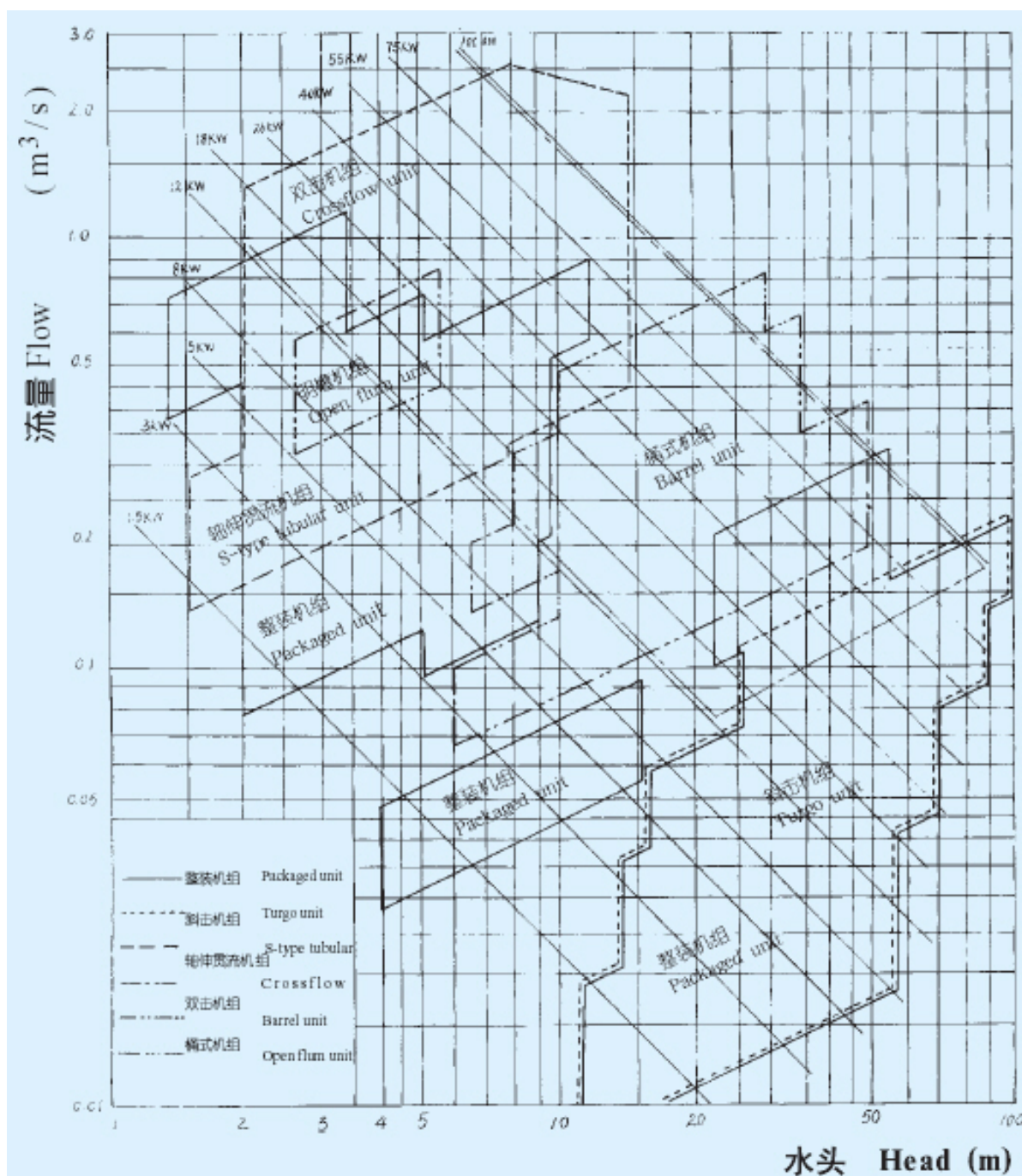


Micro hydropower equipment catalog

This catalogue is intended to introduce the micro hydro power with capacity below 100kW. Altogether 6 series of equipment is covered: package unit, s-type tubular unit, Crossflow unit, Turgo unit, Barrel type unit and open flume unit, over 10 sorts of varieties, appropriate for head range from 1m to 100m. Such equipment is easy to manufacture, low in cost, reliable in operation and simple in maintenance. Therefore, the equipment is fit for those developing countries. Specific hydropower products can be supplied as required by the customers.

Application Range of Turbine Generating Unit



Complete Equipment Ordering Precedures

The following technical information should be provided before ordering: Design head, maximum head, design discharge, unit capacity, number of units, elevation of installation, intake and diversion arrangement, water quality, sand content, frequency of power supply etc.

The complete set of equipment to be supplied includes: Turbine, generator, valve, governor, electronic load controller, control panel, transformer etc.

PACKAGED TURBINE GENERATING UNIT

The turbine and generator are packaged and delivered unit and vertically arranged. Convenient to transportation, installation, operation, and maintenance. According to the head and flow of power plant axial flow, Francis, Turgo or Tubular unit can be properly selected.

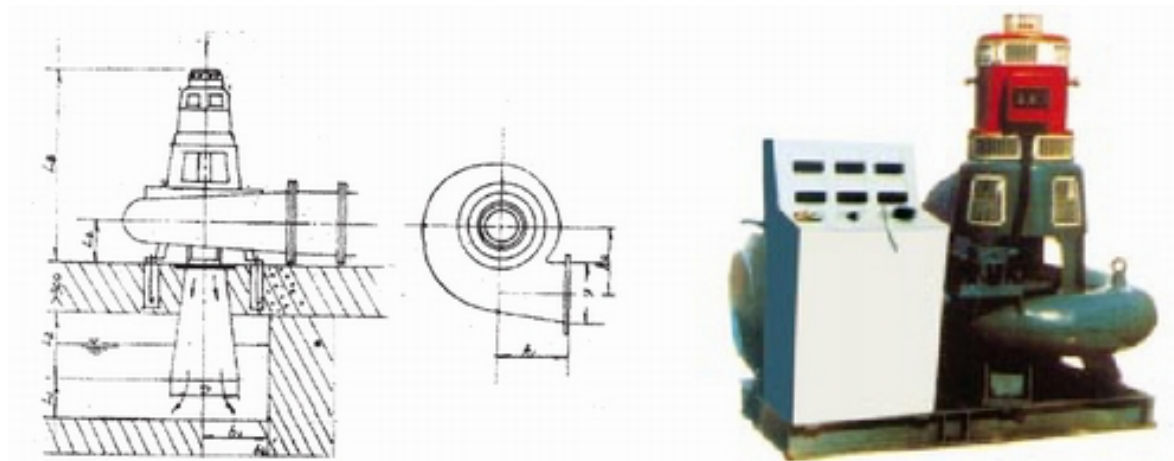
Axial Flow (560) unit



Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)	主阀直径 Diameter of main valve (mm)
直径 Diameter (cm)	装置角 Blade angle					
20	10°	5.6	0.18	1500	5	Φ300
		7.8	0.19	1500	8	Φ300
30	10°	4.2	0.33	1000	8	Φ500
		5.6	0.36	1000	12	Φ500
		7.4	0.41	1000	18	Φ500
		8.8	0.49	1000	26	Φ500
40	0°	4.8	0.45	1000	12	Φ600
		5.6	0.46	1000	20	Φ600
		6.6	0.47	1000	20	Φ600
		7.6	0.47	1000	28	Φ600
		8.6	0.48	1000	28	Φ600
		9.6	0.48	1000	30	Φ600
		10.6	0.49	1000	40	Φ600
		12.0	0.49	1000	40	Φ600
	5°	5.2	0.56	1000	20	Φ600
		6.2	0.56	1000	20	Φ600
		7.2	0.57	1000	28	Φ600
		8.2	0.57	1000	30	Φ600
		9.2	0.58	1000	40	Φ600
		10.2	0.59	1000	40	Φ600
	10°	5.8	0.67	1000	28	Φ600
		6.8	0.67	1000	30	Φ600
		7.8	0.67	1000	40	Φ600
		8.8	0.67	1000	40	Φ600
		9.8	0.81	1000	50	Φ600
		10.8	0.81	1000	50	Φ600

Installation drawing



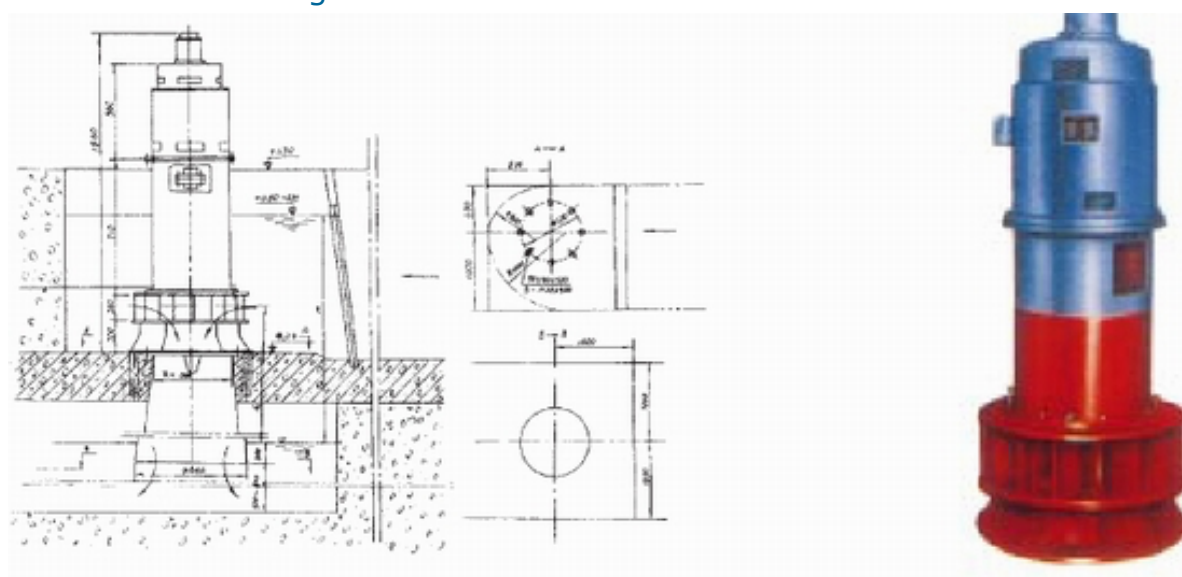
转轮直径 Runner diameter (cm)	Φ	L1	L2	L3	L4	D	h1	h2	b1	b2
20	350	> 300	800	920	295	355	400	351	400	800
30	400/450	> 400	1000	988	325	550	500	495	500	900
40	500	> 500	1400	1666	380	700	500	640	800	1800

Axial Flow (750)unit

Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)
直径 Diameter (cm)	装置角 Blade angle				
50	10°	1.3	0.53	500	4
		1.8	0.55	500	5
		2.3	0.70	500	8
		2.8	0.89	500	12
		3.5	1.10	500	18

Installation drawing



Francis unit

Main parameters

水轮机转轮直径 Diameter of turbine runner (cm)	水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator Power (kW)	主阀直径 Diameter of main valve (mm)
14	5 ~ 6	0.054 ~ 0.06	1500	2	φ200
	7 ~ 8	0.065 ~ 0.069	1500	3	φ200
	9 ~ 11	0.073 ~ 0.080	1500	5	φ200
20	20 ~ 30	0.037 ~ 0.045	1500	5	φ300
25	9.5	0.22	1500	12	φ300
35	26	0.244	750	40	φ600
	32	0.25	750	55	φ600
	39	0.28	1000	75	φ600
	48	0.31	1000	100	φ600

Installation drawing D1=14cm

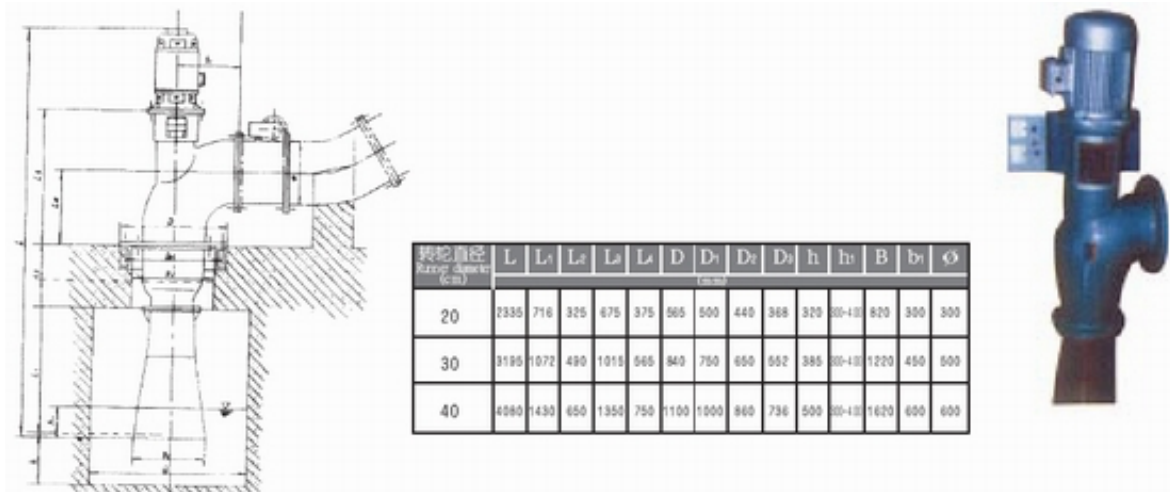


Tubular unit

Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator Power (kW)	主阀直径 Diameter of main valve (mm)
直径 Diameter(cm)	装置角 Blade angle					
20	10°	1.8	0.14	1500	1	φ400
		3.6	0.16	1500	3	φ400
		5.1	0.17	1500	5	φ400
30	10°	2.3	0.28	1000	5	φ500
		4	0.31	1000	8	φ500
	10°	4.6	0.40	1500	12	φ500
		5.2	0.42	1500	18	φ500
40	10°	3.2	0.62	1000	12	φ600
		4.1	0.65	1000	18	φ600
		5.4	0.69	1000	26	φ600
		6.7	0.93	1500	40	φ600

Installation drawing



转轮直径 Runner Diameter (cm)	L	L ₁	L ₂	L ₃	L ₄	D	D ₁	D ₂	D ₃	D ₄	h	h ₁	B	b ₁	φ
20	2335	716	325	675	375	505	500	440	368	320	30-13	820	300	300	
30	3195	1072	490	1015	565	840	750	650	552	385	30-13	1220	450	500	
40	4060	1430	650	1350	750	1100	1000	860	736	500	30-13	1620	600	600	

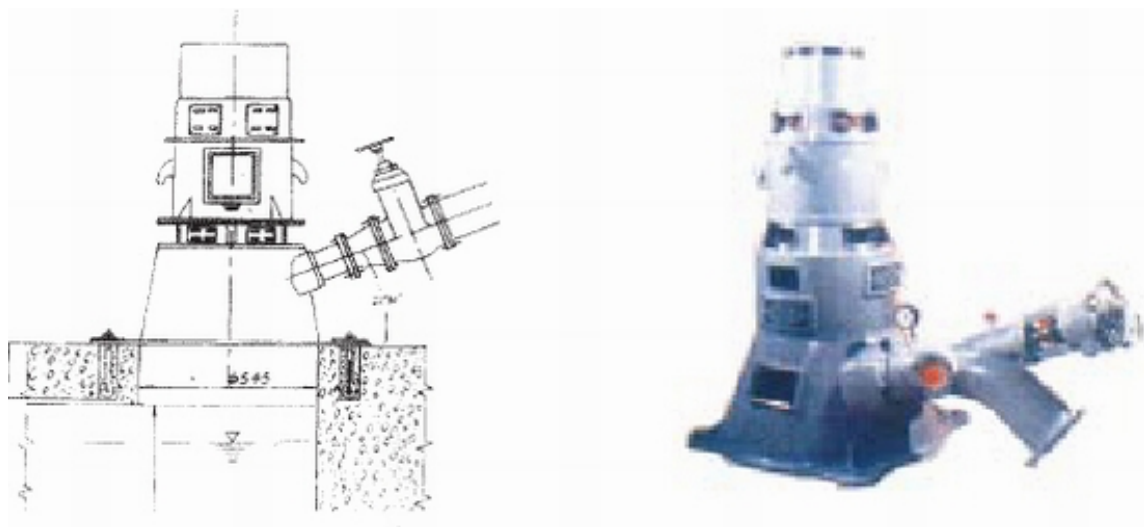
Turgo unit

This type of units is applicable to high heads and small discharges. In addition, there is no draft tube, the civil works simple and its operation dependable.

Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)
直径 Diameter (cm)	射流直径 Jet diameter (cm)				
10	2.8	12~18	0.009~0.012	1500	0.6~1
		20~24	0.012~0.013	1500	1.5
15	3.8	26~35	0.024~0.028	1500	5
		38~44	0.03~0.032	1500	8
20	5	20~35	0.038~0.05	1000	5~12
		40~55	0.053~0.063	1500	18~26
		60~65	0.065~0.068	1500	26
		70~75	0.071~0.073	1500	40
25	6.3	30~34	0.072~0.077	1000	18
		38~46	0.081~0.089	1000	26
		50~58	0.093~0.10	1000	40
32	8	28~32	0.114~0.122	750	26
		36~44	0.13~0.143	750	40
		48~52	0.15~0.156	1000	55
		56~64	0.162~0.173	1000	75

Installation drawing D1=15cm

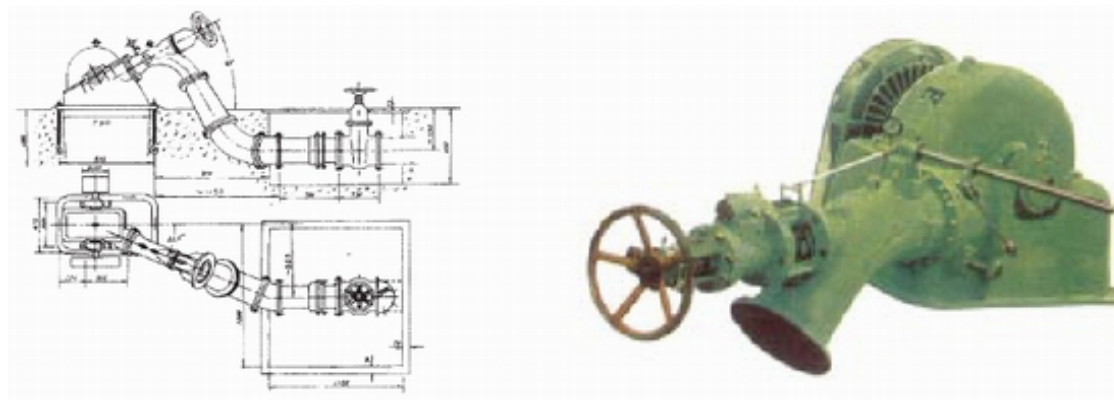


HORIZONTAL TURGO TURBINE GENERATING UNIT

Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator Power (kW)	主阀直径 Diameter of main valve (mm)
直径 Diameter (cm)	射流直径 Jet diameter (cm)					
20	5	30~40	0.048~0.056	1000	12~18	φ200
		45~50	0.059~0.062	1500	18	φ200
		55~60	0.065~0.068	1500	30	φ200
		65~70	0.071~0.073	1500	30~40	φ200
25	6	35~40	0.072~0.077	1000	18	φ250
		45~50	0.081~0.086	1000	30	φ250
		55~60	0.09~0.094	1000	30~40	φ250
		65~70	0.098~0.10	1000	40~55	φ250
	7	35~40	0.088~0.1	1000	30	φ250
		45~50	0.1	1000	30~40	φ250
		55~60	0.11~0.12	1000~1500	40~55	φ250
		65~70	0.12~0.13	1500	55~75	φ250
32	7	60~65	0.13~0.132	1000	55	φ250
		70~75	0.14~0.142	1000	75	φ250
		80~85	0.15~0.151	1000	100	φ250
		90~100	0.16~0.164	1000	100~125	φ250
	9	32~40	0.14~0.16	750	30~40	φ250
		45~50	0.17~0.18	750	55	φ250
		55~60	0.18~0.19	750	75	φ250
		65~70	0.20	1000	100	φ250

Installation drawing D1=20cm



S-TYPE TUBULAR TURBINE GENERATING UNIT

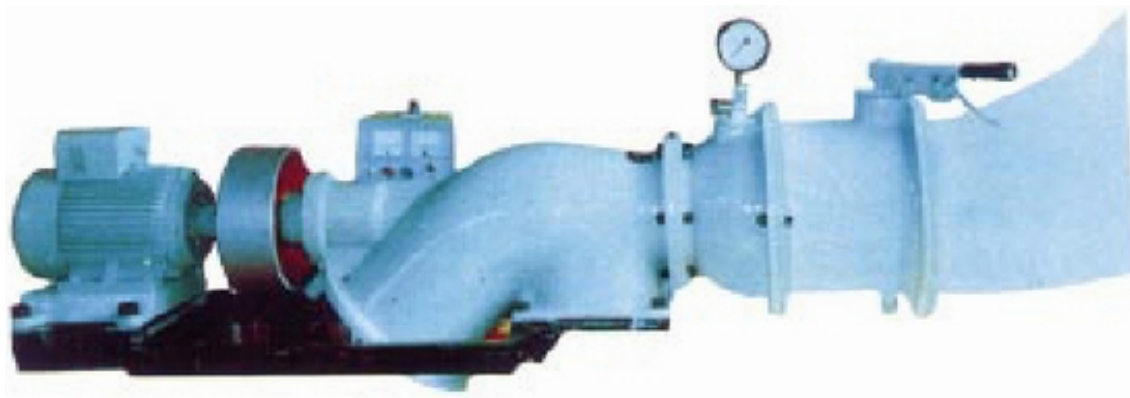
Tubular turbine with s- shaped draft tube is suitable for small hydro power station with low head and large discharge.

Compared with the traditional axial flow turbine, tubular turbine possesses simple construction, best hydraulic characteristics, easy

erection and maintenance, and simple civil works as well.

Compared with the traditional axial flow turbine, because of the large discharge, the diameter of tubular turbine can be reduced by 10----15% under the same hydraulic parameters.

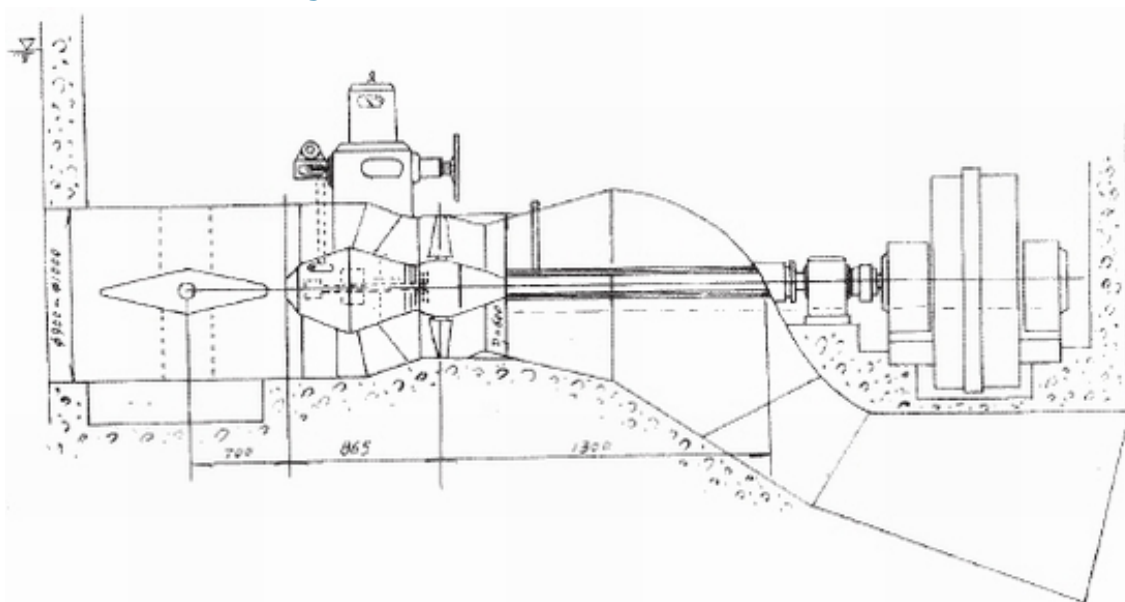
The civil works can be reduced by 20% if tubular turbine is employed.



Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)	主阀直径 Diameter of main valve (mm)
直径 Diameter (cm)	装置角 Blade angle					
12	10°	3~4	0.046~0.057	1500	0.75~1	φ150
		5~6	0.058~0.068	1500	1	φ150
15	10°	3~6	0.064~0.09	1500	3	φ200
15	10°	1.5~4	0.06~0.09	1500	0.5~1	φ200
20	10°	1.3~3	0.14~0.16	1500	1~3	φ300
		4~5	0.17~0.18	1500	3~5.5	φ300
		6~7	0.19~0.20	1500	10	φ300
30	10°	2.3~4	0.28~0.30	1000	5~8	φ400
		4.6~6.2	0.40~0.42	1000	12~18	φ400
40	10°	3.2~4.1	0.62~0.65	1000	12~18	φ500
		5.4~6.7	0.69~0.92	1000	26~40	φ500
50	10°	2.5~3.5	0.9~0.97	500	18~26	φ800
		4~4.5	1.2~1.26	750	30~40	φ800
		5~6	1.28~1.36	750	55	φ800
		6.5~7	1.36~1.39	750	75	φ800
		7.5~8.5	1.64~1.69	1000	100	φ800
60	-5°	9.3~11.5	0.9~0.96	750	55~75	φ800
	0°	9~14	1.19~1.25	750	75~125	φ800
	5°	8~12	1.41~1.47	750	75~125	φ800
	0°	2.4~5.8	1.53~2.15	375~500	26~100	φ800
	5°	2.3~6.0	1.84~2.61	375~500	30~125	φ800
	10°	2.5~5.4	2.24~3.0	375~500	40~125	φ800
	15°	2.1	1.25~1.75	500	18~26	φ800
		2.5	1.25~1.75	500	26~30	φ800

Installation drawing D1=60cm



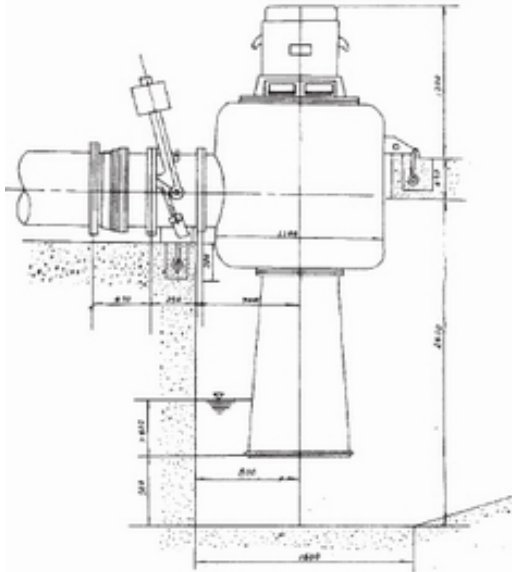
BARREL TURBINE GENERATING UNIT

Simple construction, only two bearings, easy for manufacture, low cost; high hydraulic performances; optimum water passage and best setting.

Main parameters

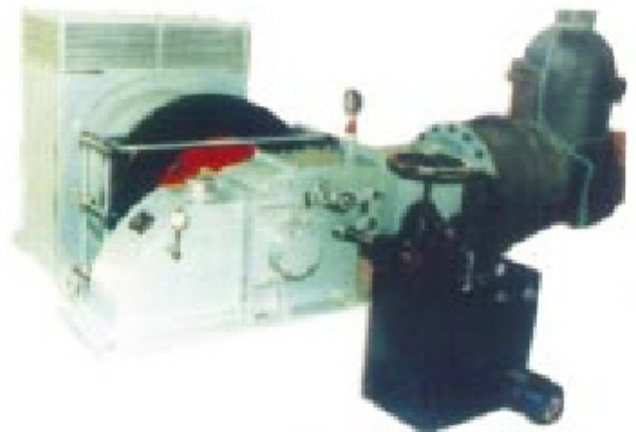
水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)
直径 Diameter (cm)	装置角 Blade angle				
15		9~15	0.061~0.065	1500	2~5
20		7~13	0.073~0.1	1000	3~8
		17~28	0.11~0.15	1500	12~26
25		13~21	0.15~0.19	1000	12~26
		28~34	0.22~0.24	1500	40~55
30		16~26	0.24~0.30	1000	26~55
		33~38	0.34~0.35	1500	75~100
	15°	4.1~5.5	0.61~0.70	750	18~26
		6.7~8.6	0.81~0.86	1000	40~55
40	15°	4~6	0.60~0.62	1000	18~26
		7~8	0.69~0.72	1000	40
	20°	3~5	0.57~0.65	750	12~26
		6~7	0.78~0.81	1000	40
		8~9	0.85~0.87	1000	55
	25°	3~5	0.65~0.7	750	18~26
		6~9	0.89~0.99	1000	40~75

Installation drawing D1=40cm



CROSS FLOW TURBINE GENERATING UNIT

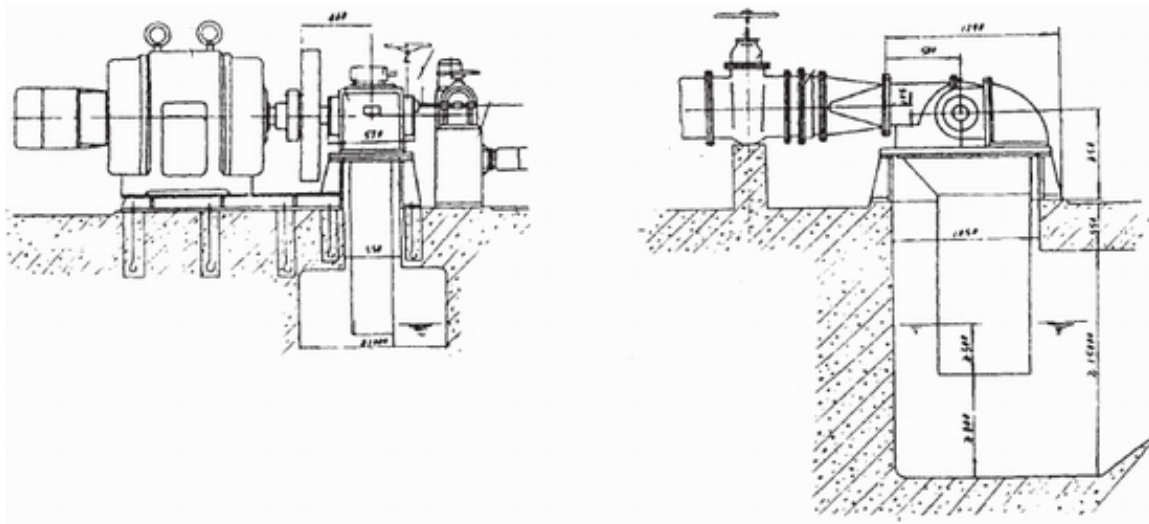
Wide application rang; Simple construction and easy for production; High average efficiency; Low cost and good economy; Reliable operation and convenient maintenance.



Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator Power (kW)	主阀直径 Diameter of main valve (mm)
直径 Diameter (cm)	宽度 Width (cm)					
20	12	10~14	0.042~0.049	750	2~4	φ150
		16~18	0.053~0.056	750	5.5	φ150
		20~25	0.059~0.066	750	10	φ150
20	18	8~12	0.071~0.087	750	5	φ200
		16~28	0.10~0.13	750~1000	10~20	φ200
		32~40	0.14~0.16	1000	30~40	φ200
30	18	8~16	0.098~0.13	375~500	5~14	φ300
		20~28	0.15~0.17	600~750	20~30	φ300
		32~36	0.19~0.197	750	40	φ300
		40~44	0.21~0.217	750	55	φ300
32	10	30~35	0.147~0.159	750	30~40	φ300
		45~65	0.18~0.219	1000	55~100	φ300
32	16	72	0.254	750	55	φ300
		89	0.272	750	75	φ300
		112	0.304	1000	100	φ300
32	20	27	0.289	750	55	φ300
		35	0.318	750	75	φ300
		40	0.34	1000	100	φ300
32	25	25	0.336	750	55	φ400
		30	0.368	750	75	φ400
		35	0.398	750	100	φ400

Installation drawing D1=40cm



OPEN FLOW TURBINE GENERATING UNIT

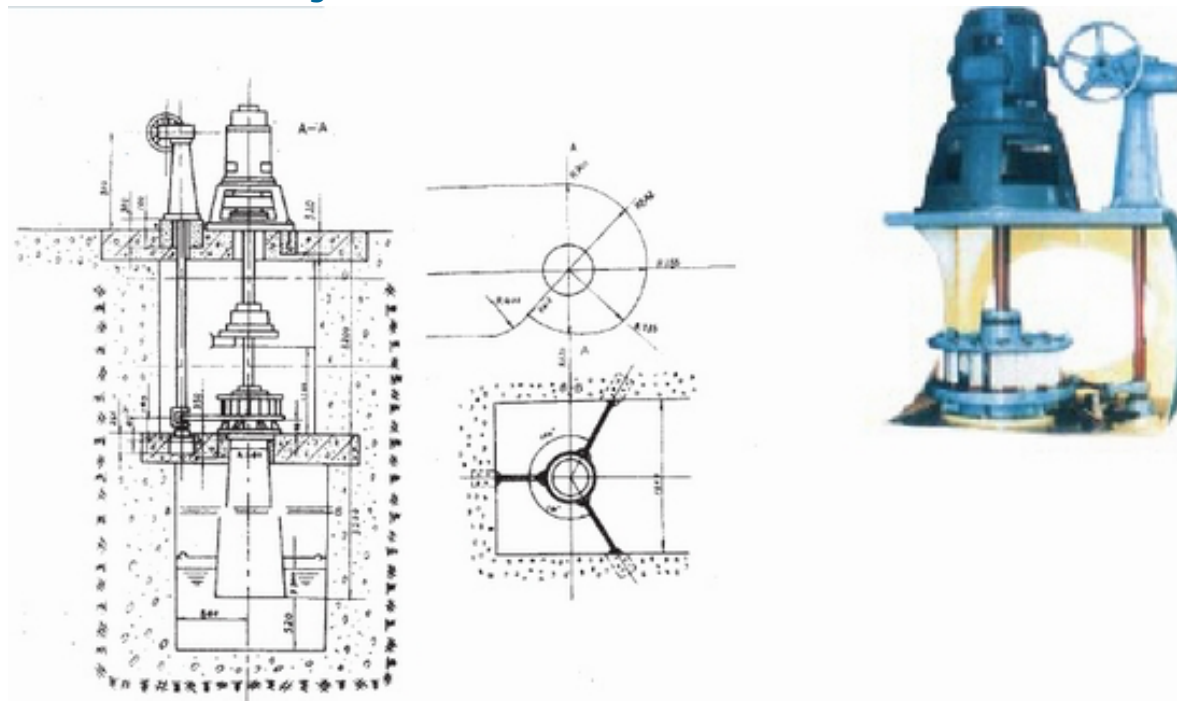
The turbine is submerged in the water, but its generator may be installed above the water or under water; its civil works is simple and convenient for erection. In addition, there is no penstock or valve and the unit can be stopped by closing the intake gate.

Axial flow unit

Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)
直径 Diameter (cm)	装置角 Blade angle				
40	5°	3.5	0.56	1000	12
		4.5	0.65	1000	18
		5.5	0.67	1000	26
	10°	3.4	0.62	750	12
		4.3	0.68	1000	18
		5	0.77	1000	26

Installation drawing

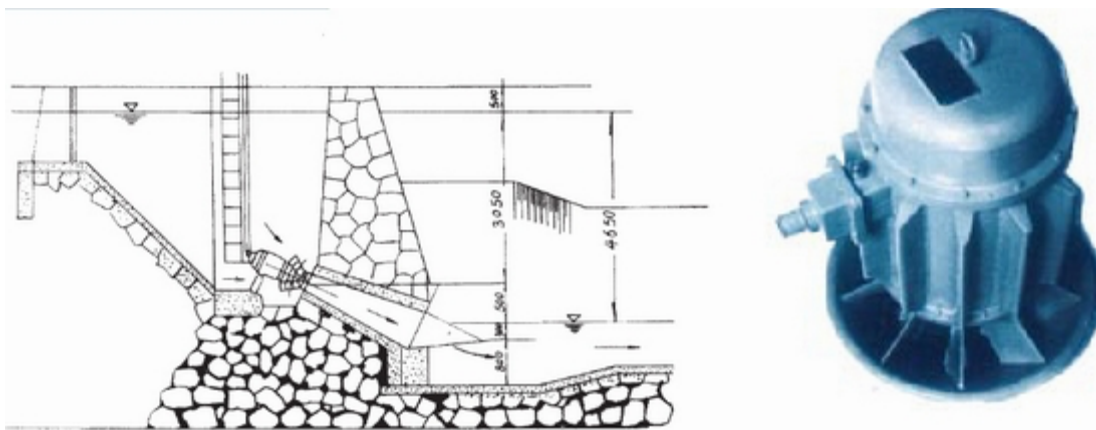


Tubular unit

Main parameters

水轮机转轮 Turbine runner		水头 Head (m)	流量 Flow (m ³ /s)	转速 Speed (r/min)	发电机功率 Generator power (kW)
直径 Diameter (cm)	装置角 Blade angle				
35	10°	3.3 ~ 4.65	0.605	1000	18

Installation drawing



Hydro Generator

The generator of these units is of synchronous type with capacity less than 100 kw if used for standalone usage; they have five frames, 26 siges, Rated frequencies are 50 Hz. The voltage rating is 400v for 3 phase, 230v for single phase (60Hz also can be supplied). According to the arrangement of main shafts, these units have vertical setting and horizontal setting. The double-supported construction is compact-designed. For below 50kW capacity, we also have the options for Rare Earth Permanent Magnet Synchronous Generator though the cost is higher.

Excitation systems: Brush less excitation with AC exciter; excitation of double winding shunt reactors with SCR and excitation of double winding shunt reactors. Generators are manufactured according to China National standards and in conformity with IEC standards.

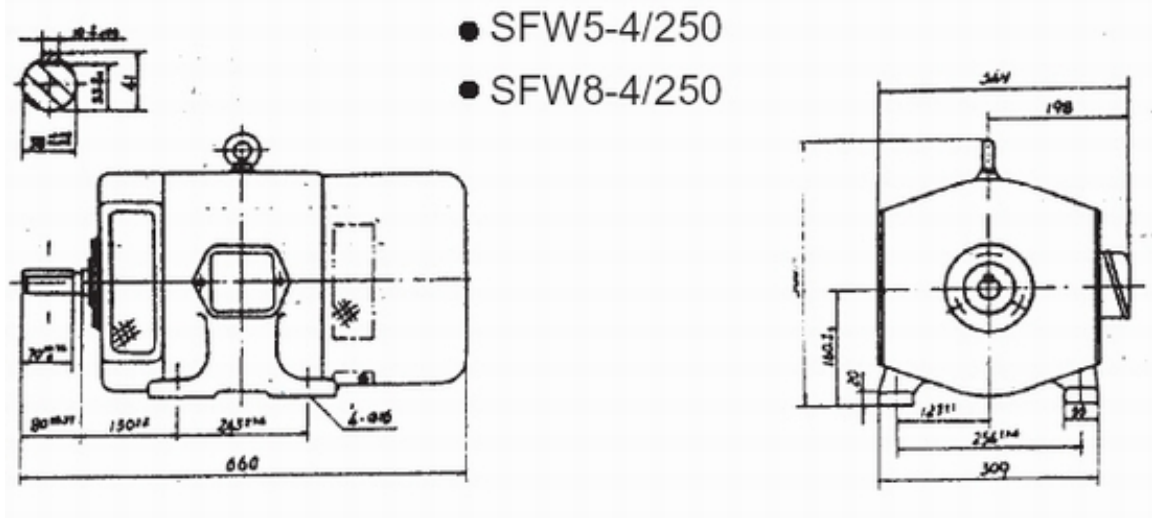
And also we can manufacture the asynchronous generator for on grid usage.



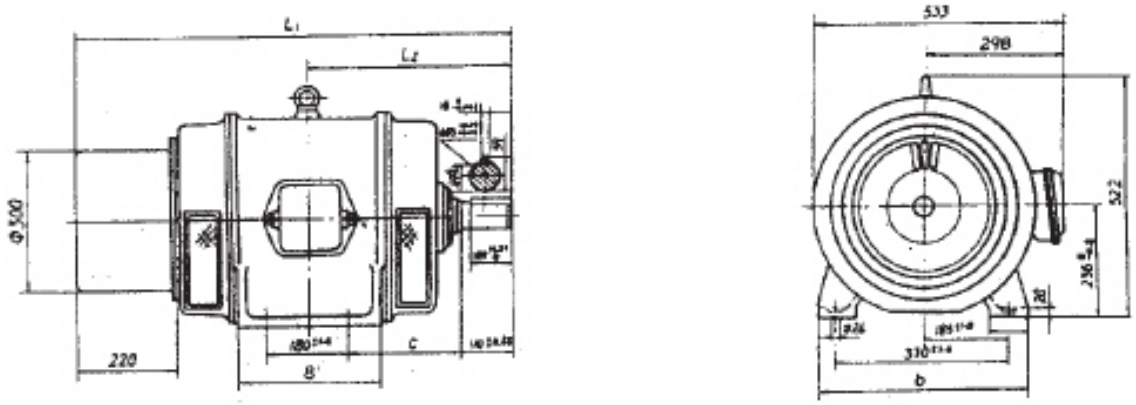
Specifications and technical data

型号 Type	功率 Power (kW)	电压 Voltage (V)	电流 Current (A)	额定转速 Speed (r/min)	频率 Frequency (Hz)	励磁电压 Excitation voltage (V)	励磁电流 Excitation current (A)	效率 Efficiency (%)	重量 Weight (kg)
S _F 5-4/250	5	400	9.02	1500	50	35.0	9.8	84.7	104
S _{FW} 8-4/250	8	400	14.4	1500	50	34.5	15.0	86.0	113
S _F 18-4/368	18	400	32.5	1500	50	28.6	23.9	83.7	250
S _{FW} 26-4/368	26	400	46.9	1500	50	35.7	23.9	85.5	280
S _F 12-6/368	12	400	21.7	1000	50	20.7	30.0	83.8	260
S _{FW} 18-6/368	18	400	32.5	1000	50	26.5	30.0	84.9	290
S _F 40-4/423	40	400	72.2	1500	50	21.3	47.8	89.0	450
S _{FW} 55-4/423	55	400	99.2	1500	50	25.7	48.5	87.8	520
S _F 26-6/423	26	400	46.9	1000	50	23.8	42.6	86.4	460
S _{FW} 30-6/423	30	400	54.1	1000	50	23.9	48.5	86.9	460
S _F 40-6/423	40	400	72.2	1000	50	29.6	48.5	88.0	530
S _{FW} 75-4/493	75	400	135.3	1500	50	22.0	42.0	88.9	710
S _F 100-4/493	100	400	180.4	1500	50	32.0	47.0	91.1	830
S _{FW} 55-6/493	55	400	99.2	1000	50	32.0	36.0	89.3	750
S _F 75-6/493	75	400	135.3	1000	50	40.0	50.0	90.6	850
S _{FW} 40-8/493	40	400	72.2	750	50	31.7	54.6	87.8	780
S _F 55-8/493	55	400	99.2	750	50	45.8	45.7	89.5	870
S _{FW} 100-6/590	100	400	180.4	1000	50	24.0	120.0	90.1	1300
S _F 75-8/590	75	400	135.3	750	50	24.0	119.0	89.7	1320
S _{FW} 100-8/590	100	400	180.4	750	50	29.0	122.0	90.9	1420

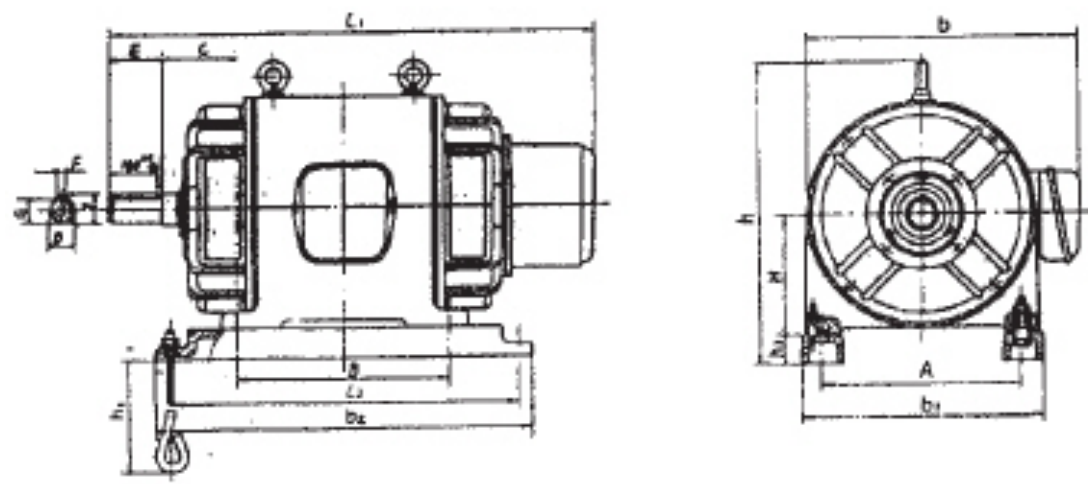
Overall view and installation dimensions



· SFW368



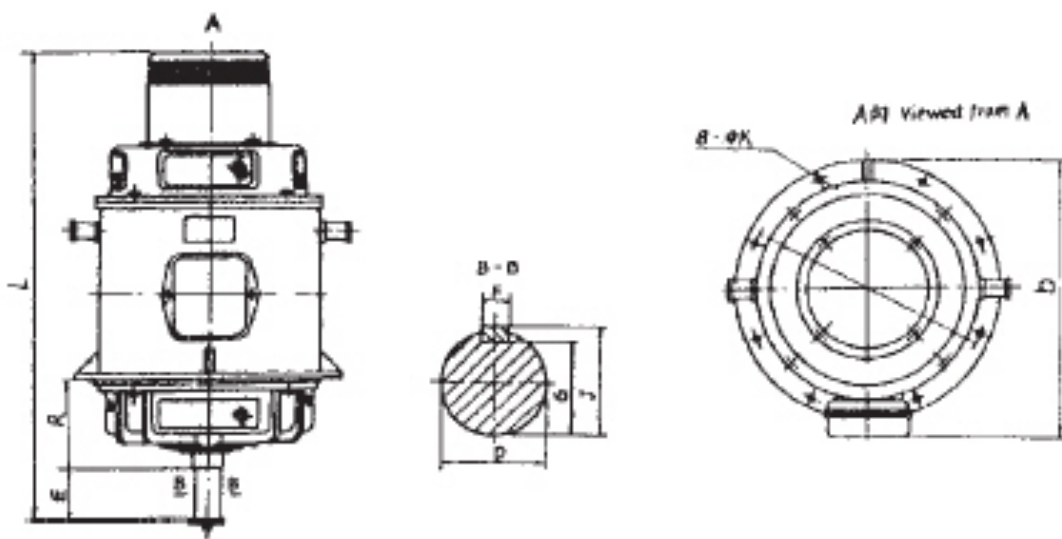
· SFW423, 493, 590



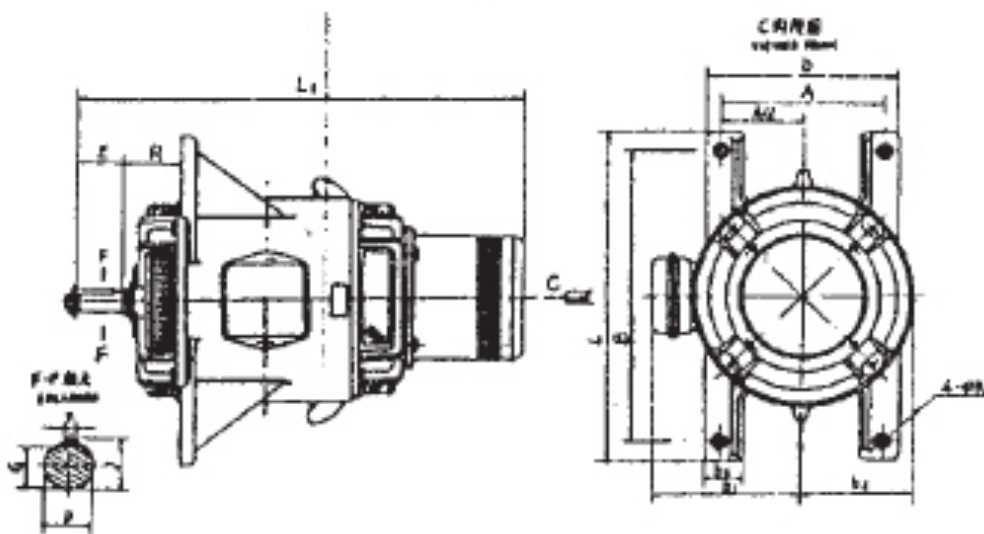
规格 Size	B	C ± 30	L1	L2	b	b1
SFW18-6/368	315	236	948	436	460	90
SFW12-6/368	245	206	878	406	455	85

规格 Size	A	B	b	b ₁	b ₂	C	D	E	F	G	H	h	h ₁	h ₂	J	J ₁	J ₂
SFW30-6/423 SFW40-6/423	457 ± 1.4	368 ± 1.4	603	562	830	190 ± 4	65 ^{+0.03} _{-0.01}	140	18 ⁰ _{-0.01}	58 ⁰ _{-0.2}	280 ⁰ ₀	680	345	70	69	1120	770
SFW75-4/793 SFW55-8/793 SFW40-8/493 SFW100-4/493 SFW75-6/493 SFW55-8/493	508 ± 1.4	457 ± 1.4	690	643	975	216 ± 4	75 ^{+0.01} _{-0.01}	140	20 ⁰ _{0.02}	67.5 ⁰ _{0.3}	315 ⁰ _{-0.16}	801	420	85	79.5	1276.5	880
SFW100-6/590 SFW75-8/590 SFW100-8/590	660 ± 1.4	700 ± 1.75	905	795	1250	250 ± 4	90 ^{-0.03} _{-0.01}	170	25 ⁰ _{-0.02}	81 ⁰ _{-0.2}	400 ⁰ _{-0.16}	1008	420	100	95	1596	1155

· SF493, 590



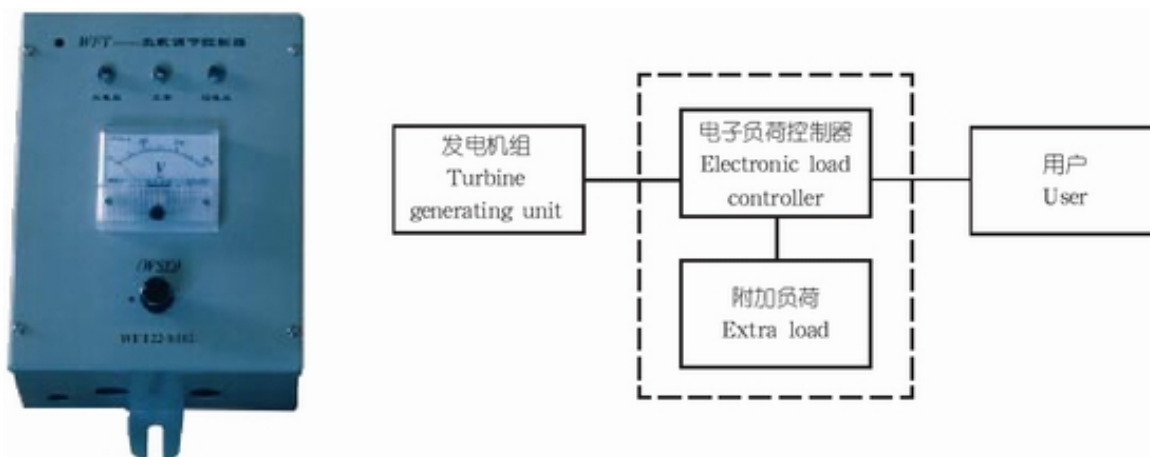
· SF493, 590(带脚 with mounting feet)



规格 Size	b	D	E	F	G	J	K	L	R	r
SF-W75-4/493 SF-W100-4/493 SF-W55-8/493 SF-W75-8/493 SF-W40-8/493 SF-W55-8/493	760	75 ^{+0.03} _{-0.011}	140 ± 0.5	20 ⁰ _{-0.052}	67.5 ⁰ _{-0.2}	79.5	22	1312	40	630
SF-W100-8/590 SF-W75-8/590 SF-W10-8/590	985	90 ^{+0.035} _{-0.013}	170 ± 0.5	25 ⁰ _{-0.052}	81 ⁰ _{-0.2}	95	22	1534	303 ± 3	865

规格 Size	A	A/2	b	b ₁	b ₂	b ₃	B	D	E	F	G	J	K	L	L ₁	R
SF75-4/493 SF55-8/493 SF40-8/493 SF100-4/493 SF75-8/493 SF55-8/493	500 ± 1.75	250 ± 1	570	385	305	90	700 ± 1.4	0.75 ^{+0.03} _{-0.011}	140 ± 0.5	20 ⁰ _{-0.052}	67.5 ⁰ _{-0.2}	79.5	28	800	1272	214.5 ± 3
SF100-8/590 SF75-8/590 SF100-8/590	600 ± 1.75	300 ± 1.25	710	520	385	140	1050 ± 1.75	0.90 ^{+0.03} _{-0.013}	70 ± 0.5	25	81	95	35	1200	1651	275 ± 3

ELECTRONIC LOAD CONTROLLER



This control device consists of a speed regulator, an excitation regulator, switches and protection etc. Its main functions are: frequency & voltage stabilization, operation monitoring, relay protection and power distribution. The frequency is stabilized by regulating the extra load. The voltage stabilization is realized through excitation regulation. Therefore, the generating unit can be manual-started, automatically operated, signal-alarm and emergency stopped thus realizing unmanned attendance.

Specifications and technical data

型号 Type	发电机 Generator			电压精度 Voltage accuracy (%)		频率精度 Frequency accuracy (%)	
	功率 Power (kW)	相数 Phase	电压 Voltage (V)	A	B	A	B
CZK-3X	3	1	230	5	3	4	1
CZK-5X	5	1	230	5	3	4	1
CZK-8X	8	1/3	230/400	5	3	4	1
CZK-12X	12	3	230/400	3	1	2	0.2
CZK-18X	18	3	230/400	3	1	2	0.2
CZK-28X	28	3	230/400	3	1	2	0.2
CZK-40X	40	3	230/400	1.5	1	2	0.2
CZK-55X	55	3	230/400	1.5	1	2	0.2
CZK-75X	75	3	230/400	1.5	1	2	0.2
CZK-100X	100	3	230/400	1.5	1	2	0.2

BUTTERFLY VALVE

Simple and compact construction, lightweight; rotation of 90° rapid closure; designed reasonably, assembled and disassembled easily, easy to maintenance; double eccentric construction, reduced friction of seal ring, long service life, good performance of sealing.



Specification and dimensions(mm)

型号 Type	D	D ₁	d	H	H ₁	H ₂	L	L ₁	L ₂	Φ	重量 kg
DN150	285	240	212	521.5	418.5	198.5	210	100	-	180	37
DN200	340	295	268	572	380.5	166	152	120	-	250	53
DN250	390	350	320	600	449	221	250	98	-	350	94
DN300	450	400	370	659	528	281	270	449	473	300	148
DN350	505	460	432	1048	618	281	290	449	473	300	188
DN400	565	515	482	1120	689	281	310	449	473	300	237
DN450	615	565	532	1190	739	281	330	449	473	300	268
DN500	670	620	585	1280	843	285	350	486	528	300	289
DN600	780	725	685	1409	890	359	390	627	596	400	480
DN700	895	840	800	1600	1055	359	430	627	596	400	615
DN800	1015	950	905	1736	1143	407	470	635	711	300	818

Installation drawing

