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A Kirloskar Group Company

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Our products are meant for pumping water and they do not have any significant effect on environment during their use, if properly selected and used as per instructions given in this manual.

Customers are advised to dispose unusable components through appropriate disposal agencies to avoid the impact on work environment.

DO NOT RUN THE PUMP DRY TO AVOID DAMAGE TO SEAL

FOR PROMPT SERVICE & SPARES Register on our website : www.kirloskarpumps.com

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1. INTRODUCTION

Kirloskar "SP" type pumps are centrifugal pumps with an added feature of self priming mechanism. The pump is always ready for use, once the pump casing is filled initially with the pumping liquid after its installation. The design speciality of "SP" type pumps allows pumping out certain amount of mud, dirt and suspended solids. These pumps are suitable for handling water and non corrosive liquids having temperature upto 60°C.

2. PRINCIPLE OF OPERATION

The self priming action of the pump works on the diffusion principle. Initially, the complete pump casing is filled with the pumping liquid which is retained by its flap valve assembly. When the pump is started, due to centrifugal action, flap assembly opens and the air from suction branch is mixed up with the liquid. Then mixture of air and liquid is transferred into large casing outside the pumping chamber and air escapes through delivery branch. De-aired liquid again diffuses with the pumping chamber and air escapes through delivery branch. No sooner all the air is eliminated, diffusion of the liquid stops and the pump works as a centrifugal pump with its full efficiency.

3. APPLICATIONS AND FEATURES

Applications :-

Where self priming action is required.

- Marine Pumping water from docks, ports, vessels.
- Industrial Pumping petroleum products, chemicals, effluents, ash-water etc.
- Civil construction Dewatering foundations, trenches and pits.
- Mobile Machinery Cooling water for marine engines and shovels.
- Public utilities Sewage pumping

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luents, ash-water etc. nd pits. d shovels.

Features : -

• Withstand wide voltage fluctuations. (For SP'M' pump only).

Voltage range from :

180V to 240V (Single Phase)

- 300V to 440V (Three Phase)
- Efficiency at par with internationally available pumps.
- Top flat efficiency curve; minimum variation in efficiency over the entire operating range.
- Perfect alignment due to monobloc construction. (For SP'M' pump only)
- Long life : due to relpaceable wearing parts
- Dynamically balanced rotating parts.
- Easy maintenance and spares availability.
- Grease lubricated deep groove ball bearings.
- Quick automatic self priming action.
- Designed for automatic air release during priming.
- Repairs possible without disturbing the pipe connections (except SP'O').
- Non clogging impeller to handle suspended solids.
- Portable when fitted on trolley/trailer.
- Suitable for motor /engine.
- No need for foot valve.
- Models are with IP-44 protection (For SP'M' pump only). Also against order, models can be supplied with IP-55 protection (For galnd packed pumps).

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• INSTALLATION

LOCATION : The pump should be located as near the water source as possible. This will minimise the suction lift and pump will give better performance. Ample space should be provided on all sides for ease in inspection, operation and maintenance.

GROUTING : After the installation is completed, the foundation bolts should be tightened evenly and grouting may be completed. Allow about 48 hours for setting and seasoning of the foundation. For coupled pumpsets, base plates should be used.



PIPING :

- Pipe size should be as per the flange size to get higher discharge. It is not recommended to reduce the pipe size. If length of delivery pipe is more than 3 m., use higher pipe size.
- The piping should be airtight. Any leakage in suction pipe may drastically affect the performance of the pump.
- The suction pipe should be as short as possible for getting better discharge.
- No. of bends and other fittings should be as minimum as possible to reduce frictional losses.









ELECTRICAL CONNECTIONS (For SP M pumps) :

- > Proper earthing connection should be made at the bolts provided for earthing.
- > Proper size of cable should be used between supply and motor terminals to minimise voltage drop and to carry full load current (FLC) marked on nameplate, cable should be large enough to carry the starting current without excessive voltage drop.
- > The starting current for the direct on line (DOL) will be 6 to 7 times of FLC at rated voltage and 3 to 4 times of FLC in star delta connection.
- > Nuts at terminal should be tightened properly.
- > No. of joints in cable should be as minimum as possible, preferably joints should be avoided.
- Wires and connections should be properly insulated. If not, it may lead to fatal shock. \succ
- Proper backup protection (reputed make starter, main switch and fuse) should be used. \geq



OPERATION PROCEDURE :

- > After the pumpset is installed, the following should be checked and done before starting the pump:
- The shaft rotates freely by hand. •
- The stuffing box (gland) is properly tightened. (in case of gland packed pump.) •
- If there is any valve in delivery branch, it is open. •
- The pump casing is filled with clear water/pumping liquid through the priming plug provided on the top of the body. Close the plug after filling.
- Turn the lantern ring grease cup 2 to 3 turns. This should be repeated weekly or as per need. •
- Do not run the pump dry for too long. •
- If the pump is idle for sometime, it may get stuck or locked in place. This sticking is usually due to film of dust or dirt developed between the impeller and pump body. Give jerk at the free end of the shaft to ensure free rotation.
- If the pump is used to handle water containing solids and slit, it is necessary to wash out the • same with clean water, before restarting. Restarting of the pump should be done after filling clean water.
- The bearing should be lubricated once a month. •

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- > Check following during running condition :
- The direction of rotation is correct.
- The pump is running smoothly. ٠
- See that the prime mover is not overloaded.
- Leakage through stuffing box is normal, i.e. 50 to 60 drops per minute in gland packed • pumps.
- There is no leakage from mechanical seal.
- The ball bearings do not get excessively hot. •
- Avoid idle running on operation against closed discharge valve for a longer period of time.

Note :

- When dirty water is handled by the pump of diesel engine set, do not use delivery side i. water for engine cooling.
- ii. Use correct grade grease in grease cups. We recommend servo Gem-2 Indian oil make or equivalent.
- iii. Use correct grade grease in the bearings. We recommend servo Gem-2, Indian oil make or equivalent.

TYPE OF THE FAILURE	Failure to Deliver water	Pump Does not deliver rated discharge	Pump does not deliver rated head	Pump loses water after Satrt	Pump overloads Primemover	Vibration	Stuffing bore overheats	Bearing overheat	Bearing wear rapidly	Motor heating up	Seized pump	Irregular delivery	Pump does not prime	Noisy Pump
REASON FOR FAILURE														
Wrong direction of rotation	✓		✓										✓	
Pump not primed or filled with liquid	✓					~					✓		✓	✓
Inlet or suction pipe insufficiently submerged	✓	✓		✓		✓								✓
NPSH available too low	✓	✓		✓		✓						✓		✓
Pump not upto rated speed	✓	✓	~											
Air leaks in suction line or stuffing box	✓	~		✓								~	✓	✓
Viscosity greater than rated		✓	✓											✓

TRO	DU	BLE	SHC	ют	ING	i (
TYPE OF THE FAILURE	Failure to Deliver water	Pump Does not deliver rated discharge	Pump does not deliver rated head	Pump loses water after Satrt	Pump overloads Primemover	
REASON FOR FAILURE						
Impeller damaged		~	✓		~	
Internal leakage (gasket)		~	~		~	
Priming air/vent valves open		✓	✓	✓	~	
Speed too high					~	
Total head lower than recommended					✓	
Viscosity and / or specific gravity higher than rated					~	
Starved suction				✓		v
Worn or loose bearings						V
Rotor out of balance						v
L	1	1	L1	1		

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Vibration Stuffing bore overhe Bearing overheat Bearing wear rapidi Motor heating up Seized pump Seized pump Irregular delivery Pump does not prim
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	TRO	OUBL	E SH	ООТ	ING	(Co	ont.))						
TYPE OF THE FAILURE	Failure to Deliver water	Pump Does not deliver rated discharge	Pump does not deliver rated head	Pump loses water after Satrt	Pump overloads Primemover	Vibration	Stuffing Box Overheats	Bearing overheat	Bearing wear rapidly	Motor heating up	Seized pump	Irregular delivery	Pump does not prime	Noisy Pump
REASON FOR FAILURE														
Impeller blocked or damaged						✓								
Bent shaft						✓			✓					✓
Foundation not rigid or poor mixture						✓								✓
Gland packing too tight					√		✓							
Gland packing not lubricated							✓							
Wrong grade of gland packing							✓							
Insufficient cooling water							✓	✓						
Stuffing box badly packed					✓		✓	\checkmark					✓	
Wrong grade of Grease								✓						
Dirt in bearings								✓	✓					
Moisture in Iubricant								✓	✓					
Failure of lubricating system								✓	✓					
Bearings too tight					✓			✓						
Excessive thrust								✓	✓					

٦	FRO	UBL	E SH	ΟΟΤ	ING	(C
TYPE OF THE FAILURE	Failure to Deliver water	Pump Does not deliver rated discharge	Pump does not deliver rated head	Pump loses water after Satrt	Pump overloads Primemover	Vibration
REASON FOR FAILURE						
Lack of Lubrication						
Bearings badly installed						1
Too much grease in bearings						
Pump does not deliver rated capacity	✓		✓			
Pipes exert forces on pump					✓	✓
Vibration	✓	✓		✓		
Foreign matter in pump						
Viscosity lower than rated	✓	✓				
Speed too low	✓	✓	✓			
Foundation bolts loose, motor/pump bolts loose						✓
Leak in delivery pipe-work	~	✓			✓	
Mechanical seal fault					✓	

• •	ЭТ	ING (nt.))	1					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Satrt	Pump overloads Primemover	Vibration	Stuffing Box Overheats	Bearing overheat	Bearing wear rapidly	Motor heating up	Seized pump	Irregular delivery	Pump does not prime	Noisy Pump
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					✓	✓					
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		✓	✓	✓	✓	✓		✓			
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• • • • • • • • • • •			✓	✓	✓	✓					✓
		✓									
		✓									

• MAINTENANCE

PROCEDURE FOR FILLING GLAND PACKING IN CASE OF GLAND PACKED RRANGEMENT :

- Spin the shaft by hand to see that there is no jamming. Rub a thin film of oil on the shaft and in the stuffing box.
- Insert the required number of gland packing before the lantern ring, staggering the joints by 180°.
- While inserting the lantern ring, see that it matches with the hole for water / grease sealing.
- Insert the remaining packing staggerating the gland plate tight and then loosen off so that while in operation, water should leak at the rate of 50 to 60 drops per minute.



PROCEDURE FOR FILLING THE MECHANICAL SEAL IN CASE OF MECHANICAL SEAL ARRANGEMENT :

- Apply soap solution on rubber cap of stationary part.
- Insert the stationary part of mechanical seal and press it upto the bore face of the mounting casing

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- Insert upper part of mechanical seal (i.e. rotating part) on the shaft.
- Insert the spacer.

RECOMMENDED SPARES :

- 1. Impeller.
- 2. Ball bearings.
- 3. Mechanical seal (In case of mechanical seal pumps).
- 4. Gland packing (In case of gland packed pumps).
- 5. Shaft sleeve (In case of gland packed pumps).
- 6. Bush bearing (If provided).
- 7. Wearing ring (If provided).
- 8. Capacitors (In case of single phase monobloc pumps).
- 9. Water deflector.
- 10. Paper Packing.

MAINTENANCE TIME TABLE

- MONTHLY:
- i. Priming time
- ii. Pump noise
- iii. All pipe connections
- SIX MONTHLY
- i. Open the pump. Check and clean interior parts.
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• YEARLY

- 1. Remove impeller, replace if vanes are worn out seriously. Clearance between impeller face and wearing plate N.D.E. should be in the range of 0.25 to 0.35 mm.
- 2. Replace shaft sleeve if worn out.
- 3. Replace gland packing if worn out.
- 4. Replace wear plates if worn out.
- 5. PROCEDURE FOR DISMANTLING AND REASSEMBLY

BARE SHAFT 'SP' PUMPS

A. DISMANTLING PROCEDURE

- a) First remove suction and delivery pipe connections. Drain water from the pump by unscrew ing plug (601). Remove grease cups, pipe nipples etc, then separate pumps from engine/ motor and base plate.
- b) Remove suction flange (490.1) and delivery flange (490) [suction cover (210)] with flap valve assembly from delivery casing (101).
- c) Dismantle the Driving Unit (i.e. assembly of stuffing box housing (238), bearing housing (240), shaft (180), ball bearings (260 & 260.1) impeller (152) etc.) by loosening the nuts from delivery casing (101). In Case of SP 'O', SP-1H, SP-2H and SP-3L + pumps, stuffing box housing is integral with bearing housing (243)
- d) Loosen impeller nut (330) and take out the impeller. Care should be taken not to damage the impeller vanes. 16

- e) Loosen gland (223) and remove stuffing box packing (430) stuffing box packing (467) for stuffing box packing (467) a models only).
- f) Take out pump coupling (391) by unscrewing the grub screw bearing nut (335) and driving end bearing cover (270).
- g) Remove shaft sleeve (310), Pull shaft (180) by swing be removed by hammering.
- h) Remove N.D.E. wearing plate (460) from delivery cas head screw (979). Remove D.E. Side Wearing Plate (460. loosening countersunk head screw (979.1), (Applicable for SP-4LA+, SP-6L and SP-6LA (SP8LA)
- After dismantling all the parts, it is necessary to clean a are to be checked for wear and damage and a
 - i. Impeller ii. Pump shaft iii. Ball bearings iv. Gland ٧. Lantern Ring Water Deflector vi vii. Stuffing box packing Rubber flap viii. ix. Keys Shaft sleeve х. 17

)), lantern ring (227). (Washer (467) for applicable for SP-1H and SP-2H pump
rew/bolt. Remove coupling key(321),
Press or Puller. Bearings should not
sing (101) by loosening countersunk 0.1) from stuffing box housing (238) by or SP-3, SP-3A, Sp3nn SP-4L+ and
and inspect them. The following parts are to be replaced, if necessary 152/153 180 260 & 260.1 223 227 236 430 488.2 320 & 321 310

	xi xii xiii (For SP-3, SP	Gasket for shaft sleeve Waring Plates (N.D.E.) Wearing Plates (D.E.) -3A,SP-3hh SP-4L+, SP-4LA+	, SP-SP6L and SP-6LA,	515 460 460.1 SP8LA
В.	ASSEMBLY P	ROCEDURE		
a)	Apply a thin la	yer of grease to all suraces the	at have to be airtight.	
b)	Clean recircula	ating port in delivery casing (10	1)	
c)	Complete the (490.1) fix wea plate driving e	flap valve assembly, if it is dis aring plate non-driving end sid nd side (460.1) with stuffing be	mantled with suction cover (460) with delivery cas ox housing (238).	ver (210)/ suction flange sing (101) and wearing
d)	Mount the D. against the ste Ball bearings of the ball be	E. (260) and N.D.E. (260.1) I eps provided on the shaft. Ap should be press-fitted, if it is n arings by putting suitable spac	pearings on shaft (180) ply grease betwen the tw ot possible then hamme er on it.	so that the bearing rest wo races of the bearings. In gradually the inner race
e)	Insert the shaf	t (180) into the bearing housing	g (240/243) from driving	end (as per model).
f)	Insert the bea for stuffing bo (180) from non	aring cap N.D.E. (275), wate x packing (467), (applicable in ı driving end side.	er deflector (236) and g case of SP-1H) SP-2H	gland (223) and washer pumps only), on the shaft
g)	Fit sub-assem SP-1H, SP-2H	bly of stuffing box housing (238 I pumps and SP-3L+)1) on bearing housing (24 8	0) (not applicable of SP'O'

- h) Put gasket (515) for shaft sleeve on the shaft and then fit shaft sleeve (310) on the shaft (180). Take care that shaft sleeve slot/keyway matches with shaft-keyway.
- i) Fit bearing cover D.E. (270) to bearing housing (240/243) (as per model).
- Insert impeller key (320) into the shaft and shaft sleeve and mount impeller (152 or 153) j) on the shaft. Lock it by impeller nut (330) alongwith its washer (621). Tighten the bearing nut (335) on the shaft. Check clearance between impeller and wearing plate D.E. (460.1). It should be 0.15 to 0.60 mm (wherever applicable).
- k) Fit the driving unit (i.e. assembly of stuffing box housing, bearing housing, bearing, shaft, impeller etc.) to the delivery casing (101) and tighten it with the help of nuts. The clearance between impeller and wearing plate N.D.E. (460) should be 0.25 to 0.35 mm. This should be adjusted by inserting required thickness of paper packing, between stuffing box housing (220) and delivery casing (101). After fitting the driving unit, check that impeller rotates freely.
- Insert Stuffing Box packing (430), Lantern Ring (227) duly filled with grease and again two I) Stuffing Box Packing.
- m) Insert Coupling Key (321) on the Shaft and mount the pump coupling (390) on the Shaft (180) and tighten it by Grub Screw/Bolt.
- n) Fix up Grease Cups (440, 440.1, 440.2) for Bearing D.E., N.D.E. and Stuffing Box.
- Tighten Sub-assembly of Suction Cover (210)/suction flange and Flap Valve (488.2) with o) delivery casing (101) and then tighten the Delivery Flange (490) and Suction Flange (490.1). Tighten the Plug (601) to Delivery Casing with its washer (517).



Part No.	DESCRIPTION	MATERIAL	QTY. (Nos.)
101	Delivery Casing	CI.Gr. FG- 200 OF IS: 210	1
*153	Impeller	CI.Gr. FG-200 OF IS: 210	1
* 180	Shaft	C.S. 15:2073 Gr C-40	1
217	Cover for Main Body	CI.Gr. FG-200 OF IS:210	1
217.1	Inspection Hole Cover	CI.Gr. FG-200 OF IS:210	1
* 223	Gland	CI.Gr. FG-200 OF IS:210	1
* 227	Split Lantern Ring	H.D.P.E.	1
* 236	Water Deflector	Natural Rubber	1
243	Bearing Housing	CI.Gr. FG-200 OF IS:210	1
* 260	Ball Bearing D.E.	Bearing Steel	1
260.1	Ball Bearing N.D.E.	Bearing Steel	1
270	Bearing Cover D.E.	CI.Gr. FG-200 OF IS:210	1
275	Ball Bearing Shield	MSIS:1079 Gr ST-34	1
* 310	Shaft Sleeve	SS	1
320	Key for impeller	EN-3A	1
321	Key for Coupling	EN-3A	1
330	Nyloc Nut	Nyloc ST -42S	1
335	Bearing Nut	IS:226 Gr. ST-42 S	1
390	Lover Joy Coupling (Pump half)	CI	1 set
391	Love Joy Coupling (Motor half)	CI	1 set
*403	Rubber Star	Rubber	1 set
430	Stuffing Box Packing	Graphited Cotton	1 set

PART NO.	DESCRIPTION	MATERIAL	QTY. (Nos.)
440, 440.1	Grease Cup	CO-5	3
4440.2			
460	Wear Plate NDE	CI.Gr. FG- 200 OF IS : 210	1
488	Weight for Flap Valve	CI.Gr. FG, 200 OF IS: 210	1
488.1	Washer for Flap Valve	CI.Gr. FG, 200 OF IS: 210	1
*488.2	Rubber Flap for Flap Valve	Nitrill Rubber	1
490	Delivery Flange	CI.Gr. FG, 200 OF IS:210	1
490.1	Suction Flange	CI.Gr. FG-200 OF IS:210	1
513.1	Packing for Del. Casing & Delivery Flange	Natural Rubber	1
515	Flat Gasket for Shaft Sleeve	NAM- 37	1
516	Paper Packing for Del. Casing & Inspction Hole Cover	Paper	1
573	Hex Bolt for Beraring Cover & Bearing Housing	IS:226 Gr ST 42S	4
574	Square Hed Bolt with	IS:226 Gr ST 42S	2 each
&582	Nut for gland		
580	Hex Nut for Del. Casing & Delivery Flange	IS:226 Gr ST 42S	4
580.1	Hex Nut for Delivery casing and Suction Flange	IS:226 Gr ST 42S	4
586	Hex Nut for Del. Casing &	IS:226 Gr ST 42S	8
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PART NO.	DESCRIPTION	MATERIAL	QTY. (Nos.)
101	Delivery Casing	CI.Gr. FG- 200 OF IS: 210	1
152	Impeller	CI.Gr. FG-200 OF IS: 210	1
*180	Pump Shaft	CS.IS:2073 Gr, C-40	1
210	Suction Cover	CI.Gr. FG-200 OF IS:210	1
217	Inspection Hole Cover	CI.Gr. FG-200 OF IS:210	1
*223	Gland	CI.Gr. FG-200 OF IS:210	1
*227	Lantern Ring	H.D.P.E.	1 set
*236	Water Deflector	Natural Rubber	1
238	Stuffing Box Housing	CI.Gr. FG-200 OF IS:210	1
240	Bearing Housing	CI.Gr. FG-200 OF IS:210	1
*260	Ball Bearing D.E.	Brg. Steel	1
*260.1	Ball Bearing N.D.E.	Brg. Steel	1
270	Bearing Cover D.E.	CI.Gr. FG-200 OF IS:210	1
271	Bearing Cover N.DE.	CI.Gr. FG-200 OF IS:210	1
*310	Shaft Sleeve	SS	1
320	Key for impeller	EN-3A	1
321	Key for Coupling	EN-3A	1
*330	Impeller Nut	Nyloc ST-42S	1
*335	Bearing Nut	IS:226 Gr. ST-42 S	1
*430	Stuffing Box Packing for drain	Graphited Cotton	1 set
440,	Grease Cup	CO-5	3
440.1			
& 440.2	24		

PART	DESCRIPTION	MATERIAL	QTY.
NO.			(Nos.)
*460	Wearing Plate N.D.E.	CI.Gr. FG- 200 OF IS: 210	1
*460.1	Wearing Plate D.E.	CI.Gr. FG- 200 OF IS: 210	1
488	Weight for Flap Valve	CI.Gr. FG- 200 OF IS: 210	1
488.1	Washer for Flap Valve	MS IS: 1079 Gr ST-32	1
*488.2	Rubber Flap	Natural Rubber	1
490	Companion Flange Delivery Side	CI.Gr. FG- 200 OF IS:210	1
490.1	Companion Flange Suction Side	CI.Gr. FG-200 OF IS:210	1
511	Paper Packing	Paper (Dalmla-Duplex)	1
3 & 513.1	Packing for Delivery	Natural Ruber	1
	flanges		
	Studs & Bolts	IS :226-Gr ST 42S	
	Nuts	IS :226-Gr ST 42S	
*515	Gasket for Shaft sleeve	Compressed Asbestos Fibre	1
517	Washer for Collared Plug	Fibre	1
540	Pipe Coupling	G.I.	1
552	Pipe Nipple	G.I.	1
601	Collared Plug for Drain	Cast Brass G.I Plug.	1
621	Washer for impeller Nut	SS	1
672	Nameplate	Bright Aluminium	1
882	Priming Hole Cover	CI. Gr. FG-200 OF IS:210	1
979	Counter Sunk Screw	C-80	3

PUMP MODEL : SP-O 'M' MONOBLOC PUMP (Refer Fig.3)

A. DISMANTLING PROCEDURE

- a) Remove the suction and delivery pipelines from the monobloc. Empty water from the pump by unscrewing the plug (1022). Remove the foundation bolts of the pump and take out the Pumpset from the foundation/installation site.
- b) Remove suction flange (490.1) and delivery flange (490). Remove flap valve (488.2) from delivery casing (101).
- c) Loosen the nuts from studs (593) and remove the delivery casing (101).
- d) Unfasten the impeller nut (303). Take out the washer (621). Pull out impeller (153) by using impeller puller. Take out the impeller key (320) from the keyway. the spacer and the mechanical seal (230)
- e) Remove fan cover (1001). pin (1111) and the fan (1000) from the shaft (189).
- Unscrew nut (1172) from stud (1171) and take out the end shield (909). Also unscrew bolt f) (1118) to detach bearing cap (1104).
- g) Unscrew nuts (1172) from studs (1171) and take out motor body (130) from motor bracket. (296.1). Also unscrew bolt (1117) before removing bracket.
- h) Hammer the shaft from the impeller end lightly with a wooden mallet and take it (shaft with rotor) out from driving end along with bearings. Simultaneously water deflector (236) will come out automatically.

Before assembly, all the parts should be thoroughly cleaned in Kerosene to remove the dirt, dust. After cleaning, all the parts should be thoroughly checked for wear/defect and should be replaced if necessary. Remove burrs from all the parts. Use new paper packings during assembly. 26

B. ASSEMBLY PROCEDURE

- a) Mount the ball bearings (1107 & 1106) on the shaft (189) by shrink fit. Fill sufficient quantity of grease in the bearings. Do not forget to inset 2 Nos. bearing caps (1104 & 1103) on the shaft.
- b) Insert the shaft (189) in the bracket (296.1). Mount water deflector (236) on shaft. Slightly hammer the shaft. So that ball bearing will take its position in the bracket (296.1).
- c) Tighten the bolts (1117) to engage bearing cap (1103).
- d) Fit the motor body (130) to motor bracket (296.1) by tightening nuts (1172) on studs.(1171)
- Mount the mechanical seal (230) on the shaft. e)
- Put the spacer on the shaft after mechanical seal (230). f)
- g) Place impeller key (320) in the key way of the shaft. Fit impeller (153) on shaft. Place the washer (621) then tighten the nyloc nut (330) on shaft (189).
- h) Fit the end shield (909) to the stator body (130) by tightening the nuts (1172) on studs (1171) and bolts (1118) to engage the bearing cap (1104).
- Mount the fan (1000) and split pin (1111) on the shaft (189).
- Fit the fan cover (1001) on the stator body by tightening the screws.
- k) Place paper packing on studs of delivery casing (101) and tighten the casing to the motor bracket with the help of stud (593) and nut.
- Replace the suction flange (490.1) after fitment of flap valve assembly and delivery flange (490) on the pump.
- m) Fix the drain hole cover/inspection cover (217) to pump body after placing paper packing (1028) by tightening the bolt (1032). 27

DISMANTLING & ASSEMBLY PROCEDURE FOR SP-1H 'M'/SP-2H 'M' MONOBLOC PUMP (Refer Fig.4)

A. DISMANTLING PROCEDURE

- a) Remove the suction and delivery pipelines from the monobloc. Drain water from the pump by unscrewing the plug (601). Remove foundation bolts of the pump.
- b) Remove suction flange (490.1) and delivery flange (490). Remove the suction cover (210) with flap valve assembly (for SP1HM and SP 2HM) from delivery casing (101) by un screwing nut from the stud provided for suction cover.
- c) Loosen the nut from the studs and remove the delivery casing (101) from Mounting casing (296.1)
- d) Unscrew the impeller (230). take out the washer (621). Pull out the impeller (153) by using puller. Take out the impeller Key (320) from the keyway and also the shaft sleeve (310)
- e) Remove grease cup (440.2) along with pipe (552). Loosen the nuts (582) from the bolts (574) and remove the gland packings (430) of lantern ring (227).
- f) Remove wearing plate (NDE) (460) from delivery casing (101) by unfastening counter sunk head screws (979)
- g) Remove the fan cover (1001). pin (1111) and the fan (1000) from the shaft (189)
- h) Take out the screw (1118) (for SP2 HM and SP 3 LM +) Unscrew nut (1115) from stud (1114) and take out the end shield (909).
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- i) Unscrew nuts (1113) from studs (1114) and take out m (296.1). Inside bearing cap (1104) will come out automatic
- j) Unscrew the screw (1148) and take out the inside bearing and outside Bearing Cap (1101).
- k) Hammer the shaft from the impeller and tightly with a woo out from driving end along with bearings. Simultaneous bearing cap (1101), bearing nut (335) and gland (223) will
- I) After dismantling all the parts, it is necessary to clean and be checked for wear and damage and are to be replaced, it

i.	Impeller	152/153
ii.	Pump shaft	180
iii.	Ballbearings	260 & 260
iv.	Gland	223
v.	Lantern Ring	227
vi.	Water deflector	236
vii.	Stuffing box packing	430
viii.	Rubber flap	488.2
ix.	Keys	320 & 321
х.	Shaftsleeve	310
xi.	Gasket for shaft sleeve	515
xii.	Wearing Plates (N.DE.)	460 29

notor body (130) from mounting casing ically for SP2 HM and SP 3LM+. g cap (1103). Lock the Bearing nut (335)	
oden mallet and take it (shaft with rotor) sly water deflector (236), D.E. outside l come out automatically. l inspect them. The following parts are to if necessary.	
).1	
	I

ASSEMBLY PROCEDURE

- a) Mount the ball bearing (1106 & 1107) on the shaft (189) by shrink fit. Fill sufficient quantity of grease in the bearings. Do not forget to insert D.E. inside bearing cap (1103) (for SP2HM+N.D.E. inside bearing cap (1104) also) on the shaft.
- b) Tighten the screw to engage the D.E. out side bearing cap (1101) on mounting.
- Insert the bearing nut (337), water deflector (236) and gland (223) in the shaft and insert the shaft C) in the mounting casing (296.1) slightly hammer the shaft so that ball bearing (1106) will take its position in the bracket.
- Tighten the bolts to engage D.E. inside bearing cap (1103). d)
- Fix the motor body (130) to the motor bracket (296.1) by tightening nut (1113) on stud (1114). e)
- f) Fix end shield (909) to the motor body by slight hammering and finally tightening with screws. At the same time fix the N.D.E. inside bearing cap (1104) with the screw (1118) (for SP2'H'M and SP3LM+)
- Place fan (1000) on shaft. Locate the cotter pin in hole provided on shaft. Fix fan cover (1001) on g) fan and using screws.
- h) Tight the bearing nut (335). Place the shft sleeve (310) on the shaft and place impeller kye (320) in the key way on shafts.
- Complete the assembly on stuffing box by packings (430), lantern ring (227) and tightening gland I) cover (223) by the nut (582) on bolts (574).

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- Fix the grease cup (440.2) and pipe nipple (552).
- k) clearance between the wearing plate and impeller. It should be 0.25 mm to 0.35 mm.
- delivery casing by CTSK screw (979).
- (884).

CROSS SECTIONAL DRAWING FOR SP 'O'M PUMPS FIG. 3



PART	DESCRIPTION	MATERIAL	QTY.
NO.			(Nos.)
101	Delivery Casing	CI.Gr. FG-200 OF IS: 210	1
130	Motor Body	CI.Gr. FG-200 OF IS: 210	1
*153	Impeller	CI.Gr. FG-200 OF IS: 210	1
164	Rotor		1
*189	Shaft	Carbon Steel	1
217	Cover for main body	CI.Gr. FG-200 OF IS:210	1
*230	Mechanical Seal	SEALOL MECH. SEAL TYPE-6	1
		To Suit 19.05 mm Shaft dia	
*236	Water Deflector	Natural Rubber	1
296.1	Mounting Casing	CI.Gr. FG-200 OF IS:210	1
320	Key for Impeller	EN 3A	1
330	Impeller Nut	Nyloc ST-42 'S'	1
488	Weight for Flap Valve	CI.Gr. FG-200 OF IS : 210	1
*488.1	Washer for Flap Valve	MS, IS:1079 Gr ST-34	1
*488.2	Rubber Flap	Nitrile Rubber	1
490	Flange Delivery Side	CI.Gr. FG-200 OF IS : 210	1
490.1	Flange Suction Side	CI.Gr. FG-200 OF IS : 210	1
580/580.1	Hex Nut for Delivery Casing.	IS:226-1962 Gr ST-42 'S'	8
	Delivery Flange & Suction Flange		
590	Stud for Delivery Casing.	IS:226-1962 Gr ST-42 'S'	4
	Suction Flange		
590.1	Stud for Delivery Casing and	IS:226-1962 Gr ST-42 'S'	4
	Delivery Flange		
593	Stud for Delivery Casing	IS:226-1962 Gr ST-42 'S'	4
	and Mounting Casing		

PART	DESCRIPTION	MATERIAL	QTY.
NO.			(1405.)
621	Washer for Nyloc Nut	MS, IS: 1079 Gr ST-34	1
909	Cover N.D.E.	CI Gr. FG-200 OF IS:210	1
911	Stator		1
1000	Fan	Polypropelyne	1
1001	Fan Cover	MS ST 34 OF IS:1079	1
1022	Capacitor	Run Capacitor 20 uf	1
1028	Packing for Cover for Main Body & Delivery Casing	PAPER	1
1029	Hex bolt with Nut for	IS:226-1962 Gr ST-42 'S'	1
	Rubber Flap Weight & Washer		2
1032	Bolts for Cover of Del. Casing	IS:226-1962 Gr ST-42 'S'	1
1073	Cap for Capacitor	Rubber	1
1103	In side Bearing Cap D.E.	Cl. Gr. FG-200 OF IS:210	1
1104	In side Bearing Cap NDE	MS IS: 1079-1963	1
*1107	Ball Bearing DE	BRG. Steel	1
*1106	Split Cotter Pin for Fan	BRG. Steel	1
1111	Hex. HD Bolt for Mounting Casing	MS	1
1117	& Brg. Cap DE Hex HD Bolt for Cover NDE &	ST-42 'S'	3
1118	INSIDE Brg. CAP NDE	ST-42 'S'	3
1141	Clamp for Capacitor	MS Sheet	1
1171	Stud for Bracket, Motor Body & Cover NDE	IS:226-1962 Gr. ST-42 'S'	4
1172	Hex Nut for Bracket, Motor Body and Cover NDE	IS:226-1962 Gr. ST-42 'S'	8
1195	Wavy Washer	Steel C- 75 IS:2507-65 HARDENED	1



DART	DESCRIPTION	ΜΔΤΕΒΙΔΙ	ΟΤΥ
NO.			(Nos.)
101	Delivery Casing	Cl.Gr. FG-200 OF IS: 210	1
*153	Impeller	Cl.Gr. FG-200 OF IS: 210	1
210	Suction Cover	CI.Gr. FG-200 OF IS: 210	1
217	Cover for main body	CI.Gr. FG-200 OF IS: 210	
*227	Lantern Ring	HDPE	1 Set
*229	Gland	Cl.Gr. FG-200 OF IS:210	1
*236	Water Deflector	Natural Rubber	1
296	Mounting Casing	CI.Gr. FG-200 OF IS:210	1
	Studs & Bolt	C.S.Gr. FE-410 of IS:1570 Part-1	-
	Nuts	C.S.Gr. FE-410 of IS:1570 Part-1	-
	Motor for SP-1HM M-90L		
	Frame 2C2/2800 RPM		1
	Motor for SP-2HM M-100		
	Frame 3C2/2810 RPM		
*310	Shaft Sleeve Bronze as per		
	KBL No. 224.	Bronze LTB of IS:318	1
320	Key for Impeller	C.S. 20 C8 of IS: 1570	1
337	Impeller Nut	Nyloc ST 42 'S'	1
*430	Gland Packing	Graphited Cotton	1 Set
434	Rubber flap Holding Piece	C.I.Gr. FG - 200 of IS:210	1
440	Grease Cup	CO-5 C.S. Gr. C-05 of IS:1570	3

PART NO.	DESCRIPTION	MATERIAL	QTY. (Nos.)
*460	Wearing Plate N.D.E.	CI.Gr. FG-200 OF IS:210	1
488	Weight for Flap Valve	CI.Gr. FG-200 OF IS:210	1
488.1	Washer for Flap Valve	CI.Gr. FG-200 OF IS:210	1
488.2	Rubber Flap for flap Valve	Nitrile Rubber	1
*490	Companion Flange Delivery Side	CI.Gr. FG-200 OF IS:210	1
490.1	Companion Flange Suction Side	CI.Gr. FG-200 OF IS:210	
510	Packing for Delivery Casing &	Duplex Paper	1
	Suction Flange		
511	Paper Packing	Duplex Paper	1
13 & 513.1	Packing for suction and Delivery	Natural Ruber	1
	Flange		
*515	Flat Gasket for Shaft Sleeve	NAM- 37	1
517.1	Wahser for collard Plug	Fibre	1
540	Pipe Coupling	G.I.	1
552	Pipe Nipple	G.I.	1
601	Collared Plug for Drain	Cast Brass	1
606	Plug for Priming Hole	G.I.	1
621	Washer for Impeller Nut	C.S. Gr. FG-330 of IS:1570 Part-2	
672	Nameplate	Bright Aluminium	1
679	Counter Sunk Screw	M.S. Gr. FE 410 of IS:1570 Part-1	3
1032	Hex bolt for cover for Main Body MS	C.S. Gr. FE 410 OF IS: 1570 Part-1	2
1106	Ball Bearing	Brg. Steel	1

Pump Series	Construction Feature	Drive Unit	Power Rating
KDS+/++	Monobloc	Electric Motor	1.5 HP - 30.0 HP
KDT+	Monobloc	(1 and 3 Phase) Electric Motor	1.0 HP - 20.0 HP
KS+	Monobloc	(1 and 3 Phase) Electric Motor	3.0 HP - 10.0 HP
KOS	Monobloc	(1 and 3 Phase) Electric Sub. Motor	0.5 HP - 10.0 HP
SP	Monobloc/Coupled	(1 and 3 Phase) Electric Motor	0.5 HP - 5.0 HP
KJV/H,KJ+	Monobloc	(Monobloc) Electric Motor	0.5 HP - 3.0 HP
MINI,DC,DHX	Monobloc	(1 and 3 Phase) Electric Motor	0.25 HP - 1.0 HP
Submersible Ku4 Winner		(1 and 3 Phase) Electric Sub. Motor (1 and 3 Phase)	0.5 HP - 75.0 HP
NW,KE,KH KHDT+,SR	Coupled	Engine / Motor	
KV, DV	Monobloc/Coupled	Electric Motor	
Alternator			2 KVA - 50 KVA
Motor			0.5 HP - 120 HP

Warranty Certificate

This product is warranted against manufacturing defects and workmanship under normal use and service for the period of 24 months from the date of manufacturing OR 12 months from date purchase of the end user whichever is earlier.

We undertake to repair or replace the product at our discretion or any part thereof, for which we are satisfied that it was originally defective in material or workmanship, provided that product or its parts are returned to our nearest regional office / dealer on freight paid basis, within the warranty period. This warranty does not cover any consequential damage of any nature.

This warranty excludes every condition, whether statutory or otherwise, whatsoever is not expressly set out here.

Product Model:

Sr. No. : _____

Date of Purchase :

Bill/Cash Memo No. :

SPECIAL INSTRUCTIONS: " Customers are advised to go through the product manual carefully for proper installation, use and servicing product & genuine spare parts. It is also advisable to go through the company's published literature, catalogue or other official publication. Any deviation, if made by the customers will void the warranty obligations. Repair by trained mechanics will get you better results."

This card must be produced at the time of claiming the warranty along with purchase documents.

Dealer's stamp and signature :_____

