

**BRISTOL BABCOCK OIL IN WATER ALARMS**

The OPM 1 oil content alarm was specifically designed for the control of 15 ppm marine bilge oil separators and fully conforms to the requirements of IMO Resolution A393(X), and MEPC 60/33.

The design results from extensive experience in the development of oil content meters and makes use of advanced techniques and components. The actual concentration is displayed on a multi element LED bargraph display and facilities are provided for a remote recorder and alarm indication.



**Operating Technique & Facilities**

The sample flows through a cylindrical glass cell through which a low intensity beam of infrared radiation is projected. Two silicon photodetectors are provided to detect and scattered path of radiation by the oil particles. The angles and field of view of the detectors have been carefully selected to provide high sensitivity to oil and very low sensitivity to solids which may be present in the sample. This, coupled with the wavelength of light chosen, ensures minimal sensitivity to water colour and other soluble components, and is inherently self compensating for window fouling, mains voltage variation, and changes in ambient or sample temperatures.

**Indication and Alarm**

Indication of oil concentration is provided by the 10 element bargraph display which provides accurate indication for a range of 20 ppm. Two alarm relays are provided, both factory set to operate at 15ppm. One is arranged to operate immediately the 15 ppm level is exceeded, while the other is provided with a delayed reaction. The operating state of each relay is indicated by solid state indicators on the door of the instrument. Additional and similar indication is also provided for Mains On and Equipment Fault.

**Installation And Maintenance**

This unit should be installed as close as practicable to the sampling point. Access is only required to the top of the cell housing, and front of the instrument. The connection requirements should closely follow the installation diagram. Little maintenance is required and is confined to a periodic check of zero against clean water and occasional cleaning of the glass sample cell, which is mounted in a cell box fixed to the side of the main instrument case. Access to the inside of the cell is provided by a hand-tightened screw cap, which enables insertion of a tube cleaning brush. No dismantling is involved.

**Specifications**

<b>Range</b>	0 - 20 ppm	
<b>Accuracy</b>	Within IMO limits	
<b>Indication</b>	10 element LED bargraph display	
<b>Enclosure Rating</b>	IP 55	
<b>Size</b>	400mm high x 380mm wide x 150mm deep	
<b>Weight</b>	11 kg	
<b>Output Signal</b>	0 - 2 V DC linear for 0 - 20 ppm (minimum load 1 k)	
<b>Ambient Temperature</b>	- 15° C to +60° C	
<b>Clean Water Requirement</b>	2 bar to 8 bar	
<b>Electrical Supply</b>	220V AC ± 10%, 50/60 Hz ± 10%	110V AC ± 10%, 50/60 Hz ± 10%
<b>Power Consumption</b>	20 VA	
<b>Relays</b>	2 off instantaneous and delayed (factory delay set @ 20 sec)	
<b>Contacts</b>	Single pole c/o Rating: 2.5A at 250 V AC	
<b>Alarm /Fault Indication</b>	3 off Instant / Delay / Fault Red LED's on front panel	
<b>Sample Pressure</b>	2 bar to 8 bar	
<b>Sample Flow</b>	1.0 litres/ min	
<b>Sample Temperature</b>	+2° C to + 40° C	
<b>Sample Connections</b>	Compression fitting for 10mm outside diameter pipe	

### **OIL IN WATER ALARM - OPM 2**

The OPM 2 Oil Content Alarm has been specifically designed for the monitoring of effluent in hazardous areas. At present there is no formal international specification for 'industrial' effluent monitors. For offshore application the OPM 2 is fully compliant with IMO specification A393X and MEPC60(33).

The design of the OPM2 Oil in Water Monitor is the result of more than 25 years experience in the development of oil content monitors, making use of advanced techniques and very high specification components. The very low level of concentration in parts per million of oil in water is displayed on a back lit LCD digital indicator. Facilities are provided for remote indication, recording, and alarm status.



### **Principle Of Measurement**

Measurement is based on the principle that oil particles scatter light. The amount of light scattered is proportional to the number of particles present, over a limited range of concentration permitted by IMO/environmental limits. The instrument measures both scattered light and transmitted light, then employs a ratiometric technique enabling the measuring system to self-compensate for variations in the brightness of the light source.

### **Features**

- Compact
- Continuous Operation
- Simple Installation
- Low Maintenance Cost
- No Warm Up Period
- Factory Calibration

### **Construction**

The OPM2 (**Option 1**) is housed in a die-cast aluminum case providing protection to IP65 requirements, and is certified for use in Zone 1 and Zone 2 areas. The measuring cell is housed in a die-cast aluminum case providing Explosion Proof Protection.

A further option is the OPM2 (Option 2) which allows the control unit to be mounted in a safe area. The OPM2 (**Option 2**) which allows the control unit to be mounted in a safe area. The OPM2 (Option 2) control unit is housed in a deep drawn steel case providing protection to IP55.

The monitor and cell can be mounted independently of each other. Interconnection is by intrinsically certified cable.

### **Operating Technique**

The side stream sample flows through the cylindrical glass cell, through which a low intensity beam of infrared radiation is projected. Two silicon photodetectors are provided to detect the direct path of radiation, and radiation scattered by oil particles. The angles and fields of view of the detectors have been carefully selected to provide high sensitivity to oil and very low sensitivity to solids which may be present in the sample stream. This, coupled with the wavelength of light chosen, ensures minimal sensitivity to water color, and other soluble components, and is inherently self compensating for window fouling, mains voltage variation, and changes in ambient or sample temperatures.

### **Calibration**

The unit construction allows factory calibration, and interchange of detector assemblies and electronic units can then be carried out on site without further calibration being required. The design utilises all solid state components.

### **Installation**

Installation of the unit must be in accordance with codes of practice for the country of installation. In the United Kingdom the flameproof code of practice is BS5345 parts 1 and 3. Bristol Babcock Ltd recommended that in absence of a local code the United Kingdom code of practice be used.

The OPM2 should be installed as close as practical to the sampling point. Access is only required to the front and top of the instrument, and the connection requirements should closely follow the installation diagram.

### **Maintenance**

Little maintenance is required and is confined to a periodic check of zero against clean water, and occasional cleaning of the glass sample cell. Access to the cell is provided via a screw cap, permitting insertion of a tube cleaning brush.

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**Quality Assurance**

Bristol Babcock Ltd is approved to BS En9001 (BS5750 Pt 1) In addition, the factory in which this unit is manufactured holds BASEEFA licence MO102.

**Area Classification**

Cell Assembly	EEx ia IIC T.4
Control Unit	OPM2(1) EExd ia IIB T.6
Control Unit (Option)	OPM2(2) Safe Area

**Specification**

Range	0 - 20 ppm
Accuracy	±2 ppm
Alarm Relay 1	Instant Alarm: Factory Set To 15ppm
Alarm Relay 2	Delayed Alarm at instant alarm level: Delay time variable 5 to 55 s (factory set at 20 s)
Alarm Contacts	Single Pole c/o Rating 2.5A @ 240V 5.0A @ 110V
Alarm Indication	Instant: Red LED Delayed: Red LED
Fault Alarm	Monitor fault sets alarm condition
Fault Indication	Red LED
Concentration Readout	Back Lit LCD display
Output Signal	4 - 20 mA
Electrical Supply: Standard	240V ac ± 10% single 50-60 Hz ± 10%
Electrical Supply: Optional	110V ac ± 10% single phase 50-60Hz ± 10%
Power Consumption	11 VA
Sample Pressure	2 bar to 8 bar
Sample Flow	1.0 litres/min
Sample Temp	+2C to +50C
Sample Connections	Compression fitting for 10mm outside diameter pipe
Ambient Temp	-15C to +50C
Clean Water Requirement	Pressure 2 bar to 8 bar for cleaning and zero check

**Size**

Cell: 260mm H x 120mm W x 80mm D  
Control Unit: OPM2(1) 445mm H x 345mm W x 210mm D  
Control Unit: OPM2(2) 400mm H x 380mm W x 150mm D

**Weight**

Cell: 1Kg  
Control Unit: OPM2(1) 30Kg  
Control Unit: OPM2(2) 11Kg

### **OIL CONTENT MONITOR - THE OPM 3**

Utilizing the return condensate to heat tanks containing fuel oil is a common practice. However, there is always a concern that oil may enter the condensate system and cause damage to the boiler internals. Bristol Babcock Limited, utilizing its previous experience in this field, now provides a simple and effective solution to this problem, the OPM 3.



#### **General Description**

The **OPM 3** Oil Content Monitor is the natural successor to the much used OT 8 boiler condensate monitor, utilizing more than 25 years of experience in the design / manufacture of oil content monitors. The level of oil content is displayed on a back lit LCD digital indicator. Facilities are provided for remote indication, recording, and alarm status.

#### **Operating Technique & Facilities**

The sample flows through a cylindrical glass cell through which a low intensity beam of infrared radiation is projected. Two silicon photodetectors are provided to detect and scattered path of radiation by the oil particles. The angles and field of view of the detectors have been carefully selected to provide high sensitivity to oil and very low sensitivity to solids which may be present in the sample. This, coupled with the wavelength of light chosen, ensures minimal sensitivity to water color and other soluble components, and is inherently self compensating for window fouling, mains voltage variation, and changes in ambient or sample temperatures.

#### **Indication And Alarm**

Indication of oil concentration is provided by a back lit LCD digital display, which gives accurate indication over a range 0 - 10 ppm. Two alarm relays are provided, both factory set, to operate at 5 ppm. One is arranged to operate immediately 5 ppm level is exceeded, while the other is provided with a delayed action. The operating state of each relay is indicated by solid state indicators on the door of the instrument. Additional and Similiar indication is also provided for Mains On and Equipment Fault.

#### **Installation and Maintenance**

The unit should be installed as close as practical to the sampling point. Access is only required to the top of the cell housing, and front of the instrument. The connection requirements should closely follow the instrument. Little maintenance is required and is confined to a periodic check of zero against clean water and occasional cleaning of the glass sample cell, which is mounted in a cell box fixed to the side of the main instrument case. Access to the inside of the cell is provided by a hand tightened screw cap, which enables insertion of a tube cleaning brush. No dismantling is involved.

#### **Specifications**

<b>Range</b>	0 -10ppm
<b>Accuracy</b>	± 1 ppm
<b>Indication</b>	LCD Digital (Resolution 0.1 ppm)
<b>Enclosure Rating</b>	IP 55
<b>Size</b>	400 mm high x 380 mm wide x 150 mm deep
<b>Weight</b>	12 kg
<b>Output Signal</b>	4 - 20 mA
<b>Ambient Temperature</b>	- 15 C To + 60 C
<b>Clean Water Requirement</b>	2 bar to 8 bar
<b>Electrical Supply</b>	220/240V or 110V AC 50/60Hz
<b>Power Consumption</b>	11VA

**Sales & Product Support: [babcock@nciweb.net](mailto:babcock@nciweb.net)**

<b>Relays</b>	2 off Instanteous and delayed (Delay factor -- set at 20 sec)
<b>Contacts</b>	Single pole c/o Rating 2.5A at 250V AC
<b>Alarm/Fault Indication</b>	3 off Instant/Delay/Fault Red LED's on front panel
<b>Sample Pressure</b>	2 bar to 8 bar
<b>Sample Flow</b>	1.0 litres/min
<b>Sample Temperature</b>	+2C to +90C
<b>Sample Connections</b>	Compression fittings for 10mm outside diameter pipe