



Obscuration Monitor OM80

Data sheet
BP620

Major features

- Electronic compensation for both lamp ageing and lens contamination
- Self-calibrating zero and span
- Full password security access
- Digital indication of % obscuration
- Analogue and relay outputs for ancillary instrumentation and alarms
- Switch selectable configuration for dust or combustion duties
- Stack optics require only low voltage cables
- Interchangeability with Electricon units

Continuous monitoring of smoke and dust emissions

The OM80 obscuration monitor provides continuous monitoring of smoke emission from combustion or dust emission from air filtration systems. Response is immediate and unaffected by weather conditions, daylight or darkness. It is a positive aid to efficient combustion and environmental pollution control.

Operation

A beam of light is projected across the stack or duct onto the photo-cell in the receiver unit. Dust or smoke passing through the light beam is displayed digitally as percentage obscuration. The OM80 software is programmed for either dust or

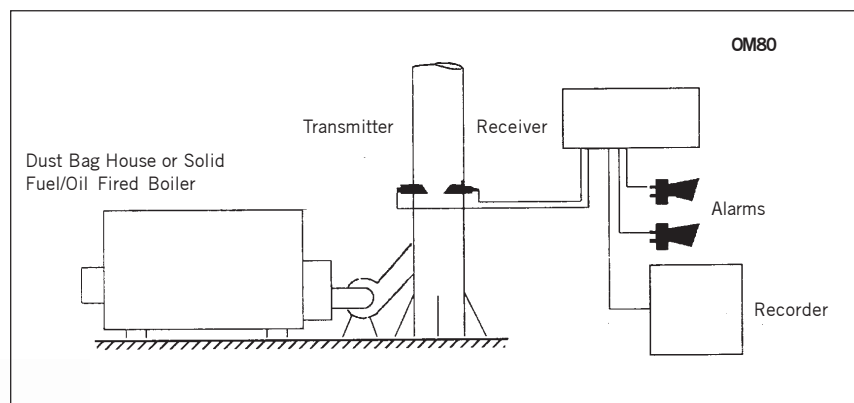
combustion monitoring as follows :

Dust : Alarm point values are preset at 5% and 10% with a 30 second delay.

Combustion : Alarm point values are preset at 20% and 25% with a 5 second delay.

The dust and combustion programs are internally switch selectable by the user. The alarm set-points may be re-programmed to suit a wide variety of applications.

Typical arrangement



Installation guidelines

For full information please refer to the "Installation Operating Instructions" supplied with the equipment.

Location: These units must be rigidly mounted in the horizontal plane on opposite sides of the stack or duct so that the projector light beam is at right angles to the flow of the flue gases and gives unrestricted illumination of the receiver photocell. The following considerations should be taken into account when choosing a suitable location.

Temperature : It is preferable that the units are installed where the ambient temperature is at a minimum. When correctly installed on mounting tubes, conducted heat is not usually a problem. Radiated heat, which has the greater effect on the units, can be effectively reduced by suitable lagging of adjacent hot surfaces. Normally sufficient cooling effect is provided by air purging. The temperature of the Projector / Receiver units should not exceed 70°C. Where the temperature of the Projector/Receiver units could exceed 70°C please consult Solartron Mobrey.

Accessibility : Optical units must be located such that they are readily accessible for lens cleaning, routine maintenance and servicing.

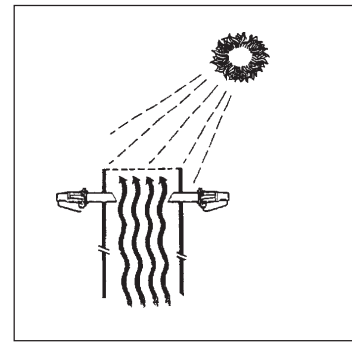
Whilst the optical units will function correctly at temperatures up to 70°C, locations of high ambient temperature should be avoided as far as possible so that routine maintenance and service can be carried out whilst the plant is in operation.

Scanning Distance : It is recommended that the scanning distance be kept within the limits 300mm to 3000mm. Where the distance between the duct walls is greater the mounting tubes may be extended into the duct to reduce the scanning distance.

Scanning distances less than 300mm should be avoided if possible. For scanning distances outside the recommended range, please consult Solartron Mobrey.

Stratification : To ensure that the smoke or dust measured by the instrument is representative of that emitted, the influence of dampers, bends, tees, obstructions and draught balance doors should be considered when selecting a suitable position. Location of the units close to bends in the flue should also be avoided as momentum of the flue gases may deposit dust on the lenses.

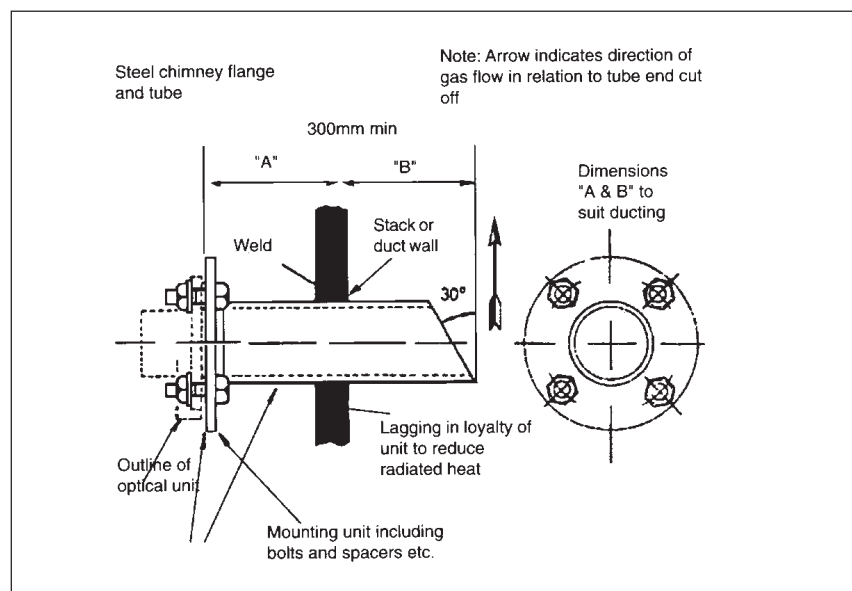
Sunlight : The optical units should not be installed at the flue opening to atmosphere as ambient light may affect the stability of readings. Where such installations are unavoidable we have developed special software which monitors and compensates for variations in stack light conditions. Please consult Solartron Mobrey before ordering.



Mounting Optical Units : The diagram below indicates the method of mounting optical units on a steel duct or chimney. Mounting tubes are normally supplied and fitted by the steel fabricator and must always be installed in the horizontal plane.

The mounting tubes should be fabricated from 80mm Schedule 40 pipe (or equivalent) and BS10 schedule 'E' flanges as illustrated below. The minimum overall length should be 300mm to avoid sooting of lens and 'B' dimension approximately 50mm provided that at least 250mm active scanning distance is available between the tubes.

The tube ends should be tapered approximately 30° as shown to minimise lens sooting.



Specifications

I2513 Flush mounting
I2514 Projection mounting

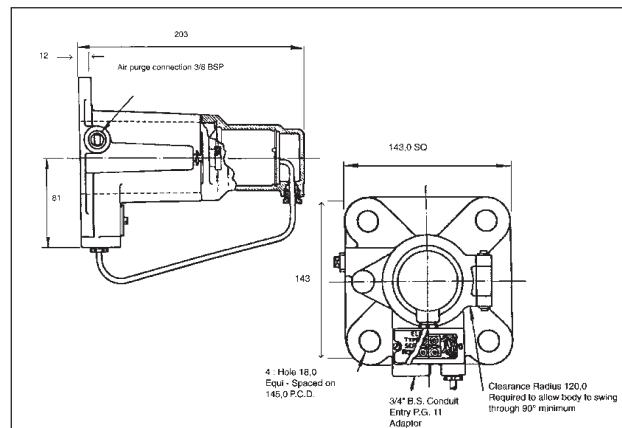
Power requirements :	80 to 265Vac/dc
Obscuration range :	0 to 100%
Output :	4 to 20mA for 0 to 50% or 0-100% obscuration, selectable
Alarms :	Two SPCO relays, each rated at 2A, 250Vac
Alarm mute :	2 minutes auto reset
Keyboard :	Touch membrane
Display :	12mm LED
Memory :	30 days
Calibration :	Automatic zero and span
Security :	Password protected programmable entries
Optical check :	Not password protected. Operator can display 'raw stack value' to check lamp and lens condition
Temperature limits :	-10° to 50°C
Panel cut-out dimensions :	H 80mm x W 180mm (± 1mm) x D 1650mm
Weight :	2 kg

Projector / Receiver units

12538 Flush mounting
12537 Projection mounting

Lamp :	2.8W, 24Vdc
Cell :	Silicon photovoltaic
Scanning distance :	100 to 3000mm
Flanges :	80mm NPS AS2129, table E
Mounting tube :	Refer installation leaflet
Air purge :	3/8 in BSP connection available
Degree of protection:	IP54
Weight :	Projector 2kg. Receiver 2 kg.

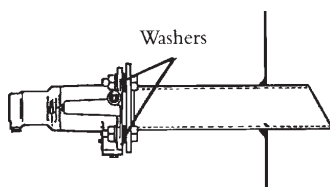
Transmitter & Receiver Dimensions



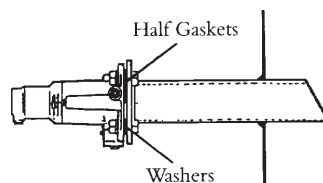
Negative pressure applications :

Where possible the optical units should be installed at a negative draught location avoiding high gas turbulence due to fans, bends and dampers. Such a location will minimise lens sooting by allowing a stream of clean external air to be drawn into the mounting tubes via a small gap between flanges as described below.

i) Indoor Locations : Where the pressure in the stack duct is less than atmospheric, the projector and receiver units should be bolted to the mounting tubes using washers to provide a 3mm spacing between the flanges. Atmospheric air will be drawn through the gap and into the units, so keeping the lenses free from soot or dust. The 3/8 inch BSP tapping should be plugged.



ii) Outdoor Locations : On externally mounted optical units, care should be taken to prevent rain entering the gap between flanges as this may affect obscuration readings. The upper side of the flange gap should be sealed by fitting several half gaskets between the two upper flange bolts. Normal spacer washers should be fitted to the lower bolts. In view of the reduced natural draught induction area the gap should be increased to approximately 5mm.



Positive pressure applications : Where the pressure inside the stack or duct is greater than atmospheric, the projector and receiver units should be bolted to the mounting tubes using a gasket to provide an air-tight seal between the flanges.

On oil-fired boilers a pressure wave may be caused when the burner ignites, disturbing soot accumulations and depositing them onto the lenses. Therefore, the units should be located as far as possible from the actual flue gas outlet of the boiler.

Injecting clean air is not always effective as the momentary pressure can be severe. Accordingly it is important to observe this precaution even when injected clean air is used during normal running conditions.

i) Air Purging : To minimise sooting-up of the lenses during normal operation, air pressurised above the stack pressure should be fed via flexible tubing into the 3/8 inch BSP tapping provided on each unit. The air supply should be switched on before the boiler is fired and should not be switched off until after the firing sequence has shut down and the purge cycle is complete.

Wiring connections

Optical Units : Use instrumentation grade shielded cables for connection to the projector, receiver and control unit. Run cables separately from any mains cable (300mm minimum separation). Cable shields to be grounded only at control unit. maximum cable length is governed by the total loop resistance of the core and should not exceed the following limits.

Projector: 5 Ohms

Receiver : 30 Ohms

Analogue Output : total loop resistance, including recorder, should be less than 350 Ohms. (OM80 output is “grounded” and therefore chart recorded inputs should be ‘floating’).

Mains Connection : This unit is supplied for 80 to 265Vac/dc operation. For optimum performance the power supply to the OM80 should never be interrupted. However, the standby battery will retain the internal values of approximately 30 days.

• **IMPORTANT NOTICE :**
When replacing an Electricon controller consult Solartron Mobrey for advice on the conversion.

Associated Boiler Products

Boiler Water Level Control

Mobrey manufacture a full range of float operated alarm and modulating level controls fully in accordance with P.M.5, TRD604, BS pr EN12953-9 & 12952-11 & SAFed PSG2

Automatic Control Check System

This product has been designed to provide high integrity and self-monitoring to float operated controls in compliance with the latest boiler standards

Steam and water Flow

Flow meters are available for steam, water and fluid flow measurement using low energy loss averaging pitot tube, orifice and ultrasonic technologies. Non intrusive meters are also available for liquid flow.

Electronic Probes

Solartron Mobrey manufactures a full range of conductive and capacitive probe controls for application on steam boilers. This equipment fully complies with the latest boiler specifications.

General Level

Solartron Mobrey is a level, flow, pressure, density and viscosity measurement instrument company. If you have a problem we will have the solution

TDS Control, Timed Bottom Blowdown, Remote Alarm & Shut down panels

For UK and Eire markets only – Full customer service provision

Solartron Mobrey is able to provide a full design, installation, commissioning and maintenance service for their site installed instrumentation through their service division of **Bestobell Service**. This organisation is able to provide a full boiler house installation and maintenance service and provide turnkey installation solutions covering all control and instrumentation functions. The following gives a typical list of operations carried out by engineers and technicians directly employed by the company and operating through 5 regional offices throughout the UK

- Total compliance with unmanned boiler regulations, Health and Safety guidance note PM5, SAFed PSG2, and BS prEN12953-9 and BS prEN12952-11 for both existing Mobrey float controls and electronic probe installation
- Steam and water flow monitoring, heat and mass flow calculation using Solartron Mobrey’s unique range of products.
- Tank and level monitoring solutions using Solartron Mobrey’s unique range of products.
- Complete automation solutions bringing together major manufacturers equipment into a single turnkey solution

Bestobell Service is an engineering company providing engineering solutions and is a full operating division of Solartron Mobrey.

For further information regarding installation, commissioning & maintenance ring 01753 756600 and ask for **Bestobell Service**



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