evak
PUMP PARTNERS

RHINO SERIES

Instruction and Maintenance Manual

Content

1. Applications and conditions ..... page. 2

2. Definition of model ..... page. 4

3. Structure ..... page. 4

4. Start-up, operation and maintenance ..... page. 17

5. Assemble and disassemble ..... page. 19

6. Fault finding and solution chart ..... page. 21

7. Important notice ..... page. 23

Read this manual carefully before installing,starting the pump

I. Applications and Conditions

Pumps of RHINO model are non-self-priming vertical multistage centrifugal pumps. The features are high efficient, low noise, low c-orrosion resistance, compact structure, good appearance, small volume, light weight, excellent maintainability good seal performance, etc.

1. Applications

- Pumped liquids: Low viscosity, neutral, non-explosive liquids, not containing solid particles or fibres. The liquid must not attack the pump materials chemically;
- Boiler water supply and condensing system
- Water treatment, filtration syste
- Food and beverage industries
- Pressure boosting in high-rise buildings
- Farmland irrigation, nursery irrigation and golf court irrigation;
- Fire fighting system
- Industry cleaning system
- Liquid conveying, circulation and boosting
- Hot and cold water

2. Operation conditions

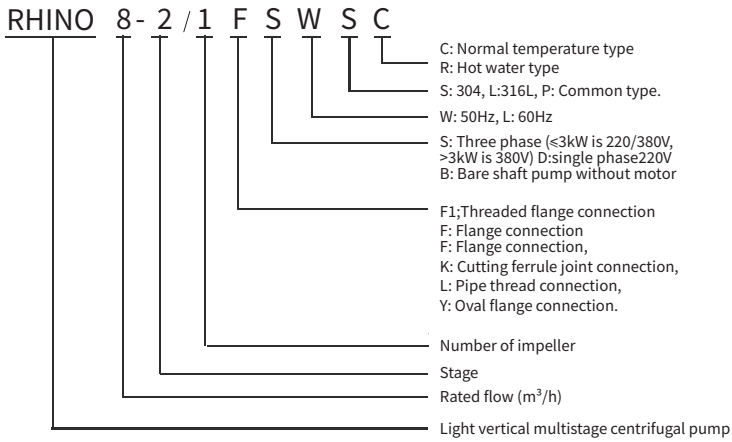
- Medium temperature: Normal temperature type -15'C~+70'C; Hot water type -15'C~+120"C
- Flow: 0.4~240m3/h
- Medium pH range: pH 5-9
- Maximum ambient temperature: +40"C
- Maximum altitude: 1000 m
- Minimum inlet pressure: Refer to NPSH curve
- Maximum working pressure refer to Fig.1A&1B
- Caution:When pumping liquids with a density and/or viscosity higher
- than that of water, use motors with correspondingly higer outputs, if required.

Fig. 1A

Model	Max. pressure(bar)
RHINO 1,3,5 Flange	16
RHINO 1,3,5 Flange, cutting ferrule joint pipe thread	25
RHINO 10 Flange	16
RHINO 10,15,20 Flange, cutting ferrule joint pipe thread	25
RHINO 32 Flange	30
RHINO 45 Flange 45-1-1 ~ 45-9 45-10-2 ~45-13-2	 25(30) 30
RHINO 65,90 Flange	25

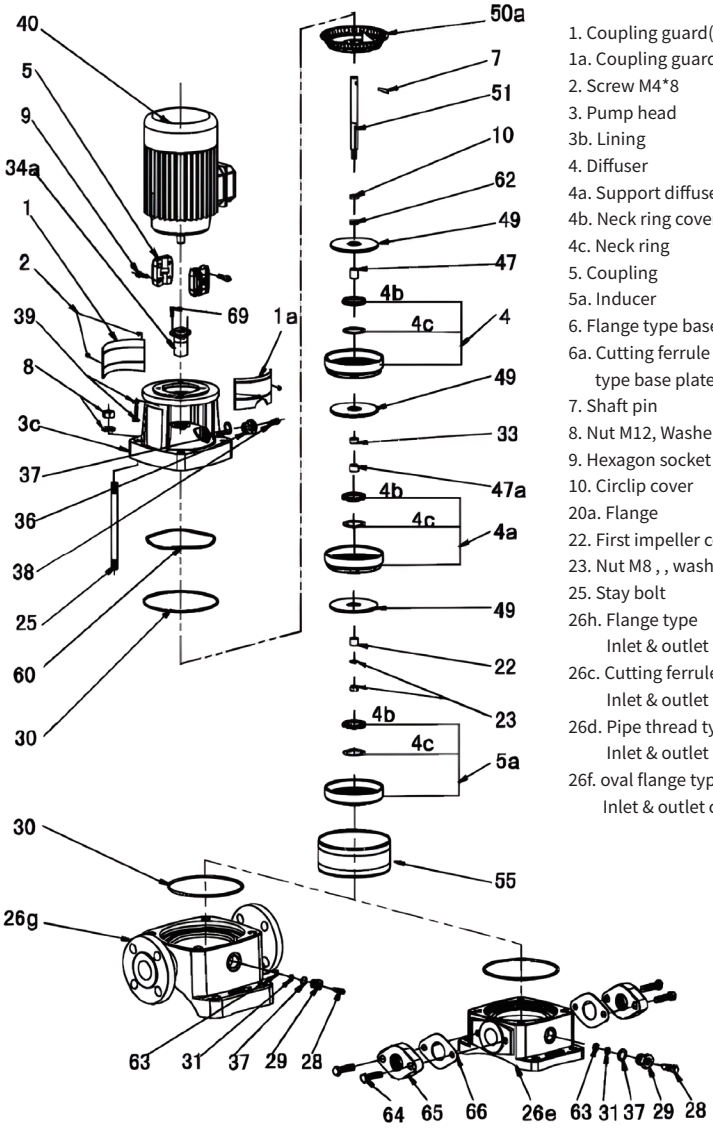
2. Definition of model

1. RHINO - 1 , 3 , 5 , 10 , 12 , 15 , 20



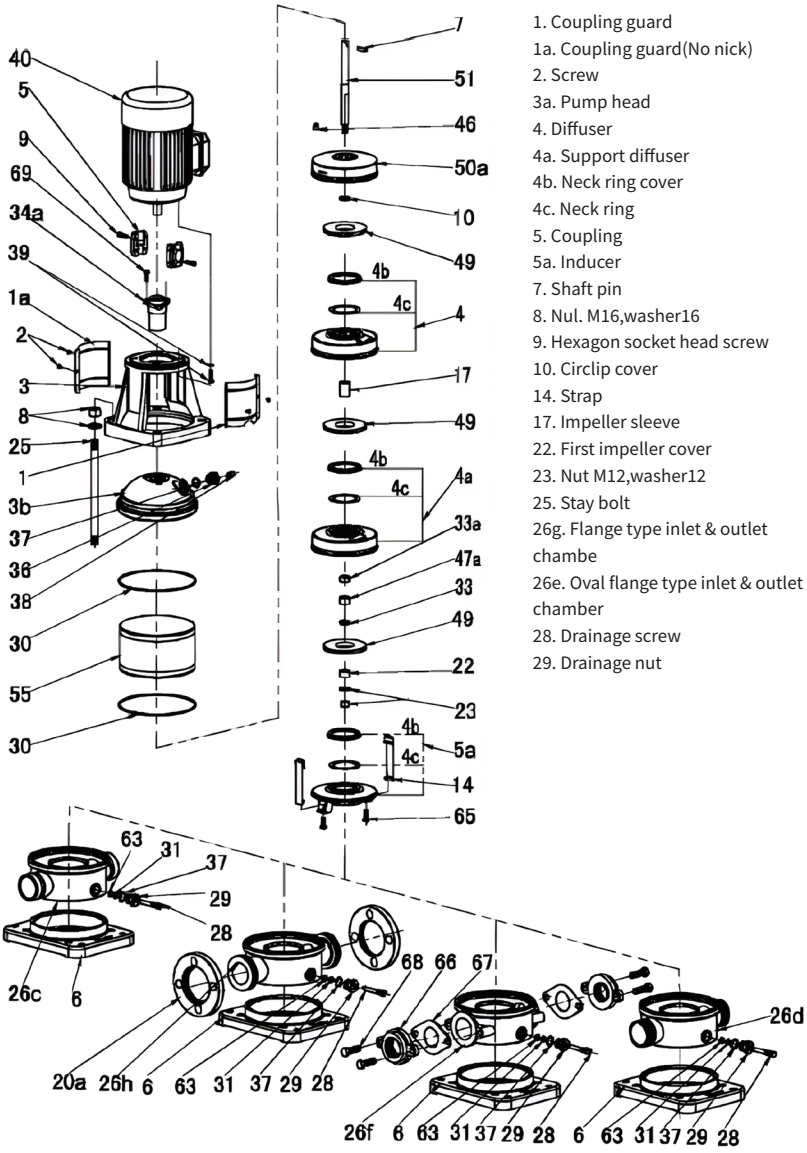
3. Structure

- The pump is mainly composed of motor, pump head, diffuser, impeller, cylinder, inlet & outlet chamber, pump shaft, mechanical seal and so on. Refer to fig.2.
- Key parts of the pump such as diffuser, impeller, cylinder, shaft, are all made of stainless steel. While for RHINO series, they are made of stainless steel.
- Mechanical seal is single mechanical seal.Griding block is cemented carbides/carbon. Support part of support diffuser is made of tungsten carb- Normally pumps and pipes are connected by round flanges. Different types of connections are also available on demand of customer. Refer to fig.3.



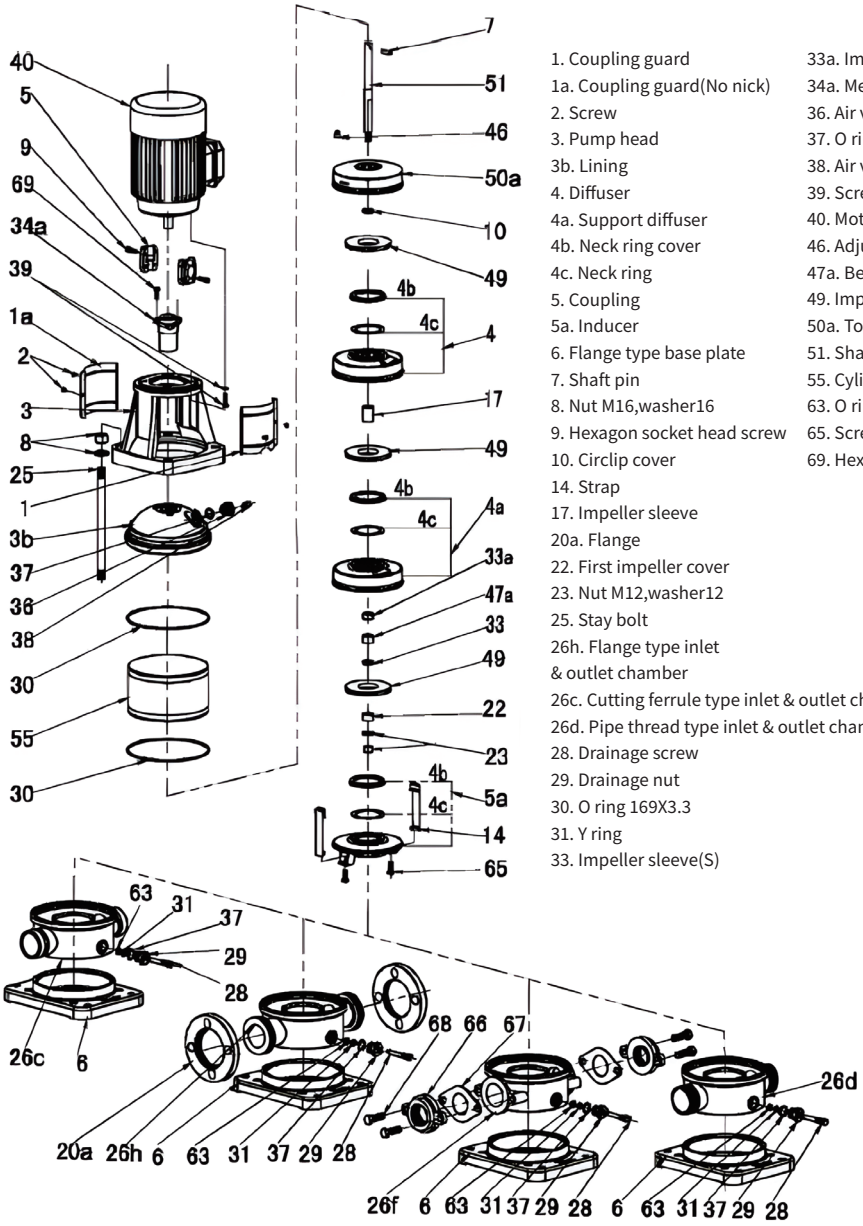
1. Coupling guard(No nick)
1a. Coupling guard
2. Screw M4*8
3. Pump head
3b. Lining
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c. Neck ring
5. Coupling
5a. Inducer
6. Flange type base plate
6a. Cutting ferrule type base plate
7. Shaft pin
8. Nut M12, Washer 12
9. Hexagon socket head screw
10. Circlip cover
20a. Flange
22. First impeller cover
23. Nut M8 , , washer 8
25. Stay bolt
26h. Flange type Inlet & outlet chamber
26c. Cutting ferrule type Inlet & outlet chamber
26d. Pipe thread type Inlet & outlet chamber
26f. oval flange type Inlet & outlet chamber
28. Drainage screw M10
29. Drainage nut
30. O ring 136.5*3.3
31. O ring 8*2.65
33. Impeller sleeve(S)
34a. Mechanical seal
36. Air vent nut
37. Oring
38. Air vent screw
39. Screw, washer
40. Motor
47. Impeller sleeve
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
60. Corrugated spring
62. Seal sleeve (only for CDLF4)
63. O ring retainer
64. Bolt M10*40
65. Oval flange
66. Oval flange gasket
69. Screw

Figure 2 RHINO-1,3,5



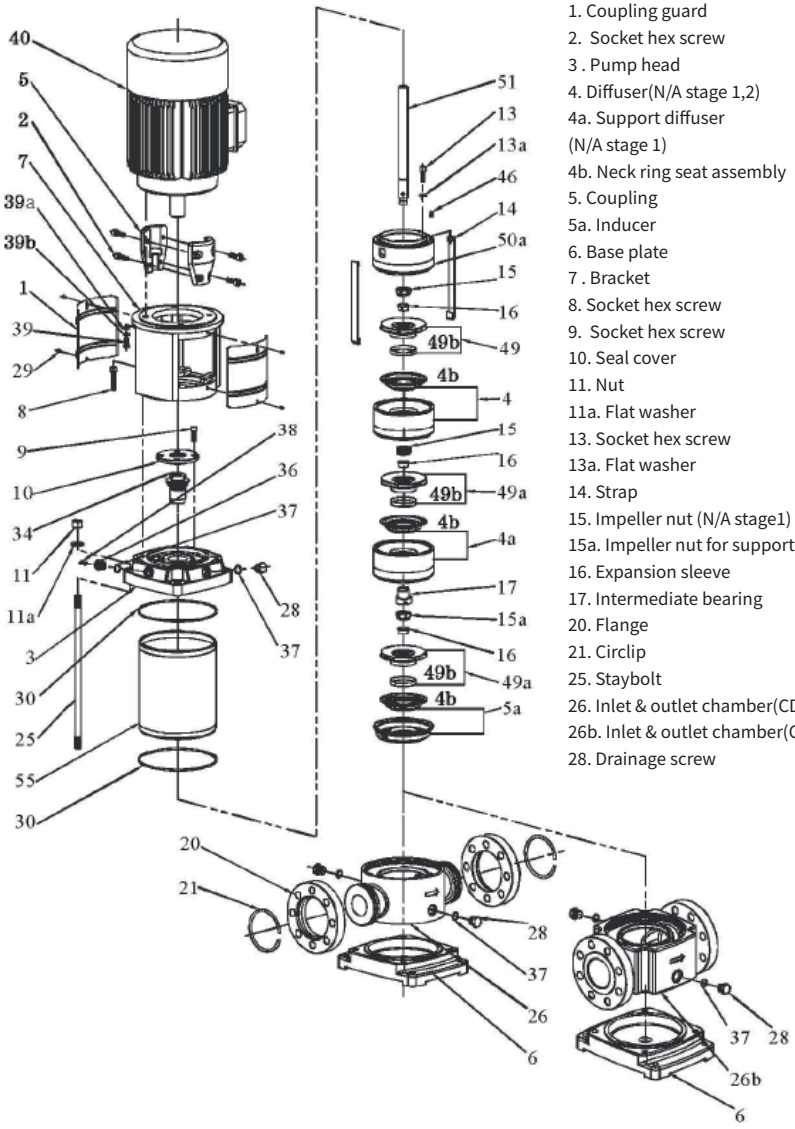
1. Coupling guard
1a. Coupling guard(No nick)
2. Screw
3a. Pump head
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c. Neck ring
5. Coupling
5a. Inducer
7. Shaft pin
8. Nul. M16,washer16
9. Hexagon socket head screw
10. Circlip cover
14. Strap
17. Impeller sleeve
22. First impeller cover
23. Nut M12,washer12
25. Stay bolt
26g. Flange type inlet & outlet chambe
26e. Oval flange type inlet & outlet chamber
28. Drainage screw
29. Drainage nut
30. O ring 169X3.3
31. Y ring
33. Impeller sleeve(S)
33a. Impeller sleeve(L)
34a. Mechanical seal
36. Air vent nut
37. O ring16X2.85
38. Air vent screw
39. Screw,washer
40. Motor
46. Adjusting rubber
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
63. O ring retainer
65. ScrewM8X20
66. Oval flange
67. Oval flange cushion
68. Screw M12X40
69. Hexagon socket head screw

RHINO-10



1. Coupling guard
1a. Coupling guard(No nick)
2. Screw
3. Pump head
3b. Lining
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c. Neck ring
5. Coupling
5a. Inducer
6. Flange type base plate
7. Shaft pin
8. Nut M16,washer16
9. Hexagon socket head screw
10. Circlip cover
14. Strap
17. Impeller sleeve
20a. Flange
22. First impeller cover
23. Nut M12,washer12
25. Stay bolt
26h. Flange type inlet
& outlet chamber
26c. Cutting ferrule type inlet & outlet chamber
26d. Pipe thread type inlet & outlet chamber
28. Drainage screw
29. Drainage nut
30. O ring 169X3.3
31. Y ring
33. Impeller sleeve(S)
33a. Impeller sleeve(L)
34a. Mechanical seal
36. Air vent nut
37. O ring16X2.85
38. Air vent screw
39. Screw,washer
40. Motor
46. Adjusting rubber
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
63. O ring retainer
65. ScrewM8X20
69. Hexagon socket head screw

RHINO-15,20

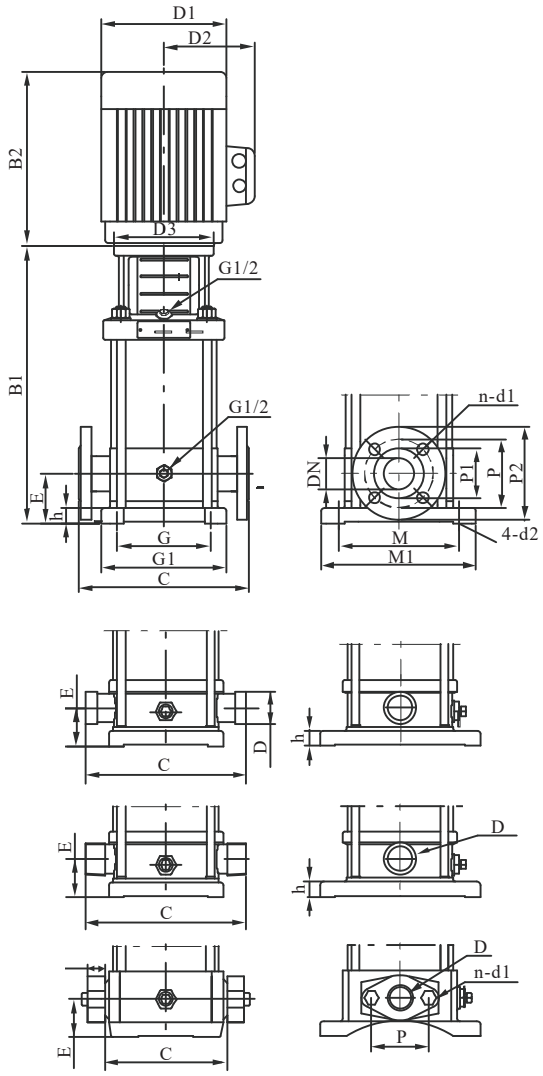


1. Coupling guard
2. Socket hex screw
3 . Pump head
4. Diffuser(N/A stage 1,2)
4a. Support diffuser (N/A stage 1)
4b. Neck ring seat assembly
5. Coupling
5a. Inducer
6. Base plate
7 . Bracket
8. Socket hex screw
9. Socket hex screw
10. Seal cover
11. Nut
11a. Flat washer
13. Socket hex screw
13a. Flat washer
14. Strap
15. Impeller nut (N/A stage1)
15a. Impeller nut for support diffuser
16. Expansion sleeve
17. Intermediate bearing
20. Flange
21. Circlip
25. Staybolt
26. Inlet & outlet chamber(CDLF)
26b. Inlet & outlet chamber(CDL)
28. Drainage screw
29. Screw
30. O ring
31. Mechanical seal
32. Air vent nut
37. O ring
38. Air vent screw
39. Screw
39a. Nut
39b. Washer
40. Motor
49. Impeller
49a. A Impeller A
49b. Impeller net ring
50a. Top diffuser(for 1 stage pump,it is top support diffuser)
51. Shaft
55. Cylinder

RHINO-32,45,65,90

Pump installation

Pump size and dimension is as below.



Round flange connection.

Cutting ferrule joint connection.

Pipe thread connection.

Oval flange connection.

Figure 3 Installation sketch

Dimesion 1, 3

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
1-2	261	220	481	138	103	23
1-3	279	220	499	138	103	23
1-4	297	220	517	138	103	24
1-5	315	220	535	138	103	25
1-6	333	220	553	138	103	25
1-7	361	248	609	148	108	29
1-8	379	248	627	148	108	29
1-9	397	248	645	148	108	30
1-10	415	248	663	148	108	33
1-11	433	248	681	148	108	33
1-12	451	248	699	148	108	34
1-13	469	248	717	148	108	34
1-15	515	292	807	171	119	39
1-17	533	292	825	171	119	39
1-19	551	292	843	171	119	41
1-21	569	292	861	171	119	42
1-23	605	292	897	171	119	44
1-25	623	292	915	171	119	45
1-26	641	292	933	171	119	46
1-27	669	343	1012	196	131	56
1-29	705	343	1048	196	131	58
1-30	723	343	1066	196	131	59

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
3-2	261	220	481	138	103	23
3-3	279	220	499	138	103	24
3-4	307	248	555	148	108	29
3-5	325	248	573	148	108	30
3-6	343	248	591	148	108	30
3-7	361	248	609	148	108	31
3-8	389	292	681	171	119	38
3-9	407	292	699	171	119	38
3-10	425	292	717	171	119	41
3-11	443	292	735	171	119	41
3-12	461	292	753	171	119	42
3-13	479	292	771	171	119	42
3-14	497	292	789	171	119	43
3-15	525	343	868	196	131	50
3-16	543	343	886	196	131	51
3-18	561	343	904	196	131	51
3-19	579	343	922	196	131	52
3-20	597	348	945	215	150	58
3-21	615	348	963	215	150	58
3-22	633	348	981	215	150	59
3-23	651	348	999	215	150	59

Dimesion 5, 10

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
5-2	279	220	499	138	103	23
5-3	316	248	564	148	108	26
5-4	343	248	591	148	108	28
5-5	380	292	672	171	119	33
5-6	407	292	699	171	119	33
5-7	434	292	726	171	119	37
5-8	461	292	753	171	119	37
5-9	488	292	780	171	119	38
5-10	525	343	868	196	131	46
5-11	552	343	895	196	131	46
5-12	579	343	922	196	131	47
5-13	606	348	954	215	150	54
5-14	633	348	981	215	150	54
5-15	660	348	1008	215	150	55
5-16	687	348	1035	215	150	55
5-17	792	383	1175	257	167	77
5-18	819	383	1202	257	167	77
5-20	846	383	1229	257	167	78
5-21	873	383	1256	257	167	78
5-22	900	383	1283	257	167	79
5-23	927	383	1310	257	167	79

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
10-1	350	248	598	148	108	40
10-2	390	292	682	171	119	47
10-3	420	292	712	171	119	51
10-4	460	343	803	196	131	61
10-5	490	348	838	215	150	69
10-6	520	348	868	215	150	69
10-7	628	383	1011	257	167	81
10-8	658	383	1041	257	167	81
10-9	688	383	1071	257	167	86
10-10	718	383	1101	257	167	86
10-11	748	383	1131	257	167	87
10-12	778	383	1161	257	167	88
10-13	838	499	1337	314	258	153
10-14	868	499	1367	314	258	154
10-15	898	499	1397	314	258	155

Dimesion 15, 20

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
15-1	400	292	692	171	119	38
15-2	455	343	798	196	131	50
15-3	500	348	848	215	150	59
15-4	623	383	1006	257	167	75
15-5	668	383	1051	257	167	81
15-6	743	499	1242	314	258	159
15-7	788	499	1287	314	258	161
15-8	833	499	1332	314	258	163
15-9	878	499	1377	314	258	176
15-10	923	499	1422	314	258	178
15-11	968	499	1467	314	258	180
15-12	1013	543	1556	314	258	202

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
20-1	400	292	692	171	119	42
20-2	445	348	793	215	150	58
20-3	568	383	951	257	167	73
20-4	613	383	996	257	167	82
20-5	688	499	1187	314	258	153
20-6	733	499	1232	314	258	154
20-7	778	499	1277	314	258	168
20-8	823	499	1322	314	258	169
20-9	868	543	1411	314	258	192
20-10	913	543	1456	314	258	194

Dimesion 32, 45

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
32-1-1	427	343	770	196	131	70
32-1	427	348	775	215	150	78
32-2-2	588	383	971	257	167	93
32-2	588	383	971	257	167	96
32-3-2	658	383	1041	257	167	101
32-3	688	499	1187	314	258	175
32-4-2	758	499	1257	314	258	180
32-4	758	499	1257	314	258	187
32-5-2	828	499	1327	314	258	202
32-5	828	543	1371	314	258	215
32-6-2	898	543	1441	314	258	220
32-6	898	543	1441	314	258	220
32-7-2	968	569	1537	355	274	266
32-7	968	569	1537	355	274	266
32-8-2	1038	569	1607	355	274	271
32-8	1038	667	1705	397	307	326
32-9-2	1108	667	1775	397	307	331
32-9	1108	667	1775	397	307	331
32-10-2	1178	667	1845	397	307	336

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
45-1-1	579	383	962	257	167	100
45-1	579	383	962	257	167	105
45-2-2	689	499	1188	314	258	180
45-2	689	499	1188	315	259	191
45-3-2	769	543	1312	314	258	201
45-3	769	543	1312	314	258	201
45-4-2	849	569	1418	355	274	242
45-4	849	667	1516	397	307	296
45-5-2	929	667	1596	397	307	301
45-5	929	667	1596	397	307	306
45-6-2	1009	667	1676	397	307	312
45-6	1009	667	1676	397	307	312
45-7-2	1089	702	1791	397	307	382
45-7	1089	702	1791	446	330	382

Dimesion 65, 90

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
65-1-1	581	383	964	257	167	98
65-1	611	499	1110	314	258	168
65-2-2	694	499	1193	314	258	178
65-2	694	569	1263	355	274	233
65-3-2	777	569	1346	355	274	238
65-3	777	667	1444	397	307	295
65-4-2	860	667	1527	397	307	325
65-4	860	702	1562	446	330	392
65-5-2	943	702	1645	446	330	397

Model	Dimesion(mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
90-1-1	621	499	1120	314	258	176
90-1	621	499	1120	314	258	182
90-2-2	713	543	1256	314	258	205
90-2-1	713	569	1282	355	274	248
90-2	713	667	1380	397	307	301
90-3-2	805	667	1472	397	307	325
90-3-1	805	667	1472	397	307	325
90-3	805	702	1507	446	330	394
90-4-2	897	702	1599	446	330	400

RHINO-Installation size

Model / Size		RHINO									
		1	3	5	10	15	20	32	45	65	90
Round flange connection	DN	25		32	40	50		65	80	100	
	P1	60			80			107	120	150	
	P	85		100	110	125		145	160	180	
	P2	115		140	150	165		185	200	220	
	n-d1	4-ϕ 14		4-ϕ 18				8-ϕ 18			
	C	250			280	300		320	365	380	
	E	75			80	90		105	140		
	h	32			25	35		30	45		
	Nominal pressure☒	PN25						PN25-40		PN16	
Cutting Ferrule Joint connection	D	42			60						
	C	210			260						
	E	50			80	90					
	h	20			25	35					
Pipe thread connection	D	R1 $\frac{1}{4}$			R2						
	C	210			260						
	E	50			80	90					
	h	20			25	35					
Oval flange connection	D	G1		G1$\frac{1}{4}$	G1$\frac{1}{2}$						
	C	162			200						
	E	50			80						
	h	20			25						
	P	75			100						
	n-d1	2-M10×40			2-M12×40						
	k	22									
Footer size	G	100			130			170	190	199	
	G1	150			199			225	245	255	
	M	180			215			240	266	280	
	M1	210			247			298	330	348	
	d2	13			14						

The pump should be sited in a well ventilated and frost-free position. The distance between pump-motor and other objects should be at least 150mm , in order to cool the motor by fan with enough air.

- In order to minimize the inlet wear, the inlet pipe shall be as short as possible.
- Ensure the check valve is installed in pipe line system before the pump installation toavoid the fluid reflux.If pump is used for boiler water supply, acheck valvemust be installed in the piping between pump and boiler.
- Pump should be installed incement base or other similarbase with suitable height. It can also be installed in fixed grounds or fixed brackets on the wall. Pay attention not to let the weight of pipe system concentrateon pump to prevent pump from damage.

Caution: When installation, motor is not allowed to be hung upside down.

- Arrow on the inlet and outlet chamber shows the direction of flow of liquid through the pump. Check whether the liquid can flow easily before starting pump.
- Before pump installation, the inlet pipe line shall be cleaned. If there is impurities in the pipe, it is necessary to install a strainer at 0.5-1'm in front of the pump inlet (particularly recommended for pump with flow less than $8m^3/h$).
- The air lock shall be avoided when installing the inlet pipe line. Refer to Fig. 4

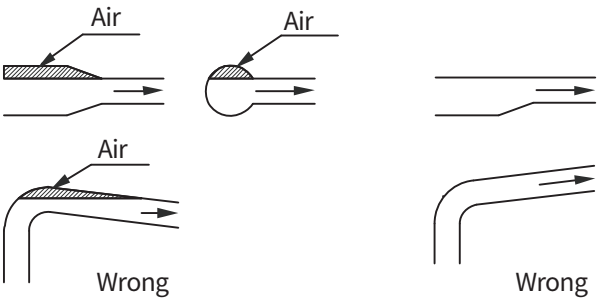


Figure. 4

- If the outlet globe valve might be closed(or the flow is decreased to zero), a bypass shall be installed in outlet pipeline to ensure adequate lubri- cation and cooling water to pass the pump.

2. Electrical connections

To make sure the motor is suitable for the power supply, cables of the motor must be connected to power supply according to the Fig. on the terminal box and the motor nameplate.

- 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 carthed reliably.

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

Warning - Electrical connection and safety devices

- The pump units should be connected to the power supply by the appropriately ratedpower cables according to the motor rating.
- The pump units should always be equipped with safety devices as required in the standards (EN 809 and/or EN 60204-1) as well as by the national rules of the country where the pump is used.
- Despite the rules of any country, the power supply to the pump unit must be equipped with at least following electrical safety devices with appropriate ratings:
- Emergency switch.
- Circuit breaker (as a supply disconnecting (isolating) device as well as an overcurrent protective device). Motor overload protection.

4. Start-up, operation and maintenance

Caution: Read the label on the cylinder carefully before start-up.

1. Do not start the pump until it has been filled with water or liquid fully.

- Fill water in pump in inverse pouring system.
  Close the pump outlet valve, release air vent screw on the pump head, and open the inlet valve slowly until stable water flows from the air vent screw. Then fasten the screw. Open the check valve completely in the inlet pipeline.
- In open system, fill water in pump when liquid surface is lower than pump.
  Notice: A check valve shall be installed in the inlet pipe. Close the pump outlet valve, release air vent screw and fill the liquid in pump through the air vent screw hole until the pump and inlet pipe line are filled with water fully. Fasten the air vent screw again.
  Caution: Do not start the pump until it has been filled with liquid fully and air vented. Be careful the direction of the air vent screw hole. Make sure the flowing water will not hurt persons or pump or its parts. Especially, prevent from hurting for the hot water application.

2. Check the rotary direction

- Switch on the power supply and view the rotary direction by viewing the motor fan. Arrow on the pump head indicates the correct direction of rotation. That is, from the motor end, pump shall run counter-clockwise.

3. Check before pump start-up

- Check whether the foundation bolt is fasten.
- Check whether pump is filled with water fully.
- Check whether the voltage of power supply is correct.
- Check whether it turns correctly.
- To make sure all pipe lines are. connected tightly and can supply water normally
- The valves in the inlet pipe line are completely opened and 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 will not exceed the max Current.

4. 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 more than 4kW, pump shall not be started rted more than 20 times in one hour. If pump starts and stops too frequently, control device shall be checked and adjusted to make pump not start and stop too frequently. Also, it is necessary to check the installation.

5. Suggestion: The operation of pump should arrording to the range of performance curve to avoid motor overload.

6. Pump which is installed according to this installation manual will work effectively with little maintenance.

- Mechanical seal will be adjusted automatically, the rotating part and stationary part is lubricated and cooled by the transfering liquid. When replace the mechanical seal, the user needn't to disassemble the motor for power higher than 7.5kW;
- The bearing in pump is lubricated by the transfering liquid.

7. Frost Protecting

Pump can be used in the system with anti-frozen measures to water. If the pump is installed in easily frozen place, suitable antifreeze shall be added to the transfering liquid to prevent pump from being damaged. If antifreeze is not used, pump shall be stopped when it might frozen. Pumps which are not being used should be drained.

8. The following should be checked regularly for pump.

- Pump working and operating pressure;
- Possible leakage
- Possible motor overheat
- Cleaning/replacement of all strainers
- The switch off time of motor when overload
- Frequency of starts and stops
- All control operation

If malfunction is found, check system according to "Fault finding and solution chart"

9. Pump shall be cleaned and kept appropriately when it is not used for a long time.

10. Pump shall be prevented from being corrupted and damaged in storage.

5. Assemble and disassemble

2. Rhino - 1,3,5

- Put the circlip cover on the shaft, and then fit the sleeve, impeller, impeller sleeve, diffuser, support diffuser. Continue the assemble order till the last impeller is fitted. Then fit the impeller cover, washer, screw the nut. Pay
  attention to the position of the support diffuser, for pump with less stages,the last one is support difluser. For pump with more stages,support diffuser should be increased accordingly, the distance of each support diffuser sh-
  ould be even, and put on the support sleeve and bearing with support diffuser,
- Put the inducer on the inlet & outlet chamber, and then fit the finished
  parts as above on the inducer.
- Fit the O-ring on the inlet & outlet chamber, put on the cylinder and the top diffuser.
- Put the pump head installed with O-ring, lining and corrugated spring on the cylinder. Screw the four nuts of the stay bolts on the basc plate. Do not tighten one nut completely at one time, but tighten them symmetrically in turn.
- Fit the mechanical seal and tighten it , then install motor and coupling,
  screw the bolts in coupling(but not tightly),press the coupling and shaft d-
  own to the direction of the base plate. Then lift it about I mm in reverse dir-
  ection, tighten the screws. Note that the space between the two couplings
  should be equal.
- Tighten fasten screws in mechanical seal, rotate the coupling to ensure that the shaft can rotate freely and not be choked
  Reverse the process above can disassemble a pump.

2. Rhino - 10,15,20

- Put the circlip cover on the shaft, and then fit the sleeve, impeller, impeller sleeve, diffuser, support diffuser, bearing, support sleeve. Continue the assemble order till the last impeller is fitted, and then install the impellercover, washer, tighten the nuts.
- Put the inlet & outlet chamber on the base plate, then put the O-ring, clamp plate, inducer on inlet & outlet chamber, then put the finished parts on the inducer, and put the top diffuser on the top, tighten nuts of straps. At last, put on the cylinde.
- Put the pump head installed with O-ring, lining and adjusting rubber on the cylinder, then tighten the four stay bolts symmetrically in turn.
- Fit the mechanical scal and tighten it , then install motor and coupling, screw the bolts in coupling(but not tightly),press the coupling and shaft down to the direction of the base plate. Then lift it about I mm in reverse direction ighten the screws. Note that the space between the two couplings should be equal;
- Tighten fasten screws in mechanical scal, rotate the coupling to ensure that the shaft can rotate freely and not be choked Reverse the process above can disassemble a pump.

3. Rhino 32, 45, 65, 90

- Put the inlet & outlet chamber on the base plate, fit flanges on inlet& outlet chamber at two s ides, and fit the inducer,
- Put the first impeller on the shaft, tighten the nuts and put the impeller on the neck ring base of inducer, then put on the diffuser, impeller, support diffuser, until the top diffuser, then fix all the diffuser with the straps;
- shaft parts: fit the bottom sleeve, cover, washer on the shaft, tighten the bolts, fit bottom bearing on the inlet & outlet chamber, fit washer. Then put the shaft parts on the inlet & outlet chamber, fit on O-ring, lubricate the O ring and then put on the cylinder;
- Fit stay bolts on the basc plate, then fit the O-ring, adjusting rubber, air vent gag on the pump head, and put the pump head on the stay bolts, then put on the washer and tighten all the nuts.
- Fit the mechanical seal on the pump head, then fit the seal cover, tighten the bolts, and the bolts in the seal. Lift the shaft and insert the adjusting
- Fit the bracket and motor on the pump head.

Finally fit the coupling, bien the bolts, and take out the adjing sliceliie
Rotate the coupling to ensure that the shaft can rotate freely and not be ch-
oked. Reverse the above process to disassemble a pump.

6. Fault finding and solution chart

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 does not run when started	a) Possible power supply failure. b) Fuses are blown. c) Motor is overloaded. d) Main contacts of starter are not connected well or the coil is defective. e) Control circuit is defective. f) Motor is defective.	a)Check power supply. b) Replace fuses. c) Check system. d) Replace motor starter. e) Check control circuit. f)Repair.	
Overload device of motor startertrips out immediately when power supply is switched on.	a) Fuses are blown. b) Contacts of overload device are faulty. c) Cable connection is loose or faulty. d) Motor winding is defective. e) Pump mechanically blocked.	a) Replace fuses. b) Check motor starter. c) Check cables and power supply d) Replace motor e) Check and repair pump	In the case of d) and e), users shall not disassemble the pump by themselves.
Overload device trips out occasionally.	a)The setting of overload is too low. b) Periodic power supply faults. c) Low voltage at peak times.	a) Reset overload setting b) Check power supply c) Add regulator.	
Motor starter has not tripped out but the pump does not run.	a) Contacts of starter are not contacted well or the coil is faulty. b) Control circuit are defective	a) Change motor starter b) Check control circuit	

Continued

Fault	Cause	Solution	Remarks
Pumped water does not flow constantly	a) Suction pipe is too small. b) There is not sufficient water in pump water inlet. c) Liquid level is low. d) Pump inlet pressure is too low compared with water temperature, pipeline loss and flow. e) Suction pipe is partly blocked by impurities.	a) Enlarge inlet pipeline b) Improve system and increase coming water c) Try to lift liquid level. d) Improve system and try to increase the inlet pressure. e) Check and clear impurities.	
Pump runs but fives no water.	a) Suction pipe is blocked by impurities. b) Foot valve or check valve is closed. c) Leakage in suction pipe. d) There is air in suction pipe or pump.☒	a) Check and clean suction pipe b) Check and repair foot valve or check valve. c) Check and repair suction pipe d) Refill liquid, release air.	
Pump runs backwards when witched off.	a) Leakage in suction pipe b) Foot valve or check valve is defective. c) Foot valve is blocked in opened or partly opened position. d) There is air lock in suction pipe.	a) Check suction pipe b) Check and repair foot valve or check valve. c) Check and repair foot valve. d) Check and repair suction pipe and release air.	

Continued

Fault	Cause	Solution	Remarks
Abnormal vibration or noise from pump	a) Leakage in suction pipe. b) Suction pipe is too small or suction pipe is partly blocked by impurities. c) There is air in suction pipe or pump. d) The comparison of the delivery head of device with delivery head of pump is very low. e) Pump mechanically blocked.	a) Check and repair suction pipe. b) Enlarge or check suction pipe. c) Refill liquid to the pump and vent air. d) Improve system or choose another pump model. e)Check and repair pump.	In the case of e), users shall not disassemble the pump by themselves.

7. Important notice

1.Customers will not be advised if this manual is updated.

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

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

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