API 682 – Plan 21

Enjoy the Flopac performance and treat your equipment by selecting the Flopac® series SPX-21_ seal flushing units.

The range of Flopac® SPX seal flushing units include plan 21 seal flushing units that are typically used with arrangement 1 contacting wet seals (1CW-FX, 1CW-FL), or, with arrangement 2 contacting wet seals (2CW–CW) in combination with plan 52. Plan 21 seal flushing units are intended to cool and lubricate the (inner) seal and reduce the product vapour pressure at the seal chamber.

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

Advantages:

- **Not just a cooler but a complete (API 682) compliant package.**
- **Including vent- and drain valve.**
- **Engineered to offer an optimal user experience.**
- **As per your preference, air or liquid cooled.**
- **Quick delivery program for our competitively priced standard range.**
- **Fully engineered package available.**

Technical Specification API 682 – Plan 21

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Plan 21 – Description

Purpose

A plan 21 provides a cool flush to the seal in order to improve the lubrication properties of the product and to improve the seal operating conditions by lowering the vapour pressure.

Operation

In a Plan 21 pump product is tapped from the (high pressure) pump discharge or pump discharge piping and routed through a flow control orifice and cooler, then into the seal chamber. The product in the seal chamber is isolated from that in the impeller area of the pump by a throat bushing. A plan 21 may be needed to improve the margin to vapour formation, to meet secondary sealing element temperature limits, to reduce coking or polymerizing, or to improve lubricity (as in hot water).

The plan 21 uses pump product for seal flushing liquid. Circulation of the seal flushing liquid is established using the pressure differential between the higher pressure of the pump discharge versus the lower pressure at the seal chamber.

A properly designed Plan 21 operates self-reliant, provided it is offered a sufficient pressure differential to allow good flow rates.

Heat exchangers

A plan 21 may be equipped with a liquid (water) cooler or an air fin cooler. The preferred method for cooling is by means of a natural air draught cooling section, yet for higher heat loads a water cooler or forced air blast cooler may be needed. Flopac can provide all. Please have a look at our cooler section to check our standard availability. Tailored solutions available as well.

For our air coolers Flopac uniquely uses full contact laser-welded cooling fins in a SS316Ti quality, suitable for the most aggressive industrial atmospheres including offshore.

Instrumentation

A plan 21 is equipped with a a temperature gauge to monitor the seal flush supply temperature. It could be considered to use transmitters iso gauges. There is no need for pressure instruments. Optionally the plan 21 can be equipped with flow control orifice.

Notes/recommendations

Flopac provides a complete API 682 compliant package, including support and vent- and drain valve.

Given the industry's negative experiences with cooler plugging and/or the often excessive cooler sizing requirements, a plan 21 would not be our first choice. We would rather recommend a plan 23 unless you want to avoid the added seal complexity imposed by a Plan 23 (size and cost).

Please contact Flopac for a more detailed advise on all topics related to Flopac® seal support system plan 21. We will gladly assist.

Plan 21 – Features

Plan 21 – main features

- Improves the lubricity of the product.
- Reduction of Vapour pressure at seal chamber.
- Operates self-reliant.
- No circulation device needed.
- Prone to plugging.
- May need excessively sized heat exchangers.

Benefits of the Flopac Plan 21

- Wetted parts all SS316.
- Full contact laser-welded SS316Ti cooling fins.
- Flexible designs all properly engineered.
- Reliable performance.
- Little to no operating cost.
- Complete (API 682/ISO 21049) compliant packages available (not just a loose cooler)
- Vent- and drain valves included.
- Compact and lightweight configuration.
- Engineered to optimise thermosiphon mechanism.
- Directly from the manufacturer.

Options

- Alternative material selections for specific services like HF and H_2S (NACE) services.
- These units can be tailored to all your specific demands.
- The use of Smart transmitters instead of switches for remote alarm / control functions.

- High pressure designs (ANSI 600# / 1500#) for static designs up to 200 barg.
- Additional pressure-, temperature- or flow instruments to enhance monitoring facilities.
- The addition of a temperature gauge, make Badotherm, skin type TG18 -/-20/+120°C, dial 100mm, made from SS316/SS304. Other makes/types and ranges on request.

Mechanical seal system SPX-210

A complete and fully packaged Plan 21 system for arrangement 1 wet single seals (or the wet inner seal of an arrangement 2 unpressurised dual seal) in accordance with API 682 or ISO 21049 latest edition. Including support.

Standard configuration

Design ASME VIII, div. 1/not stamped and/or the European legislation (CE) such as PED 2014/68/EU and the ATEX 114 / 2014/34/EU – Zone 2 II/A T1-T3.
Suitable for general oil/water service – Non-hazardous.

Design 40 barg @ -15/+90°C / ANSI 300#-sch.40s.
Wetted parts AISI 316(L) / with SS 316Ti full contact laser-welded fins. SS304 studbolts.

To- and from seal connections ANSI 3/4" 300# RF smf.
Vent and drain connections ANSI 1/2" 300# RF smf.

Engineering units: SI units, Bar/°C.
NDE: Visual-/hydrostatic and leaktesting.
Surface preparation : Flopac std 3 layer epoxy system.

For heat loads up to 1.5 KW.

Available at request:

- Designs for higher heat loads
- 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

SPX-210 Configuration

Main components

One heat exchanger

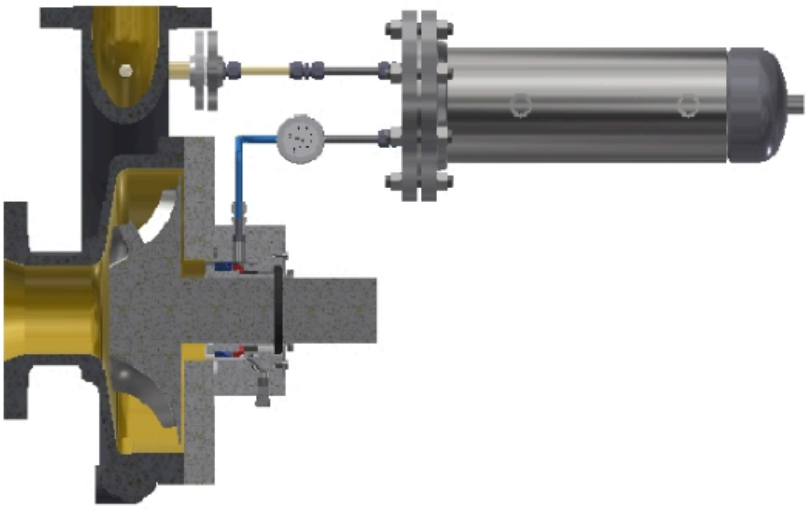
As appropriate, refer to the section coolers.

Appendages

Vent- and drain valves as appropriate; API 602 forged gate type.

One temperature gauge

Make Badotherm, skin type TG18 -/-20/+120°C, dial 100mm, made from SS316/SS304. Other makes/types and ranges on request.



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