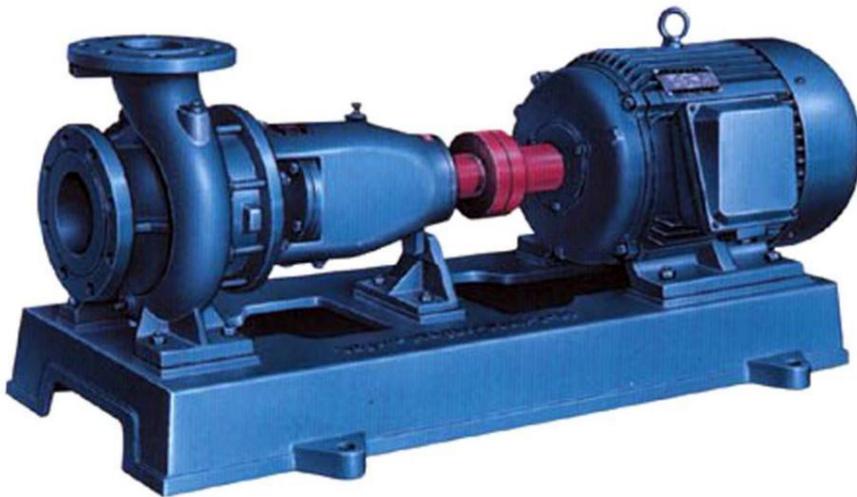


# **IS Type Single-stage Single-suction Clean Water Centrifugal Pump**

## **Installation Instructions**

### **Instruction On Installation And Operation**



# CATALOGUE

1. General
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## 1. General

The pump of type IS is a single stage, single suction (axial suction) centrifugal for pumping clean water and the other liquids physically and chemically similar to the clean water. The temperature of liquid shall not be over 80°C. This pump is suitable for public water supply and drainage duties in industries and land irrigation also in agriculture.

Design duty and features: (at design point)

Speed	n:	2900rpm and 1450rpm
Inlet diameter:		50 to 200mm
Capacity Q:		6.3 to 400m <sup>3</sup> /h
Head	H:	5 to 125m

See Fig 2 and chart 1 for size and performance parameters of IS pump.

Details should be supplied by manufacturer.

Description of pump symbol figures:

For example: IS 80-65J-160A

IS—— Single stage, single suction clean water centrifugal pump

80—— Inlet diameter (mm)

65—— Outlet diameter (mm)

J——Rated speed dropped

160: Nominal impeller diameter

A——A, B, C separately represent that impeller diameter is cut the first the second and the third time

## 2. Construction

IS type pump is designed with performance and dimensions specified to the International Standard ISO 2858. The major components are casing (1) casing cover (2) impeller (3) shaft (4) wear ring (5) shaft sleeve (8) bearing bracket (12) etc. ( See Fig 1 )

IS pump is divided into the casing and the casing cover from the back face of the impeller ie back pull-out design.

IS pump has the advantages for ease of inspection and maintenance. When inspection, only dismantle the intermediate connector between pump coupling and motor coupling. The rotating element can be completely removed without disturbing the casing, suction and discharge pipeline and motor.

The pump volute form is composed of casing and casing cover. The rotating element consists of impeller, shaft and rolling bearing. The rotating element is carried by the rolling bearings mounted in a hanging bearing bracket and radial and axial thrust is supported by the bearings.

In order to balance axial thrust, there are both wear rings in front and at the back of the majority of the impeller and the balance hole is on the back shroud of the impeller. The axial thrust of some pumps is not big enough, so there is no wear ring and balance hole at the back of the impeller.

Description of a Sectional Arrangements of Type IS Pump

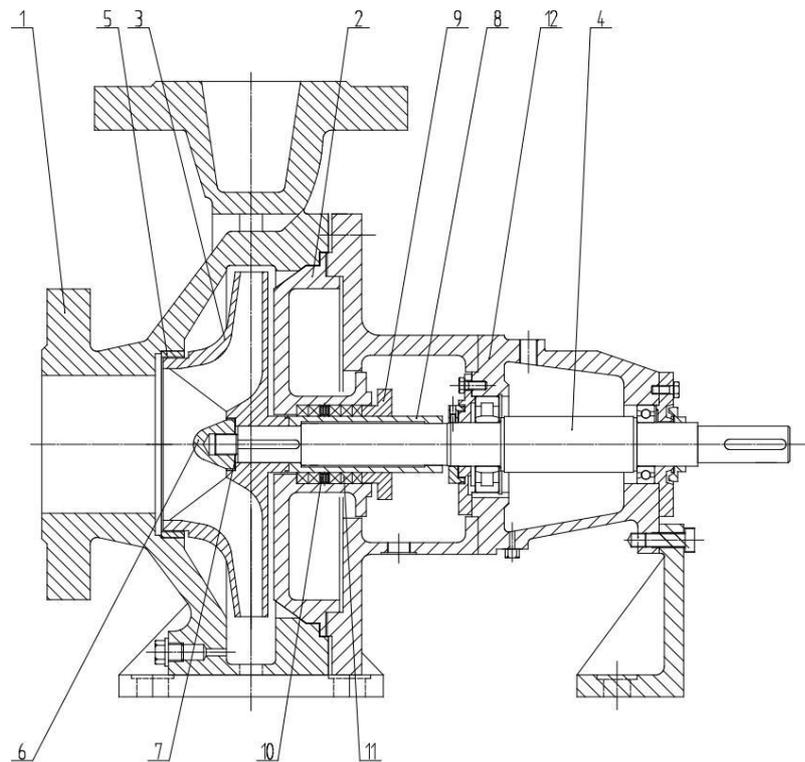


Figure 1

1. Casing    2.casing cover 3.impeller 4.shaft                    5.wear ring 6.impeller nut  
7. Brake gasket 8.shaft sleeve 9.gland 10.water seal ring 11.packing 12.bearing bracket

The shaft seal consists of packing gland (9) water seal ring (10) and packing (11) to prevent air from in taking or the amount of leakage. If there is a balance hole of the impeller, cavity for soft packing connects to the impeller entrance. If liquid of the impeller entrance is at vacuum state, it is easy for air entraining along the surface of the shaft sleeve. So water seal ring is in the stuffing box.

Pressure water in the pump volute is led to water seal ring to be sealed. If there is no balance hole of the impeller, liquid pressure at the back face of the impeller is higher than atmosphere. There is no air leakage, so the water seal ring can not be packed.

The shaft sleeve is on the shaft to avoid excessive shaft wear. There is “O” ring between the shaft and the shaft sleeve to prevent air entrance or water leakage along the matched surface. Drive is transmitted from the motor to the pump by a flexible coupling with the intermediate connector. Rotation is clockwise when viewed from the driven end.

See Fig 3 and chart 2 for the pump dimensions. See Fig 5 and chart 4 for dimensions of suction and delivery flange.

### **3. Assembling and Dismantling**

First inspect whether there are some defects and clean well before installing.

3.1 Tight connecting bolts and screwed plug to the corresponding parts in advance.

3.2 Put “O” seal ring, paper gasket and felt less pad on the corresponding parts in advance.

3.3 Fit wear ring, packing, water seal ring and gland in the casing cover in proper order.

3.4 Put rolling bearing on the shaft and then carry it into the bracket to be covered with a gland. Press the rolling bearing and put the water thrower on the shaft.

3.5 Put the shaft sleeve on the shaft and the casing cover on the bracket. Then place impeller, brake gasket and impeller nut and tighten them up. At last carry the above components into the casing and tight connecting bolts on the casing and the casing cover.

Specially take care of these parts for ease of omission or disorder of sequence such as flat key, oil baffle, water thrower, “O” seal ring in the shaft sleeve during the process of assembling.

Dismantle sequence is the opposite direction to the assembling sequence.

#### **4. Erection**

Pump installing has an important influence on pump operating and service life, so installing and alignment must be done carefully. See Fig 4 and chart 3 for the Overall dimensions of pump.

##### **4.1 Assembling and Alignment**

(1) Clean off oil stain and dirt on the soleplate and put the soleplate on the foundation.

(2) Level the soleplate by using a level-meter and adjust the level by iron shimming piece.

(3) Grout in the foundation and the bolts holes.

(4) When the grouting had been set, check looseness of the found action and the bolt holes and tighten the foundation bolts. Readjust the level.

(5) Clean the surfaces of support, pump foot and motor foot. The pump and motor are mounted on the soleplate.

(6) Keep the certain clearance between the couplings. Check the alignment of the centerline of the motor shaft to the pump shaft and adjust the alignment by a thin packing piece. The radial displacement at the coupling periphery is within 0.1 mm. The difference between maximum and minimum clearance at the periphery of the Two coupling end faces are not more than 0.3 mm.

##### **4.2 Erecting Instructions**

(1) The installing height of the pump, length and diameter of the pipe and velocity should be required to meet calculation. Decrease unnecessary losses to a minimum and calculate for reference to chart 5.

(2) Select the large pipe diameter for long distance pumping. To avoid the damage to the pump, the pipes should have their supports and not allow the weight of the pipes to impose on the pump casing.

(3) The check valve should be fitted inside gate valve in the delivery pipe.

## **5. Starting, Shutdown and Running**

### **5.1 Starting**

(1) Check that the motor rotates in the correct direction and that the pump rotates well before the motor is connected to the pump.

(2) Close the valve in the delivery pipe.

(3) The pump is fully primed or is primed by the vacuum pump.

(4) After power connection has been done and the pump has attained the normal speed, open the gate valve slowly in the delivery pipe and bring the pump gradually up to load required. The pump must not be allowed to run continuously for more than three minutes against a fully closed gate valve in the delivery pipe.

### **5.2 Shutdown Procedure**

(1) Close the gate valve gradually in the delivery pipe and power cut.

(2) If the ambient temperature is below 0°C, water should be drained out of the pump to prevent frost crack.

(3) If the pump is to be stored for a long period, it should be dismantled, cleaned, oiled, packed and well preserved.

### **5.3 Running checks**

(1) Carefully check that all instruments and gauges, bearing overheating, the leakage from the gaskets, the packing overheating, excessive vibration and excessive noise level have been existing during the operational period. If the faults are found and they are to be eliminated immediately.

(2) The high temperature of the bearing does not exceed 80 °C and the temperature of the bearing must not be allowed to exceed 40 °C of the ambient temperature.

(3) There is a little and even leakage when packing is in good condition.

(4) Ensure that oil is maintained at its correct level, not too high or too low. Replenish with correct grade of lubricating oil at too low.

(5) If the clearance between the wear ring and the mating face of impeller neck is excessive, renew a wear ring.

Model	Speed r/min	Capacity		Head m	Efficiency %	Power		NPSHr m	Weight kg
		m <sup>3</sup> /h	L/S			Shaft power KW	Power KW		
IS(R) 65-50-125	2900	15	4.17	21.8	58	1.54	3.0	2.0	
		25	6.94	20	69	1.97		2.5	
		30	8.3	18.5	68	2.22		3.0	
IS(R) 65-50-125A		22.4	6.22	16	69	1.41	2.2	2.5	
IS(R) 65-50-125J	1450	12.5	3.47	5.0	64	0.27	0.55	2.0	
IS(R) 65-50-125JA		11.2	3.11	4.0	65	0.17		2.5	
IS(R) 65-50-160	2900	15	4.17	35	54	2.65	5.5	2.0	
		25	6.94	32	65	3.35		2.0	
		30	8.33	30	66	3.71		2.5	
IS(R) 65-50-160A		23.4	6.5	28	65	2.75	4	2.0	
IS(R) 65-50-160B		21.7	6.03	24	65	2.18	3	2.0	
IS(R) 65-50-160J	1450	12.5	3.47	8.0	60	0.45	0.75	2.0	
IS(R) 65-50-160JA		11.7	3.25	7.0	60	0.34	0.55	2.0	
IS(R) 65-50-160JB		10.8	3.01	6.0	60	0.27		2.5	
IS(R) 65-40-200	2900	15	4.17	53	49	4.42	7.5	2.0	
		25	6.94	50	60	5.67		2.0	
		30	8.33	47	61	6.29		2.5	
IS(R) 65-40-200A		23.7	6.58	45	60	4.83	5.5	2.0	
IS(R) 65-40-200B		22.3	6.2	40	60	4.05		2.0	
IS(R) 65-40-200C		21.2	5.9	36	60	3.48	4	2.0	
IS(R) 65-40-200J	1450	12.5	3.47	12.5	55	0.77	1.1	2.0	
IS(R) 65-40-200JA		11.7	3.25	11	55	0.58	0.75	2.0	
IS(R) 65-40-200JB		10.8	3.01	9.5	54	0.47		2.5	
IS(R) 65-40-250	2900	15	4.17	82	37	9.05	15	2.0	
		25	6.94	80	50	10.86		2.0	
		30	3.88	78	53	12.02		2.5	
IS(R) 65-40-250A		24.2	6.72	75	50	8.87	11	2.0	
IS(R) 65-40-250B		23.4	6.5	70	50	8.42		2.0	
IS(R) 65-40-250C		22.5	6.26	65	50	8.00		2.0	
IS(R) 65-40-250D		21.7	6.03	60	50	6.96	7.5	2.0	
IS(R) 65-40-250E		20.75	5.76	55	50	6.22		2.0	
IS(R) 50-32-250J	1450	12.5	3.47	20	46	1.48	2.2	2.0	
IS(R) 65-40-250JA		11.7	3.25	17.5	48	1.05	1.5	2.0	
IS(R) 65-40-250JB		10.8	3.01	15	48	0.83	1.1	2.5	

Model	Speed r/min	Capacity		Head m	Efficiency %	Power		NPSHr m	Weight kg
		m <sup>3</sup> /h	L/S			Shaft power KW	Power KW		
IS(R) 65-40-315	2900	15	4.17	127	28	18.5	30	2.0	
		25	6.94	125	40	21.3		2.5	
		30	8.33	123	44	22.8		3.0	
IS(R) 65-40-315A		23.9	6.64	114	40	18.58	22	2.5	
IS(R) 65-40-315B		22.7	6.3	103	39	15.94	18.5	2.5	
IS(R) 65-40-315C		21.4	5.94	92	38	13.4	15	2.5	
IS(R) 65-40-315J	1450	12.5	3.47	32	37	2.94	4	2.5	
IS(R) 65-40-315JA		11.9	3.32	28.2	37	2.32	3	2.5	
IS(R) 65-40-315JB		11.3	3.15	25.8	36	1.99		3.0	
IS(R) 80-65-125	2900	30	8.33	22.5	64	2.87	5.5	3.0	
		50	13.9	20	74	3.63		3.0	
		60	16.7	18	74	3.98		3.5	
IS(R) 80-65-125A	1450	44.7	12.42	16	75	2.27	4	3.0	
IS(R) 80-65-125J		25	6.94	5.0	71	0.48	0.75	2.5	
IS(R) 80-65-125JA		22.4	6.22	4	71	0.34	0.55	3.0	
IS(R) 80-65-160		2900	30	8.33	36	61	4.82	7.5	2.5
	50		13.9	32	73	5.97	2.5		
	60		16.7	29	72	6.59	3.0		
IS(R) 80-65-160A	1450	46.8	13	28	73	4.80	5.5	2.5	
IS(R) 80-65-160B		43.3	12.4	24	73	3.80	4	2.5	
IS(R) 80-65-160J		25	6.94	8	69	0.79	1.5	2.5	
IS(R) 80-65-160JA		23.4	6.5	7	69	0.6	1.1	2.5	
IS(R) 80-65-160JB		21.7	6.03	6	68	0.48	0.75	3.0	
IS(R) 80-50-200		2900	30	8.33	53	55	7.87	15	2.5
	50		13.9	50	59	9.87	2.5		
	60		16.7	47	71	10.8	3.0		
IS(R) 80-50-200A	1450	46.8	13	44	69	8.14	11	2.5	
IS(R) 80-50-200B		40	11.11	38	69	6.52	7.5	2.5	
IS(R) 80-50-200C		40	11.1	32	69	5.05		2.5	
IS(R) 80-50-200J	1450	25	6.94	12.5	65	1.31	2.2	2.5	
IS(R) 80-50-200JA		23.4	6.5	11	65	1.01	1.5	2.5	
IS(R) 80-50-200JB		21.7	6.08	9.5	64	0.81	1.1	3.0	
IS(R) 80-50-250	2900	30	8.33	84	52	13.2	22	2.5	
		50	13.9	80	63	7.3		2.5	

Model	Speed r/min	Capacity		Head m	Efficiency %	Power		NPSHr m	Weight kg
		m <sup>3</sup> /h	L/S			Shaft power KW	Power KW		
IS(R)80-50-250	2900	60	16.7	75	64	19.2	22	3.0	
IS(R)80-50-250A		46.81	13.00	70	63	14.18	18.5	2.5	
IS(R)80-50-250B		43.3	12.4	60	63	11.23	15	2.5	
IS(R)80-50-250J	1450	25	6.94	20	60	2.27	3	2.5	
IS(R)80-50-250JA		23.4	6.5	17.5	60	1.77	2.2	2.5	
IS(R)80-50-250JB		21.7	6.03	15	60	1.4		3.0	
IS(R)80-50-315	2900	30	8.33	128	41	25.5	37	2.5	
		50	13.9	125	54	31.5		2.5	
		60	16.7	123	57	35.3		2.5	
IS(R)80-50-315A		47.7	13.25	114	54	27.8	30	2.5	
IS(R)80-50-315B		45.4	12.6	103	54	23.6		2.5	
IS(R)80-50-315C		42.9	11.9	92	54	19.83		22	2.5
IS(R)80-50-315J	1450	25	6.94	32	52	4.19	5.5	2.5	
IS(R)80-50-315JA		23.4	4.17	28.5	52	3.34	4	2.5	
IS(R)80-50-315JB		22.3	6.3	25.3	51	2.94		3.0	
IS(R)100-80-125	2900	60	16.7	24	69	5.86	11	4.0	
		100	27.8	20	78	7.0		4.5	
		120	33.3	16.5	74	7.28		5.0	
IS(R)100-80-125A		89.4	24.83	16	78	5.0	7.5	4.5	
IS(R)100-80-125J	1450	50	13.9	5	75	0.91	1.5	2.5	
IS(R)100-80-125JA		44.7	12.42	4	75	0.62	1.1	3.0	
IS(R)100-80-160	2900	60	16.7	36	70	8.42	15	3.5	
		100	27.8	32	78	11.2		4.0	
		120	33.3	28	75	12.2		5.0	
IS(R)100-80-160A		93.51	26	28	78	9.16	11	4.0	
IS(R)100-80-160B		68.6	24.1	24	78	7.24		4.0	
IS(R)100-80-160C		79	21.9	20	77	5.52		7.5	4.0
IS(R)100-80-160J	1450	50	13.9	8.0	75	1.45	2.2	2.5	
IS(R)100-80-160JA		46.8	13	7	75	1.14	1.5	2.0	
IS(R)100-80-160JB		43.3	12.4	6	74	0.90	1.1	3.5	
IS(R)100-65-200	2900	60	16.7	54	65	13.6	22	3.0	
		100	27.8	50	76	17.9		3.6	
		120	33.3	47	77	19.9		4.8	
IS(R)100-65-200A		95	26.4	45	76	15.35	18.5	3.6	

Model	Speed r/min	Capacity		Head m	Efficiency %	Power		NPSHr m	Weight kg	
		m <sup>3</sup> /h	L/S			Shaft power KW	Power KW			
IS(R)100-65-200B	2900	89.4	24.8	40	76	12.79	15	3.6		
IS(R)100-65-200C		85	23.57	36	76	10.99		2.0		
IS(R)100-65-200J	1450	50	13.9	12.5	73	2.33	4	2.0		
IS(R)100-65-200JA		46.8	13	11	72	1.84	3	2.0		
IS(R)100-65-200JB		43.3	12.04	9.5	72	1.48	2.2	2.5		
IS(R)100-65-250	2900	60	16.7	87	61	23.4	37	3.5		
		100	27.8	80	72	30.3		3.8		
		120	33.3	74.5	73	33.3		4.8		
IS(R)100-65-250A	2900	93.5	26	70	72	26.6	30	3.8		
IS(R)100-65-250B		86.6	24.1	60	72	17.03	22	3.8		
IS(R)100-65-250C		79	22	50	72	14.90	18.5	3.8		
IS(R)100-65-250J		1450	50	13.9	20	68	4.00	5.5		2.0
IS(R)100-65-250JA			46.8	13	17.5	68	3.09	4		2.0
IS(R)100-65-250JB	43.3		12.04	15	67	2.03	3	2.5		
IS(R)100-65-315	2900	60	16.7	133	55	39.6	75	3.0		
		100	27.8	125	66	51.6		3.6		
		120	33.3	118	67	57.5		4.2		
IS(R)100-65-315A	2900	95.5	26.53	114	66	45.03	55	3.6		
IS(R)100-65-315B		90.8	25.2	103	66	38.63	45	3.6		
IS(R)100-65-315C		85.8	23.83	92	66	32.52	37	3.6		
IS(R)100-65-315D		81	22.5	87.5	66	27.4	30	3.6		
IS(R)100-65-315J		1450	50	13.9	32	63	6.92	11		2.0
IS(R)100-65-315JA	47.7		13.25	28.5	63	5.62	7.5	2.0		
IS(R)100-65-315JB	45.4		12.5	25.8	62	4.82		2.5		
IS(R)100-65-315JC	42.9		11.9	23	61	4.06	5.5	2.5		
IS(R)125-100-200	2900	120	33.3	57.5	67	28.0	45	4.5		
		200	55.5	50	81	33.6		4.5		
		240	66.7	44.5	80	36.4		5.0		
IS(R)125-100-200A	2900	190	52.7	45	81	28.8	37	4.5		
IS(R)125-100-200B		179	49.7	40	81	24	30	4.5		
IS(R)125-100-200C		170	47.2	36	81	20.63	22	4.5		
IS(R)125-100-200J	1450	100	27.8	12.5	76	4.48	7.5	2.5		
IS(R)125-100-200JA		93.5	26	11	76	3.46	5.5	2.5		
IS(R)125-100-200JB		86.5	24.1	9.5	75	2.79	4	3.0		

Model	Speed r/min	Capacity		Head m	Efficiency %	Power		NPSHr m	Weight kg
		m <sup>3</sup> /h	L/S			Shaft power KW	Power KW		
IS(R) 125-100-250	2900	120	33.3	87	66	43.0	75	3.8	
		200	55.6	80	78	55.9		4.2	
		240	66.7	72	75	62.8		5.0	
IS(R) 125-100-250A		193.6	53.78	75	78	50.7	55	4.0	
IS(R) 125-100-250B		187	52	70	78	45.73		4.0	
IS(R) 125-100-250C		180	50	65	78	36.9	45	4.0	
IS(R) 125-100-250D		173	48.1	60	78	36.4		4.0	
IS(R) 125-100-250E		160	44.4	55	78	31.9	37	4.0	
IS(R) 125-100-250J		1450	100	27.8	20	76	7.17	11	2.5
IS(R) 125-100-250JA	93.5		26	17.5	76	5.71	7.5	2.5	
IS(R) 125-100-250JB	86.5		24.1	15	75	4.5	5.5	3.0	
IS(R) 125-100-315	2900	120	33.3	132.5	60	72.1	110	4.0	
		200	55.6	125	75	90.8		4.5	
		240	66.7	120	77	101.9		5.0	
IS(R) 125-100-315A		194	53.89	117.5	75	82.87	90	4.5	
IS(R) 125-100-315B		187	51.94	110	75	74.3		4.5	
IS(R) 125-100-315C		180	50	102.5	75	66.19	75	4.5	
IS(R) 125-100-315D		174	48.33	95	75	59.8		4.5	
IS(R) 125-100-315E		167	46.38	87.5	75	53.24		4.5	
IS(R) 125-100-315J		1450	100	27.5	32	73	11.9	15	2.5
IS(R) 125-100-315JA	95.5		26.53	28.5	73	9.81	11	5.5	
IS(R) 125-100-315JB	90.8		25.2	25.8	72	8.51		3.0	
IS(R) 125-100-400	1450	60	16.7	52	53	16.1	30	2.5	
		100	27.8	50	65	21.0		2.5	
		120	33.3	48.5	67	23.6		3.0	
IS(R) 125-100-400A	1450	95	26.38	45	65	18	22	2.5	
IS(R) 125-100-400B		89.4	24.8	40	65	15	18.5	2.5	
IS(R) 125-100-400C		84.8	20	36	65	12.89	15	2.5	
IS(R) 150-125-250	1450	120	33.3	22.5	71	10.4	18.5	3.0	
		200	55.6	20	81	13.5		3.0	
		240	66.7	17.5	78	14.7		3.5	
IS(R) 150-125-250A		187	52	17.5	81	11.08	15	3.0	
IS(R) 150-125-250B		173	48.1	15	80	8.74	11	2.5	

Model	Speed r/min	Capacity		Head m	Efficiency %	Power		NPSHr m	Weight kg
		m <sup>3</sup> /h	L/S			Shaft power KW	Power KW		
IS(R)150-125-315	1450	120	33.3	34	70	15.86	30	2.5	
		200	55.6	32	79	22.08		2.5	
		240	66.7	29	80	23.71		3.0	
IS(R)150-125-315 A		187	52	28	79	18.1	22	2.5	
IS(R)150-125-315 B		173	48.1	24	79	14.33	18.5	2.5	
IS(R)150-125-315 C		160	44	20	78	11.7	15	2.0	
IS(R)150-125-400	1450	120	33.3	53	62	27.9	45	2.0	
		200	55.6	50	75	36.3		2.8	
		240	66.7	46	74	40.6		3.5	
IS(R)150-125-400 A		187	52	44	75	29.9	37	2.8	
IS(R)150-125-400 B		173	48.1	38	75	24.09	30	2.8	
IS(R)150-125-400 C		160	44.4	32	75	18.8	22	2.8	
IS(R)200-150-250	1450	240	66.7	22.6	70	21.1	37	3.6	
		400	111.1	20.0	83	26.2		4.6	
		460	127.8	17.2	79	27.3		4.9	
IS(R)200-150-250 A		374	103.8	17.5	83	21.83	30	4.6	
IS(R)200-150-250 B		346	96.2	15	80	17.24	22	4.6	
IS(R)200-150-315		1450	240	66.7	37	70	34.6	55	3.0
	400		111.1	32	82	42.5	3.5		
	460		127.8	28.5	80	44.6	4.0		
IS(R)200-150-315 A	374		103.8	28	82	35.38	45	3.5	
IS(R)200-150-315 B	346		96.2	24	80	28.12	37	3.5	
IS(R)200-150-400	1450		240	66.7	55	74	48.6	90	3.0
		400	111.1	50	81	67.2	3.8		
		460	127.8	45	76	74.2	4.5		
IS(R)200-150-400 A		374	130.8	44	81	55.4	75	3.8	
IS(R)200-150-400 B		346	96.2	38	81	45.58	55	3.8	
IS(R)200-150-400 C		330	91.6	34	81	37.57	45	3.8	
IS(R)125-80-160	2900	160	44.4	32	80	17.5	22	5.6	
IS(R)125-80-160J	1450	80	22.2	8	77	2.26	3	2.5	
IS(R)125-80-200	2900	160	44.4	50	80	27.2	37	5.2	
IS(R)125-80-200 J	1450	80	22.2	12.5	77	3.54	4	2.5	
IS(R)125-80-250	2900	160	44.4	80	77	45.3	55	4.8	
IS(R)125-80-250 J	1450	80	22.2	20	74	5.89	7.5	2.2	

### 7. Probable Fault and Their Remedy

SYMPTOM	PROBABLE FAULT	REMEDY
(1) Pump loses liquid. Indicating needle of pressure gauge and vacuum meter jumps severely.	Pump not fully primed. Air leaks in pipe line or gauge.	Stop pump. Re-prime and repair leak.
(2) Pump loses liquid. Vacuum meter is at hard vacuum state.	Foot valve not open or blocked. Resistance force too high. Suction line too high.	Adjust or renew foot valve. Clear or renew suction pipe. Reduce height.
(3) Pressure exists at pressure gauge but no discharge from pipe.	Resistance force too high, impeller rotating in wrong direction. Impeller blocked.	Check pipe and motor. Shorten pipe and clean impeller.
(4) Quantity underestimated.	Blockage in pump. Rings worn excessively.	Clean pump and pipe, Renew ring.
(5) Excessive power consumption.	Stuffing boxes too tight. Stuffing boxes overheating. Pump delivering more than its rated quantity because of impeller damaged for wear.	Tight stuffing boxes or reassemble stuffing boxes as necessary. Renew impeller. Increase resistance force in discharge pipe to reduce capacity.
(6) Noise is not good within pump. Loss of suction.	Flow quantity too large. Resistance force too high in suction line. Height too high and air leak at inlet of suction pipe. Temperature too high.	Increase resistance force in delivery pipe to reduce flow quantity. Check resistance force in suction pipe. Check foot valve. Reduce suction lift. Make good if any leaks. Reduce temperature of liquid.
(7) Bearing overheating	No oil. Pump and driving unit out of alignment.	Fill with oil. Realign pump and driving unit.
(8) Pump excessive vibration.	Pump and driving unit out of alignment. Pump shaft bent.	Realign pump and driving unit. Straighten shaft.