

Belt Sway Detection and Correcting Equipment Motor-Operated Adjusting Carrier



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.



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 _____

Operation Principles of Motor-Operated Adjusting Carrier(Operated Adjusting Carrier)

Operation Principles

- 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.



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

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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 $k\Omega$)
Driving Motor	Reversible motor (40 W 30 min. rating)
Positioner	Non-contact type, with operation lamp
Space Heater	20 W, 7 k Ω (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

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 $k\Omega$)
Position Limit Switch	Set angle: 3°
Gear Ratio	2.571/1
Connection Cab	5-core CVV (Control-use, vinyl-insulated, vinyl-sheathed) cable: 1.25 $\mbox{mm}^2 \times 5\mbox{ m}$

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

External Dimensions in mm

Carrier side mounting type

Actuating Device



(belt width: 1500mm, trough angle: 30°).

Madal	Belt	ط ط:م	14/	^		т			Mass	$\theta = 30^{\circ}$		$\theta = 30^{\circ}$		$\theta =$		<i>θ</i> =30°		Madal	Belt	a*	b*	Mass
Iviodei	width	a ala.	VV	A		I	m	n	(kg)	S	*	L*		IVIOUEI	width	(kg)						
HAB-MC-050 2H	500	00.1	740	790	170	15	140	190	75	26	3	518		HAB-DC-050302H	500	106	207	13				
HAB-MC-060 2H	600	09.1	840	890	185	4.5	150	200	80	29	3	600		HAB-DC-060302H	600	136	216	14				
HAB-MC-075 2H	750		1040	1090	207				85	34	4	756		HAB-DC-075302H	750	184	224	15				
HAB-MC-090 2H	900	114.3	1190	1240	201	6	160	210	90	36	9	893		HAB-DC-090302H	900	210	232	15				
HAB-MC-100 2H	1000		1290	1340	237	237			95	43	1	998		HAB-DC-100302H	1000	227	237	16				
HAB-MC-105 2H	1050		1340	1390					100	45	6	1053		HAB-DC-105302H	1050	275	238	16				
HAB-MC-120 2H	1200	139.8	1490	1540	250		180	230	105	46	6	1190		HAB-DC-120302H	1200	299	245	17				
HAB-MC-135 2H	1350		1640	1690					160	49	1	1326		HAB-DC-135302H	1350	321	251	17				
HAB-MC-140 2H	1400		1730	1790		0			165	58	9	1414		HAB-DC-140302H	1400	412	272	18				
HAB-MC-150 2H	1500		1830	1890	333	9	280	340	175	60	9	1523		HAB-DC-150302H	1500	417	290	18				
HAB-MC-160 2H	1600	165.2	1930	1990					200	62	9	1633		HAB-DC-160302H	1600	441	281	18				
HAB-MC-180 2H	1800		2220	2280	262		220	200	240	69	4	1824		HAB-DC-180302H	1800	523	333	19				
HAB-MC-200 2H	2000		2420	2480	303		330	290	260	73	4	2042		HAB-DC-200302H	2000	533	342	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: 1050mm).





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

Model	Belt width	d dia.	W	А	н	Е	L	Т	m	n	Mass (kg)
HAB-MR-050052H	500	QQ 1	740	790		270	592	4.5	140	190	60
HAB-MR-060052H	600	09.1	840	890		300	651		150	200	65
HAB-MR-075052H	750	114.3	1040	1090	125	370	797	6		210	70
HAB-MR-090052H	900		1190	1240		450	956		160		75
HAB-MR-100052H	1000		1290	1340		500	1056				80
HAB-MR-105052H	1050		1340	1390		520	1094	9		230	90
HAB-MR-120052H	1200	139.8	1490	1540		600	1253		180 280 330		95
HAB-MR-135052H	1350		1640	1690		670	1392				100
HAB-MR-140052H	1400		1730	1790	150	700	1450				105
HAB-MR-150052H	1500		1830	1890	150	750	1550			340	145
HAB-MR-160052H	1600	165.2	1930	1990		800	1649				150
HAB-MR-180052H	1800		2220	2280]	940	1938			390	215
HAB-MR-200052H	2000		2420	2480		1050	2157				235

Model	Belt width	н	а	Mass (kg)
HAB-DR-050052H	500	CE.	270	12
HAB-DR-060052H	600	co	270	13
HAB-DR-075052H	750			14
HAB-DR-090052H	900	53		14
HAB-DR-100052H	1000		300	14
HAB-DR-105052H	1050			14
HAB-DR-120052H	1200	60		15
HAB-DR-135052H	1350			15
HAB-DR-140052H	1400		320	15
HAB-DR-150052H	1500			16
HAB-DR-160052H	1600	78		16
HAB-DR-180052H	1800		205	16
HAB-DR-200052H	2000		300	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.

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Matsushima Measure Tech Co.,Ltd.

HEAD SALES OFFICE / FACTORY 1-8-18, Norimatuhigashi, Yahatanishi-ku, Kitakyushu, 807-0837, Japan Tel: +81-(0)93-691-3731 Fax: +81-(0)93-691-3735

SEOUL LIAISON OFFICE 220, 2F Hyundai Knowledge Industry Center, 70, Dusan-ro, Geumcheon-gu, Seoul, Republic of Korea Tel: +82-(0)2-852-3731 Fax: +82-(0)2-852-3734

SHANGHAI DAHONG MATSUSHIMA MACHINERY CO., LTD. 70 Hengcang Road, Dahong, Malu, Jiading, Shanghai 201801, China Tei: +86-(0)21-59514138 Fax: +86-(0)21-59514139

https://www.matsushima-m-tech.com E-mail : info@matsushima-m-tech.com