

# **Nold DeAerator™**

## **Applications**

The Model 2100 Nold DeAerator is used in...

- The preparation of de-aired, bubble-free, water or glycol solutions (anti-freeze), for use in hydraulic settlement systems, twin-tube hydraulic piezometers, and manometer-type water-level monitoring systems
- The preparation of de-aired water for use in soil testing laboratories, triaxial tests, saturation and permeability tests
- The degassing of hydraulic oils
- Numerous other non-geotechnical applications such as biological research, food and chemical production, ultrasound imaging, etc.



• Model 2100 Nold DeAerator shown degassing a liquid.

## **Operating Principle**

The Nold DeAerator is designed to quickly remove dissolved gasses from liquids without the application of heat. It was originally developed for geotechnical applications to allow the preparation of de-aired water for use in hydraulic twin-tube piezometers and hydraulic settlement systems, where the presence of air bubbles in the connecting tubing would give rise to measurement errors.

The degassing is accomplished by means of cavitation and nucleation. Cavitation, an ultra-high vacuum, is produced behind the blades of a rotating impeller. The violent agitation so produced breaks up the liquid into a fine mist-like spray of particles (nucleation), from which the dissolved gasses can easily escape. Centrifugal forces hurl the released gasses (air, H<sub>2</sub>S, SO<sub>2</sub>, methane, radon, etc.) outwards where they bubble up to an evacuated space above the liquid surface. From there, the gasses are drawn off through a vacuum tube.



• Typical system components include (from left to right) the Model 2100, a storage tank, a moisture trap and vacuum pump.

### Advantages and Limitations

The Nold DeAerator can quickly (within 3 to 5 minutes) produce de-aired water with a purity of less than 1 ppm dissolved air without the need for application of heat.

The Nold DeAerator can be used with all water and glycol mixtures and with hydraulic oils. Liquids which will attack acrylic plastics (such as those containing alcohol), should be avoided.

Vacuums must exceed 29.5 inches Hg (12 Torr) for the DeAerator to be effective. Belt-driven, two-stage, oil-filled vacuum pumps of 25 liter per minute capacity are preferred. Where the water aspirator is used, the water pressure must exceed 65 psi (450 kPa) and approximately 12 liters of water will be needed. The water aspirator provided has a 3/8 NPT male connector, which must be adapted to.

### System Components

The Nold DeAerator consists of a sealed acrylic chamber which can be evacuated using either a vacuum pump (not supplied) or a water aspirator supplied with the equipment. The vacuum is used to draw liquid into the chamber through an intake valve. At the base of the chamber is a multi-bladed impeller, which is connected

via a magnetic clutch to an electric motor. Energizing the motor rotates the impeller producing cavitation and nucleation.

Wetted parts are made from acrylic, polypropylene, epoxy plastics, Buna-N O-rings, stainless steel, brass, and tubing of PVC and latex rubber.

### Accessories

Storage tanks are available for the storage of de-aired liquids. These tanks are identical to the expansion tanks used in heating systems. They contain a rolling rubber membrane that separates one end of the tank from the other, allowing the tank to be filled and emptied without the de-aired liquid coming into contact with the air.

### Technical Specifications

Standard Capacity	8 liters
Degassing Purity	0.6 ppm
Vacuum Requirements	750 mm Hg, (12 Torr), or better
Power Supply	115V 60 Hz or 230V 50/60 Hz
Power Consumption	115V: 59 watts 230V: 64/59 watts
L x W x H	190 x 190 x 600 mm
Shipping Weight	9 kg