



TAIWAN EXCELLENCE
GOLD AWARD 2005

Ballscrew

- For Heavy-Load Drive



TAIWAN EXCELLENCE 2004

Positioning Guideway



TAIWAN EXCELLENCE
GOLD AWARD 2004

Linear Synchronous Motor

- Coreless Type (LMC)



TAIWAN EXCELLENCE 2002

Linear Actuator

- LAN for Hospital
- LAM for Industrial
- LAS Compact Size
- LAK Controller



TAIWAN EXCELLENCE
GOLD AWARD 2003, 2010

Industrial Robot

- For Semiconductor & Electronic (KK Series)
- For Automation (KS, KA Series)



TAIWAN EXCELLENCE
SILVER AWARD 2009

Linear Motor Air Bearing Platform



TAIWAN EXCELLENCE
GOLD AWARD 2008
TAIWAN EXCELLENCE
SILVER AWARD 2007, 2002

Linear Guideway

- HG/EG/RG/MG Type
- Ecological & Economical lubrication Module E2
- Low Noise (Q1)
- Air Jet (A1)



Positioning Measurement System



TAIWAN EXCELLENCE
GOLD AWARD 2009, 2008
TAIWAN EXCELLENCE
SILVER AWARD 2006, 2001, 1993

Ballscrews

- Ground/Rolled
- High Speed (High Dm-N Value/Super S Series)
- Heavy Load (Cool type II)
- Ecological & Economical lubrication Module E2
- Rotating Nut (R1)



Linear Motor X-Y Robot



TAIWAN EXCELLENCE
SILVER AWARD 2006

TMS Direct-Driver Positioning System



Linear Motor Gantry

AC SERVO MOTOR Safety Precautions

www.hiwin.com.au

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: $-10^{\circ}\text{C}\sim+50^{\circ}\text{C}$
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.

Rotary Motor

1. AC Servo Motor	1
AC Servo Motor Ordering Information	1
AC Servo Motor Features	1
AC Servo Motor 50W Model.....	3
AC Servo Motor 100W Model.....	4
AC Servo Motor 200W Model.....	5
AC Servo Motor 400W Model.....	6
AC Servo Motor 750W Model.....	7
Motor Power Cable.....	8
Encoder cable.....	8
AC Servo Motor and Driver Wiring	9
2. mega-fabs Israel Driver	10
AC Servo Motor Accessories	14
3. Two Phase Stepping Motor	15
Stepping Motor Ordering Information	15
Stepping Motor Features Curve.....	15
40mm Stepping angle 1.8° ST40 Model.....	16
55mm Stepping angle 1.8° ST55 Model.....	17
4. Stepping Driver (STD-24A)	18
Base Specifications	18
Wiring and Set-up	18
The connect with PCI-4P Wiring Example.....	20
The connect with PLC Wiring Example.....	20
Connect Figure	21
Shape Figure	21
Stepping Motor Accessories	21
5. HIWIN Robot and Motor Adaptor Flange	22
6. DC Brush Motor	23
DC Brush Motor Ordering Information	23
Motor Features Curve	23
Position Inspect Function	24
Cautions	24
AM1 Model.....	25
AM3 Model.....	27
AM4 Model.....	28
AM6 Model.....	29
AM7 Model.....	31
7. Rotary Motor Requirements List	32

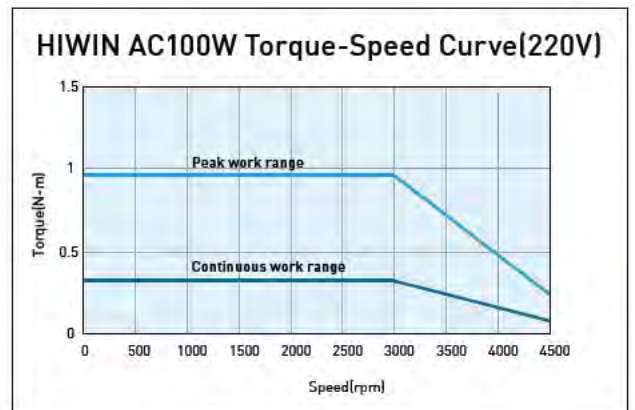
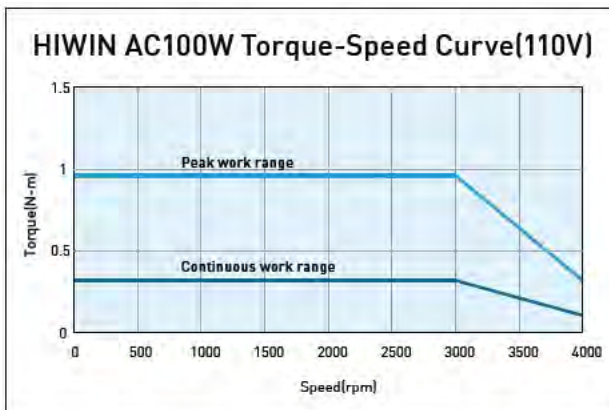
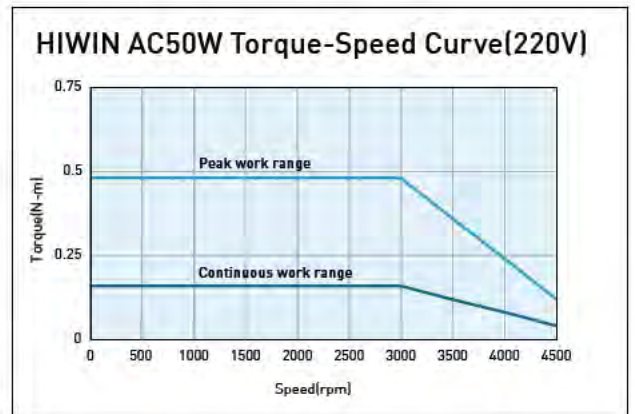
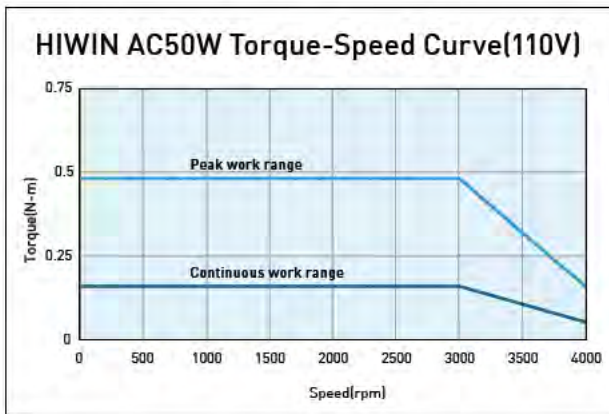
1. AC Servo Motor

AC Servo Motor Ordering Information

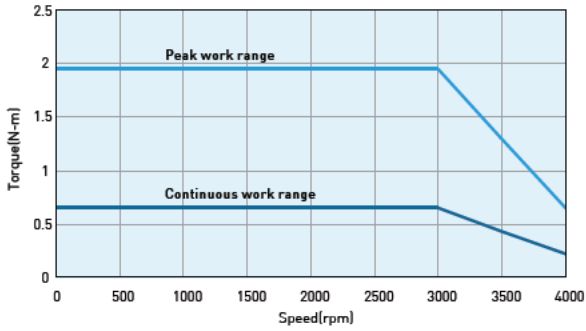
	FRAC	1	0	10	11	01
Product	Accessory	Key	Type	Voltage	Serial number	
FR:Brushless Motor AC:AC Servo Motor	1:Without Brake B:With Brake	0:Without Key K:With Key	05 : 50W 10 : 100W 20 : 200W 40 : 400W 75 : 750W	11 : 110V 22 : 220V	01~99	

AC Servo Motor Features

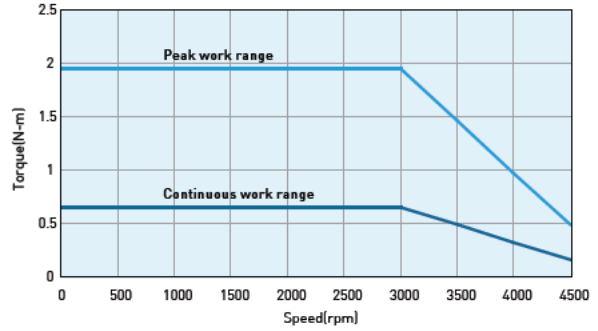
- Output Power [W] : The power of motor is working at rated torque and rated speed.
- Rated Torque [Tc] : Motor is working at rated current.
- Rated speed [ω_c] : Motor is working at rated power.
- Peak Max. Torque [Tp] : Momentary output torque and It is 3 times of rated torque.
- No Load Max. speed [ω_p] : Motor max speed when no load.
- Peak Max. current [Ip] : The current when Peak torque occur and It is 3 times of rated current.



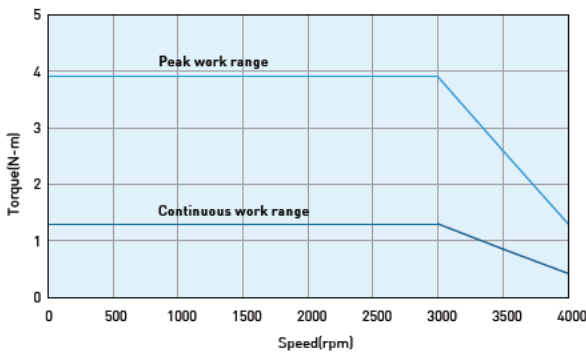
HIWIN AC200W Torque-Speed Curve(110V)



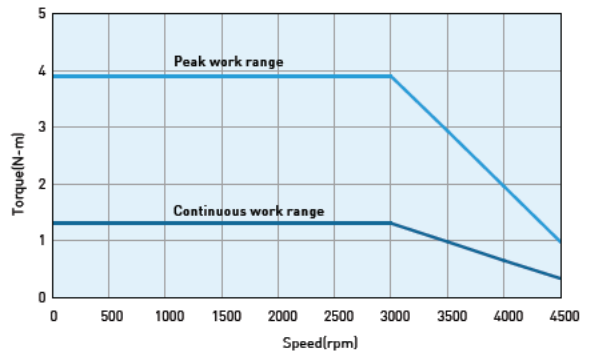
HIWIN AC200W Torque-Speed Curve(220V)



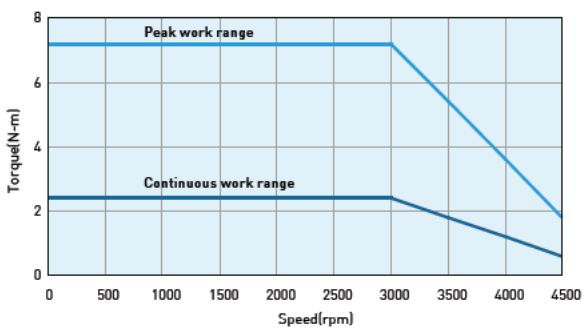
HIWIN AC400W Torque-Speed Curve(110V)



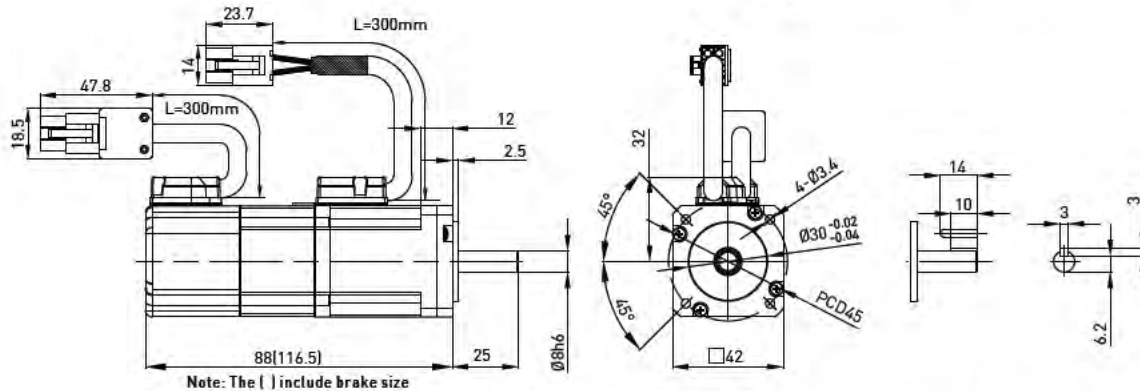
HIWIN AC400W Torque-Speed Curve(220V)



HIWIN AC750W Torque-Speed Curve(220V)

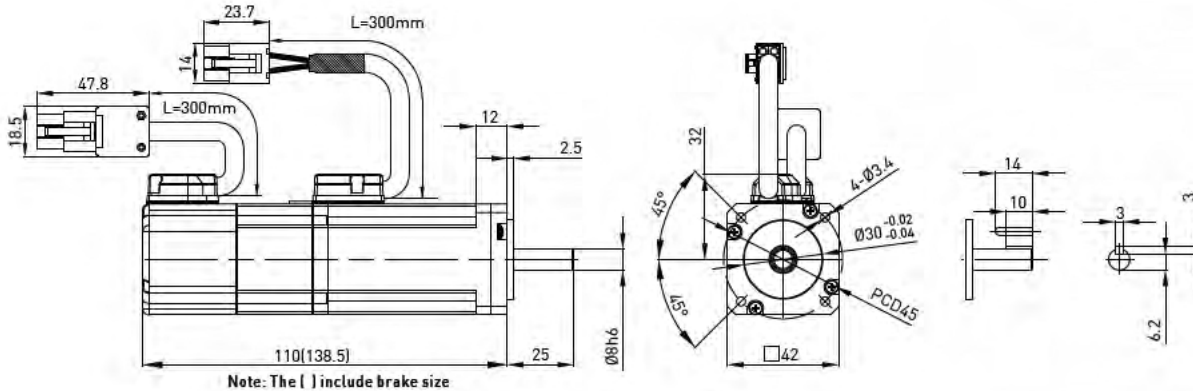


AC Servo Motor 50W Model



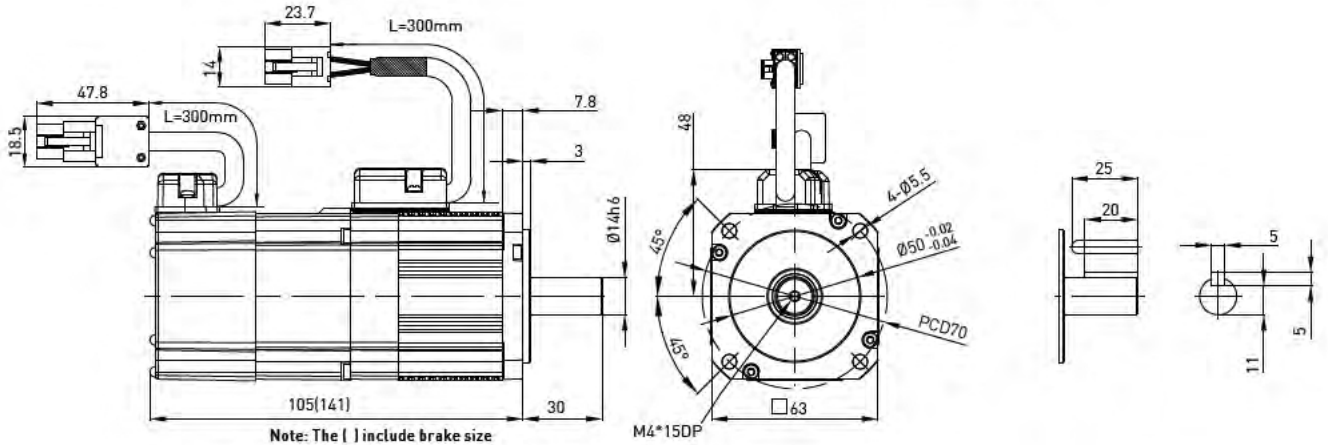
	Symbol	Unit	FRAC□□0511□□	FRAC□□0522□□
Input Voltage	V	V	AC110	AC220
Rated Power	W	W		50
Rated Torque	T _c	N.m		0.16
Rated Current	I _c	A(rms)		0.9
Peak Max. Torque	T _p	N.m		0.48
Peak Max. Current	I _p	A(rms)		2.7
Rated Speed	ω _c	rpm		3000
No Load Max. Speed	ω _p	rpm	4000	4500
Torque Constant	K _t	N-m / Arms		0.178
Back EMF Constant	K _e	V _{rms} / krpm		10.74
Resistance (line to line)	R	Ω		4.7
Inductance (line to line)	L	mH		4.7
Number of poles	P	-		8
Inertia of Rotating Parts (with brake)	J	kg-m ²		0.02*10 ⁻⁴ (0.022*10 ⁻⁴)
Weight (with brake)	M	kg		0.45(0.58)
Encoder Resolution	CPR	pulse		2500
Brake Keep Torque	T _b	N-m		0.32
Brake Voltage	V	V		DC24±10%
Motor Insulation grade			Class B	
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 gas, inflammable gas, oil and dust.	
	Elevation		1000m down	
Vibration		49m/s ² down		

AC Servo Motor 100W Model



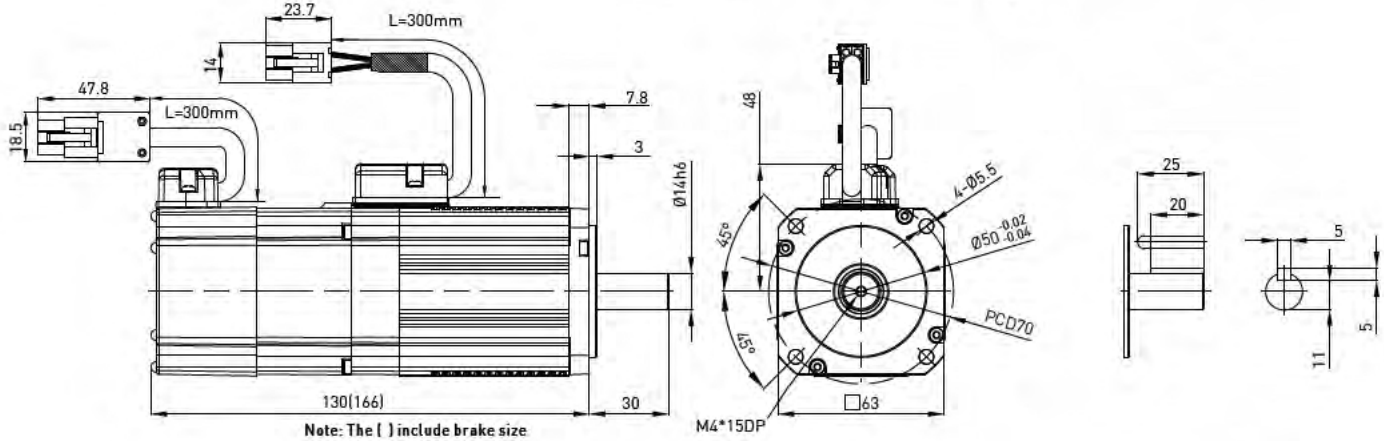
	Symbol	Unit	FRAC□□1011□□	FRAC□□1022□□
Input Voltage	V	V	AC110	AC220
Rated Power	W	W		100
Rated Torque	T _c	N.m		0.32
Rated Current	I _c	A(rms)		0.9
Peak Max. Torque	T _p	N.m		0.96
Peak Max. Current	I _p	A(rms)		2.7
Rated Speed	ω _c	rpm		3000
No Load Max. Speed	ω _p	rpm	4000	4500
Torque Constant	K _t	N-m / Arms		0.356
Back EMF Constant	K _e	V _{rms} / krpm		21.98
Resistance (line to line)	R	Ω		8
Inductance (line to line)	L	mH		8.45
Number of poles	P	-		8
Inertia of Rotating Parts (with brake)	J	kg-m ²	0.036*10 ⁻⁴ (0.038*10 ⁻⁴)	
Weight (with brake)	M	kg		0.63(0.76)
Encoder Resolution	CPR	pulse		2500
Brake Keep Torque	T _b	N-m		0.32
Brake Voltage	V	V		DC24±10%
Motor Insulation grade			Class B	
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 gas, inflammable gas, oil and dust.	
	Elevation		1000m down	
Vibration		49m/s ² down		

AC Servo Motor 200W Model



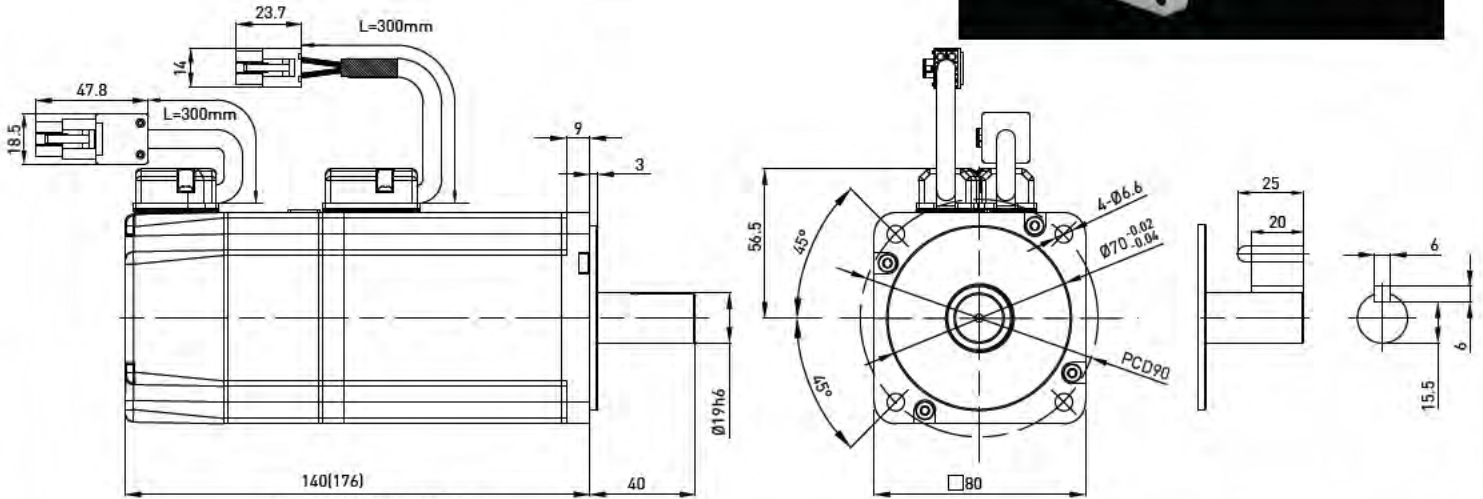
	Symbol	Unit	FRAC□□2011□□	FRAC□□2022□□
Input Voltage	V	V	AC110	AC220
Rated Power	W	W		200
Rated Torque	T _c	N.m		0.65
Rated Current	I _c	A(rms)	3.2	2
Peak Max. Torque	T _p	N.m		1.95
Peak Max. Current	I _p	A(rms)	9.6	6
Rated Speed	ω _c	rpm		3000
No Load Max. Speed	ω _p	rpm	4000	4500
Torque Constant	K _t	N-m / Arms	0.2	0.325
Back EMF Constant	K _e	V _{rms} / krpm	12.275	19.64
Resistance (line to line)	R	Ω	1	2.7
Inductance (line to line)	L	mH	1.5	4.5
Number of poles	P	-	8	8
Inertia of Rotating Parts (with brake)	J	kg·m ²		0.26*10 ⁻⁴ (0.3*10 ⁻⁴)
Weight (with brake)	M	kg		1.04(1.85)
Encoder Resolution	CPR	pulse		2500
Brake Keep Torque	T _b	N-m		1.3
Brake Voltage	V	V		DC24±10%
Motor Insulation grade			Class B	
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 gas, inflammable gas, oil and dust.	
	Elevation		1000m down	
	Vibration		49m/s ² down	

AC Servo Motor 400W Model



	Symbol	Unit	FRAC□□4011□□	FRAC□□4022□□
Input Voltage	V	V	AC110	AC220
Rated Power	W	W		400
Rated Torque	T _c	N.m		1.3
Rated Current	I _c	A(rms)	3.2	2
Peak Max. Torque	T _p	N.m		3.9
Peak Max. Current	I _p	A(rms)	9.6	6
Rated Speed	ω _c	rpm		3000
No Load Max. Speed	ω _p	rpm	4000	4500
Torque Constant	K _t	N-m / Arms	0.4	0.65
Back EMF Constant	K _e	V _{rms} / krpm	24.17	37.96
Resistance (line to line)	R	Ω	1.7	4.6
Inductance (line to line)	L	mH	2.6	7
Number of poles	P	-	8	8
Inertia of Rotating Parts (with brake)	J	kg·m ²		0.44*10 ⁻⁴ (0.48*10 ⁻⁴)
Weight (with brake)	M	kg		1.52(2.06)
Encoder Resolution	CPR	pulse		2500
Brake Keep Torque	T _b	N-m		1.3
Brake Voltage	V	V		DC24±10%
Motor Insulation grade			Class B	
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 gas, inflammable gas, oil and dust.	
	Elevation		1000m down	
	Vibration		49m/s ² down	

AC Servo Motor 750W Model



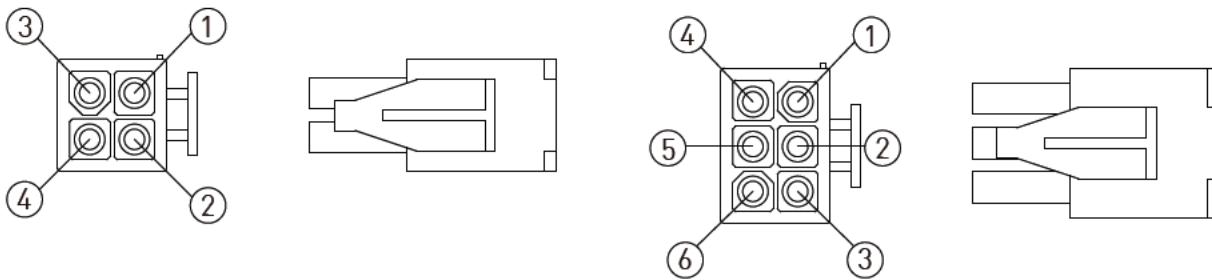
Note: The () include brake size

	Symbol	Unit	FRAC□□7522□□
Input Voltage	V	V	AC220
Rated Power	W	W	750
Rated Torque	T _c	N.m	2.4
Rated Current	I _c	A(rms)	5.1
Peak Max. Torque	T _p	N.m	7.2
Peak Max. Current	I _p	A(rms)	15.3
Rated Speed	ω _c	rpm	3000
No Load Max. Speed	ω _p	rpm	4500
Torque Constant	K _t	N-m / Arms	0.47
Back EMF Constant	K _e	V _{rms} / krpm	28.4
Resistance (line to line)	R	Ω	0.813
Inductance (line to line)	L	mH	3.4
Number of poles	P	-	8
Inertia of Rotating Parts (with brake)	J	kg-m ²	1.4*10 ⁻⁴ (1.46*10 ⁻⁴)
Weight (with brake)	M	kg	2.66(3.32)
Encoder Resolution	CPR	pulse	2500
Brake Keep Torque	T _b	N-m	2.4
Brake Voltage	V	V	DC24±10%
Motor Insulation grade			Class B
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 gas, inflammable gas, oil and dust.
	Elevation		1000m down
Vibration		49m/s ² down	

Motor Power Cable

Single	Color	AMP-4PIN(M)	AMP-6PIN(M)
U	Red	3	3
V	White	2	2
W	Black	1	1
GND	Green	4	4
B+	Black	--	5
B-	Black	--	6

Connect Pins Position Definition

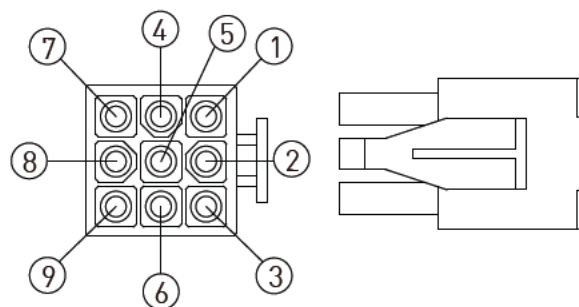


Encoder Cable

Encoder Specifications

- A/B/Z phase output , Line Driver differential output signal
- 2500 resolution
- Work temperature for $-20^{\circ}\text{C} \sim +85^{\circ}\text{C}$.
- 200KHz frequency response
- Work voltage DC $+5\text{V} \pm 5\%$
- RoHS

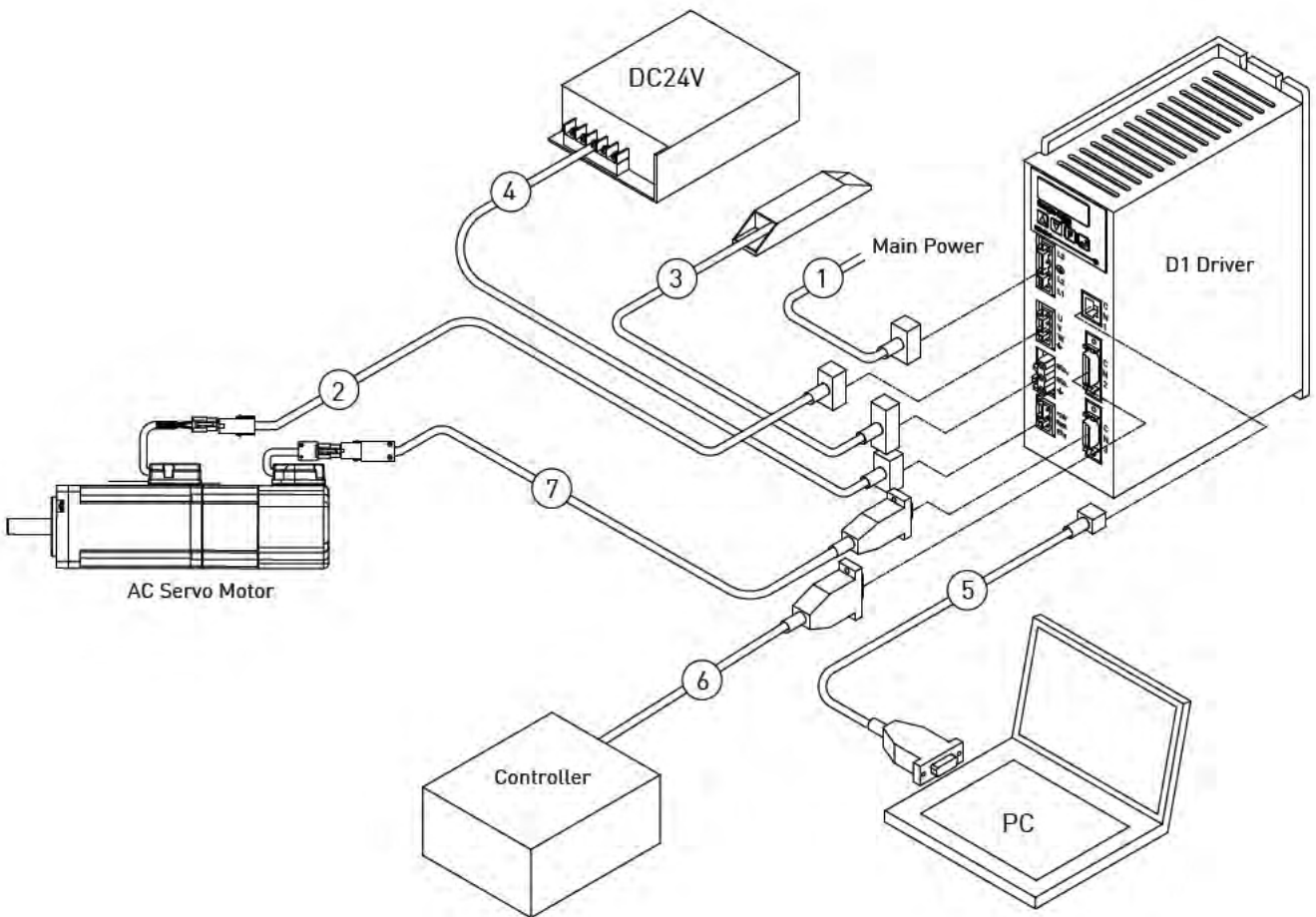
Connect Pins Position Definition



Incremental Encoder

Function	Signal	Color	AMP-9PIN(M)
Power	$5\text{V} \pm 5\%$	Red	1
	0V	Black	2
Incremental signal	A +	Blue	3
	A -	Blue/Black	4
	B +	Green	5
	B -	Green/Black	6
Reference signal	Z +	Yellow	7
	Z -	Yellow/Black	8
Shielding	Shielding	Black	9

AC Servo Motor and Driver Wiring



Number	Name	Description
1	AC Main Power	Connected single-phase \ three-phase AC power
2	Motor Power Connect	Connected to motor three-phase power source
3	Regenerative resistor	Connected to regenerative resistor(Optional)
4	24Vdc Control Power	24Vdc source used for control and I/O
5	RS232 Connect(CN1)	Connected to PC
6	Control signal Connect(CN2)	Connected to controller
7	Feedback Signal Connect(CN3)	Connected to encoder

2. mega-fabs Israel Driver

Application for AC Servo Motor \ Linear Motor
 Instruct Control Model

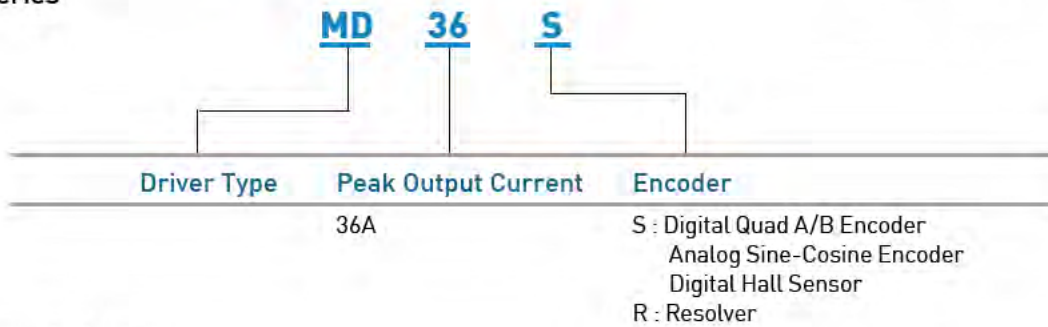
- Position, Speed, Torque

Input Type

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



Drive Series



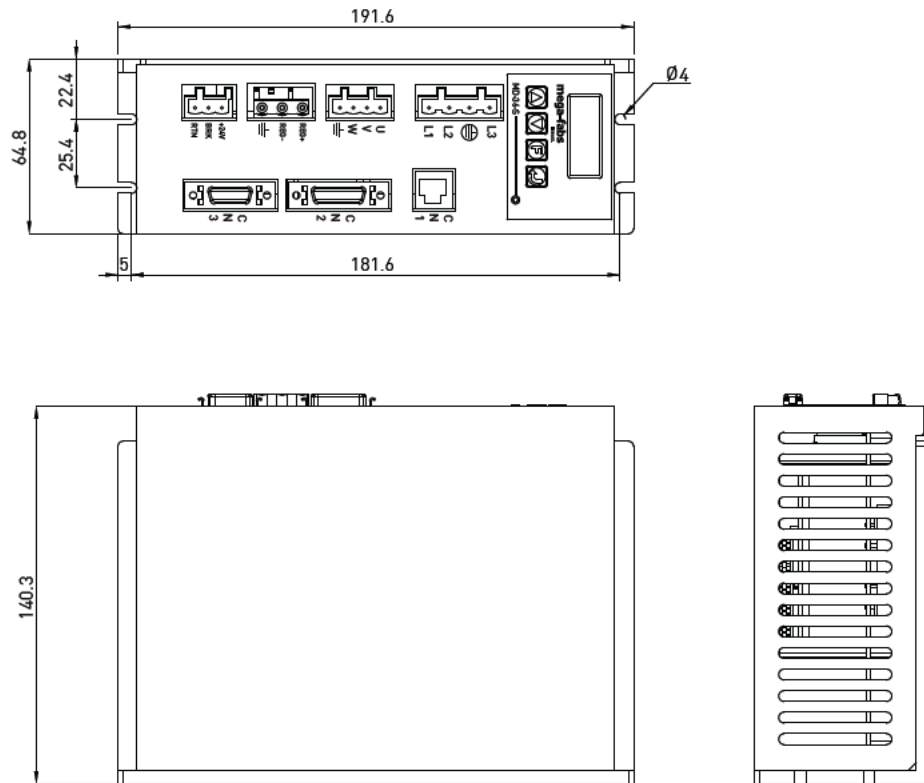
Application industry

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

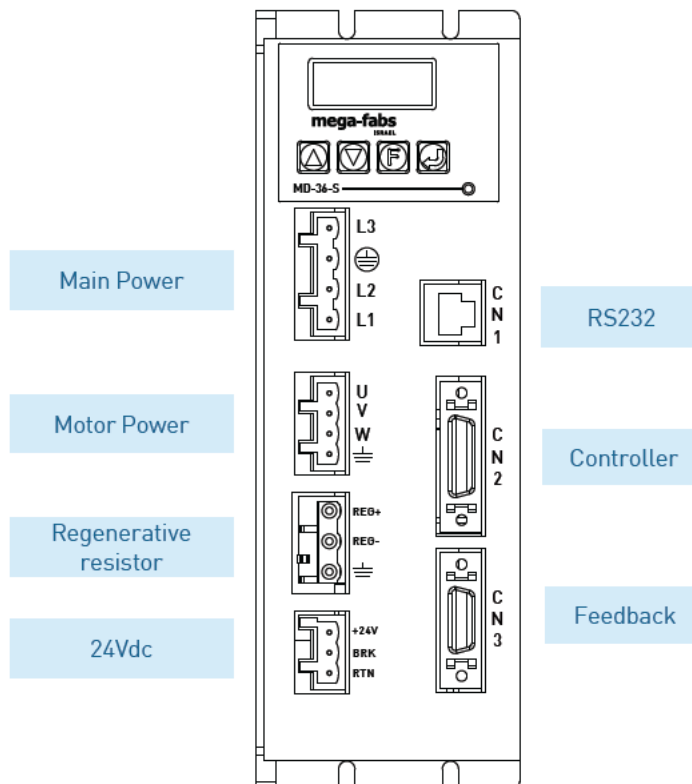
Specifications

Item	Driver	Specifications
Max pulse command bandwidth	Pulse Input	2M Pulse/s max.
	Quad A/B	8M Count/s max.
Encoder Signal	Digital	5V \pm 5% RS422
	Analog	1Vp-p (Sin/Cos)
DC power input (Control loop power)		24Vdc \pm 10%/1A
AC power output (Motor drive power)		100~240VAC \pm 10%, 50~60Hz/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°C ~ 45°C
Store temperature		-20°C~ +85°C

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 RS-232

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 Temp.[I5]	14		

● STATE

LED Color	State
RED	ERROR
GREEN	Servo Ready

Software

Name : Lightning

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	Type	Description	Quantity
Driver Accessories Package (Without SCSI 20-PIN Connector)	D1-CK1	AC Main Power Connector	1
		Motor Power Connector	1
		Regenerative Resistor Connector	1
		DC24V Connector	1
		Control Signal Connector[CN2]	1
		Connector Tool	1
Driver Accessories Package (With SCSI 20-PIN Connector)	D1-CK2	AC Main Power Connector	1
		Motor Power Connector	1
		Regenerative Resistor Connector	1
		DC24V Connector	1
		Control Signal Connector[CN2]	1
		Feedback Connector[CN3]	1
EMC Accessories Package (Single-Phase)	D1-EMC1	Single-Phase Filter(FN2090-10-06)	1
		EMI Core KCF-130-B	2
EMC Accessories Package (Three-Phase)	D1-EMC2	Three-Phase Filter (FN3258-7-45)	1
		EMI Core KCF-130-B	2

AC Servo Motor Accessories

Name	Type	Connect	Description
Ⓐ RS-232 Cable	HE00LMACR21D	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

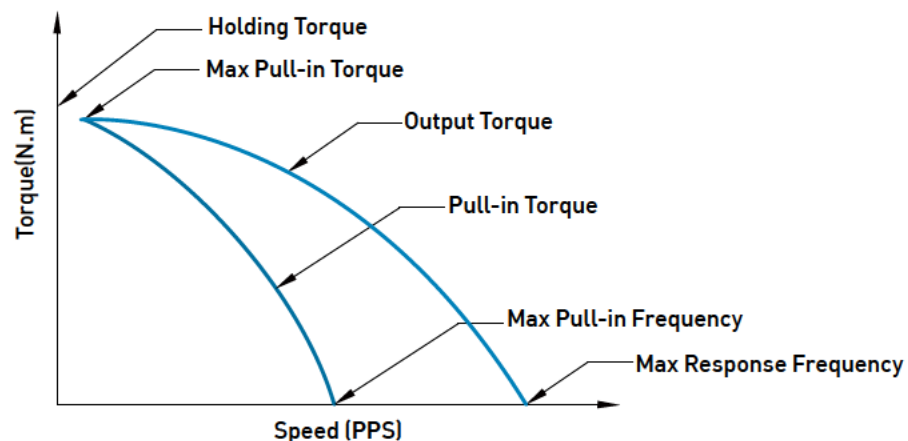
Signal	AMP 9PIN	SCSI 20Pin (Male)
5V	1	3
0V	2	2
A+	3	4
A-	4	5
B+	5	6
B-	6	7
Z+	7	8
Z-	8	9
Shielding	9	1,20,shell

3. Two Phase Stepping Motor

Stepping Motor Ordering Information

Product	Model	Phase/Shaft	Type	Step Angle	Voltage	Serial number
Brushless Motor	ST:	0: 2S (2 phase/single axis) 1: 2D (2 phase/double axis)	1X: ST40 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.

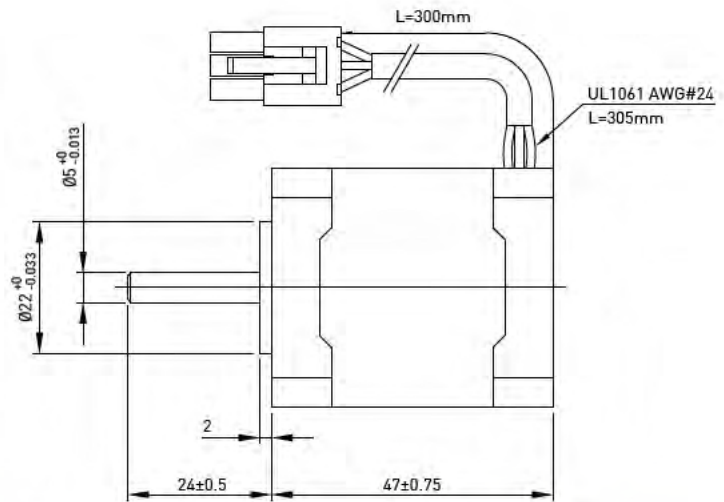
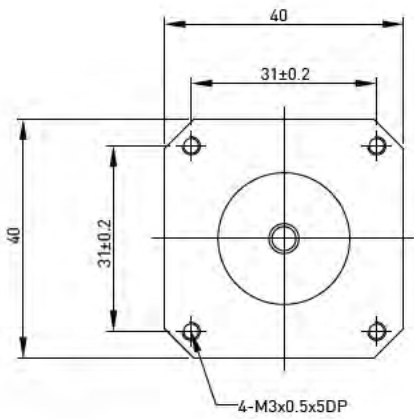
- **Max Response Frequency**

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**

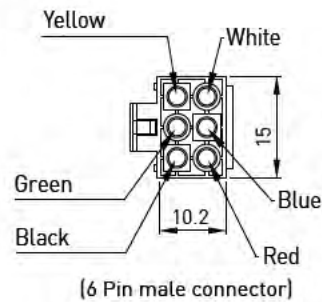
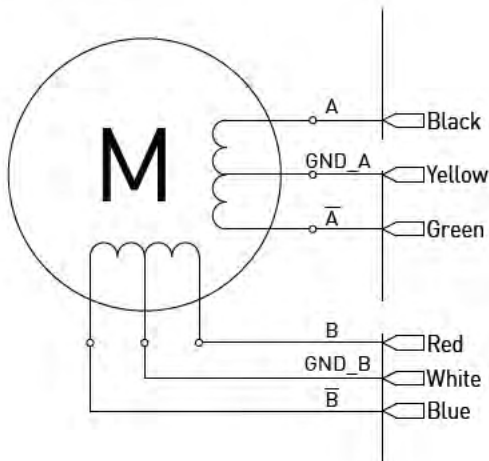
It is exerting max torque for extra add load to change rotor position in rotor keep motionless that motor stator winding is enable.

40mm Step Angle 1.8° ST40 Series



Model	Winding Type	Holding Torque	Current	Resistance	Inductance	Rotor Inertia	Leads	Motor Length	Input Voltage
Single axis		N.m	A/phase	Ω/phase	mH/phase	g-cm ²		(L)mm	Vdc
FRST01102401	Single Pole	0.1	0.95	3.3	3.5	19	6	47	4

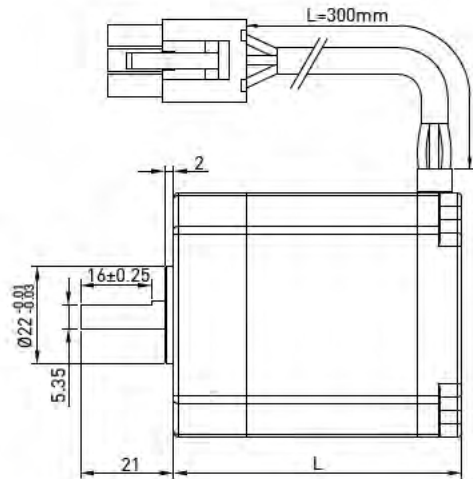
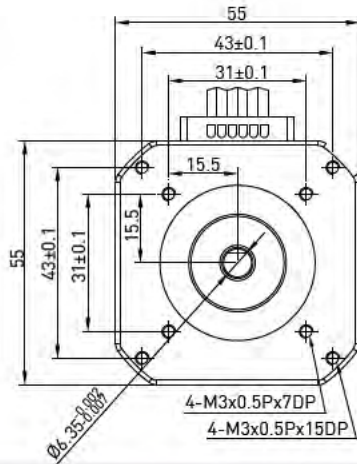
● Wiring Diagram



Notice:

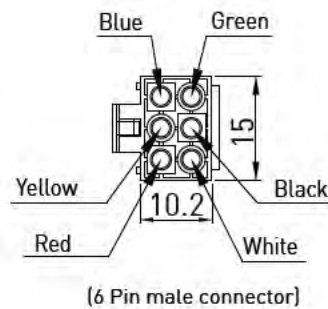
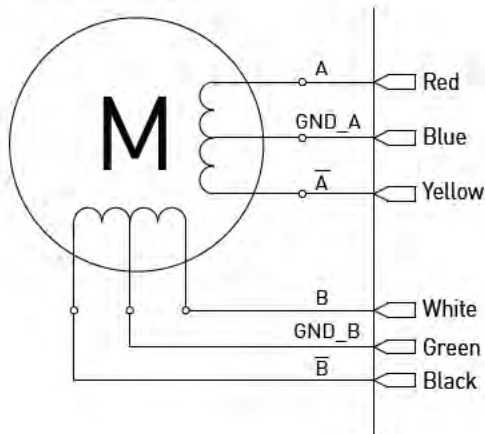
- ★ Please use the wire which is larger than 0.5mm² and as short as possible for power and motor connection.
- ★ Support 2 phase stepping motor (6 lead wire).

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-m ²		(L)mm	Vdc
FRST02102401	FRST12102401	Single Pole	0.25	1.3	2.8	3.3	90	6	50.5	3
FRST02202401	FRST12202401	Single Pole	0.6	1.3	4.0	7.0	171	6	65	4
FRST02302401	FRST12302401	Single Pole	1.05	1.2	5.6	13.0	290	6	87	5.3

● Wiring Diagram



Notice:

- ★ Please use the wire which is larger than 0.5mm² 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

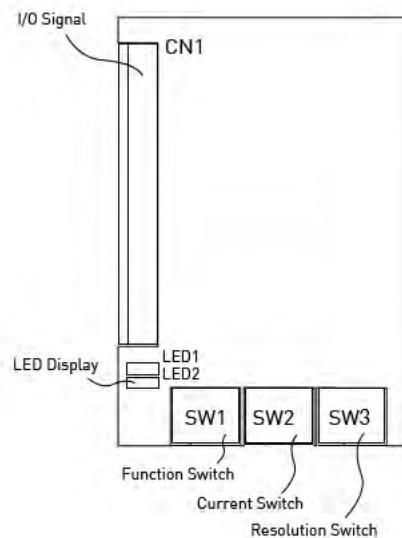
1. LED State

- LED display

Display	Color	function
LED1	Red	Power light
LED2	Green	State light

- State light Information

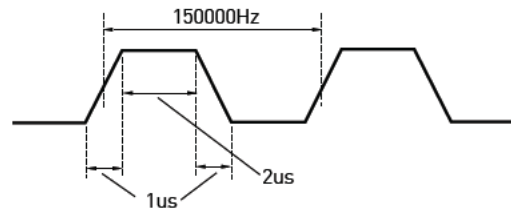
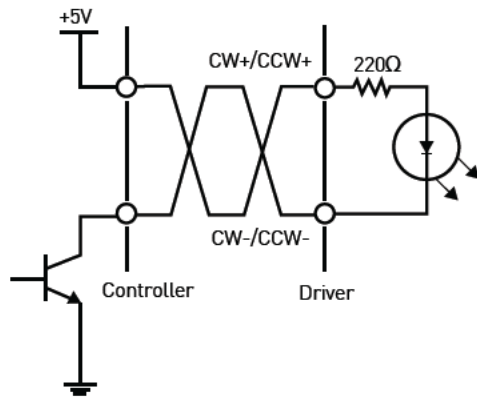
Drive State	LED State
Forward	low speed flash (0.5s/per)
Reverse	high speed flash (0.2s/per)
Limit Input	low speed flash (1s/per)
Exciting release	dark
Stand by	light



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

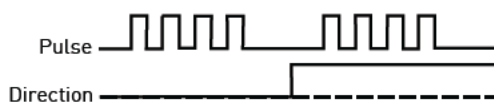
● Input Pulse Single Wiring Diagram



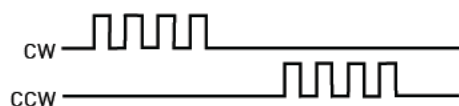
Notice:

- ※ Please use the wire which is larger than 0.5mm^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 :

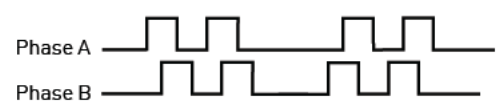
A. Pulse/Direction (1P)



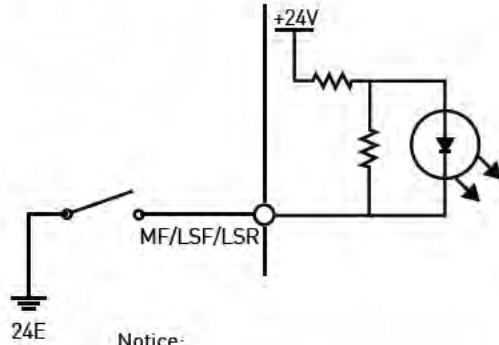
B. CW/CCW (2P)



C. Quadrature (A/B)



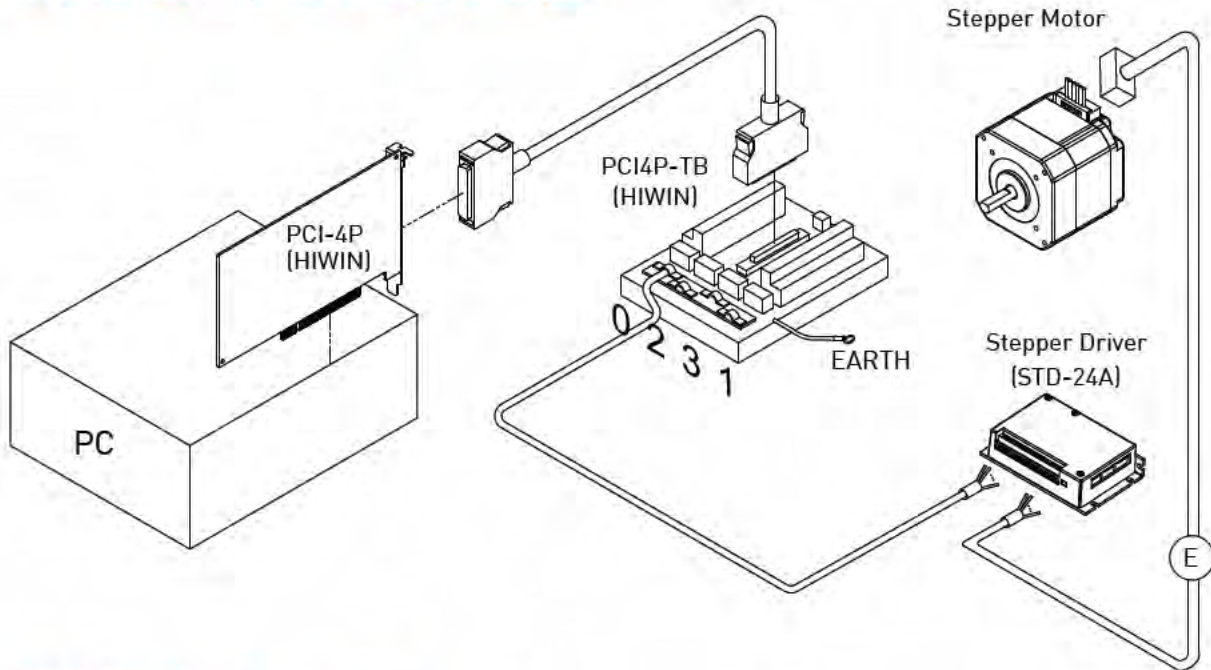
● Limit Input \ Motor Disable Wiring Diagram



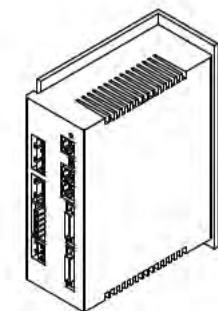
Notice:

- ※ 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.

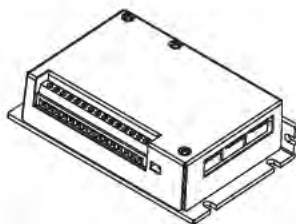
HIWIN PCI-4P Wiring Example



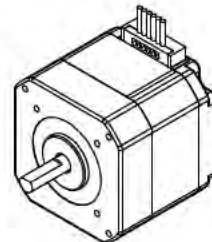
PLC Wiring Example



PLC Motion Controller

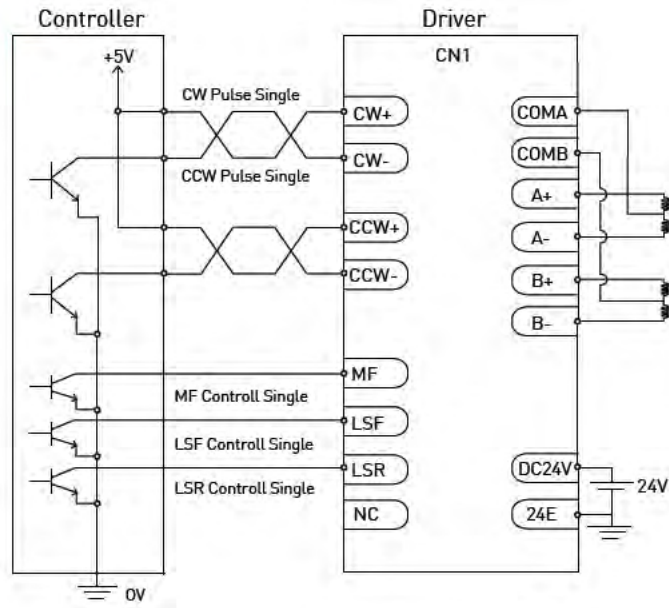


Stepper Motor Driver [STD-24A]



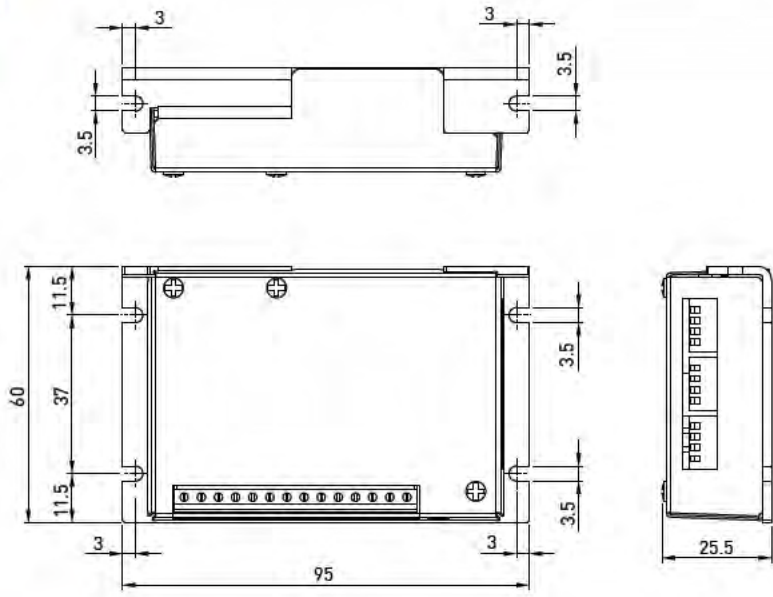
Stepper Motor

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 Wiring Table		
				Signal	6Pin (F)	Western-style post
 Stepping Motor Cable	HV00FRSTP□□A	MOTOR OUTPUTS	 6 Pin(Female)	COMA	1	COM A
				A-	2	A-
				A+	3	A+
				COM B	4	COM B
				B-	5	B-
				B+	6	B+

List A

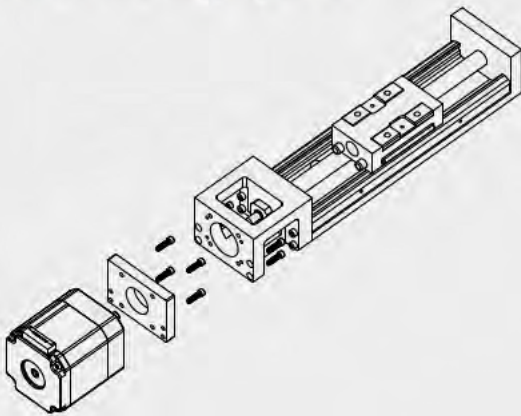
□□	30	50	70	A0
L (m)	3	5	7	10

5. HIWIN Robot and Motor Adaptor Flange

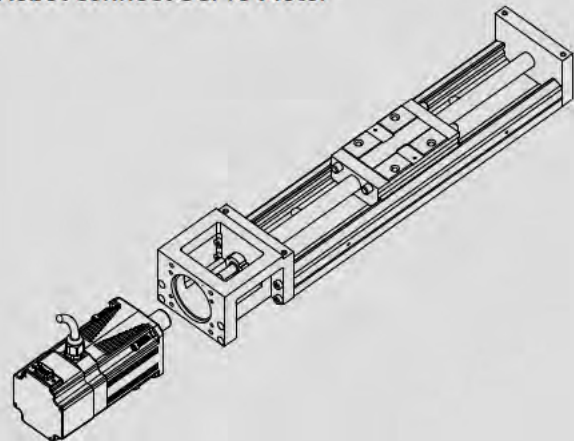
Motor Flange List

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
Brush Motor	01 : Brush DC 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.

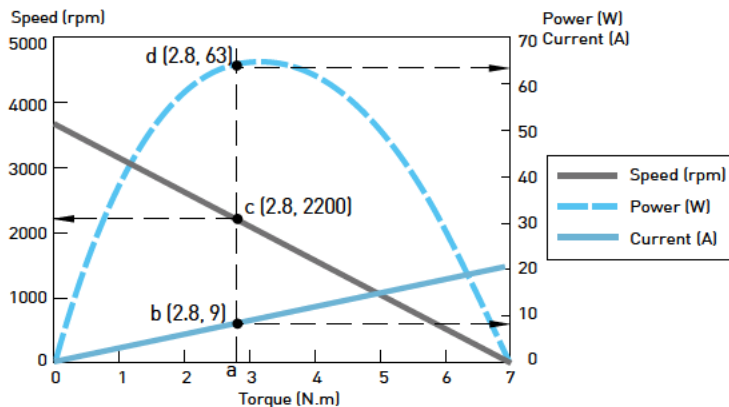
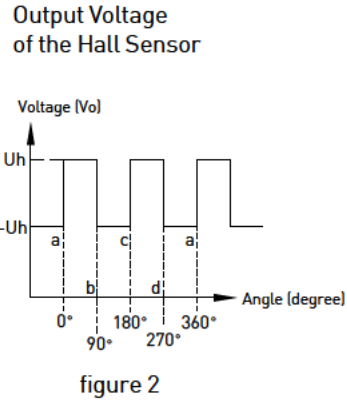
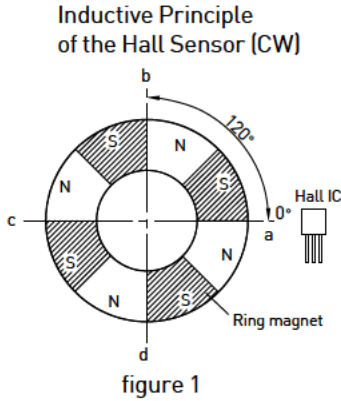


Illustration for Capability of Encoder



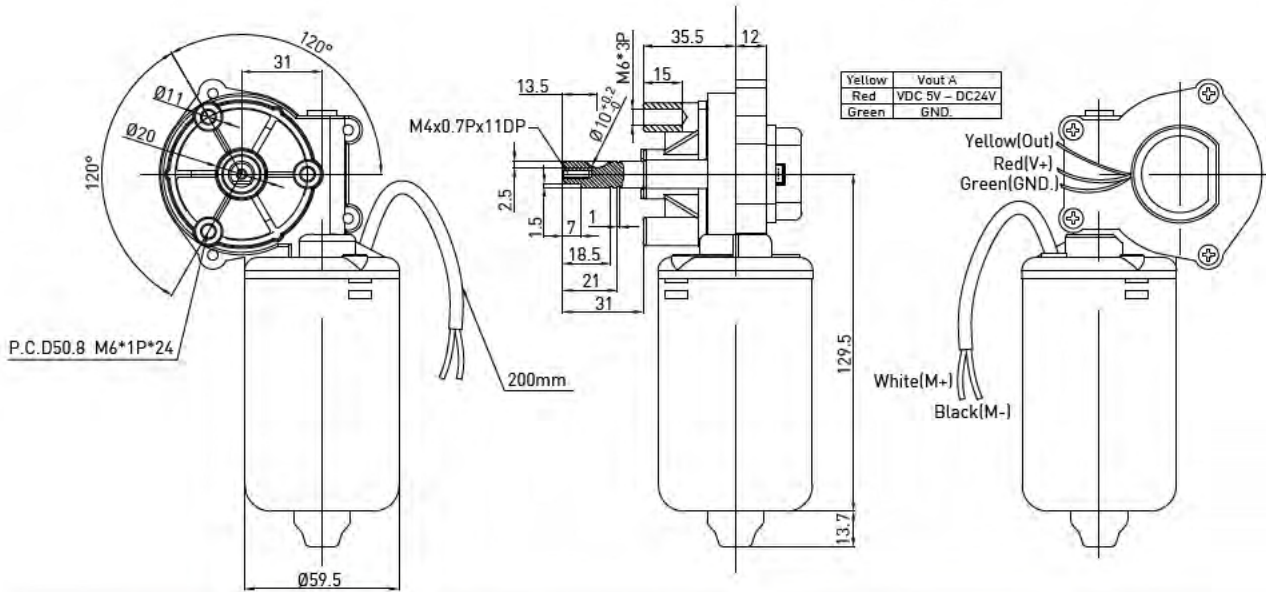
※The principle of picking out the Hall IC

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 U_h ~ $-U_h$ 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.

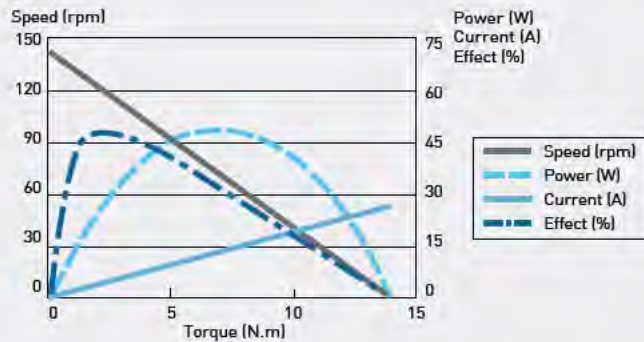
Cautions

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.

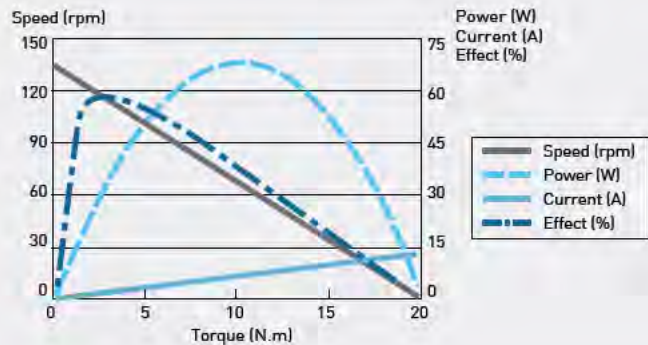
Motor Type Dimensions for AM1 Type



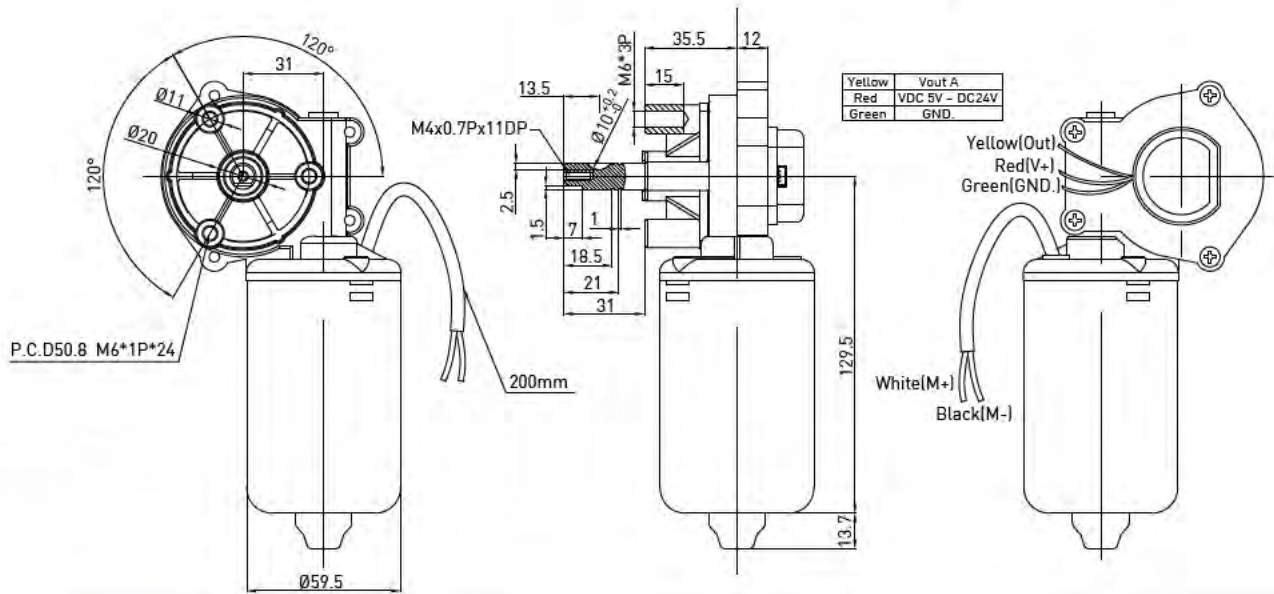
DC 12V	72W
No load current	1.5A (max.)
No load speed	140 rpm
Nominal torque	3.0 N.m
Nominal speed	110 rpm
Nominal current	6.0A (max.)
Maximum current	26A
Breaking torque	14 N.m
Reduction ratio	2 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130101201



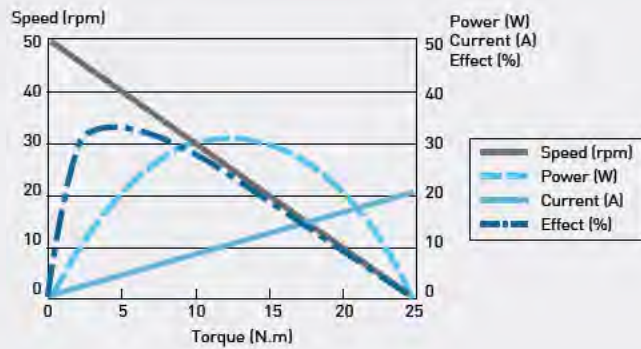
DC 24V	60W
No load current	0.8A (max.)
No load speed	135 rpm
Nominal torque	3.0 N.m
Nominal speed	115 rpm
Nominal current	2.5A (max.)
Maximum current	15A
Breaking torque	20 N.m
Reduction ratio	2 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130102401



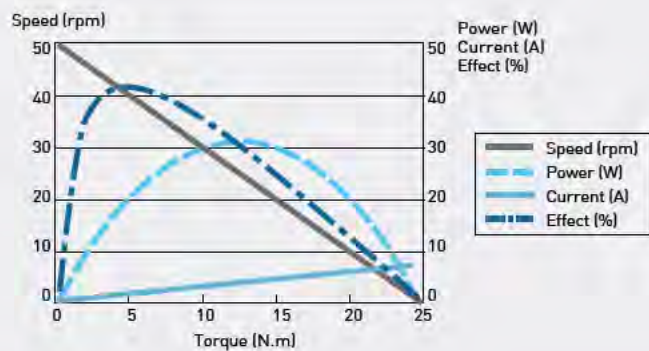
Dimensions for AM1 Type



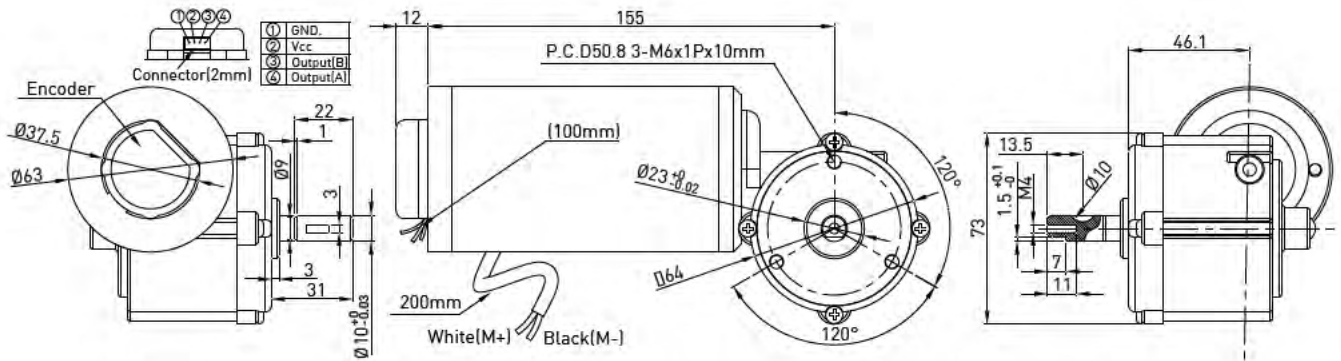
DC 12V	72W
No load current	1.5A (max.)
No load speed	50 rpm
Nominal torque	5.0 N.m
Nominal speed	40 rpm
Nominal current	6.0A (max.)
Maximum current	21A
Breaking torque	25 N.m
Reduction ratio	1 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130101202



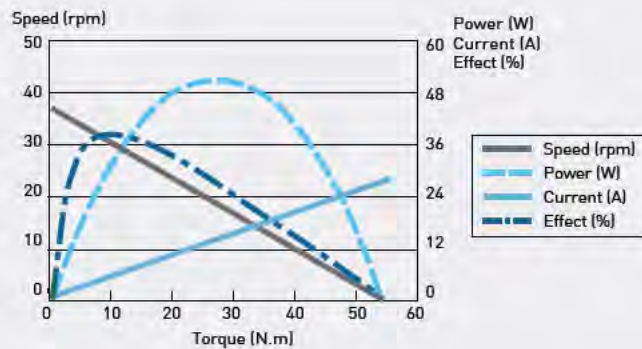
DC 24V	60W
No load current	0.8A (max.)
No load speed	50 rpm
Nominal torque	5.0 N.m
Nominal speed	40 rpm
Nominal current	2.5A (max.)
Maximum current	8A
Breaking torque	25 N.m
Reduction ratio	1 : 52
Resolution	15 pulse/rev
Rated duty	S1
Weight	1200 g
Number	FB0130102402



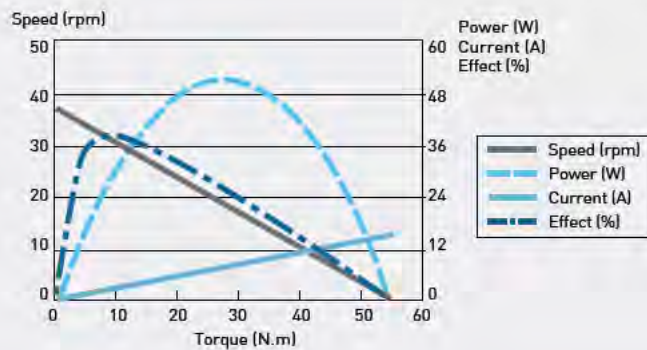
Dimensions for AM3 Type



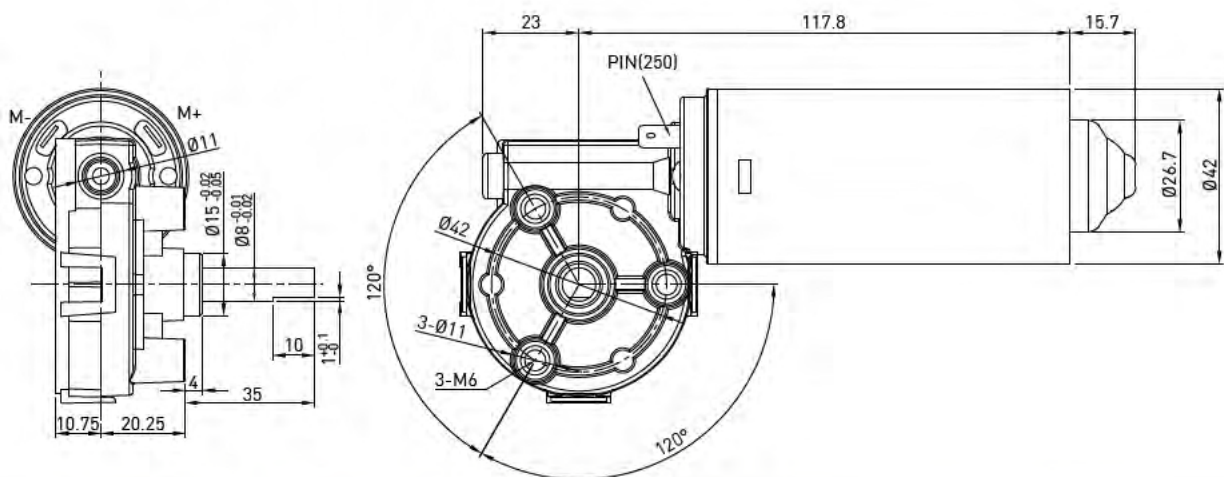
DC 12V	66W
No load current	2.0A (max.)
No load speed	37 rpm
Nominal torque	5.0 N.m
Nominal speed	33 rpm
Nominal current	5.5A (max.)
Maximum current	30A
Breaking torque	55 N.m
Reduction ratio	1 : 65.33
Resolution	980 pulse/rev
Rated duty	S1
Weight	1950 g
Number	FB0130301201



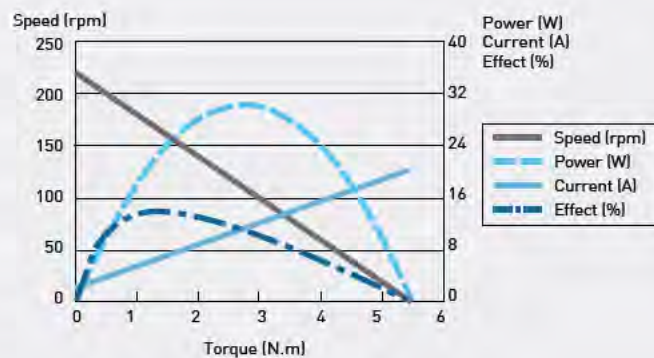
DC 24V	60W
No load current	1.5A (max.)
No load speed	37 rpm
Nominal torque	5.0 N.m
Nominal speed	33 rpm
Nominal current	2.5A (max.)
Maximum current	15A
Breaking torque	55 N.m
Reduction ratio	1 : 65.33
Resolution	980 pulse/rev
Rated duty	S1
Weight	1950 g
Number	FB0130302401



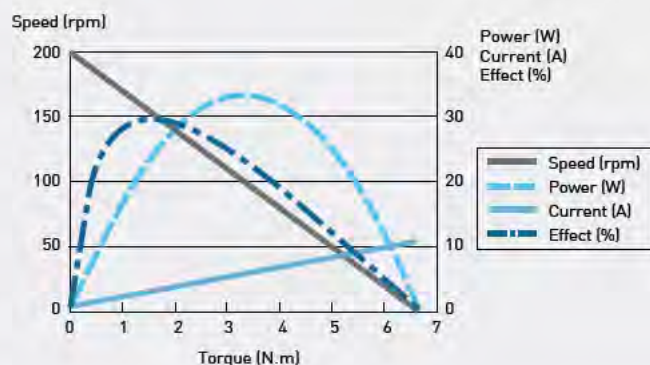
Dimensions for AM4 Type



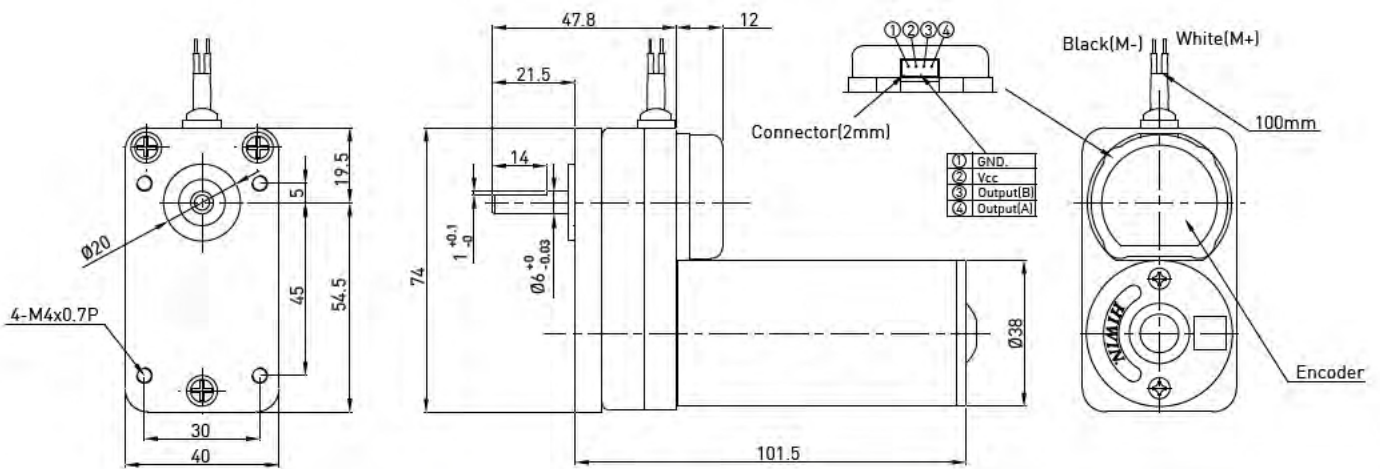
DC 12V	66W
No load current	2.5A (max.)
No load speed	220 rpm
Nominal torque	1.0 N.m
Nominal speed	180 rpm
Nominal current	5.5A (max.)
Maximum current	20A
Breaking torque	5.5 N.m
Reduction ratio	2 : 49
Resolution	-
Rated duty	100%
Weight	600 g
Number	FB0110401201



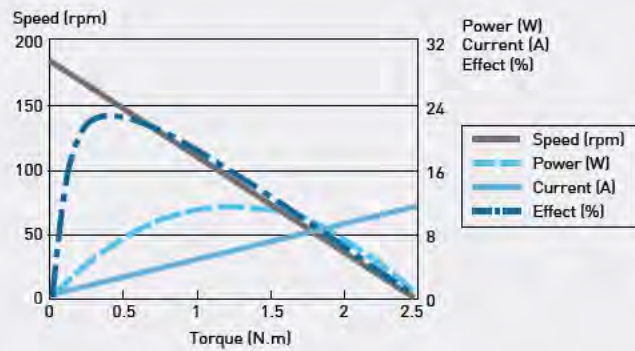
DC 24V	60W
No load current	1.5A (max.)
No load speed	200 rpm
Nominal torque	1.0 N.m
Nominal speed	170 rpm
Nominal current	2.5A (max.)
Maximum current	11A
Breaking torque	6.5 N.m
Reduction ratio	2 : 49
Resolution	-
Rated duty	100%
Weight	600 g
Number	FB0110402401



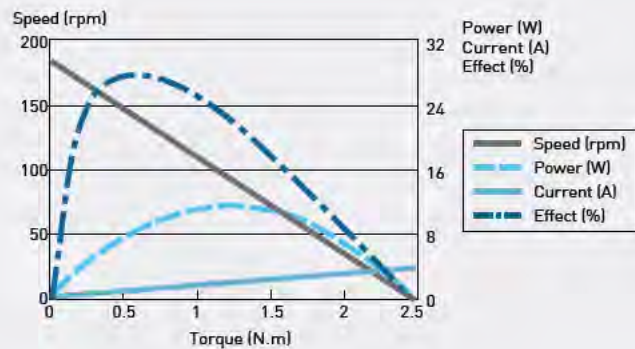
Dimensions for AM6 Type



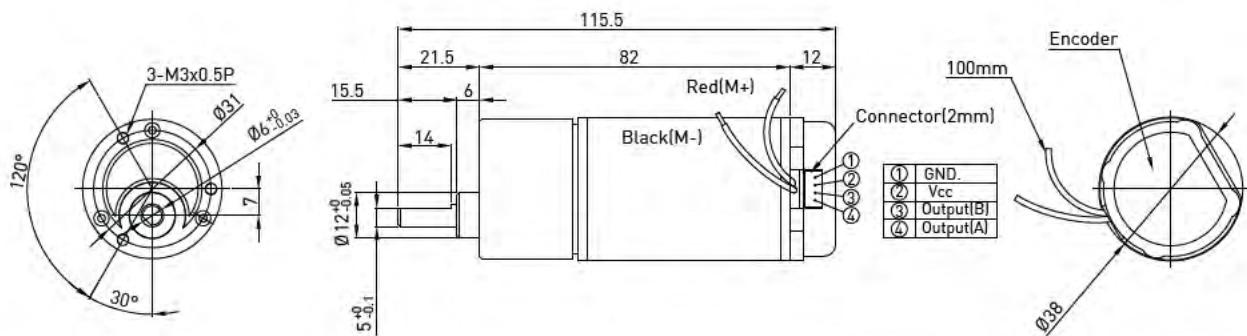
DC 12V	36W
No load current	1.0A (max.)
No load speed	185 rpm
Nominal torque	0.5 N.m
Nominal speed	145 rpm
Nominal current	3.0A (max.)
Maximum current	12A
Breaking torque	2.5 N.m
Reduction ratio	1 : 21.6
Resolution	15 pulse/rev
Rated duty	S1
Weight	600 g
Number	FB0130601201



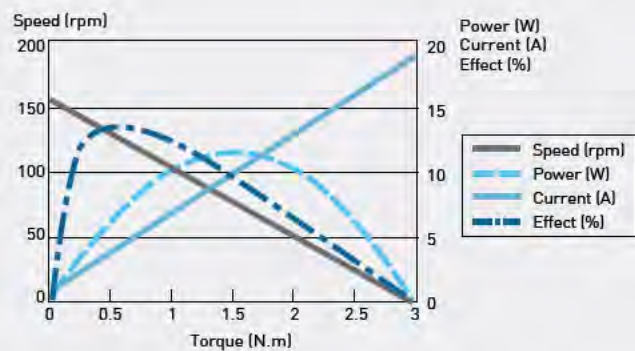
DC 24V	36W
No load current	0.5A (max.)
No load speed	185 rpm
Nominal torque	0.5 N.m
Nominal speed	145 rpm (min.)
Nominal current	1.5A (max.)
Maximum current	4A
Breaking torque	2.5 N.m
Reduction ratio	1 : 21.6
Resolution	15 pulse/rev
Rated duty	S1
Weight	600 g
Number	FB0130602401



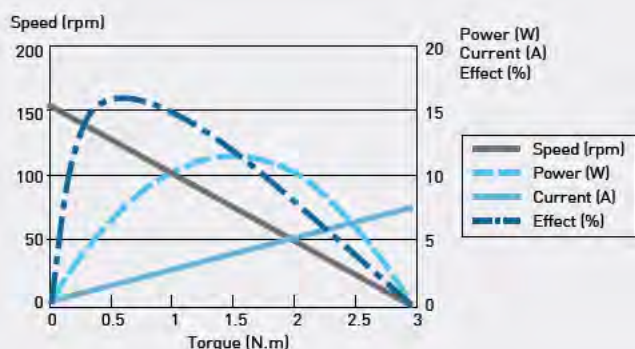
Dimensions for AM6 Type



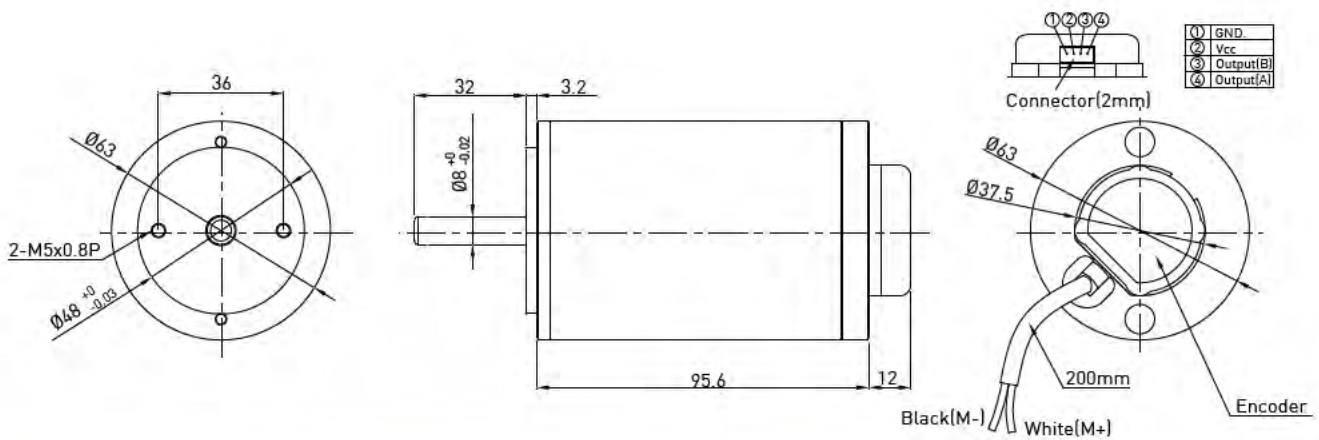
DC 12V	48W
No load current	1.0A (max.)
No load speed	155 rpm
Nominal torque	0.5 N.m
Nominal speed	130 rpm
Nominal current	4.0A (max.)
Maximum current	19A
Breaking torque	3 N.m
Reduction ratio	1 : 50
Resolution	750 pulse/rev
Rated duty	S1
Weight	440 g
Number	FB0130601202



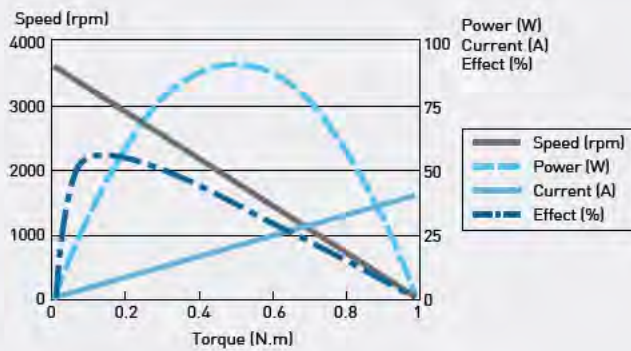
DC 24V	48W
No load current	0.5A (max.)
No load speed	155 rpm
Nominal torque	0.5 N.m
Nominal speed	130 rpm
Nominal current	2.0A (max.)
Maximum current	7A
Breaking torque	3 N.m
Reduction ratio	1 : 50
Resolution	750 pulse/rev
Rated duty	S1
Weight	440 g
Number	FB0130602402



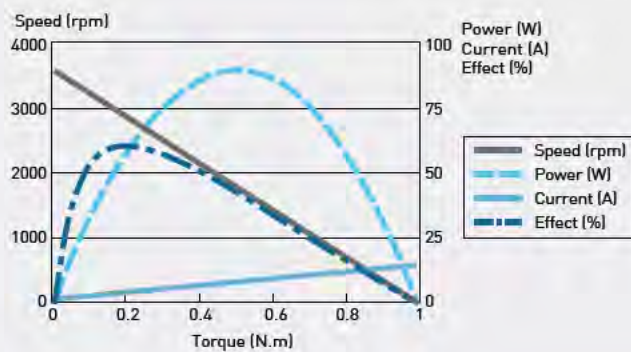
Dimensions for AM7 Type



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 :		Date :			
Email :		Contact Person :			
Tel :		Appointment :			
Fax :		Note :			
Motor Type	<input type="checkbox"/> AC Servo Motor <input type="checkbox"/> Stepping Motor <input type="checkbox"/> DC Motor				
AC Motor Series	<input type="checkbox"/> 50W <input type="checkbox"/> 100W <input type="checkbox"/> 200W <input type="checkbox"/> 400W <input type="checkbox"/> 750W				
Stepping Motor Series	<input type="checkbox"/> ST40 <input type="checkbox"/> ST55				
DC Motor Series	<input type="checkbox"/> AM1 <input type="checkbox"/> AM3 <input type="checkbox"/> AM4 <input type="checkbox"/> AM6 <input type="checkbox"/> AM7 <input type="checkbox"/> other_____				
Input Voltage[V]	AC : <input type="checkbox"/> 110V <input type="checkbox"/> 220V DC : <input type="checkbox"/> 12V <input type="checkbox"/> 24V <input type="checkbox"/> other_____				
Driver Series	<input type="checkbox"/> mega-fabs Driver <input type="checkbox"/> STD-24A				
Servo driver Accessories	HV04FRACP□□□ (Power Cable) HV06FRACP□□□ (Power Cable -Brake) HV00FRACE□□□ (Encoder Cable) HE00LMACR21D (RS-232) , quantity : _____ Accessories Package : _____ , quantity : _____				
Special need					
Purpose					
Budget cost					
Motor quantity					
Operation environment					
Size					
Rated Current A(rms)					
Rated Speed(rpm)					
Rated Torque(N-m)					
Encoder	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Resolution(pulse/rev)					
Brake	<input type="checkbox"/> Yes <input type="checkbox"/> No				
The information below is to be filled out by HIWIN or authorized agents.					
Recommended specifications :					

Manager :

Engineer :

Salesperson :



HIWIN[®]
Motion Control and System Technology



HIWIN MIKROSYSTEM CORP.
No. 7, Jingke Road, Nantun District
Taichung 408, TAIWAN
Tel: +886-4-23550110
Fax: +886-4-23550123
www.hiwinmikro.com.tw
business@mail.hiwinmikro.com.tw

HIWIN USA
•CHICAGO
1400 Madeline Lane
Elgin, IL 60124, USA
Tel: +1-847-8272270
Fax: +1-847-8272291
www.hiwin.com
info@hiwin.com
•SILICON VALLEY
Tel: +1-510-4380871
Fax: +1-510-4380873

HIWIN GmbH
Brücklesbünd 2, D-77654
Offenburg, GERMANY
Tel: +49-781-93278-0
Fax: +49-781-93278-90
www.hiwin.de
www.hiwin.eu
info@hiwin.de

HIWIN SCHWEIZ
Schachenstrasse 80
CH-8645 Jona, SWITZERLAND
Tel: +41-55-2250025
Fax: +41-55-2250020
www.hiwin.ch
info@hiwin.ch

HIWIN S.R.O.
Kastanova 34
CZ 62000 Brno,
CZECH REPUBLIC
Tel: +420-548-528238
Fax: +420-548-220233
www.hiwin.cz
info@hiwin.cz

HIWIN JAPAN
•KOBE
3F. Sannomiya-Chuo Bldg.
4-2-20 Goko-Dori, Chuo-Ku
KOBE 651-0087, JAPAN
Tel: +81-78-2625413
Fax: +81-78-2625686
www.hiwin.co.jp
info@hiwin.co.jp

HIWIN FRANCE
24 ZI N°1 EST-BP 78, LE BUAT,
61302 L'AIGLE Cedex, FRANCE
Tel: +33-2-33341115
Fax: +33-2-33347379
www.hiwin.fr
info@hiwin.fr

Mega-Fabs Motion Systems, Ltd.
13 Hayetzira St. Industrial Park,
P.O. Box 540, Yokneam 20692, ISRAEL
Tel: +972-4-9891050
Fax: +972-4-9891080
www.mega-fabs.com
mega-f@mega-f.co.il