AC SERVO MOTOR Safety Precautions

Thank you for purchasing HIWIN's AC servo motor. Installation and operation of the motor must be in accordance with the HIWIN manual. Before using the servo motor, please read these safety instructions and precautions carefully.

★ Unpacking instructions

1. Before using the servo motor, please read these safety instructions and precautions carefully. HIWIN is not responsible for any damage, accident, or injury caused by incorrect handling.
2. Examine the appearance of the motor for any unusual marks or damage from shipment.
3. Inspect the wires for damage.
4. Do not disassemble the motor. Since the product design has been based on structure calculations, computer simulations, and prototype testing, do not disassemble the product without the permission of HIWIN engineers.
5. Supervise children when handling this product.
6. People with psychosomatic illness or insufficient experience should not handle this product, unless under the direct supervision of managers or product narrators.

If any items are damaged or incorrect, please contact your distributor or HIWIN sales representative.

★ Safety instructions

1. The product can only be repaired by HIWIN engineers. Please send the product back to us if there is any unusual phenomenon.
2. Do not hold the motor by its wire harness or shaft.
3. Do not hit the motor or shaft. Shock can damage the encoder inside the motor.
4. Do not apply loads to the motor shaft that are in excess of the specified value.
5. Protect the motor and encoder from high electrical noise, vibration, and unusual temperatures.
6. Do not change the motor parts or disassemble the screws. HIWIN will not be responsible for any damages, injuries, or accidents that may occur.

★ Wiring instructions

1. Ensure the specified power input value before using the product, and verify that the proper power supply is being used.
2. Before operation, please ensure that the motor, brake, and encoder are connected correctly. Incorrect wiring may cause abnormal motor operation or even cause permanent damage to the motor.
3. To avoid voltage coupling and electrical noise on the encoder, ensure adequate separation of the motor power wires and the encoder wires.
4. Ensure that the motor ground wire is connected to the ground terminal on the servo drive.
5. Do not perform a dielectric voltage-withstand test on any encoder terminal. The test may cause damage to the encoder.

★ Operation instructions

1. Higher than maximum specified current may cause demagnetization of magnetic components inside the motor.
2. The AC servo motor is designed to operate through a dedicated servo drive. Do not connect to a commercial power source (100/200V AC, 50/60 HZ). The motor will not operate correctly and may cause permanent damage.
3. The motor must be operated within its specified range.
4. Attention should be given to ensure adequate cooling and ventilation of the motor during operation.
5. For long term use, the motor shaft should be resupplied with proper and sufficient oil during the period of operation.
6. If any abnormal odor, noise, smoke, temperature rise or vibration is detected, stop the motor immediately. Remove power from the servo drive and isolated the motor.

★ Maintenance and Storage instructions

1. Do not store the product in an inflammable environment or that with chemical agents.
2. Store the product in a place without humidity, dust, harmful gases, or liquids.
3. The motor shaft opening is neither waterproof nor oil-proof. Do not install the motor in an environment where there is harmful gas, liquid, excessive moisture, or water vapor.
4. Do not store the servo motor where it will be subjected to vibration or shock in excess of the specified limit.
5. The storage and transportation temperature of this product: -10℃~+50℃
6. Clean：Wipe with Alcohol (70%)
7. Before shipping, the motor shaft is coated with antirust oil to protect the motor shaft against rust formation. However, the material of the motor shaft is not entirely rust-proof. When the motor storage time has exceeded six months, please inspect and examine the motor shaft and resupply with proper and sufficient antirust oil at least once every three months thereafter.
8. Product abandoned：Follow the local laws and regulations for recycling.

A one year guarantee is provided from the date of delivery. For product damage caused by improper operation (Please refer to the notes and instructions in this operation manual). HIWIN will not be held responsible for replacing or maintaining the product as a result of any natural disasters that may occur during this period.

⚠ Warning：For the proper use of the HIWIN AC servo motor read these safety precautions carefully before installation, operation, and maintenance.

Caution：Please read these safety precautions before using the product.
Caution：Do not alter the instrument without the permission of the manufacturer.
Caution： Remove the broken power line buckle carefully.
Caution：The product cannot be used in an inflammable environment.
Caution：Remove the power before cleaning.
Caution：Overload use of this product will cause the temperature of the cover to rise.

HIWIN®
Motion Control and System Technology

Rotary Motor

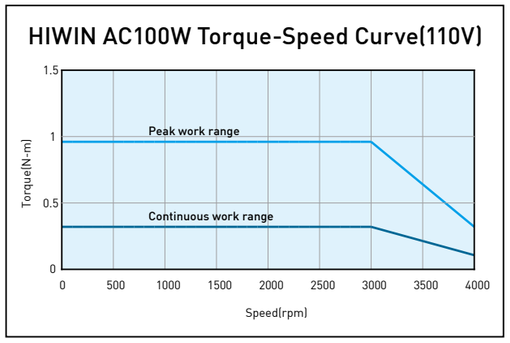
1. AC Servo Motor

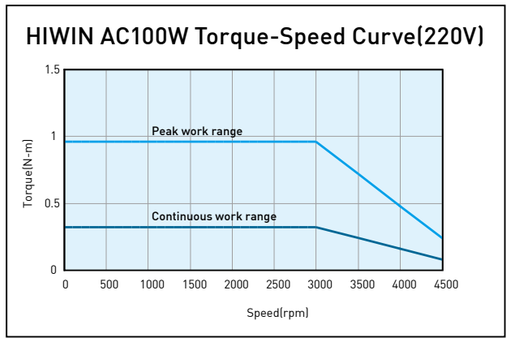
AC Servo Motor Ordering Information

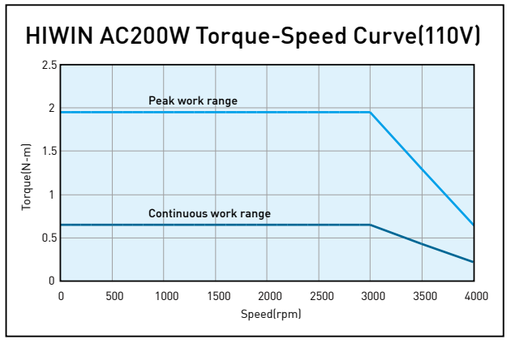
FRAC	0	0	10	11	01
Product	Accessory	Key	Type	Voltage	Serial number
FR : Motor Series AC : Servo Motor	1 : Without Brake B : Brake	0 : Without K : Key	05 : 50W 10 : 100W 20 : 200W 40 : 400W 75 : 750W	11 : 110V 22 : 220V	01~99

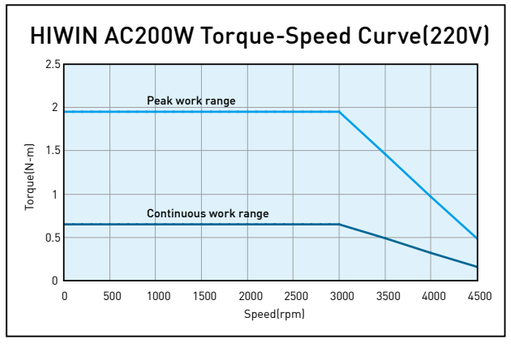
AC Servo Motor Features

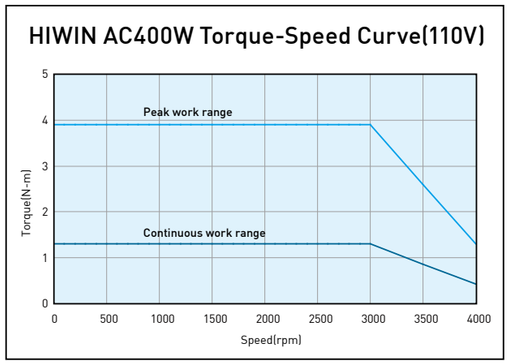
- Output Power [W] : The power of motor is working at continuous torque and speed.
- Nominal Torque [Tc] : Motor is working at nominal current.
- Nominal speed [ωc] : Motor is working at nominal output power.
- Peak Max. Torque [Tp] : It is 2~3 multiple of continuous torque.
- No Load Max. speed [ωp] : Motor is working at no Load.
- Peak Max. current [Ip] : It is 2~3 multiple of continuous current.

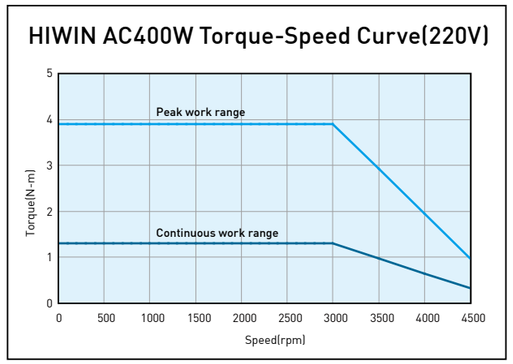


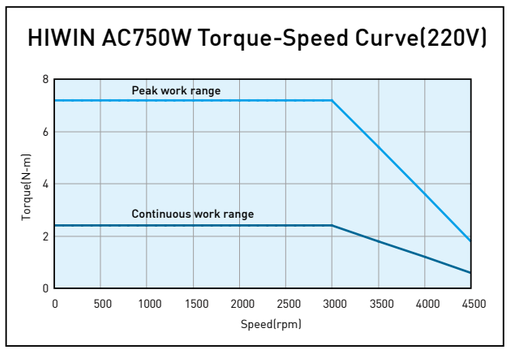




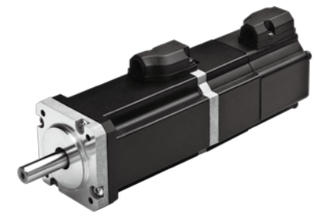


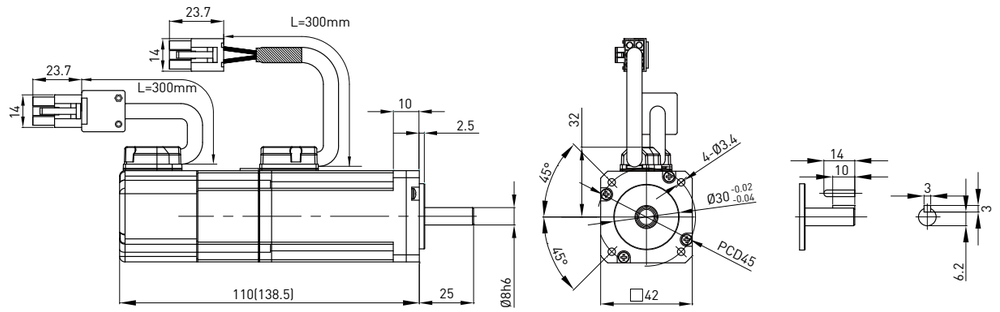






AC Servo Motor 100W Model

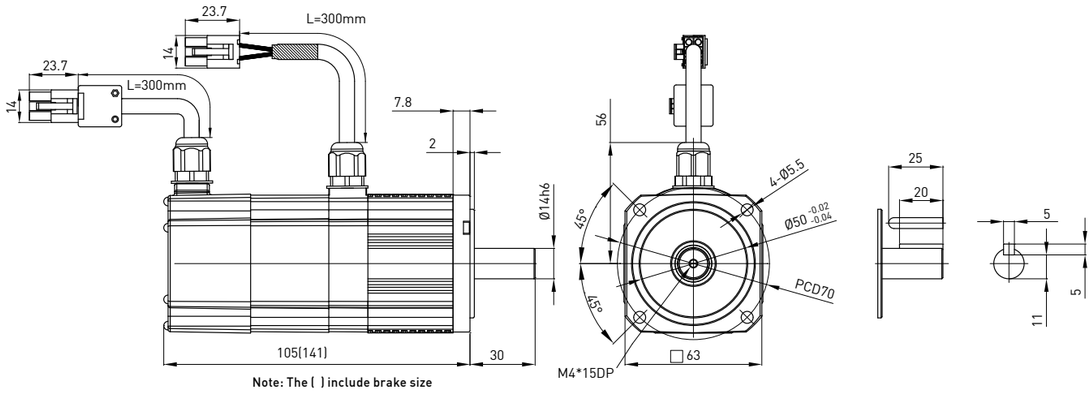




Note: The ( ) include brake size

	Symbol	Unit	FRAC□□1011□□	FRAC□□1022□□
Input Voltage	V	V	AC110	AC220
Output Power	W	W	100	
Nominal Torque	Tc	N.m	0.32	
Peak Max. Torque	Tp	N.m	0.96	
Nominal Current	Ic	A(rms)	0.9	
Peak Max. Current	Ip	A(rms)	2.7	
Nominal Speed	ωc	rpm	3000	
No Load Max. Speed	ωp	rpm	4000	4500
Torque Constant	Kt	N-m / Arms	0.356	
Back EMF constant	Ke	Vrms / krpm	21.98	
Resistance (line to line)	R	Ω	8.23	
Inductance (line to line)	L	mH	14.17	
Number of poles	P	-	8	
Inertia of rotating Parts	J	kg-m^2	0.036*10^{-4}	
Weight	M	kg	0.6	
Encoder Resolution	CPR	pulse	2500	
Brake Keep Torque	Tb	N-m	0.32	
Brake Voltage	V	V	DC24±10%	
Case shelter grade	IP65			
Insulation grade	H-grade			
Environment: Work temperature	0℃~40℃			
Environment: Preserve temperature	-15℃~70℃			
Environment: Work Humidity	80%RH down			
Environment: Preserve Humidity	80%RH down			
Environment: Preserve Environment	Indoor &keep off causticity air, easy Ran air, oil and dirty.			
Environment: Elevation	1000m down			
Environment: Vibrate	49m/s^2 down			

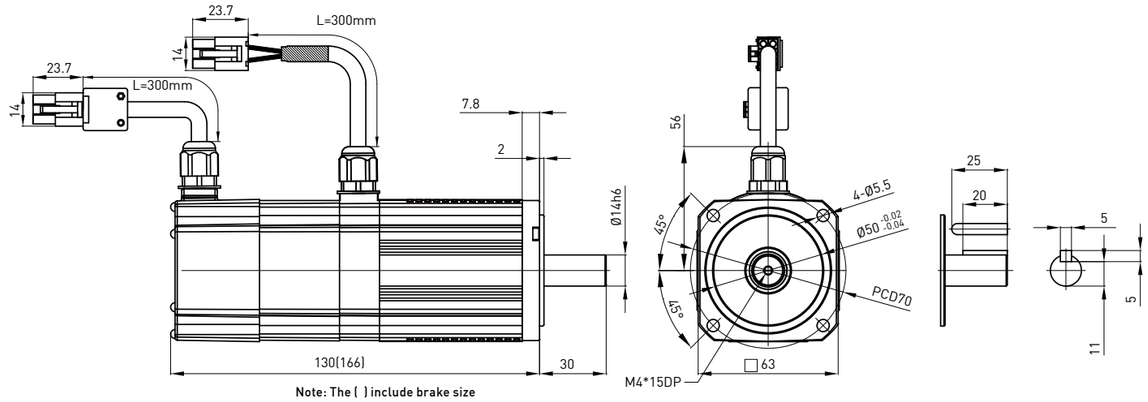
AC Servo Motor 200W Model



Note: The ( ) include brake size

	Symbol	Unit	FRAC□□2011□□	FRAC□□2022□□
Input Voltage	V	V	AC110	AC220
Output Power	W	W	200	
Nominal Torque	Tc	N.m	0.65	
Nominal Current	Ic	A(rms)	3.2	2
Peak Max. Torque	Tp	N.m	1.95	
Peak Max. Current	Ip	A(rms)	9.6	6
Nominal Speed	ω	rpm	3000	
No Load Max. Speed	ωp	rpm	4000	4500
Torque Constant	Kt	N-m / Arms	0.2	0.325
Back EMF constant	Ke	Vrms / krpm	12.275	19.64
Resistance (line to line)	R	Ω	1.04	2.756
Inductance (line to line)	L	mH	2.86	7.52
Number of poles	P	-	8	8
Inertia of rotating Parts	J	kg-m^2	0.26*10^{-4}	
Weight	M	kg	0.86	
Encoder Resolution	CPR	pulse	2500	
Brake Keep Torque	Tb	N-m	1.3	
Brake Voltage	V	V	DC24±10%	
Case shelter grade	IP65			
Insulation grade	H-grade			
Environment: Work temperature	0℃~40℃			
Environment: Preserve temperature	-15℃~70℃			
Environment: Work Humidity	80%RH down			
Environment: Preserve Humidity	80%RH down			
Environment: Preserve Environment	Indoor & keep off causticity air, easy Ran air, oil and dirty.			
Environment: Elevation	1000m down			
Environment: Vibrate	49m/s^2 down			

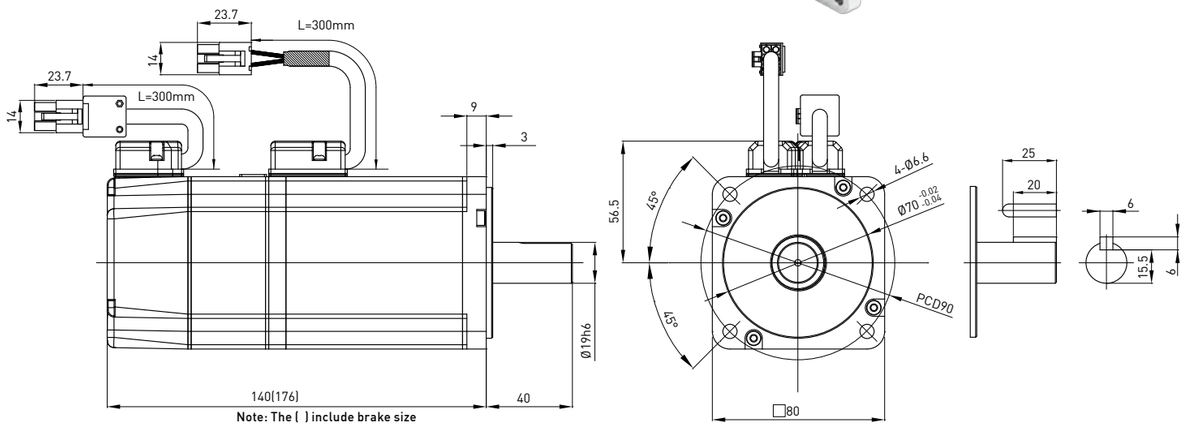
AC Servo Motor 400W Model



Note: The ( ) include brake size

	Symbol	Unit	FRAC□□4011□□	FRAC□□4022□□
Input Voltage	V	V	AC110	AC220
Output Power	W	W	400	
Nominal Torque	Tc	N.m	1.3	
Nominal Current	Ic	A(rms)	3.2	2
Peak Max. Torque	Tp	N.m	3.9	
Peak Max. Current	Ip	A(rms)	9.6	6
Nominal Speed	ω	rpm	3000	
No Load Max. Speed	ωp	rpm	4000	4500
Torque Constant	Kt	N-m / Arms	0.4	0.65
Back EMF constant	Ke	Vrms / krpm	24.17	37.96
Resistance (line to line)	R	Ω	1.79	4.634
Inductance (line to line)	L	mH	5.3	13.92
Number of poles	P	-	8	8
Inertia of rotating Parts	J	kg-m^2	0.44*10^{-4}	
Weight	M	kg	1.48	
Encoder Resolution	CPR	pulse	2500	
Brake Keep Torque	Tb	N-m	1.3	
Brake Voltage	V	V	DC24±10%	
Case shelter grade	IP65			
Insulation grade	H-grade			
Environment: Work temperature	0℃~40℃			
Environment: Preserve temperature	-15℃~70℃			
Environment: Work Humidity	80%RH down			
Environment: Preserve Humidity	80%RH down			
Environment: Preserve Environment	Indoor & keep off causticity air, easy Ran air, oil and dirty.			
Environment: Elevation	1000m down			
Environment: Vibrate	49m/s^2 down			

AC Servo Motor 750W Model

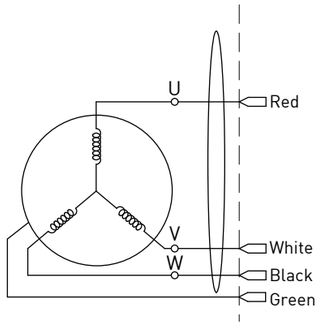


Note: The [ ] include brake size

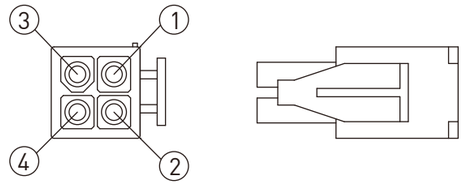
		Symbol	Unit	FRAC□□7522□□
Input Voltage		V	V	AC220
Output Power		W	W	750
Nominal Torque		Tc	N.m	2.4
Nominal Current		Ic	A(rms)	5.1
Peak Max. Torque		Tp	N.m	7.2
Peak Max. Current		Ip	A(rms)	15.3
Nominal Speed		ω	rpm	3000
No Load Max. Speed		ωp	rpm	4500
Torque Constant		Kt	N-m / Arms	0.47
Back EMF constant		Ke	Vrms / krpm	28.4
Resistance (line to line)		R	Ω	0.813
Inductance (line to line)		L	mH	6.59
Number of poles		P	-	8
Inertia of rotating Parts		J	kg-m^2	1.4*10^{-4}
Weight		M	kg	2.66
Encoder Resolution		CPR	pulse	2500
Brake Keep Torque		Tb	N-m	2.4
Brake Voltage		V	V	DC24±10%
Case shelter grade		IP65		
Insulation grade		H-grade		
Environment	Work temperature	0˚C~40˚C		
	Preserve temperature	-15˚C~70˚C		
	Work Humidity	80%RH down		
	Preserve Humidity	80%RH down		
	Preserve Environment	Indoor & keep off causticity air, easy Ran air, oil and dirty.		
	Elevation	1000m down		
	Vibrate	49m/s^2 down		

Motor Cable

Single	Color	AMP-4PIN(M)
U	Red	3
V	White	2
W	Black	1
GND	Green	4



Connect pins position definition

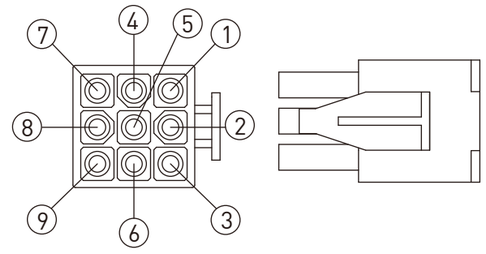


Encoder Cable

Encoder Specifications

- A/B/I phase output, RS-422 Line Driver output
- Inspect motor poles position of U,V,W phase Signal
- 2500 resolution
- Work temperature for -200C~+850C.
- 200KHz frequency response
- Work voltage DC +5V±5%
- RoHS

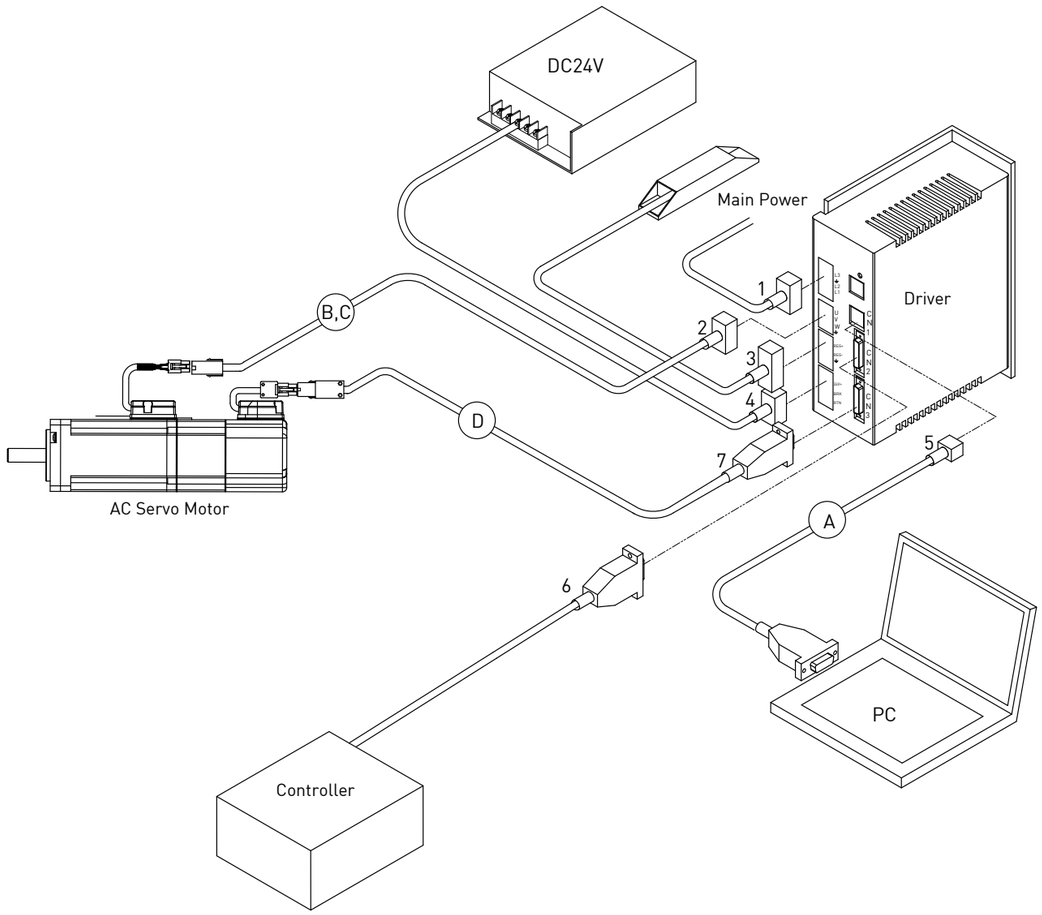
Connect pins position definition



Increase Encoder

Function	Single		Color	AMP-9PIN(M)
Power	5V±5%		Red	1
	0V		Black	2
Increase	A	+	Blue	3
	A	-	Blue/Black	4
	B	+	Green	5
	B	-	Green/Black	6
Ref.	Z	+	Yellow	7
	Z	-	Yellow/Black	8
Shielding	Shielding		Black	9

AC Servo Motor and Driver Wiring



Number	Name	Description
1	AC power input	To single-phase, three-phase AC power
2	Motor power connect	To input power for Motor
3	REGEN Resistor connect	To REGEN resistor for Motor
4	Logic power /Brake	DC 24V of logic power and brake output
5	RS 232 connect	To PC
6	Control single connect	To Controller
7	Feedback single connect	To Motor encoder

2. mega-fabs Israel Driver

Application for AC Servo Motor、Linear Motor Instruct Control Model

- Position, Speed, Torque

Input Tpye

- ±10V analogy instruct (Position /Speed/Torque)
- PWM instruct (Speed/Torque)
- Pulse model has electronic gear function
- I/O Digital signal

Drive Series

MD 36 S

Driver Type	Peak Output Current	Encoder
	36A	S : Digital Quad A/B Encoder Analog Sine-Cosine Encoder Digital Hall Sensor R : Resolver

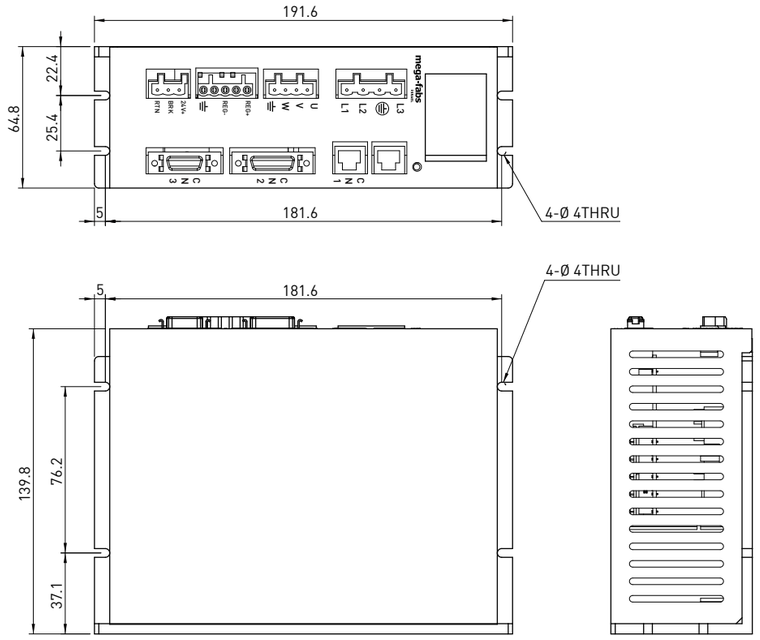
Application industry

- Faceplate Industry
- Semiconductor equipment
- PCB.AOI equipment
- Automation Industry

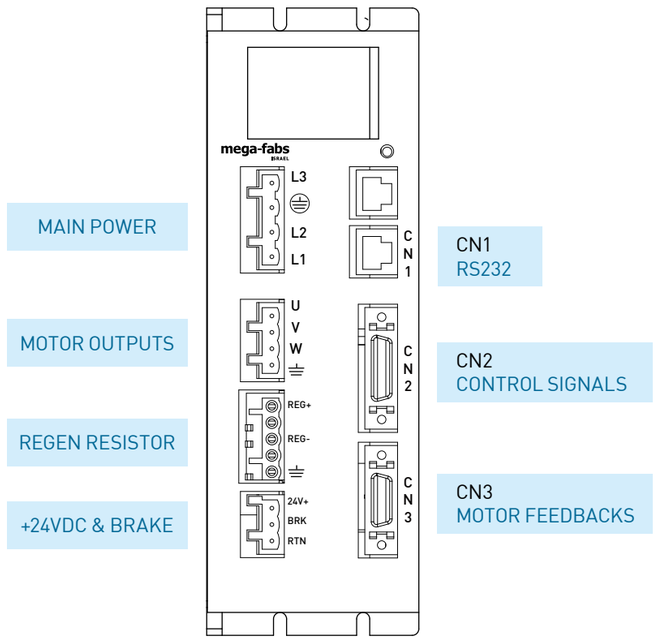
Specifications

Item	Driver	Specifications
Max pulse command bandwidth	Pulse Input	2M Pulse/s max.
	Quad A/B	8M Count/s max.
Encoder Signal	Digital	5V±5% RS422
	Analog	1Vp-p (Sin/Cos)
DC power input (Control loop power)		24VDC ±10% / 1A
AC power output (Motor drive power)		100~240VAC/ 1 & 3 Phase
Digital input point		10 inputs(5Vdc)
Digital output point (Open Drain)		3 outputs(24VDC)
Dynamic brake output signal		DC 24V / 0.5A max.
Weight		1,250 g
Work temperature		0℃ ~ 45℃
Store temperature		-20℃~ +85℃

Driver Size



Driver Interface



Wiring

- **MAIN POWER**

Signal	PIN
Main Input L3	L3
Protective Ground	⏚
Main Input L2	L2
Main Input L1	L1

- **MOTOR OUTPUTS**

Signal	PIN
Phase U	U
Phase V	V
Phase W	W
Cable Shield	⏚

- **REGEN RESISTOR**

Signal	PIN
Frame GND	⏚
No Connect	NC
REGEN Resistor (-)	REG-
No Connect	NC
REGEN Resistor(+)	REG+

- **CN1 RS232**

Signal	PIN
No Connect	6
TxD _MAIN	5
Signal GND	4
Signal GND	3
RxD_ MAIN	2
No Connect	1

- **+24VDC & BRAKE**

Signal	PIN
24V+	24V+
Brake Signal	BRK
24V+ Return	RTN

- **CN2 CONTROL SIGNALS**

Signal	PIN	Signal	PIN	Signal	PIN
Frame GND	1	P+/A+/CW+ [I9]	10	/B	19
Signal GND	2	D+/B+/CCW+ [I10]	11	Z	20
ENABLE [I1]	3	[I11]	12	/Z	21
[I2]	4	ALM [O1]	13	+5VE	22
[I3]	5	INPOSITION [O2]	14	Signal GND	23
POS LIMIT [N4]	6	[O3]	15	REF+	24
NEG LIMIT [I6]	7	A	16	REF-	25
P-/A-/CW- [I7]	8	/A	17	[I12]	26
D-/B-/CCW- [I8]	9	B	18		

- **CN3 MOTOR FEEDBACKS**

Signal	PIN	Signal	PIN	Signal	PIN
Frame GND	1	Z	8	Signal GND	15
Signal GND	2	/Z	9	SIN(+)	16
+5VDC	3	Signal GND	10	SIN(-)	17
A	4	HALL A	11	COS(+)	18
/A	5	HALL B	12	COS(-)	19
B	6	HALL C	13	Signal GND	20
/B	7	Motor Over Temp.	14		

- **STATE**

LED Color	State
RED	ERROR
GREEN	Servo Ready

Software

Name : Lightening

Apply : WINDOWS Series

Computer equipment :

- CPU:586 MHz over
- RAM:128 MB over
- RS-232 serial port or USB port with a USB to RS-232 adapter.

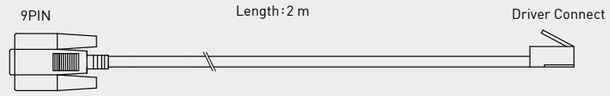
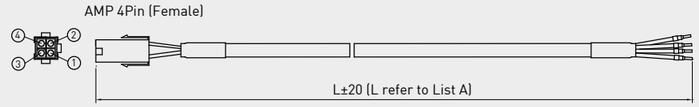
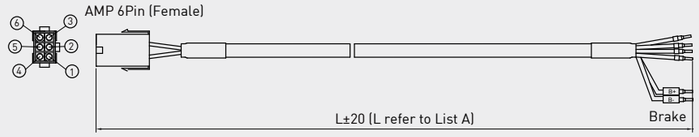
Software obtain information :

- CD Rom for produce
- http://www.hiwinmikro.com.tw

Driver Accessories

Name	Number	Description
Accessories	051800200057	24Vdc connect x1 MAIN POWER connect x1 MOTOR OUTPUTS connect x1 REGEN connect x1 MOTOR FEEDBACK connect (case) x1 Connect Toolx2

Driver Accessories

Name	Type	Connect	Description
Ⓐ RS-232 Cable	LMACR21D	CN1	
Ⓑ AC Servo Motor Power Cable	HV04FRACP□□A HV04FRACP□□B (flexible)	MOTOR OUTPUTS	
Ⓒ AC Servo Motor Power Cable (Brake)	HV06FRACP□□A HV06FRACP□□B (flexible)	MOTOR OUTPUTS	
Ⓓ AC Servo Motor Encoder Cable	HV00FRACE□□A HV00FRACE□□B (flexible)	CN3	

List A

□□	30	50	70	A0
L (m)	3	5	7	10

Connect pins position

HV04FRACP□□A
HV04FRACP□□B

AC Servo Motor Power Cable Wiring Table		
Signal	AMP 4Pin	Western-style post
U	3	U
V	2	V
W	1	W
⏚	4	⏚

HV06FRACP□□A
HV06FRACP□□B

AC Servo Motor Power Cable Wiring Table (Brake)		
Signal	AMP 6Pin	Western-style post
U	3	U
V	2	V
W	1	W
⏚	4	⏚
B+	5	B+
B-	6	B-

HV00FRACE□□A
HV00FRACE□□B

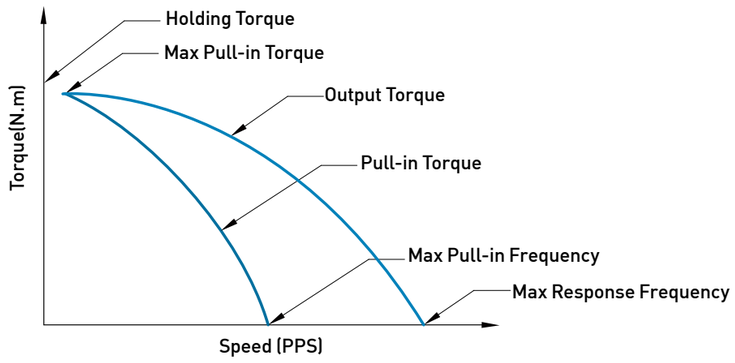
AC Servo Motor Encoder Cable Wiring Table		
Signal	AMP 9PIN	SCSI 20Pin (Male)
5V	1	3
0V	2	2
A+	3	4
A-	4	5
B+	5	6
B-	6	7
Z+	7	8
Z-	8	9
Shading	9	1,20

3. Two Phase Stepping Motor

Stepping Motor Ordering Information

FR	ST	0	20	0	24	01
Product	Model	Phase/Shaft	Type	Step Angle	Voltage	Serial number
Motor	ST: Stepping Motor	0 : 2S (2phase/single) 1 : 2D (2phase/double)	1X : ST42 2X : ST55	0 : F (stepping angle 1.8 meh.) 1 : H (stepping angle 0.9 meh.)	24V	01~99

Characteristic Curves of Stepping Motor



● **Pull-in Torque**
It is the Max. torque that stepping motor and input signal are starting, stop synchronously. The range under of pull-in torque that motor can starting, stop synchronously and forward/reverse. The range is Starting rang oneself.

● **Max Pull-in Torque**
It is the starting pulse frequency lower than 10 pps, the Max torque of stepping motor can input signal for starting, stop synchronously.

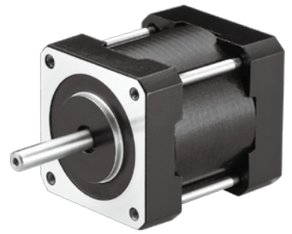
● **Max Pull-in Frequency**
It is the Max input pulse rate of motor at no load that motor can stop, start in instant.

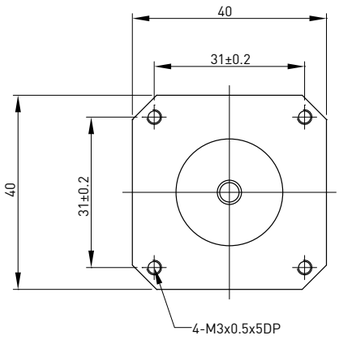
● **Max Pull-in Torque**
It is the motor and input signal for work synchronously, but can't start ,stop in instant for Max torque. The torque larger than output torque that motor be not work. The output torque below and start torque above of region in the meantime, the motor can't start or stop in instant that region is call slew region. It must be relay start region oneself at start and stop in slew region, otherwise has out of set.

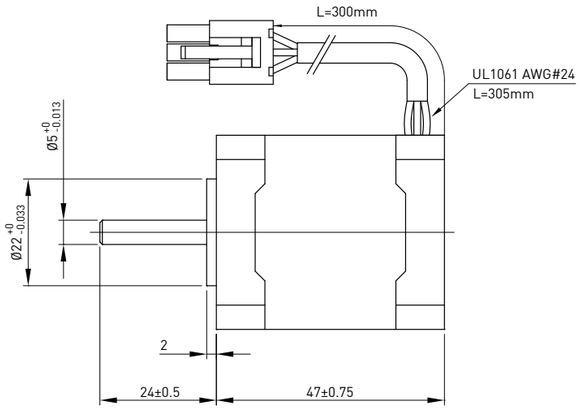
● **Max Response Frequency**
The output torque is equal zero for Max input frequency in motor at no load that calls it. In instant the Motor can't start or stop at the moment.

● **Holding Torque**
It is exerting max torque for extra add load to change rotor position in rotor keep motionless that motor stator winding is enable.

40mm Step Angle 1.8° ST40 Series

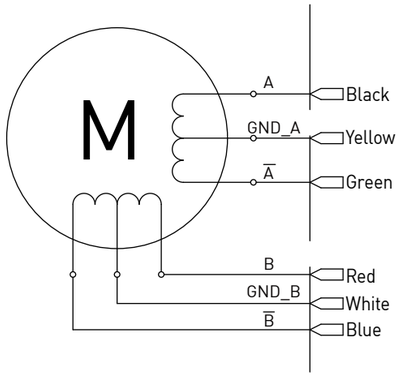


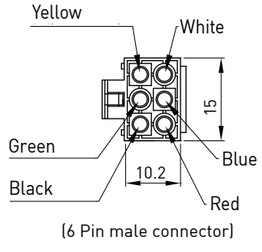




Model Single axis	Winding Type	Holding Torque	Current	Resistance	Inductance	Rotor Inertia	Leads	Motor Length	Input Voltage
		N.m	A/phase	Ω/phase	mH/phase	g-cm²		(L)mm	Vdc
FRST01102401	Single Pole	0.1	0.95	4.2	3.0	19	6	47	4

● **Wiring Diagram**

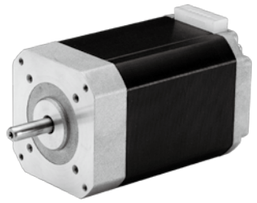


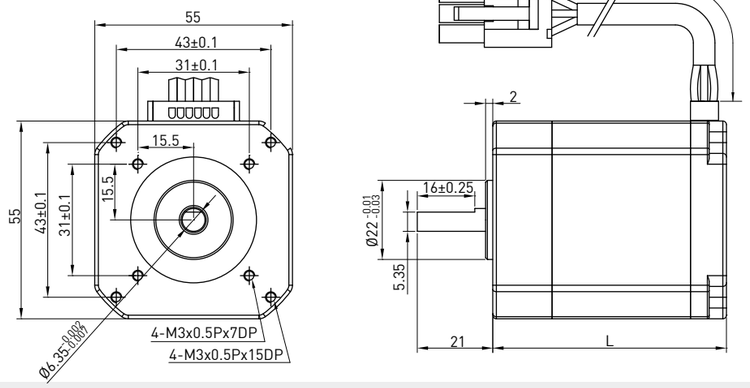


(6 Pin male connector)

Notice:
★ Please use the wire which is larger than 0.5㎜² and as short as possible for power and motor connection.
★ Support 2 phase stepping motor (6 lead wire).

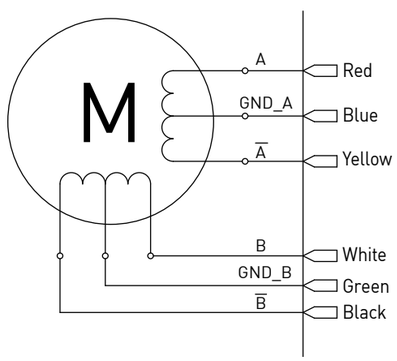
55mm Step Angle 1.8° ST55 Series

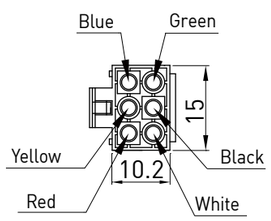




Model		Winding Type	Holding torque	Current	Resistance	Inductance	Rotor Inertia	Leads	Motor Length	Input Voltage
Single axis	Double axis		N.m	A/phase	Ω/phase	mH/phase	g-m²		(L)mm	Vdc
FRST02102401	FRST12102401	Single Pole	0.25	1.3	2.3	2.9	90	6	50.5	3
FRST02202401	FRST12202401	Single Pole	0.6	1.3	3.1	4.8	171	6	65	4
FRST02302401	FRST12302401	Single Pole	1.05	1.2	4.4	7.8	290	6	87	5.3

- **Wiring Diagram**





(6 Pin male connector)

Notice:
★ Please use the wire which is larger than 0.5㎜² and as short as possible for power and motor connection.
★ Support 2 phase stepping motor (6 lead wire).

4. HIWIN Stepping Driver (STD-24A)

Specification

- 2 phase stepping motor (6 lead wire)
- Signal Pole current driver
- Micro-stepping driver function
- Constant output current 0.2A~2A
- Max Frequency response 150000Hz
- Support Pulse/Direction Pulse (1P)
- Support CW/CCW Pulse (2P)
- Support Quadrature Pulse (A/B)
- Additional Positive/Negative pole limit control
- Motor exciting release
- RoHS certificate
- CE safe characteristic

Connect and Setting

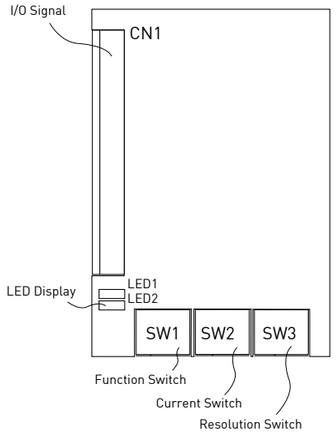
1. LED State

- **LED display**

Display	Color	function
LED1	Red	Power light
LED2	Green	State light

- **State light Information**

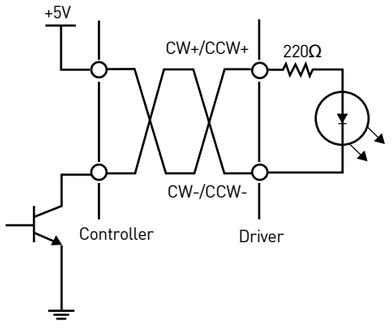
Drive State	LED State
Forward	low speed flash (0.5s/per)
Reverse	high speed flash (0.2s/per)
Limit Input	low speed flash (1s/per)
Exciting release	dark
Stand by	light

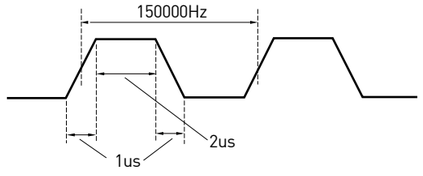


2. Input / Output

Interface	Pin	Input / Output	Mark
(CN1)	1	Power Input	DC24V
	2		Power Input
	3	Motor connect	COM A
	4	Motor connect	COM B
	5	Motor connect	A +
	6	Motor connect	A -
	7	Motor connect	B +
	8	Motor connect	B -
	9	Pulse single Input	CW +
	10	Pulse single Input	CW -
	11	Pulse single Input	CCW +
	12	Pulse single Input	CCW -
	13	Control single	MF
	14	Control single	LSF
	15	Control single	LSR
	16	No use	NC

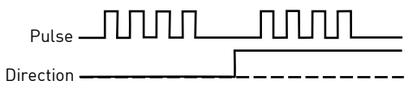
● Input Pulse Single Wiring Diagram



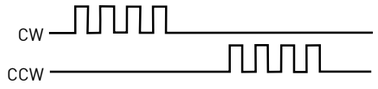


Notice:
※ Please use the wire which is larger than 0.5㎜² and as short as possible for power and motor connection.
※ Pulse width please corresponds to the sketch.
※ These signal types are accepted by driver：

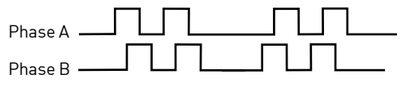
A. Pulse/Direction (1P)



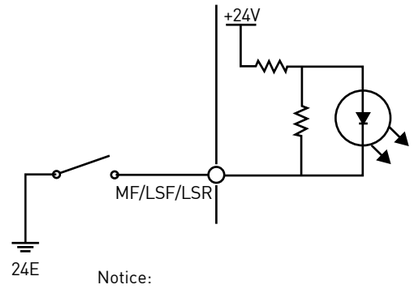
B. CW/CCW (2P)



C. Quadrature (A/B)

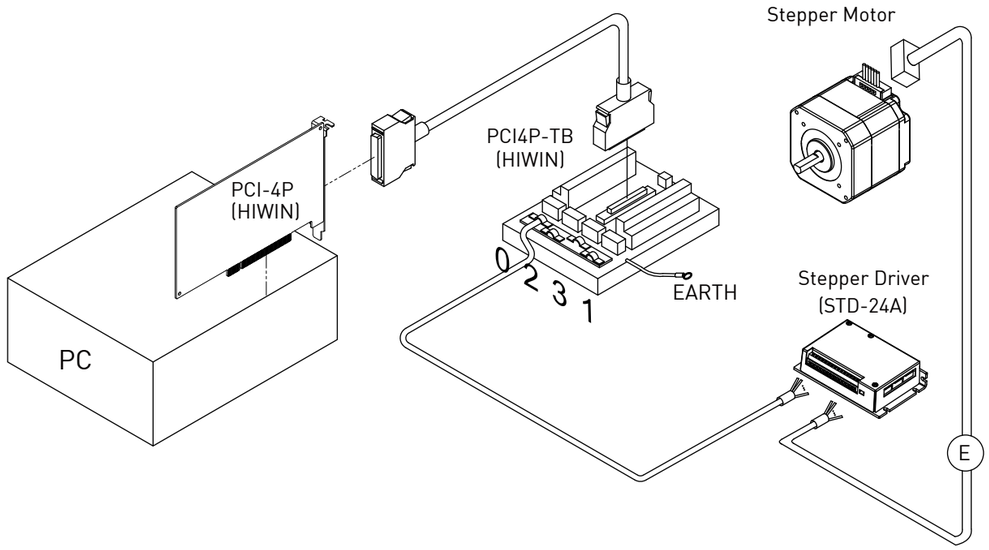


● Limit Input、Motor Disable Wiring Diagram

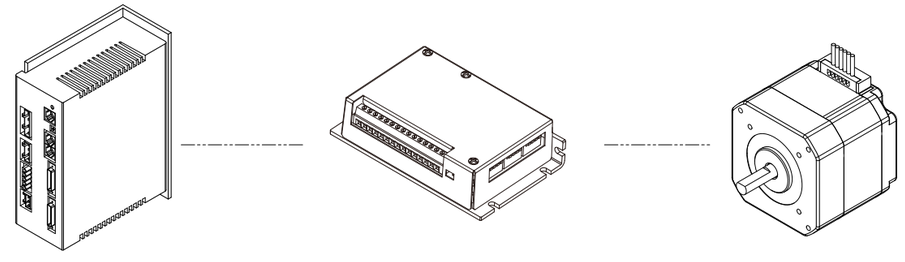


Notice:
※ The function was triggered by closing the switch (ON).
※ The forward limit signal is ON，motor will not rotate even receiving forward pulse command. Furthermore, The reverse limit signal is ON，motor will not rotate even receiving reverse pulse command.
※ Motor release signal is ON, exciting release.

HIWIN PCI-4P Wiring Example

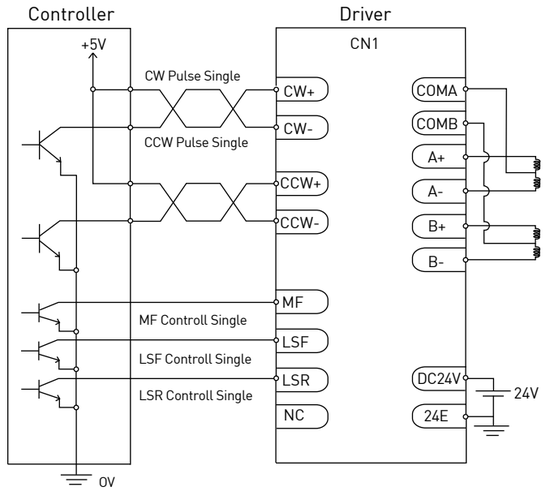


PLC Wiring Example



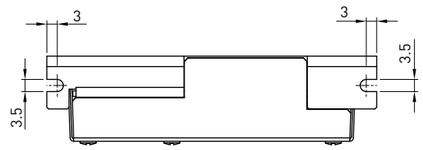
PLC Motion Controller　　Stepper Motor Driver (STD-24A)　　Stepper Motor

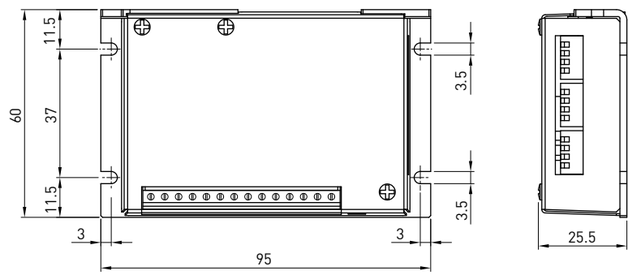
Connect Diagram



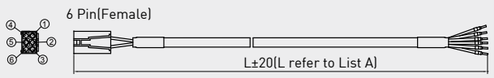
Notice:
※ Please input DC+5V pulse.
※ Please use twisted line or shading line as signal line which is as short as possible.

Size Diagram





Stepping Motor Accessories

Name	Type	Connect	Description
Ⓔ Stepping Motor Cable	HV00FRSTP□□A	MOTOR OUTPUTS	

Stepping Motor Cable Wiring Table		
Signal	6Pin (F)	Western-style post
COM A	1	COM A
A-	2	A-
A+	3	A+
COM B	4	COM B
B-	5	B-
B+	6	B+

List A

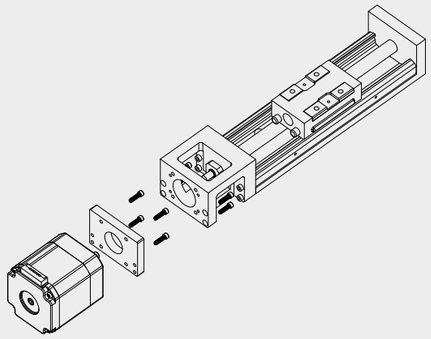
□□	30	50	70	A0
L (m)	3	5	7	10

5. HIWIN Robot and Motor Adaptor Flange

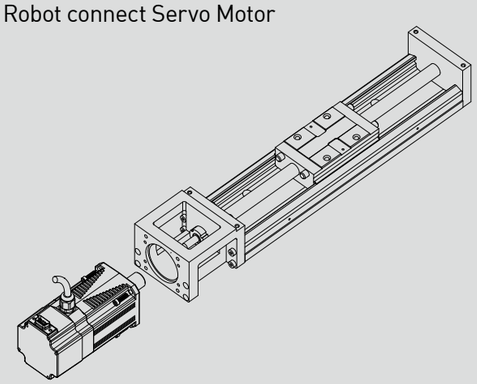
Motor Flange List

Model	AC 100W	AC 200W	AC 400W	AC 750W	ST40-21	ST55-21	ST55-22	ST55-23
KK40	F2	-	-	-	F3	F3	F3	F3
KK50	F2	-	-	-	F3	F3	F3	F3
KK60	F2	-	-	-	F5	F5	F5	F5
KK86	-	F0	F0		-	-	-	-
KK100	-	F0	F0	F1	-	-	-	-
KK130	-	F1	F1	F2	-	-	-	-
KA100	F1	-	-	-	-	-	-	-
KA136	-	F0	F0	-	-	-	-	-
KA170	-	F0	F0	F1	-	-	-	-
KS05	FE	-	-	-	-	-	-	-
KS10	Inner Type	-	-	-	-	-	-	-
KS14	-	Inner Type	Inner Type	-	-	-	-	-
KS18	-	Inner Type	Inner Type	-	-	-	-	-

Robot connect Stepping Motor

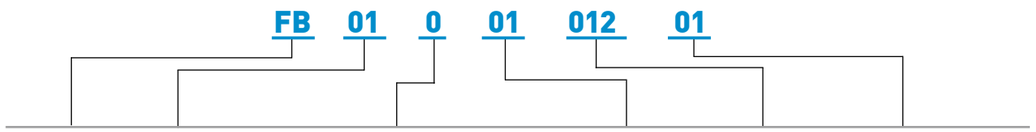


Robot connect Servo Motor



6. DC Brush Motor

Ordering Information



Product	Model	Accessory	Type	Voltage	Serial number
Motor	01 : Brush DC Motor 02 : Stepping Motor	0 : only motor 1 : motor + gear 2 : motor + encoder 3 : motor + gear + encoder	01 : AM1 03 : AM3 06 : AM6 07 : AM7	012 : 12V 024 : 24V MAX : 100V	01~99

Illustration for Characteristic Curves of Motor

According to the customer use for meeting the main value of the motor load moment demand specifications, corresponds to the characteristic curve in the rotational speed (ns), the electric current (I) , the power (P) and so on, can obtain the final operation range. Like the chart shows, when customers choose motor operation and the load moment is A, may obtain coordinates position B, C, D respectively be the rotational speed, electric current and power value.

For example:
Torque position A requirement is：2.8N.m
By position C to obtain speed is：2200rpm
At this time corresponds to position B、D respectively be the current and power value is 9A and 63W.

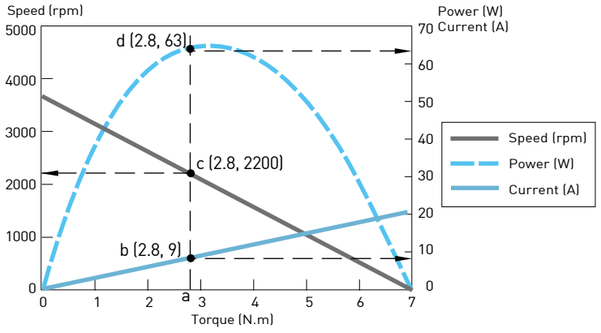


Illustration for Capability of Encoder

Inductive Principle of the Hall Sensor (CW)

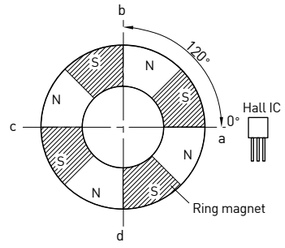


figure 1

Output Voltage of the Hall Sensor

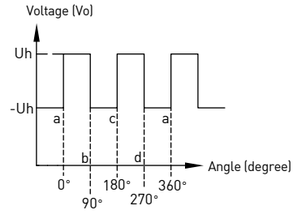


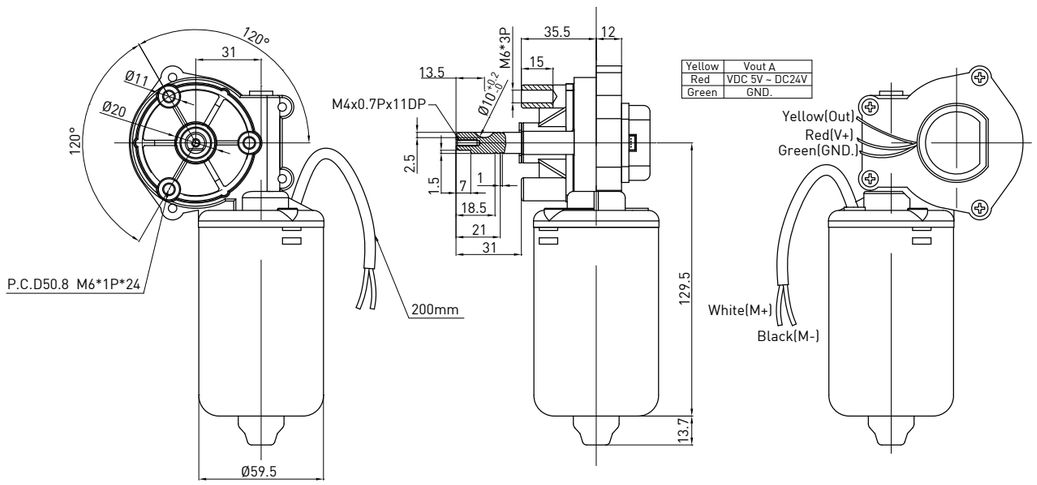
figure 2

※**The principle of picking out the Hall IC**
The voltage input range of Hall IC is about 2.4V~26V.The Hall IC will create the induced voltage signal (See Fig 1) through the NS magnetic field of circular magnet. (See Fig 2).The NS poles of circular magnet will decide the signal frequency which is interrelated to the numbers of magnet pole and the rotational speed of motor. As shows on Fig 1, there are 8 poles of circular magnet to induce on one piece Hall IC. When the magnet operates one cycle, the output will obtain the voltages between Uh~-Uh from Hall IC. The 5 points (a, b, c, d, a) are located respectively in the measure positions from the circular magnet of Hall IC. The motor rotation circumference can be divided into 8 equal portions and obtains pulse signal precisely, as shows on Fig 2.

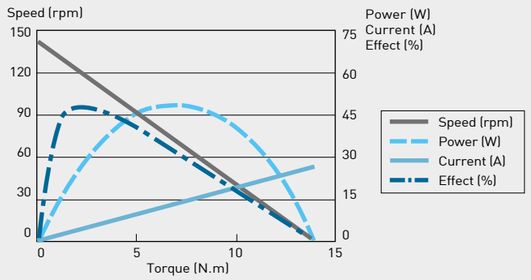
Cautions

1. Please avoid any mechanical interference when motor operates. Otherwise it will break down the motor.
2. Please follow the voltage specification to input DC voltage. Then the DC voltage can be able to provide with the current under maximum loading which named “Duty maximum current”.
3. When switch the +/- power supply, the motor will operate reverse movement.
4. Please don’t exceed the standardized motor maximum loading.
5. Please follow the waterproof specification use.

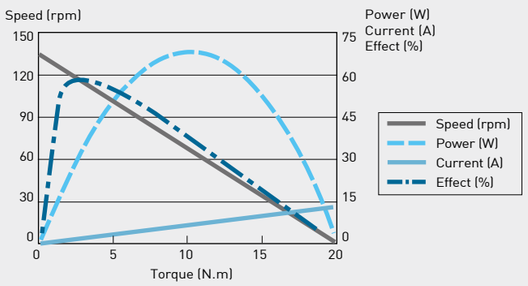
Motor Type
Dimensions for AM1 Type



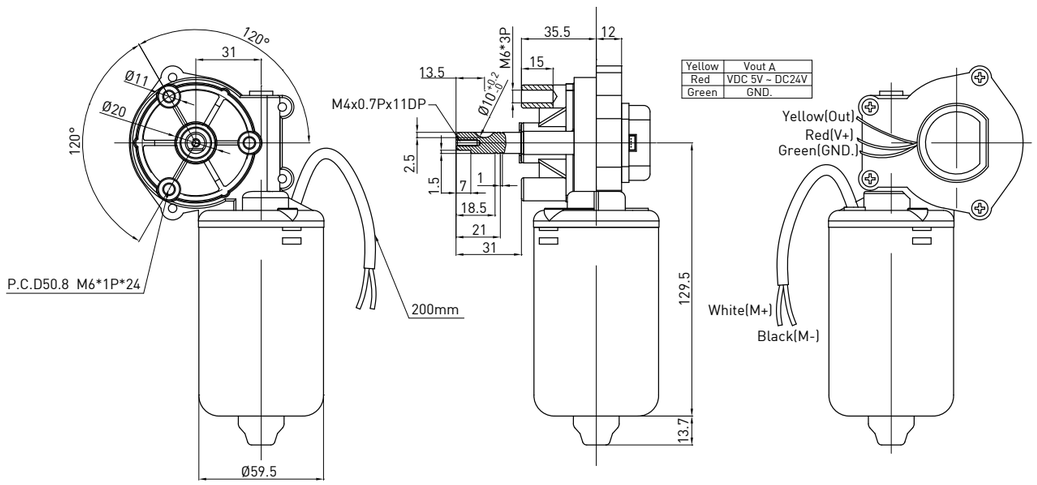
DC 12V	72W
No load current	1.5A (max.)
No load speed	140 rpm
Nominal torque	3.0 N.m
Nominal speed	110 rpm
Nominal current	6.0A (max.)
Maximum current	26A
Breaking torque	14 N.m
Reduction ratio	2 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130101201



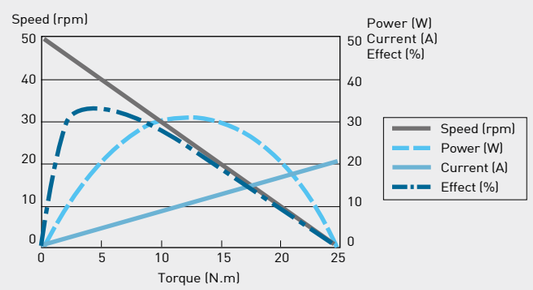
DC 24V	60W
No load current	0.8A (max.)
No load speed	135 rpm
Nominal torque	3.0 N.m
Nominal speed	115 rpm
Nominal current	2.5A (max.)
Maximum current	15A
Breaking torque	20 N.m
Reduction ratio	2 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130102401



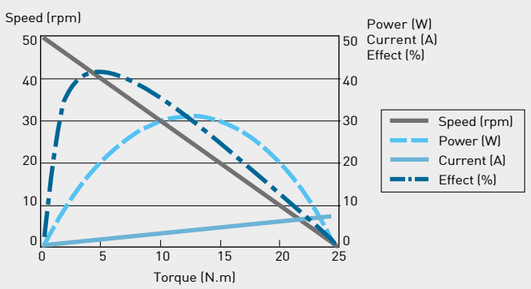
Dimensions for AM1 Type



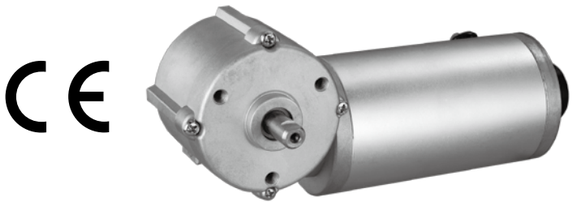
DC 12V	72W
No load current	1.5A (max.)
No load speed	50 rpm
Nominal torque	5.0 N.m
Nominal speed	40 rpm
Nominal current	6.0A (max.)
Maximum current	21A
Breaking torque	25 N.m
Reduction ratio	1 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130101202

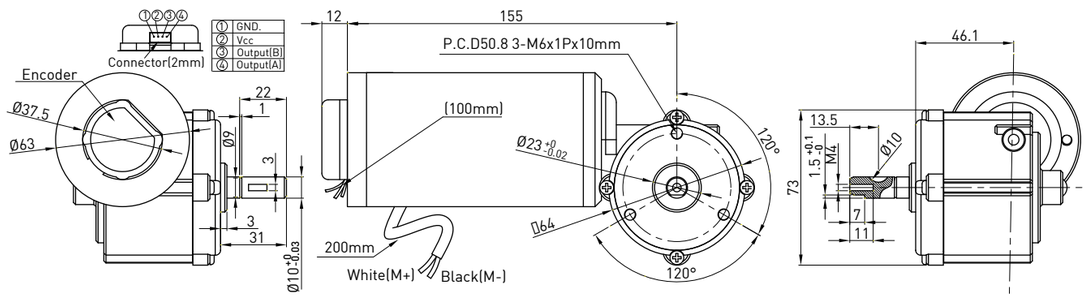


DC 24V	60W
No load current	0.8A (max.)
No load speed	50 rpm
Nominal torque	5.0 N.m
Nominal speed	40 rpm
Nominal current	2.5A (max.)
Maximum current	8A
Breaking torque	25 N.m
Reduction ratio	1 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130102402

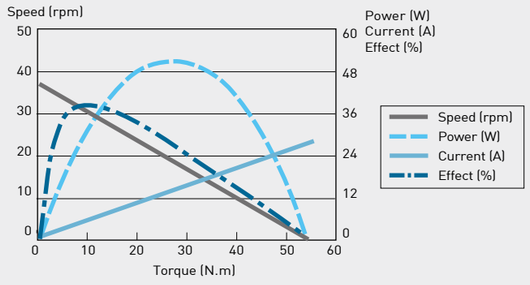


Dimensions for AM3 Type

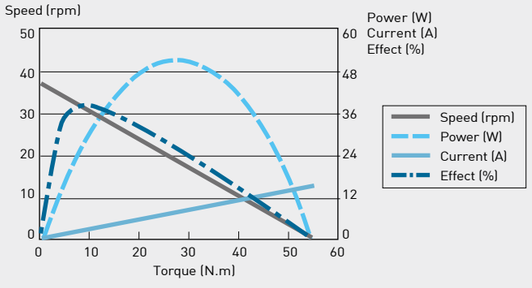




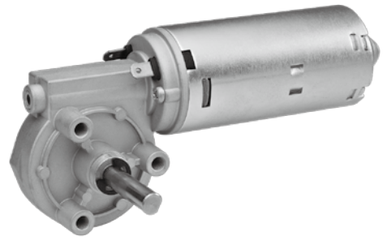
DC 12V	66W
No load current	2.0A (max.)
No load speed	37 rpm
Nominal torque	5.0 N.m
Nominal speed	33 rpm
Nominal current	5.5A (max.)
Maximum current	30A
Breaking torque	55 N.m
Reduction ratio	1 : 65.33
Resolution	980 pulse/rev
Rated duty	S1
Weight	1950 g
Number	FB0130301201

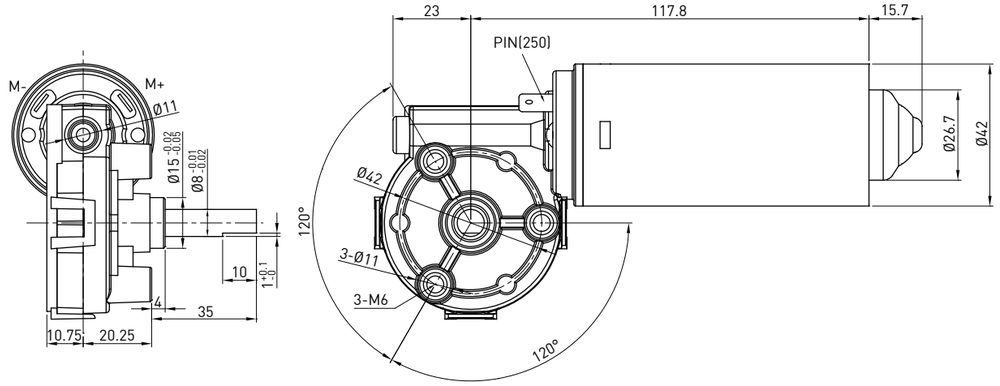


DC 24V	60W
No load current	1.5A (max.)
No load speed	37 rpm
Nominal torque	5.0 N.m
Nominal speed	33 rpm
Nominal current	2.5A (max.)
Maximum current	15A
Breaking torque	55 N.m
Reduction ratio	1 : 65.33
Resolution	980 pulse/rev
Rated duty	S1
Weight	1950 g
Number	FB0130302401

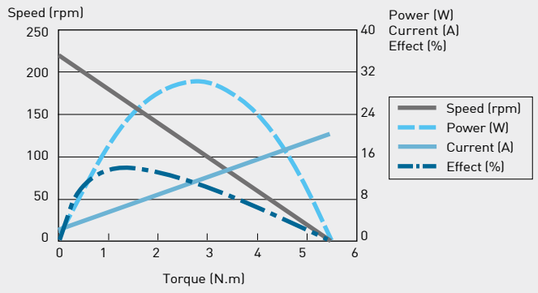


Dimensions for AM4 Type

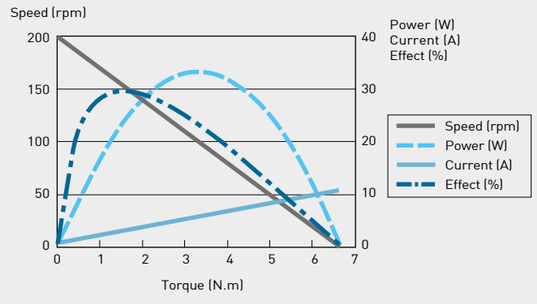




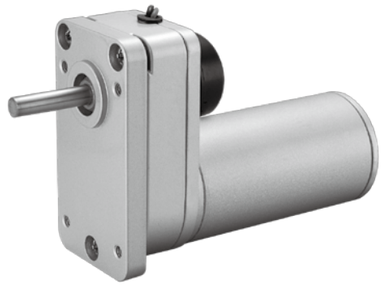
DC 12V	66W
No load current	2.5A (max.)
No load speed	220 rpm
Nominal torque	1.0 N.m
Nominal speed	180 rpm
Nominal current	5.5A (max.)
Maximum current	20A
Breaking torque	5.5 N.m
Reduction ratio	2 : 49
Resolution	-
Rated duty	100%
Weight	600 g
Number	FB0110401201

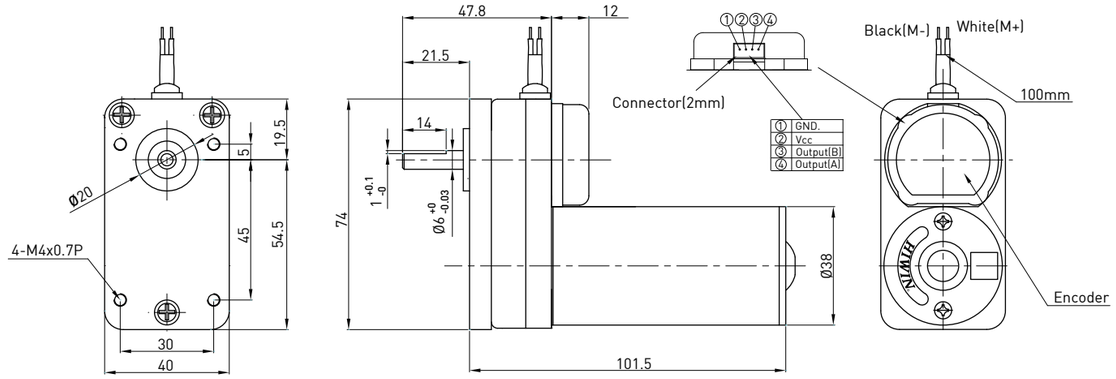


DC 24V	60W
No load current	1.5A (max.)
No load speed	200 rpm
Nominal torque	1.0 N.m
Nominal speed	170 rpm
Nominal current	2.5A (max.)
Maximum current	11A
Breaking torque	6.5 N.m
Reduction ratio	2 : 49
Resolution	-
Rated duty	100%
Weight	600 g
Number	FB0110402401

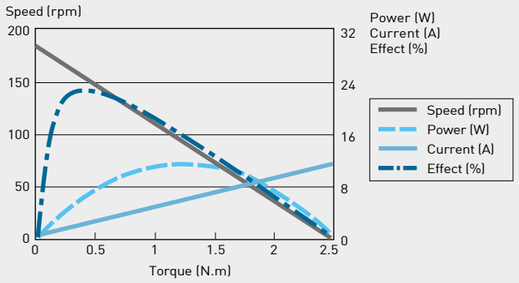


Dimensions for AM6 Type

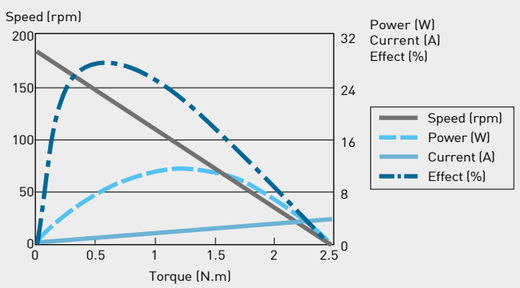




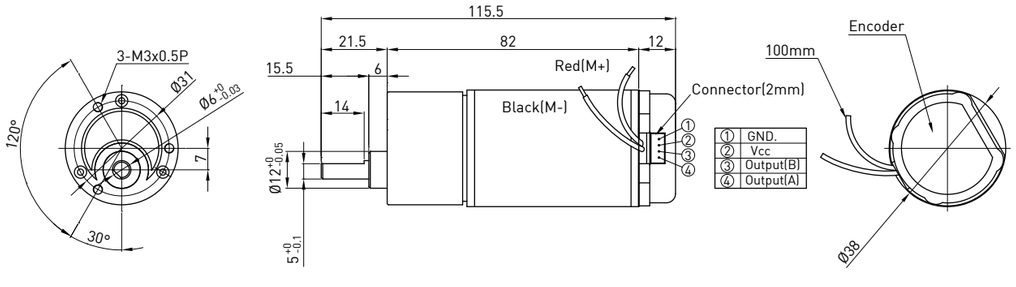
DC 12V	36W
No load current	1.0A (max.)
No load speed	185 rpm
Nominal torque	0.5 N.m
Nominal speed	145 rpm
Nominal current	3.0A (max.)
Maximum current	12A
Breaking torque	2.5 N.m
Reduction ratio	1 : 21.6
Resolution	15 pulse/rev
Rated duty	S1
Weight	600 g
Number	FB0130601201



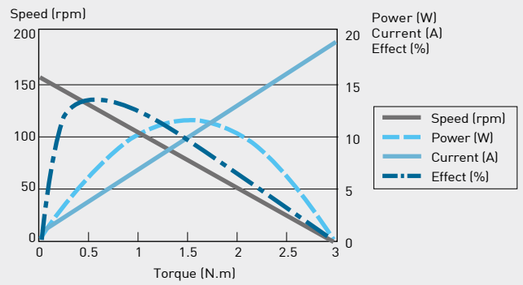
DC 24V	36W
No load current	0.5A (max.)
No load speed	185 rpm
Nominal torque	0.5 N.m
Nominal speed	145 rpm (min.)
Nominal current	1.5A (max.)
Maximum current	4A
Breaking torque	2.5 N.m
Reduction ratio	1 : 21.6
Resolution	15 pulse/rev
Rated duty	S1
Weight	600 g
Number	FB0130602401



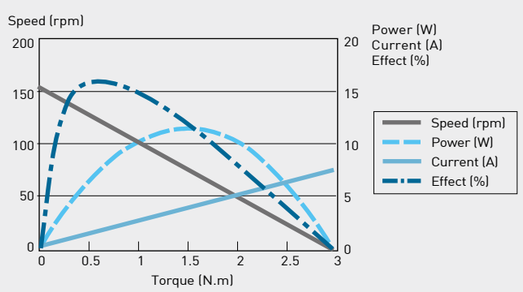
Dimensions for AM6 Type



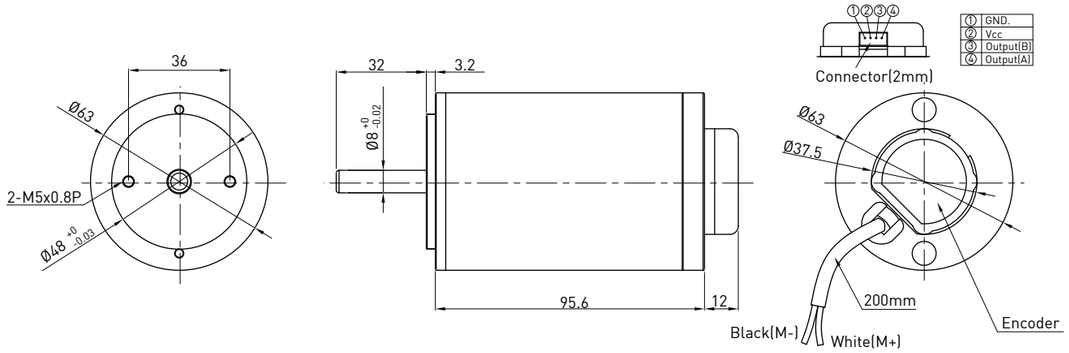
DC 12V	48W
No load current	1.0A (max.)
No load speed	155 rpm
Nominal torque	0.5 N.m
Nominal speed	130 rpm
Nominal current	4.0A (max.)
Maximum current	19A
Breaking torque	3 N.m
Reduction ratio	1 : 50
Resolution	750 pulse/rev
Rated duty	S1
Weight	440 g
Number	FB0130601202



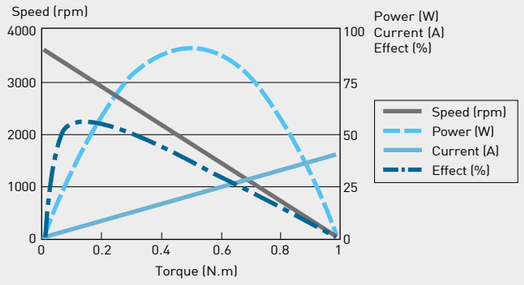
DC 24V	48W
No load current	0.5A (max.)
No load speed	155 rpm
Nominal torque	0.5 N.m
Nominal speed	130 rpm
Nominal current	2.0A (max.)
Maximum current	7A
Breaking torque	3 N.m
Reduction ratio	1 : 50
Resolution	750 pulse/rev
Rated duty	S1
Weight	440 g
Number	FB0130602402



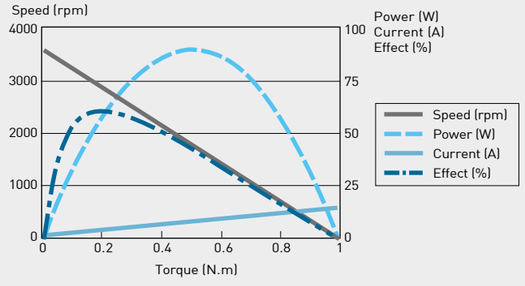
Dimensions for AM7 Type



DC 12V	60W
No load current	1.5A (max.)
No load speed	3600 rpm
Nominal torque	0.1 N.m
Nominal speed	3200 rpm
Nominal current	5.0A (max.)
Maximum current	41A
Breaking torque	1.0 N.m
Reduction ratio	----------
Resolution	15 pulse/rev
Rated duty	S1
Weight	1100 g
Number	FB0120701201



DC 24V	60W
No load current	1.0A (max.)
No load speed	3600 rpm
Nominal torque	0.1 N.m
Nominal speed	3200 rpm
Nominal current	2.5A (max.)
Maximum current	18A
Breaking torque	1.0 N.m
Reduction ratio	----------
Resolution	15 pulse/rev
Rated duty	S1
Weight	1100 g
Number	FB0120702401



7. Rotary Motor Requirements List

Customer : Email : Tel : Fax :		Date : Receiver : Professional :
Motor Type	☐ AC Servo Motor ☐ Stepping Motor ☐ DC Motor	Note :
AC Motor Series	☐ 50W ☐ 100W ☐ 200W ☐ 400W ☐ 750W	
Stepping Motor Series	☐ STD40 ☐ STD55	
DC Motor Series	☐ AM1 ☐ AM3 ☐ AM4 ☐ AM6 ☐ AM7 ☐ other_____	
Input Voltage(V)	AC : ☐ 110V ☐ 220V DC : ☐ 12V ☐ 24V ☐ other_____	
Driver Series	☐ mega-fabs Driver ☐ STD-24A	
Servo driver Accessories	HV04FRACP☐☐A (Power Cable) HV06FRACP☐☐A (Power Cable -Brake) HV00FRACE☐☐A (Encoder Cable) HV00FRACE☐☐B (Encoder Cable-Flexible) LMACR21D (RS-232) , quantity : _____	
Special need		
Purpose		
Work environment		
Installation size		
Budget cost		
Motor quantity		
Nominal Current(A)		
Nominal Speed(rpm)		
Nominal Torque(N-m)		
Encoder	☐ Yes ☐ No	
Resolution(pulse/rev)		
Brake	☐ Yes ☐ No	

The information below is to fill out by HIWIN or Agents

Suggest specifications :

Manager : Engineer : Salesperson :

MEMO

MEMO

MEMO