Installation, Operation & Maintenance Manual

SCH Series

Horizontal Split Case Pump

EXCLUSIVE SECURITY STICKERS

All pumps & motors have exclusive designed hologram security sticker with unique serial number certifying that the said products are original and genuine produced by Stellar Pump Australia.

To validate if product purchased is original & genuine, serial numbers are registered in **"Authentic"** page of Stellar Pump official website **http://www.stellarpump.com.au** Serial numbers can be found in metal nameplates & data information stickers.

If your serial numbers are not on the list, it means

- The list is not yet updated. *(quarterly updating the Authentic page)*
- It has been removed to accommodate newly registered serial numbers.
- The product(s) that you have received is counterfeit of unknown origin.

Original and genuine product data information & technical specifications can be provided within 48 hours to 72 hours upon receipt of requested email. Send your request along with serial number, complete name, company, business address, position & contact details to **authenticity@stellarpump.com.au**

On behalf of Stellar Pump Australia and authorized local distributor, we appreciate for doing business with us & we trust that you will enjoy using our genuine high performance & reliable products.

STELLAR PUMP AUSTRALIA

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SECTION I: INTRODUCTION

STELLAR SCH Series Horizontal split case centrifugal pumps are designed with double suctions. The said series have high flow capacities, high efficiency, cost economical, high quality & wide series of applications in commercial establishments, industrial sectors, municipal & water districts, irrigations and air-conditioning systems.

This IOM Manual shall be read entirely prior for installation and operation. Stellar Pump shall not be liable for any injuries, damages & pertaining cost due to failure in observing the instructions and maintenance contained in this manual.

The following symbols indicated in this manual are needed to pay attention:

Extreme hazard which will result of severe injury or death

Hazard which could result of personal injury or severe damage to property

Hazard which could result of minor injury or damage to property

SECTION II. GENERAL PRACTICE

1. Do not operate the pump without proper procedure of priming (pump volute flooded with water).
2. Do not operate the pump if water has sand or any solid particles that could clog the impeller.
3. Maximum Lifting Speed shall be 3 meters per second.
4. Do not operate the pump beyond its limits and parameters.
5. Always shut down the power supply when performing maintenance checkup in electric motor terminal box.
6. Never operate the pump if power supply (voltages) are not within the normal ranges.
7. Never operate the pump without proper procedure of checking pump alignment. Excessive vibration could result of severe damage of pump and motor.
8. For negative suction (suction lift) installation, Net Positive Suction Head (NPSH) should be calculated against the depth of water source (Tank) to avoid cavitation.
9. Always wear personal protective equipment before performing installation, operation and maintenance of this pump.

SECTION III. WARRANTY CONDITION

- This warranty applies against all defective materials and/or faulty manufacture for the period of **One (1) year** from the date of shipment unless specifically stated otherwise.
- Pumps shall be used in accordance for only specific purpose and shall be operated within the designed limits & capabilities.
- Valid replacement of parts and components shall be shipped direct to client free of charge. However, labor cost for replacement of parts, disassembly and assembly of pumps is not included.
- This warranty shall be null and void if other parties have tampered, adjusted and/or repaired the pump.
- For genuine spare parts, kindly refer to authorize distributor or agent of Stellar Pump in your local area.

SECTION IV. STORAGE & LIFTING

- Storage room or warehouse should be clean, free from any dust particles that could enter to sensitive rotating parts of the pump & motor.
- Pump shaft should be rotated 15 to 20 revolutions periodically.
- Protect against corrosion by painting corrosive resistant coating of some unpainted surfaces of the pump.
- Lubricant shall be applied to bearings for long term storage.
- When lifting or hoisting the SCH series figure 1 is highly recommended:

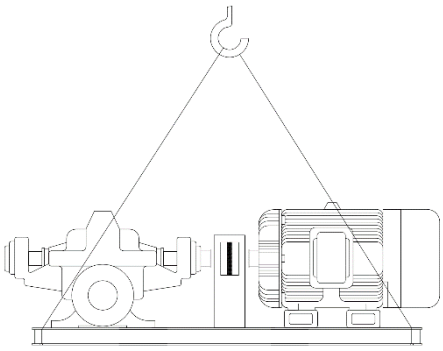


Figure 1: SCH Series

SECTION V. INSTALLATION

1. **Pump Room or Storage**
   a. Pump room or storage should be clean, free from any construction activities, materials & debris.
   b. Pump room or storage should be ventilated with proper lighting, safety / warning signage & secured with steel door and lock.
   c. Pump room or storage should be provided for provision of crane or chain block for installation & maintenance purposes.
   d. Pump room or storage should be protected against flooding.

2. **Mounting**
   a. Pumps can be mounted in fabricated steel base plate or concrete base or plinth as long as surface is properly level.
   b. Pump can be installed with rubber isolation, spring isolation or inertia base to avoid transfer of vibration during operation. Kindly refer to manufacturer for appropriate sizes and types.
   c. Pumps should be properly mounted with bolts tighten evenly.

3. **Alignment**
   a. All pumps ship to country of destination are factory aligned.

⚠CAUTION

   b. Misalignment during transportation, improper handling and installation could occur. Henceforth, inspection of alignment using mechanical dial indicator or laser alignment instrument is mandatory prior for start-up.
   c. Parallel and Agular alignment must be checked using alignment instruments to ensure smooth running operation of pump. Please refer to instructions from manufacturer of coupling and alignment instrument for more information.

4. **Piping Connections**

⚠WARNING

   a. Procedure of installation of suction and discharge pipe connections shall be in accordance to related plumbing and/or water system codes & local regulations.

b. Standard practice that suction diameter of the pipe should be larger than the suction diameter of the pump. Use eccentric reducer in pump suction and concentric reducer in pump discharge.
c. Net Positive Suction Head (NPSH) should be calculated against the depth of water source (Tank) to avoid cavitation.
d. For negative suction or suction lift, install priming pipe with isolation valve in suction pipe for proper priming procedure.
e. Minimum distance of 10 pipe diameter from any fixtures, valves and fittings to pump suction is recommended to produce laminar flow in suction pipe.
f. Avoid numerous off-setting in suction pipe to avoid producing of cavitation.
g. Proper support brackets and/or thrust blocks in suction & discharge pipe must be installed.
h. Valves, fixtures and fittings must be followed in accordance to plumbing and/or water system codes & local regulation with all necessary mechanical valves to protect the pump and piping system during operation.
i. If pump is supplied with packing gland seal, it is recommended to install drain pipe to avoid flooding of water inside the pump room.

5. Wiring Connections for Electric Motors

a. Procedure of installation of wires and cables for electric motor shall be in accordance to related electrical code & local regulations.
b. Wire or cable sizes must be appropriate to Kilowatt (kw) or Horsepower (hp) rating of electric motor. Kindly refer to electrical code & local regulations.
c. Procedure of wire or cable termination or connection to electric motor terminal box should be followed in accordance to electric code & local regulations.
d. Wires or cables should be installed in metal conduit or light tight conduit.
e. Electrical components related in protecting the electric motor against irregular conditions should be installed in control panels.

SECTION VI. OPERATION PROCEDURE

1. Pre-start-up & Checking

a. Wear Personal Protective Gear or Equipment prior for start-up and operation.
b. Prepare your instrument or tools to observe the performance of the pump.
c. Check water source. Never operate the pump if water has presence of sand or any solid particles.
d. Check all valves & fittings. Never activate the pump where suction and discharge isolation valve is closed.
e. “Prime” the suction pipe prior for start-up. Remove trap air by unscrew the plug located in pump volute.
f. Inspect shaft seal (packing or mechanical) if it is properly installed. For packing gland, adjust the packing nut necessary to avoid excessive water leak during operation.
g. Inspect pump shaft alignment. It may misalign during shipment, improper handling and installation.
h. Pump shaft must be rotated freely by hand.
i. Adjust the impeller clearance if necessary.
j. Pump should be clean, free from any dust particles that might affect the smooth performance of pump & motor bearings.

2. Start-Up

a. Open the isolation valve in suction pipe.
b. Make sure suction pipe is properly primed upon opening of the gate valve.

c. Check the rotation by jump start the motor. Rotation should be same to direction of arrow reflected in pump volute.
d. Start the driver.
e. Slowly open the isolation valve in discharge pipe.
f. Do not operate the pump exceeding to its rated working pressure.
g. Use calibrated tester or current meter instrument to check if actual current of motor is within the normal range.
h. Observe the pump volute. If high temperature is observe, immediately shut down the pump and inspect the pump and suction pipe.

i. Observe pump vibration if it is within the normal range.
j. Mechanical Seal
    i. Excessive temperature & vibration could damage the ceramic coating of mechanical seal.
    ii. Presence of solid particles in water could also damage the mechanical seal.
    iii. Misalignment of pump and/or motor shaft could also damage the mechanical seal.
k. Packing Seal
    i. Adjust packing gland nut if excessive water is observe during operation.
    ii. Apply more packing if water leak is excessive.
f. Adjust all necessary protective electrical components in control panel for motor protection.
g. Do not operate electric motors if actual voltage fluctuates. Please refer Section VII. #5.a for reference.

3. Pump Stop

a. Necessary valves & fittings are required to protect the pump from water hammer effects when stopping the operation. Please refer to plumbing and/or water system codes & local regulations for reference.
b. If pump will not be used for longer period of time or if climate of freezing exists, close the suction and discharge isolation valve and drain the water inside the pump volute completely.

SECTION VII. MAINTENANCE PROCEDURE

1. General Maintenance

a. Pump room should be clean & free from any dust particles or any related matters to maintain the smooth operation of pump & motor bearings, mechanical seals and motor exhaust fan.

b. Floor of pump room or storage should be dry, free from any stagnant water for avoid certain accidents.
c. No moisture or humidity exists inside the pump room or storage. Necessary ventilation system is required.
d. Pump room or storage must be secured, free from any thieves and trespassers. Only authorized personnel or maintenance should have an access inside.

e. Shut down all power supply when performing maintenance routine to avoid certain accidents.
f. Wear Personal Protective Gear or Equipment before performing maintenance check.
g. It is highly recommended to update regularly the maintenance record for future reference.

2. Bearings

a. Bearings are not allowed to operate higher than 70°C. Inspect the bearings if temperature is not within the normal ranges.
b. Lubricate bearings using calcium based grease or SAE20W Oil. Pumps in 2 pole speed (2900rpm in 50hz or 3500rpm in 60hz) should replenish oil or grease every 2500 working hours. 4 pole speed (1450rpm in 50hz or 1750rpm in 60hz) should replenish oil or grease every 5000 working hours. Do not over lubricate because it will cause to overheat.
c. Bearings should be replaced every 10000 working hours.

3. Mechanical Seal

a. Presence of high temperature in pump volute, excessive vibration and poor quality of water will damage the ceramic coating of mechanical seal.
b. Mechanical seals should be replaced immediately if leakage found during standby and running operation.

4. Packing Gland Seal

a. There should be water droplet in packing gland seal during in running operation. Standard drop ranges from 50 to 70 droplets in every minute.
b. Adjust packing gland cover by adjusting the bolts if water droplets is exceeded in standard ranges.
c. Packing gland is consumable or subject for wear & tear depending on operation. Replace the packing gland if water droplet exceeded to its standard ranges even though packing gland cover has been adjusted accordingly.

5. Electrical Conditions

a. Power voltage fluctuations
    i. To maintain the expected life period, do not operate the electric motor if
        1. Actual voltage fluctuates beyond tolerance bands of +/- 10% from normal power voltage.
        2. Actual voltage fluctuates within tolerance bands of +/- 10% from normal power voltage for more than 60 minutes each day.
    ii. Electric components for protection against abnormal fluctuation of power supply voltage or to maintain the stability of power supply voltage for entire day is required to avoid premature damage of electric motor.

b. Electric motor
   i. Check the termination of wires or cables inside the terminal box. Retighten the bolts and screw if necessary.
   ii. Bearings should be checked thoroughly. Please refer section VII. #2 for reference.
   iii. Measure the motor insulation using insulation tester if it is within the normal range.
   iv. Check body temperature of electric motor. Standard body temperature of electric motor ranges from 40°C to 60°C

SECTION VIII. SPARE PARTS

1. **Recommended Spare Parts for HESC Series Horizontal split case centrifugal pumps**

a. Intermittent duty

*Item	Description
3	Wear Ring
1, 1.1	Casing & Bottom Gasket
**13	Set of Mechanical Seal
***17, 18, 19, 20	Set of Packing Gland

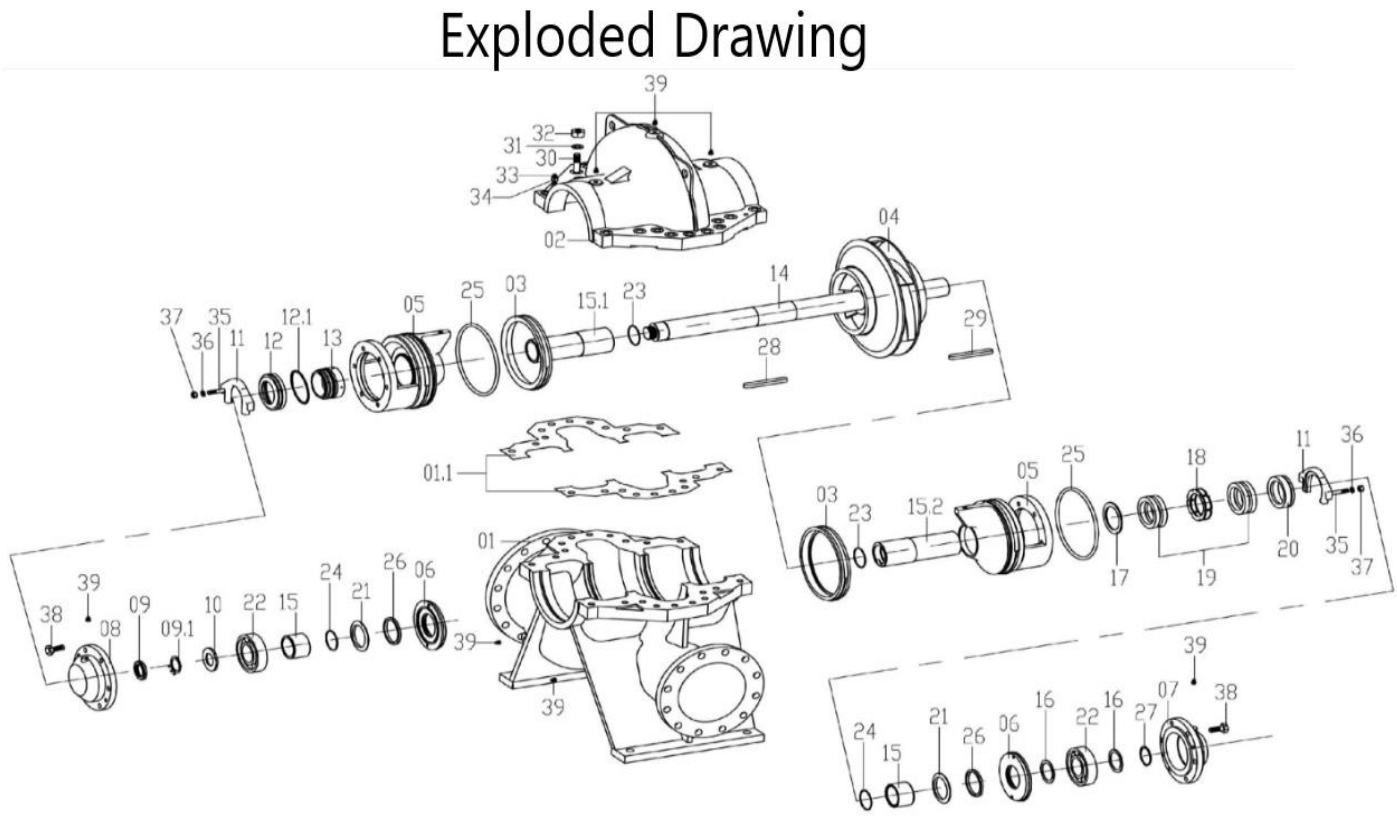
* Refer to Section IX for reference
** If type of seal is mechanical
*** If type of seal is packing gland

b. Continuous operation

*Item	Description
3	Wear Ring
1, 1.1	Casing & Bottom Gasket
**13	Set of Mechanical Seal
***17, 18, 19, 20	Set of Packing Gland
4	Impeller
22	Ball bearing
10	Bearing Slinger
15, 15.1	Shaft Sleeves
26	Felting
23, 24, 25	O-Ring
16	Bearing Seal Plate
27	External Circlips
21	Slinger
26	Felting
28, 29	Key

* Refer to Section IX for reference
** If type of seal is mechanical
*** If type of seal is packing gland

SECTION IX. EXPLODED VIEW

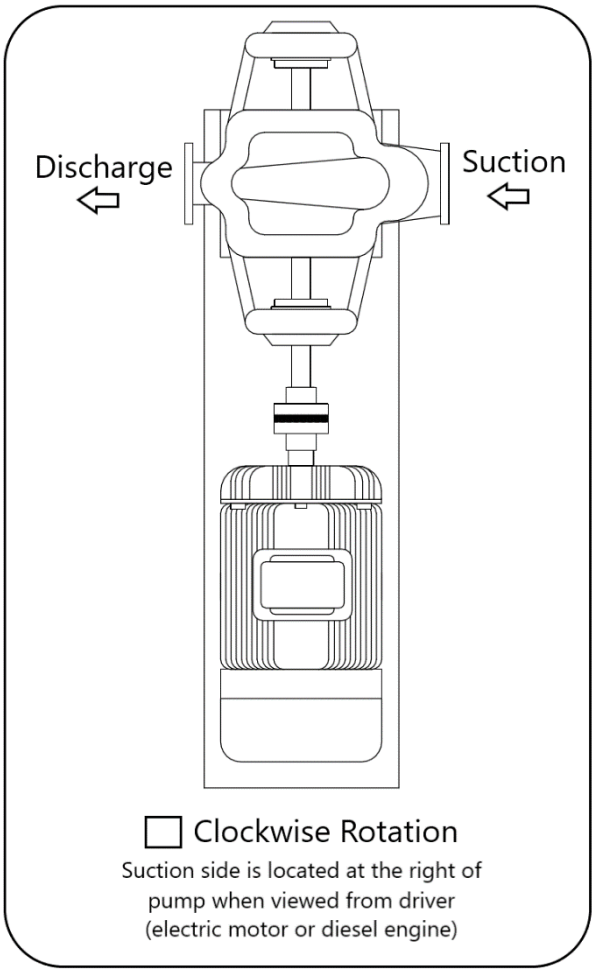


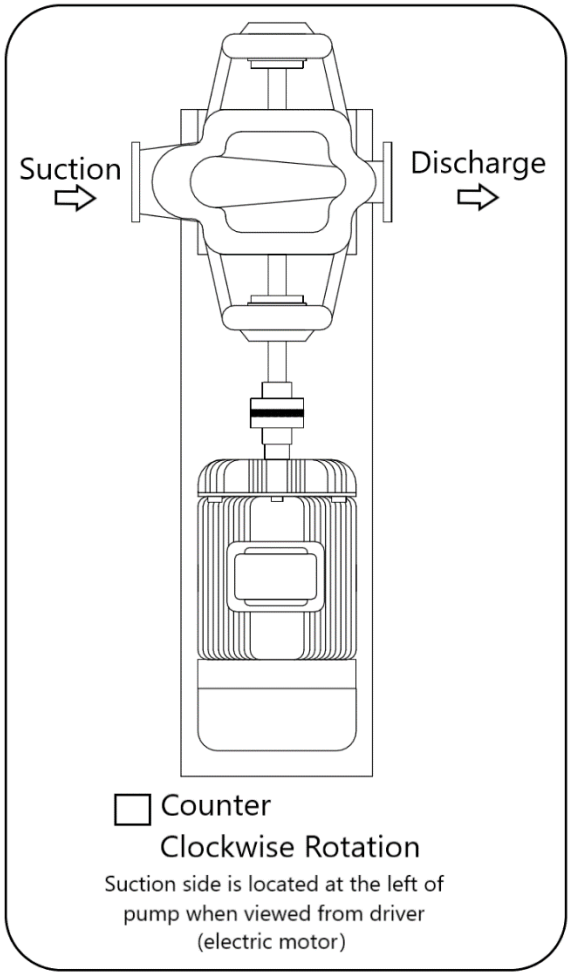
Item	Description
1	Bottom Casing
1.1	Casing Gasket
2	Top Casing
3	Wear Ring
4	Impeller
5	Seal Frame
6	Bearing Cover
7	Bearing Frame – Driver Side
8	Bearing Frame – Non Driving Side
9	Screw Nut
9.1	Lock Washer for Nut
10	Bearing Slinger
11	Seal Plate
12	Seal Cover
12.1	Seal Cover Gasket

Item	Description
13	Mechanical Seal
14	Shaft
15	Shaft Sleeve – Short
15.1	Shaft Sleeve
15.2	Packing shaft Sleeve
16	Bearing Seal Plate
17	Packing Seal Plate
18	Lantern Ring
19	Gland
20	Packing Cover
21	Slinger
22	Ball Bearing
23 24 25	O-Ring
26	Felting
27	External Circlips

Item	Description
28, 29	Key
30	Screw Bolt
31	Spring Washer
32	Screw Nut
33	Pin
34	Screw Nut
35	Screw Bolt
36	Flat Gasket
37	Screw Nut
38	Screw Bolt
39	Plug

SECTION X. IMPELLER ROTATION





Pump rotation must be confirmed by client or end user prior to manufacturing

SECTION XI. TROUBLE SHOOTING

Problems	Causes	Recommended Solutions
No discharge flow	1. Trap air or leak at suction pipe 2. Impeller clogged 3. Damaged shaft and impeller	1. Remove trap air or repair leak. Prime properly the suction pipe 2. Remove solid particles 3. Replace shaft and impeller
Pump loses prime while operating	1. Insufficient NPSH 2. Trap air or leak at suction pipe	1. Reduce suction lift 2. Remove trap air or repair leak
Actual pump capacity and/or head insufficient	1. Insufficient NPSH 2. Actual head greater than expected 3. Trap air or leak at suction pipe 4. Impeller direction wrong 5. Small Impeller diameter 6. Impeller clogged 7. Wear ring defective	1. Reduce suction lift 2. Reduce valves & fittings or replace bigger pump 3. Remove trap air or repair leak. Prime properly the suction pipe 4. Interchanged wires & cables to reverse the rotation 5. Replace impeller but take note BHP vs motor HP 6. Remove solid particles 7. Replace wear ring
Excessive noise and vibration	1. Trap air or leak at suction pipe 2. Impeller direction wrong 3. Misalignment 4. Bearings operating dry condition	1. Remove trap air or repair leak. Prime properly the suction pipe 2. Interchanged wires & cables to reverse the rotation 3. Realign shaft. Use dial indicator for checking of alignment. 4. Apply oil or grease or replace bearings
Bearings produce excessive heat	1. Misalignment 2. Dirty 3. Operating dry condition	1. Realign shaft. Use dial indicator for checking of alignment. 2. Clean the bearing 3. Apply oil or grease
High current readings in electric motor	1. Abnormal power voltage 2. Impeller clogged 3. Misalignment 4. Bearings operating dry condition 5. Low or no motor Insulation	1. Use electric components to stabilize the power voltage 2. Remove solid particles 3. Realign shaft. Use dial indicator for checking of alignment. 4. Apply oil or grease or replace bearings 5. Rewind or replace the motor
Pump volute produces high temperature	1. Trap air or leak at suction pipe 2. Insufficient NPSH	1. Remove trap air or repair leak. Prime properly the suction pipe 2. Reduce suction lift