EagleBurgmann®
Rely on excellence

API 682 4th edition Category 2/3 Configurations

Mechanical seals

Piping plans

Seal supply systems

Configuration

1CW-FL

API 682 4th edition

Category 2 and 3

Configuration 1CW-FL (Contacting Wet – FLoating throttle bushing)

EagleBurgmann mechanical seals applicable for this configuration

	Seal type A (Balanced pusher seals)	Seal type B (Metal bellows seals with O-Rings)	Seal type C (Metal bellows seals with flexible graphite)
ROTATING	■ H75VA4-S ■ LL9UC	■ LY9SA	■ MBS682
STATIONARY	■ LEK777 ■ SH		■ LY9TC

Engineered Seals

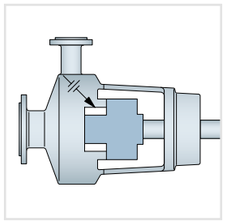
Beyond API specifications, EagleBurgmann offers a comprehensive range of engineered seals tailored to customer's specification. Please inquire.

EagleBurgmann seal supply systems and components

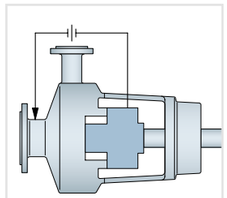
Plans	Products
21 (22), 23	WEF6 Water cooler, WEL6 Air cooler, SPT6 Temperature indicator
31	ZYA6 Cyclone separator
41	WEF6 Water cooler, WEL6 Air cooler, SPT6 Temperature indicator, ZYA6 Cyclone separator
32	SPX6 Flush unit
51	QFT6 Quench system
65A	LSA6 Leakage collection reservoir
65B	LSB6 Leakage collection reservoir
66A, 66B	SPP6 Leakage detection system
62 (61), 99	Engineered to customer's specifications

API piping plans applicable for 1CW-FL configuration

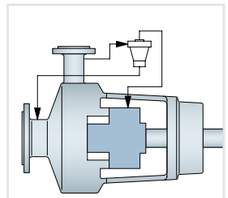
Process side



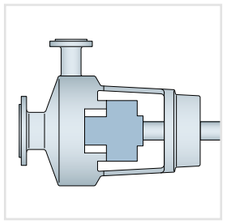
Plan 01
Integral (internal) recirculation from the pump discharge to the seal chamber.



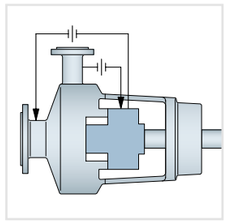
Plan 13
Recirculation from the seal chamber through a flow control orifice and back to the pump suction or pump suction piping.



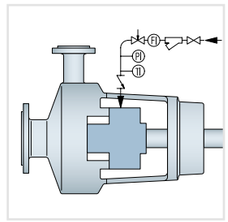
Plan 31
Recirculation from the pump discharge through a cyclone separator delivering the clean fluid to the seal chamber. The solids are delivered to the pump suction line.



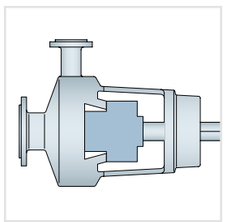
Plan 02
Dead-ended seal chamber with no recirculation of flushed fluid. Flush connections plugged.



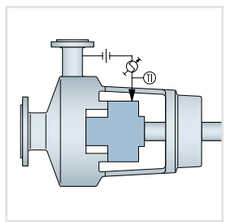
Plan 14
Recirculation from pump discharge through a flow control orifice to the seal and simultaneously from the seal chamber through a flow control orifice to pump suction.



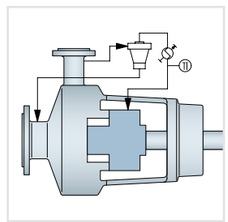
Plan 32
Injection of clean fluid into the seal chamber from an external source.



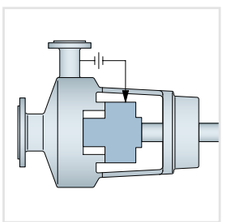
Plan 03
Circulation between the seal chamber and the pump created by the design of the seal chamber. Flush connections plugged.



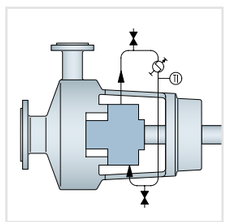
Plan 21 (22)
Recirculation from pump discharge through a flow control orifice and cooler (in Plan 22 through a strainer, a flow control orifice and a cooler) into the seal chamber.



Plan 41
Recirculation from the pump discharge through a cyclone separator delivering the clean fluid to a cooler and then to the seal chamber. The solids are delivered to the pump suction line.

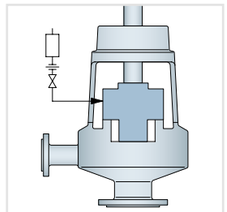


Plan 11 (12)
Recirculation from the pump discharge through a flow control orifice (in Plan 12 through a strainer and a flow control orifice) into the seal chamber.

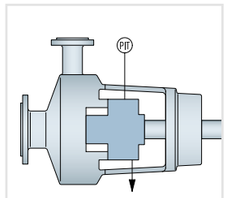


Plan 23
Recirculation from a circulation device in the seal chamber through a cooler and back into the seal chamber.

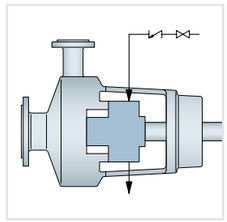
Atmospheric side



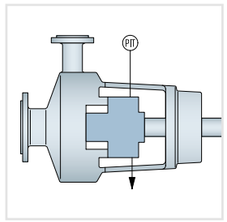
Plan 51
Reservoir providing a dead-ended blanket for fluid to the quench connection of the gland plate. Only recommended for vertical pumps.



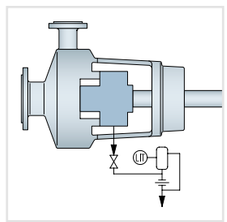
Plan 66A
Throttle bushings in the seal gland minimize the seal leakage leaving the seal gland and allow for detection of a seal failure by an alarm of the monitoring pressure transmitter.



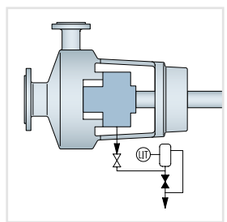
Plan 62 (61)
Quench stream from an external source to the atmospheric side of the seal faces. The quench stream can be low-pressure steam, nitrogen or clean water. (Plan 61: tapped and plugged atmospheric-side connections for purchaser's use.)



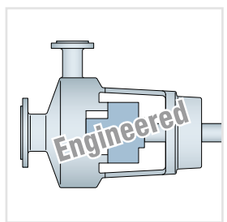
Plan 66B
An orifice plug in the drain port minimizes the seal leakage leaving the seal gland and allows for detection of a seal failure by an alarm of the monitoring pressure transmitter.



Plan 65A
Atmospheric leakage collection and alarm system for condensing leakage. Failure of the seal will be detected by an excessive flow rate into the leakage collection system.



Plan 65B
Atmospheric leakage collection and detection system for condensing leakage. Failure of the seal will be detected by a cumulative leakage into the system.



Plan 99
Engineered piping plan not defined by other existing plans.

The API experts

EagleBurgmann is one of the leading international system providers of sealing technology. For more than 20 years we have been actively contributing our expertise to developing and implementing the API 682 standard for the selection and application of seals and supply systems in centrifugal and rotary pumps.

Solutions for more safety and productivity

The new 4th edition of API 682 is in line with the latest achievements and current developments. EagleBurgmann offers the widest portfolio of seals and seal supply systems acc. to API 682 4th edition, and consequently has the optimum product for each API-compliant requirement: technically mature, practical solutions that provide significantly greater safety and process reliability in refining technology, petrochemical, oil & gas and chemical industries.

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Important note

All the technical specifications are based on extensive tests and our many years of experience. However, the diversity of possible applications means that they can serve as guide values only.

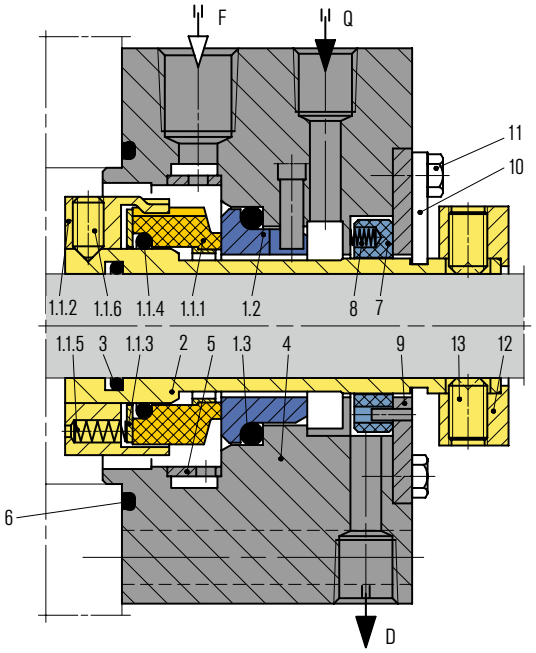
It should be noted that the extremal values of each operating parameter cannot be applied at the same time because of their interaction. Furthermore, the operating range of each specific product depends on the respective shaft diameter, materials used, mode of operation and on the medium to be sealed.

A guarantee can only be given in the individual case if the exact conditions of application are known and these are confirmed in a special agreement. When critical conditions of operation are involved, we recommend consulting with our specialist engineers.

Subject to change.

Seal type A

H75VA4-S



Features

- API 682 Category 2 and 3, Type A, Arrangement 1 seal
- Single seal
- Balanced
- Cartridge unit
- Rotating multiple springs
- Bi-directional design
- Integrated pumping device available

Advantages

- Compact design
- Universally applicable both for retrofits or original equipment
- Efficient stock-keeping due to standardized components
- Extended selection of materials
- Extended field of operation in terms of temperature and pressure
- Metal parts also in special materials available

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- Highly volatile hydrocarbons
- LPG plants
- API 610/ISO 13709 pumps
- Process pumps

Operating range (see note on page 3)

Shaft diameter: d = 20 ... 110 mm (0.79" ... 4.33")
Pressure: p1 = ... 42 bar (609 PSI)
Temperature: t = –40 °C ... +176 °C (–40 °F ... +349 °F)*
Sliding velocity: vg = 23 m/s (75 ft/s)
Axial movement:
d ≤40 mm ±1.0 mm
d ≥40 mm ±1.5 mm
* Engineered up to 260 °C (500 °F) with FFKM (K) secondary seals

Materials

Seal ring: Blister resistant carbon,
Silicon carbide SSiC (Q1), RBSiC (Q2)
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)
Springs: Hastelloy® C-276 (M5)
Metal parts: CrNiMo steel 316 (G) or equivalent,
optional materials on request.

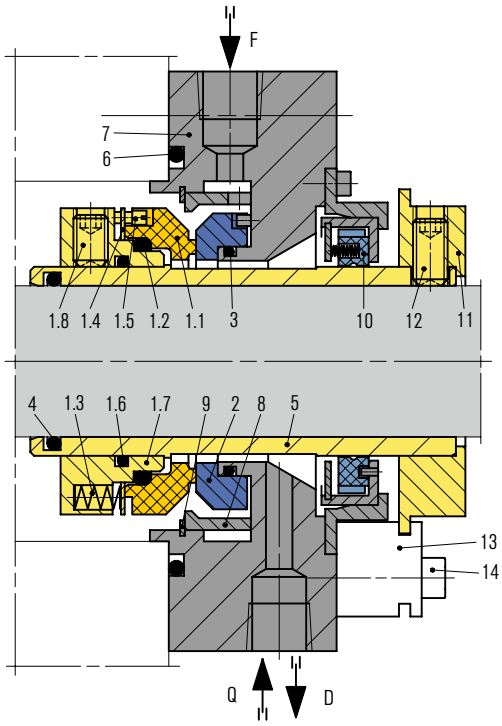
Recommended piping plans

Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

Item	Description
1.1.1	Seal ring
1.1.2	Driver
1.1.3	Thrust ring
1.1.4, 1.3, 3, 6	O-Ring
1.1.5, 8	Spring
1.1.6, 13	Set screw
1.2	Mating ring
2	Seal sleeve
4	Gland plate
5	Flow distributor
7	Throttle ring
9	Disc
10	Setting device
11	Hexagon bolt
12	Set ring
F	Flush
Q	Quench
D	Drain

Seal type A

LL9UC



Features

- API 682 Category 2 and 3, Type A, Arrangement 1 seal
- Single seal
- Balanced
- Cartridge unit
- Rotating multiple springs
- Solid seal faces

Advantages

- Compact design
- Low heat generation and power consumption due to narrow seal face width
- Longer seal life
- Pressure-balanced design prevents mating ring being forced out under reverse pressure
- No damage to shaft sleeve as dynamic O-Ring is not in direct contact with the sleeve
- Extended selection of materials
- Metal parts also in special materials available

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- Highly volatile hydrocarbons
- LPG plants
- API 610/ISO 13709 pumps
- Process pumps

Operating range (see note on page 3)

Shaft diameter: d1 = 20 ... 110 mm (0.79" ... 4.33")
Pressure: p = vacuum ... 42 bar (... 609 PSI)
Temperature: t = –40 °C ... +176 °C (–40 °F ... +349 °F)*
Sliding velocity: vg ... 23 m/s (... 75 ft/s)
* Engineered up to 260 °C (500 °F) with FFKM (K) secondary seals

Materials

Seal ring: Blister resistant carbon,
Silicon carbide SSiC (Q1), RBSiC (Q2)
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)
Springs: Hastelloy® C-276 (M5)
Metal parts: CrNiMo steel 316 (G)

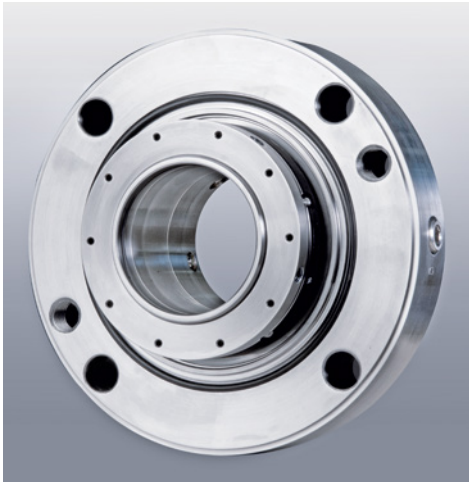
Recommended piping plans

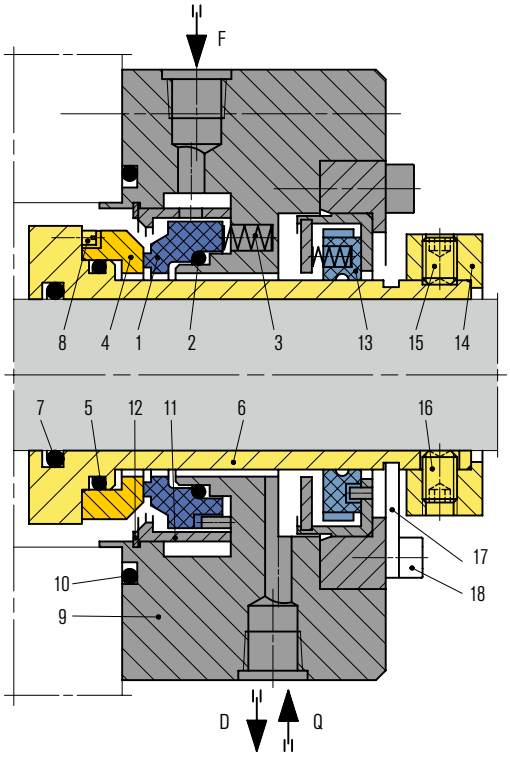
Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

Item	Description
1.1	Seal ring
1.2, 1.6, 3, 4, 6	O-Ring
1.3	Spring
1.4	Thrust ring
1.5	Drive screw
1.7	Collar
1.8, 12	Set screw
2	Mating ring
5	Seal sleeve
7	Gland plate
8	Flow distributor
9	Retaining ring
10	Throttle bushing
11	Drive collar
13	Setting device
14	HSH Cap screw
F	Flush
Q	Quench
D	Drain

Seal type A

LEK777





Features

- API 682 Category 2 and 3, Type A, Arrangement 1 seal
- Single seal
- Balanced
- Cartridge unit
- Stationary multiple springs
- Solid seal faces

Advantages

- Suitable for higher speeds
- Good followability due to no influence from run-out, squareness or vibration of the shaft
- Compact design
- Low heat generation and power consumption due to narrow seal face width
- Longer seal life
- Pressure-balanced design prevents mating ring being forced out under reverse pressure
- No damage to shaft sleeve as dynamic O-Ring is not in direct contact with the sleeve

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- Highly volatile hydrocarbons
- LPG plants
- API 610/ISO 13709 pumps
- Process pumps

Operating range (see note on page 3)

Shaft diameter: d1 = 20 ... 110 mm (0.79" ... 4.33")
Pressure (product seal): p = vacuum ... 60 bar (... 870 PSI)
Temperature: –40 °C ... +176 °C (–40 °F ... +349 °F)*
Sliding velocity: vg = 50 m/s (164 ft/s)
* Engineered up to 260 °C (500 °F) with FFKM (K) secondary seals

Materials

Seal ring: Blister resistant carbon, Silicon carbide SSiC (Q1), RBSiC (Q2)
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)
Springs: Hastelloy® C-276 (M5)
Metal parts: CrNiMo steel 316 (G)

Recommended piping plans

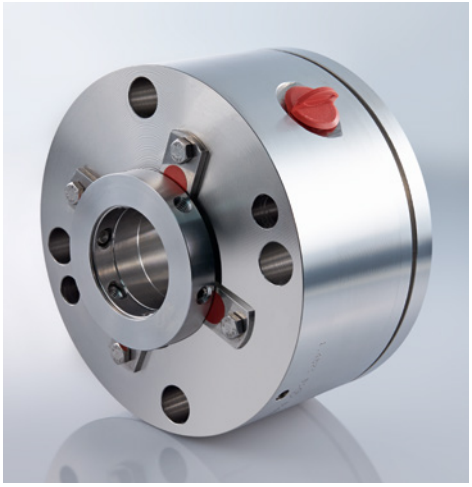
Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

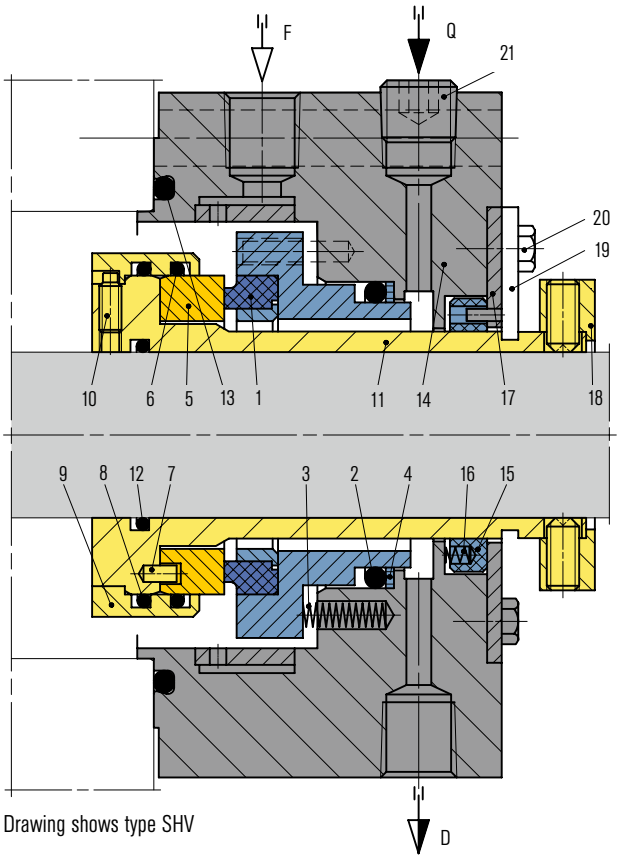
Item	Description
1	Seal ring
2, 5, 7, 10	O-Ring
3	Spring
4	Mating ring
6	Seal sleeve
8	Drive screw
9	Gland plate
11	Flow distributor
12	Retaining ring
13	Throttle bushing
14	Drive collar
15, 16	Set screw
17	Setting device
18	HSH Cap screw

F	Flush
D	Drain
Q	Quench

Seal type A

SH





Drawing shows type SHV

Features

- API 682 Category 2 and 3, Type A, Arrangement 1 seal
- Single seal
- Balanced
- Cartridge unit
- Stationary multiple springs
- Shrink-fitted seal ring
- Solid mating ring

Advantages

- Engineered seal for extended requirements
- Deformation-optimized seal for high pressure and high sliding velocity
- Insensitive to shaft deflections due to stationary design
- Version for extreme applications available

Recommended applications

- Oil and gas industry
- Refining technology
- Chemical industry
- Hot water
- Sour water
- Caustic soda
- Amines
- Crystallizing media
- Crude oil
- Process water
- Crude oil feed pumps
- Injection pumps
- Multiphase pumps

Operating range (see note on page 3)

Shaft diameter: d1 = 40 ... 110 (250) mm
(1.57" ... 4.33 (9.84)"
Pressure: p1 = 42 (150) bar (609 (2,175) PSI)
Temperature: t = –40 °C ... +176 (+200) °C
(–40 °F ... +350 (+394) °F)
Sliding velocity: vg = 23 (60) m/s (76 (197) ft/s)
Axial movement: ±3.0 mm

Materials

Seal ring: Blister resistant carbon,
Silicon carbide SSiC (Q1), RBSiC (Q2, Q3)
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)
Springs: Hastelloy® C-4 (M)* and C-276 (M5)
Metal parts: CrNiMo steel 316 (G) or equivalent,
optional materials on request.
* EagleBurgmann standard

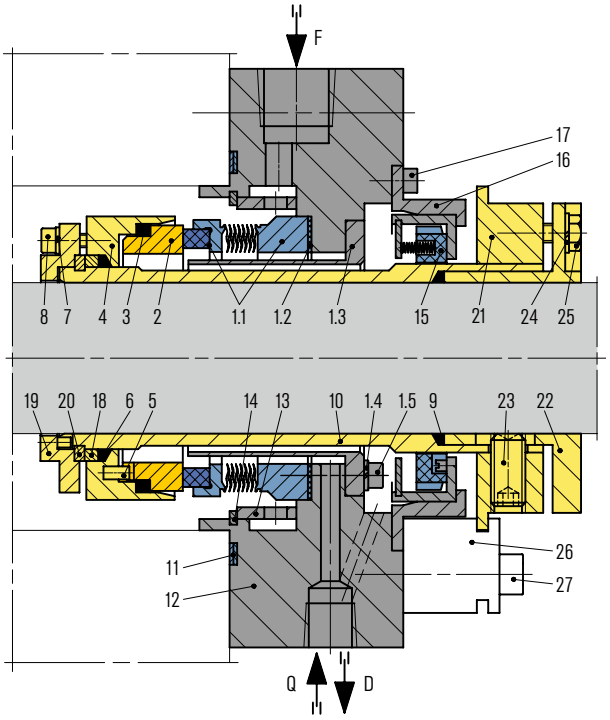
Recommended piping plans

Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

Item	Description
1	Seal ring
2, 6, 8, 12, 13	O-Ring
3, 16	Spring
4	Thrust ring
5	Mating ring
7, 10	Set screw
9	Sleeve
11	Seal sleeve
14	Gland plate
15	Throttle ring
17	Disk
18	Set ring
19	Setting device
20	Hexagon bolt
21	Plug
F	Flush
Q	Quench
D	Drain

Seal type C

LY9TC



Features

- API 682 Category 2 and 3, Type C, Arrangement 1 seal
- Single seal
- Balanced
- Cartridge unit
- Stationary metal bellows
- Shrink fitted seal ring and solid mating ring

Advantages

- Suitable for higher speeds
- Good followability due to no influence from run-out, squareness or vibration of the shaft
- Compact design
- Low heat generation and power consumption due to narrow seal face width
- Longer seal life
- Also available in double ply design
- Suited for applications with extreme high and low temperatures
- Absence of dynamic O-Ring eleminates/reduces seal face hang-up
- Bellows design minimizes variation in face load due to shaft expansion or face wear
- Resistant to abrasive particles in the medium, no shaft or sleeve fretting

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- LPG plants
- API 610/ISO 13709 pumps
- Process pumps

Operating range (see note on page 3)

Shaft diameter: d1 = 20 ... 110 mm (0.79" ... 4.33")
Pressure single ply bellows: p = vacuum ... 20 bar (... 290 PSI), Pressure two ply bellows: p = vacuum ... 35 bar (... 508 PSI)
Temperature: t = –130 °C ... +400 °C (–202 °F ... +752 °F)
Sliding velocity: vg ... 50 m/s (... 164 ft/s)

Materials

Seal ring: Blister resistant carbon,
Silicon carbide SSiC (Q1), RBSiC (Q2)
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Bellows: Inconel® 718 (M6)
Secondary seals: Graphite (G)
Metal parts: CrNiMo steel 316 (G), Carpenter® 42 (T4)

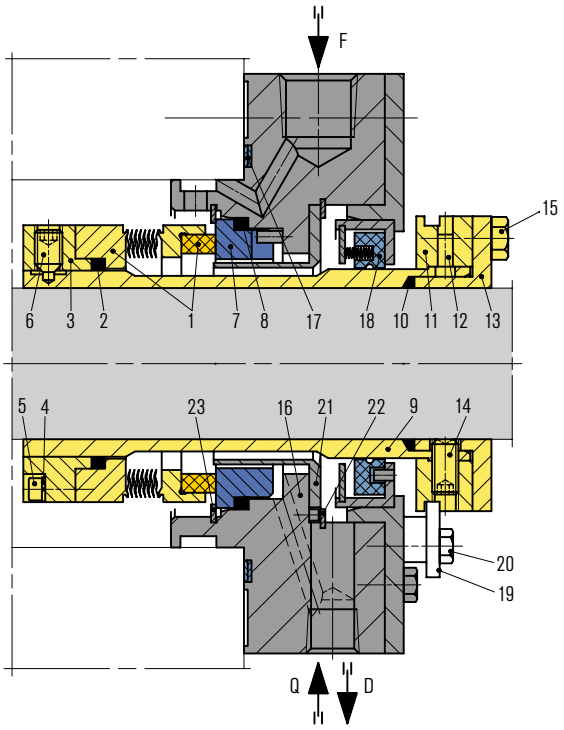
Recommended piping plans

Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

Item	Description
1.1	Seal ring with bellows unit
1.2, 11	Gasket
1.3	Baffle sleeve
1.4, 7, 24	Spring washer
1.5, 8, 17, 27	HSH Cap screw
2	Mating ring
3, 6, 9	Graphite ring
4	Retainer
5	Pin
10	Seal sleeve
12	Gland plate
13	Flow distributor
14	Retaining ring
15	Throttle bushing
16	Adapter
18	Thrust ring
19	Drive ring
20	Split ring
21	Drive collar
22	Clamp sleeve
23	Set screw
25	Hexagon bolt
26	Setting device
F	Flush
Q	Quench
D	Drain

Seal type C

MBS682



Features

- API 682 Category 2 and 3, Type C, Arrangement 1 seal
- Single seal
- Balanced
- Cartridge unit
- Rotating metal bellows
- Shrink fitted seal ring and solid mating ring

Advantages

- Compact design
- Suited for applications with extreme high and low temperatures
- Absence of dynamic O-Ring eleminates/reduces seal face hang-up
- Bellows design minimizes variation in face load due to shaft expansion or face wear
- Resistant to abrasive particles in the medium, no shaft or sleeve fretting
- Also available in double ply design

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- LPG plants
- API 610/ISO 13709 pumps
- Process pumps

Operating range (see note on page 3)

Shaft diameter: d1 = 20 ... 110 mm (0.79" ... 4.33")
Pressure single ply bellows: p = vacuum ... 25 bar (... 363 PSI)*
Pressure double ply bellows: p = vacuum ... 35 bar (... 508 PSI)
Temperature: t = −75 °C ... +400 °C (−103 °F ... +752 °F)
Sliding velocity: vg ... 23 m/s (... 75 ft/s)
* p >20 bar (290 PSI) on request.

Materials

Seal ring: Blister resistant carbon, Silicon carbide SSiC (Q1), RBSiC (Q2)
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Bellows: Inconel® 718 (M6)
Secondary seals: Graphite (G)
Metal parts: CrNiMo steel 316 (G), Carpenter® 42 (T4)

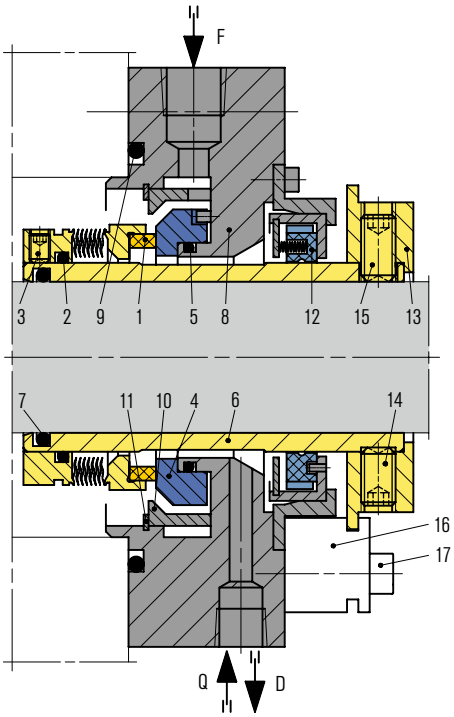
Recommended piping plans

Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

Item	Description
1	Seal ring with bellows unit
2, 8, 10	Graphite ring
3	Collar
4	Spring washer
5	HSH Cap screw
6, 14	Set screw
7	Mating ring
9	Seal sleeve
11	Drive collar
12	Pin
13	Clamping sleeve
15, 20	Hexagon bolt
16	Gland plate
17	Gasket
18	Throttle bushing
19	Setting device
21	Baffle sleeve
22, 23	Retaining ring
F	Flush
Q	Quench
D	Drain

Seal type B

LY9SA



Features

- API 682 Category 2 and 3, Type B, Arrangement 1 seal
- Single Seal
- Balanced
- Cartridge unit
- Rotating metal bellows
- Shrink fitted seal ring and solid mating ring

Advantages

- Compact design
- Bellows design allows use of balanced seal with plain sleeve
- Absence of dynamic O-Ring eleminates/reduces seal face hang-up
- Bellows design minimizes variation in face load due to shaft expansion or face wear
- Resistant to abrasive particles in the medium, no shaft or sleeve fretting
- Low heat generation and power consumption due to narrow seal face width
- Longer seal life

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- LPG plants
- API 610/ISO 13709 pumps
- Process pumps

Operating range (see note on page 3)

Shaft diameter: d1 = 20 ... 110 mm (0.79" ... 4.33")
Pressure: p = vacuum ... 20 bar (290 PSI)
Temperature: t = –40 °C ... +200 °C (–40 °F ... +392 °F)
Sliding velocity: vg ... 23 m/s (75 ft/s)

Materials

Seal ring: Blister resistant carbon
Mating ring: Silicon carbide SSiC (Q1), RBSiC (Q2)
Bellows: Hastelloy® C-276 (M5),
option: Inconel® 718 (M6)
Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)
Metal parts: CrNiMo steel 316 (G), Hastelloy® C-276 (M5)

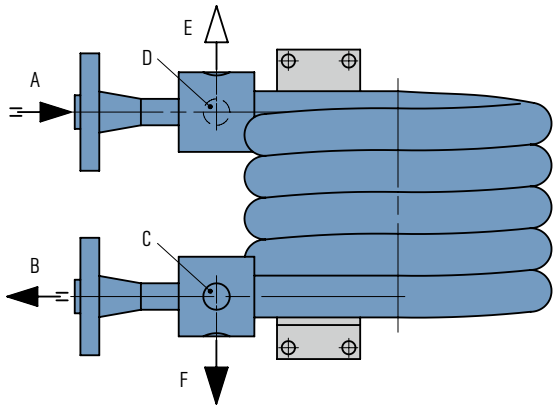
Recommended piping plans

Process side:
01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41
Atmospheric side: 51, 61, 62, 65A, 65B, 66A, 66B

Item	Description
1	Seal ring with bellows unit
2, 5, 7, 9	O-Ring
3, 14, 15	Set screw
4	Mating ring
6	Seal sleeve
8	Gland plate
10	Flow distributor
11	Retaining ring
12	Throttle bushing
13	Drive collar
16	Setting device
17	HSH Cap screw
F	Flush
Q	Quench
D	Drain

Plans 21 (22), 23, 41

WEF6 Water cooler



Features

Heat exchangers of the WEF6000-A4 range are used to cool process/barrier fluids in seal supply circuits. WEF6000-A4 heat exchangers are fully compliant with API 682 4th edition regulations. The process/barrier medium is directed through the tube, and the cooling medium is directed through the shell.

Venting and draining of the process/barrier medium side as well as the cooling water side is ensured. In addition, the heat exchangers can also be combined with a temperature instrument in the supply line to the mechanical seal (optional in accordance with API 682 4th edition).

Advantages

- Operating limits up to 45 bar/260 °C (653 PSI/500 °F) (tube side): suitable for a wide range of demanding operating conditions.
- Cooling water side and process side can be completely vented and drained
- Seamless pipes on process side
- Special design without welding inside the cooler
- Higher cooling water velocity due to innovative cooler design
- Stainless steel 316L: high resistance to corrosive media

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

Notes

Design and production in accordance with EU Pressure Equipment Directive PED 97/23 EC.
Design, calculation and production acc. to ASME VIII, Div. 1 (cooler not subject to ASME stamp requirements, piping <6")

Cleaning: Process/barrier medium side and cooling water side: flush with a suitable solvent.

Item	Description
A	From mechanical seal
B	To mechanical seal
C	Cooling water IN
D	Cooling water OUT
E	Vent
F	Drain

Product variants

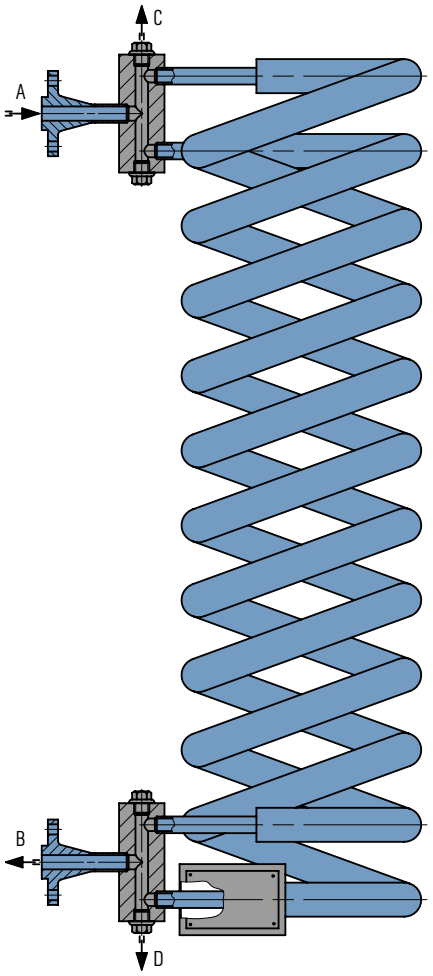
Designation	WEF6100-A4		WEF6100-A4		WEF6000-A4		WEF6000-A4	
Type of heat exchanger	ASME		PED		ASME		PED	
	Tube	Shell	Tube	Shell	Tube	Shell	Tube	Shell
Process connections	Flange 3/4", 600 lbs	NPT 3/4"	Flange 3/4", 600 lbs	NPT 3/4"	Flange 3/4", 600 lbs	Flange 3/4", 300 lbs	Flange 3/4", 600 lbs	Flange 3/4", 300 lbs
Drain/vent connection	NPT 1/2"		NPT 1/2"		NPT 1/2"		NPT 1/2"	
Allowable pressure[1]	45 bar (653 PSI)	16 bar (232 PSI)	45 bar (653 PSI)	16 bar (232 PSI)	45 bar (653 PSI)	16 bar (232 PSI)	45 bar (653 PSI)	16 bar (232 PSI)
Allowable temperature cooling water side (shell side)[1]	–29 °C ... +150 °C (–20 °F ... +302 °F)		–29 °C ... +150 °C (–20 °F ... +302 °F)		–29 °C ... +150 °C (–20 °F ... +302 °F)		–29 °C ... +150 °C (–20 °F ... +302 °F)	
Allowable temperature process/ barrier medium side (tube side)[1]	–29 °C ... +260 °C (–20 °F ... +500 °F)		–29 °C ... +260 °C (–20 °F ... +500 °F)		–29 °C ... +260 °C (–20 °F ... +500 °F)		–29 °C ... +260 °C (–20 °F ... +500 °F)	
Cooling capacity (kW)[2]	10		10		10		10	
Cooling capacity (kW)[3]	3		3		3		3	
Required cooling water quantity (m^3/h)	0.6		0.6		0.6		0.6	
Metal parts	316L		316L		316L		316L	

Other versions on request.

[1] Design data, permissible working values depend on the actual conditions of service.
[2] Guidelines with buffer/barrier fluid water 60 °C (140 °F) – cooling water 20 °C (68 °F).
[3] Guidelines with buffer/barrier fluid oil 60 °C (140 °F) – cooling water 20 °C (68 °F).

Plans 21 (22), 23, 41

WEL6 Air cooler



Features

Heat exchangers of the WEL6000-A4 range (shown here: WEL6002-A4) are used to cool process/barrier fluids in seal supply circuits. The heat exchangers are made of helical, laserwelded finned tubes. The cooling medium is ambient air. It is important, therefore, for WEL heat exchangers to be installed in well ventilated places indoors or, ideally, outdoors. There is a choice of three different basic versions of the WEL6000-A4 range as well as supplied fully assembled together with valves, base frame and other system components.

Advantages

- Operating limits up to 44 bar/260 °C (638 PSI/500 °F) (tube side): suitable for a wide range of demanding operating conditions.
- Can be completely vented and drained
- Seamless pipes
- Stainless steel 316L: high resistance to corrosive media

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

Notes

Design and production in accordance with EU Pressure Equipment Directive PED 97/23 EC.
Design, calculation and production acc. to ASME VIII, Div. 1 (cooler not subject to ASME stamp requirements, piping <6")

Item	Description
A	From mechanical seal
B	To mechanical seal
C	Vent
D	Drain

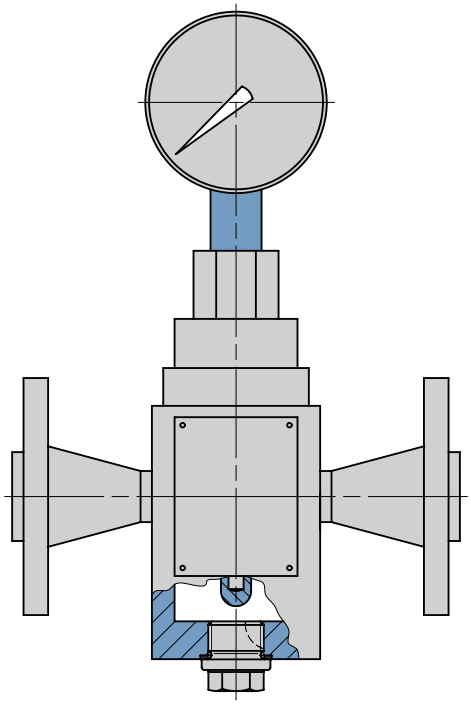
Product variants

Designation	WEL6001-A4A001-D0		WEL6002-A4A001-D0		WEL6003-A4A001-D0	
Type of heat exchanger	ASME	PED	ASME	PED	ASME	PED
Number of finned tubes	1		2 finned tubes switched in parallel		2 finned tubes switched in parallel and doubled length	
Connections	Flange 3/4", 600 lbs		Flange 3/4", 600 lbs		Flange 3/4", 600 lbs	
Drain/vent connection	Flange 1/2", 600 lbs [4]		Flange 1/2", 600 lbs [4]		Flange 1/2", 600 lbs [4]	
Allowable pressure[1]	44 bar (638 PSI)	44 bar (638 PSI)	44 bar (638 PSI)	44 bar (638 PSI)	44 bar (638 PSI)	44 bar (638 PSI)
Allowable temperature process/ barrier medium side (tube side)[1]	–29 °C ... +260 °C (–20 °F ... +500 °F)		–29 °C ... +260 °C (–20 °F ... +500 °F)		–29 °C ... +260 °C (–20 °F ... +500 °F)	
Cooling capacity (kW)[2]	1.5		2		3	
Cooling capacity (kW)[3]	1.2		1.5		2	
Volume (liters)	1.2		2.4		4.8	
Metal parts	316L		316L		316L	

Other versions on request.
[1] Design data, permissible working values depend on the actual conditions of service.
[2] Guidelines with buffer/barrier fluid water 60 °C (140 °F) – ambient temperature 20 °C (68 °F); moved air at min. 0.7 m/s (2.3 ft/s); product flow rate 8 l/min.
[3] Guidelines with buffer/barrier fluid oil 60 °C (140 °F) – ambient temperature 20 °C (68 °F); moved air at min. 0.7 m/s (2.3 ft/s); product flow rate 8 l/min.
[4] Version with screwed connection G1/2" available as an option.

Plans 21 (22), 23, 41

SPT6 Temperature indicator



Features

The measuring unit of the SPT6000-A4 range is used to visually monitor the operating temperature.

The measuring unit consists of a bi-metallic temperature gauge (NG100) with protective sleeve installed in a measuring block incl. drain connection.

Advantages

- Operating limits up to 45 bar/260 °C (653 PSI/500 °F) (design parameters)
- Temperature indicating range up to 200 °C (392 °F)
- Wetted parts: Stainless steel 316L for high resistance to corrosive media

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

Product variants

Designation	SPT6000-A4	SPT6000-A4
Connections – process	Flange 3/4", 600 lbs	Flange 3/4", 600 lbs
Connections – drain	G 1/2"	G 1/2"
Allowable pressure[1)]	45 bar (653 PSI)	45 bar (653 PSI)
Temperature range	0 °C ... +120 °C (+32 °F ... +248 °F)	0 °C ... +200 °C (+32 °F ... +392 °F)
Wetted parts	316L	316L

Other versions on request.

[1)] Design data, permissible working values depend on the actual conditions of service.

Plans 31, 41

ZYA6 Cyclone separator

Features

The ZY6000-A4 range is available in three versions:

ZYA6000-A4:
Cyclone separator for high flow rates and high pressures.

ZYB6000-A4:
Cyclone separator for high flow rates and high pressures; 100 % X-ray capability.

ZYC6000-A4:
Cast version, block-type design with integral flanges.

Advantages

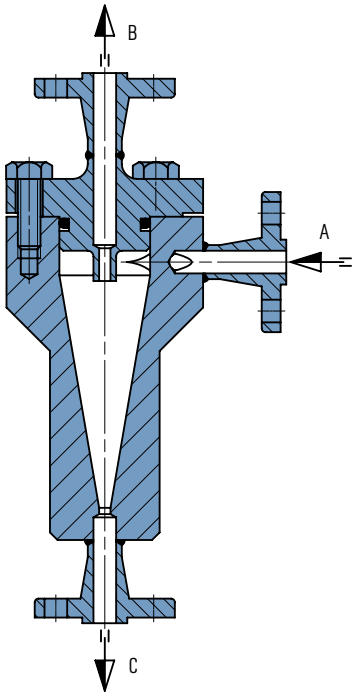
- Contamination is automatically conveyed to the suction nozzle of the pump: maintenance-free mode of operation for guaranteed reliability
- High filtration efficiency
- Wide range of products for the optimum solution for every application
- ZYA6000-A4 and ZYB6000-A4: available for operating pressures of up to 200 bar (2,900 PSI)
- ZYC6000-A4 in block-type design with integrated flange connections: low space requirements because of compact design

Functional description

Cyclone separators of the ZY6000-A4 range are used to clean mainly aqueous liquids containing contamination such as dirts and solids (e. g., in circulation systems of sewage, sludge or pipeline pumps).

The best possible filtration efficiency is achieved when the specific weight of the solids is much higher than that of the carrier liquid and when the differential pressure is as large as possible within the permissible pressure range (min. 1.7 bar (24.7 PSI) in accordance with API 682). The viscosity of the medium is a factor that also needs to be taken into account.

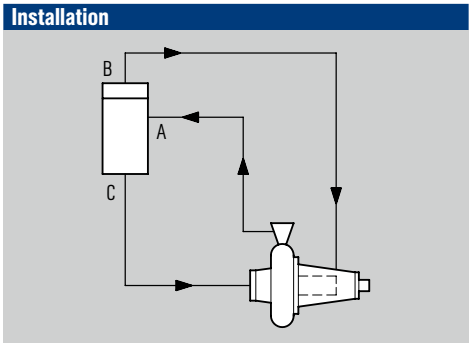
ZYA6000



Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

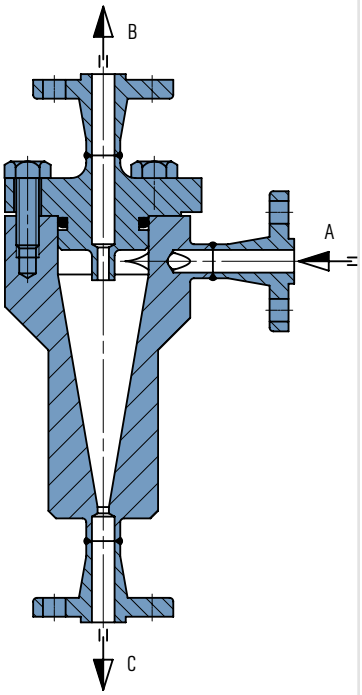
Installation



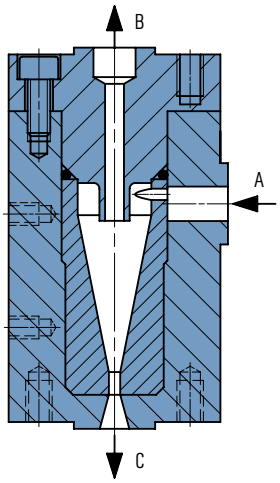
P&ID for ZY6000-A4 Cyclone separators
A Contaminated liquid IN
B Clean liquid OUT
C Separated liquid OUT

Product variants

ZYB6000



ZYC6000



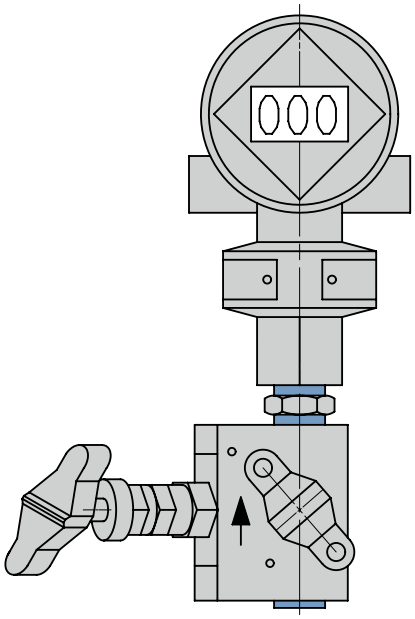
Product variants

Designation	ZYA6000	ZYB6000	ZYC6000
Features	Standard	100 % X-ray capability	Cast version
Connections – product inlet	Flange 3/4", 600 lbs	Flange 3/4", 600 lbs	Integral flange 3/4", 600 lbs
Connections – clean product outlet	Flange 3/4", 600 lbs	Flange 3/4", 600 lbs	Integral flange 3/4", 600 lbs
Connections – contaminated product outlet	Flange 3/4", 600 lbs	Flange 3/4", 600 lbs	Integral flange 3/4", 600 lbs
Allowable pressure[1]	60 bar (870 PSI)	60 bar (870 PSI)	60 bar (870 PSI)
Temperature range	–29 °C ... +150 °C (–20 °F ... +302 °F)	–29 °C ... +150 °C (–20 °F ... +302 °F)	–29 °C ... +150 °C (–20 °F ... +302 °F)
O-Ring[2]	Viton®	Viton®	Viton®
Wetted parts	316L	316L	316L

Other versions on request.
[1] Max. permissible working values depend on version.
[2] Other materials on request, e. g. FKM, EPDM.

Plans 66A, 66B

SPP6 Leakage detection system



Features

The EagleBurgmann leakage control systems of the SPP6006-A4 range consist of a pressure transmitter which is supplied together with a block and bleed valve.

Advantages

- Compact design
- Easy to integrate in existing piping systems.

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

Functional description

The SPP6006-A4 leakage control system is used to detect leakage from single seals. In case of a seal failure, the SPP6006-A4 is required to monitor excessive leakage. If the seal leakage exceeds a certain value, the bushing/ orifice will limit the amount of leakage leaving the seal gland. Consequently the pressure will increase on the upstream side of the inner bushing. The pressure is monitored by means of the transmitter which will provide information about seal performance and seal failure.

Product variants

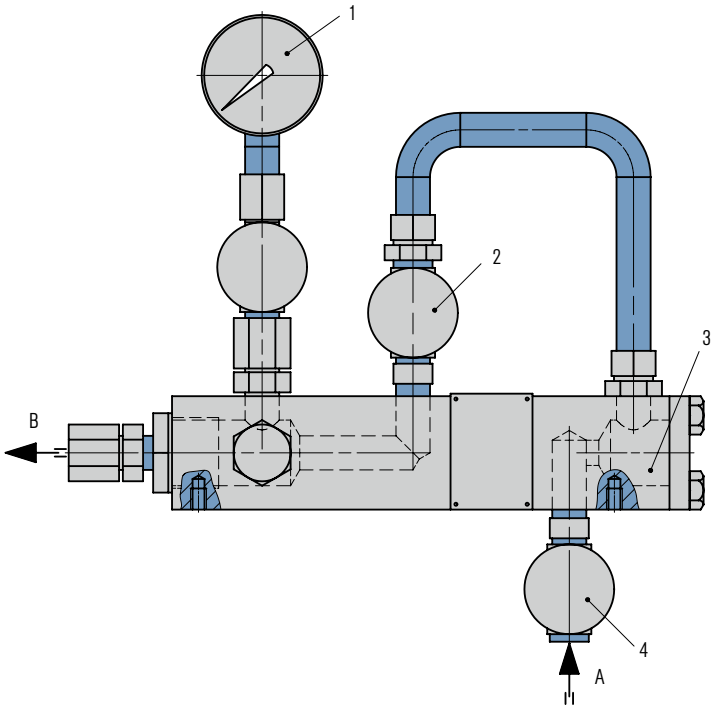
Designation	SPP6006-A4	SPP6006-A4
Process connections	1/2" NPT	1/2" NPT
Pressure range	0 ... 55 bar (0 ... 798 PSI)	0 ... 55 bar (0 ... 798 PSI)
Calibration range[1)]	0 ... 16 bar (0 ... 232 PSI)	0 ... 40 bar (0 ... 580 PSI)
Allowable temperature[1)]	–29 °C ... +120 °C (–20 °F ... +248 °F)	–29 °C ... +120 °C (–20 °F ... +248 °F)
Wetted parts	316L	316L

Other versions on request.

[1)] Design data, permissible working values depend on the actual conditions of service.

Plan 32

SPX6 Flush unit



Features

The EagleBurgmann flush unit of the SPX6000-A4 range consists of a manifold with integrated inline filter supplied together with a needle valve and pressure gauge. Optional available with temperature gauge and/or flow indicator. The unit is used to control the flushing of a mechanical seal.

Advantages

- Compact design due to integral filter
- Modular concept – optimal monitoring equipment available

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

Functional description

The SPX6000-A4 flush unit continuously supplies flushing media from an external source to the mechanical seal. This plan is almost always used in combination with a throat bushing which serve as a throttle device to maintain a higher pressure in the stuffing box to isolate the pumped product from the seal chamber.

Item	Description
1	Pressure indicator
2	Needle valve
3	Integral filter
4	Valve
A	From external source
B	To mechanical seal

Product variants

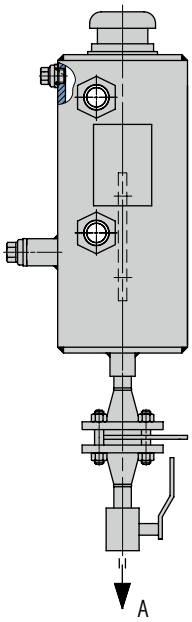
Designation	SPX6000-A4
Allowable pressure[1)]	44 bar (638 PSI)
Allowable temperature[1)]	–20 °C ... +120 °C (–4 °F ... +248 °F)
Process connections	1/2" NPT
Metal parts	316L

Other versions on request.

[1)] Design data, permissible working values depend on the actual conditions of service.

Plan 51

QFT6 Quench system



Features

Quench fluid supply systems are used with single mechanical seals. They act as a convenient fluid reservoir. The QFT6000-A4 stainless steel tank is equipped with a sight glass for monitoring the MIN/MAX filling level and can be fastened with a lug fixture.

Advantages

- Sight-glass for MIN/MAX monitoring has a large indicator area
- Filling is possible via a filling filter or a separate pipe connection
- Combined filling and ventilation filter in the quench fluid tank for reliable operation
- Tank made of 1.4571: high resistance to corrosive media

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

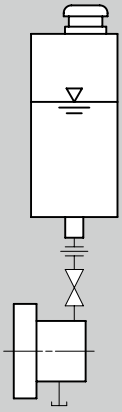
Functional description

Quench fluid systems (Plan 51) are employed to:

- Absorb leakage
- Monitor the leakage rate (e. g., through periodic reading of the level in the tank)
- Prevent icing
- Protect against dry running
- Stabilize the lubricating film
- Exclude air from the media in order to prevent a reaction with oxygen in the air

Item	Description
A	To mechanical seal

Installation



Product variants

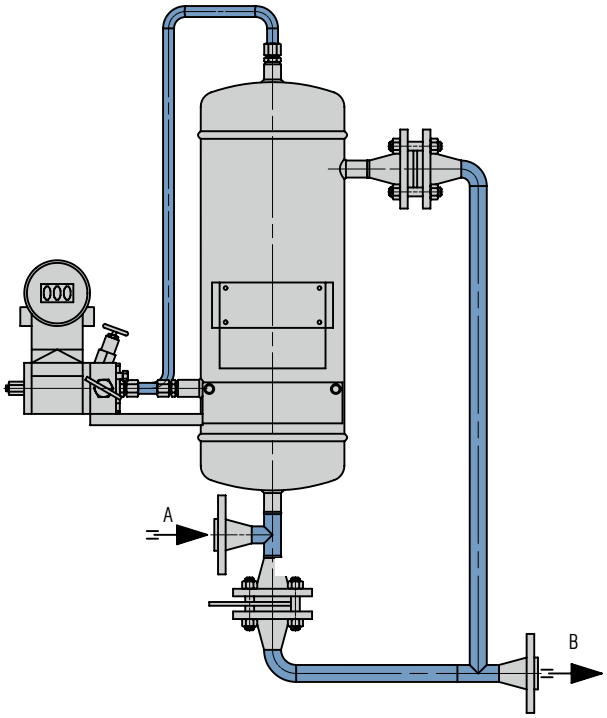
Designation	QFT6000/M001-D0
Pressure Equipment Directive	n/a
Volume, vessel (liters)	3
Allowable pressure	Pressureless
Allowable temperature system[1)]	–29 °C ... +100 °C (–20 °F ... +212 °F)
Metal parts (tank)	316Ti
Filling filter	Glass-fibre-reinforced polyamide
Sight-glass	Glass
Gasket	FKM

Other versions on request.

[1)] Design data, permissible working values depend on the actual conditions of service.

Plan 65A

LSA6 Leakage collection reservoir



Features

The EagleBurgmann leakage control systems of the LSA6000 range in accordance with API Plan 65A consist of a leakage collection tank with integrated orifice and overflow pipe. The level can be monitored with the differential pressure transmitter which is supplied together with a five-way manifold valve.

Advantages

- Seal failure detection
- Safe discarding of excessive seal leakage
- To ensure durability, all components are corrosion resistant

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

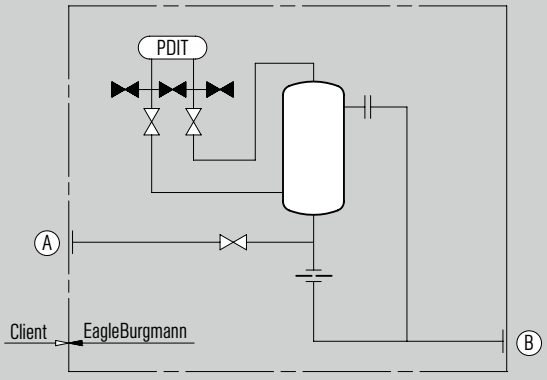
Functional description

In accordance with API Plan 65A, the LSA6000 leakage control system is used to discharge leakage from single seals. The outboard leakage is collected in an external tank; the leakage volume is monitored (level in the tank).

Notes

Design and production available in accordance with EU Pressure Equipment Directive PED 97/23 EC. Design, calculation and production available acc. to ASME VIII, Div. 1.
3rd party inspection, ASME stamp on request.

Installation



P&ID for LSA6000-A4
Leakage collection system
A From mechanical seal
B To leakage collection system

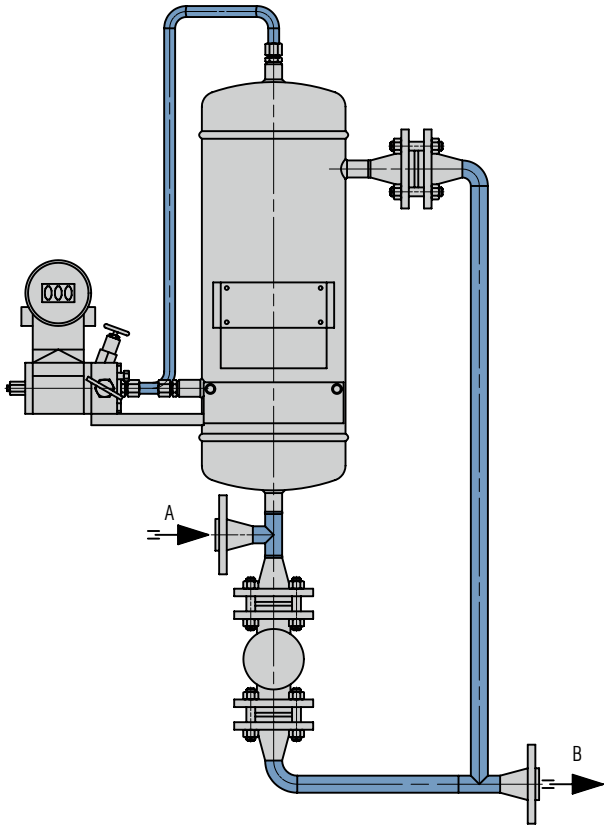
Product variants

Designation	LSA6000-A4
Pressure Equipment Directive	PED | ASME
Volume of vessel (liters)	4
Allowable pressure[1)]	44 bar (638 PSI)
Allowable temperature[1)]	–20 °C ... +120 °C (–4 °F ... +248 °F)
Connection	Flange 3/4", 600 lbs
Metal parts	316L

Other versions on request.
[1)] Design data, permissible working values depend on the actual conditions of service.

Plan 65B

LSB6 Leakage collection reservoir



Features

In accordance with API Plan 65B, the EagleBurgmann leakage control systems of the LSB6000 range consist of a leakage collection tank with valve and overflow pipe. The level can be monitored with the differential pressure transmitter which is supplied together with a five-way manifold valve.

Advantages

- Seal failure detection
- Safe discarding of excessive seal leakage
- To ensure durability, all components are corrosion resistant

Recommended applications

- Refining technology
- Oil and gas industry
- Petrochemical industry
- Chemical industry
- Power plant technology

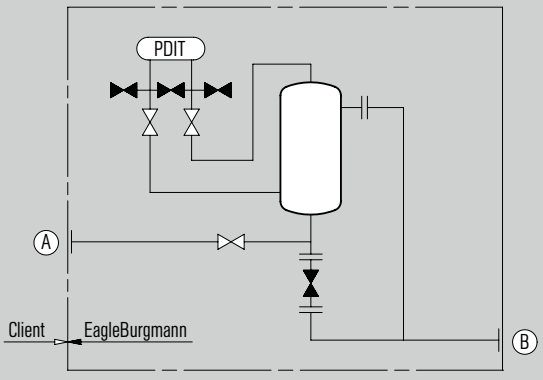
Functional description

In accordance with API Plan 65B, the LSB6000 leakage control system is used to discharge leakage from single seals. The outboard leakage is collected in an external tank; the leakage volume is monitored (level in the tank).

Notes

Design and production available in accordance with EU Pressure Equipment Directive PED 97/23 EC. Design, calculation and production available acc. to ASME VIII, Div. 1.
3rd party inspection, ASME stamp on request.

Installation



P&ID for LSB6000-A4
Leakage collection system
A From mechanical seal
B To liquid collection system

Product variants

Designation	LSB6000-A4
Pressure Equipment Directive	PED | ASME
Volume of vessel (liters)	4
Allowable pressure[1)]	44 bar (638 PSI)
Allowable temperature[1)]	–20 °C ... +120 °C (–4 °F ... +248 °F)
Connection	Flange 3/4", 600 lbs
Metal parts	316L

Other versions on request.
[1)] Design data, permissible working values depend on the actual conditions of service.

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API 682
4th edition

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