

[← SEAL SUPPORT](#)

API 682 – Plan 52

Enjoy the Flopac performance and treat your equipment by selecting the Flopac® series SPA-52_ seal support systems.

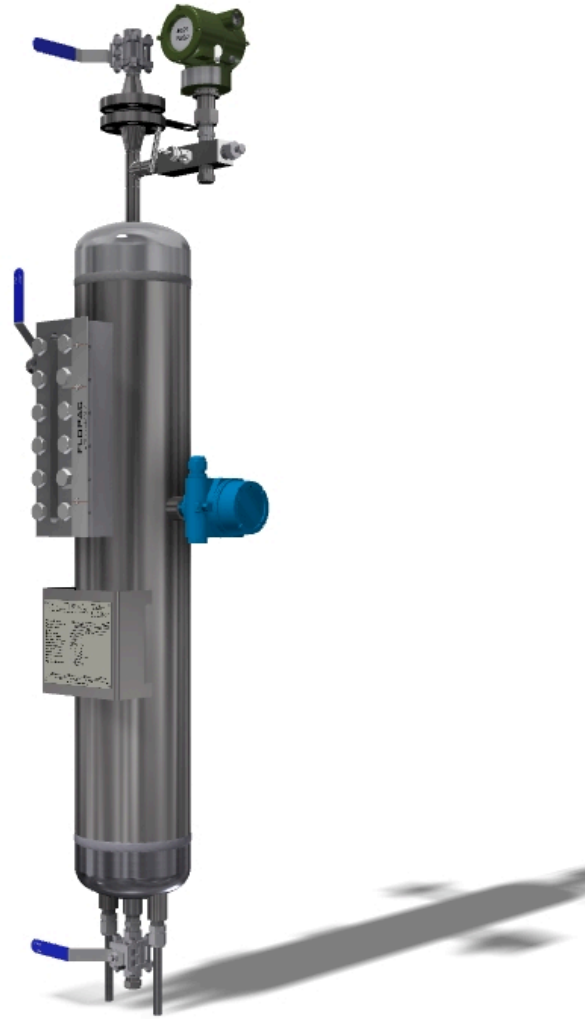
The range of Flopac® SPA seal support systems include plan 52 seal flushing units that are typically used with arrangement 2 contacting wet seals (2CW-CW).

Plan 52 seal support systems are closed loop systems that circulate buffer liquid between a non-pressurised dual seal arrangement and an external reservoir to cool and lubricate the (in- and) outboard seal. Product leakage over the inboard seal is absorbed by the buffer liquid and channelled to the external reservoir where it is collected for disposal in an orderly way.

Flopac seal support systems; for reliable seal performance and optimal process efficiency.

Advantages:

- » **Compact and light weight designs.**
- » **Engineered to offer an optimal user experience.**
- » **Complete (API 682) compliant packages.**
- » **Quick delivery program for our competitively priced standard range.**
- » **Custom designs available.**



Technical Specification API 682 – Plan 52

The range of Flopac® SPA seal support systems include plan 52 seal flushing units that are typically used with arrangement 2 contacting wet seals (2CW-CW).

Plan 52 – Description

Purpose

Plan 52 seal support systems provide a buffer fluid to cool and lubricate the (in-and) outboard seal, whilst controlling product leakage.

Operation

Plan 52 seal support systems are closed loop systems that use an external reservoir to provide buffer fluid for the outer seal of an unpressurized dual seal arrangement. The process, or inner seal, of the dual unpressurized arrangement usually has its own piping plan. For example, the piping plans for a dual unpressurized seal arrangement might be written as Plan 11/52.

During normal operation, circulation between reservoir and seals is maintained by an internal pumping ring. Operated with an open vent the pressure is kept near to atmospheric, below the process/seal chamber pressure. As a result the normal product leakage will enter the closed loop of the plan 52 piping system. This product leakage is absorbed by the buffer liquid and then channelled to the external reservoir where it is collected for disposal in an orderly way; Usually vented to a flare or vapour recovery system for volatile products, or, periodically drained for non-volatile products.

Maintenance associated with seal repairs, filling, draining, and flushing of a contaminated buffer system can be considerable. Refer to notes/recommendations below.

Instrumentation

A plan 52 should be equipped with a pressure indicating transmitter, a level transmitter and a level gauge to monitor the systems pressure and level. A temperature instrument could be considered if relevant.

Provided the unit is equipped with an internal cooling coil one may also consider a cooling water sight flow indicator.

Heat exchangers

In order to provide cool buffer fluid plan 52 seal support systems are often equipped with a cooler. The cooling capacity must be designed to cope with the seals heat generation and the heat soak.

Although natural air draught cooling is preferred, most plan 52 seal support systems are equipped with an internal liquid (water) cooler. The size of natural air draught cooling sections will often prove impractical.

For the higher heat loads external water cooler or forced air blast cooler may be considered. Flopac can provide all. Please have a look at our cooler section to check our standard availability. Tailored solutions are available as well.

Notes/recommendations

Flopac provides a complete API 682 compliant package, including all the necessary appendages.

The operating principle of this seal plan accepts a certain product leakage. So inevitably, the inboard seals will pass pump product – mind the seal faces – and may transform the buffer fluid into (hazardous) chemical waste.

A higher cost for maintenance, seal repairs, filling, draining, and flushing of the contaminated buffer system must be contemplated.

Also, contrary to expectations, the low operating pressure of a plan 52 will not buy an inexpensive low pressure design. It is common practice – and API 682 specified – to have the plan 52 seal support systems designed for the same pressure and temperature ratings as the pump. So the non-pressurised dual seal plan 52 solution will not be safe (much) compared to the pressurised plan 53 solutions. That is why for dual seal applications we would generally recommend the pressurised plan 53(B) solution as it has quite some advantages – explained elsewhere.

The non-pressurised plan 52 solution should be considered though, for high purity applications where the pumped product accepts no contamination or when high sealing pressures would result in excessive heat loads.

Non-pressurised dual seal plan 52 solutions work best for clean, solids-free and non-polymerizing products with a vapour pressure that is higher than 1.1 bar-a at lowest ambient. It is better not used for products with a low(er) vapour pressure, nor products that are highly dangerous or lethal, like H₂S gas.

The unit may see some overpressure and contain product. A safe refill of buffer fluid requires specific equipment, usually referred to as topping-up / make up or refill units. Please refer to our section Make up units for further details. The use of filling funnels is strongly discouraged!

Please [contact Flopac](#) for a more detailed advise on all topics related to Flopac® seal support system plan 52. We will gladly assist.

Plan 52 – Features



Plan 52 – main features

- » (Near) atmospheric operating pressure.
- » Leakage disposed of in orderly way.
- » Lubricates and cools the seals.
- » Lower heat load.
- » Circulation device needed.



Benefits of the Flopac Plan 52

- » Wetted parts all SS316.
- » Flexible designs all properly engineered.
- » Reliable performance.
- » (API 682/ISO 21049) compliant.
- » Compact and lightweight configuration.
- » Directly from the manufacturer.



Options

- » Alternative material selections for specific services.
- » Flexible designs to fit a specific location or available space.
- » High pressure designs (ANSI 600# / 1500#) for static designs up to 200 barg.
- » Additional temperature- or flow instruments to enhance monitoring facilities.
- » Addition of a buffer liquid circulation unit; to ensure circulation and to enhance cooling capacity.
- » Addition of an all stainless steel 5 ltr refill unit with 75cc/str handpump. (Other refill options available. Note: filling funnels should not be used!)

Mechanical seal system SPA-520

A complete and fully functional Plan 52 system for arrangement 2 (2CW-CW) dual seals in accordance with API 682 or ISO 21049 latest edition – for shaft diameters $\leq 60\text{mm}$.

These low budget, yet complete and fully functional units are best suited for standard applications. Also for applications with shaft diameters $> 60\text{mm}$, but that requires an exception to the API 682.

Standard configuration

Design ASME VIII, div. 1/not stamped and/or the European legislation (CE) such as PED 2014/68/EU and the ATEX 2014/34/EU – Zone 2 II/A T1-T3.

Wetted parts AISI 316(L) – Suitable for general oil/water service – Non-hazardous.

Design 40 barg @ $-15/+90^{\circ}\text{C}$
ANSI 300#-NPS 6" – sch.40s.
Vmin 12 L @ NLL.

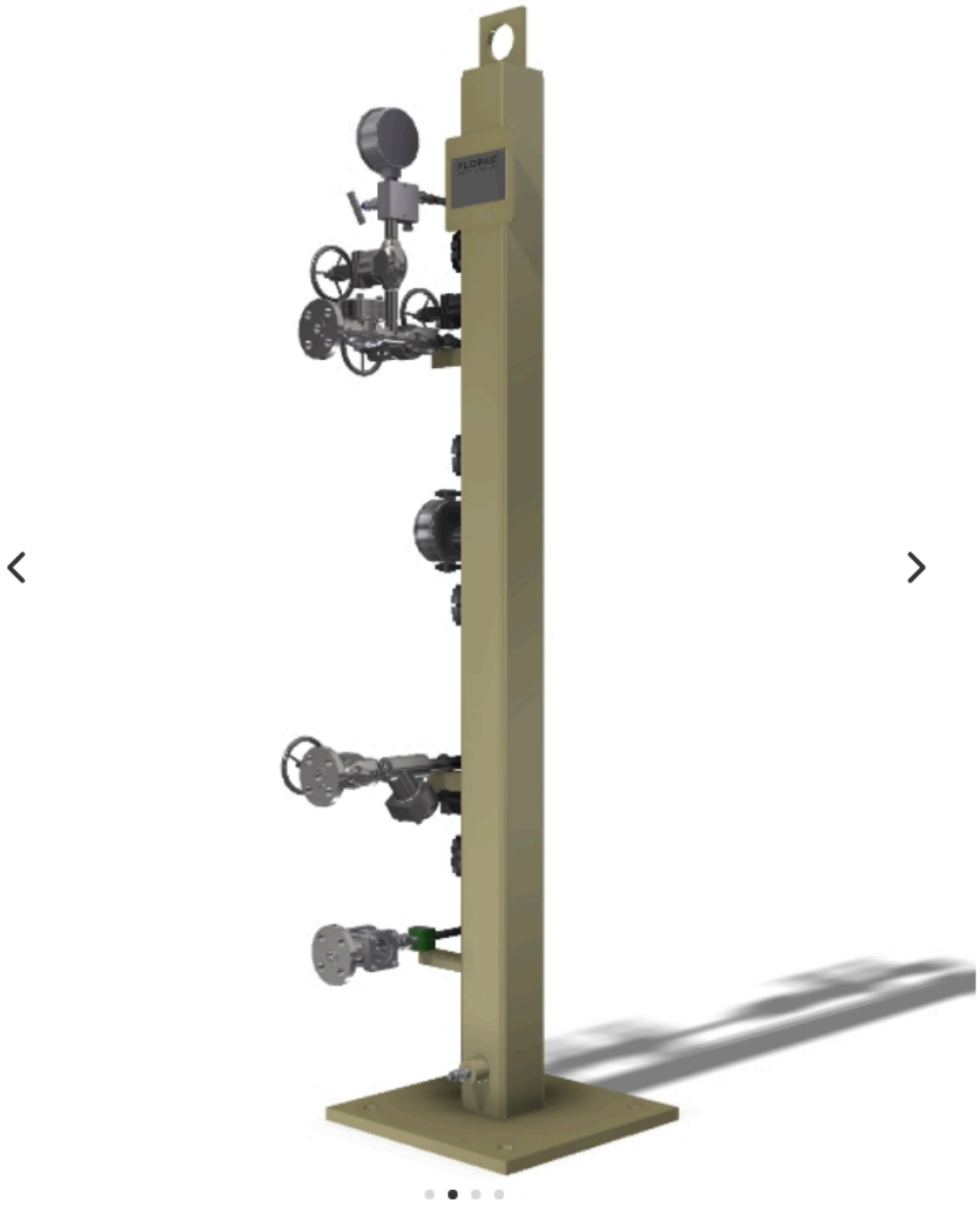
Seal supply and return connections $\frac{3}{4}"$ NPT
All further connections $\frac{1}{2}"$ NPT
Coolwater connections OD $\frac{1}{2}"$

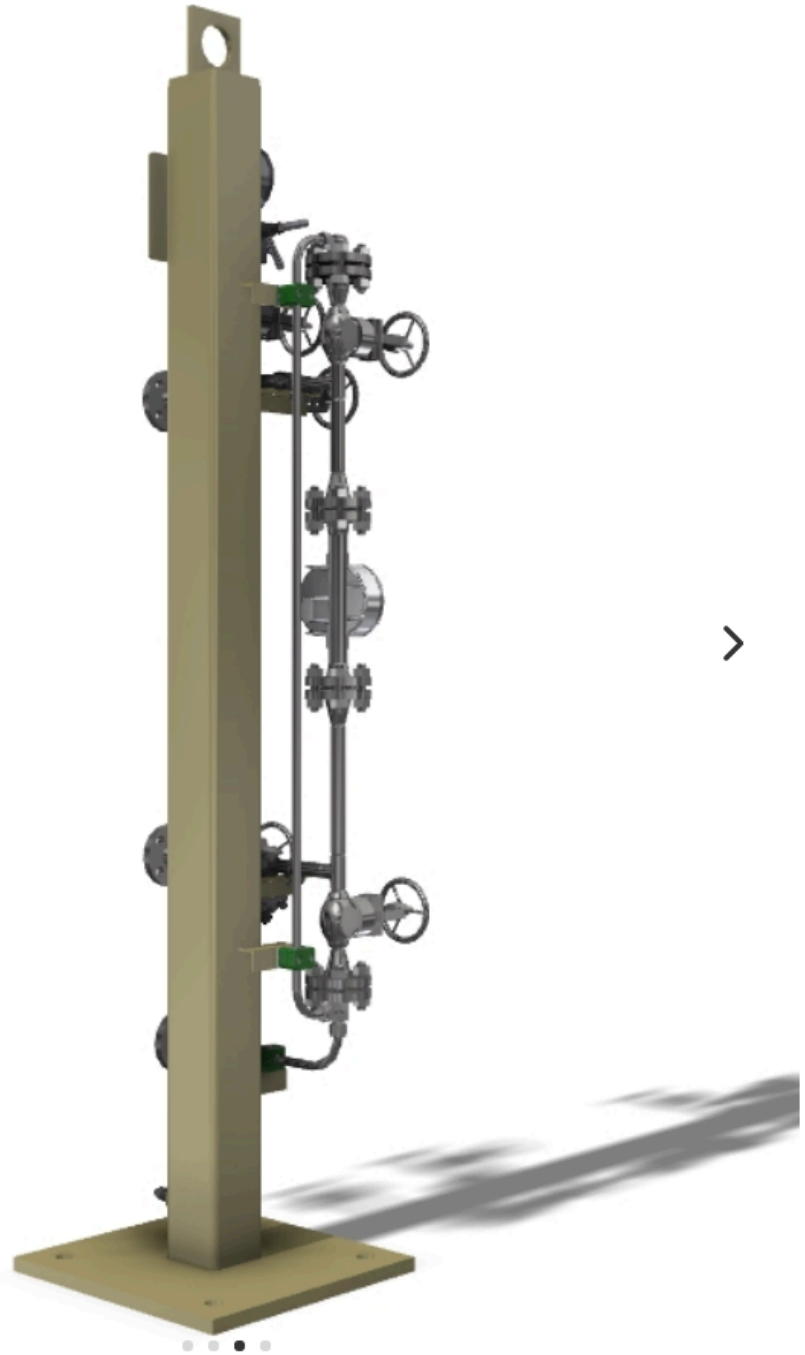
Engineering units: SI units, Bar/ $^{\circ}\text{C}$.
NDE: Visual-/hydrostatic and leaktesting.
Surface preparation : Flopac std.

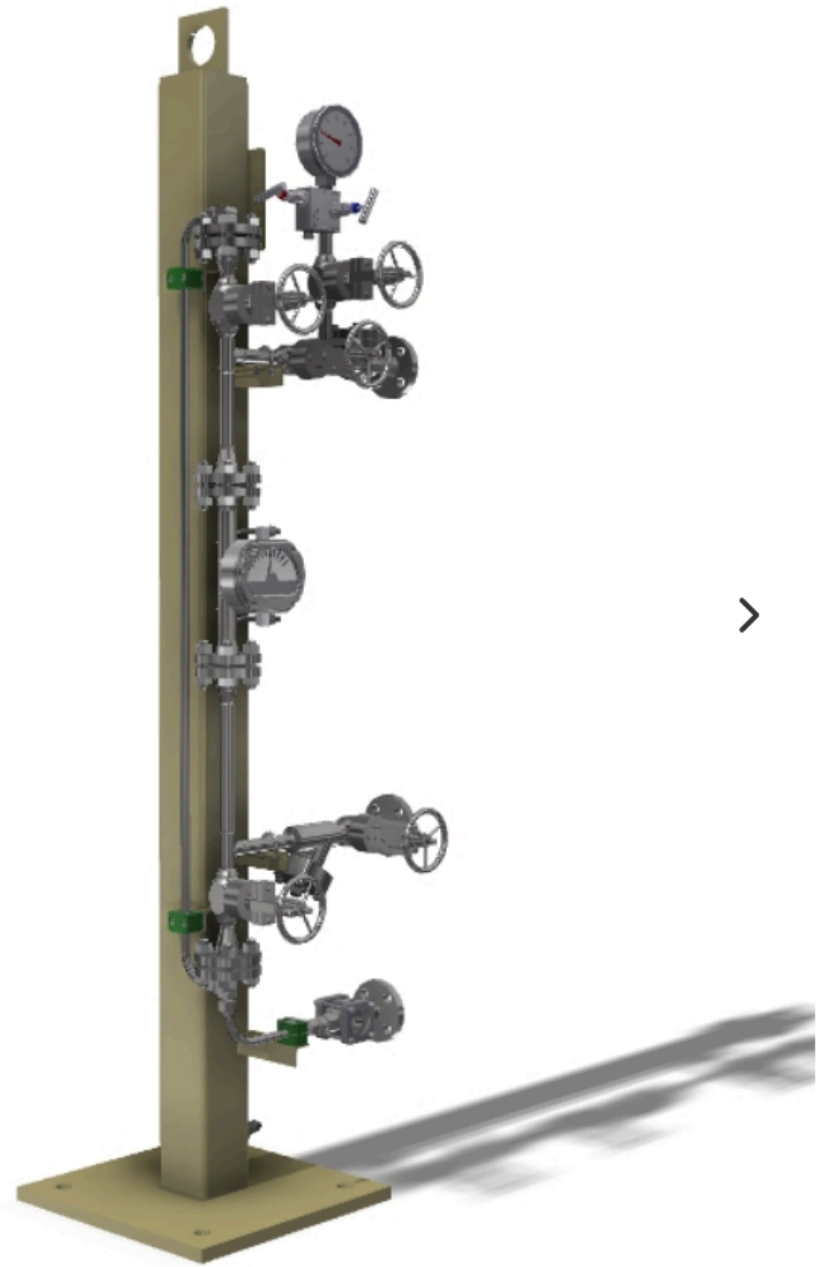
Available at request:

- » Extended NDE packages to include inspections such as X-ray, LPE and P(A)MI.
- » Refer to the section 'options' below.









SPA-520 Configuration



Main components

» One piping assembly

An all welded – stainless steel 316L construction with threaded NPT connections, as appropriate.

» Appendages

The vent, fill and drain connections are provided with a block valve. The fill connection is additionally fitted with provided with a non-return valve, the vent connection with a 3.2mm bore SS 316 restriction orifice. Further appendages as appropriate;

» One pressure indicating transmitter

A 4-20mA Smart/Hart® transmitter of high industrial quality with a 0.2% accuracy, including local display. Wetted parts SS316 with an IP 66 PU coated aluminium housing. Mounted on a SS316 instrument valve.

» One level transmitter

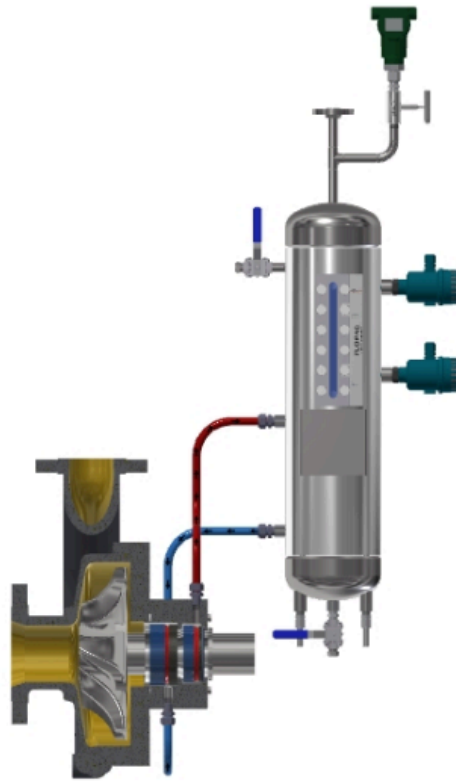
A 4-20mA Smart/Hart® Guided Wave Radar (GWR) transmitter of high industrial quality with a 0.5% accuracy, excluding local display. Wetted parts SS316 with an IP 66 PU coated aluminium housing.

» One level indicator

A Flopac weld pad level gauge with reflex glass complete with level markings. Wetted parts SS316.

» One internal cooling coil

A Flopac high efficiency spiral wound cooling coil fitted inside the reservoir. Nominal capacity 850 Watt. Wetted parts SS316. Connections OD ½" – tube.



Options

- » Additional temperature- or flow instruments to enhance monitoring facilities.
- » Addition of a buffer liquid circulation unit; to ensure circulation and to enhance cooling capacity.
- » Addition of an all stainless steel 5 ltr refill unit with 75cc/str handpump. (Other refill options available. Note: filling funnels should not be used!)

Mechanical seal system SPA-526

A complete and fully functional Plan 52 system for arrangement 2 (2CW-CW) dual seals in accordance with API 682 or ISO 21049 latest edition – for shaft diameters $\leq 60\text{mm}$.

For applications with a shaft diameter $> 60\text{mm}$, kindly refer to our SPA-528 units.

Our SPA-526 units serve the need for a more robust and all welded, yet flexible design that easily adopts to the more specific design requirements and/or high end client specs.

Standard configuration

Design ASME VIII, div. 1/not stamped and/or the European legislation (CE) such as PED 2014/68/EU and the ATEX 2014/34/EU – Zone 2 II/A T1-T3.

Wetted parts AISI 316(L) – Suitable for general oil/water service – Non-hazardous.

Design 40 barg @ $-15/+90^{\circ}\text{C}$
ANSI 300# – NPS 6" – sch.40s.
Vmin 15 L @ NLL.

Seal supply and return connections $\frac{3}{4}$ " NPT
All further connections $\frac{1}{2}$ " NPT
Coolwater connections OD $\frac{1}{2}$ "

Engineering units: SI units, Bar/ $^{\circ}\text{C}$.
NDE: Visual-/hydrostatic and leaktesting.
Surface preparation : Flopac std.

Available at request:

- » Designs tailored to meet your specific requirements.
- » High pressure designs (ANSI 600# / 1500#) for static designs up to 200 barg.
- » High temperature designs.
- » Extended NDE packages to include inspections such as X-ray, LPE and P(A)MI.
- » Refer to the section 'options' below.









SPA-526 Configuration



Main components

» One piping assembly

An all welded – stainless steel 316L construction with threaded NPT, socket- or butt-welded flanged connections, as appropriate.

» Appendages

The vent, fill and drain connections are provided with a block valve. The fill connection is additionally fitted with provided with a non-return valve, the vent connection with a 3.2mm bore SS 316 restriction orifice. Further appendages as appropriate;

» One pressure indicating transmitter

A 4-20mA Smart/Hart® transmitter of high industrial quality with a 0.2% accuracy, including local display. Wetted parts SS316 with an IP 66 PU coated aluminium housing. Mounted on a SS316 instrument valve with block-, venting and test facilities.

» One level transmitter

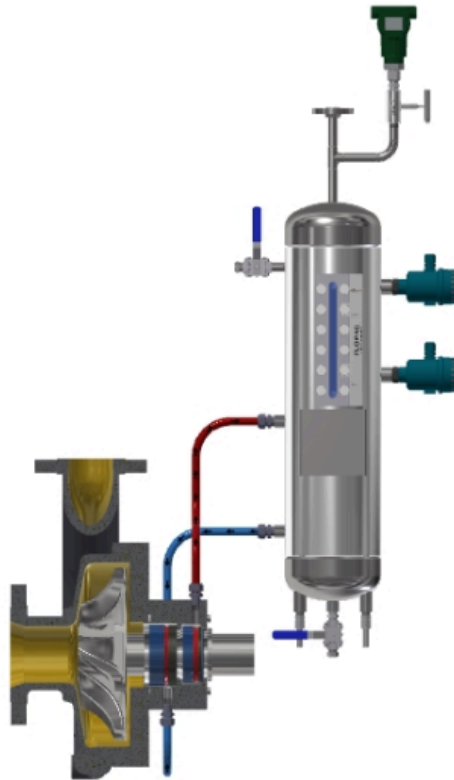
A 4-20mA Smart/Hart® Guided Wave Radar (GWR) transmitter of high industrial quality with a 0.5% accuracy, excluding local display. Wetted parts SS316 with an IP 66 PU coated aluminium housing.

» One level indicator

A Flopac weld pad level gauge with reflex glass complete with level markings. Wetted parts SS316.

» One internal cooling coil

A Flopac high efficiency spiral wound cooling coil fitted inside the reservoir. Nominal capacity 850 Watt. Wetted parts SS316. Connections OD ½" – tube.



Options

- » Alternative material selections for specific services.
- » Flexible designs to fit a specific location or available space.
- » High pressure designs (ANSI 600# / 1500#) for static designs up to 200 barg.
- » Additional temperature- or flow instruments to enhance monitoring facilities.
- » Addition of a buffer liquid circulation unit; to ensure circulation and to enhance cooling capacity.
- » Addition of an all stainless steel 5 ltr refill unit with 75cc/str handpump. (Other refill options available. Note: filling funnels should not be used!)

Mechanical seal system SPA-528

A complete and fully packaged Plan 52 system for arrangement 2 (2CW-CW) dual seals in accordance with API 682 or ISO 21049 latest edition – for shaft diameters > 60mm.

For applications with a shaft diameter \leq 60mm, kindly refer to our SPA-526 units.

Our SPA-528 units serve the need for a more robust and all welded, yet flexible design that easily adopts to the more specific design requirements and/or high end client specs.

Standard configuration

Design ASME VIII, div. 1/not stamped and/or the European legislation (CE) such as PED 2014/68/EU and the ATEX 2014/34/EU – Zone 2 II/A T1-T3.

Wetted parts AISI 316(L) – Suitable for general oil/water service – Non-hazardous.

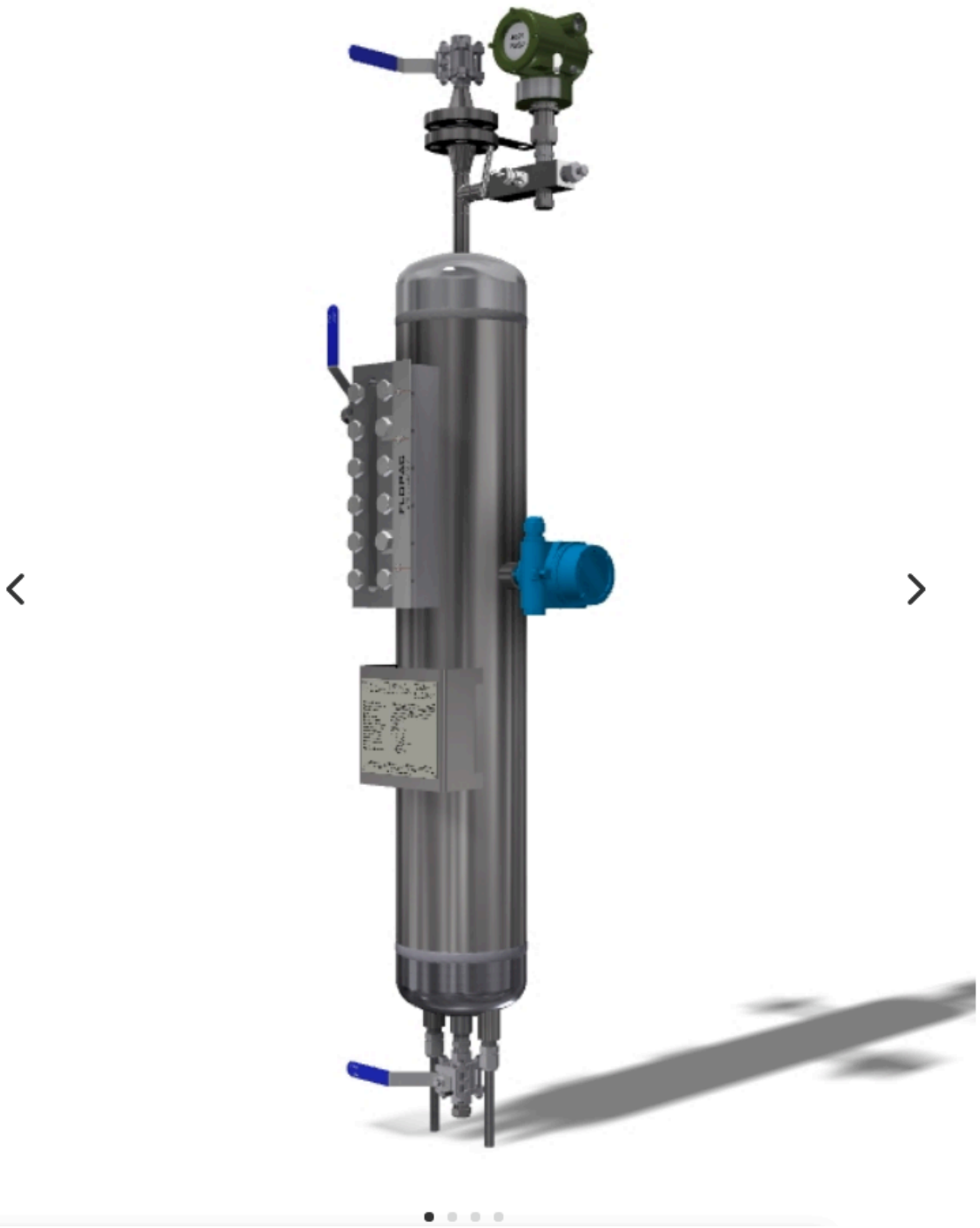
Design 40 barg @ -15/+90°C
ANSI 300# – NPS 6" – sch.40s.
Vmin 20 L @ NLL.

Seal supply and return connections $\frac{3}{4}$ " NPT
All further connections $\frac{1}{2}$ " NPT
Coolwater connections OD $\frac{1}{2}$ "

Engineering units: SI units, Bar/°C.
NDE: Visual-/hydrostatic and leaktesting.
Surface preparation : Flopac std.

Available at request:

- » Designs tailored to meet your specific requirements.
- » High pressure designs (ANSI 600# / 1500#) for static designs up to 200 barg.
- » High temperature designs.
- » Extended NDE packages to include inspections such as X-ray, LPE and P(A)MI.
- » Refer to the section 'options' below.









SPA-528 Configuration



Main components

» One piping assembly

An all welded – stainless steel 316L construction with threaded NPT, socket- or butt-welded flanged connections, as appropriate.

» Appendages

The vent, fill and drain connections are provided with a block valve. The fill connection is additionally fitted with provided with a non-return valve, the vent connection with a 3.2mm bore SS 316 restriction orifice. Further appendages as appropriate;

» One pressure indicating transmitter

A 4-20mA Smart/Hart® transmitter of high industrial quality with a 0.2% accuracy, including local display. Wetted parts SS316 with an IP 66 PU coated aluminium housing. Mounted on a SS316 instrument valve with block-, venting and test facilities.

» One level transmitter

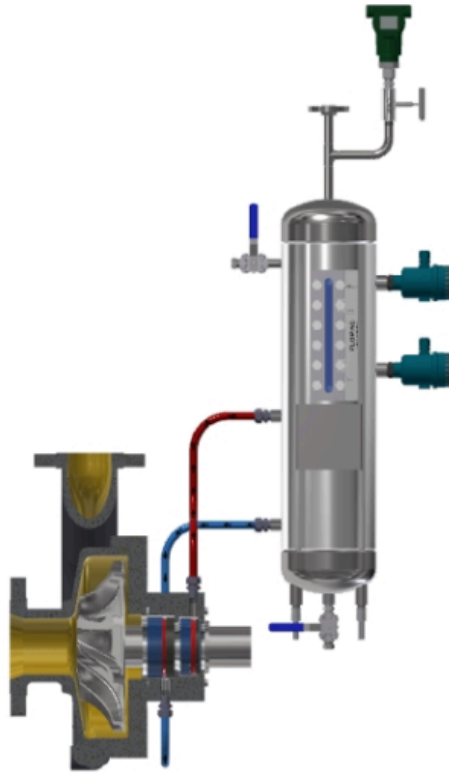
A 4-20mA Smart/Hart® Guided Wave Radar (GWR) transmitter of high industrial quality with a 0.5% accuracy, excluding local display. Wetted parts SS316 with an IP 66 PU coated aluminium housing.

» One level indicator

A Flopac weld pad level gauge with reflex glass complete with level markings. Wetted parts SS316.

» One internal cooling coil

A Flopac high efficiency spiral wound cooling coil fitted inside the reservoir. Nominal capacity 1500 Watt. Wetted parts SS316. Connections OD ½" – tube.



Options

- » Alternative material selections for specific services.
- » Flexible designs to fit a specific location or available space.
- » High pressure designs (ANSI 600# / 1500#) for static designs up to 200 barg.
- » Additional temperature- or flow instruments to enhance monitoring facilities.
- » Addition of a buffer liquid circulation unit; to ensure circulation and to enhance cooling capacity.
- » Addition of an all stainless steel 5 ltr refill unit with 75cc/str handpump. (Other refill options available. Note: filling funnels should not be used!)



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