



R&M Materials Handling, Inc.
 4501 Gateway Boulevard
 Springfield, Ohio 45502
 P.: (937) 328-5100
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3 Safe operation

3.1 Intended use of the hoist and ambient conditions

The hoist is intended for lifting and moving goods. The hoist may not be used for lifting and moving people. The hoist is intended for indoor use or for use in outdoor premises when specially equipped for the purpose. The ambient temperature should be -10 ... +40°C (14...104°F), with explosive proof hoists - 20 ... +40°C (14...104°F), or, if specially equipped, -20 ... +50°C (-4...122°F). The relative humidity of the ambient should be less than 90%. If the hoist is used in exceptional ambient conditions (such as in a windy area, a corrosive atmosphere or in an area prone to earthquakes) or is used to handle dangerous materials (such as molten metal), any need for special equipment must be determined with the manufacturer or the manufacturer's representative.

3.2 Sound intensity level

The sound intensity level of the hoist in an operating location will not exceed 70dB (A).

3.3 Service classification of hoist

Safe and effective operation of the hoist is dependent on correct classification of the hoist's operating group. According to FEM9.511 standard the hoist's operating group can be determined from its:

- load spectrum
- average daily operating time

3.3.1 Load spectrum

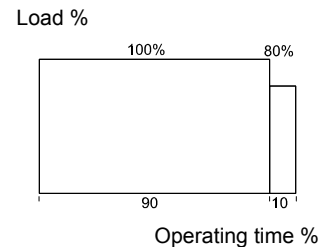
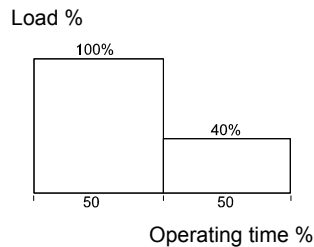
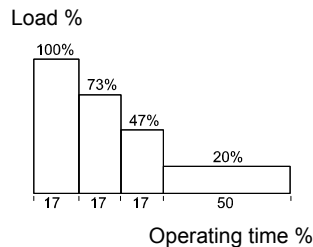
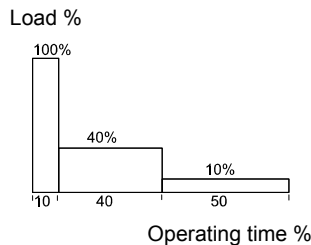
The load spectrum can be determined from the table below.

LIGHT
 Occasional full load.
 Usually light load.
 Small fixed load.

MEDIUM
 Occasional full load.
 Usually light load.
 Average fixed load.

HEAVY
 Repetitive full load.
 Usually average load.
 Heavy fixed load.

VERY HEAVY
 Usually almost full load.
 Very heavy fixed load.



3.3.2 Average daily operating time

The average daily operating time of the hoist can be calculated from the running time of the hoisting machinery [hours/day].

$$t = \frac{2 * H * N * T}{V * 60}$$

- H = average hoisting height [m]
- N = number of work cycles per hour [cycles/h]
- T = daily working time [h]
- V = hoisting speed [m/min]



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3.3.3 Determining the operating group of the hoist

When the load spectrum and the average daily operating time of the hoist are identified, the hoist's operating group is obtained from the table below.

Load spectrum	Average daily operating time (hours per day)					
	ISO/FEM					
	≤ 0.5	≤ 1	≤ 2	≤ 4	≤ 8	≤ 16
LIGHT			M3 1Bm	M4 1Am	M5 2m	M6 3m
MEDIUM		M3 1Bm	M4 1Am	M5 2m	M6 3m	M7 4m
HEAVY	M3 1Bm	M4 1Am	M5 2m	M6 3m	M7 4m	
VERY HEAVY	M4 1Am	M5 2m	M6 3m	M7 4m		

3.4 Safe working principles

Carefully following safe working principles is one of the most effective ways of preventing damage to property and injury to personnel. The operator, serviceman and work manager for the hoist should be familiar with the safe working principles for the hoist. A service organization authorized by the manufacturer can provide training for operating the hoist and any maintenance services needed under a separate agreement.

Misuse of the hoist or improper servicing may result in an accident that cannot be prevented by the safety equipment. Crane Operator, operation and safety training will introduce the operator to the essential safe handling of loads with the hoist equipment and safety procedures to follow. Service training can also provide the preventive maintenance requirements of the hoist to prevent equipment failure effecting production and/or safety.

Work management has an important role in implementing the principles for using the hoist safely. Work management must ensure that the hoist and its accessories are fit for the intended purpose, and that servicing and maintenance of the equipment is carried out as scheduled. Management must also ensure that personnel are adequately trained in the safe operation of handling loads.



The hoist operator, the hoist serviceman and personnel in charge of hoist operation and servicing shall be familiar with and comply with the safe working principles described in the instructions.



Read all safety instructions supplied with products.



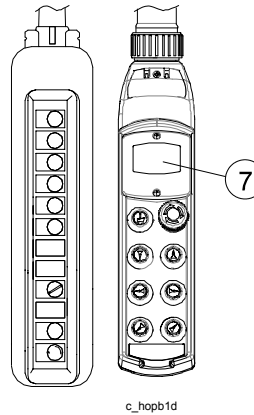
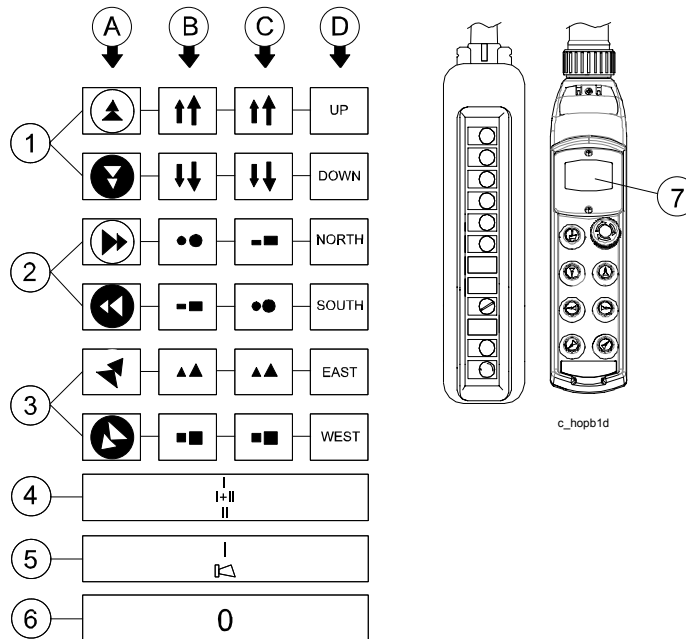
Study meaning of stickers on products.

3.5 Using the pushbutton controller

The hoisting and travel motions of the hoist as well as crane travel motions are controlled with the pushbutton controller or by remote control. Some pushbutton controllers and remote control units are provided with a selector switch that allows the same controller unit to be used to control several hoists and/or cranes. If the hoist has remote control (infrared or radio control) separate operating instructions for the remote controller are provided with the hoist. The direction symbols on the pushbutton controller conform to local requirements.



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c_hopb1d

- A. Markings in compliance with FEM and DIN standards
- B. Markings in compliance with SEN standard
- C. Markings in compliance with SFS standard
- D. Markings in compliance with ANSI standard
- 1. Up/Down pushbutton
- 2. Right/Left pushbutton for trolley
- 3. Forwards/Backwards pushbutton for bridge of crane
- 4. Hoist selection pushbutton (only if the pushbutton controls several hoists)
- 5. On pushbutton and warning signal
- 6. Emergency stop pushbutton (released by turning, lockable in some models)

Use the following procedure to start up a hoist that is in standby mode:

- Release the emergency stop pushbutton (6) by turning it. Use a key to release if it is the lockable type.
- Press the On pushbutton (5). The hoist is now ready for operation.



If the pushbutton controller includes a selection switch, check that the hoist selection switch (4) is in the correct position before using pushbuttons (1), (2) and (3).

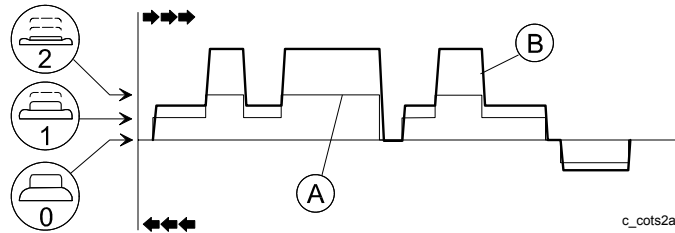
After operating the hoist, return it to standby mode as follows:

- Run the hoist to the correct parking position. Stop all hoist motions.
- When all hoist motions have ceased, press the emergency stop pushbutton (6). The pushbutton will lock.



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3.5.1 Using the pushbuttons (two steps, contactor control)



A. Position of pushbutton (0, 1 and 2)
B. Speed

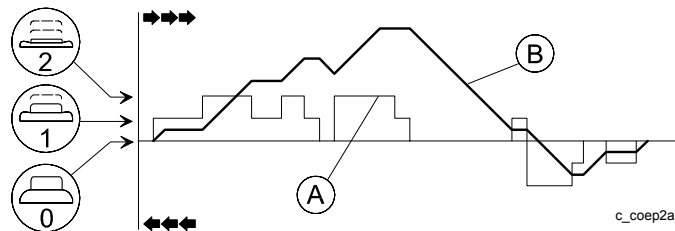
The position of the pushbutton affects the speed as follows:

- Position 0: Neutral position. Motion stops.
- Position 1: Slow speed.
- Position 2: High speed.



A skilled operator always uses the low speed (step 1) when starting to hoist. Slack is taken out of rigging and the wire rope is subjected to the load in the low speed. Be aware of load balance as the load is hoisted from floor level. Proceed to high speed (step 2) when the load is clear of all obstacles. When lowering the load, a skilled operator controls the lowering speed from High to Low speed when setting the load. Low speed allows time to maneuver load into position. Minimal jogging (or inching) may be required. DO NOT JOG FROM NEUTRAL TO HIGH SPEED POSITION OR VICE VERSA.

3.5.2 Using the pushbuttons (EP-mode, optionally used with Inverter controls)



A. Position of pushbutton (0, 1 and 2)
B. Speed

Variable speed with 2 step pushbutton - (Electronic Potentiometer)

The position of the pushbutton affects the speed as follows:

- Position 0: Neutral Position. Controls motion to slowdown and stop.
- Position 1: Start in low speed and Hold speed Command.
 - When starting the movement in first step, go to low speed is initiated.
 - When speeding up (pushing step 2, accelerate to high speed) and a desired speed is reached return to position 1, the Inverter control will hold the speed the motion has reached. A quick, back and forth movement between position 1 & 2 can provide the crane operator variable speeds for safer and more productive operation.
 - When slowing down (release button to neutral) and returning to position 1, the Inverter control will hold the speed the motion has attained. A quick, back and forth movement between position 0 & 1 again provides



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the crane operator variable speeds to minimize swing, reducing the slowdown ramp time to stop, providing safer and productive operation.

- Position 2: Accelerate to high (maximum) speed



Inverter Drives provide state of the art control in the hoist, bridge and trolley motions of industrial cranes. A skilled operator can benefit from this type of control system. Note an established acceleration or speed up ramp time will minimize the motion from achieving full speed instantly, minimizing load swing. Position 2 is the High speed command but the ramping time to full speed allows the operator to hold any speed between Low and High by returning to the first position, commanding - HOLD SPEED.

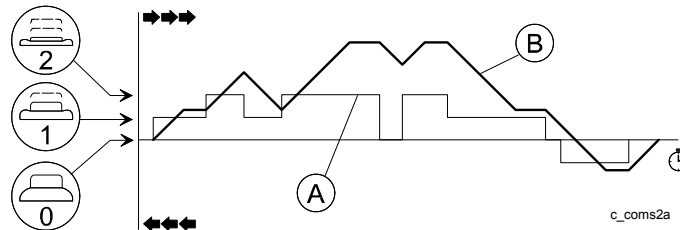


NOTICE: when the pushbutton is returned to neutral, an established deceleration or slowdown ramp time is in full control of the motion before STOP. A skilled operator can use this ramp time to his advantage by pushing in position 1, to command HOLD SPEED. The motion will hold the speed the motion has slowed down to.



EMERGENCY STOP WILL ALWAYS STOP MOTION IMMEDIATELY!

3.5.3 Using the pushbuttons (two speeds, controlled by Inverter)



- A. Position of pushbutton (0, 1 and 2)
- B. Speed

Two step pushbutton - Low and High Speed with Soft Starting and Soft Stopping

The position of the pushbutton affects the speed as follows:

- Position 0: Neutral Position. Controls motion to slowdown and stop.
- Position 1: Accelerate to low speed.
- Position 2: Accelerate to High speed.



Frequency Inverter Drives provide state of the art control in the hoist, bridge and trolley motions of industrial cranes. This simple control has two speeds, Low and High, but with the advantage of speeding up smoothly to minimize swing. When returning to Low Speed or Stop a smooth slowing down occurs to minimize swing.



NOTICE: when the pushbutton is returned to neutral, an established deceleration or slowdown ramp time is in full control of the motion before STOP.



EMERGENCY STOP WILL STOP MOTION IMMEDIATELY.