建肯®
JIANKEN

High Speed Motor Spindle

OPERATION MANUAL

JINGJIANG CITY JIANKEN HIGH-SPEED ELECTRIC MOTOR CO.,LTD

（Initial: **JINGJIANG CITY JINGGONG HIGH-SPEED ELECTRIC MOTOR CO.,LTD**）

Thanks for selecting Jianken JG series High-Speed Spindle Motor(High-speed motor, high-speed grinding head). We wish Jianken products to accelerate the pace of your business success and help you obtain splendid achievements. During the operation, please feel free to contact us or the dealer for any questions or suggestions, and we will be at your service.

This manual is intended to provide the user with instructions on how to install, operate, routinely maintain, preserve, and precautions. In order to ensure proper installation and operation, please read this manual carefully before operation, and keep it properly for future overhaul and maintenance.

CONTENTS

1. Tips

◆ It's necessary to match the high speed spindle motor with inverter. No allowing directly plugging the spindle motor to the power supply. Otherwise, it will damage the high-speed spindle directly.

◆Before the inverter drives the spindle, all the parameters must be set up correctly. Wrong settings will also damage the spindle motor.

2. JGL Pneumatic Tool Change Spindle Motor

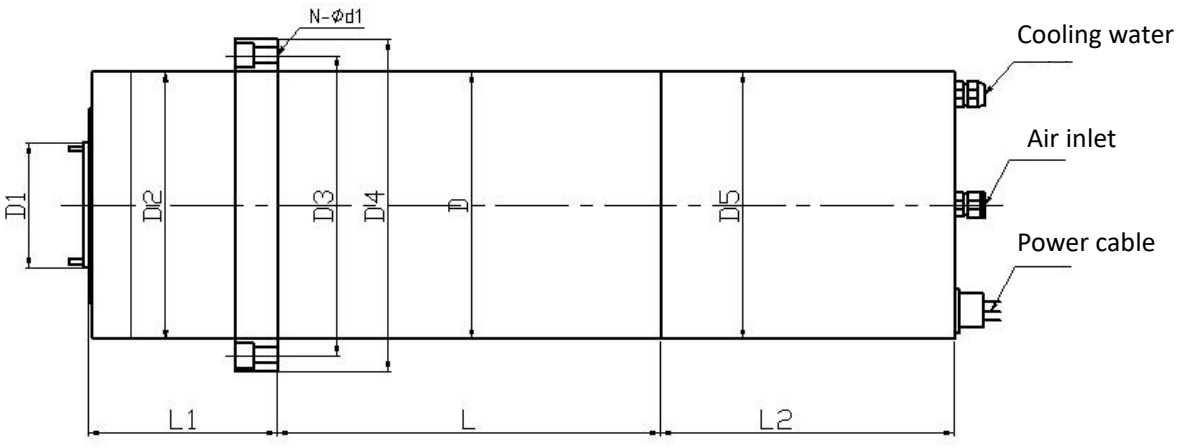
JGL series is the high precise automatic tool change spindle motor, drove by inverter, which can continuously adjust the spindle speed by controlling the frequency. It has the characteristics of low noise, stable and reliable operation, fast tool changing and high precision of repeated tool change. It's mainly used for high speed drilling, grinding and engraving in machining centers. During the machining, the tool can be changed automatically by the air cylinder on the spindle and CNC controlling on the machine, which improves the machining efficiency.

2.1、Specifications

models	Speed (r/min)	Motor parameters				Lub mode	Inter face	cool	Note
		power (kW)	Volt (V)	Freq (HZ)	Cur (A)				
JGL-62/1.8R60	60000	1.8	220	1000	4.5	grease	263504	water	with unclamp & clamp unit
JGL-62/1.8R60-10	60000	1.8	220	1000	4.5	grease	ISO10	water	with unclamp & clamp unit
JGL-80/1.5R24-20	24000	1.5	220	400	4.2	grease	ISO20	water	with sensor unclamp & clamp unit
JGL-80/2.2R24-20	24000	2.2	220	400	6	grease	ISO20	water	with sensor unclamp & clamp unit
JGL-80/2.2R30-20	30000	2.2	220	500	6	grease	ISO20	water	with sensor unclamp & clamp unit

models	Speed (r/min)	Motor parameters				Lub mode	Inter face	cool	Note
		power (kW)	Volt (V)	Freq (HZ)	Cur (A)				
JGL-80/2.2R40-20	40000	2.2	220	666	6	grease	ISO20	water	with sensor unclamp & clamp unit
JGL-85/1.5R24-20	24000	1.5	220	400	4.2	grease	ISO20	water	with sensor unclamp & clamp unit
JGL-100/2.5R24-25	24000	2.5	380	800	4	grease	ISO25	water	with sensor unclamp & clamp unit
JGL-100/3.2R24-25	24000	3.2	380	800	5.2	grease	ISO25	water	with sensor unclamp & clamp unit
JGL-110/4.2R24-30	24000	4.2	380	800	7.5	grease	BT30	water	with sensor unclamp & clamp unit
JGL-120/5.5R24-30	24000	5.5	380	500-800	9	grease	BT30	water	with sensor unclamp & clamp unit
JGL-120/7.5R24-30	24000	7.5	380	500-800	13	grease	BT30	water	with sensor unclamp & clamp unit
JGL-125/5.5R24-30	24000	5.5	380	500-800	9	grease	BT30	water	with sensor unclamp & clamp unit
JGL-150/7.5R15-30	15000	7.5	380	500	13	grease	BT30	water	with sensor unclamp & clamp unit
JGL-150/7.5R12-40	12000	7.5	380	300-400	15	grease	BT40	water	with encoder sensor unclamp & clamp unit
JGL-150/11R18-40	18000	11	380	600	22	grease	BT40	water	with encoder sensor unclamp & clamp unit
JGL-170/13.5R12-40	12000	13.5	380	400	27	grease	BT40	water	with encoder sensor unclamp & clamp unit

2. 2、overall dimensions



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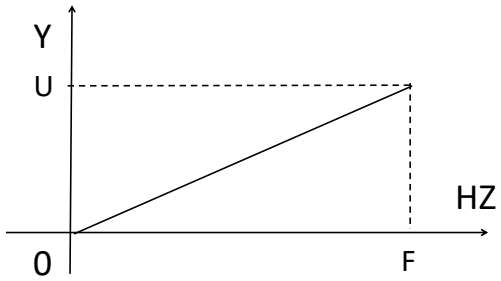
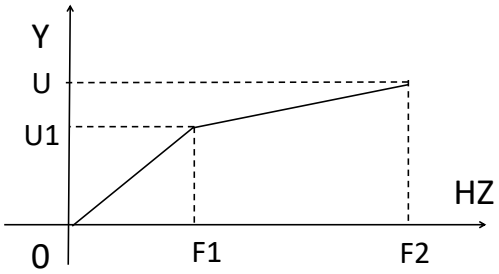
model	Overall dimensions										N.W KG
	D	D1	D2	D3	D4	D5	L	L1	L2	N-d1	
JGL-62/1.8R60	61.9	16	52	-	-	78	146	11	88		3.5
JGL-62/1.8R60-10	61.9	19	61.9	-	-	78	146	13	103		4.8
JGL-80/1.5R24-20	80	28	77	-	-	79.9	178	14	114	-	7.8
JGL-80/2.2R24-20	80	28	73	-	-	79.9	198	13	114		7.8
JGL-80/2.2R30-20	80	28	77	-	-	102	175	14	122	-	8.2
JGL-80/2.5R40-20	80	28	67	-	-	102	170	14	143	-	8.8
JGL-85/1.5R24-20	85	28	77	-	-	102	175	14	122	-	13
JGL-100/2.5R24-25	100	33	92	-	-	99.8	210	12.5	163	-	14.8
JGL-100/3.2R24-25	100	33	92	-	-	99.8	208	14	162	-	14.8
JGL-110/4.2R24-30	110	33	92	-	-	109.8	228	12.5	152	-	16.3
JGL-120/5.5R24-30	120	38	96	-	-	119.8	240	16	150	-	22
JGL-120/7.5R24-30	120	38	96			119.8	240	16	150		22
JGL-125/5.5R24-30	125	38	96	-	-	119.8	240	16	150	-	23.5
JGL-150/7.5R15-30	150	43	120	-	-	149.8	280	50	163	-	48
JGL-150/7.5R12-40	150	63	148	168	185	149.8	223	24	200	8-φ8.5	55
JGL-150/11R18-40	150	58	136	-	-	149.8	304	24	200	-	54
JGL-170/13.5R12-40	170	72	168	190	210	149.8	285	26	182	8-φ8.5	68

3. 3、V/F diagram

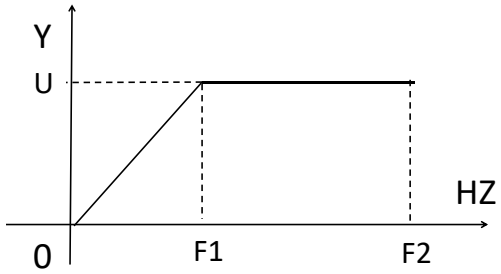
⑴、diagram for constant torque：



⑵、diagram for constant power：



⑶、diagram for approx constant power：



2. 4、Installations

⑴、Operating ambient temperature range: -10℃~40℃

⑵、Before installation, manually rotate the spindle nose to check if it's smooth without any block.

⑶、check if the insulation resistance of stator is 200 MΩ or more.

⑷、Put the spindle into mount bracket without any loose.

⑸、For the water-cool spindle motor, cycled cooling liquid is needed to go through the spindle during operation. The water amount is 0.5L/KW.min, minimum flow rate of the water is not less than 1.5 L/min; A separate water tank is required for the cooling water with anti rust inside. Precise machine tool require to keep the water homothermal at 22

±2℃. The inlet & outlet water tubing should be connected according to the labels on the spindle. No leaking at the joint. Make sure the cooling liquid flows smoothly.

⑹、Water prevention and shielding measures should be taken for the power cables. It's better no more than 200cm long of the distance between the spindle motor and inverter. High frequency should be prevented to avoid the interference on CNC machine controlling system.

⑺、Set up the parameters of inverter correctly. The inverter's voltage and frequency should accord with those of the spindle motor. (If the inverter is not purchased from us, the rated frequency is usually made 50HZ. If directly running without any settings on the inverter, the spindle will be burnt at once due to the high current). During the inverter setting, its rated frequency (corner frequency), maximum frequency, maximum voltage should correspond with those of the spindle graphs respectively. Overload current is set 120% of the rated current. Overload protection time is set 8s. Speed up & down is set 10~12s. Prolong the speed-up time if the starting time exceeds the rated current.

⑻、 Respectively connect U, V, W of the inverter with three thick cables of the spindle. Another two thin wires are for thermistor. After power on, inch the inverter. Observe if the spindle rotates in the same direction as the arrow direction shown on the spindle. If not, stop the spindle immediately, and then exchange any two of the three power cables. In this way, the connection is surely correct. No allowing running the spindle in the wrong direction.

⑼、Check if the pressure of air supply is 0.6~0.8 mpa. And filter the output air at the accuracy 25μm.

⑽、 Before starting the spindle, ensure the valve of "air sealed" is turned on normally at the pressure 0.1~0.15 mpa. From the beginning to

the end, no matter the spindle is working or the tool is changing, “air sealed” should be activated all the time unless the whole CNC machine stops, which is to avoid the pollution from cooling liquid or the cutting chips.

⑾、There is thermistor inside the spindle stator, with the model 103F3950，R25:10K 1% B: 3950K。It’s used to detect the temperature inside the spindle.

2. 5、Air connection & steps of tool change

According to the labels at the back of spindle, connect “air inlet”, “dust removal”, “air return” and “air sealed”. Adjust the pressure as following:

air inlet: to release the tool holder, 0.6~0.7 mpa,

dust removal: to clean the dust off the internal of rotor, 0.4~0.5 mpa

air return: to make the air cylinder return to its initial position, 0.6~0.7 mpa

air sealed: to clean the dust & chips off the external of spindle waterway , 0.1~0.2 mpa

To change the tool, please see the steps as following:

(1) Control the valve for tool released, pressurize “air inlet” for 3~5s. At this moment, clamp inside the spindle cone will open.

(2) Control the valve of “dust removal” and pressurize it at the pressure 0.4~0.5 mpa.

(3) Insert the tool holder into spindle cone till the cone top.

(4) Turn off the valve of “air inlet” and “dust removal” at the same time. Discharge the air inside the cylinder through exhaust. Now the

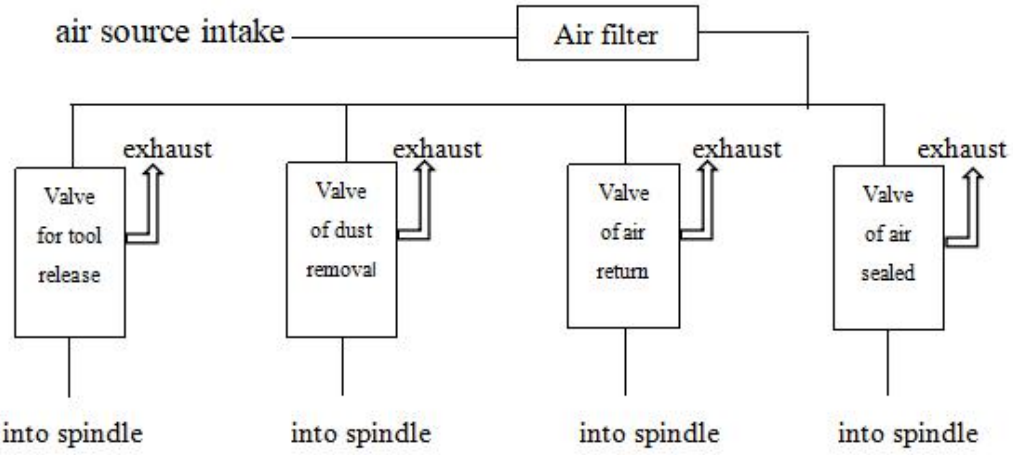
tool holder is installed.

(5) Turn on the valve of “air return” and pressurize it for 5s. Then turn it off.

(6) Now that’s all for a whole step of tool changing.

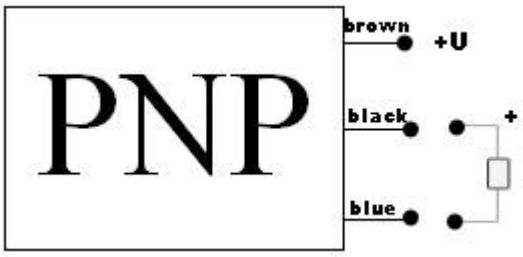
(7) Turn on the valve of “air inlet” once again, the initially installed tool holder will be released.

(8) A diagram of air connection:



2. 6、Sensor connection & operation

Without your specifications in advance, we offer PNP type of sensor for the spindle. If NPN is needed, please specify in advance.

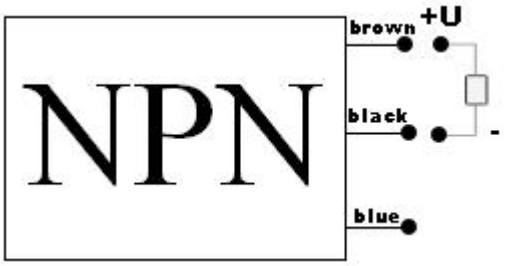


brown wire U 10-30V DC

I 200mA max

black wire positive voltage output

blue wire 0V



brown wire U 10-30V DC

I 200mA max

black wire negative voltage output

blue wire 0V

Turning on “air inlet” will have the clamp inside the spindle cone

opened,the sensor for tool released will output signal of voltage. When “air inlet” is turned off, and tool holder is in the right place of spindle, the sensor for tool clamped will output signal of voltage. Only when the sensor with too holder in place outputs voltage, the spindle can be started.

2. 7、Maintenance

⑴、Warranty period of bearings is 2500 hrs; for the other parts of the spindle, it’s one year. However, maintenance has to be chargeable If users ignore “air sealed”, which leads to the fluid or cutting chips entering the bearing and then damaging the bearing / spindle.

⑵、For new spindle or spindle with renewed bearings, to prolong its lifetime, gradually speed it up from low rpm to high rpm. About an-hour running for raising every 10000 rpm, till the maximum speed. It avoids shortening the bearing lifetime if the spindle directly runs at high speed.

⑶、 To stop the spindle, please cut off the power supply first, then turn off the cooling water only when the spindle completely stops running. In case of long-time deactivation, blow the cooling water out of the spindle waterway with the compressed air.

⑷、 The spindle bearing lifetime will become longer by using the tools with precise dynamic balancing.

⑸、After the spindle is deactivated or stored for six months, it can be used only when the grease is replaced, otherwise, its lifetime will be affected.

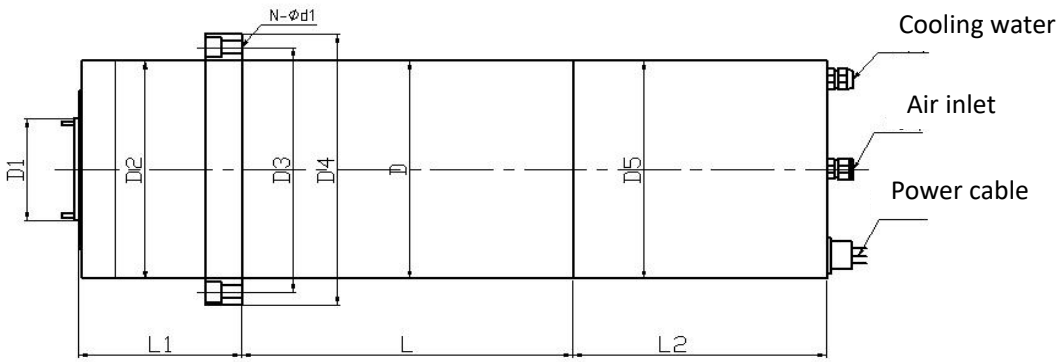
3.JGY Permanent magnet synchronous pneumatic tool change spindle

JGY motor spindle is made on the basis of pneumatic tool change spindle. The rotor is with permanent magnetic material, while the stator winding is redesigned; with inductive encoder inside, the speed can be controlled precisely both in clockwise and anti clockwise motion. Compared to the same size of other spindles, it's characteristic of high power and high torque at low speed, with the function of drilling, tapping, milling, etc.

3.1 Specifications

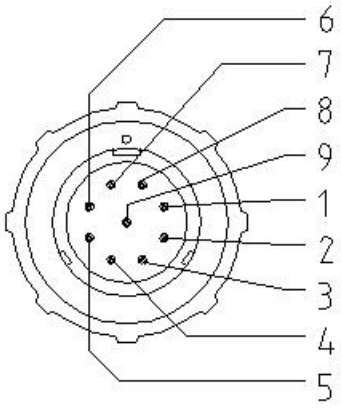
Model	speed(r/min)	Motor parameters				Lub mode	Inter face	cool
		Power (kW	Volt (V)	Freq (HZ)	Cur (A)			
JGY-80/3.7R24-ISO20	24000~30000	3.7	380	800~1200	6	grease	ISO20	water
JGY-100/5.5R15-24-BT30	15000~24000	5.5	380	500~800	10.5	grease	BT30	water
JGY-110/7.5R12-24-BT30	12000~24000	7.5	380	400~800	13	grease	BT30	water
JGY-120/10R13-24-T30	13000~24000	10	380	433~800	21	grease	BT30	water
JGY-150/15R7.5-20-T40	7500~20000	15	380	250~667	30	grease	BT40	water

3. 2 Overall dimension



Model	Overall dimensions										N.W (kg)
	D	D1	D2	D3	D4	D5	L	L1	L2	N-d1	
JGY-80/3.7R24-ISO20	80	28	72	-	-	102	170	7	126	-	10
JGY-100/5.5R15-24-BT30	100	38	72			99.9	220	8	114		14
JGY-110/7.5R12-24-BT30	110	38	92	-	-	110	228	12.5	152	-	19
JGY-120/10R13-24-T30	120	42	120	140	158	120	190	93	165	6-φ8.5	26
JGY-150/15R7.5-20-T40	150	63	148	168	185	149.8	223	24	200	8-φ8.5	55

3. 3、Connection diagram of encoder



No.	Wire colour	Square wave	sine wave
1	brown	Power +5	Power +5
2	white	Power 0	Power 0
3	green	A+	A+
4	yellow	A-	A-
5	blue	B+	B+
6	red	B-	B-
7	gray	Z+	Z+
8	pink	Z-	Z-
9		grounded	grounded

JGY motor spindle needs special permanent magnet synchronous driver. Common inverters can not drive it.

Regarding the installation and maintenance of JGY motor spindle, please refer to JGL motor spindle.

4.

JGD Constant Torque motor spindle

JGH Constant Power motor spindle

JGM Grinding motor spindle

JG series High-speed Spindle motor (High-speed motor, High-speed grinding head), is widely used for CNC drilling, milling, 3D engraving, precise grinding, moudle processing and other high speed machines. The whole equipment and other parts are all precisely processed. High-speed bearings with highly precision are used. The speed is continuously variable.

The spindle is characteristic of high precision, small volume, big torque, stable running and low sound.

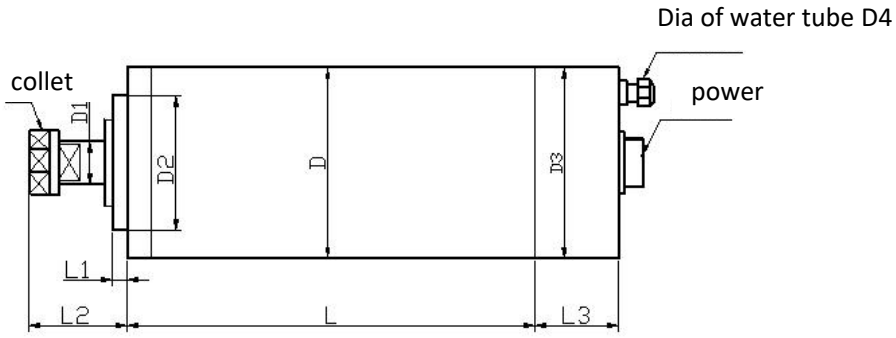
4. 1、Specifications & overall dimensions

JGD constant torque motor spindle

Model	Max speed (r/min)	Motor parameters				Collet type	cool	N. W (kg)
		Power (kW)	Volt (V)	Freq (HZ)	Cur (A)			
JGD-40/0.07	40000	0.07	48	300~666	1	ER8	self	1.1
JGD-48/0.09	50000	0.09	52	300~833	1	ER8	self	1.6
JGD-48/0.15	42000	0.15	75	400~700	1.3	ER11	self	1.9
JGD-48/0.25	60000	0.25	75	400~1000	2	ER8	water	1.3
JGD-48/0.3	50000	0.3	75	400~833	2.5	ER8	water	1.4
JGD-58/0.3	42000	0.3	110	300~700	1.6	ER11	self	2.7
JGD-58/0.4	24000	0.4	110	300~400	2.1	ER11	self	3.1
JGD-62/0.5	40000	0.5	220	400~666	2.6	ER11	water	3.2
JGD-62/0.75	40000	0.75	220	400~666	2	ER11	water	3.2
JGD-62/0.8	30000	0.8	220	400~500	2.2	ER11	water	3.5
JGD-62/1.0R60	60000	1	220	1000	2.8	ER11	water	3.1

JGD-80/0.75	24000	0.75	220	400	2	ER16	self	5.5
JGD-80/1.5R24	24000	1.5	220	400	4.2	ER16	water	7.5
JGD-80/1.5R40	40000	1.5	220	666	4.2	ER16	water	7.5
JGD-80/1.5R60	60000	1.5	220	1000	4.2	ER16	water	7.5
JGD-80/2.2	24000	2.2	380	400	3.5	ER20	water	8.2
JGD-80/2.5R40	40000	2.5	220	666	6.5	ER20	water	8.5
JGD-85/1.5	24000	1.5	220	400	4.2	ER16	water	8
JGD-85/2.2	24000	2.2	380	400	3.5	ER20	water	8.5
JGD-105/2.2	24000	2.2	220	350	6	ER20	water	14
JGD-105/3.2	24000	3	380	350	5	ER20	water	15.5
JGD-125/4.2	24000	4.2	380	350	7.5	ER25	water	23
JGD-125/5.5	24000	5.5	380	400	11	ER25	water	26
JGD-150/13	15000	13	380	250	20	ER32	water	48

JGD overall dimensions



Model	ΦD	ΦD1	ΦD2	ΦD3	ΦD4	L	L1	L2	L3
JGD-40/0.07	40	10	40	40	--	105	5	20	26
JGD-48/0.09	48	10	40	48	--	106	5	20	26
JGD-48/0.15	48	14	46	48		126	5	38	24
JGD-48/0.25	48	10	40	32	6	109	5	20	3
JGD-48/0.3	48	12	42	32	6	119	5	20	3
JGD-58/0.3	58	14	46	57.9	--	120	5	20	26
JGD-58/0.4	58	14	46	57.9	--	140	5	20	26
JGD-62/0.5	62	14	46	61.9	6	123	5	20	28

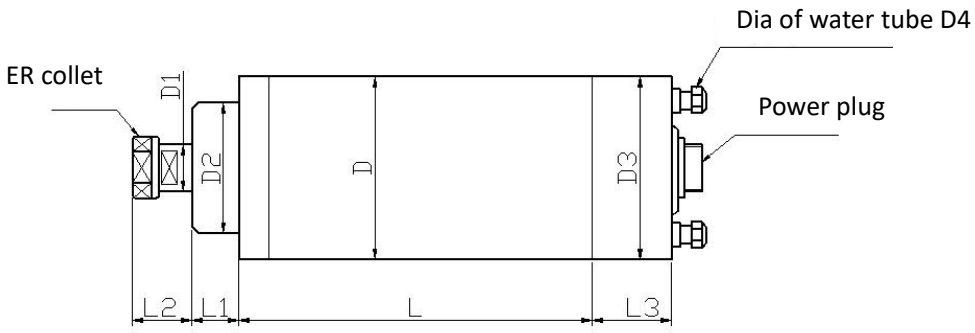
JGD-62/0.75	62	14	46	61.9	8	142	5	20	28
JGD-62/0.8	62	14	50	61.9	8	160	8	23	28
JGD-62/1.0R60	62	14	50	61.9	8	155	8	23	15
JGD-80/0.75	80	19	60	79.9	8	172	6	25	28
JGD-80/1.5R24	80	19	60	79.9	8	182	6	25	28
JGD-80/1.5R40	80	19	60	79.9	8	172	6	25	15
JGD-80/1.5R60	80	15	58	79.9	8	153	11	22	18
JGD-80/2.2	80	24	64	79.9	8	212	14	25	28
JGD-80/2.5R40	80	24	64	79.9	8	216	14	25	28
JGD-85/1.5	85	19	60	84.9	8	186	7	26	28
JGD-85/2.2	85	24	76	84.9	8	212	13	29	28
JGD-105/2.2	105	24	78	104.8	8	222	21	29	40
JGD-105/3.0	105	24	78	104.8	8	242	25	30	40
JGD-125/4.2	125	34	94	124.8	10	249	43	32	42
JGD-125/5.5	125	38	96	124.8	10	262	72	32	42
JGD-150/13	150	38	115	149.8	10	312	52	46	49

JGH constant power motor spindle

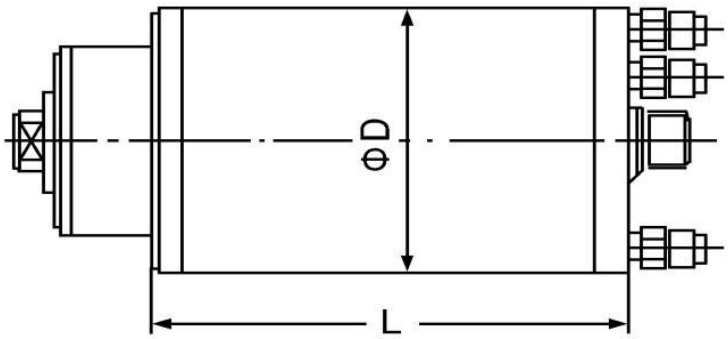
Model	Speed (r/min)	Motor parameters				Collet type	cool	N.W (kg)
		Power (kW)	Volt (V)	Freq (HZ)	Cur (A)			
JGH-80/1.5	12000~24000	1.5	220	400~800	4.2	ER16	water	7.2
JGH-85/1.8	18000~24000	1.8	220	600~800	5	ER20	water	8.5
JGH-105/2.2	12000~21000	2.2	220	400~700	5.9	ER20	water	12
JGH-105/3.0	12000~21000	3	380	400~700	5	ER20	water	16
JGH-125/4.2	12000~21000	4.2	380	400~700	6.2	ER25	water	23
JGH-125/5.5	12000~18000	5.5	380	400~600	7.6	ER25	water	26
JGH-136/5.5	7500~15000	5.5	380	250~500	9	ER32	water	35
JGH-136/7.5	12000~15000	7.5	380	400~500	13	ER32	water	35
JGH-150/11	9000~12000	11	380	300~400	13	ER40	water	53

JGH overall dimensions

model	ΦD	ΦD1	ΦD2	ΦD3	ΦD4	L	L1	L2	L3
JGH-80/1.5	80	24	60	79.9	8	190	18	28	29
JGH-85/1.8	85	24	60	84.9	8	212	26	29	29
JGH-105/2.2	105	24	78	64	8	222	21	29	40
JGH-105/3.0	105	24	78	64	8	242	25	30	40
JGH-125/4.2	125	34	94	90	10	249	43	32	42
JGH-125/5.5	125	34	96	90	10	262	72	32	42
JGH-136/5.5	136	42	106	135.9	10	303	76	32	46
JGH-136/7.5	136	42	106	135.9	10	303	76	32	46
JGH-150/11	150	48	115	149.8	10	310	51	46	49

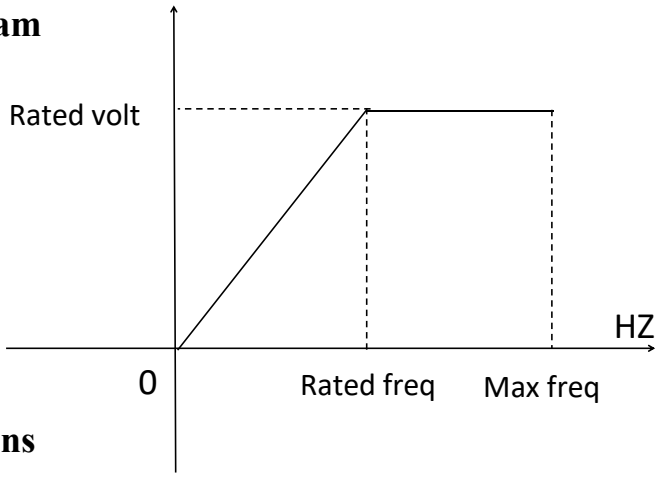


JGM Specifications & overall dimensions



model	Speed r/min	Motor parameteres				Overall size Φ*L	lub	冷却	Nose size	Bearing type
		Power (KW)	Volt (V)	Freq (HZ)	cur （A)					
JGM-48/0.25R60	60000	0.25	75	1000	2	48*110	grease	water	ER8	1/7000-1/708
JGM-58/0.3R50	50000	0.3	110	833	1.6	58*155	grease	--	ER11	1/7002-1/7001
JGM-62/0.75R42	42000	0.75	220	700	2	62*175	grease	water	ER11	1/7002-1/7001
JGM-62/1.2R60	60000	1.2	220	1000	2.6	62*165	grease	water	ER11	2/7002-1/7002
JGM-70/1.0R60	60000	1	220	1000	2.6	70*145	grease	water	M6	1/7001-1/7001
JGM-80/1.5R24	24000	1.5	220	400	3.5	80*215	grease	water	ER16	2/7005-1/7203
JGM-80/1.5R40	40000	1.5	220	666	3.5	80*205	grease	water	ER16	2/7004-2/7003
JGM-80/1.5R60	60000	1.5	220	1000	3.5	80*190	grease	water	ER11	2/7003-2/7003
JGM-85/2.2R60	60000	2.2	380	1000	4.2	85*180	grease	water	M8	2/7003-2/7003
JGM-100/3.2R40	40000	3.2	380	666	6	100*235	grease	water	M12*1	2/7004-2/7004
JGM-105/3.2R24	24000	3.2	400	400	6	105*310	grease	water	M16*1.5	2/7006-2/7005
JGM-120/5.5R36	36000	5.5	350	600	11	120*240	grease	water	M14*1.5	2/7005-2/7005
JGM-125/4.2R24	24000	4.2	380	400	9	125*280	grease	water	ER25	2/7007-2/7205
JGM-125/5.5R24	24000	5.5	380	400	11	125*313	grease	water	M22*1.5	2/7008-2/7205
JGM-150/12.5R24	24000	12.5	350	400	26	150*300	grease	water	M24*1.5	2/7009-2/7008

4. 2、V/F diagram



4. 3、Installations

⑴、Before unpacking the spindle, please check if the package is intact without moisture.

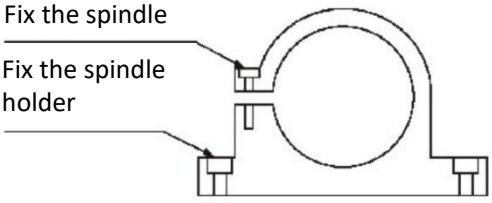
⑵、Please check if the specifications of the motor accord with the application requirement.

⑶、Carefully check if there is any damage or transformation during the transportation, and if the fastener loosens or drops.

⑷、It's permitted to install the motor spindle vertically or horizontally. For self-cooling spindle, think about the heat dissipation during the installation and use a radiator if necessary.

⑸、For water cool motor spindle, make sure the tubing joint is tight and strong enough to avoid water leaking.

⑹、Generally, the spindle is fixed on its housing. Please manufacture the holder according to the following image.。



⑺、Before starting the spindle, manually feel if the spindle can rotate smoothly without any blocking.。

⑻、For the spindle with power plug, its connection is like that: Below

3.5kw, its pin 1, 2, 3 are input terminal, which connect to U, V, W of the frequency converter. Terminal 4 is grounded.

Above 4.0kw, 2, 3, 4 are input terminal while terminal 1 is grounded.

⑼、The starting time of the spindle is usually 5~20 seconds. When operation, please avoid prompt start as much as possible.

⑽、Correctly set up the frequency converter. (VFD) (If the VFD is not purchased from our factory, usually the parameters are not suitable for the motor spindle. So, it's necessary to reset it) Make sure the rated frequency (corner frequency), maximum frequency and its output voltage are in line with those of the spindle.

⑾、After the VFD is set up well, start it without connection to the high speed motor. Measure output of U, V, W with AC voltmeter to see if the voltage goes up with the frequency rising, and then reach the set value. Observe if the starting & stopping time is correct. Then connect it to the spindle motor after it's confirmed there is nothing abnormal.

⑿、Without the user's extra statement, the spindle rotates clockwise by seeing from the spindle back towards its front. No allowing running the spindle in the opposite direction. Otherwise, the nut at the end of the spindle will loosen and drop easily, and then cause danger.

⒀、For the motor spindle with dirt proof by air, the air that will enter the spindle should be dehumidified and filtered to get it cleaned. The air pressure is about 0.1~0.15mpa.

⒁、Intermittent or abnormal sound or vibration should not happen when the spindle is running with & without loading. Temperature of the bearings can not go up to 85℃.

⒂、If power supply deviates above 5%, continuous output of rated power can not be guaranteed.

⒃、No allowing overloading the motor spindle when it's working continuously.

5. Precautions

1、 The ambient conditions have to keep dry. Surface of the spindle should be clean.

2、The operator should obtain skillful and normative operating abilities.

3、After the spindle is started, it must be pre-heated by low-speed running for 10 or 15 minutes, which makes the grease fiber permuted in the direction which bearings rotate. Thus it can reduce the bearing heat and fully lubricate the bearings. Otherwise, without sufficient lubrication, the bearing balls will slip in the raceway and can not be well lubricated, which will easily damage the bearings and cause an increase in noise.

4、Sufficient cooling must be ensured when the spindle is working. For the water cooling spindle, the water has to be 2°C more than the ambient temperature. Maximum water temperature should be not above 60°C. If the high-speed spindle works at a high temperature for a long time, it will accelerate the grease failure, and eventually the rotating noise becomes louder, the vibration increases, the high-speed bearings are damaged, the coil is burnt, and maybe some other faults.

5、Using an abraded tool for machining, or continuing using the tool after it's abraded, will generate a large axial & radial force to the high speed bearing during cutting feeding, which will accelerate the bearing damage and increase the rotation noise. After the spindle works like it for a long time, an axial gap will be caused.

6、If the collet can not get off the nut or get stuck at the end of spindle rotor, usually it's due to damaged nut. Please replace the nut timely.

7、Clean the wasted chips off the nut, collet and rotor end timely. . These chips will not only scratch the rotor cone which affects the

tool-clamping accuracy and eventually scrap the rotor, but also abrade the thread on nuts and rotor which will eventually levigate the rotor thread and make the nut unlocked, loose and useless.

8、In order to ensure the necessary line speed for the small tool cutting, the characteristic of high speed on the spindle is fully taken into account when the spindle is designed. The rigid structure of the spindle motor is limited. Overloading the spindle during cutting, inappropriate processing parameters, and higher capacity on the spindle than its designed ability will all shorten the spindle lifetime.

9、Due to the high speed rotation, there must be some gap between spindle rotor and the material below. In operation, the cutting fluid should be avoided splashing on the nut and rotor as much as possible. At high-speed rotation, the cutting fluid retained on the rotor will go up to the bearings along the rotor rotation, which will destroy the lubrication conditions inside the bearing. It will greatly shorten the bearing lifetime.

10、To stop the spindle, please cut off the power supply first, then turn off the cooling water when the spindle completely stops running. In case of long-time deactivation, blow the cooling water out of the spindle waterway with the compressed air.

11、The spindle bearing lifetime will become longer by using the tools with precise dynamic balancing.

12、After the spindle is deactivated or stored for six months, it can be used only when the grease is replaced, otherwise, its lifetime will be affected.

13、The grinding wheel in the grinding spindle should be watched out to make sure that the working line speed does not exceed the safety line speed. Otherwise, accidents may occur.

6. Maintenance

1、When the thermal protection and short-circuit protection of the inverter are continuously activated, check that the fault may come from the motor, or too low setting values on overloading or protection device. Only when the fault is cleared, the inverter can be operated.

2、The high-speed spindle with grease lubrication should keep in good lubrication during operation. Typically, the lubricant should be supplied or replaced after the spindle has been working for 2000 hours. During operation, when it's found that the bearing is overheated or deteriorated, also replace the lubricant timely.

3、When replacing the lubricant, clear the old and clean the bearing and the cover with gasoline of grade above 95≠ for three times or more. After the cleaned bearing is completely dried, fill up the cavity between its inner ring and outer ring with high-speed & high-temperature lubricant. The filling amount covers 1/2 or 1/3 of the cavity.

4、For the high-speed spindle, angular contact bearings are mostly used. During assembly, the bearing modes and positions should remain its original. Otherwise, the bearing lifetime will be shortened.

5、When the bearing ends its life, the spindle vibration and noise will increase significantly. It's time to replace the bearings. During replacement, pay attention to the matching between the bearing and the shaft & holes. To ensure the assembly quality and accuracy, select the bearing within the same type.

6、When replacing the spindle coil, take notes of the mode, size, turns number, wire gauge, etc. of original coil. Once some data is lost, inquire the manufacturer. If changing the designed coil at random, one or some performances of the motor spindle will deteriorate. The spindle can not be used at all.

7、Bearing type

Spindle bearing type			
Accuracy grade		Bearing type	QTY
Front bearing		P4	
Back bearing		P4	

8、 In case of long-time deactivation, drain away the cooling water inside the waterway, and inject a little anti-rust oil to avoid rusting and blocking. Also oil the spindle collet, nuts and the spindle front part. Treat the whole spindle with rust & damp proof.

9、For new spindle or spindle with renewed bearings, to prolong its lifetime, gradually speed it up from low rpm to high rpm. About an-hour running for raising every 10000 rpm, till the maximum speed. It avoids shortening the bearing lifetime if the spindle directly runs at high speed.

10、 Warranty period of bearings is 2500 hrs; the other parts of the spindle is one year. If users ignore “sealed air”, which leads to the fluid or cutting chips entering the bearing and then damaging the bearing, they have to pay for the maintenance.

7. Warranty specifications

Since the day the product is delivered from our factory, warranty period of bearings is 2500 hrs; for the other parts of the spindle, it’s one year. However, maintenance has to be chargeable even in the warranty period in case of one of the following conditions.

1、damage caused by performing the parameters beyond the rated

2、damage caused by retrofitting or maintaining the spindle without

permission from our factory

3、damage caused by rude carrying or transporting

4、damage caused by other factors not from the spindle motor itself

5、damage caused by natural disaster such as thunder, lightning, etc

8. Others

1、For users' convenience, we provide services about maintenance and consultation.

2、Jianken follows the concepts of sustainable development. We reserve the right to modify, improve and explain any characteristics and performances described in this manual without further notice.

9. Packing List

Packing list of JG series of high-speed spindle motor

No	items	Type	unit	QTY	note
1	High speed motor		unit	1	
2	collet		pc	1	for JGD and JGH
3	nut		pc	1	for JGD and JGH
4	plug		pc		
5	wrench		pc		
6	manual		copy		
7	qualification		copy	1	
8	packing list		copy	1	
9					

Jingjiang City Jianken High-Speed Electric motor Co.,Ltd

Certificate of Qualification

Product name: High-Speed spindle motor

Product model:

Series No.:

The product has been tested and qualified for delivery.

Inspector：

Quality Control Depart：

Delivery Date：

Jingjiang City Jianken High-Speed Electric motor Co.,Ltd

ADD：No. 16 Runjinggang Rd, Hongguang industrial park, Jingjiang city, Jiangsu, China

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http://www.jian-ken.com/

http://www.jkspindle.com