

Belt Sway Detection and Correcting Equipment  
***Motor-Operated Adjusting Carrier***



Model HAB-MC



Model HAB-MR



Detector  
Model HBVL-5□-□□  
Model HBVL-6□-□□

# Automatically adjusts the conveyor belt to correct deviation or sway

Swaying of the conveyor belt causes loads to fall and conveyor belt damage.

An adjustment of the conveyor belt is the only way to correct this swaying.

Matsushima's Motor-Operated Adjusting Carrier detects conveyor belt sway and automatically corrects it, greatly reducing the time and cost needed for operation control and maintenance.



## Features

### *Ideal protection for your materials, your products and your conveyor belt*

Falling loads and the resulting accidents can be prevented.

As an additional benefit, your conveyor belt life is extended because the breakage and damage caused by swaying and twisting is prevented.

### *Easy installation and maintenance*

The Motor-Operated Adjusting Carrier requires no extra installation space. It can easily be mounted on your conveyor, and is built to operate even under severe environmental conditions. The Motor-Operated Adjusting Carrier replaces conventional manual adjustment and simplifies conveyor belt maintenance.



Carrier side mounting type  
Model HAB-MC



Return side mounting type  
Model HAB-MR



#### Detector

Model HBVL-5□-□□

H:Hold type

A:Automatic reset type

0:Operating Angle (Return side)

20:Operating Angle (Carrier side)

30:Operating Angle (Carrier side)

Model HBVL-6□-□□

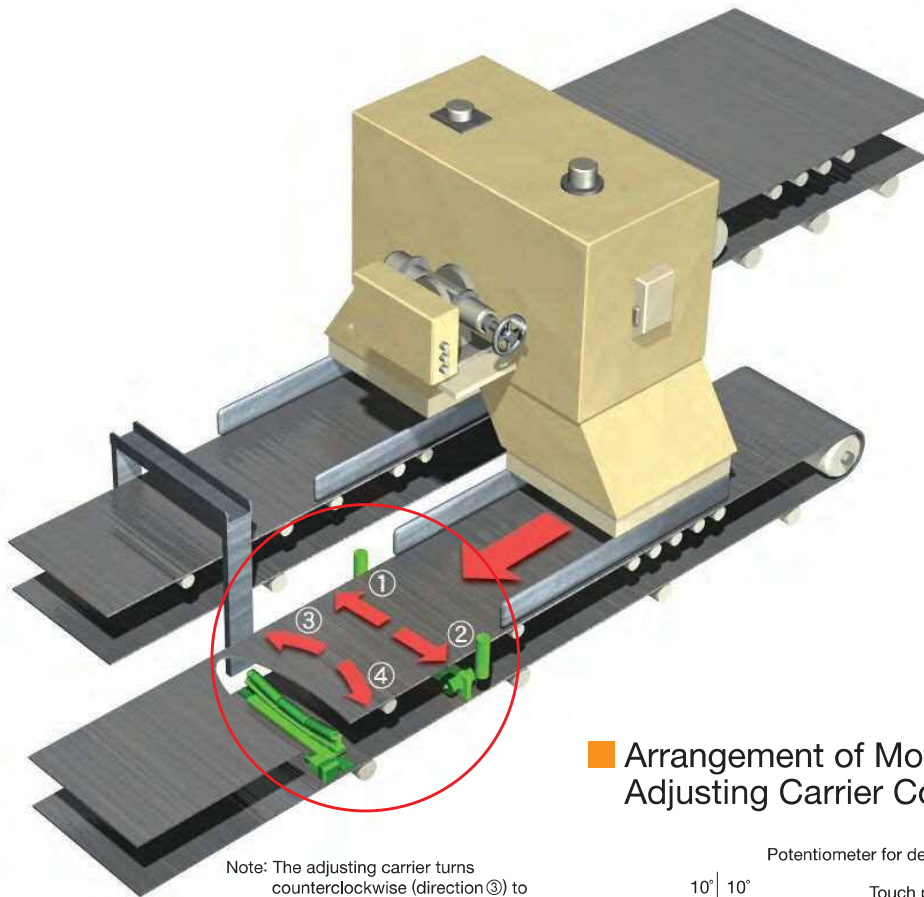
(Heavy Duty Type)



# Operation Principles of Motor-Operated Adjusting Carrier (With Hold Type Detector)

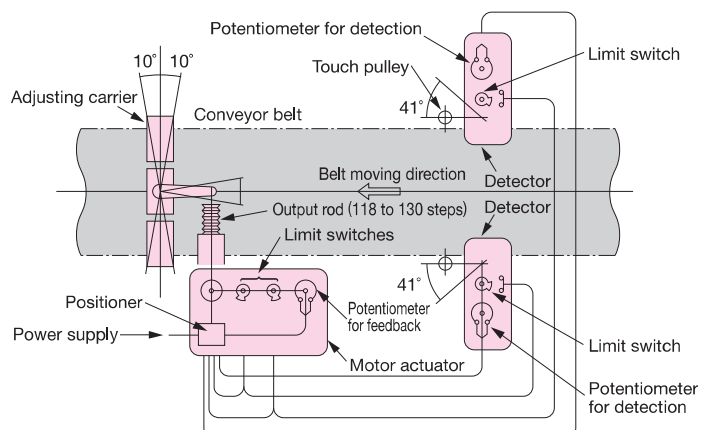
## Operation Principles

1. When the conveyor belt sways, the belt edge pushes the touch pulley into a slanted position. Then, the potentiometer in the detector rotates at an angle in proportion to the pulley slant angle, and the microswitch in the detector operates to specify the direction for correction at the same time.
2. The positioner in the motor actuator compares the potentiometer resistance value of the detector with that of the motor actuator, and operates the motor actuator to turn the adjusting carrier in a direction that agrees with the potentiometer resistance value of the motor actuator to correct the sway.
3. The adjusting carrier maintains the slant angle after the conveyor belt position has been corrected and the belt edge is no longer in contact with the touch pulley. If the conveyor belt sways in the same direction again, the adjusting carrier will automatically move to correct the belt sway.
4. If the conveyor sways in the opposite direction, the adjusting carrier will turn in the reverse direction to adjust the conveyor belt, correcting the sway at the moment the belt edge pushes against the touch pulley on the other side to slant it.



Note: The adjusting carrier turns counterclockwise (direction ③) to correct the deviation when the conveyor belt deviates (sways) in direction ① shown in the figure above, and turns clockwise (direction ④) when the belt deviates in direction ②.

## Arrangement of Motor-Operated Adjusting Carrier Components



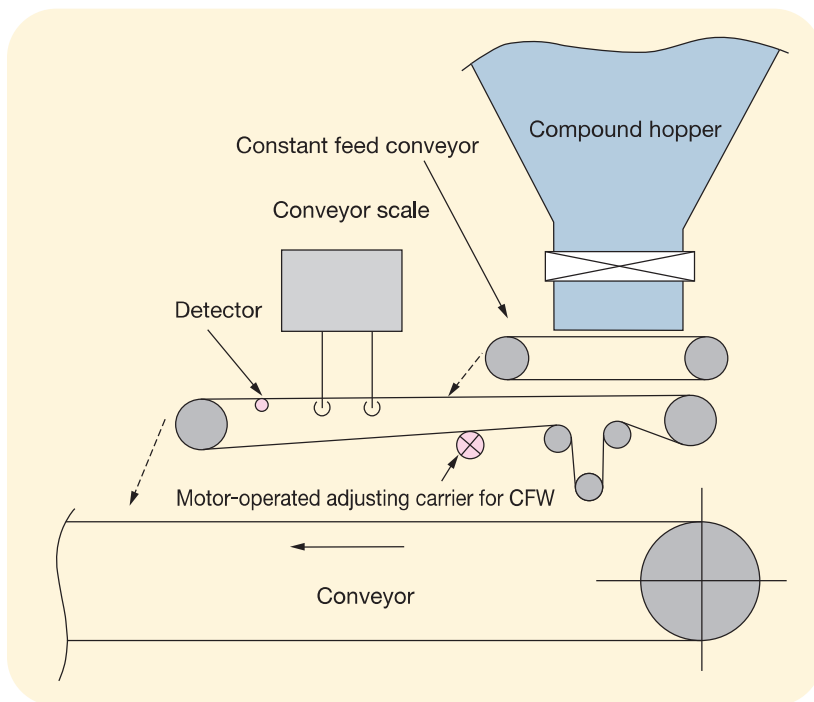
# Application Example

## Constant Feed Weigher (CFW) (Constant Feeder)

In iron and steel plants or cement plants, a constant feeder is attached to the bottom of the hopper to remove a constant amount of material from the hopper. This feeder uses a flat belt, and flat belts characteristically sway under certain operation and maintenance conditions. As a result, the belt edge frequently suffers damage caused by rubbing against the detection arm of the load cell. The only way to solve this problem is by the position adjustment of tail pulley bearings

while the conveyor is still running. This adjustment must be completed quickly, or humidity will cause the materials to stick to the belt and the conveyor frame will warp.

The return side mounting type Motor-Operated Adjusting Carrier is widely used in iron and steel plants as well as cement plants to correct conveyor belt sway, and has proven results in the reduction of maintenance costs, prevention of accidents, and reliable performance.



### Motor Actuator

Item	Specifications
Enclosure	IP55
Allowable Temperature	-10 °C to 50 °C
Supports	Trunnions
Joints	Clevis brackets
Stroke	118 mm for normal operation
Speed	197/236 mm/min. (50/60 Hz)
Operating Time	36/30 s (50/60 Hz) (with normal stroke)
Force	1.76 kN (180 kgf)
Position Limit Switches	One each for forward limit and backward limit
Potentiometer	For position feedback (1 kΩ)
Driving Motor	Reversible motor (400 W 30 min. rating)
Positioner	Non-contact type, with operation status indicator lamp
Space Heater	20 W, 7 kΩ (for prevention of internal condensation)
Thermal Relay	With thermal trip contact signal
Power Supply	200 V (100 V) 50/60 Hz
Power Consumption	65 W

The potentiometer output is only for detection and cannot be used externally.

### Adjusting Carrier

Item	Specifications
Applicable Conveyor Belt Width	500 mm to 2000 mm
Applicable Conveyor Speed	250 m/min. max.
Trough Angle*	20°, 30°, 45°
Max. Operating Angle	±10°

\*: No trough angle on the return side  
(Standard trough angle: 30°)

### Detector

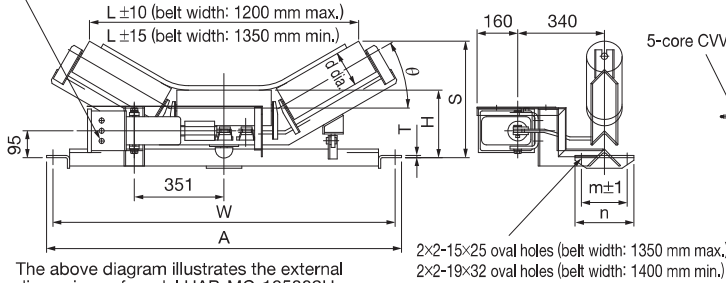
Item	Specifications
Enclosure	IP67
Allowable Temperature	-10 °C to 50 °C
Slant Angle of Touch Pulley	41° max.
Potentiometer	For detection of conveyor sway angle (1 kΩ)
Position Limit Switch	Set angle: 3°
Gear Ratio	3/1
Connection Cable	5-core CW (Control-use, vinyl-insulated, vinyl-sheathed) cable: 1.25 mm <sup>2</sup> × 5 m

# External Dimensions in mm

## Carrier side mounting type

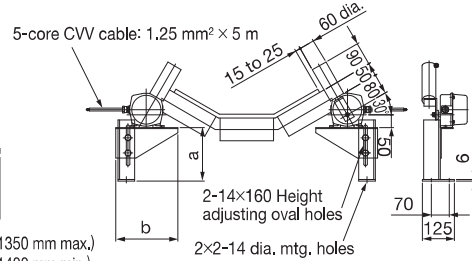
### Actuating Device

3-lead outlet  
Cable size: 8 to 12 dia.



The above diagram illustrates the external dimensions of model HAB-MC-105302H (belt width: 1050 mm, trough angle: 30°).

### Detecting Device

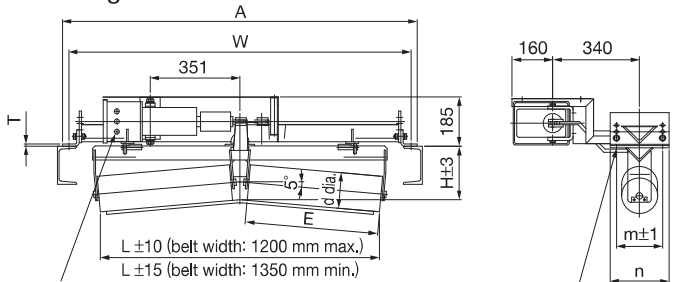


Model	Belt width	d dia.	W	A	H	T	m	n	Mass (kg)	$\theta=30^\circ$		Model	Belt width	a*	b*	Mass (kg)
										S*	L*					
HAB-MC-050□□2H	500	89.1	740	790	170	4.5	140	190	75	263	518	HAB-DC-050302H	500	106	201.5	13
HAB-MC-060□□2H	600		840	890	185		150	200	80	293	600	HAB-DC-060302H	600	136	210.5	14
HAB-MC-075□□2H	750		1040	1090	207		6	160	210	85	344	756	HAB-DC-075302H	750	184	218.5
HAB-MC-090□□2H	900	1190	1240	237	90	369				893	HAB-DC-090302H	900	210	226.5	15	
HAB-MC-100□□2H	1000	1290	1340		95	431				998	HAB-DC-100302H	1000	227	231.5	16	
HAB-MC-105□□2H	1050	139.8	1340	1390	250	9	180	230	100	441	1053	HAB-DC-105302H	1050	275	232.5	16
HAB-MC-120□□2H	1200		1490	1540					105	466	1190	HAB-DC-120302H	1200	299	239.5	17
HAB-MC-135□□2H	1350		1640	1690					160	491	1326	HAB-DC-135302H	1350	321	245.5	17
HAB-MC-140□□2H	1400	165.2	1730	1790	333	9	280	340	165	589	1414	HAB-DC-140302H	1400	412	266.5	18
HAB-MC-150□□2H	1500		1830	1890					175	609	1523	HAB-DC-150302H	1500	417	284.5	18
HAB-MC-160□□2H	1600		1930	1990					200	629	1633	HAB-DC-160302H	1600	441	275.5	18
HAB-MC-180□□2H	1800	2220	2280	363	9	330	390	240	694	1824	HAB-DC-180302H	1800	523	327.5	19	
HAB-MC-200□□2H	2000	2420	2480					260	734	2042	HAB-DC-200302H	2000	533	336.5	20	

\*: The dimensions of motor actuators S and L and of detectors a and b depend on the trough angle.

## Return side mounting type

### Actuating Device

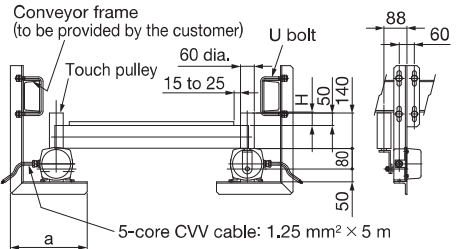


3-lead outlet  
Cable size: 8 to 12 dia.

The above diagram illustrates the external dimensions of model HAB-MR-105052H (belt width: 1050 mm.).

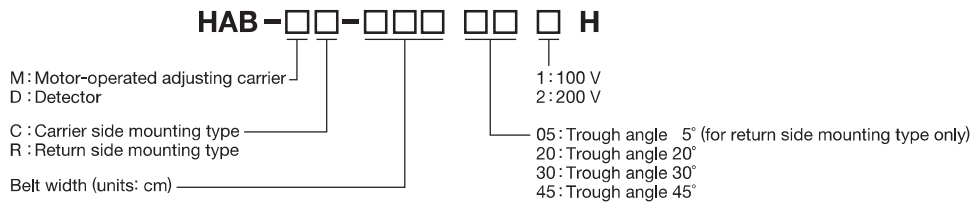
2×2-15×25 oval holes (belt width: 1350 mm max.)  
2×2-19×32 oval holes (belt width: 1400 mm min.)

### Detecting Device

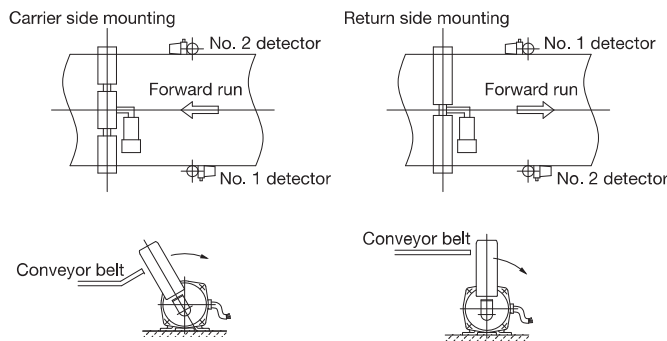
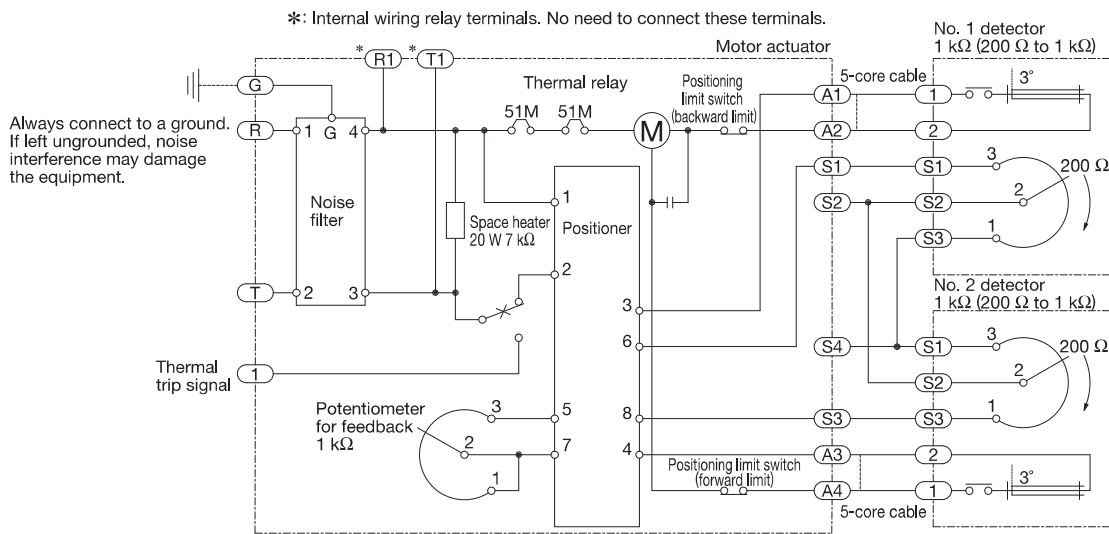


Model	Belt width	d dia.	W	A	H	E	L	T	m	n	Mass (kg)	Model	Belt width	H	a	Mass (kg)		
																	HAB-MR-050052H	500
HAB-MR-060052H	600	840	890	300	651	150	200	65	HAB-DR-060052H	600	14							
HAB-MR-075052H	750	1040	1090	370	797	6	160	210	70	HAB-DR-075052H	750	14						
HAB-MR-090052H	900	1190	1240	450	956				80	210	75	HAB-DR-090052H	900	53	14			
HAB-MR-100052H	1000	1290	1340	500	1056				90	210	80	HAB-DR-100052H	1000	14				
HAB-MR-105052H	1050	139.8	1340	1390	210	520	1094	9	180	230	95	HAB-DR-105052H	1050	300	14			
HAB-MR-120052H	1200		1490	1540		600	1253				100	230	95		HAB-DR-120052H	1200	60	15
HAB-MR-135052H	1350		1640	1690		670	1392				105	230	100		HAB-DR-135052H	1350	15	
HAB-MR-140052H	1400	165.2	1730	1790	227	700	1450	9	280	340	105	HAB-DR-140052H	1400	78	15			
HAB-MR-150052H	1500		1830	1890		750	1550				145	340	145		HAB-DR-150052H	1500	320	16
HAB-MR-160052H	1600		1930	1990		800	1649				150	340	150		HAB-DR-160052H	1600	16	
HAB-MR-180052H	1800	2220	2280	363	9	940	1938	9	330	390	215	HAB-DR-180052H	1800	365	16			
HAB-MR-200052H	2000	2420	2480			1050	2157				235	390	235		HAB-DR-200052H	2000	16	

## Model Designation



## Connection Diagram (Hold Type Detectors) for Unidirectional Conveyor Application



- Notes: 1. An auto reset type detector is also available.  
2. If the wires between terminals A1 and A2 and terminals A3 and A4 are short-circuited in the above diagram, the motor will start running to move the Motor-Operated Adjusting Carrier back to the neutral position after the conveyor belt sway has been corrected and the deviation (sway) signal indicates 0 (zero).

### Mounting positions

For forward run, mount the motor actuator and detectors as shown on the left.  
For reverse run, reverse the positions of the No.1 detector and the No.2 detector.  
Mount the detectors so that their lead outlets are positioned to the outside of the conveyor belt.

Specifications are subject to change without notice.  
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