

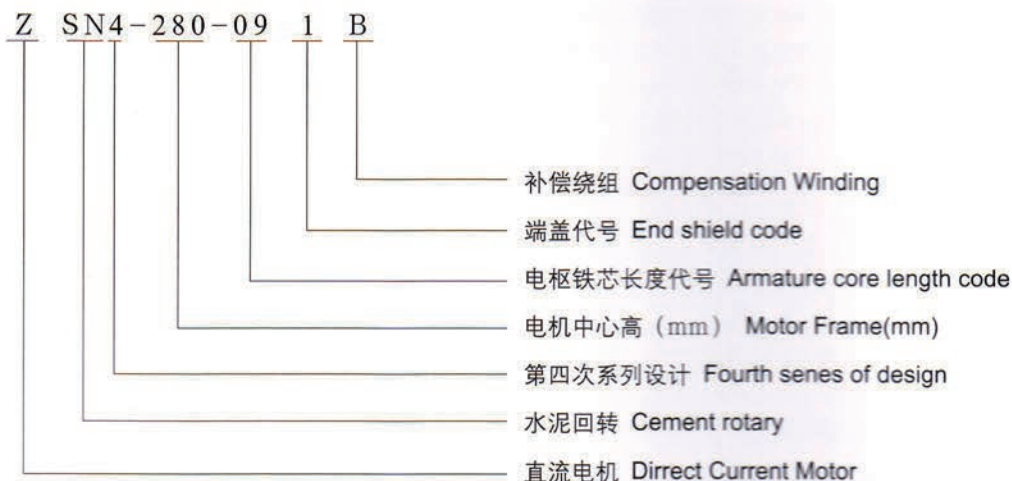
# GUANGZHOU HAOQING MOTOR CO.,LTD

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## ZSN4系列水泥回转窑主传动用直流电动机

### 型号说明 / Explanations for Type



注: 数字1、2表示短、长端盖

Remarks: No.1,2 Stands for Short/Long end Shield

### 结构特点 / Structure Features

1. 电机的冷却方式和外壳防护等级见表1。

Motor cooling type and protection class pls refers to form 1.

表1 ( Table 1 )

冷却方式 Cooling type	单管风 (IC17) Single-tube air	双管风 (IC37) Double-tube air
防护等级	IP21S	IP44

2. 电机安装型式: 卧式底脚安装 (IMB3) 电机可制造成双轴伸或单轴伸, 单轴伸电机可在非传动端侧装测速发电机。常用的永磁直流测速发电机型号见表2。其他规格的测速机或旋转编码器也可协商。

Motor mounting types: horizontal foot mounting (IMB3), motor could be designed as double shaft extension or single shaft extension. Tacho-generator could be fixed at the non-drive end side of single shaft extension motor. Commonly used permanent magnet DC tacho-generator models are shown in Table 2. Other specifications of the tacho-generator or rotary encoder could also be negotiated.

表2 ( Table 2 )

型号 Type	额定功率 (W) Rated output	额定电压 (V) Rated voltage	额定电流 (mA) Rated current	额定转速 (r/min) Rated speed
ZYS-3A	22	110	200	0~2000
ZYS-100A	8	100	80	0~1000

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3. 根据需要, 电机的定子绕组里可埋置过热保护元件, 过热保护元件型号需在合同中注明。  
If necessary, overheating protection thermal components could be embedded in the stator windings of the motor, thermal components model pls be specified in the contract.
4. 出线盒位置, 从传动端看, 在机座右侧, 根据需要也可在机座左侧或上方。  
The location of terminal box could be fixed at the right side of the motor, view from the shaft extension, could also be fixed in the left side or above of the motor if necessary.

## 电机性能 / Motor Function

1. 技术数据表中的数据应按下列使用条件工作:
- 海拔不超过1000米;
  - 进入电机的初级冷却介质温度不超过40℃;
  - 电动机为连续工作制 (S1)
  - 电动机电枢回路和励磁回路可由静止整流电源供电, 也适应由直流发电机组供电。
  - 对管道通风冷却的电机, 其风量风压需满足表3的规定, 进风口在电机非换向器侧端盖上。

1.Data listed in the technical data sheet should be employed under the following conditions:

- Altitude above sea level max,1000m;
- Cooling air temperature max.40℃;
- Duty:Continuous(S1)
- Armature and field circuit for motors may be either operated on static thyristor controlled supplies, or from d-c generator.
- Motor for tube ventilation and cooling, the pressure of the air volume need to meet the requirements in Table 3, the air inlet is located on end shield of the motor commutator side.

表3 ( Table 3 )

机座号 Motor Frame	风量 (米 <sup>3</sup> /小时) Air Volume(m <sup>3</sup> /hr)	静压(帕) Static Pressure(Pa)
ZSN4-225	2880	1400
ZSN4-250	3000	1400
ZSN4-280	4000	1600
ZSN4-315	4680	1600
ZSN4-355	5200	1600
ZSN4-400	7200	1800

- 2.本系列电机性能均符合国家标准GB755-2000《旋转电机 定额和性能》, 也可按国际电工委员会标准IEC34-1的要求考核。
- 3.电机绝缘等级为F级。
- 4.电动机标准电枢电压为440伏。也可根据具体情况派生出220伏或其他电压。减小电枢电压为恒转矩调速, 在电枢电流连续条件下, 其最低转速可达20r/min, 此时仍能维持额定转矩, 转速平稳。
- 5.电动机标准励磁电压为180伏。其他励磁电压也可协商。为确保励磁系统绝缘的可靠, 在断开励磁回路时, 需在励磁绕组二端并联一个释放电阻, 以防止自感电势。在标准励磁电压时, 其值约为7倍励磁绕组电阻 (冷态), 励磁电压高于标准电压时, 并接释放电阻可小于7倍, 反之大于7倍。
- 6.ZSN4-225机座号电机带串励绕组, 其他机座号均带补偿绕组。
- 7.电机提供有接地标志的接线柱。
- 8.技术数据表内的效率值为额定功率, 额定电压和转速时的效率。它包括励磁损耗。

2.Performances of motors all comply with State Standard GB755-2000《Rotating electrical machines-Rating and performance》, also be in accordance with the requirements of evaluation of the International Electrotechnical Commission standard IEC 34-1

- 3.Motor manufactured as F insulation.
- 4.Standard rated voltage: 440V, 220-volt or other voltage can also be derived under the specific circumstances.constant torque speed control could be done by Reducing armature voltage.The lowest speed could be adjusted to 20r/min under the circumstance of continually armature current. Meanwhile, motors could still remain the rated torque with smoothly speed.
5. Nominal field voltage: 180V, other excitation voltage are also acceptable on request.

To assure the reliability of insulation of excitation system, the motor must be protected against self-induced voltages by a release resistor connected in parallel with the field winding when the excitation circuit of the motor is interrupted. At rated field winding resistance(cold).While the field voltage is higher than nominal voltage, the value of shunt resistance may be lower than seven-times field resistance, otherwise higher than seven-times.

6. ZSN4-225 motor adopts series field winding, others adopts compensating winding.
7. A marked earthing terminal is provided for the motors.
8. The efficiencies listed in the data sheet are for rated output, voltage and speed, and include excitation losses.

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## 特点和用途

## Feature and applications

ZSN4系列直流电动机是我公司在Z4系列直流电动机的基础上,根据水泥回转窑主传动的工况特点,而开发的专用系列品种。

本系列电机采用八角形结构,定子空间利用率高。定子磁轭为叠片式,能承受脉动电流与电流急剧变化之工况,电机适应三相全控式整流电源,以及不外接直流平波电抗器而长期工作。新颖的F级绝缘结构,保证了绝缘性能稳定和散热良好。根据水泥回转窑的特定工况,进行设计制造,使电动机的起动力矩可达到额定力矩的2.5倍。采用管道通风的冷却方式,使电动机能在粉尘较大的恶劣环境中,安全可靠的运行。

ZSN4 series DC motor is designed based on Z4 series DC motor, it is the exclusively used as main drive motor for cement rotary kiln.

This series of motors adopt octagon shape to take good use of inner space of motor. The motors have laminated yokes, which means that when used on rectifier power supplies they can endure both current ripple and rapid current changes (load change) under dynamic condition. The stator design leads to high accuracy of pole spacing and consequent good commutation. The motors could be lastingly operated from fully controlled three phase bridge without a smoothing reactor, whose inductance is specified in the relevant technical data, should be inserted in the armature circuit to suppress ripple circuit. Motors are class F insulated, ensuring stable dielectric performance and excellent heat dissipation.

Designed exclusively according to special working conditions of cement rotary kiln, this series of motor could reach starting torque 2.5 times of rated torque. Adopting tube ventilation and cooling method, motors could be operated safely under bad circumstance full of dust and powder.

## 订货说明

1. 订货前, 请先查阅产品目录, 明确所需产品的规格, 如果所需规格与目录有所出入或有特殊要求, 请事先提出具体而明确的要求, 与我公司有关部门协商, 经同意后, 签订合同或技术协议。
2. 订货时请注明电机型号、功率、电压、转速、结构型式、励磁电压、出线盒位置, 以及所需装配成套供应的附件(如测速机的型号, 过热保护元件规格数量)。
3. 如果需要湿热带型, 请在原型号后面注明有“TH”

1. Pls refer to our catalogue before ordering, if the types, ratings you need are not covered by our form list, pls contact with us. Should you have particular needs, pls offer us specific proposal in advance. A contract or technical agreement may be made when the requirements are fixed by common consent.
2. Please write clearly the type, output, volts, speed, duty, type of construction, excitation, field voltage, No. of shaft-end, location of terminal box, necessary accessories and spare parts, etc( like the model and quantity of tacho-generator, thermal components).
3. If humid-tropical type required, please mark "TH" behind the original motor model.

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**技术数据表**  
**Technical Specification**

型号 Model	额定 功率 Rated Output Pn	额定 转速 Rated Speed 440v	电枢 电流 Armature Current In	励磁 功率 Field Power Pf	电枢回 路电阻 Armature Circuit R	电枢回 路电感 Armature Circuit La	磁场 电感 Magnetic Inductance Lf	效率 Efficiency	惯量矩 Moment of inertia Gd <sup>2</sup>	重量 Weight	
	kW	r/min	A	W	$\Omega$ (20°C)	mH	H	%	kgm <sup>2</sup>	kg	
ZSN4-225-091	55	1500	140	1000	0.1872	4.0	19.3	87.8	3.68	530	
	40	1000	105		0.3163	8.3	11.2	82.8			
ZSN4-225-11	75	1500	198	1400	0.1174	3.3	25.4	88.9	4.2	580	
	40	750	107		0.3861	11.7	8.84	82.6			
ZSN4-225-21	90	1500	227	1600	0.105	2.4	16	89	4.8	630	
	55	1000	145		0.2079	4.8	14.9	84			
ZSN4-250-11B	110	1500	276	2600	0.0740	0.79	16.7	89.4	5.0	810	
	75	1000	195		0.1433	1.8	9.39	86.8			
	55	750	147		0.2578	3.3	6.51	86.6			
ZSN4-250-21B	125	1500	312	2700	0.0537	0.54	5.43	89.6	5.6	890	
	90	1000	230		0.1140	1.2	6.4	87			
ZSN4-250-31B	75	750	196	2800	0.1718	2.5	10.2	85.0	6.2	960	
ZSN4-280-091B	160	1500	397	2800	0.0410	0.52	9.88	90.1	8.8	1080	
	110	1000	281		0.2945	1.4	12.3	87.9			
ZSN4-280-11B	190	1500	471	3000	0.0326	0.36	5.41	90.4	10	1190	
	125	1000	316		0.0704	0.93	7.11	88.4			
	90	750	233		0.1290	1.1	7.20	85.4			
ZSN4-280-21B	22B	220	1500	3200	0.0245	0.41	6.23	91.3	11.2	1300	
	21B	160	1000		403	0.0572	1.0	5.89			88.8
	072	110	750		282	0.1032	1.2	14.9			86.0
ZSN4-315-071	072	250	1500	2900	0.0248	0.42	9.03	91.5	12.8	1300	
	071	125	750		323	0.0972	1.7	15.5			86.8
ZSN4-315-082	280	1500	690	3300	0.0214	0.36	8.22	91.7	15.6	1460	
	190	1000	475		0.0403	0.72	6.36	90.1			

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续上表

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	kW	r/min	A	W	Ω (20°C)	mH	H	%	kgm <sup>2</sup>	kg
092 ZSN4-315-092	315	1500	770	3500	0.0148	0.28	8.0	92.4	18.4	1620
	220	1000	543		0.0323	0.63	7.96	90.8		
	091	160	750		405	0.0614	1.2	7.66		
ZSN4-315-12	250	1000	615	3800	0.0268	0.58	9.8	91	21.2	1780
	190	750	478		0.0490	1.1	9.57	89.1		
ZSN4-315-22	220	750	550	4000	0.0392	0.88	5.81	89.4	24	1970
ZSN4-355-082	280	1000	682	3800	0.0185	0.42	6.3	91.4	32	2310
	250	750	622		0.0331	0.74	6.18	89.9		
ZSN4-355-092	315	1000	764	4000	0.0152	0.39	7.64	92	36.8	2530
	280	750	696		0.0297	0.69	7.49	90.1		
ZSN4-355-12	355	1000	864	4200	0.0161	0.34	24.7	92.2	42	2780
	315	750	776		0.0236	0.45	9.28	90.5		

## 其他部分已生产过规格技术数据表

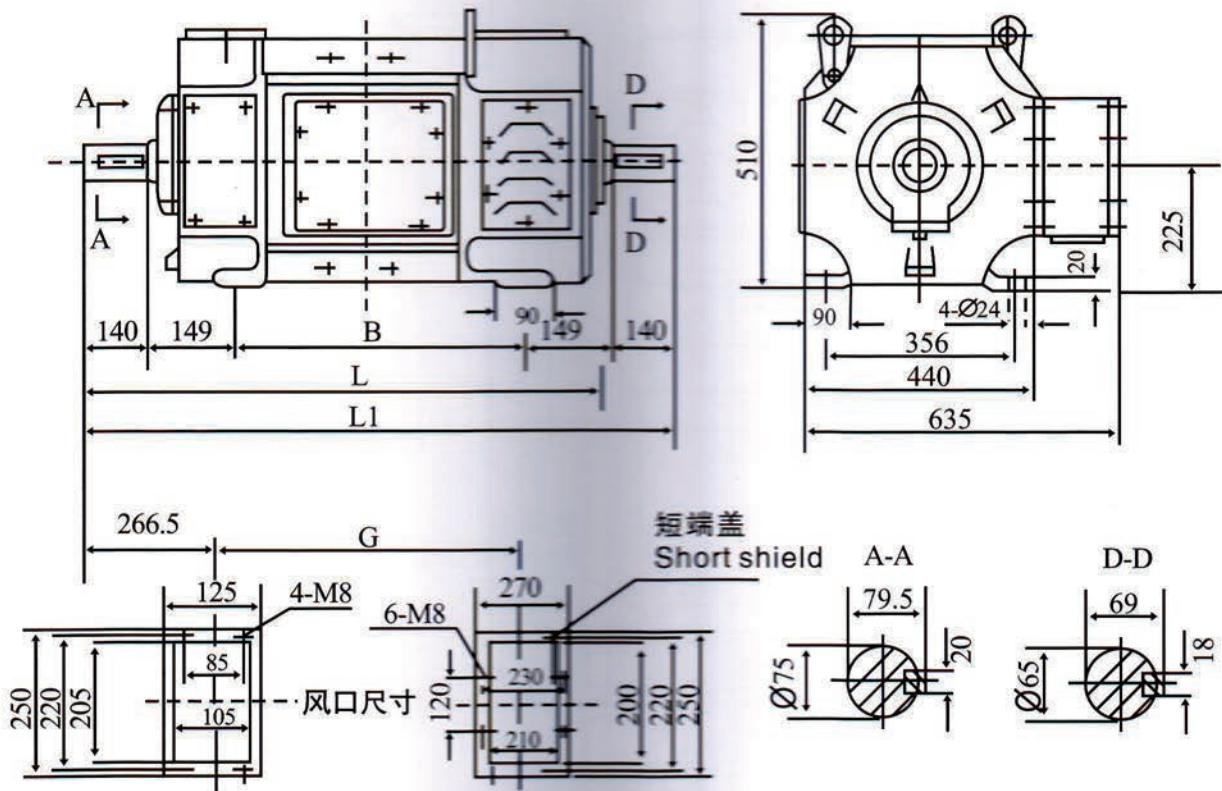
### Part of production specifications and teehnical data:

型号 Model	额定 功率 Rated Output Pn	额定 转速 Rated Speed 440v	电枢 电流 Amature Current In	励磁 功率 Field Power Pf	电枢回 路电阻 Amature Circuit R	电枢回 路电感 Amature Circuit La	磁场 电感 Magnetic Inductance Lf	效率 Efficiency	惯量矩 Moment of inertia Gd <sup>2</sup>	重量 Weight kgs
	kW	r/min	A	W	Ω (20°C)	mH	H	%	kgm <sup>2</sup>	kg
ZSN4-280-21B	75	500	199	3200	0.2	2.75	6.5	84	11.2	1300
ZSN4-280-31B	90	500	239	3400	0.167	2.3	7.73	84.2	13	1550
ZSN4-315-11	110	500	285	3800	0.102	1.92	9.75	86.5	21.2	1890
ZSN4-355-11	132	600	335	4000	0.0758	1.35	5.45	88	24	2080
ZSN4-355-11	165	500	414	4200	0.0575	1.1	8.89	89.5	42	2890
ZSN4-355-11	185	500	466	4200	0.0536	1.1	18.4	89.5	42	2890
ZSN4-400-21	250	400	650	5000	0.0407	1.05	14.8	87	24	4500
ZSN4-400-22	560	1000	1365	5000	0.0081	0.2	17	92.1	74	4500

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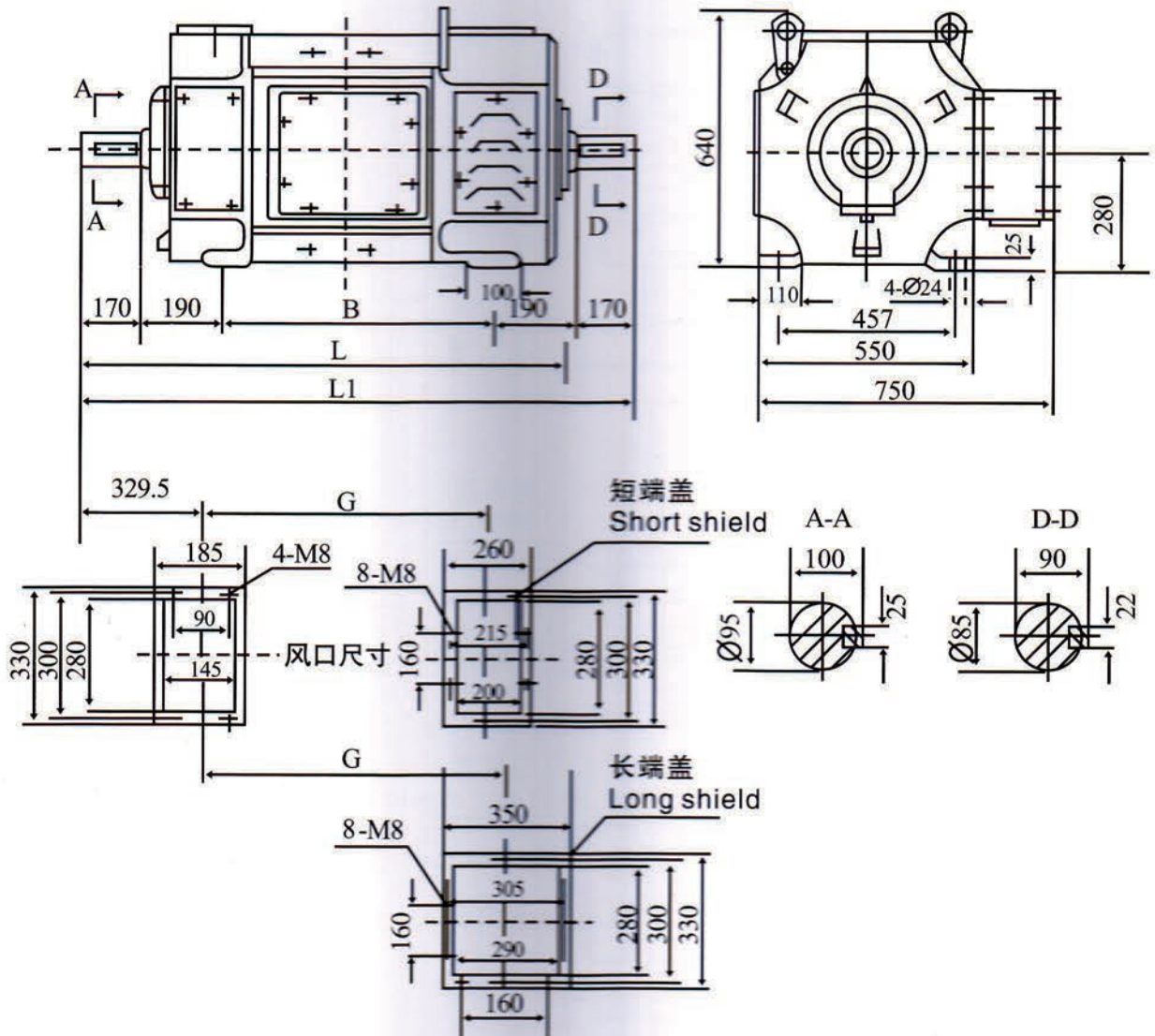
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ZSN4-225-091	661	1100	1239	635
ZSN4-225-11	701	1140	1279	675
ZSN4-225-21	751	1190	1329	725



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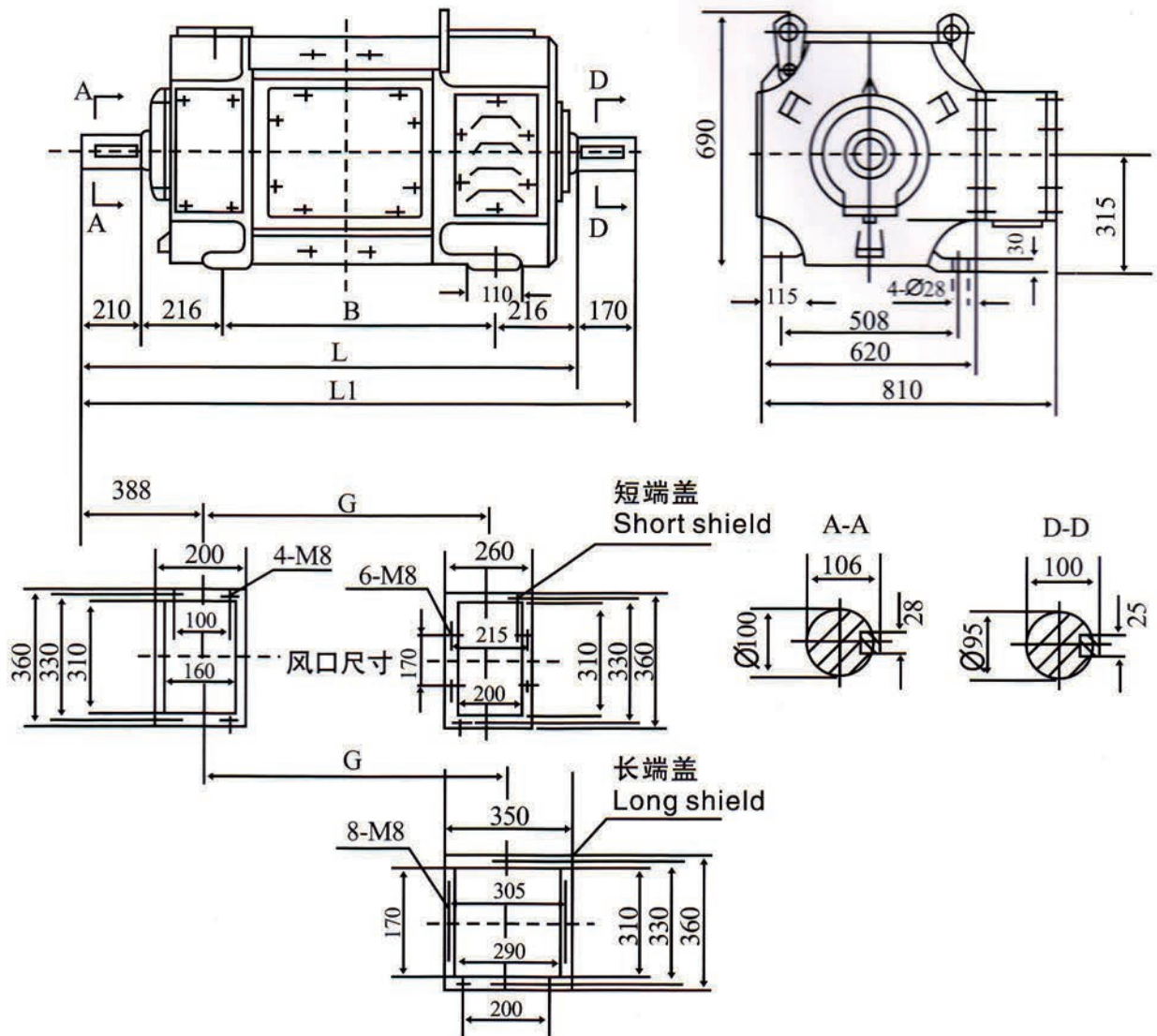


型号 Model	B	L	L <sub>1</sub>	G
ZSN4-280-091	712	1265	1432	727.5
ZSN4-280-11	762	1315	1482	777.5
ZSN4-280-21	822	1375	1542	837.5
ZSN4-280-22	912	1465	1632	882.5
ZSN4-280-31	892	1445	1615	907.5

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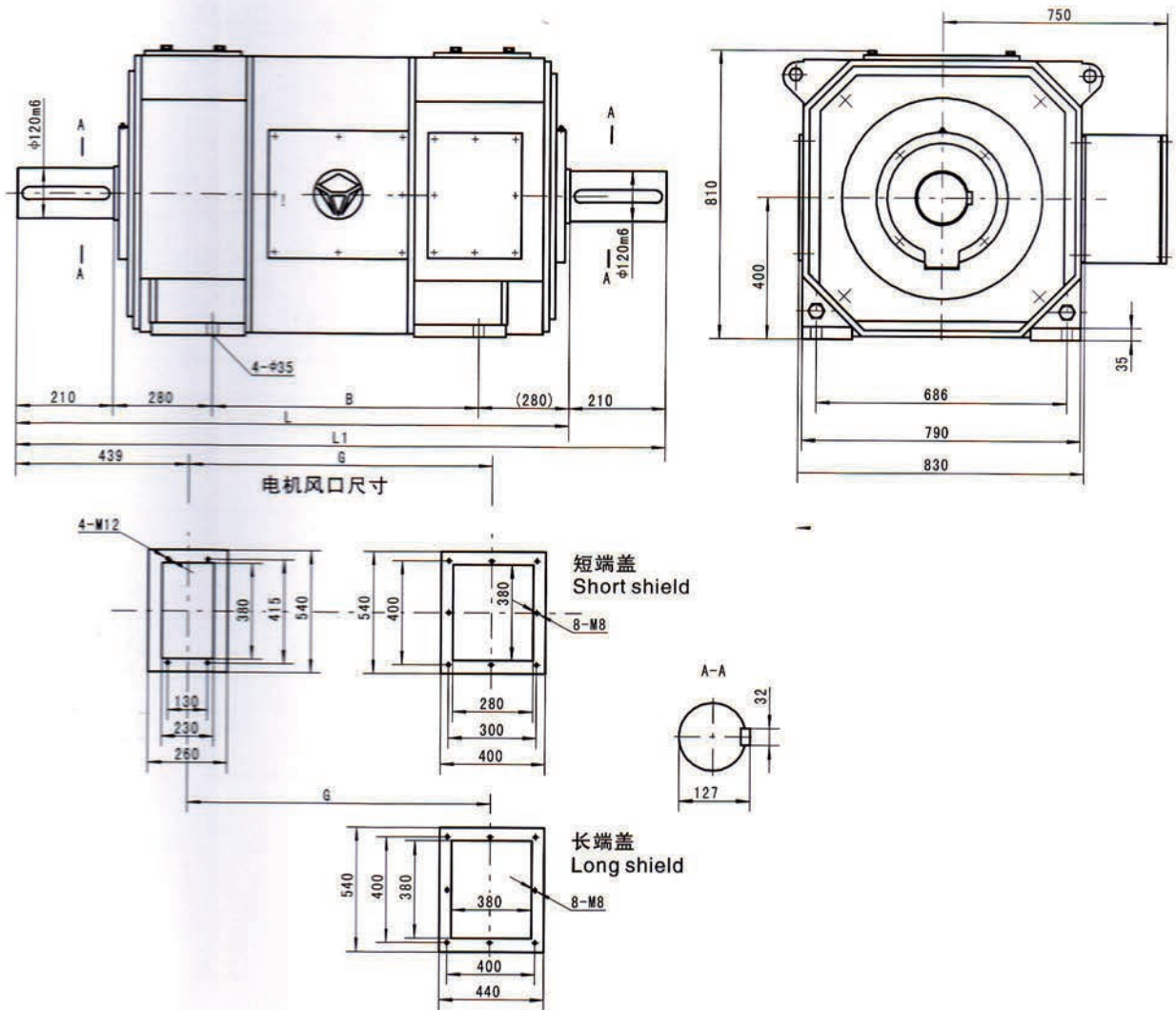
型号 Model	B	L	L <sub>1</sub>	G
ZSN4-315-071	707	1352	1519	760
ZSN4-315-072	797	1442	1609	805
ZSN4-315-082	847	1492	1659	855
ZSN4-315-091	817	1462	1629	870
ZSN4-315-092	907	1552	1719	915
ZSN4-315-12	977	1622	1789	985
ZSN4-315-22	1057	1702	1869	1065
ZSN4-315-11	887	1532	1702	940
ZSN4-315-21	967	1612	1782	1020



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型号 Model	B	L	L <sub>1</sub>	G
ZSN4-400-22	1159	1929	2139	1143
ZSN4-400-21	1039	1809	2019	1073