



Mechanical Seals API 682

Tenute Meccaniche API 682

Since 1962

DEFINITIONS

Purpose of API 682	page 02
Category	page 02
Type	page 02
Arrangement	page 02
Code	page 02
Vapour pressure	page 03
Leakages	page 03

TYPE - SUMMARY TABLE	page 04
-----------------------------	---------

DOCUMENTATION	page 05
----------------------	---------

TYPES

CB8S	page 06
CB8L	page 07
CB8D/T	page 08
BM8S	page 09
LL8F - GAS seal	page 10
TR8S	page 11
TR8D/T	page 12
TR8B	page 13
BM6S	page 14
BM6L	page 15
BM6D/T	page 16
BM6B	page 17
LL6D - GAS seal	page 18
TR6S	page 19
TR6D/T	page 20
TR6B	page 21
TSHS	page 22
TRHS	page 23
TRHD/T	page 24
TRHB	page 25
TSHF	page 26
TR6L - hybrid	page 27
TRHL - hybrid	page 28
BM4L - engineered	page 29

SPECIAL APPLICATIONS	page 30
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PURPOSE OF API 682

The API 682 standard refers to sealing systems for centrifugal pumps and rotary pumps and its purpose is to provide guidelines for manufacturing and supplying mechanical seals and their accessories on the most common (system) applications, for the Oil&Gas, petrochemical and chemical industries and oil pipelines worldwide.

However, the specific application of the recommended standards is subject to the experience of the manufacturer and/or end user so it doesn't represent a mandatory standard.

API 682 standards are not only applicable to pumps but also to other machines, such as compressors and mixers, and their guidelines can be applied in all industrial sectors. The API 682 standard defines a classification in three categories (1, 2 and 3); three types (A, B and C); three arrangements (1, 2 and 3). In turn, seals in arrangements 2 and 3 can be oriented: tandem (seals assembled in series), back-to-back (flexible elements assembled between the seal rings) or face-to-face (flexible elements assembled outside the seal rings).

CATEGORY

The category groups the mechanical seals into three macro areas defining their main requirements: dimension of the stuffing box (ASME B73.1 and B73.2, or API 610), design, pressure and temperature range, tests, qualifications and necessary documents.

- CAT 1 are seals for ASME B73.1 and B73.2 pumps, usually chemical and petrochemical pumps, with temperatures that do not exceed 260° C and pressure up to 20 bar;
- CAT 2 are seals for API 610 pumps in the Oil&Gas industry with temperatures not exceeding 400° C and pressure up to 40 bar;
- CAT 3 are seals for API 610 tested and certified pumps in the Oil&Gas industry with temperatures not exceeding 400° C and pressure up to 40 bar. These seals are accompanied by extensive documentation compared to CAT2.

The table summarises the main parameters and the differences between the three categories.

	CATEGORY I Seals for pumps non API 610	CATEGORY II Seals sized for API 610 pumps	CATEGORY III Seals tested and certified for API 610 pumps
Temperature	-40 °C to 260 °C -40 °F to 500 °F	-40 °C to 400 °C -40 °F to 750 °F	-40 °C to 400 °C -40 °F to 750 °F
Pressure	20 barg	40 barg	40 barg
Sectional drawing	ASME B73.1 and B73.2	API 610	API 610
Flushing	Direct	Multipoint	Multipoint
Bushing	Fixed	Floating	Floating
Documentation	Standard	Standard	Extended

TYPE

The type describes the main requirements of the seal: seal design, design of seal rings, sealing technology, material of the faces and O-rings. They are classified as:

- **TYPE A** classifies balanced cartridge seals, with rotary springs and seals with elastomer as secondary sealing elements. Versions with stationary springs or single spring are optional;
- **TYPE B** refers to balanced cartridge mechanical seals with rotary metal bellows and with elastomer as secondary sealing elements. The version with stationary bellows is optional;
- **TYPE C** refers to balanced cartridge mechanical seals with stationary metal bellows and with graphoil as secondary sealing elements. The version with rotary bellows is optional.

ARRANGEMENT

The arrangement defines the flushing used for the seal depending on stuffing box pressure, containment seal technology and orientation of the seals inside the cartridge.

Arrangement 1 includes single contact seals that are fluid lubricated with floating bushing (1CW-FL) and fixed bushing (1CW-FX).

Arrangement 2 includes dual contact seals that are lubricated with unpressurised fluid (2CW-CW), lubricated with unpressurised fluid with secondary dry/gas seal (2CW-CS) and dual non-contact seals with external containment seal (2NC-CS).

Arrangement 3 includes lubricated seals with pressurised barrier fluid:

- face-to-back contact seal (3CW-FB);
 - back-to-back contact seal (3CW-BB);
 - face-to-face contact seal (3CW-FF);
- and includes lubricated seals with pressurised barrier gas:
- back-to-back non-contact seal (3NC-BB);
 - face-to-face non-contact seal (3NC-FF);
 - face-to-back non-contact seal (3NC-FB).

CODE

The code of the mechanical seal, which is defined by API, provides a concise but accurate description of the design, seal features and auxiliary systems created for the application.

Category refers to the type of machine that the mechanical seal can be applied to, and it is defined by code 1, 2 or 3.

The arrangement refers to the configuration of the mechanical seal and is defined according to by code 1, 2 or 3.

Type refers to the process fluid and is defined according to code A, B or C.

Containment device refers to the auxiliary sealing device and is defined as follows:

ITEM				APPLICABLE CODES				UNIT	
CATEGORY	DESCRIPTION	TYPE		CONTAINMENT DEVICE	UNIT SECTION	UNIT SECTION		UNIT SECTION	
1	2	3	4	5	6	7	8	9	10

See example of a mechanical seal arrangement.

- F Full range without bushing
- L Floating bushing
- R Fixed bushing
- C Containment seal
- S Segmented floating bushing
- X Not specified (to be defined separately)

Gasket materials are defined as follows:

- F Fluorocarbon (FFM)
- G Polytetrafluoroethylene (PTFE)
- W Nitrile rubber
- S Perfluorocarbon (PFM)
- B Flexible graphite
- X unspecified (to be defined separately)

petroleum product is indicated by ASTM (American Society for Testing and Materials International) with the D-529 standard procedure.

For proper operation of the mechanical seal, the vapour pressure margin value (VPM) - the difference between stuffing box pressure and maximum vapour pressure - must not be lower than 3.5 bar (50 psi) or a minimum ratio of 1.3 between stuffing box pressure and vapour pressure. (Ref. API 682 4th ed Point 5.1.2.14.2)

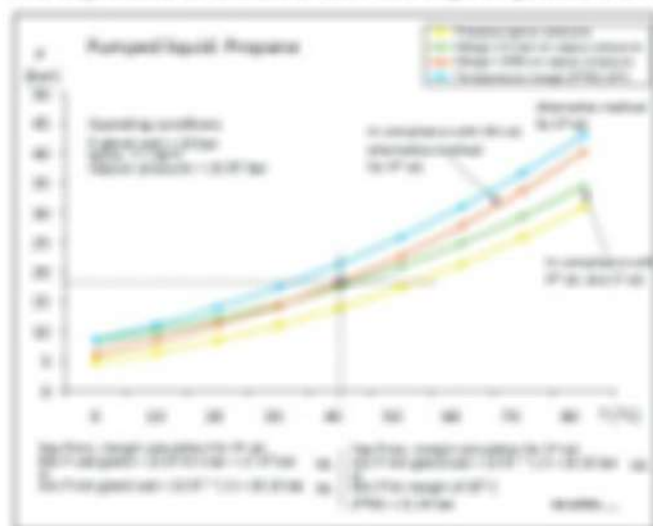
LEARNERS



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Vapour pressure is the pressure below which a liquid switches to the gaseous phase at a certain temperature. It is expressed in absolute bar. The vapour pressure of a



1		Number
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5		It is an increase. Nothing? It is a constant change.
6		It is not an increase. Nothing? It is a constant change.
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		RVU	W(hour)	Suggested Type
Non-Thyroidal Diseases	Chronic disease	1-50	1-20	A
	Chronic disease	1-50	20-40	A
	Minor	1-50	1-20	A
	Acute disease	1-50	1-20	A
	Diagnosis, Consults and Health Care, which requires	1-50	1-20	A
Non-Thyroidal Diseases				
Thyroidal Diseases	Chronic disease	50-100	1-20	A
	Chronic disease	50-100	1-20	A
	Minor	50-100	1-20	A
	Acute disease	50-100	1-20	A
	Diagnosis, Consults and Health Care, which requires	50-100	1-20	A
Thyroidal Diseases				
Thyroidal Diseases	Chronic disease	100-200	1-20	A
	Chronic disease	100-200	1-20	A
	Minor	100-200	1-20	A
	Acute disease	100-200	1-20	A
	Diagnosis, Consults and Health Care, which requires	100-200	1-20	A
Thyroidal Diseases				
Thyroidal Diseases	Chronic disease	200-400	1-20	A
	Chronic disease	200-400	1-20	A
	Minor	200-400	1-20	A
	Acute disease	200-400	1-20	A
	Diagnosis, Consults and Health Care, which requires	200-400	1-20	A
Thyroidal Diseases				

Level	Category			Documents (For more details, refer to Annex C)	Customer	Pump manufacturer	Seal manufacturer
	1	2	3				
After request	X	X	X	Letter of request	X	X	
	X	X	X	Seal sheet according to Annex C or alternatively according to the customer's request	X	X	
After purchase	X	X	X	Letter of offer			X
	X	X		Seal sheet according to Annex C or alternatively according to the customer's request			X
			X	Seal sheet that includes the seal sheet of the seal in the shaft			X
	X	X	X	General technical drawing of the seal			X
			X	General technical drawing of the seal			X
	X	X	X	Drawing of the stuffing box separated from the seal			X
			X	Seal qualification certificate			X
			X	Seal form of seal qualification test data - compare with Annex C			X
			X	Technical drawing of the stuffing box			X
			X	Technical drawing of the stuffing box			X



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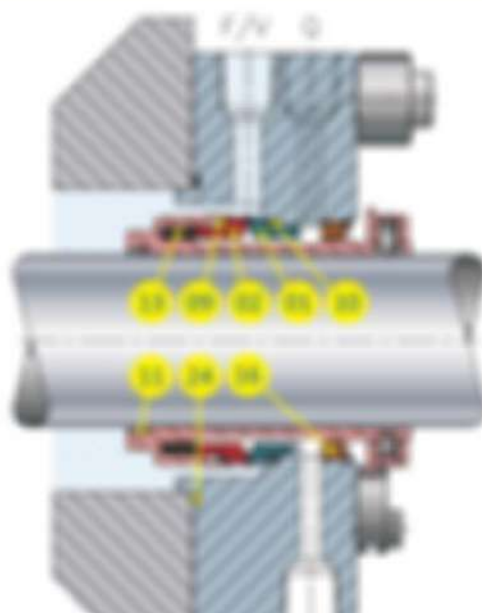
After purchase			X	Specific technical drawing of the seal			X
	X	X	X	General technical drawing of the seal			X
	X	X		General technical drawing of the seal			X
			X	General technical drawing of the seal			X
			X	Performance curve of the pumping device			X
	X	X		Drawing of the stuffing box			X
			X	Specific drawing of the stuffing box			X
	X	X	X	General technical drawing of the stuffing box materials			X
	X	X	X	Seal of sealing system			X
	X	X		General technical drawing of the stuffing box			X
			X	Specific technical drawing of the stuffing box			X
			X	Hydraulic test certificate			X
			X	Material testing data sheet			X
	X	X	X	Inspection for comparison with Annex C	X	X	

X: Required

X: If specified

**COMPONENTS KIT
(standard materials)**

88 Stationary ring: graphite
antimony impregnated (210),
reaction bonded silicon carbide
(240), carbonised silicon carbide
(310), integral tungsten carbide
bonded nickel (320)
88 Rotary ring: reaction
bonded silicon carbide (240),
carbonised silicon carbide (310),
integral tungsten carbide
bonded nickel (320)
88 Rotary ring gasket:
fluoropolymer (3), EPDM (3),
nitrile (3/730)
88 Stationary ring gasket:
fluoropolymer (3), EPDM (3),
nitrile (3/730)
33 O-ring gasket:
fluoropolymer (3), EPDM (3),



FLUITEN

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Product code (see) **10-00**

Operating limits: offering from three material sets for different seal designs. The selected speed and pressure values are not absolute limits but are intended to calculate them if a product will also be used in other applications. The temperature and mechanical features of the fluid for the design, maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

- Tested and unique driving system of the rotary ring, developed to be efficient in case of vibrations, misalignment and wear of the sealing rings
- Connections for flushing, quench and/or drain
- Possibility of using the shaft's flange and sleeve according to customer requirement
- Recommended for ANSI horizontal and vertical pumps

RECOMMENDED PLANS

Product side: 01, 02, 05, 11, 12, 13, 14, 21, 22, 25, 31, 32, 41.
Atmosphere side: 51.

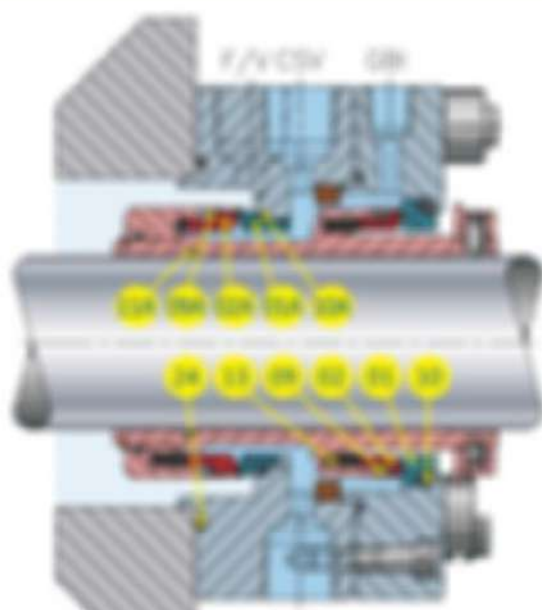
F/42, 43A/B, 44A/B



CBBS version with flushing (12/18/19)



CBBS version with integral flushing (12/18/19)



COMPONENTS KEY
(standard materials)

1	Stationary ring: reaction bonded silicon carbide (SiC),
2	Stationary ring: graphite anti-wear impregnated (SiC), reaction bonded silicon carbide (SiC), uncoated silicon carbide (SiC), integral tungsten carbide bound roller (SiC)
3	Stationary ring: graphite impregnated resin for dry running (SiC)
4	Stationary ring: reaction bonded silicon carbide (SiC), uncoated silicon carbide (SiC), integral tungsten carbide bound roller (SiC)
5	Stationary ring: pocket fluoropolymer (F), EPDM (E), nitrile (N)



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours** of the request.

- Cartridge solution, single balanced contacting with process and secondary containment mechanical seal
- Containment mechanical seal is the stationary type to reduce the load on the surfaces and minimize the generated heat, also with the use of FluGrid, a special Fluiten technology
- Dual direction of rotation
- Springs outside the product of the pumped liquid
- Solid sealing rings
- Tested and unique driving system of the rotary ring, developed to be efficient in case of vibration, misalignment and wear of the sealing rings
- Connections for flushing or vent and control of physiological leakages of the seal on the process side
- Possibility of using the shaft flange and drive according to customer requirement
- Recommended for ANSI horizontal and vertical pumps

RECOMMENDED PLANS

Product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
Atmosphere side: 51A/B, 71, 72, 73, 76.

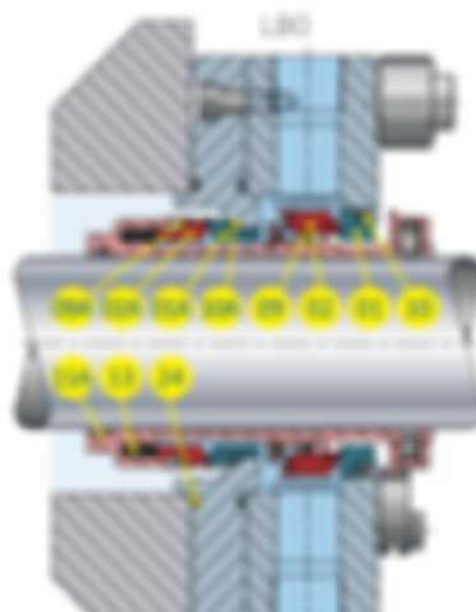
Operating limits

DIMENSION (mm)	FROM 20
	TO 125
SPEED (rpm)	0.25
TEMPERATURE (°C)	FROM -40
	TO 175
PRESSURE	FROM 0.1 bar
PROCESSED (mm)	TO 20

Operating limits: Offsets from these reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure limits are not absolute limits but are evaluated by calculating them F & G product and also by taking into account the temperature and chemical/physical features of the fluid. For the reason, maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

COMPONENTS KEY (standard materials)

85 Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC)
 85a Stationary ring: graphite, antimony impregnated (21.5), reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bound nickel (K21)
 86 Inverted rotary ring: graphite loaded antimony (21.5)
 86a Rotary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bound nickel (K21)
 88 Rotary ring gasket: Fluoroelastomer (F), EPDM (E), metal (M200)



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Operating limits

DIMENSION (mm)	FLUENT 20
	10 120
SPEED (rpm)	6 20
TEMPERATURE (°C)	FLUENT 40
	10 120
PRESSURE	FLUENT 100/150
FLUENT 200 (bar)	10 20

Operating limits differing from those reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by reference to the product and after taking into account the temperature and chemical/physical features of the fluid for the system, magnitude pressure, speed, temperature and shaft diameter values cannot be combined together.

- The balanced dual cartridge solution is ideal for arrangement 2 and 3 or with auxiliary fluid at atmospheric pressure (buffer) CBST or pressurized (barrier) CBSD
- Version CBSD: zero emission into the atmosphere
- Dual direction of rotation
- Springs outside the product
- Solid sealing rings on process side
- Tested and unique driving system of the rotary ring, developed to be efficient in case of vibration, misalignment and wear of the sealing rings
- Connection for flushing or vent and N₂/O₂ for auxiliary liquid
- Circulation device of the auxiliary liquid with high heat dissipation capacity preventing the need for an external pump
- Possibility of using the shaft flange and sleeve according to customer request
- Recommended for ANSI horizontal and vertical pumps

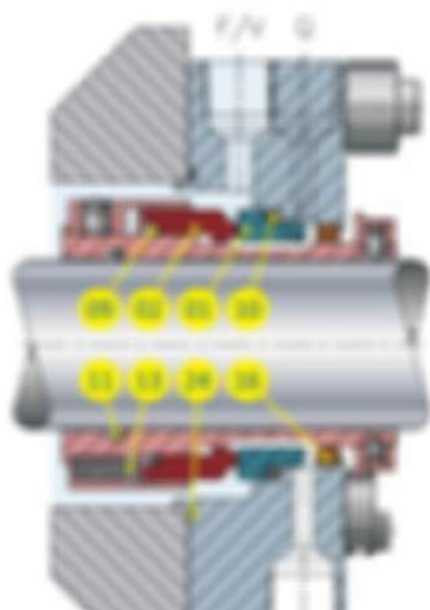
RECOMMENDED PLANS

CBST

Product side: 01, 02, 05, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41. Atmosphere side: 52, 55.

CBSD

Product side: 01, 02, 05, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
 Atmosphere side: 55A/56C, 54.



COMPONENTS KEY
(standard materials)

- 15** Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded nickel (W20)
- 14** Integral rotary ring: graphite, sintered tungsten carbide (SiC), sintered silicon carbide (SiC), sintered tungsten carbide bonded nickel (W20)
- 13** Rotary ring gasket: Fluoroelastomer (F), EPDM (E), nitrile (N), aramid FFR (FR)
- 12** Stationary ring gasket: Fluoroelastomer (F), EPDM (E), nitrile (N)



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remains and resistant to vibrations and shaft misalignments

- Connections for flushing, quench and/or drain
- Possibility of using the shaft flange and sleeve according to customer request
- Solution developed for installation in existing machines
- Recommended for AMS horizontal and vertical pumps

RECOMMENDED PLANS

Product side: 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Atmosphere side: 01, 02A/B, 03B.

PRESSURE **PERFORMANCE**
PMX200 (bar) 10-20

Operating limits: offering from these requests can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by calculating them from a product and also by taking into account the temperature and chemical/physical features of the fluid. For this reason, maximum pressure, speed, temperature and shaft diameter values cannot be combined together.



Model version with flushing/cooling (12/18/19)



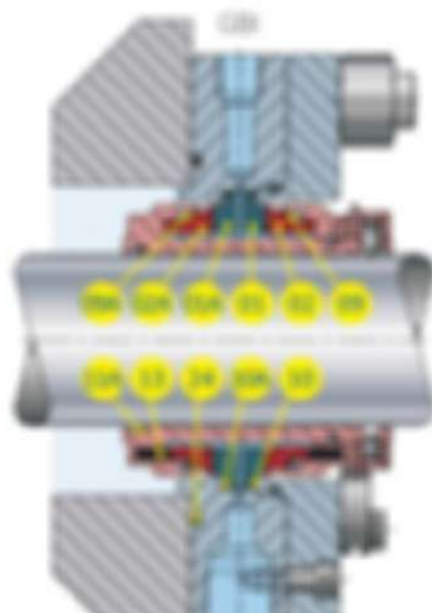
Model version with quench/cooling and flush/cooling



Model version with drain/cooling (12/18/19)

COMPONENTS KEY
(standard materials)

- 85 Stationary ring: graphite
impregnated resin for dry
running (2270)
- 85A Stationary ring: graphite
impregnated resin for dry
running (2270)
- 86 Rotary ring: reaction
bonded silicon carbide (240),
sintered silicon carbide (270)
- 86A Rotary ring: reaction
bonded silicon carbide (240),
sintered silicon carbide (270)
- 88 Rotary ring gasket:
fluorocarbon (3), EPDM (3),
nitril (2/20)
- 88A Rotary ring gasket:
fluorocarbon (3), EPDM (3),
nitril (2/20)
- 88B Stationary ring gasket



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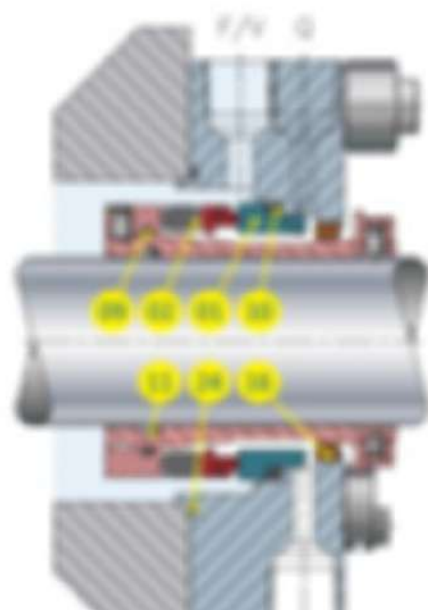
DIAMETER (mm)	FROM 25
	TO 125
SPEED (rpm)	5 25
TEMPERATURE (°C)	FROM 40
	TO 175
PRESSURE	FROM VACUUM
PROCESS (bar)	TO 20

Operating limits differing from those reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by exceeding them it is product and also by taking into account the temperature and rheological features of the fluid. For the correct installation, product, speed, temperature and shaft diameter values cannot be combined together.

- Zero emissions into the atmosphere
- Fluit's laser technology developed on rotary rings to allow the sealing rings to float on the pressurized barrier gas and avoid contact thus reducing friction and overheating
- Possibility of dual direction of rotation
- Springs outside the product of the pumped liquid
- Solid sealing rings
- Tested and unique driving system of the rotary ring, developed to be efficient in case of vibrations, misalignment and wear of the sealing rings
- Possibility of using the shaft flange and drive according to customer request
- Recommended for ANSI horizontal and vertical pumps

RECOMMENDED PLANS

Product side: 02, 03. Atmosphere side: 76.



COMPONENTS KEY
(standard materials)

- 41** Stationary ring: reaction-bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded nickel (W2C)
- 42** Rotary ring: SiC, SiC-Monelloy and sintered rotary ring: graphite loaded sintering (SiC), sintered silicon carbide (SiC), sintered tungsten carbide bonded nickel (W2C)
- 43** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 44** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 45** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 46** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 47** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 48** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 49** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 50** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 51** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 52** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 53** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 54** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 55** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 56** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 57** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 58** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 59** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 60** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 61** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 62** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 63** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 64** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 65** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 66** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 67** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 68** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 69** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 70** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 71** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 72** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 73** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 74** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 75** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 76** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 77** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 78** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 79** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 80** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 81** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 82** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 83** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 84** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 85** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 86** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 87** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 88** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 89** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 90** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 91** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 92** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 93** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 94** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 95** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 96** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 97** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 98** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 99** Rotary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)
- 100** Stationary ring gasket: Fluoropolymer (F), EPDM (E), nitrile (N)



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours** of the request.

- Dual direction of rotation
- The "bellows" solution in category 1, with O-rings as secondary gaskets, is especially suitable for fluids which tend to crystallize in contact with the atmosphere when the possibility of an external wash is not guaranteed
- Connections for flushing, quench and/or drain
- Possibility of using the shaft flange and sleeve according to customer request
- Recommended for ANSI horizontal and vertical pumps

PRESSURE **FUNCTIONAL**
PROCESS (bar) **TO 20**

Operating limits: offering from these reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure limits are not absolute limits but are indicated by calculating them from P & A product and also by taking into account the temperature and rheological characteristics of the fluid for the process. Maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

RECOMMENDED PLANS

Product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
Atmosphere side: 51, 52, 53A/B



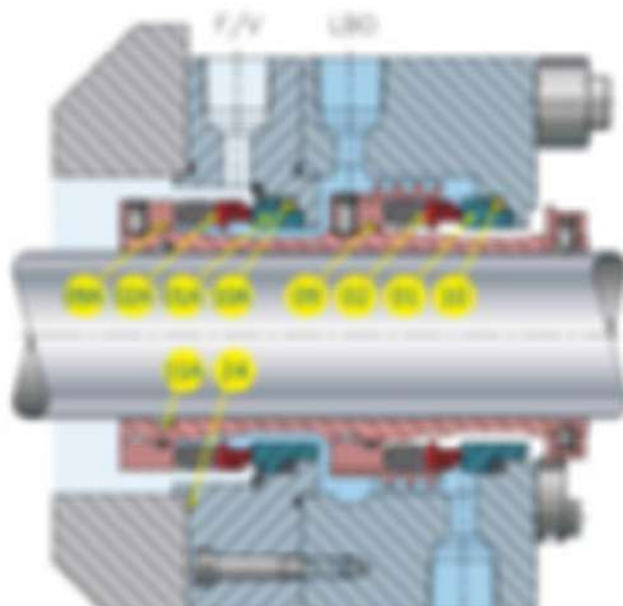
1000 version with floating bushing (31/06/17)



1000 version with segmented bushing (31/06/17)

COMPONENTS KEY (standard materials)

80 Stationary ring reaction bonded silicon carbide (SiC), vitrified silicon carbide (SiC),
80A Stationary ring reaction bonded silicon carbide (SiC), vitrified silicon carbide (SiC), integral tungsten carbide bonded nickel (SiC),
82 Rotary bellows: nitride-metallic and inserted rotary ring graphite uniformly impregnated (SiC),
82A Rotary bellows in 82: nitride-metallic and inserted rotary ring graphite uniformly impregnated (SiC), inserted reaction bonded silicon carbide (SiC), inserted silicon carbide (SiC), inserted tungsten



FLUITEN

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Operating limits

DIAMETER (mm)	FROM 20 TO 125
SPEED (m/s)	≤ 25
TEMPERATURE (°C)	FROM -60 TO 170
PRESSURE	FROM VACUUM TO 20

Operating limits differing from those reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are evaluated by calculating them in a product and after taking into account the temperature and chemical/physical features of the fluid for the system. Inadequate pressure, speed, temperature and shaft diameter values cannot be combined together.

auxiliary fluid at atmospheric pressure (buffer) TRBT or pressurised (barrier) TRBO

- Arrangement with metal rotary bellows
- The bellows solution in Category 1, with O-rings as secondary gaskets, is especially suitable for fluids which tend to crystallise in contact with the atmosphere where the possibility of an external leak is not guaranteed
- Connection for flushing or vent and IN/OUT for auxiliary liquid
- Efficient circulation device of the auxiliary liquid
- Possibility of using the shaft flange and sleeve according to customer request
- Recommended for ANSI horizontal and vertical pumps

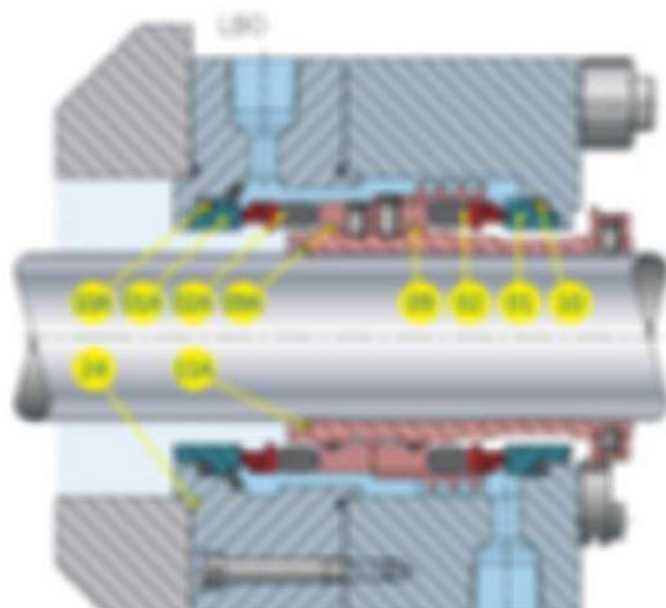
RECOMMENDED PLANS

TRBT:

Product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
 Atmosphere side: 52, 55.

TRBO:

Product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
 Atmosphere side: 10A/10C, 14.

COMPONENTS KEY
(standard materials)

- 46 Stationary ring: reaction bonded silicon carbide (SiC), ordered silicon carbide (SiC)
- 46A Stationary ring: reaction bonded silicon carbide (SiC), ordered silicon carbide (SiC), integral tungsten carbide bound nickel (W2C)
- 42 Rotary bellows: AlTiSiB-Monelloy and inserted rotary ring: graphite armature impregnated (GIC)
- 42A Rotary bellows in 46/46A-Monelloy and inserted rotary ring: graphite armature impregnated (GIC), inserted silicon carbide (SiC), inserted tungsten carbide bound nickel (W2C)



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours of the request**.

- The sealers operate with carriage mounted in seal arrangement 1 and 2 or with auxiliary fluid at atmospheric pressure (buffer) or pressurized (barrier)
- Arrangement with metal rotary bellows
- The bellows solution in Category 1, with o-rings as secondary gaskets
- Connections 1/4" O.D. for auxiliary liquid
- Efficient circulation device of the auxiliary liquid
- Possibility of using the shaft flange and sleeve according to customer request
- Recommended for ANSI horizontal and vertical pumps

RECOMMENDED PLANS

Product side: 02, 05. Atmosphere side: 53A, 76/C, 54.

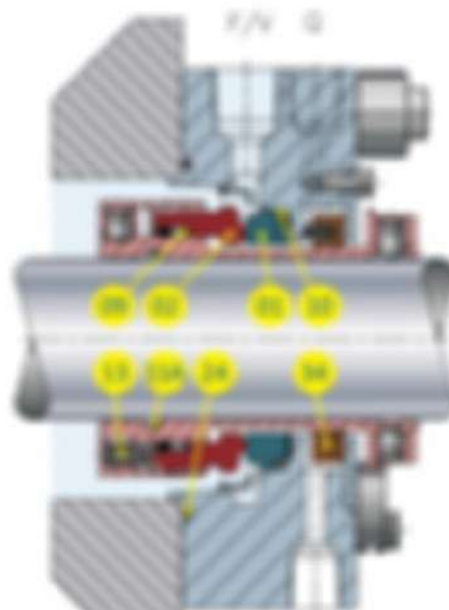
Operating limits

DIAMETER (mm)	FROM 20 TO 176
SPEED (rpm)	0.25
TEMPERATURE (°C)	FROM -40 TO 176
PRESSURE	FROM VACUUM
PROCESS (bar)	TO 20

Operating limits differing from those reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by calculating them in a gradient and also by taking into account the temperature and thermodynamic behavior of the fluid for the media, maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

COMPONENTS KEY (standard materials)

- 88 Stationary ring reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded nickel (W21)
- 89 Integral rotary ring graphite with/without integrated (SiC), sintered sintered silicon carbide (SiC), sintered tungsten carbide bonded nickel (W21)
- 88 Stationary ring gasket Fluoroelastomer (F), EPDM (E), metal (M2120)
- 88 Stationary ring gasket Fluoroelastomer (F), EPDM (E), metal (M2120)



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours of the request**.

	ISO 5296
PRELIMINARY	PRELIMINARY
PRELIMINARY (rev)	ISO 40

Operating limits: Working from these limits can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by calculating that it is a product and also by taking into account the temperature and chemical/physical features of the fluid for the system. Indicated pressure, speed, temperature and shaft diameter values cannot be combined together.

- Seal system with inner: rotary ring, outer: stationary ring, integrated or spring and ring are reliable and resistant to vibrations and shaft misalignments
- Connections for flushing, quench and/or drain
- Uniform distribution system of multipoint injection flushing
- Possibility of using the shaft flange and clamp according to customer request
- Recommended for API horizontal and vertical pumps

RECOMMENDED PLANS

Product side: 01, 02, 05, 11, 12, 13, 14, 21, 22, 25, 31, 32, 41.
Atmosphere side: 11, 61, 62, 65A/B, 66A/B.



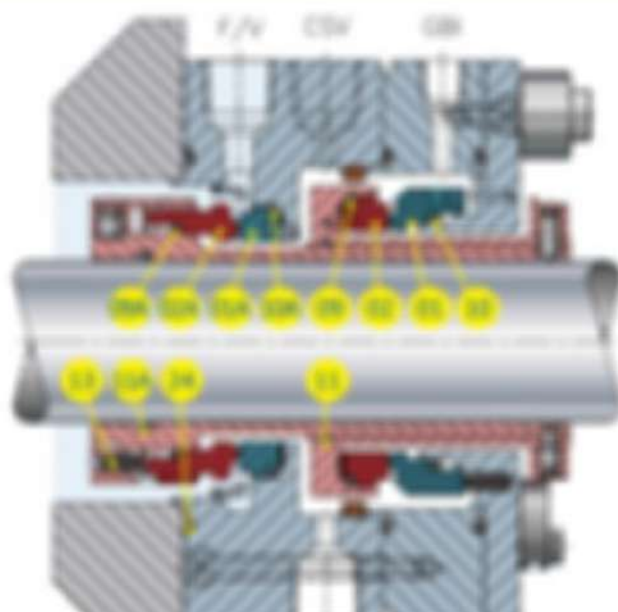
Version with sintered ring



W66C version with segmented flushing (21M-11)



W66C version with sintered ring



COMPONENTS KEY
(standard materials)

- 01 Stationary ring: graphite loaded resin for dry running (2017)
- 02 Stationary ring: reaction bonded silicon carbide (2401), ordered silicon carbide (2402), integral tungsten carbide bonded nickel (2411)
- 03 Stationary ring: reaction bonded silicon carbide (2401), ordered silicon carbide (2402)
- 04 Integral rotors: ring: graphite; stationary: impregnated (2015), ordered silicon carbide (2402), bonded tungsten carbide bonded nickel (2411)
- 05 Stationary ring gasket: fluoropolymer (24), EPDM (25),



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Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours** of the request.

- Drive system with three "Fluten-designed spindles" recognized as being the only one reliable and resistant to vibrations and shaft misalignments
- Stationary mechanical containment seal with Fluten's Flutgrid technology
- Connections for flushing or vent and control of the physiological leakages of the seal on the process side
- Possibility of using the shaft flange and sleeve according to customer request

RECOMMENDED PLANS

Product side: 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Atmosphere side: 01A, 02A, 03A, 04A, 05A, 06A, 07A, 08A, 09A, 10A, 11A, 12A, 13A, 14A, 15A, 16A, 17A, 18A, 19A, 20A, 21A, 22A, 23A, 24A, 25A, 26A, 27A, 28A, 29A, 30A, 31A, 32A, 33A, 34A, 35A, 36A, 37A, 38A, 39A, 40A, 41A, 42A, 43A, 44A, 45A, 46A, 47A, 48A, 49A, 50A, 51A, 52A, 53A, 54A, 55A, 56A, 57A, 58A, 59A, 60A, 61A, 62A, 63A, 64A, 65A, 66A, 67A, 68A, 69A, 70A, 71A, 72A, 73A, 74A, 75A, 76A, 77A, 78A, 79A, 80A, 81A, 82A, 83A, 84A, 85A, 86A, 87A, 88A, 89A, 90A, 91A, 92A, 93A, 94A, 95A, 96A, 97A, 98A, 99A, 100A.



BMSL Narrow Type



BMSL with inserted ring

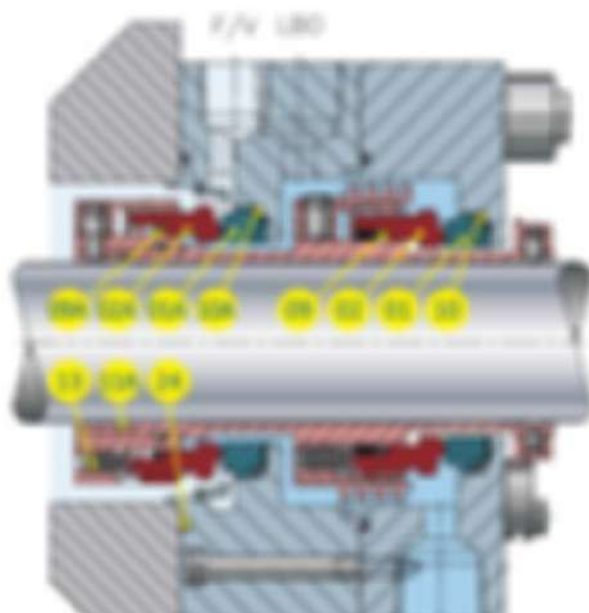
Operating limits

DIMENSION (mm)	FIGURE 20
TO 130	
SPEED (m/s)	0.25
TEMPERATURE (°C)	FIGURE 40
TO 170	
PRESSURE	FIGURE 40/41
FIGURE 20 (m/s)	TO 40

Operating limits differing from those reported can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by consulting their T & P product and also by taking into account the temperature and chemical/physical behavior of the fluid. For the reason, maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

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Journal of Internal Medicine 255: 103–110

65 Stationary ring reaction
 bonded silicon carbide [140],
 unbonded silicon carbide [170],
 integral tungsten carbide
 bonded roller [320]
65A Stationary ring reaction
 bonded silicon carbide [140],
 unbonded silicon carbide [170],
 integral tungsten carbide
 bonded roller [320]
66 Integral rotary ring graphite
 primary impregnated [270]
66A Integral rotary
 ring graphite primary
 impregnated [270], graphite
 primary impregnated [270],
 reacted reaction bonded
 silicon carbide [140], reacted
 silicon carbide [170], reaction



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000000 000000

Operating limits

CHARGE TIME (min)	CHARGE 20
	70-110
SPEED (mm/s)	6-20
TEMPERATURE (°C)	CHARGE 40
	70-170
PRECISION	CHARGE 0.000000
PRECISION (mm)	70-80

Operating costs, differing from those reported on the defined cost approach to the latter Technical Committee, the indicated speed and pressure values are not absolute limits but are indicated by calculating that if a product will also be taking into account the temperature and thermodynamic features of the fluid. In this sense, magnitude pressure, speed, temperature and shaft dynamic values related to the conditions specified.

- Solid casting rings
- Drive system with three "Fluten designed spines" recognised as being the only one reliable and resistant to vibrations and shaft misalignments
- Connection for flushing or vent and IN-OUT for auxiliary liquid
- Uniform distribution system of multipoint injection flushing
- Efficient circulation device of the auxiliary liquid
- Possibility of using the shaft flange and clevis according to customer request
- Recommended for API horizontal and vertical pumps

RECOMMENDED PLANS

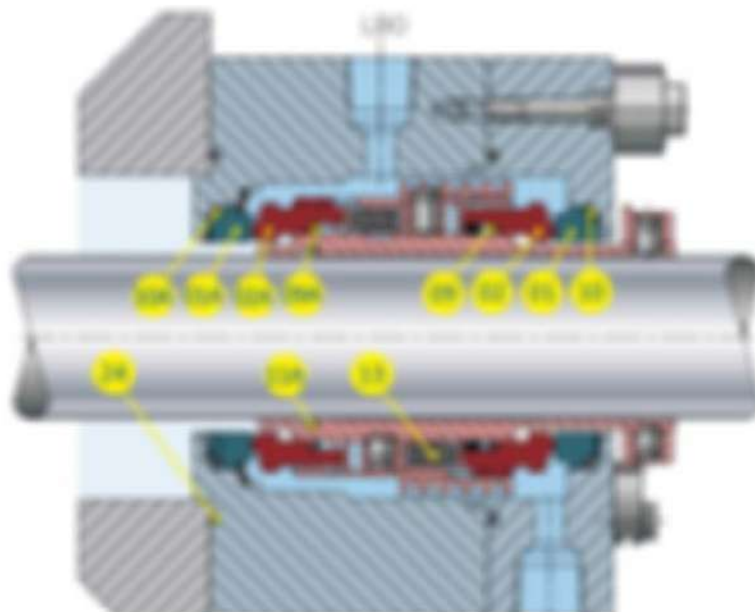
Sample:
Product side: 01, 02, 08, 13, 12, 18, 04, 20, 22, 29, 05, 32, 41. Atmosphere side: 52, 55.
Sample:
Product side: 01, 02, 08, 13, 12, 18, 04, 20, 22, 29, 05, 32, 41. Atmosphere side:
12A, 04C, 54.



Abstract: (2) *Warren's Name Integrated*



Figure 1 shows a schematic diagram of a ring. It consists of a central node connected to several peripheral nodes arranged in a circular pattern. The connections form a ring structure.



COMPONENTS KEY
(standard materials)

- 45 Stationary ring: reaction bonded silicon carbide (SiC), ordered silicon carbide (SiC), integral tungsten carbide bonded nickel (W2)
- 45A Stationary ring: reaction bonded silicon carbide (SiC), ordered silicon carbide (SiC), integral tungsten carbide bonded nickel (W2)
- 46 Integral rotary ring: graphite anti-wear, impregnated (200)
- 46A Integral rotary ring: graphite anti-wear, impregnated (200), inserted silicon carbide (SiC), inserted tungsten carbide bonded nickel (W2)



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours** of the request.

reverse pressure in case of accident

- Dual direction of rotation
- Solid sealing rings
- Drive system with three "Fluiten designed spindles" recognised as being the only one reliable and resistant to vibrations and shaft misalignments
- Efficient circulation device of the auxiliary liquid
- Connections IN/OUT for auxiliary liquid
- Possibility of using the shaft flange and drive according to customer request
- Recommended for API horizontal and vertical pumps



BM5B with inserted ring

RECOMMENDED PLANS

Product side: CS, CS
Atmosphere side: SSA/B/C, SA

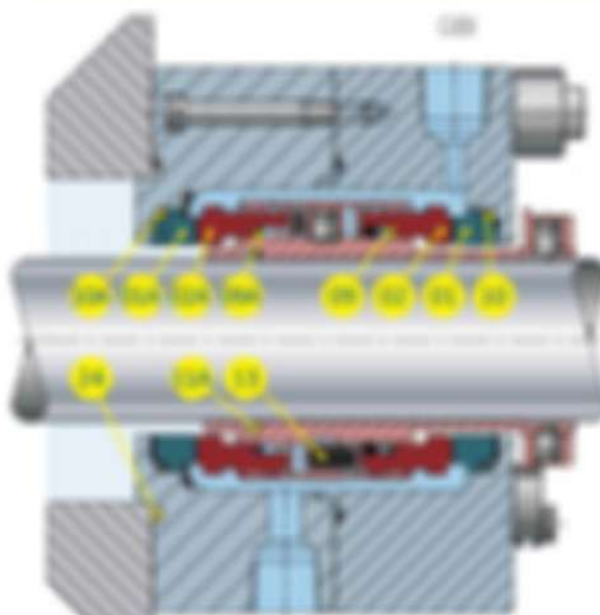
Operating limits

DIMENSION (mm)	FROM 20
	TO 120
SPEED (rpm)	0 20
TEMPERATURE (°C)	FROM -40
	TO 170
PRESSURE	FROM VACUUM
PROCESS (bar)	TO 40

Operating limits: offering from these required can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are indicated by calculating their P x V product and also by taking into account the temperature and chemical composition of the fluid for the reason: maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

COMPONENTS KEY
(standard materials)

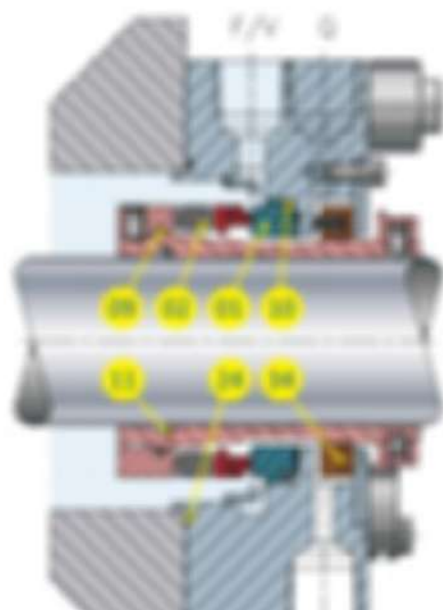
- 85 Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC)
- 85A Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC)
- 86 Rotary ring: graphite impregnated resin for dry running (GFR)
- 86A Rotary ring: graphite impregnated resin for dry running (GFR)
- 88 Rotary ring gasket: Fluoropolymer (FF), EPDM (EP), metal (MET)
- 88A Rotary ring gasket: Fluoropolymer (FF), EPDM (EP), metal (MET)



Would you like to receive our complete technical manual?

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	TO: 000	
SPEED (m/s)	0.25	• Balanced opposed dual cartridge solution and non-contact sealing rings • Zero emissions into the atmosphere • Fluiten laser technology developed on rotary rings to allow the sealing rings to float on the pressurized barrier gas and to avoid contact • On demand, possibility of dual direction of rotation • Springs outside the product of the pumped liquid • Solid sealing rings • Drive system with three "Fluiten designed spine" recognized as being the only one reliable and resistant to vibrations and shaft misalignments • Possibility of using the shaft flange and drive according to customer request • Recommended for API horizontal and vertical pumps
TEMPERATURE (°C)	INCOME -40 TO 000	
PRESSURE	INCOME 000 PRESSURE (bar)	
Operating limits differing from those mentioned can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are evaluated by calculating them in a product and also by taking into account the temperature and chemical/physical features of the fluid for the process. Temperature, pressure, speed, temperature and shaft diameter values cannot be combined together.		
RECOMMENDED PLANS Product side 02, 03. Atmosphere side 76.		

COMPONENTS KEY
(standard materials)

- 01 Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded nickel (W20)
- 02 Rotary bellows in AISI 316-modelling (316) and inserted rotary ring: graphite antimony impregnated (215), inserted silicon carbide (SiC), inserted tungsten carbide bonded nickel (W20)
- 03 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 04 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 05 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 06 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 07 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 08 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 09 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 10 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 11 Rotary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded nickel (W20)
- 12 Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded nickel (W20)
- 13 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 14 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 15 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 16 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 17 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 18 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 19 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 20 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 21 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 22 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 23 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 24 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 25 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 26 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 27 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 28 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 29 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 30 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 31 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 32 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 33 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 34 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 35 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 36 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 37 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 38 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 39 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 40 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 41 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 42 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 43 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 44 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 45 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 46 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 47 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 48 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 49 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 50 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 51 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 52 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 53 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 54 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 55 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 56 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 57 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 58 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 59 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 60 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 61 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 62 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 63 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 64 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 65 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
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- 68 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 69 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 70 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 71 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 72 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 73 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 74 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 75 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 76 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 77 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 78 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 79 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 80 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 81 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 82 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 83 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 84 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 85 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 86 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 87 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 88 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 89 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 90 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 91 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 92 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 93 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 94 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 95 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 96 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 97 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 98 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 99 Rotary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)
- 100 Stationary ring gasket: Fluoroelastomer (F), EPDM (20), nitrile (N/200)



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours of the request**.

- The bellows solution in category 2, with O-rings as secondary gaskets, is especially suitable for fluids which tend to crystallize in contact with the atmosphere where the possibility of an external wash is not guaranteed.
- Connections for flushing, washing and/or drain of any leaks
- Possibility of using the shaft flange and sleeve according to customer request
- Recommended for API horizontal and vertical pumps

PROCESS (see)

TD-40

Operating limits: offering from these manuals can be defined and approved by our Sales Technical Department. The indicated speed and pressure values are not absolute limits but are evaluated by calculating them from a product and also by taking into account the temperature and chemical/physical features of the fluid for the results: maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

RECOMMENDED PLANS

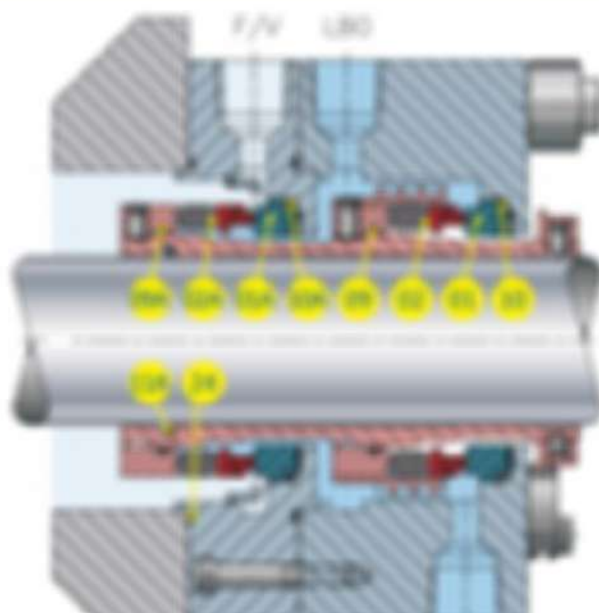
Product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41. Atmosphere side: 11, 41, 62, 45A/B, 66A/B.



01A1 version with segmented bellows (DIN 2475)

COMPONENTS KEY (standard materials)

80 Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC)
80A Stationary ring: reaction bonded silicon carbide (SiC), sintered silicon carbide (SiC), integral tungsten carbide bonded roller (SiC)
80 Rotary bellows: stainless-steel (st) integral rotary ring: graphite anti-wear: impregnated (SiC)
80A Rotary bellows: stainless-steel (st) and inserted rotary ring: graphite anti-wear: impregnated (SiC), inserted reaction bonded silicon carbide (SiC), inserted tungsten carbide bonded roller



Would you like to receive our complete technical manual?

Fill in the fields in the **format above**, you will receive them via e-mail within **48 hours of the request**.

Operating limits

DIMENSION (mm)	FFLUITEN 20
	10-130
SPEED (rpm)	1-25
TEMPERATURE (°C)	FFLUITEN 400
	10-170
PRESSURE (MPa)	FFLUITEN 400
	10-40

Operating limits: offering from these requests can be defined and adapted to our latest technical improvements. The indicated speed and pressure values are not absolute limits but are indicated to illustrate that F & V product will also be taking into account the temperature and chemical/physical features of the fluid for the design, maximum pressure, speed, temperature and shaft diameter values cannot be combined together.

- Rotary metal bellows and flange with fixed bushing
- Uniform distribution system of multipoint injection flushing on the product side seal
- The bellows solution in Category 2, with O-rings as secondary gaskets
- Efficient circulation device of the auxiliary liquid
- Connection for flushing or vent and in-out for auxiliary liquid
- Possibility of using the shaft flange and sleeve according to customer request
- Recommended for API horizontal and vertical pumps

RECOMMENDED PLANS

TRISO product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
 Atmosphere side: 12, 13.
TRISO product side: 01, 02, 03, 11, 12, 13, 14, 21, 22, 23, 31, 32, 41.
 Atmosphere side: 10A/10C, 14.