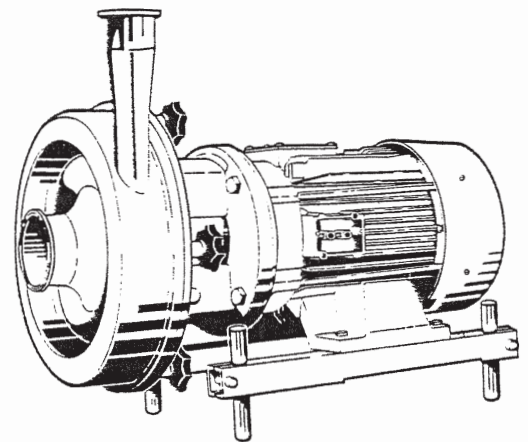
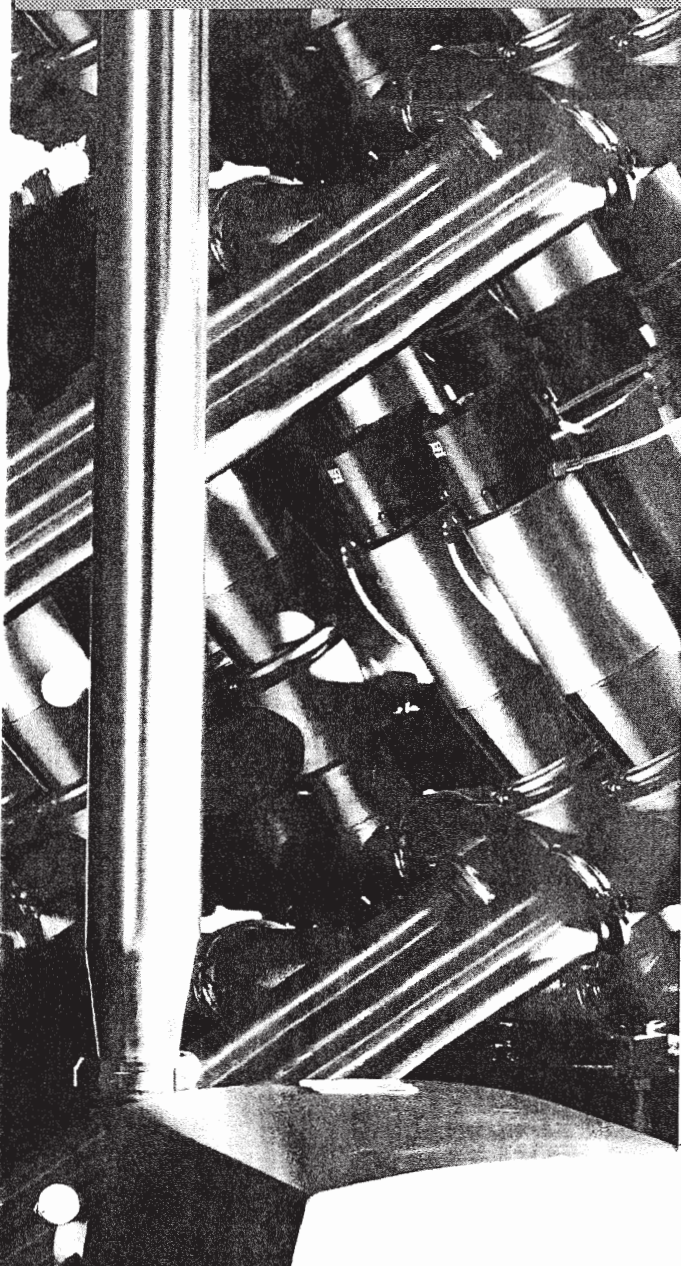


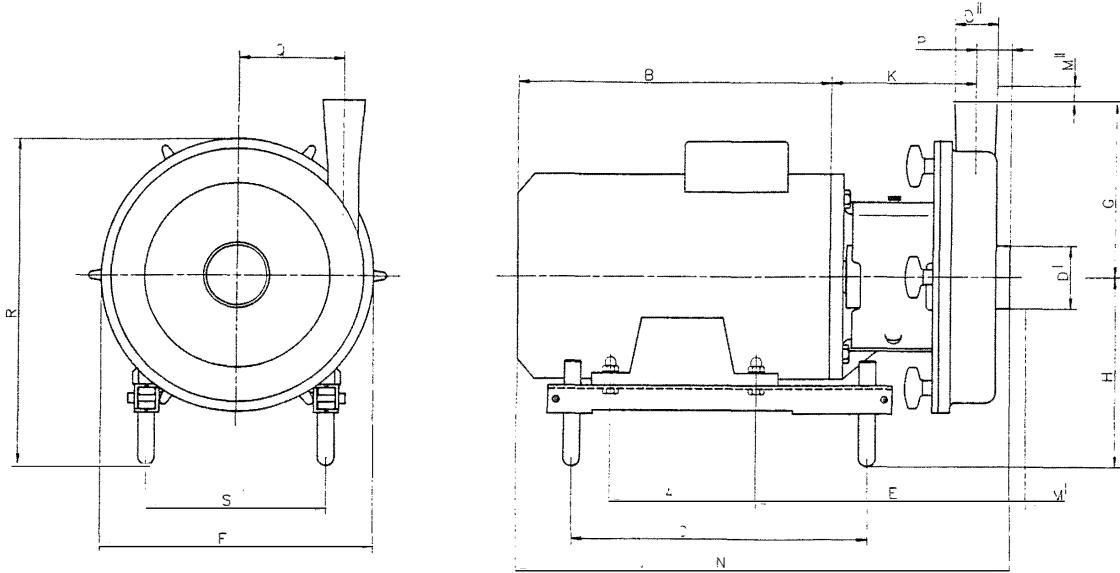
INSTRUCTION  
MANUAL

**CENTRIFUGAL PUMP  
TYPE GHH-10, 20, 30, 40, 50, 60**



IM 70737-E1 USA  
9011

WE RESERVE THE RIGHT TO  
MINOR CHANGES IN DESIGN  
AND FUNCTION



**GHH-10**

DIM	1 ½ Hp 143 TC	2 Hp 145 TC	3 Hp 182 TC	5 Hp 184 TC	7 ½ Hp 213 TC	10 Hp 215 TC
A	4.00	5.00	4.50	5.50	5.5	7.00
B	8.56	9.62	10.75	12.19	13.11	15.16
C	9.53	9.53	12.60	12.60	14.17	14.17
E	8.50	8.50	9.53	9.53	11.02	11.02
F	9.72	9.72	9.72	9.72	9.72	9.72
G	5.59	5.59	5.59	5.59	5.59	5.59
H	7.32	7.32	8.35	8.35	9.09	9.09
K	5.35	5.35	5.87	5.87	6.61	6.61
N	14.84	15.91	17.52	18.98	20.63	22.68
P	0.91	0.91	0.91	0.91	0.91	0.91
Q	3.43	3.43	3.42	3.42	3.43	3.43
R	12.21	12.21	13.19	13.19	13.95	13.95
S	5.51	5.11	7.48	7.48	8.50	8.50

**GHH-20**

DIM	1 ½ Hp 143 TC	2 Hp 145 TC	3 Hp 182 TC	5 Hp 184 TC	7 ½ Hp 213 TC	10 Hp 215 TC
A	4.00	5.00	4.50	5.50	5.50	7.00
B	8.56	9.62	10.75	12.19	13.11	15.16
C	9.53	9.53	12.60	12.60	14.17	14.17
E	8.98	8.98	10.00	10.00	11.50	11.50
F	9.96	9.96	9.96	9.96	9.96	9.96
G	5.59	7.09	7.09	7.09	7.09	7.09
H	7.32	7.32	8.35	8.35	9.09	9.09
K	5.67	5.67	6.18	6.18	6.93	6.93
N	15.44	16.38	18.03	19.49	21.10	23.15
P	1.06	1.06	1.06	1.06	1.06	1.06
Q	3.47	3.47	3.47	3.47	3.47	3.47
R	12.32	12.32	13.31	13.31	14.06	14.06
S	5.51	5.51	7.48	7.48	8.50	8.50

# Dimensions GHH-Pumps

## GHH-30

DIM	7½ Hp 213 TC	10 Hp 215 TC	15 Hp 254 TC	20 Hp 256 TC	25 Hp 284 TS	30 Hp 286 TS
A	5.50	7.00	8.27	10.00	9.49	11.00
B	13.11	15.16	19.50	19.50	19.50	19.50
C	14.17	14.17	19.02	19.02	20.00	20.00
E	13.07	13.07	15.43	15.43	15.43	15.43
F	12.95	12.95	12.95	12.95	12.95	12.95
G	8.35	8.35	8.35	8.35	8.35	8.35
H	9.09	9.09	10.08	10.08	10.91	10.91
K	7.01	7.01	8.03	8.03	8.03	8.03
N	22.67	24.72	30.16	30.16	30.16	30.16
P	2.63	2.63	2.63	2.63	2.63	2.63
Q	4.96	4.96	4.96	4.96	4.96	4.96
R	15.55	15.55	16.58	16.58	17.39	17.39
S	8.50	8.50	10.00	10.00	11.00	11.00

## GHH-40

DIM	7½ Hp 213 TC	10 Hp 215 TC	15 Hp 254 TC	20 Hp 256 TC	25 Hp 284 TS	30 Hp 286 TS
A	5.50	7.00	8.27	10.00	9.49	11.00
B	13.11	15.16	19.50	19.50	19.50	19.50
C	14.17	14.17	19.02	19.02	20.00	20.00
E	11.54	11.54	13.90	13.90	13.90	13.90
F	12.95	12.95	12.95	12.95	12.95	12.95
G	8.35	8.35	8.35	8.35	8.35	8.35
H	9.09	9.09	10.08	10.08	10.91	10.91
K	7.01	7.01	8.03	8.03	8.03	8.03
N	21.14	23.19	28.62	28.62	28.62	28.62
P	1.10	1.10	1.10	1.10	1.10	1.10
Q	4.96	4.96	4.96	4.96	4.96	4.96
R	15.55	15.55	16.58	16.58	17.39	17.39
S	8.50	8.50	10.00	10.00	11.00	11.00

## GHH-50

DIM	7½ Hp 213 TC	10 Hp 215 TC	15 Hp 254 TC	20 Hp 256 TC	25 Hp 284 TS	30 Hp 286 TS
A	5.50	7.00	8.27	10.00	9.49	11.00
B	13.11	15.16	19.50	19.50	19.50	19.50
C	14.17	14.17	19.02	19.02	20.00	20.00
E	12.05	12.05	14.37	14.37	14.37	14.37
F	12.95	12.95	12.95	12.95	12.95	12.95
G	8.07	8.07	8.07	8.07	8.07	8.07
H	9.09	9.09	10.08	10.08	10.91	10.91
K	7.17	7.17	8.27	8.27	8.27	8.27
N	21.61	23.66	26.58	29.13	29.13	29.13
P	1.42	1.42	1.42	1.42	1.42	1.42
Q	4.61	4.61	4.61	4.61	4.61	4.61
R	15.55	15.55	16.58	16.58	17.39	17.39
S	8.50	8.50	10.00	10.00	11.00	11.00

**Connections Sanitary**

**Connections for GHH-10/20/30**

D <sup>I</sup> 2½" D <sup>II</sup> 2"	GC	Bevel Seat	H.line	HDI
M <sup>I</sup>	1.13	2.37	1.00	1.16
M <sup>II</sup>	1.13	2.19	1.00	1.03

**Connections for GHH-40**

D <sup>I</sup> 3" D <sup>II</sup> 2"	GC	Bevel Seat	H.line	HDI
M <sup>I</sup>	1.13	2.63	1.00	1.22
M <sup>II</sup>	1.13	2.19	1.00	1.03

**Connections for GHH-50**

D <sup>I</sup> 4" D <sup>II</sup> 3"	GC	Bevel Seat	H.line	HDI
M <sup>I</sup>	1.13	2.94	1.00	1.34
M <sup>II</sup>	1.13	2.63	1.00	1.22

**Connections Industrial**

**Connections for GHH-10/20/30**

D <sup>I</sup> 2½" D <sup>II</sup> 2"	GC	Bevel Seat	H.line	HDI	MNPT
M <sup>I</sup>	1.13	2.37	1.00	1.16	2.31
M <sup>II</sup>	1.13	2.19	1.00	1.03	1.81

**Connections for GHH-40**

D <sup>I</sup> 3" D <sup>II</sup> 2"	GC	Bevel Seat	H.line	HDI	MNPT
M <sup>I</sup>	1.13	2.63	1.00	1.22	2.50
M <sup>II</sup>	1.13	2.19	1.00	1.03	1.81

**Connections for GHH-50**

D <sup>I</sup> 4" D <sup>II</sup> 3"	GC	Bevel Seat	H.line	HDI	MNPT
M <sup>I</sup>	1.13	2.94	1.00	1.34	2.56
M <sup>II</sup>	1.13	2.63	1.00	1.22	2.50

## Mounting

The pump is delivered as a complete unit; no alignment is required.

The pump should be mounted so that it is easily accessible for maintenance and service.

Check that there is sufficient room for disassembly and assembly and for the installation of the piping.

## Pipe System

Suction and discharge lines should have at least the same diameter as the respective connection. The suction side should have as few elbows as possible. Insure there are not any leaks in the suction lines.

Conical reducers should be used when line size differs from pump connections. Use eccentric, conical reducers with the straight side up on suction lines.

## Lines - Connections

Install the pump so that the liquid enters the pump through the front connection (suction branch) and leaves through the top connection (discharge branch).

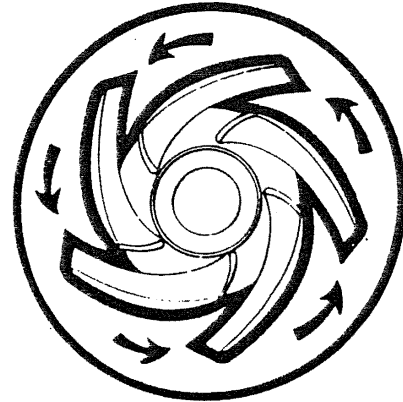
***Install the pump so that it does not suck in air.***

The lines should be installed properly so that there is no strain on the pump casing when the connections are tightened.

The lines should be installed so that they do not cause any strain on the pump casing because of their thermal expansion.

Line vibrations, thermal expansion of straight lines, welding close to the pump or abnormal strain caused by someone standing on the lines can all cause damage to the pump casing.

***G/H Products Corp. cannot be held responsible for damage due to improper installation by the customer.***



## Moving The Pump

The shroud, if fitted, should be removed before the pump is lifted or moved.

## Pre-Start Up Checklist

1. Disassemble pump casing and impeller.
2. Start and stop the motor quickly and check the direction of rotation.  
  
The correct direction of rotation is counter clockwise as seen from the inlet side.
3. Thread on the impeller and hand tighten it until there is metal-to-metal contact between the impeller and the stop on the shaft.
4. Mount the casing again and hand tighten the wing nuts firmly.

### **Note:**

***The pump should not under any circumstance be started in the wrong direction of rotation with the impeller installed. If so, the pump may be severely damaged or cause serious injuries.***

## Maintenance

Shaft seal and rubber O-rings are normally the only parts which require maintenance.

We recommend that the above mentioned parts are checked after each twelve (12) month period of one-shift operation.

### Note:

Twelve months are valid for ideal conditions. For more demanding conditions the inspections should be carried out at shorter intervals.

## Shaft Seal

The shaft seal is the most sensitive part in the pump. It is very difficult to state a normal operating time as this depends on the liquid to be pumped, operating temperature, abrasive particles, etc. Experience during operation should consequently indicate the required service intervals.

***The seal should not drip during operation, if it is in good condition.***

Normally the entire shaft seal should be replaced if the seal leaks due to wear.

***Always keep spare shaft seals in stock.***

Shaft seals: see **Parts List**

## Rubber O-rings

The O-ring for the pump casing may take a set after a period of time so that it does not seal. If swelling occurs, this indicates that a wrong rubber material has probably been used. The casing O-ring should then be replaced by an O-ring of a proper elastomer.

See also Table in **Operating Instructions**.

If the pump is equipped with an impeller retaining bolt, the O-ring on the front side of the impeller should be checked carefully after dismantling and, if necessary, replaced. (Lubricate the O-ring with silicone grease or silicone oil before assembly).

***Always keep spare O-rings in stock.***

## Motors

The motors do not require lubrication. The bearings are sealed and permanently lubricated and should be replaced when they become worn.

Pump disassembly: See **Assembly And Disassembly**.

# Operating Instructions

## Starting

Never throttle the suction side of the pump. The flow should always be regulated by means of throttling on the discharge side of the pump, by reducing the impeller diameter or by means of speed control.

## Liquid Temperatures

The standard pump with EPDM O-rings can be used for liquid temperatures up to 285°F. Temperature ranges for optional O-rings are as follow: Nitrile - +195°F and FPM - +285°F. A single-flushed shaft seal or a double-flushed mechanical seal is recommended for temperatures exceeding +230°F.

***The pump should not be run dry as this will decrease the shaft seal life.***

## Inlet Pressure

Max inlet pressure: 60 PSI

## Outlet Pressure

Maximum outlet pressure: 125 PSI. (The outlet pressure = the pressure increase in the pump + the inlet pressure.)

## Single-flushed Shaft Seal

Connections: BSP 1/8" delivered with stainless steel nipple and adaptor to 1/4" plastic tubing.

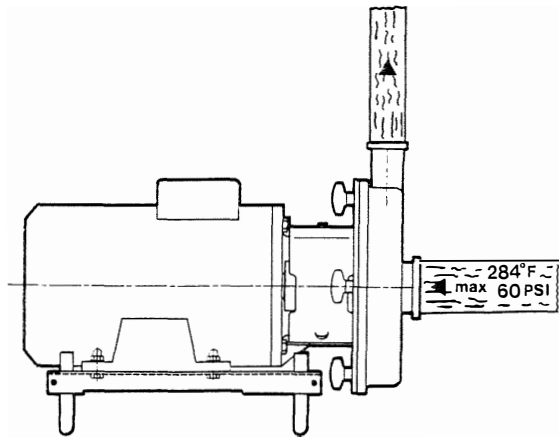
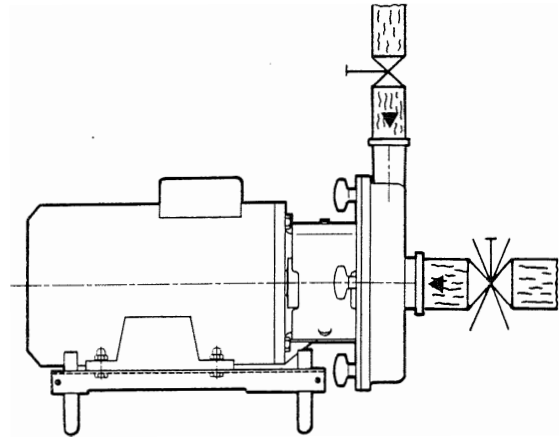
## Water

Water consumption: approximately 1/4 - 1/2 os/min. Water pressure: maximum 15 PSI above the inlet pressure of the pump.

## Steam

The steam must be moist and the pressure must not exceed the atmospheric pressure corresponding to a temperature of 212°F.

***Water and steam supplies should be regulated at the inlet side of the seal.***



## Cavitation

There is a risk for cavitation if the inlet pressure to the pump is low, particularly if the liquid temperature is high.

The pump is made of corrosion resistant stainless steel and is therefore very resistant to damage by cavitation with non-corrosive liquids. However, the outlet pressure will drop, sometimes to zero, during strong cavitation. The noise level of the pump may increase. Severe conditions of cavitation can cause erosion damage to wetted parts of the pump and bearing damage to the motor.

### Rubber Materials

O-rings of different materials are available. The Table below indicates the ranges of application for the packing materials.

***Concentration, temperature, etc. can affect the rubber considerably. The table only states guide values.***

**When in doubt, please contact G/H Products Corp.**

### Motor (NEMA)

Should it be necessary to replace the motor, in most cases this can be done without replacing any other parts if the motor meets the demands of the standard.

It is important to check the direction of rotation (counter clockwise) if the electric motor has been replaced or repaired. This should be done with as short a start as possible.

See **Pre-Startup Checklist** before starting the pump.

### Overload

The performance curves\* are valid for pumping of liquids with the density and viscosity of water. The power will increase when liquids with higher density and/or viscosity are pumped. The motor may then be overloaded.

Pumps for certain duties are fitted with motors which are not large enough for the entire capacity range of the pump. The motor may become overloaded if the pressure after the pump is lowered; the capacity therefore increases. The power consumption must be checked when the operating conditions are altered. This can be done by measuring the current to the motor and comparing it with the rated current on the motor plate or by means of the pump performance curves.

The capacity, and the power consumption, can be limited by reducing the impeller diameter, restricting the pump discharge, or reducing pump speed with a speed controller.

\* Pump performance curves can be ordered separately.

Rubber type	Weather ozone	Milk Cream	Hot water Steam Weak acids Alkali	Strong and oxidizing acids	Petrol oil,fats (not milk and cream)	Solvents
EPDM (stand)	Excellent	Good	Excellent	Good	Bad	Bad (Good for acetone and alcohols only)
Nitrile	Not satisfactory	Good	Good	Not satisfactory	Good	Bad
Viton	Excellent	Good	Excellent*	Good	Good	Good (EPDM for acetone and alcohols)
PTFE	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

\* Except steam, water >175°F, and sodium hydroxide (NaOH).





## Seal Selection

The pumps can be fitted with three types of mechanical shaft seals:

- Single seal
- Single - flushed seal
- Double - flushed seals

Rubber grades: - EPDM (alt. NITRILE and VITON®)

Product	Seal alternatives		
	Single seal	Single-Flushed	Double-flushed
Alcohol, methyl	x		
Alcohol, ethyl	x		
Alcohol, butyl	x		
Animal fats or oil < 195°F	x 1)		
Beer	x		
Brine (NaCl) < 5%	x		
Brine saturated	x		
Cider	x		
Coffee diluted	x		
Cream < 175°F	x		
Cream < 285°F		x 1)	x 1)
Deodorants, liquid	x 2)		
Fruit juices	x 1)		
Glycerine	x		
Ice cream mix	x	x	x
Mineral oil	x		
Milk < 175°F	x		
Milk < 285°F		x 2)	x 2)
Nitric Acid < 2%	x 2)		
Sodium Hydroxid < 2%	x		
Soft drink syrup	x 2)		
Soup, low concentrations	x 1)		
Starch	x 3)	x	x
Steam < 285°F	x 2)	x 2)	x 2)
Sugar, liquid < 10%	x		
Sugar, liquid > 10%		x	x
Vegetable juice	x 1)		
Vegetable oil	x 1)		
Vinegar	x 2)		
Water	x 2)		
Whey < 175°F	x		
Whey < 285°F	x 2)	x	x
Wine	x		
Wort		x 1)	x 1)

Viton not suitable in connection with steam.

- 1) Order with Viton
- 2) Order with EPDM
- 3) Order with Silicone Carbide
- 4) Specify double-flushed seals for same duty service as single-flushed seal and where flushing pressure required exceeds 80 PSI



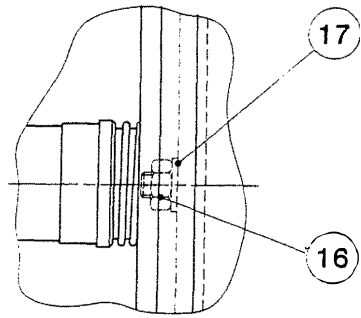
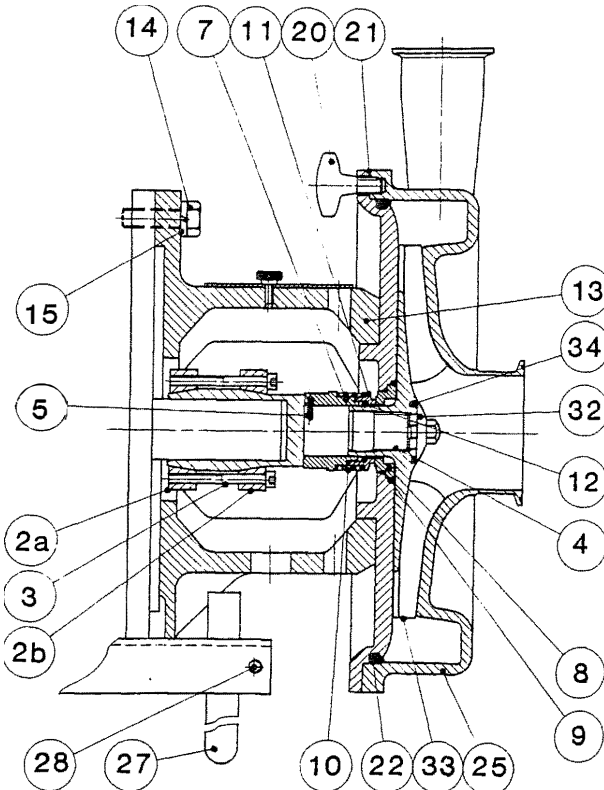
## Single Shaft Seal

### Assembly

**Note:** Lubricate all O-rings with food grade silicone grease or oil before assembly. Mineral oil or grease will damage EPDM rubber.

Nitrile should be specified when Petroleum based lubricants are used on O-rings.

1. Fit compression rings (2a) and (2b) on stub shaft (4). Fit screws (3) with heads away from motor end.
2. Fit stub shaft on motor shaft so that the distance between end of shaft and motor flange is 3/8" - 3/4".
3. Tighten screws (3) evenly but no more than to allow the stub shaft to be moved on motor shaft by knocking gently with a plastic hammer.
4. Fit adapter (13) on the motor using bolts (14) and lock washers (15).
5. Fit back plate (21) on adapter (13) using washers (17) and nuts (16) and tighten.
6. Screw impeller (33) fully onto stub shaft.
7. Knock gently with a plastic hammer on impeller to move stub shaft further onto motor shaft until the distance between impeller and back plate is 0.02". Check distance with a feeler gauge or 0.02" foil.



Mounting of back-plate to adaptor.

## Assembly And Disassembly

### Single Shaft Seal

#### Assembly (cont.)

8. Remove impeller and back plate and tighten screws (3) firmly and evenly to 132 in-lbs (14 ft-lbs) using a torque wrench.
9. Mount O-ring (9) on stationary seal ring (8).
10. Screw stationary seal ring into the back plate (left hand thread) using the spanner delivered with the pump, and tighten firmly.
11. Mount drive ring on the stub shaft so that the drive pin (5) on the shaft enters the notch in the drive ring.
12. Fit O-ring (12) in the rotating seal ring (11) as far as possible away from the seal face, and fit this in the spring (10).
13. Mount spring and rotating seal ring on the drive ring.
14. Pre-fit the rotating seal ring with spring into place so that the driver on the drive ring is located in the notch on the rotating seal. Release this assembly carefully so that alignment is maintained.
15. Push back plate (21) carefully with stationary seal ring over the shaft on which other seal parts are already mounted. Fit washers (17) and nuts (16) and tighten.
16. Screw impeller (33) onto stub shaft. Fit impeller retaining bolt (32), if used. Remember to install O-ring (34) into O-ring groove on face of impeller (33).
17. Install safety shield over adaptor (13) and secure using thumb screw.
18. Fit O-ring (22) on back plate.
19. Fit pump casing (25) on back plate and tighten wing nuts (20) finger tight so that there is metal-to-metal contact between casing and back plate.

**Note:** Be very careful that the driver on the driving ring enters the notch in the rotating seal ring.

**Note:** The notch in the rotating seal ring must be exactly opposite to the driver on the drive ring. Otherwise, the seal ring may break during continued assembly.



## Replacement Of Single Shaft Seal

**Note:** Lubricate all O-rings with food grade silicone grease or oil before assembly. Mineral oil or grease will damage EPDM rubber.

Nitrile should be specified when Petroleum based lubricants are used on O-rings

1. Remove wing nuts (20) and dismount casing.
2. Remove safety shield.
3. Remove impeller retaining nut (32), if supplied with pump.
4. Hold stub shaft with one hand and knock gently on impeller vanes with plastic hammer counter clockwise to loosen impeller. Remove impeller (33).
5. Remove nuts (16) and washers on adapter (13) and pull off back plate.
6. Remove rotating seal, O-ring, and spring.
7. Fit O-ring (15) inside the new rotating seal ring (17). Replace rotating seal ring. Make sure that the driver in the driving ring is directly opposite the notch in the seal ring and check that the spring (18) is correctly positioned.
8. Unscrew the stationary seal ring (8) in the back plate (left hand thread) with the tool delivered with the pump.
9. Fit O-ring (9) on the new stationary seal ring (8) and screw it into back plate.
10. Carefully push back plate (21) with stationary seal ring over the shaft on which other seal parts are already mounted. Fit washers (17) and nuts (16) and tighten.

**Note:** Be very careful that the driver on the driving ring enters the notch in the rotating seal ring.

11. Screw impeller (33) onto stub shaft. Fit impeller retaining bolt (32), if used. Remember to install O-ring (34) into O-ring groove on face of impeller.
12. Fit O-ring (22) on back plate.
13. Fit pump casing (25) on back plate and tighten wing nuts (20) finger tight so that there is metal-to-metal contact between casing and back plate.
14. Install safety shield over adaptor and secure using thumb screw.

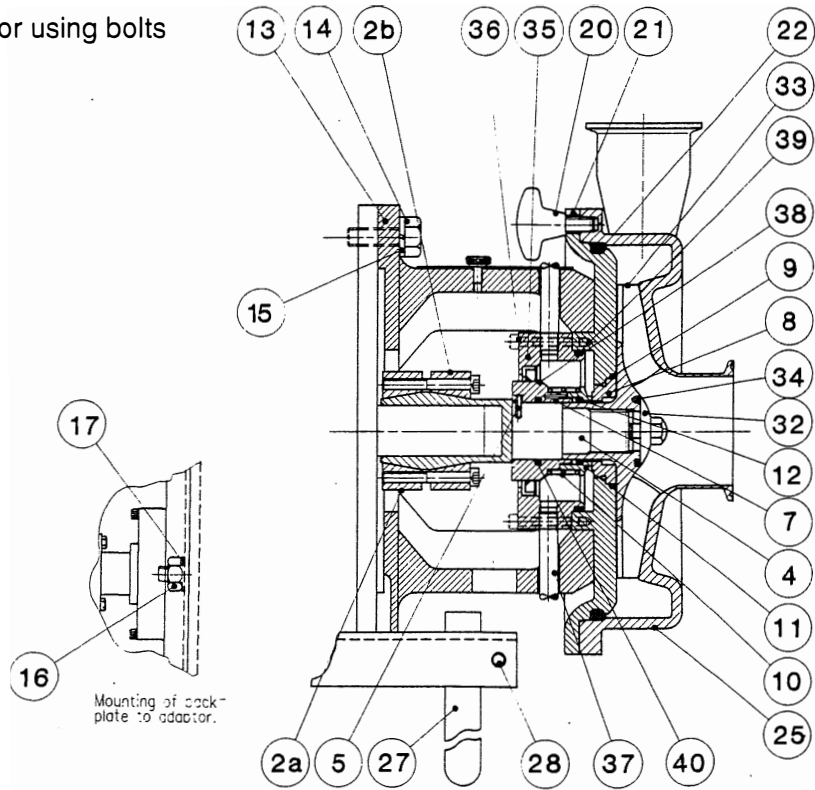
## Single-Flushed Shaft Seal

### Assembly

**Note:** Lubricate all O-rings with food grade silicone grease or oil before assembly. Mineral oil or grease will damage EPDM rubber.

Nitrile should be specified when Petroleum based lubricants are used on O-rings

1. Fit compression rings (2a) and (2b) on stub shaft (4). Fit screws (3) with heads away from motor end.
2. Fit stub shaft on motor shaft so that the distance between end of shaft and motor flange is 3/8" - 3/4".
3. Tighten screws (3) evenly, but no more than to allow the stub shaft to be moved on the motor shaft by knocking it gently with a plastic hammer.
4. Fit adapter (13) on the motor using bolts (14) and washers (15).
5. Fit back plate (21) on adapter (13), using washers (17) and nuts (16) and tighten.
6. Screw impeller (33) fully onto stub shaft.
7. By knocking gently with a plastic hammer on impeller move, stub shaft further onto motor shaft until the distance between impeller and back plate is 0.02". Check distance with a feeler gauge or 0.02" foil.
8. Remove impeller and back plate and tighten screws (3) firmly and evenly to 132 in-lbs (11ft-lbs) using a torque wrench.
9. Mount O-ring (9) on stationary seal ring (8).
10. Screw stationary seal ring into the back plate (left hand thread) using the spanner delivered with the pump, and tighten firmly.



## Single-Flushed Shaft Seal

### Assembly (cont.)

11. Fit lip seal (38) in seal housing (35) observing the direction of the lip. The lip seal must be facing the internal portion of the seal housing. Press the lip seal and knock into position by using a suitable tool, e.g. a piece of pipe, of proper diameter. Be careful not to damage the lip seal.
  12. Mount seal housing (35) with O-ring (39) on the back plate and fasten screws (36).
- Note:** One of the flushing liquid connections should point downwards (see fig.)
13. Fit O-ring (40) in drive ring (7). Mount drive ring on the stub shaft so that drive pin (5) on the shaft enters the notch in the drive ring.
  14. Fit O-ring (12) in the rotating seal ring (11) as far away as possible from the seal face, and fit this in spring (10).
  15. Mount spring and rotating seal ring on the drive ring.
  16. Prefit the rotating seal ring with spring into place so that the driver on the drive ring is located in the notch in the rotating seal. Release this assembly carefully so that alignment is maintained.
- Note:** The notch in the rotating seal ring must be exactly opposite to the driver on the drive ring. Otherwise, the seal ring may break during the continued assembly.
17. Fit back plate (21) with seal housing and stationary seal ring on adapter (13). Be careful when the lip seal is pushed over the shaft on which the other seal parts are mounted.
- Note:** Be very careful that the driver on the driving ring enters the notch in the rotating seal ring.
18. Secure with washers (17) and nuts (16). Tighten.
  19. Screw impeller (33) onto stub shaft. Fit impeller retaining bolt (32), if used. Remember to install O-ring (34) into O-ring groove on the face of the impeller (33).
  20. Install safety shield over adaptor (13) using thumb screw.
  21. Fit O-ring (22) on back plate.
  22. Fit pump casing (25) on back plate and hand tighten wing nuts (20) finger tight so that there is metal-to-metal contact between casing and back plate.
  23. Fit and tighten tubes (37).
- Note:** Connect the flushing liquid inlet to the lower connection.

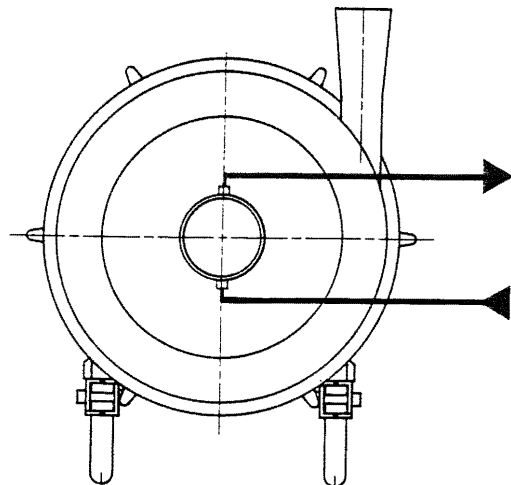
## Single-Flushed Shaft Seal

### Replacement Of Primary Shaft Seal

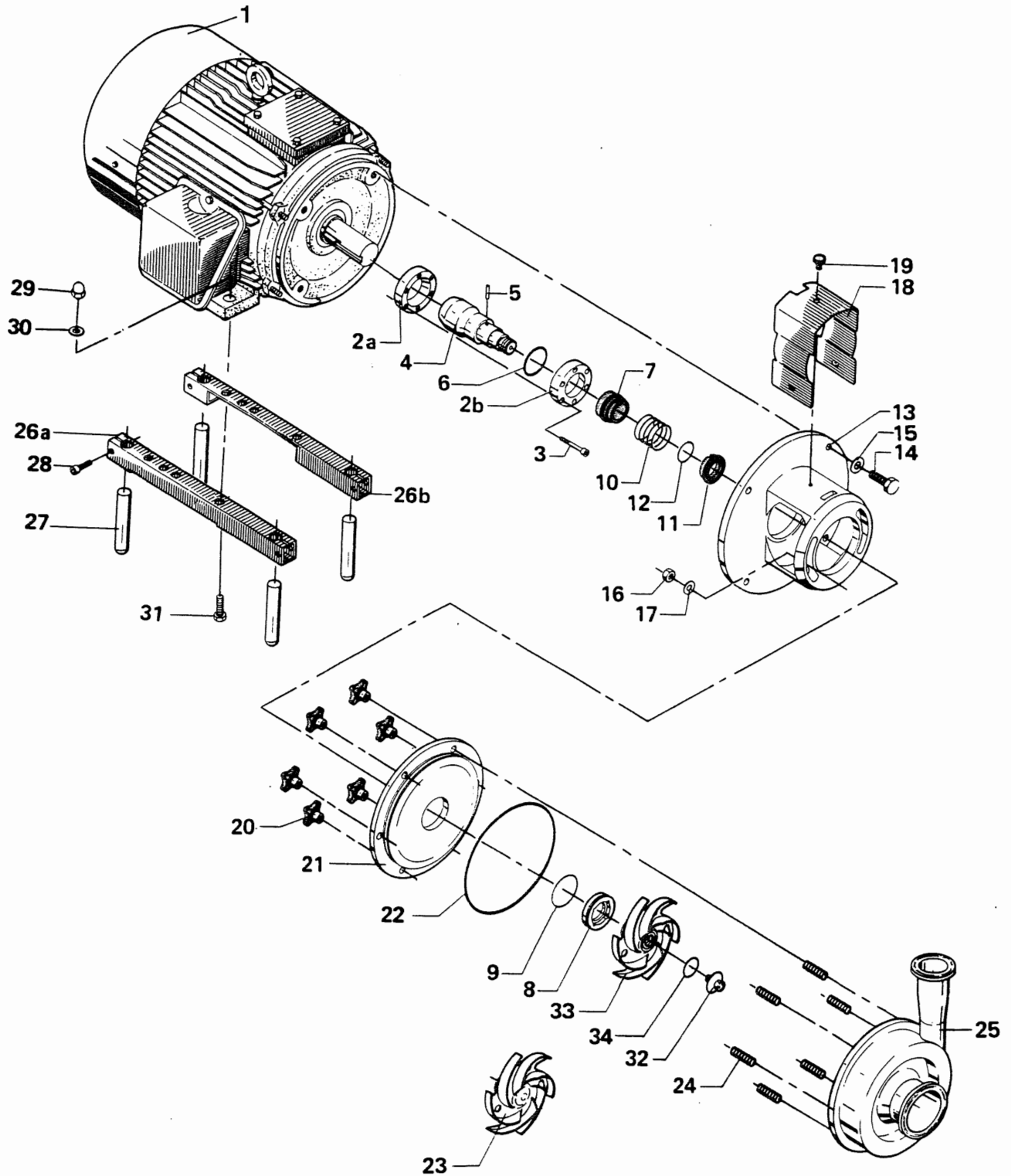
**Note:** Lubricate all O-rings with food grade silicone grease or oil before assembly. Mineral oil or grease will damage EPDM rubber.

Nitrile should be specified when Petroleum based lubricants are used on O-rings

1. Remove wing nuts (20) and dismount casing.
  2. Remove safety shield.
  3. Remove impeller retaining nut (33), if supplied with pump.
  4. Hold stub shaft and knock gently on impeller vanes counter clockwise with plastic hammer to loosen impeller. Remove impeller.
  5. Remove nuts (16) and washers (17) in adapter (3) and pull off back plate.
  6. Remove rotating seal, O-ring, and spring.
  7. Fit O-ring (12) inside the new rotating seal ring (11). Replace rotating seal ring. Make sure that the driver in the driving ring is directly opposite the notch in the seal ring and check that the spring (10) is correctly positioned.
  8. Unscrew the stationary seal ring (8) in the back plate (left hand thread) using the spanner delivered with the pump.
  9. Fit O-ring (9) on the new stationary seal ring (8) and screw it into back plate.
  10. Carefully push back plate with seal housing and stationary seal ring over the shaft with seal parts.
- Note:** Be very careful that the driver on the driving ring enters the notch in the rotating seal ring.
11. Fit back plate (21) on adapter (13). Secure with washers (17) and nuts (16) and tighten.
  12. Screw impeller (33) onto stub shaft. Fit impeller retaining bolt, if used. Remember to install O-ring into O-ring groove on face of impeller.
  13. Fit O-ring (22) on back plate.
  14. Fit pump casing (25) on back plate and tighten wing nuts (20) finger tight so that there is metal-to-metal contact between casing and back plate.
  15. Fit and tighten tubes (37).



# Centrifugal Pump, Type GHH-10 Single Shaft Seal



CSI

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Pos.	Qty.	Denomination	1½Hp	2 Hp	3 Hp	5 Hp	7½Hp	10 Hp
1	1	Motor .....	143 TC	145 TC	182 TC	184 TC	213 TC	215 TC
2a	1	Compression ring with thread .....	9612-1336-01	9612-1336-01	9612-1336-02	9612-1336-02	9612-1336-06	9612-1336-06
2b	1	Compression ring without thread .....	9612-1337-01	9612-1337-01	9612-1337-02	9612-1337-02	9612-1337-06	9612-1337-06
3	6	Screw .....	9611-99-2032	9611-99-2032	9611-99-2032	9611-99-2032	9611-99-2338	9611-99-2338
4	1	Shaft, inc. pos. 5 .....			9612-1331-02	9612-1331-02	9612-1332-02	9612-1332-02
	1	Shaft, inc. pos. 5 + 6 .....	9612-1330-02	9612-1330-02				
5	1	Connex pin .....	9611-99-0622	9611-99-0622	9611-99-0622	9611-99-0622	9611-99-0622	9611-99-0622
6	1	Retaining ring .....	9611-99-2307	9611-99-2307				
7	1	Drive ring .....	9612-1377-01	9612-1377-01	9612-1377-01	9612-1377-01	9612-1377-01	9612-1377-01
13	1	Adaptor .....	9612-1298-01	9612-1298-01	9612-1345-01	9612-1345-01	9612-1346-01	9612-1346-01
14	4	Screw for adaptor .....	2210942	2210942	2210948-34	2210948-34	2210948-34	2210948-34
15	4	Washer for adaptor .....	41381	41381	223107-22	223107-22	223107-22	223107-22
16	2	Nut .....	9611-99-0353	9611-99-0353	9611-99-0353	9611-99-0353	9611-99-0353	9611-99-0353
17	2	Washer .....	9611-99-0786	9611-99-0786	9611-99-0786	9611-99-0786	9611-99-0786	9611-99-0786
18	1	Safety shield .....	9612-1297-02	9612-1297-02	9612-1311-09	9612-1311-09	9612-1311-10	9612-1311-10
19	1	Screw for safety shield .....	31460-1309-1	31460-1309-1	31460-1309-1	31460-1309-1	31460-1309-1	31460-1309-1
20	6	Handle .....	9611-99-2302	9611-99-2302	9611-99-2302	9611-99-2302	9611-99-2302	9611-99-2302
21	1	Backplate .....	9612-1384-16	9612-1384-16	9612-1384-16	9612-1384-16	9612-1384-16	9612-1384-16
22	1	Joint ring, EPDM, (std.) .....	9611-99-2137	9611-99-2137	9611-99-2137	9611-99-2137	9611-99-2137	9611-99-2137
	1	Joint ring, NBR .....	9611-99-2139	9611-99-2139	9611-99-2139	9611-99-2139	9611-99-2139	9611-99-2139
	1	Joint ring, FPM .....	9611-99-2138	9611-99-2138	9611-99-2138	9611-99-2138	9611-99-2138	9611-99-2138
	1	Joint ring, PTFE .....	9611-99-2140	9611-99-2140	9611-99-2140	9611-99-2140	9611-99-2140	9611-99-2140
24	6	Bolt .....	9611-99-2168	9611-99-2168	9611-99-2168	9611-99-2168	9611-99-2168	9611-99-2168
25	1	Pump casing, GC .....	9612-1288-01	9612-1288-01	9612-1288-01	9612-1288-01	9612-1288-01	9612-1288-01
	1	Pump casing, bev. seat .....	9612-1288-02	9612-1288-02	9612-1288-02	9612-1288-02	9612-1288-02	9612-1288-02
	1	Pump casing, H-line .....	9612-1288-03	9612-1288-03	9612-1288-03	9612-1288-03	9612-1288-03	9612-1288-03
	1	Pump casing, HDI .....	9612-1288-04	9612-1288-04	9612-1288-04	9612-1288-04	9612-1288-04	9612-1288-04
32	1	Impeller screw .....	9612-1396-03	9612-1396-03	9612-1396-03	9612-1396-03	9612-1396-03	9612-1396-03
33	1	Impeller .....	9612-1312-06	9612-1312-06	9612-1312-06	9612-1312-06	9612-1312-06	9612-1312-06
34	1	O-ring EPDM .....	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145
	1	O-ring NBR .....	9611-99-2147	9611-99-2147	9611-99-2147	9611-99-2147	9611-99-2147	9611-99-2147
	1	O-ring FPM .....	9611-99-2146	9611-99-2146	9611-99-2146	9611-99-2146	9611-99-2146	9611-99-2146
	1	O-ring PTFE .....	9611-99-2148	9611-99-2148	9611-99-2148	9611-99-2148	9611-99-2148	9611-99-2148
<b>Alternatives</b>								
23	1	Impeller .....	9612-1312-05	9612-1312-05	9612-1312-05	9612-1312-05	9612-1312-05	9612-1312-05
<b>Legs</b>								
26a	1	Support bar, right .....	31460-1287-6	31460-1287-6	31460-1287-5	31460-1287-5	31460-1287-2	31460-1287-2
26b	1	Support bar, left .....	31460-1288-6	31460-1288-6	31460-1288-5	31460-1288-5	31460-1288-2	31460-1288-2
27	4	Leg .....	31460-1018-1	31460-1018-1	31460-1018-1	31460-1018-1	31460-1018-1	31460-1018-1
28	4	Screw .....	9611-99-1907	9611-99-1907	9611-99-1907	9611-99-1907	9611-99-1907	9611-99-1907
29	4	Acorn cap nut .....	221851-14	221851-14	221851-11	221851-11	221851-11	221851-11
30	4	Spring washer .....	41381	41381	223107-21	223107-21	223107-21	223107-21
31	4	Screw .....	9611-99-1910	9611-99-1910	9611-99-1911	9611-99-1911	9611-99-1911	9611-99-1911
<b>Accessories</b>								
	1	Tool compl. ....	9612-1371-01					

\* Not shown



# Centrifugal Pump, Type GHH-10 Single Shaft Seal

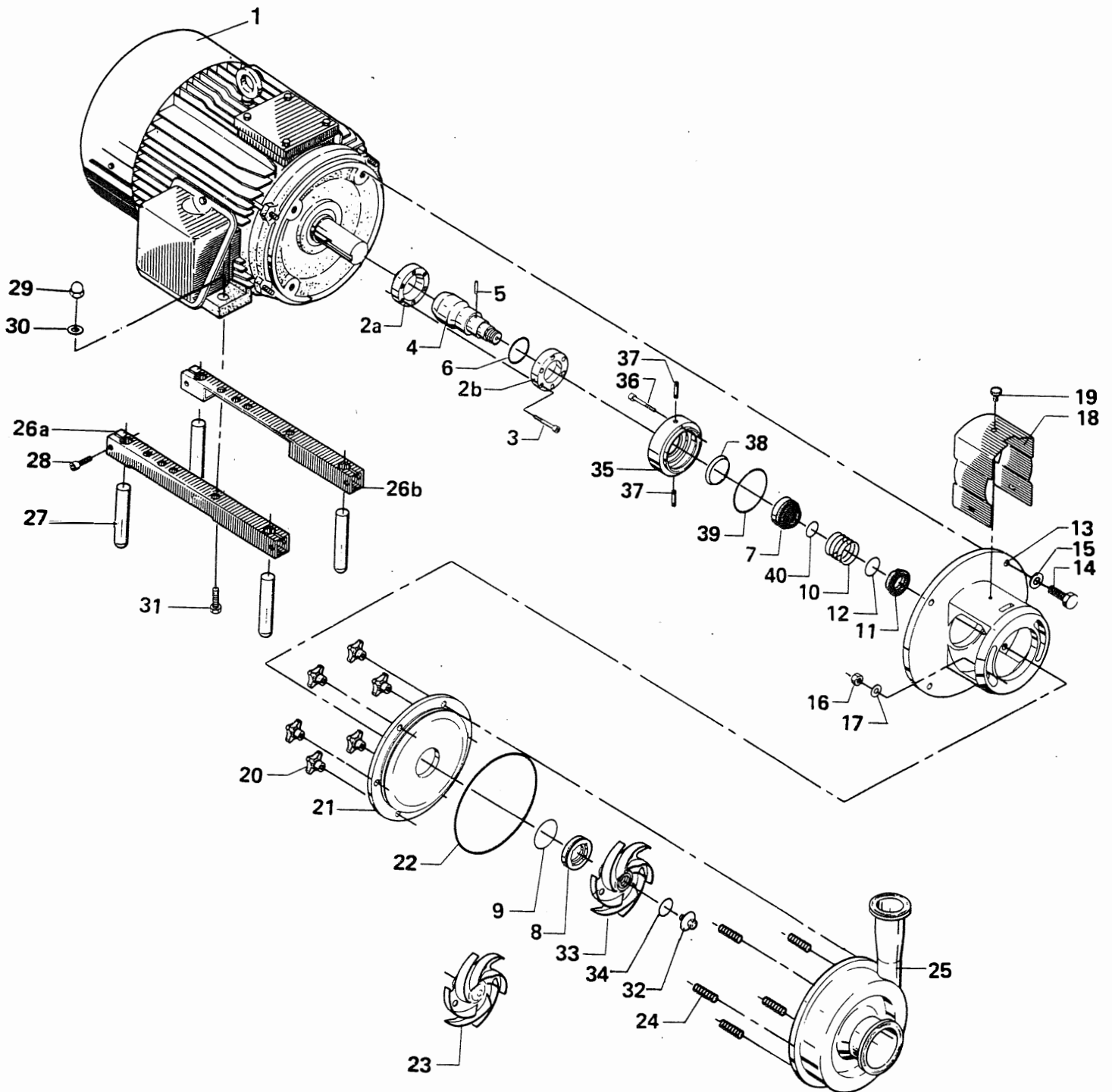
Pos.	Qty.	Denomination	
Shaft seal compl. EPDM (std.) ..... 9612-1296-01			
8	1	Stationary seal ring, ..... stainless steel	9612-1378-01
9	1	O-ring, EPDM .....	9611-99-2149
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, EPDM .....	9611-99-2145
Shaft seal compl. NBR ..... 9612-1296-02			
8	1	Stationary seal ring, ..... stainless steel	9612-1378-01
9	1	O-ring, NBR .....	9611-99-2151
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, NBR .....	9611-99-2147
Shaft seal compl. FPM ..... 9612-1296-03			
8	1	Stationary seal ring, ..... stainless steel	9612-1378-01
9	1	O-ring, FPM .....	9611-99-2150
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, FPM .....	9611-99-2146
Shaft seal compl. PTFE ..... 9612-1296-04			
8	1	Stationary seal ring, ..... stainless steel	9612-1378-01
9	1	O-ring, PTFE .....	9611-99-2152
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, PTFE .....	9611-99-2148
<b>Alternatives</b>			
Shaft seal compl. EPDM ..... 9612-1296-05			
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, EPDM .....	9611-99-2149
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, EPDM .....	9611-99-2145
Shaft seal compl. NBR ..... 9612-1296-06			
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, NBR .....	9611-99-2151
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, NBR .....	9611-99-2147
Shaft seal compl. FPM ..... 9612-1296-07			
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, FPM .....	9611-99-2150
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, FPM .....	9611-99-2146
Shaft seal compl. PTFE ..... 9612-1296-08			
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, PTFE .....	9611-99-2152
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, PTFE .....	9611-99-2148



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# Centrifugal Pump, Type GHH-10 Single - Flused Shaft Seal



Pos.	Qty.	Denomination	1½Hp	2 Hp	3 Hp	5 Hp	7½Hp	10 Hp
1	1	Motor .....	143 TC	145 TC	182 TC	184 TC	213 TC	215 TC
2a	1	Compression ring with thread .....	9612-1336-01	9612-1336-01	9612-1336-02	9612-1336-02	9612-1336-06	9612-1336-06
2b	1	Compression ring without thread ....	9612-1337-01	9612-1337-01	9612-1337-02	9612-1337-02	9612-1337-06	9612-1337-06
3	6	Screw .....	9611-99-2032	9611-99-2032	9611-99-2032	9611-99-2032	9611-99-2338	9611-99-2338
4	1	Shaft, inc. pos. 5 .....			9612-1331-02	9612-1331-02	9612-1332-02	9612-1332-02
	1	Shaft, inc. pos. 5 + 6 .....	9612-1330-02	9612-1330-02				
5	1	Connex pin .....	9611-99-0622	9611-99-0622	9611-99-0622	9611-99-0622	9611-99-0622	9611-99-0622
6	1	Retaining ring .....	9611-99-2307	9611-99-2307				
7	1	Drive ring .....	9612-1397-01	9612-1397-01	9612-1397-01	9612-1397-01	9612-1397-01	9612-1397-01
13	1	Adaptor .....	9612-1298-01	9612-1298-01	9612-1345-01	9612-1345-01	9612-1346-01	9612-1346-01
14	4	Screw for adaptor .....	2210942	2210942	2210948-34	2210948-34	2210948-34	2210948-34
15	4	Washer for adaptor .....	41381	41381	223107-22	223107-22	223107-22	223107-22
16	2	Nut .....	9611-99-0353	9611-99-0353	9611-99-0353	9611-99-0353	9611-99-0353	9611-99-0353
17	2	Washer .....	9611-99-0786	9611-99-0786	9611-99-0786	9611-99-0786	9611-99-0786	9611-99-0786
18	1	Safety shield .....	9612-1297-02	9612-1297-02	9612-1311-09	9612-1311-09	9612-1311-10	9612-1311-10
19	1	Screw for safety shield .....	31460-1309-1	31460-1309-1	31460-1309-1	31460-1309-1	31460-1309-1	31460-1309-1
20	6	Handle .....	9611-99-2302	9611-99-2302	9611-99-2302	9611-99-2302	9611-99-2302	9611-99-2302
21	1	Backplate .....	9612-1384-16	9612-1384-16	9612-1384-16	9612-1384-16	9612-1384-16	9612-1384-16
22	1	Joint ring, EPDM (std.) .....	9611-99-2137	9611-99-2137	9611-99-2137	9611-99-2137	9611-99-2137	9611-99-2137
	1	Joint ring, NBR .....	9611-99-2139	9611-99-2139	9611-99-2139	9611-99-2139	9611-99-2139	9611-99-2139
	1	Joint ring, FPM .....	9611-99-2138	9611-99-2138	9611-99-2138	9611-99-2138	9611-99-2138	9611-99-2138
	1	Joint ring, PTFE .....	9611-99-2140	9611-99-2140	9611-99-2140	9611-99-2140	9611-99-2140	9611-99-2140
24	6	Bolt .....	9611-99-2168	9611-99-2168	9611-99-2168	9611-99-2168	9611-99-2168	9611-99-2168
25	1	Pump casing, GC .....	9612-1288-01	9612-1288-01	9612-1288-01	9612-1288-01	9612-1288-01	9612-1288-01
	1	Pump casing, Bev. seat .....	9612-1288-02	9612-1288-02	9612-1288-02	9612-1288-02	9612-1288-02	9612-1288-02
	1	Pump casing, H-line .....	9612-1288-03	9612-1288-03	9612-1288-03	9612-1288-03	9612-1288-03	9612-1288-03
	1	Pump casing, HDI .....	9612-1288-04	9612-1288-04	9612-1288-04	9612-1288-04	9612-1288-04	9612-1288-04
32	1	Impeller screw .....	9612-1396-03	9612-1396-03	9612-1396-03	9612-1396-03	9612-1396-03	9612-1396-03
33	1	Impeller .....	9612-1312-06	9612-1312-06	9612-1312-06	9612-1312-06	9612-1312-06	9612-1312-06
34	1	O-ring EPDM .....	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145
	1	O-ring NBR .....	9611-99-2147	9611-99-2147	9611-99-2147	9611-99-2147	9611-99-2147	9611-99-2147
	1	O-ring FPM .....	9611-99-2146	9611-99-2146	9611-99-2146	9611-99-2146	9611-99-2146	9611-99-2146
	1	O-ring PTFE .....	9611-99-2148	9611-99-2148	9611-99-2148	9611-99-2148	9611-99-2148	9611-99-2148
35	1	Seal housing .....	9612-1339-01	9612-1339-01	9612-1339-01	9612-1339-01	9612-1339-01	9612-1339-01
36	2	Screw for seal housing .....	9611-99-0203	9611-99-0203	9611-99-0203	9611-99-0203	9611-99-0203	9611-99-0203
37	2	Pipe .....	31457-0056-1	31457-0056-1	31457-0056-1	31457-0056-1	31457-0056-1	31457-0056-1
38	1	Lip seal .....	31446-0088-2	31446-0088-2	31446-0088-2	31446-0088-2	31446-0088-2	31446-0088-2
39	1	O-ring for seal housing, EPDM .....	9611-99-2153	9611-99-2153	9611-99-2153	9611-99-2153	9611-99-2153	9611-99-2153
40	1	O-ring for drive ring, EPDM .....	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145	9611-99-2145

**Alternatives**

23	1	Impeller .....	9612-1312-05	9612-1312-05	9612-1312-05	9612-1312-05	9612-1312-05	9612-1312-05
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**Legs**

26a	1	Support bar, right .....	31460-1287-6	31460-1287-6	31460-1287-5	31460-1287-5	31460-1287-2	31460-1287-2
26b	1	Support bar, left .....	31460-1288-6	31460-1288-6	31460-1288-5	31460-1288-5	31460-1288-2	31460-1288-2
27	4	Leg .....	31460-1018-1	31460-1018-1	31460-1018-1	31460-1018-1	31460-1018-1	31460-1018-1
28	4	Screw .....	9611-99-1907	9611-99-1907	9611-99-1907	9611-99-1907	9611-99-1907	9611-99-1907
29	4	Acorn cap nut .....	221851-14	221851-14	221851-11	221851-11	221851-11	221851-11
30	4	Spring washer .....	41381	41381	223107-21	223107-21	223107-21	223107-21
31	4	Screw .....	9611-99-1910	9611-99-1910	9611-99-1911	9611-99-1911	9611-99-1911	9611-99-1911

**Accessories**

*	1	Tool compl. ....	9612-1371-01					
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\* Not shown

Conversion kit single to double shaft seal: 9611-92-2042



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# Centrifugal Pump, Type GHH-1 Single - Flused Shaft Seal

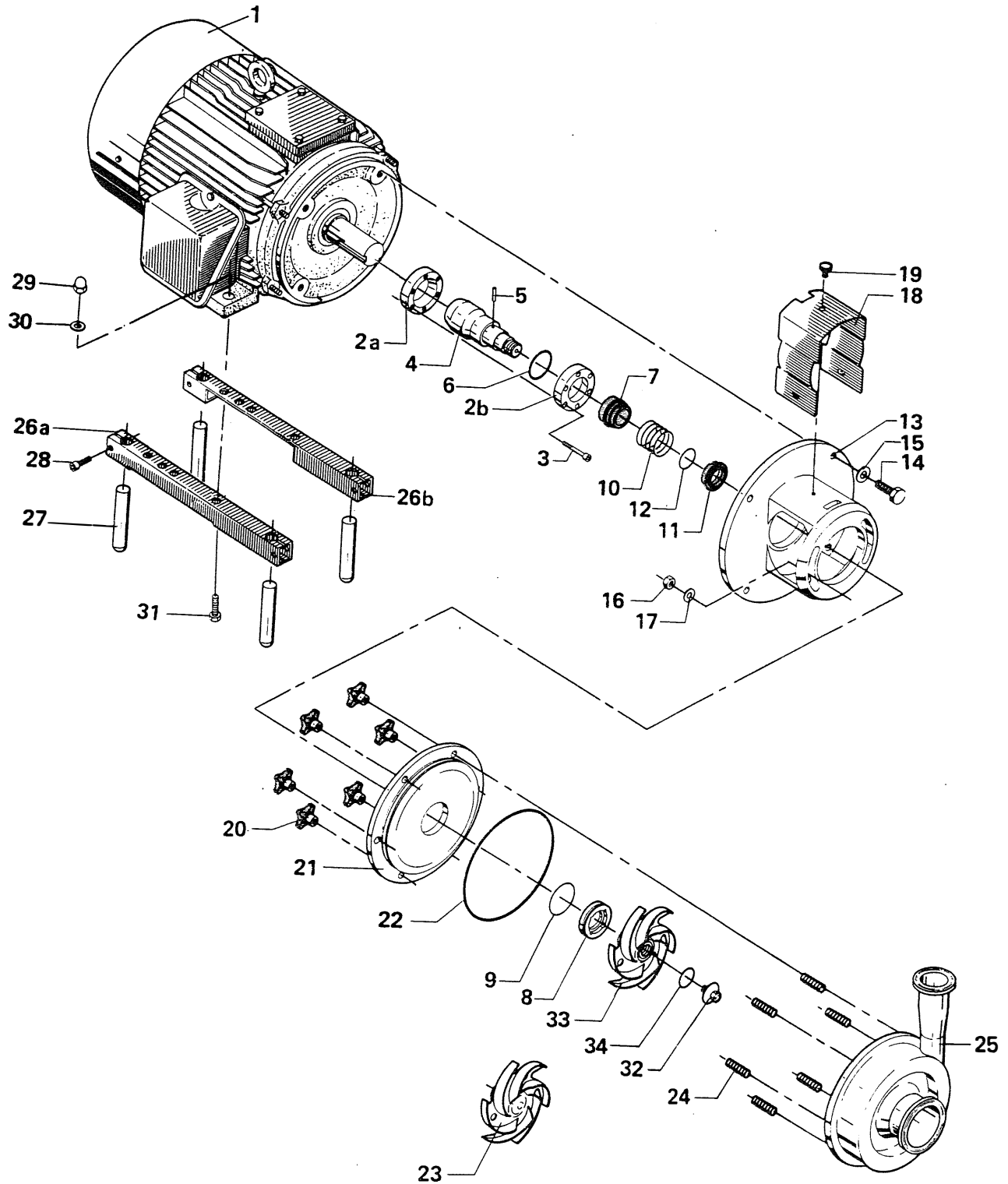
Pos.	Qty.	Denomination	
		Shaft seal compl. EPDM (std.) .....	9612-1296-01
8	1	Stationary seal ring, .....	9612-1378-01
		stainless steel	
9	1	O-ring, EPDM .....	9611-99-2149
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, EPDM .....	9611-99-2145
		Shaft seal compl. NBR .....	9612-1296-02
8	1	Stationary seal ring, .....	9612-1378-01
		stainless steel	
9	1	O-ring, NBR .....	9611-99-2151
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, NBR .....	9611-99-2147
		Shaft seal compl. FPM .....	9612-1296-03
8	1	Stationary seal ring, .....	9612-1378-01
		stainless steel	
9	1	O-ring, FPM .....	9611-99-2150
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, FPM .....	9611-99-2146
		Shaft seal compl. PTFE .....	9612-1296-04
8	1	Stationary seal ring, .....	9612-1378-01
		stainless steel	
9	1	O-ring, PTFE .....	9611-99-2152
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring, carbon .....	9612-1364-01
12	1	O-ring, PTFE .....	9611-99-2148
<b>Alternatives</b>			
		Shaft seal compl. EPDM .....	9612-1296-05
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, EPDM .....	9611-99-2149
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, EPDM .....	9611-99-2145
		Shaft seal compl. NBR .....	9612-1296-06
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, NBR .....	9611-99-2151
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, NBR .....	9611-99-2147
		Shaft seal compl. FPM .....	9612-1296-07
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, FPM .....	9611-99-2150
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, FPM .....	9611-99-2146
		Shaft seal compl. PTFE .....	9612-1296-08
8	1	Stationary seal ring, sic. ....	9612-1379-01
9	1	O-ring, PTFE .....	9611-99-2152
10	1	Spring .....	9612-1376-01
11	1	Rotating seal ring sic. ....	9612-1364-02
12	1	O-ring, PTFE .....	9611-99-2148



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# Centrifugal Pump, Type GHH-10 Single Shaft Seal. Industrial



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