▶ Only appropriately trained personnel working in controlled conditions may disassemble or assemble this Microdial Flowmeter.

2.2. Cautions!

- ▶ The performance of the flowmeter may be affected if it is stored or transported in temperatures outside of the range -20 °C to +60 °C (-4 °F to +140 °F).
- ▶ The Microdial Flowmeter is not suitable for autoclaving.

3. Functional Description



3.1. Intended Use

The Microdial Flowmeter is intended to control the flow of medical oxygen during oxygen therapy in both homecare and clinical environments. The flow selection dial has 12 positions, including 11 discrete flow rates and an off position. Flow is indicated in litres per minute (l/min) and is visible through a window adjacent to the flow selection dial.

3.2. Technical Description

The Microdial Flowmeter has a flow selection dial that is rotated to select the desired oxygen flow. Rotating the dial changes the size of the orifice through which the gas passes and consequently adjusts the gas flow rate.

The Microdial Flowmeter includes a pre-regulator (pressure regulator) upstream of the metering orifice plate. The pre-regulator provides a consistent pressure upstream of the metering orifice plate over a wide range of inlet pressures.

The Microdial Flowmeter has inlet and outlet connectors. The inlet connector is the larger of the two and is a gas specific oxygen probe for connection to the oxygen supply. The smaller outlet connector may be either a barbed outlet for direct connection to oxygen delivery tubing or a threaded DISS (9/16" UNF) connector for connection to a bubble humidifier.

4. Operating Instructions

4.1. Pre-Use Checks

Warning! If any defect is found during a pre-use checks, the device must be taken out of service.

Check the Microdial Flowmeter is not past its intended life (12 years after date of manufacture, see section 1 of this manual and the first 4 digits of the serial number on the device label.

Check that the Microdial Flowmeter is not beyond the service due date. See the device label adjacent to the spanner / wrench symbol.

Check that the device is in good condition and there are no signs of damage.

Connect the Microdial Flowmeter to the gas supply. If the supply is a gas cylinder, ensure the gas cylinder valve is open.

Warning! Where the gas specific connector is dependent on a threaded fastener (e.g. DISS CGA – V5 1240, AS 2902/SIS handwheel) offer device to outlet and connect a few turns. Align device to the final vertical position and fully hand tighten the connection before turning on the supply pressure. Do not use the device to tighten or lock the connection.

For quick connector probes (e.g. BS5682, DIN, AFNOR), ensure that the connection is correctly made by gently pulling the flowmeter before turning on the supply pressure.

Turn the flow selection dial to the prescribed setting for the patient and check that gas flow can be felt. For very low flow rates, flow can be detected by submerging a connected tube in water. If no gas flow is detected, refer to section 7 of this manual.

4.2. Operation

Connect the free end of the oxygen delivery tubing to the outlet barb fitting.

Determine the appropriate gas flow rate in litres per minute (l/min) required for the patient. Turn the flow selection dial until the required rate is visible in the flow indication window; the dial clicks into place and is obvious to the touch.

Warning! There is no flow between the indicated settings provided on the oxygen flowmeter. Do not attempt to set it between settings.

If the patient requires more or less oxygen flow, this is simply achieved in distinct stages by rotating the flow selection dial.

Continue to monitor the patient and check the cylinder contents gauge regularly.

4.3. After Use

Upon completion of the therapy, turn the flow selection dial to zero.

5. Maintenance

5.1. Interim Inspection

Microdial Flowmeters should be inspected and tested on an annual basis to ensure correct performance.

Warning! If any defect is found during inspection, the device must be taken out of service.

5.1.1. Inspection

Check the exterior condition of the device and the gas inlet connector. Check that the flow control dial clicks securely into each position. Check the condition of the inlet connector seal if applicable.

5.1.2. Internal Leak Test

Set the flow selection dial to zero and connect to a gas supply. Connect tubing to the outlet barb and immerse the other end of the tube in water. Observe whether any bubbles are formed, which will indicate an internal leak.

5.1.3. Flow Rate Verification

Verify flow rates at all flow settings against those given in the Device Specification in section 6. Mass flow meters with appropriate full-scale ranges for the flow rates are particularly suitable for this.

Alternatively, where flow measuring equipment is not available, a qualitative check can be performed by confirming that gas flow can be sensed to be increasing with each step increase in flow across the full flow range. For higher flow rates, this can be sensed audibly or by holding a hand close to the flow outlet; moistening the skin can increase the cooling sensation and therefore sensitivity to the flow.

For very flow rates, this may better be achieved by placing the end of a connected tube in a glass of water to observe the bubbles.

5.2. Cleaning

Wipe over the external surfaces of the Microdial Flowmeter with an alcohol or disinfecting wipe. Do not allow the ingress of water or other solution into the device.

5.3. Planned Preventative Servicing

The Microdial Flowmeters must be serviced every 2 years to ensure that it continues to perform in accordance with its specification. Microdial Flowmeters have a Service Due date on their labelling adjacent to the spanner / wrench symbol, indicating when the next service is due.

When serviced by BPR Medical Ltd, and where the time to end of life is less than the normal service interval, the Service Due date will be replaced by the End of Life date and preceded by a symbol (⚠). In these cases, the date now indicates when the device reaches end of life.

Warning! Servicing must be carried out by a competent person working in a controlled environment.

Full details of the recommended servicing requirements can be found in the Service Manual. The Service Manual can be obtained from your local BPR Medical distributor, details of which can be found at www.bprmedical.com. Complete the service in accordance with the instructions given in the Service Manual or return the device to a recognised BPR Medical Service Centre on or before the date shown.

6. Specification

Specification	Value
Supply Pressure	Nominal Inlet Pressure 345 kPa to 500 kPa (50 psi to 73 psi)
	Maximum 1000 kPa (145 psi)
	Minimum 280 kPa (40 psi)
Flow Setting (l/min)	Range A: 0, 0.02, 0.03, 0.05, 0.08, 0.12, 0.2, 0.3, 0.5, 0.75, 1.0, 3.0
	Range E: 0, 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 1.0
Filtration	Sintered bronze: 40 µm nominal first stage, 5 µm nominal second stage
Flow Accuracy	±10 % of setting at 1 l/min and above, +20 % to -10 % of setting below 1 l/min
Effects on Accuracy	Varying Inlet Pressure: +/-3 % change in flow within the range 300 to 500 kPa
	Varying Temperature: ±3.4 % change in flow per ±20 °C deviation in temperature from 20 °C
	Varying Outlet Resistance: Less than 1 % change in flow up to 5 kPa resistance
Environmental	Transport/Storage/Operation: -20 °C to +60 °C (-4 °F to +140 °F) Humidity: 0-100 % RH non-condensing
Regulatory	CE: Medical Device Directive 93/42/EEC – Class IIa
Intended Life	12 years

Applied Standards

BS EN ISO 10524-4	Pressure regulators for use with medical gases. Low-pressure regulators
BS EN ISO 15002	Flow-metering devices for connection to terminal units of medical gas pipeline systems
BS 5682	Specification for probes (quick connectors) for use with medical gas pipeline systems
AS 2896	Installation and testing of non-flammable medical gas pipeline systems
AS 2902	Medical gas systems-Low pressure flexible hose assemblies (see Appendix B for SIS information)
AS 3840.1	Pressure regulators for use with medical gases. Part 1: Pressure regulators and pressure regulators with metering devices

7. Troubleshooting

Fault	Possible Cause	Solution
No gas flow	Gas cylinder turned off	Check gas supply
	Flowmeter not connected properly	Check gas specific probe is correctly connected
	Gas cylinder empty	Replace gas cylinder
	Medical gas terminal unit on a pipeline system is isolated	Seek advice from someone authorised to operate the medical gas pipeline system isolation valves
	Filter blocked	Service or repair required
	Selection dial set to '0'	Select a positive flow rate
Internal/external leak	Seal failure	Service or repair is required
Insufficient gas flow	Filter partially occluded	Service is required
	Supply pressure too low and/or gas cylinder nearly empty	Check gas supply and/or replace gas cylinder

8. Parts and Spares List

Part Number	Description
816-0026	Microdial Flowmeter - Range A - Hose Barb Outlet (AS 2902)
816-0027	Microdial Flowmeter - Range E - Hose Barb Outlet (AS 2902)
816-0039	Microdial Flowmeter - Range A - Hose Barb Outlet (BS 5682)
816-0040	Microdial Flowmeter - Range E - Hose Barb Outlet (BS 5682)

Spare Parts and Servicing

604-0055	Microdial Flowmeter Output Barb Assembly
610-0067	Microdial Flowmeter Service Kit Australia (5 pack)
999-0003	Dialflow Meter Service

9. Distributor Details

Australia

BOC Healthcare
Customer Service Centre
10 Julius Avenue
North Ryde
Sydney
NSW, 2113
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