



Technical Specification

**Oscillatory Baffled
Reactor / Crystalliser (OBRC)**

**DN25 & DN40
Laboratory Evaluation Units**

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Overview:

This Evaluation Reactor (OBR "Oscillatory Baffled Reactor") has been manufactured for the intended use of evaluating the potential benefits of oscillatory baffled mixing with chemical reactions and crystallisations. It will allow the investigation of the fundamental kinetics and critical process parameters such as reactant ratios, cooling rates, temperatures, addition rates etc. and what benefits the baffled mixing can bring. It can be used as a direct substitute for batch stirring of reactions or crystallisations. These results can then be taken, scaled-up and validated in a COBR/COBC or scaled up to a larger OBR system.

The framework and vessel mountings are standardized to allow either a DN40 or DN25 vessel to be used.

Operating Parameters:

	DN25 Vessel	DN40 Vessel
Temperature Range:	-20 °C ~ +120 °C	-20 °C ~ +120 °C
Oscillator Frequency:	0.1 Hz ~ 6.0 Hz in 0.1 Hz increments	0.1 Hz ~ 6.0 Hz in 0.1 Hz increments
Oscillator Stroke:	5 mm ~ 40 mm in 1 mm increments	5 mm ~ 60 mm in 1 mm increments
Operating Pressure:	Ambient	Ambient
Working Volume:	110 ml	280 ml

Although the above conditions are individually possible, no guarantees can be given for any particular combination. The overall speed of the oscillation is limited by the linear motor and whilst, for example 10mm at 6Hz is possible, 40mm at 6Hz may not be.

Materials of Construction:

The wetted parts of the OBR are manufactured, as standard, from the following materials:

Glass Vessel:	Borosilicate 3.3
Interface Collar(s)	316L
Bottom Outlet Valve:	PEEK / FFKM / FEP
Splash Cap:	PTFE
Baffle String:	316L/PEEK

Alternative materials, where suitable, are available on request.

Weights and Dimensions:

Reactor:	40kg, 410mm x 410mm x 815mm (width x depth x height)
Controls:	20kg, 525mm x 400mm x 310mm (width x depth x height)

System:

Reaction Vessel:

The Reaction Vessel comprises of straight glass sections with 316L end caps and intermediate process insertion collars. The design is such that the smooth bore and minimal dead volume connection and sampling points allow the operator to work with heterogenous solids with minimal hang-up.

The intermediate process insertion collar can be used for sampling or PAT and can be supplied with a range of fittings to suit the operator's requirements.

The reactor can be supplied with either a 25mm or 40mm diameter vessel to suit the end user requirements.

Vessel, end caps and intermediate collars are fully jacketed to achieve optimum temperature control throughout the reactor.



Figure 1: OBR Vessel, support structure and control panel

General Arrangement:

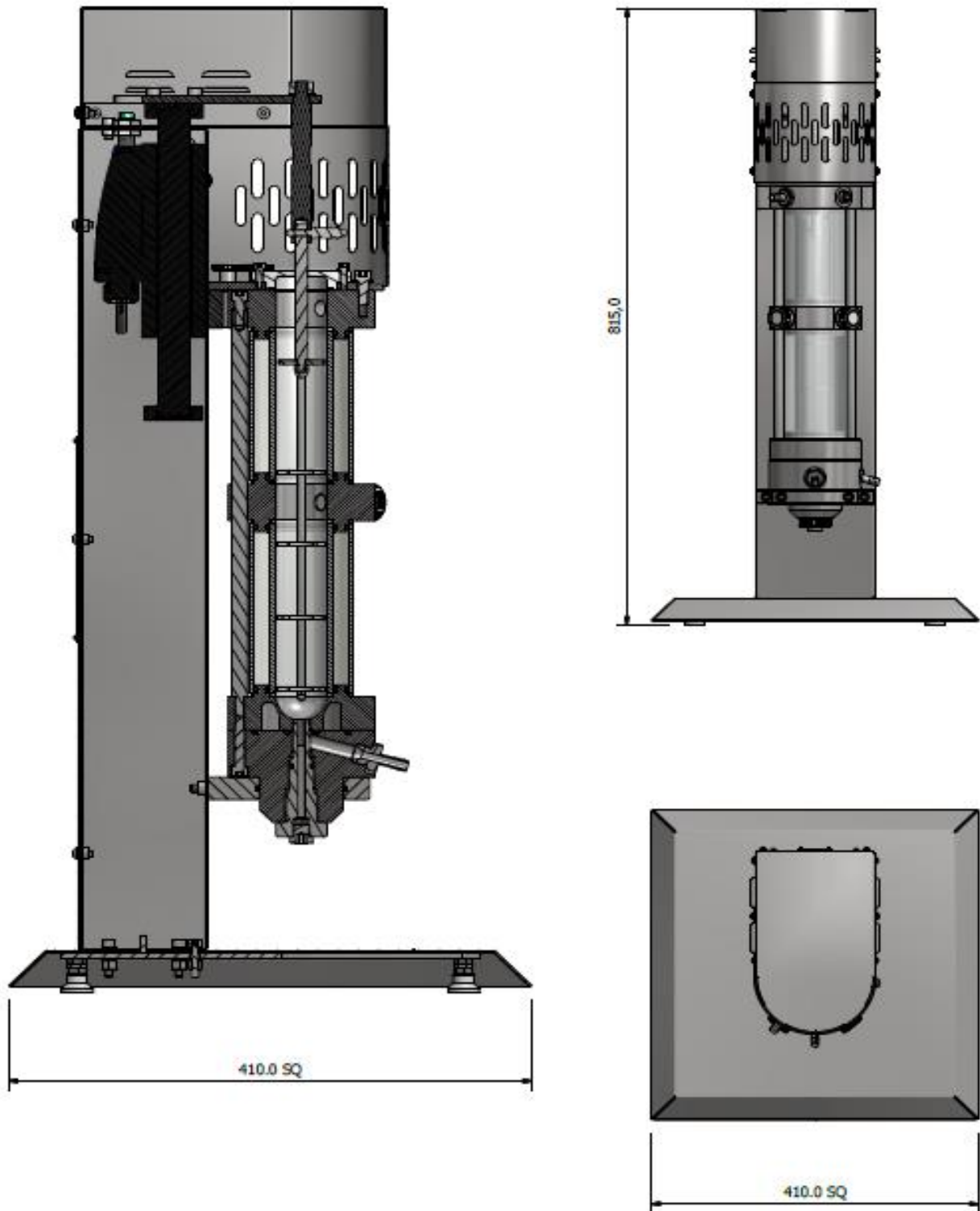


Figure 2: OBR40 General Arrangement

Support Structure:

The reaction vessel is supported on a stainless steel support structure. The rear stainless steel support structure encloses the drive mechanism and moving parts.

The vessel can easily be removed from the support structure for cleaning purposes.

Drive System:

The drive system consists of a linear motor and controller, pre-programmed to allow the amplitude and frequency of the baffled agitator to be adjusted via the touch screen which is mounted on the control system cabinet.

The linear motor and all moving parts are built in to the frame and enclosed behind the metal guard.

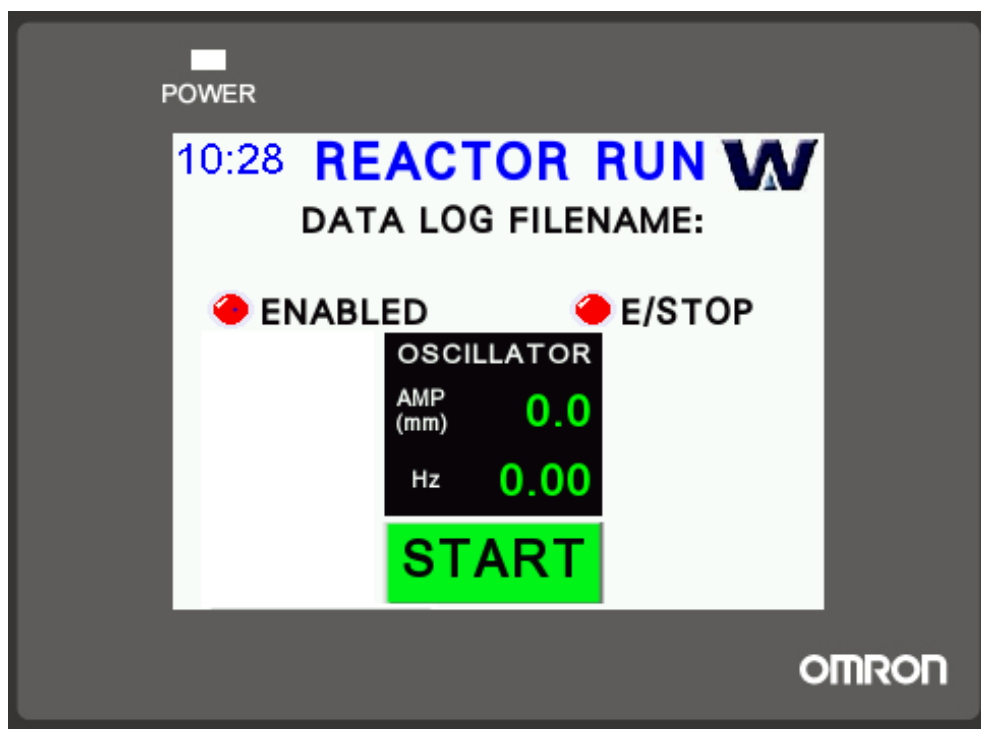


Figure 3: HMI Touchscreen Controls

Control System:

The control system cabinet houses the PLC, drive controller, safety circuits (Emergency Stop) fuses and power isolator and an on-board touch screen to allow the control system to operate as a standalone unit without the need for an external laptop or PC.



Figure 4: Control Panel

Electrical Specifications:

Supply: 1 phase, N and Bonded Earth, 230 Volts, 50Hz (alternative configurations are available on request).

The machine operating current is up to 10 Amps.

The supply to the control panel must be via an earthed mains connector.

Temperature:

The control system should be operated in an ambient temperature of between 0 and 50°C. (140°F). Storage should be within an ambient temperature range of 0 to 65 °C and a relative humidity range of 5 to 95% non-condensing.

Documentation:

Each unit is supplied with one hard and one electronic copy of the documentation package which includes the following items:

- Operations and Maintenance Manual
- CE Declaration of Conformity
- General Arrangements and Parts Lists
- Electrical Schematic Drawings
- Proposal and Technical Specifications
- Safety Documentation

Standards and Directives:

AWL's laboratory range of OBR's are built as standard to meet the following directives:

EN 60204 – 1:2018

Safety of Machinery - Electrical Equipment of machines.

EN 61000-6-4:2018

Electromagnetic compatibility. Generic emissions standard for industrial environments

EN 61000-6-2:2016

Electromagnetic compatibility. Generic immunity standards for industrial environments

Options:

At or before the time of order the customer can chose from a range of options and extras including:

Increased operating temperatures

Integrated feed pump

Additional feed collars, process insertion points

Bespoke feed collar to suit end user PAT

DCS control

Temperature controlled transfers in/out

Alternative materials of construction

For further information

please contact: enquiries@a-w-l.co.uk ***or visit:*** www.a-w-l.co.uk