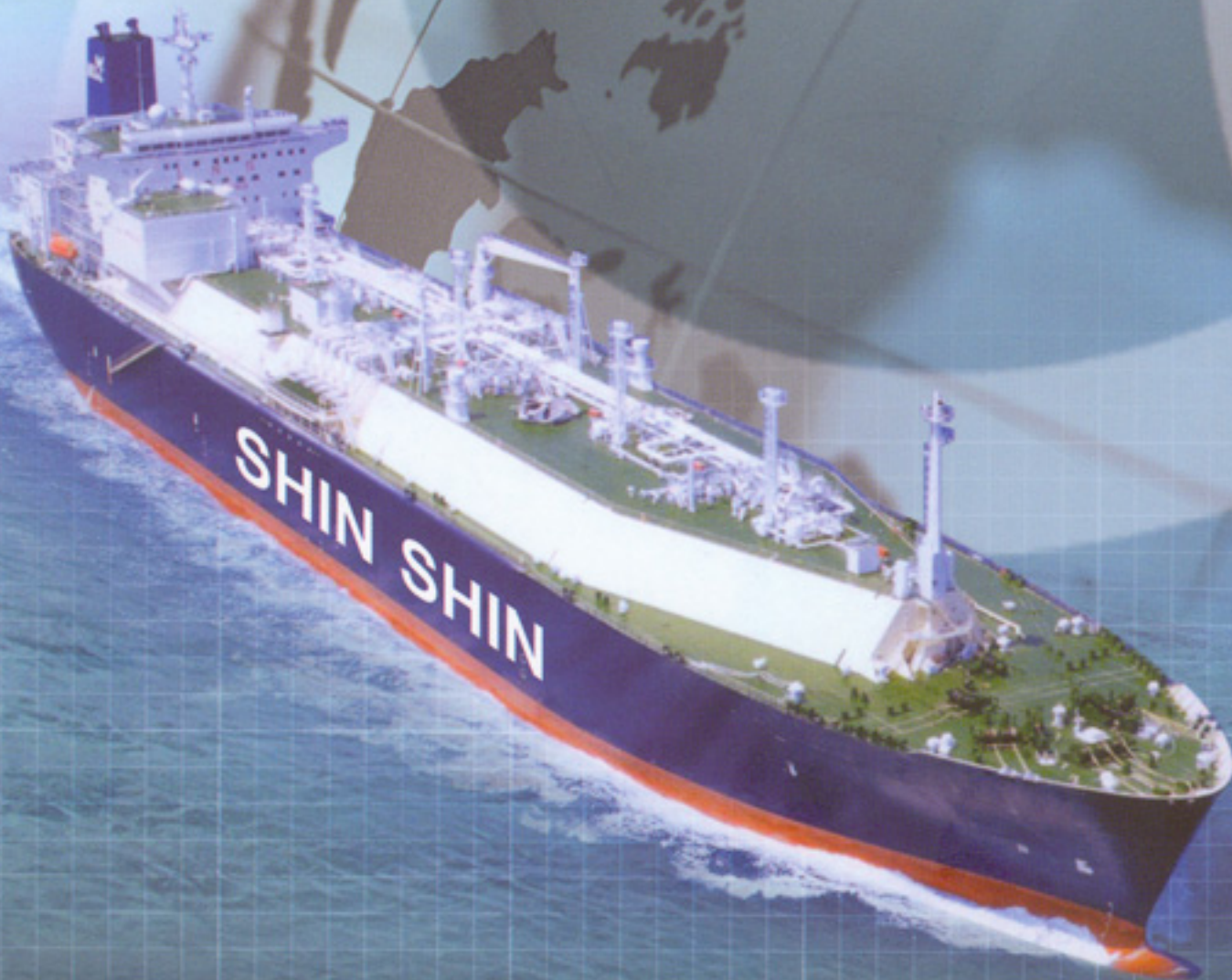


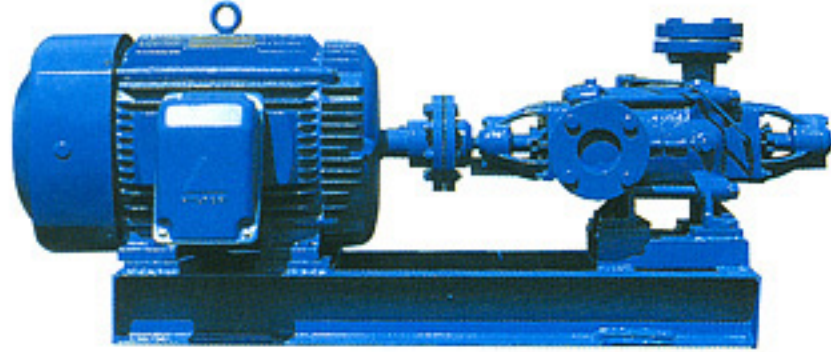
SHIN SHIN MARINE



 SHIN SHIN MACHINERY CO., LTD.

MB BOILER FEED PUMP

Horizontal multi-stage single suction



■ Applications

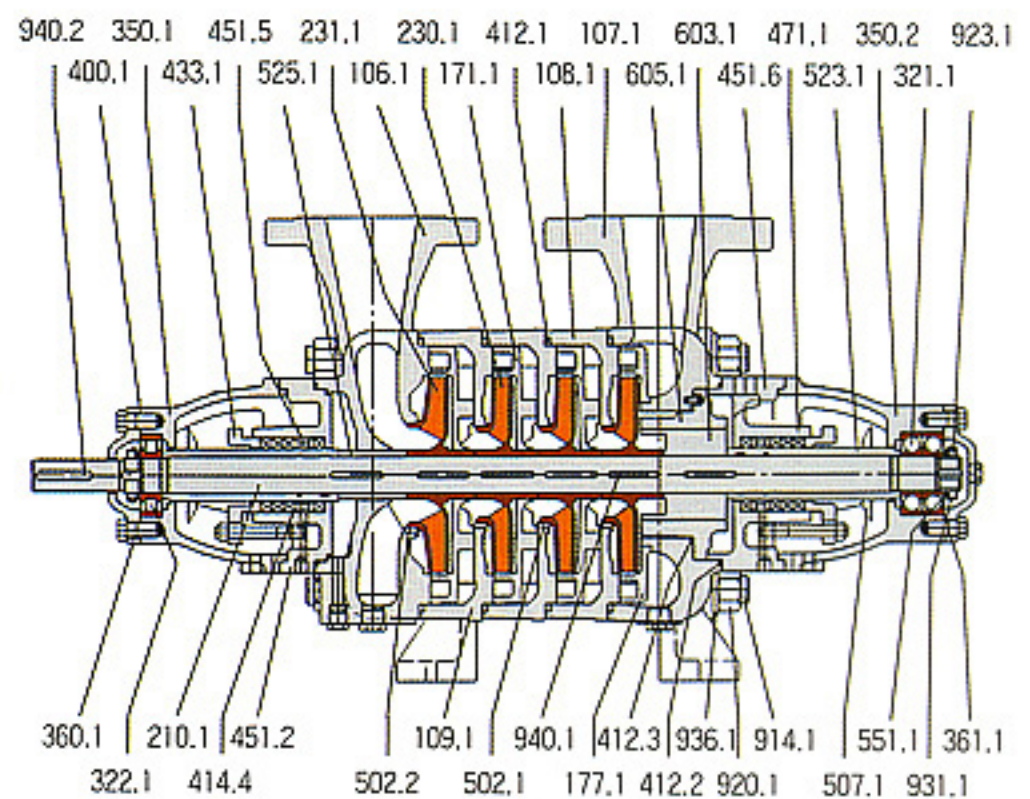
Feed pump for aux. boiler & exhaust gas boiler in diesel ship.

■ Principal Particulars

Item	Model	MB 32	MB 40	MB 65
Rotation		Clockwise viewed from drive end		
Suction bore (mm)		50	65	80
Discharge bore (mm)		32	40	65
Ball bearing		7304BDF + NU304	7305BDF + NU305	7306BDF + NU306
Service life (hr)		Abv. 50,000hr		
Stuffing box seal		Gland packing or mechanical seal		

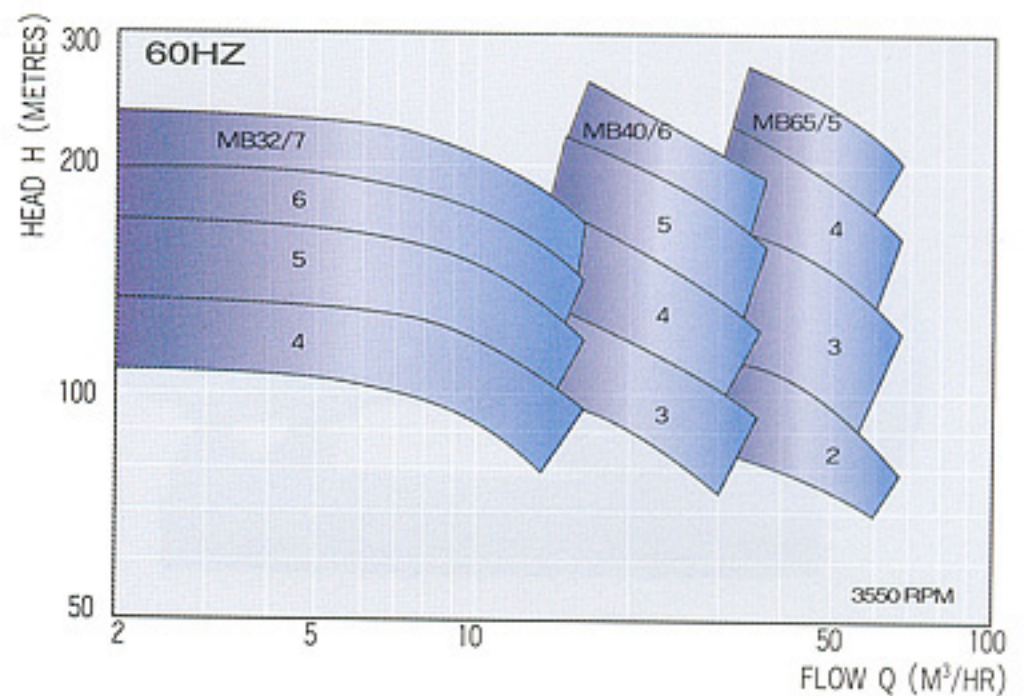
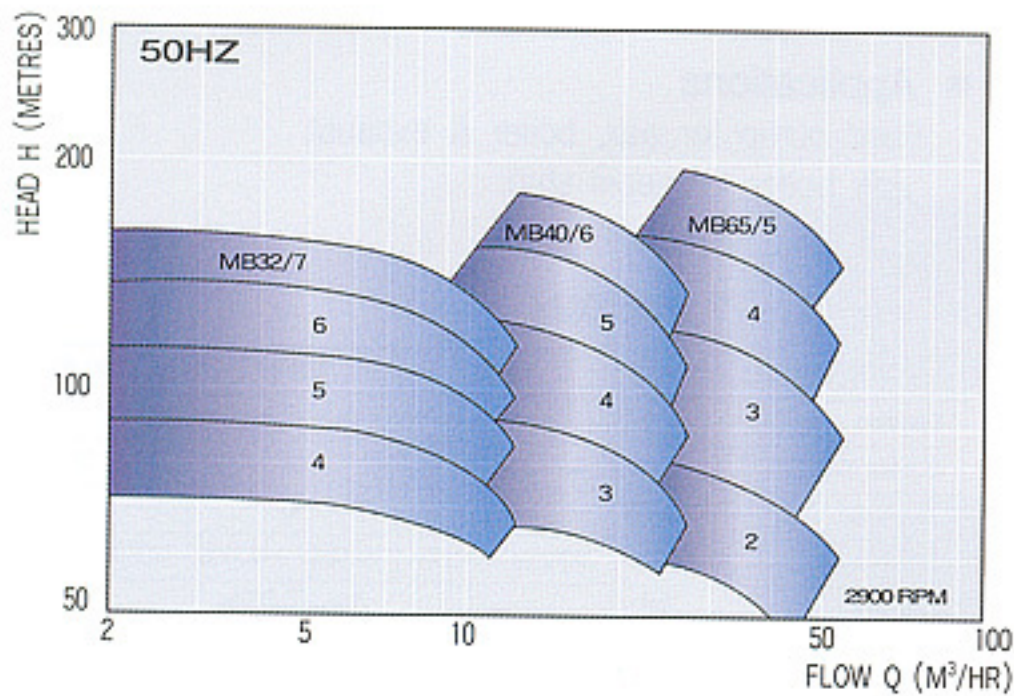
■ Standard Materials

Part No.	Name Of Part	REQ. NO. FOR 1PUMP	MATERIAL	
			Name	KS
106.1	SUCTION CASING	1	DUCTILE CAST IRON	GCD45
107.1	DISCHARGE CASING	1	DUCTILE CAST IRON	GCD45
108.1	STAGE CASING	N-1	DUCTILE CAST IRON	GCD45
109.1	STAGE CASING(WITH FOOT)		DUCTILE CAST IRON	GCD45
171.1	DIFFUSER	N-1	CAST IRON	GC200
210.1	SHAFT	1	STAINLESS STEEL	STS304
230.1	IMPELLER	SEE NOTE	STAINLESS STEEL	SSC13
231.1	SUCTION IMPELLER	1	STAINLESS STEEL	SSC13
321.1	BALL BEARING	1ST	BEARING STEEL	STB2
322.1	ROLLER BEARING	1	BEARING STEEL	STB2
350.1	BEARING HOUSING	1	CAST IRON	GC200
350.2	BEARING HOUSING	1	CAST IRON	GC200
360.1	BEARING END COVER	1	CAST IRON	GC200
361.1	GASKET	1	NON ASBESTOS	
400.1	O-RING	2	EPDM	
400.2	O-RING	2	EPDM	
412.1	O-RING	N	EPDM	
412.2	O-RING	2	EPDM	
412.3	O-RING	1	EPDM	
412.4	O-RING	2	EPDM	
433.1	PACKING GLAND	2	CAST IRON	GC200
451.6	STUFFING BOX	1	CAST IRON	GC200
415.6	STUFFING BOX	1	CAST IRON	GC200
471.1	LANTERN RING	2	STAINLESS STEEL	SSC13
507.1	THROWER	2	NBR	SM45C
523.1	PACKING	8	NON METALLIC	
523.2	SHAFT SLEEVE	2	STAINLESS STEEL	STS304
525.1	SPACER SLEEVE	1	STAINLESS STEEL	STS304
551.1	SPACER DISC	2	STEEL	SS41
603.1	BALANCE DRUM	1	STAINLESS STEEL	STS304
605.1	BALANCE DRUM LINER	1	BRONZE	BC6
914.1	TIE.BOLT	4	CARBON STEEL	SM45C
920.1	HEX. BOLT	8	CARBON STEEL	SN45C
923.1	BEARING LOCK NUT	2	STEEL	SS41
931.1	BEARING LOCK WASHER	2	STEEL	SS41
936.1	PLAIN WASHER	8	CARBON STEEL	SM45C
940.1	KEY	N+2	CARBON STEEL	SM45C
940.2	COUPLING KEY	1	CARBON STEEL	SM45C



Notes

- (231.1) is put in case of size 65. and the others is applied(230.1)only
- N; stage

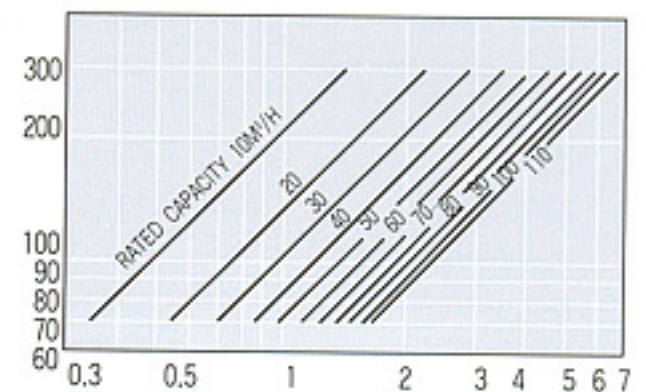


■ Axial Thrust-Balance Piston

In general, During operation of the pump an axial thrust towards suction side will be exerted on the rotor, as the area on the impeller back shroud is greater than on the front shroud. These axial forces are absorbed by the hydraulic balancing device which is consisted of a balance piston and balance bushing.

■ Minimum Flow

If the discharge of pump becomes too small, water temperature rise and trouble is caused by lack of NPSH. In general, minimum flow is returned to the suction tank so that water temperature rise dose not exceed about 10°C even at shutoff operation. Its approximate by-pass capacity is shown in the figure at right.

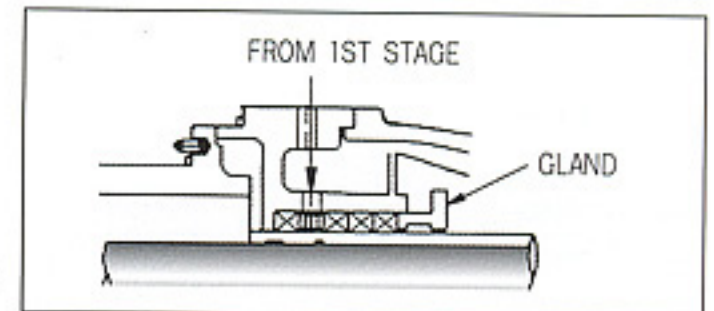


■ Stuffing Box Seal

As standard, gland packing are used, but by the order, the mechanical seal can be fitted.

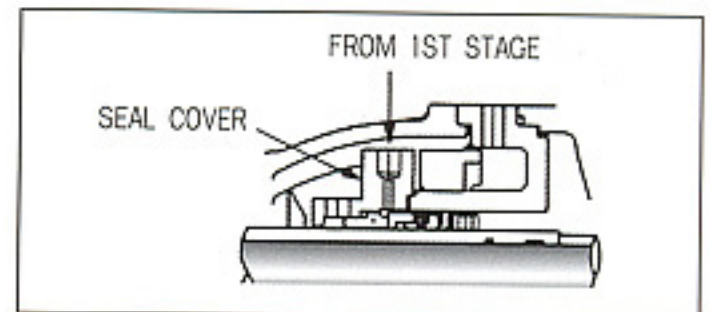
Fitted with gland packing

Sealing water is led to the stuffing box from the discharge side of 1st stage and most of water is returned to the suction side passing through lantern ring, the rest is drained to bilge after sealing gland packing.



Fitted with mech, seal

Flushing water is led to the stuffing box from the discharge side of 1st stage and returned to the suction side after flushing mechanical seal.



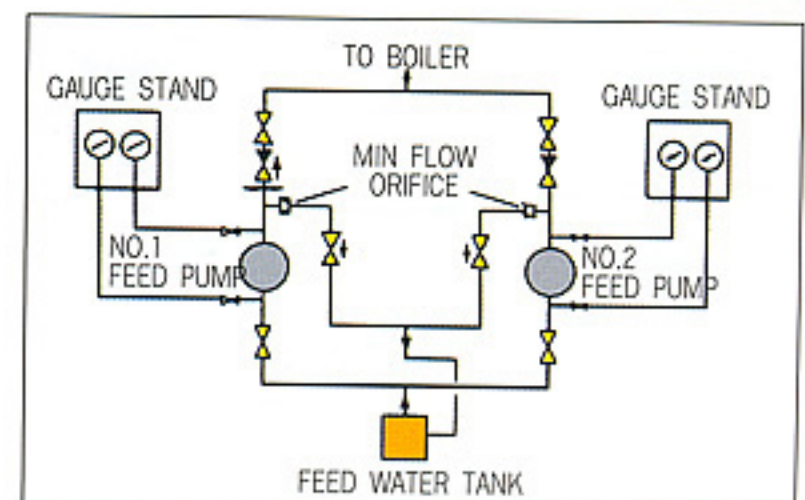
■ Bearings & Lubrication

In case of series MB the shaft runs in antifriction bearings grease lubricated on both side.

■ Piping Diagram

Generally, piping is carried out by customer as shown in the drawing at right.

The pump, gauge stand minimum flow orifice and supplied by manufacturer, but the others must be prepared by customer.

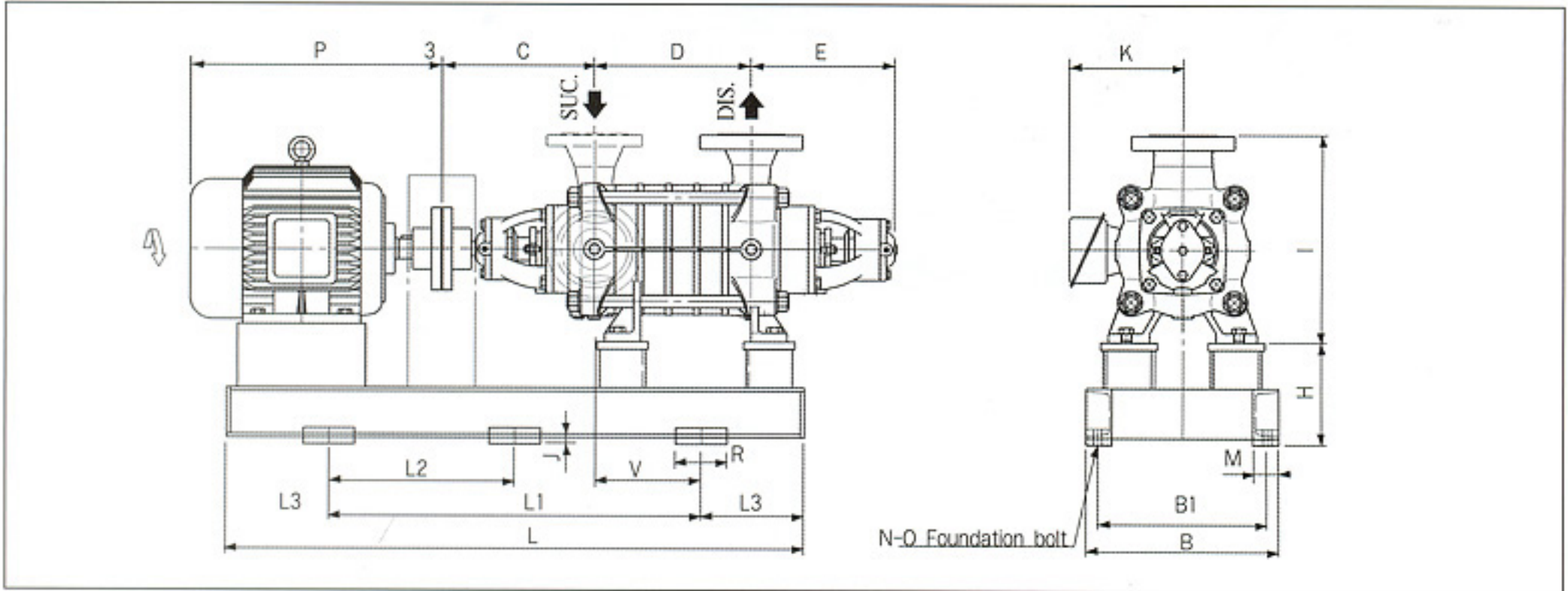


■ Standard Accessories

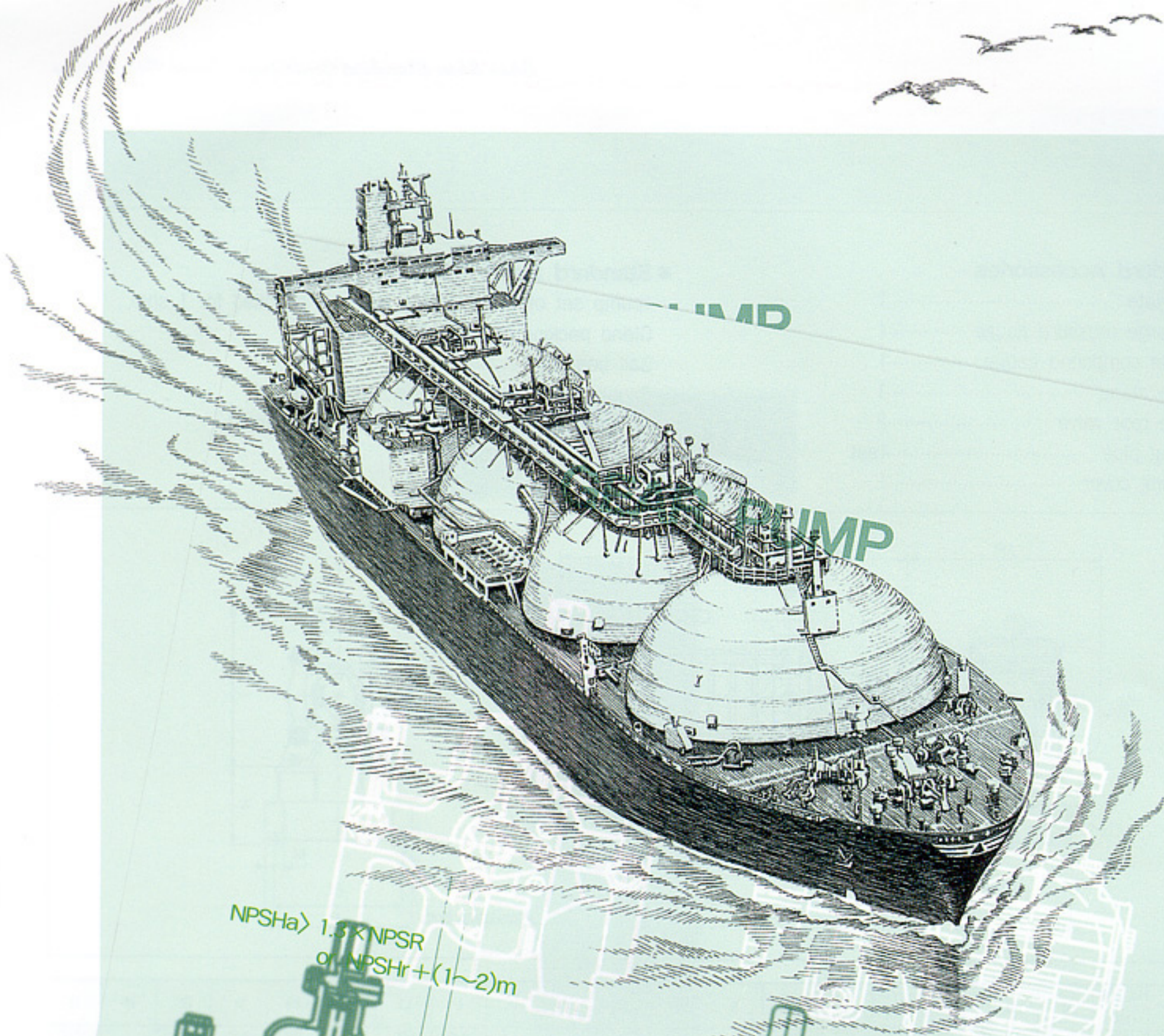
- Baseplate 1
- Discharge pressure gauge1
- Suction compound gauge1
- Gauge stand1
- Gauge root valve2
- Sealing pipe1set
- Coupling cover1

■ Standard Spare Parts

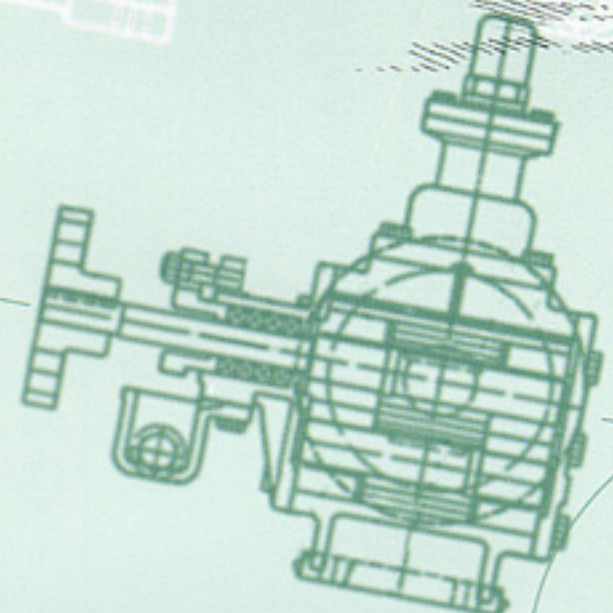
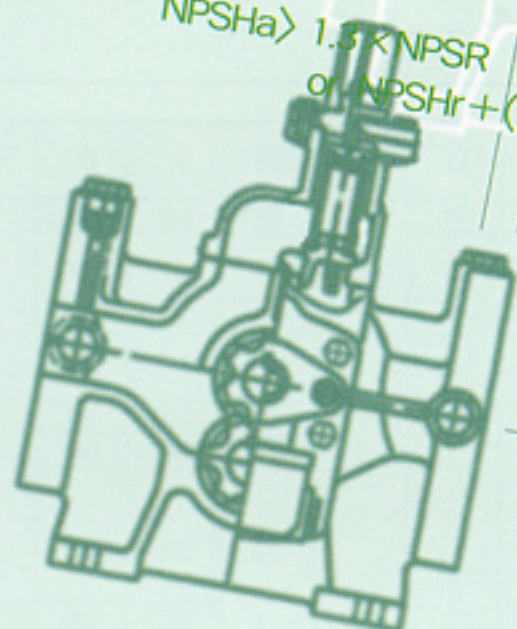
- 1 pump set of the following spare is supplied for 1 ship.
- Gland packing or mechanical seal
- Ball bearing
- Coupling bolt, nut & washer, rubber ring
- Complete set of rotating element(if required)



Type	MOTOR KW	C	D	E	H	I	P	K	R	M	J	V	L	L1	L2	L3	B	B1	N	O				
MB32X4S	3.7	240	175	212	113	302	382	199	100	50	28	90	800	500	-	150	300	265	4	M12				
	5.5				138		444	207					900	560		170	335	290						
	7.5				153		482	217					1000	630		185	375	330						
	11				153		593	273					130	65		30	70	1000			630	185	375	330
5S	5.5	240	215	212	138	302	444	217	100	50	28	110	900	560	-	170	335	290	4	M12				
	7.5				153		482	217					1000	630		185	375	330						
	11				153		593	273					130	65		30	70	1000			630	185	375	330
6S	7.5	240	255	212	153		302	482					217	130		65	30	130			1000	630	-	205
	11				153	593		273	130	65	30	130	1000		630				185	375	330			
	15				173	637		273	130	65	30	130	1120		710				205	375	330			
7S	11	240	295	212	153	302		593	273	130	65	30	150		1120				710	-	400	335		290
	15				173		637	273	130					65	30	150	1120	710	205		375	330		
	19				173		647	297	130					65	30	150	1120	710	205		375	330		
MB40X3S	7.5	270	150	243	140		340	482	217					100	50	28	60	900	560		-	170	335	290
	11				140	593		273	1000	630	185	375	330											
	15				140	637		273	1000	630	185	375	330											
4S	11	270	195	243	140	340		593	273	100	50	28	100					1200	710	-		205	400	355
	15				155		637	277	1200					710	205	400	355							
	19				155		647	297	1200					710	205	400	355							
	22				155		685	297	1200					710	205	400	355							
5S	15	270	240	243	140	340	637	273	100	50	28	120	1200	710	-	205	400	355	6	M16				
	19				180		647	297					1200	710		205	400	355						
	22				180		665	297					1200	710		205	400	355						
	30				205		708	331					1200	710		205	400	355						
6S	15	270	285	243	160	340	637	273	100	50	28	190	1250	900	450	175	425	365	6	M16				
	19				180		647	293					1250	900			450	175			400	340		
	22				180		665	293					1250	900			450	175			425	365		
	30				205		708	331					1250	900			450	175			475	415		
MB65X3S	19	295	195	278	155	405	647	293	130	65	30	160	1250	900	450	175	425	365	6	M16				
	22				175		685	293					1250	900			450	175			475	415		
	30				175		708	331					1250	900			450	175			475	415		
	37				175		747	331					1250	900			450	175			475	415		
4S	30	295	250	278	200	405	708	331	130	65	30	170	1250	900	450	175	475	415	6	M16				
	37				175		747	331					1250	900			450	175			475	415		
	45				175		787	449					1250	900			450	175			530	470		
	55				175		812	449					1250	900			450	175			530	470		
5S	37	295	305	278	200	405	747	331	130	65	30	240	1400	1000	500	200	475	415	6	M16				
	45				200		787	449					1400	1000			500	200			530	470		
	55				200		812	449					1400	1000			500	200			530	470		
	75				230		894	477					1400	1000			500	200			560	500		



$NPSHa > 1.3 \times NPSR$
or $NPSHr + (1 \sim 2)m$



$NPSHa > 1.3 \times NPSR$
or $NPSHr + (1 \sim 2)m$

SHIN SHIN MACHINERY CO.

**STANDARD GEAR PUMP
FOR MARINE**



The following are the basic design and the manufacturing specification for Shin Shin standard gear pumps, particularly for marine use.

■ Standard specification

Description	For model NHG/NLG,NHGH,HG,VG	For model WL
Liquid pumped	Lubricating oil, Fuel Oil(A,B,C Heavy oil) or other lubricative oil	L.O.F.O & Non-lubricative liquid
Temperature	0~70°C	0~80°C
Pressure	NHG,NLG,type up to 6kgf/cm ² NHGH type up to 16kgf/cm ² HG, VG type up to 7kgf/cm ²	up to 7kgf/cm ² (normally under 5.5kgf/cm ²)
NO. of Revolutions (Different by the kind of oil viscosity, temperature, pressure etc)	NHG, NLG, NHGH type less than 400cst 1800rpm less than 500cst 1500rpm less than 1000cst 1000~1200rpm HG,VG type less than 1000cst 900~1200rpm	depending on the size of pump 750~1200rpm
Viscosity	25.8cst(RW,NO.1 100sec) is the lowest allowable viscosity to keep standard Capacity. Allowable range is different by the kind of oil, pressure and rpm, so choose between 5 to 2000 cst.	

■ General procedure to Select

- By the capacity, considering Hz of establish-zone, select type and No. of revolution with a details leaflet.
In case of need to keep the capacity under a condition of viscosity less than 25.8cst, select a bigger size type.
- Select output of motor. In the detail leaflet of each model, referring to performance graph, catch the cross point between pressure line and highest viscosity line, and pick up the output of motor.
These graph's output of motors are calculated supposing pressure is arising with full shutted discharge valve.
- Structure and Measurements.
Designate the seal, Glandpacking or Mechanical seal, and pick out the structure drawings and see the measurements in detail leaflet by pump type and motor output.

■ Structure & Performance

Special Gear Teeth, called "One-Point-Contact Type" originally designed for gear pumps application, therefore, neither cavitation nor noise will arise.

- Relief valve is set together with casing body.
- For model NHG/NLG, NHGH, HG, VG, Bearing Metal are set at the inside of casing and they are self lubricated with shifting oil.
For model WL, Grease lubricated ball bearings are set at the external bearing boxes.
- Flanges

NHG/NLG, HG, VG, WL type	KS or JIS	10kgf/cm ²
NHGH type Suction	KS or JIS	10kgf/cm ²
Discharge	KS or JIS	16kgf/cm ²



4. Capacity of relief valve

Discharge pressure maximum arising value is designed to be less than 132% of designed total pressure, even if the discharge valve is full shutted. But when designed total pressure is less than 5kgf/cm², the pressure arising value should be less than 1.6kgf/cm².

Setting pressure for safety valve

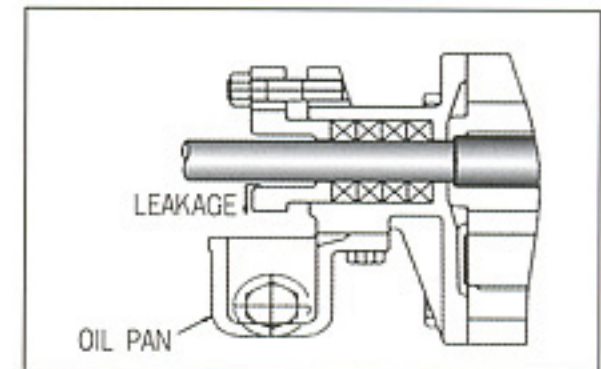
NHG, NLG type	Designed total pressure + 0.2kgf/cm ² (Max. 6.2kgf/cm ² , Min. 2.2kgf/cm ²)
NHGH type	Designed total pressure + 0.5kgf/cm ² (Max. 16.5kgf/cm ² , Min. 8.5kgf/cm ²)
HG, VG type	Designed total pressure + 0.2kgf/cm ² (Max. 7.2kgf/cm ² , Min. 2.2kgf/cm ²)
WL type	Designed total pressure + 0.2kgf/cm ² (Max. 7.2 kgf/cm ² , Min 2.2 kgf/cm ²)

5. Shaft sealing

As standard, gland packing are used, but by the order, the mechanical seal can be fitted only changing a gland case

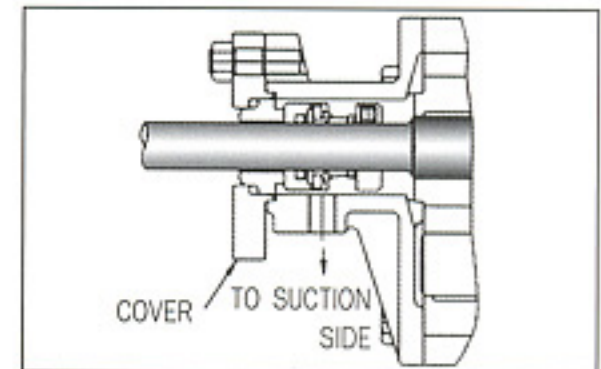
Fitted with gland packing

The leakage passing through the gland packing is drained to oil pan.



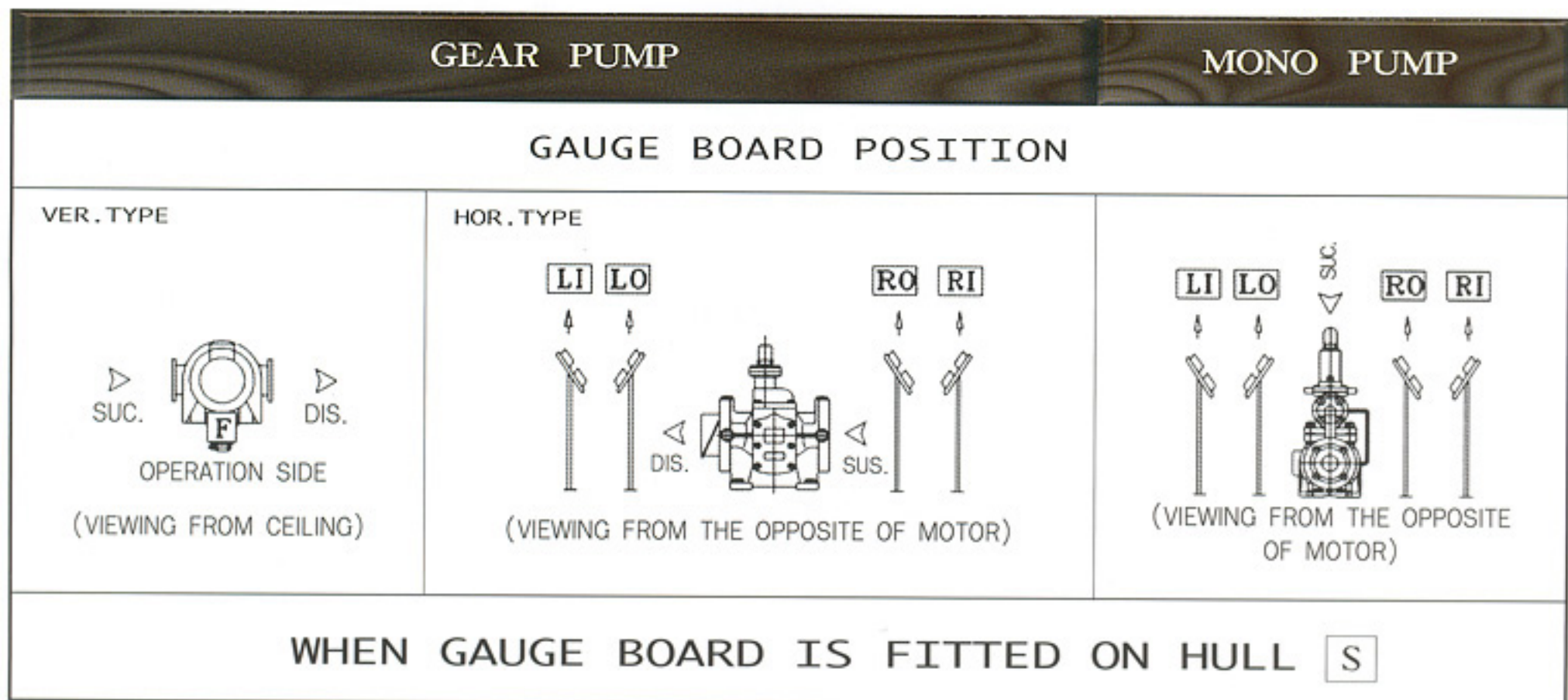
Fitted with mech seal

The reducing pipe is led to suction side in casing from gland case.



Notes • For model VG & WL, the sealing method is described in the detailed contents individually.

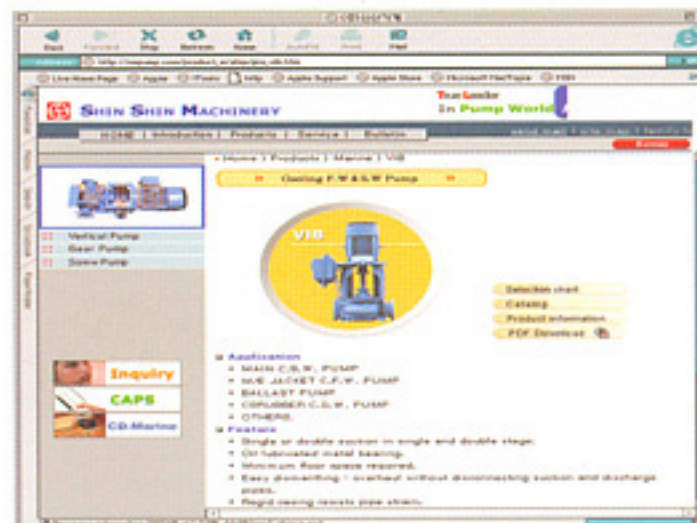
■ Standard Drawing of Gauge Installation





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