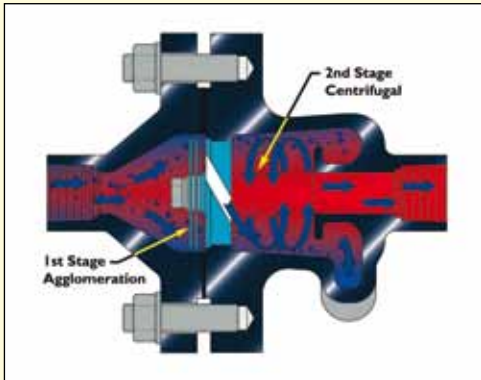


Kelburn Engineering Limited are a world leader in liquid from gas separation technology. Producing a complete range of gas separation equipment for the process, power and petrochemical industries. Our separators are designed to cover all gas and compressed air applications.

HIGH EFFICIENCY COALESCENT CYCLONE SEPARATORS



MKII Type KS Cyclone Separator

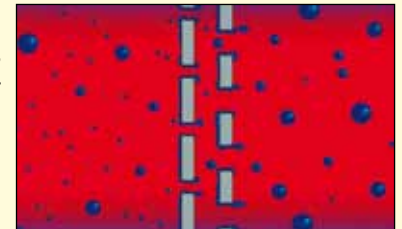
Liquid droplets within the gas flow at both start up and during normal operation may cause the following problems.

- Equipment damage due to erosion and/or corrosion.
- Reduction in process efficiency due to lower heat transfer rates.
- Increased maintenance and downtime.
- Process contamination due to liquid carryover.
- Impact damage to mechanical components.
- Pipeline corrosion.

The Kelburn Engineering Coalescent Cyclone Separator both protects equipment and prevents the problems associated with liquid entrainment in gas or compressed air. The separator range has been proven in service world wide.

OPERATION

The Coalescent Cyclone Separator has a two stage separation design. The first stage agglomerates the fine liquid particles causing them to coalesce by bringing the droplets together, increasing their size and mass. The second stage then utilises profiled deflector blading which imparts powerful centrifugal forces to separate all the liquid droplets from the gas flow. The liquid exits the separator from a volute contoured drain.



1st Stage Agglomeration

PERFORMANCE

These highly efficient, flow driven separators remove all droplets down to 10 microns in size and 80 - 90% in the range 5 - 10 microns. The separator operates with overall extraction efficiencies of more than 99.5%.

The Kelburn Engineering separator generates a very low pressure drop, typically less than 1% of the system operating pressure.



MKII KS Coalescent Cyclone Separator

DESIGN FEATURES

- Inline inlet and outlet
- Low pressure drop.
- No moving parts.
- Body of cast construction allowing manufacture in all material specifications.
- Internal contoured profile and volute drain for improved flow and separation.
- No maintenance and no spare parts requirement.
- Self clearing of separated liquids and solids.
- Flange and pressure ratings up to ANSI 2500 and PN 160.
- Separators specifically sized for each application, for maximum efficiency.
- Full range of separator sizes DN 10 to DN 1400 (¼" to 56")

APPLICATIONS GAS

- Liquid removal from all gases - H₂, N₂, CO₂, NH₃, O₂, CH₄, C₂H₆, ...
- Pressure reducing valve, control valves and flow meter protection.
- Gas compressor inlet protection.
- Liquid hydrocarbon removal from fuel gas lines.
- Gas turbine protection on fuel / air mixing system.
- Oil removal from gas turbine breather systems.
- Oil removal from refrigerant gas.
- Condensate removal from gas cooler outlet.
- Corrosive liquid removal from process gas.
- Reciprocating equipment protection.
- Heat exchanger protection.

APPLICATIONS AIR

- Air dryer inlet water removal, reducing regeneration costs.
- Liquid removal in primary airlines.
- Air receiver outlet.
- Compressor inter and after coolers.
- Instrument air.

HIGH EFFICIENCY KNOCKOUT CYCLONE GAS SEPARATORS

Process and petrochemical plant systems, compressor stations and other equipment are always vulnerable to the severe loadings imposed by the sudden and/or continuous transmission of large volumes of liquids and/or the ingestion of solid particles. This may result in the following problems within a gas system.

- Shock loadings on rotating equipment.
- Equipment damage due to erosion and/or corrosion.
- Reduction in process efficiency due to lower heat transfer rates.
- Increased maintenance and downtime.
- Process contamination due to liquid carryover.



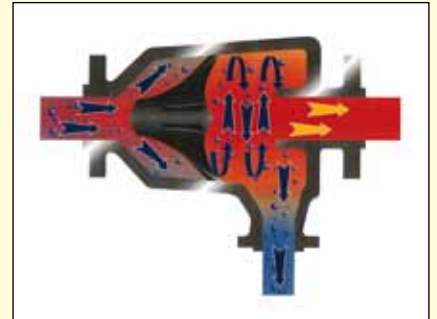
12" KSS Cyclone & Reservoir

Additionally, many processes require the continuous removal of liquid streams to ensure optimum operational efficiencies.

The Kelburn Engineering High Efficiency Knockout Cyclone Gas Separator has been developed to satisfy the dual separation requirement of large volumes of liquids and the removal of solid debris.

OPERATION

Slugs or streams of liquids, pipe scale and other debris enters the separator with the gas flow and hits the coned deflector vane section (designed to withstand the large impact loadings) where the flow is split into several streams. The flow then enters a vortex chamber tangentially from the deflector vanes and is subjected to a powerful centrifugal action. The liquid and solid particles are forced to the cyclone walls and leave the unit via a large area drain. The large bore drain and pipe reservoir provide rapid liquid removal and high capacity storage during a large water carryover event.

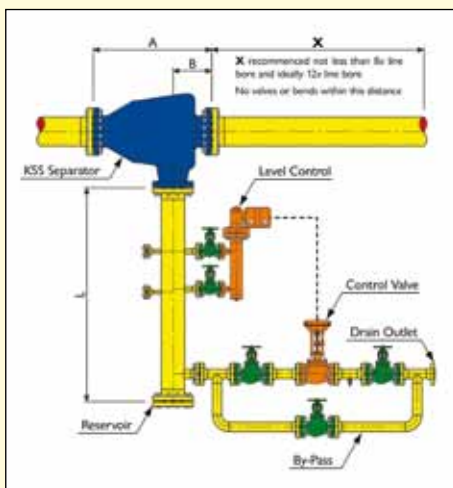


KSS Cyclone Separator

PERFORMANCE

These highly efficient, flow driven separators remove 99% of all droplets down to 15 microns in size.

The Kelburn Engineering separator generates a very low pressure drop, typically less than 1% of the system operating pressure. Separation of sand, pipe scale, swarf and other solid debris down to 15 microns in size. Separation and dispersion of liquid slugs and streams.



Cyclone Separator c/w Level Control, Drain & Bypass

DESIGN FEATURES

- Body of cast construction allowing manufacture in all material specifications.
- Separators specifically sized for each application, for maximum efficiency.
- Strengthened internal vanes for absorption of shock loadings.
- Full range of separator sizes DN 100 to DN 1400 (4" to 56")
- Flange and pressure ratings up to ANSI 2500 and PN 160.
- No maintenance and no spare parts requirement.
- Self clearing of separated liquids and solids.
- Large bore drain for rapid liquid removal.
- Compact in size.
- Inline inlet and outlet
- No moving parts.
- Low pressure drop.

APPLICATIONS

- Replacement of scrubbers and high volume gravity separators.
- Bulk gas liquid separation for metering applications.
- Gas preconditioning to filters or scrubbers.
- Gas compressor station protection.
- Heat exchanger protection.
- De-bottle necking.
- 2 phase separation.



15" KSS Cyclone Separator Natural Gas Application