



ANOD

RESEARCH & PRODUCTION CENTRE

EQUIPMENT GUIDE

**PUMP UNITS
MECHANICAL SEALS
SUPPORT SYSTEMS**



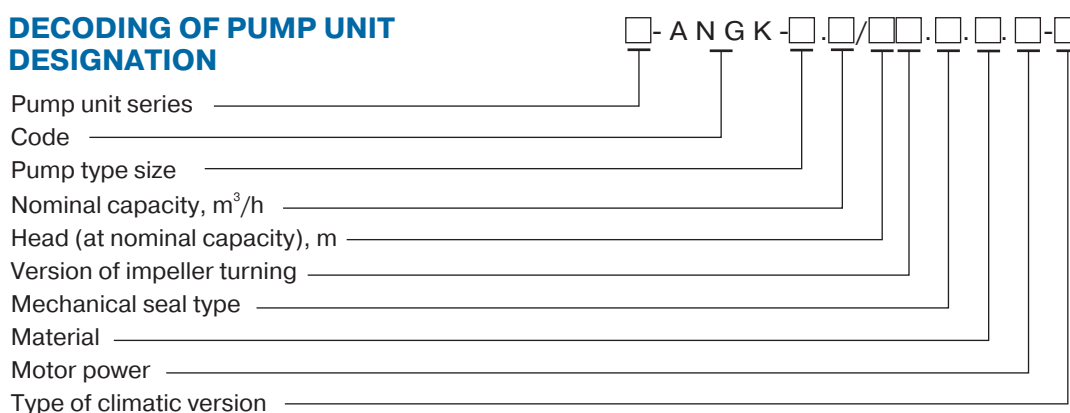
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ANGK pump units by Research & Production Centre "ANOD" are applied for transferring of oil, oil products, liquefied hydrocarbon gases and other fluids, as agreed.

Features of pump units:

- High efficiency.
- Pressure casings by foreign manufacturers.
- Pump units are furnished with high-reliability sealing complex by R&PCANOD.
- Due to original bearing support, pump units are able to operate at low temperatures without cooling in free-running mode.
- Furnished with up-to-date plate couplings.
- Equipped with block inspection sensor.
- Russian or foreign electromotors.

DECODING OF PUMP UNIT DESIGNATION



PUMP UNIT SERIES

Series	1	2	3	4	5	6	7
Pn, bar	50	50	16	10;16	45	100	16, 25, 40, 50
T, °C, not lower than	-40	+200	-40	-40	-40	-10	-40
T, °C, not higher than	+200	+400	+180	+180	+400	+120	+400

MATERIALS

Materials	A	K	E	C
Material	Carbon steel	12X18H10T steel	12X17H13M2T steel	Special material

EXAMPLE OF PUMP UNIT DESIGNATION

Overhung pump unit of Series 1, type size 6, with capacity of 30 m³/h and 130 m head, furnished with mechanical seal of 30UTD type, motor power – 30 kW, material – carbon steel, type of climatic version – U2.

1-ANGK-6.30/130a.30UTD.A.30-U2

APPLIANCE

Pump units of **1-ANGK** type are used for pumping fluids of up to +200°C. For liquids with temperature up to +400°C **2-ANGK** pump type are applied.

3-ANGK pumps are designed for fluids of temperature range from -40°C to +180°C.

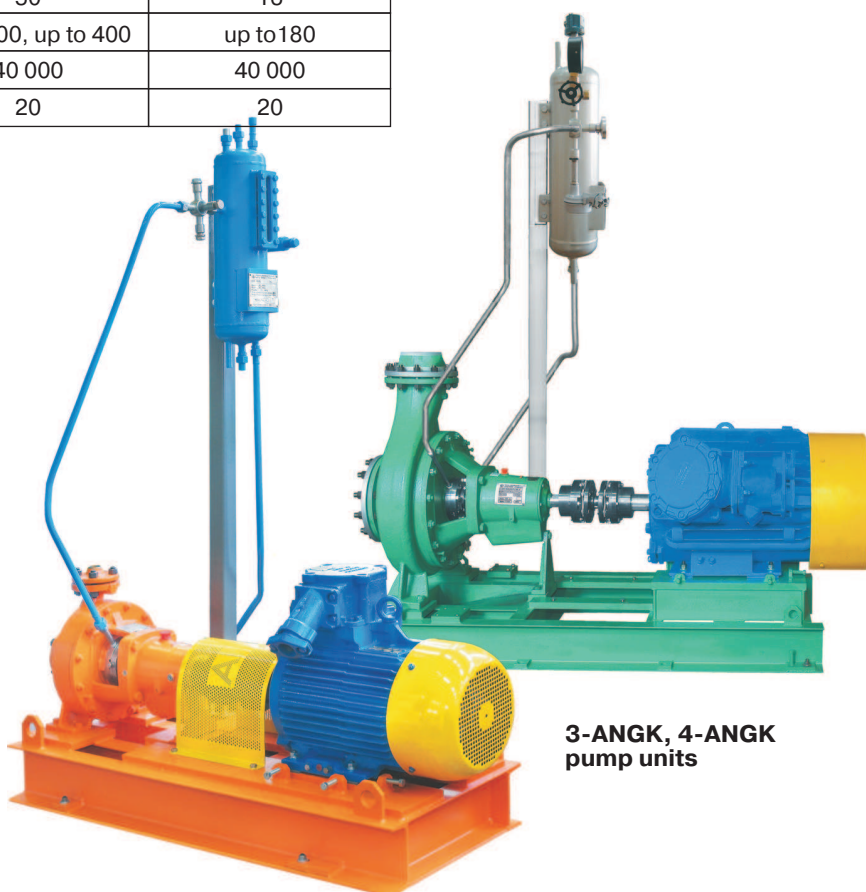
Pump units of **4-ANGK** is the most compact and the lightest pump type. It is considered to be used for non-corrosive mediums of up to +180°C at light workload.

FEATURES

- Pumps have high efficiency.
- Pump units are furnished with up-to-date lamellar couplings that reduce vibration and bearings and electromotor load.
- Pump units are furnished with highly reliable mechanical seals by R&PC "ANOD" and bearings by "SKF".
- Pressure casings by foreign manufacturers.
- Pumps are equipped with block inspection sensor.
- Russian or foreign electromotors.

TECHNICAL PARAMETERS

Parameter	1, 2-ANGK	3, 4-ANGK
Speed, rpm	1500, 3000	1500, 3000
Flow, m ³ /h	6 ≥ 1000	6 ≥ 1000
Head, m	20 ≥ 130	50 ≥ 130
Power, kW	up to 500	up to 800
Casing pressure, PN, kg/cm ²	50	16
Temperature, °C (up to)	up to 200, up to 400	up to 180
Service life, h (no less than)	40 000	40 000
Life cycle, y (no less than)	20	20

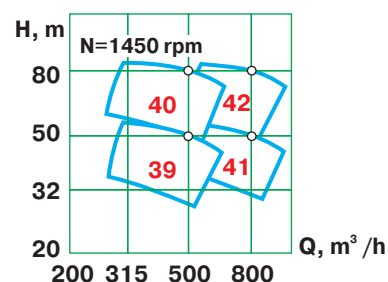
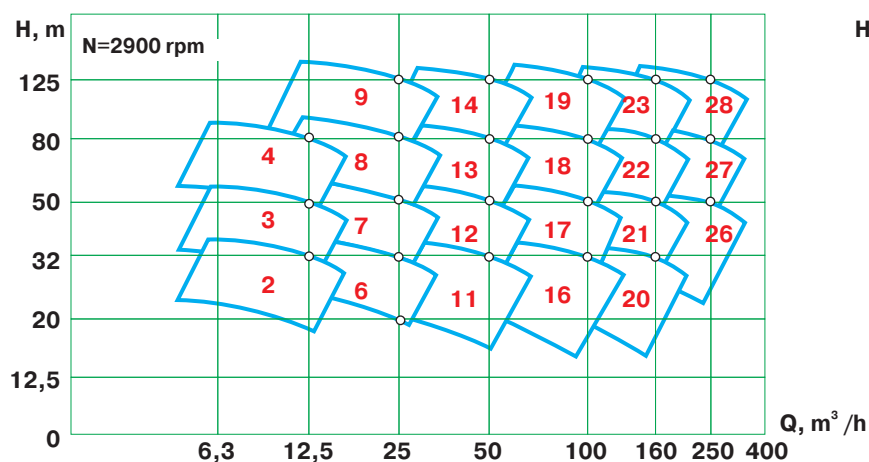


3-ANGK, 4-ANGK
pump units

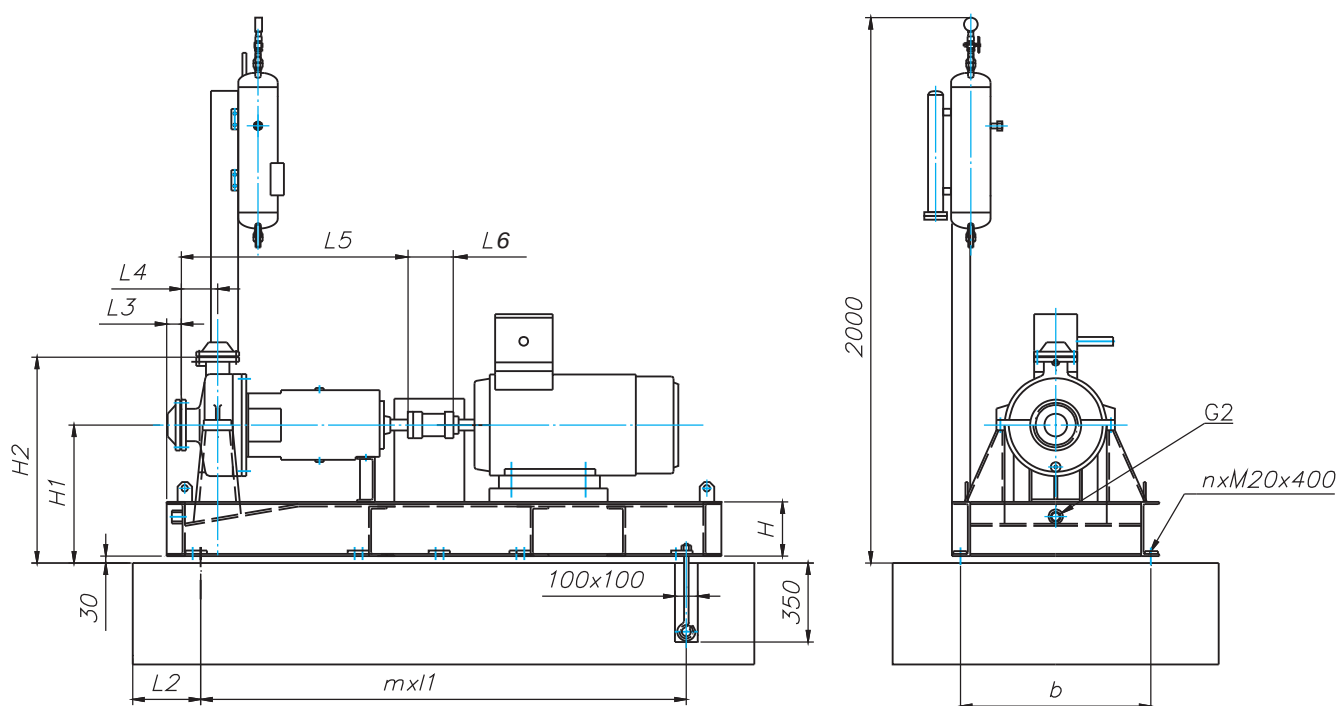
OPERATING POINTS OF 1-ANGK AND 2-ANGK PUMP TYPES

Pump designation	Flow, m ³ /h	Head, m	NPSH, Δh, m	Nominal diameter of impeller, mm	DN suction pipe, mm	DN discharge pipe, mm
1(2)-ANGK-2.15/30	12,5	35	3	160	50	40
1(2)-ANGK-3.15/50	12,5	50	3,3	200	50	40
1(2)-ANGK-4.15/80	12,5	80	3,5	250	50	40
1(2)-ANGK-6.30/30	25	32	2,7	160	80	50
1(2)-ANGK-7.30/50	25	50	2,5	200	80	40
1(2)-ANGK-8.30/80	25	80	3,8	250	80	40
1(2)-ANGK-9.30/130	25	125	4,7	315	80	40
1(2)-ANGK-11.60/30	50	32	3,5	160	100	80
1(2)-ANGK-12.60/50	50	50	2,9	200	80	50
1(2)-ANGK-13.60/80	50	80	2,6	250	80	50
1(2)-ANGK-14.60/130	50	125	4,3	315	80	50
1(2)-ANGK-16.90/30	100	32	4,6	160	100	80
1(2)-ANGK-17.90/50	100	50	3,9	200	100	80
1(2)-ANGK-18.90/80	100	80	3,9	250	100	80
1(2)-ANGK-19.90/130	100	125	3,8	315	100	80
1(2)-ANGK-20.150/30	160	32	4,9	160	150	80
1(2)-ANGK-21.150/50	160	50	5,8	200	150	80
1(2)-ANGK-22.150/80	160	80	6,3	250	150	80
1(2)-ANGK-23.150/130	160	125	4,3	315	150	80
1(2)-ANGK-26.200/50	250	50	5,6	200	150	100
1(2)-ANGK-27.200/80	250	80	5,8	250	150	100
1(2)-ANGK-28.200/130	250	125	5,9	315	150	100
1(2)-ANGK-39.450/50	500	50	5,2	400	250	200
1(2)-ANGK-40.450/80	500	80	4,5	500	250	200
1(2)-ANGK-41.800/50	800	50	6,2	400	300	250
1(2)-ANGK-42.800/80	800	80	6,8	500	300	250

WORKING RANGE DIAGRAMS FOR 1-ANGK AND 2-ANGK PUMP TYPES



The diagrams are given as an example. If required, other pump parameters can be provided.



1-ANGK pump unit

DIMENSIONS OF 1-ANGK and 2-ANGK PUMP SERIES

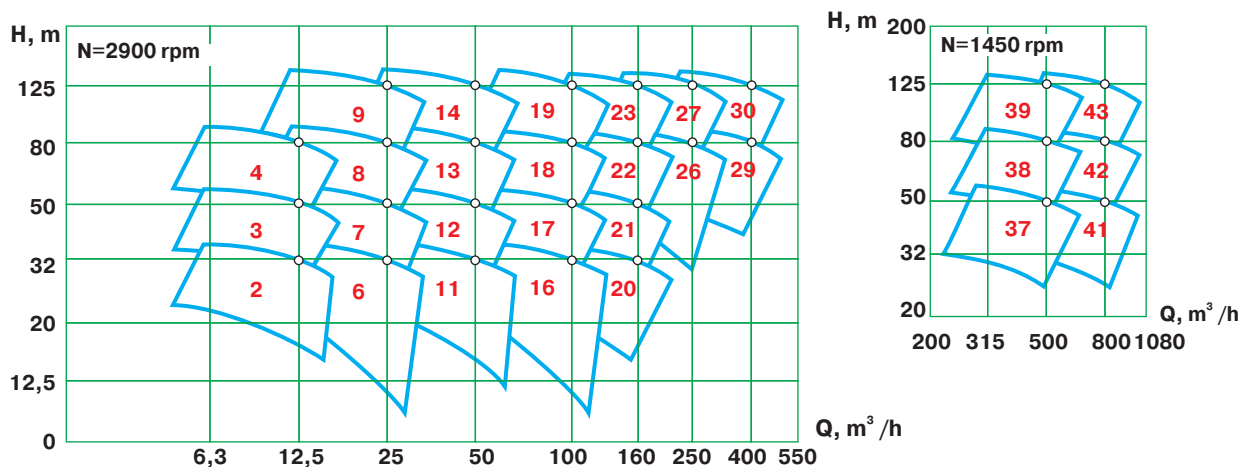
Pump type size	L	L1	L2	L3	L4	L5	L6	B	B1	H	H1	H2	b	n	m	l	weight, kg
2	1535	1780	275	60	120	820	140	760	1235	200	380	590	685	6	2	615	343
3	1535	1780	275	60	120	820	140	760	1235	200	455	665	685	6	2	615	378
4	1840	2090	275	60	140	887,5	140	760	1235	200	455	705	685	6	2	770	641
6	1840	2090	275	60	140	840	140	760	1235	200	455	685	685	6	2	770	482
7	1840	2090	275	60	140	840	140	760	1235	200	455	705	685	6	2	770	610
8	1840	2090	275	60	140	887,5	140	760	1235	200	455	705	685	6	2	770	660
9	2145	2445	300	65	150	897,5	140	760	1285	240	540	840	685	6	3	615	1008
11	1840	2090	275	60	150	860	140	760	1235	200	480	730	685	6	2	770	566
12	1840	2090	275	60	150	850	140	760	1235	200	480	730	685	6	2	770	616
13	2145	2445	300	65	150	897,5	140	760	1285	240	520	795	685	6	3	615	774
14	2145	2445	300	65	160	907,5	140	760	1285	240	540	890	685	6	3	615	1006
16	1840	2090	275	60	140	887,5	140	760	1235	200	455	705	685	6	2	770	639
17	2145	2445	300	65	150	897,5	140	760	1285	240	496	770	685	6	3	615	753
18	2145	2445	300	65	150	897,5	140	760	1285	240	540	830	685	6	3	615	877
19	2450	2745	300	65	160	1050	140	915	1440	240	610	910	840	8	3	715	1362
20	1840	2090	275	65	150	897,5	140	760	1235	200	455	805	685	6	2	770	655
21	2145	2445	300	65	170	917,5	140	760	1285	240	520	75	685	6	3	615	848
22	2145	2445	300	65	170	917,5	140	760	1285	240	540	850	685	6	3	615	1043
23	2450	2745	300	65	170	1050	140	915	1440	240	580	940	840	8	3	715	1478
26	2145	2445	300	65	160	907,5	140	760	1285	240	540	890	685	6	3	615	997
27	2450	2745	300	65	170	1060	140	915	1440	240	570	910	840	8	3	715	1418
28	2750	3110	325	70	170	1060	140	1065	1640	280	645	1005	990	10	4	615	1070
39	2750	3110	325	70	240	1230	180	1065	1640	280	660	1210	990	10	4	615	2294
40	3165	3560	350	75	250	1540	180	1245	1870	300	770	1380	1170	10	4	715	3198
41	3165	3560	350	75	290	1330	180	1245	1870	300	750	1400	1170	10	4	715	2995
42	3165	3560	350	75	290	1330	180	1396	2020	300	780	1500	1320	10	4	715	4030

Depending on motor dimensions, baseplate size can be changed.

OPERATING POINTS OF 3-ANGK PUMP TYPES

Pump designation	Flow, m ³ /h	Head, m	NPSH, Δh, m	Nominal diameter of impeller, mm	DN suction pipe, mm	DN discharge pipe, mm
3-ANGK-2.15/30	12,5	35	1,5	160	50	32
3-ANGK-3.15/50	12,5	50	1,8	200	50	32
3-ANGK-4.15/80	12,5	80	1,6	250	50	32
3-ANGK-6.30/30	25	32	2,1	160	65	50
3-ANGK-7.30/50	25	50	1,6	200	65	40
3-ANGK-8.30/80	25	80	1,8	250	65	40
3-ANGK-9.30/130	25	125	1,9	315	65	40
3-ANGK-11.60/30	50	32	2,3	160	80	65
3-ANGK-12.60/50	50	50	2,3	200	80	50
3-ANGK-13.60/80	50	80	2,2	250	80	50
3-ANGK-14.60/130	50	125	2,2	315	80	50
3-ANGK-16.90/30	100	32	3,6	160	100	80
3-ANGK-17.90/50	100	50	3,4	200	100	65
3-ANGK-18.90/80	100	80	3,4	250	100	65
3-ANGK-19.90/130	100	125	3,4	315	100	65
3-ANGK-20.150/30	160	32	4,4	160	125	80
3-ANGK-21.150/50	160	50	4,3	200	125	80
3-ANGK-22.150/80	160	80	4,5	250	125	80
3-ANGK-23.150/130	160	125	4,0	315	125	80
3-ANGK-26.200/50	250	80	5,3	250	125	100
3-ANGK-27.200/80	250	125	5,3	315	125	100
3-ANGK-29.400/80	400	80	8,3	250	150	125
3-ANGK-30.400/125	400	125	7,6	315	150	125
3-ANGK-37.500/50	500	50	3,9	400	250	200
3-ANGK-38.500/80	500	80	4,3	500	250	200
3-ANGK-39.500/125	500	125	3,4	630	250	200
3-ANGK-41.800/50	800	50	5,2	400	300	250
3-ANGK-42.800/80	800	80	6,2	500	300	250
3-ANGK-43.800/125	800	125	6,3	630	300	250

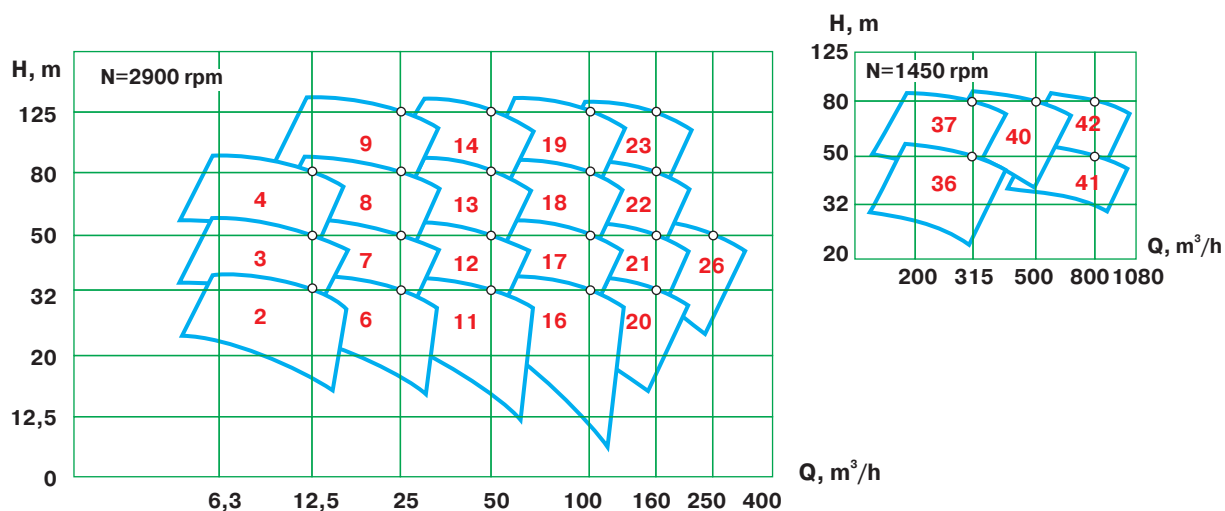
WORKING RANGE DIAGRAMS FOR 3-ANGK PUMP TYPES



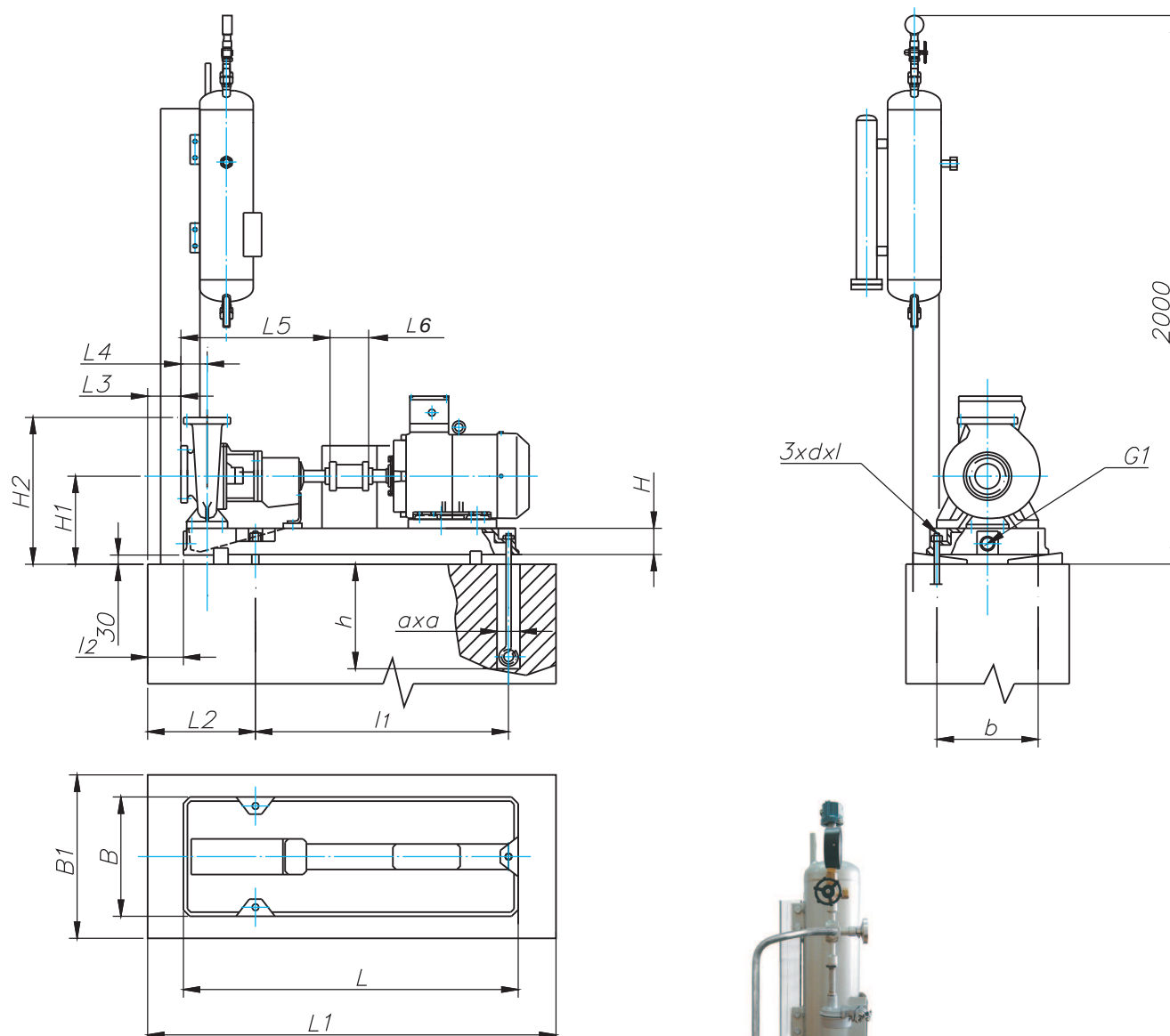
OPERATING POINTS OF 4-ANGK PUMP TYPES

Pump designation	Flow, m ³ /h	Head, m	NPSH, Δh , m	Nominal diameter of impeller, mm	DN suction pipe, mm	DN discharge pipe, mm
4-ANGK-2.15/30	12,5	35	0,9	160	50	32
4-ANGK-3.15/50	12,5	50	2,3	200	50	32
4-ANGK-4.15/80	12,5	80	4,2	250	50	32
4-ANGK-6.30/30	25	32	2,3	160	65	50
4-ANGK-7.30/50	25	50	1,6	200	65	40
4-ANGK-8.30/80	25	80	2,6	250	65	40
4-ANGK-9.30/120	25	125	3,7	315	65	40
4-ANGK-11.60/30	50	32	2,6	160	80	65
4-ANGK-12.60/50	50	50	2,4	200	80	50
4-ANGK-13.60/80	50	80	3,0	250	80	50
4-ANGK-14.60/120	50	125	4,0	315	80	50
4-ANGK-16.80/30	100	32	3,9	160	100	80
4-ANGK-17.80/50	100	50	3,9	200	100	65
4-ANGK-18.80/80	100	80	3,3	250	100	65
4-ANGK-19.80/130	100	125	3,9	315	100	65
4-ANGK-20.100/30	160	32	4,7	160	125	80
4-ANGK-21.150/50	160	50	5,0	200	125	80
4-ANGK-22.150/80	160	80	4,8	250	125	80
4-ANGK-23.150/130	160	125	4,7	315	125	80
4-ANGK-26.200/50	250	50	5,5	200	125	100
4-ANGK-36.300/50	315	50	2,9	400	250	200
4-ANGK-37.300/80	315	80	3,3	500	250	200
4-ANGK-40.500/80	500	80	4,3	500	250	200
4-ANGK-41.700/50	800	50	5,3	400	300	250
4-ANGK-42.900/80	800	80	4,1	500	300	250

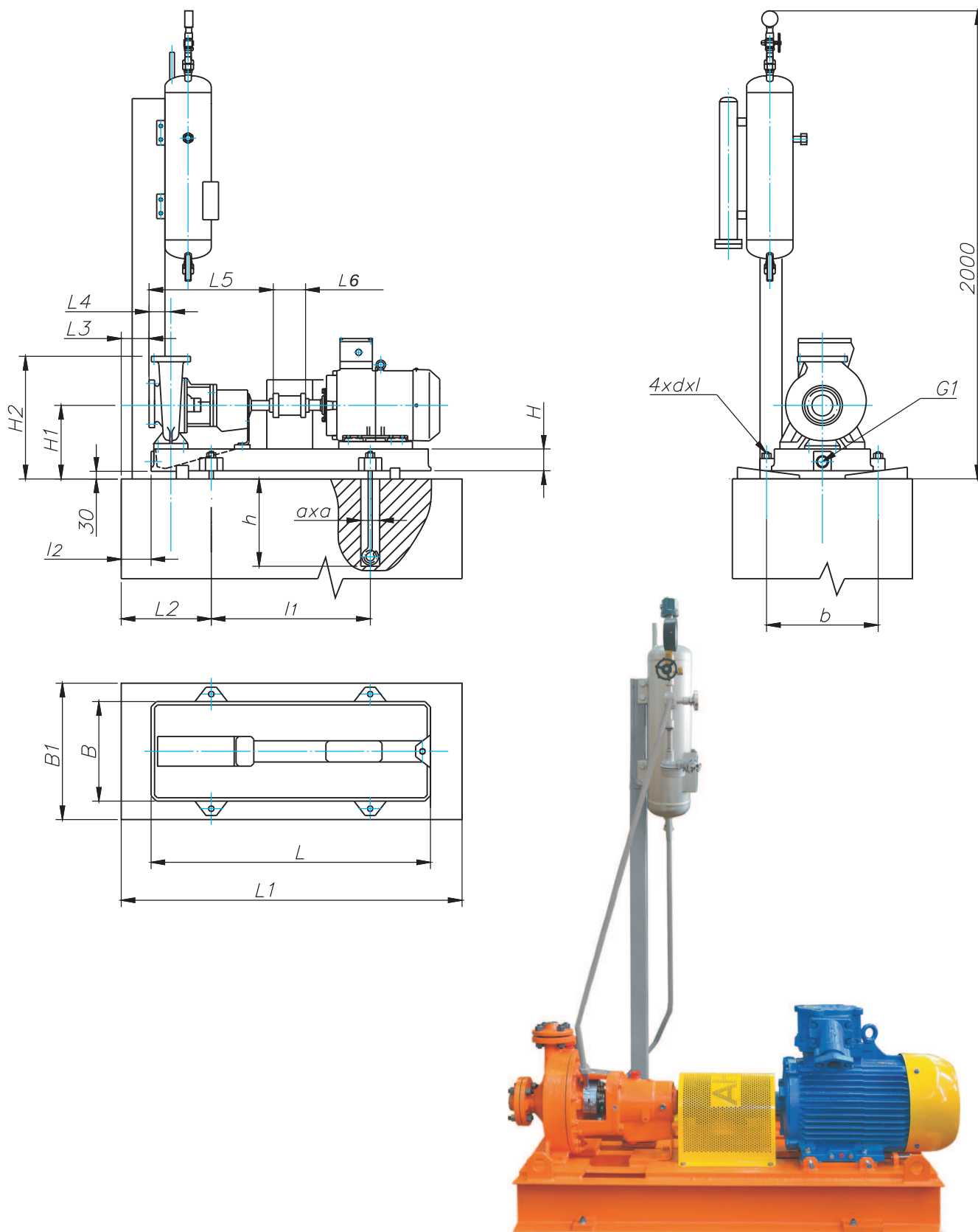
WORKING RANGE DIAGRAMS FOR 4-ANGK PUMP TYPES



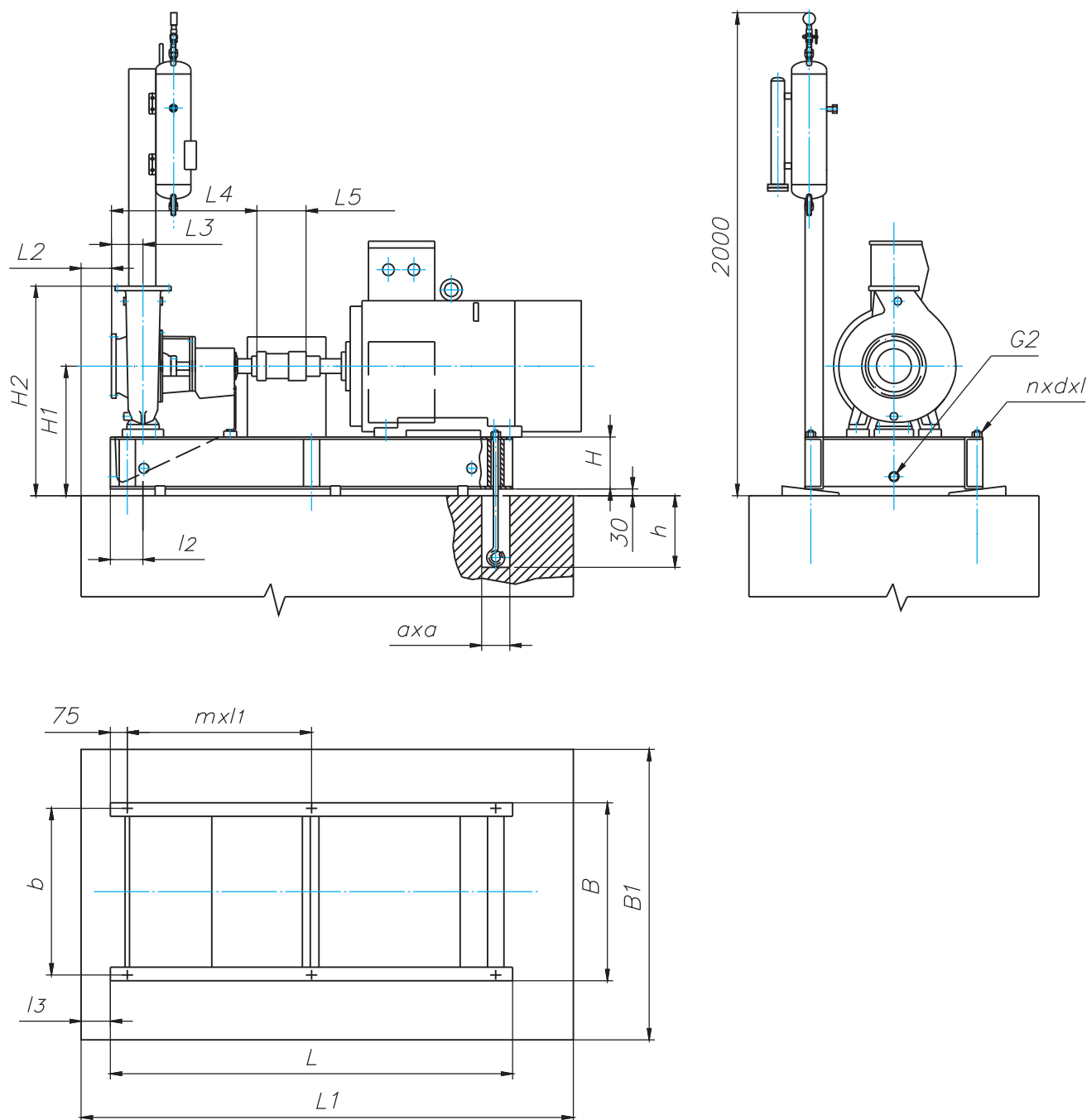
The diagrams are given as an example. If required, other pump parameters can be provided.



3-ANGK pump unit



4-ANGK pump unit



PUMP TYPE SIZES 2-27

Pump type size	L	L1	L2	L3	L4	L5	L6	B	B1	H	H1	H2	a	b	h	l1	dxl	weight, kg
2	920	1200	350	125	80	465	100	320	450	70	232	392	60	265	260	675	M16x260	147
3	1025	1250	330	102	80	465	100	365	500	80	270	450	70	310	320	775	M20x320	186
4	1270	1550	355	123	100	600	100	430	800	90	300	525	70	490	320	840	M20x320	319
6	1025	1250	330	102	80	465	100	365	500	80	242	402	70	310	320	775	M20x320	181
7	1140	1400	380	100	100	485	100	400	570	80	270	450	70	340	320	860	M20x320	241
8	1270	1550	355	123	100	600	100	800	490	90	300	525	70	490	320	840	M20x320	389
9	1420	1750	405	122	125	625	100	480	900	100	330	580	90	550	400	940	M24x400	478
11	1140	1400	380	100	100	485	100	400	570	80	270	450	70	340	320	860	M20x320	232
12	1140	1400	380	100	100	485	100	400	570	80	270	470	70	340	320	860	M20x320	245
13	1420	1750	405	122	125	625	100	480	900	100	330	555	90	550	400	940	M24x400	458
14	1420	1750	405	122	125	625	100	480	900	100	355	635	90	550	400	940	M24x400	498
16	1270	1550	355	123	100	600	100	430	800	90	280	480	70	490	320	840	M20x320	288
17	1420	1750	405	147	100	600	140	480	900	100	310	535	90	550	400	940	M24x400	392
18	1420	1750	405	140	125	625	140	480	900	100	330	580	90	550	400	940	M24x400	494
19	1625	2000	470	165	125	655	140	530	1000	120	400	680	90	600	400	1060	M24x400	848
20	1420	1750	405	122	125	625	140	480	900	100	310	535	90	550	400	940	M24x400	395
21	1420	1750	405	122	125	625	140	480	900	100	330	580	90	550	400	940	M24x400	483
22	1625	2000	470	165	125	625	140	530	1000	120	300	680	90	600	400	1060	M24x400	788
23	1830	2250	525	190	125	655	140	600	1150	130	440	755	90	670	400	1200	M24x400	1102
26	1830	2250	525	175	140	670	140	600	730	130	440	720	90	670	400	1200	M24x400	1019
37	1830	2250	525	155	180	850	180	600	1150	130	515	1015	90	670	400	1200	M24x400	1261

PUMP TYPE SIZES 27, 29-43

Pump type size	L	L1	L2	L3	L4	L5	B	B1	H	H1	H2	a	b	h	nxdl	mxl1	l2	l3	weight, kg
27	1790	2190	135	140	670	150	790	1290	230	575	890	125	740	320	6xM24x500	2x820	125	150	1286
29	1790	2190	135	140	670	140	790	1290	230	575	930	125	740	320	6xM24x500	2x820	145	130	1279
30	1790	2190	135	140	670	140	790	1290	230	575	930	125	740	320	6xM24x500	2x820	145	130	1561
38	1970	2370	75	200	870	180	820	1320	230	685	1245	125	770	320	6xM24x500	2x910	245	55	1916
39	3050	3500	50	250	1350	250	1270	1800	335	865	1535	140	1200	500	10xM30x800	4x725	175	100	3415
41	2100	2500	75	200	970	180	960	1460	230	685	1285	125	910	320	8xM24x500	3x650	175	100	1713
42	2580	2980	75	200	970	180	980	1470	270	775	1445	125	920	400	8xM24x630	3x810	245	55	2566
43	3050	3500	0	300	1400	250	1270	1800	335	865	1615	140	1200	500	10xM30x800	4x720	175	100	3955

Depending on motor dimensions, baseplate size can be changed.

PUMP TYPE SIZES 2-22, 26, 36

Pump type size	L	L1	L2	L3	L4	L5	L6	B	B1	H	H1	H2	a	b	h	l1	dxl	weight, kg
2	920	1200	350	125	80	465	100	320	450	70	232	392	60	265	260	675	M16x260	136
3	1025	1250	330	102	80	465	100	365	500	80	270	450	70	310	320	775	M20x320	184
4	1270	1550	355	123	100	600	100	430	800	90	300	525	70	490	320	840	M20x320	262
6	1025	1250	330	102	80	465	100	365	500	80	242	402	70	310	320	775	M20x320	169
7	1140	1400	380	100	100	485	100	400	570	80	270	450	70	340	320	860	M20x320	223
8	1270	1550	355	123	100	600	100	430	800	90	300	525	70	490	320	840	M20x320	278
9	1420	1750	405	122	125	625	100	480	900	100	330	580	90	550	400	940	M24x400	470
11	1140	1400	380	100	100	485	100	400	570	80	270	450	70	340	320	860	M20x320	117
12	1140	1400	380	100	100	485	100	400	570	80	270	470	70	340	320	860	M20x320	233
13	1420	1750	405	122	125	625	100	480	900	100	330	555	90	550	400	940	M24x400	450
14	1420	1750	405	122	125	625	100	480	900	100	355	635	90	550	400	940	M24x400	565
16	1270	1550	355	123	100	600	100	430	800	90	280	480	70	490	320	840	M20x320	266
17	1420	1750	405	147	100	600	140	480	900	100	330	555	90	550	400	940	M24x400	440
18	1420	1750	405	140	125	625	140	480	900	100	355	605	90	550	400	940	M24x400	548
19	1625	2000	470	165	125	655	140	530	1000	120	400	680	90	600	400	1060	M24x400	814
20	1420	1750	405	122	125	625	140	480	900	100	310	535	90	550	400	940	M24x400	381
21	1420	1750	405	122	125	625	140	480	900	100	330	580	90	550	400	940	M24x400	467
22	1625	2000	470	165	125	625	140	530	1000	120	400	680	90	600	400	1060	M24x400	788
23	1830	2250	525	190	125	530	140	600	1150	130	440	755	90	670	400	1200	M24x400	1085
26	1625	2000	470	165	125	625	140	530	1000	120	400	680	90	600	400	1060	M24x400	692
36	1830	2250	525	175	160	830	180	600	1150	130	475	925	90	670	400	1200	M24x400	1030

PUMP TYPE SIZES 23, 37-42

Pump type size	L	L1	L2	L3	L4	L5	B	B1	H	H1	H2	a	b	h	nxdxl	mxl1	l2	l3	weight, kg
37	1970	2370	115	160	830	180	820	1320	230	636	1135	125	770	320	6xM24x500	2x910	145	130	1617
40	1970	2370	75	200	970	180	820	1320	230	685	1245	125	770	320	6xM24x500	2x910	145	130	1917
41	2100	2500	75	200	970	180	960	1460	230	685	1285	125	910	320	8xM24x500	3x650	175	100	1827
42	2580	2980	75	200	970	180	980	1470	270	775	1445	125	920	400	8xM24x630	3x810	175	100	2800

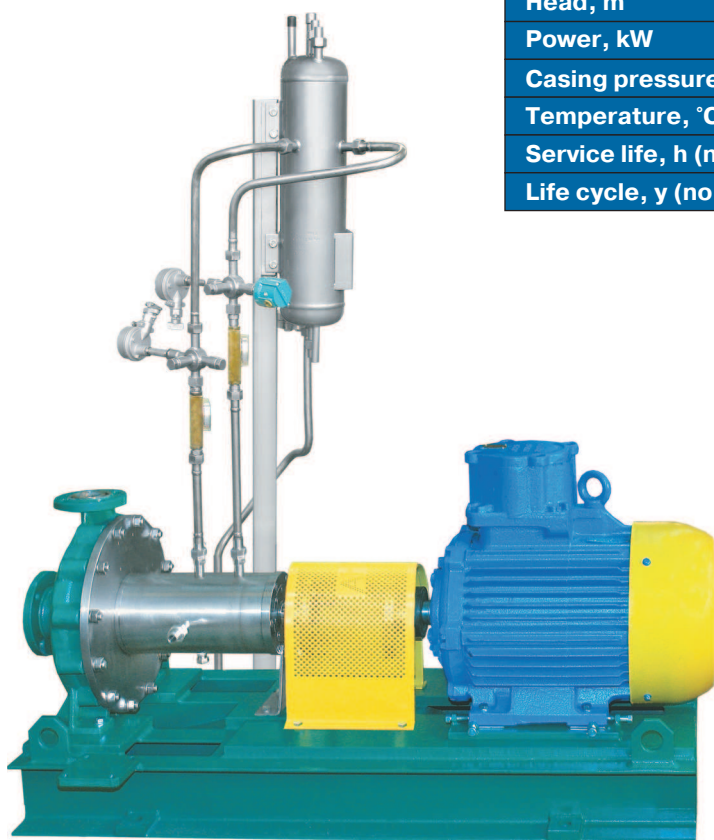
Depending on motor dimensions, baseplate size can be changed.

FEATURES

- Furnished with highly reliable bearing seal blocks.
- Plain bearings are placed in cavity formed by means of block body and seals, making the block hermetically tight on both sides.
- Block lubrication and cooling are performed with the help of clean barrier fluid, whose circulation is carried out by built-in impeller.
- Installation diagram is in compliance with API 682: Plan 52 or Plan 53.
- Improved vibroacoustic characteristics.
- Furnished with up-to-date plate couplings.
- Russian or foreign electromotors.
- Provided with modern reliable control equipment, including thermometer, pressure difference sensor, rotameter.

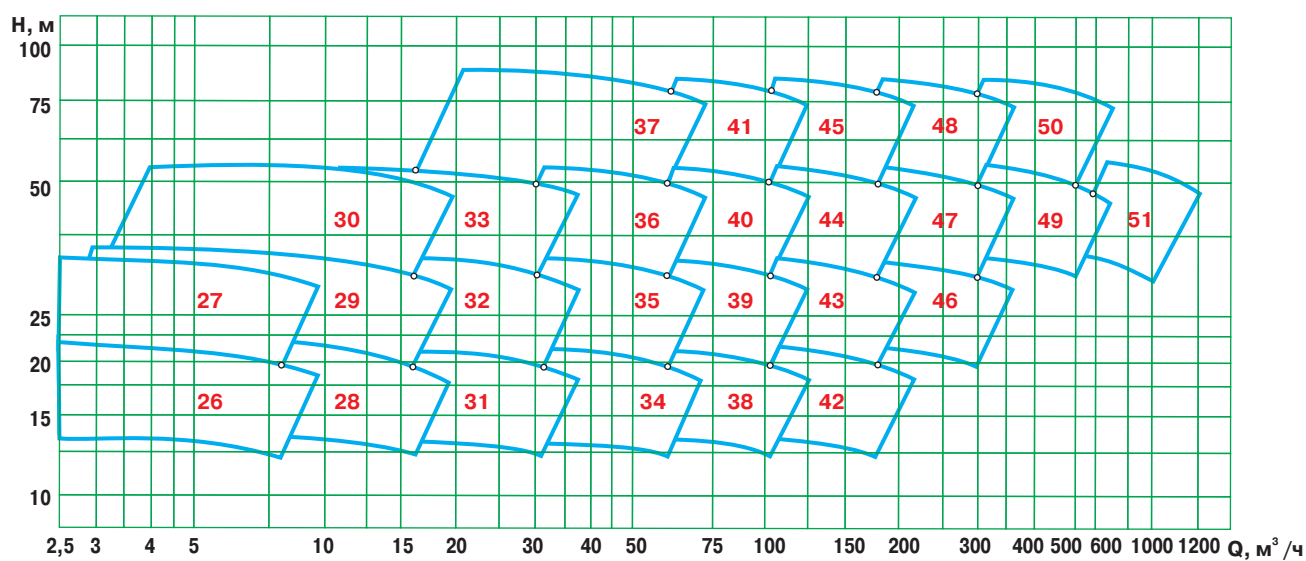
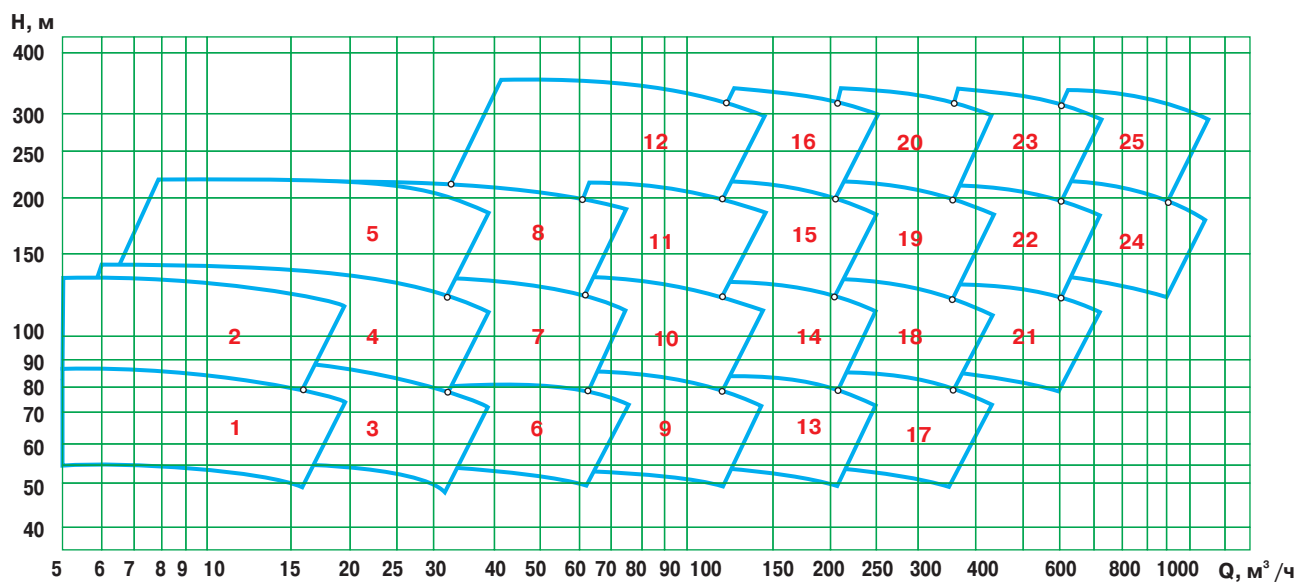
TECHNICAL PARAMETERS

Speed, rpm	1000, 1500, 3000
Flow, m ³ /h	5 ≥ 5200
Head, m	40 ≥ 200
Power, kW	800
Casing pressure, PN, kg/cm ²	16, 25, 40, 50, 64, 100
Temperature, °C (up to)	400
Service life, h (no less than)	40 000
Life cycle, y (no less than)	20



5-ANGK pump unit

WORKING RANGE DIAGRAMS FOR 5-ANGK PUMP TYPES



The diagrams are given as an example. If required, other pump parameters can be provided.

APPLIANCE

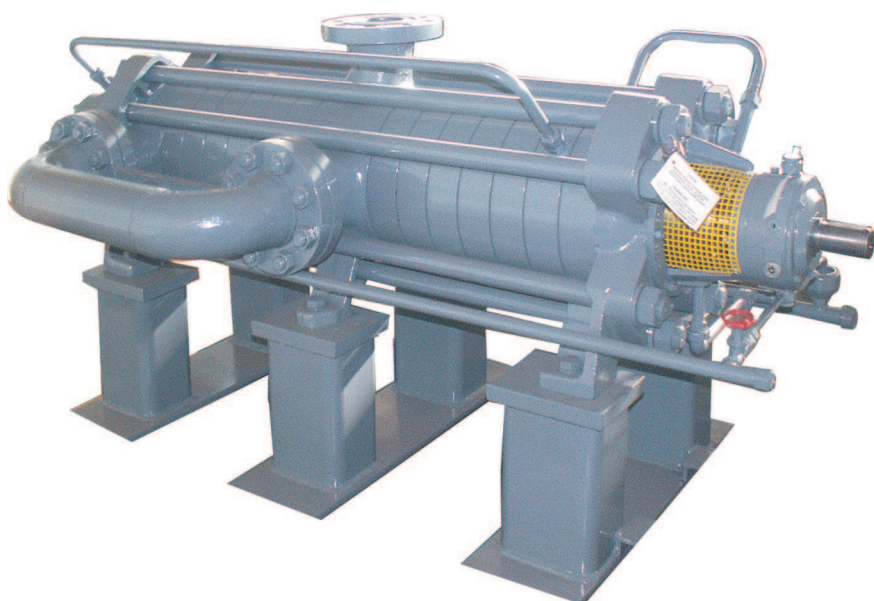
High lift pumps of 6-AHГK are to transfer oil, benzine, thin oil, kerosene, crude oil and other hydrocarbons with density of 680...1200 kg/m³, viscosity of not more than 60 cSt at temperature range from -10 °C to +120 °C. 6-AHГK pump units can be applied as transfer pumps for water and oil long-distance pipelines. They also can be used with alkali and non-corrosive water solutions without any mechanical impurities.

FEATURES

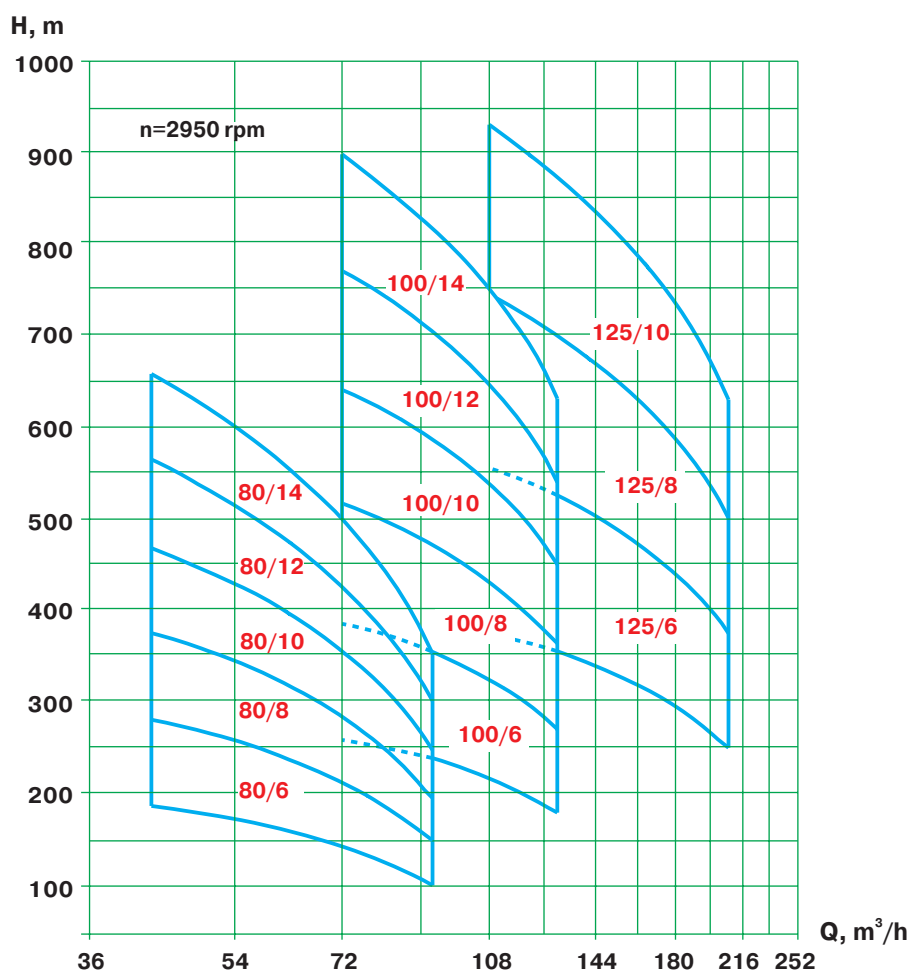
- Pumps have high efficiency.
- Pump units are furnished with up-to-date lamellar couplings that reduce vibration and pump loads.
- Furnished with highly reliable seals by R&PC ANOD.
- Pressure casings by foreign manufacturers.
- Pumps are equipped with block inspection sensor.
- Russian or foreign electromotors.
- Axial hydraulic force relief.

TECHNICAL PARAMETERS

Speed, rpm	3000
Flow, m ³ /h	2 ≥ 600
Head, m	up to 3800
Power, kW	up to 2000
Casing pressure, PN, kg/cm ²	up to 200
Temperature, °C (up to)	120
Service life, h (no less than)	40 000
Life cycle, y (no less than)	20



WORKING RANGE DIAGRAMS FOR 6-ANGK PUMP TYPES



The diagrams are given as an example. If required, other pump parameters can be provided.

APPLIANCE

Used for pumping of oil, oil products, liquefied hydrocarbon gases and mediums which contain harmful agents of 2, 3, 4 Danger Class, with density of 600...1900 kg/m³, kinematic viscosity coefficient not more than 132 cSt, solid inclusion volume concentration of not more than 2% and size of not more than 0,2 mm at temperature range from -40 to +400°C.

FEATURES

- High efficiency at low power inputs.
- Russian or foreign electromotors.
- Pump units are furnished with up-to-date lamellar couplings that reduce vibration and pump loads.
- No liquid cooling system of pump and seal bearing assembly.
- High operability due to reduced number of seal assemblies, usage of vibromonitoring system and direct measurement temperature control of bearing assembly.
- Usage of "tandem" mechanical seals with minimal leakage rate (max. 0,002l/h).

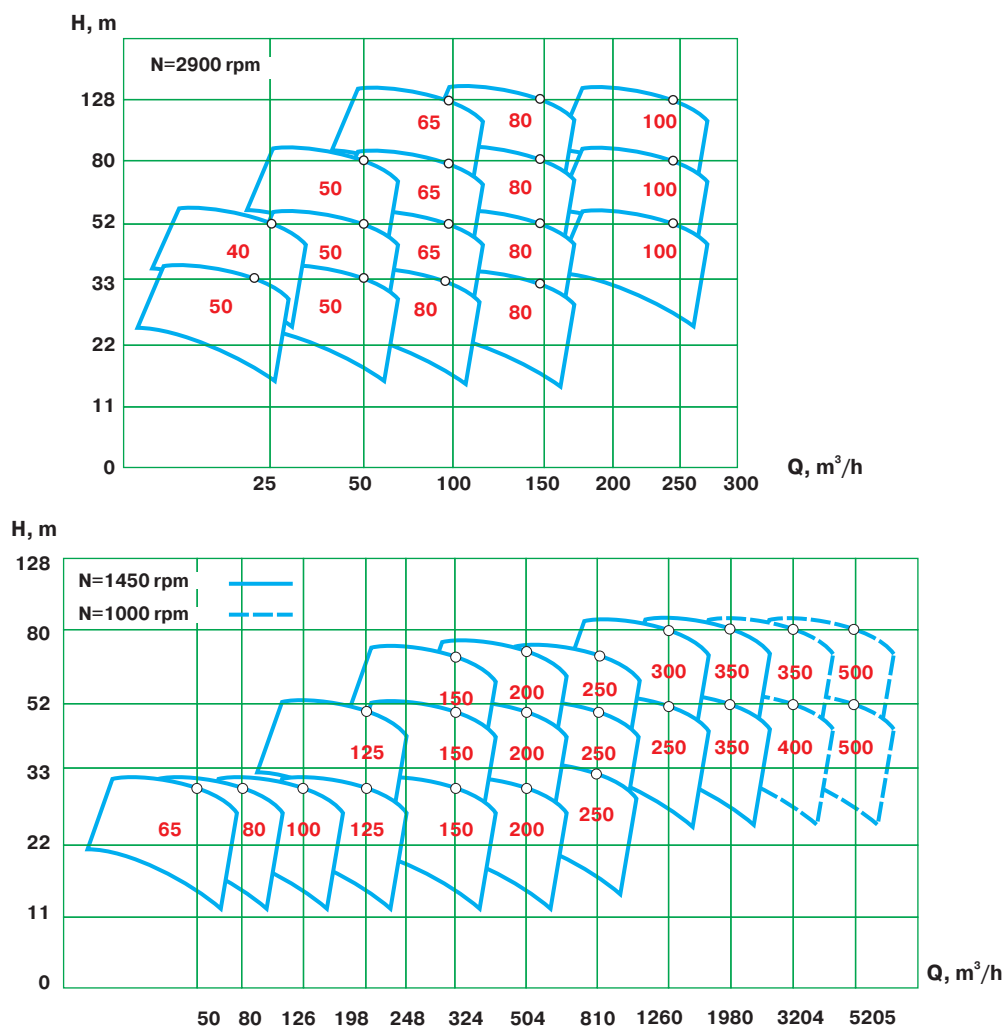
TECHNICAL PARAMETERS

Speed, rpm	1000, 1500, 3000
Flow, m ³ /h	23,5 ≥ 5200
Head, m	30 ≥ 125
Power, kW	7 ≥ 1000
Casing pressure, PN, kg/cm ²	16, 25, 40, 50
Temperature, °C (up to)	400
Service life, h (no less than)	40 000
Life cycle, y (no less than)	20



7-ANGK pump unit

WORKING RANGE DIAGRAMS FOR 7-ANGK PUMP TYPES



The diagrams are given as an example. If required, other pump parameters can be provided.

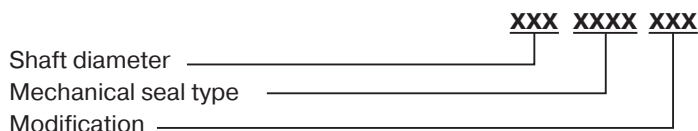


7-ANGK pump unit

OPERATING POINTS OF 7-ANGK PUMP TYPES

Pump designation	Flow, m ³ /h	Head, m	Nominal diameter of impeller, mm	DN suction pipe, mm	DN discharge pipe, mm
7-ANGK-40.25/50	25	52	200	50	40
7-ANGK-50.25/30	23,5	33	160	80	50
7-ANGK-50.50/30	50	33	160	80	50
7-ANGK-50.50/50	50	52	200	80	50
7-ANGK-50.50/80	49	79	250	80	50
7-ANGK-65.50/30	50	30	315	100	65
7-ANGK-65.100/50	97	52	200	100	65
7-ANGK-65.100/80	97	79	250	100	65
7-ANGK-65.100/130	97	127	315	100	65
7-ANGK-80.80/30	79	30	315	100	80
7-ANGK-80.100/30	96	32	160	100	80
7-ANGK-80.150/30	147	32	160	100	80
7-ANGK-80.150/50	147	52	200	100	80
7-ANGK-80.150/80	147	80	250	100	80
7-ANGK-80.150/130	147	128	315	100	80
7-ANGK-100.250/50	248	51	200	125	100
7-ANGK-100.250/80	248	80	250	125	100
7-ANGK-100.250/130	248	128	315	125	100
7-ANGK-100.120/30	126	30	315	125	100
7-ANGK-125.200/30	198	30	315	150	125
7-ANGK-125.200/45	198	46	400	150	125
7-ANGK-150.320/30	324	30	315	200	150
7-ANGK-150.320/45	324	46	400	200	150
7-ANGK-150.320/70	324	70	500	200	150
7-ANGK-200.500/30	504	30	315	250	200
7-ANGK-200.500/45	504	46	400	250	200
7-ANGK-200.500/70	504	71	500	250	200
7-ANGK-250.800/30	810	32	350	300	250
7-ANGK-250.800/45	810	46	400	300	250
7-ANGK-250.800/70	810	70	500	300	250
7-ANGK-250.1200/50	1260	50	450	300	250
7-ANGK-300.1200/80	1260	80	530	300	250
7-ANGK-350.2000/50	1980	50	450	350	350
7-ANGK-350.2000/80	1980	80	530	350	300
7-ANGK-350.3000/80	3204	80	800	350	350
7-ANGK-400.3000/50	3204	50	670	500	400
7-ANGK-500.5000/50	5205	50	700	600	500
7-ANGK-500.5000/80	5205	80	800	600	500

MECHANICAL SEAL DESIGNATION



MECHANICAL SEAL TYPES:

- UT** - single mechanical seal
- UTH** - single mechanical seal with cooler
- UTD** - double mechanical seal
- UTDH** - double mechanical seal with cooler
- UtT** - double mechanical seal of "tandem" type
- UTTH** - double mechanical seal of "tandem" type with cooler
- UTD100** - double mechanical seal for equipment with mixers
- UTDH100** - double mechanical seal with cooler for equipment with mixers
- UTDS100** - double mechanical seal with flouroplastic bellow for equipment with mixers
- UTG** - single mechanical seal for superchargers and compressors
- UTDG** - double mechanical seal for superchargers and compressors
- UTGP** - combined mechanical seal for superchargers and compressors

EXAMPLE OF MECHANICAL SEAL DESIGNATION

Double mechanical seal with cooler, shaft diameter – 80mm,
modification – 2 - **80UTDH2**

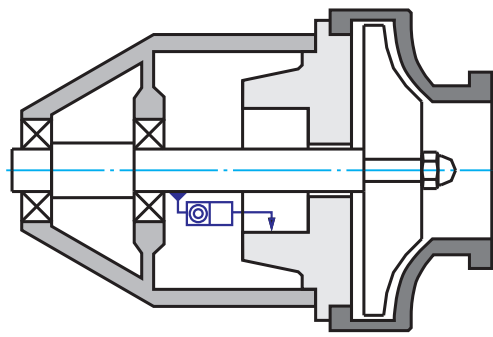
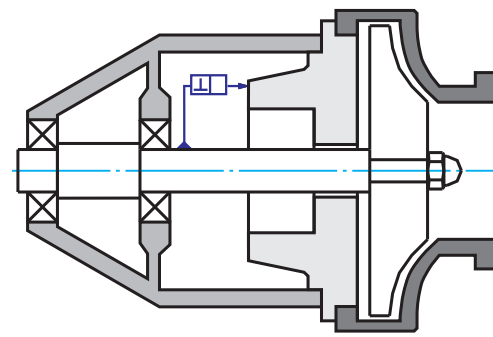
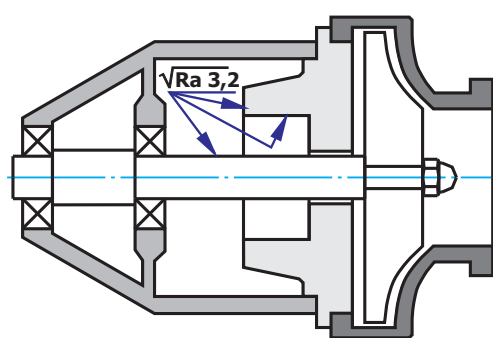
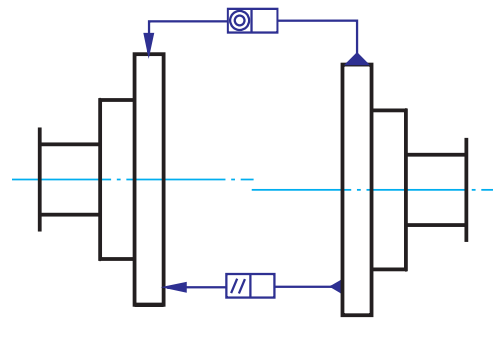
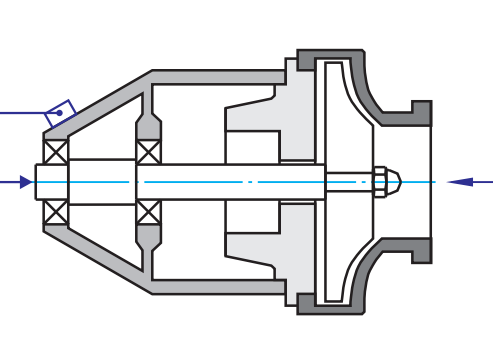
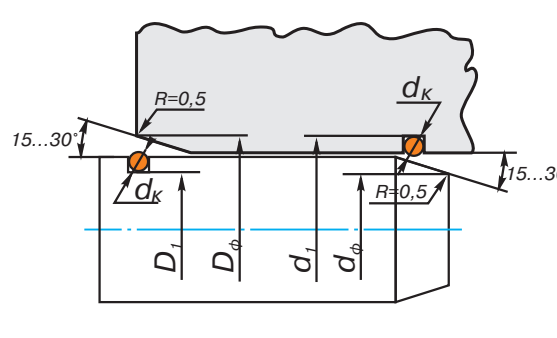


Features of mechanical seals by R&PC "ANOD" are the following:

- **OPERATING STABILITY, AT TEMPERATURE AND PRESSURE DIFFERENTIAL** of fluid sealed, is provided by means of thermic and force stabilization of friction surfaces, contacting rings and thorough hydraulic balancing.
- **INCREASES SERVICE LIFE:** operating time of the first serial mechanical seals exceeds 50 000 hours.
- **DIMENSIONAL AND ATTACHING COMPABILITY** with pumps and other equipment being produced and operated. No additional pump/equipment update is required to install mechanical seal.
- **MONOBLOCK DESIGN** allows to perform all the testing required while manufacturing. Mounting doesn't necessitate additional adjusting.
- **HIGH DEGREE UNIFICATION, MINIMAL RANGE OF PARTS:** interchangeable parts (friction pairs, ring holders, O-rings, springs, force averting devices, drive collars, connecting pipes) are used in all types of seals, for the same shaft diameter.
- **QUICK PARTS REPLACEMENT.**
- **OPERABILITY WITH DIFFERENT WORKING MEDIUMS:** liquids, gases, as well as aggressive and abrasive-carrying ones.
- **REDUCED COSTS** of seal replacement, repair works, maintenance staff and electricity.
- **COMPLIANCE WITH API 682.**



In case of exceeding the values below, mechanical seal failure can ensue.

 Shaft misalignment relative to seal chamber – $\leq 0,2$ mm.	 Deviation of perpendicularity of chamber mounting surface relative to shaft – $\leq 0,1$ mm.
 Mounting surface roughness – $\leq Ra 3,2$	 Driver and shaft displacement and fracture – $\leq 0,08$ mm
 Shaft axial movement – ≤ 2 mm	 Shaft and seal chamber lead-in $D_{\phi}=D_1+2d_k+1,0$; $d_{\phi}=d_1-2d_k-1,0$; at an angle of up to 30°, where d_k is O-ring diameter.

APPLIANCE

Applied in pump units and equipment for neutral and non-toxic mediums.

UT type is used at temperatures up to 200°C. Fluids with temperatures up to 250°C require mechanical seals with cooler (UTH).

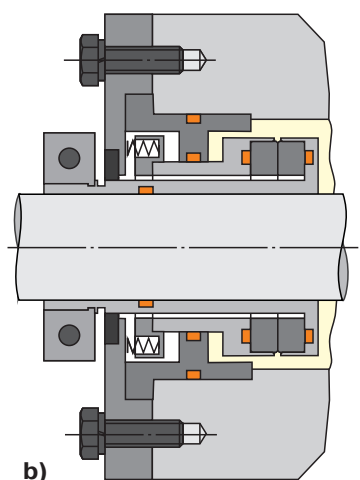
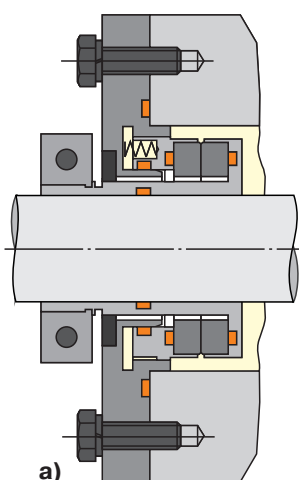


MODIFICATIONS

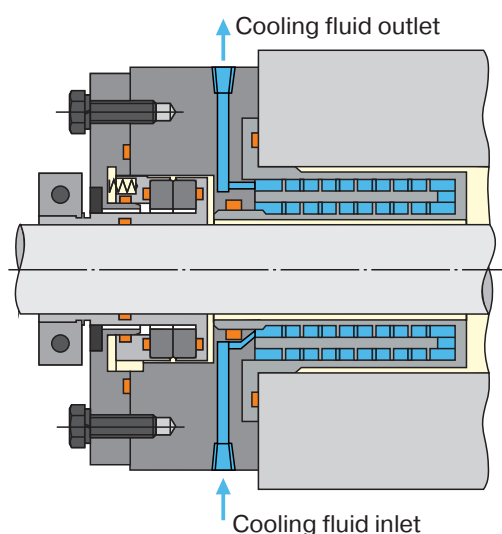
- With springs located in the medium transferred (medium sealed);
- With springs located out of the medium transferred. Applied in case if clogging of orifices and springs with abrasives is possible.
- With or without cooler.

FEATURES

- Seals can be installed inside seal chamber or outside it, through adapting flange, if seal chamber is small.
- Temperature reduction is provided in and around O-rings.
- Various cooling liquids can be used: process water, antifreeze solution, diesel fuel, etc.
- Connecting pipes are provided for air-removal and supply of medium into seal chamber.



Single mechanical seal schemes
a) springs in the medium sealed,
b) springs out of the medium sealed.



Single mechanical seal (with cooler) scheme

TECHNICAL PARAMETERS

Mechanical seal type	Shaft diameter, mm		Shaft rotation speed, rpm		Temperature of sealed medium, °C		Pressure of sealed medium, MPa		Maximum leakage, l/h
	Min	Max	Min	Max	Min	Max	Min	Max	
UT/UTH	18	250	30	7500	-60	200/250	0,1	20/10	0,002

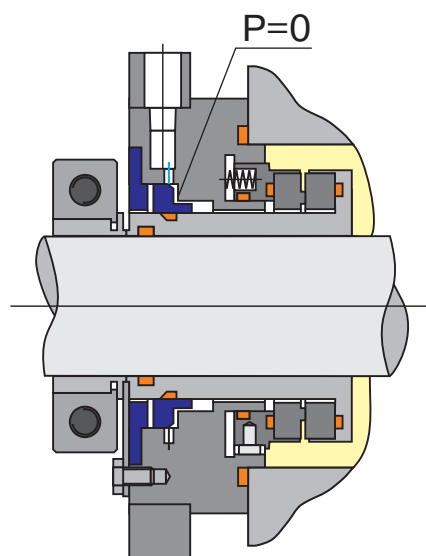
* Without water cooler, maximal temperature of medium sealed is + 85 °C.

APPLIANCE

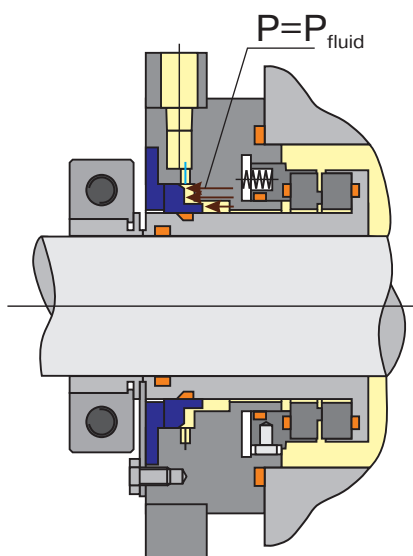
Applied in trunk line pumps where sealed fluid is oil and oil products.

FEATURES

- Main sealing components are performed from stainless steel.
- Friction pairs used have silicon carbide execution.
- Elastomeric parts are produced from rubber.
- Protective step prevents leakage of pumped fluid into atmosphere in case of main sealing disclosure and participate in transferring of shut-off signal.



Subsidiary seal step
at normal operation



Subsidiary seal step
at main friction pair disclosure

SINGLE MECHANICAL SEALS WITH PROTECTIVE STEP

NAME	D _{shaft}	AGGREGATE
45UT5	45/62	6NDV-b
45UT7	45	oil-products 180/1,6
50UT15	49,5	NRH/4NRH11A
65UT5	65	12NDsN
65UT8	65	12NDsN
65UT9	65	8NDV
70UT5-00,-01	70	NM 710/280

NAME	D _{shaft}	AGGREGATE
70UT8	69,5	NRH/4NRH17A
80UT15	80	NKV 600/320
85UT5-00,-01	85	NM 1250-260
95UT6	95	NCN-E
105UT4-00,-01	105	NM 1250-400
105UT5	105	NM 2500-230, NM 3600-230
120UT1	120/115	NM 10000-210

SINGLE MECHANICAL SEALS WITH COOLER

NAME	D _{shaft}	AGGREGATE
38UTH	38	ZE 80-2250
38UTH1	38	ND 6x4x31
48UTH	48	RCNA 220-20
49UTH	49,5	1,5 HPX10A
50UTH	50	150x100 UCWM/T 25
50UTH 1	50	HPX/6HPX12A
50UTHA, 50UTHA1	50	SE-500-70
52UTH	52	SE-500-70
54UTH	54	10 x 15 SVCN
55UTH	55	HZ 210-5400
55UTH 1	55	NKU-140M

NAME	D _{shaft}	AGGREGATE
60UTH	60	NK-200/120
68UTH	68	G310A/B
70UTH	70	NK 65/35-240
75UTH	75	RPKS 150-35
80UTH	80	NK 200/370
80UTH1, 80UTH3	80	8ND-10 x 5
80UTH4-00,-01	80	PD 650-160
90UTH	90	NPS 200/700, NKV1000/200, NKV1000/320, D 630-90
110UTH	110	350x250 KSM 71

SINGLE MECHANICAL SEALS

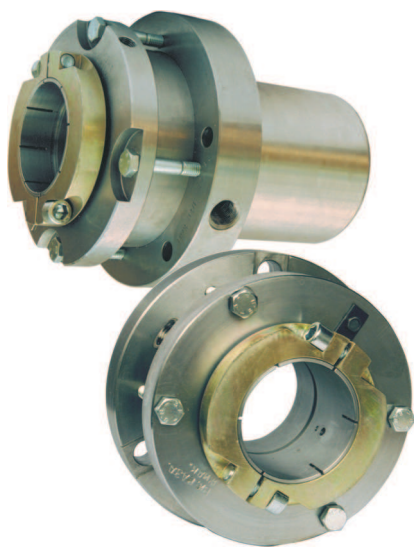
NAME	D _{shaft}	AGGREGATE
20UT	20	Sea water pump
23UT	23	WORTHINGTON SUD 32-CB-200
23UT1	23	PC-302
24UT	24	UODN 130-100-75
24UT1	24	XM 2/30-K-5
25UT	25	ANSh-45/9
25UT1	24,5	113-j
28UT	28	CEH 4101
28UT1	28	TKNA 10303
29UT	29	Propeller unit (BMA)
29UT1	29	50x40 ICWM 16
30UT	30	AX-E-100-65-400
30UT2-00,-01	30	NK, AX-65-50-160;1,25-X-2E
30UT3	30	RS-01
30UT4	30	1,25X-2A-1
30UT5	30	WKF 65-11-52 KSB
30UT6	30	HO 80-50-200-K-55-U2
32UT	32	3x10WY
32UT1-00,-01	31,7	1002-j 109-j
32UT2	32	TKNA 10303
32UT3	32	SGI - EXR 3/516
33UT	33	ETANORM 6/10- 315
34UT	33,3	RS-301
34UT1	34,4	NPV-4, K90/20
35UT-00,-01	28/35	KML pumps
36UT1, 36UT3	36/38/40	ODN 200-150-125, ODN 290-150-125
36UT2	36	K100-65-200
38UT	38,1	Worthington-batignolts 1HNN 111
38UT1	38	ND 6x4x31
40UT-00,-01	40	NK 12/40, H 80-50-250
40UT1	40	NShO-80/13
40UT2	40	50x40 UCWM/T 25
40UT3	40	HO 90/33 E 2G U2
40UT4	40	Horizontal mixer
40UT5	40	VSP2-50/75
41UT	41	Worthington 4CNEX 112
42UT	42	KS-50-55-2
42UT1	42	MC 65N-12V
42UT2, 42UT5, 42UT7	42	Reservoir pressure maintenance pump
42UT3	42	H 72/20 T
42UT4	42	SJC-EGR 4 / 833
42UT6	42	CN 160 / 112-E
44UT	44	6NK9x1, 4NK-5x1, 5NK-5x1, 5NK-9x1, 6NK-8x1, H80/50x250
44UT1	44	6NKE-9x1
44UT2	44	6NK 9x1
44UT3	44/38	Halberg CBS-100/26
44UT4	44/45	6NK 6X1
45UT	45	4N5x2
45UT1	45	H 90/85

NAME	D _{shaft}	AGGREGATE
45UT2	45	AH-E-100-65-400
45UT3	45,5/50,8	NH 63.00.000 (Mixer)
45UT4	45	5NK-5x1
45UT6	45	6NDv-Bt-E
47UT	47,7	Flowserve Mark III
48UT	48	RPH 80-230(KSB)
48UT1	48	oil pump
50UT-00...-05	50	NK65/35-40, NK200/120-40
50UT1	50	MSR 20/10
50UT2	50	10NDV-6x1
50UT4	50	CNS38
50UT5	50	8ND-6x1, 10ND-6x1, 5N-5x2
50UT6-00,-01	50/40	1D315-71, 6NDS, D320-50, 1D200-90 B
50UT7-00...-03	50	CNS38
50UT8	50	5GrT-8
50UT9	50	CNS-38
50UT10	50	10ND6x1
50UT11	50	CNSM-38-0-132V (CNSM-38-220V)
50UT12	50	8ND6x1
50UT13-00...-03	50	CNSM-38-88, CNSG
50UT14	49,5	1NRH11A
50UT19	50	CNS 38
50UT20	50	Horizontal shaft mixer fan
50UT21	50	10ND6x1
50UT22	50	CNSM 38 - 66
50UT23	50	HGN 25 / 32
51UT	50,8	TS pump
51UT1	45/50,8	7TS MIXER
52UT	52	KGV-160/80
52UT1	52	80xSOUCWM
52UT2	52,4	TS pump
52UT3-00,-01	52/50	5N-5x4
52UT4	52	KGV - 160/80
52UT5	52,5	5N5x4
52UT6	52	5N5x4
55UT	55	Included in 55KPU
55UT3	55	8ND-9x2, 8ND-9x2S
55UT4	55	HOE 200-150-315K
58UT	58	Sulzer MC 50-220
59UT	59	3HNNS-153
59UT1	59,5	NRH/6 NRH12
60UT-00...-03	60	NK63/35-70, NK200/120, NK200/120-70, NK200/120/120, TKA32/125, TKA63/125, TKA63/80, TKA120/80, TKA210/80, NK65/35-125
60UT1	60	6N-7x2
60UT2	60	Testing facility
60UT3	60	4N-5x4
60UT4	60	PE 65-53
60UT5-00,-01	60	NK63/35-70, NK200/120, NK200/120-70, NK200/120/120, TKA32/125, TKA63/125, TKA63/80, TKA120/80, TKA210/80, NK65/35-125

SINGLE MECHANICAL SEALS

NAME	D _{shaft}	AGGREGATE
60UT6	60	45WUC-2R10
60UT7	60	Mixer
60UT8	60	SRK-E 40-200
60UT9	60	ODN-300-200-150
61UT	61	R602-A
62UTA-00,-01	62	D 630-90
63UT	63	WORTHINGTON BWN 194
65UT	65	12NDsMn
65UT1	65	D 500-65, D 800-57
65UT2	65	ALLWEILER CNH -B65-3156-WX
65UT3	65	6 NG - 10 x 4
65UT4	64,8	200 D 90
65UT6	65/55	RP5810-A/B, RP58106-A/B
65UT7	65	6N-10x4
65UT10-00,-01	65	1D630-90A
67UT	67/75	250-200-NHS-400-48-OC
68UT	68	G310A/B
68UT1	68,5	7 KTS-13
68UT2	68	5N-5x4
70UT-00....-05	70	NK65/120A, NK200/120-210, NK65/35-240, NK560/335-70, NK560/335-180, NK560/180A, NK560/180, NK210/200
70UT1	70	NKV 600/125, NPД-150
70UT2	70	SEU-300-10
70UT3	70 (65)	CNS 60-50...250
70UT4-00,-01	70	NM 710/280
70UT6	69,8	3X4-16 B HHS
70UT7-00,-01	70	PE-65-35
70UT9-00,-01	70	DA 4X11
72UT	72	D 1250 / 65
75UT, 75UT2, 75UT4	75	CNS105
75UT5	75	4 WTBS - 143 L
75UT6	75	H-280/72
75UT7	75	14NDSn-1260/37
76 UT	76	SE1250-140-8
78UT	78	CN-400-105
78UT1-00, -01	78	400 x 350 KS -63
80UT-00....-03	80	NK560/300, NK200/370, NK560/30, NK560/300A, NPS65/35-500
80UT1	80	Ks1600-220 G11A/B/C
80UT2	80	Borneman MPC-268
80UT3	80	NK560/300, NK200/370, NK560/30, NK560/300A, NPS65/35-500
80UT4	80	8ND 10x5
80UT6	80	1D630-90A
80UT7	80	YNK 350-500 (KSB)
80UT8	80	CNSn -180
80UT9-00,-01	80,80/60	250-QVD-355
80UT10	80/94	PB-315 / 56
80UT11	80	NRK 350-500
80UT12	80	ODN-440-400-350
80UT13	80	PNA-150/50
80UT14	80	NK 200/370
82UT	82	8ND 10x5
85UT	85,4	SVPE-320-550
85UT1	85	Ks 1600-220, Ks 1000-220
85UT2	85	Top-head drive of vertical screw pump
85UT4	85	50BO
86UT	86	G310C
90UT-00....-03	90	NPS120/65-750, NPS200-700, NSD210/700, 10ND-13x3, 5NS-6x8, NKV 1000/200, NKV 1000/320

NAME	D _{shaft}	AGGREGATE
90UT1	90	5N5x8
90UT2	90	Hub of boat screw propeller
90UT3	90	350-NQD-390-73-S5FE
93UT-00,-01	93/91,5	14NDcN
95UT	95,4	SVPE-320-550
95UT2	95	CNS-63-1400
95UT3-00,-01	95/92	PE 270-150-3, PE 250-180-3
95UT4	95	PE 270-150
95UT5-00,-01	95	SE 800-100-11
100UT-00....-04	100	CNS 180 - 85
100UT1-00,-01	100	CE 2500-180-10
100UT2	100	CN -1000 / 180x2
100UT3	100	SE 1250-70
100UT4	100	PD 1600-180
104UT	104,8	D 3200-75a-2
105UT1-00,-01	105	NM 2500-230
105UT2	105	BNM 2500-230-I
105UT3	105	18NDS
105UT6	105	8 X 6 T
105UT7	105	CNSn -315-730
107UT-00,-01	107	VD 525.364424.232 (water-jet)
110UT-02....-04	110	CNS-300
110UT1	110	CNS-180/1422(1900)
110UT2	105;110	5000-32a-2-10
110UT5	110	WORTHINGTON 20 QLQ 23/30/3
110UT6	110\108	SCN 1250-140-11
110UT7	110	SE 1250-140-11
115UT	115,4	SVPT 340-1000
115UT1	115	D5000-32
115UT2	115	D3200-75
115UT3	115	PE 500-180-3
115UT3-00....-02	115	PE 500-180-2
115UT4-00....-03	115	CNS-300
115UT5-00,-01	115	PE 500-185-3
115UT6-00,-01	115	PE 580-185-3
115UT7	115	PNEA-650-320
115UT8	115	CNS-630-1700
119UT	119	SE5000x70, SE5000-160
119UT-00,-01	119	D1600-90
119UT1	119	SE5000-160-10
120UT-00,-01	120	NM 10000-210
121UT	121	"SULZER" pump HPT 300-400-6s
124UT	124	SE2500x60, T till 70°C
124UT1	124	D5000-32
124UT2	124	D3200-75
124UT3	124	SE2500x60, T till 120°C
130UT-00,-01	130	D2000-100
130UT100	130	Gas blower
134UT	134	SVPT 340-1000
136UT, 136UT2	136	PTN-1150-340-14
136UT3-00,-01	136	PTN-1150-340-M
137UT	137	KSB CHTD 7/6
145UT	145	NP1500-350
145UT1	145	Dredger pump, GrUT2000/63-S-UHL-4
150UT	150	PN1500-350
151UT1	151	(KSB) CHTD 8 / 7
167UT	167	Screw low-pressure turbine
180UT	180	Horizontal hydroturbine



APPLIANCE

Applied in pump units and equipment where sealed fluids are oil products, liquefied hydrocarbon gases, liquids with harmful chemical agents.

Double mechanical seals are mostly effective with fluids, enriched with abrasive components, with high-viscous products and at half-floating conditions.

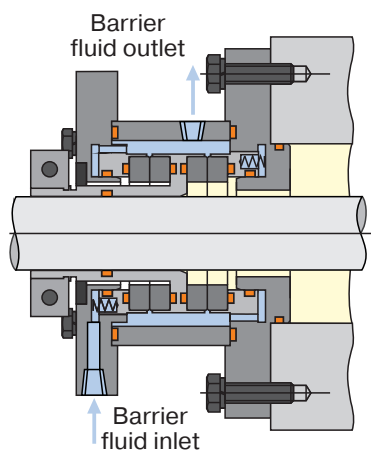
Mechanical seals of UTD type are used at temperatures up to 200°C. Fluids with temperatures up to 400°C require mechanical seals with cooler (UTDH).

MODIFICATIONS

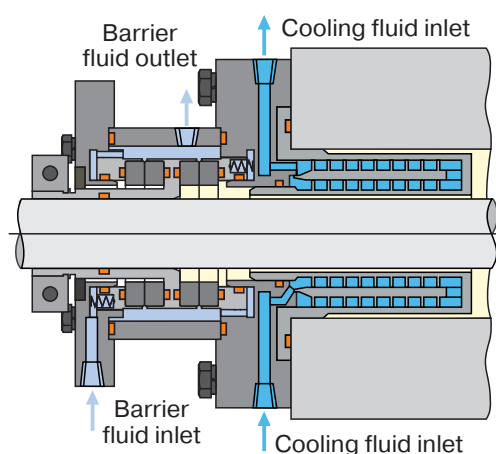
- **With impeller.** Applied in case autonomous fluid circulation system is used.
- **Without impeller.** Applied in case outer fluid circulation system is used.
- With shaft cooler or without it.

FEATURES

- Leakage of sealed fluid into atmosphere is completely excluded.
- First (circuit) friction pair operates at barrier fluid and sealed fluid pressure drop. Second, atmospheric one, - at barrier fluid and air pressure difference.
- Barrier fluid pressure is 0,1-0,3 MPa greater than sealed fluid pressure.
- Mechanical seal retains its operability in case barrier fluid pressure is lower than this one of the medium sealed.
- Barrier fluid is a chemically unaggressive, non-toxic liquid, compatible with sealed fluid.
- Cooler provides for favourable temperature conditions in mechanical seals.
- Usage of various cooling liquids (process water, antifreeze, diesel fuel, etc.).
- Piping is performed according to API 682: Plan 53 or Plan 54.



Double mechanical seal scheme



Double mechanical seal (with cooler) scheme

TECHNICAL PARAMETERS

Mechanical seal type	Shaft diameter, mm		Shaft rotation speed, rpm		Temperature of sealed medium, °C		Pressure of sealed medium, MPa		Maximum leakage, l/h
	Min	Max	Min	Max	Min	Max	Min	Max	
UTD/UTDH	22	250	30	3000	-60	200/400	vacuum	10	0,002

APPLIANCE

Applied in pump units and equipment where sealed fluids are oil products, liquefied hydrocarbon gases, liquids with harmful chemical agents.

Tandem mechanical seals are mostly effective in cases when barrier fluid penetration into pumped fluid is not permitted.

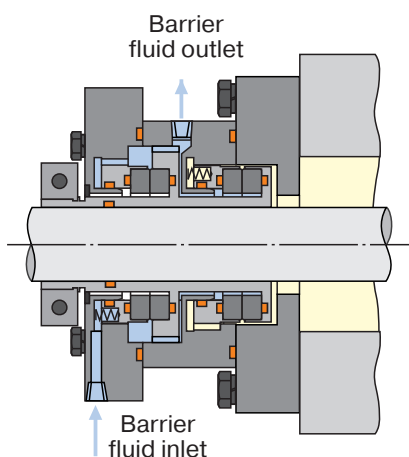
Mechanical seals of UTT type are used at temperatures up to 200°C. Fluids with temperatures up to 400°C require mechanical seals with cooler (UTTH).

MODIFICATIONS

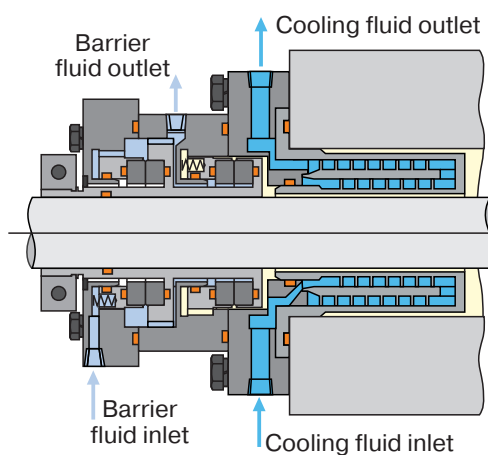
- **With impeller.** Applied in case autonomous fluid circulation system is used.
- **Without impeller.** Applied in case outer fluid circulation system is used.
- With shaft cooler or without it.

FEATURES

- Penetration of barrier fluid into sealed fluid is eliminated.
- First (circuit) friction pair operates at barrier fluid and sealed fluid pressure drop. Second, atmospheric one, - at barrier fluid and air pressure difference.
- Barrier fluid is a chemically unaggressive, non-toxic liquid, compatible with sealed fluid.
- Cooler provides for favourable temperature conditions in mechanical seals.
- Usage of various cooling liquids (process water, antifreeze, diesel fuel, etc.).
- Piping is performed according to API 682: Plan 52.
- Barrier fluid pressurization by means of gas is not required.



Tandem mechanical seal scheme



Tandem mechanical seal (with cooler) scheme

TECHNICAL PARAMETERS

Mechanical seal type	Shaft diameter, mm		Shaft rotation speed, rpm		Temperature of sealed medium, °C		Pressure of sealed medium, MPa		Maximum leakage, l/h
	Min	Max	Min	Max	Min	Max	Min	Max	
UTT/UTTH	22	160	30	4500	-60	200/400	0,1	10	0,002

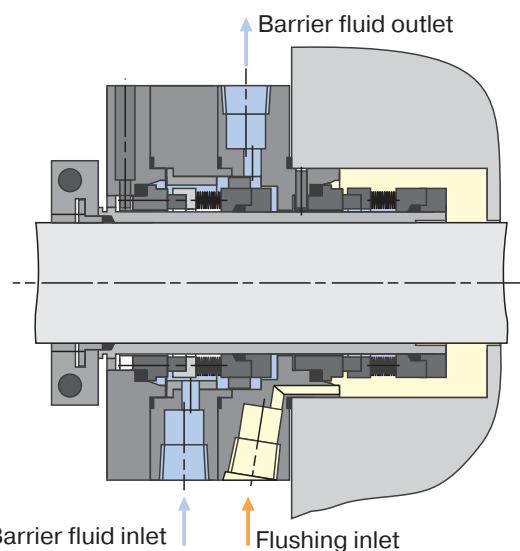
APPLIANCE

Applied in pump units and equipment where sealed fluids are oil products, liquids with harmful chemical agents, including dissolving rubber, at process operating temperatures up to 400°C.

Are used in case of hindered clean cooling liquid supply.

FEATURES

- Penetration of barrier fluid into sealed fluid is eliminated.
- First (circuit) friction pair operates at barrier fluid and sealed fluid pressure drop. Second, atmospheric one, - at barrier fluid and air pressure difference.
- Barrier fluid is a chemically unaggressive, non-toxic liquid, compatible with sealed fluid.
- No elastomer.
- Rotating bellows blocks provide for corrugations self-cleaning.
- Piping is performed according to API 682: Plan 52.
- Barrier fluid pressurization by means of gas is not required.



TECHNICAL PARAMETERS

Mechanical seal type	Shaft diameter, mm		Shaft rotation speed, rpm	Temperature of sealed medium, °C		Pressure of sealed medium, MPa		Maximum leakage, l/h
	Min	Max		Min	Max	Min	Max	
UTT	30	100	3000	-70	425	vacuum	20	0,002

BELLOWS TANDEM SEALS

NAME	D _{shaft}	AGGREGATE
38UTT4	38,1	FX-1 1/2x9
38UTT5	38,1	1-HN-91
40UTT8	40/32	AH 12,5/50
44UTT2	44	2-HN-112, 2-HN-122, 4-HNT-92
45UTT7	44,5	3700 1x2-9N
48UTT1	48	SULZER WEISE ZE 50-3400
48UTT2-00,-01	47,6	3 BFH-A/8
52UTT2-00,-01	52,4	N-6x11 TC
54UTT3	54	3700M/3x6-13
54UTT4	54	1 1/2xHNB 113

NAME	D _{shaft}	AGGREGATE
58UTT	58	ZE 80-4450
60UTT8	60	NK63/35-70, NK200/120, NK200/120-70, NK200/120/120, TKA32/125, TKA63/125, TKA63/80, TKA120/80, TKA210/80, NK65/35-125
65UTT2	65	6-YND-134 (05-P6A/B)
67UTT1	66,7	model 3700L mark 4x6-16N
67UTT3	66,7	model 3700L mark 6x8-16A
70UTT8	70	NK65/35-240, NK200/120-210, NK560/335-70, NK560/335-180, NK560/120A, NK560/180A, NK560/180
80UTT8	80	NK200/370, NK560/30, NK560/300A, NPS65/35-500, NKV360/320, NKV600/125, NKV600/320, NK200/370, NG200/120-370, NP200/120-370, NP560/335-371

DOUBLE MECHANICAL SEALS

NAME	D _{shaft}	AGGREGATE
22UTD	22	SKC 4.08
24UTD	24,5	SRK 32-160
28UTD	28	SKC 5.08: SKC 7.04
28UTD1	28	ND 8x5x20
30UTD	30	2 HO - 4K - 2G
30UTD1	30	HE 80-50-200K-55
30UTD2	30	32 CPH 160 -R-55
31UTD	31	SRK 65-250, SRK 80-250, SRK 40-200
32UTD	32	SKC, 8.06
34UTD	34	HZI - 50 / 225
34UTD1	34	SRKS 1 80-250
35UTD1	35	GNOM 100-25
38UTD	38	2 HO - 4K - 2D - 2G
38UTD1	37,5/38	GUINARD KSB
38UTD2	38	ND 5x3x25
39UTD	39	4K-8
40UTD1	40,1	H 45 / 54 - K -2
40UTD2, 40UTD3	40	NK 12/40
41UTD	41	50x40 CSHS TORISCHIMA PUMP
42UTD-00,-01	42	CN 160/112-E
44UTD	44	3HNN122
45UTD-00,-01	45	HE100-65-250K-55;-01 for HE100-65-200K-55
45UTD1	45	ENK 50-32-280
45UTD2	45	HO-80-50-315
45UTD3	45	H 100-80-160
45UTD4	45	5NK- 5x1-55
45UTD5-00,-01	45	6NDV
45UTD6	45/50	H 100-65-400
45UTD7	45	HO 280/29k
46UTD	46	BETA-4
50UTDA	50	compressor 1FUU-80
50UTD-01....-03	50	HGN20/32, HGN12,5/32
50UTD2	50	NK65/35-40, NK200/120-40
50UTD5	50	AH-100/50.0200
50UTD7	50	mixer
50UTD8	50	H-08/60
54UTD	54,55	BETA-19
55UTD	55	MVN130
55UTD2	55	MVN130.01
55UTD3	54,5	125 CJAV-305-15
55UTD4	55	TGH 185 - 125
58UTD	58	Sulzer ZF 150-4401
60UTD-00....-02	60	HGN 300/70
60UTD1-00,-01	60	NK type pumps

NAME	D _{shaft}	AGGREGATE
60UTD3	60	HO - 45 / 90
60UTD4-00,-01	60	1TR-300 A/B ; 2TR-300 A/B
60UTD5-00....-03	60	NK, TKA
60UTD6	60	T-8-100-NR4
62UTD -00,-01	62	12NDS
65UTD1	65	WN1-12
65UTD3-00,-01	65	8NDV
65UTD4-00,-01	65	200 D 90B
70UTD1-00,-01	70	NK65/35-240, NK200/120-210
70UTD3	70	MNV-63
70UTD5	70	NK type
70UTD6	70	NK 560/325
70UTD7-00,-01	70	D 630/90
75UTD	75	AH-100/65
75UTD1	74-78	KsV 500-220-1, KsV 320-160-2
75UTD1-01	74-78	KsV 500-150, KsV 500-85
78UTD1	78	16KsV11x4-2
80UTD4	80	SCN-1.0-0.1
80UTD7	80	NC 325/110
80UTD8	80	12KsV9x4
80UTD9	80	FG 450/22,5
80UTD10	80	Horizontal vacuum drier
80UTD11-00,-01	80	6WLH-142S
80UTD12-00....-03	80	NK type pumps
80UTD13	80	compressor AUU 200, AUU 400
80UTD14	80	200-NQD-400-35-C6-F
83UTD-00,-01	83	12LN17
90UTD	90	Centersorter M800
90UTD1-00,-01	90	NSD210/700, NKV1000/200, NKV1000/320
91UTD-00....-03	91/110	D 1250-125
91UTD1-00,-01	91	D 1250-125
92UTD-00,-01	92	Force-feed sorter C3-13
95UTD2	95	Centersorter D8
100UTD1, 100UTD2	100	KsV1600-90
105UTD	105	Gas blower VRJ2504
110UTD4	110	KsV-1000-95
115UTD	115,1	Hh 12 N 55
120UTD	120	KsV 1500-140
130UTD	130	PGN 800/200
130UTD2	130	Gas blower VRF4501
170UTD	170	Screw low-pressure turbine
210UTD	210	Disk refiner TF4E
222UTD	222	Refiner RGP-60S

DOUBLE MECHANICAL SEALS WITH COOLER

NAME	D _{shaft}	AGGREGATE
38UTDH	38/40	CPKT 40-250
40UTDH	40	GAMA 7-ON
43UTDH	43	CPKE 50-250
50UTDH1	50	GAMA-8
50UTDH2	50,8	насос LI15
50UTDH3	50	GAMA 4-ON
50UTDH4	50/48/35	CPKN-E 65-315, KSB PEGNITS
54UTDH	54	97 NRH
58UTDH	58	SULZER pump ZE100-4450

NAME	D _{shaft}	AGGREGATE
60UTDH1	60	Flowserve pump SCER 2x3x13,25
60UTDH2-00....-03	60	NK, TKA type pumps
64UTDH	64	TORISCHIMA PUMP 150 CSHS
70UTDH	70	NK pumps
70UTDH2-00....-03	70	NK pumps
80UTDH-00,-01	80	HZZ 201-361
80UTDH2-00....-03	80	NK200/370, NK560/30
86UTDH-00,-01	86	GSG 150-360/3+2d
90UTDH-00,-01	90	NSD 210/700, NKV 1000/200, NKV 1000/320

TANDEM MECHANICAL SEALS WITH COOLER

NAME	D _{shaft}	AGGREGATE
45UTTH	45	NK pumps
45UTTH1-00,-01	45	8NGD 6x1
48UTTH	48	RPH 50-450
48UTTH1	48/42	ZF 150-3315 (LK-3)
57UTTH	57	RPH 100-450
58UTTH	58	"SULZER" pump ZE 100-4401
60UTTH1-00....-03	60	NK, TPA type pumps
66UTTH-00,-01	66	GSG 80 - 260

NAME	D _{shaft}	AGGREGATE
70UTTH1-00....-03	70	NK pumps
79UTTH -01	79	GSG 100 - 300
80UTTH1-01....-03	80	NSD 210-700, NKV360/320, NKB600/125, NKV600/320, NPS65/35-500, NK200/370, NG200/120-370, NP200/120-370, NP560/335-370
85UTTH	85/83,2	HGUR-200/8/64 pump
90UTTH-00,-01	90	10NGD 13-3
90UTTH1-00,-01	90	NKV1000/200, NKV1000/320
90UTTH2-00,-01	90	NPS 200x700

TANDEM MECHANICAL SEALS NOMENCLATURE LIST

NAME	D _{shaft}	AGGREGATE
22UTT	22	SKC.4.08
22UTT1	22	Bx-1x7-CTC
24UTT	24,5	CPK 32-160
25UTT	25	Pump 1-1/2 CNEJO-72
25UTT1	25	ERP 40 x 160
28UTT	28	Ochsner of type CN, CPR
28UTT1	28	SKC 5.08 ,SKC 7,04
28UTT2	28/22	50-32-NHD-200-8-OC
28UTT3	28	AH 40-25-160
30UTT	30/40	H 20/53-K-SD-U2
30UTT1	30	HM-8/40
31UTT1	30,8	3x10WY
32UTT	32	Rotor-pulsator device RPG-160T
32UTT1	32	Pump SKC,8,06
32UTT2	32	SV W50-4ST
32UTT3-00,-01	32	HGUIR -50/6/40V-601
32UTT4	32	H 50-32-250b
32UTT5-00,-01	32	HGUIR -50/8/40V-601
34UTT	34/33/24	65-40-NHJ-200-11-ON
34UTT1-00...-02	34	Beta- 3
34UTT2	34	ERP 50 x 315 (ERP 40x315)
35UTT	35	GABBIONETA R-300/80G
36UTT	36	Ochsner типа CN, CPR
37UTT	37	1CNEJO-132
38UTT	38 /28	125-100-NHD-200-40-ON
38UTT1	38	K-100-80-160-E
38UTT2	38	SULZER TTMC 40-180
38UTT3-00,-01	38	SULZER ZF 100-2250
39UTT	38,5	2-WVC4(L)
40UTT	40	NK 12/40
40UTT1	40	HNN5-111,-91,1/2 HNN5-91
40UTT2	39/40	KSB
40UTT4	40	50x40 UCWM/T 25, 80x50 UCWM 25
40UTT5	40	100x80 UCWM 20
42UTT-00,-01	42	HGUIR-80/4/64 (HGUIR-80/12/64)
42UTT1-00,-01	42	SULZER TTMC 50-180
43UTT	43/44	Worthington ERP 150-250
44UTT-00,-01	44	6NK 9x1
44UTT1	44	CHC 80/26
45UTT-00,-01	45	6NDv-Bt-E
45UTT1	45	5NG-5x2, 4NG-5x4
45UTT2	45	5NK 5x1
45UTT3	45	6NK-9x1
45UTT4-00,-01	40/45	SGUR-80/6/40
45UTT5-00,-0	45	5NG-5x2
45UTT6-00,-01	45	H(O)E-20/53
45UTT8-00,-01	45	4N 5x2
45UTT9	45	5NK 9x1
45UTT10-00...-03	45	5N 5x2
47UTT-00...-02	47	50-32-NHJ-250-8,5
48UTT	48	Guinard SMKD 2x4x12 ?
49UTT	49,5	1 NRH11A
49UTT1	49,5	NRH/2NRH 9A
49UTT2	49,5	NRH/2NRH13A
50UTT	50	10ND-6x1, 5N-5x2, 8ND-6x1
50UTT1	50	3HNN-122
50UTT2	50	80x50UCWM32, 80x50UCWM32N, 150x100UCWM
50UTT3-00,-01	50/45	5N-5x2
50UTT4	50	Finder Pompe 3x4HPP102
50UTT5	50	1X1,5X7M
50UTT6-00,-01	50	5N5x2
50UTT6-02,-03	50	5N5x4
50UTT7-00,-01	50	5N5x4
50UTT9	50	GABBIONETA C-300G
51UTT	50,8	1/2x11 TC
52UTT	52	8ND-9x2
52UTT1	52	HGUIR 185/4/40V
53UTT	53/40	100-65-NHD-250-19-ON
54UTT	54	KNR-P704-120
54UTT1	54	3700M/3x6-11
54UTT2	54	KRGH-80/315/25
55UTT	55	AH-100-65-400
55UTT1	55	SMK-2x4x13H/2

NAME	D _{shaft}	AGGREGATE
55UTT2	55	KSMK 2x4X13HH
55UTT3-00...-02	55/54	Beta 23 (125-80-NHJ-315-21)
55UTT4	55	125 LS 400 UNF
57UTT	57,15	U-4x15x13TC, S-4x13-TC/1, M-3x13-TC/1
57UTT1-00,-01	57	Flowserve TSHO/2x4x15
58UTT1	58	ZF 100-4400
59UTT	59	3NRH 13A/ NRH
60UTT1	60	Pumps NK type
60UTT2	60	F-4x11-MSNL, 8 stad
60UTT4	60	KSMK 2x4X13HH
60UTT5-00...-03	60	Pumps NK and TKA types
60UTT6	60	AHP-45/31
60UTT7-00,-01	60	100-CES-230-14
60UTT9	60	100-NEF-250
60UTT10-00,-01	60	NVN
65UTT-00,-01	65	12NDS-Nm-E
66UTT-00,-01	66	GSG 80-260
67UTT	67/75	Beta 34-ON ; 250-150-NHJ-400-38-ON-120
67UTT2	66,5	model 3700L mark 6x8-16A
67UTT4	66,7	4 x 15 TC
68UTT	68	HZ 201
68UTT1	68	SVN 4 x 19
70UTT1	70	OHG6-25
70UTT2	65/70	NM 710-280
70UTT5	70	Pumps NK type
70UTT7	69,8	150 x 80 UCWM 40 U
70UTT9	70	Finder Pompe 3x6 HPP 174L
70UTT10	70	HZZ-102-361
70UTT11-00,-01	70	CUD 6-12,1-150-3-12
70UTT12	69,5	5NRH12A
70UTT13-00...-02	69,5/70	NRH/4NRH18A; DA/4x10
70UTT15	70	100-NTD-420
73UTT	73,15	4 x 11MSN-H/6
74UTT	74,6	4X6X15M
75UTT	75	250-200-NHJ-500-45-ON
75UTT1-00,-01	75	14NDSn-1260/37
75UTT2-00,-01	75	125 CEM-265-15/8
75UTT3-00,-01	75	125 CES-265-16
75UTT4	75	150 LS 500 UNF
76UTT1-00,-01	76,2	10x23 DVSHF
76UTT2-00,-01	76	200 x 150 DCD 10 GM
76UTT3-00...-02	76	300-250-NHJ-500-55-ON
79UTT	79,3	250x200 UCWM 50
79UTT1-00,-01	79/78	GSG 100-300
79UTT2	79	RPH-S1 100-450
80UTT2	80	D 350-30
80UTT4-00,-01	80	250x200 KSM 48
80UTT5-00...-03	80	NK200/370, NK560/30, NK560/300A, NPS65/35-500, NKV360/320, NKV600/125, NKV600/320, NK200/370, NG200/120-370, NP200/120-370, NP560/335-370
81UTT-00,-01	81,5	8ND 10x5
82UTT	82	GABBIONETA C-300G
85UTT, 85UTT1	85/80	NM 1250/260
85UTT2	85/83,2	HGUR-200/8/64
89UTT	89	10x27 DVSHF
90UTT-00...-02	90	NSD 210/700 , NPS120/65-70
90UTT2	90/85	NM 500/800
90UTT3-00...-03	90	NPS 200-700, NKV 1000/200, NKV 1000/320
90UTT5	90	14NDS
90UTT9-00,-01	90	HOH 275-860/55-440
92UTT-00,-01	92	DVSS 10.10.14.
95UTT-00,-01	95	NCN-E
95UTT2-00...-03	95	14NDSN
95UTT3-00,-01	95	6UYD12
95UTT4 -00,-01	95,1	I J/6 T I J
95UTT5-00,-01	95/90	8HDS 264
105UTT	105	18NDS
110UTT	109,5	10HNN27 Worthington
112UTT-00,-01	112	12HDS34 Worthington
118UTT	118	250-NEF-450
125UTT-00,-01	125	SDC 350/450-H1
128UTT	128	300 NEF-670
134UTT-00,-01	134	Guinard DVMX 10,12,14

APPLIANCE

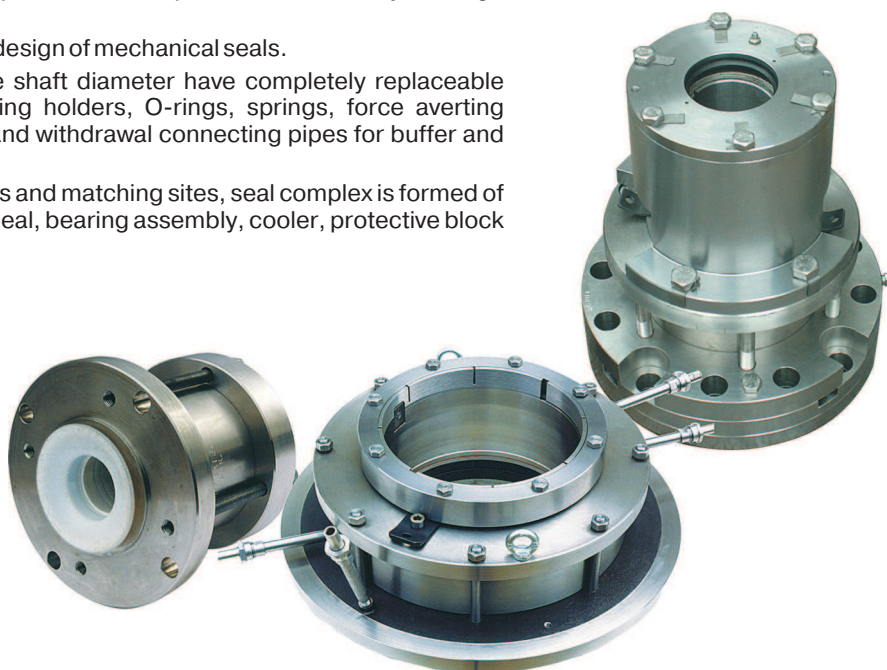
Dual mechanical seals are used in equipment with mixers for aggressive, toxic, highly explosive, environmentally hazardous, polymerizing and crystallizable mediums.

MODIFICATIONS

- Double mechanical seals.
- Double mechanical seals with cooler.
- Double mechanical seals with bearing assembly.
- Double mechanical seals with bearing assembly and cooler.
- Double mechanical seals with bellows.
- Double mechanical seals with bellows and bearing assembly.
- Double mechanical seals with bellows, bearing assembly and cooler.
- Double mechanical seals with protective block against adhesive and crystallizing mediums.
- Double mechanical seals with bearing assembly, cooler and protective block against adhesive and crystallizing mediums.
- Double mechanical seals with shut-down seal.
- Double mechanical seals with shut-down seal and bearing assembly.
- Other design solutions developed for particular service conditions.

FEATURES

- Leakage of sealed fluid into atmosphere is completely excluded.
- Parts, contacting medium sealed are made of corrosion-resistant materials.
- Friction pair materials used are siliconized graphite, silicon carbide, ceramic, graphite-fluoroplastic compounds.
- O-rings are manufactured of fluorine rubber with increased thermal resistance (up to 300°C).
- Mechanical seal can be removed without depressurization of equipment.
- Fluoroplastic bellows of special high pressure design.
- Mechanical seal parts protection against corrosive and aggressive working mediums.
- Mechanical seal design provides for operational reliability at high temperature and pressure.
- Cartridge interchangeable design of mechanical seals.
- All seal types for the same shaft diameter have completely replaceable components: friction pairs, ring holders, O-rings, springs, force averting devices, drive collars, intake and withdrawal connecting pipes for buffer and cooling fluids.
- Due to mounting dimensions and matching sites, seal complex is formed of separate blocks (mechanical seal, bearing assembly, cooler, protective block and shut-down seal).

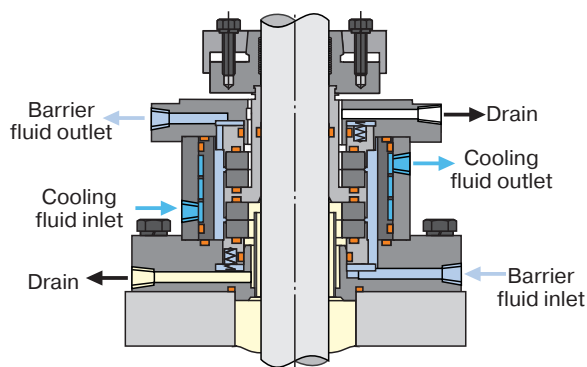
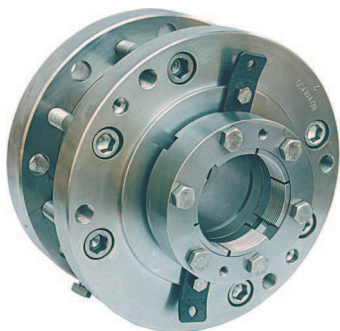


DOUBLE MECHANICAL SEALS FOR REACTORS AND MIXERS

DOUBLE MECHANICAL SEAL (UTD100)

FEATURES

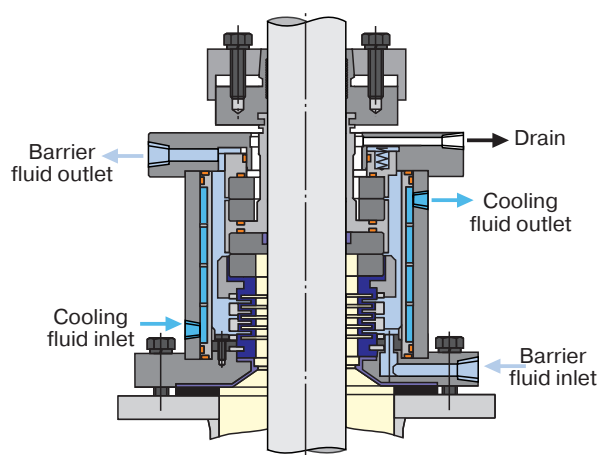
- Outer cooler enhances mechanical seal operability at medium temperature of up to 200 °C.
- Drain connections allow to remove wear debris and collect leakage, thus preventing working medium against them.
- Mounting dimensions and matching sites allow to connect mechanical seal with different blocks (cooler, bearing assembly, shut-down seal, etc.)



DOUBLE MECHANICAL SEAL WITH FLUOROPLASTIC BELLOW

FEATURES

- Fluoroplastic bellows of special high pressure design.
- Parts, contacting working medium are protected with fluoroplastic enclosure.
- Outer cooler diminishes barrier fluid temperature and thus enhances mechanical seal operability.



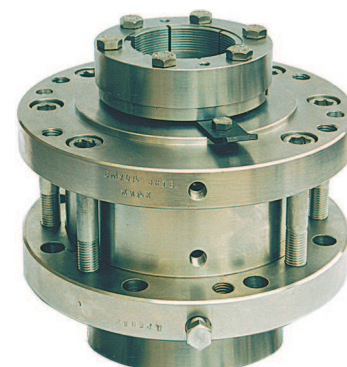
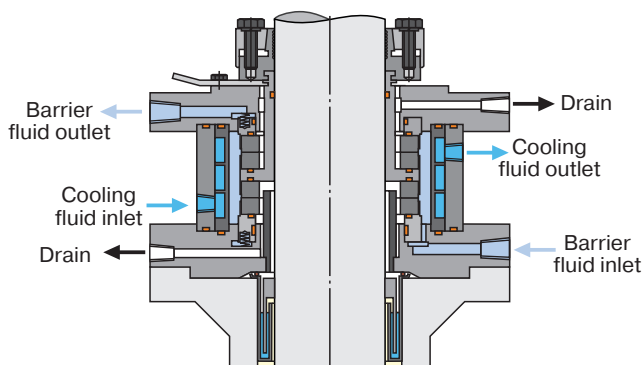
TECHNICAL PARAMETERS

	Shaft diameter, mm		Shaft rotation speed, rpm		Temperature of sealed medium, °C		Pressure of sealed medium, MPa	
	Min	Max	Min	Max	Min	Max	Min	Max
double	25	310	10	1500	-35	200	vacuum	3,2
with fluoroplastic bellow	25	130	10	1500	-50	200	vacuum	1,6

DOUBLE MECHANICAL SEAL WITH PROTECTIVE BLOCK AGAINST ADHESIVE AND CRYSTALLIZING MEDIUMS

FEATURES

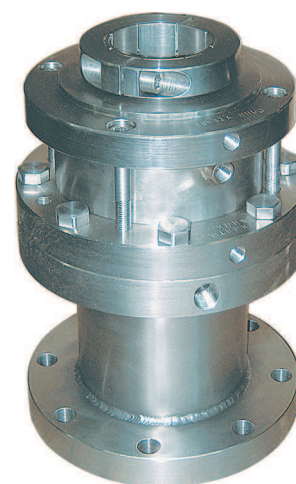
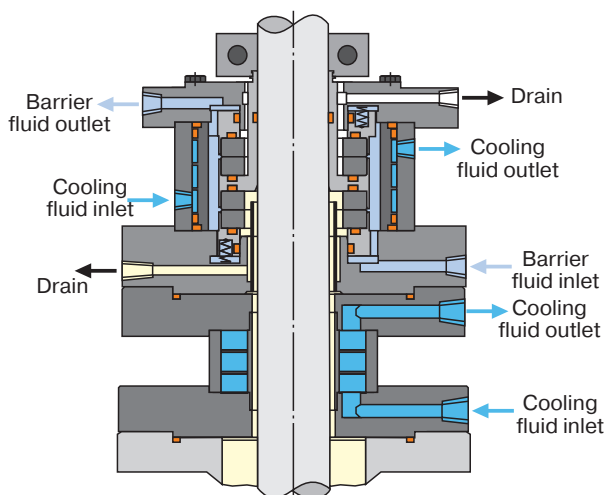
- Protective block installed before mechanical seal, enhances protection against adhesive and crystallizing mediums.
- Through connecting pipe at the bottom flange, protective block is filled with the fluid compatible with the working medium, thus neutralizing its adhesive and crystallizing properties.



DOUBLE MECHANICAL SEAL WITH COOLER (UTDH100)

FEATURES

- Provided with cooler which allows to apply the seal at temperature of up to +300°C and maintain acceptable temperature within.



TECHNICAL PARAMETERS

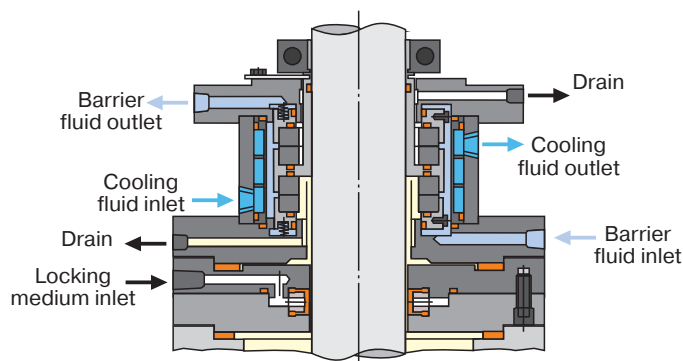
	Shaft diameter, mm		Shaft rotation speed, rpm		Temperature of sealed medium, °C		Pressure of sealed medium, MPa	
	Min	Max	Min	Max	Min	Max	Min	Max
with protective block	25	130	10	1500	-35	200	vacuum	1,6
with cooler	25	240	10	1500	-35	400	vacuum	3,2

DOUBLE MECHANICAL SEAL WITH SHUT-DOWN SEAL



FEATURES

- In case of mechanical seal failure, working medium runout is averted.
- Mechanical seal replacement without depressurization of equipment.
- Shut-down seal is autonomously fixed in equipment pad and operates independently, regardless of possible shaft stop.

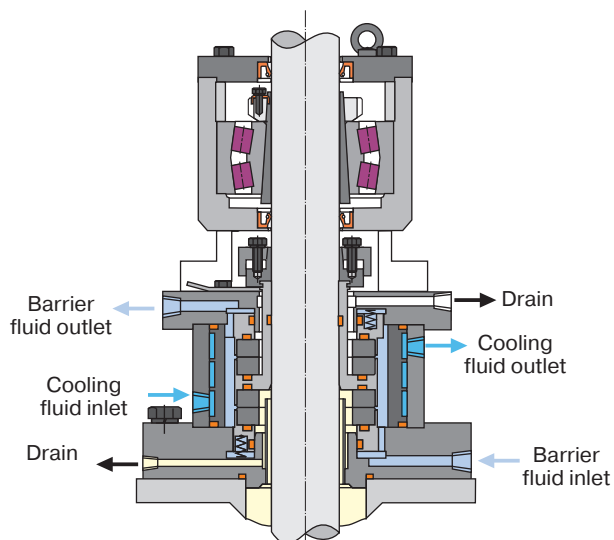


DOUBLE MECHANICAL SEAL WITH BEARING ASSEMBLY



FEATURES

- Additional bearing assembly, rigidly coupled with the seal, takes essential radial and, partially, axial loading.
- Applied for long, flexible and single-support shafts.



TECHNICAL PARAMETERS

Shaft diameter, mm		Shaft rotation speed, rpm		Temperature of sealed medium, °C		Pressure of sealed medium, MPa	
Min	Max	Min	Max	Min	Max	Min	Max
25	130	10	1500	-35	200	vacuum	3,2

NAME	D _{shaft}	AGGREGATE	MECHANICAL SEAL TYPE
25UTD	25	Chemical apparatus	double mechanical seal
32UTD100-00...-03	31,75	Chemical apparatus	double mechanical seal
40UTD-00...-02	40	Chemical apparatus	double mechanical seal
40UTD100	40	Chemical apparatus	double mechanical seal
40UTD101-00...-05	40	Chemical apparatus	double mechanical seal
40UTD102-00...-05	40	Chemical apparatus	double mechanical seal with bearing assembly
40UTD103-00...-05	40	Chemical apparatus	double mechanical seal with bearing assembly and protective block
40UTD104-00...-05	40	Chemical apparatus	double mechanical seal with bearing assembly and protective block
40UTDS	40	Chemical pump	double mechanical seal with fluoroplastic bellow
40UTDS200-00...-02	40	Chemical apparatus	double mechanical seal with fluoroplastic bellow
40UTDP100	40	Chemical apparatus	double mechanical seal with bearing assembly
40UTDH100-00...-02	40	Chemical apparatus	double mechanical seal with bearing assembly, cooler and protective block
50UTDH	50	Chemical apparatus	double mechanical seal with cooler
50UTD	50	Chemical apparatus	double mechanical seal
50UTD1	50	Mixer	double mechanical seal
50UTD3	50	Mixer	double mechanical seal
50UTD4	50	Apparatus MG166-32	double mechanical seal
50UTD100	50	Chemical apparatus	double mechanical seal
50UTD101-00...-05	50	Chemical apparatus	double mechanical seal
50UTD102-00...-05	50	Chemical apparatus	double mechanical seal with bearing assembly
50UTD121	50	Chemical apparatus	double mechanical seal with protective block
50UTDS100-00...-02	50	Chemical apparatus	double mechanical seal with fluoroplastic bellow
52UTD100	52	Chemical apparatus	double mechanical seal
55UTD1	50	Mixer	double mechanical seal
57UTDS100-00...-03	57,1	Chemical apparatus	double mechanical seal with fluoroplastic bellow
60UTD100	60	Chemical apparatus	double mechanical seal
63UTDS100-00...-03	63,4	Chemical apparatus	double mechanical seal with fluoroplastic bellow
64UTD100-00...-05	63,5	Chemical apparatus	double mechanical seal
65UTD2	65	Chemical apparatus	double mechanical seal
65UTD6-00...-02	65	Chemical apparatus	double mechanical seal
65UTD100-00...-05	65	Chemical apparatus	double mechanical seal
65UTD101	65	Chemical apparatus	double mechanical seal
65UTD102-00...-05	65	Chemical apparatus	double mechanical seal with protective block
65UTD103-00...-05	65	Chemical apparatus	double mechanical seal
65UTD104-00...-05	65	Chemical apparatus	double mechanical seal
65UTD107-00...-05	65	Chemical apparatus	double mechanical seal
65UTD110-00...-03	65	Chemical apparatus	double mechanical seal with shut-down seal
65UTDP101-00...-03	65	Chemical apparatus	double mechanical seal with bearing assembly
65UTDP107-00...-05	65	Chemical apparatus	double mechanical seal with bearing assembly
65UTDS	65	Chemical apparatus	double mechanical seal with fluoroplastic bellow
65UTDH100-00...-05	65	Chemical apparatus	double mechanical seal with cooler
65UTD H101-00...-05	65	Chemical apparatus	double mechanical seal with cooler and protective block
65UTDH102	65	Chemical apparatus	double mechanical seal with cooler
70UTD4	70	PN-63-03\08-14-01	double mechanical seal
80UTDH100	80	Chemical apparatus	double mechanical seal with cooler
80UTD	80	Chemical apparatus	double mechanical seal
80UTD1	80	Mixer	double mechanical seal
80UTD2	80	Chemical apparatus	double mechanical seal
80UTD3	80	Chemical apparatus	double mechanical seal
80UTD5	80	Apparatus K-480	double mechanical seal
80UTD6	80	Chemical apparatus	double mechanical seal
80UTD100-00...-02	80	Chemical apparatus	double mechanical seal with protective block
80UTD101-00...-02	80	Chemical apparatus	double mechanical seal
80UTD102	80	Chemical apparatus	double mechanical seal
80UTD103-00...-02	80	Chemical apparatus	double mechanical seal with protective block
80UTD104-00...-02	80	Chemical apparatus	double mechanical seal
80UTD105-00...-02	80	Chemical apparatus	double mechanical seal with bearing assembly
80UTD107-00...-02	80	Chemical apparatus	double mechanical seal
80UTD110,-01,-02	80	Chemical apparatus	double mechanical seal with shut-down seal
80UTD111-00...-02	80	Chemical apparatus	double mechanical seal with protective block and shut-down seal
80UTD122,-01,-02	80	Chemical apparatus	double mechanical seal with protective block
80UTD127-00...-02	80	Chemical apparatus	double mechanical seal with protective block
80UTDS100	80	Chemical apparatus	double mechanical seal with fluoroplastic bellow
80UTDS101	80	Chemical apparatus	double mechanical seal with fluoroplastic bellow and bearing assembly
80UTDP104-00...-02	80	Chemical apparatus	double mechanical seal with bearing assembly
80UTDP112	80	Chemical apparatus	double mechanical seal with bearing assembly and shut-down seal

DOUBLE MECHANICAL SEALS FOR REACTORS AND MIXERS

NAME	D _{shaft}	AGGREGATE	MECHANICAL SEAL TYPE
80UTDP122-00...-02	80	Chemical apparatus	double mechanical seal with bearing assembly and protective block
80UTDP127-00...-02	80	Chemical apparatus	double mechanical seal with bearing assembly and protective block
89UTD100-00...-02	88,9	Chemical apparatus	double mechanical seal
89UTD101-00...-03	88,9	Chemical apparatus	double mechanical seal
89UTD102-00...-03	88,9	Chemical apparatus	double mechanical seal with bearing assembly
95UTDH	95	Chemical apparatus	double mechanical seal with cooler
95UTD	95	Chemical apparatus	double mechanical seal
95UTD1	95	Chemical apparatus	double mechanical seal
95UTD3	95	Chemical apparatus	double mechanical seal
95UTD100	95	Chemical apparatus	double mechanical seal
95UTD101-00...-07	95	Chemical apparatus	double mechanical seal
95UTD102-00...-05	95	Chemical apparatus	double mechanical seal
95UTD103-00...-05	95	Chemical apparatus	double mechanical seal
95UTD110-00...-02	95	Chemical apparatus	double mechanical seal with shut-down seal
95UTD105	96	Chemical apparatus	double mechanical seal
95UTDP100	95	Chemical apparatus	double mechanical seal with bearing assembly
95UTDP113	95	Chemical apparatus	double mechanical seal with bearing assembly
95UTDH122-00...-05	95	Chemical apparatus	double mechanical seal with cooler and protective block
99UTD100	99	Chemical apparatus	double mechanical seal
102UTD100-00...-02	101,6	Chemical apparatus	double mechanical seal
102UTD101-00...-03	101,5	Chemical apparatus	double mechanical seal
105UTD100-00...-03	105	Chemical apparatus	double mechanical seal
105UTD101-00...-03	105	Chemical apparatus	double mechanical seal with bearing assembly
110UTD	110	Chemical apparatus	double mechanical seal
110UTD1	110	Chemical apparatus	double mechanical seal
110UTD2	110	Chemical apparatus	double mechanical seal
110UTD3	110	Chemical apparatus	double mechanical seal
110UTD104-00...-05	110	Chemical apparatus	double mechanical seal
110UTD5	110	Chemical apparatus	double mechanical seal
110UTDS100-00...-02	110	Chemical apparatus	double mechanical seal with fluoroplastic bellow
114UTD100-00...-03	114	Chemical apparatus	double mechanical seal
114UTD101-00...-03	114	Chemical apparatus	double mechanical seal with bearing assembly
120UTD100	120	Chemical apparatus	double mechanical seal
120UTD101-00...-05	120	Chemical apparatus	double mechanical seal
122UTD100	122	Chemical apparatus	double mechanical seal
127UTD100-00...-05	127	Chemical apparatus	double mechanical seal
127UTD101-00...-05	127/128	Chemical apparatus	double mechanical seal with bearing assembly
130UTD101	130	Chemical apparatus	double mechanical seal
130UTD102-00...-05	130	Chemical apparatus	double mechanical seal
130UTD103-00...-05	130	Chemical apparatus	double mechanical seal with protective block
130UTDP101	130	Chemical apparatus	double mechanical seal with bearing assembly
130UTDS	130	Chemical apparatus	double mechanical seal with fluoroplastic bellow
130UTDS100	130	Chemical apparatus	double mechanical seal with fluoroplastic bellow
130BPUS100	130	Chemical apparatus	double mechanical seal with fluoroplastic bellow and bearing assembly
130UTDP101-00...-05	130	Chemical apparatus	double mechanical seal with bearing assembly
140UTD	140	Chemical apparatus	double mechanical seal with bearing assembly
140UTDP	140	Chemical apparatus	double mechanical seal with bearing assembly
150UTD	150	Chemical apparatus	double mechanical seal
150UTD100	150	Chemical apparatus	double mechanical seal
150UTDS100-00...-03	150	Chemical apparatus	double mechanical seal with fluoroplastic bellow
150UTDS101-00...-03	150	Chemical apparatus	double mechanical seal with fluoroplastic bellow and bearing assembly
150UTDS102-00,-01	150/160	Chemical apparatus	double mechanical seal with fluoroplastic bellow
150UTDS103-00,-01	150/160	Chemical apparatus	double mechanical seal with fluoroplastic bellow and bearing assembly
150BPU	150	Chemical apparatus	double mechanical seal with bearing assembly
150BPU100	150	Chemical apparatus	double mechanical seal with bearing assembly
152UTDP100	152	Chemical apparatus	double mechanical seal with bearing assembly
152UTD100	152,4	Chemical apparatus	double mechanical seal with bearing assembly
152UTDH100-00...-03	152,4	Chemical apparatus	double mechanical seal with bearing assembly and cooler
155UTDS100-00,-01	155/158	Chemical apparatus	double mechanical seal with fluoroplastic bellow and bearing assembly
155UTDS101-00,-01	155/158	Chemical apparatus	double mechanical seal with fluoroplastic bellow and bearing assembly
175UTD100	175	Chemical apparatus	double mechanical seal with bearing assembly
200UTD100	200	Chemical apparatus	double mechanical seal
200UTD101	200	Chemical apparatus	double mechanical seal
216UTD100	216	Chemical apparatus	double mechanical seal with bearing assembly
240UTD	240	Chemical apparatus	double mechanical seal
250UTD100	250	Chemical apparatus	double mechanical seal
310UTD100-00...-05	310	Chemical apparatus	double mechanical seal

APPLIANCE

Can be applied for centrifugal gas-transfer equipment superchargers of gas-main pipelines, underground storage facilities, turbo-expander installations and compressors.

MODIFICATIONS

- Single (UTG type).
- Double (UTDG type).
- Combined (UTGP type). Basic seal is of mechanical type, subsidiary seal is groove or labyrinth one.

FEATURES

- Block version.
- Turbine oil used as barrier fluid.
- Pressure difference between locking oil and gas sealed is 0,1-0,6 Mpa.
- Cooling is performed by means of barrier fluid forced circulation through seal chamber with subsequent throttling.
- Gas leakage through seal block is completely excluded; that is of all importance while transferring combustible, toxic and poison gases.
- Minimal diametral dimensions of rotary elements significantly reduce friction loss.



140UTG



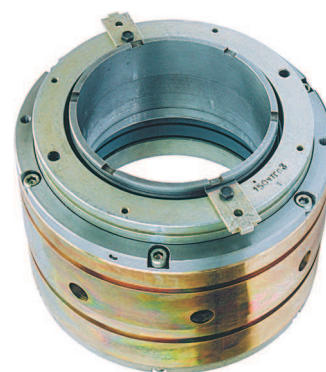
130UTG



150UTG



125UTGP

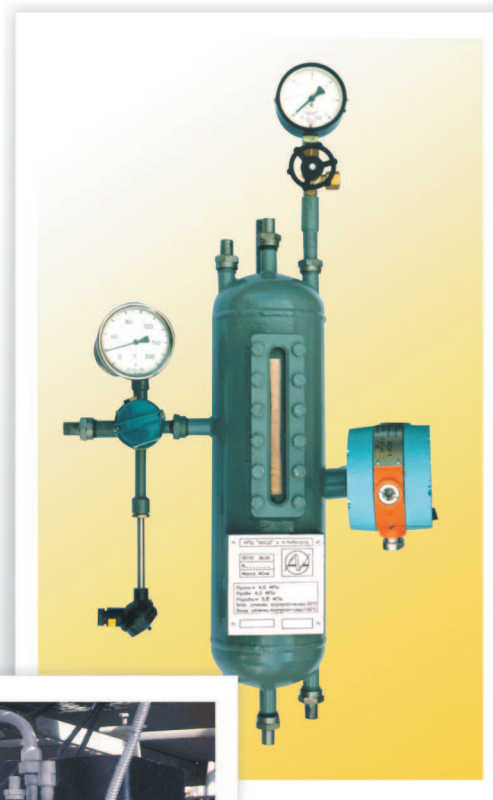


150UTGP4

NOMENCLATORIAL RANGE OF MECHANICAL SEALS FOR SUPERCHARGERS AND COMPRESSORS

Name	Shaft diameter, mm	Aggregate	Shaft rotation speed, rpm	Sealed medium	Barrier fluid	Pressure of sealed medium, MPa	Leakage of barrier fluid, kg/h	Service life, h (no less than)	Life cycle, y (no less than)	Weight, kg
65UTGP1	65	compression pump 7VKG	3000	Oil gas	Turbine oil	0,3	0,05	15000	5	22,6
72UTGP	72	Supercharger NC340-81-4	12700	Hydrocarbon gas CH	Turbine oil	0,03	0,1	50000	10	10,3
74UTGP-00,-01	74	compression pump 4RSA-32	13400	Flare gas	Turbine oil	4	0,1	50000	10	3,5-3,4
75UTGP	70	NS1-13,5-10MHL4	10000	Natural gas	Turbine oil	10	0,05	15000	10	11,8
85UTGP	85	43CKO-160/15	10000	Hydrocarbon gas CH	Turbine oil	0,2	0,1	100000	20	11,4
85UTDG	85	43CKO-160/15	10000	Hydrocarbon gas CH	M8G2/M10G2K	1,5	0,05	15000	5	10
90UTGP-00...-03	90,5	5GV-12/b	3000	Oil-dissolved gas	Oil KP-8s	0,6	0,1	50000	10	2,9
98UTG	98	Supercharger 280-12-7	8000	Natural gas	Turbine oil	0,6	0,1	50000	10	5,9
100UTDG	100,5	Supercharger N47-11-1	11000	Natural gas	Turbine oil	6	0,1	10000	10	17,8
100YH1	100	Supercharger CNT900-11-1	3000	Sulfurous gas	Air	0,12	-	500	-	6,5
101UTGP	101	Supercharger GPA-C-6,3/56M	8500	Natural gas	Turbine oil	3,9	0,1	50000	10	17,2
105UTDG	105	compression pump 43CKO-160/15	10000	Hydrocarbon gas CH	Turbine oil	3,9	0,1	50000	10	16
105UTGP	105	compression pump 43CKO-160/15	10000	Hydrocarbon gas CH	M8G2/M10G2K	1,5	0,05	15000	5	10
108UTG	108	compression pump Mitsubishi M555B	6500	Natural gas	Turbine oil	1,5	0,05	15000	5	8
110UTGP	110	NC-6,3-56/1,45; N-196-1,45	8500	Natural gas	Turbine oil	4,1	0,05	25000	20	15,6
110UTGP1	110	NC-6,3-56/1,45; N-196-1,45	8500	Natural gas	Turbine oil	4,1	0,05	15000	10	16,6
110UTGP2	110	NC-6,3-76/1,45	8500	Natural gas	Turbine oil	5,6	0,05	15000	10	18
110UTGP3	110	NCV-6,3-125/2,2	8500	Natural gas	Turbine oil	7,6	0,05	15000	10	18
110UTGP4	101	NC-6,3/56-1,45; N-196-1,45	8500	Natural gas	Turbine oil	4,1	0,1	100000	20	16
110UTGP5-00, -01	110	GPA-C-6,3/56M, 6,3 GC2-210/24-41S, 6,3GC2-204/38-56S, 6,3GC2-137/38-64S	8500	Natural gas	Turbine oil	4,1; 5,6; 6,4	0,1	15000	10	14,3
110UTGP6	100/110	GPA-C-6,3/56M	8500	Natural gas	Turbine oil	3,9	0,1	100000	20	16
110UTGP7, 10UTGP8	110	7GV-40/7,5	3000	Flare gas	Turbine oil	0,6	0,1	50000	10	3,8/3,2
110UTGP9	110	7GV-40/7,5	3000	Oil gas	Turbine oil	0,5	0,1	50000	10	3,8
110UTG	110	N-196-1,45; NC-6,3-56/1,45	8500	Natural gas	Turbine oil	4,1	0,1	100000	20	16
115UTGP, 115UTGP1	115	VG-50/7	3000	Oil-dissolved gas	Turbine oil TP-30	0,9	0,1	50000	10	3,9
116UTGP	116	NCV-6,3/32K-2,2	8200	Natural gas	Turbine oil	1,4-2,9	0,1	100000	20	20
120UTG	120	CN370-14-1M	5300	Natural gas	Turbine oil	8	0,05	15000	10	21,3
120UTGP	120	compression pump 4VR350/550G	11000	Hydrogen gas with ammonia	Oil KP-8s	0,45	0,1	50000	10	18,5
124UTGP	123,9	NC-6,3-76/1,45	8500	Natural gas	Turbine oil	5,6	0,05	15000	10	18
125UTGP	125	compression pump 5RSA56	8600	Hydrogen gas	Turbine oil	4,5	0,1	100000	20	15,2
130UTG-00,-01	130	235-21-1	5000	Natural gas	Turbine oil	8	0,05	15000	10	12,5
130UTGP, 130UTGP	130	VG-30/1,4-17	3000	Oil-dissolved gas	Turbine oil	0,9	0,1	50000	10	4,8/5,5
130UTDG-00,-01	130	VG-30/1,4-17	1500	Oil-dissolved gas	Turbine oil	0,9	0,1	50000	10	5,1
130UTDG1-00,-01	130	VG-30/1,4-17	1500	Oil-dissolved gas	Turbine oil	0,9	0,1	50000	10	6,9
140UTG	140	CN370-18-1	5300	Natural gas	Turbine oil	8	0,05	15000	10	15
140UTG1	140	CN370-17-1M	5000	Natural gas	Turbine oil	8	0,05	15000	10	15
145UTG, 145UTG1	145	NC520-12-1	5200	Natural gas	Turbine oil	8	0,05/0,1	15000	10	19/16
150UTG	150	N235-28-1	4800	Natural gas	Turbine oil	5,6	0,05	50000	10	23,5
150UTG1	150	235-28-1	4800	Natural gas	Turbine oil	8	0,05	15000	10	23,5
150UTG2	150	385-21-1	6500	Natural gas	Turbine oil	5,5	0,1	100000	20	24,1
150UTGP	150	NC-16/76; NC16/76; SPCh73/1,7; SPCh76/1,44	5300	Natural gas	Turbine oil	5,6	0,05	15000	10	28,7
150UTGP1	150	NC-16/76; NC16/76; SPCh73/1,7; SPCh76/1,45	5300	Natural gas	Turbine oil	5,6	0,05	15000	10	28,7
150UTGP2	150	NC-16/76; NC16/76; SPCh73/1,7; SPCh76/1,46	5300	Natural gas	Turbine oil	5,6	0,05	15000	10	28,7
150UTGP3	150	NC-16-76/1,44	5300	Natural gas	Turbine oil	5,6	0,05	15000	10	28,7
150UTGP4-00,-01	150	NCV-16/56-1,44; NC-16/76-1,36	5300	Natural gas	Turbine oil	3,9; 5,6	0,1	50000	10	23,5
158UTG	158	GPA-16R	5300	Natural gas	Turbine oil	4,1-5,5	0,05	100000	20	24
160UTGP	160	NC-18/21-2,2	5300	Natural gas	Turbine oil	1	0,05	100000	20	54,2
160UTGP	160	NC-16/76-1,36	5300	Natural gas	Turbine oil	1,8	0,05	100000	20	54,2
160UTGP1-00,-01	160	NC-16/56-1,44	5300	Natural gas	Turbine oil	5,6/3,9	0,05	100000	20	25,4
160UTGP2-00,-01	160	NC18/41-2,2; NC18/21-2,2	5300	Natural gas	Turbine oil	4,1; 2,1	0,05	100000	20	28;27,5
160UTGP3	160	Supercharger PCL804/24	6500	Natural gas	Turbine oil	5,5	0,1	50000	10	23,4
190UTGP	190	Supercharger PCL804/2	6500	Natural gas	Turbine oil	5,6	0,1	50000	20	28
190UTTG-00,-01	190	Supercharger PCL804-2/36	5148	Natural gas	Azote	5,2	120-buffer; 4-barrier.	50000	10	75
200UTG	200	N650-21-1;N650-21-2; N650-22-2	3700	Natural gas	Turbine oil	8	0,05	100000	20	54,2

- Mechanical seal support system operates at fluid pressure of up to 4,0 MPa and doesn't necessitate safety valve installation.
- Mechanical seal support system includes reservoir (SBTU) that can be used with all types of two-stage seals: double and "tandem", operating in- and outdoors.
- Universal reservoir matching sites for instrumentation allow to provide the system with devices which generate signals for automatic PC control system.
- Variants of instrumentation arrangement for SBTU shown in this catalogue, enable to provide seal with visual or distant automatic monitoring.
- SBTU-4 reservoir has bypass level indicator furnished with controllable gauges. Reliability of the system is provided due to absence of fragile parts that contact fluids at excess pressure.
- If required, support system instrumentation set can be determined optionally by the customer.

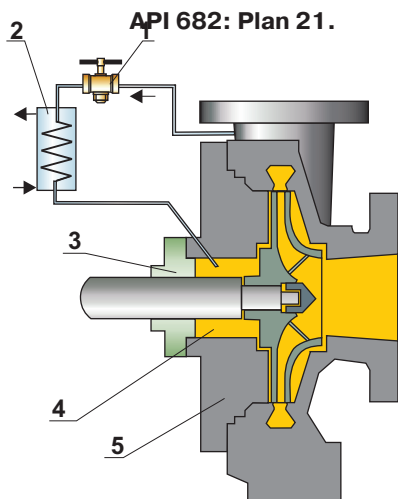


SUPPORT SYSTEM DIAGRAMS FOR SINGLE MECHANICAL SEALS

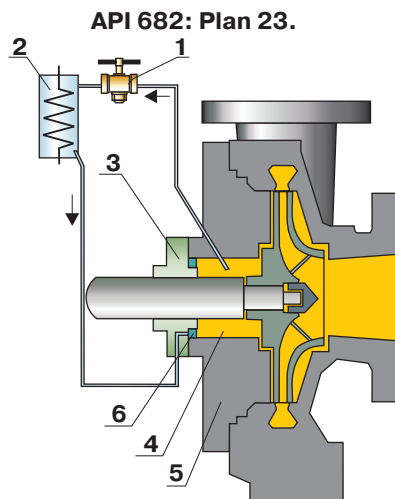
As a rule, single mechanical seals do not require any support system. In some cases, in order to comply with required fluid parameters, at excess pressure in seal chamber, the diagrams shown below can be used:

SINGLE MECHANICAL SEALS

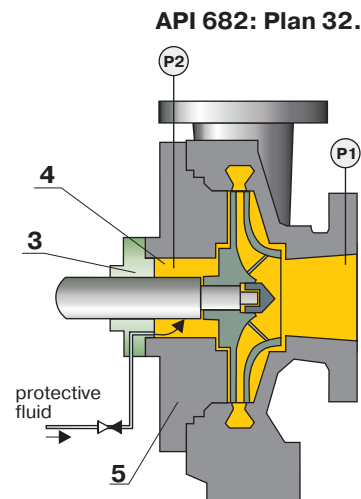
P1 - suction pressure
P2 - seal chamber pressure
 $P2 > P1, P2 > P_{ATM}$.



Support system diagram for single mechanical seals, with seal chamber fluid supply from pump discharge pipe

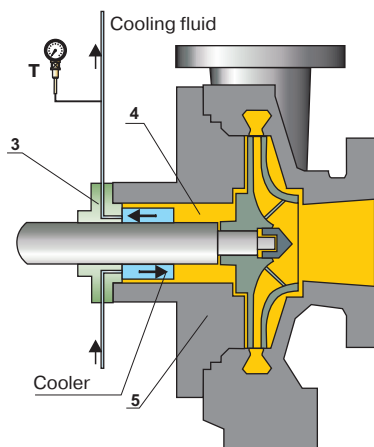


Support system diagram for single mechanical seals with impeller which generates fluid circulation in autonomous circuit through seal chamber.

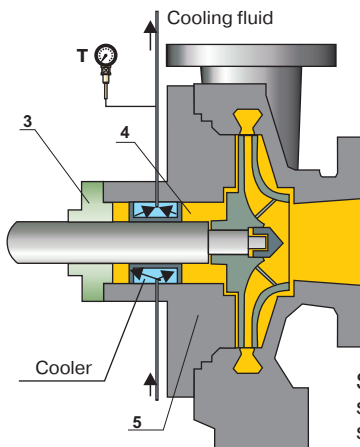


Support system diagram for single mechanical seals with "protective" fluid supplied from without.

SINGLE MECHANICAL SEALS WITH COOLER



Support system diagram for mechanical seals with integrated cooler and cooling fluid supply through the seal



Support system diagram for mechanical seals with integrated cooler and cooling fluid supply through pump casing

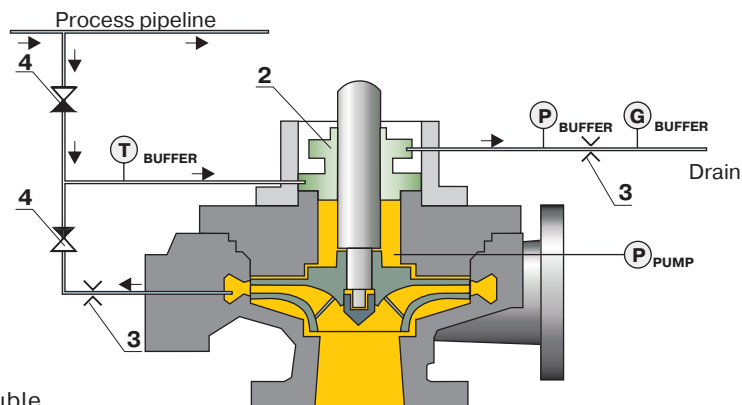
Pos.	Description
1	Control valve
2	Cooler (at pumped medium temperature $>150...200^{\circ}\text{C}$)
3	Single mechanical seal (UT)
4	Pump seal chamber
5	Pump
6	Impeller
T	Outlet temperature monitoring

CONDENSATE PUMP

For condensate pumps with probable “dry” seal operation guaranteed barrier/buffer fluid supply can be as follows.

$$P_{\text{BUFFER}} = P_{\text{PUMP}} + (0,1 \dots 0,3) \text{ MPa}$$

$$T_{\text{BUFFER}} \geq 75 \text{ }^{\circ}\text{C}, G_{\text{BUFFER}} \geq 0,2 \text{ m}^3/\text{h}$$



Support system diagram for double mechanical seals, with pump discharge and industrial line supply of fluid

DOUBLE MECHANICAL SEALS

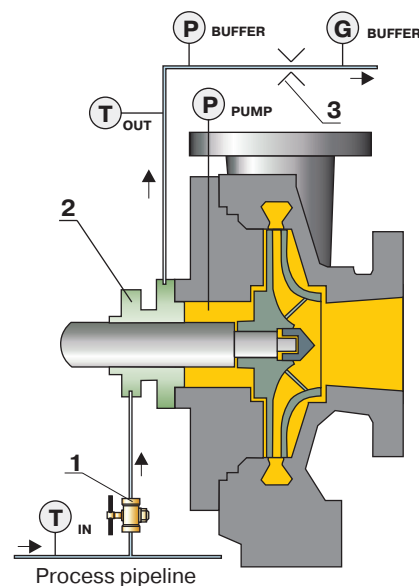
The most frequent support system diagram used is that one of barrier/buffer fluid supply from separate pipeline.

$$P_{\text{BUFFER}} = P_{\text{PUMP}} + (0,1 \dots 0,3) \text{ MPa}$$

$$T_{\text{IN}} = 5 \dots 30 \text{ }^{\circ}\text{C}, T_{\text{OUT}} \geq 40 \text{ }^{\circ}\text{C}$$

$$G = 0,2 \dots 1,0 \text{ m}^3/\text{h}$$

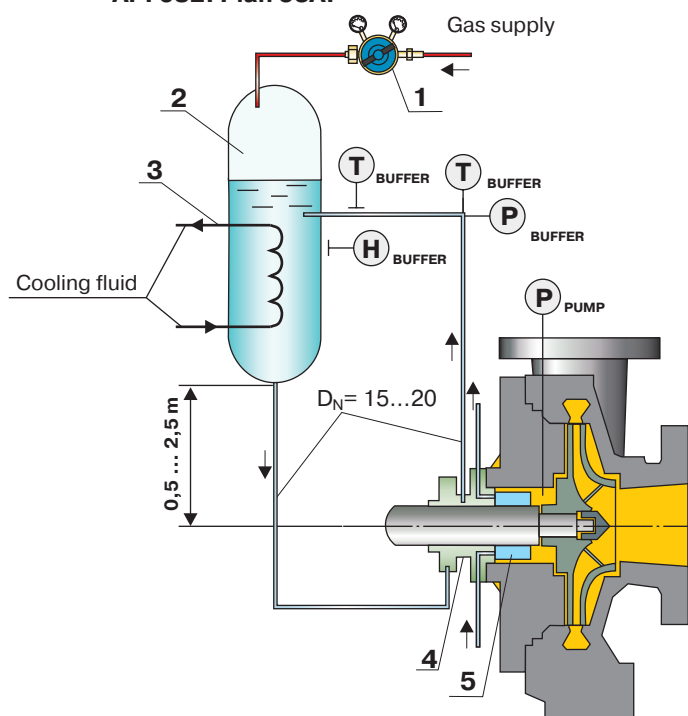
API 682: Plan 54.



Support system diagram for double mechanical seals, with drain barrier/buffer fluid supply from excess pressure pipe-line through the seal.

Pos.	Description
1	Control valve
2	Double mechanical seal
3	Throttler
4	Check valve
P	Pressure gauge
T	Temperature gauge
G	Flow level gauge

API 682: Plan 53A.



FOR DOUBLE MECHANICAL SEALS

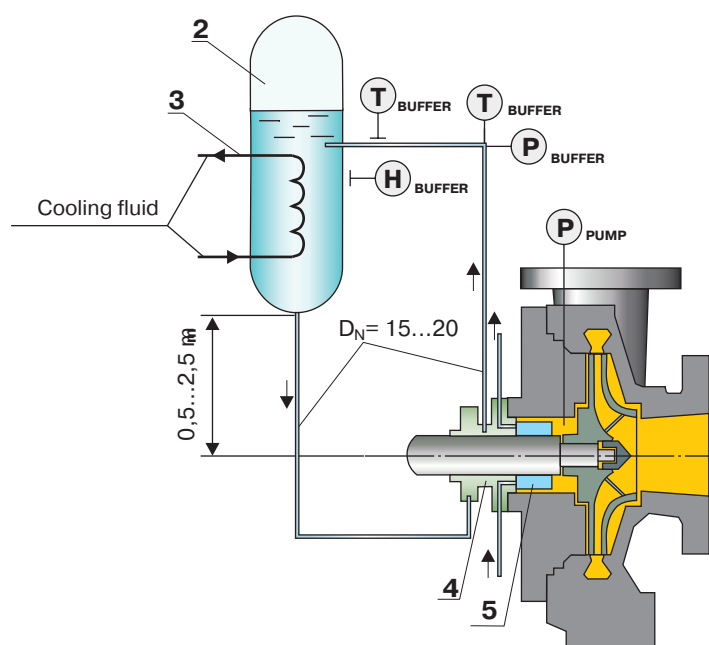
Support system operates at constant buffer fluid pressure (reservoir pressure), within the following limits:

$$P_{\text{BUFFER}} = P_{\text{PUMP}} + (0,1 \dots 0,3) \text{ MPa}$$

$$G_{\text{COOLING}} = 0,2 \dots 1,5 \text{ m}^3/\text{h}$$

At operating medium temperature of up to 150°C seals can be applied without any cooler. At 150...400 °C cooler is required.

API 682: Plan 52.



FOR TANDEM SEALS

After SBTU reservoir is filled, no excess pressure in it is required.

In case seal chamber pressure is lower than this one rated of reservoir (4MPa), no safety valve installation is required in reservoir pipe-line.

At operating medium temperature of up to 400 °C, "tandem" mechanical seals can be used with cooler, as well as without it at temperature of up to 150 °C.

$$T_{\text{COOLING}} = 5 \dots 30 \text{ }^{\circ}\text{C}$$

$$G_{\text{COOLING}} = 0,2 \dots 1,5 \text{ m}^3/\text{h}$$

Pos.	Description
1	Gas pressure regulator
2	Pressurized reservoir
3	Reservoir cooling system
4	Mechanical seal
5	Cooler
P	Pressure gauge
T	Temperature gauge
H	Fluid level gauge

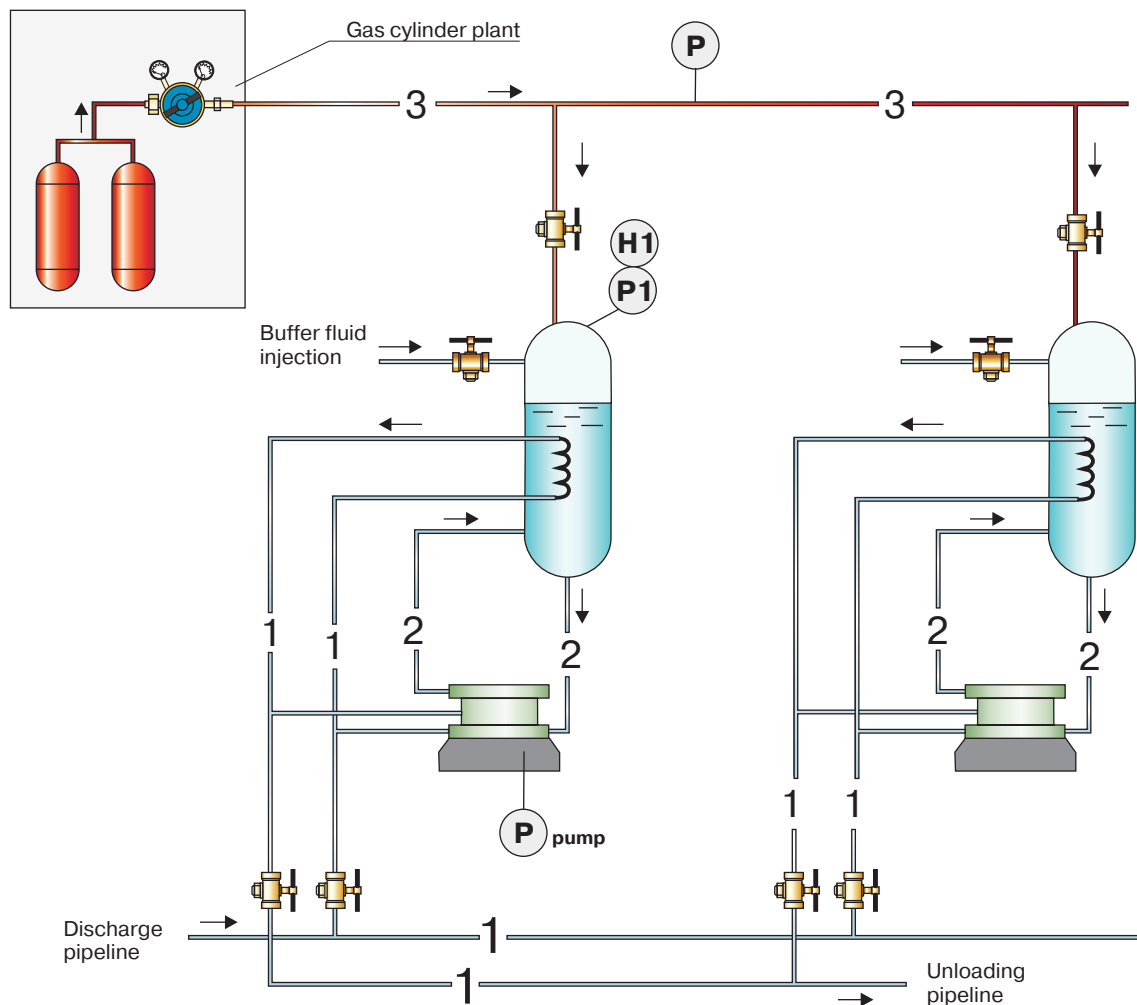
FOR MECHANICAL SEALS OF PUMP GROUP

For seals maintenance within group of pumps, being used for the same purpose and closely located, it is possible to apply the diagram shown below:

$$P_{\text{BUFFER}} = P_{\text{PUMP}} + (0,1 \dots 0,3) \text{ MPa}$$

$P > P1$ - at gas injection

$P < P1$ - at gas pressure relief



Pos.	Description
1	Cooling fluid pipeline
2	Buffer fluid pipeline
3	Gas pipe (nitrogen, air, etc.)
P	Pressure gauge
H	Fluid level gauge

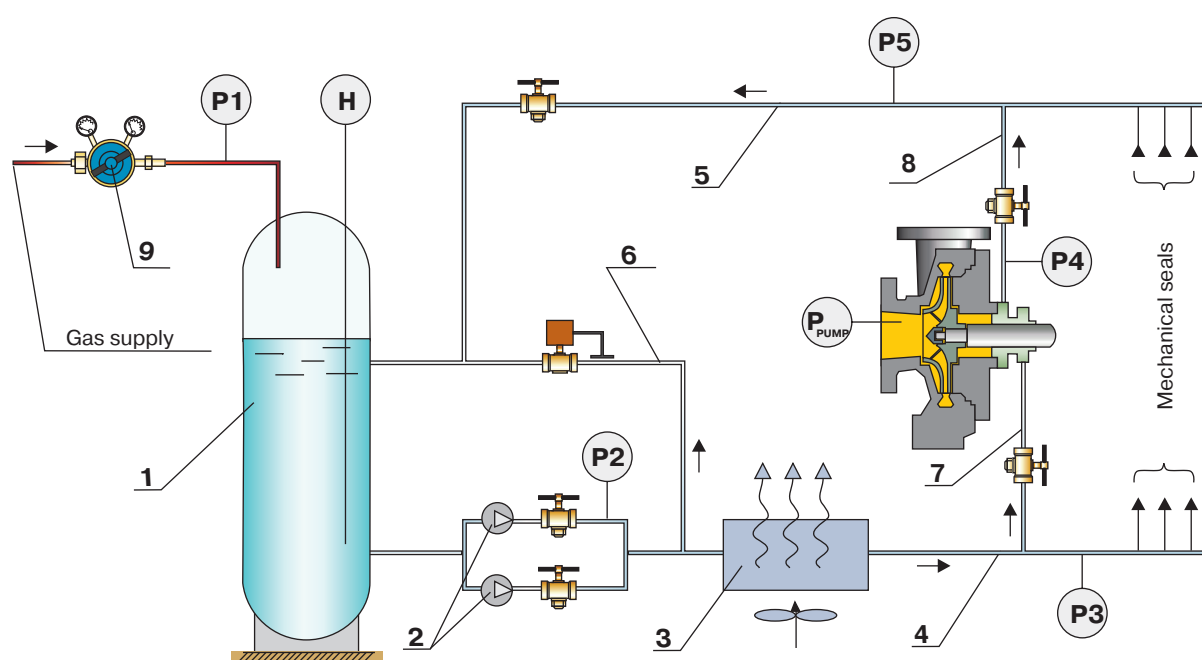
CLOSED SUPPORT SYSTEM DIAGRAM FOR DOUBLE AND "TANDEM" MECHANICAL SEALS GROUP

FOR DOUBLE SEALS

$P1 \approx P_{PUMP}$;
 $P3 > P4 > P_{PUMP}$;
 $P4 > P5 > P1$;
 Stand by pump is enabled at $P2 = P_{PUMP} + 0,2 \text{ MPa}$.

FOR TANDEM SEALS

$P1 \approx P_{ATM}$;
 $P4 \ll P_{PUMP}$;
 $P3 > P4 > P5$;
 $P4 \geq 0,1 \text{ MPa}$.



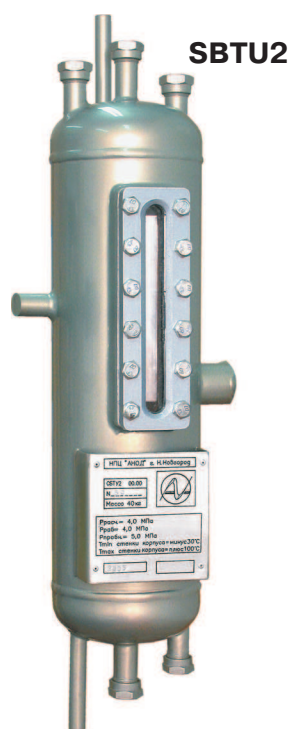
Pos.	Description
1	Extra buffer fluid tank
2	Main and standby pumps
3	Heat exchanger
4	Discharge pipeline
5	Unloading pipeline
6	Bypass pipeline
7	Buffer fluid supply pipeline
8	Buffer fluid withdrawal pipeline
9	Gas pressure regulator
H	Fluid level gauge
P1	Tank pressure
P2	Buffer fluid pressure, after pump pressurization
P3	Buffer fluid pressure in forcing pipe
P4	Mechanical seal pressure
P5	Buffer fluid pressure in drain pipe
P _{PUMP}	Seal chamber pressure

BUFFER FLUID CHOICE FOR MECHANICAL SEALS

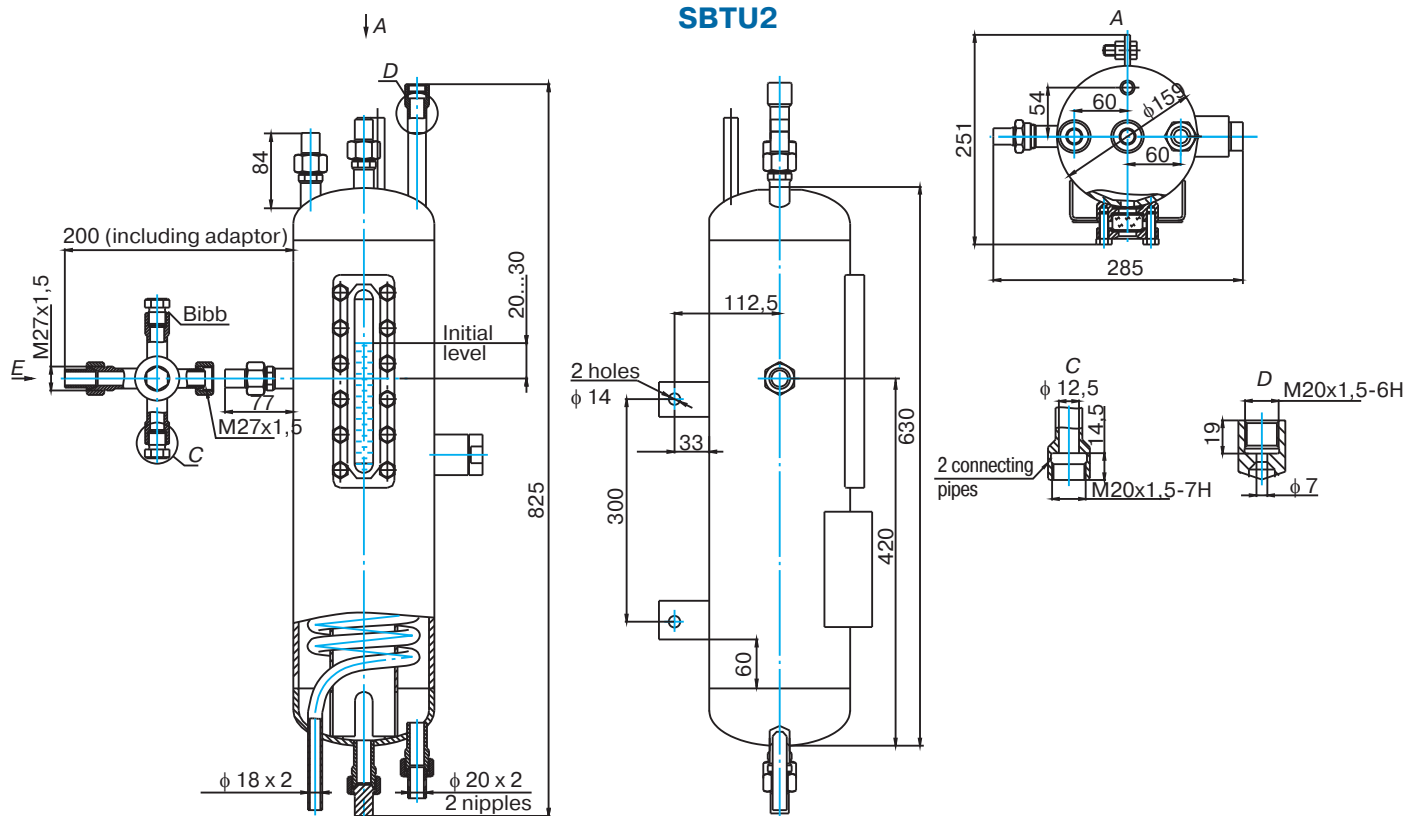
The right choice of buffer fluid is one of the most important factors which influence reliable operation and long service life of mechanical seals.

In order to choose the fluid, the following factors should be taken into consideration:

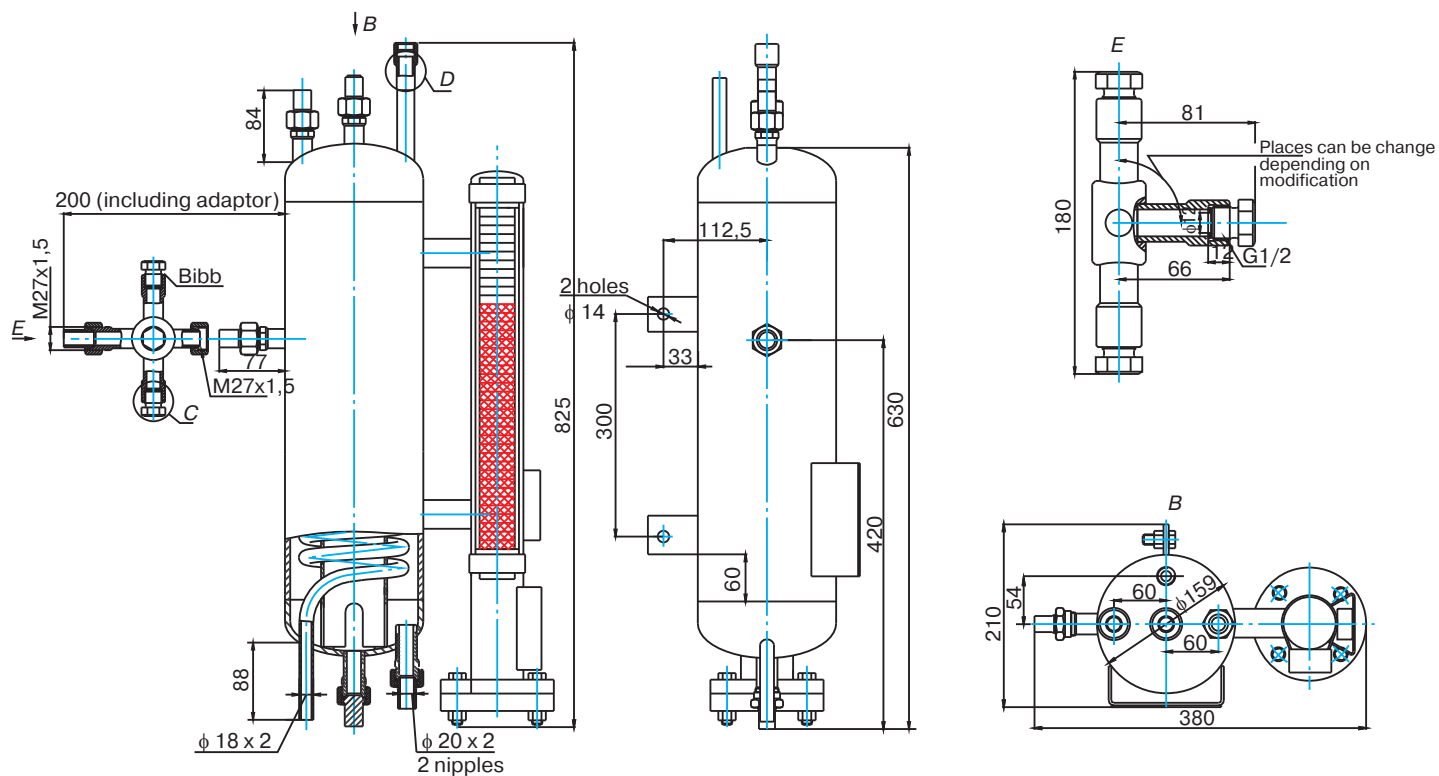
- Buffer fluid compatibility with the medium pumped;
- Buffer fluid compatibility with material of mechanical seal, reservoir, pipeline and pump;
- Buffer fluid compatibility with gas, in case buffer fluid circulation is enabled by gas pressure;
- Buffer fluid viscosity against operating and site conditions;
- Buffer fluid boiling to be eliminated;
- Buffer fluid boiling point should be 10°C higher than operating temperature;
- In oxygen presence, flash point should exceed barrier/buffer fluid temperature range;
- Deposition, polymerization, crystallizing, carbonization, gel and emulsion formation to be eliminated;
- Buffer fluid should be non-toxic.

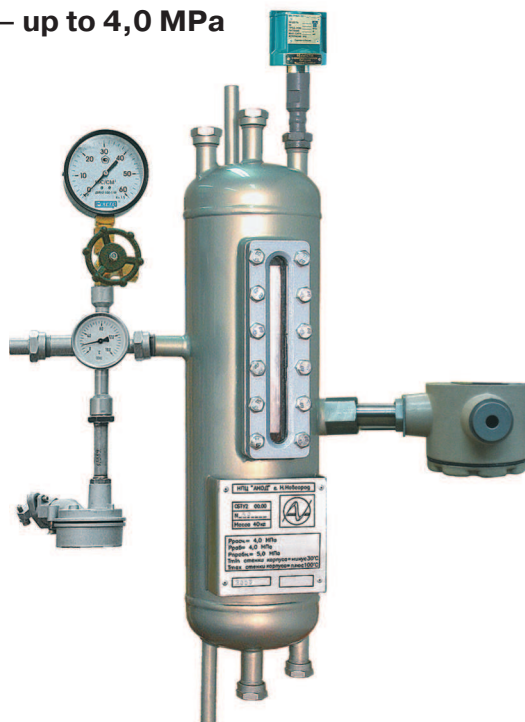
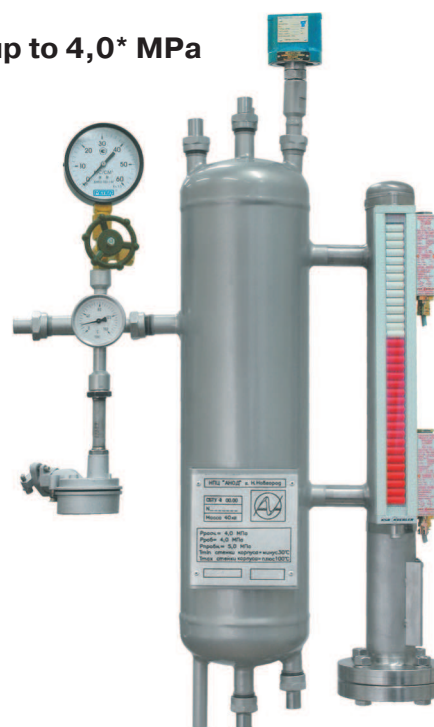


SBTU2



SBTU4



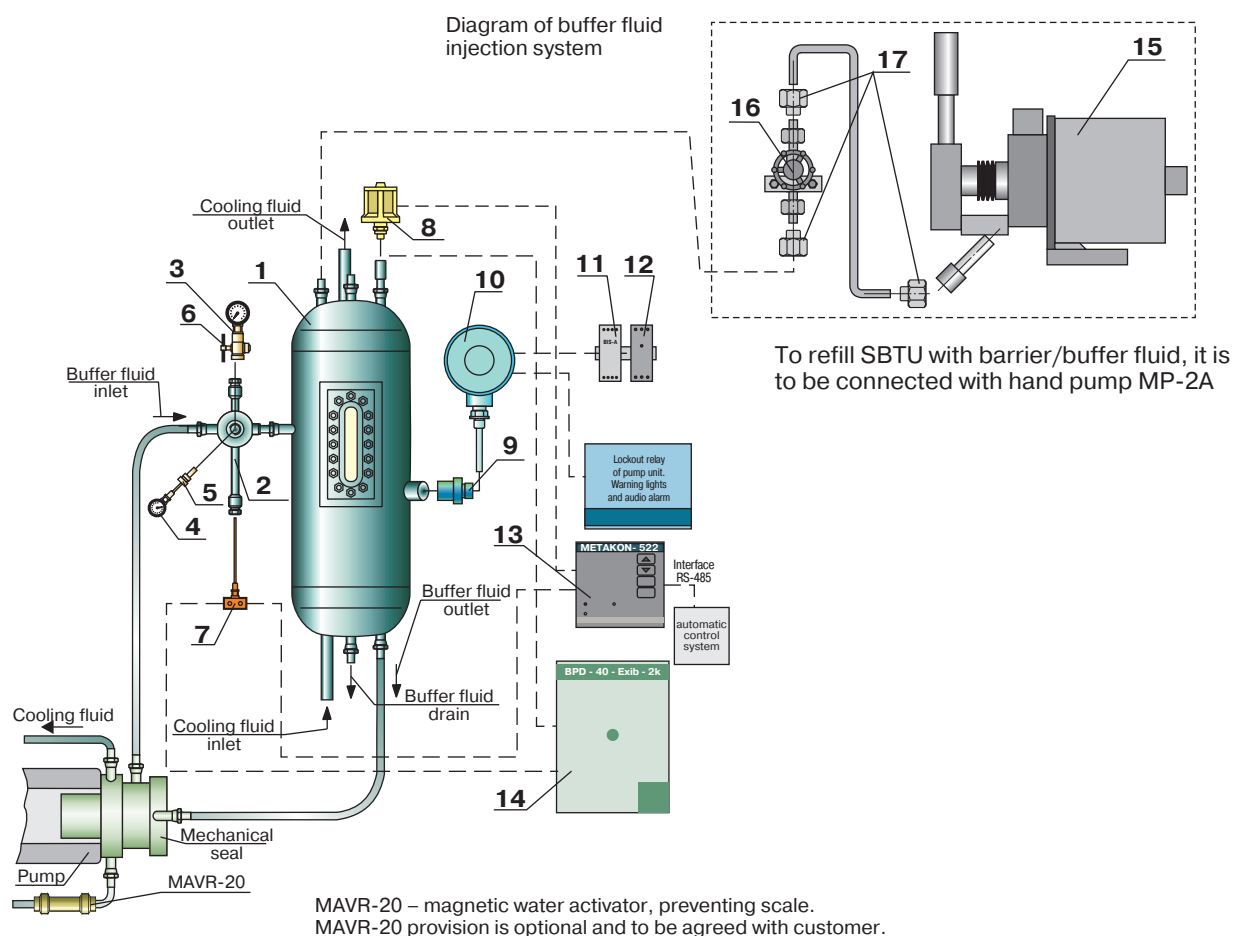
SBTU2
P_{WORK} – up to 4,0 MPa

SBTU4
P_{WORK} – up to 4,0* MPa

TECHNICAL PARAMETERS

	Coil	Casing
Working pressure, MPa	up to 4,0*	up to 4,0*
Operating fluid temperature, °C	up to +40	from -30 to +100
Rated wall temperature, °C	100	100
Minimum allowable wall temperature, °C	-30	-30
Operating fluid	water or non-freezing fluid	Non-aggressive, non-toxic fluid, compatible with the fluid sealed
Explosion and fire risk	no	no
Capacity, m³	0,0007	0,01

*Optionally, up to 10,0 MPa

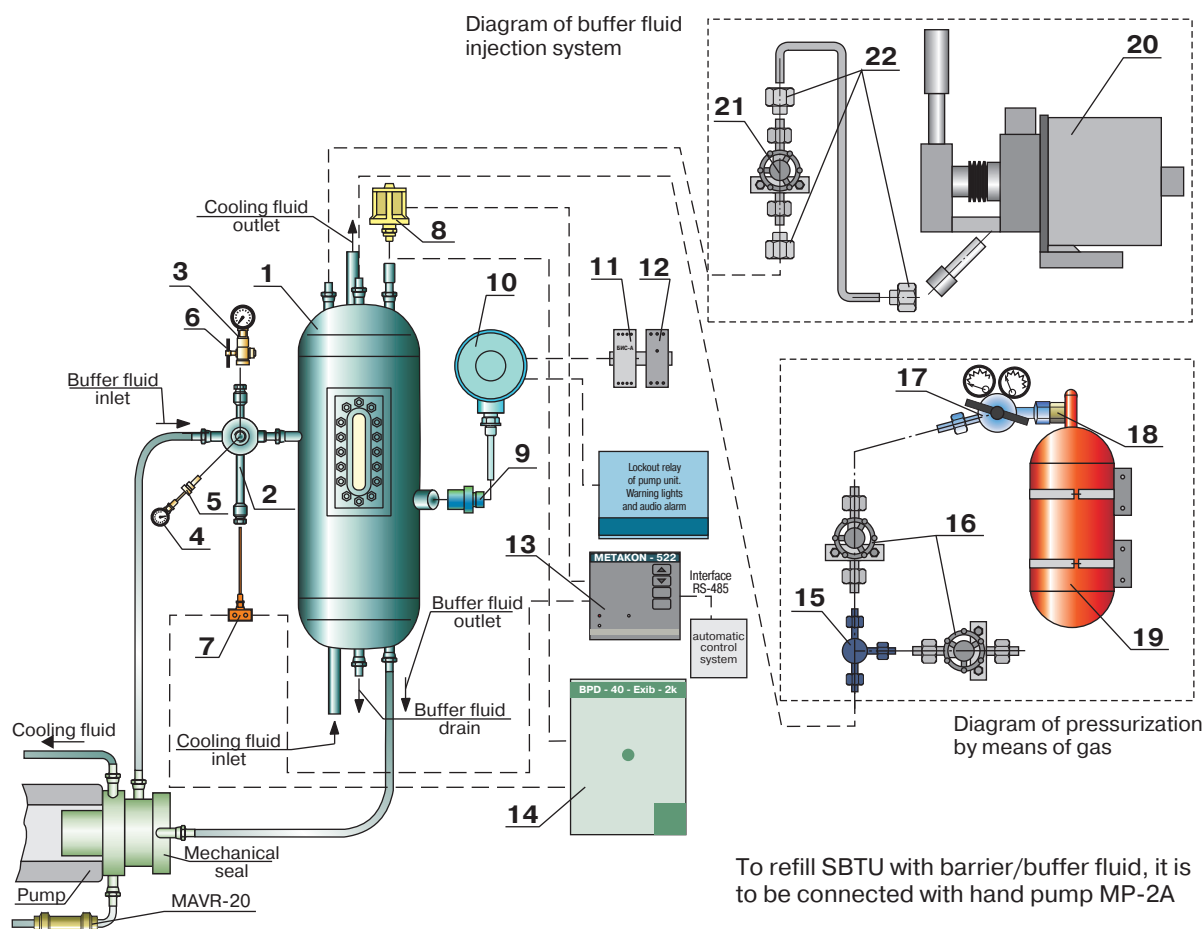
Manufacturer reserves the right to change reservoir design, as well as instrumentation set arrangement.

RESERVOIR SBTU2 FOR TANDEM MECHANICAL SEALS



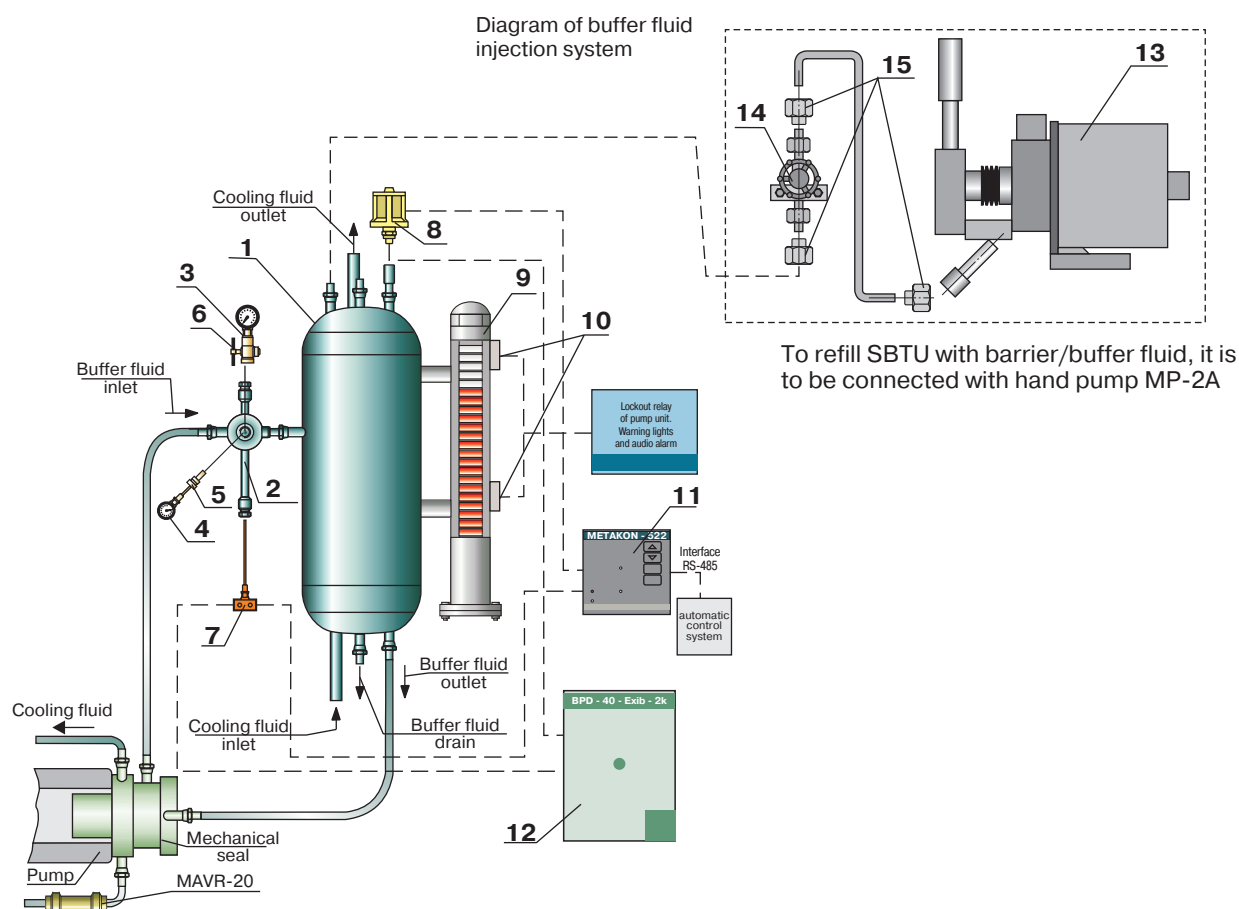
№ POS.	NAME	MODEL, PARAMETERS	Q-TY
1	Reservoir	SBTU2	1
2	Adapter	PO 4	1
3	Manometer	Measurement range* 0 - 1,0 MPa	1
4	Bimetallic thermometer	Measurement range 0 - 160°C	1
5	Protective sleeve	Stainless steel	1
6	Needle valve	KZIM 10 (PN 10MPa)	1
7	Resistive temperature transducer	TSPU Metran 276 (L=60 mm)	1
8	Pressure gauge	Metran 55-DY-EH	1
9	Adapter	P10	1
10	Level switch	SGU-1	1
11	Intrinsic safety barrier	Exia II B	1
12	Power supply unit for level switch SGU-1	24 B	1
13	Microprocessor regulator	«METAKON» -522-P-0/20-1	1
14	Power supply unit	BPD-40-Exib-2k	1
15	Hand charge pump	MP-2A	1
16	Cutoff valve	DN 15, PN 160	1
17	Connecting pipe	Steel 20	3

* Pressure measurement range is to be agreed with customer



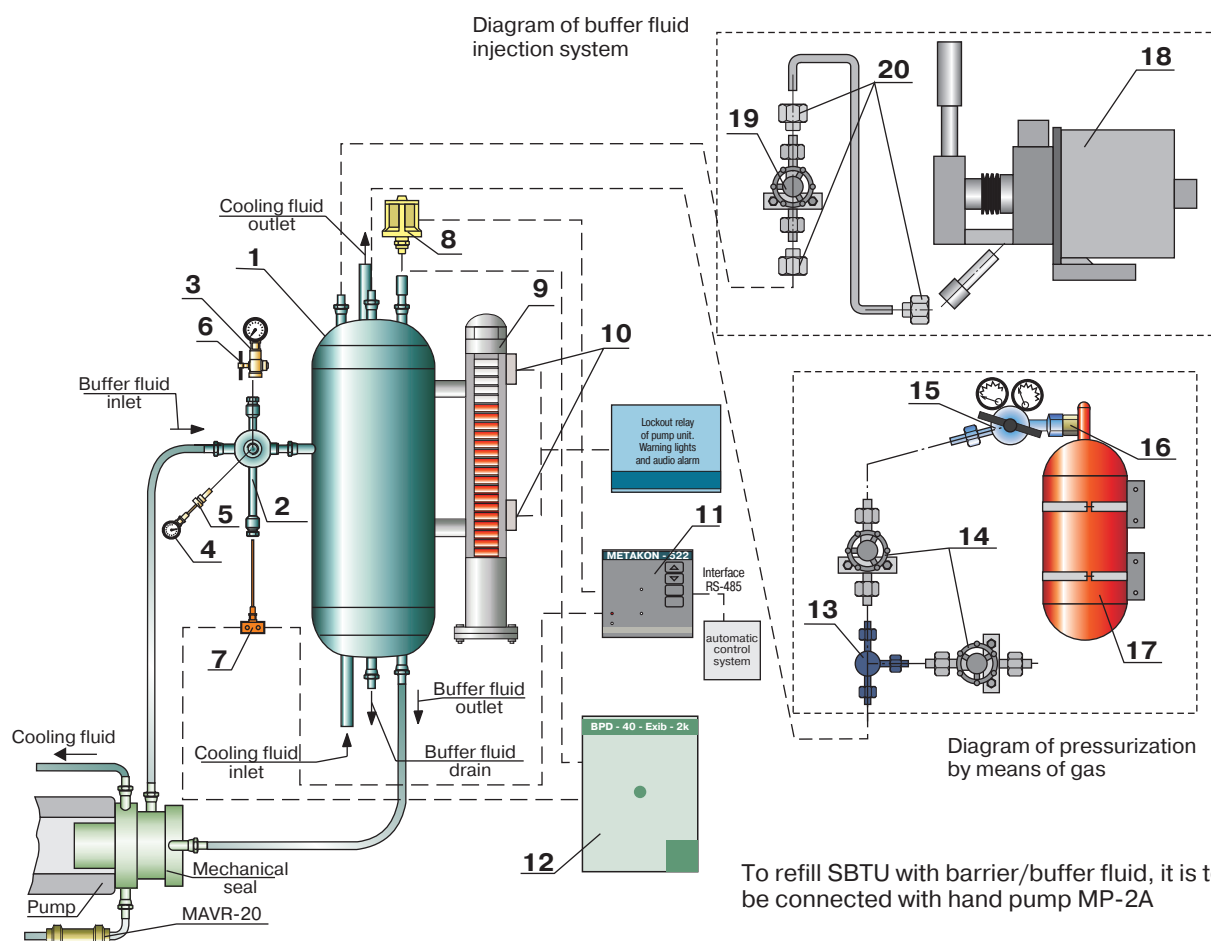
№ POS.	NAME	MODEL, PARAMETERS	Q-TY
1	Reservoir	SBTU2	1
2	Adapter	PO 4	1
3	Manometer	Measurement range* 0 - 1,0 MPa	1
4	Bimetallic thermometer	Measurement range 0 - 160°C	1
5	Protective sleeve	Stainless steel	1
6	Needle valve	KZIM 10 (PN 10MPa)	1
7	Resistive temperature transducer	TSPU Metran 276 (L=60 mm)	1
8	Pressure gauge	Metran 55-DY-EH	1
9	Adapter	P10	1
10	Level switch	SGU-1	1
11	Intrinsic safety barrier	Exia II B	1
12	Power supply unit for level switch SGU-1	24 B	1
13	Microprocessor regulator	«METAKON» -522-P-0/20-1	1
14	Power supply unit	BPD-40-Exib-2k	1
15	T-joint	Steel 20	1
16	Cutoff valve	DN15, PN 160	2
17	Pressure reduction unit	RV-90	1
18	Adapter	Steel 35	1
19	Nitrogen cylinder	5...10 l	1
20	Hand charge pump	MP-2A	1
21	Cutoff valve	DN 15, PN160	1
22	Connecting pipe	Steel 20	3

RESERVOIR SBTU4 FOR TANDEM MECHANICAL SEALS



MAVR-20 – magnetic water activator, preventing scale.
MAVR-20 provision is optional and to be agreed with customer.

№ POS.	NAME	MODEL, PARAMETERS	Q-TY
1	Reservoir	SBTU4	1
2	Adapter	PO 4	1
3	Manometer	Measurement range 0 - 1,0 MPa	1
4	Bimetallic thermometer	Measurement range 0 - 160°C	1
5	Protective sleeve	Stainless steel	1
6	Needle valve	KZIM 10 (PN 10MPa)	1
7	Resistive temperature transducer	TSPU Metran 276 (L=60 mm)	1
8	Pressure gauge	Metran 55-DY-EH	1
9	Bypass level indicator	BNA-S 3/4"-M300-V60x2-MRA	1
10	Magnet switch	BGU-EEEx d 1 PVC	2
11	Microprocessor regulator	«METAKON»-522-P-0/20-1	1
12	Power supply unit	BPD-40-Exib-2k	1
13	Hand charge pump	MP-2A	1
14	Cutoff valve	DN 15, PN 160	1
15	Connecting pipe	Steel 20	3



№ POS.	NAME	MODEL, PARAMETERS	Q-TY
1	Reservoir	SBTU4	1
2	Adapter	PO 4	1
3	Manometer	Measurement range 0 - 1,0 MPa	1
4	Bimetallic thermometer	Measurement range 0 - 160°C	1
5	Protective sleeve	Stainless steel	1
6	Needle valve	KZIM 10 (PN 10MPa)	1
7	Resistive temperature transducer	TSPU Metran 276 (L=60 mm)	1
8	Pressure gauge	Metran 55-DY-EH	1
9	Bypass level indicator	BNA-S 3/4"-M300-V60x2-MRA	1
10	Magnet switch	BGU-EEEx d 1 PVC	2
11	Microprocessor regulator	«METAKON»-522-P-0/20-1	1
12	Power supply unit	BPD-40-Exib-2k	1
13	T-joint	Steel 20	1
14	Cutoff valve	DN 15, PN 160	2
15	Pressure reduction unit	RV-90	1
16	Adapter	Steel 35	1
17	Nitrogen cylinder	5...10	1
18	Hand charge pump	MP-2A	1
19	Cutoff valve	DN 15, PN 160	1
20	Connecting pipe	Steel 20	3

Customer, address:			
Contact person:			
Position:			
P.O. box		Telephone:	Fax:

Item, No			
Quantity		SYSTEM DATA	
GENERAL		Capacity, m ³ /h	minimal
Location			maximal
Ambient temperature, °C			nominal
min		Pressure MPa, g	suction
max			discharge
Explosion hazard zone (as per PUE)		Head, m	
Service		NPSHa, m	
MEDIUM PUMPED		PUMP CHARACTERISTICS	
Pumped medium/ composition, %		Speed, rpm	
Pumped medium/ composition, %		Flow, m ³ /h	
Operating temperature, °C		Head, m	
Relative Density, kg/m ³		NPSH, Δh, m	
Viscosity, mm ² /s		Efficiency, %	
Vapour pressure @ T _{operating} , kg/cm ² (a)		Rated power, kW	
Toxicity (max permissible concentration), mg/m ³		DRIVER	
Class of hazard (as per GOST 12.1.007-76)		Type of motor	
Class of Explosiveness (as per GOST 12.011-78)		Explosion protection	
pH		Rated power, kW	
Crystallization temperature, °C		Voltage, V	
Green test, water		Speed, rpm	
Green test, pumped medium		PUMP SHAFT SEAL	
Material		Type and size	
Rubber type (firm in the medium)		Barrier fluid	
AUXILIARY PIPING		API Plan	
Scheme (diagram)		Special requirements	
Cooling		COMPLETENESS OF SUPPLY	
Parameters			
Special requirement			

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LS

Customer, address:			
Contact person:			
Position:			
P.O. box		Telephone:	Fax:

Reservoir model (SBTU2 or SBTU4)	SBTU arrangement variants	Quantity
-------------------------------------	------------------------------	----------

NAME	MODEL, PARAMETERS	SBTU2		SBTU4		Personal
		for UTT	for UTD	for UTT	for UTD	
Adapter	PO 4	1	1	1	1	
Manometer	Measurement range 0 - 1,0 MPa	1	1	1	1	
Bimetallic thermometer	Measurement range 0 - 160°C	1	1	1	1	
Protective sleeve	Stainless steel	1	1	1	1	
Needle valve	KZIM 10 (PN 10MPa)	1	1	1	1	
Resistive temperature transducer	TSPU Metran 276 (L=60 mm)	1	1	1	1	
Pressure gauge	Metran 55-DY-EH	1	1	1	1	
Adapter	P10	1	1	-	-	
Level switch	SGU-1	1	1	-	-	
Intrinsic safety barriers	Exia II B	1	1	-	-	
Power supply unit for level switch SGU-1	24 B	1	1	-	-	
Bypass level indicator	BNA-S 3/4"-M300-V60x2-MRA	-	-	1	1	
Magnet switch for bypass level indicator	BGU-EEEx d 1 PVC	-	-	2	2	
Microprocessor regulator	«METAKON»-522-P-0/20-1	1	1	1	1	
Power supply unit	BPD-40-Exib-2k	1	1	1	1	
T-joint	Steel 20	-	1	-	1	
Cutoff valve	DN 15, PN 160	-	2	-	2	
Pressure reduction unit	RV-90	-	1	-	1	
Adapter	Steel 35	-	1	-	1	
Nitrogen cylinder	5 - 10 litres	-	1	-	1	

If required, instrumentation arrangement can be changed.

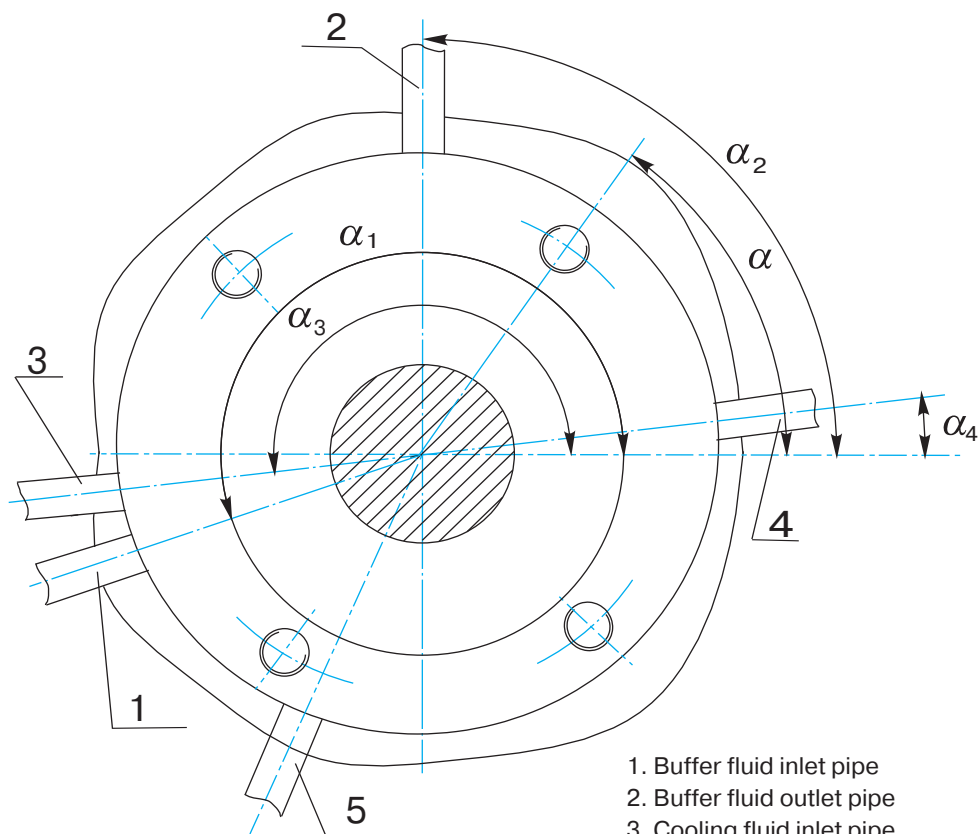
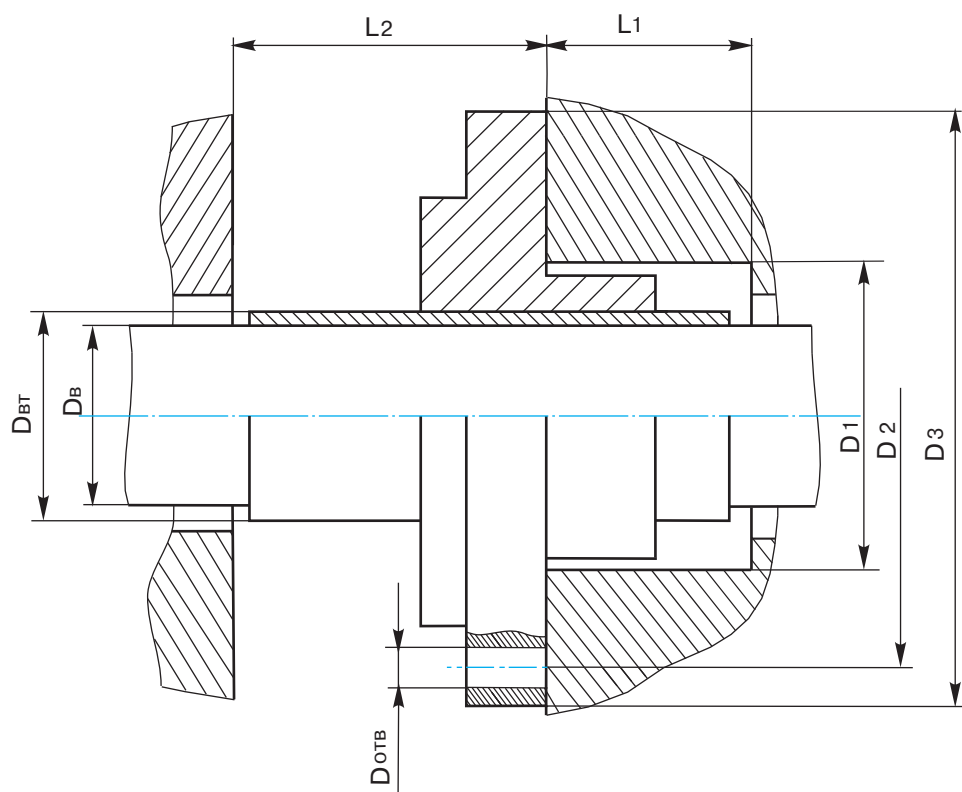
Necessity for MP-2A hand pump supply (to mark)	Supply is required	Supply is not required
--	--------------------	------------------------

OPERATION REQUIREMENTS

Reservoir material	
Mechanical seal type	Double Tandem
Pumped medium	
Buffer liquid, compatible with the medium pumped	
Temperature of pumped medium, °C	
Pressure drop, bar	Suction
	Discharge
Other conditions	

SIGNATURE _____

LS



1. Buffer fluid inlet pipe
2. Buffer fluid outlet pipe
3. Cooling fluid inlet pipe
4. Cooling fluid outlet pipe
5. Leakage drain pipe

MECHANICAL SEAL ORDER DATA SHEET FOR PUMP UNIT

WWW.ANOD.RU

Customer, address:			
Contact person:			
Position:			
P.O. box		Telephone:	Fax:

Quantity				
Mechanical seal type	Single	Double	Tandem	Bellows
Connecting pipe length, mm	cooling liquid inlet	cooling liquid outlet	buffer liquid inlet	buffer liquid outlet

EQUIPMENT CHARACTERISTICS

Type and model of equipment	
Shaft rotation speed, rpm	
Buffer liquid, compatible with the medium pumped	
Admissible leakage rate, cm ³ /h	

CHARACTERISTICS OF THE PUMPED MEDIUM

PARAMETERS	MIN	MAX
Seal chamber pressure absolute, MPa (a)		
Seal chamber temperature, °C		
Boiling point at P _{OPERATING} , °C		
Pumped medium		
Rubber oil-and-benzine resistance in the pumped medium		
Viscosity, mm ² / c		
pH (for water solutions)		
Firm inclusions		
Special properties of pumped medium (radioactivity, explosion hazard, fire risk, toxicity, etc.)		

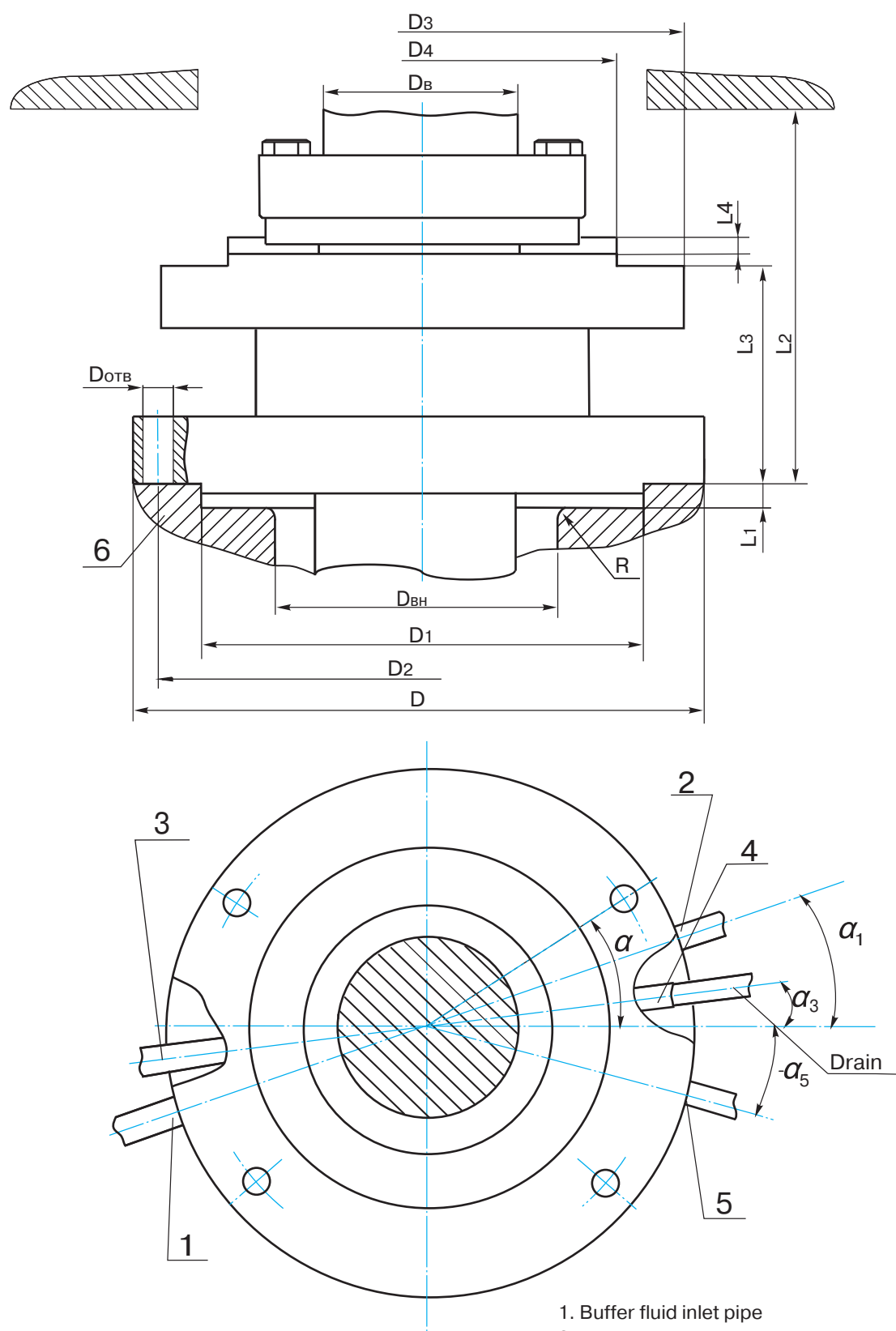
DESIGN CHARACTERISTICS

Shaft diameter (without sleeve)	DB	
Shaft sleeve diameter	DBT	
Seal chamber diameter	D1	
Seal chamber depth	L1	
Max value of mounting distance (from seal chamber seal face up to bearing or flange face)	L2	
Hole-circle diameter for bolt fastening	D2	
Max seal flange diameter	D3	
Apertures diameter for bolt fastening	DotB	
Apertures number for bolt fastening	N	
Mounting holes angle relatively to the horizon	α°	
Buffer fluid inlet pipes angle	α1°	
Buffer fluid outlet pipes angle	α2°	
Cooling fluid inlet pipes angle	α3°	
Cooling fluid outlet pipes angle	α4°	
Is sleeve removal possible?	Yes	No
Trimming is possible		
Features of shaft geometry (threading, grooves, ledges, etc.), their arrangement relatively to seal chamber seal face (to specify if required)		

SIGNATURE _____

LS

MECHANICAL SEAL ORDER DATA SHEET FOR MIXER



1. Buffer fluid inlet pipe
2. Buffer fluid outlet pipe
3. Cooling fluid inlet pipe
4. Cooling fluid outlet pipe
5. Leakage drain pipe
6. Бобышка аппарата

MECHANICAL SEAL ORDER DATA SHEET FOR MIXER

WWW.ANOD.RU

Customer, address:			
Contact person:			
Position:			
P.O. box		Telephone:	Fax:
Quantity			
Connecting pipe length, mm	Cooling liquid inlet/ outlet	Buffer liquid inlet/ outlet	Leakage drain

EQUIPMENT CHARACTERISTICS

Type and model of equipment		Equipment and shaft surface material interacting with the working medium	
Manufacturer		Shaft position (vertical, horizontal, top, bottom, other)	
Type (reactor, pump, compressor, another)		Direction of rotation from motor's side (left, right, other)	
Location (indoors, outdoors, portable)		Speed of rotation, s ⁻¹ (rpm)	
Service (continuous, intermittent /hours)		Shaft diameter, Dв, mm	
Seals in use (stuffing box seal, lip type seal, mechanical seal, labyrinth seal, etc.)		Internal diameter of equipment pad, Dвн, mm	
		Bending radius of pad, R, mm	

CHARACTERISTICS OF THE PUMPED MEDIUM

PARAMETERS	MIN	MAX
Operating pressure/ vacuum, MPa		
Operating temperature, °C		
Pumped medium		
Composition (components, %)		
Relative Density, g/cm ³		
Viscosity, mm ² / c		
Boiling point/ ignition, °C		
Abrasive components (size, mm; ratio, %)		
Chemical properties (aggressive, corrosive, crystallizing, pH, explosion and fire properties, adhesiveness)		
Changeability of medium properties during the process		
Name and composition of buffer fluid (permissible)		
Permissible leakage, cm ³ /h		

DESIGN CHARACTERISTICS

Max seal seal flange diameter	D		Max value of mounting distance (from equipment pad up to the nearest casing parts)	L2	
Bore diameter of equipment pad	D1		Distance from equipment pad up to seal top flange	L3	
Hole-circle diameter for bolt fastening	D2		Lug value for seal top flange	L4	
Outer diameter of driver's top flange	D3		Mounting holes angle relatively to the support gap axis	α°	
Bore diameter of driver's top flange	D4		Buffer fluid inlet/outlet pipes angle relatively to the support gap axis	α1°	
Apertures diameter for bolt fastening	DoTB		Cooling fluid inlet/outlet pipes angle relatively to the support gap axis	α3°	
Apertures number for bolt fastening	N		Leakage drain pipe angle relatively to the support gap axis	-α5°	
Equipment pad lug/bore value	L1				
Features of shaft geometry (threading, grooves, ledges, etc.), their arrangement relatively to seal chamber seal face (to specify if required)					

SIGNATURE _____

LS

