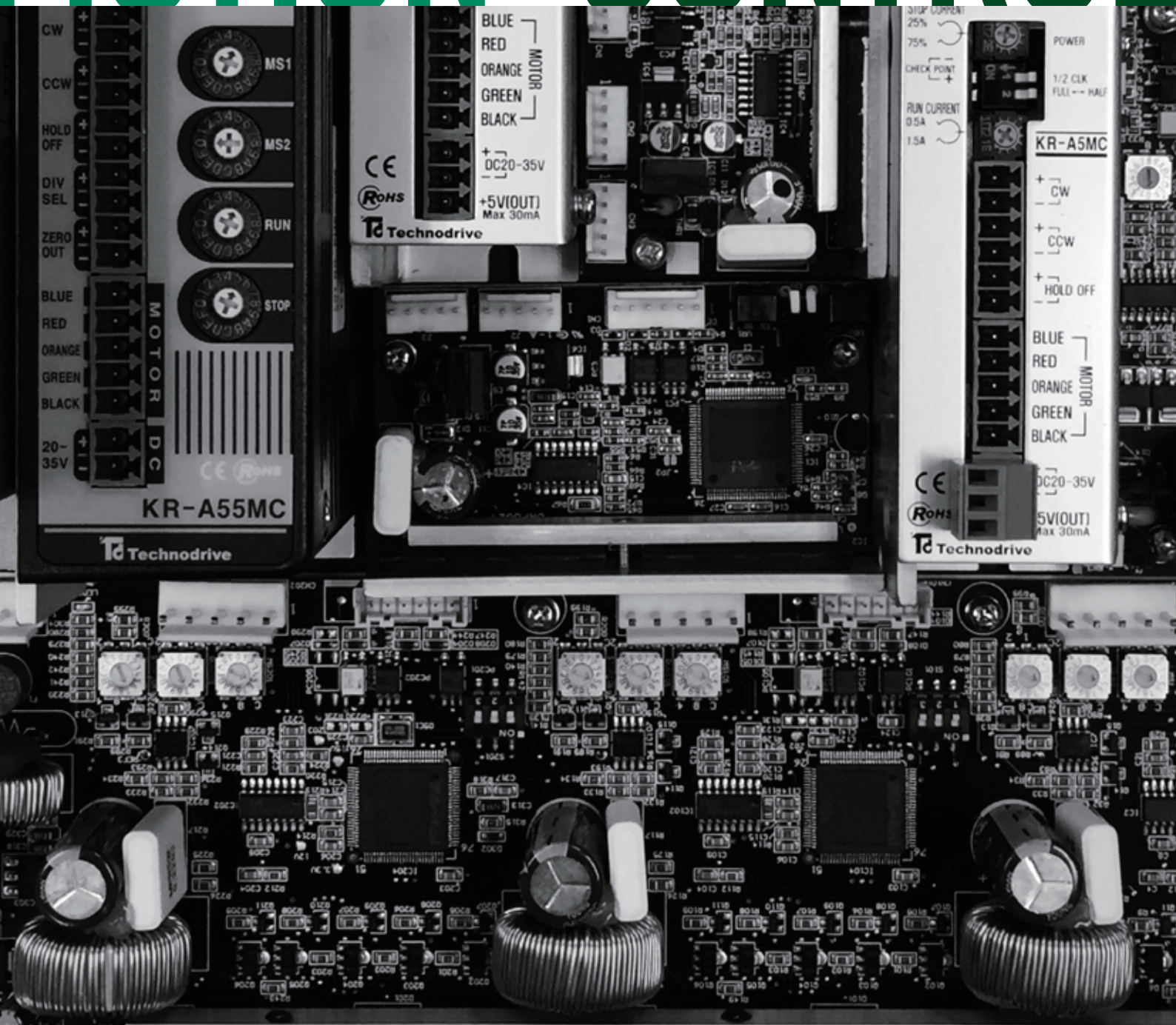
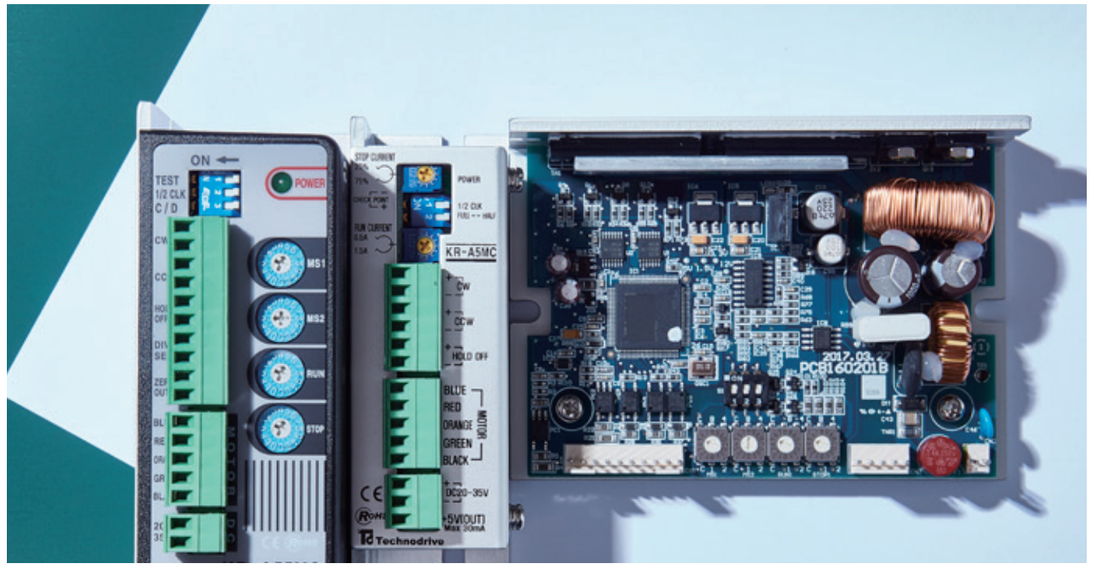
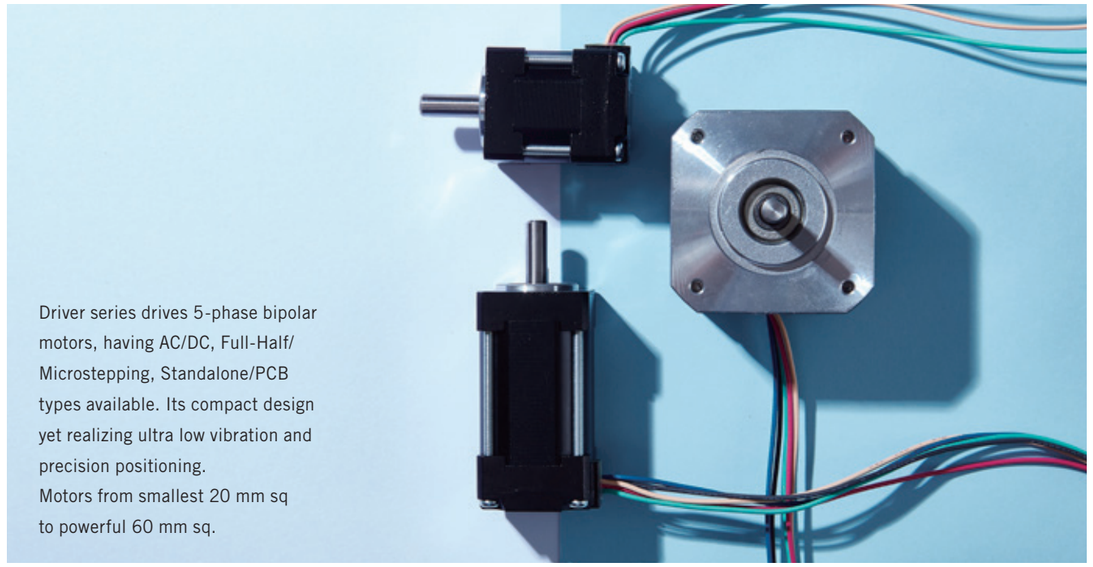
TECHNO DRIVE

MOTION CONTROL



TECHNO DRIVE

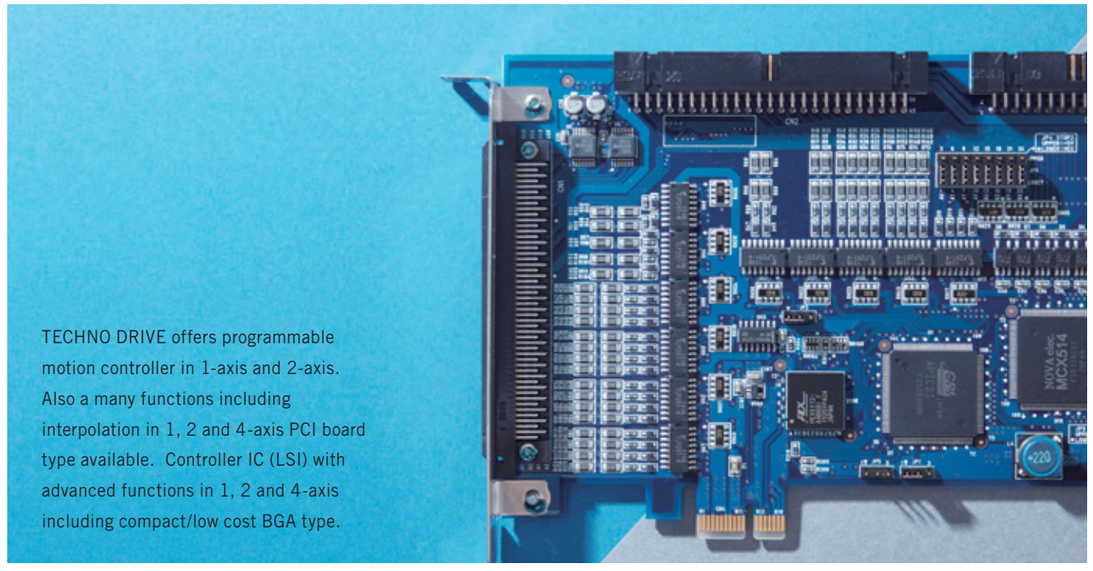




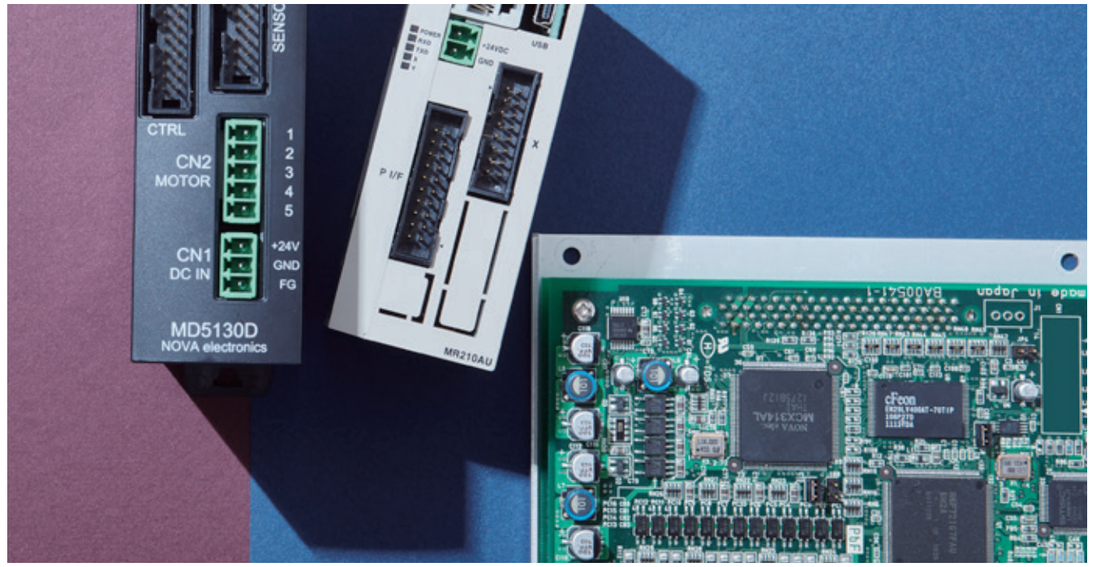
Driver series drives 5-phase bipolar motors, having AC/DC, Full-Half/ Microstepping, Standalone/PCB types available. Its compact design yet realizing ultra low vibration and precision positioning.
Motors from smallest 20 mm sq to powerful 60 mm sq.

COMPANY PROFILE

TECHNO DRIVE has been leading stepping motor drive systems by introducing forefront technologies such as microstepping systems.



TECHNO DRIVE offers programmable motion controller in 1-axis and 2-axis. Also a many functions including interpolation in 1, 2 and 4-axis PCI board type available. Controller IC (LSI) with advanced functions in 1, 2 and 4-axis including compact/low cost BGA type.



■ GLOBAL BUSINESS

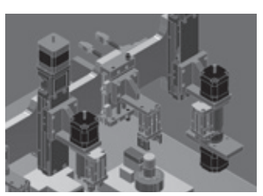
For developing markets such as ASEAN area, introducing precision positioning systems for a higher production efficiency and quality stability.

Factory Automation Systems

Utilizing over 25 years know-how of positioning systems, achieving most suitable automation systems to satisfy the requirements.

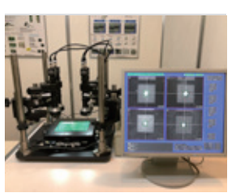
Examples

*Automatic inspection systems with Air-micrometer applications
*Automatic handling systems for blast machines



Auto-focus Systems Alignment Systems

Long time application experiences for factory automation and automated inspection. Most suitable for semi-conductor, FPD and screen printing applications.



GLOBAL PARTNERS

Amid the rapid globalization of the market, we help to create new business by connecting Asian and Western technologies and cultures.

isel Germany AG

Linear guides, linear sliders
Linear motors, spindle motors
CNC machine & tools

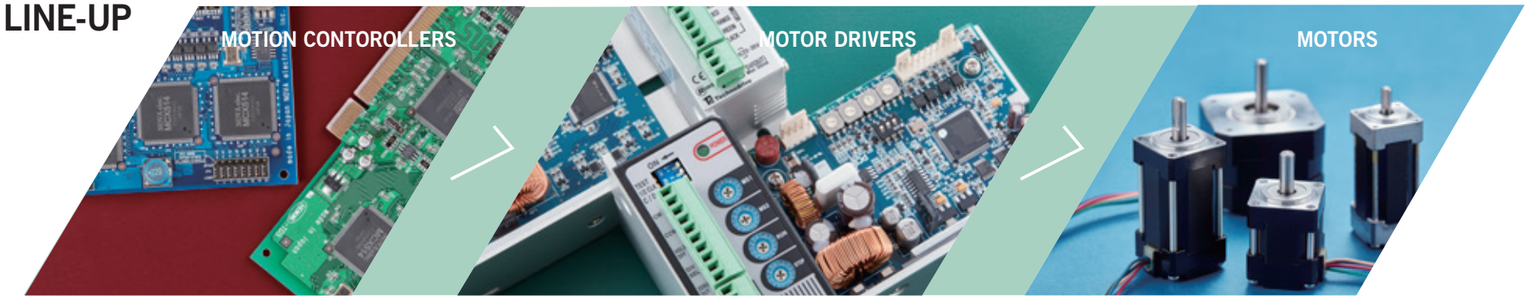
Wingtone Industrial

Precision cold formed components

MOTION CONTROL

TECHNO DRIVE offers 5-phase stepping motors and related products, which are indispensable for precision positioning, in optimal configurations to suitable to your applications.

LINE-UP



MOTION CONTROLLERS

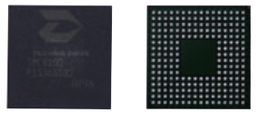
For designing own control boards

MCX500 series

MCX501 (1-axis)
MCX512 (2-axis) ★
MCX514 (4-axis) ★

BGA type

TMC8100 (4-axis) ★
TMC1100 (1-axis)



For Plug-n-Go controllers

Programmable controllers

Standard 1-axis / 2-axis
MR210AU/220AU

Driver integrated type

1-axis / 2-axis motion controller
for 5-phase stepping motor ★

Controller boards for Windows PC

PCI slot built-in type

MC8541P (4-axis) ★
MC8581P (8-axis) ★

PCI Express

MC8541Pe (4-axis) ★
MC8581Pe (8-axis) ★

USB-LAN type

MR540 (4-axis) ★
MR580 (8-axis) ★

★ = with linear/circular interpolation function

5-PHASE STEPPING MOTOR DRIVERS

DC Input

Suitable for small/medium sized motors of 42 mm square or less

Full/Half step drive
- Low cost models with basic functions

- KR-A5M (0.75A / 1.4A)
- KR-A5MC (0.75A / 1.4A)
- KR-A5CC (0.35A / 0.75A)

Microstep drive
- Smoother drive with low vibration

■ Single axis drive type
- KR-A55ME (0.75A / 1.4A)
- KR-A55MC (0.75A / 1.4A)

■ Multi-axis drive type
- KR-A55ME-2Z (2-axis) (0.75A / 1.4A)
- KR-A55ME-3Z (3-axis) (0.75A / 1.4A)

AC Input

Suitable for medium and large motors of 42 mm square or larger

Microstep drive
- smoother drive with low vibration

- KR-A535M (0.75A / 1.4A)
- KR-A535MT (0.75A / 1.4A)

5-PHASE STEPPING MOTORS

Standard motor

4 types of 20, 24, 42, 60mm square

From minimum 20mm sq. to 60mm sq., you can choose according to size and torque.

Ball screw motor

Direct connection in between the ball screw and the motor shaft by eliminating coupling, for a better response.

■ Motor/Driver compatibility table

MOTORS \ DRIVERS		KR-A5M	KR-A5MC	KR-A55ME	KR-A55MC	KR-A55ME-2Z/3Z	KR-A535M	KR-A535MT
02K-S523	□24mm	◎	◎	◎	◎	◎	◎	◎
04K-S525	□24mm	◎	◎	◎	◎	◎	◎	◎
1K-S543	□42mm	◎	◎	◎	◎	◎	◎	◎
2K-S544	□42mm	◎	◎	◎	◎	◎	◎	◎
3K-S545	□42mm	◎	◎	◎	◎	◎	◎	◎
4K-S564	□60mm	○	○	○	◎	◎	◎	◎
4K-M564	□60mm	○	○	○	◎	◎	◎	◎
8K-S566	□60mm	○	○	○	◎	◎	◎	◎
8K-M566	□60mm	○	○	○	◎	◎	◎	◎
16K-M569	□60mm	○	○	○	○	○	◎	◎

5-PHASE STEPPING MOTOR DRIVERS

DC Input

KR-A5M
KR-A5MC/A5CC

Drive method	Bipolar constant current pentagon drive
Power supply	DC24V(DC20～35V) 3A MAX
RUN current	0.5～1.5A/Phase(default 0.75A/Phase) 0.1~0.9A/Phase(default 0.35A/Phase) [CC]
Max. response frequency	50Kpps or Less
Input voltage	Photocoupler Input 0-8V
Function	Pulse input method selection Full/Half step selection Auto current down Run/Stop current setting Hold off function
Ambient temp.	0～40℃(no freezing)
Ambient hum.	35～85% RH(at non-dew status)
Dimensions	[M]W77 × D45.5 × H32.5(mm) [MC/CC] W93 × D45 × H32(mm)
Weight	[M]Approx. 74g [MC] Approx. 120g [CC] Approx. 120g

DC Input

Microstep

Single axis drive type

KR-A55ME
KR-A55MC

Drive method	Bipolar constant current pentagon drive
Power supply	DC24V(DC20～35V) 3A MAX
RUN current	0.4～1.4A/Phase(default 0.75A/Phase)
Resolution	1/1～1/250(16 types)
Max. response frequency	500Kpps or Less
Input voltage	Photocoupler Input 0-8V
Function	Pulse input method selection Test mode Auto current down setting Run/Stop current setting Zero point excitation output signal(ZERO OUT) Hold off function Microstep resolution setting/selection
Ambient temp.	0～40℃(no freezing)
Ambient hum.	35～85% RH(at non-dew status)
Dimensions	[ME] W105 × D74 × H38(mm) [MC] W105 × D76.5 × H39.5(mm)
Weight	[ME] Approx. 180g [MC] Approx. 220g

DC Input

Microstep

Multi-axis drive type

KR-A55ME-2Z/3Z

Drive method	Bipolar constant current pentagon drive
Power supply	[2Z] DC24V(DC20～35V) 5A MAX [3Z] DC24V(DC20～35V) 7A MAX
RUN current	0.4～1.4A/Phase(default 0.75A/Phase)
Resolution	1/1～1/250(16 types)
Max. response frequency	500Kpps or Less
Input voltage	Photocoupler Input 0-8V
Function	Pulse input method Selection Test mode Auto current down setting Run/Stop current setting Zero point excitation output signal(ZERO OUT) Hold off function Microstep resolution setting
Ambient temp.	0～40℃(no freezing)
Ambient hum.	35～85% RH(at non-dew status)
Dimensions	[2Z] W190 × D80 × H40(mm) [3Z] W260 × D80 × H40(mm)
Weight	[2Z] Approx. 292g [3Z] Approx. 411g

AC Input

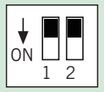
Microstep

KR-A535M
KR-A535MT

Drive method	Bipolar constant current pentagon drive
Power supply	AC100～220V(±10%) 3A MAX 50/60Hz
RUN current	0.4～1.4A/Phase(default 0.75A/Phase)
Resolution	1/1～1/250(16 types)
Max. response frequency	500Kpps or Less
Input voltage	Photocoupler Input 0-8V
Function	Pulse input method selection Test mode Auto current down setting Run/Stop current setting Zero point excitation output signal(ZERO OUT) Hold off function Microstep resolution setting Microstep resolution selection(KR-A535M) Alarm output function(Overheat/Overcurrent)
Ambient temp.	0～50℃(no freezing)
Ambient hum.	35～85% RH(at non-dew status)
Dimensions	[M] W170 × D42 × H133.5(mm) [MT] W170 × D39 × H130(mm)
Weight	[M] Approx. 680g [MT] Approx. 687g

KEY FEATURES

● DIP switch for function selecting



No.	Name	Function	Switch position	
			ON	OFF (default)
1	1/2 CLK	Pulse input method	1-pulse input method	2-pulse input method
2	FULL↔HALF	Select resolution	FULL (0.72˚)	HALF (0.36˚)

※Must be changed when the motor stopped.
※If it is changed while driving, the motor may step out.

No.	Name	Function	Switch position	
			ON	OFF (default)
1	TEST	Test mode	250pps rotation	Not use
2	2/1 CLK	Pulse input method	1-pulse input method	2-pulse input method
3	C/D	Auto current down	Not use	Use

TEST···Test function for motors and drivers.
- ・It rotates at a speed of 30 rpm in Full Step and it is changed depending on resolution.
- ・It rotates to CCW in 1-pulse input method and CW in 2-pulse input method.

*Please note that the motor operate immediately with the ON setting when the power is turned on .

1/2 CLK···Pulse input method selection
- ・1-pulse input method: CW → Operating rotation signal input
  CCW → Rotation direction signal input
  [ON] CW [OFF] CCW
- ・2-pulse input method: CW → CW signal input
  CCW → CCW signal input

C/D (Auto current down)
- ・This function is to reduce the current provided for motor automatically for preventing severe motor's heat when motor stops.

● RUN current selecting

- ・Connect a voltmeter to CP+ and CP- and turn the RUN volume to set the RUN current.
- ・Refer to the formular below for RUN current setting.
- ・RUN current (A) = $\frac{\text{CP voltage (V)}}{2}$

※RUN current should be changed during the operating of the motor.

Switch No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Current (A/Phase)	0.4	0.5	0.57	0.63	0.71	0.77	0.84	0.9	0.96	1.02	1.09	1.15	1.22	1.27	1.33	1.4

- ・ RUN current setting is for the current provided for motor when the motor runs.
- ・ Set RUN current within the range of motor's rated current according to its load.
- ・ When RUN current is set too high, the heat is severe.
- ・ When RUN current is increased, RUN torque of the motor is also increased.

※Must be changed with the motor stopped.

● STOP current selecting

- ・Turn the STOP volume to set the STOP current.
- ・The set value of STOP current is a percentage ratio of the set drive current.
  e.g.) If the drive current is set to 1.0A then the STOP current volume is set at 50%, STOP current becomes 0.5A/Phase.

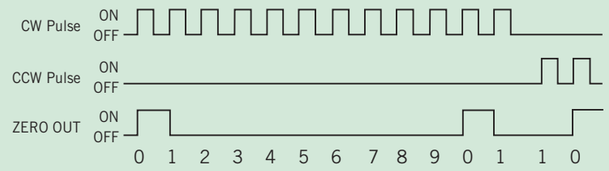
※Must be changed when the motor stopped.

Switch No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
%	27	31	36	40	45	50	54	58	62	66	70	74	78	82	86	90

- ・STOP current setting is for the current provided for motor when the motor stops for preventing severe motor's heat.
- ・This setting is applied when using C/D (Current down) function.
- ・Setting value of STOP current is percentage (%) ratio of the set RUN current.
  E.g.) Set RUN current as 1.4A and STOP current as 40%.
  STOP current is set as 1.4A×0.4=0.56A.
  When STOP current is decreased, STOP torque of the motor is also decreased.
  When STOP current is set too low, the heat is lower.。

※Must be changed when the motor stopped.。

● Zero point excitation output signal (ZERO OUT)



- ・This output indicates the initial step of excitation order of stepping motor and rotation position of motor axis.
- ・This signal outputs every 7.2˚ of rotation of the motor axis regardless of resolution. (50 outputs per 1 rotation of the motor.)
  E.g.) Full step: outputs one time by 10 pulses input.
  20-division: outputs one time by 200 pulses input.

※ Photocoupler [ON] = input [ON]
Photocoupler [OFF] = input [OFF]

● Hold off function

- ・This signal is for rotating motor's axis using external force or used for manual positioning.
- ・When hold off signal maintains over 1ms as [ON], motor excitation is released.
- ・When hold off signal maintains over 1ms as [OFF], motor excitation is in a normal status.

※Must be done when the motor stopped.

● Microstep Resolution Setting

Switch No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Resolution	1	2	4	5	8	10	16	20	25	40	50	80	100	125	200	250
Step angle	0.72°	0.36°	0.18°	0.144°	0.09°	0.072°	0.045°	0.036°	0.0288°	0.018°	0.0144°	0.009°	0.0072°	0.00576°	0.0036°	0.00288°

- ・The MS1, MS2 switches is for resolution setting.
- ・Select the step angle (motor rotation angle per 1 pulse).
- ・The calculation formula of divided step angle is as below.

Set step angle = $\frac{\text{Basic step angle (0.72˚)}}{\text{Resolution}}$

※Must be done with the motor stopped.

● Microstep Resolution Selection

- ・ Select MS1 or MS2 by DIVISION SELECTION signal.
  [OFF]:MS1 [ON]:MS2

※ Must be done when the motor stopped.
※ If it is changed while driving, the motor may step out.

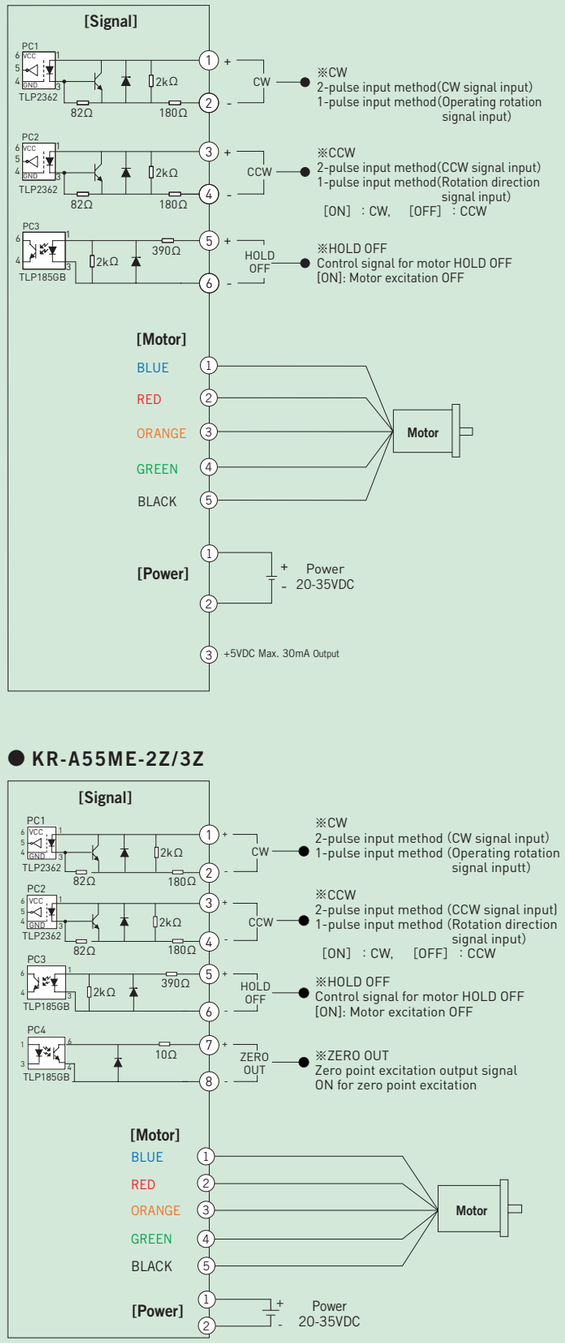
● Alarm output function

OVER HEAT
- ・When the temperature of driver base is over 80˚C, alarm LED (Red) turns ON and motor stops with holding the excision. Turn OFF the power and remove the causes. Turn ON the power and alarm output is OFF.

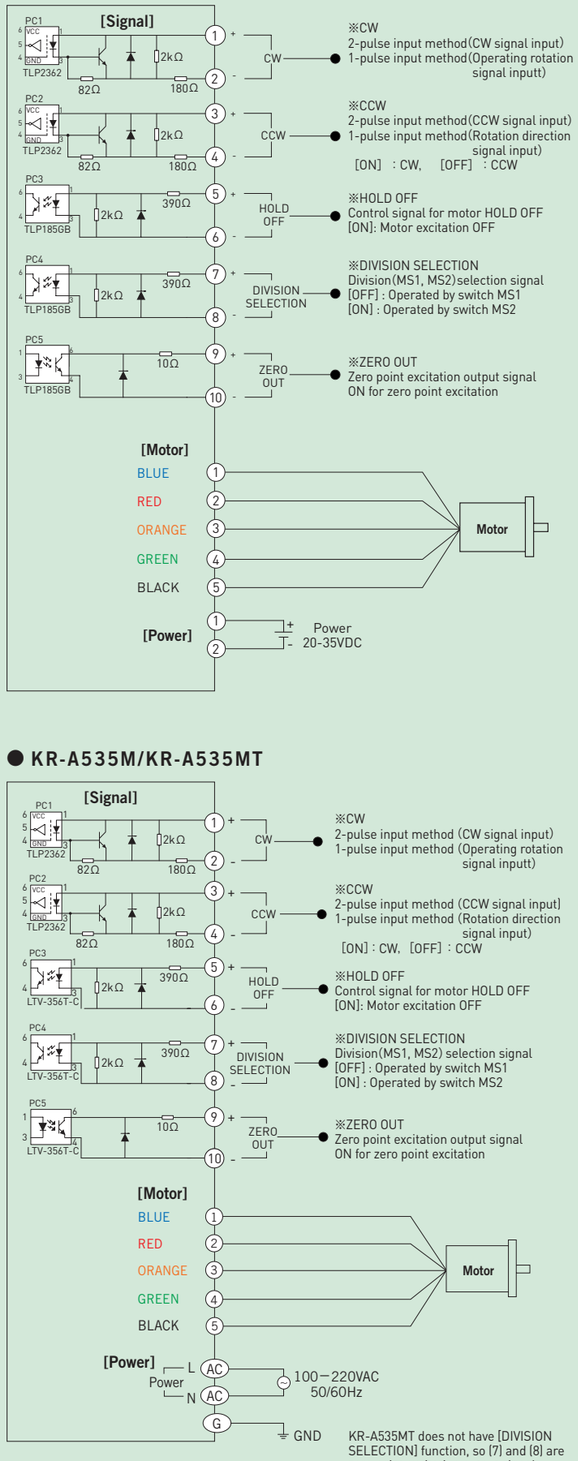
OVER CURRENT
- ・When Over current is applied from motor damage by burn, driver damage, or error, alarm LED (Red) is flashed.
  When overcurrent occurs, the motor becomes HOLD OFF.
- ・Turn OFF the power and remove the causes to normal operation.

■ Connection diagram

● KR-A5M/KR-A5MC/CC



● KR-A55ME/KR-A55MC



● KR-A55ME-2Z/3Z

※Power input of 2/3-axis are used as same and I/O terminals are proportional to the number of axes.

Note) Photocoupler [ON] means input [ON]
Photocoupler [OFF] means input [OFF]

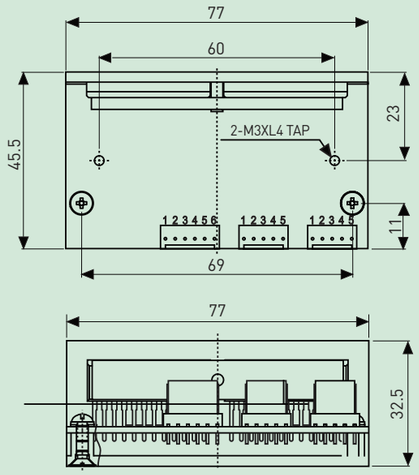
● KR-A535M/KR-A535MT

KR-A535MT does not have [DIVISION SELECTION] function, so (7) and (8) are zero point excitation output signal.

■ Outline

● KR-A5M

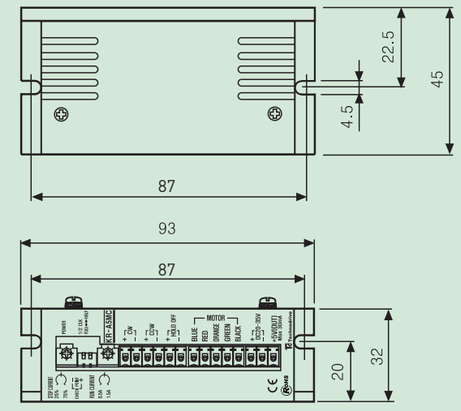
(Unit : mm)



Wiring cable set with connector for KR-A5M
CBL-A2
Cable length 60cm loose wire, no terminal processing,
Set of cables for signal, motor and power with pre-processed connector on driver side

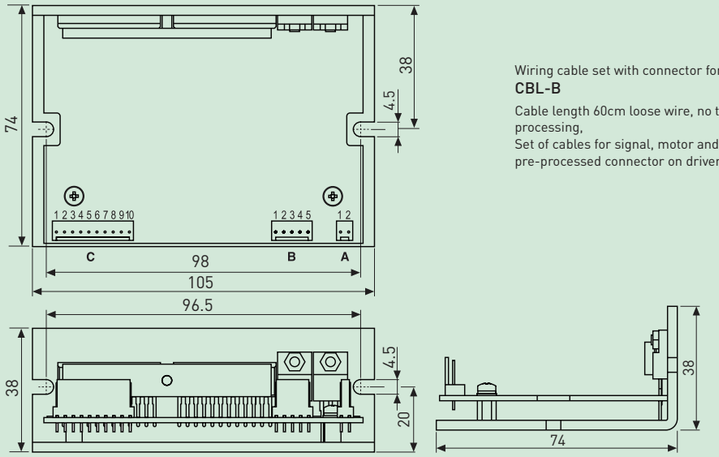
● KR-A5MC/CC

(Unit : mm)



● KR-A55ME

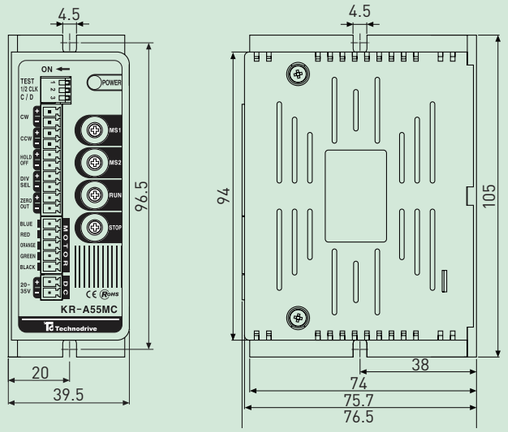
(Unit : mm)



Wiring cable set with connector for KR-A55ME
CBL-B
Cable length 60cm loose wire, no terminal processing,
Set of cables for signal, motor and power with pre-processed connector on driver side

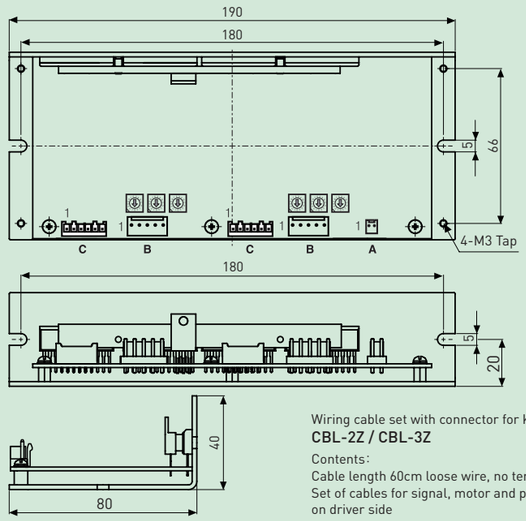
● KR-A55MC

(Unit : mm)



● KR-A55ME-2Z

(Unit : mm)



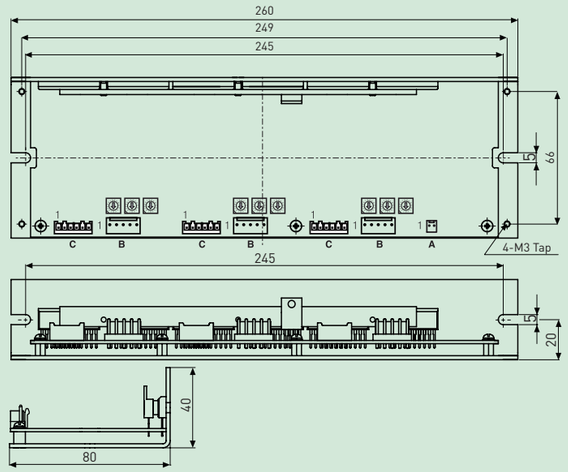
Wiring cable set with connector for KR-A55ME-2Z/3Z

CBL-2Z / CBL-3Z

Contents:
Cable length 60cm loose wire, no terminal processing
Set of cables for signal, motor and power with pre-processed connector on driver side

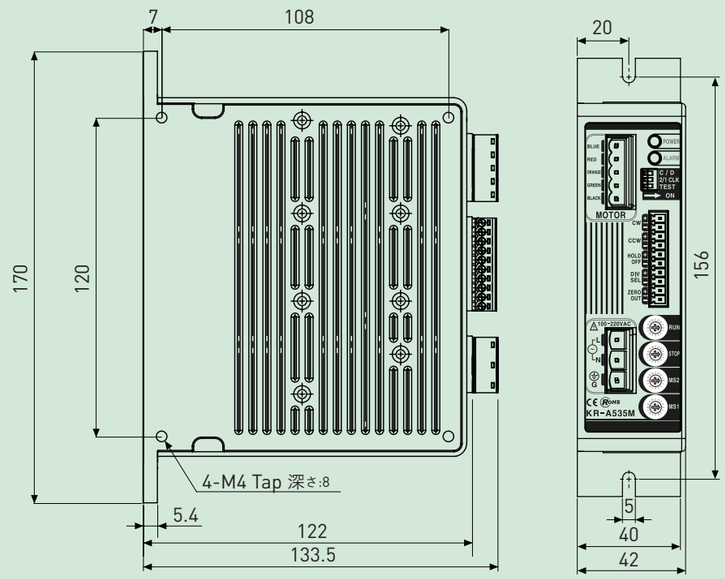
● KR-A55ME-3Z

(Unit : mm)



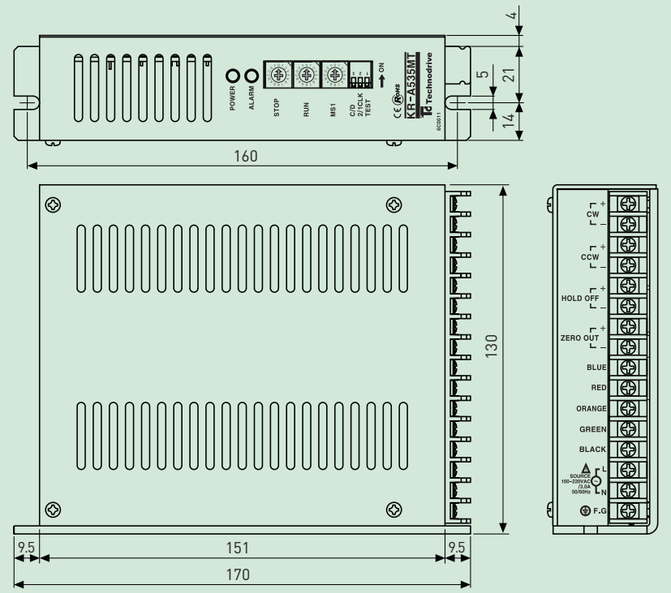
● KR-A535M

(Unit : mm)

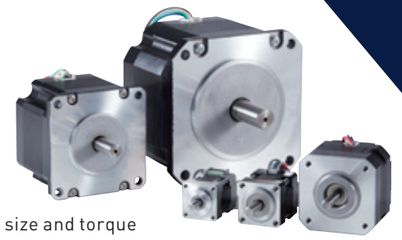


● KR-A535MT

(Unit : mm)



MOTORS



5-phase stepping motor RoHS

4 types of 20, 24, 42, 60mm square

You can choose from a minimum of 20 mm square to 60 mm square according to size and torque

Motor Size	Rated current A/Phase	Model Single	Model Double	Holding torque N·m (kgf·cm)	Winding resistance Ω /Phase	Rotor inertia 10^{-7}kg·m^2	Length L (mm)	Weight g
□ 20mm	0.35A	01K-C513	01K-C513W	0.013 (0.13)	6.1	1.9	30	50
	0.35A	02K-C515	02K-C515W	0.024 (0.24)	11.4	4	46.5	85
□ 24mm	0.75A	02K-S523	02K-S523W	0.017 (0.17)	1.1	4.2	30.5	70
	0.75A	04K-S525	04K-S525W	0.028 (0.28)	1.7	8.3	46.5	120
□ 42mm	0.75A	1K-S543	1K-S543W	0.13 (1.3)	1.7	35	33	200
	0.75A	2K-S544	2K-S544W	0.18 (1.8)	2.2	54	39	240
	0.75A	3K-S545	3K-S545W	0.24 (2.4)	2.2	68	47	310
□ 60mm	0.75A	4K-S564	4K-S564W	0.45 (4.5)	2.6	175	48.5	500
	1.4A	4K-M564	4K-M564W	0.45 (4.5)	0.8	175	48.5	500
	0.75A	8K-S566	8K-S566W	0.8 (8)	3.4	220	56.5	700
	1.4A	8K-M566	8K-M566W	0.8 (8)	1.1	220	56.5	700
	1.4A	16K-M569	16K-M569W	1.5 (15)	1.8	440	86.5	1200

※ 0.35A motors are made to order

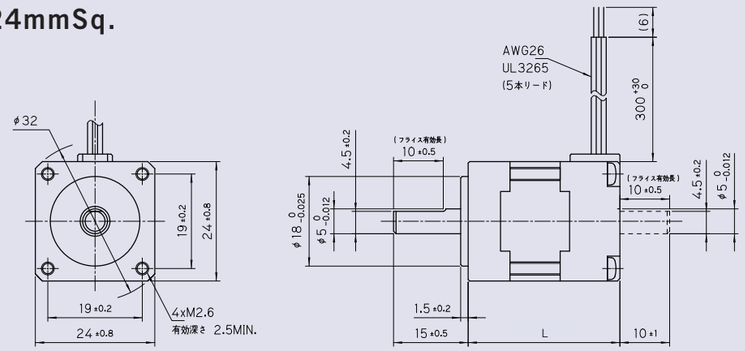
5-phase stepping motor with direct connected ball screw RoHS

5-pahse stepping motor is mounted directly onto the shaft end of C3 grade precision ball screw, which is suitable for high accurate positioning system.
Ball screw shaft is ideally constructed to form the motor rotor shaft.
Since combining the motor shaft and ball screw shaft, coupling-less, saving total length, low lost-motion can be achieved.
Our KR series drivers fit these motors.

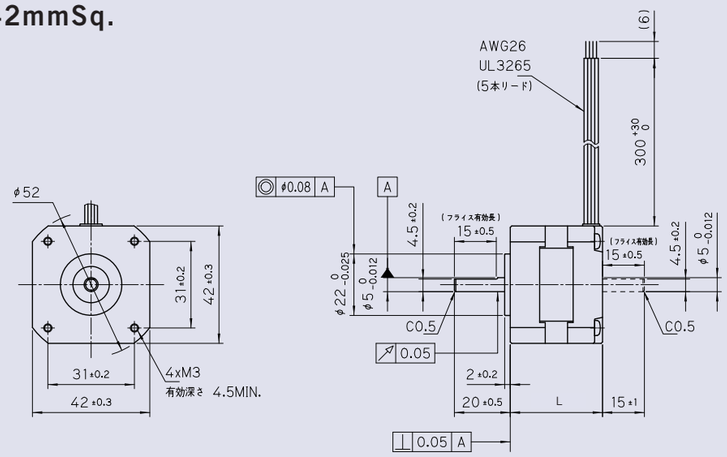
Rated current A/Phase	Model	Motor size	Shaft dia. mm	Lead mm	Travel mm	Accuracy grade Axial play	Reference Thrust N	Weight g
0.75A	MB04005A	□ 20mm	4	0.5	20	C3-0.005 Less	10	84
0.75A	MB0401A	□ 20mm	4	1	30	C3-0	20	84
0.75A	MB0401	□ 24mm	4	1	30	C3-0	50	100
0.75A	MB0601	□ 24mm	6	1	75	C3-0	100	170
0.75A	MB0602	□ 24mm	6	2	75	C3-0	50	180
0.75A	MB0801	□ 42mm	8	1	150	C3-0	300	310
0.75A	MB0802	□ 42mm	8	2	150	C3-0	150	320

■ Outline

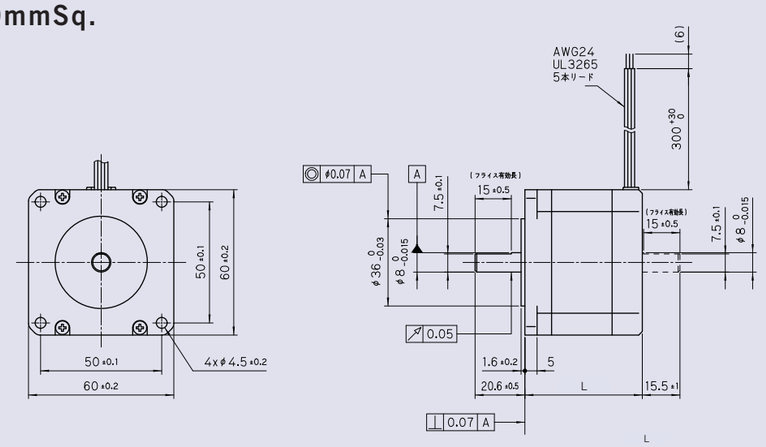
24mmSq.



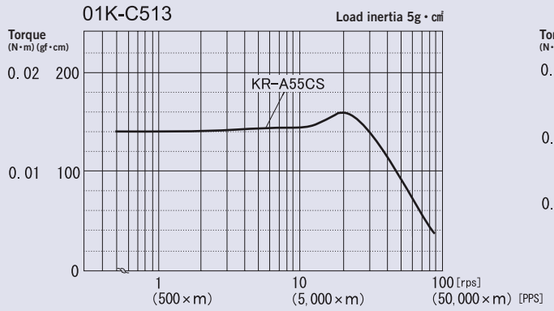
42mmSq.

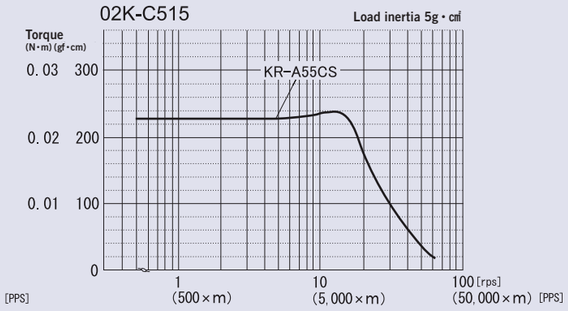


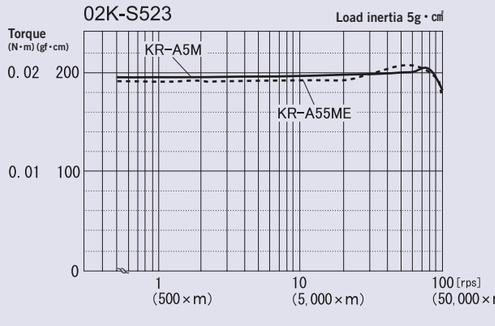
60mmSq.

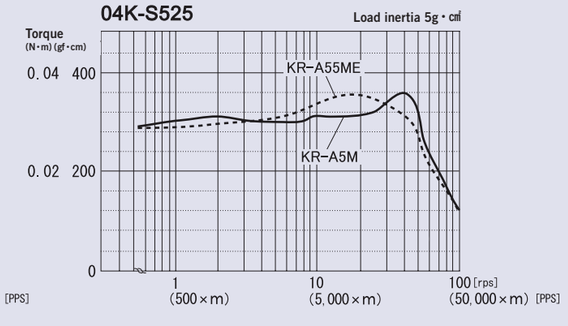


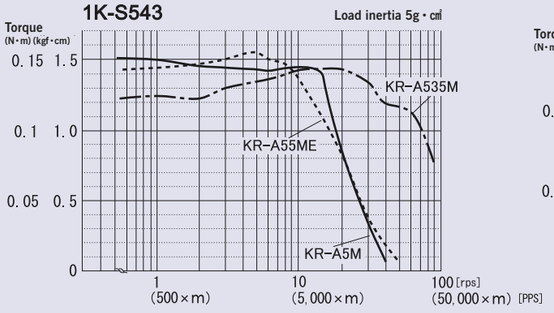
■ Torque characteristics table

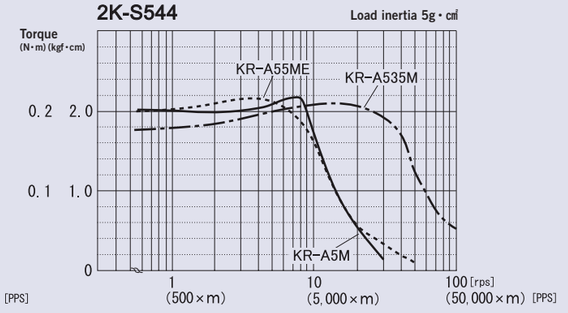


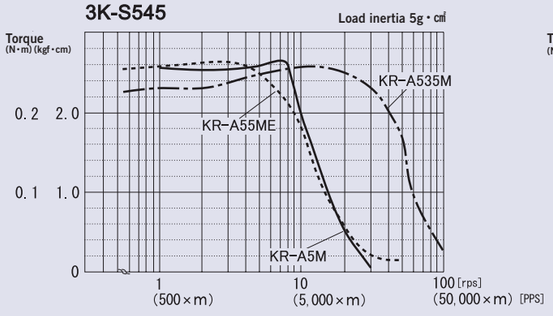


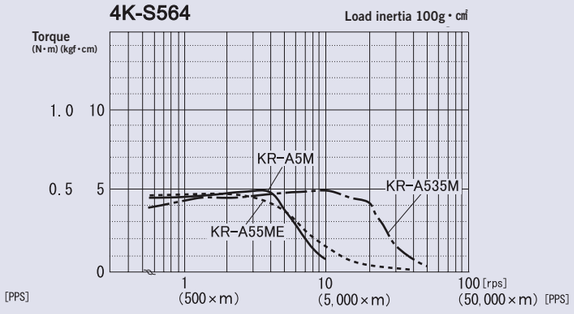


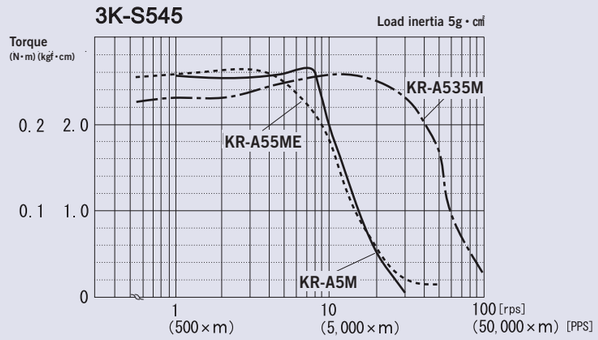




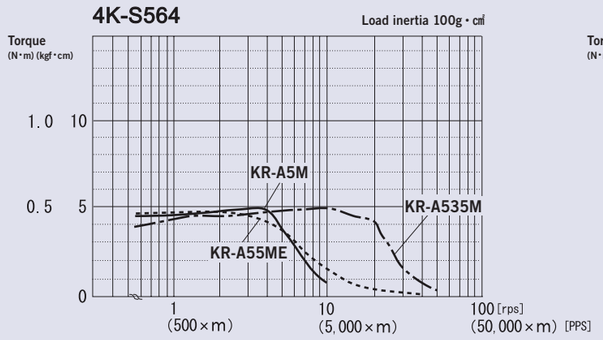


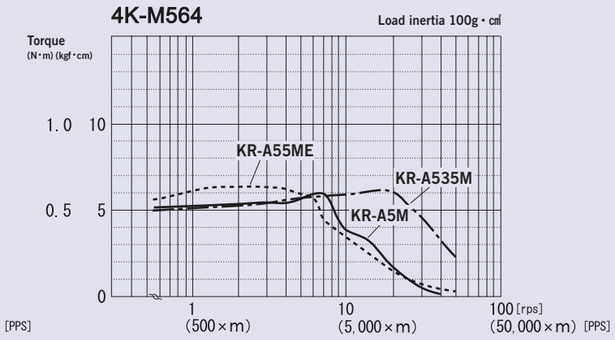


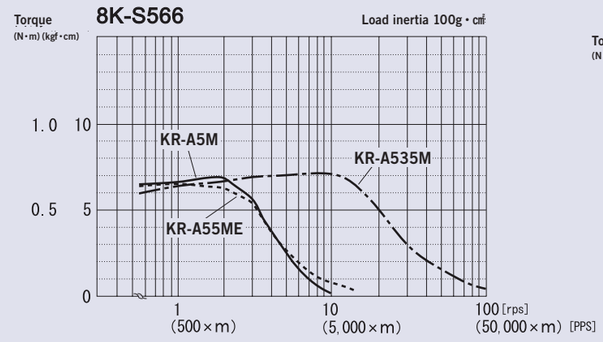


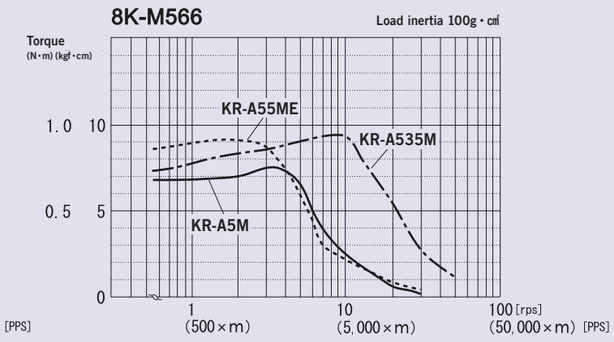


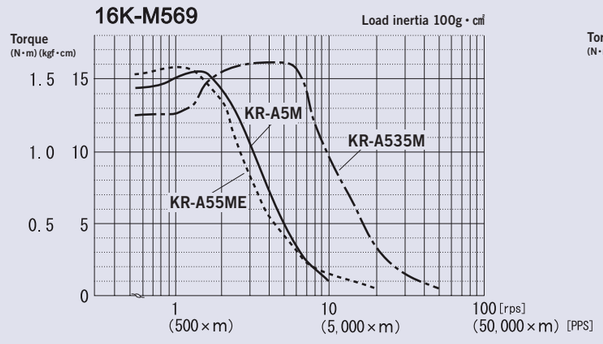
※ m＝Microstep Resolution
例］ m＝1 ; Full Step
m＝2 ; Half Step

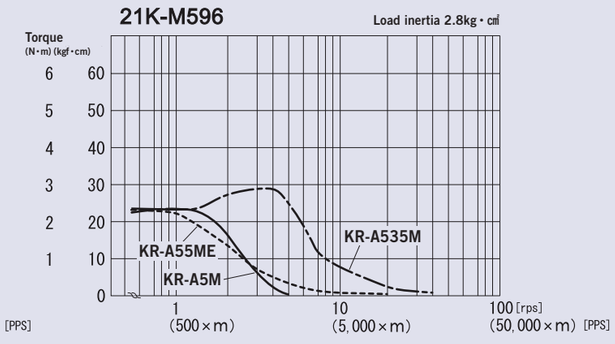












ADVANCED MOTION CONTROL ICs

MCX514 RoHS

- 2/3/4-axis linear interpolation
- CW/CCW circular interpolation
- 8 stages of pre-buffer for continuous interpolation
- Bit pattern interpolation
- Helical interpolation
- Short axis pulse equalization mode for interpolation
- 2-axis high accuracy constant vector speed mode
- Multichip interpolation
- Speed range free
- Automatic deceleration of non-symmetrical trapezoidal acceleration/deceleration
- Parabolic S curve/trapezoidal acceleration/deceleration driving
- Automatic home search
- Split pulse
- I^2C serial interface bus
- Synchronous action 4sets/axis

MCX514 is 4-axis motion control IC which connects to CPU with 8/16-bit or I^2C serial interface bus and can control either a stepper motor driver or pulse type servo driver for position and speed. MCX514 can perform linear interpolation, circular interpolation, helical interpolation and bit pattern interpolation driving, selecting an arbitrary 2, 3 or 4-axis of 4 axes. In addition, multichip axes linear interpolation of more than 5-axis can be performed by using several these ICs. MCX514 has no multiple of speed (Range Setting) to set the drive speed. This will enable us to freely set the speed from 1pps up to 8Mpps in increments of 1pps.

Max Drive Spped:8Mpps (When CLK=20MHz:Max10Mpps)
Package:144pin QFP 20×20mm 0.5mm Pitch
Power voltage:3.3V±10%

MCX512 RoHS

- 2-axis linear interpolation
- CW/CCW circular interpolation
- 8 stages of pre-buffer for continuous interpolation
- Bit pattern interpolation
- Short axis pulse equalization mode for interpolation
- 2-axis high accuracy constant vector speed mode
- Speed range free
- Automatic deceleration of non-symmetrical trapezoidal acceleration/deceleration
- Parabolic S curve/trapezoidal acceleration/deceleration driving
- Override
- Automatic home search
- Split pulse
- I^2C serial interface bus
- Synchronous action 4sets/axis
- Timer 1set/axis

MCX512 is 2-axis motion control IC which connects to CPU with 8/16-bit or I^2C serial interface bus and can control either a stepper motor driver or pulse type servo driver for position and speed. MCX512 can perform 2-axis linear interpolation, circular interpolation, bit pattern interpolation and continuous interpolation driving. MCX512 has no multiple of speed (Range Setting) to set the drive speed. This will enable us to freely set the speed from 1pps up to 8Mpps in increments of 1pps.

Max drive spped:8Mpps (When CLK=20MHz:Max10Mpps)
Package:100pin QFP 14×14mm 0.5mmPitch
Power voltage:3.3V±10%

MCX501 RoHS

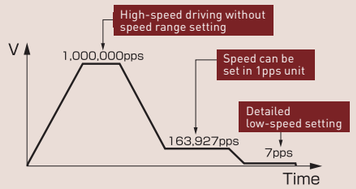
- Speed range free
- Various acceleration/deceleration driving mode
- Various synchronous actions
- Built in timer
- Split pulse
- Automatic home search
- Integral input filter built-in

MCX501 is 1-axis motion control IC which can control either stepper motor driver or pulse type servo motor for position and speed control and can perform trapezoidal/smooth S-curve driving as acceleration/deceleration drive. MCX501 has no multiple of speed (Range Setting) to set the drive speed. This will enable us to freely set the speed from 1pps up to 8Mpps in increments of 1pps.

Max drive spped:8Mpps (When CLK=20MHz:Max10Mpps)
Package:64pin QFP 10×10mm 0.5mmPitch
Power voltage:3.3V±10%

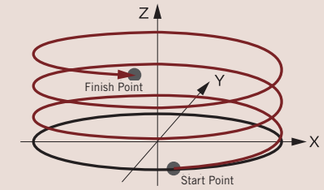
KEY FEATURES

■ Speed range free



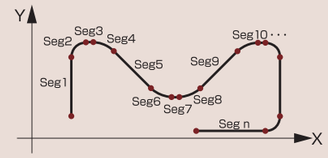
MCX514 has no speed multiple, speed can be set 1pps unit.
This IC can change the speed directly from low speed, 1pps, 2pps to high speed pulse like 1Mpps during driving.

■ Helical interpolation



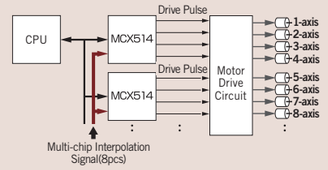
In addition to linear and circular, helical interpolation can be executed which drives another axis synchronous with circular interpolation on X,Y surface. Example of multiple rotation of helical interpolation in the above figure.

■ 8 stages of pre-buffer for continuous interpolation



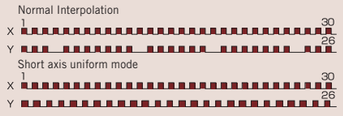
8 steps pre-buffer registers are equipped to execute high speed continuous interpolation driving. Continuous interpolation can be executed if there is short segment like Seg.3 in the above figure, when average drive time of 8 segments is longer than position data set time of next segment.

■ Linear interpolation with multi-chip



Multi-axis linear interpolation with 5 or more axes can be executed by connecting multiple MCX514.

■ Short axis pulse uniform mode of interpolation



In 2-axis linear interpolation driving, axis which drives longer (long axis) keeps to output pulses continuously. Meanwhile, axis which drives shorter (short axis) sometimes outputs pulses by interpolation calculation result and sometimes does not. MCX514 has short axis pulse uniform function. For short axis, drive pulses are output making pulse interval uniform as much as possible.

■ 2-axis high accuracy constant vector speed mode

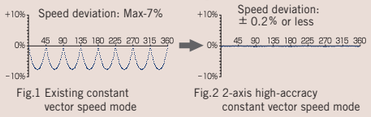
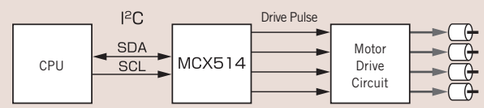


Fig.1 Existing constant vector speed mode
Fig.2 2-axis high-accracy constant vector speed mode

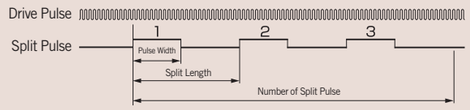
Besides existing constant vector speed mode, MCX514 has 2-axis high accuracy constant vector speed mode which is significantly improved constant vector speed mode. Short axis pulse uniform mode and 2-axis high accuracy constant vector speed mode are used together in 2-axis linear interpolation, circular interpolation and helical interpolation, speed deviation of vector speed is ±0.2% or less. Drastic accuracy improvement of speed in interpolation driving is expected.

■ I^2C interface bus

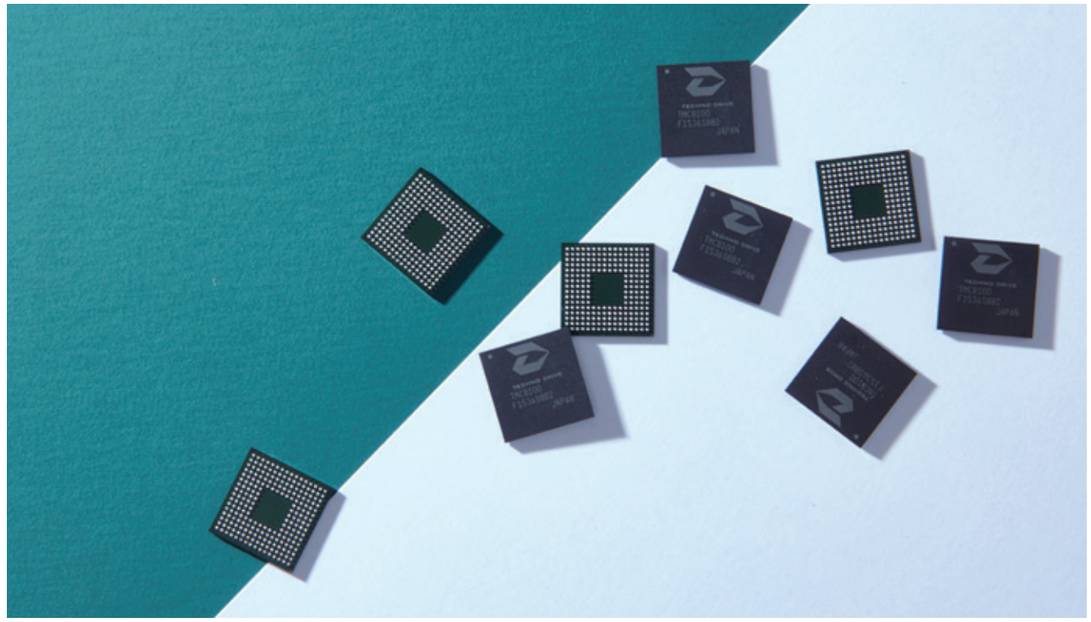


In addition to 8/16bit data bus, MCX514 can connect to the master CPU with I^2C serial interface bus. Max 8pcs of MCX514 can be connected to one interface bus.

■ Split pulse



This is the function which outputs split pulse during driving. Synchronizing an axis's movement, various kinds of actions can be performed in specified intervals. By combining the split pulse output and the synchronous action, start/stop split pulse from a specified position and split length and pulse width can be changed by external signal input.



TMC8100 RoHS

知と技で世界に羽ばたく
川崎ものづくりブランド

- 4-axis control
- Linear interpolation Max.4-axis
- Optional 2-axis CW/CCW circular interpolation
- Circular interpolation constant peripheral speed control
- Continuous interpolation control
- Simultaneous control of independent drive and interpolation drive
- Multi-chip control
- Linear/S-curve acceleration/deceleration (asymmetry possible)
- Automatic deceleration stop
- Multi-axis synchronous start
- 1-pulse/2-pulse/2-phase pulse output
- Triangular drive avoidance
- Manual pulsar control
- Input signal digital filter
- Limit signal stop
- Software limit stop
- Step-out detection by deviation amount calculation

TMC8100 is a 4-axis motion control IC that is connected to a host CPU via an 8-bit or 16-bit bus and provides independent positioning control of pulse trains to servo motors and stepping motors, and linear interpolation for up to 4-axis/arc interpolation trajectory control for any 2-axis. Independent positioning control and linear interpolation/ circular interpolation trajectory control can be performed simultaneously. TMC8100 also provides various functions such as a counter function, interrupt generation function, synchronous start function, and over ride function.
The package is 14×14mm, 0.8mm pitch 220 Pin FPBGA. Despite its small size, the 0.8 mm pitch package has a low incidence of surface mounting defects.

Max. output frequency.: 10Mpps (5 Mpps during interpolation)
Package:220Pin FPBGA 14×14 mm ,0.8 mm Pitch
Power supply : 3.3V single power supply

TMC1100 RoHS

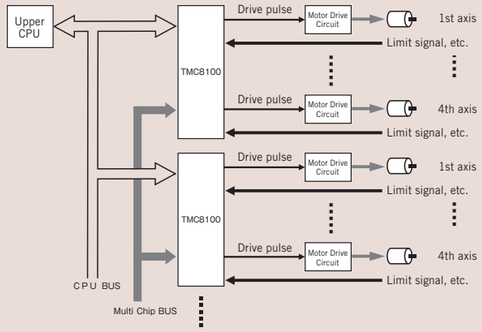
- 1-axis control
- 1-axis interpolation control
- Multi-axis linear interpolation control using multiple units
- Continuous drive control
- Linear/S-curve acceleration/deceleration (asymmetry possible)
- Automatic deceleration stop
- Multi-axis synchronous start
- 1-pulse/2-pulse/2-phase pulse output
- Triangular drive avoidance
- Manual pulsar control
- Input signal digital filter
- Limit signal stop
- Software limit stop
- Step-out detection by deviation amount calculation

TMC1100 is a single-axis motion control IC that can be controlled by a high-level CPU, 8-bit or 16-bit bus, or clock-synchronous serial interface. The clock-synchronized serial interface, which is designed for mounting inside motor drivers and motors, enables the construction of original field networks. Up to 64 pcs can be connected to the same serial bus. TMC1100 also provides various functions such as a counter function, interrupt generation function, synchronous start function, and override function.
The package is 10×10mm, 0.8mm pitch 121 Pin FPBGA assuming mounting inside motor drivers and motors. Despite its small size, the 0.8 mm pitch package has a low incidence of surface mounting defects.

Max. output frequency.: 10Mpps
Package:121Pin FPBGA 10×10 mm ,0.8 mm Pitch
Power supply : 3.3V single power supply

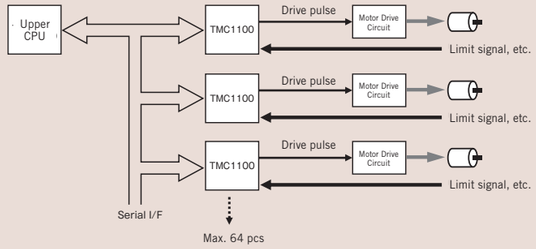
KEY FEATURES

■ Multiple chip Control (TMC8100)



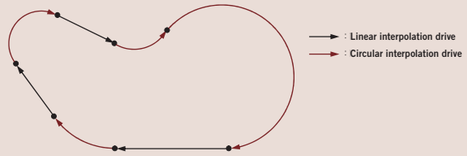
TMC8100 has a specific bus (Multi Chip Bus) for connecting to other TMC8100s, and by sharing internal information with each other, fully synchronous 4 x n-axis linear interpolation drive and circular interpolation drive of any 2 axes out of 4 x n-axis are available.

■ Clock-synchronous serial interface (TMC1100)



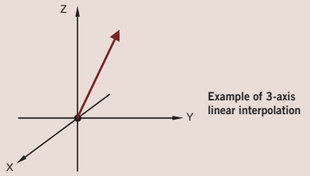
TMC1100 can be controlled by a clock-synchronized serial I/F in addition to control by a CPU bus, which is highly useful when built into a driver unit or the motor itself. It can also be controlled by a CPU without an external data bus.

■ Continuous interpolation control (TMC8100)



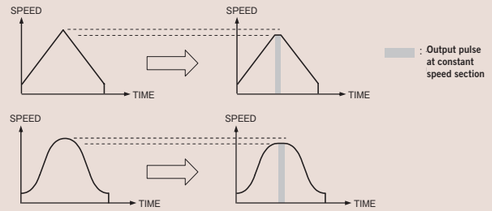
TMC8100 offers continuous interpolation drive combining linear and circular interpolation drive, which can start at any point and stop at any point. Also, a sequence of drives can be performed in a single acceleration/deceleration motion or at a constant speed.

■ Single axis interpolation control and multiple chip synchronous start (TMC1100)



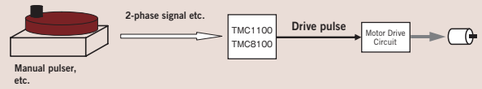
TMC1100 is a single-axis control IC, but it has a linear interpolation drive function. By using several TMC1100s and starting them with synchronous start, a multi-axis linear interpolation drive can be done. There is no limit to the number of interpolation axes. Continuous interpolation is also available.

■ Triangular drive avoidance (TMC1100・TMC8100)



When driving with a specified number of pulses with a small number of output pulses, the motor cannot reach the specified speed and suddenly shifts from an acceleration state to a deceleration state. This is called triangular drive and can cause vibration and step-out of the mechanical system. The triangle drive avoidance function reduces triangle drive by outputting at least 1/16 of the total output pulses in the constant speed section.

■ Manual pulser control (TMC1100・TMC8100)



Manual adjustment is available by connecting a manual pulser to TMC1100/TMC8100.

CONTROLLERS

1/2-axis motion control unit
MR210AU / MR220AU

MR210AU/220AU is a motion control unit equipped with 2-axis motion control IC, “MCX302”. This unit can control 1 or 2-axis of either stepper motor or pulse type servo motor for position and speed controls. Users can program driving parameter values and position data of up to 64 steps for each axis on a built-in EEPROM. MR210AU controls 1-axis and MR220AU controls 2-axis.

Programmable function

User can program driving parameter values and position data (relative or absolute value can be set.) of up to 64 steps for each axis on a built-in EEPROM with an accessory communication cable. Position data which is programmed can be operated through parallel interface and serial communication port. 4 types of driving speed is selectable for position data of each axis. Program control commands such as jump, repetition and input condition jump are applied, so it makes users program efficiently for memory.

Serial control interface

Writing and editing programs from PC and manual operation for each axis is operated through USB and RS232C serial communication port on Windows. Or these are also possible from an optional remote box, MR200RB, directly connect to RS232C port of MR210AU/220AU without PC. Users can control MR210AU/220AU by Microsoft VB and VC programs which are made by themselves according to a serial communication commands. (Serial communication commands are prepared by an additional document.)

Parallel control interface

MR210AU/220AU can connect to PLC (Programmable Logic Controller) through parallel I/F, any position data can be activated at designated speed. Scanning drive, continuous drive and program execution are also possible.

Various home search modes

As input signals for the home search, inputs for the home position, home sensor, and encoder Z-phase signal are available. Home search functions such as high-speed home search, low-speed home search, logical home offset, etc. can be programmed to suit various customer systems.

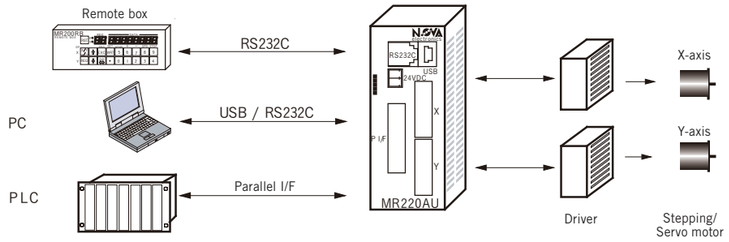
Power-on automatic start

When the power is turned on, the registered program is automatically started from REG00. This function is useful for axis control of built-in type machines.

Remote box (option)

By connecting to the main unit with the attached RS-232C cable, users can write operation modes, parameters, and programs. Users can also perform operations such as jog feeding of each axis, home search, and program running.

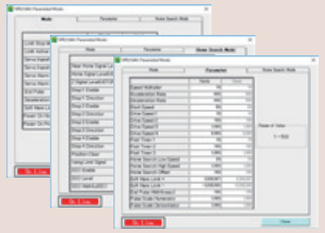
■ Example of connection



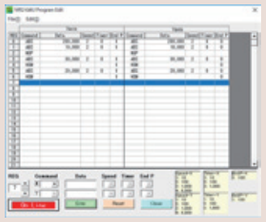
Remote box
MR200RB

To operate MR210AU/220AU, it is necessary to register the operation mode (limit signal logic, enable/disable signals for servo motors, etc.), the operation parameters (acceleration, drive speed, post timer, etc.), and the operation program to the main unit to suit your system. MR210AU/220AU can easily register operation data by connecting to a PC with the attached cable and starting the operation program (pre-installed).

① Start the operating program.
⑥ Check actual operations



② Select driving mode.
③ Set parameters.
④ Set home search mode



⑤ Set driving programs

Note : The program data can be registered by connecting a remote box (MR200RB) .

■ Specifications

Specifications	MR210AU	MR220AU
Control axis	1 axis	2 axes (independently programmable for each axis.)
Controllable motor	Stepper motor or pulse type servo motor	
Index pulse registration numbers	64 for each axis	
Index pulse setting range	− 8388608 ～+ 8388607 (Relative / Absolute value can be specified.) with Pulse scaling function	
Drive speed registration numbers	4	
Drive speed setting range	1pps ～ 4Mpps (1 ～ 8000×multiplier 1 ～ 500)	
Acceleration/Deceleration curve	Constant speed, Linear Acceleration (Trapezoid)	
Driving mode	・Home search ・Scan driving ・Continuous driving ・Index driving ・Program driving	
Home search driving mode	Automatically executes High-speed near home search (Step1) → Low-speed home search(Step2) → Low-speed Z-phase search (Step3) → High-speed offset drive (Step4). Search direction for each step and enable/disable can be specified.	
Program function	・Memory media EEPROM ・Steps 64 ・Commands 12 commands ・Power On Program Start Function	
Remote box (Optional extra) MR200RB	・Driving mode, Parameter and Program writing ・Driving operations (Jog, Program execution and Home search are available)	
Control interface	・Parallel I/F ・RS-232C ・USB (USB Standard 2.0 compliant)	
General output	1 point	2 points (1 point for each axis)
Power input	DC24V	
Consumption current	Max. 0.25A when input/output signal is open.	
Temperature range for driving	0 ～ 45˚C (No Condensation)	
Package dimensions	90mm (Height)×36mm (Width)×64mm (Depth)	
Mass	96g	102g
Accessory	CN1 : MC1.5/2-ST-3.5(PHOENIX) or equivalent 1 CN3: 20P MIL standard 2.54mm connector 1 CN4: 16P MIL standard 2.54mm connector 1 RS-232C cable (1.5m) 1 USB cable (1.8m) 1	CN1 : MC1.5/2-ST-3.5(PHOENIX) or equivalen 1 CN3: 20P MIL standard 2.54mm connector 1 CN4,5: 16P MIL standard 2.54mm connector 2 RS-232C cable (1.5m) 1 USB cable (1.8m) 1
System requirements for the operating program	OS: Windows 10	

Integrated motion controller and driver for 5-phase stepping motor

MD5130D / MD5230D

MD5130D is 1-axis, MD5230D is 2-axis integrated motion controller and driver for 5-phase stepper motor with bipolar pentagon drive system. A built-in EEPROM is for reading and writing driving parameter values and the user program of up to 1000 steps. The software "MD Operation Tool" is attached which can edit and register configuration data and a user program.

Integrated motion controller and driver

MD5130D/MD5230D are the integrated motion controller with motion control function and microstep driver for 5-phase stepper motor. The user can easily set configuration and operations using the attached software.

User program

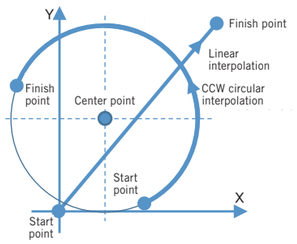
The user can register various driving parameters and the user program of up to 1000steps by 27 kinds of commands for MD5130D, 36 kinds of commands for MD5230D. Thereby the complex operation can easily be performed by registering them in advance.

Various acceleration/deceleration mode

There is various acceleration/deceleration driving, constant speed, trapezoidalacceleration/deceleration (symmetry/ non-symmetry) and S-curveacceleration/deceleration driving. In addition, a simple mode is available that does notrequire a start speed setting.

Interpolation function[MD5230D]

MD5230D can execute linear and circular interpolation in XY or thogonal coordinates. Continuous interpolation can also be executed that performs a series of interpolation processes such as linear interpolation →circular interpolation → linear interpolation



Step out detection

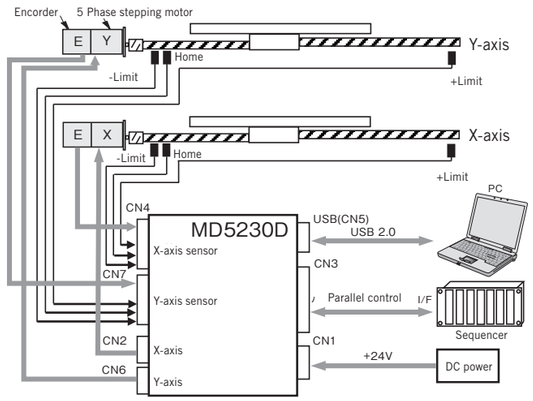
If the differential between real position and logical position by an encoder signal is more than a specified value, it detects a step out error.

Microstep

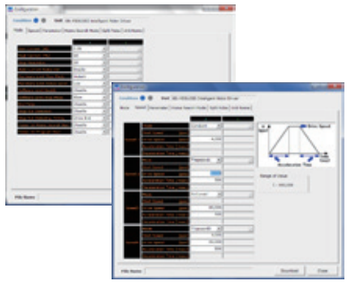
Microstep resolution is available 16 different resolutions, divided from 1 to 250.

Low vibration drive

Microstep driver with low vibration function achieves a smooth drive in low-speeddriving. Even when the set value of the number of microstep divisions is 16 or less (excluding 5 and 10), vibration during low-speed operation is reduced, and low vibration and Smooth motion is achieved.



System configuration example of MD5230D



The attached software "**MD Operation Tool**" to set and control from PC is equipped. Connect to PC with USB cable and the user can register configuration data and a user program, operate jog feed and perform a user program using "**MD Operation Tool**"

■ Specifications

Specifications	MD5130D	MD5230D
■ Drive functions		
Control axis	1 axis	2 axes
Drivable motor	5-phase stepper motor with 5 leads or 10 leads	
Driving current	0.35 ～ 1.4A / phase (selectable from 16 kinds)	
Driving system	Bipolar pentagon drive system microstep drive	
Microstep resolutions	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 (16 kinds)	
Auto current reduction	It sets rest current to run current by percentage, selectable from 16 kinds, 25% to 100%	
■ Control Function		
Speed setting	・Speed setting number : 4/each axis (Mode, Start speed, Drive speed, Acceleration time, Deceleration time) ・Mode : Constant, linear acceleration/deceleration (Trapezoid) (with / without Start speed), non-symmetry linear acceleration/deceleration, S-curve acceleration/deceleration (with / without Start speed) ・Drive speed, Start speed : Setting range 1pps ～ 500kpps ・Acceleration Time, Deceleration Time : Setting range 1 ～ 10000msec	
Driving mode	Automatic home search / Scan driving / Continuous driving / Preset driving / Program driving	
Automatic home search	・Automatically executes High-speed home search (Step 1) → Low-speed home search (Step 2) → Low-speed encoder Z-phase search (Step 3) → High-speed offset drive (Step 4) ・Each step of search direction and enable/disable can be specified.	
Program function	・Memory media EEPROM ・Steps 1000 ・Commands 27 Commands ・Power On Program Start Function	・Memory media EEPROM ・Steps 1000/each axis ・Commands 36 Commands ・Power On Program Start Function
Communication commands	Communication commands that controls a unit with USB cable from the program on PC created by VB and VC.	
Interpolation	—	・Linear interpolation ・Circular interpolation ・Continuous interpolation
Step out detection function	・Monitors the difference between the logical and real positions, and if detects the abnormal difference, motor rotation stops. ・Step Out Differential can be set.	
Encoder scaling function	・Function to set the scale in order to match the count value of logical and real positions for motor rotation.	
Pulse scaling function	・Function to set the scale in order to input and display the specified position and logical position according to the actual moving distance (mm).	
Hardware limit	・Number of input signals 2 (each 1 for + and – direction) ・Stop signal active level can be set. ・Stop mode Instant / Slow is selectable.	
Software limit	・Stop mode Instant / Slow is selectable. ・Each axis +direction, -direction	
Input signal	【Axis sensor signal】(Each axis) Encoder A / B phase input, Encoder Z phase input, Home, Limit signal (1point each +,-direction), Emergency stop, General input 2points 【Parallel control signal】 External reset signal input, Automatic home search start input, Program driving start input, Motor stop input, Program designation 0~5 input, Driving mode designation 0, 1 input, Axis assignment (MD5230D)	
Output Signal (Each axis)	Split pulse output, general output, General output 2 signals, Output during driving / End pulse, Error output, Open collector output, DC30V or less and 60mA or less	
Control interface	・Parallel control I/F ・USB (USB standard V2.0 compliant) The maximum of 16 units can be connected to one PC with USB cable.	
■ Others		
Input power	DC 24V (3A MAX.)	DC 24V (6A MAX.)
Ambient temperature	0 ~ 40˚	
Ambient humidity	0 ~ 85%RH (No Condensation)	
Mass	245g	429g
Package dimensions	108mm (Height) × 34mm (Width) × 95mm (Depth) (except projecting part)	130mm (Height) × 46.5mm (Width) × 98.5mm (Depth) (except projecting part)
Accessory	・CN1 : XW4B-03B1-H1 (Omron) or equivalent 1 ・CN2/6 : XW4B-05B1-H1 (Omron) or equivalent Each 1 ・CN3 : 20P MIL standard 2.54mm connector 1 ・CN4/7 : 16P MIL standard 2.54mm connector Each 1 ・USB cable (1.5m) *CN6 and CN7 are attached to only MD5230D	
System requirements for the software	Windows 10	

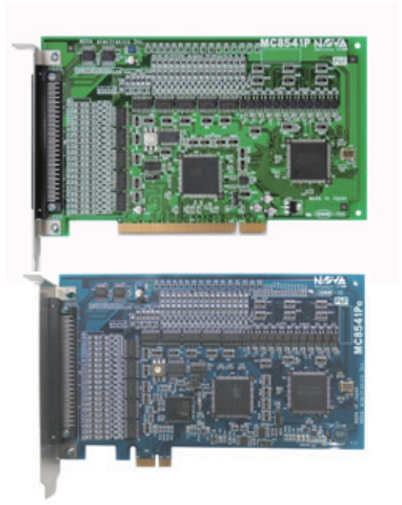
High-performance standard multi-axis motion control board

4-axis motion control board RoHS

MC8541P/MC8541Pe

8-axis motion control board RoHS

MC8581P/MC8581Pe



PCI bus/PCI-Express compatible with circular/linear interpolation function

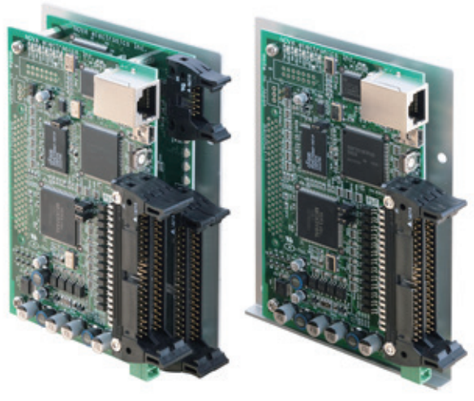
MC8541P/81P and MC8541Pe/81Pe are PCI bus and PCI-Express x1 compatible circuit boards, equipped with MCX514 high-performance 4-axis motor control IC. A single board can control the positioning or speed of 4-axis/8-axis servo motors or stepping motors independently for each axis. With enhanced interpolation functions, MC8541P/Pe can perform 4 axes linear interpolation, 4 axes bit pattern interpolation, and helical interpolation in addition to the existing 2-axis/3-axis linear interpolation, circular interpolation, and bit pattern interpolation. MC8581P/Pe can perform linear interpolation for up to 8-axis in any axes. In addition to circular interpolation, helical interpolation, and bit pattern interpolation, MC8581P/Pe can perform 2 interpolation motions simultaneously.

- **Control axis**: MC8541P/Pe (4-axis) , MC8581P/Pe (8-axis)
- **Power-supply**: MC8541P/81P +5V ± 5%　MC8541Pe/81Pe +3.3V ± 5%
- **Drive speed**: 1PPS ~ 8MPPS
- **Output circuit**: Differential line driver (AM26C31) output
- 2-axis/3-axis/4-axis linear interpolation, CW/CCW circular interpolation, 2-axis/3-axis/4-axis bit pattern interpolation, helical interpolation, continuous interpolation 8-stage pre-buffer, short axis pulse uniformity, linear speed constant mode, Speed range free, synchronous motion, acceleration/deceleration drive (constant speed/linear acceleration/deceleration, S-curve acceleration/deceleration), automatic deceleration start, S-curve acceleration/deceleration curve

OS: Windows10
Software: Device driver, Sample program (VC/VB/C#)
Evaluation tool program
outline: W174.6×H106.7mm(not including connector, including bottom plate)

USB/LAN connection compatible 4/8-axis motion control board with interpolation function RoHS

MR540/MR580



MR540/580 are USB/LAN-compatible motion control boards equipped with the MCX314AL 4-axis motion control IC with interpolation function. MR540 and MR580 can control positioning or speed of 4-axis/8-axis servo motors and stepping motors independently for each axis. Up to 16 units (128 axes) can be connected via LAN/USB hub.

- **Control axis:** MR540/4-axis, MR580/8-axis
- **Power-supply**: DC24V±10%
- **Drive speed**: 1PPS~4MPPS
- **Output circuit**: Differential line driver (AM26C31) output
- **Communication method**: USB2.0/LAN
- Circular/linear/continuous interpolation, parabolic S-curve acceleration/deceleration, synchronous motion

OS: Windows10
Language: VC (C,C++) [VB6.0,VB.NET]
Software: Device driver, Sample program
Evaluation tool program
outline: [MR540]W98×H129×D26.2mm
[MR580]W98×H129×D26.2mm
(not including connector, including bottom plate)

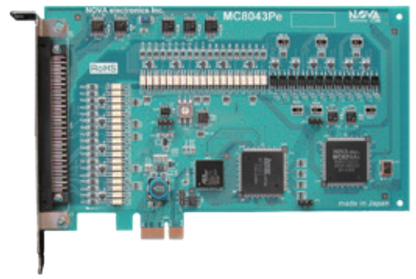
Standard 4-axis motion control board with interpolation function

PCI bus compatible RoHS

MC8043P

PCI Express x1 compatible RoHS

MC8043Pe



MC8043P and MC8043Pe are circuit boards with 4-axis motor control IC MCX314As with interpolation function, which are compatible with PCI Bus and PCI-Express × 1, respectively. It can control 4-axis servo motors or stepping motors with positioning or speed control independently for each axis on a single board. It can also control 2-axis/3-axis linear interpolation, circular interpolation, and 2-axis/3-axis bit pattern interpolation (interpolation using bit data from the CPU) by selecting any 2 or 3-axis of the 4-axis.

- **Control axis**: 4-axis　(Independent simultaneous control possible)
- **Drive speed**: 1PPS ~ 4MPPS
- **Output circuit**: Differential line driver (AM26C31) output
- 2-axis/3-axis linear/circular/continuous interpolation
- Non-symmetrical parabolic S-curve/trapezoidal acceleration/deceleration drive
- Encoder phase-A / phase-B / phase-Z input

OS: Windows10
Software: Device driver, Sample program (VB・VC++)
Evaluation tool program

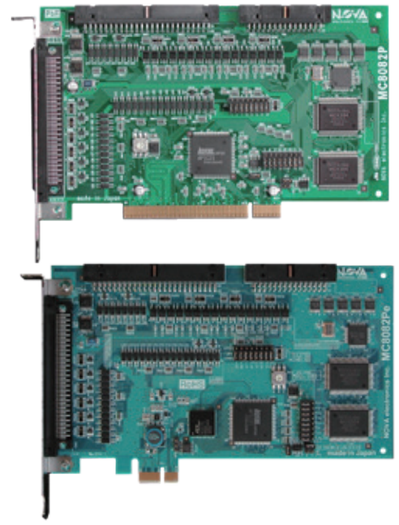
Standard multi-axis motion control board

2/4/8-axis PCI bus compatible RoHS

MC8022P
MC8042P
MC8082P

8-axis PCI Express x1 compatible RoHS

MC8082Pe



MC8002P series is a PCI standard motion control board for 2 to 8-axis with MCX304 on board. Up to 16 boards can be used on a single PC by setting the board ID. Each board operates with the same device driver, so that even an increase in the number of axes due to specification changes is easily handled by a simple program update. In addition to various sensor inputs, standard outputs are also available.

- **Control axis**: MC8022P(2-axis), MC8042P(4-axis), MC8082P/Pe(8-axis)
- **Drive speed**: 1PPS ~ 4MPPS
- **Output circuit**: Differential line driver (AM26C31) output
- Parabolic S curve/trapezoidal acceleration/deceleration driving, Automatic deceleration of non-symmetrical rapezoidal acceleration/deceleration
- Automatic home search

OS: Windows10
Software: Device driver, Sample program (VB・VC++)
Evaluation tool program

MOTION CONTROL ICs

MCX302 Standard 2-axis motion control IC

MCX302 is 2-axis motion control IC which can independently control 2-axis of either stepper motor driver or pulse type servo motor for position and speed control.
It is also equipped with the advanced functions such as automatic home search.

- Parabolic S curve/trapezoidal acceleration/deceleration drive
- Automatic deceleration for non-symmetrical trapezoidal drive

Automatic home search | Synchronous action | Built-in integral filter

Max. drive speed :4Mpps | 100pin plastic QFP type | Power:5V±5%

MCX304 Standard 4-axis motion control IC

MCX304 is 4-axis motion control IC which can independently control 4-axis of either stepper motor driver or pulse type servo motor for position and speed control.
It is also equipped with the advanced functions such as automatic home search.

- Parabolic S curve/trapezoidal acceleration/deceleration drive
- Automatic deceleration for non-symmetrical trapezoidal drive

Automatic home search | Synchronous action | Built-in integral filter

Max. drive speed :4Mpps | 100pin plastic QFP type | Power:5V±5%

MCX312 Standard 2-axis motion control IC

MCX312 is 2-axis motion control IC which can independently control 2-axis of either stepper motor driver or pulse type servo motor for position and speed control.
In addition, it can perform 2-axis linear, circular and bit pattern interpolation (bit pattern interpolation is executed by bit data from CPU). Multichip axes linear interpolation is also available.

- Circular / linear / continuous interpolation
- Parabolic S curve/trapezoidal acceleration/deceleration drive
- Automatic deceleration for non-symmetrical trapezoidal drive
- Multichip axes linear interpolation

Synchronous action | Built-in integral filter

Max. drive speed :4Mpps | 100pin plastic QFP type | Power:5V±5%

MCX314As/AL Standard 4-axis motion control IC

MCX314As/AL is 4-axis motion control IC which can independently control 4-axis of either stepper motor driver or pulse type servo motor for position and speed control.
In addition, it can perform 2/3-axis linear interpolation, CW/CCW circular interpolation, 2/3-axis bit pattern interpolation and continuous interpolation.

- 4-axis independent drive
- Circular / linear / continuous interpolation
- Non-symmetrical parabolic S-curve / trapezoidal acceleration / deceleration drive

Automatic home search | Synchronous action | Built-in integral filter

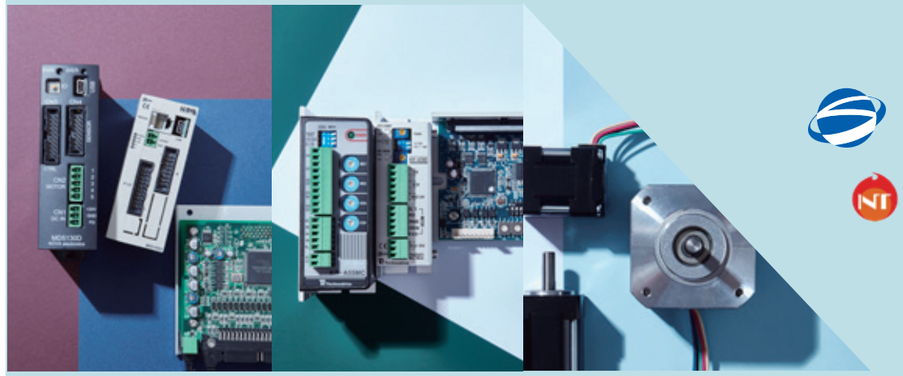
Max. drive speed : [As] 4Mpps [AL] 8Mpps (at CLK=32MHz), 4Mpps (at CLK=16MHz)

144pin plastic LQFP | Power:[As]5V±5% [AL] 3V±10%

GLOBAL BUSINESS

AUTOMATION BUSINESS

Utilizing over 25 years know-how of positioning systems, achieving most suitable automation systems to satisfy the requirements.



PARTNERS

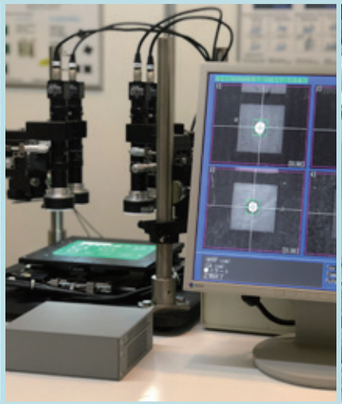
SKS CORPORATION

NISHIDA Co.,Ltd. 株式会社ニシダ

OXISO

Cases

Automatic inspection syetems with Air-micrometer



Auto alingment systems with PIG stage

Automatic handling systems for blast machines

DISTRIBUTOR BUSINESS

We help create new businesses by connecting Asian and Western technologies and cultures under the rapid globalization of the market.

iselGermanyAG

WINGTONE Industrial Co., Ltd.

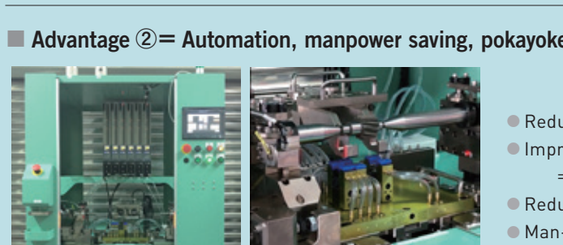
SKS CORPORATION

ACQUEST®

Inspection process improvement by Air-micrometer

Air-micrometer
→ Comparator by change of air flow and pressure

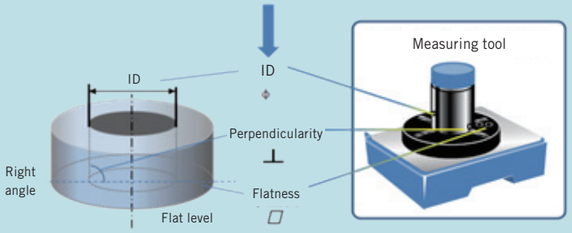
■ User friendly
Easy, quick and stable result by any operator!



- No variation by operator ⇒Stable measuring result
  ⇒Easy to conform Gauge R&R
- No skill and training required
- Higher accuracy and efficiency⇒Quick result at production line
- Measurement by Micron⇒For tight tolerances ！

■ Advantage Ⅰ= Reduction of inspection man-hours
By Multi-task design, multiple points can be measured at once !

For example, with a ring-shaped product like this, it is possible to measure a combination of these points.



Measurable points

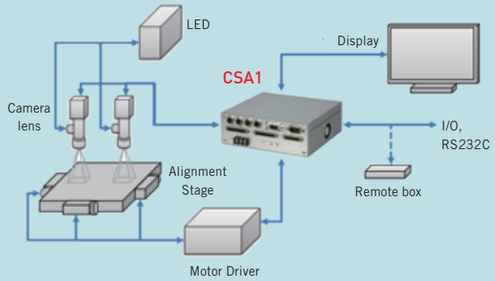
①ID②OD③Thickness④Height⑤Width⑥Concentricity⑦Straightness⑧Perpendicularity⑨Cylindricity⑩Pitch

■ Advantage ②= Automation, manpower saving, pokayoke by combination with robots !

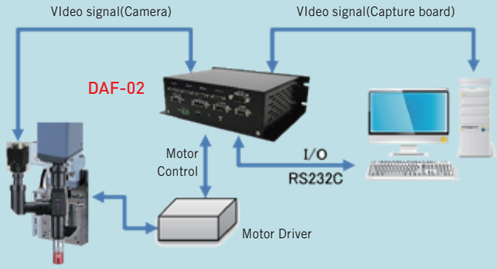
- Reducing number of inspectors
- Improving production efficiency and products quality
  ⇒Eliminates measuring error and skip measurement
- Reducing training and education for inspector
- Man-hour reduction by multi-task design
- Measuring result record⇒Tendency management

NISHIDA Co.,Ltd.
株式会社ニシダ

Alignment systems/Auto-focus systems

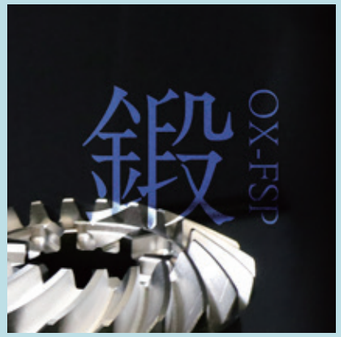


The CSA1 series is an auto-alignment system with high-speed DSP that provides high-precision positioning.
1 to 4 cameras to automatically recognize specific marks and control automatic positioning to pre-set positions.
The teaching (automatic learning) function automatically calibrates the camera's mounting position, tilt, as well as the amount of change in the field of view, No need to register the coordinates.



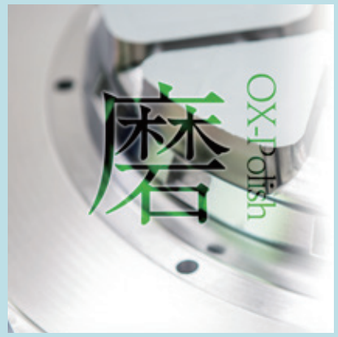
Digital autofocus unit DAF-02 detects focusing information from the camera live image and focusses quickly. Easy mountable to existing microscope, stable focusing, and suitable for dimension measurement and appearance inspection.

OXISO



OX-FSP
OXISO's Fine Shot Peaning

OX-FSP is a process that improves fatigue strength and wear resistance mainly by selecting shot parameters in detail and processing under optimal conditions according to the product material, heat treatment, strength, operating environment in addition to shot peening which is often used to increase the fatigue strength of gears etc.,



OX-Polish
OXISO's Special polishing process

OX-Polish is a special polishing process that forms optimal surface texturing characteristics by applying the surface preparation and surface treatment process that OXISO has developed with fine particle precision shot peening (OX-FSP). It is very effective in reducing gear oscillation friction.

OX-HTT
OXISO's Heat Processing Technology

Oxiso's unique heat processing technology and OX-HTT's original heat treatment pattern create a high standard products that are different from the standard heat treatment process. The combination of OX-FSP and each heat process offers products with fine metallurgical structure and high fatigue strength.

iselGermanyAG

isel Germany AG is a wholly owned company of the Aalberts Group and is represented in Germany at the company's sites in Eichenzell & Eiterfeld (Hesse) with production, warehouse and office space.

The main business field of isel Germany AG is the provision of components from the areas of MECHANICS, ELECTRONICS and SOFTWARE. Furthermore, CNC units and CNC machines with extensive accessories from the SYSTEMS area are offered. This includes also commissioned work and project planning for OEM customers in all sectors.

CNC machines from isel: 50 years full service CNC solutions

Precision and speed for the most efficient manufacture of your products.

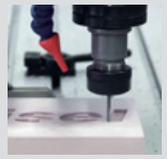
- Bespoke CNC systems
- Maximum manufacturing depth
- Free samples
- Easy to use
- Can be upgraded later

Whether it is medical technology, automotive industry, optics or dosing technology: isel CNC customers receive a comprehensive carefree package. Individual advice, a fast, competent isel-own hotline, detailed training, prompt support via Netviewer and a simple user interface thanks to modern CAD/CAM systems are self-evident for us. We are also happy to produce a free production sample including video recording of the processing.

Mechanical components from isel: Flexible & highly-efficient

For over 50 years mechanical elements from isel have been used in a wide range of industries for sophisticated and creative design solutions. All mechanical components from isel are made in Germany and feature exclusively self-produced components, so that the perfect gearing of all components ensures excellent work results. Their aluminium-steel compound makes isel mechanical components considerably cheaper than the competition and their high manufacturing depth makes them very flexible. Whether it is aluminium profiles, linear guides, drive units, linear units and rotary stations:
isel Mechanics requires only minor planning and minimal installation time despite minimal costs.
3D printing components and accessories | isel offers you a wide range of products which are essential for 3D printers

Electronics from isel: developed robustly and field-tested!



isel electronic components have been used in a host of automation solutions for more than four decades and boost the productivity of your machines and systems. Whether stepper or servo motor solutions from our motor range – you will find the right, inexpensive drive system for almost any application and which completes the movements based on your requirements. Our control systems are robust and have stood the test of time and can be used to implement single-axis, multi-axis or CNC solutions simply and cost-effectively. All electronic components are available as control modules for isel ProNC, Remote and PAL-PC and are thus quick and easy to use. This facilitates a short implementation phase, ensuring that your systems are quickly ready for operation. We develop and produce the products in-house, so we can respond to customer requests and implement custom solutions quickly and flexibly.

WINGTONE Industrial Co., Ltd.

Wingtone is the leading precision cold formed components manufacturer in Taiwan. Key technology to produce unique hollow components mainly for automotive industry.

- Over 40 years mass production experiences
- TS16949 since 2006 (ISO9001 since 1998)
- 100% in-house designed / made cold forming production machines
- 100% in-house designed / made tooling
- Long hollow parts, large diameter, thin wall thickness, unique shape and etc.
- Minimizes and/or eliminates secondary process by near-net shape by unique forming machine
- Unique built-in additional functions such as automated D-cut / slit in the forming machine
- Eliminates secondary process by utilizing in-house drawn shaped wire materials

In-House made 7 stage forming machine

In-House Process Technologies

In-house designed / made 7 stage forming machine

In-house designed / made progressive 7 stage tooling

Wire drawing process

Cold forming process

Tapping process

Cost competitiveness
Design flexibility

Total production
Quality stability

Production Capabilities

- Average monthly production : 800 tons
  Current active parts : 150 part numbers
- Materials : C1008 to C1045, Alumium
- Number of 7 stage forming machines : 70

Plug In Go

PIG Motorized Slider

Precision positioning module. User friendly "Plug-In and Go" features. High accuracy with a lower cost precision rolled ball screw technology. Built-in 5-phase stepping motor as standard. Servo motor available as an option with absolute or incremental feedback. connector type for easy connection. Limit sensor included. Custom designs available.
Best matched with our easy to program controller and 5-phase micro stepping drivers.

PIG Motorrized Slider

Available lead/stroke (Custom order)
TD15 Lead : 1mm
Stroke: 100mm
TD23 Lead : 5mm
Stroke: 50mm / 150mm / 200mm
TD30 Lead : 4mm / 5mm
Stroke: 50mm / 100mm / 300mm / 400mm / 500mm / 600mm / 650mm

Model	TD1502-050	TD1502-150	TD2302-100	TD3010-200
Stroke (mm)	50	150	100	200
Lead (mm)	2			10
Resolution (Full step, mmm)	0.004			0.02
Repeatablity (mm)	0.05			
Lost motion (mm)	0.01			0.02
Allowable moment Mp (Nm)	10		46	101
Allowable moment My (Nm)	11		51	120
Allowable moment Mr (Nm)	28		134	260
Motor torque (Nm)	0.018		0.13	0.4
Load capacity (Horizontal, Nm)	25		180	100
Load capacity (Vertical, Nm)	12.5		90	50
Weight (g)	400	600	1500	3380

Plug In Go

PIG 3 AXIS TABLE

All 3 drive axis are on the same plane for high positioning accuracy. Much lower profile in comparison with the other existing tables. A different combination of 3- axis linear drive sliders creates variety of table size and radial movement. Easy initial set-up with dedicated control software.

PIG3-220	X	Y	θ
Stroke (mm)	50	50	±9° (*)
Lead (mm)	2		—
Resolution (Full step, mm)	0.004		
Repeatablity (mm)	0.05		
Lost motion (mm)	0.01		
Load capacity (Horizontal, Nm)	25		
Weight (Kg)	3.7		

* θ axis stroke is at the unit center(mm)

MEMO

TECHNO DRIVE

株式会社テクノドライブ
TECHNO DRIVE CO., LTD
〒214-0034 神奈川県川崎市多摩区三田1-26-28
ニューウェル生田ビル101
New-Well Ikuta Build. 1-26-28 Mita,
Tama-Ku,Kawasaki-City, Kanagawa
214-0034 Japan
TEL : 044-935-0072（+81-44-935-0072）
FAX : 044-935-0708（+81-44-935-0708）
URL : www.technodrive.com

2023/01 ver.2