All-in-One 0.72° Stepper Motor
PKA Series Built-in Controller Type

CE
● For detailed information about regulations and standards, please see the Oriental Motor website.

These are 0.72° stepper motors with DC power supply input and an integrated driver and motor.

● Space Saving and Reduced Wiring of the Equipment
● Built-in Controller Type FLEX

FLEX What is FLEX?
FLEX is the collective name for products that support I/O control, Modbus (RTU) control, and FA network control via network converters. These products enable simple connection and simple control, shortening the total lead time for system construction.

View Expanded Product Information, Specifications, CAD, Accessories & more online. Visit **www.orientalmotor.com/catalog** or use the QR code and select "**PKA** Series".

■Features

Contributes to Space Saving and Reduced Wiring of the Equipment

The driver and motor are integrated and since there is a built-in positioning function, there is no need for a pulse generator. The resulting simplified system allows for space saving, reduced wiring, and more compact equipment.
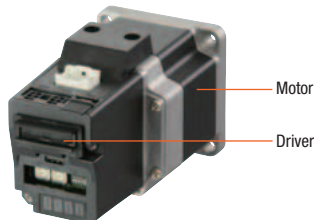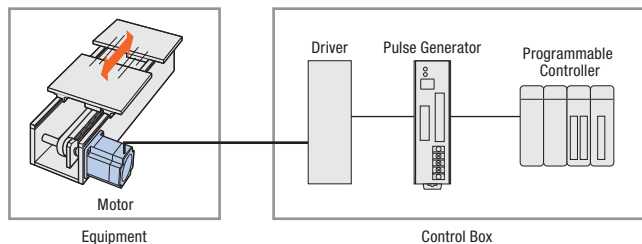
Motor
Driver

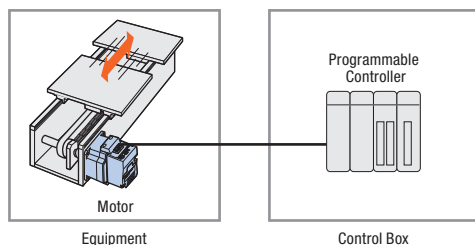### Contributes to Reduced Startup Time of the Equipment

Since "motor – driver" wiring and "driver – pulse generator" wiring are not needed, the wiring time can be cut down. This also has the effect of reducing problems caused by wiring.
Therefore, the startup time of the equipment can be shortened.

● For Motor + Driver + Pulse Generator

Driver   Pulse Generator   Programmable Controller

Motor
Equipment   Control Box

● **PKA** Series

Programmable Controller

Motor
Equipment   Control Box

3 Control Methods that can be Selected

The driver is compatible with FLEX, so a control method that suits the operation system can be selected.

●Built-in Controller Type [FLEX]

● When Controlling with I/O

CPU
Power Supply
I/O
No Need for Positioning Module

①I/O

● When Controlling from Computer or Touch Screen (HMI)

②Modbus (RTU)

● When Controlling with Serial Communication

CPU
Serial Communication Module
Power Supply

②Modbus (RTU)

● When Controlling with FA Network

Power Supply
CPU
FA Network Module

CC-Link
MECHATROLINK
EtherCAT

③FA Network

Network Converter

②RS-485

With this type, the operating data is set in the driver, which can then be selected and executed from the host system.

Host system connection and control are performed with ① I/O, ② Modbus (RTU)/ RS-485 or ③ FA network.

●Control System Configuration for Each Built-in Controller Type
① Control via I/O

The positioning module (pulse generator) function is built into the driver, and therefore, an operation system using I/O can be configured by connecting directly to a switch box or PLC. A positioning module is not necessary on the PLC side, saving space and simplifying the system.

● Example of Using a Switch Box
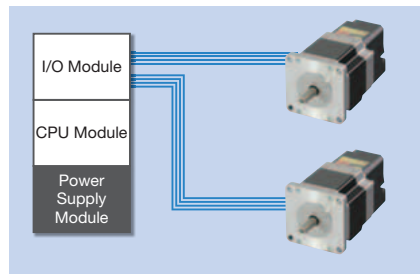
STR STOP
CCW CW
STR STOP
CCW CW

Switch Box
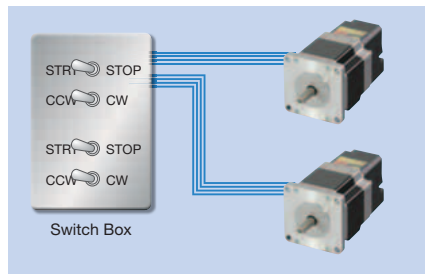
Operating data is set in the driver, and the motor can be started or stopped simply by connecting to the switch at hand. Control can be performed easily without using PLC.

Easy Control   Low-Cost Design

### ● Example of Using PLC

I/O Module
CPU Module
Power Supply Module

When using PLC, an operation system can be configured by connecting directly to an I/O module. A positioning module is not necessary on the PLC side, so space is saved and the system is simplified.

Easy Control   Low-Cost Design

Space Saving

● Example of Using PLC and a Touch Screen

Touch Screen
I/O Module
CPU Module
Power Supply Module
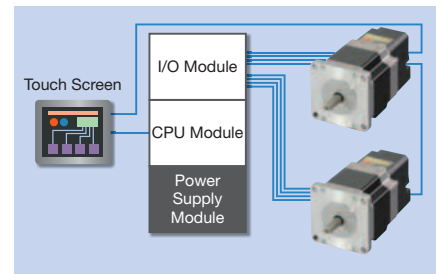
Normally, the motor is started and stopped with I/O. Changing the operating data settings and displaying the monitors and alarms are performed with the touch screen using Modbus (RTU) communication. When there is a lot of setup work, changes can be easily made on the touch screen, which reduces the burden of creating ladders.

Easy Control   Support for Small Lots of Multiple Products

② Control via Modbus (RTU)/RS-485 Communication

RS-485 communication can be used to set operating data and parameters, as well as input operation commands.
For each serial communication module, up to 31 motors can be connected. It also comes with a function that enables multiple axes to be started simultaneously.
The protocol is supported by Modbus (RTU) and can be used to connect to touch screen and computers.

Easy Control   Simple Wiring   Supports Brands of Serial Modules

Motor Controlled by Computer   Simplified System

③ Control via FA Network

By using a network converter (sold separately), CC-link, MECHATROLINK or EtherCAT communication are possible. All of these can be used to set operating data and parameters, as well as input operation commands.

Easy Control   Simple Wiring

Multi-Axis Control at Low Cost
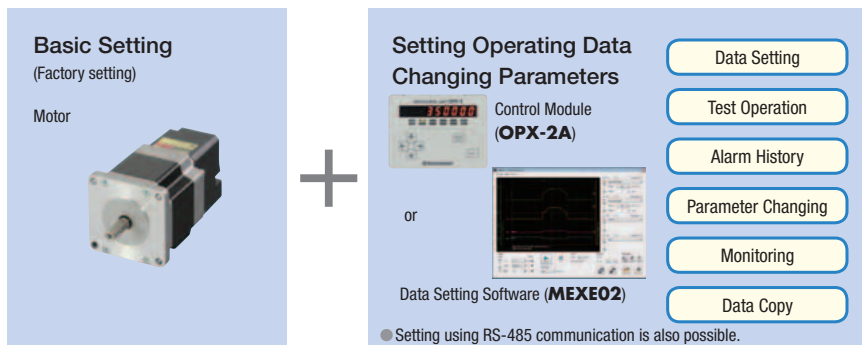
Built-in Controller Type *FLEX*

Because the information necessary for motor operation is stored in the driver, the burden on the host PLC is reduced. The system configuration when using multi-axis control can be simplified.
Settings are configured using a control module (sold separately), data setting software or RS-485 communication.

Basic Setting
(Factory setting)

Motor

+

Setting Operating Data Changing Parameters

Control Module
(**OPX-2A**)

or

Data Setting Software (**MEXE02**)

Data Setting

Test Operation

Alarm History

Parameter Changing

Monitoring

Data Copy

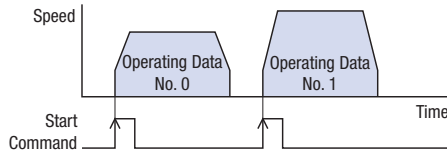● Setting using RS-485 communication is also possible.

● Operation Types

In the built-in controller type, the operating speed and traveling amount of the motor are set with operating data, and operation is performed according to the selected operating data. There are 4 patterns of operations.

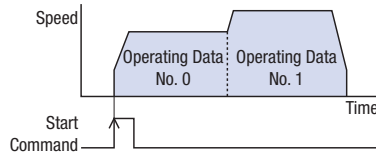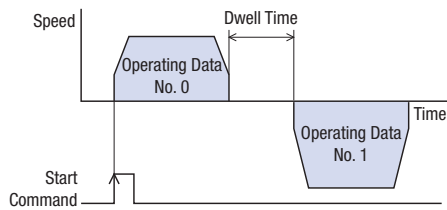| Item		Contents	
Common	Control Method	I/O Control	
		RS-485 Communication	Network Converter Connection
			Modbus RTU Protocol Connection
	Position Command Input	Setting with operating data number Command range for each point: −8388608~8388607 [step] (Setting unit: 1 [step])	
	Speed Command Input	Setting with operating data number Command Range: 0~1000000 [Hz] (Setting unit: 1 [Hz])	
	Acceleration/ Deceleration Command Input	Set with the operating data number or parameter. The acceleration/deceleration rate [ms/kHz] or acceleration/deceleration time [s] can be selected. Command Range: 0.001~1000.000 [ms/kHz] (Setting unit: 0.001 [ms/kHz]) 0.001~1000.000 [s] (Setting unit: 0.001 [s])	
	Acceleration/ Deceleration Processing	Velocity Filter, Traveling Average Filter	
Return-To-Home Operation	Return-to-Home Modes	2-Sensor Mode	A return-to-home operation that uses a limit sensor (+LS, −LS)
		3-Sensor Mode	A return-to-home operation that uses a limit sensor and a HOME sensor
		Position Preset	A function where P-PRESET is input at the desired position to confirm the home position
			The home position can be set to the desired value.
Positioning Operation	Number of Positioning Points	64 points (No. 0~63)	
	Operating Modes	Incremental Mode (Relative positioning)	
		Absolute Mode (Absolute positioning)	
	Operation Functions	Independent Operation	A PTP (Point to Point) positioning operation
		Linked Operation	A multistep speed-change positioning operation that is linked with operating data
		Linked Operation 2	A positioning operation with a timer that is linked with operating data The timer (dwell time) can be set from 0~50.000 [s]. (Setting unit: 0.001 [s])
	Start Methods	Operating Data Selection Method	Starts the positioning operation when START is input after selecting M0~M5
		Direct Method (Direct positioning)	Starts the positioning operation with the operating data number set in the parameters when MS0~MS5 is input
		Sequential Method (Sequential positioning)	Starts the positioning operation in sequence from operating data No. 0 each time SSTART is input
Continuous Operation	Number of Speed Points	64 points (No. 0~63)	
	Speed Change Method	Changes the operating data number	
Other Operations	JOG Operation	Regular feed is performed by inputting +JOG or −JOG.	

Positioning Operation
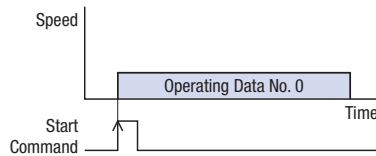
<Operation Functions>

● Independent Operation

Speed
Operating Data No. 0
Operating Data No. 1
Start Command
Time

● Linked Operation

Speed
Operating Data No. 0
Operating Data No. 1
Start Command
Time

● Linked Operation 2

Speed
Dwell Time
Operating Data No. 0
Operating Data No. 1
Start Command
Time

● Push-Motion Operation

Speed
Operating Data No. 0
Start Command
Time

+

<Start Methods>

- ● Operating Data Selection Method
- ● Direct Positioning
- ● Sequential Positioning

Return-To-Home Operation

● 2-Sensor Mode

−LS +LS
+Side VR / VS
−Side VS / VR

● 3-Sensor Mode

−LS HOMES +LS
+Side VR / VS
−Side VS / VR
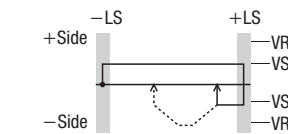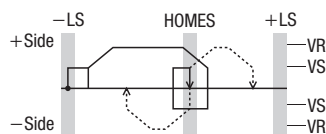
● Position Preset

Continuous Operation

+Direction
+Motor Operation
−Direction
Time
M0 ～ M5 Input
FWD Input
RVS Input
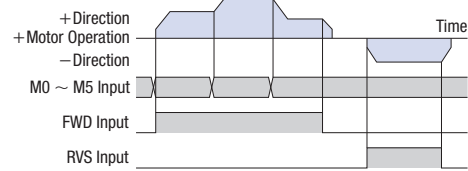
Other Operations

● JOG Operation (Test operation)

● Group Send Function

This function enables multiple axes to be started simultaneously using Modbus (RTU) communication and FA network.
Multiple drivers can be grouped together, and when an operation command is sent to the master unit, all the drivers that belong to the same group as the master unit will operate simultaneously.

● Modbus (RTU) Control: Supports simultaneous start, changes to traveling amount and speed, and monitoring
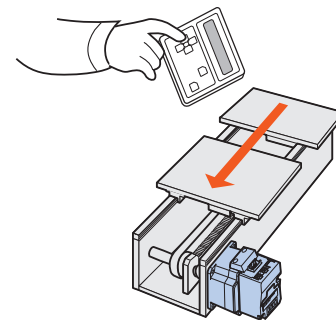● FA Network Control: Simultaneous start only

● Example of Modbus (RTU) Communication Control

Serial Communication Module
Group
Main Sub Sub
Multi-Axis Simultaneous Starting Operation is Possible.
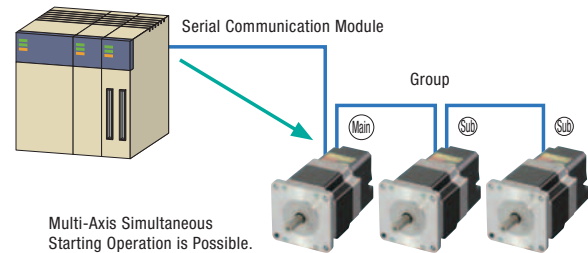
● Teaching Function

Teaching can be performed with the **OPX-2A** control module (sold separately) or the **MEXE02**✽ data setting software. The table is moved to the desired position, and the position data at that time is stored as the positioning data.
✽The data setting software can be downloaded from the website. Please contact us for details.

■**System Configuration**

✽1 Not supplied
✽2 Required for I/O control drive

Accessories (Sold separately)

Control Module Cable✽2

Accessories (Sold separately)✽2

Control Module

Data Setting Software
Communication Cable

or

**Data Setting Software
MEXE02**

To USB Port

Computer✽1

PKA Series

**24 VDC Power
Supply✽1**

**Programmable
Controller✽1**

Sensor✽1

Accessories (Sold separately)

Motor Mounting Brackets

MCS Couplings

RS-485 Communication
Cables

Peripheral Products (Sold separately)

Network Converters

● The User Manual, which describes how to operate the product, is available. Contact us for more details or download from the Oriental Motor website.
http://www.orientalmotor.com/

● The system configuration shown above is an example. Other combinations are also available.

■Product Number

PKA 5 4 4 K D
① ② ③ ④ ⑤ ⑥

①	Series Name	**PKA**: **PKA** Series
②	**5**: 5-Phase	
③	Motor Frame Size	**4**: 42 mm (1.65 in.) **6**: 60 mm (2.36 in.)
④	Motor Case Length	
⑤	Power Supply Input	**K**: 24 VDC
⑥	Driver Type	**D**: Built-in Controller Type

■Product Line

Product Name	List Price
PKA544KD	$415.00
PKA566KD	$432.00

The following items are included with each product:
Motor, Connection Cable, Connector Cap,
Operating Manual

Overview, Product Series

AC Input Motor & Driver

0.36°/Geared
α*STEP*
AR

0.36°/Geared
α*STEP*
Absolute
AZ

0.72°/Geared
RK**Ⅱ**

DC Input Motor & Driver

0.36°/Geared
α*STEP*
AR

0.36°/Geared
α*STEP*
Absolute
AZ

0.72°/0.36°/Geared
CRK

1.8°/Geared
RBK

1.8°/0.9°/Geared
CMK

0.72°
All-in-One
PKA

Motor Only

1.8°/0.9°
PKP/PK

Geared
PKP

0.72°/0.36°
PKP

Accessories