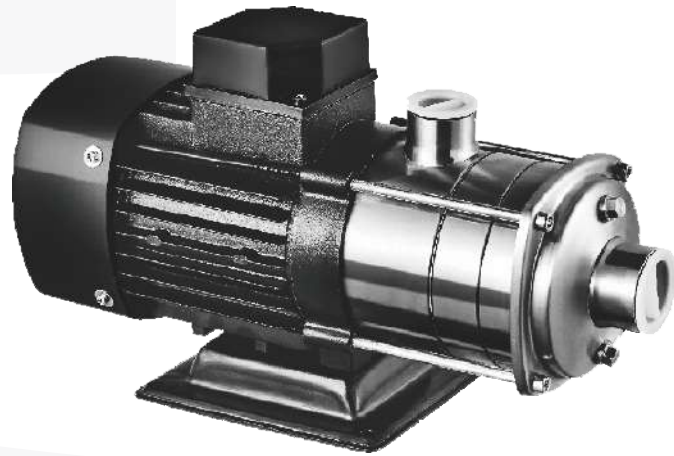


SEM

SERIES HORIZONTAL MULTISTAGE CENTRIFUGAL PUMP

Operation Manual

Contents

I.Construction

• Pump is horizontal, multistage, sectional type. Pump shaft is the extended motor shaft. Axial suction and radical discharge;

• **CM** is a mainly composed of motor, seal plate, diffuser, impeller, inlet and outlet chamber, pump shaft, mechanical seal, etc.

• **SEM** is composed of motor, suction head,discharge head,diffuser, impeller, pump shaft, mechanical seal,etc.

• The key parts of pump: diffuser, impeller, inlet and outlet chamber, pump shaft are made of stainless.

• Mechanical seal is single case seal, **CM** and **SEM** seal part is made of silicon carbide/graphite.

• The standard connection type is pipe thread connection.

II.Application and condition

CM,SEM are non-self-priming horizontal multistage centrifugal pump, they are efficient and low noise pump

1. Application

• Pumping liquids: low viscosity, neutral, non-explosive liquids, not containing solid particles or fibers. The liquid must not attack the pump material chemically(Oil or the liquid mainly consisted of oil can be pumped by special type of pumps);

• Circulation for air condition system;

• Cooling system

• Water treatment, purification system;

• Industrial cleaning system

• Liquid transferring, circulation, boosting;

• Hot and cold water

• Feed preparation system for food, drinking, agriculture, etc.

2. Operation conditions

• Liquid temperature: Normal water temperature -15℃～+70℃； Hot water temperature -15℃～+110℃

• Flow range: 0.5~28m³/h

• Max pressure: 10bar

• Liquid pH range: 5 to 9

• Max ambient temperature: +40℃

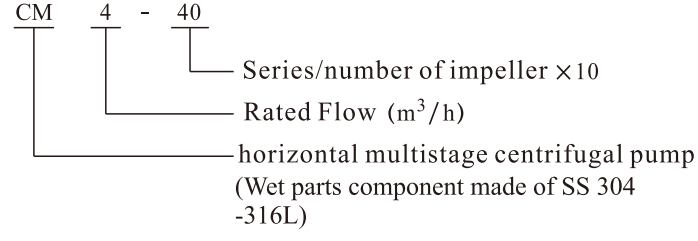
• The max suction pressure is limited by max operation pressure.

• Min inlet pressure: refer to catalog

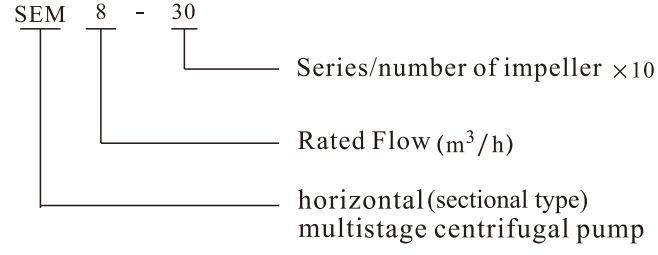
Caution: when pumping liquid with a density and/or viscosity higher than that of water, use motor with a higher outputs

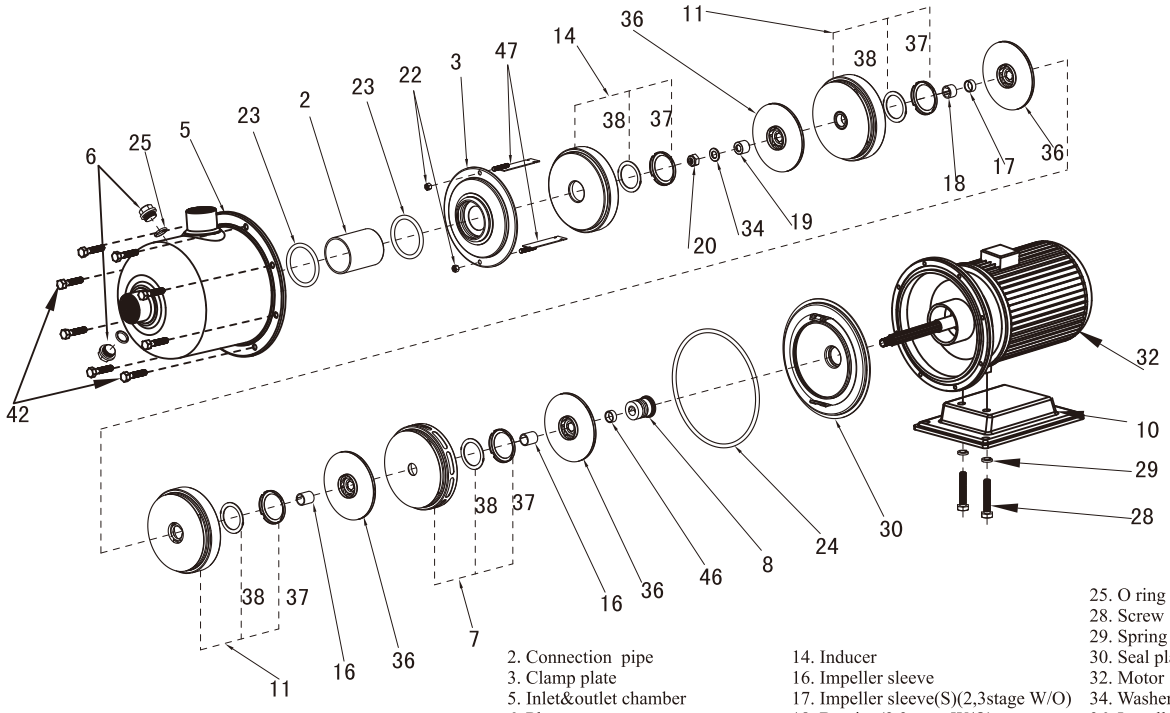
III.Definition of model

CM2/4/8/12/16/20



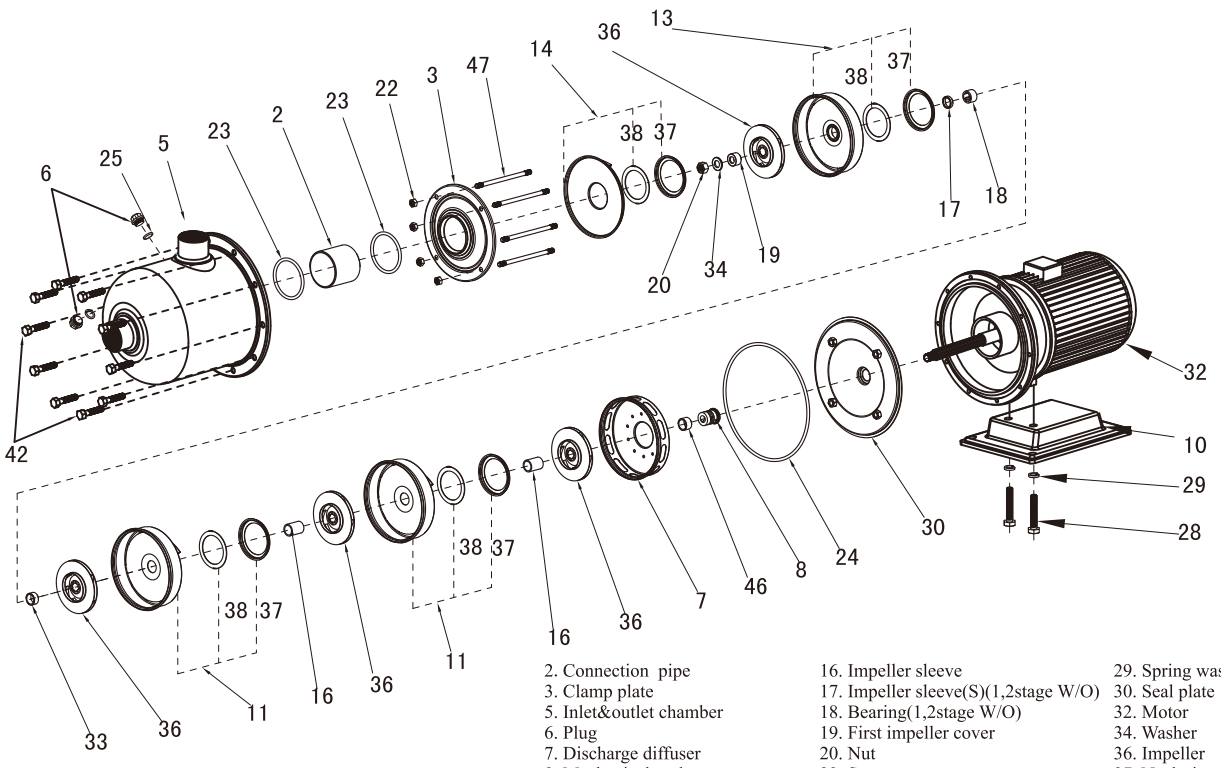
SEM2/4/8/12/16/20





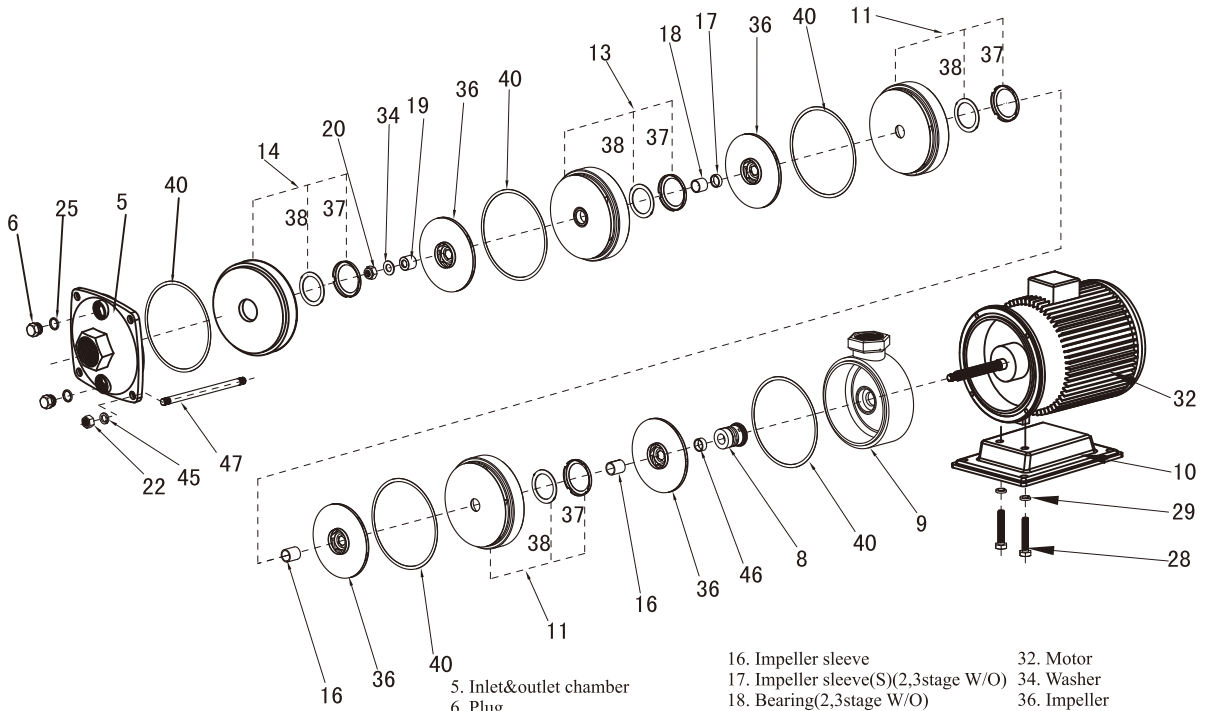
CM 2/4

2. Connection pipe
3. Clamp plate
5. Inlet&outlet chamber
6. Plug
7. Discharge diffuser
8. Mechanical seal
10. Base plate
11. Diffuser(2 stage W/O)
13. Support diffuser(2,3stage W/O)
14. Inducer
16. Impeller sleeve
17. Impeller sleeve(S)(2,3stage W/O)
18. Bearing(2,3stage W/O)
19. First impeller cover
20. Nut
22. Screw
23. O ring
24. O ring
25. O ring
28. Screw
29. Spring washer
30. Seal plate
32. Motor
34. Washer
36. Impeller
37. Neck ring cover
38. Neck ring
42. Screw
46. Sleeve(SM2 W/O)
47. Stay bolt



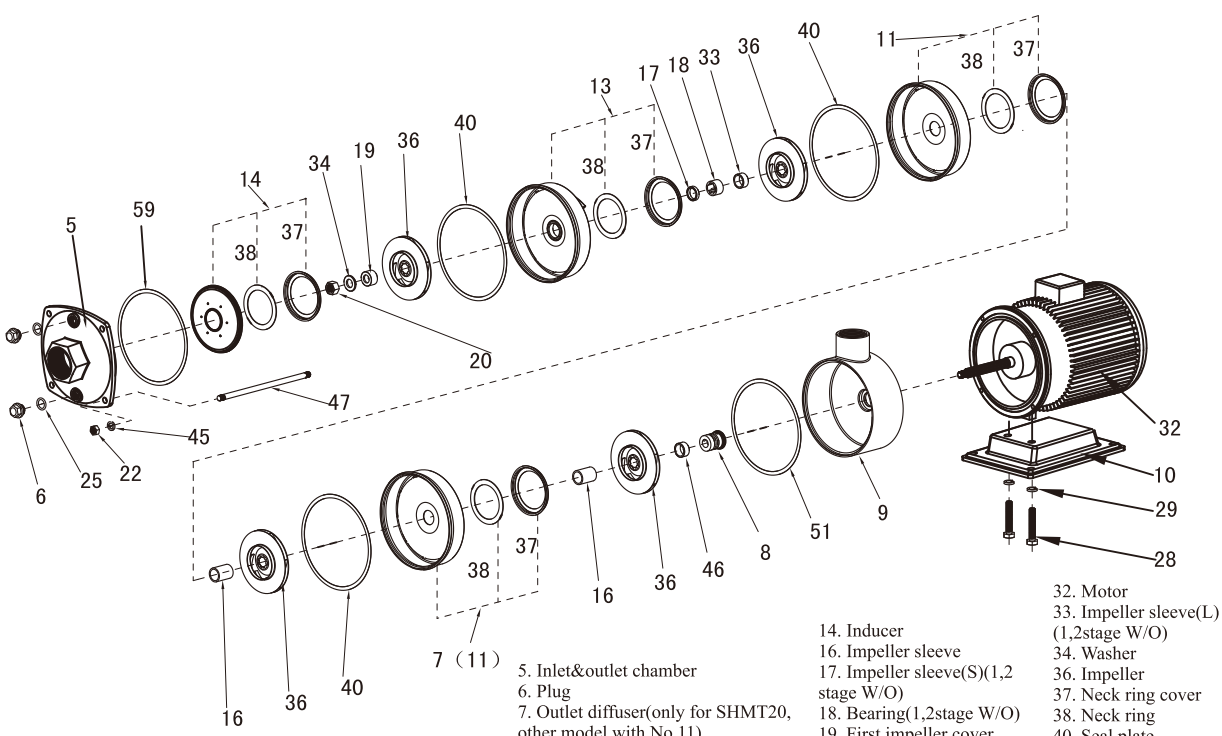
CM8/12/16/20

2. Connection pipe
3. Clamp plate
5. Inlet&outlet chamber
6. Plug
7. Discharge diffuser
8. Mechanical seal
10. Base plate
11. Diffuser
13. Support diffuser(1,2stage W/O)
14. Inducer
16. Impeller sleeve
17. Impeller sleeve(S)(1,2stage W/O)
18. Bearing(1,2stage W/O)
19. First impeller cover
20. Nut
22. Screw
23. O ring
24. O ring
25. O ring
28. Screw
29. Spring washer
30. Seal plate
32. Motor
34. Washer
36. Impeller
37. Neck ring cover
38. Neck ring
42. Screw
46. Sleeve(SM2 W/O)
47. Stay bolt



SEM2/4

5. Inlet&outlet chamber
6. Plug
8. Mechanical seal
9. Discharge
10. Base plate
11. Diffuser
13. Support diffuser(2,3stage W/O)
14. Inducer
16. Impeller sleeve
17. Impeller sleeve(S)(2,3stage W/O)
18. Bearing(2,3stage W/O)
19. First impeller cover
20. Nut
22. Screw
25. O ring
28. Screw
29. Spring washer
32. Motor
34. Washer
36. Impeller
37. Neck ring cover
38. Neck ring
40. Seal plate
45. Spring washer
46. Sleeve(SHMT W/O)
47. Stay bolt



SEM8/12/16/20

5. Inlet&outlet chamber
6. Plug
7. Outlet diffuser(only for SHMT20, other model with No.11)
8. Mechanical seal
9. Discharge
10. Base plate
11. Diffuser(SEMT20-1/2/3 W/O)
13. Support diffuser(1,2stage W/O)
14. Inducer
16. Impeller sleeve
17. Impeller sleeve(S)(1,2 stage W/O)
18. Bearing(1,2stage W/O)
19. First impeller cover
20. Nut
22. Screw
25. O ring
28. Screw
29. Spring washer
32. Motor
33. Impeller sleeve(L) (1,2stage W/O)
34. Washer
36. Impeller
37. Neck ring cover
38. Neck ring
40. Seal plate
45. Spring washer
46. Sleeve
47. Stay bolt
51. Seal plate
59. Seal plate

IV.Installation and connection

1. Installation

• Pump should be installed in a well ventilated area. The distance between pump and other surrounding objects should be at least 150mm, in order to cool the motor by fan with enough air.

• To reduce the head loss of inlet as less as possible, the inlet pipe shall be as short as possible.

• Ensure that, the check valve is installed in pipe line system before the installation of the pump to avoid liquid returning.

• Pump should be fixed horizontally on ground or on a bracket to the wall. Pump should be fixed safely and stably. Don't let any over weight of the pipe system to load on the pump, in order to avoid pump to be damaged.

• Before installation, make sure that the inlet pipe is clean, if impurities are expected in the liquid, it is advised to install strainer of 0.5-1mm before the pump inlet.

• The air pockets shall be avoided when installing the inlet pipe line. see Fig.2

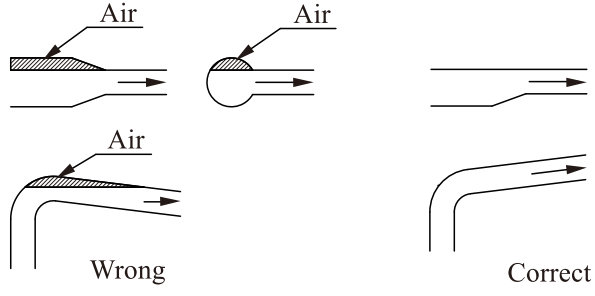


Figure 2

• It is recommended to install a pressure gauge to observe and control operation of the pump.

• If the pump installed in a higher position than the liquid level, in the suction range of pump, check valve should be installed in the end of inlet pipe.

1. Electrical connection

• The electrical connections should be carried out by a qualified electrician.

• To make sure the motor is suitable for the power supply, cables of motor must be connected to power supply according to the drawing on the terminal box and the motor name plate.

• Motor shall be connected with a fast and effective motor starter, to ensure that the motor will not be damaged by lack of phase, unstable voltage or overload; the motor shall be earthed reliably.

Caution: Before taking off the terminal box cover or dismantle pump, make sure that, the power supply is switched off.

2. Wiring -Electrical connection and safety devices

• The pump units should be connected to the power supply by the appropriately rated power cables according to the motor ratings.

• The pump units should be always equipped with safety devices, as required in the standards as well as by the national rules of the country where the pump is used.

• Despite the rules of any country, the power supplied to the pump must be equipped with at least following electrical safety devices with appropriate ratings:

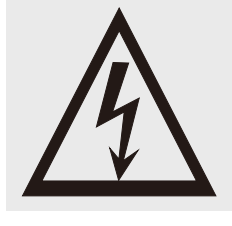
- Emergency switch
- Circuit breaker(as a supply disconnection (isolating) device as well as and overcorrect protective device)
- Motor overload protection

The following is for suggestion:

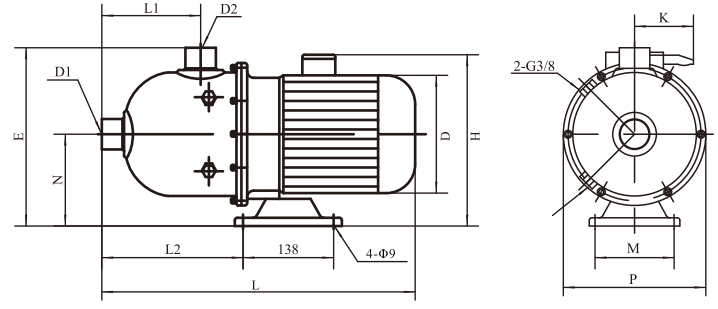
380V(50Hz/60Hz)						
No.	Power input (kW)	Cable connection	Input current(A)	Cable spec (mm2)	Circuit breaker (A)	Thermal protector (A)
1	0.37	Y	1	0.75	5	1.2
2	0.55	Y	1.4	0.75	5	1.7
3	0.75	Y	1.8	0.75	5	2.2
4	1.1	Y	2.6	1	5	3.1
5	1.5	Y	3.5	1	10	4.2
6	2.2	Y	4.9	1.5	10	5.9
7	3	Y	6.3	1.5	10	7.6
8	4	Y	8.2	2.5	20	9.8
9	5.5	Y	11	2.5	20	13.2

The acoustic noise emission is around 75dB(A).

Before open the terminal box, please shut off the power supply to prevent from power shock.

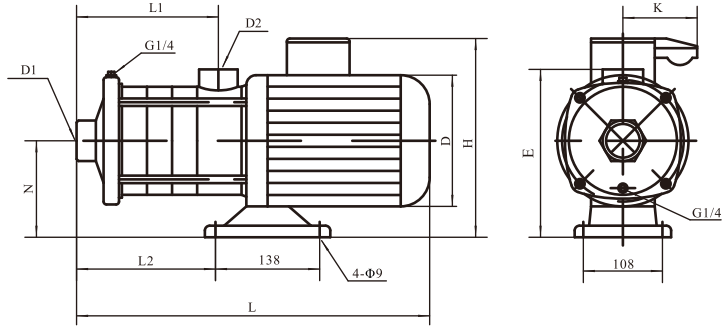


4.CM dimensions(mm)



Model	D1	D2	N	E	L1	L2	L3	d	L	D	H		K	P	M	Weight
											3ph	1ph	1ph			kg
CM2-10	G1	G1	110	215	120	160	138	9	400	145	215	230	96	165	108	13
CM2-20																
CM2-30																
CM2-40																
CM2-50																
CM2-60									445	170	225	245	100			14
CM4-20	G1 1/4	G1	110	215	120	160	138	9	400	145	215	230	96	165	108	12
CM4-30									445	170	225	245	100			13
CM4-40																15
CM8-20	G2	G2	118	268	178	280	138	9	560	170	230	265	100	230	108	20
CM8-30																23
CM8-40									580	180	240	270				25
CM8-50																29
CM12-20	G2	G2	118	268	178	280	138	9	560	170	230	265	100	230	108	21
CM12-30									580	180	240	270				25
CM12-40																28
CM12-50			126	276		270			610	195	270	/	/			33
CM16-20	G2	G2	118	268	178	280	138	9	580	180	240	270	100	230	108	27
CM16-30			126	276		270			610	195	270	/	/			34
CM20-20			118	268		280			580	180	240	270	100	230	108	28
CM20-30			120	270		360	140	12	650	220	270	/	/		190	41

5.SEM dimensions(mm)



Model	D1	D2	N	E	L	L1	L2	L3	d	D	H		K	M	Weight
											3ph	1ph	1ph		kg
SEM 2-20	G1	G1	110	182	305	84	87	138	9	145	215	230	96	108	13
SEM 2-30					323	102	105								
SEM 2-40					341	120	123								14
SEM 2-50					359	138	141								
SEM 2-60					422	156	159			170	225	245	100		16
SEM 4-20	G1 1/4	G1	110	182	329	102	105	138	9	145	215	230	96	108	15
SEM 4-30					356	129	132								
SEM 4-40					416	156	162			170	225	245	100		17
SEM 4-50					455	183	188								
SEM 4-60					482	210	213								
SEM 8-20	G1 1/2	G1 1/4	110	228	395	108	126	138	9	170	230	265	100	108	20
SEM 8-30					425	138	156								24
SEM 8-40					490	168	186			180	240	270			28
SEM 8-50					520	198	216								30
SEM 12-20	G1 1/2	G1 1/2	118	228	395	108	126	138	9	170	230	265	100	108	21
SEM 12-30					425	138	156			180	240	270			25
SEM 12-40					490	168	186								29
SEM 12-50			126	240	555	198	216			195	270	/	/		34
SEM 16-20	G2	G2	118	228	455	126	151	138	9	180	240	270	100	108	27
SEM 16-30			130	240	561	171	196			195	270	/			33
SEM 16-40			120	230	621	216	340	140	12	220	270	/	/		40
SEM 20-20	G2	G2	118	228	455	126	151	138	9	180	240	270	100	108	27
SEM 20-30			120	230	576	171	294	140	12	220	270	/	/	190	40
SEM 20-40					621	216	340								44

V.Start-up, operation and maintenance

Caution: It is prohibited to run without liquid, which will damage mechanical seal and sliding bearing.

1. Don't start the pump until it has been filled with water or liquid.

• Fill water to the pump in inverse pouring system.

• Close the pump outlet valve, release air vent screw on the pump head, and open the inlet value slowly until stable water flows from the air vent screw. Then fasten the screw.

• Fill water in pump when liquid level is lower than pump. Before start up, pump and pipes must be fully filled with liquid and air must be vented.

2. Check the rotary direction

Switch on the power supply and view the rotary direction by viewing the motor fan. From the motor end, pump shall run counter-clockwise.

3. Before pump start-up

• Check whether the pump is fixed securely

• Check whether pump is filled with water fully and check whether liquid can flow freely

• Check whether the voltage of power supply is stable

• Check whether it turns correctly

• Make sure all pipe lines are connected rightly and can supply water normally

• The valve in the inlet pipe line are completely opened

• The outlet valve shall be opened slowly after the pump is started up

• Check the operation pressure if pressure meter is installed

• Check all the controls for normal operation, if the pump is controlled by pressure switch, check and adjust the starting pressure and stopping pressure. Check the full load current to make sure it not surpasses the max allowed current.

3. Frequency of pump starts

• Pump should not be started too frequently. It is suggested pump shall not be started more than 100 times per hour if the motor power is less or equal to 4kW. when motor power is big than 4kW, pump shall not be started more than 20 times in one hour.

• Suggestion: when pump running, flow should be controlled at the range of 0.5-1.3 times of rated flow

• There should be no noise when pump running, if so, stop pump, check , and repair.

4. Frost protecting

Pump can be used in the system with anti-frozen measures. If the pump is

installed in an environment which easily frozen, suitable antifreeze shall be added to the transferring liquid to prevent pump from being damaged. If antifreeze is not used, pump shall not be used during periods of frost. Pump should be drained when stopped for a long time.

5. The following should be checked regularly for pump

• Pump working and operating pressure
• Possible leakage
• Possible motor overheat
• Cleaning/replacement of all strainers (if strainers fit)
• The switch of time of motor overload
• Frequency of starts and stops
• All control operation

If find any faults, check system according to “troubleshooting”

• Pump shall be cleaned and kept appropriately when it is not used for a long time
• Pump shall be prevented from being corrupted and damaged when stored.

VI.Assemble and disassemble

1. CM

• Fit the seal plate on the motor. Fit mechanical seal. The surfaces of mechanical seal should be lubricated.

• Fit the impellers, diffusers etc. in position according to the drawing. Fit inducer and clamp plate, tightened by straps.

• Finally, fit the connecting pipe, inlet and outlet chamber.

• After fitting all the parts, rotate the motor fan by hand to ensure that the shaft is not choked.

• Reverse the process above can disassemble a pump.

2. SEM

• Fit the seal plate on the motor. Fit mechanical seal. The faces of mechanical seal should be lubricated.

• Fit the impellers, diffusers etc. in position according to the drawing. Then fit impeller cover, tighten nuts, fit seal circle on every diffusers.

• Fit suction head, stay bolts, tighten the nuts of stay bolts.

• Rotate the motor fan by hand to ensure that the shaft is not choked. Reverse the process above can disassemble a pump.

VII.Trouble shooting

Caution: Before removing the terminal box cover and before any removal/ dismantling of the pump, make sure that the power supply has been switched off.

Fault	Cause	Solution	Remarks
Motor dose not run when started	1. power supply failure	1. check power supply	
	2. fuses are blown	2. replace fuses	
	3. motor is overloaded	3. check system	
	4. main contacts of starter are not connected well or the coil is defective	4.replace motor starter	
	5. control circuit is defective	5.check control circuit	
	6. motor is defective	6.repair	
Overload device of motor starter trips out immediately when power supply is switched on	1. fuses are blown	1.replace fuses	In the case of 4 and 5, users shall not disassemble the pump by themselves
	2. contacts of overload device are faulty	2.check control starter	
	3. cable connection is lows or faulty	3.check cables and power supply	
	4. motor winding is defective	4.replace motor	
	5. pump mechanically blocked	5.check and repair pump	
Overload device trips out occasionally	1. the setting of overload is too low	1.reset overload setting	
	2. periodic power supply faults	2.check power supply	
	3. Low voltage at peak times	3.add regulator	
Motor starter has not tripped out but the pump dose not run	1. contacts of starter are not contacted well or the coil is faulty	1.change motor starter	
	2. control circuit are defective	2.check control circuit	
Pumped water dose not flow constantly	1. suction pipe is too small	1.enlarge inlet pipeline	
	2. there is not sufficient water in pump water inlet	2.improve system and increase supplied water	
	3. liquid level is low	3.try to lift liquid level	
	4. pump inlet pressure is too low compared with water temperature, pipeline loss and flow	4.improve system and try to increase the inlet pressure	
	5. suction pipe is partly blocked by impurities	check and clear impurities	

Continued

Fault	Cause	Solution	Remarks
Pump runs but gives no water	1. suction pipe is blocked by impurities	1. check and clean suction pipe	
	2. foot valve or check valve is closed	2. check and repair foot valve or check valve	
	3. leakage in suction pipe	3. check and repair suction pipe	
	4. there is air in suction pipe or pump	4. refile liquid release air	
Pump runs backwards when switched off	1. leakage in suction pipe	1. check suction pipe	
	2. foot valve or check valve is defective	2. check and repair foot valve or check valve	
	3. foot valve is blocked in opened or partly opened position	3. check and repair foot valve	
	4. there is air in suction pipe	4. check and repair suction pipe and release	
Abnormal vibration or noise from pump	1. leakage in suction pipe	1. check and repair suction pipe	In the case of 5, users shall not disassemble the pump by themselves
	2. suction pipe is too small or suction pipe is partly blocked by impurities	2. enlarge or check suction pipe	
	3. there is air in suction pipe or pump	3. refile liquid to the pump and vent air	
	4. the comparison of the delivery head of device with delivery head of pump is very slow	4. improve system or choose another pump model	
	5. pump mechanically blocked	5. check and repair pump	

VIII. Important notice

1.Pump will be guaranteed for one year under normal operation with the correct model. Wearing part is not included.

2.Users shall be responsible for the damage if they disassemble the pumps by themselves in guaranteed period.

Dear customer, we wish you enjoy using our high performance and reliable product ,thank you.