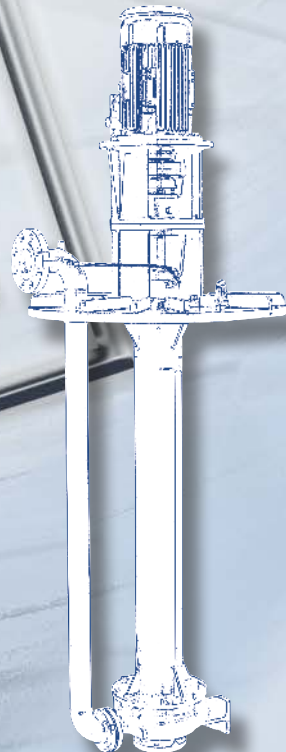
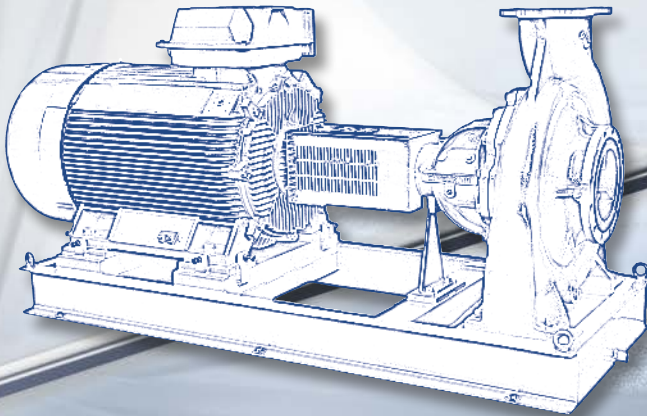




GARBARINO®

MU/MU-VS

Centrifugal pumps according to EN 733
Vertically suspended line-shaft centrifugal pumps





MU/MIU-VS

CENTRIFUGAL PUMPS ACCORDING TO EN 733 STANDARDS

COMMON AND GENERAL USE

Fresh and sea water, condensate, oils, chemical and petrochemical products.

MAIN APPLICATIONS

Shipbuilding industry, heating plants, air conditioning system, water distribution, effluent treatment plants, fire fighting, petrochemical plants, power plants, chemical plants.

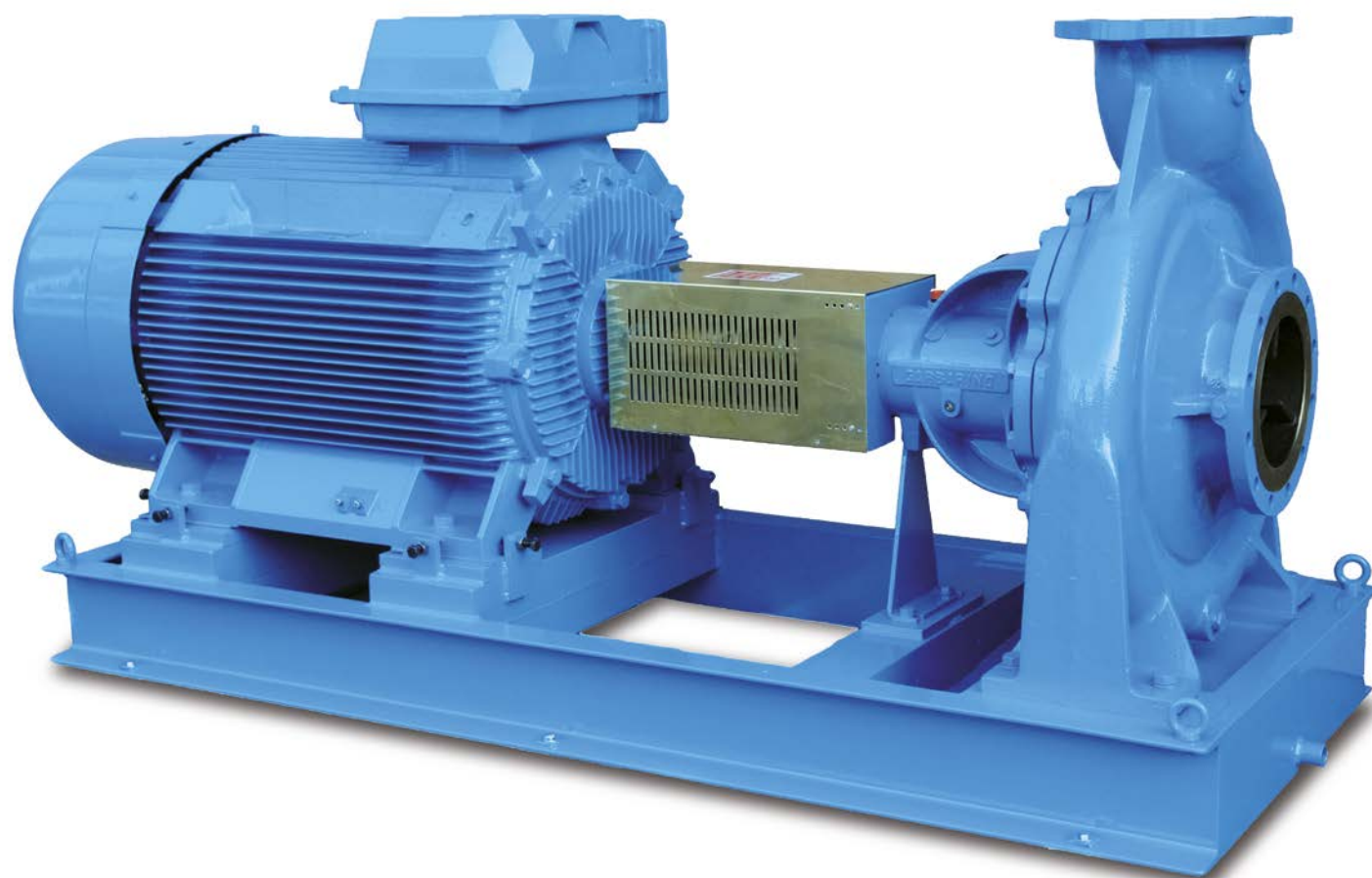
MAIN FEATURES

PUMP: centrifugal type, end-suction single volute casing, single flow and axial inlet.

IMPELLER: high efficiency, close type, statically and dynamically balanced. Low axial thrust thanks to impeller provided with balancing holes.

MOUNTING SYSTEM: shaft supported by radial and thrust type bearings placed in an oil bath bracket or, upon request, by self lubricated or grease lubricated ball bearings. The bracket is usually made of cast-iron, bronze or stainless steel for special executions (non magnetic pumps).

SEAL: single mechanical seal. Special mechanical seal or cartridge type of best manufacturers for specific application or aggressive liquids. Possibility to install soft-packing with external flushing. For temperature higher than 248°F, it is possible to fit the pump with a cooling chamber.



VERTICALLY SUSPENDED LINE-SHAFT CENTRIFUGAL PUMPS

DESCRIPTION

The VS series pumps are suspended vertical line-shaft, single stage pumps with base plate. The main components (casing, cover, pump flanges etc.) are based on our MU or MCA series.

APPLICATIONS

The VS series pumps are used to pump clean or dirty fluids that may contain suspended abrasive materials. They are especially useful for many industrial processes, supply drainage, etc.. Thanks to their versatility and material diversification, the VS series handle and pump a wide range of fluids.

VERSIONS

The standard pumps of the VS series are manufactured with closed impeller and rectangular base plate. The range is wide and includes different impeller options and base plate shapes. They can be adapted to any type and size of tanks, as each pump is available in 60 different models and shaft lengths up to 22.9 ft.

MANUFACTURING

MOTOR FRAME AND BEARING BOX: Motor frame according to ICC or NEMA standard ensures overall stiffness and motor support. Alternative solutions with grease lubricated dual ball bearing for standard execution and with bearing cooling chamber for high temperature fluids are available.

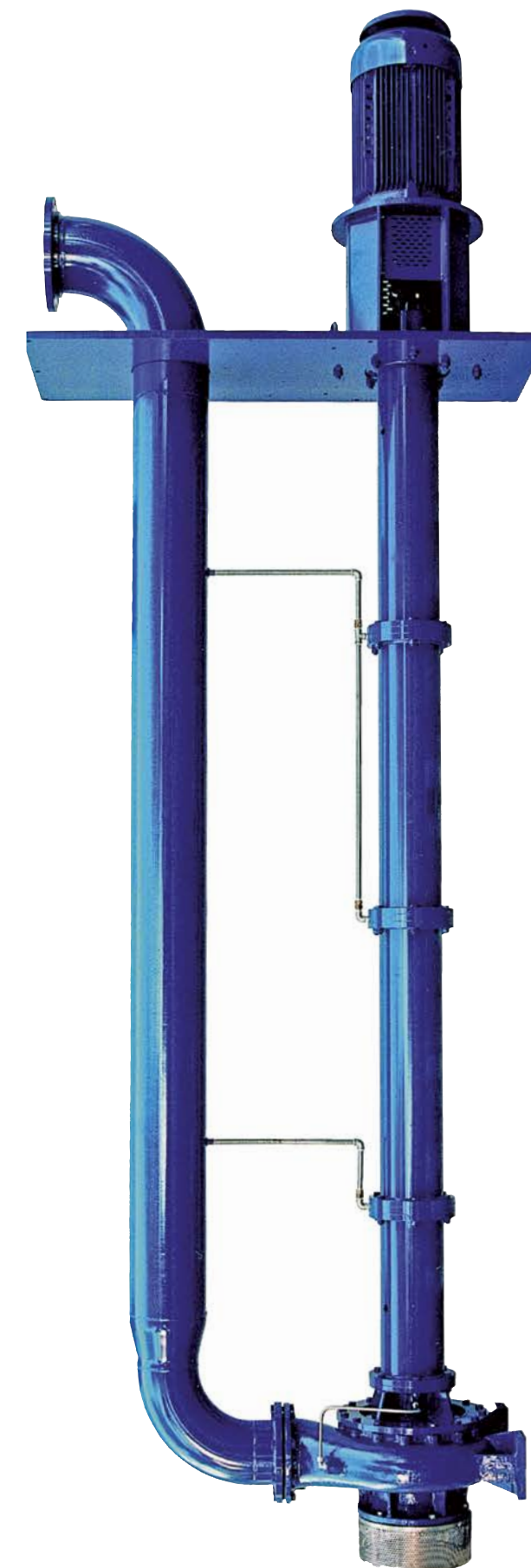
BASE PLATE: Rectangular base plate in standard execution. Optional versions with circular base plate, according to ANSI or on drawing measures particularly useful for installation in cylindric tanks are also available. The thicker than normal base plate is calculated to support the overhung and the assembly stresses.

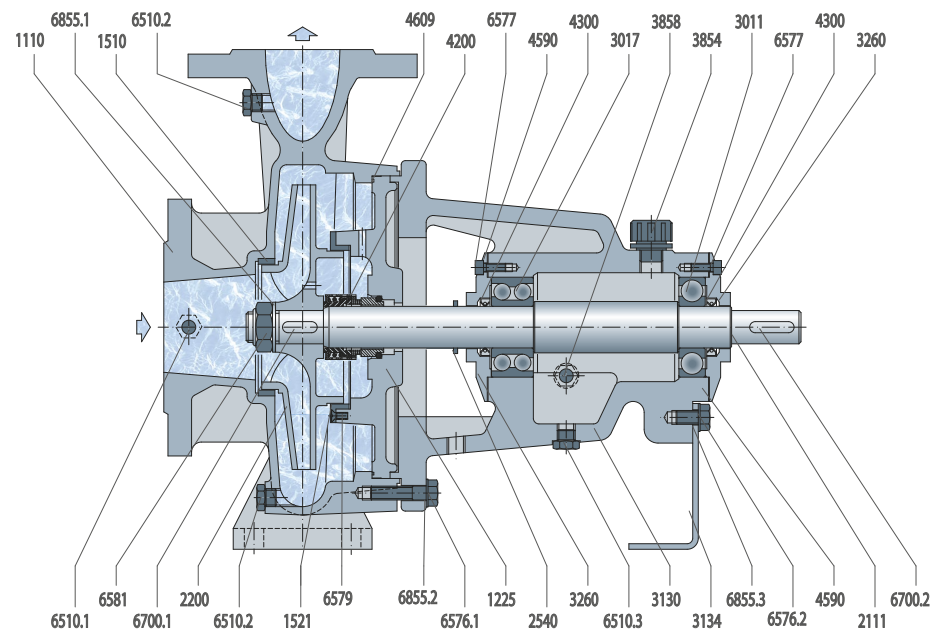
BUSHING AND TIGHTNESS:

The pump standard sealing on mounting plate is by means of a lip sealing ring. Alternatively also the following versions are available: soft packing - mechanical seal. The standard bushes are lubricated by the pumped fluid. They can also be lubricated by grease, oil, water or other fluids through an external device. Bush grooves ensure the lubrication.

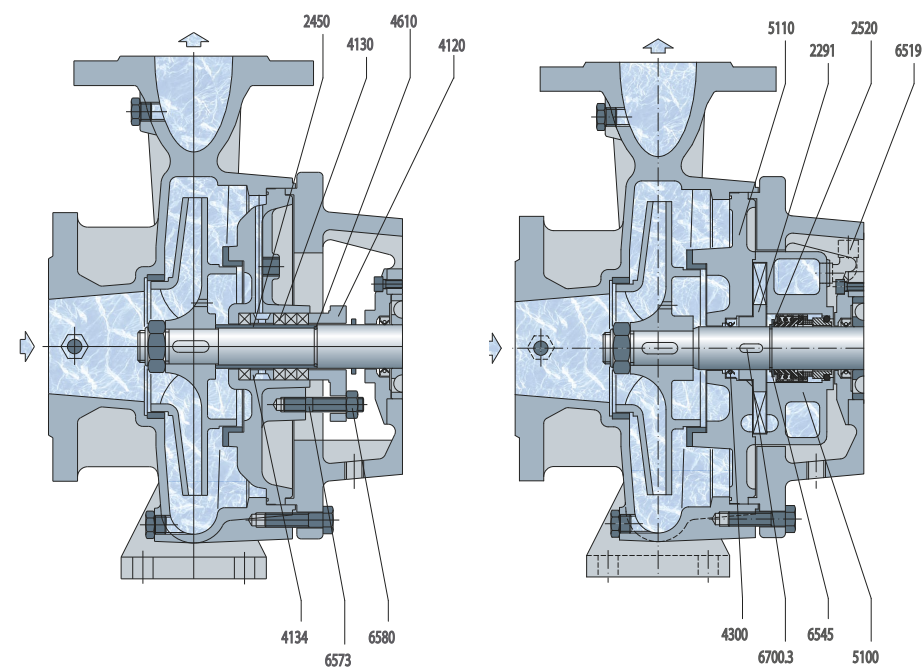
MATERIALS

Materials of construction are Ni-Al Bronze, SS, duplex, super duplex, monel, Cast iron and Carbon steel are also available. Any other material combinations can be supplied.





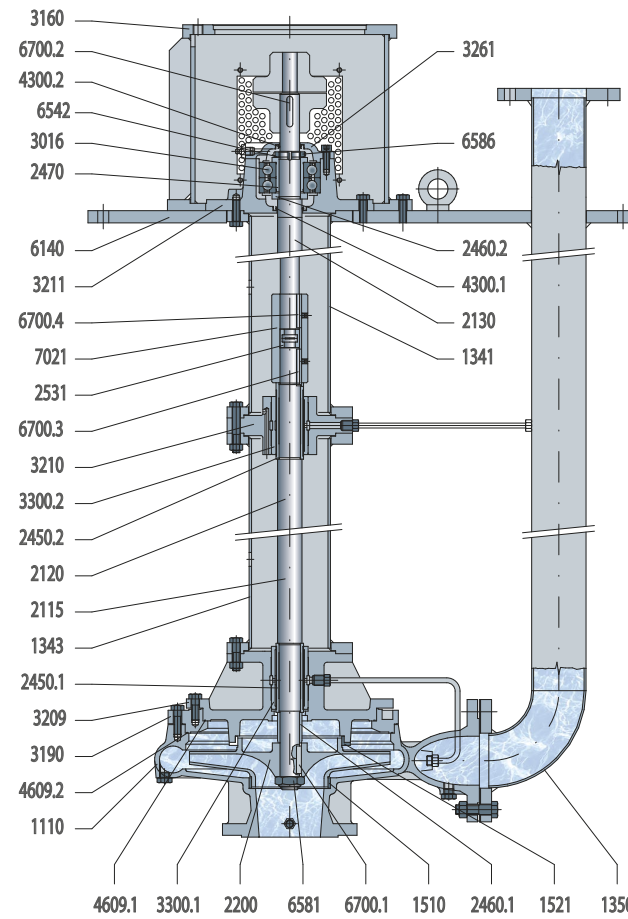
LONGITUDINAL SECTION



SOFT PACKING VERSION

SELF-PRIMING VERSION

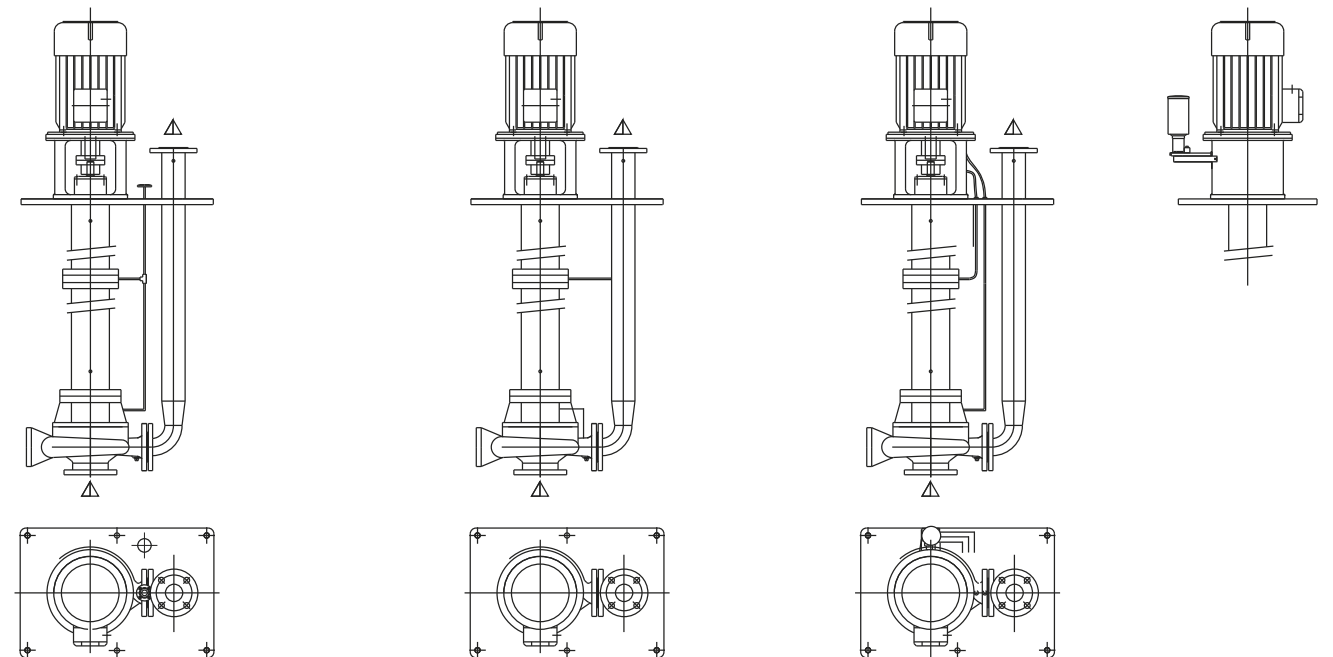
Pos	Description <i>Descrizione</i>
1110	Pump casing
1225	Casing cove
1510	Wear ring
1521	Wear ring
2111	Pump shaft
2200	Impeller
2291	Priming stage impeller
2450	Shaft sleeve
2520	Shoulder ring
2540	Deflector
3011	Radial ball bearing
3017	Angular ball bearing
3130	Bearing bracket
3134	Support foot
3260	Bearing cover
3854	Oil filler plug
3858	Oil level
4120	Stuffing box gland
4130	Gland packing
4134	Lantern ring
4200	Mechanical seal
4300	Radial shaft seal
4590	Gasket
4609	O-Ring
4610	O-Ring
5100	Priming stage casing
5110	Priming stage cover
6510.1	Plug
6510.2	Plug
6510.3	Plug
6519	Thread fitting
6545	Seeger
6573	Stud
6576.1	Screw
6576.2	Screw
6577	Screw
6579	Screw
6580	Nut
6581	Impeller nut
6700.1	Key
6700.2	Key
6700.3	Key
6855.1	Washer
6855.2	Washer
6855.3	Washer



MU-VS LONGITUDINAL SECTION

Pos	Description <i>Descrizione</i>
1110	Pump casing
1341	Support column
1343	Column pump side
1350	Column pipe
1510	Casing wear ring
1521	Wear ring
2115	Vertical pump shaft
2120	Intermediate shaft
2130	Top shaft
2200	Impeller
2450.1	Shaft sleeve
2450.2	Shaft sleeve
2460.1	Spacer sleeve
2460.2	Spacer sleeve
2470	Centering sleeve
2531	Retaining ring
3016	Ball bearing
3160	Motor stool
3190	Reduction ring
3209	Bearing housing pump side
3210	Bearing housing intermediate
3211	Bearing housing drive side
3300.1	Bearing bush
3300.2	Bearing bush
4300.1	Radial shaft seal
4300.2	Radial shaft seal
4609.1	O-Ring
4609.2	O-Ring
6140	Support plate
6542	Lockwasher for locknut
6581	Impeller selflocking nut
6700.1	Key
6700.2	Key
6700.3	Key
6700.4	Key
7021	Intermediate coupling

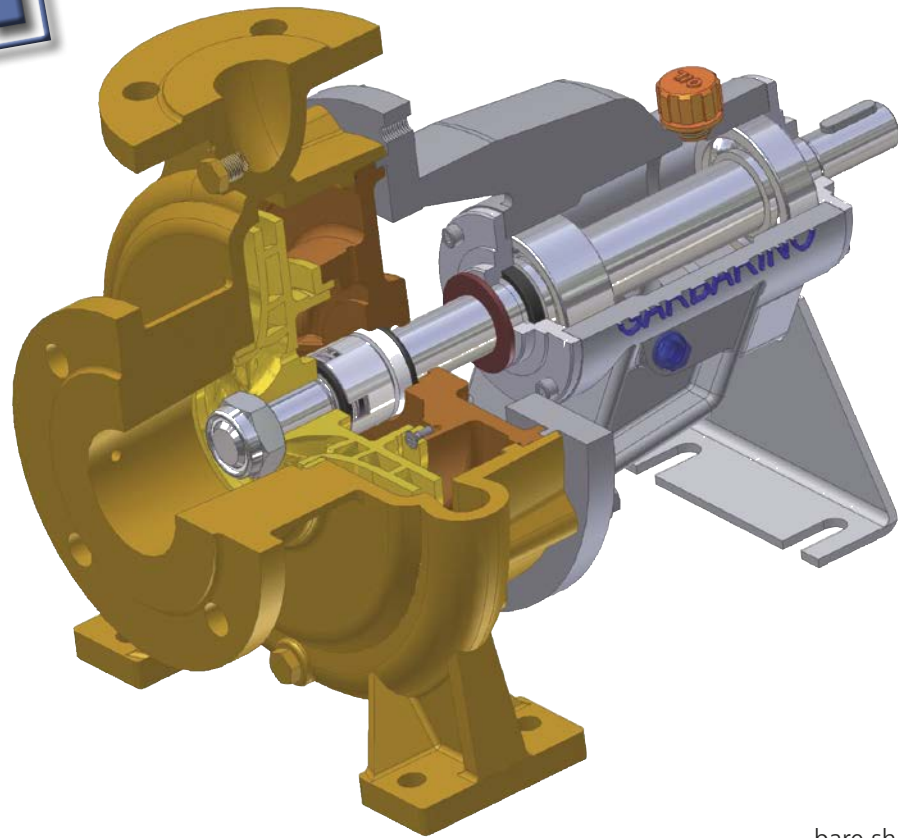
LINE-SHAFT BUSHINGS LUBRICATION OPTION



Lubrication from external source

Lubrication with pumped liquid

Grease lubrication by automatic greaser pump



bare shaft version

MATERIALS	MAX. WORKING PRESSURE
CAST IRON	145 PSI
STAINLESS STEEL, BRONZE, SPECIAL ALLOY DUPLEX, SUPER DUPLEX	232 PSI
<i>NOTE: SPECIAL EXECUTIONS EXCEEDING THE ABOVE LIMITS AVAILABLE ON REQUEST</i>	

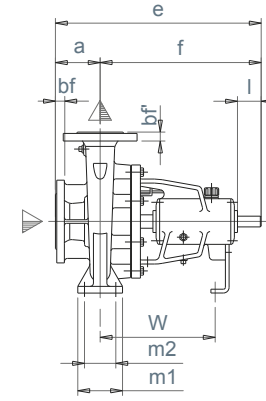
INTERCHANGEABILITY	
MODELS	50
CASINGS	50
IMPELLERS	50
SHAFTS	6
BEARING BRACKETS	6
COVERS	6
MECHANICAL SEALS	6



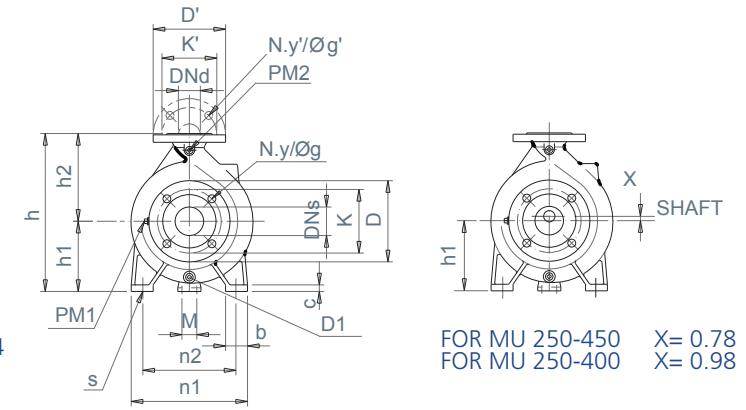
close coupled version



self priming element with star impeller behind main impeller to remove air effectively



SHAFT END
KEY ACCORDING TO UNI 6604



FOR MU 250-450 X= 0.78
FOR MU 250-400 X= 0.98

PUMP DIMENSIONS													SHAFT				PUMP TYPE	SUCTION FLANGE	DELIVERY FLANGE	FLANGES DIMENSIONS ANSI 150 RF					HOLES NUMBER	DRAINAGE	VACUUM GAUGE	PRESSURE GAUGE	PUMP WEIGHT							
a	f	e	h	h1	h2	b	c	m1	m2	n1	n2	s	l	M	W	d	t	u	DNs	DNd	D	D'	bf	bf'	K	K'	g	g'	y	y'	D1	PM1	PM2	lb		
2.48	9.33	11.81	10.70	4.40	6.29	1.96	0.47	3.93	2.75	8.66	7.08	0.47	36	1.41	4.33	6.33	0.74	0.84	0.23	25-160	1"	1"	4.88	4.88	0.62	0.62	3.12	3.12	M14	M14	4	4	1/4"G	1/4"G	1/4"G	49
3.14	14.17	17.32	13.38	6.29	7.08	1.96	0.59	3.93	2.75	9.44	7.48	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	25-200	1 1/2"	1"	6.14	4.88	0.70	0.62	3.87	3.12	M14	M14	4	4	1/4"G	1/4"G	1/4"G	91
3.14	-	-	9.92	4.40	5.51	1.96	0.47	3.93	2.75	7.48	5.51	0.55	-	-	-	-	-	-	-	32-125*	2"	1 1/4"	6.49	5.51	0.78	0.70	4.75	3.50	M16	M14	4	4	3/8"G	1/4"G	1/4"G	89
3.14	14.17	17.32	11.49	5.19	6.29	1.96	0.59	3.93	2.75	9.44	7.48	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	32-160	2"	1 1/4"	6.49	5.51	0.78	0.70	4.75	3.50	M16	M14	4	4	1/4"G	1/4"G	1/4"G	95
3.14	14.17	17.32	13.38	6.29	7.08	1.96	0.59	3.93	2.75	9.44	7.48	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	32-200	2"	1 1/4"	6.49	5.51	0.78	0.70	4.75	3.50	M16	M14	4	4	1/4"G	1/4"G	1/4"G	95
4.33	14.17	18.50	15.94	7.08	8.85	2.55	0.70	4.92	3.74	12.59	9.84	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	32-250	2"	1 1/4"	6.49	5.51	0.78	0.70	4.75	3.50	M16	M14	4	4	1/4"G	1/4"G	1/4"G	137
3.14	-	-	9.92	4.40	5.51	1.96	0.59	3.93	2.75	8.26	6.29	0.55	-	-	-	-	-	-	-	40-125*	2 1/2"	1 1/2"	7.28	6.14	0.78	0.70	5.51	3.87	0.74	M14	8	4	3/8"G	1/4"G	1/4"G	93
3.14	14.17	17.32	11.49	5.19	6.29	1.96	0.59	3.93	2.75	9.44	7.48	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	40-160	2 1/2"	1 1/2"	7.28	6.14	0.78	0.70	5.51	3.87	0.74	M14	8	4	1/4"G	1/4"G	1/4"G	95
3.93	14.17	18.11	13.38	6.29	7.08	1.96	0.59	3.93	2.75	10.43	8.34	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	40-200	2 1/2"	1 1/2"	7.28	6.14	0.78	0.70	5.51	3.87	0.74	M14	8	4	1/4"G	1/4"G	1/4"G	100
3.93	14.17	18.11	15.94	7.08	8.85	2.55	0.59	4.92	3.74	12.59	9.84	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	40-250	2 1/2"	1 1/2"	7.28	6.14	0.78	0.70	5.51	3.87	0.74	M14	8	4	1/4"G	1/4"G	1/4"G	133
4.92	18.50	23.42	18.89	7.87	11.02	2.55	0.78	4.92	3.74	13.58	11.02	0.55	80	3.14	4.33	13.38	1.25	1.37	0.39	40-315	2 1/2"	1 1/2"	7.28	6.14	0.78	0.70	5.51	3.87	0.74	M14	8	4	1/4"G	1/4"G	1/4"G	216
3.93	-	-	11.49	5.19	6.29	1.96	0.59	3.93	2.75	9.44	7.48	0.55	-	-	-	-	-	-	-	50-125*	2 1/2"	2"	7.28	6.49	0.78	0.78	5.51	4.75	0.74	M16	8	4	3/8"G	1/4"G	1/4"G	100
3.93	14.17	18.11	13.38	6.29	7.08	1.96	0.59	3.93	2.75	10.43	8.34	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	50-160	2 1/2"	2"	7.28	6.49	0.78	0.78	5.51	4.75	0.74	M16	8	4	1/4"G	1/4"G	1/4"G	106
3.93	14.17	18.11	14.17	6.29	7.87	1.96	0.59	3.93	2.75	10.43	8.34	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	50-200	2 1/2"	2"	7.28	6.49	0.78	0.78	5.51	4.75	0.74	M16	8	4	1/4"G	1/4"G	1/4"G	106
3.93	14.17	18.11	15.94	7.08	8.85	2.55	0.59	4.92	3.74	12.59	9.84	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	50-250	2 1/2"	2"	7.28	6.49	0.78	0.78	5.51	4.75	0.74	M16	8	4	1/4"G	1/4"G	1/4"G	133
4.92	18.50	23.42	19.88	8.85	11.02	2.55	0.98	4.92	3.74	13.58	11.02	0.55	80	3.14	4.33	13.38	1.25	1.37	0.39	50-315	2 1/2"	2"	7.28	6.49	0.78	0.78	5.51	4.75	0.74	M16	8	4	1/4"G	1/4"G	1/4"G	221
3.93	-	-	13.38	6.29	7.08	1.96	0.59	3.93	2.75	11.02	8.34	0.55	-	-	-	-	-	-	-	65-125*	3"	2 1/2"	7.87	7.28	0.86	0.78	5.98	5.51	0.74	0.74	8	8	3/8"G	1/4"G	1/4"G	106
3.93	14.17	18.11	14.17	6.29	7.87	2.55	0.59	4.92	3.74	11.02	8.34	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	65-160	3"	2 1/2"	7.87	7.28	0.86	0.78	5.98	5.51	0.74	0.74	8	8	1/4"G	1/4"G	1/4"G	108
3.93	14.17	18.11	15.94	7.08	8.85	2.55	0.59	4.92	3.74	12.59	9.84	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	65-200	3"	2 1/2"	7.87	7.28	0.86	0.78	5.98	5.51	0.74	0.74	8	8	1/4"G	1/4"G	1/4"G	122
3.93	18.50	22.44	17.71	7.87	9.84	3.14	0.70	6.29	4.72	14.17	11.02	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	65-250	3"	2 1/2"	7.87	7.28	0.86	0.78	5.98	5.51	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	177
4.92	18.50	23.42	19.88	8.85	11.02	3.14	0.98	6.29	4.72	15.74	12.40	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	65-315	3"	2 1/2"	7.87	7.28	0.86	0.78	5.98	5.51	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	223
4.92	18.50	23.42	23.81	9.84	13.97	3.14	0.98	6.29	4.72	16.53	13.18	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	65-400	3"	2 1/2"	7.87	7.28	0.86	0.78	5.98	5.51	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	287
4.92	14.17	19.09	15.94	7.08	8.85	2.55	0.59	4.92	3.74	12.59	9.84	0.55	50	1.96	4.33	10.23	0.94	1.06	0.31	80-160	4"	3"	9.01	7.87	0.86	0.86	7.51	5.98	0.74	0.74	8	8	1/4"G	1/4"G	1/4"G	133
4.92	18.50	23.42	16.92	7.08	9.84	2.55	0.70	4.92	3.74	13.58	11.02	0.55	80	3.14	4.33	13.38	1.25	1.37	0.39	80-200	4"	3"	9.01	7.87	0.86	0.86	7.51	5.98	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	167
4.92	18.50	23.42	18.89	7.87	11.02	3.14	0.70	6.29	4.72	15.74	12.40	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	80-250	4"	3"	9.01	7.87	0.86	0.86	7.51	5.98	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	194
4.92	18.50	23.42	22.24	9.84	12.40	3.14	0.98	6.29	4.72	15.74	12.40	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	80-315	4"	3"	9.01	7.87	0.86	0.86	7.51	5.98	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	245
4.92	20.86	25.78	25.00	11.02	13.97	3.14	0.98	6.29	4.72	17.12	13.97	0.70	110	4.33	4.33	14.56	1.65	1.77	0.47	80-400	4"	3"	9.01	7.87	0.86	0.86	7.51	5.98	0.74	0.74	8	8	3/8"G	1/4"G	3/8"G	342
4.92	18.50	23.42	18.89	7.87	11.02	3.14	0.70	6.29	4.72	14.17	11.02	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	100-200	5"	4"	10.00	9.01	0.94	0.86	8.50	7.51	0.90	0.74	8	8	3/8"G	1/4"G	3/8"G	188
5.51	18.50	24.01	19.88	8.85	11.02	3.14	0.70	6.29	4.72	15.74	12.40	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	100-250	5"	4"	10.00	9.01	0.94	0.86	8.50	7.51	0.90	0.74	8	8	3/8"G	1/4"G	3/8"G	232
5.51	18.50	24.01	22.24	9.84	12.40	3.14	0.70	6.29	4.72	15.74	12.40	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	100-315	5"	4"	10.00	9.01	0.94	0.86	8.50	7.51	0.90	0.74	8	8	3/8"G	1/4"G	3/8"G	256
5.51	20.86	26.37	25.00	11.02	13.97	3.93	0.98	7.87	5.90	19.68	15.74	0.86	110	4.33	4.33	14.56	1.65	1.77	0.47	100-400	5"	4"	10.00	9.01	0.94	0.86	8.50	7.51	0.90	0.74	8	8	3/8"G	1/4"G	3/8"G	419
5.51	18.50	24.01	23.81	9.84	13.97	3.14	0.70	6.29	4.72	15.74	12.40	0.70	80	3.14	4.33	13.38	1.25	1.37	0.39	125-250	6"	5"	11.22	10.00	0.94	0.94	9.48	8.50	0.90	0.90	8	8	3/8"G	1/4"G	3/8"G	265
5.51	20.86	26.37	25.00	11.02	13.97	3.93	0.98	7.87	5.90	19.68	15.74	0.86	110	4.33	4.33	14.56	1.65	1.77	0.47	125-315	6"	5"	11.22	10.00	0.94	0.94	9.48	8.50	0.90	0.90	8	8	3/8"G	1/4"G	3/8"G	397
5.51	20.86	26.37	28.14	12.40	15.74	3.93	0.9																													

Member of CISQ Federation



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