



# Seal Support Systems Brochure



[www.aesseal.com](http://www.aesseal.com)

# Contents

05	<b>AESSEAL (MCK) Ltd. Introduction</b>
06	<b>Customer Service</b>
07	<b>Environmental Focus</b>
08	<b>Industry Choice Made Easy</b>
09	<b>API Plans &amp; Certification Explained</b>
10	<b>The Importance of Fluid Film</b>
11	<b>Barrier Fluid Choice</b>
12	<b>Introduction to Water Management Systems</b>
13	<b>Water Technology Ladder</b>
14	<b>FLOWTRUE® Flow Meter Device</b>
15	<b>FLOWTRUE® Selection Guide</b>
16	<b>Cyclone Separator &amp; Coolers</b>
17	<b>SWM™ &amp; SWP™ Plant Water Line Pressurized System</b>
18	<b>SW Range SW2™ &amp; SW3™ Systems</b>
19	<b>SWFF-TF™ Flow Fuse™ &amp; Thermal Fuse™ System</b>
20	<b>SWC™ Condensate System</b>
21	<b>FDU™ Fluid Distribution Unit</b>
22	<b>Introduction to Oil Support Systems</b>
23	<b>Oil Technology Ladder</b>
24	<b>SP Range SP1™, SP2™ &amp; SP3™ Systems</b>
25	<b>AES-15™ &amp; AES-FV™ High Pressure Vessels</b>
26	<b>PP/SOU™ Oil PUMPPAC™</b>
27	<b>PP/O1™ Oil PUMPPAC™</b>
28	<b>AES-28™ API System</b>
29	<b>High End Systems</b>
30	<b>Gas Panel Gas Barrier System</b>
31	<b>Cooler Options</b>
32	<b>Optional Extras</b>
33	<b>Contact Sheet</b>
34-35	<b>Systems Order Coding</b>



# AESSEAL (MCK) Systems Division

AESSEAL® is a leading global specialist in the design and manufacture of mechanical seals, seal support systems and bearing seals. With operations in six continents, AESSEAL® is the world's 4th largest supplier of mechanical seals, achieving growth through exceptional customer service and innovative products that provide real customer benefits.

AESSEAL (MCK) Ltd. is the seal support systems division of the AESSEAL Group of Companies. The systems division shares the Group's dedication to superior customer service and innovative research & development. This is evident through the high level of customer satisfaction with our technical range of seal support systems.

The AESSEAL (MCK) location (Picture 1) is modelled on the highly technical and professional environment of the AESSEAL Global Technology Centre. The facility allows the systems division to manufacture innovative seal support systems within an exceptionally short time frame.

Through our partnership with the AESSEAL Group, the systems division offers customers the opportunity to install complete sealing solutions. Employing an AESSEAL seal support system alongside an AESSEAL mechanical seal ensures a complete sealing solution and will significantly increase plant uptime and the life of the mechanical seal.

The complete sealing solution ensures that AESSEAL® provides its customers with such exceptional service that they need never consider an alternative source of supply.



1. AESSEAL (MCK) Ltd.
2. AESSEAL® Group Global Technology Centre (England)
3. AESSEAL (MCK) Workshop

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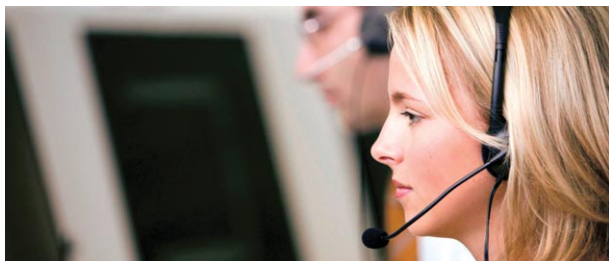
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# Customer Service

## Global Presence & Customer Service

AESSEAL® supplies products to 93 countries world wide. The focus of each of our locations is simple: to provide unrivalled customer service and technical assistance. The AESSEAL Systems Division supplies Seal Support Systems to all global locations with the same focus on customer service.



## Short Lead Times

The AESSEAL Systems Division provides standard and bespoke products within exceptionally short time frames. The Systems Division holds high levels of inventory and so achieves a 97% on time delivery rate.



## Training

The Systems training facilities at the AESSEAL Global Technology Centre and AESSEAL (MCK) Ltd. are dedicated to delivering effective training. Through informative training sessions our sales engineers and support staff are able to provide customers with the necessary expertise and support they require.

The Centres enable 'hands on' training to be undertaken. This gives trainees the opportunity to actually install and commission each of the Systems products. As a result the trainees become fully aware of how the products operate, enabling them to become experts in Seal Support Systems.



## Pressure Testing

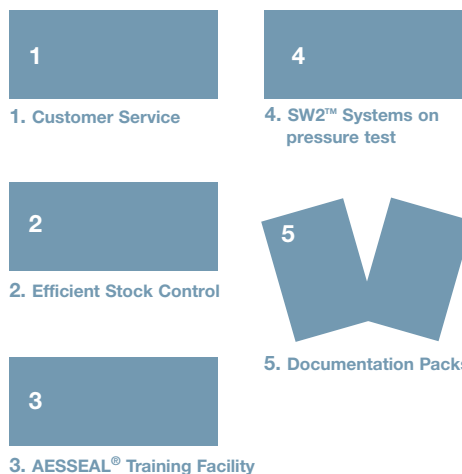
All products manufactured at the AESSEAL Systems Division are pressure tested prior to despatch. This ensures that all products are fit for purpose. This is a requirement of the Pressure Equipment Directive PED 97/23/EC.



## Installation and Documentation

All Standard Seal Support Systems are supplied with installation instructions written in the language of the customer. This ensures the efficient and correct installation of the company's products.

Each Seal Support System is also supplied with a documentation pack. This pack provides all the Systems' technical details and is an excellent reference source for the maintenance of the company's AESSEAL Seal Support System (please note that enhanced documentation packages are available on request).



# AESSEAL Water Management Technology saves global industry 5 Billion gal (US) / 19 Billion Litres of Water per year!

This is an enormous contribution to global water conservation and clearly displays the environmental focus of AESSEAL®. The company thanks its customers for contributing to this achievement and for their promotion and installation of Water Management Systems. The water savings are a direct result of the support and dedication of customers in using reliability focused sealing solutions. AESSEAL® looks forward to continuing its work with customers to generate even greater water savings!

## OF ALL THE WORLD'S WATER:

**94% is salt water**

**2% is ice**

**Only 0.6% is suitable for industrial use and human consumption**

**AESSEAL®**

## Supports Global Water Charity

AESSEAL® feels that the conservation of water resources is too big an issue to ignore. WaterAid is an international charity dedicated to helping people escape the stranglehold of poverty and disease caused by living without safe water and sanitation. WaterAid's vision is of a world where everyone has access to safe water and effective sanitation. AESSEAL® shares in this vision and as a result it entered into an agreement with WaterAid to donate a percentage of all profits from Water Management Systems to the charity. This means that every time a customer purchases a Water Management System, it is helping WaterAid to provide clean water and sanitation to those who need it.

For more information on WaterAid's essential work please visit [www.wateraid.org.uk](http://www.wateraid.org.uk)



1. WaterAid's Campaign

1



# Industry Choice Made Easy

The AESSEAL Seal Support System Range is designed and constructed to operate in the testing environments of a variety of industries. Please contact your local AESSEAL representative to discover more about proven seal support solutions.

Ethanol



Water



Refining



Mining



Chemical & Pharmaceutical



Power



Food, Beverage & Brewing



Pulp & Paper



Offshore



Corn Processing

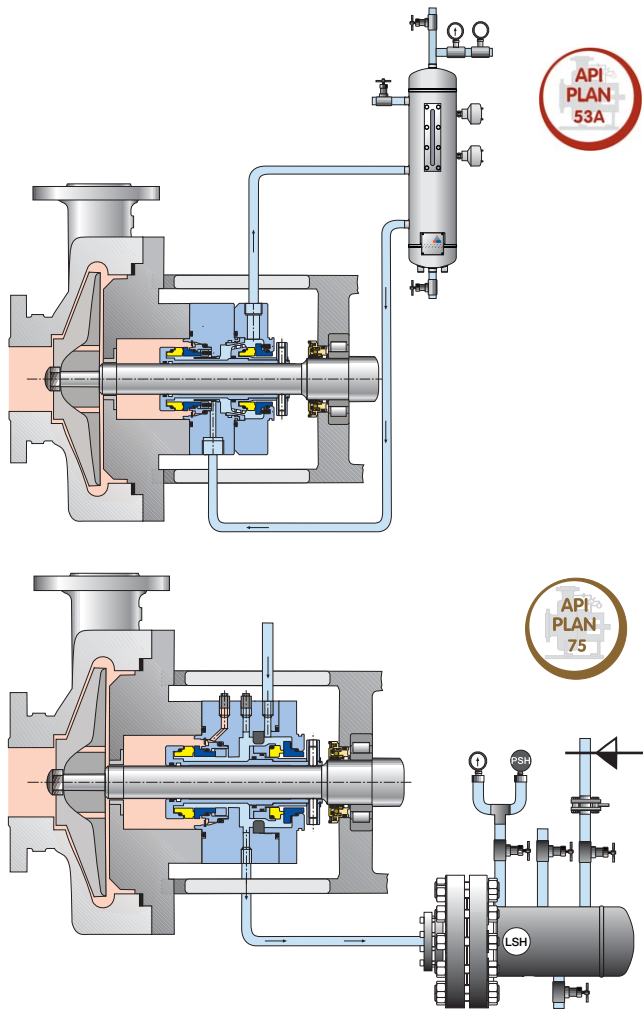




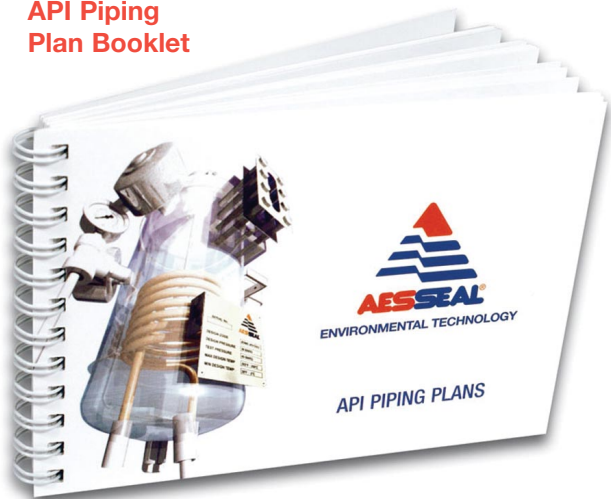
# API Piping Plans and Certification Made Easy

## API Icons

To make the selection of a Seal Support System easier AESSEAL® has designed a number of API icons so that a customer is able to link products to specific API Piping Plans. The company has developed an API Piping Plan booklet as a guide. Examples of how the API Plans are displayed in this booklet are shown below:



## API Piping Plan Booklet



# Certification Icons

All AESSEAL pressure vessels are designed and manufactured in accordance with specific certification requirements. This guarantees that they are legally fit for purpose in all locations.

The company has invested thousands of man hours into the study of these standards and has implemented all the necessary design and manufacturing procedures to ensure that a customer is able to have complete confidence in the product. The latest software is used to guarantee that calculations and designs meet all the required standards (Figures 1 & 2).

Please read below for specific details on standards that AESSEAL® Systems meet:

The PED (PED 97/23/EC) came into force in November 1999. It is European legislation covering pressure equipment operating at above 0.5 bar. The PED's aim is to ensure pressure equipment is safe and covers design, manufacture, testing, marking, labelling, instructions and materials which are considered to be essential for safety reasons. Dependent upon the vessel category, 'Notified' bodies are appointed by national governments to oversee / approve key parts of PED (i.e. higher risk equipment). The notified bodies are involved in either the monitoring of the manufacturers' quality assurance system or in direct product inspection.



Failure to comply with the PED has different penalties and prosecutions for each PED member state. The information below relates to the penalties and prosecutions associated with the UK:

The PED was transposed into UK law by the Pressure Equipment Regulations (PER). Failure to comply with the PER can result in the following:

- Such equipment cannot legally be placed on the market or put into service in the UK or the European Community or EEA.
- Could result in prosecution and penalties on conviction of a fine or imprisonment or both.

TÜV - The TÜV is an internationally recognized third party inspectorate. It has inspected AESSEAL pressure vessels and stated that they are fit for purpose in light of the standards set by the PED.



ASME VIII Div.1 - The American Society of Mechanical Engineers is an internationally recognized organization.



The International Boiler and Pressure Vessel Code states the rules of safety for governing the design, fabrication and inspection of boilers and pressure vessels during construction.

All AESSEAL® vessels are designed and manufactured to the latest standard which is updated every three years. All of the company's welders are fully coded to EN 287-1 and ASME IX.

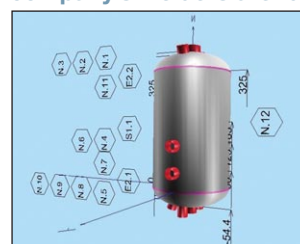


Fig. 1



Fig. 2

# The Importance of Fluid Film

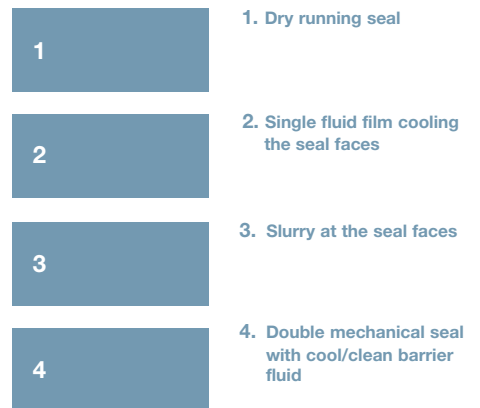
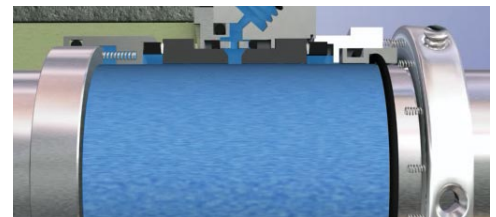
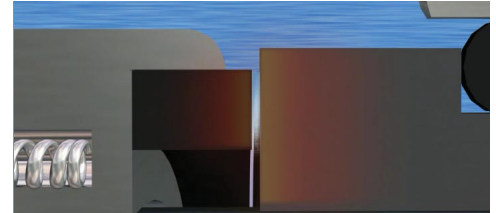
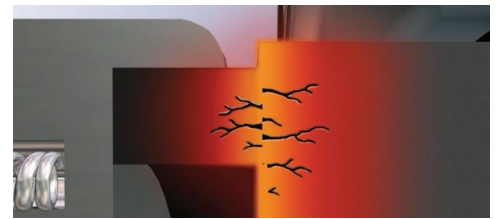
A single mechanical sealing device incorporates two flat faces, one fixed and one rotating, running against each other with a liquid film between them providing lubrication. This liquid film is commonly known as the fluid film. Without a stable fluid film between the faces they would be in full contact causing frictional heat build up and dry running, leading to excessive wear and component damage (Image 1). The key to successful sealing is the maintenance of a cool, clean and stable fluid film between the sealing faces (Image 2). This very thin, 2 - 3 micrometer, fluid film can be difficult to maintain and this is the primary challenge when sealing a pump application.

If a single mechanical seal is used then the process fluid becomes the fluid film. As long as the process fluid is an acceptable lubricant, is at an acceptable temperature and is not a dangerous substance, a single seal can be used.

Many process liquids are not, however, acceptable for cooling and lubricating the seal faces (Image 3). These fluids fall into the following categories:

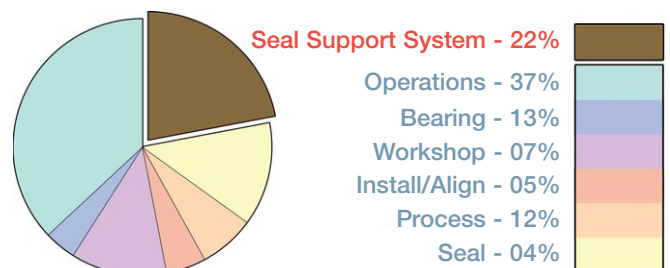
- Slurries.
- Hot liquids that can evaporate as the pressure drops across the faces.
- Cold liquids that can become very viscous or solidify.
- Liquids that crystallize as they contact atmospheric conditions.
- Liquids that coke as they contact atmospheric conditions.
- Liquids that leave a film or a deposit across the seal faces due to the heat generated between the faces.

All of the above conditions require a double mechanical seal with an external barrier fluid between the two sets of seal faces. The external barrier fluid must be at a higher pressure than the sealing chamber pressure to drive the clean, cool barrier fluid across the inboard seal faces rather than allowing the process fluid to cross the faces (Image 4).



# Reliability Enhancement

In April 2007 research was finalized on 11,000 mechanical seal failures recorded by all manufacturers worldwide over the previous two years. The results highlighted that inadequate Seal Support Systems contributed to 22% of these failures. AESSEAL technical support staff will recommend a reliable Seal Support System for your applications and remove this 22% failure risk.



Source: Stephen Flood, Performance Plus Ltd - "Mechanical Seal Reliability - What Realistically can Be Achieved?" presented at The Mechanical Sealing Technology Seminar, I Mech E, London, April 07

# Barrier Fluid Choice

## Water Barrier Fluid

Water is the best barrier fluid choice for cooling mechanical seal faces. Traditionally a quench to drain arrangement is used in industry to provide a higher pressure water barrier fluid to a double mechanical seal. This arrangement removes a significant amount of heat from the double mechanical seal but it has major pitfalls.

Operational demands in a plant impact upon the available pressure in the plant water line and can make it unstable.

This will interrupt the pressure and or supply of the water barrier fluid to the double mechanical seal and allow damaging process liquids to come back across the seal faces. The other issue is that the water exiting the seal is often sent to the drain, meaning there is both a cost to purchasing and to treating the water which will either return to the seal water ring main system or to its original source. A double mechanical seal running quench to drain can use 1.7 million gal (US) / 6.3 million litres of water annually per pump application so the cost implications can be significant.

The AESSEAL Systems Division has designed a range of Seal Support Systems known as Water Management Systems that provide a reliable water barrier fluid. Water will thermosyphon or convect which means the hotter, lower density water will rise while the cooler water sinks. Therefore, with water as a barrier fluid, the warm water will radiate heat from the seal through the System vessel to atmosphere and allow the colder water to move to the bottom of the vessel to be supplied to the mechanical seal (Figure 1).

A Water Management System will significantly increase the Mean Time Between Failure (MTBF) of the mechanical seal and in doing so increase plant uptime. The environmentally friendly Systems can reduce annual water consumption from 1.7 million gal (US) / 6.3 million litres, to 8.5 gal (US) / 32 litres. Therefore the systems significantly reduce or totally remove water consumption and costs.



Figure 1

## Oil Barrier Fluid

If the process is not compatible with water as a barrier fluid, an oil product can be used (e.g. a food grade or synthetic oil). In comparison to water, organics and oils have a much lower heat capacity and are less inclined to circulate (indeed some will not circulate at all). In this situation a number of options are available.

A mechanical seal with a pumping scroll (e.g. the AESSEAL DMSF™ double mechanical seal) can be used to move the oil through the mechanical seal more effectively when a Seal Support System is being used. Alternatively an in-line circulation pump can be used to circulate the oil barrier fluid to and from the mechanical seal. If the oil was not moved it could overheat at the mechanical seal and coke on the faces. An external gas source is required to pressurize the oil barrier fluid to the necessary 1 bar / 15 psi above seal chamber pressure. This is usually an external compressed air or nitrogen gas supply (Figure 2).

If the previous methods are not viable, an API plan 54 arrangement can be used with an AESSEAL Oil PUMPPAC™ System. This is a forced circulation system used to circulate the oil barrier fluid to and from the mechanical seal.

AESSEAL® offers a range of Oil Support Systems that can supply a reliable oil barrier fluid to the mechanical seal.

## Gas Barrier

When water or oil is not compatible with the process as barrier fluids an inert gas can be used. A pressurized gas supply will be fed between the faces of the mechanical seal to provide a clean barrier. Once the gas has passed between the seal faces it will be consumed by the process.

Nitrogen will normally be used as the gas barrier. The AESSEAL Gas Panel Seal Support System was designed to supply the gas barrier to the seal (Figure 3). The Gas Panel used in conjunction with the AESSEAL Mixmaster or Clip™ seal range forms an efficient and reliable Seal Support System on gas barrier applications. These applications are particularly common in the Chemical and Pharmaceutical markets where water or oil barrier fluid contamination of the process can be particularly costly.

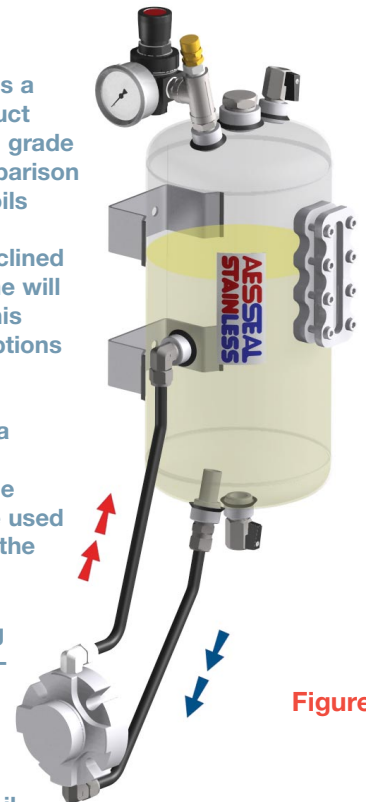


Figure 2



Figure 3



# Water Management Systems

The AESSEAL Water Management System Range connects to the plant water line to feed the mechanical seal with a clean, cool and stable water barrier fluid. Water Management Systems are self replenishing and pressurizing, being able to regulate down the pressure available in the plant water line. This is a reliable and cost saving Seal Support System method for a number of reasons:

- **INCREASE PLANT UPTIME AND MEAN TIME BETWEEN FAILURE (MTBF)**

The Water Management System Range reduces equipment downtime by increasing the MTBF of the mechanical seal. This reduces equipment down time.

- **REDUCE WATER USAGE AND COSTS**

Traditional quench to drain and flush seal support methods waste huge quantities of water (up to 1.7 million gal (US) / 6.3 million litres of water per seal application per year). Water Management Systems reduce this water consumption to as little as 8.45 gal (US) / 32 litres per seal application per year. This is a massive saving that will reduce water purchase and effluent treatment costs.

- **FAST RETURN ON INVESTMENT (ROI)**

The reduction in down time and water / energy / operator costs means that there is a very efficient ROI with Water Management Systems. A typical ROI when installing an AESSEAL Water Management System and mechanical seal is 6-9 months.

- **ENVIRONMENTALLY FRIENDLY**

The reduction in the use of water and energy means that Water Management Systems will make the customer's manufacturing process more environmentally friendly and reduce your carbon footprint.

- **REDUCE OPERATOR COSTS**

Water Management Systems are largely maintenance free and free up operator / maintenance resources for other areas of the plant.

- **REDUCE ENERGY USAGE AND COSTS**

Water Management Systems restrict the amount of water migrating across the seal faces into processes that require evaporation during the manufacturing process.



Photo Courtesy of Hawkeye Renewables

# Water Technology Ladder

The Water Technology Ladder shows the progression of Technology within the company's Water Management System Range.



FDU™



SWC™



SWFF-TF™



SW Range



SWM™ & SWP™



FLOWTRUE®



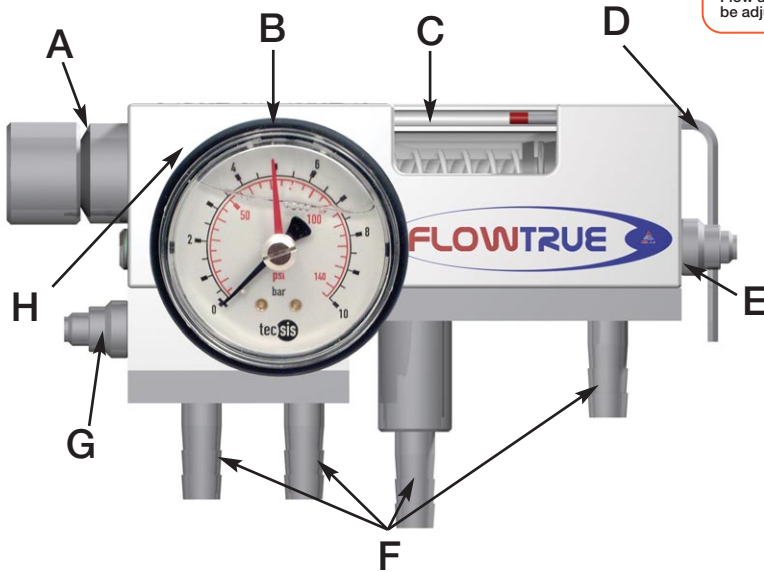
Cyclone Separator

# FLOWTRUE®



The AESSEAL FLOWTRUE® is a robust and adjustable flow meter that controls the amount of water flowing to the mechanical seal for cooling purposes. The unique and advanced FLOWTRUE® design means that of all the flow meters available it is the least likely to clog. This is due to large internal clearances within the design. There are three models of the FLOWTRUE® available, which enables the product to be used on packing applications, single seals and double mechanical seals.

Features	Benefits
Flow cartridge design	Cartridge has a tapered design which gives larger clearances. This means that it is less likely to clog than competitor models
Unique segmental valves	There are larger clearances within the FLOWTRUE® flow control valve. This means that it is less likely to clog than competitor models
Innovative flow tube cleaning mechanism	FLOWTRUE® can be cleaned without interrupting flow or pressure
Integrated non-return valve	Protects the plant water supply from product contamination
Modular design	Ensures that the FLOWTRUE® can be easily upgraded and repaired
Flow and pressure controls can only be adjusted by using an allen key	Restricts the opportunity for accidental adjustment of flow or pressure by operators



Label	Description	Purpose
A	Cartridge Assembly	The heart of the system, also contains the cleaning function
B	Pressure Gauge	Indicates the pressure of the water at the mechanical seal (double seal models only)
C	Flow Channel	Gives details of the flow of water through the FLOWTRUE®
D	Valve adjustment key	Used to adjust the flow and pressure control valves
E	Flow Control Valve	Controls the volume of water flowing through the FLOWTRUE®
F	Water Connections	Connects the FLOWTRUE® to the mechanical seal and water feed
G	Pressure Control Valve	Controls the pressure of the water at the seal (double seal models only)
H	Polyacetal standard white body material	Maximum temperature 80°C / 176°F, Maximum Pressure 25 bar / 360 psi

## FLOWTRUE® Product Range

**FT - FLOWTRUE® for packing and single seals (push on connections).**



**FTP - FLOWTRUE® with pressure gauge for packing and single seals (push on connections).**



**FTPB - FLOWTRUE® with pressure gauge and back pressure control valve for double mechanical seals (push on connections).**



**FT-SC - FLOWTRUE® for packing and single seals (screwed connections).**



**FTP-SC - FLOWTRUE® with pressure gauge for packing and single seals (screwed connections).**



**FTPB-SC - FLOWTRUE® with pressure gauge and back pressure control valve for double mechanical seals (screwed connections).**





# FLOWTRUE®

## Selection Guide

Below are five steps to follow in order to select a FLOWTRUE® from the price list. Optional extras are ordered as separate items.

### STEP 1 - Selection of base model

FLOWTRUE® Base Model	(Code)
For use with packed glands and single seals without pressure gauge	FT-XX
For use with packed glands and single seals with pressure gauge	FTP-XX-YYY
For use with double mechanical seals, with pressure gauge, with back pressure valve	FTPB-XX-YYY

### STEP 2 - Selection of flow range

Flow Range	(XX)
0.1 - 0.4 gpm (0.5 - 1.5 l/min)	04
0.2 - 0.8 gpm (0.5 - 3.0 l/min)	08
0.25 - 2.0 gpm (1.0 - 8.0 l/min)	20
1.0 - 4.0 gpm (2.0 - 15 l/min)	40

### STEP 3 - Selection of pressure range

Pressure Gauge Range	(YYY)
No gauge	
0 - 145 psi (0 - 10 bar)	145
0 - 360 psi (0 - 25 bar)	360

### STEP 4 - Selection of main body material

Material	Max Temperature	Max Pressure	Coding
Polyacetal (standard)	80°C (176°F)	25 Bar (360 psi)	
Polyethylene	60°C (140°F)	10 Bar (145 psi)	PE

### STEP 5 - Selection of connections

Connection	Coding
10mm Push-on (standard)	
Screwed connections 1/4" NPT	SC

### Optional Extras

Stock Code	Description
FLOWTRUE® mounting options	
FT-BRKT	Mounting bracket for push on connection models, Stainless Steel
FT-BRKT-SC	Mounting bracket for screwed connection models, Stainless Steel
FT-STAND	Floor mount stand, 316 Stainless Steel

Inductive Alarm	
FT-ALARM-AC250	AC 20-250 volts
FT-ALARM-DC55	DC 10-55 volts

Hose kit for push-on connection models	
FT-HSK-FT	1 off 3/8" (10mm) ID Hose x 5ft (1.5m) & SS seal fittings - FT & FTB model
FT-HSK-FTPB	2 off 3/8" (10mm) ID Hose x 5ft (1.5m) & SS seal fittings - FTPB model

Hose kit for screwed connection models	
FT-HSK-FT-04	1 off 1/2" OD Hose x 5ft (1.5m) & 2 SS compression fittings & 1 SS seal fitting
FT-HSK-FTPB-04	2 off 1/2" OD Hose x 5ft (1.5m) & 4 SS compression fittings & 2 SS seal fittings
FT-HSK-FT-12	1 off 12mm OD Hose x 5ft (1.5m) & 2 SS compression fittings & 1 SS fitting
FT-HSK-FTPB-12	2 off 12mm OD Hose x 5ft (1.5m) & 4 SS compression fittings & 2 SS seal fittings

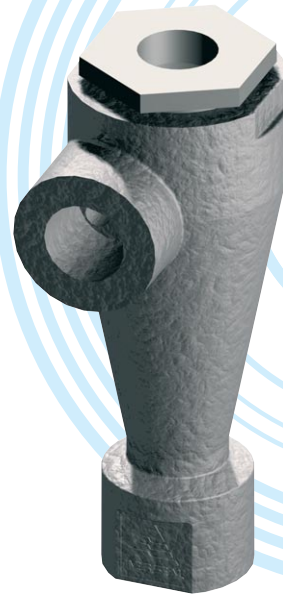
Order Example - FLOWTRUE® with back pressure valve, with pressure gauge for double seals, 0.2-0.8 gpm, 0-360 psi, Polyacetal body, Threaded connections = FTPB - 08 - 360 - SC.

Order Example - FLOWTRUE® without pressure gauge, for single seals, 0.1-0.4 gpm Polyethylene body, Push-on connections = FT - 04 - PE.

# Cyclone Separator

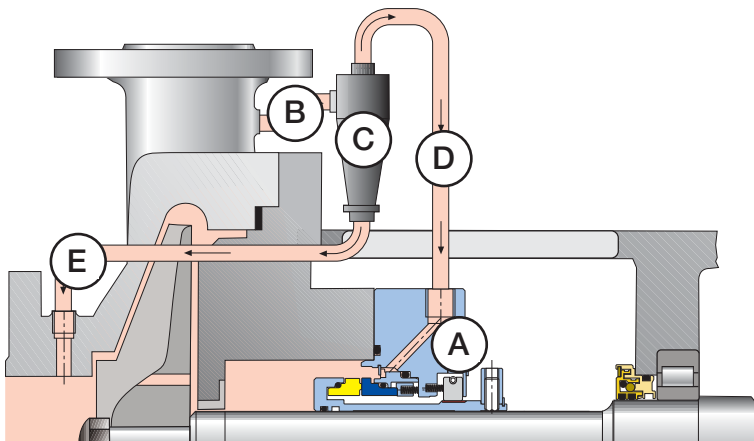


The CYCL™ (Cyclone Separator) is designed to separate heavy particles from the product liquid. The clean fluid is ideal for use as flush liquid, improving conditions at the seal faces. The separated particles drain back into the sealed product. The benefit is a reliable and low cost sealing system for heavy product particle applications which does not require an independent flush supply.



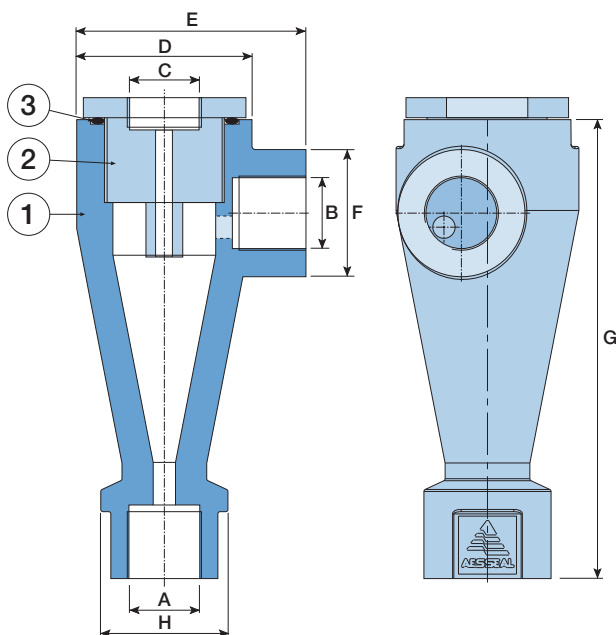
1. AESSEAL Cyclone Separator

## CYCL™ - Operation



Item	Description
A	Mechanical seal
B	Dirty product liquid pressure feed
C	Cyclone separator
D	Clean product liquid (Mechanical seal flush fluid)
E	Dirty product liquid return to pump suction

## CYCL™ - Items and Sizing



### CYCL™ - Parts List

Item	Description
1	Cyclone separator body
2	Hex. reducing bush
3	Dowty washer

### CYCL™ - Key interface dimensions, mm (inches)

Style	Ø A, B, C	Ø D	Ø E	Ø F	Ø G	Ø H
316 SS Duplex	1/2" NPT	46mm 1.89"	66mm 2.60"	35mm 1.38"	118mm 4.65"	35mm 1.38"
316 SS Duplex	1" NPT	82mm 3.20"	106.5mm 4.09"	57mm 2.20"	220mm 8.7"	57mm 2.20"

# SWM™ & SWP™

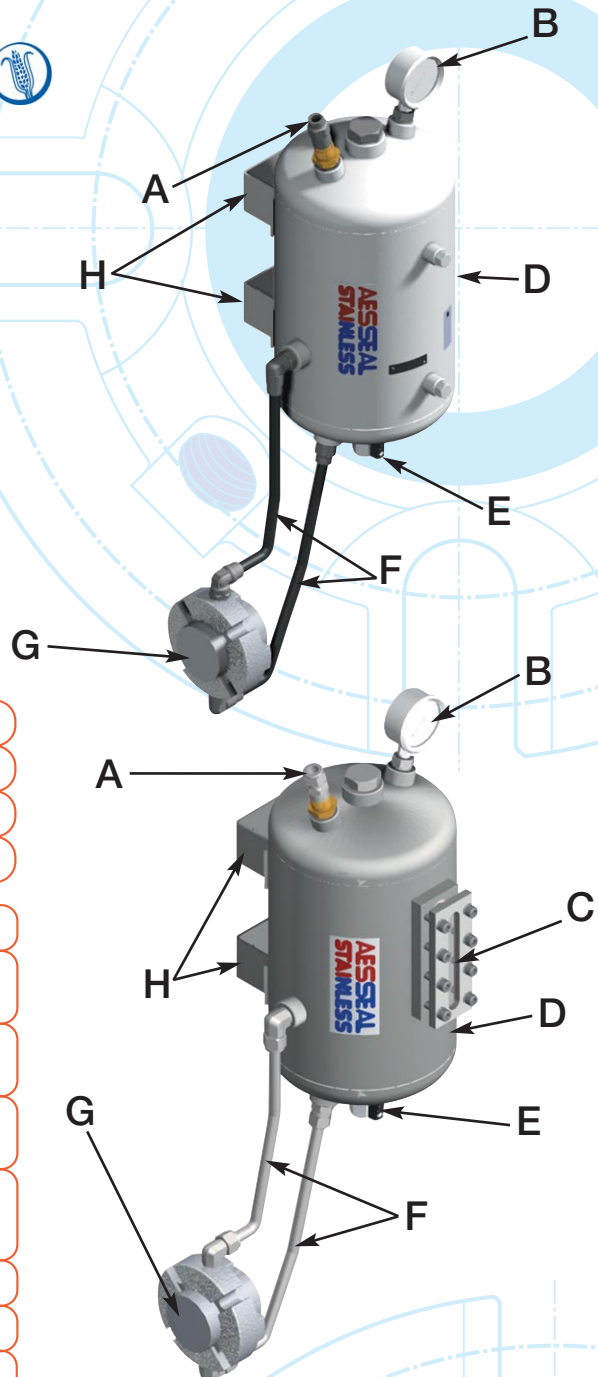


The SWM™ (System Water Management) & SWP™ (System Weld Pad) are closed loop Water Management Systems. These Systems operate at the maximum pressure available in the plant water line (i.e. if the plant water line pressure is 45 psi / 3 bar the pressure of the barrier fluid in the tank will be the same). A check valve is supplied as part of the System, which ensures that the plant water line does not become contaminated with process and also ensures that the barrier fluid pressure remains at the maximum available from the plant water line even if the water line pressure fluctuates (e.g. if a plant operator uses a hose and reduces the plant water line pressure, the barrier fluid pressure in the SWM™ or SWP™ is not effected). Barrier fluid is circulated from the System to the seal and back to the System via the thermosyphon effect (see operating principle below).

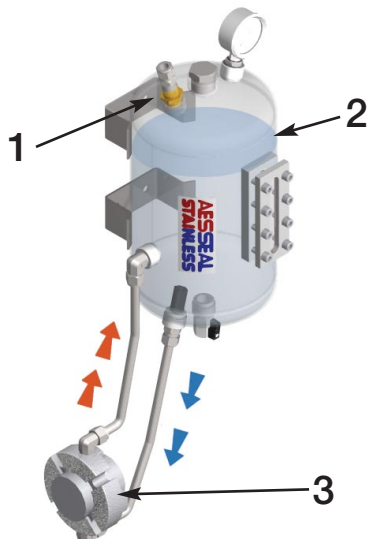
The SWP™ system incorporates a robust weld pad level gauge (SWP™ only) which allows an industrially acceptable visual indication of barrier fluid level.

Features	Benefits
304 SS vessel construction	Suitable for a range of challenging environments
Non-return valve	Protects plant water supply from potential contamination and maintains vessel pressure in the event of supply interruption
Weld pad level gauge (SWP™ only)	Robust and industrially acceptable visual indication of barrier fluid level

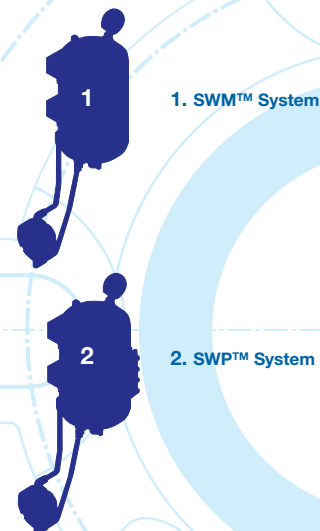
Label	Description	Purpose
A	Check valve	Protects against process entering the plant water line and protects the barrier fluid pressure against fluctuations in plant water line pressure
B	Pressure Gauge	Displays the barrier fluid pressure in the system
C	Weld Pad Level Gauge (SWP™ only)	Visual indication of barrier fluid level in the Vessel
D	Vessel - (304 SS Construction, 10 litre / 2.64 gal (US) capacity (SWM™), 12 litre / 3 gal (US) weld pad type (SWP™), both with 14 bar / 203 psi pressure limit 100°C / 212°F temperature limit)	Dissipates the heat from the barrier fluid to atmosphere
E	Drain Valve	Drain barrier fluid from the system
F	Mechanical seal feed and System return lines	Supplies barrier fluid to the mechanical seal and back to the system
G	Mechanical seal	Not supplied as part of the SWM™ or SWP™ Systems
H	Mounting brackets	Securely mounts the SWM™ or SWP™ Systems



## Operating Principle



1. Water from the plant water line enters the System.
2. Barrier fluid pressure will be the maximum pressure available from the plant water line.
3. The barrier fluid is circulated to the seal and back to the System by the thermosyphon effect.





# SW Range

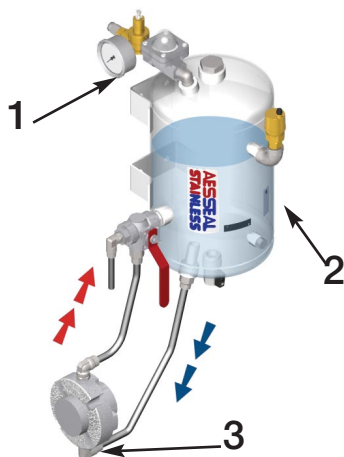


The SW Range consists of the SW2™ and SW3™ Water Management Systems. The environmentally friendly SW Range Systems connect directly to the plant water line. Using the pressure regulator supplied, the plant water line pressure can be adjusted so that the Systems barrier fluid pressure is set at 1 bar / 15 psi above stuffing box pressure. The flow indicator allows a visual indication of mechanical seal upset or failure. The SW3™ is supplied with finned tubing as standard so that it can be used on high heat applications. Barrier fluid is circulated to and from the mechanical seal via the thermosyphon effect.

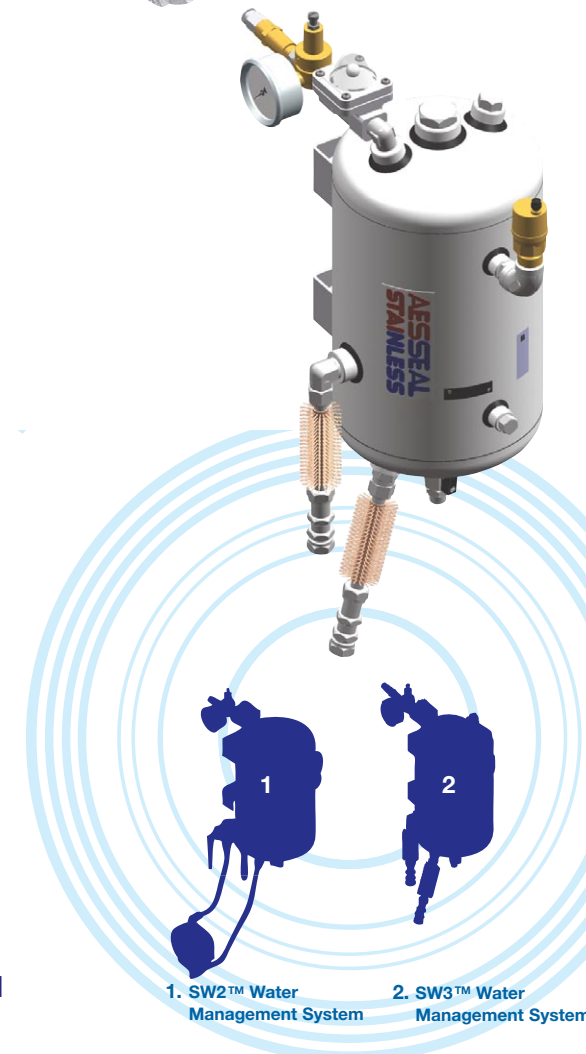
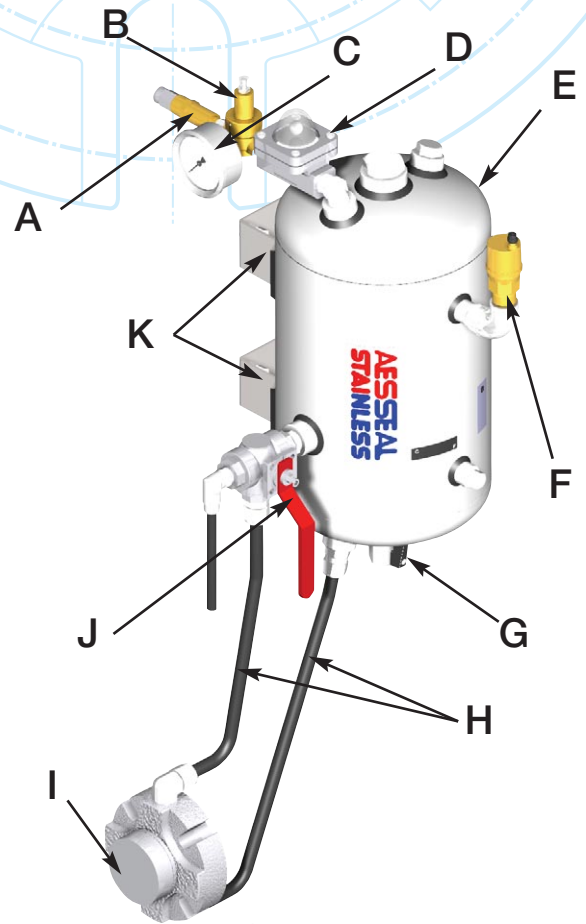
Features	Benefits
304 SS vessel construction	Suitable for a range of challenging environments
Water regulator	Maintains vessel water level and pressure
Flow indicator	Visually alerts the user of an inboard seal failure
Non-return valve	Protects plant water supply from potential contamination and maintains vessel pressure in the event of water supply interruption
Supplied as a complete system	The SW Range have all the components necessary for fast and easy installation

Label	Description	Purpose
A	Non-Return Valve (Brass)	<ul style="list-style-type: none"> <li>Protects plant water supply from potential contamination from the process.</li> <li>Protects the barrier fluid from pressure fluctuations in the plant water line</li> </ul>
B	Pressure Regulator (Brass, Max outlet pressure 10 bar / 150 psi)	<ul style="list-style-type: none"> <li>Regulates the plant water line pressure so it can be set at 1 bar / 15psi above stuffing box pressure</li> <li>Automatically Replenishes lost water and re-sets barrier fluid pressure if there is a mechanical seal upset</li> </ul>
C	Pressure Gauge (Brass)	<ul style="list-style-type: none"> <li>Displays the pressure of the barrier fluid in the SW2™ system</li> </ul>
D	Flow Indicator (SS)	<ul style="list-style-type: none"> <li>Provides a visual indication of a mechanical seal upset (White ball will become visible)</li> </ul>
E	Vessel- (304 SS Construction 10 litre / 2.64 gal (US) capacity, 25 litre / 6.60 gal (US) option, 14 bar / 203 psi pressure limit, 100°C temperature limit)	<ul style="list-style-type: none"> <li>Dissipates the heat from the barrier fluid to atmosphere</li> </ul>
F	Air Vent Valve (Brass)	<ul style="list-style-type: none"> <li>Ensures that a sufficient air pocket is left at the top of the system to allow for thermal expansion during operation</li> </ul>
G	Drain Valve (Nickel Plated Brass)	<ul style="list-style-type: none"> <li>When this is opened it cleans out any sediment at the bottom of the vessel. When it is closed again the pressure regulator will replenish any water lost and bring the SW2™ back up to pressure</li> </ul>
H	Mechanical seal feed and return lines	<ul style="list-style-type: none"> <li>Supplies barrier fluid to and from the mechanical seal</li> </ul>
I	Mechanical seal	<ul style="list-style-type: none"> <li>Not supplied as part of the SW Range</li> </ul>
J	3-way valve (SW2™ only Brass)	<ul style="list-style-type: none"> <li>Enables the flushing of the seal for cleaning purposes</li> <li>Is the point where barrier fluid returns to the System</li> </ul>
K	Mounting Brackets	<ul style="list-style-type: none"> <li>Securely mounts the SW Range</li> </ul>

## Operating Principle



1. Water from the plant water line enters the System.
2. The pressure of the barrier fluid in the vessel can be regulated via the pressure regulator
3. The barrier fluid is circulated to the seal and back to the System by the thermosyphon effect.



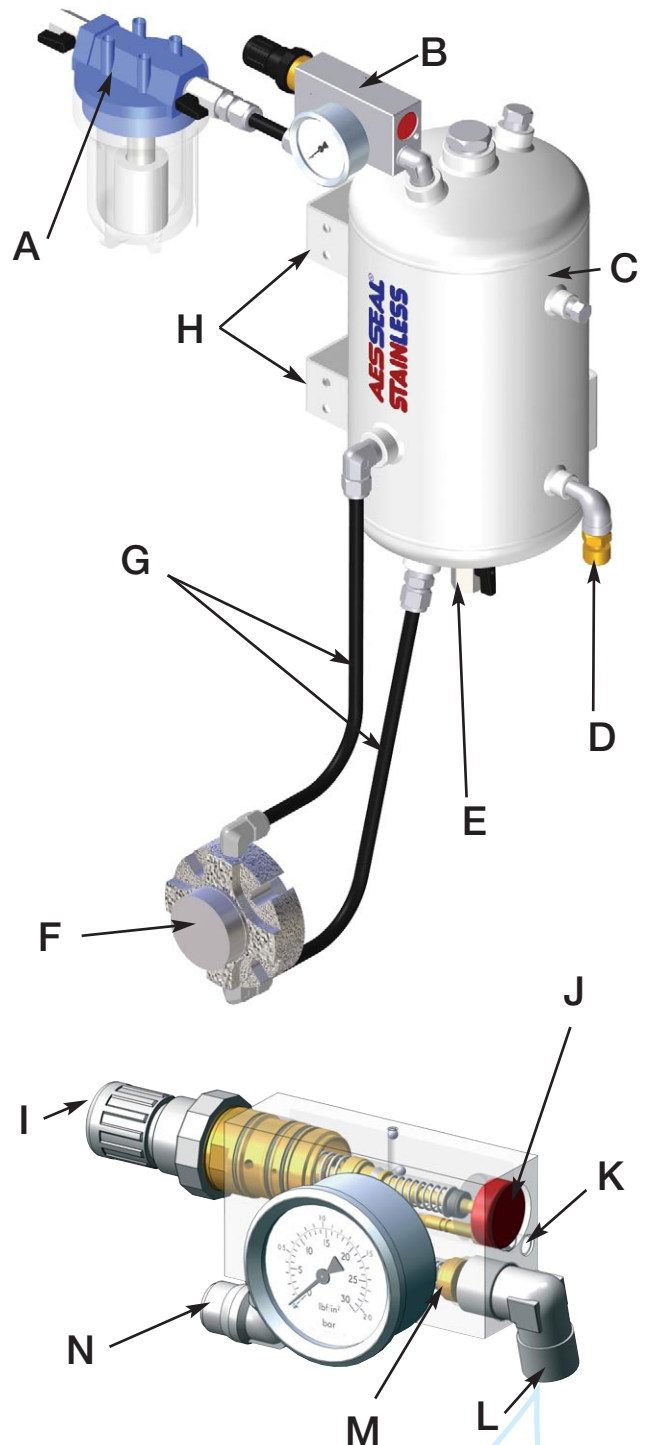
# SWFF-TF™



The intelligent SWFF-TF™ System incorporates the Flow Fuse™ and Thermal Fuse™ products:

- The Flow Fuse™ is designed to restrict barrier fluid contamination of the process upon momentary or permanent seal failure. The Flow Fuse™ does this by shutting off the plant water supply when it detects an abnormally high flow of water. This abnormal flow will be the result of the momentary or permanent seal failure. The Flow Fuse™ product has two operating functions. These are manual-reset and auto-reset. In manual-reset the Flow Fuse™ will completely shut off the plant water supply upon the detection of seal failure and the only way to reset the Flow Fuse™ is manually. Manual-reset is most suited to applications where barrier fluid contamination of the process cannot be tolerated. In auto-reset mode, upon seal failure the Flow Fuse™ will shut off the plant water supply but allow a small volume of water to continue to pass through. If the seal failure is momentary (e.g. temporary parting of the seal faces) the Flow Fuse™ will automatically reset itself to the original operating pressures once the seal failure has been resolved.
- The Thermal Fuse™ is a pressure relief valve designed to relieve the System of pressure build up as a result of a temperature increase.

Features	Benefits
Flow sensing shut off valve	Protects the process from barrier fluid contamination upon catastrophic seal failure
Water regulator	Maintains water level and pressure, which reduces due to normal seal operation
Automatic re-set facility	Protects the mechanical seal from running dry during process up-sets
Thermal relief valve	Maintains systems pre-set pressure by accommodating any thermal expansion



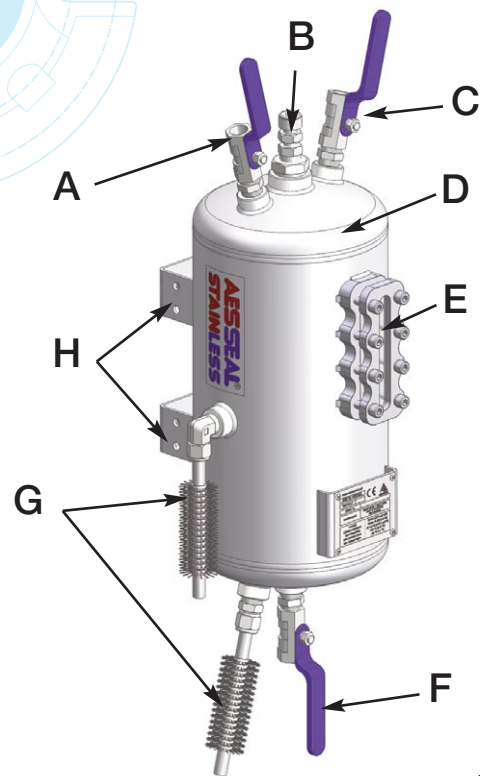
Label	Description	Purpose
A	In-line filter (1 micron)	Cleans plant water before it fills the vessel
B	Flow Fuse™ (Nickel plated brass construction)	Heart of the SWFF-TF™ System
C	Vessel - (304 SS construction 10 litre / 2.64 gal (US) capacity, 25 litre / 6.60 gal (US) option 14 bar / 203 psi pressure limit 100°C / 212°F temperature limit)	Dissipates the heat from the barrier fluid to atmosphere
D	Thermal Fuse™ (Brass)	Will relieve the system of excess pressure build up as a result of a temperature increase
E	Drain valve (Nickel plated brass)	Drains any sediment from the SWFF-TF™
F	Mechanical seal	Seals the pump equipment (not supplied as part of the SWFF-TF™)
G	Seal feed and return lines	Carries barrier fluid to and from the mechanical seal
H	Mounting brackets	Provides a secure and stable mounting for the SWFF-TF™ system
I	Pressure regulator	Regulates the plant water line pressure to 2 bar / 30 psi above seal chamber pressure
J	Activation indicator and manual reset button	When the red button moves outside the Flow Fuse™ casing it shows that it has been activated. The button needs to be pushed in to refill the vessel in manual reset mode
K	Automatic reset adjusting screw	When screw is fully screwed in the Flow Fuse™ will be in manual reset mode. When it is screwed out it will be in auto reset mode
L	Flow Fuse™ vessel inlet	Is the point where the Flow Fuse™ connects to the system vessel
M	Integral check valve	Protects the plant water supply from potential contamination from the process
N	Plant water inlet	Is the point where the plant water line is connected to the Flow Fuse™

# SWC™



## Condensate System

The SWC™ Condensate System is an easily installed, low cost and low maintenance Seal Support System for use with double mechanical seals on condensate applications. Uniquely, the SWC™ uses the pump discharge line (API Plan 11) to maintain the pressure and level of the barrier fluid in the vessel (API Plan 53A - Figure 1). The API Plan 11 feed cools down once it reaches the vessel and is carried to and from the mechanical seal via the thermosyphon effect. This greatly increases the expected life of the mechanical seal on condensate applications and therefore increases plant up time and reduces running costs, such as the cost of cooling water to drain. When purchased the SWC™ is supplied as a complete System with finned tubing, weld pad vessel, thermal relief valve and fittings as standard to aid fast and direct connection to the mechanical seal.



Features	Benefits
Level and pressure maintained by pump discharge	Eliminates the need for an external water and/or pressure source
Uses the thermosyphon effect	Eliminates the need for forced circulation
Finned tubing	Enhances the surface area for barrier fluid cooling and eliminates the need for secondary cooling through heat exchangers

Label	Description	Purpose
A	Pump discharge feed	Is the point where condensate is piped in from the pump discharge
B	Thermal relief valve (Brass on SWC-12™ and SWC-25™, SS on the SWC-15™)	Relieves pressure from SWC™ upon build up due to temperature increase
C	Fill valve	Is the point for cold water initial fill of SWC™ prior to pressurisation with condensate from pump discharge
D	Vessel - (304 SS Construction on SWC-12™ and SWC-25™ and 316 SS on SWC-15™)	Dissipates the heat from the barrier fluid to atmosphere
E	Weld pad level gauge	Visual indication of barrier fluid level in the SWC™
F	Drain valve	Allows the draining of barrier fluid from the SWC™
G	Finned tubing	Increases the surface area for barrier fluid cooling
H	Mounting brackets	Securely mounts the SWC™ System

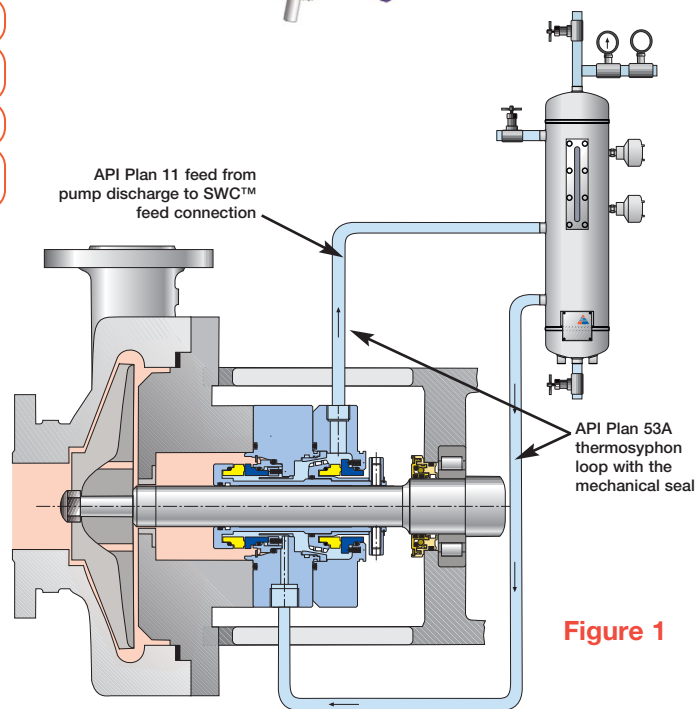
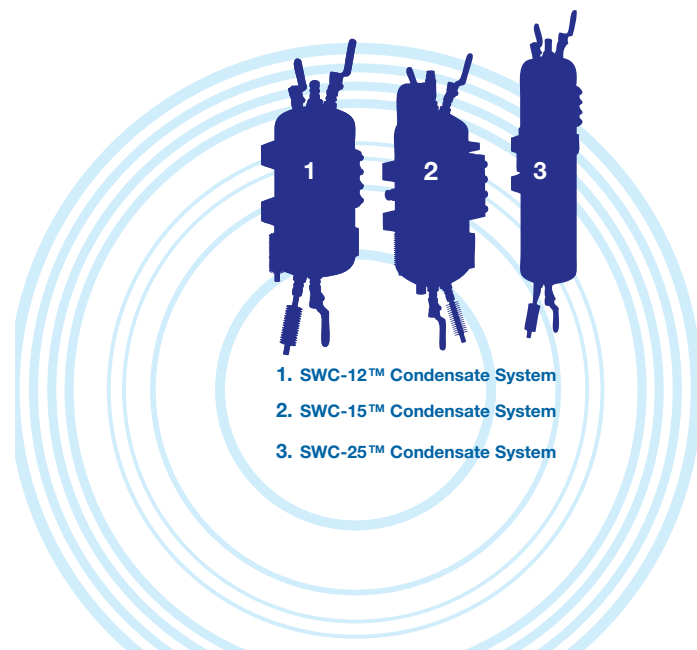
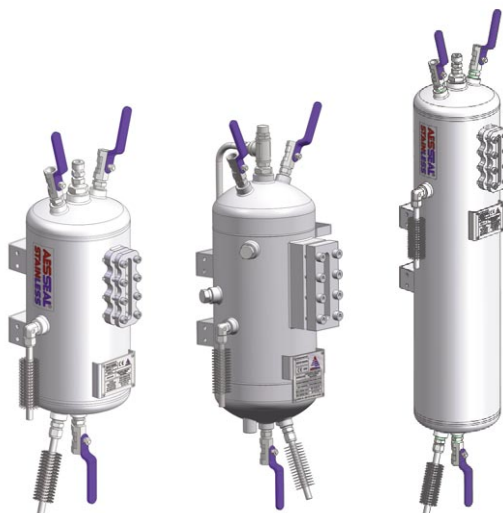


Figure 1

### SWC™ Condensate System Range



1. SWC-12™ Condensate System
2. SWC-15™ Condensate System
3. SWC-25™ Condensate System



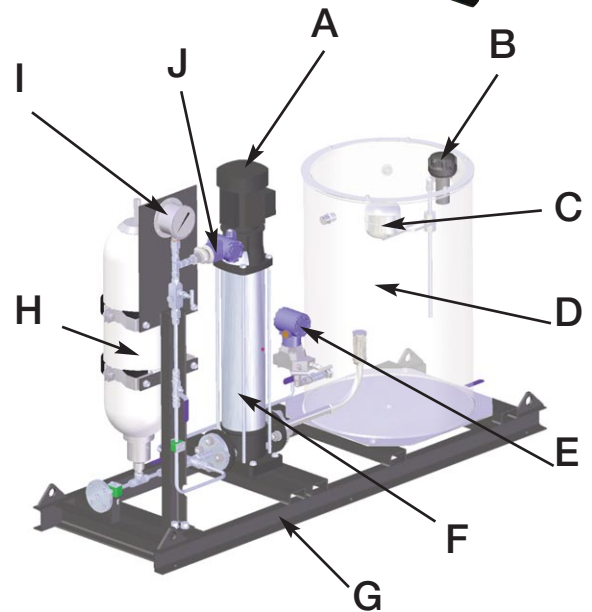
# FDU™



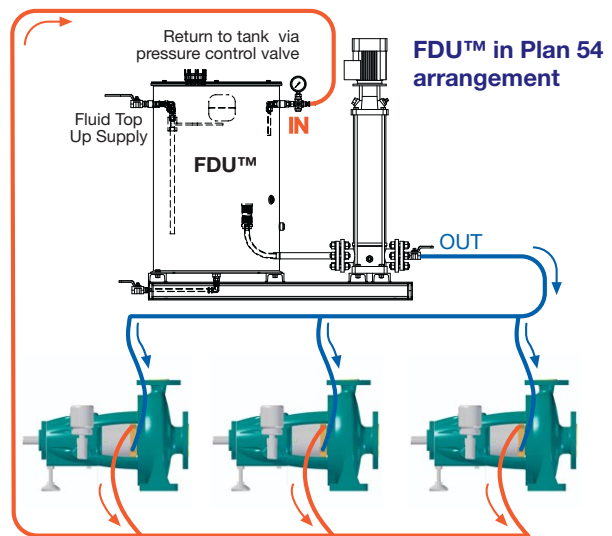
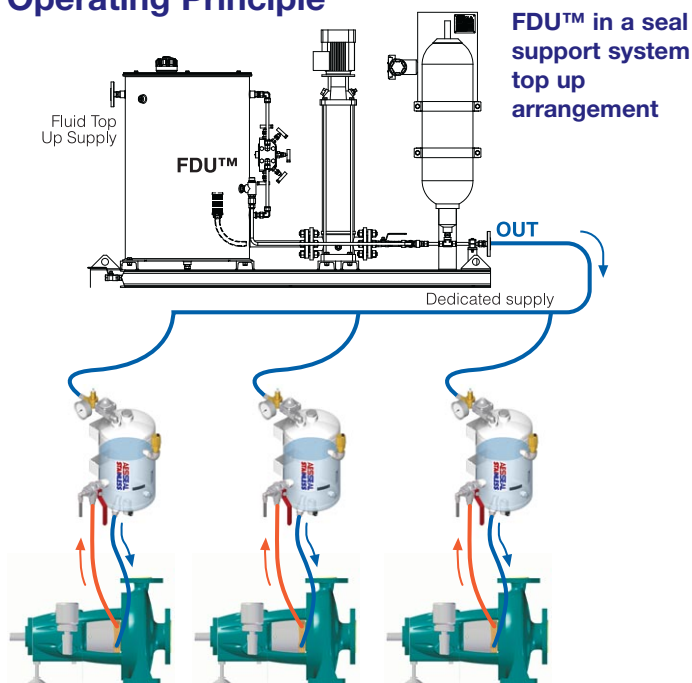
The AESSEAL FDU™ (Fluid Distribution unit) is an efficient and high performance forced circulation PUMPPAC™ system. The product was developed to meet the requirements of the API Plan 54 piping plan, which maximizes heat dump potential for more arduous pump applications. The FDU™ is adaptable to a wide range of industry applications with the fitting of additional equipment (optional: accumulator, level switch/transmitter and pressure switch/transmitter). Please note that both oil and water can be used with the FDU™.

Features	Benefits
Independent pressurized Fluid supply system	Removes the expense of piping a pressurized clean water / oil supply to a new area of the plant
Can feed a number of Seal support systems	Removes the expense of purchasing one system per mechanical seal
Optional pressure switch and accumulator	Enables greater control of water / oil line pressure from the FDU™
Reduced energy consumption	The system can be operated intermittently to reduce energy costs via dead-ended piping

Label	Description	Purpose
A	Motor (three phase, cast iron housing, 50/60hz, IP55)	Drives the pump
B	Filler Cap (plastic, breather type)	Filling point for tank
C	Float control valve	Re-fill mechanism for tank
D	Tank (304SS, 180 litre / 48 gal (US) capacity)	Large volume ensures ample barrier fluid supply
E	Optional level switch/transmitter	Warns of low barrier fluid level in tank
F	Pump (vertical multistage centrifugal, cast iron head, 316SS wetted parts, 16.6 litre / 4.4 gal (US) or 5 litre / 1.3 gal (US) capacity options)	Pump barrier fluid to systems
G	Platform (carbon steel, powder coated)	Platform for all FDU™ components
H	Optional accumulator (bladder type, body carbon steel, capacity 20 litre / 5.3 gal (US) capacity, 20 bar / 290 psi max operating pressure)	Holds pressure in top up arrangement
I	Pressure gauge (0-25 bar / 0-363 psi)	Displays the barrier fluid / top up pressure
J	Optional pressure switch/transmitter	Warns of drop in barrier fluid / top up pressure



## Operating Principle



The diagram to the left illustrates how the FDU™ can supply multiple seal support systems. The diagram above illustrates how the FDU™ can supply multiple seals in a closed loop operation.



# AESSEAL

## Oil Support Systems

AESSEAL® designs and manufactures a range of reliable and innovative Oil Support Systems. These Systems utilize an inert gas feed (usually nitrogen) to pressurize the barrier fluid. Whilst all of these Systems are primarily designed to be used with oil as a barrier fluid, water and oil / water mixes can also be used as a barrier fluid with a number of the Systems in the Oil Support System Range (i.e. SP Range, AES-15™, AES-FV™ and AES-28™).

### ○ INCREASE PLANT UPTIME AND MEAN TIME BETWEEN FAILURE (MTBF)

The Oil Support System Range increases the life of sealing equipment. This reduces equipment repair and down time.

### ○ WIDE CHOICE OF BARRIER FLUID

Different oils can be used as barrier fluids on all Systems. Some of the Systems in this section will also allow water to be used as a barrier fluid.

### ○ INCREASED SAFETY

The pressurized oil barrier fluid will stop hazardous products escaping to atmosphere.

### ○ ENHANCED LUBRICATION FOR SEAL FACES

Oil acts as an excellent lubricant for the mechanical seal faces.

### ○ HIGHER TEMPERATURE AND PRESSURE APPLICATIONS

The physical properties of oil allow it to be utilized as a barrier fluid on high temperature / pressure applications.

# Oil Technology Ladder

The Oil Technology Ladder shows the progression of Technology within our Oil Support System Range

PP/01™



AES-28™



PP/SOU™



AES-15™ & AES-FV™



SP Range



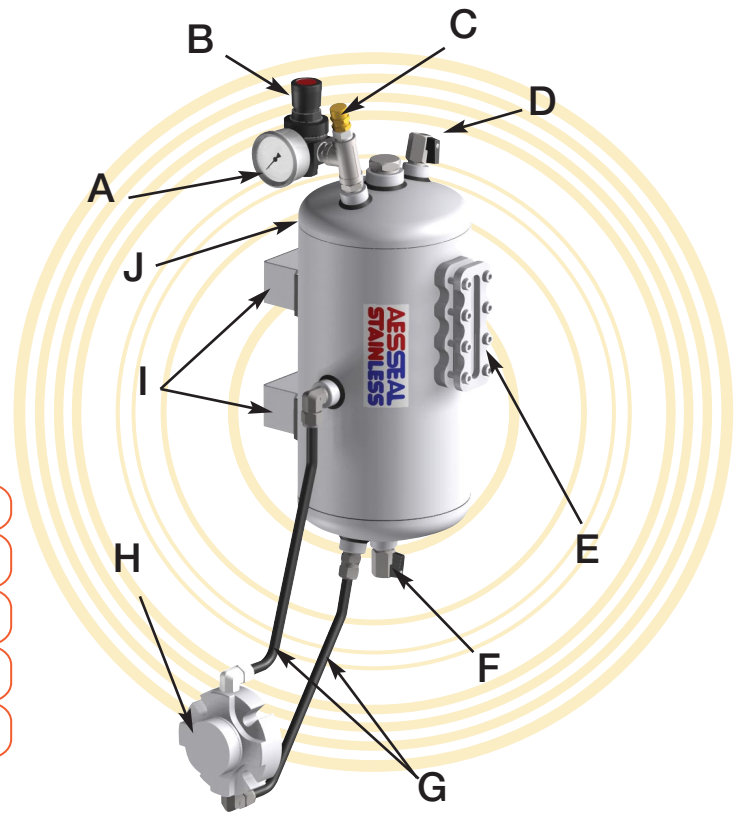
# SP Range



The SP Range consists of the SP1™, SP2™ and SP3™ Systems. The SP1™ is a non-pressurized Buffer System modelled on the API plan 52 piping plan. The SP2™ and SP3™ Systems are modelled on the API 53A piping plan. The SP3™ has the addition of finned tubing so that it has extra surface area to operate on high heat applications. All vessels are designed and manufactured in accordance with ASME VIII Div.1 and certified by TÜV to cover PED requirements.

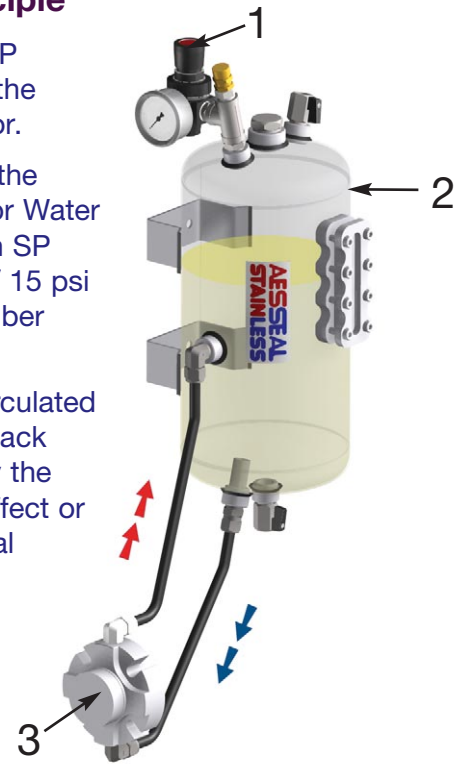
Features	Benefits
Integral 304 SS weld pad level gauge	Robust and industrially acceptable visual indication of barrier fluid level
304 SS vessel construction	Suitable for a wide range of arduous environments
Satin bead blast finish	Suitable for a wider range of industrial environments
Available with / without cooling coil	Adaptable to wider range of equipment arrangements

Label	Description	Purpose
A	Pressure Gauge	Displays the pressure of the barrier fluid inside the System
B	Pressure Regulator	Regulates the pressure of the inert gas source feeding the SP2™ System
C	Pressure relief Valve	Protects against pressure build up in the System
D	Fill valve	Fills the vessel with barrier fluid prior to pressurization
E	Weld Pad level Gauge, 304 SS Construction	Gives a visual indication of barrier fluid level in the system
F	Drain Valve	Can be used to drain the vessel
G	Seal Feed & Return Lines	Carries barrier fluid to and from the seal
H	Mechanical Seal	Not supplied as part of the system
I	Mounting brackets	Used to mount the system so it is free from vibration and in close proximity to the seal. We recommend the use of an AESSEAL® mounting stand for mounting this system
J	Vessel (304 SS Construction, 12 litre / 3 gal (US) capacity, 25 litre / 6.60 gal (US) option, 14 bar / 203 psi pressure limit, 100°C / 212°F temperature limit)	Dissipates the heat of the barrier fluid to atmosphere

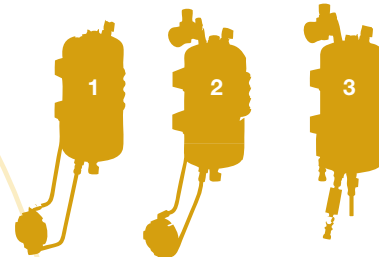
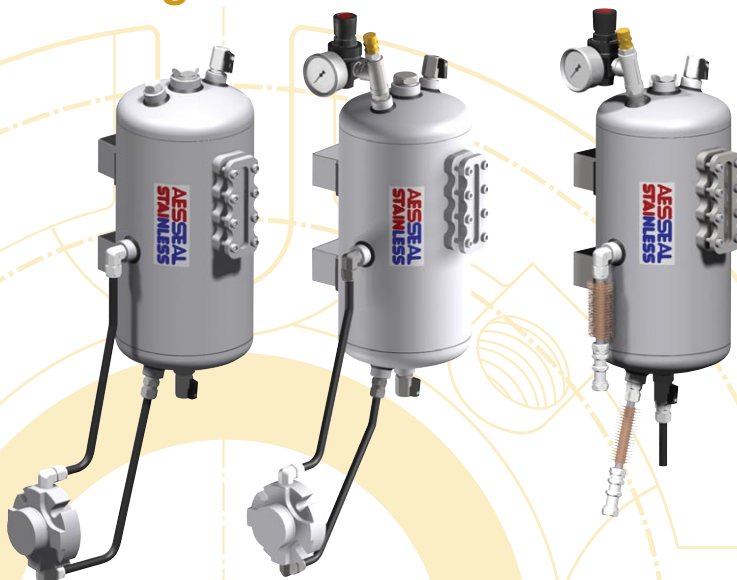


## Operating Principle

1. Gas enters the SP System through the pressure regulator.
2. Gas pressurizes the barrier fluid (Oil or Water can be used with SP Range) to 1 bar / 15 psi above seal chamber pressure.
3. Barrier fluid is circulated to the seal and back to the System by the thermosyphon effect or by a bi-directional pumping ring.



## SP Range



1. SP1™ Buffer System
2. SP2™ System
3. SP3™ System

# AES-15™

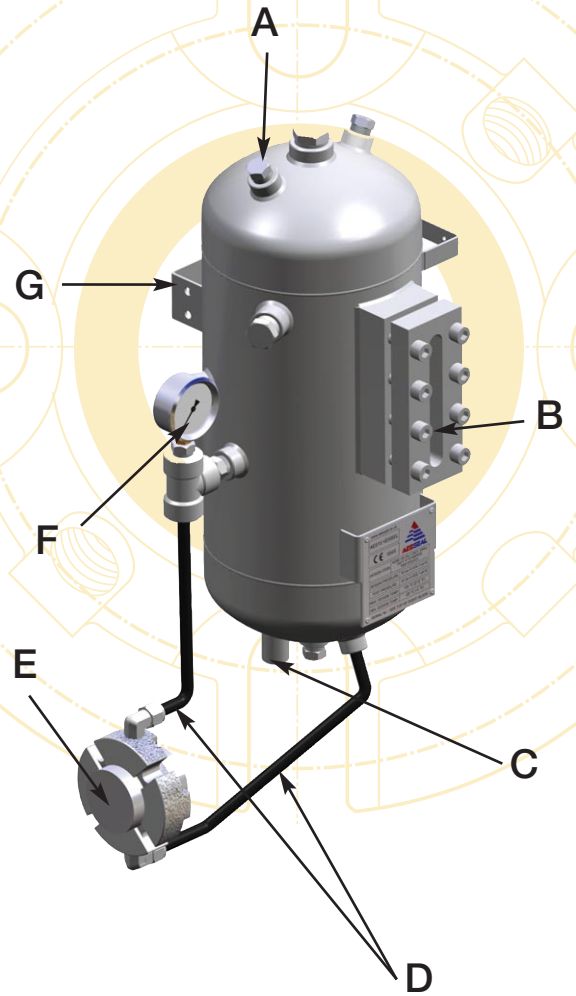


The AES-15™ vessel forms the core of a robust, low maintenance and highly reliable Seal Support System. The vessel is constructed from 316 stainless steel and is designed to meet the high end needs of the Chemical, Pharmaceutical and Petrochemical industries. A Cooling Coil is supplied as standard with the vessel.

The AES-15™ can operate at pressures up to 30 bar / 435 psi and temperatures up to 200°C / 392°F. Both oil and water can be used as barrier fluids with the AES-15™, ensuring its compatibility with a wide range of industrial pump applications.

Features	Benefits
316 SS vessel construction	Robust vessel suitable for a range of challenging environments
Vessels are designed and manufactured in accordance with ASME VIII Div.1 and PED 97/23/EC	Suitable for a wide range of arduous environments. Design rating 30 bar @ 200°C / 435 psi @ 392°F
Enhanced modular design	Available in threaded as standard or flanged construction
Cooling Coil as standard	Additional cooling available for high heat applications

Label	Description	Purpose
A	Vessel (316 SS 15 litre/ 3.96 gal (US) )	Dissipates heat of the barrier fluid to atmosphere
B	Weld pad level gauge (316 SS construction)	Visual indication of barrier fluid level in the vessel
C	Cooling coil connections (Cooling coil supplied as standard with the AES-15™)	Cooling coil provides additional cooling of the barrier fluid
D	Mechanical seal feed and AES-15™ return lines	Supplies barrier fluid to the mechanical seal and back to the AES-15™
E	Mechanical seal	Not supplied as part of AES-15™
F	Pressure gauge (optional extra)	Displays the barrier fluid pressure in the AES-15™
G	Mounting brackets	Securely mounts the AES-15™ System



# AES-FV™



The AES-FV™ (Flanged Vessel) System is to be used on arduous applications where bacteria build up in the vessel is an issue. The AES-FV™ can have its bottom flange easily removed to administer efficient internal cleaning (Figure 1).

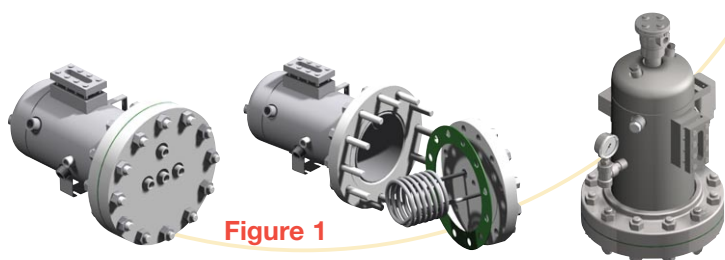
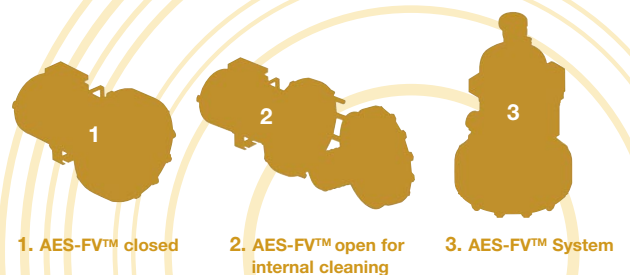


Figure 1



1. AES-FV™ closed

2. AES-FV™ open for internal cleaning

3. AES-FV™ System



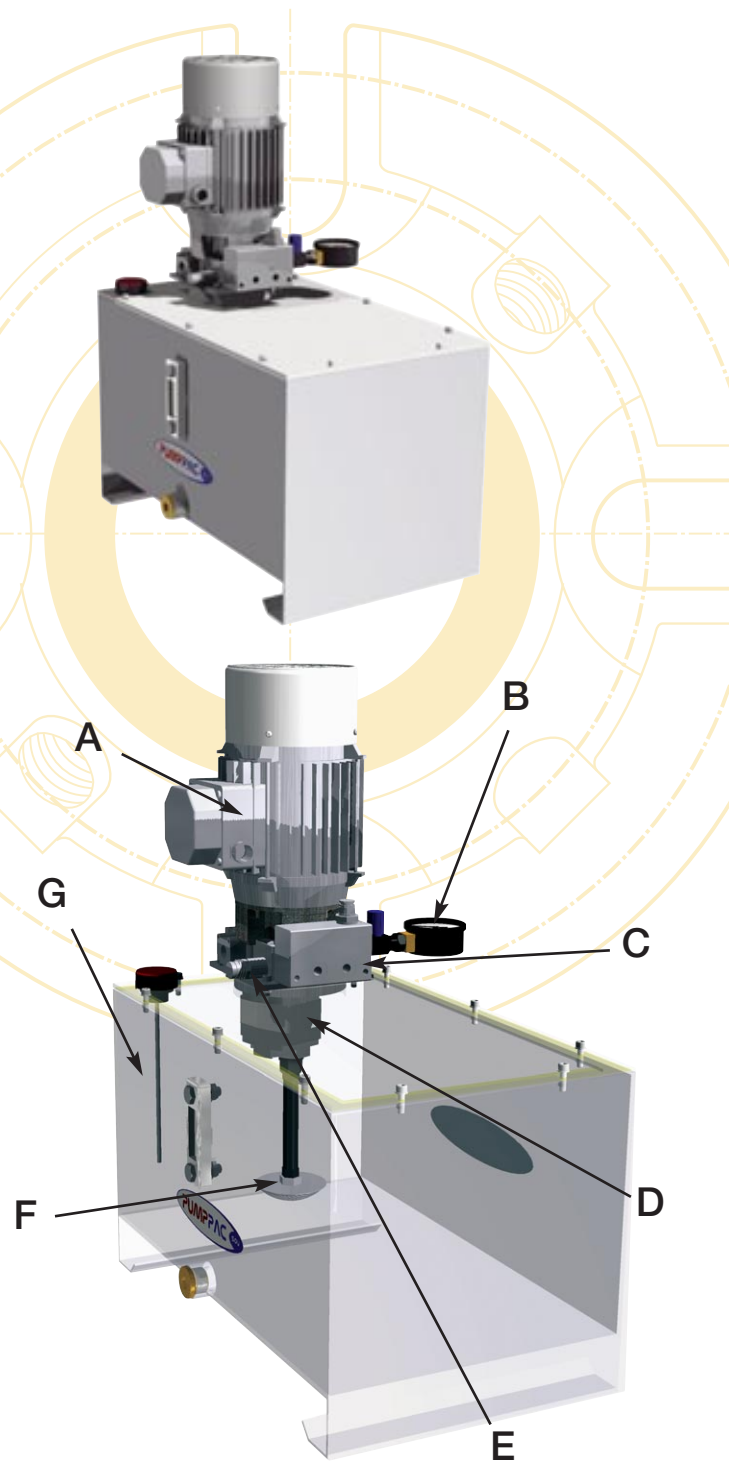
# PP/SOU™



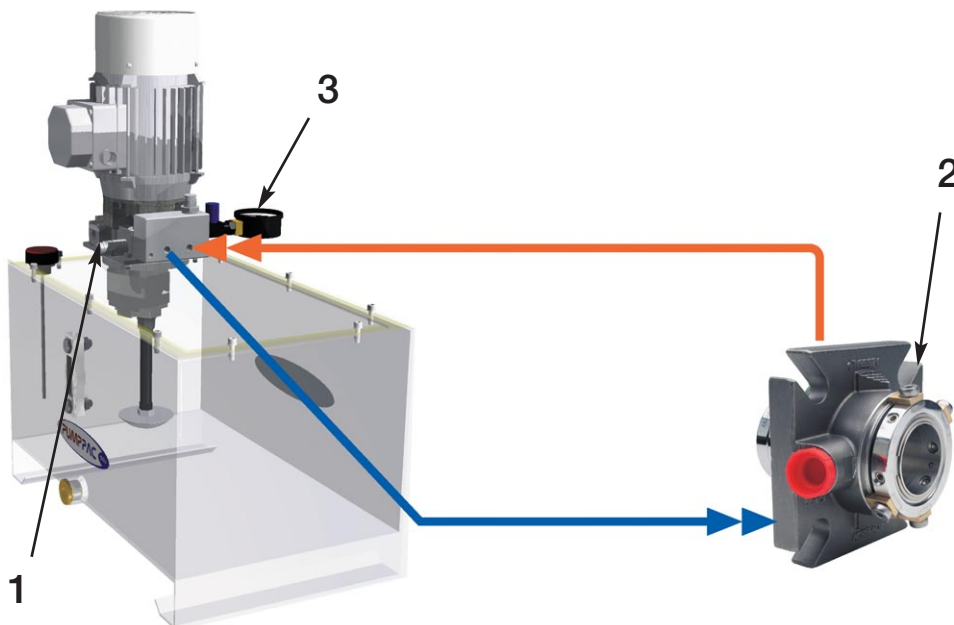
The PP/SOU™ (Special Oil Unit) utilizes the same technology as the standard AESSEAL® PUMPPAC™ Range. The product is suitable for many industries and is designed in accordance with the specifications set by the API Plan 54 forced circulation piping plan. The PP/SOU™ can be adapted to different pumping environments by adding instrumentation to the standard offering. This is a high specification and low cost solution to forced circulation Seal Support Systems.

Features	Benefits
Uses the same proven technology and modular design as the standard AESSEAL® PUMPPAC™ Range	The PP/SOU™ can be installed in a variety of zoned environments by interchanging the instrumentation options
Specifically designed to be used in a range of non-high corrosive environments	High specification and low cost solution to forced circulation barrier fluid systems
API Plan 54 forced circulation system	Maximises barrier fluid heat dump potential
Capable of supplying split flows and pressures for two mechanical seals	Barrier fluid cooling of up to two mechanical seals can be accurately controlled

Label	Description	Purpose
A	Motor (Aluminium body, weather proof IP55, 3 phase 0.55 KW 0.79Hp -230/400V-50/60Hz, 4 pole- 1450/1750 rpm)	Drives the pump
B	Pressure Gauge (polycarbonate anti-impact body, brass wetted parts)	Displays the pressure of the barrier fluid feeding the mechanical seal
C	Manifold (Aluminium body, 5-50 bar / 72-725 psi)	Securely attaches the motor to the PUMPPAC™ reservoir
D	Pump (Aluminium construction 3.8 litres /1.0 gal (US) per minute)	Supplies the barrier fluid to the mechanical seal
E	Pressure Control Valve (Aluminium construction 5-50 bar / 72-725 psi)	Controls the pressure of the barrier fluid feeding the mechanical seal
F	Suction Filter (Carbon steel, 45 litre/ 12 gal (US) )	Cleans the barrier fluid feeding the mechanical seal
G	PUMPPAC™ reservoir (Painted carbon steel 45 litre / 12 gal (US) )	Large surface area for barrier fluid cooling to atmosphere



## Operating Principle



1. Cool Barrier fluid is pumped from the PUMPPAC™ to the mechanical seal.
2. Barrier fluid passes through the mechanical seal and back to the PUMPPAC™ where it is cooled.
3. The back control valve controls the pressure in the line.

# PP/01™

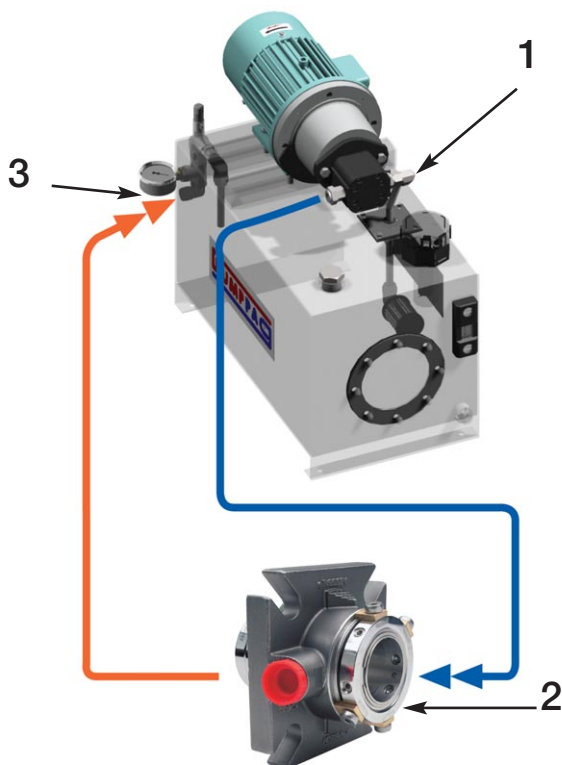
The AESSEAL Oil PUMPPAC™ (PP/01™) is an efficient and high performance forced circulation system. The product was developed to meet the requirements of the API Plan 54 piping plan, which maximizes heat dump potential for the more arduous pump applications. The PP/01™ can be adapted to a wide range of industry applications by fitting additional instrumentation. The maximum operating pressure of the standard PP/01™ is 70 bar / 1016 psi.

A fully certified ATEX version of the PP/01™ is now available with a range of optional extras to suit all applications. AESSEAL® also offers a high flow pump option that can generate 12 litres / 3.17 gal (US) per minute (max pressure 35 bar / 508 psi).

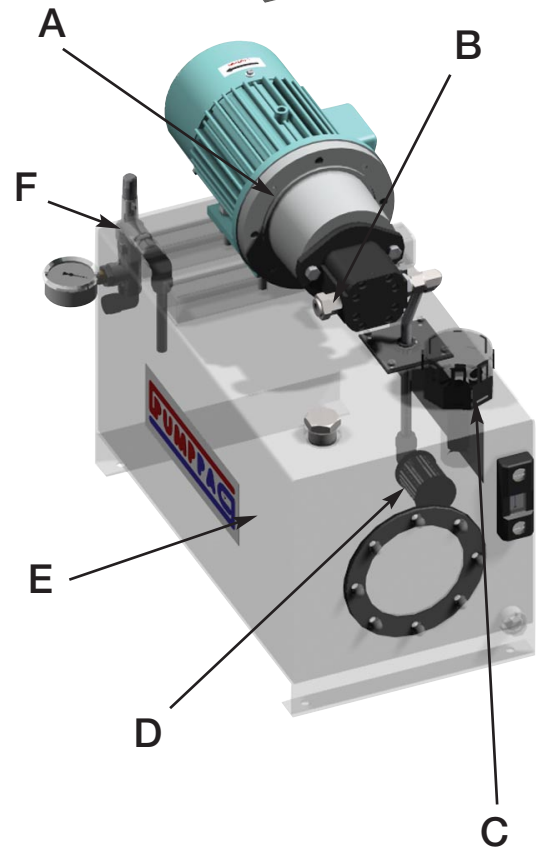
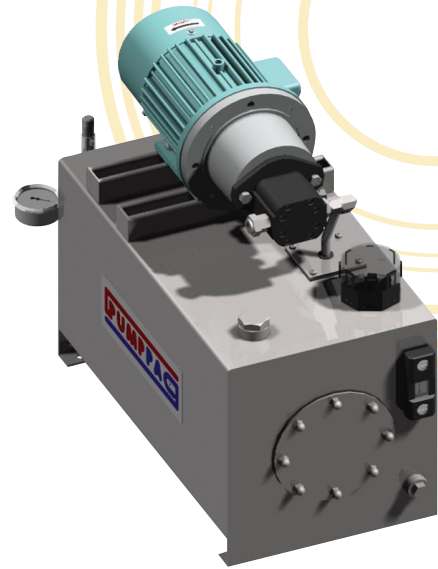
Features	Benefits
API Plan 54 forced circulation system	Maximizes barrier fluid heat dump potential
Enhanced modular design to be used on a range of high end applications	The PUMPPAC™ can be installed in a variety of zoned environments by interchanging the instrumentation options
Capable of supplying split flows and a range of pressures for two or more mechanical seals	Barrier fluid cooling of two or more mechanical seals can be accurately controlled

Label	Description	Purpose
A	Pump / Motor Assembly (Cast Iron Positive Pump, 4 liters / 1.1 gal (US) per minute, Cast Iron Safe Area Motor)	This is the heart of the system providing the mechanism for transferring the barrier fluid from the reservoir to the mechanical seal
B	Seal Feed	Is the point where the barrier fluid leaves the PUMPPAC™ and travels to the mechanical seal
C	Fill Cap	Is the place where the reservoir can be filled with barrier fluid
D	Suction filter	Cleans the barrier fluid as it is removed from the reservoir
E	PUMPPAC™ reservoir: (45 litres / 12 gal (US) capacity, SS Construction)	The large volume ensures efficient cooling of the barrier fluid to atmosphere
F	Back Pressure Control Valve (SS Construction)	Controls the pressure of the barrier fluid feeding the seal

## Operating Principle



1. Cool barrier fluid is pumped from the PUMPPAC™ to the mechanical seal.
2. Barrier fluid passes through the mechanical seal and back to the PUMPPAC™ where it is cooled.
3. The back control valve controls the pressure in the line.



# AES-28™



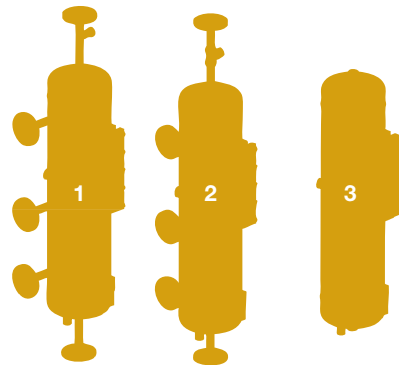
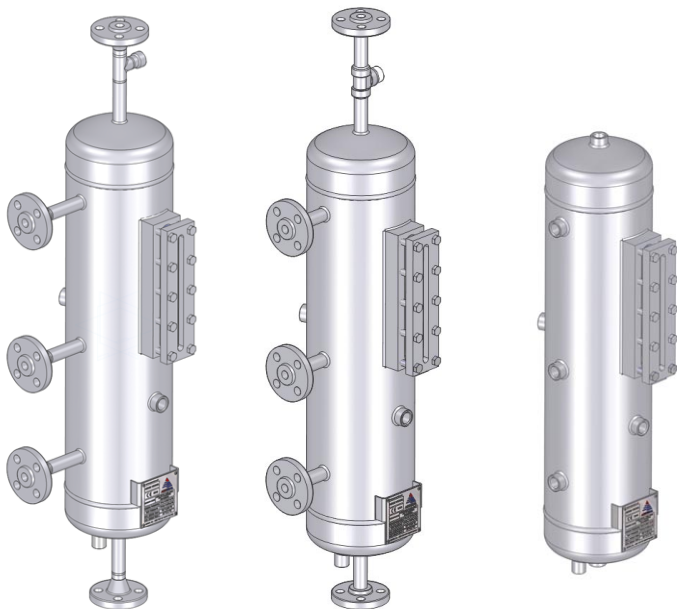
The design of the AES-28™ vessels is based on a 316 stainless steel, 28 litre / 7.39 gal (US) vessel, which comprises a weld pad level gauge and integral cooling coil as standard. The vessels have a design rating of 45 bar @ 38°C / 652.7 psi @ 100°F. They are designed and manufactured in accordance with a wide range of international specifications.

The AES-28™ range is available with a choice of three vessel options, all of which are held in inventory. This range includes a screwed connection vessel, a socket welded vessel and a butt welded vessel. All three vessel options are fully compliant with API 682. A variety of component options are available to adapt the vessel to specific pump applications. These options include electrical equipment which is supplied as intrinsically safe or explosion proof.



Features	Benefits
Designed and manufactured in accordance with ASME V III Div 1 and PED 97/23/EC	Suitable for a wide range of arduous environments. Design rating of 45 bar @ 38°C / 652.7 psi @ 100°F
316 SS vessel and weld pad construction	Robust vessel suitable for a range of challenging environments
28 litre / 7.309 gal (US) vessel	Large barrier fluid capacity for seal cooling
Modular design	A number of intrinsically safe and EEXD explosion proof instrumentation option can be fitted

## AES-28™ Vessel Options

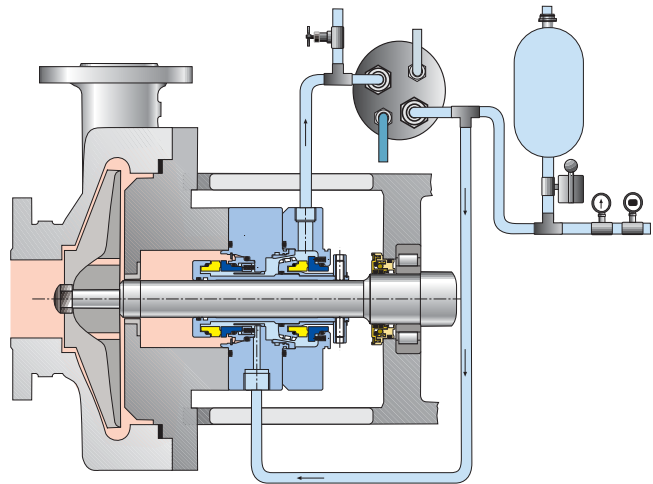


1. AES-28™ Vessel with Butt Welded Flanges
2. AES-28™ Vessel with Socket Welded Flanges
3. AES-28™ Vessel with Screwed Connections

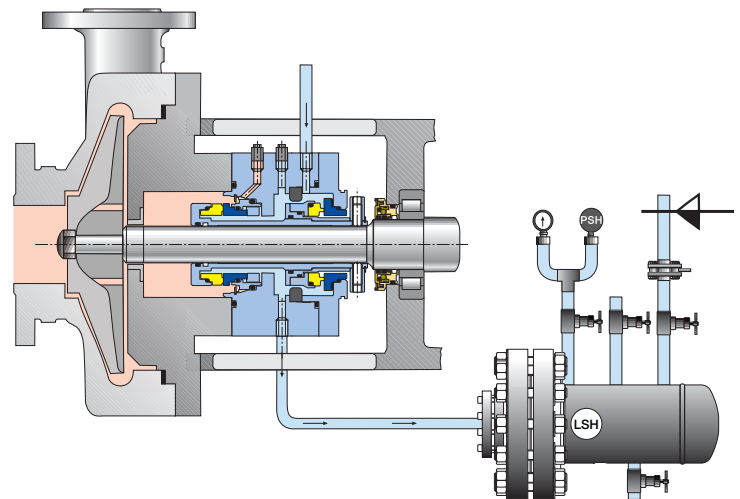
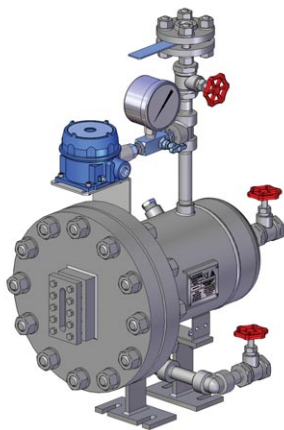
# High End Systems

In addition to the company's extensive range of standard products, AESSEAL® has a dedicated High End Systems Division. The Division's research and development team has invested 5,000 man-hours in deciphering the finer details of API 682, ASME VIII Div 1, 2007, 2008a and PED 97/23/EC. This dedication has resulted in the design of modular products that guarantee the delivery of High End Systems within short lead times.

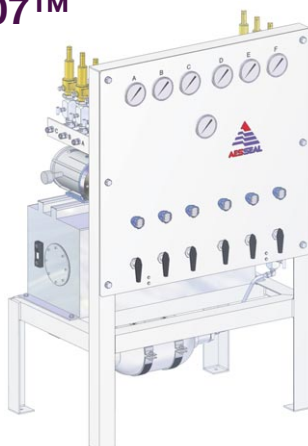
## API Plan 53B



## API Plan 75



## Compact 107™



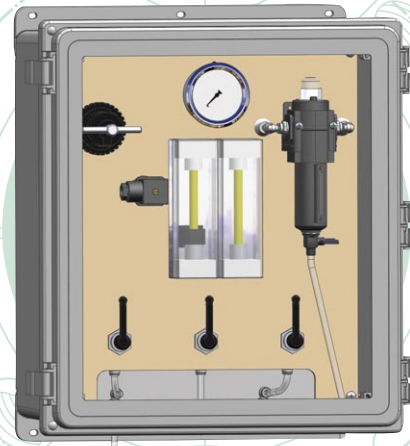
The Compact 107™ is an innovative AESSEAL® specific design that combines the benefits of API Plans 53A, 53B and 54. The System can be used to supply pressurized barrier fluid to a number of seals. Please contact your local AESSEAL® representative for further details.



# Gas Panel

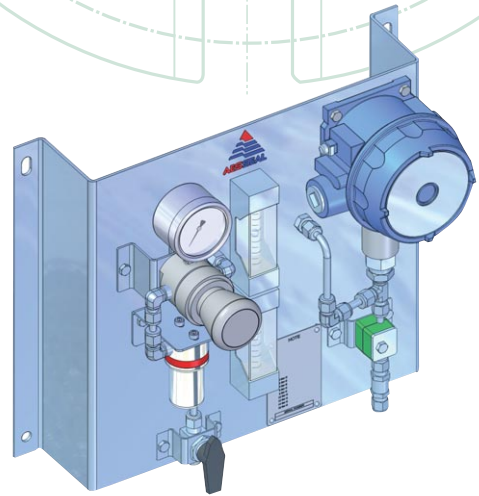


The Gas Panel System is designed to supply inert gas (e.g. Air or Nitrogen) to mechanical seals on processes that cannot tolerate contamination by water or oil barrier fluids. The self contained system (Image 1) has a maximum inlet pressure of 14 bar / 203 psi and a maximum outlet pressure of 10 bar / 145 psi enabling it to be used on a wide range of applications. The modular design also allows the incorporation of a number of optional extras.

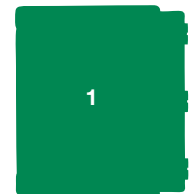
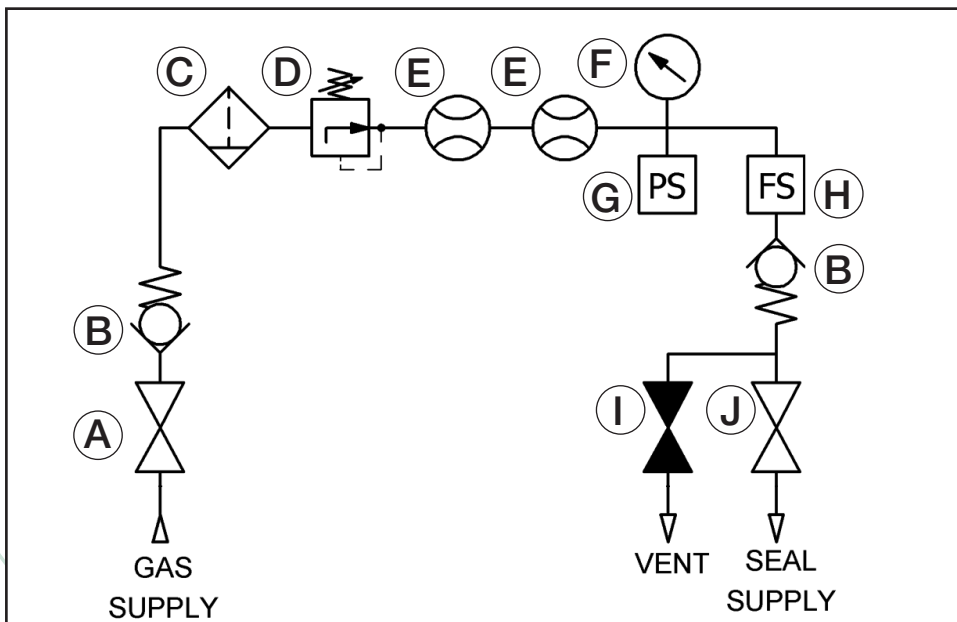


Features	Benefits
Coalescing filter	Ensures that a clean gas supply is feeding the seal
Components are enclosed in a secure cabinet (this does not apply to the intrinsically safe and explosion proof versions)	Protects the components from the industrial environment
Non-return valve	Prevents product contamination of the gas panel during upset conditions
Dual flow meters	The second flow meter will display a high gas flow which indicates seal wear

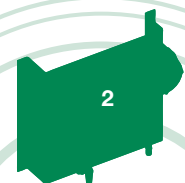
Label	Description	Purpose
A	Isolating valve	Valve can be closed to isolate the gas panel system to enable maintenance to be carried out
B	Check valve (2 off)	Protects the gas supply from process contamination
C	Coalescing filter	Cleans the gas supply to the seal
D	Pressure regulator	Regulates the pressure of the gas barrier feeding the seal (10 bar / 145 psi maximum output pressure)
E	Flow meter (2 off)	Displays the flow rate of gas feeding the seal
F	Pressure gauge	Displays the pressure of gas feeding the seal
G	Pressure switch	Will warn of problems with the gas pressure
H	Flow switch	Will warn of problems with the gas flow rate
I	Drain valve	Drains gas from the system
J	Supply valve	Supplies the gas barrier to the mechanical seal



## Standard Gas Panel Schematic



1. Standard Gas Panel



2. UDGSTM Gas Panel

# Cooler Options

## Liquid - Helicoil Cooler

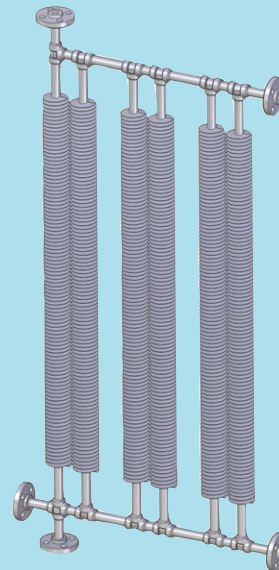
The AESEAL Cooler is constructed from 316 stainless steel tube and cast iron casing (cast steel & cast 316 steel casting options available).

This robust product is a very efficient seal cooler used on API Piping Plan 21, 22 and 23 arrangements. The product can also be used in conjunction with other products in the Systems Division Range to provide additional cooling on high heat applications.



## Convection - Finned Tubing

Finned tubing provides additional convection cooling on high heat applications. The tubing is constructed from 316 SS schedule 40 pipe with aluminum wound fin and 316 SS turbulator. It is available in banks of 2, 4 and 6, depending on the amount of heat that needs to be removed. Butt and socket weld flanges are available for each bank option.



6 Bank Finned Tubing



Finned Tubing Cross Section

## Air Blast Cooler

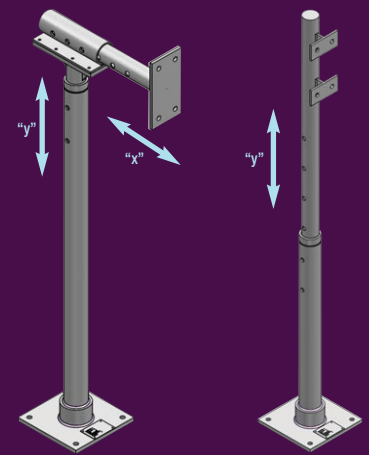
The Air Blast Cooler uses a combination of high performance cooling elements and high capacity, compact AC electrically powered fans to give long trouble-free operation in arduous applications. The compact design provides the highest cooling performance in heat dissipation whilst minimizing the space required.

- Cooling range 0-5 kW
- AC motors in 230/400 Volt 50/60 Hz
- Maximum working pressure 16 bar / 232 psi
- Also Available with ATEX Zone 1 Antistatic Exd Motor.



# Vessel Options

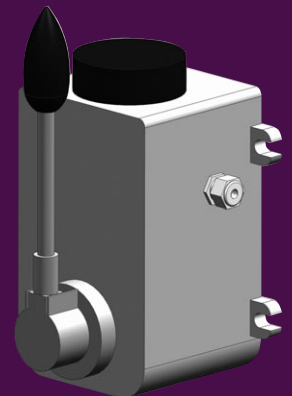
- Mounting Stand - Standard and Telescopic options
- Level Switch - Safe Area, Intrinsically Safe and Explosion Proof options
- Pressure Switch - Safe Area, Intrinsically Safe and Explosion Proof options
- PTFE Lined Braided Flexible Hose kit - SS construction
- Hard Pipe kit - SS construction
- Finned Tubing kit - Includes all necessary connections
- In-line Water Filter kit - Includes all necessary connections
- Cooling Coil - 316 SS construction
- Hand Pumps - Water and oil options
- Air / Nitrogen Supply Regulator - Zinc alloy construction / SS option
- Vessel kits - Consists of a vessel and decals only
- Top up Trolley - For use on Systems pressurized by an external gas supply
- Pressure Gauge - All SS option



XY and Y Telescopic System Stands

# PUMPPAC™ Options

- ATEX certified Oil PUMPPAC™
- High pressure Water PUMPPAC™
- Explosion Proof Motor - Cast iron construction and ATEX certified
- Top Entry Low Level Switch - Safe Area, Intrinsically Safe and Explosion Proof Options
- High / Low Pressure Switch - Safe Area, Intrinsically Safe and Explosion Proof Options
- Plate Heat Exchanger - SS brazed construction
- Back Pressure Valve - SS construction
- Cooling Coil - SS construction
- Water Pump - SS construction
- Suction Filter - SS construction
- Bell Housing - SS construction
- Flow Divider - Splits the flow to feed multiple mechanical seals (the amount of seals that can be fed depends on the model of PUMPPAC™ being used, please consult your local AESSEAL representative for more information)
- High Flow Oil Pump - For use on Oil PUMPPAC™ only
- Pressure Gauge - SS construction



Hand Pump

# Gas Panel Options

- Pressure Switch - Safe Area, Intrinsically Safe and Explosion Proof Options
- Flow Switch - Plastic casing



EExd Pressure Switch

# Contact Sheet

## HIGH END SYSTEMS DIVISION



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The Rotherham based Systems Division is dedicated to the design and manufacture of High End Seal Support Systems, primarily aimed at the Oil and Gas Industry.

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The Northern Ireland based Systems Division is dedicated to the manufacture and global supply of Standard Seal Support Systems.



# Seal Support Systems Order Coding Guide

The Systems Division has established a new order code guide to simplify the process of ordering a Standard Seal Support System. The new codes ensure that customers order the exact product they require and remove the need for developing AZA or MZM System codes when ordering products with optional extras. Please see the tables below for details of old stock codes, the new stock code and an explanation of how to form the new stock code.

## OLD STOCK CODE

Old
VSE/SP02
VSE/SW02
VSE/SW02-25
VSE/SW03-25-CC-US
VSE/SP02-25 With explosion proof low level switch
VSE/SP02-SS (US) Fully stainless components
VSE/SW3-25 With safe area pressure switch and stand

## NEW STOCK CODE

New
VSE/P212--SA----A-
VSE/W210--SA----A-
VSE/W225--SA----A-
VSE/W325CCSA----H-
VSE/P212--SAEC--A-
VSE/P212SS---F-
VSE/W325--SAS-A-GA

## SYSTEM CODE (1-3)

This refers to the type of vessel a customer will be using with the Seal Support System. All Standard Systems use a 10, 12 or 25 litre SSE type vessel so please enter VSE for this part of the order code.

## SYSTEM TYPE (5-6)

This defines the type of system a customer needs, i.e. P2 for a standard gas pressurized system, W2 for a standard water management system or WC for a condensate system.

- P1** = Buffer systems for use with oil and water (See page 24)
- P2** = Gas pressurized system (See page 24)
- P3** = Gas pressurized system with the addition of finned tubing for high heat applications (See page 24)
- W2** = Standard water management system using plant water line as water and pressure source (See page 18)
- W3** = Standard water management system using plant water line as water and pressure source with addition of finned tubing for high heat applications (See page 18)
- WF** = Flow Fuse™ water management system (See page 19)
- WM** = Low cost water management system utilizing the full pressure in the plant water line (See page 17)
- WP** = Low cost water management system, with weld pad level gauge, utilizing the full pressure in the plant water line (See page 17)
- WC** = Water management system specifically designed for condensate applications (See page 20)

## VESSEL SIZE (7-8)

Relates to the capacity of the vessel a customer is ordering. Please note that with W2, W3, WM & WP type systems, 10 litres is the standard, but with P1, P2 & P3 type systems the 12 litre weld pad is the standard.

- 10** = White powder coat finish as standard, no weld pad level gauge
- 12** = Shot bead blast finish and integral weld pad level gauge as standard
- 15** = Shot bead blast finish, integral weld pad and cooling coil as standard (option for WC system only)
- 25** = There are 2 options available (type of system will determine the option used)
  1. White powder coat with no weld pad level gauge
  2. Bead blast with integral weld pad level gauge

## COOLING COIL (9-10)

Add **CC** when ordering a System incorporating a cooling coil

## COMPONENT MATERIAL (11-12)

When ordering a system with standard component configurations, please choose SA. If it is to be a fully stainless system (all components in stainless steel), then please choose SS (only available for W2, W3, P1, P2 & P3 systems). Please note that when ordering a SS system it will be supplied with braided hose as standard, therefore when ordering a SS system, please choose option E or F in the **HOSE OPTION SECTION**.

- SA** = System with standard components
- SS** = System with fully stainless components (only an option on W2, W3, P1, P2 & P3 systems)

## NEW STOCK CODE EXPLANATION

System code				Type		Size		Cooling		Material		Inst	Level	Pressure	H/Pump	Hose	Stand
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
V	S	E	/	P	2	1	2	-	-	S	A	-	-	-	-	A	-
V	S	E	/	W	2	1	0	-	-	S	A	-	-	-	-	A	-
V	S	E	/	W	2	2	5	-	-	S	A	-	-	-	-	A	-
V	S	E	/	W	3	2	5	C	C	S	A	-	-	-	-	H	-
V	S	E	/	P	2	1	2	-	-	S	A	E	C	-	-	A	-
V	S	E	/	P	2	1	2	-	-	S	S	-	-	-	-	F	-
V	S	E	/	W	3	2	5	-	-	S	A	S	-	A	-	G	A

### INSTRUMENT PROTECTION (13)

Relates to site preferences in terms of the hazard level where electrical equipment will be installed.

**S** = Safe Area

**E** = Explosion Proof

**I** = Intrinsically Safe

### LEVEL SWITCH OPTIONS (14)

**A** = Safe Area Low Level Switch

**B** = Safe Area High/Low Level Switch

**C** = Explosion Proof Low Level Switch (Flameproof, Zone 1 & Division 1, ATEX certified)

**D** = Intrinsically Safe High/Low Level Switch (can be incorporated in an Intrinsically Safe Circuit ATEX certified)

### PRESSURE SWITCH OPTIONS (15)

**A** = Safe Area High/Low Pressure Switch (standard range 0-10 bar / 0-145 psi)

**B** = Explosion Proof High/Low Level Pressure Switch (Flameproof, Zone 1 & Division 1, ATEX certified)

**C** = Intrinsically Safe High/Low Pressure Switch (can be incorporated in an Intrinsically Safe Circuit, ATEX certified)

### HAND PUMP OPTIONS (16)

**A** = Oil Hand Pump - Can only be used with oil

**B** = Water Hand Pump - Can be used with water and oil

### HOSE OPTIONS (17, 1 Kit = Supply & return hose & fittings)

**A** = Nylon hose kit (12mm) supplied with seal fittings

**B** = Nylon hose kit (1/2") supplied with seal fittings. For US specification systems

**C** = SS hard pipe kit, 2 of 58" / 1.5m lengths of 12mm hard pipe and seal fittings

**D** = SS hard pipe kit, 2 of 58" / 1.5m lengths of 1/2" hard pipe and seal fittings. For US specification systems

**E** = SS braided flexible hose kit - 1 x 42" and 1 x 48" of 12mm stand pipe braided hose and seal fittings

**F** = SS braided flexible hose kit - 1 x 42" & 1 x 48" of 1/2" stand pipe braided hose and seal fittings. For US specification systems

**G** = Finned tube kit - 2 off lengths of finned tube supplied with seal and vessel fittings (12mm)

**H** = Finned tube kit - 2 off lengths of finned tube supplied with seal and vessel fittings (1/2"). For US specification systems

### MOUNTING STAND (18)

**A** = Standard Systems Stand 304 SS

**B** = Telescopic Y stand in carbon steel painted (vertical orientation of the stand can be adjusted)

**C** = Telescopic XY stand in carbon steel painted (vertical and horizontal orientation of the stand can be adjusted)




















































**D** = Telescopic Y stand in 304 SS (vertical orientation of the stand can be adjusted)

**E** = Telescopic XY stand in 304 SS (vertical and horizontal orientation of the stand can be adjusted)



ENVIRONMENTAL TECHNOLOGY

**Our Purpose** *'To give our customers such exceptional service that they need never consider alternative sources of supply.'*

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