GreeF

Power the World with Green Energy

Permanent Magnet Motor

中国·山东

CHINA SHANDONG

1. Overview

TYP series high-efficiency permanent magnet inverter synchronous motors must be used in conjunction with permanent magnet motor inverters. The rotor of this series of motors is built-in permanent magnet structure, and the special design of different alternating and straight axial magnetic circuits makes this series of motors have a certain convex pole torque. Therefore, the frequency converter needs to control the work with the maximum torque/current ratio control mode, so that this series of motors have high power factor in the whole speed regulation range, small working current and low copper consumption.

The rotational speed of TYP series high-efficiency permanent magnet frequency conversion synchronous motor is synchronized with the rotating magnetic field of the stator, there is no rotational difference, which saves the rotational power, and makes TYP series high-efficiency permanent magnet frequency conversion synchronous motor have high efficiency in the whole speed range, and the energy-saving effect is obvious.

TYP series high-efficiency permanent magnet frequency conversion synchronous motors are widely used in injection molding machines, air compressors, pipe making equipment, hydraulic machinery, food machinery, cement pipe making machines, plastic extruders, wire drawing machines and pharmaceutical equipment.

Our company is equipped with special control cabinet for this series of products, which can be customized according to user requirements.

2. The motor is used under the following conditions

Altitude:not exceeding 1000m

Ambient temperature: - 15～+40℃

Base frequency: 50, 75, 125, 150, 180Hz (can be customized according to the user)

Frequency regulation range: constant torque speed regulation below rated frequency, and certain weak magnetic speed regulation above rated frequency.

Voltage: 380V ±10%, 660V ±10%

Protection class: IP54 or IP55

Thermal classification (insulation class): 130 (B), 155 (F)

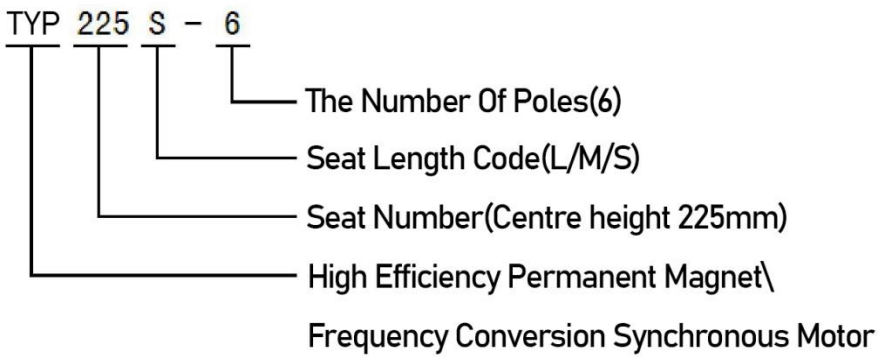
Cooling method: IC411, IC416

Executive standard: Q/1083 SLJ 018- 2014

3. Specifications and parameters

3.1 Significance of motor TYPe

Example:



3.2 Main Parameters of TYP Series High Efficiency Permanent Magnet Frequency Conversion Synchronous Motor

model number	input voltag	Power	Synchronous	Torque (N.m)	Efficiency	frequency
TYP132S-6	380	3	1000	28.7	88.7	50
TYP132M1-6		4		38.2	89.7	
TYP132M2-6		5.5		52.5	89.5	
TYP160M-6		7.5		71.6	90.2	
TYP160L-6		11		105.1	91.5	
TYP180L-6		15		143.3	92.5	
TYP200L1-6		18.5		176.7	93.1	
TYP200L2-6		22		210.1	93.9	
TYP225M-6		30		286.5	94.3	
TYP250M-6		37		353.4	94.6	
TYP280S-6		45		429.8	94.9	
TYP280M-6		55		525.3	95.2	
TYP315S-6		75		716.2	95.4	
TYP315M-6		90		859.5	95.6	
TYP315L1-6		110		1050.5	95.6	

model number	input voltag	Power	Synchronous	Torque (N.m)	Efficiency	frequency
TYP315L2-6	380	132	1000	1260.6	95.8	50
TYP355M1-6		160		1528.0	96.0	
TYP355M2-6		200		1910.0	96.1	
TYP355L1-6		220		2101.0	96.1	
TYP355L2-6		250		2387.5	96.1	
TYP355L3-6		280		2674.0	96.1	
TYP112M-6		4	1500	25.5	90.9	75
TYP132S-6		5.5		35.0	92.1	
TYP132M-6		7.5		47.8	92.6	
TYP160M-6		11		70.0	93.6	
TYP160L-6		15		95.5	94.0	
TYP180M-6		18.5		117.8	94.3	
TYP180L-6		22		140.1	94.7	
TYP200L-6		30		191.0	95.0	
TYP225S-6		37		235.6	95.3	
TYP225M-6		45		286.5	95.6	
TYP250M-6		55		350.2	95.8	
TYP280S-6		75		477.5	96.0	
TYP280M-6		90		573.0	96.2	
TYP315S-6		110		700.3	96.4	
TYP315M-6		132		840.4	96.5	
TYP315L1-6		160		1018.7	96.5	
TYP315L-6		185		1177.8	95.9	
TYP315L2-6		200		1273.3	96.0	
TYP355M1-6		220		1400.7	96.0	
TYP355M2-6		250		1591.7	96.7	
TYP355L1-6		280		1782.7	96.7	
TYP355L2-6		315		2005.5	96.8	
TYP200L1-6		30	2500	114.6	94.5	125
TYP200L2-6		37		141.3	94.8	
TYP132S1-6		5.5	3000	17.5	91.5	150
TYP132S2-6		7.5		23.9	92.1	
TYP160M1-6		11		35.0	93.0	
TYP160M2-6		15		47.8	93.4	
TYP160L-6		18.5		58.9	93.8	
TYP180M-6		22		70.0	94.4	
TYP200L1-6		30		95.5	94.5	
TYP200L2-6		37		117.8	94.8	
TYP225M-6		45		143.2	95.1	
TYP250M-6		55		175.1	95.4	
TYP280S-6		75		238.8	95.6	
TYP280M-6		90		286.5	95.8	
TYP280M2-6		110		350.2	96.0	
TYP315M-6		132		420.2	96.0	
TYP315L1-6		160		509.3	96.2	
TYP315L2-6		200		636.7	96.3	

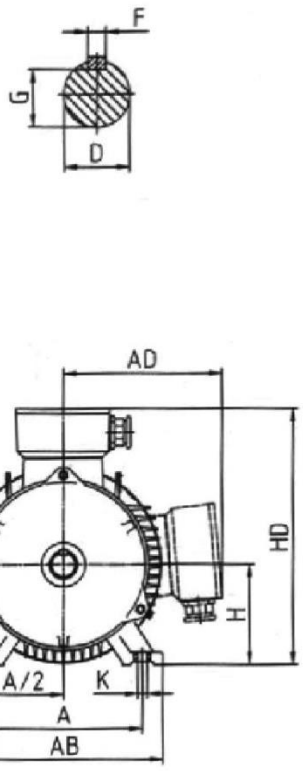
TYP355M1-6		**220**		**700.3**	**96.3**	
TYP355M2-6		**250**		**795.8**	**96.4**	
TYP355L1-6		**280**		**891.3**	**96.4**	
TYP355L2-6		**315**		**1002.8**	**96.5**	
TYP160M1-6		**11**		**29.2**	**93.0**	
TYP160M2-6		**15**		**39.8**	**93.4**	
TYP160L-6		**18.5**		**49.1**	**93.8**	
TYP180M-6		**22**	**3600**	**58.4**	**94.4**	**180**
TYP200L1-6		**30**		**79.6**	**94.5**	
TYP200L2-6		**37**		**98.2**	**94.8**	
TYP225M-6		**45**		**119.4**	**95.1**	
TYP112M-6		**11**		**21.0**	**93.0**	
TYP112M-6		**15**		**28.7**	**93.4**	
TYP132S-6		**18.5**		**35.3**	**93.8**	
TYP132M1-6	**380, 660**	**22**	**5000**	**42.0**	**94.4**	**250**
TYP132M2-6		**30**		**57.3**	**94.5**	
TYP160M-6		**37**		**70.7**	**94.8**	
TYP160L-6		**45**		**86.0**	**95.1**	
TYP180L-6		**55**		**105.1**	**95.4**	

Performance Parameters of High-efficiency Permanent Magnet Synchronous(3000 rpm/min)											
seat number	**rating (kW)**	**rated voltage (V)**	**rated current (A)**	**frequency (Hz)**	**Rated speed (r/min)**	**Efficiency η(%)**	**Power factor COSφ**	**Service Coefficient**	**Insulation class**	**Protection**	**work system**
TYP-90	**1.5**		**2.63**			**91.3**	**0.95**	**1.3**			
TYP-90	**2.2**		**3.82**			**92.0**	**0.95**	**1.3**			
TYP90-100	**3**		**5.16**			**92.9**	**0.95**	**1.3**			
TYP100-112	**4**		**6.82**			**93.8**	**0.95**	**1.3**			
TYP112-132	**5.5**		**9.31**			**94.5**	**0.95**	**1.3**			
TYP112-132	**7.5**		**12.6**			**94.9**	**0.95**	**1.3**			
TYP132-160	**11**		**18.4**			**95.4**	**0.95**	**1.3**			
TYP132-160	**15**		**25.1**			**95.7**	**0.95**	**1.3**			
TYP160-180	**18.5**		**30.8**			**96.0**	**0.95**	**1.3**			
TYP160-180	**22**		**36.6**			**96.2**	**0.95**	**1.3**			
TYP180-200	**30**		**49.8**			**96.4**	**0.95**	**1.3**			
TYP180-200	**37**		**61.4**			**96.4**	**0.95**	**1.3**			
TYP200-225	**45**	**380**	**74.6**	**150**	**3000**	**96.5**	**0.95**	**1.3**	**F**	**IP55**	**S1**
TYP225-250	**55**		**91.1**			**96.6**	**0.95**	**1.3**			
TYP250-280	**75**		**124.0**			**96.7**	**0.95**	**1.3**			
TYP250-280	**90**		**148.9**			**96.7**	**0.95**	**1.3**			
TYP280-315	**110**		**181.7**			**96.8**	**0.95**	**1.3**			
TYP280-315	**132**		**218.1**			**96.8**	**0.95**	**1.3**			
TYP250-315	**160**		**263.8**			**97.0**	**0.95**	**1.3**			
TYP280-315	**200**		**329.8**			**97.0**	**0.95**	**1.3**			
TYP280-315	**250**		**412.2**			**97.0**	**0.95**	**1.3**			
TYP315-355	**315**		**518.3**			**97.2**	**0.95**	**1.3**			
TYP315-355	**375**		**617.0**			**97.2**	**0.95**	**1.3**			
TYP315-355	**400**		**658.2**			**97.2**	**0.95**	**1.3**			
TYP315-355	**420**		**691.1**			**97.2**	**0.95**	**1.3**			
TYP315-355	**450**		**740.4**			**97.2**	**0.95**	**1.3**			

Performance Parameters of High-efficiency Permanent Magnet Synchronous(1500 rpm/min)											
seat number	rating (kW)	rated voltage	rated current	frequency	Rated speed	Efficiency	Power factor	Service	Insulation	Protection	work system
TYP90	1.5	380	2.62	75	1500	91.4	0.95	1.3	F	IP55	S1
TYP90-100	2.2		3.82			92.2	0.95	1.3			
TYP100-112	3		5.16			93.0	0.95	1.3			
TYP100-112	4		6.81			93.9	0.95	1.3			
TYP112-132	5.5		9.31			94.5	0.95	1.3			
TYP112-132	7.5		12.6			95.0	0.95	1.3			
TYP132-160	11		18.4			95.5	0.95	1.3			
TYP132-160	15		25.0			95.8	0.95	1.3			
TYP160-180	18.5		30.8			96.1	0.95	1.3			
TYP160-180	22		36.5			96.3	0.95	1.3			
TYP180-200	30		49.7			96.5	0.95	1.3			
TYP200-225	37		61.3			96.6	0.95	1.3			
TYP200-225	45		74.4			96.7	0.95	1.3			
TYP225-250	55		90.9			96.8	0.95	1.3			
TYP250-280	75		123.9			96.8	0.95	1.3			
TYP250-280	90		148.5			96.9	0.95	1.3			
TYP280-315	110		181.4			97.0	0.95	1.3			
TYP315	132		217.6			97.0	0.95	1.3			
TYP315	160		263.8			97.0	0.95	1.3			
TYP315	200		329.1			97.2	0.95	1.3			
TYP315	250		411.4			97.2	0.95	1.3			
TYP315-355	315		518.3			97.2	0.95	1.3			
TYP315-355	375		617.0			97.2	0.95	1.3			
TYP315-355	400		658.2			97.2	0.95	1.3			
TYP315-355	420		691.1			97.2	0.95	1.3			
TYP315-355	450		740.4			97.2	0.95	1.3			

4. Installation dimensions

B3 安装形式



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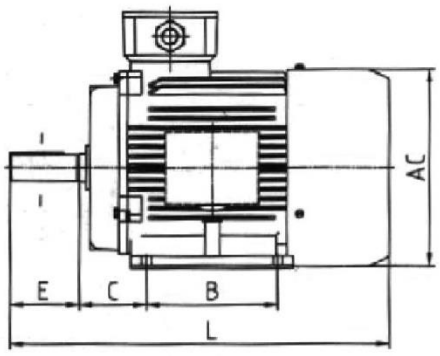

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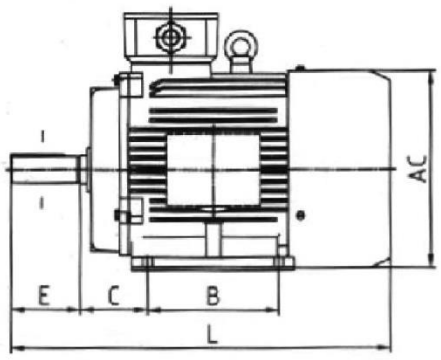

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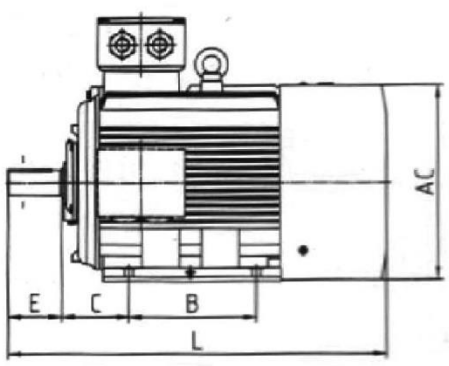

机座号 160-355

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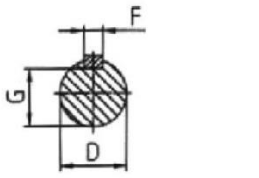

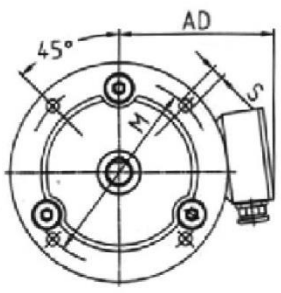

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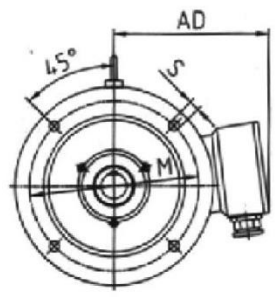

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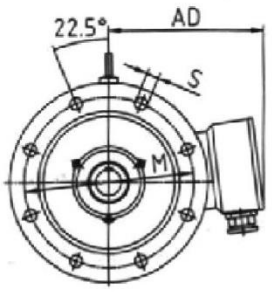

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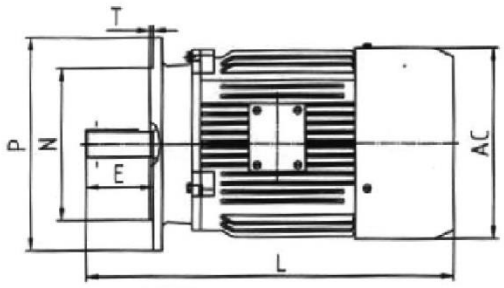

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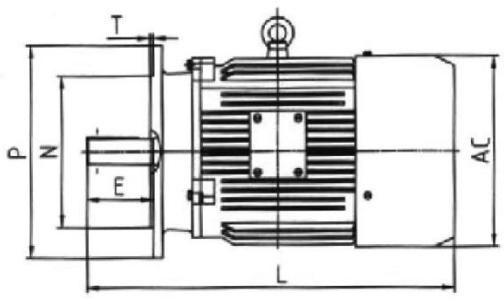

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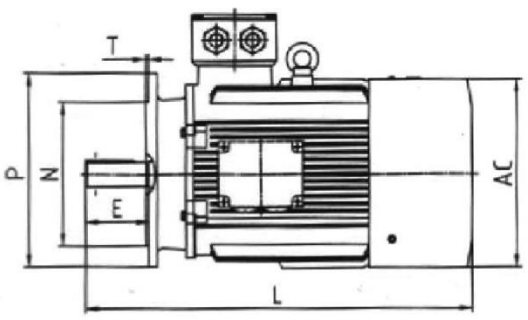

机座号 160-280

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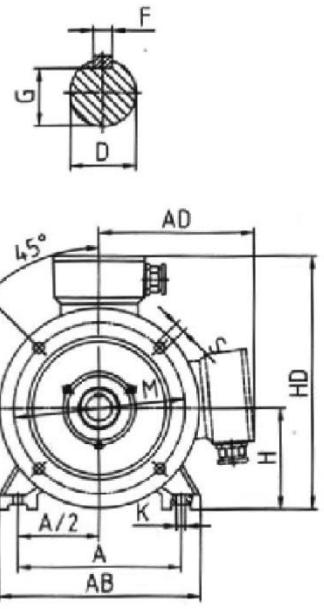

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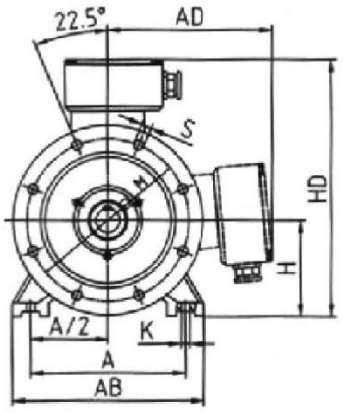

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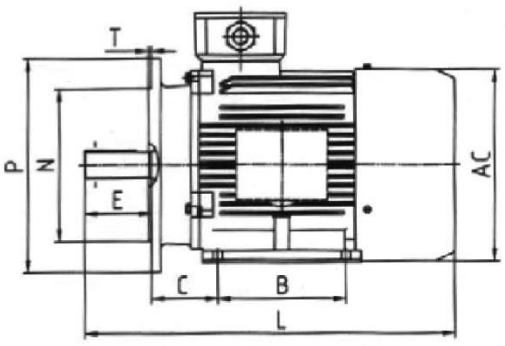

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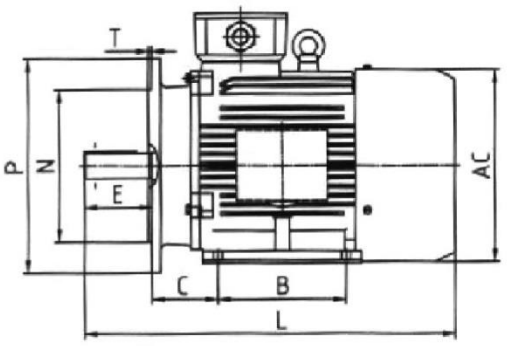

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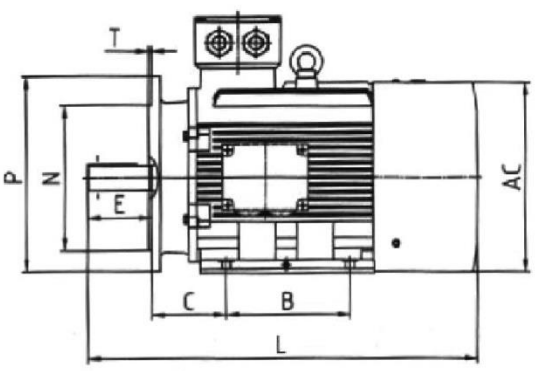


机座号160-355

Shape and installation dimensions (speed ≤ 2000r/min)

seat number	Mounting Dimensions																									Overall dimensions				
	A	A/2	B	C		D		E		F		G		H		K	M	N		P	R		S			T		Flange Number of hole	AB	AC	AD	HD	L
90S	140	70	100	56	±1.5	24	+0.009 -0.004	50	±0.31	8	0 -0.036	20	0 -0.20	90	0 -0.5	10	165	130	+0.014 -0.011	200	0	±1.5	12	+0.430	φ1.0	3.5	0 -0.12	4	180	195	155	250	320
90L			125																														345
100L	160	80	140	63		28		60	±0.37			24		100		12	215	180		250			14.5		φ1.2	4			205	215	180	270	385
112M	190	95		70	±2.0									112								±2.0							230	240	190	300	400
132S	216	108		89		38		80		10		33		132			265	230		300									270	275	210	345	470
132M			178																														510
160M	254	127	210	108	±3.0	42	+0.018 +0.002	110	±0.43	12	0 -0.043	37		160		14.5	300	250	+0.016 -0.013	350		±3.0	18.5	+0.520		5			320	330	255	420	615
160L			254																														670
180M	279	139.5	241	121		48				14		42.5		180															355	380	280	455	700
180L			279																														740
200L	318	159	305	133		55				16		49		200		18.5	350	300	±0.016	400									395	420	310	505	785
225S	356	178	286	149	±4.0	60	+0.030 +0.011	140	±0.50	18		53		225			400	350	±0.018	450								8	435	470	335	560	820
225M			311																														845
250M	406	203	349	168		65				18	0 -0.043	58		250	0 -0.5														490	510	370	615	920
280S	457	228.5	368	190	±4.0	75	+0.030 +0.011	140	±0.50	20	0 -0.052	67.5	0 -0.20	280	0 -1.0	24	500	450	±0.020	550		±4.0	18.5	+0.520	φ1.2	5	0 -0.12	8	550	580	410	680	990
280M			419																														1040
315S	508	254	406	216	±4.0	80	+0.030 +0.011	170	±0.50	22	0 -0.052	71	0 -0.20	315	0 -1.0	28	600	550	±0.022	660			24	+0.520	φ2.0	6	0 -0.15	8	635	645	530	845	1240
315M			457																														1350
315L			508																														1350

355M	610	305	560	254		95	+0.035 +0.013			25		86		355			740	680	±0.025	800									730	710	655	1010	1530
355L			630																														

Note: R dimension is the distance from the flange mating surface to the shoulder of the shaft extension; L dimension may be longer when fan end is fitted with an axial fan.

Outline and mounting dimensions (speed 2000～3600r/min)

seat number	Mounting Dimensions																												Overall dimensions				
	A	A/2	B	C		D		E		F		G		H		K	M	N		P	R		S			T		Flange Number of holes	AB	AC	AD	HD	L
90S	140	70	100	56	±1.5	24	+0.009 -0.004	50	±0.31	8	0 -0.036	20	0 -0.20	90	0 -0.5	10	165	130	+0.014 -0.011	200	0	±1.5	12	+0.43 0	φ1.0	3.5	0 -0.12	4	180	195	155	250	320
90L			125																														345
100L	160	80			±2.0	28		60	±0.37			24		100		12	215	180		250		±2.0	14.5		φ1.2	4			205	215	180	270	385
112M	190	95	140	70										112															230	240	190	300	400
132S	216	108		89		38	+0.018 +0.002	80		10		33		132			265	230	+0.016 -0.013	300									270	275	210	345	470
132M			178																														510
160M	254	127	210	108	±3.0	42		110	±0.43	12	0 -0.043	37		160		14.5	300	250		350		±3.0	18.5	+0.52 0		5			320	330	255	420	615
160L			254																														670
180M	279	139.5	241	121		48				14		42.5		180															355	380	280	455	700
180L			279																														740
200L	318	159	305	133		55	+0.030 +0.011			16		49		200		18.5	350	300	±0.016	400									395	420	310	505	785
225S	356	178	286	149	±4.0	55			±0.50	18				225			400	350	±0.018	450		±4.0						8	435	470	335	560	820
225M			311																														845
250M	406	203	349	168		60		140			0 -0.043	53		250	0 -0.5	24	500	450	±0.020	550			18.5	+0.52 0		5	0 -0.12	8	490	510	370	615	920
280S	457	228.5	368	190		65					0 -0.052	58		280	0 -1.0														550	580	410	680	990
280M			419																														1040

315S	508	254	406				216	28	600	550	±0.022	660	φ2.0	2	0 -0.15	635	645	530	845			1240
315M			457																			1350
315L			315 508																			
355M	610	305	560	254	7520	67.5			355	740	680	±0.025				800	730	710	655	1010	1500	
355L			630																			

5. Notes:

5.1 TYP series high-efficiency permanent magnet frequency conversion synchronous motor must be used with permanent magnet motor frequency converter, and must not be directly connected to the three-phase current through the frequency converter;

5.2 TYP series high-efficiency permanent magnet inverter synchronous motor frequency converter must adopt the maximum torque/current ratio control method, otherwise it cannot reach the optimum working condition, which will cause the motor power factor to drop and torque to decrease;

5.3 TYP series high-efficiency permanent magnet frequency conversion synchronous motors are Y-connected and Y/△ conversion is not allowed.

6. Energy saving principle of permanent magnet synchronous motor:

6.1 High efficiency: compared with Y2 series motors, the average power saving is more than 10%. Generally, the efficiency of asynchronous motor decreases faster when the load is below 60% of the rated load, and the efficiency is very low when the load is light; the efficiency of a s y n c h r o n o u s motor decreases faster with the decrease of the rotational speed, so the efficiency of asynchronous motor is very low when the motor is in the low-speed and low load; the TYP series of high-efficiency permanent magnet inverter synchronous motor is in the high-efficiency zone at the load from 20% to 110% of the rated load. The power saving rate of TYP series high-efficiency permanent magnet frequency conversion synchronous motor is 10%~40% as measured by many manufacturers under different working conditions.

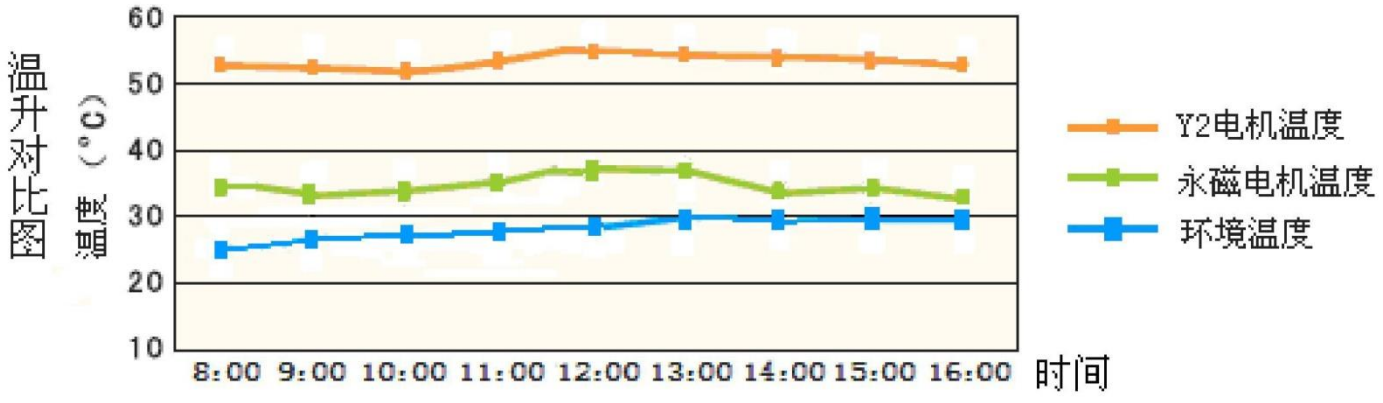
6.2 High power factor, the measured value of the rated state is close to the limit value of 1.0, and all of them are above 0.95, and the power factor curve and efficiency curve of TYP series high-efficiency permanent magnet frequency conversion synchronous motors are high and flat; with high power factor, the stator current is small, which reduces the copper consumption of the stator and improves the efficiency.

6.3 Small current: As this series of motors adopts rotor magnet steel built-in structure, it has a certain convex pole torque, and then adopts the maximum torque/current ratio control mode, so that the motor has a high power factor in the full speed range, and the current of the motor decreases significantly. It has been measured that the stator current value of high-efficiency permanent magnet frequency conversion synchronous motor and asynchronous motor can be reduced by 15% to 30%, and the motor current is greatly reduced, which reduces the loss in cable transmission, and it is equal to expanding the capacity of the cable, and more motors can be installed in the transmission cable.

6.4 No slip and stable speed: TYP series high-efficiency permanent magnet frequency conversion synchronous motor is a synchronous motor, the motor speed is only related to the power supply frequency, the motor speed is synchronized with the rotating magnetic field speed of the stator, which is not affected by voltage fluctuation and load size, and there is no loss of rotor, no slip, and no rotor power loss, thus improving the efficiency and control accuracy.

6.5 Lower temperature rise 15～20℃: Due to the high efficiency and low loss of TYP series high-efficiency permanent magnet frequency conversion synchronous motor, the temperature rise is lower. As measured, under the same conditions, the working temperature of high efficiency permanent magnet frequency conversion synchronous motor is 15-20℃ lower than that of asynchronous motor.

Temperature Rise Comparison Chart



VII. Installation of electric motors

1. The motor is allowed to be driven by couplings, spur gears and pulleys.

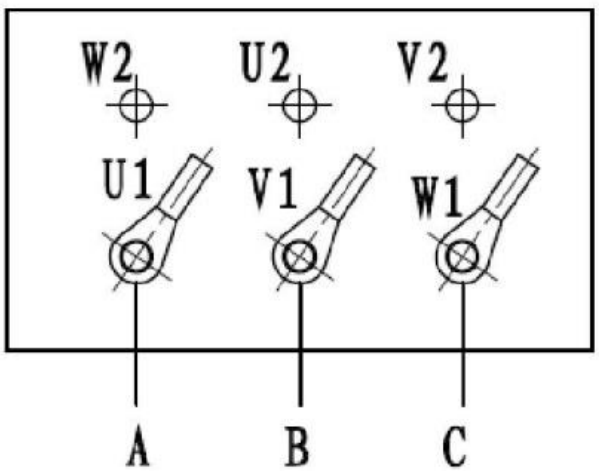
2、When belt drive is used, the centerline of motor shaft and load shaft are parallel to each other and the centerline of belt is perpendicular to the centerline of shaft; when coupling drive is used, t h e centerline of motor shaft and the centerline of load shaft should coincide.

3. The installation of the motor should ensure its good ventilation and cooling conditions.

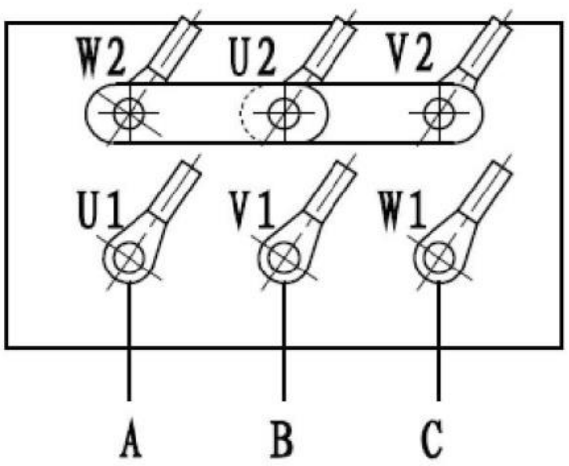
VIII. Operation of electric motors

1. The motor should be properly grounded, and there is a grounding device in the junction box. If necessary, the motor can also be used to ground the foot fastening bolts.

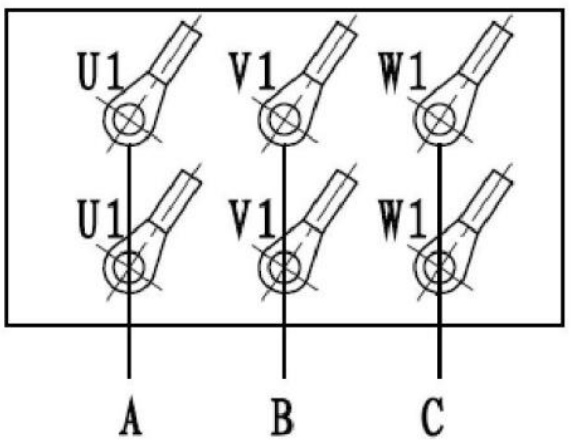
2. There are 6 terminals on the terminal board of the motor. If the stator winding has been Y-connected, only three wires with terminals are drawn out and connected to the terminals of U1, V1 and W1 of the terminal board, and the power supply wires A, B and C are connected to these three terminals, and no wires or connecting pieces are connected to U2, V2 and W2; if the stator winding has not been Y-connected, six wires with terminals are drawn out and connected to the terminals of U1, V1, W1, W2, U2 and V2, and connected to the terminals of W2, U2 and V2 with connecting pieces. W2, U2, V2 connection on the terminal board, connected to Y connection; stator winding has been Y connection, lead with terminal six wires, respectively, connected to U1, U1, V1, V1, W1, W1 terminal, wiring two U1 connected to the A-phase power supply, the two V1 connected to the B-phase power supply, the two W1 connected to the C-phase power supply. The following diagram shows the connection method:



The motor winding is Y-connected internally, 3 wires are drawn out



The motor winding is not Y-connected internally, 6 wires are drawn out of the motor winding



The motor winding is Y-connected internally, 6 wires are drawn out of the motor winding

3. When the three-phase power supply is connected to terminals U1, V1 and W1 according to phase sequence A, B and C respectively, the motor's steering will be clockwise from the end of the shaft extension, and the motor's steering will be counterclockwise by replacing the two power supply phases arbitrarily.

4. Overloading is not allowed for motors that work continuously.

5. The motor should not have intermittent or abnormal sound or vibration in no-load or load operation, and the bearing temperature should not exceed 95℃.

IX. Maintenance and repair of electric motors

1. the use of the environment should always be kept dry, the surface of the motor should be kept clean, the air inlet should not be obstructed by dust, fibers and so on.

2. When a protection alarm occurs, the cause of the fault should be identified and the fault should be eliminated before it is put into operation.

3. When stopping for inspection, wait until the motor is completely stopped before operation.

4. In order to ensure good lubrication of the motor in the process of operation, the motor running about 4000 hours, that is, should be supplemented or replaced grease (closed bearings in the use of life without replacing the grease), operation found that the bearings are overheated or deterioration of the grease, the grease should be replaced in a timely manner. When replacing the grease, the old grease should be removed and the oil groove of the bearing and the bearing cover should be cleaned with gasoline, and then small and medium-sized motor grease should be added to fill **two thirds of the gap between the inner and outer rings of the bearing.**

5 .When the life of the bearings ends, the vibration and noise of the motor operation will increase significantly, check the radial clearance of the bearings reaches the value in the following table, that is, the bearings should be replaced.

Bearing inner diameter	20-30	35 - 50	55-80	85-120
Limit wear	0.10	0.15	0.20	0.30

Bearing specifications are listed below:

Bearing specification table for motors with speed **≤2000 r/min**

seat number	Bearing	
	Spindle	fan side
H90	6205-2RZ/Z1	6205-2RZ/Z1
H100	6206-2RZ/Z1	6206-2RZ/Z1
H112	6206-2RZ/Z1	6206-2RZ/Z1
H132	6208-2RZ/Z1	6208-2RZ/Z1
H160	6309/Z1	6209/Z1
H180	6311/Z1	6211/Z1
H200	6312/Z1	6212/Z1
H225	6313/Z1	6312/Z1
H250	6314/Z1	6313/Z1
H280	6317/Z1	6314/Z1
H315	N319	6319/Z1
H355	N322	6322/Z1

Rotation speed **2000 to 3600r/min Bearing specification table for electric motors**

seat number	Bearing	
	Spindle	fan side
H90	6205-2RZ/Z1	6205-2RZ/Z1
H100	6206-2RZ/Z1	6206-2RZ/Z1
H112	6206-2RZ/Z1	6206-2RZ/Z1
H132	6208-2RZ/Z1	6208-2RZ/Z1
H160	6209/Z1 C3	6209/Z1 C3
H180	6211/Z1 C3	6211/Z1 C3
H200	6212/Z1 C3	6212/Z1 C3
H225	6312/Z1 C3	6312/Z1 C3
H250	6313/Z1 C3	6313/Z1 C3
H280	6314/Z1 C3	6314/Z1 C3
H315	6317/Z1 C3	6317/Z1 C3
H355	6319/Z1 C3	6319/Z1 C3

6. The maintenance of TYP series high efficiency permanent magnet frequency conversion synchronous motor requires qualified units or personnel who understand the precautions of TYP series high efficiency permanent magnet frequency conversion synchronous motor.

When disassembling the motor, it is acceptable to remove the rotor from either the shaft extension or the non-shaft extension. If it is not necessary to remove the fan, it is more convenient to remove the roto r from the non-extended end. When removing the rotor from the stator, prevent damage to the stator windings or insulation.

8. When replacing the windings, the form, size, number of turns and gauge of the original windings must be noted. Replacement of the original design windings at will will often deteriorate one or more of the motor's properties, or even make it impossible to use the motor.

X. Storage and transportation of electric motors:

1. The motor should be kept dry in storage to avoid drastic changes in ambient temperature.
2. The motor should not be stacked too high in storage to avoid damage to the lower motor.
3. The motor should be prevented from dumping or inverting during storage and transportation.

Coalbed Methane Application Cases and Energy Saving Tests

The technicians tested the TYP160L-8-7.5kW motor instead of the YCT225-4B-15kW motor in the coalbed methane reform project in Kakizhuang Town, Jincheng City, Shanxi Province, and achieved remarkable energy-saving effects.

1. Content:

The retrofit project is YCT225-4B-15kW speed control motor, and the equipment is mainly used in coal bed methane pumping machines. Several companies participating in the bidding replaced the YCT motor with a permanent magnet motor, and a third-party enterprise with testing qualifications participated in the test and issued the test report. Lijiu Motor achieved the first place in the test.

Based on the trial machine test data record (attached picture below) to get: YCT225-4B-15kW electric motor average power consumption per hour is 3.554kWh.

The average hourly power consumption of TYP160-8-7.5kW permanent magnet frequency conversion motor is 0.8421 kWh.

2. Energy-saving effect:

From the calculation, we can get the average power saving of 2.7119 kWh per hour, and the average power saving rate is 2.7119/3.554 mcm276.3%. The coalbed methane pumping machine operates all day long, and the annual calculation is based on 300 days, and the electricity cost is calculated according to 0.70 yuan per unit, and the monthly power saving under this condition is as follows: 2.7119 kWh ×24 hours ×300 days ×0.70 yuan/kWh = 13668.00 yuan/year.

Original YCT225-4-15W Motor

TYP160l-8-7.5kW permanent magnet synchronous motor

Roots fan application cases and energy saving tests

Technicians in Hebei Junli Pharmaceutical and Chemical Co., Ltd. Roots fan 90KW motor replacement TYP90KW permanent magnet motor test, achieved significant energy-saving effect.

1. Content:

This retrofit project consisted of six 90KW Roots fans, which are mainly used to supply air to the bacteria reservoirs. The site conditions are such that the water level varies during daytime working hours and is at a fixed height during off-duty hours.

Roots fan is SSR three-lobe Roots blower produced by Shandong Zhanghuang Machinery Industry Co., Ltd the original supporting motor is 280M-4-90KW ordinary three-phase asynchronous motor. The energy-saving transformation method is to replace the original ordinary three-phase asynchronous motor with a permanent magnet synchronous motor, which is controlled by a series of frequency converter specially designed for permanent magnet by I n v e n t e c , and the on-site test is operated by the staff of Junli Pharmaceutical and Chemical Compan y, and is based on the data records of the trial test (the following pictures are attached):

280M-4-90KW Average hourly power consumption of ordinary three- phase asynchronous motor is 72kWh TYP280M-90KW Average hourly power consumption of permanent magnet frequency conversion motor is 60.6 kWh.

2. Energy saving effect:

From the calculation, we can get an average of 11.4 kWh per hour, and the average power saving rate is 11.4/72 smelting mechanisms15.83% Junli's pharmaceutical and chemical Roots blower operates all day long, and the electricity cost is calculated according to 30 days per month, and the electricity cost is calculated according to one yuan, and the power saving per month is 11.4 kWh ×24 hours ×30 days ×1 yuan/degree=8208 yuan/month under this condition.

It can be seen that the cost of retrofitting can be recovered in three or four months under these conditions.

SSR Tri-lobe Roots Blowers produced by Shandong Zhanghuang Machinery Industry Co:

Y280M-4-90kW Motor

TYP280M-90KW Permanent Magnet Synchronous Motor

Cement pipe making machine application case and energy saving test

The technicians replaced two motors of pipe making equipment in Jinan Yongshun Pipeline Co., Ltd, one of which is YCT355-4E-132kW motor for maximum production of φ2000*2000, and replaced it with TYP280M-6-90kW
motor; one of which is YCT355-4B-75kW motor for maximum production of φ1200*2000, and replaced it with TYP225S2-6-45kW motor through on-site test. TYP225S2-6-45kW motor, through the field test, has a significant effect of power saving.

1. Measuring equipment and instruments

Table 1

test unit	Test equipment	Measuring device		
		Instrument name	Accurat	Measurement function
Jinan Yongshun Pipeline Co.	TYP 280M-6-90W Motor Replacement YCT355-4E-132kW Maximum production of φ2000*2000 cement pipe	Elcometer ELE-3D3Y Three-Phase Liquid Crystal Multifunction Power Meter	0.5	Phase voltage, line voltage, three-phase current, power factor, active power, reactive power, active power, reactive power
		Astronergy 250/ 5 Current Transformer	0.5	Active power, reactive power, active power, reactive power
	TYP 225S2-6-45W Motor replacement YCT355-4B-75kW Maximum production φ1200*2000 cement pipe	Elcometer ELE-3D3Y Three-Phase Liquid Crystal	0.5	Phase voltage, line voltage, three-phase current, power factor, active power, reactive power, active power, reactive power
		Multifunction Power Meter	0.5	

2. Measurement results

Table 2

Pipe making machine Motor type	φ2000×2000			φ1500×2000		
	Time（min）	Electricity consumption（kWh）	Power saving（%）	Time（min）	Electricity consumption（kWh）	Power saving（%）
YCT355-4E-132kW	30	12.2	37.7	20	7.3	57.5
TYP 280M-6-90kW	30	7.6		20	3.1	

Table 3

Pipe making machine Motor Model	φ1200×2000			φ1000×2000			φ800×2000		
	Time（min）	Power consumption（kWh）	Power saving（%）	Time（min）	Electricity consumption（kWh）	Power saving（%）	Time（min）	Electricity consumption（kWh）	Power saving（%）
YCT355-4B-75kW	15	5.43	47.5	15	2.24	44.2	15	1.95	36.9
TYP 225S2-6-45kW	15	2.85		15	1.25		15	1.23	

TYP280M-6-90kW Replacement YCT355-4E-132kW Motor

TYP225S2-6-45kW Replacement YCT355-4B-75kW Motor

TYP Series High Efficiency Permanent Magnet Synchronous Frequency Converter Motor Energy Saving Case

Plastic Extruder Application Cases and Energy Saving Tests

Permanent magnet motors are also widely used in the plastic extruder industry, such as "Wuxi Boyu Plastic Machinery Co., Ltd.", which is now u s i n g a large number of permanent magnet inverter motors, the following is a case of Wuxi Boyu Plastic Machinery Co., Ltd. using permanent magnet synchronous motors instead of asynchronous motors to save a lot of investment for the user.

A flooring manufacturer in Changzhou is using a SPC 92 four-roll flooring production line from Wuxi Boyu Plastic Machinery Co., Ltd. for the production of flooring, the main power motors are ordinary asynchronous inverter motors as well as high-efficiency permanent magnet synchronous inverter motors, one equipment is equipped with a Siemens 4-pole, 50-pole, 110KW asynchronous inverter motor with a rated current of 205A, the motor rotates at 863 r e v o l u t i o n s / m i n u t e during operation, the output torque is 583-59% of the rated torque, the input current is around 143A. The output torque is

58.3-59% of the rated torque, the input current is around 143A, and the input power of the motor at this time is 54.3KW, with an efficiency of 73%, as m e a s u r e d on site by a meter and other measuring instruments.

And the other supporting use is TYP315S-6-110kW, frequency 75Hz high-efficiency permanent magnet frequency conversion synchronous motor, rated current 185A, the input current is 64A at basically the same working condition, and the measured input power of the motor is 24.3KW with an efficiency of 96%.

After comparison, TYP high-efficiency permanent magnet synchronous frequency conversion motor in the same working conditions, per hour than the asynchronous frequency conversion motor to save electricity 30kWh (degrees) or so, if the average price of electricity price of 0.8 yuan / kWh calculations, at this time, the TYP high-efficiency permanent magnet frequency conversion synchronous motor to save money 24 yuan per hour, according to the characteristics of flooring enterprises 24 hours a day to save 576 yuan in electricity, comprehensively consider all aspects of the factors, according to 400 yuan per day to save electricity, 1 month can be purchased permanent magnet motor to save the price difference is the enterprise's net profit. Considering all factors, according to the daily electricity saving 400 yuan, 1 month can be purchased permanent magnet motor price difference to save out, and then the monthly savings is the enterprise's net profit. If it is a 200KW motor of SPC 110 model, the saving of electricity cost per day can be up to 1,000 RMB.

Wuxi Boyu Plastic Machinery Co. SPC Floor Production Line