

- **Reduced sensor fouling design**
  - minimizes operational costs
- **Low maintenance, long-life sensor**
  - easy to maintain
- **Complete systems and kit versions available**
  - satisfies a wide range of applications
- **On-line water wash option**
  - extends duration between maintenance reducing operational costs
- **Stainless steel mounting brackets**
  - eliminates corrosion problems



**Dissolved oxygen systems  
designed for reliable operation  
with minimal operating costs**

## General

Reliable monitoring of dissolved oxygen levels in sewage treatment works is often hampered by fouling of the sensor with rags, or other large solids, present in the sample under test. These materials tend to become attached to the sensor and sensor holder giving rise to incorrect readings.

This problem is avoided by using the Model 9408 Floating Ball Dissolved Oxygen System, which comprises a flat-ended sensor mounted into a relatively large diameter spherical flotation collar. This form of construction presents to the sample a surface on which it is difficult for rags and other large solids to lodge. For more demanding applications, on-line cleaning is available using the water wash option.

The Floating Ball has been designed to operate in conjunction with the ABB Models 4640 and 4645 Dissolved Oxygen Transmitters and provides an easy-to-use, low-maintenance system for dissolved oxygen measurement.

## 9408-700 Floating Ball System

The system utilizes a sensor assembly which includes an 8012-170 sensor capsule. This assembly is mounted into a support tube which also houses a temperature sensor for automatic temperature compensation. The support tube, in turn, fits onto a 3m (9.75 ft) long pivoted boom via which the system is attached to the guard rail around the aeration tank.

The support bracket is manufactured from stainless steel to ensure maximum life.

The spherical flotation collar is secured around the support tube to provide buoyancy, allowing the sensor to be maintained a few centimetres below the surface of the sample.

## 9408-750 and 9408-760 Floating Ball Systems

The floating ball system is supplied in kit form, without the support arm, to reduce carriage costs and minimize handling difficulties when onward transportation to site is involved. A tube of solvent cement is provided with the kit to complete the simple construction of the system.

Kits are available in both metric and imperial sizes to suit local requirements and can be supplied with the Swivel-bracket option.

## 9408-710, -720 and -730 Dip Systems

The 9408 Dip Systems are of rugged construction and are intended for use in aeration tanks and open channels. Incorporated within the system is a 3-wire Pt100 temperature probe together with an oxygen sensor body. The system is supplied fully assembled and requires only the 8012-170 oxygen capsule to be fitted to make the system operational.

The system has been designed with ease of maintenance being a major consideration. Periodic replacement of the disposable oxygen capsule being the only routine maintenance apart from calibration checks.

The systems are provided with wall-mounting brackets.

## 9408-600 Submersible System

To enable monitoring where there is a high rise and fall of the sample, e.g. 3m (9.75 ft) and greater, or where access is difficult, a submersible version 9408-600 is available. It is supplied with 10m (32.5 ft) of cable as standard. Provision is made for a support chain to be attached to determine the level of immersion and to protect the signal cable from excessive strain.



*Submersible Probe*

### Swivel Bracket Option

To make routine maintenance even easier and more convenient, there is an option to order the floating ball system with a swivel bracket. This enables the system to be rotated horizontally for cleaning purposes without the need to remove it completely.



*Swivel-bracket – Optional Extra*

### The Sensor Model 8012/170

The heart of the system and the key to success is the dissolved oxygen sensor. Easy to maintain with no specialist skills required when replacing capsules, keeping cost of ownership to a minimum.



*Model 8012/170 Oxygen Sensors*

### Calibration

All that is essential to calibrate the system is a full-scale calibration, carried out in air or in air-saturated water. Zero calibration of the sensor is not essential but can be carried out in a 5% solution of sodium sulphite.

### Maintenance

Maintenance is limited to periodic cleaning and calibration, no refurbishment of the sensor being necessary. A replacement sensor capsule can be easily fitted when required. Sensor life varies depending upon the application but is typically 9 to 12 months.

### Water Wash

On applications where maintenance demands are high, or where performance is critical, ABB offer on-line water wash feature. Field trials have demonstrated extended life and significantly reduced maintenance levels.

## Floating Ball System

### Specification

#### Sensor type

8012-170 sensor capsule

#### Response

Typically 20s for 90% of a step-change of oxygen concentration at 20°C (68°F)

#### Temperature compensation

Automatic correction by means of an integral Pt100 resistance thermometer

#### Operating temperature

0 to 40°C (32 to 104°C)

#### Operating pressure

Atmosphere

#### Minimum liquid velocity

30cm/s (11.8 in./s)

#### Accuracy

±0.2mg/l or ±2% saturation within ±10°C (50°F) of the calibration temperature in the range 0 to 35°C (32 to 95°C)

#### Materials of construction

Support arm (for 9408-750 kit)

ABS plastic o.d. 50mm. Wall thickness 3.3mm (0.13 in.)  
Pressure rating 10bar

Support arm (for 9408-760 kit)

ABS plastic OD 48.3mm (1.9 in.). Wall thickness 4.5mm (0.18 in.)  
Pressure rating 10bar

Flotation collar – polypropylene

Mounting bracket – stainless steel

#### Mounting

Pipe-mounting (50mm [1.97 in.] OD)

#### Connection cable

10m (32.5 ft) fitted as standard

Part no. 0233-828. Maximum distance 100m (325 ft) via junction box (customer supply)

#### Optional Swivel-bracket Accessory

Part no. 9408-135 for use with 9408-750 and 9408-752

Part no. 9408-136 for use with 9408-760 and 9408-762

### Ordering Information

**9408-700** Floating Ball system complete with support arm, mounting brackets and all other accessories.

or

**9408-750** Floating Ball kit (metric) comprising a complete 9408-700 system without the 3m support arm (which is available from local stockists). Included within the kit is a tube of suitable solvent cement which is used to secure the 3m support arm

or

**9408-752** As 9408-750 above but without water-wash

or

**9408-760** Floating Ball kit (imperial) comprising a complete 9408-700 system without the 10ft support arm (which is available from local stockists). Included within the kit is a tube of suitable solvent cement which is used to secure the 10ft support arm.

**9408-762** As 9408-760 above but without water-wash

### Connection Cable

10m (32.5 ft) fitted as standard

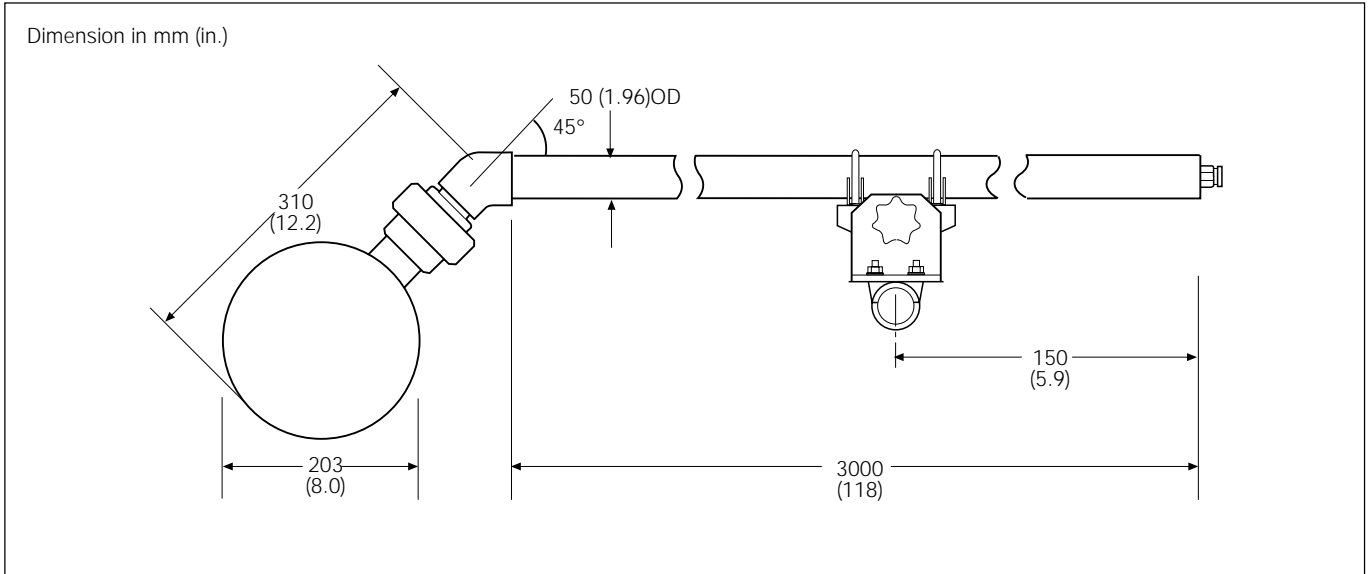
Part no. 0233-828. Maximum distance 100m (325 ft) via junction box (customer supply)

**Instruments** All 9408 systems are compatible with the 4640 and 4645 dissolved oxygen transmitters.  
(See Data sheet SS/4640)



9408 Floating Ball Kit – Swivel-bracket not included

### Overall Dimensions - Floating Ball System



## Dip and Submersible Systems

### Specification

#### Sensor type

8012-170 sensor capsule

#### Response

Typically 20s for 90% of a step change of oxygen concentration at 20°C

#### Temperature compensation

Automatic correction by means of an integral Pt100 resistance thermometer

#### Operating temperature

0 to 40°C (32 to 284°F)

#### Operating pressure

Atmospheric

#### Minimum liquid velocity

30cm/s (11.8 in./s)

#### Accuracy

±0.2mg/l or ±2% saturation within ±10°C (±50°F) of the calibration temperature in the range 0 to 35°C (32 to 95°F)

#### Materials of construction

Polypropylene

#### Mounting

Wall-mounting bracket

#### Connection cable

10m (32.5 ft) fitted as standard

Maximum distance 100m (325 ft) via junction box (customer supply)

### Ordering Information

#### Dip Systems

**9408-710** 1m (325 ft) system complete

**9408-720** 2m (650 ft) system complete

**9408-730** 3m (975 ft) system complete

**Cable** 10m (32.5 ft) fitted as standard  
Part no. 0233-828. Maximum distance 100m (325 ft) via junction box (customer supply)

#### Dip Systems with Water-wash

**9408-712** 1m (325 ft) system complete with Water-wash

**9408-722** 2m (650 ft) system complete with Water-wash

**9408-732** 3m (975 ft) system complete with Water-wash

**Cable** 10m (32.5 ft) fitted as standard  
Part no. 0233-828. Maximum distance 100m (325 ft) via junction box (customer supply)

#### Dip System Kits

9408-770 Dip kit metric version non-Water-wash

9408-771 Dip kit imperial version non-Water-wash

9408-772 Dip kit metric version complete with Water-wash

9408-773 Dip kit imperial version complete with Water-wash

#### Submersible

**9408-600** Submersible system complete with 10m (32.5 ft) of connection cable

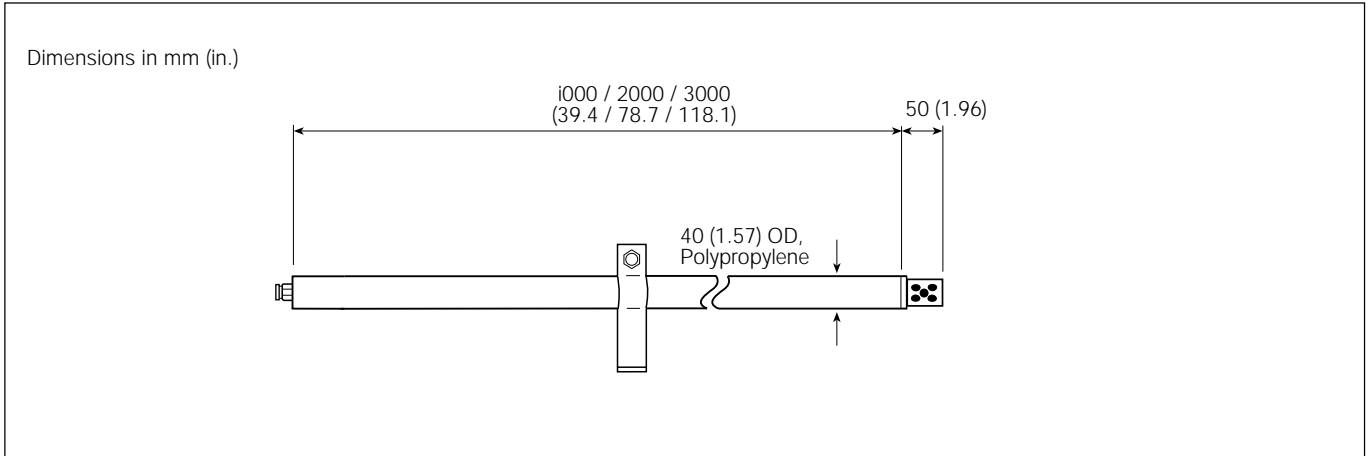
Part no. 0233-828. Maximum distance 100m (325 ft) via junction box (customer supply)

#### Submersible with Water-wash

**9408-602** Submersible system complete with 10m (32.5 ft) of connection cable

Part no. 0233-828. Maximum distance 100m (325 ft) via junction box (customer supply)

### Overall Dimensions - Dip System



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