

Excelling in Separation Solutions

enerscope Deoiling Hydrocyclone – Series EDH

As a world leader in meeting your produced water treatment needs, Enerscope offers a complete line of filtration & separation equipment. Our liquid/liquid hydrocyclone is the most advanced, yet least complicated deoiling hydrocyclone available.

Advanced Separation Technology

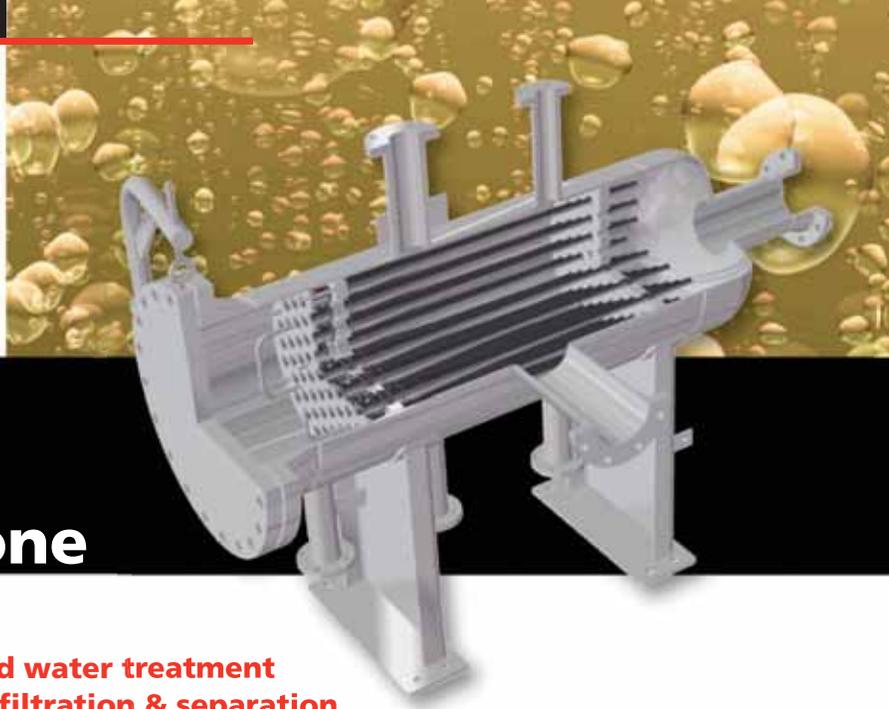
OVERVIEW

As a leading systems integrator Enerscope Systems International utilizes the most current field-proven technology within our packages to ensure we provide cost effective and efficient solutions for all process conditions. To enable us to do this for our Produced Water Treatment Packages we are pleased to offer our most advanced liquid/liquid hydrocyclone.

Enerscope EDH 38 Deoiling Hydrocyclone liners represents the state of the art in primary Produced Water Treatment technology; an advanced generation hydrocyclone geometry optimizing the critical balance between oil removal efficiency and capacity. This ensures that optimal separation is achieved in the most cost effective and space efficient manner.

Using advanced engineering design tools, Enerscope has developed the latest generation deoiling hydrocyclone, the Enerscope EDH. The Enerscope EDH has a unique patented inlet geometry that minimizes turbulence and reduces inlet wear. The innovative liner geometry produces finer hydrocarbon separation at higher unit capacities, allowing fewer cyclone liners to be used for optimal performance and cost.

The EDH 38 liner has undergone extensive independent trials and has proved to be one of the most efficient liquid/liquid hydrocyclones available to the Oil & Gas Industry. The Enerscope EDH is used to treat produced water streams with higher rates of entrained oil than previously possible, while meeting stringent discharge water oil content.



PRINCIPLE OF OPERATION

Fluid enters our deoiling hydrocyclone through the involute inlet. Its velocity is converted into tangential velocity in the inlet area, thereby creating a centrifugal action. As the fluid moves down the conical section, tangential velocity progressively increases.

The water phase, which is subjected to higher centrifugal forces, moves to the outer wall of the cyclone. The lighter phase (oil droplets), are move toward the inner core of the cyclone. The water phase exits the deoiling hydrocyclone as underflow.

The core of the light phase, which is oil, moves axially up the cyclone, due to back pressure on the underflow, and exits out the reject orifice as overflow.

The EDH 38 liner:

- maximizes the acceleration field created by the axially rotating flow
- minimizes the radial distance that an oil droplet must travel to reach the axial oil core
- maximizes the residence time that the oil drop has to reach the axial oil core



Benefits

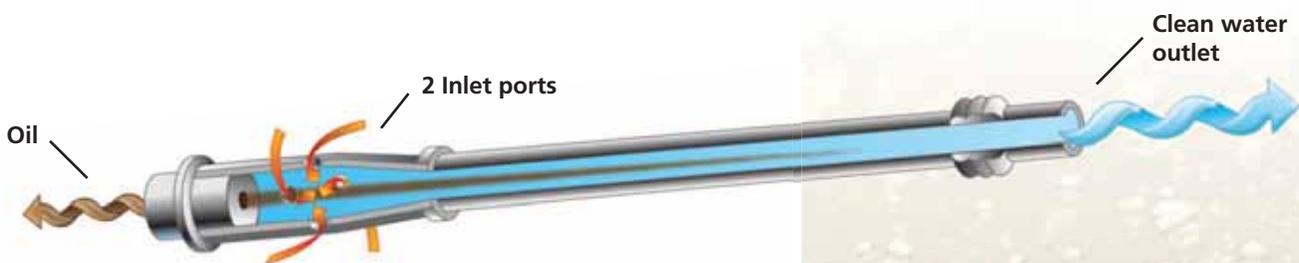
Multiple inlets. The patented design features multiple inlet ports, radially balanced around the circumference of the unit. This provides superior hydraulic stability that produces a straight oil core that is stable even at very low flow rates. This enables the hydrocyclone to achieve higher removal efficiencies that can reduce or eliminate the need for emulsion breaking chemicals as well as allows our hydrocyclone to operate at higher turndown ratios.

High Efficiency Liquid/ Liquid Hydrocyclone

Adjustable overflow orifice. The diameter of the overflow orifice is automatically adjustable during operation. This dramatically increases efficiency and compensates for varying oil volumes.

Heating capability. A jacket permits circulation of hot fluids or steam around the unit to reduce viscosity thereby enhancing separation performance.

Solids removal option. Solids separation option allows our deoiling hydrocyclone to separate and removes solids in slurry form.





OPTIONS & RETROFITS

High Turndown Vessel Design & Options

For applications requiring high turndown, Enerscope offers its high turndown design compartmentalized vessel. Internal baffles are used to divide the vessel into either two or more separate compartments. Each compartment can be switched in or out of service using external valving to suit your process conditions. This operation can be manual or fully automated. The Enerscope high turndown design has considerable benefits over traditional methods to increase turndown as it eliminates the need for either blanking liners or using multiple vessels.

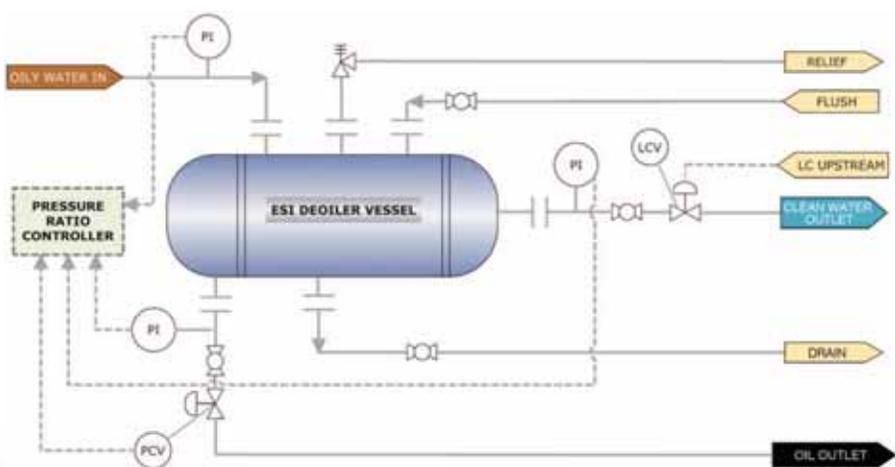
Pumped Deoiling Hydrocyclone Option

When the existing process pressure is too low, a low shear closed impeller booster pump is included to increase inlet pressure. Our pump ensures minimal shearing of oil droplets and our piping design optimizes system operation.

EDH Series Retrofits

The capacity of your existing hydrocyclone system can be increased while improving separation performance by implementing Enerscope EDH 38 Series Deoiling Hydrocyclone liners. This can be accomplished without the addition of extra hydrocyclone vessels in nearly all cases. The Enerscope EDH 38 Series liner can be adapted to retrofit your existing third party hydrocyclone vessel.

Process Flow Diagram





Key Features

- Stable oil core provides **higher separation performance**
- No moving parts – **saves maintenance time and cost**
- Low and steady pressure loss **saves energy and provides predictable flow rates and operating system**
- Designed to handle slugging, upset situation and high solids loading **provides predictable operating system**
- Enhanced inlet ports for **optimum oil recovery**
- Choice of profiles to accommodate space and piping limitation making for **an easy layout and installation**
- Systems and skidded units available
- Light weight and small footprint
- Not affected by fluctuations in motion (suitable for FPSOs)
- Annular axial inlets reduce turbulence
- Multiple inlets improve wear resistance
- Multiple inlets provide a stable oil core and improved recovery
- Involute can be inspected without liner disassembly
- Low CAPEX and OPEX
- Tested and Field-proven technology

General Specifications

- Standard pressure ratings up to 1,480 psi (102 bar), other pressure ratings available
- ANSI flanged inlet and outlet connections; DIN and other connections available
- Designed and constructed to all recognized standard (ASME, ANSI, CRN, PED and NACE among others)
- Liner Material: Duplex 2205 Stainless Steel, other materials available

Produced Water Treatment Systems

Enerscope's EDH Series Deoiling Hydrocyclone systems form an integral part of our Produced Water Treatment capability. These systems can range from fully automated packaged systems to stand alone vessels. The integration of complete systems to treat produced water from oil and gas processing is an important element of our business. Enerscope Systems have designed and built packages to meet the most stringent discharge limits. The designs can include one or more stages to treat high inlet levels of hydrocarbon-in-water.

HERE ARE A FEW OF OUR COMMON APPLICATIONS:

Pipeline Flushing & Testing **FWKO** SAGD Produced Water Deoiling Waterflood Injection Frac Water
Offshore Production Disposal Wells Secondary Recovery **Subsea Production** Tertiary Recovery & Treatment

CORPORATE OFFICE

LOCAL CONTACT