

**Description & Operation**

Sankyo's **LM Series** offers adjustable torque limiting in any linear axis. It mounts directly to linear slide arms for human & tooling protection. Designed with a slim low profile, it accurately trips and automatically resets without mechanical intervention. When overloaded, the slide retracts to keep your tooling out of the danger zone. To reset the unit, simply move the tooling back in the original position by hand or reverse the machine in the opposite motion quickly. This is the ultimate option for any reciprocating motion like an air cylinder or Sankyo's linear pick and place handlers.



A spring forces the detent ball into a pocket with a rod for overload detection. The overload rod can be fitted with a beam sensor for a logic shutdown signal. An adjustable locking nut sets the spring tension to the desired torque. All the internal components are made of high precision hardened steel which provides low backlash, repetitive overload thresholds in both directions while maintaining an overall strong rigidity. Mounting is versatile in any position or stacked dual mounted units supply protection in both axis. Three low-maintenance unit sizes are available with each having three torque ranges by simply changing the internal spring.

**Features**

- Accurate linear resetting position within  $\pm 0.03$  mm ( $\pm 0.001$ " )
- Accurately trips for overload within 10% repeatability
- Designed for accurate resetting, large bending moment capacity, adjustable torque ranges at any speed
- Unit retracts with free-motion after an overload occurs and the tooling block to be moved back to the original position by hand or reversing the machinery
- Compact design offers versatile mounting in any position, including dual stacked units for two axis protection
- Torque settings are adjustable by rotating a locking nut
- Three torque ranges are available per torque limiter unit size by simply changing a spring
- Linear ball slide is low-maintenance and made hardened stainless steel
- Optional beam sensor detects when a torque limit setting has been exceeded or overloaded
- Three unit sizes available

**Specifications – Quick Reference**

Description	Unit	4LM	5LM	6LM
Standard Force Ranges	N (lbf)	5~45 (1.1~10.1)	5~45 (1.1~10.1)	15~120 (3.3~27)
Resetting Accuracy	mm (in)	$\pm 0.03$ ( $\pm 0.001$ )		
Torque Resetting Accuracy	-	10%		
Overload Retract Stroke	mm (in)	17 (0.66)	25 (0.98)	36 (1.41)
Max. Static Moment	Nm (lbf-in)	8 (70.8)	16 (141.6)	31 (274.3)
Rail Mounting Surface	mm (in)	18x75 (0.70x2.95)	24x85 (0.94x3.34)	42x105 (1.65x4.13)
Block Mounting Surface	mm (in)	30x44 (1.18x1.73)	40x50 (1.57x1.96)	60x60 (2.36x2.36)
Overload Detection	-	Yes	Yes	Yes
Lubrication	-	Maintenance-free		
Overall Weight / Mass	kg (lb)	0.14 (0.30)	0.24 (0.52)	0.54 (1.19)

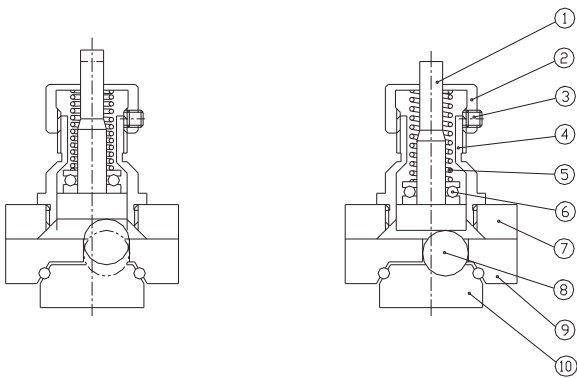
# LM Series

# Linear Torque Limiting Clutch

Mechanism & Mounting Options

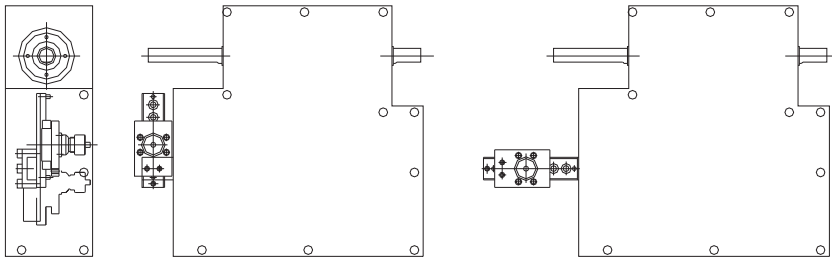
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## Mechanism



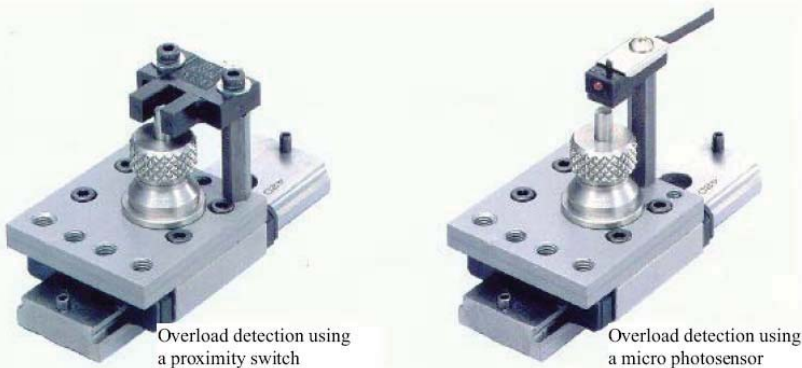
- 1) Overload Detection Plunger
- 2) Torque Adjustment Nut
- 3) Locking Set Screw
- 4) Spring Housing
- 5) Spring
- 6) Thrust Bearing
- 7) Tooling Mounting Plate
- 8) Hardened Detent Ball
- 9) Linear Bearing Pillow Block
- 10) Hardened Linear Rail

## Mounting



Mounting is versatile in either the X or Y axis. Use the axis motion with the highest potential of crashing or mount dual stacked units for protection in both the lift and extend axis.

## Overload Detection

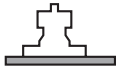


## Support

Sankyo offers repair or rebuild service at our USA facility in Sidney, Ohio. On site service is also available throughout the North America, Central America, South America, Europe, the Middle East and Africa. Our mother plant in Japan, Korea or China covers the Asian areas and Australia.

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# 4LM Linear Torque Limiter

# SANKYO

## Dimensions

Unit : mm

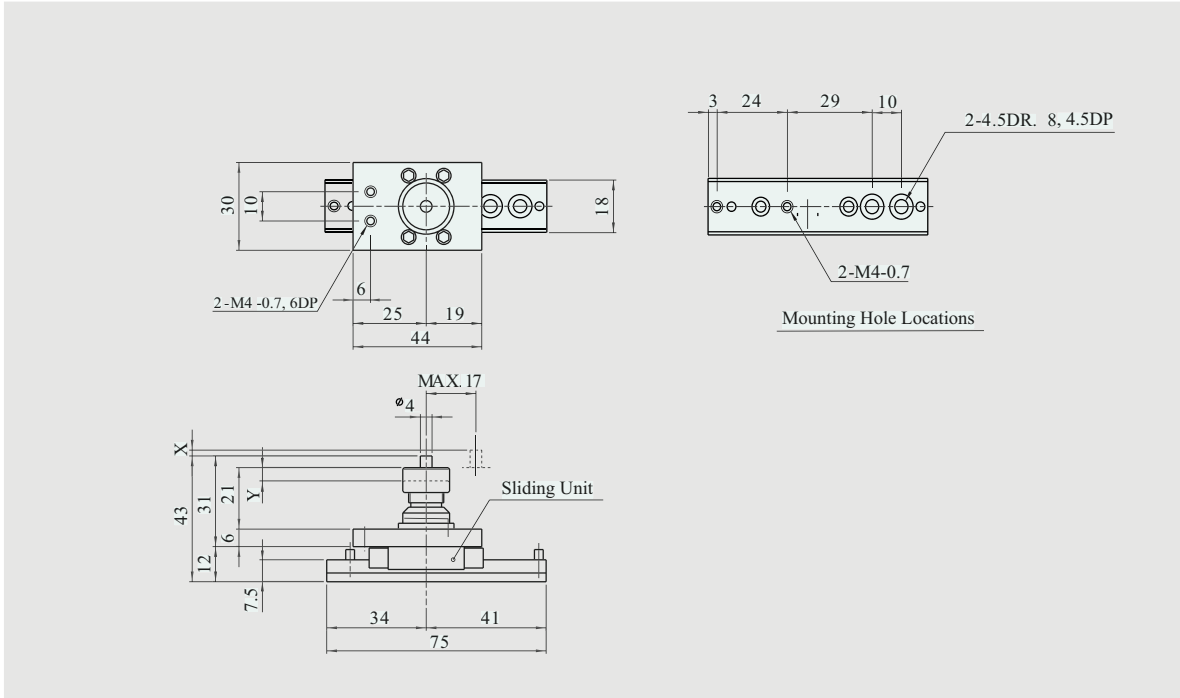
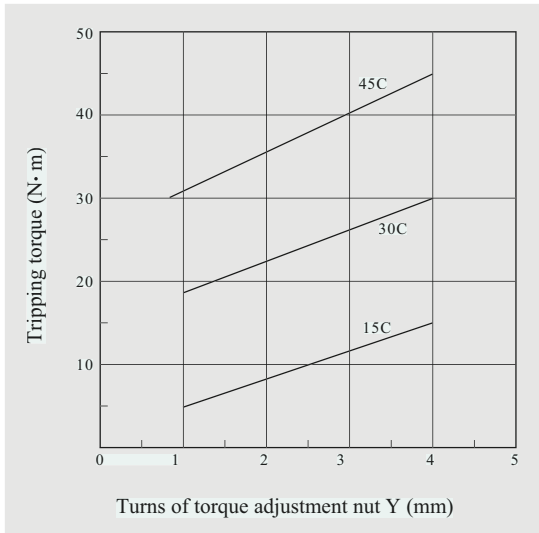


Figure 4LM-1

## Torque Capacity Chart

Figure 4LM-2



### NOTE

1. After adjusting the tripping force, make sure to fasten the set bolt securely.

## Dimension Tolerance

Table 4LM-1

Model	Range of tripping force (N)	X mm	Ymax mm
4LM - 15C	5 ~ 15	2	4
-30C	19 ~ 30	2	4
-45C	30 ~ 45	2	4

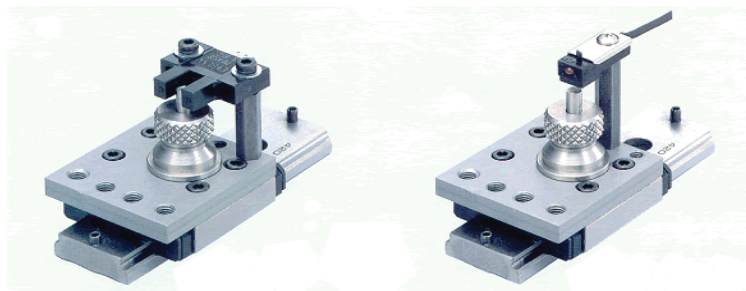
## Specifications

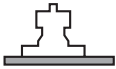
Table 4LM-2

Item	Unit	Value
Thread pitch of tripping force adjustment	mm	1.0
Static allowable moment	N m	8
Mass	kg	0.14 inner rail 0.07kg

X : Denotes amount of movement when an overload occurs. Optional monitoring sensors can input to the controller to stop the machine.

Ymax : Denotes the amount of turns the torque adjustment nut must be turned to obtain maximum tripping torque. Tightening beyond this amount can prevent the torque limiter from tripping.





# 5LM Linear Torque Limiter

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## Dimensions

Unit : mm

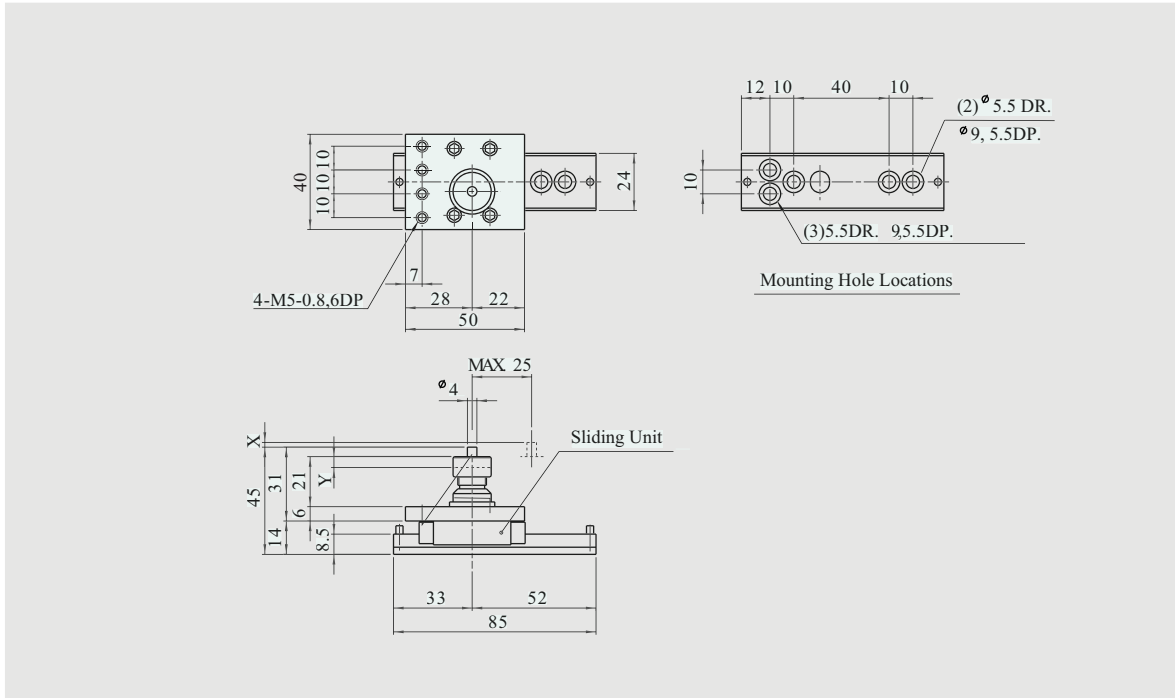
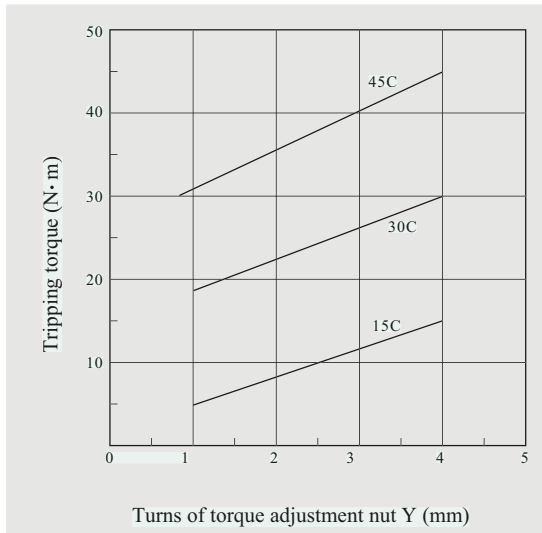


Figure 5LM-1

## Torque Capacity Chart

Figure 5LM-2



### NOTE

1. After adjusting the tripping force, make sure to fasten the set bolt securely.

## Dimension Tolerance

Table 5LM-1

Model	Range of tripping force (N)	X mm	Ymax mm
5LM - 15C	5 ~ 15	2	4
-30C	19 ~ 30	2	4
-45C	30 ~ 45	2	4

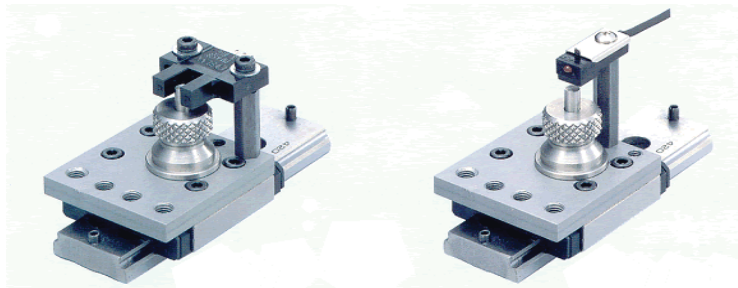
## Specifications

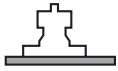
Table 5LM-2

Item	Unit	Value
Thread pitch of tripping force adjustment	mm	1.0
Static allowable moment	N·m	16
Mass	kg	0.24 inner rail 0.12kg)

X : Denotes amount of movement when an overload occurs.  
Optional monitoring sensors can input to the controller to stop the machine.

Ymax : Denotes the amount of turns the torque adjustment nut must be turned to obtain maximum tripping torque.  
Tightening beyond this amount can prevent the torque limiter from tripping.





# 6LM Linear Torque Limiter

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Unit : mm

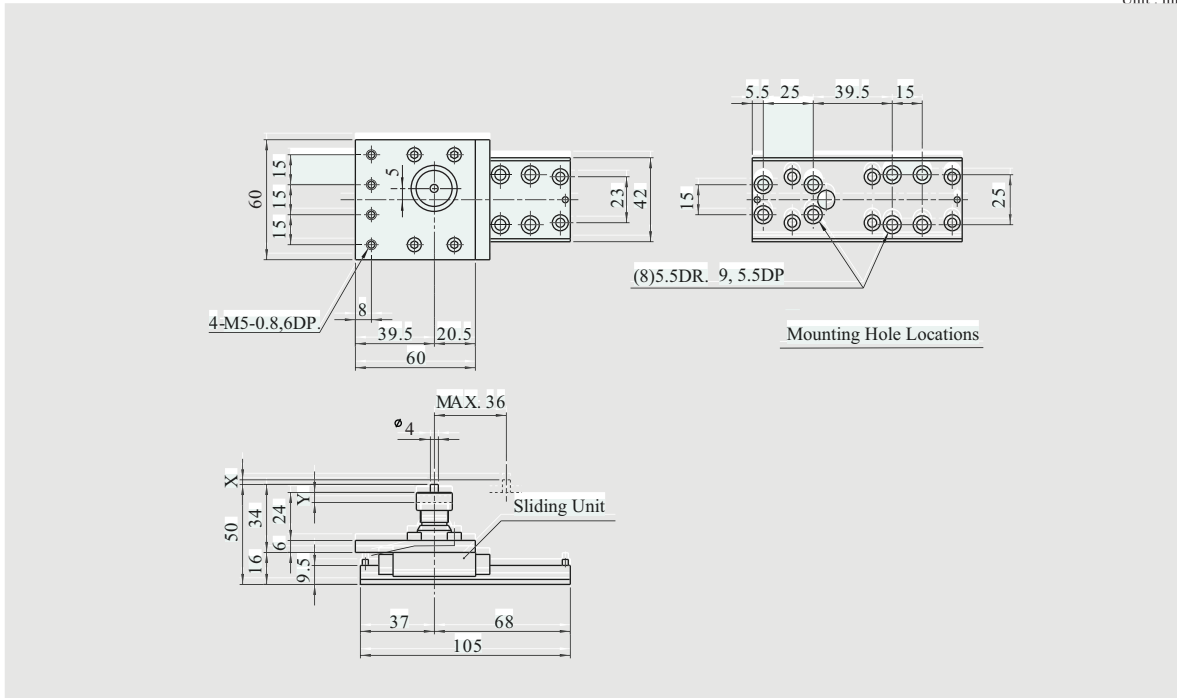
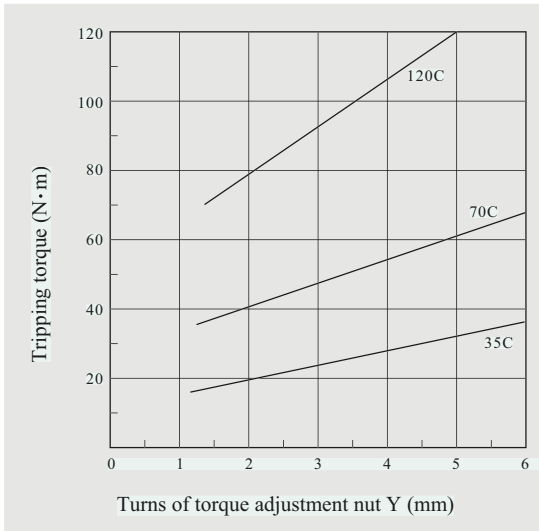


Figure 6LM-1

## Torque Capacity Chart

Figure 6LM-2



## Dimension Tolerance

Table 6LM-1

Model	Range of tripping force (N)	X mm	Ymax mm
6LM - 35C	5 ~ 35	2.3	6
- 70C	35 ~ 70	2.3	6
- 120C	70 ~ 120	2.3	6

## Specifications

Table 6LM-2

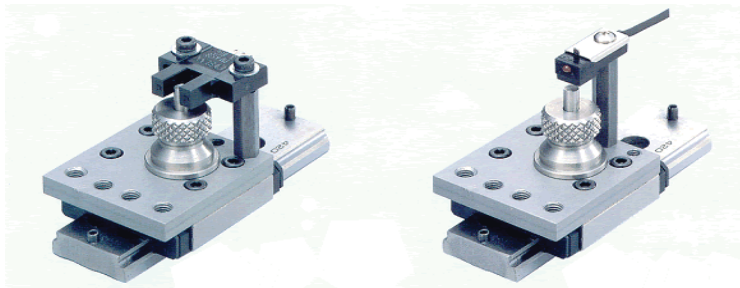
Item	Unit	Value
Thread pitch of tripping force adjustment	mm	1.0
Static allowable moment	N·m	31
Mass	kg	0.54 inner rail 0.32kg

X : Denotes amount of movement when an overload occurs.  
Optional monitoring sensors can input to the controller to stop the machine.

Ymax : Denotes the amount of turns the torque adjustment nut must be turned to obtain maximum tripping torque.  
Tightening beyond this amount can prevent the torque limiter from tripping.

## NOTE

1. After adjusting the tripping force, make sure to fasten the set bolt securely.



# LM Series






Related Products

# Linear Torque Limiting Clutch

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## Fixed Stop Rotary Indexers

Sankyo's AD/DTR low profile dial indexers feature hollow bore centers for routing supply lines with a stationary flange for mounting a second dial above the indexing dial. Our ED series offers nickel plated steel billet housings with cleanroom compatible models available. A great choice for packaging machine, our DU series is designed with short index periods for continuous duty cycles. Parallel shaft indexers are designed for inline indexing in confined spaces. Most series perform index or oscillate motion with  $\pm 30$  arcsec accuracy. Special configurations are available to meet your needs.

				
<i>AD – Dial Index (High Torque Capacity)</i>	<i>DTR – Large Dial (Integrated Reducer)</i>	<i>ED – Right Angle Index (Cleanroom Compatible)</i>	<i>DU – Universal Index (Short Index Period)</i>	<i>P – Parallel Index (Parallel Shafts)</i>

## Programmable Rotary Indexers

Each series below features programmable stops or non-patterned motions driven with servo motor drives. Constant lead cams include internal cam ratios which can be driven with or without optional reducers for combined ratios up to 1600:1. Multiple housing sizes are available in each series with stationary or rotating hollow outputs, for cycle rates up to 1500+ cycles/minute.

				
<i>AR – Dial Index (High Torque)</i>	<i>RE – Dial Index (Mid Torque/speed)</i>	<i>RTR – Dial Index (Extreme Torque)</i>	<i>RA – Rotating Bore Index (High Speed)</i>	<i>Ro – Ring Index (Large Bore)</i>




## Linear & Rotary Handlers

Sankyo's handlers feature rotary & linear motions combined with lift motions. All internal cam motions include gripper dwell times and easy synchronization (1 input shaft revolution for one full cycle). Multiple sizes for each series are available.

				
<i>FN – Rotary Handler (Lift, Index, Oscillate)</i>	<i>FH – Rotary Handler (600 cpm Handler)</i>	<i>GY – Linear Handler (Pick &amp; Place)</i>	<i>GV – Linear Handler (Walking Beam)</i>	<i>G – Linear Handler (Large Capacity W.B.)</i>

## Rotary & Linear Assembly

Our rotary and linear assembly machine can incorporate synchronizes or asynchronous handlers. Our BH series can mount 0~12 synchronized handlers above a 6~36 station indexing dial plate. The IC80 series precision chain conveyor can use our GY series handler with 12~256 stations. Our MPC series can change feed pitch by station. Each pallet is driven with a cam to control the pallet motion by station. Perfect for accumulation or long inspection times.

	<p><b>BH Series</b> (rotary assembly)</p> <ul style="list-style-type: none"> <li>• 90 cycles/min</li> <li>• 6~36 stations</li> <li>• 0~12 handlers</li> <li>• 3 frame sizes</li> <li>• 1 motor drives index &amp; handler</li> <li>• clutch protected</li> </ul>		<p><b>IC80 Series</b> (linear assembly)</p> <ul style="list-style-type: none"> <li>• 120 cycles/min</li> <li>• 80~160mm link</li> <li>• 1~4 link pitch</li> <li>• 960~9600 long</li> <li>• line shaft drive for handlers</li> <li>• clutch protected</li> </ul>		<p><b>MPC Series</b> (linear assembly)</p> <ul style="list-style-type: none"> <li>• 60 cycles/min</li> <li>• 0~375mm pitch</li> <li>• 30~100 pallets</li> <li>• pallets can accumulate or feed multiples</li> <li>• clutch protected</li> </ul>
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