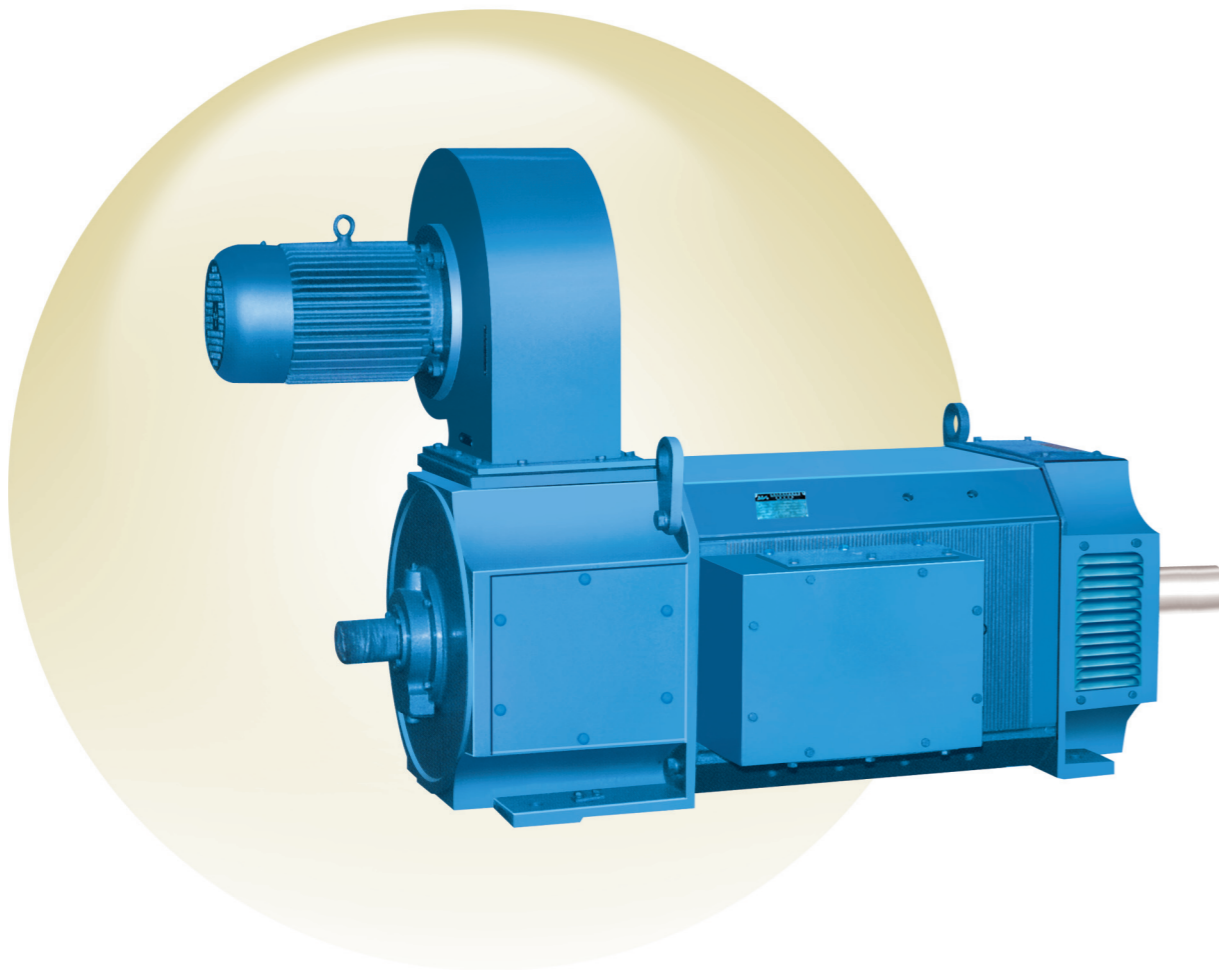


ZFQZ系列频繁起制动直流电动机

ZFQZ SERIES FREQUENTLY STARTING/ BRAKING DC MOTORS



说明

ZFQZ系列直流电动机是在Z4系列直流电动机的基础上，借鉴ZZJ-800系列直流电动机的主要工艺而开发的系列产品。电机的转动惯量分别为ZZJ-800系列和ZZJ-900系列的45%和65%，适应频繁正反转和频繁起制动的恶劣工况。电机具有优良的过载特性，其最大转矩和启动转矩分别是ZZJ-800系列和ZZJ-900系列的112%和117%。电机重量仅为ZZJ-800系列的65%。电机功率等级符合IEC34-13《起重、冶金用辅机电动机技术规范》的国际标准。电机外形尺寸除了两底脚孔间轴向尺寸“B”之外，均符合IEC72国际标准。电机通过带底板可达到ZZJ-800和ZZJ-900系列相一致的主要安装尺寸，并可通过协商制成ZZJ-800和ZZJ-900系列相对应的轴伸尺寸，因而可替换ZZJ-800和ZZJ-900系列产品。

使用条件

- 1、电动机适用于环境空气温度为-30℃到+40℃，海拔不超过1000米的场所。
- 2、电动机的供电电源采用静止整流电源或直流发电机电源。当采用三相全控桥式整流电源时，可不外接平波电抗器而长期工作。

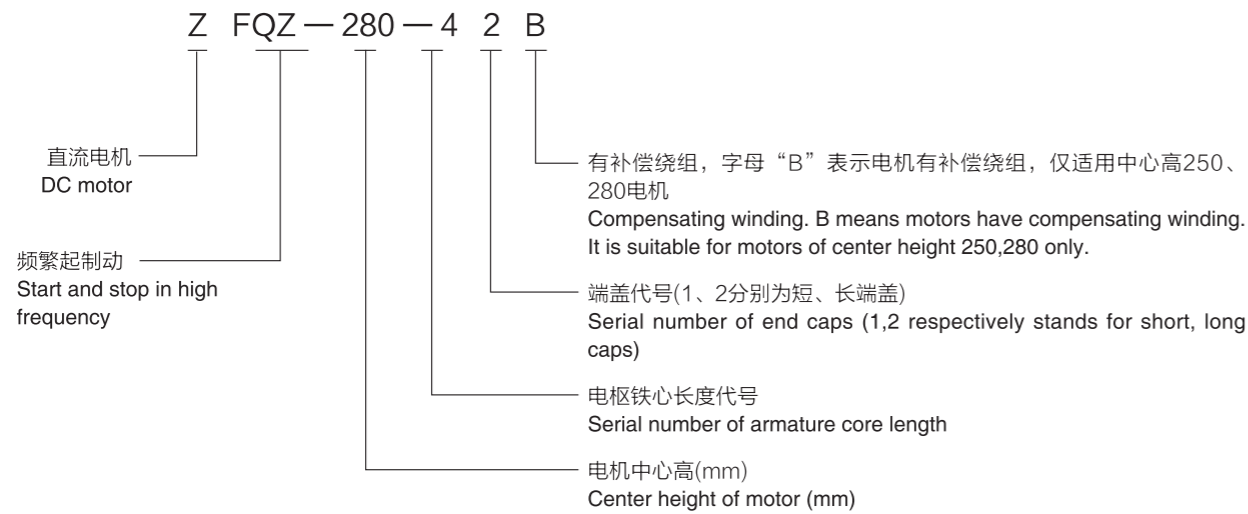
General Description

Series ZFQZ DC motors are developed on the basis of Z4 Series and ZZJ-800 Series DC motors. The rotating inertia of the motors is 45% and 65% of the motors of Series ZZJ-800 and ZZJ-900 respectively. The motors are suitable for direct and reversal rotation and start and stop in high frequency in a bad working circumstance. The motors are good-overloading. The max. rotating moment and the starting moment are 112% and 117% of the moments of Series ZZJ-800 and Series ZZJ-900 motors respectively. The weight of the motors is just 65% of the Series ZZJ-800 motors. The class of the motor power is in accordance with the international standard IEC34-13 "Technical Criteria of Auxiliary Machine and Hoisting and Metallurgy". Outline mounting dimensions of the motors comply with IEC 72 Standard, except for the axial distance between the mounting holes (dimension B). The mounting dimension of the motors with bottom plates is able to be in compliance with the dimension of Series ZZJ-800 and Series ZZJ-900 motors. Also, the shaft extension dimension of the motors can be customized into the corresponding dimension of Series ZZJ-800 and Series ZZJ-900 motors after discussion with customers. Therefore, Series ZFQZ DC motors can substitute for Series ZZJ-800 and Series ZZJ-900 motors.

Requirements for Use

1. The allowable ambient temperature for the operation of the motors is -30℃+40℃ and the allowable sea level is not higher than 1000m.
2. The supplying electric source of the motors adopts rectified electric source or DC generator electric source. When adopting 3-phase, fully controllable bridge rectified electric source, the motors can work for a long period without outer smoothing reactor.

型号说明 Type Designation



产品性能

- 1、电动机的额定电压有220V、440V两种。根据需要也可派生出其他等级电压。
- 2、电动机的励磁方式为他励, 励磁电压为180V或310V。根据需要也可派生出其他等级电压。
- 3、电动机基速时允许按技术数据表规定的最大运行转矩运行, 历时60s。
- 4、额定电压为220V的电机, 可以提高外施电压, 使转速增加到额定转速的2倍。此时允许最大运行转矩为额定转矩的1.8倍, 历时15s
- 5、额定电压220V的电动机按技术数据表规定的弱磁转速运行时最大运行转矩为额定转矩的0.6倍, 历时15s。
- 6、电动机的电流变化率($\frac{di}{dt}$)可达到200-250倍额定电流/秒。若需 $\frac{di}{dt} > 250$, 可以协商解决。
- 7、电动机的出线盒标准位置从传动端视在机座右侧。根据需要, 也可装于机座左侧, 但需在订货时注明。

Products Specification

1. There are 2 kinds of rated voltage of motors: 220V, 440V. As required, the motors with other voltage level can be produced.
2. The mode of excitation of motors is separate excitation. The voltage of excitation is 180V or 310V. As required, the motors with other voltege level can be produced.
3. The motors running at basic speed can reach max. rotating moment regulated in the Technical Data Table. It will last 60s.
4. For the motors of rated voltage 220V, the rotating speed can reach as 2 times as the rated rotating speed through increasing the applied voltage. At this time, the allowable max. rotating moment is as 1.8 times as the rated rotating moment. It will last 15s.
5. For the motors of rated voltage 220V the max.rotating moment is as 0.6 times as the rated rotating moment when the motors are running with low intensity magnetic rotation regulated in the Technical Data Table. It will last 15s.
6. The electric current changing rate($\frac{di}{dt}$) of the motors can reach as 200-250 times as the rated eletric current changing rate. It can b6 discussed if $\frac{di}{dt} > 250$ is required.
7. The standard position of wire outlet box of the motors is on the right of the machine baseplate seen from the drive end. If required, it can be mounted on the left of the machine baseplate. If so, this requirement should be stated in the order.

结构性能

- 1、电动机的机座为八角形薄钢板迭片结构, 具有定子空间利用率高, 内部结构紧凑、转动惯量小、重量轻、适应可控硅供电等优点。
- 2、电动机全部带补偿绕组, 使电机有优良的换向性能和过载能力。
- 3、电动机的绝缘等级为F级, 并经无溶剂真空压力浸漆(VIP)处理。绕组绝缘具有良好的绝缘性能和机械强度。
- 4、换向片为竖板式整体结构。竖板与电枢线圈连接采用钨极惰性气体保护焊(TIG)。
- 5、电枢铁心采用斜槽结构, 能有效减小振动和噪音。
- 6、电动机采用滚动轴承及不停机加油结构。

Structure Features

1. The motor baseplate is of octagon laminated thin steel plate structure. Therefore, it has many advantages such as high utilization of stator room, tight inner structure, small rotating inertia, slight weight and suitability for supplying electricity by controllable silicon.
2. All the motors have compensating winding, which makes motors have a good ability of commutation and overload.
3. The insulating level of motors is Level F. The insulation of motors is handled by VPI. The winding has a good insulation and mechanical intensity.
4. The commutator segment is of vertical plate and integral structure. The connection with the vertical plate and armature coil adopts TIG.
5. The armature core is of skewed slot structure, which is able to decrease vibration and noise.
6. The motors is of rolling bearing and oil-filling without stopping motors structure.

工作制、防护等级、冷却方法和安装形式

Working System, Protection Level, Cooling Mode and Mounting Type

- 电机为连续工作制(S1), 其他工作制可按表1对技术数据表中的值进行折算。
The motors adopt continuous working system. Other working systems can convert the data in the Technical Data Table according to the Table 1.

表1 (Table 1)

工作制 Working System	负载增加 Overload increasing
S2-30min	107%
S2-60min	100%
S3-40%	120%
S3-60%	110%

- 电机冷却方式均为他冷、强迫通风, 即电机自带径向骑式鼓风机或管道通风或带空/水冷却器。其防护等级和冷却方式的对应关系见表2。所需要的冷却风量、风压及风机电动机的功率见表3, 空/水冷却器循环风机功率冷却水流量见表4。
- All the cooling modes of the motors are of separately-cooling and forced ventilation type. It means the motors are equipped with radial ride type air blower, duct ventilation cooler or air/water cooler. The corresponding relations between the protection level and the cooling mode are shown in Table 2. The ventilation quantity, ventilation pressure and the air blower power of the cooler are shown in Table 3. The recycling air blower power and cooling water discharge of the air/water cooler are shown in Table 4.

表2 (Table 1)

	防护等级 Protection Level	冷却方式 Cooling Mode
径向骑式鼓风机冷却 Radial Ride Type Air Blower Cooling	IP21S	IC06
单管风 Single-duct Ventilation	IP23S	IC17
双管风 Double-duct Ventilation	IP44	IC37
带空/水冷却器 With Air/Water Cooler	IP44	ICW86

表3 (Table 3)

机座号 Baseplate No.	风量(m³/h) Ventilation Quantity	静压(Pa) Static Pressure	电动机功率(kw) Motor Power	重量(kg) Weight
ZFQZ-250	3000	1400	3.0	70
ZFQZ-280	4000	1600	4.0	80
ZFQZ-315	4860	1600	5.5	90
ZFQZ-355	5200	1600	5.5	120
ZFQZ-400	7200	1800	5.5	180
ZFQZ-450	9000	1800	7.5	250

注: 风机电动机为三相二极380V

Note: The motors of air blower adopt 3-phase, 2-electrode and 380V

表4 (Table 4)

冷却器型号 Cooler Type	风机电动机(kw) Air Blower Motor	冷却水流量(m³/h) Cooling Water Discharge	重量(kg) Weight
KSL-250	4.0	11	400
KSL-280	5.5	12	500
KSL-315	5.5	13	600
KSL-355	7.5	15	750
KSL-400	7.5	18	850
KSL-450	11	19.5	950

注: 风机电动机为三相二极380V

Note: The motors of air blower adopt 3-phase, 2-electrode and 380V

- 用户如需要其它类型工作制、防护等级、冷却方式和安装形式可另行协商。
If other working system, protection level, cooling mode and mounting type are required, it should be discussed separately.

附件 Attachments

根据用户需要, 本系列电动机可配套供应测速元件、过速保护装置、加热器和测温、限温保护元件等。
AS required, this series of motors can be equipped with tacho-components, over speed protection device, heater and temperatdre-measurement, temperature-limit components.

技术数据 (A) Technical Data Table(A)

(与ZZJ-800和ZZJ-900系列相对应规格) (Specifications corresponding to Series ZZJ-800 and ZZJ-900)

型号 Type	额定功率 Rated Power	额定电压 Rated Voltage	额定转速 Rated Rotating Speed	弱磁转速 Low-intensity Magnetic Rotating Speed	额定电流 Rated Current	额定转矩 Rated Rotating Moment	最大运行转矩 Max. Running Rotating Moment	起动转矩 Starting Rotating Moment	电枢回路电阻 Armature Circuit Resistance	电枢回路电感 Armature Circuit Inductance	励磁功率 Excitation Power	转动惯量 Rotating Inertia	重量 Weight
	kW	V	r/min		A	kNm			20°C mΩ	mH	kW	kgm²	kg
ZFQZ-250-081B	37.3	220	575	1725	220	0.62	1.86	2.17	130.7	0.93	2.10	0.95	710
		440	575	1150	112				541.4	3.7			
ZFQZ-250-21B	52	220	550	1650	288	0.91	2.73	3.19	77.1	0.62	2.75	1.4	900
		440	550	1100	144				329.5	3.4			
ZFQZ-280-12B	75	220	515	1300	415	1.39	4.17	4.87	54.8	0.51	3.10	2.5	1170
ZFQZ-280-11B	75	440	515	1050	202				208.6	2.3			
ZFQZ-315-082	112	220	500	1250	614	2.14	6.42	7.49	34.4	0.48	4.50	4.1	1720
ZFQZ-315-081	112	440	500	1000	300				134.9	2.0			
ZFQZ-315-22	150	220	480	1200	795	2.99	8.97	10.5	22.5	0.39	4.35	6.0	1960
ZFQZ-315-21	150	440	480	960	393				89.5	1.4			
ZFQZ-355-092	186	220	435	1100	982	4.09	12.3	14.3	17.7	0.34	4.20	9.2	2520
ZFQZ-355-091	186	440	435	870	488				73.8	1.3			
ZFQZ-355-42	280	440	390	780	720	6.86	20.6	24.0	42.3	0.90	6.50	15	3720

技术数据 (B) Technical Data Table(B)

(部分已生产过的规格)

(Specifications of Partial Produced Motors)

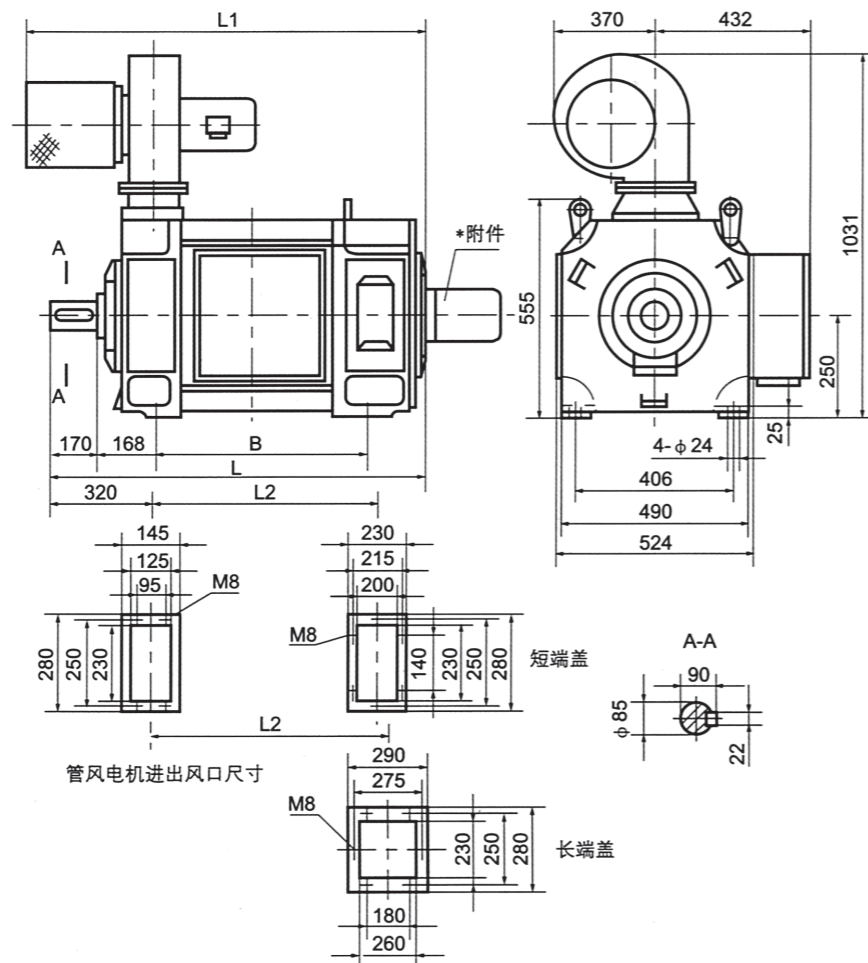
型号 Type	额定功率 Rated Power	额定电压 Rated Voltage	额定转速 Rated Rotating Speed	额定电流 Rated Current	额定转矩 Rated Rotating Moment	最大运行转矩 Max. Running Rotating Moment	起动转矩 Starting Rotating Moment	电枢回路电阻 Armature Circuit Resistance	电枢回路电感 Armature Circuit Inductance	励磁功率 Excitation Power	转动惯量 Rotating Inertia	重量 Weight
	kW	V	r/min	A	kNm			20°C mΩ	mH	kW	kgm²	kg
ZFQZ-450-42	600	725	600	880	9.55	28.7	33.4	23.9	0.7	7.5	43.5	6700
ZFQZ-450-42	500	660	500	810	9.55	28.7	33.4	27.8	0.8	7.5	43.5	6700
ZFQZ-450-31	420	660	430	700	9.33	28.0	32.6	47.2	1.0	7.1	39	6000
ZFQZ-450-31	220	370	180	730	11.6	35.0	40.0	58.1	1.1	7.1	39	6000
ZFQZ-400-42	418	725	530	635	7.53	22.6	26.4	54.1	1.5	7.1	23.5	5200
ZFQZ-400-42	400	440	410	1020	9.32	28.0	32.6	29.0	0.8	7.1	23.5	5200
ZFQZ-400-42	205	420	280	570	6.99	21.0	24.5	57.7	1.3	7.1	23.5	5200
ZFQZ-400-42	500	660	708	810	6.74	20.2	23.6	26.0	0.6	7.1	23.5	5200
ZFQZ-400-32	440	660	600	725	7.0	21.0	22.5	37.8	1.0	6.4	21	4900
ZFQZ-355-42	418	725	600	630	6.65	20	23.3	51.5	1.2	6.5	15	3750
ZFQZ-355-42	355	440	500	895	6.78	20.3	23.7	26.8	0.74	6.5	15	3750
ZFQZ-355-42	361	600	550	665	6.27	18.8	22	45.1	1.1	6.5	15	3750
ZFQZ-355-32	450	725	750	670	5.73	17.2	20.0	41.1	1.0	6.0	13	3400
ZFQZ-355-32	315	440	500	800	6.02	18.1	21.0	30.4	0.88	6.0	13	3400
ZFQZ-355-22	450	660	900	735	4.78	14.3	16.7	64.2	1.0	5.6	11.5	3200
ZFQZ-355-22	370	440	650	930	5.44	16.3	19.0	25.3	0.6	5.6	11.5	3200
ZFQZ-355-12	315	660	880	510	3.42	10.3	12.0	42.0	0.7	4.7	10.5	2900
ZFQZ-315-42	315	600	800	570	3.76	11.3	13.2	44.0	0.8	5.2	7.7	2450
ZFQZ-315-42	315	440	750	780	4.0	12.0	13.5	23.9	0.51	5.2	7.7	2450
ZFQZ-315-42	284	400	680	785	4.0	12.0	13.5	25.6	0.52	5.2	7.7	2450
ZFQZ-315-32	280	660	750	465	3.56	10.7	12.5	68.4	1.3	4.6	7.0	2300
ZFQZ-315-32	320	440	900	785	3.4	10.2	11.9	21.1	0.6	4.6	7.0	2300
ZFQZ-315-22	230	220	705	1175	3.12	9.35	11.0	10.5	1.0	4.3	6.0	2100
ZFQZ-315-21	150	660	480	260	2.98	8.95	10.4	199	3.3	4.35	6.0	1950
ZFQZ-315-12	160	440	600	410	2.55	7.65	8.93	69.8	1.0	3.85	5.3	1800
ZFQZ-280-32B	170	440	900	430	1.8	5.41	6.31	53.4	1.5	3.0	3.0	1600
ZFQZ-250-31B	92	400	880	260	1.0	3.0	3.5	96.1	0.99	2.85	1.55	1000

说明: 技术数据表(A)和技术数据表(B)列出了ZZJ-800和ZZJ-900系列相对应的规格和部分已生产制造过的规格, 仅供设计选型时参考。如果所需产品的型号规格与本技术表有出入或有特殊要求, 请与我厂有关部门联系, 经确认后签订技术协议和合同。

Note: The specifications corresponding to Series ZZJ-800 and Series ZZJ-900 and the specifications of partial produced motors are listed in Technical Data Table (A) and Technical Date Table (B) respectively All these specifications are for design and type choice only If the required specifications of the motors are not in accordance with those in the Technical Data Tables or some special requirements are offered, please contact us. After confirmation, the technical agreement can be made.

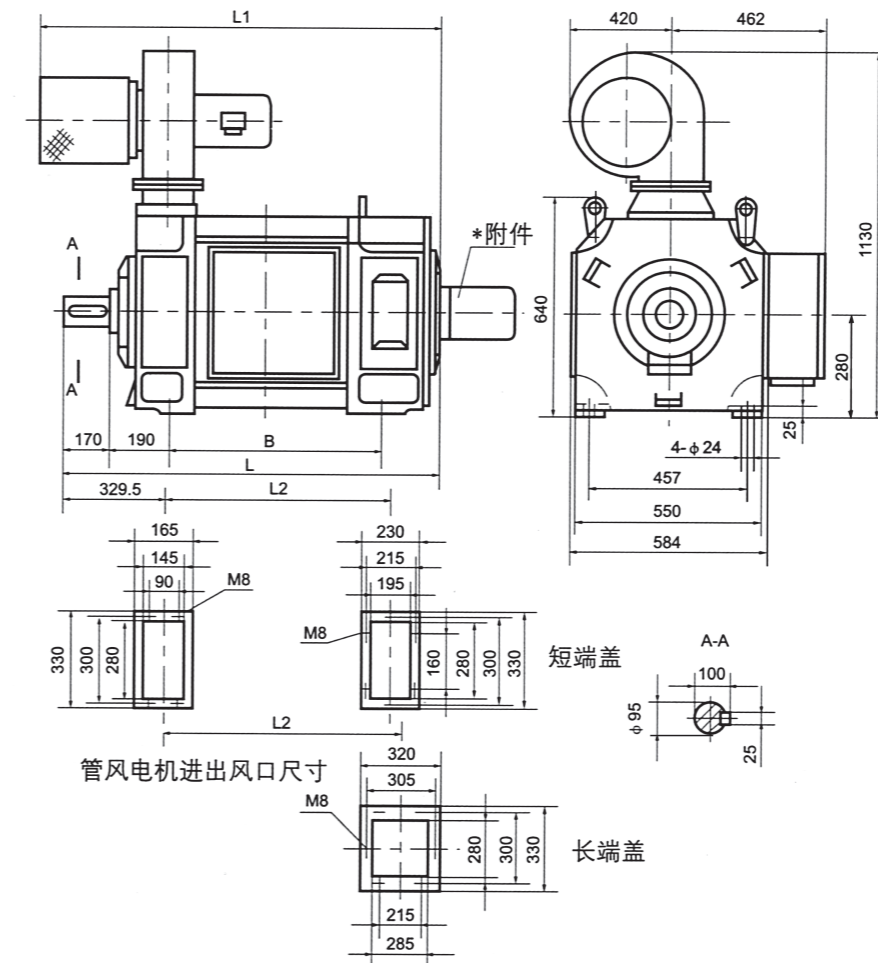
ZFQZ-250 电机安装外形图

Mounting Figuration Drawing of Motors



ZFQZ-280 电机安装外形图

Mounting Figuration Drawing of Motors

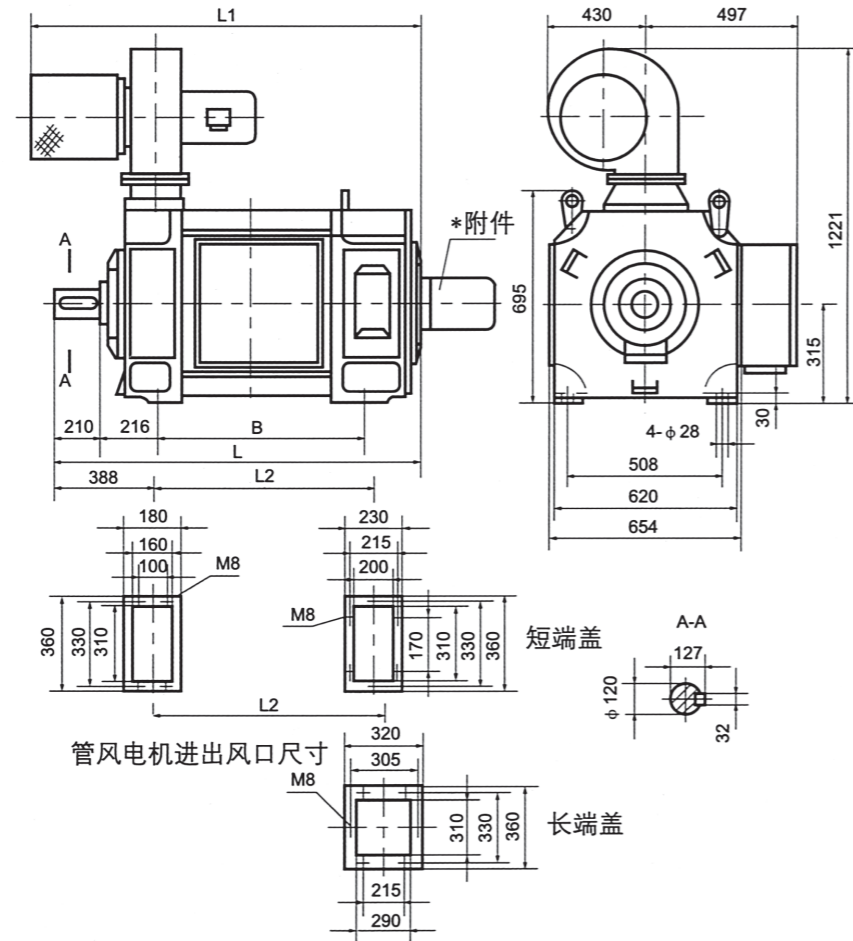


电机型号 Motor Type	安装尺寸 Mounting Dimension		外形尺寸 Figuration Dimension	
	B	L2	L	L1
ZFQZ-250-081	635	614.5	1145	1580
ZFQZ-250-082	695	644.5	1205	1640
ZFQZ-250-091	675	654.5	1185	1620
ZFQZ-250-092	735	684.5	1245	1680
ZFQZ-250-11	715	694.5	1225	1660
ZFQZ-250-12	775	724.5	1285	1720
ZFQZ-250-21	765	744.5	1275	1710
ZFQZ-250-22	825	774.5	1335	1770
ZFQZ-250-31	825	804.5	1335	1770
ZFQZ-250-32	885	834.5	1395	1830
ZFQZ-250-41	895	874.5	1405	1840
ZFQZ-250-42	955	904.5	1465	1900

电机型号 Motor Type	安装尺寸 Mounting Dimension		外形尺寸 Figuration Dimension	
	B	L2	L	L1
ZFQZ-280-11	762	777.5	1315	1750
ZFQZ-280-12	852	822.5	1405	1840
ZFQZ-280-21	822	837.5	1375	1810
ZFQZ-280-22	912	822.5	1465	1900
ZFQZ-280-31	892	907.5	1445	1880
ZFQZ-280-32	982	952.5	1535	1970
ZFQZ-280-41	972	987.5	1525	1960
ZFQZ-280-42	1062	1032.5	1615	2050

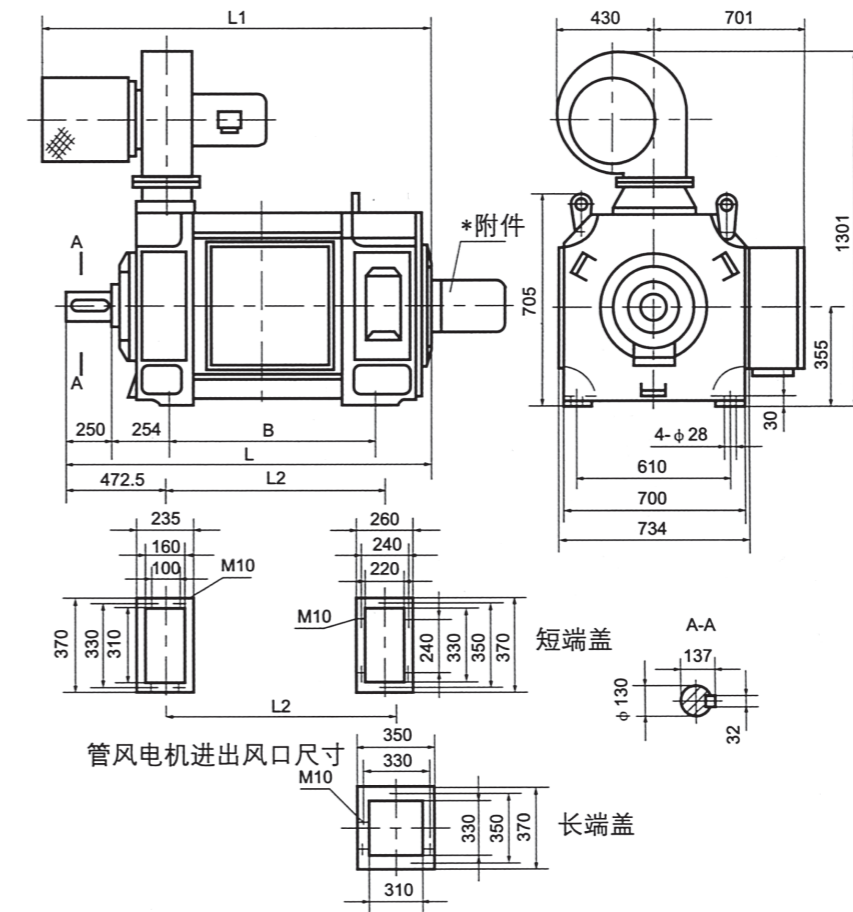
ZFQZ-315 电机安装外形图

Mounting Figuration Drawing of Motors



ZFQZ-355 电机安装外形图

Mounting Figuration Drawing of Motors

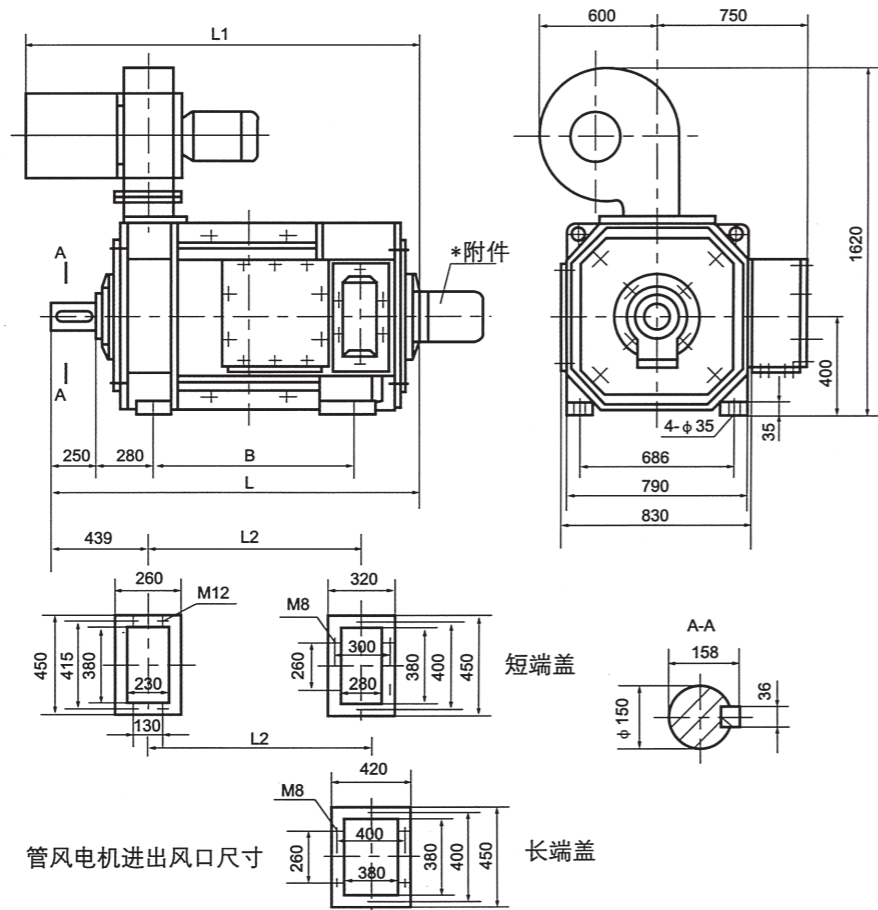


电机型号 Motor Type	安装尺寸 Mounting Dimension		外形尺寸 Figuration Dimension	
	B	L2	L	L1
ZFQZ-315-081	757	810	1405	1770
ZFQZ-315-082	847	855	1495	1860
ZFQZ-315-091	817	870	1465	1830
ZFQZ-315-092	907	915	1555	1920
ZFQZ-315-11	887	940	1535	1900
ZFQZ-315-12	977	985	1625	1990
ZFQZ-315-21	967	1020	1615	1980
ZFQZ-315-22	1057	1065	1705	2070
ZFQZ-315-31	1057	1110	1705	2070
ZFQZ-315-32	1147	1150	1795	2160
ZFQZ-315-41	1157	1210	1805	2170
ZFQZ-315-42	1247	1255	1895	2260

电机型号 Motor Type	安装尺寸 Mounting Dimension		外形尺寸 Figuration Dimension	
	B	L2	L	L1
ZFQZ-355-091	888	936.5	1650	1930
ZFQZ-355-092	978	981.5	1740	2020
ZFQZ-355-11	968	1016.5	1730	2010
ZFQZ-355-12	1058	1061.5	1820	2100
ZFQZ-355-21	1058	1106.5	1820	2100
ZFQZ-355-22	1148	1151.5	1910	2190
ZFQZ-355-31	1158	1206.5	1920	2200
ZFQZ-355-32	1248	1251.5	2010	2290
ZFQZ-355-41	1268	1316.5	2030	2310
ZFQZ-355-42	1358	1361.5	2120	2400

ZFQZ-400 电机安装外形图

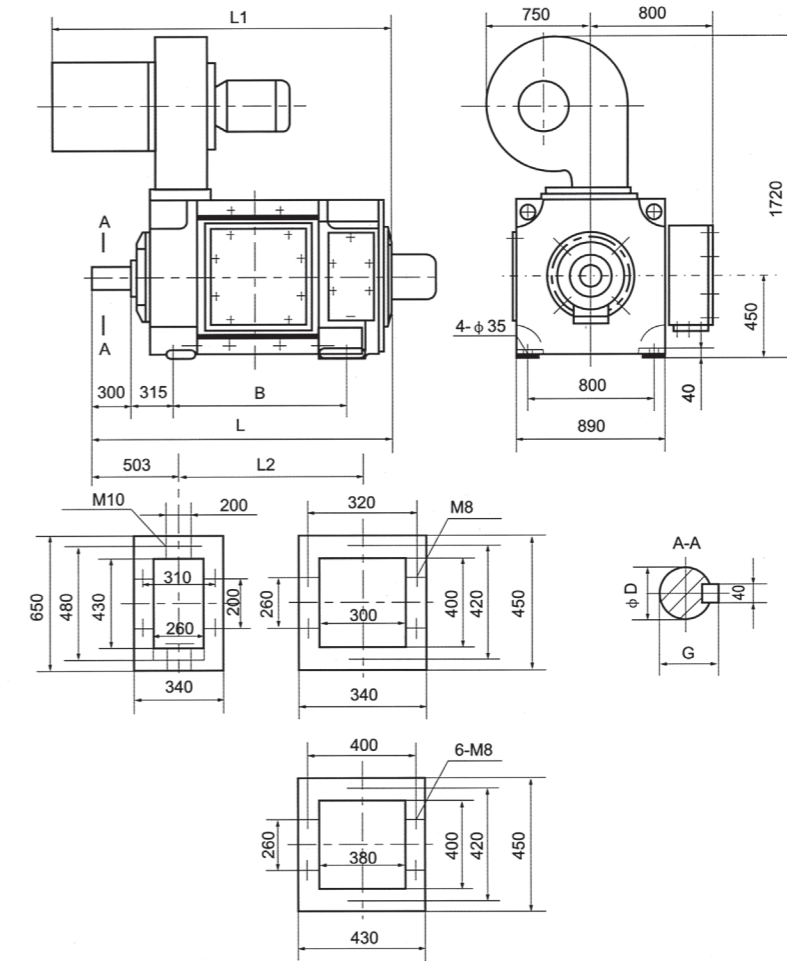
Mounting Figuration Drawing of Motors



管风电机进出口尺寸

ZFQZ-450 电机安装外形图

Mounting Figuration Drawing of Motors



电机型号 Motor Type	安装尺寸 Mounting Dimension		外形尺寸 Figuration Dimension	
	B	L2	L	L1
ZFQZ-400-11	959	1003	1770	1820
ZFQZ-400-12	1079	1063	1890	1940
ZFQZ-400-21	1039	1083	1850	1900
ZFQZ-400-22	1159	1143	1970	2020
ZFQZ-400-31	1129	1173	1940	1990
ZFQZ-400-32	1249	1233	2060	2110
ZFQZ-400-41	1229	1273	2040	2090
ZFQZ-400-42	1349	1333	2160	2210

电机型号 Motor Type	安装尺寸 Mounting Dimension			外形尺寸 Figuration Dimension		
	B	D	G	L2	L	L1
ZFQZ-450-12	1181	160	169	1147	2120	2070
ZFQZ-450-21	1151			1197	2085	2140
ZFQZ-450-22	1271			1237	2205	2260
ZFQZ-450-31	1251			1297	2185	2240
ZFQZ-450-32	1371			1337	2305	2360
ZFQZ-450-41	1361	170	179	1407	2300	2350
ZFQZ-450-42	1481			1447	2415	2470
ZFQZ-450-51	1482			1527	2415	2470