

Submersible Pump

KS series and LSM-KRC

KUBOTA Corporation

<http://www.kubota-global.net/>

Tokyo Office
1-3, Kyobashi 2-chome, Chuo-ku, Tokyo, JAPAN
Phone: +81-3-3245-3444 Facsimile: +81-3-3245-3454

Kubota Corporation Dubai Office
Office No. LB180508 & 180509, JAFZA VIEW 18, Jebel Ali Free Zone, P.O.Box17440, Dubai,
UNITED ARAB EMIRATES
Phone: +971-4-8857033 Facsimile: +971-4-8857032

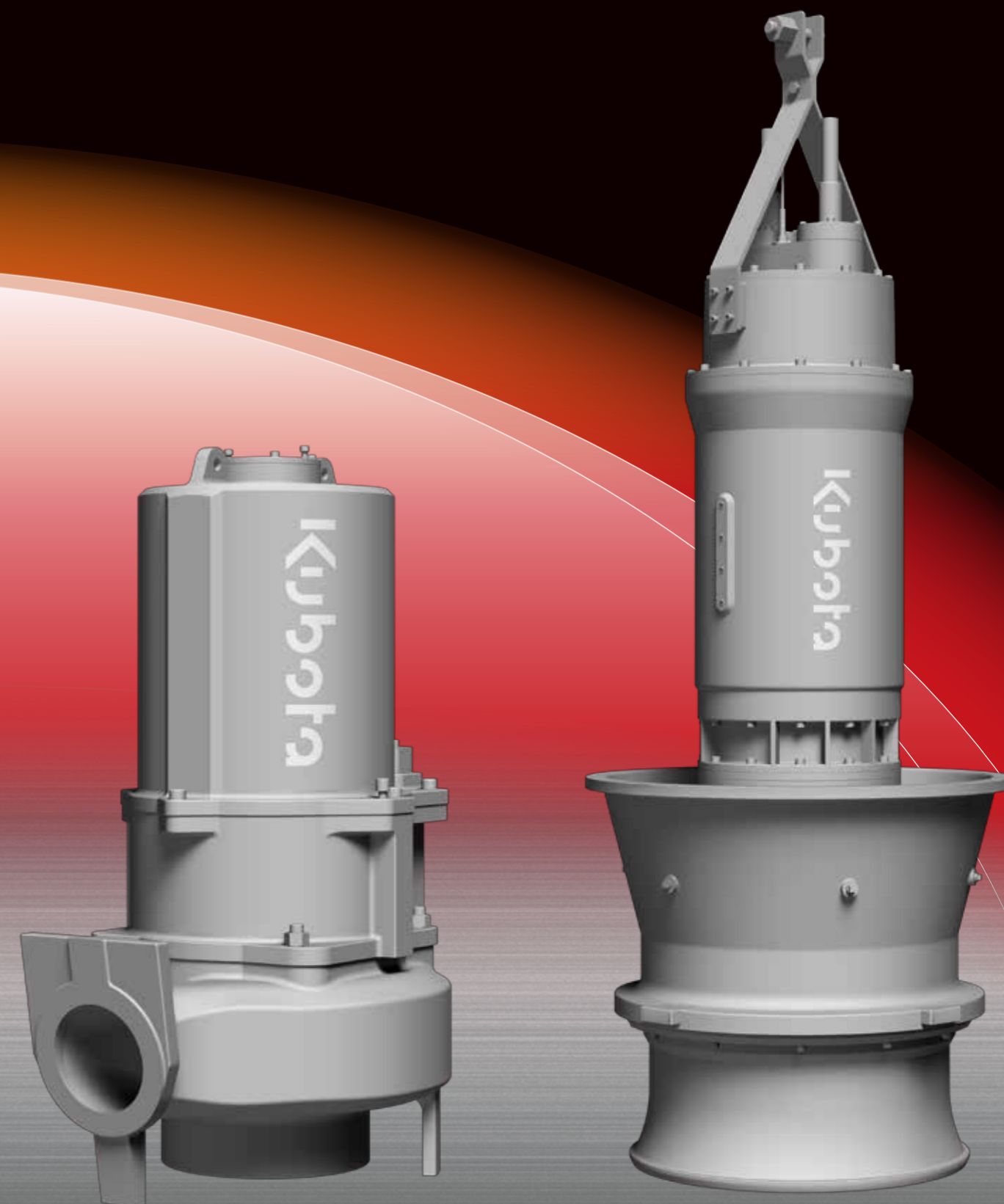
Kubota Corporation Malaysia Branch Office
801A, Amcorp Tower, Amcorp Trade Centre, No.18, Jalan Persiaran Barat 46050 Petaling Jaya,
Selangor, MALAYSIA
Phone: +60-3-7954-2334 Facsimile: +60-3-7954-1335

KUBOTA KASUI THAILAND CO., LTD.
719, 19th Floor KPN Tower Building, Rama 9 Road, Bangkok, Huay-Kwang, Bangkok 10320, Thailand
Phone: +66-2717-0815 Facsimile: +66-2717-0816

KUBOTA KASUI PHILIPPINES CORPORATION
Suite 302, 3rd Floor Golden Rock Building, No.168 Salcedo St., Legaspi Village, Makati City, Philippines
1229
Phone: +63-2-957-2379 Facsimile: +63-2-856-5519

KUBOTA KASUI VIETNAM CO., LTD.
No.3, Street 20, Song Than Industrial Zone II, Di An Dist., Binh Duong Province, VIETNAM
Phone: +84-6503-790521 Facsimile: +84-6503-790526

KUBOTA SANLIAN PUMP(ANHUI)CO.,LTD
<http://www.kubota-sanlian.cn>
He Xian County Economic Development Zone in Anhui Province, 238200, China
Phone: +86-555-5338018



■ KS series

Lifting Type Submersible Pump

■ Application

Water works, sewerage, drainage of rainwater, steel plant, power plant and other industries.

■ Features

1. Pump can be simply attached or removed by sliding it along with guide pipes, making maintenance and inspection work very easy.
2. Suitable types of impeller can be selected corresponding to the water quality.
3. Pump can be operated at wide range of water level since impeller is installed below the motor. Upon applying the self-cooled system with water jacket for the motor, pump operation can be continued even though the water level becomes lower than the motor top. In addition, protective water level detector in the well can be installed if necessary.
4. Mechanical seal is installed on the pump shaft and prevents water from entering into the motor.
5. Type KS-EC series are most advanced and sophisticated new products integrated with high technology. They achieve higher quality and performance and have advantage of anti-clogging / twisting performance against rubbish.



■ LSM-KRC

Large Size Submersible Pump

■ Application

Water works, sewerage, drainage of rainwater, steel plant, power plant and other industries.

■ Features

1. Suitable type of mixed flow or axial flow impeller can be selected based on the requirement of head and flow capacity.
2. Pump can be operated at wide range of water level since impeller is installed below the motor.
3. Pump can be selected between the two different connecting types corresponding to the installation arrangement with pipes. One is flange fixed type, and the other is easily attached or removed type.
4. Mechanical seal is installed on the pump shaft and prevents water from entering into the motor.
5. High security is achieved with protecting devices such as water leakage detector and bimetallic thermo detective guard for motor.



Specification (Lifting Type Submersible pump)

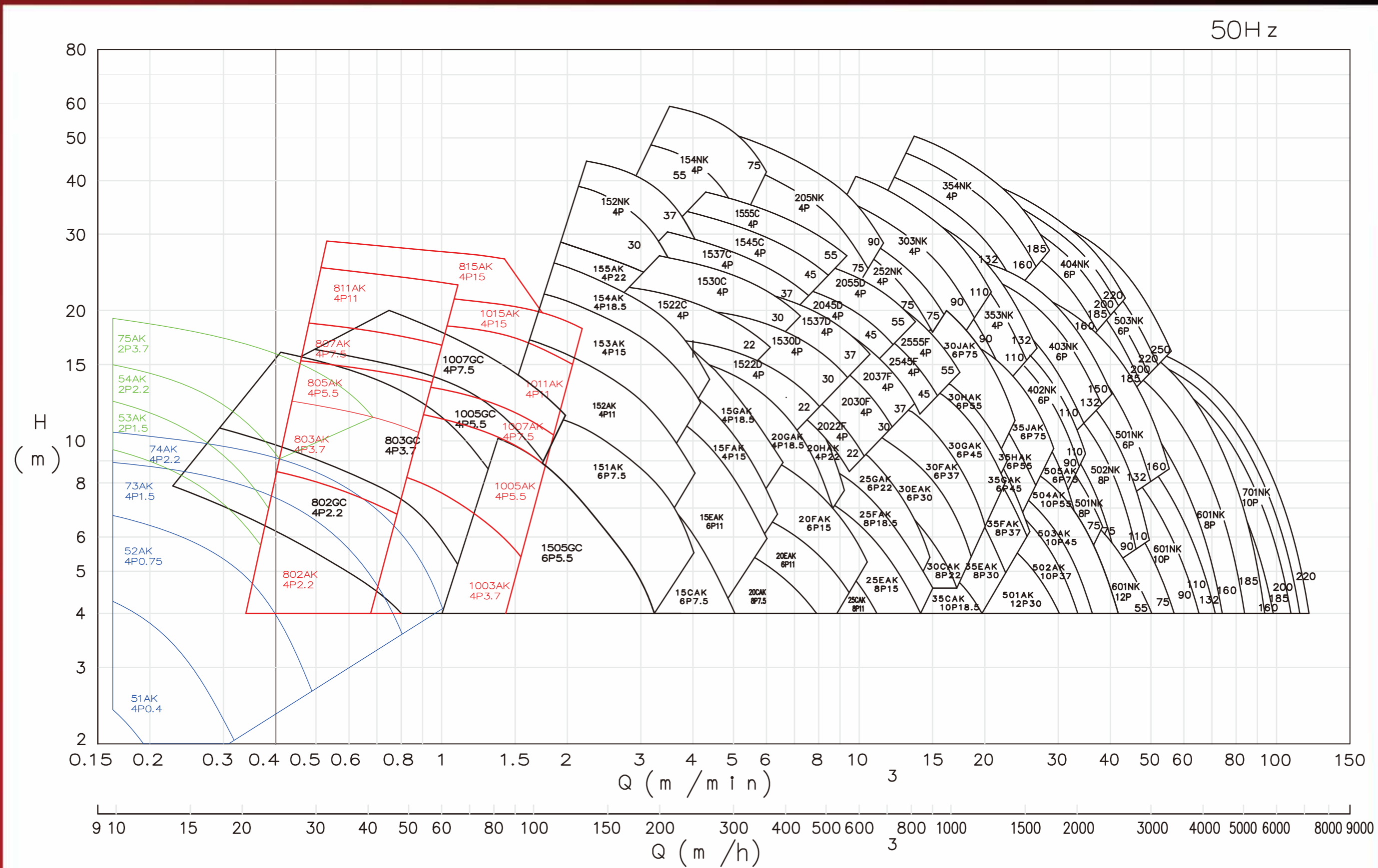
Discharge bore : $\phi 50\text{mm} \sim \phi 700\text{mm}$ Motor output : 0.4kW \sim 250kW

Capacity : $9\text{m}^3/\text{h} \sim 7500\text{m}^3/\text{h}$ Number of poles : 2P \sim 12P (50Hz)

Total head : 2m \sim 60m Main material : Casting (HT250)

Selection Chart

Impeller (HT250/ZG0Cr18N19)



DATA sheet

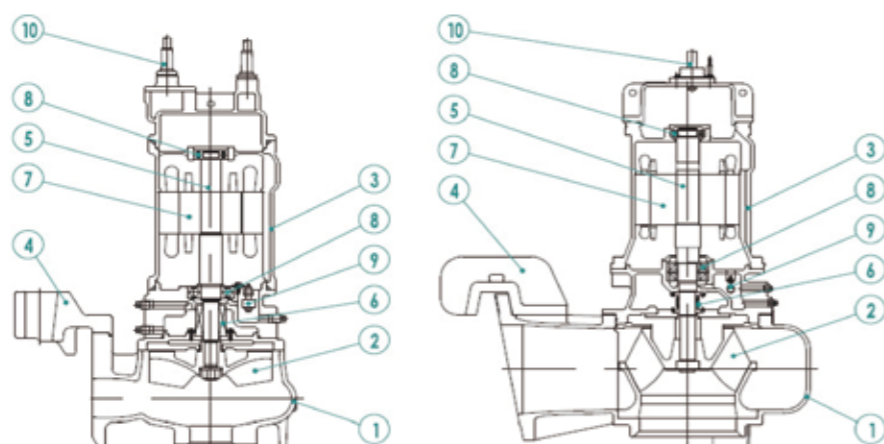
Pump Type	Bore (mm)	Capacity		Head (m)	Poles (P)	Power (kW)	Weight (kg)		
		(m ³ /min)	(m ³ /h)				Pump	Bend	
Vortex	KS-VLC 51-AK	50	0.2	12	4.0	4	0.4	35	8
	KS-VLC 52-AK	50	0.3	19	5.0	4	0.75	40	8
	KS-VHC 53-AK	50	0.3	18	9.2	2	1.5	50	8
	KS-VHC 54-AK	50	0.3	18	12.0	2	2.2	55	8
	KS-VLC 73-AK	65	0.6	36	6.0	4	1.5	55	16
	KS-VLC 74-AK	65	0.7	42	7.0	4	2.2	75	16
	KS-VHC 75-AK	65	0.6	36	12.6	2	3.7	80	16
	KS-VGC 802-AK	80	0.8	45	5.0	4	2.2	75	12
	KS-VGC 803-AK	80	0.9	54	9.0	4	3.7	90	12
	KS-VGC 805-AK	80	1.1	66	11.0	4	5.5	135	12
	KS-VGC 807-AK	80	1.2	72	14.5	4	7.5	145	12
	KS-VGC 811-AK	80	1.4	84	18.0	4	11	240	12
	KS-VGC 815-AK	80	1.5	90	22.0	4	15	250	12
	KS-VGC 1003-AK	100	1.0	60	7.0	4	3.7	95	22
	KS-VGC 1005-AK	100	1.3	78	9.0	4	5.5	140	22
	KS-VGC 1007-AK	100	1.5	90	11.5	4	7.5	145	22
	KS-VGC 1011-AK	100	1.7	102	15.0	4	11	245	22
	KS-VGC 1015-AK	100	1.8	108	19.0	4	15	255	22
Non-clog Mixed-flow	KS-GC 802-GC	80	0.8	48	7.5	4	2.2	80	12
	KS-GC 803-GC	80	0.9	54	12.0	4	3.7	95	12
	KS-GC 1005-GC	100	1.4	84	11.5	4	5.5	150	22
	KS-GC 1007-GC	100	1.5	90	15.0	4	7.5	155	22
	KS-GC 1505-GC	150	2.0	120	8.0	6	5.5	260	57
	KS-EC 151-AK	150	3.4	206	7.5	6	7.5	340	60
	KS-EC 15C-AK	150	3.5	212	7.1	6	7.5	410	60
	KS-EC 152-AK	150	3.0	182	12.2	4	11	330	60
	KS-EC 15E-AK	150	4.5	271	9.3	6	11	490	60
	KS-EC 153-AK	150	3.5	208	15.4	4	15	360	60
	KS-EC 15F-AK	150	5.0	298	10.4	4	15	560	60
	KS-EC 154-AK	150	3.5	211	18.6	4	18.5	430	60
	KS-EC 15G-AK	150	4.8	290	13.5	4	18.5	470	60
	KS-EC 155-AK	150	3.8	227	21.3	4	22	450	60
	KS-J 1522D	150	7.0	420	13.2	4	22	390	60
	KS-J 1522C	150	5.2	312	17.6	4	22	310	60
	KS-EC 152-NK	150	2.6	156	35.6	4	30	600	60
	KS-J 1530D	150	8.0	480	15.7	4	30	430	60
	KS-J 1530C	150	6.0	360	21.6	4	30	330	60
	KS-EC 152-NK	150	3.0	179	40.4	4	37	650	60
	KS-J 1537D	150	9.0	540	17.6	4	37	460	60
	KS-J 1537C	150	6.0	360	24.5	4	37	410	60
	KS-J 1545C	150	6.8	408	27.0	4	45	430	60
	KS-J 1555C	150	7.5	450	30.4	4	55	550	60
	KS-EC 154-NK	150	3.8	230	45.1	4	55	800	60
	KS-EC 154-NK	150	4.6	275	54.4	4	75	1050	60
	KS-EC 20C-AK	200	7.7	462	4.1	8	7.5	500	120

Pump Type	Bore (mm)	Capacity		Head (m)	Poles (P)	Power (kW)	Weight (kg)		
		(m ³ /min)	(m ³ /h)				Pump	Bend	
Non-clog Mixed-flow	KS-EC 20E-AK	200	9.5	568	4.5	6	11	490	120
	KS-EC 20F-AK	200	8.8	528	6.9	6	15	560	120
	KS-EC 20G-AK	200	7.1	427	10.5	4	18.5	550	120
	KS-EC 20H-AK	200	7.5	452	12.0	4	22	570	120
	KS-J 2022F	200	8.1	486	11.8	4	22	470	120
	KS-J 2030F	200	9.6	576	13.7	4	30	510	120
	KS-J 2037F	200	10.7	642	15.7	4	37	540	120
	KS-J 2045D	200	10.0	600	19.8	4	45	540	120
	KS-J 2055D	200	11.2	672	22.5	4	55	650	120
	KS-EC 204-NK	200	5.3	316	36.0	4	55	850	120
	KS-EC 205-NK	200	6.4	382	39.8	4	75	1150	120
	KS-EC 205-NK	200	7.1	423	44.3	4	90	1250	120
	KS-EC 25C-AK	250	10.1	604	4.6	8	11	770	190
	KS-EC 25E-AK	250	11.9	712	5.3	8	15	790	190
	KS-EC 25F-AK	250	11.6	696	6.7	8	18.5	850	190
	KS-EC 25G-AK	250	12.0	718	8.0	6	22	790	190
	KS-J 2545F	250	12.2	732	16.2	4	45	620	190
	KS-J 2555F	250	14.0	840	18.1	4	55	740	190
	KS-EC 252-NK	250	9.7	583	28.3	4	75	1100	190
	KS-EC 30C-AK	300	14.8	887	5.9	8	22	950	250
	KS-EC 30E-AK	300	14.3	859	8.5	6	30	920	250
	KS-EC 30F-AK	300	16.6	994	9.3	6	37	960	250
	KS-EC 30G-AK	300	19.2	1,153	10.5	6	45	1100	250
	KS-EC 30H-AK	300	17.4	1,045	12.9	6	55	1190	250
	KS-EC 30J-AK	300	19.1	1,145	16.8	6	75	1340	250
	KS-EC 303-NK	300	11.0	657	28.3	4	75	1250	250
	KS-EC 303-NK	300	12.1	724	31.3	4	90	1350	250
	KS-EC 303-NK	300	13.5	808	34.9	4	110	1550	250
	KS-EC 35C-AK	350	17.9	1,075	4.6	10	18.5	1230	360
	KS-EC 35E-AK	350	18.6	1,117	7.1	8	30	1250	360
	KS-EC 35F-AK	350	21.5	1,287	8.2	8	37	1340	360
	KS-EC 35G-AK	350	18.8	1,126	10.9	6	45	1260	360
	KS-EC 35H-AK	350	20.4	1,224	12.3	6	55	1340	360
	KS-EC 35J-AK	350	20.6	1,238	15.7	6	75	1430	360
	KS-EC 353-NK	350	17.7	1,059	20.8	4	90	1500	360
	KS-EC 353-NK	350	19.7	1,184	23.2	4	110	1700	360
	KS-EC 353-NK	350	13.8	829	23.7	4	132	1750	360
	KS-EC 354-NK	350	15.5	928	35.7	4	132	1750	360
	KS-EC 354-NK	350	17.3	1,035	39.9	4	160	1800	360
	KS-EC 354-NK	350	18.7	1,120	43.2	4	185	1900	360
	KS-EC 402-NK	400	28.6	1,718	12.7	6	90	1600	480
	KS-EC 402-NK	400	29.6	1,775	13.2	6	110	2050	480
	KS-EC 403-NK	400	27.5	1,648	16.1	6	110	2250	480
	KS-EC 403-NK	400	30.3	1,820	17.8	6	132	2450	480
	KS-EC 403-NK	400	32.1	1,923	18.8	6	150	2800	480

DATA sheet

Pump Type	Bore (mm)	Capacity		Head (m)	Poles (P)	Power (kW)	Weight (kg)		
		(m ³ /min)	(m ³ /h)				Pump	Bend	
Non-clog Mixed-flow	KS-EC 404-NK	400	24.2	1,451	28.4	6	160	2750	480
	KS-EC 404-NK	400	26.0	1,561	30.8	6	185	2800	480
	KS-EC 404-NK	400	27.3	1,635	32.3	6	200	2900	480
	KS-EC 404-NK	400	28.3	1,699	33.5	6	220	2900	480
	KS-EC 501-AK	500	29.3	1,755	4.2	12	30	1950	700
	KS-EC 502-AK	500	29.5	1,771	5.3	10	37	1930	700
	KS-EC 503-AK	500	31.4	1,882	5.7	10	45	2050	700
	KS-EC 504-AK	500	29.8	1,790	7.7	10	55	2180	700
	KS-EC 505-AK	500	29.6	1,773	9.1	6	75	1730	700
	KS-EC 501-NK	500	28.3	1,698	10.0	8	75	2550	700
	KS-EC 502-NK	500	33.1	1,988	9.2	8	75	2550	700
	KS-EC 502-NK	500	36.6	2,195	10.1	8	90	3050	700
	KS-EC 502-NK	500	39.2	2,351	10.9	8	110	2850	700
	KS-EC 501-NK	500	33.9	2,036	16.0	6	132	2800	700
	KS-EC 501-NK	500	37.3	2,235	17.6	6	160	3200	700
	KS-EC 503-NK	500	37.6	2,254	20.0	6	185	3250	700
	KS-EC 503-NK	500	39.3	2,356	20.9	6	200	3350	700
	KS-EC 503-NK	500	41.3	2,478	22.0	6	220	3350	700
	KS-EC 503-NK	500	44.5	2,667	23.7	6	250	3450	700
	KS-EC 601-NK	600	35.2	2,111	6.7	12	55	4050	770
	KS-EC 601-NK	600	36.7	2,201	8.3	10	75	4050	770
	KS-EC 601-NK	600	40.7	2,440	9.2	10	90	4100	770
	KS-EC 601-NK	600	43.5	2,611	10.1	10	110	4100	770
	KS-EC 601-NK	600	43.3	2,597	12.4	8	132	4000	770
	KS-EC 601-NK	600	48.1	2,885	13.8	8	160	4100	770
	KS-EC 601-NK	600	53.0	3,177	15.1	8	185	4150	770
	KS-EC 701-NK	700	58.1	3,488	11.5	10	160	5500	1160
	KS-EC 701-NK	700	63.1	3,787	12.5	10	185	5600	1160
KS-EC 701-NK	700	65.8	3,947	13.0	10	200	5650	1160	
KS-EC 701-NK	700	68.7	4,123	13.6	10	220	5700	1160	

Construction drawing



NO	Parts Name
1	Casing
2	Impeller
3	Motor Frame
4	Guide Slider
5	Shaft
6	Mechanical Seal
7	Motor
8	Bearing
9	Water Leakage Detector
10	Cable

Note)
This construction drawing for pump is one of typical examples.

Installation

1. Installed parts

Auxiliary parts required during pump installation are as follows:

- 1) Discharge bend
The outlet siphon is fixed to the bottom of pump pit through anchor bolt and used to connect pump and lifting pipe. The flange connection between outlet siphon and pump is detachable.
- 2) Guide pipe
Guide pipe comprises of two supports used to guide rise or decline of pump during disassembly and installation. The upper part is fixed on the guide holder, and the lower is fixed on the outlet siphon.
- 3) Guide holder
The guide holder is installed on inner wall above the pump pit and is used to fix the guide pipe.

2. Installation essentials

Follow the following procedure to install pump. In addition, do not make the front end of the vinyl cabtyre cable soaked in water.

- 1) The pump hatch in pump pit shall be set in such a way to ensure its location and size do not influence the lifting work and moving in/out of the pump.
- 2) Horizontally install the discharge bend on the foundation according to installation drawings, and use heavy hamper for location comparison to ensure verticality of the guide pipe.
- 3) The lower pad of guide pipe is fixed on the discharge bend, and the upper part is inserted into the guide holder for fixing. The next step is to install pipe behind the discharge bend.
- 4) Use chain block or crane to hoist the pump, and gently lower the lock in guide pipe of fixing bracket connected to discharge flange of the pump. When reaching the bottom, the outlet of pump and the outlet siphon will automatically connect due to self weight.

Operation

Start operation after pipe installation and wiring according to the following procedure.

1. Before start-up (before pump installation)
 - 1) Check the lubrication oil of the mechanical seal. Confirm whether the oil in the oil chamber is sufficient.
 - 2) Confirm the nameplate
Make sure whether the used voltage is in accordance with the recorded value on the nameplate.
 - 3) Confirm the protection devices
Make sure whether the protection devices are correctly connected.
 - 4) Confirm the earth wire
Make sure the earth wire attached on the vinyl cabtyre cable of the pump is grounded.
 - 5) Manually rotate the impeller and make sure it can easily rotate.

2. Start-up (after the pump is installed at the discharge bend)

Confirm the rotation direction

Open the valve at the water outlet, connect the switch of submersible motor, and observe the water outlet status after operation for several seconds. In the event of reverse rotation, the water outlet is little or there is no water outlet. In addition, pressure increase required by performance data of pump dose not exist. At this time, it is essential to change the connection of submersible cable, operate pump again and confirm whether the rotation direchon is correct. Please note that long-term continuous reverse rotation will cause failure.

3. Shut down

Stop the pump after the cock of pressure gauge is closed.

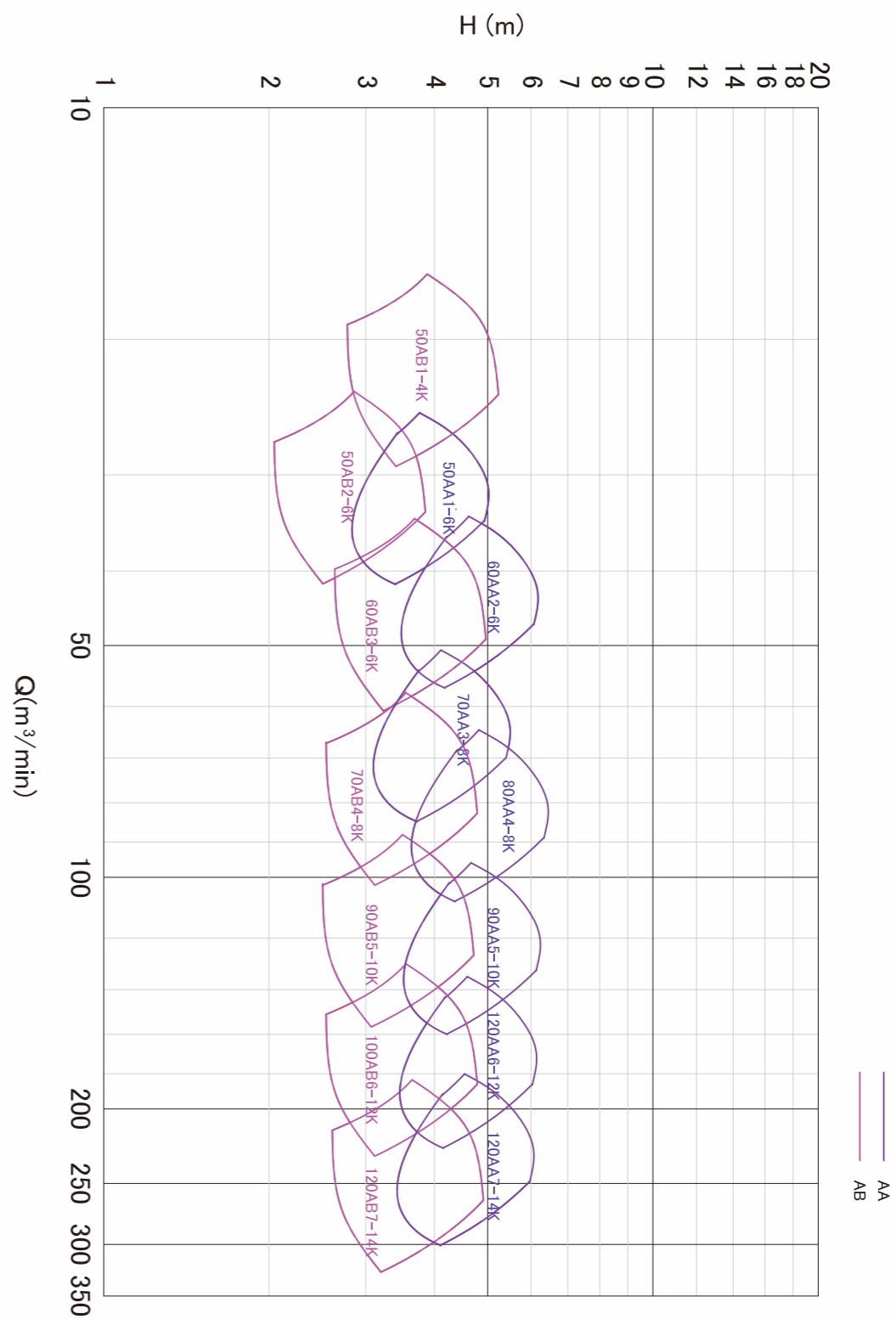
■ Specification (Large Size Submersible Pump)

Discharge bore : $\phi 500\text{mm} \sim \phi 1200\text{mm}$ Motor output : 30kW ~ 710kW
 Capacity : $24\text{m}^3/\text{m} \sim 240\text{m}^3/\text{m}$ Number of poles : 4P ~ 16P
 Total head : 3m ~ 12m Main material : Casting(HT250), Shaft(20Cr13), Impeller(HT250 ZG0Cr18N19), Impeller Hub(ZG230-450)

■ Selection Chart (MA, MB Type)



■ Selection Chart (AA, AB Type)



DATA sheet (MA Type)

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
50MA1-4K	-5°	19	1,146	318	15.3	1470	75	77.1
		21	1,249	347	13.3			78.9
		23	1,365	379	11.1			77.1
	-3°	21	1,234	343	16.3		77.1	
		24	1,428	397	13.2		75	79.3
		26	1,564	434	10.5		77.1	
	0°	24	1,418	394	17.6		110	77.1
		27	1,643	456	14.3		81.5	
		31	1,855	515	10.4		77.1	
	+3°	26	1,551	431	18.2		110	77.1
		30	1,773	493	15.7		80.3	
		34	2,053	570	11.4		77.1	
	+5°	28	1,677	466	19.1		132	77.1
		31	1,861	517	16.8		80.2	
		36	2,151	597	12.7		77.1	
50MA2-6K	-5°	20	1,192	331	9.1	980	45	77.1
		22	1,300	361	7.9			78.9
		24	1,420	395	6.7			77.1
	-3°	21	1,285	357	9.7		55	77.1
		25	1,486	413	7.9		79.3	
		27	1,628	452	6.3		77.1	
	0°	25	1,476	410	10.5		75	77.1
		28	1,710	475	8.6		81.5	
		32	1,930	536	6.2		77.1	
	+3°	27	1,614	448	10.9		75	77.1
		31	1,845	513	9.4		80.3	
		36	2,137	594	6.8		77.1	
	+5°	29	1,746	485	11.4		75	77.1
		32	1,937	538	10.0		80.2	
		37	2,238	622	7.6		77.1	
50MA3-6K	-5°	28	1,678	466	11.5	980	75	77.5
		30	1,830	508	10.0			79.3
		33	1,999	555	8.4			77.5
	-3°	30	1,808	502	12.2		90	77.5
		35	2,092	581	9.9		79.7	
		38	2,291	636	7.9		77.5	
	0°	35	2,078	577	13.2		110	77.5
		40	2,407	668	10.8		81.9	
		45	2,717	755	7.8		77.5	
	+3°	38	2,271	631	13.7		132	77.5
		43	2,598	722	11.8		80.7	
		50	3,008	835	8.6		77.5	
	+5°	41	2,457	683	14.3		150	77.5
		45	2,727	757	12.6		80.6	
		53	3,150	875	9.5		77.5	
60MA4-6K	-5°	39	2,329	647	14.3	980	132	78.2
		42	2,539	705	12.4			80.0
		46	2,774	771	10.4			78.2
	-3°	42	2,509	697	15.2		150	78.2
		48	2,903	806	12.3		80.4	
		53	3,180	883	9.8		78.2	
	0°	48	2,883	801	16.4		185	78.2
		56	3,340	928	13.4		82.6	
		63	3,770	1,047	9.7		78.2	
	+3°	53	3,152	876	17.0		220	78.2
		60	3,605	1,001	14.7		81.4	
		70	4,174	1,159	10.7		78.2	
	+5°	57	3,410	947	17.8		250	78.2
		63	3,784	1,051	15.7		81.3	
		73	4,372	1,214	11.8		78.2	

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
70MA5-8K	-5°	50	3,018	838	11.5	735	132	79.4
		55	3,291	914	10.0			81.2
		60	3,595	999	8.4			79.4
	-3°	54	3,252	903	12.3		150	79.4
		63	3,762	1,045	10.0		81.6	
		69	4,121	1,145	7.9		79.4	
	0°	62	3,736	1,038	13.3		185	79.4
		72	4,328	1,202	10.8		84.0	
		81	4,886	1,357	7.9		79.4	
	+3°	68	4,085	1,135	13.8		220	79.4
		78	4,671	1,298	11.9		82.7	
		90	5,409	1,502	8.7		79.4	
	+5°	74	4,419	1,227	14.4		250	79.4
		82	4,904	1,362	12.7		82.6	
		94	5,665	1,574	9.6		79.4	
80MA6-8K	-5°	65	3,929	1,091	13.8	735	220	80.1
		71	4,285	1,190	12.0			81.9
		78	4,681	1,300	10.1			80.1
	-3°	71	4,234	1,176	14.7		250	80.1
		82	4,898	1,361	11.9		82.3	
		89	5,365	1,490	9.5		80.1	
	0°	81	4,865	1,351	15.9		280	80.1
		94	5,635	1,565	12.9		84.7	
		106	6,361	1,767	9.4		80.1	
	+3°	89	5,318	1,477	16.5		335	80.1
		101	6,082	1,689	14.2		83.4	
		117	7,042	1,956	10.3		80.1	
	+5°	96	5,753	1,598	17.2		375	80.1
		106	6,385	1,774	15.1		83.3	
		123	7,376	2,049	11.4		80.1	
90MA7-12K	-5°	88	5,279	1,466	9.8	490	200	81.7
		96	5,757	1,599	8.5			83.6
		105	6,290	1,747	7.1			81.7
	-3°	95	5,689	1,580	10.4		220	81.7
		110	6,581	1,828	8.4		84.0	
		120	7,209	2,002	6.7		81.7	
	0°	109	6,536	1,816	11.2		280	81.7
		126	7,572	2,103	9.2		86.4	
		142	8,548	2,374	6.6		81.7	
	+3°	119	7,146	1,985	11.7		315	81.7
		136	8,172	2,270	10.0		85.1	
		158	9,463	2,629	7.3		81.7	
	+5°	129	7,731	2,147	12.2		355	81.7
		143	8,579	2,383	10.7		85.0	
		165	9,911	2,753	8.1		81.7	
100MA7-10K	-5°	106	6,335	1,760	14.1	588	335	82.0
		115	6,908	1,919	12.2			83.9
		126	7,548	2,097	10.3			82.0
	-3°	114	6,827	1,896	15.0		375	82.0
		132	7,897	2,194	12.2		84.3	
		144	8,651	2,403	9.7		82.0	
	0°	131	7,844	2,179	16.2		450	82.0
		151	9,086	2,524	13.2		86.7	
		171	10,257	2,849	9.6		82.0	
	+3°	143	8,575	2,382	16.8		530	82.0
		163	9,807	2,724	14.5		85.4	
		189	11,355	3,154	10.5		82.0	
	+5°	155	9,277	2,577	17.6		600	82.0
		172	10,295	2,860	15.5		85.3	
		198	11,894	3,304	11.7		82.0	

Pump Type		Capacity			Head (m)	Speed (min ⁻¹)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
120MA8-12K	-5°	149	8,934	2,482	13.9	490	450	82.5
		162	9,742	2,706	12.0			84.4
		177	10,644	2,957	10.1			82.5
	-3°	160	9,627	2,674	14.8		500	82.5
		186	11,136	3,093	12.0			84.8
		203	12,199	3,389	9.5			82.5
	0°	184	11,061	3,072	16.0		600	82.5
		214	12,813	3,559	13.0			87.2
		241	14,464	4,018	9.4			82.5
	+3°	202	12,093	3,359	16.6		750	82.5
		230	13,829	3,841	14.3			85.9
		267	16,013	4,448	10.4			82.5
	+5°	218	13,082	3,634	17.3		800	82.5
		242	14,517	4,033	15.2			85.8
		280	16,772	4,659	11.5			82.5

Pump Type		Capacity			Head (m)	Speed (min ⁻¹)	Motor (kW)	Eff. (%)		
		(m ³ /min)	(m ³ /h)	(l/s)						
50MB3-8K	-5°	24	1,426	396	4.8	735	30	75.9		
		27	1,635	454	4.0			76.9		
		28	1,699	472	3.7			75.9		
	-3°	25	1,507	419	5.1		37	77.4		
		29	1,731	481	4.3			78.8		
		31	1,872	520	3.7			77.4		
	0°	28	1,684	468	5.8		45	78.8		
		32	1,914	532	5.1			82.0		
		38	2,285	635	3.5			78.8		
	+3°	35	2,103	584	6.1		55	78.8		
		38	2,287	635	5.5			80.4		
		42	2,549	708	4.3			78.8		
	+5°	39	2,367	657	5.6		55	78.8		
		43	2,567	713	5.0			80.0		
		44	2,622	728	4.8			78.8		
	60MB3-6K	-5°	32	1,901	528		8.6	980	75	75.2
			36	2,180	606		7.2			76.2
			38	2,265	629		6.7			75.2
-3°		33	2,010	558	9.1	75	76.7			
		38	2,308	641	7.6		78.2			
		42	2,495	693	6.6		76.7			
0°		37	2,245	624	10.3	90	78.2			
		43	2,552	709	9.1		81.3			
		51	3,046	846	6.3		78.2			
+3°		47	2,804	779	10.8	132	78.2			
		51	3,049	847	9.8		79.7			
		57	3,398	944	7.6		78.2			
+5°		53	3,156	877	9.9	132	78.2			
		57	3,423	951	8.9		79.3			
		58	3,496	971	8.6		78.2			
60MB4-8K		-5°	32	1,906	529	5.9	735		45	76.3
			36	2,186	607	4.9				77.2
			38	2,271	631	4.6				76.3
	-3°	34	2,015	560	6.2	55		77.7		
		39	2,314	643	5.2			79.2		
		42	2,502	695	4.5			77.7		
	0°	38	2,251	625	7.0	75		79.2		
		43	2,558	711	6.2			82.4		
		51	3,054	848	4.3			79.2		
	+3°	47	2,811	781	7.4	90		79.2		
		51	3,057	849	6.7			80.8		
		57	3,407	946	5.2			79.2		
	+5°	53	3,164	879	6.8	90		79.2		
		57	3,432	953	6.1			80.4		
		58	3,505	974	5.8			79.2		
	70MB5-8K	-5°	45	2,687	746	7.4		735	90	76.5
			51	3,082	856	6.2				77.5
			53	3,202	889	5.7				76.5
-3°		47	2,842	789	7.8	90	78.0			
		54	3,262	906	6.5		79.5			
		59	3,528	980	5.7		78.0			
0°		53	3,174	882	8.8	110	79.5			
		60	3,607	1,002	7.8		82.7			
		72	4,307	1,196	5.4		79.5			
+3°		66	3,964	1,101	9.2	150	79.5			
		72	4,311	1,198	8.4		81.1			
		80	4,804	1,335	6.5		79.5			
+5°		74	4,461	1,239	8.5	150	79.5			
		81	4,839	1,344	7.6		80.7			
		82	4,942	1,373	7.4		79.5			

DATA sheet (MB Type)

Pump Type		Capacity			Head (m)	Speed (min ⁻¹)	Motor (kW)	Eff. (%)		
		(m ³ /min)	(m ³ /h)	(l/s)						
50MB1-6K	-5°	17	1,041	289	5.7	980	30	75.3		
		20	1,194	332	4.8			76.3		
		21	1,240	345	4.5			75.3		
	-3°	18	1,101	306	6.1		30	76.8		
		21	1,264	351	5.1			78.3		
		23	1,367	380	4.4			76.8		
	0°	20	1,230	342	6.9		37	78.3		
		23	1,398	388	6.1			81.4		
		28	1,669	463	4.2			78.3		
	+3°	26	1,536	427	7.2		45	78.3		
		28	1,670	464	6.6			79.8		
		31	1,861	517	5.1			78.3		
	+5°	29	1,728	480	6.7		45	78.3		
		31	1,875	521	5.9			79.4		
		32	1,915	532	5.7			78.3		
	50MB2-6K	-5°	24	1,428	397		7.1	980	45	74.7
			27	1,638	455		5.9			75.6
			28	1,702	473		5.5			74.7
-3°		25	1,510	419	7.5	45	76.1			
		29	1,734	482	6.3		77.6			
		31	1,875	521	5.4		76.1			
0°		28	1,687	469	8.5	75	77.6			
		32	1,917	533	7.5		80.7			
		38	2,289	636	5.2		77.6			
+3°		35	2,106	585	8.9	75	77.6			
		38	2,291	636	8.1		79.2			
		43	2,553	709	6.3		77.6			
+5°		40	2,371	659	8.2	90	77.6			
		43	2,572	714	7.3		78.8			
		44	2,626	730	7.1		77.6			

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
70MB6-8K	-5°	57	3,406	946	8.6	735	132	77.1
		65	3,907	1,085	7.2			78.1
		68	4,059	1,127	6.7			77.1
	-3°	60	3,602	1,001	9.2		132	78.6
		69	4,135	1,149	7.7			80.1
		75	4,472	1,242	6.6			78.6
	0°	67	4,024	1,118	10.3		160	80.1
		76	4,573	1,270	9.2			83.3
		91	5,459	1,517	6.3			80.1
	+3°	84	5,024	1,396	10.8		220	80.1
		91	5,465	1,518	9.9			81.7
		102	6,090	1,692	7.7			80.1
	+5°	94	5,655	1,571	10.0		220	80.1
		102	6,134	1,704	8.9			81.3
104		6,264	1,740	8.6	80.1			
70MB6-10K	-5°	45	2,725	757	5.5	588	75	77.4
		52	3,125	868	4.6			78.4
		54	3,247	902	4.3			77.4
	-3°	48	2,882	800	5.9		75	78.9
		55	3,308	919	4.9			80.4
		60	3,578	994	4.2			78.9
	0°	54	3,219	894	6.6		90	80.4
		61	3,658	1,016	5.9			83.6
		73	4,368	1,213	4.0			80.4
	+3°	67	4,020	1,117	6.9		110	80.4
		73	4,372	1,214	6.3			82.0
		81	4,872	1,353	4.9			80.4
	+5°	75	4,524	1,257	6.4		110	80.4
		82	4,907	1,363	5.7			81.6
84		5,011	1,392	5.5	80.4			
80MB7-10K	-5°	78	4,709	1,308	7.9	588	150	77.3
		90	5,401	1,500	6.7			78.3
		94	5,611	1,559	6.2			77.3
	-3°	83	4,979	1,383	8.4		160	78.8
		95	5,717	1,588	7.1			80.3
		103	6,182	1,717	6.1			78.8
	0°	93	5,563	1,545	9.5		220	80.3
		105	6,322	1,756	8.5			83.5
		126	7,547	2,096	5.8			80.3
	+3°	116	6,946	1,929	10.0		280	80.3
		126	7,554	2,098	9.1			81.9
		140	8,419	2,339	7.1			80.3
	+5°	130	7,818	2,172	9.2		280	80.3
		141	8,479	2,355	8.2			81.5
144		8,660	2,405	7.9	80.3			
80MB7-12K	-5°	65	3,924	1,090	5.5	490	90	79.3
		75	4,501	1,250	4.6			80.3
		78	4,676	1,299	4.3			79.3
	-3°	69	4,149	1,153	5.9		110	80.9
		79	4,764	1,323	4.9			82.4
		86	5,152	1,431	4.2			80.9
	0°	77	4,636	1,288	6.6		132	82.4
		88	5,268	1,463	5.9			85.7
		105	6,289	1,747	4.0			82.4
	+3°	96	5,788	1,608	6.9		160	82.4
		105	6,295	1,749	6.3			84.1
		117	7,016	1,949	4.9			82.4
	+5°	109	6,515	1,810	6.4		160	82.4
		118	7,066	1,963	5.7			83.6
120		7,216	2,005	5.5	82.4			

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
90MB8-14K	-5°	94	5,620	1,561	5.7	420	132	80.2
		107	6,446	1,791	4.8			81.2
		112	6,697	1,860	4.4			80.2
	-3°	99	5,943	1,651	6.1		150	81.7
		114	6,823	1,895	5.1			83.3
		123	7,379	2,050	4.4			81.7
	0°	111	6,640	1,844	6.8		185	83.3
		126	7,545	2,096	6.1			86.6
		150	9,008	2,502	4.2			83.3
	+3°	138	8,290	2,303	7.2		250	83.3
		150	9,017	2,505	6.5			85.0
		167	10,049	2,791	5.1			83.3
	+5°	156	9,331	2,592	6.6		250	83.3
		169	10,121	2,811	5.9			84.5
172		10,336	2,871	5.7	83.3			
100MB8-12K	-5°	109	6,557	1,821	7.8	490	200	79.3
		125	7,521	2,089	6.5			80.3
		130	7,813	2,170	6.0			79.3
	-3°	116	6,934	1,926	8.2		220	80.9
		133	7,960	2,211	6.9			82.4
		143	8,609	2,391	6.0			80.9
	0°	129	7,746	2,152	9.3		280	82.4
		147	8,803	2,445	8.3			85.7
		175	10,510	2,919	5.7			82.4
	+3°	161	9,672	2,687	9.8		355	82.4
		175	10,520	2,922	8.9			84.1
		195	11,724	3,257	6.9			82.4
	+5°	181	10,886	3,024	9.0		375	82.4
		197	11,808	3,280	8.1			83.6
201		12,059	3,350	7.8	82.4			
120MB9-14K	-5°	154	9,229	2,564	7.9	420	280	80.7
		176	10,586	2,940	6.7			81.7
		183	10,997	3,055	6.2			80.7
	-3°	163	9,759	2,711	8.4		300	82.3
		187	11,204	3,112	7.1			83.9
		202	12,117	3,366	6.1			82.3
	0°	182	10,903	3,029	9.5		400	83.9
		207	12,390	3,442	8.5			87.2
		247	14,792	4,109	5.8			83.9
	+3°	227	13,614	3,782	10.0		530	83.9
		247	14,806	4,113	9.1			85.5
		275	16,501	4,584	7.1			83.9
	+5°	255	15,323	4,256	9.2		530	83.9
		277	16,619	4,616	8.2			85.1
283		16,973	4,715	7.9	83.9			
120MB9-16K	-5°	135	8,075	2,243	6.1	368	185	81.0
		154	9,262	2,573	5.1			82.0
		160	9,622	2,673	4.7			81.0
	-3°	142	8,539	2,372	6.5		220	82.6
		163	9,804	2,723	5.4			84.1
		177	10,602	2,945	4.7			82.6
	0°	159	9,540	2,650	7.3		280	84.1
		181	10,841	3,012	6.5			87.5
		216	12,943	3,595	4.4			84.1
	+3°	199	11,912	3,309	7.6		355	84.1
		216	12,956	3,599	7.0			85.8
		241	14,439	4,011	5.4			84.1
	+5°	223	13,407	3,724	7.1		355	84.1
		242	14,542	4,039	6.3			85.4
248		14,851	4,125	6.1	84.1			

DATA sheet (AA Type)

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
50AA1-6K	-5°	25	1,495	415	3.8	980	30	77.9
		26	1,541	428	3.6			77.9
		26	1,587	441	3.4			77.9
	-3°	26	1,572	437	4.2		30	77.9
		30	1,772	492	3.5			80.1
		32	1,916	532	2.9			77.9
	0°	28	1,698	472	4.7		37	77.9
		33	1,973	548	3.9			81.2
		37	2,211	614	2.9			77.9
	+3°	31	1,883	523	5.0		45	77.9
		36	2,166	602	4.2			81.7
		40	2,416	671	3.1			77.9
	+5°	34	2,066	574	4.9		45	77.9
		38	2,301	639	4.1			79.4
		42	2,499	694	3.4			77.9
60AA2-6K	-5°	34	2,038	566	4.6	980	45	78.0
		35	2,101	584	4.4			78.0
		36	2,163	601	4.2			78.0
	-3°	36	2,144	595	5.2		55	78.0
		40	2,416	671	4.3			80.2
		44	2,613	726	3.6			78.0
	0°	39	2,315	643	5.8		75	78.0
		45	2,690	747	4.8			81.3
		50	3,014	837	3.5			78.0
	+3°	43	2,567	713	6.2		75	78.0
		49	2,953	820	5.2			81.8
		55	3,294	915	3.8			78.0
	+5°	47	2,817	783	6.1		75	78.0
		52	3,138	872	5.1			79.5
		57	3,407	946	4.2			78.0
70AA3-8K	-5°	51	3,041	845	4.1	735	55	79.5
		52	3,134	871	4.0			79.5
		54	3,228	897	3.8			79.5
	-3°	53	3,198	888	4.6		75	79.5
		60	3,605	1,001	3.9			81.8
		65	3,898	1,083	3.2			79.5
	0°	58	3,453	959	5.1		75	79.5
		67	4,013	1,115	4.3			82.9
		75	4,497	1,249	3.1			79.5
	+3°	64	3,830	1,064	5.5		90	79.5
		73	4,405	1,224	4.6			83.4
		82	4,915	1,365	3.4			79.5
	+5°	70	4,203	1,167	5.4		110	79.5
		78	4,681	1,300	4.5			81.1
		85	5,083	1,412	3.7			79.5
80AA4-8K	-5°	64	3,862	1,073	4.8	735	90	80.9
		66	3,981	1,106	4.6			80.9
		68	4,099	1,139	4.4			80.9
	-3°	68	4,062	1,128	5.4		90	80.9
		76	4,578	1,272	4.5			83.2
		83	4,951	1,375	3.7			80.9
	0°	73	4,386	1,218	6.0		110	80.9
		85	5,097	1,416	5.0			84.3
		95	5,712	1,587	3.7			80.9
	+3°	81	4,864	1,351	6.4		132	80.9
		93	5,595	1,554	5.4			84.8
		104	6,242	1,734	4.0			80.9
	+5°	89	5,338	1,483	6.3		150	80.9
		99	5,945	1,651	5.3			82.5
		108	6,455	1,793	4.4			80.9

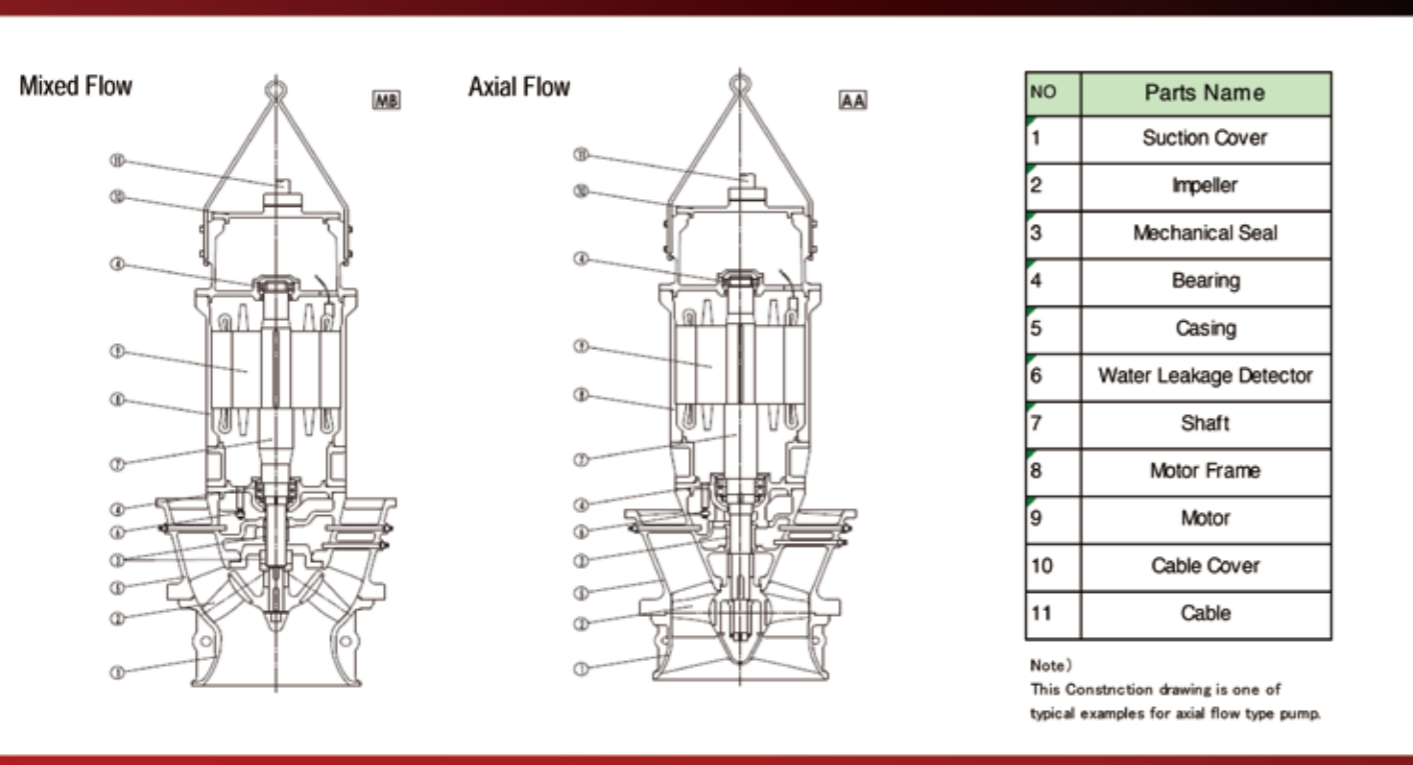
Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
90AA5-10K	-5°	96	5,745	1,596	4.7	588	132	82.0
		99	5,922	1,645	4.5			82.0
		102	6,099	1,694	4.3			82.0
	-3°	101	6,043	1,679	5.2		132	82.0
		114	6,811	1,892	4.4			84.4
		123	7,365	2,046	3.6			82.0
	0°	109	6,525	1,812	5.8		160	82.0
		126	7,583	2,106	4.8			85.5
		142	8,497	2,360	3.5			82.0
	+3°	121	7,237	2,010	6.2		185	82.0
		139	8,323	2,312	5.2			86.0
		155	9,287	2,580	3.9			82.0
	+5°	132	7,941	2,206	6.1		200	82.0
		147	8,845	2,457	5.1			83.7
		160	9,604	2,668	4.2			82.0
120AA6-12K	-5°	135	8,078	2,244	4.6	490	160	83.1
		139	8,326	2,313	4.4			83.1
		143	8,574	2,382	4.2			83.1
	-3°	142	8,496	2,360	5.2		185	83.1
		160	9,576	2,660	4.3			85.5
		173	10,355	2,876	3.6			83.1
	0°	153	9,173	2,548	5.7		220	83.1
		178	10,661	2,961	4.8			86.6
		199	11,947	3,319	3.5			83.1
	+3°	170	10,175	2,826	6.1		250	83.1
		195	11,702	3,251	5.2			87.1
		218	13,057	3,627	3.8			83.1
	+5°	186	11,165	3,101	6.0		280	83.1
		207	12,435	3,454	5.0			84.8
		225	13,503	3,751	4.2			83.1
120AA7-14K	-5°	180	10,807	3,002	4.5	420	220	83.7
		186	11,140	3,094	4.4			83.7
		191	11,472	3,187	4.1			83.7
	-3°	189	11,367	3,157	5.1		250	83.7
		214	12,812	3,559	4.3			86.1
		231	13,854	3,848	3.5			83.7
	0°	205	12,273	3,409	5.7		280	83.7
		238	14,264	3,962	4.7			87.2
		266	15,984	4,440	3.4			83.7
	+3°	227	13,613	3,781	6.1		335	83.7
		261	15,657	4,349	5.1			87.7
		291	17,469	4,852	3.8			83.7
	+5°	249	14,937	4,149	6.0		355	83.7
		277	16,637	4,621	5.0			85.3
		301	18,066	5,018	4.1			83.7

DATA sheet (AB Type)

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
50AB1-4K	-5°	16	984	273	3.9	1470	18.5	75.2
		18	1,065	296	3.3			76.6
		19	1,143	317	2.8			75.2
	-3°	17	1,046	291	4.3		22	75.2
		19	1,149	319	3.8			78.1
		21	1,288	358	2.8			75.2
	0°	19	1,140	317	4.9		30	75.2
		21	1,254	348	4.3			78.9
		25	1,476	410	2.9			75.2
	+3°	22	1,312	364	5.1		30	76.0
		25	1,478	411	4.2			78.6
		27	1,609	447	3.3			75.2
	+5°	24	1,416	393	5.2		37	75.2
		25	1,528	424	4.7			77.3
		28	1,689	469	3.8			75.2
	50AB2-6K	-5°	23	1,398	388		2.8	980
25			1,513	420	2.5	79.0		
27			1,624	451	2.0	77.6		
-3°		25	1,486	413	3.2	22	77.6	
		27	1,633	454	2.8		80.6	
		31	1,830	508	2.1		77.6	
0°		27	1,619	450	3.6	30	77.6	
		30	1,783	495	3.1		81.4	
		35	2,097	582	2.1		77.6	
+3°		31	1,864	518	3.7	30	78.4	
		35	2,100	583	3.1		81.1	
		38	2,286	635	2.4		77.6	
+5°		34	2,012	559	3.9	37	77.6	
		36	2,171	603	3.5		79.8	
		40	2,399	667	2.8		77.6	
60AB3-6K		-5°	34	2,045	568	3.7	980	
	37		2,213	615	3.2	79.6		
	40		2,375	660	2.6	78.2		
	-3°	36	2,174	604	4.1	37		78.2
		40	2,389	664	3.6			81.2
		45	2,677	744	2.7			78.2
	0°	39	2,369	658	4.6	45		78.2
		43	2,607	724	4.0			82.0
		51	3,067	852	2.8			78.2
	+3°	45	2,727	758	4.8	55		79.0
		51	3,072	853	4.0			81.7
		56	3,343	929	3.2			78.2
	+5°	49	2,942	817	5.0	75		78.2
		53	3,176	882	4.5			80.4
		58	3,510	975	3.6			78.2
	70AB4-8K	-5°	57	3,444	957	3.5		735
62			3,727	1,035	3.1	81.9		
67			4,001	1,111	2.5	80.4		
-3°		61	3,661	1,017	4.0	75	80.4	
		67	4,023	1,118	3.4		83.5	
		75	4,509	1,252	2.6		80.4	
0°		66	3,989	1,108	4.5	75	80.4	
		73	4,391	1,220	3.9		84.4	
		86	5,165	1,435	2.7		80.4	
+3°		77	4,593	1,276	4.6	90	81.2	
		86	5,174	1,437	3.8		84.0	
		94	5,631	1,564	3.0		80.4	
+5°		83	4,955	1,376	4.8	110	80.4	
		89	5,349	1,486	4.3		82.7	
		99	5,911	1,642	3.4		80.4	

Pump Type		Capacity			Head (m)	Speed (min-1)	Motor (kW)	Eff. (%)
		(m ³ /min)	(m ³ /h)	(l/s)				
90AB5-10K	-5°	88	5,264	1,462	3.5	588	75	81.4
		95	5,698	1,583	3.0			83.0
		102	6,115	1,699	2.5			81.4
	-3°	93	5,597	1,555	3.9		90	81.4
		102	6,150	1,708	3.4			84.6
		115	6,892	1,915	2.5			81.4
	0°	102	6,099	1,694	4.4		110	81.4
		112	6,713	1,865	3.8			85.5
		132	7,896	2,193	2.6			81.4
	+3°	117	7,021	1,950	4.6		132	82.3
		132	7,909	2,197	3.8			85.1
		143	8,608	2,391	3.0			81.4
	+5°	126	7,575	2,104	4.7		150	81.4
		136	8,176	2,271	4.2			83.7
		151	9,036	2,510	3.4			81.4
	100AB6-12K	-5°	129	7,748	2,152		3.5	490
140			8,386	2,330	3.1	84.1		
150			9,001	2,500	2.5	82.5		
-3°		137	8,238	2,288	4.0	132	82.5	
		151	9,052	2,514	3.4		85.7	
		169	10,145	2,818	2.6		82.5	
0°		150	8,976	2,493	4.5	160	82.5	
		165	9,880	2,744	3.9		86.6	
		194	11,622	3,228	2.7		82.5	
+3°		172	10,334	2,871	4.6	185	83.4	
		194	11,642	3,234	3.8		86.2	
		211	12,670	3,519	3.0		82.5	
+5°		186	11,150	3,097	4.8	220	82.5	
		201	12,034	3,343	4.3		84.8	
		222	13,300	3,694	3.4		82.5	
120AB7-14K		-5°	183	10,962	3,045	3.6	420	
	198		11,865	3,296	3.1	84.4		
	212		12,735	3,538	2.6	82.9		
	-3°	194	11,655	3,237	4.1	185		82.9
		213	12,807	3,558	3.5			86.1
		239	14,353	3,987	2.6			82.9
	0°	212	12,700	3,528	4.6	250		82.9
		233	13,979	3,883	4.0			87.0
		274	16,443	4,568	2.7			82.9
	+3°	244	14,621	4,062	4.8	280		83.8
		275	16,471	4,575	3.9			86.6
		299	17,926	4,979	3.1			82.9
	+5°	263	15,775	4,382	4.9	315		82.9
		284	17,027	4,730	4.4			85.2
		314	18,817	5,227	3.5			82.9

■ Construction drawing



■ Installation

1. Installation preparation

When installation is to be performed, please read above "danger, warning and caution" items firstly. The mechanical seal is not added with lubrication oil for the purpose of easy handling. Before installation, put the incidental lubrication oil on the pump.

2. Before pump installation

1) Confirm the nameplate.

Make sure whether the required contents are in accordance with those recorded on the nameplate.

2) Confirm the lubrication oil of the mechanical seal.

Confirm whether the oil in the oil chamber is sufficient.

3) Confirm the protection devices.

Make sure whether the protection devices are correctly connected.

4) Manually rotate the impeller and make sure it can easily rotate.

3. Installation

Finish installation by setting pump at the low end of column pipe. In addition, anti-rotation device is arranged at the lowest end of the column pipe to avoid pump entity rotating under turning force generated during pump start-up.

1) Please open the column cover.

2) Use crane to hoist pump and slowly lower it down.

3) keep hoisting status of the crane, and rotate the pump in an anticlockwise direction (seen from above) to connect anti-rotation device of column pipe and that of pump.

4) Install the column cover on the column pipe. At this time, tighten the bolt on cable holder.

5) Please lead out the exhaust pipe from the automatic air valve.

6) Please connect the submersible cable of pump with the operation panel or the terminal box.

■ Operation

Start operation after pipe installation and wiring according to the following procedure.

1. Start-up (after the pump is installed)

1) Please confirm that the small pipe ball valve of pressure gauge on outlet of column pipe is in closed status.

2) Confirm the rotation direction (initial operation after pump is installed).

Start the pump by using operation panel.

Observe the water outlet status after pump operates for several seconds. In the event of reverse rotation, the water outlet is little or there is no water outlet.

At this time, it is essential to confirm the connection of submersible cables, operate pump again after correcting connection and confirm whether the rotation direction is correct. Please note that start-up without water or long-term continuous reverse rotation will cause failure.

3) Confirm ampere meter and other meters.

When points of ampere meter swing obviously, or the value exceeds rated current of motor in normal status, foreign matters may enter the impeller. Please check it.

2. Shut down

Please stop the pump by using operation panel. In addition, do not get close to the pump before it completely stops.

