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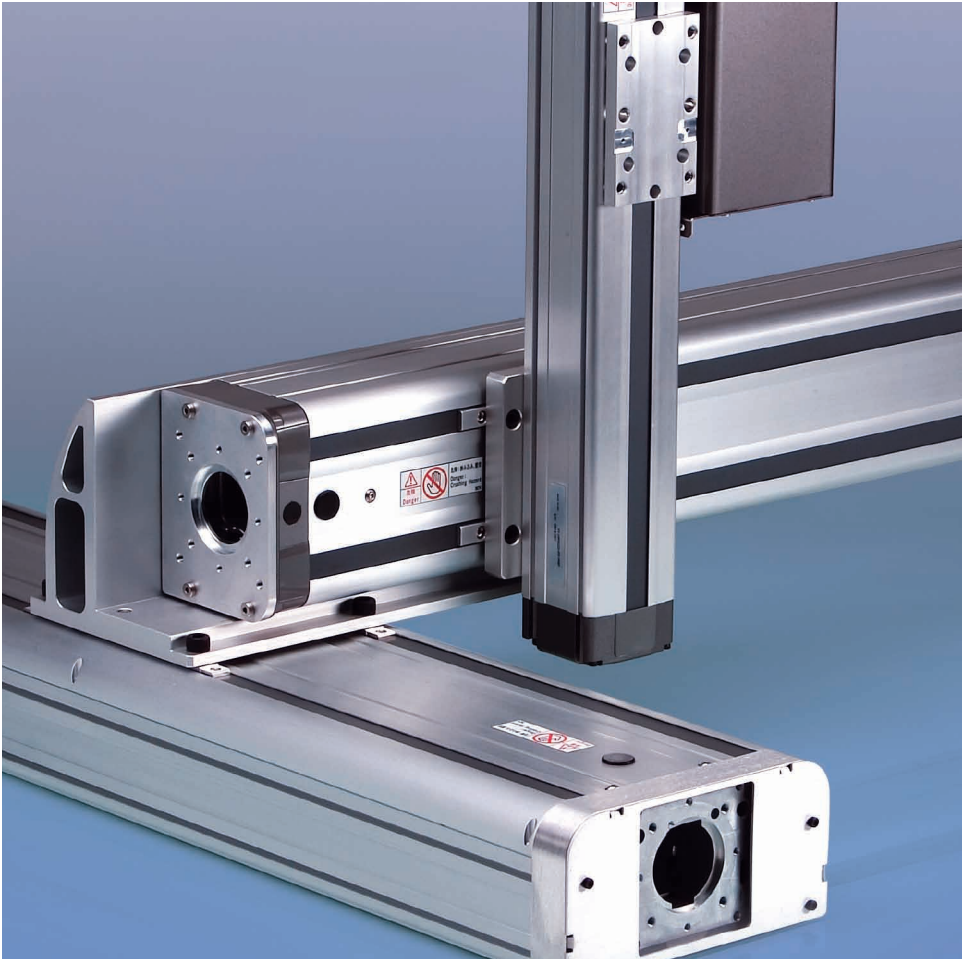
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# Assembly and Installation of NSK Robot Module™ MR Series



# 1.0 Introduction

Congratulation on purchasing your NSK Robot Module. Your NSK Robot module is made from our high quality linear guides and ballscrews for maximum performance and reliability.

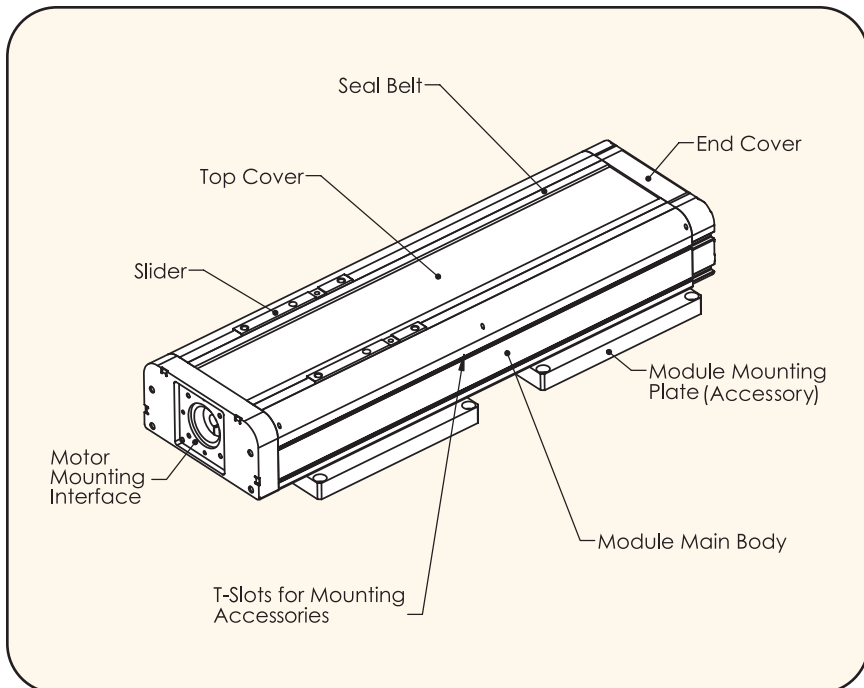
## 2.0 Purpose

This installation guide is intended to provide you with detailed instructions on how to mount and assemble your Robot Module Hardware.

**The guide is split up into several sections:**

- 1) Module construction
- 2) Installation precautions
- 3) Lifting and transporting requirements
- 4) Robot module mounting
- 5) Maintenance
- 6) Assembling 2 axis systems
- 7) Assembling 3 axis systems

## 3.0 Module Construction



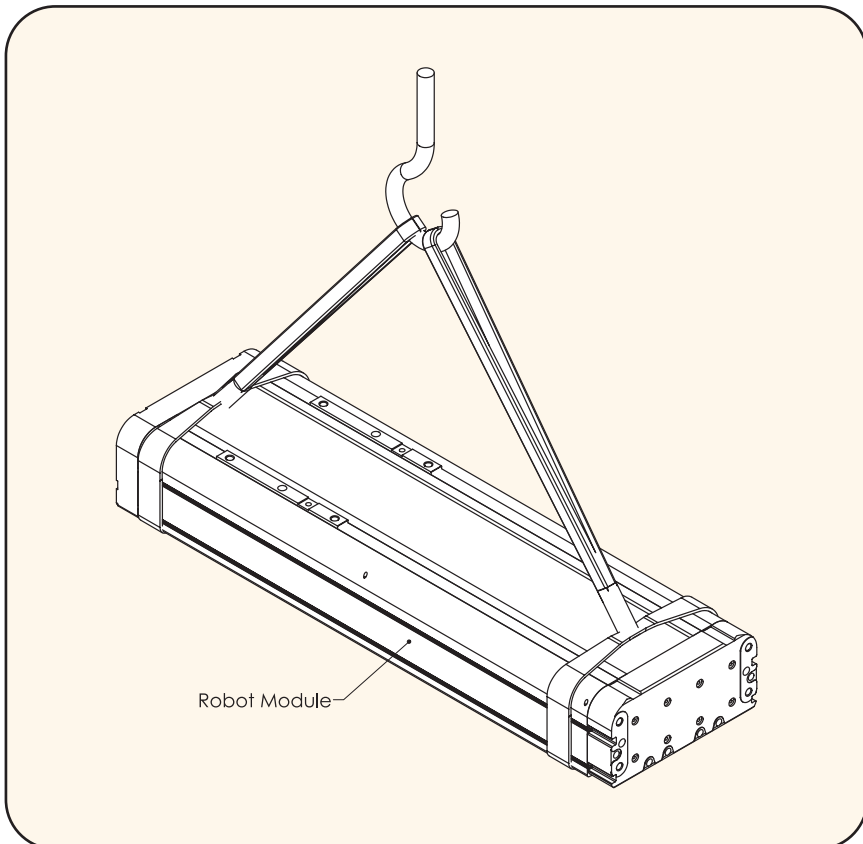
## 3.1 Installation

## 3.2 Installation Precautions

- 1) Follow all rules and recommendation defined herein.
- 2) The Robot Module is a precision device and requires careful handling.
- 3) Install Robot Module on a smooth, finished surface. Flatness < 0.1mm
- 4) Use mounting screw engagement lengths defined herein.
- 5) Do not disassemble the robot module.
- 6) Keep Robot Module away from water and oil splash.

## 3.3 Lifting and Transporting

- 1) Use sling or other appropriate lifting equipment to move individual modules or multi-axis systems.



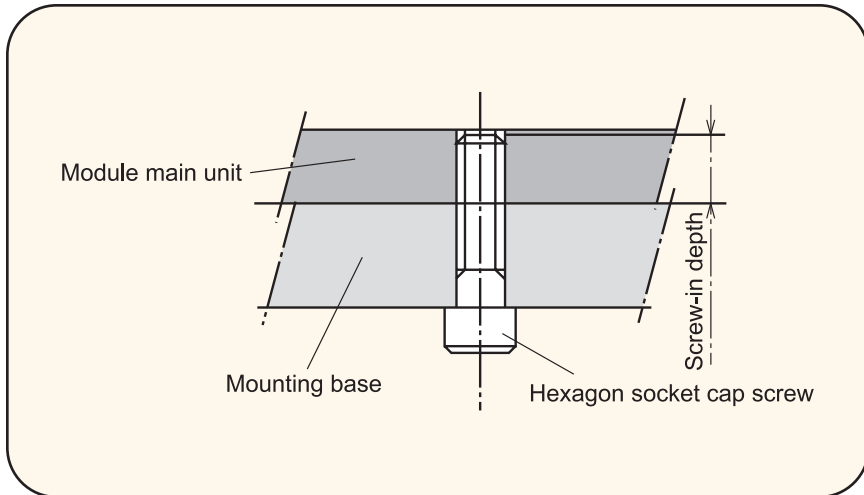
## 3.4 Mounting the Robot Module

There are two methods for mounting the robot module to the work surface:

- 1) Direct mounting using tapped holes on underside of Module.
- 2) Mounting with Module Mounting Plates.

### 3.4.1 Direct mounting using tapped holes on underside of Module

- 1) Drill through holes in mounting base.
- 2) Fix module to base using underside holes in Robot Module.
- 3) Use bolt engagement depths per table below.



	RH Module	RM Module	RS Module
Bolt Size	M8	M6	M5
Thread Engagement	12-16mm	9-12mm	7-9mm
Tightening Torque	33.3N-m	14.7N-m	5.9N-m

## 3.4.2 Mounting with Module Mounting Plates

- 1) Attach mounting plates to underside of Robot Module using supplied fasteners.
- 2) Transfer mounting hole pattern from mounting plates to base.
- 3) Drill and tap mounting holes into mounting base.
- 4) Fix module to mounting base.

## 3.4.3 Mounting tooling to Robot Module Slider

- 1) Mount tooling to slider using bolts per table.

	RH Module	RM Module	RS Module
Bolt Size	M8	M6	M5
Thread Engagement	12-16mm	9-12mm	6-8mm
Tightening Torque	33.3N-m	14.7N-m	5.9N-m

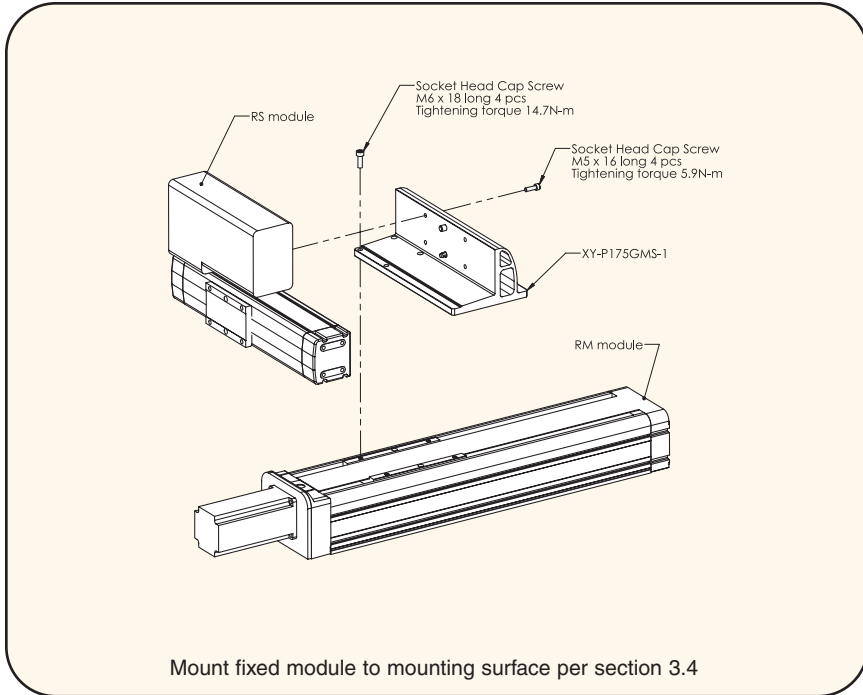
## 3.5 Maintenance

Perform these daily maintenance checks.

- 1) Check for looseness of mounting bolts. Re-tighten as necessary.
- 2) Check for looseness of tooling mounting bolts. Re-tighten as necessary.

## 4.0 Installation of 2 Axis Combination

### 4.1 – RG-MS Combination



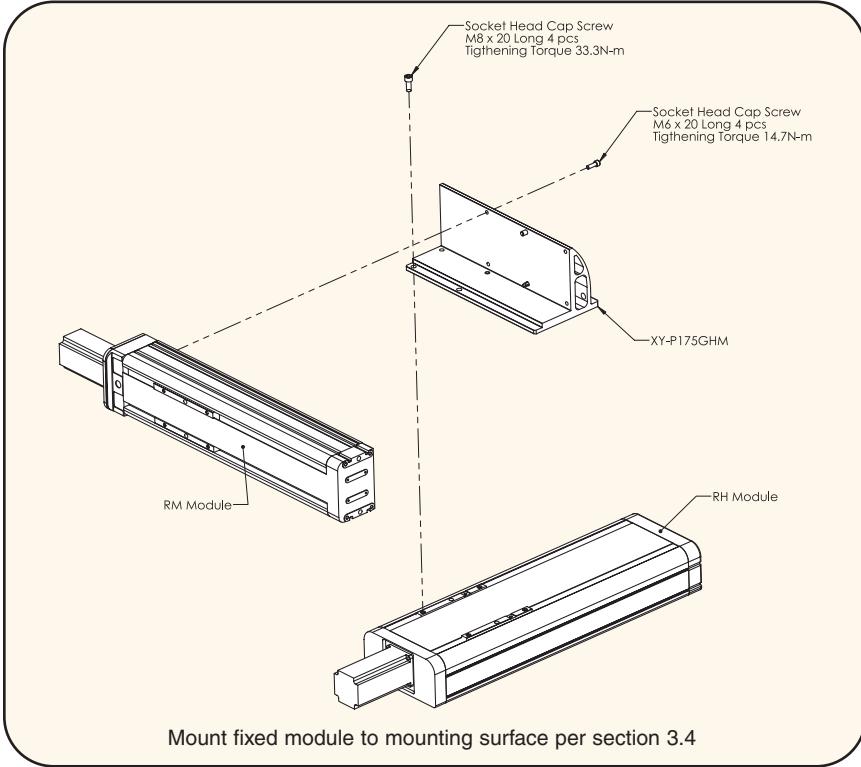
#### Material List for RG-MS Combination

	Part Number	Qty
X Axis Module	XY-HRS0*5-RM*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*0-RS1R*F	1
XY Combining Bracket	XY-P175GMS-1	1
	RGMS-1 Bracket, Qty 1	
	M6 x 18 Lg Socket Head Cap Screw, Qty 4	
	M5 x 16 Lg Socket Head Cap Screw, Qty 4	

#### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3543RM	1
Limit Sensor Kit, Y Axis	XY-L3544RM	1
X Axis Module Mounting Plate	XY-P170M-1	2
	RM Module Mounting Plate, Qty 1	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 4.2 – RG-HM Combination



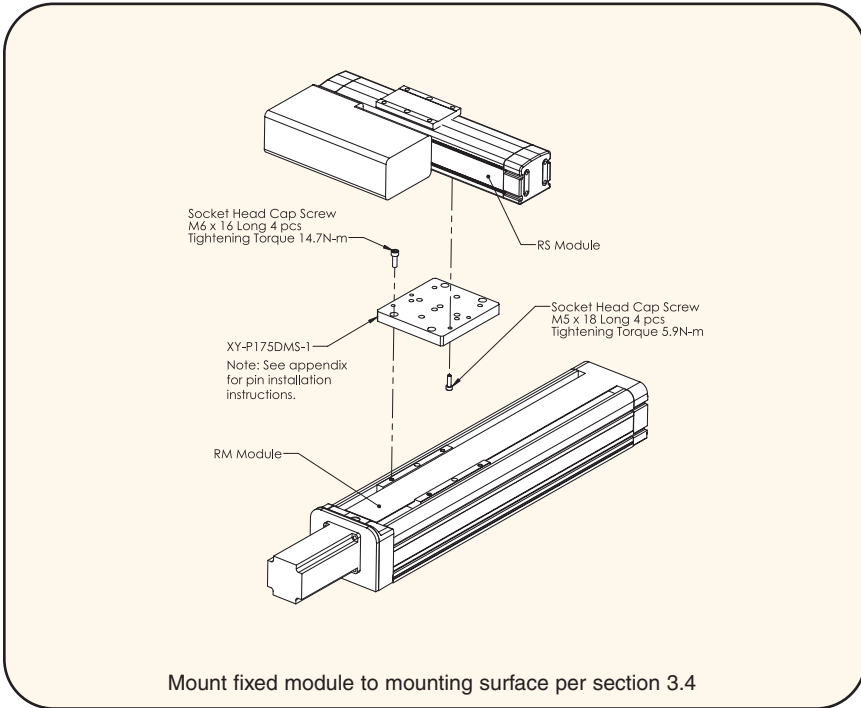
### Material List for RG-HM Combination

	Part Number	Qty
X Axis Module	XY-HRS0*0-RH*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*5-RM*SNF	1
Y Axis Motor Mounting Kit	XY-P****RM	1
XY Combining Bracket	XY-P175GHM-1 or XY-P175GHM-2	1
	RGHM-1 or RGHM-2 Bracket, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3542RM	1
Limit Sensor Kit, Y Axis	XY-L3543RM	1
X Axis Module Mounting Plate	XY-P170H-1	2
	RH Module Mounting Plate, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 4.3 – RD-MS Combination



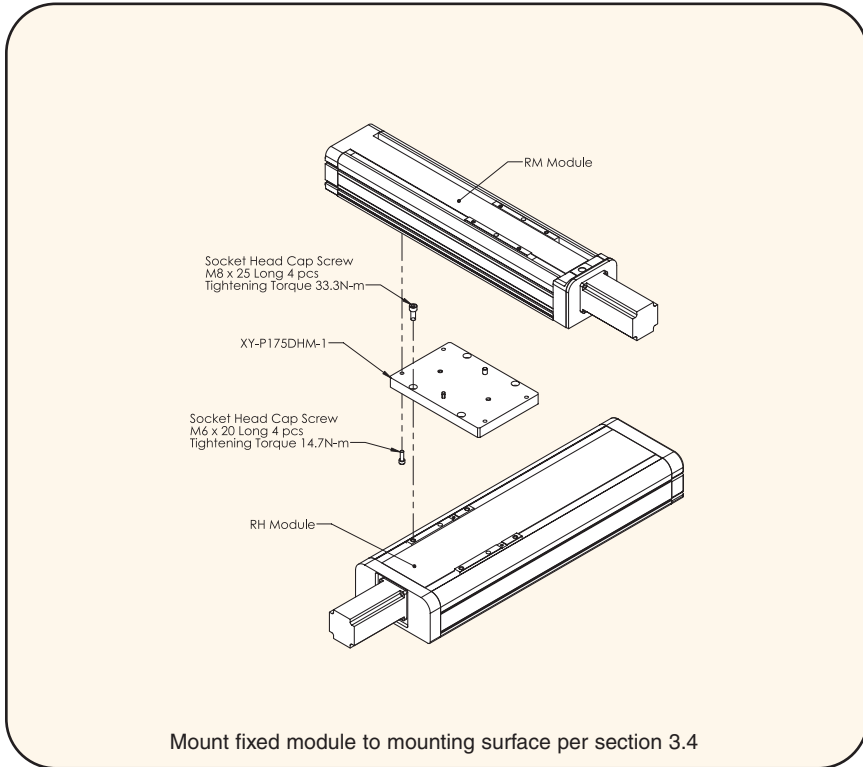
### Material List for RD-MS Combination

	Part Number	Qty
X Axis Module	XY-HRS0*5-RM*SNF	1
X Axis Motor Mounting Kit	XY-P***RM	1
Y Axis Module	XY-HRS0*0-RS1**F	1
XY Combining Bracket	XY-P175DMS-1	1
	RDMS-1 Bracket, Qty 1	
	M6 x 16 Lg Socket Head Cap Screw, Qty 8	
	M5 x 18 Lg Socket Head Cap Screw, Qty 4	
	8mm diameter x 18Lg Pin, Qty 1	
	8mm diameter x 20Lg Diamond Pin, Qty 1	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3543RM	1
Limit Sensor Kit, Y Axis	XY-L3544RM	1
X Axis Module Mounting Plate	XY-P170M-1	2
	RM Module Mounting Plate, Qty 1	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 4.4 – RD-HM Combination



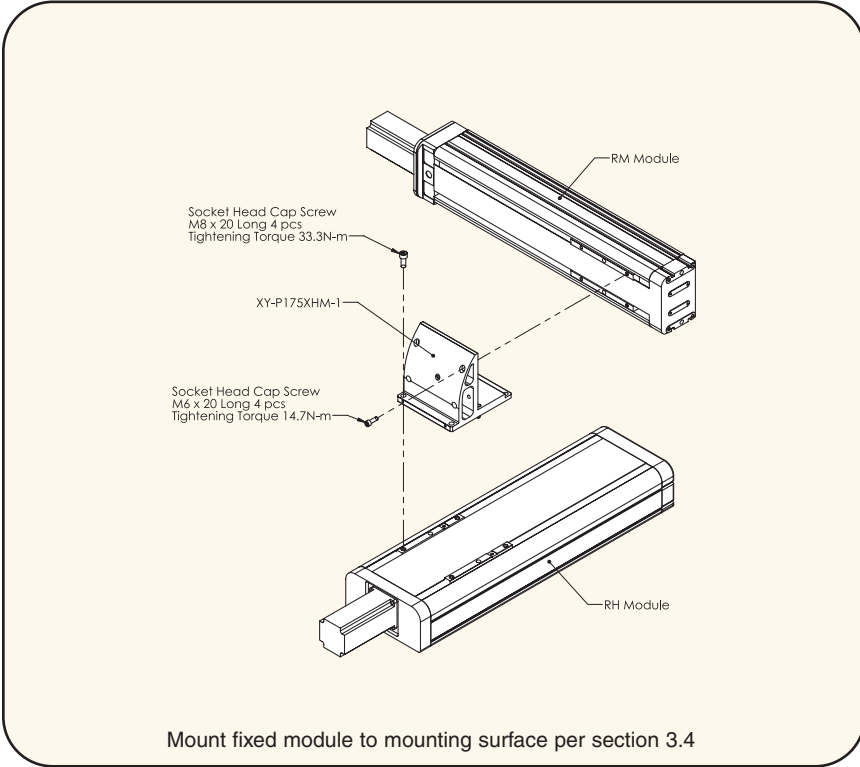
### Material List for RD-HM Combination

	Part Number	Qty
X Axis Module	XY-HRS0*0-RH*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*5-RM*SNF	1
Y Axis Motor Mounting Kit	XY-P****RM	1
XY Combining Bracket	XY-P175DHM-1	1
	RDHM-1 Bracket, Qty 1	
	M8 x 25 Lg Socket Head Cap Screw, Qty 4	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3542RM	1
Limit Sensor Kit, Y Axis	XY-L3543RM	1
X Axis Module Mounting Plate	XY-P170H-1	2
	RH Module Mounting Plate, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 4.5 – RX-HM Combination



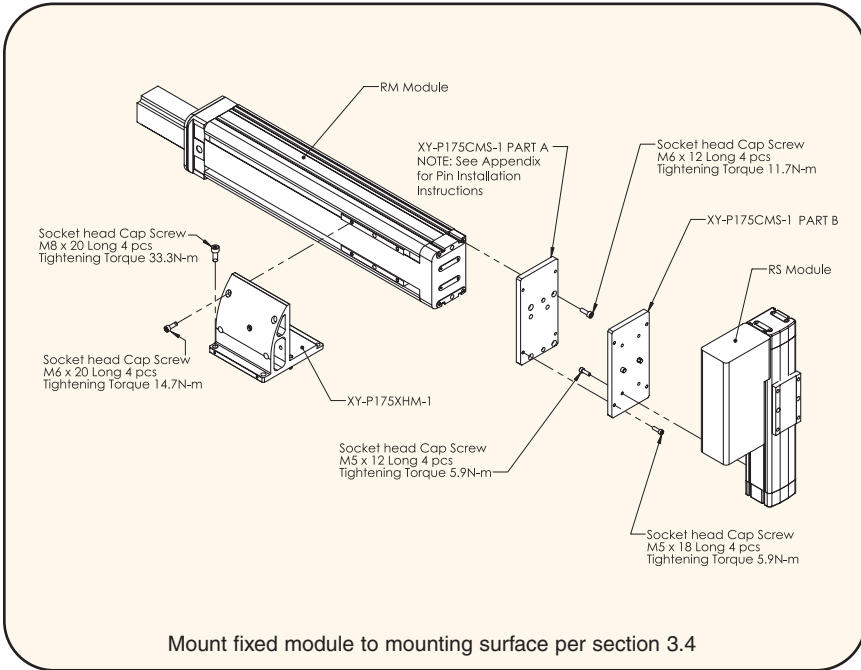
### Material List for RX-HM Combination

	Part Number	Qty
X Axis Module	XY-HRS0*0-RH*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*5-RM*SNF	1
Y Axis Motor Mounting Kit	XY-P****RM	1
XY Combining Bracket	XY-P175XHM-1	1
	RXH-1 Bracket, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3542RM	1
Limit Sensor Kit, Y Axis	XY-L3543RM	1
X Axis Module Mounting Plate	XY-P170H-1	2
	RH Module Mounting Plate, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 4.6 – RC-MS Combination



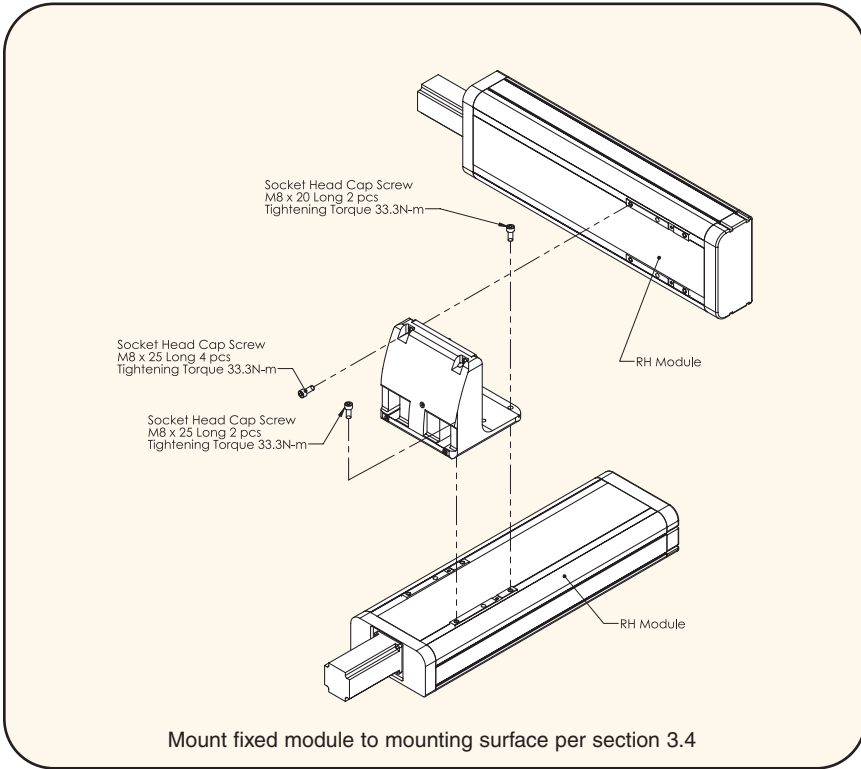
### Material List for RC-MS Combination

	Part Number	Qty
X Axis Module	XY-HRS0*5-RM*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*0-RS1**F	1
XY Combining Bracket	XY-P175CMS-1	1
	RCMS-1 Bracket, Qty 1	
	M5 x 12 Lg Socket Head Cap Screw, Qty 4	
	M5 x 18 Lg Socket Head Cap Screw, Qty 4	
	M6 x 10 Lg Socket Head Cap Screw, Qty 4	
	M6 x 12 Lg Socket Head Cap Screw, Qty 4	
	8mm diameter x 22Lg Pin, Qty 1	
	8mm diameter x 25Lg Diamond Pin, Qty 1	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3543RM	1
Limit Sensor Kit, Y Axis	XY-L3544RM	1
X Axis Module Mounting Plate	XY-P175XHM-1	1
	RXHM-1 Bracket, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 4.7 – RX-HH Combination



### Material List for RX-HH Combination

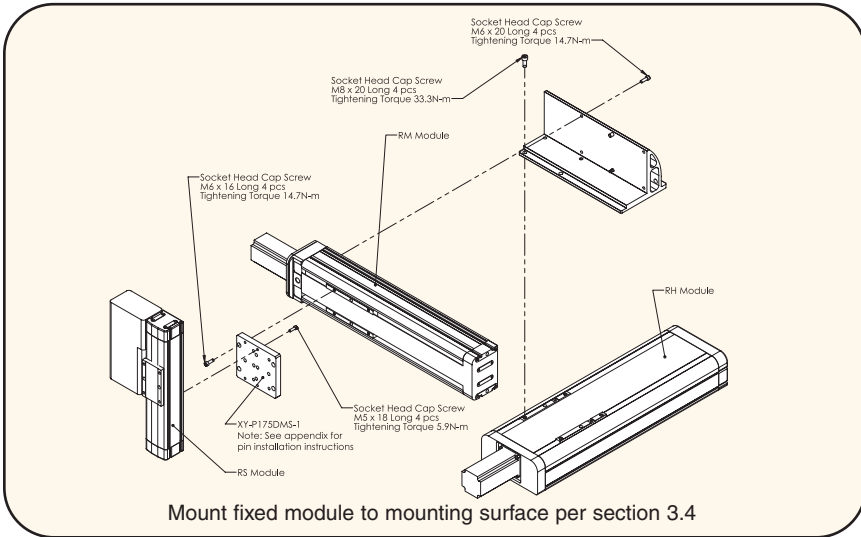
	Part Number	Qty
X Axis Module	XY-HRS0*0-RH*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*0-RH*SNF	1
Y Axis Motor Mounting Kit	XY-P****RM	1
XY Combining Bracket	XY-P175XHH-1	1
	RXHH-1 Bracket, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 2	
	M8 x 25 Lg Socket Head Cap Screw, Qty 6	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3542RM	1
Limit Sensor Kit, Y Axis	XY-L3542RM	1
X Axis Module Mounting Plate	XY-P170H-1	2
	RH Module Mounting Plate, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

# 5.0 Installation of 3 Axis Combinations

## 5.1 – RP-HMS Combination



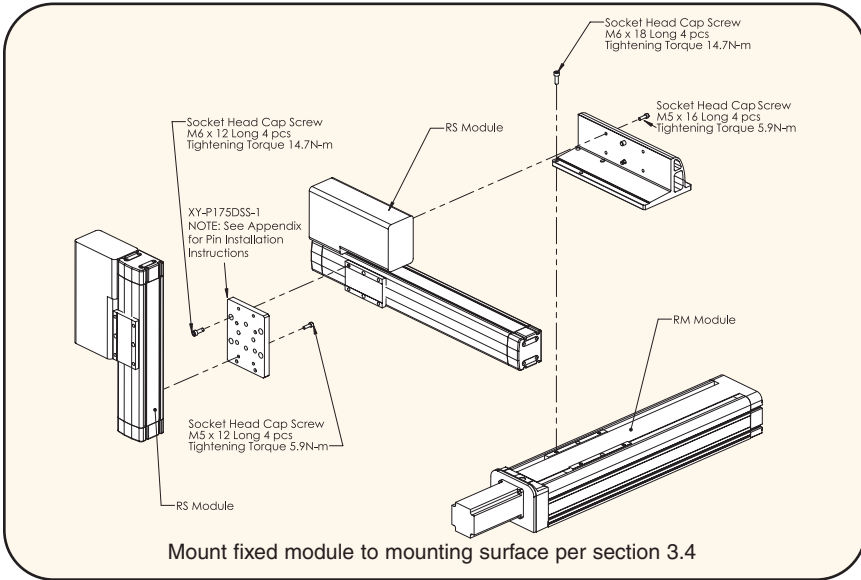
### Material List for RP-HMS Combination

	Part Number	Qty
X Axis Module	XY-HRS0*0-RH*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*5-RM*SNF	1
Y Axis Motor Mounting Kit	XY-P****RM	1
Z Axis Module	XY-HRS0*0-RS1**F	1
XY Combining Bracket	XY-P175GHM-1 or XY-P175GHM-2	1
	RGHM-1 or RGHM-2 Bracket, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	
YZ Combining Bracket	XY-P175DMS-1	1
	RDMS-1 Bracket, Qty 1	
	M5 x 18 Lg Socket Head Cap Screw, Qty 4	
	M6 x 16Lg Socket Head Cap Screw, Qty 8	
	8mm diameter x 18Lg Pin, Qty 1	
	8mm diameter x 20Lg Diamond Pin, Qty 1	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3542RM	1
Limit Sensor Kit, Y Axis	XY-L3543RM	1
Limit Sensor Kit, Z Axis	XY-L3544RM	1
X Axis Module Mounting Plate	XY-P170H-1	2
	RH Module Mounting Plate, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 5.2 – RP-MSS Combination



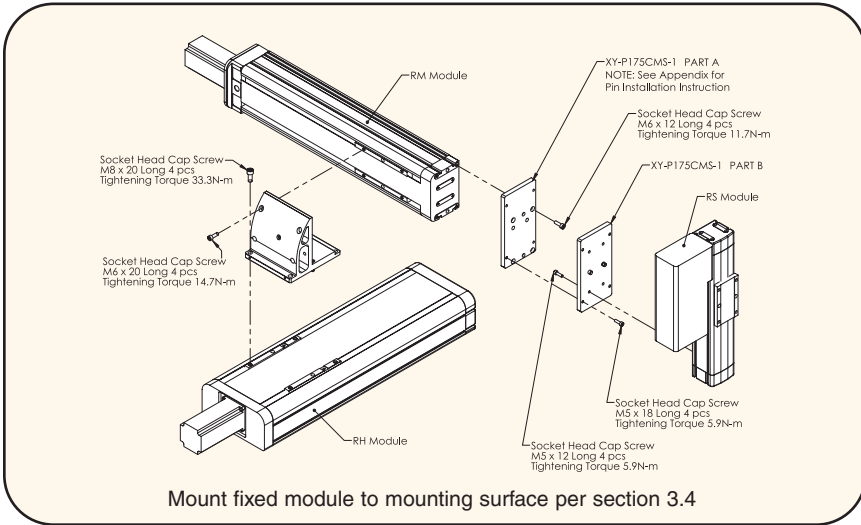
### Material List for RP-MSS Combination

	Part Number	Qty
X Axis Module	XY-HRS0*5-RM*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*0-RS1R*F	1
Z Axis Module	XY-HRS0*0-RS1L*F	1
XY Combining Bracket	XY-P175GMS-1	1
	RGMS-1 Bracket, Qty 1	
	M5 x 16 Lg Socket Head Cap Screw, Qty 4 M6 x 18 Lg Socket Head Cap Screw, Qty 4	
YZ Combining Bracket	XY-P175DSS-1	1
	RDSS-1 Bracket, Qty 1	
	M5 x 18 Lg Socket Head Cap Screw, Qty 8 M6 x 10Lg Socket Head Cap Screw, Qty 8	
	8mm diameter x 18Lg Pin, Qty 1 8mm diameter x 20Lg Diamond Pin, Qty 1	

### Options

	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3543RM	1
Limit Sensor Kit, Y Axis	XY-L3544RM	1
Limit Sensor Kit, Z Axis	XY-L3544RM	1
X Axis Module Mounting Plate	XY-P170M-1	2
	RM Module Mounting Plate, Qty 1 M6 x 20 Lg Socket Head Cap Screw, Qty 4	
Square Nut Kit	XY-P170M3-1 (4 nuts per kit)	1

## 5.3 – RJ-HMS Combination



### Material List for RJ-HMS Combination

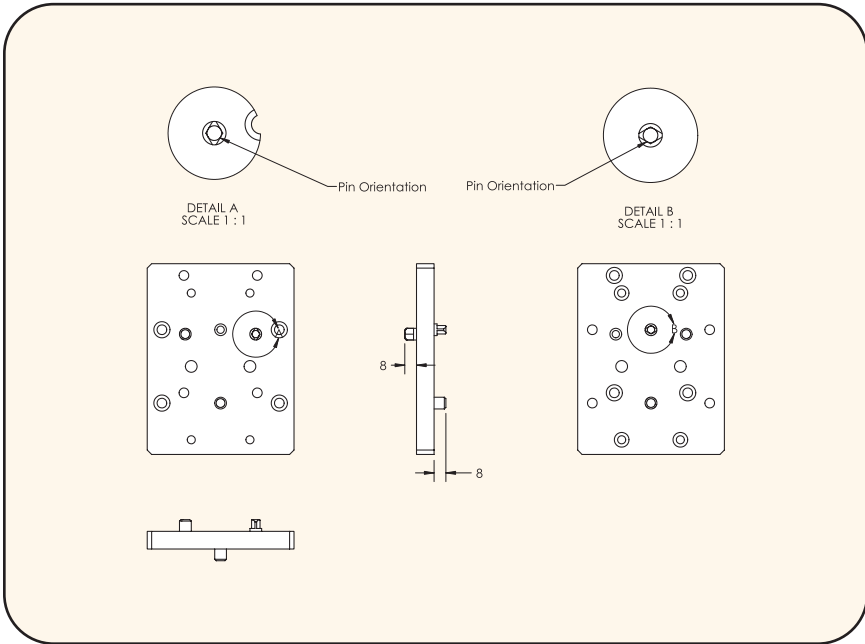
	Part Number	Qty
X Axis Module	XY-HRS0*0-RH*SNF	1
X Axis Motor Mounting Kit	XY-P****RM	1
Y Axis Module	XY-HRS0*5-RM*SNF	1
Y Axis Motor Mounting Kit	XY-P****RM	1
Z Axis Module	XY-HRS0*0-RS1**F	1
XY Combining Bracket	XY-P175XHM-1	1
	RXHM-1 Bracket, Qty 1	
	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
	M6 x 20 Lg Socket Head Cap Screw, Qty 4	
YZ Combining Bracket	XY-P175CMS-1	1
	RCMS-1 Bracket, Qty 1	
	M5 x 12 Lg Socket Head Cap Screw, Qty 4	
	M5 x 18 Lg Socket Head Cap Screw, Qty 4	
	M6 x 10Lg Socket Head Cap Screw, Qty 4	
	M6 x 12Lg Socket Head Cap Screw, Qty 4	
	8mm diameter x 22Lg Pin, Qty 1	
	8mm diameter x 25Lg Diamond Pin, Qty 1	

### Options

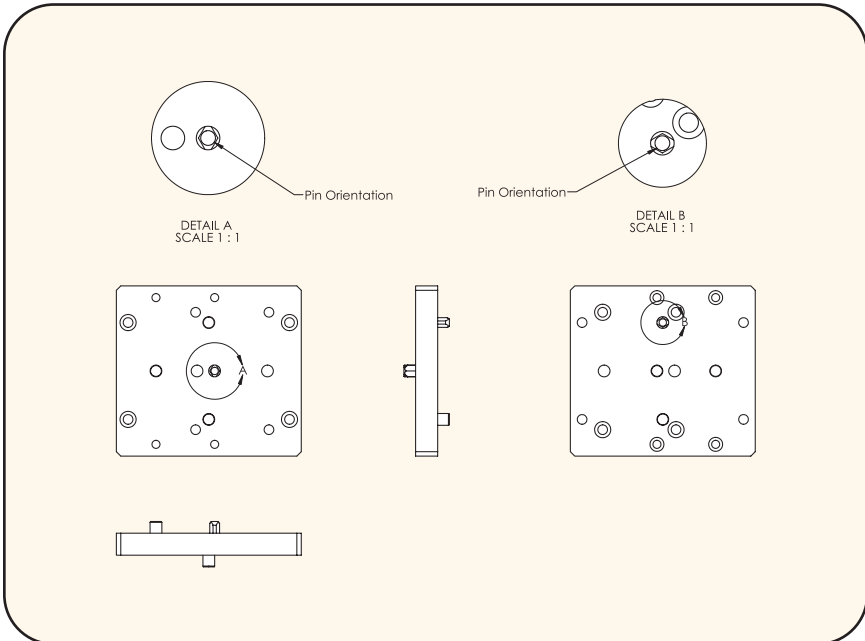
	Part Number	Qty
Limit Sensor Kit, X Axis	XY-L3542RM	1
Limit Sensor Kit, Y Axis	XY-L3543RM	1
Limit Sensor Kit, Z Axis	XY-L3544RM	1
X Axis Module Mounting Plate	XY-P170H-1	2
	RH Module Mounting Plate, Qty 1	
Square Nut Kit	M8 x 20 Lg Socket Head Cap Screw, Qty 4	
	XY-P170M3-1 (4 nuts per kit)	1

# Appendix – Pin Installation Instructions

## XY-P175DSS-1



## XY-P175DMS-1



### XY-P175CMS-1 PART A

