

# MODEL CMS COMPACT MOTION SWITCH

*Economy model with one signal set point*

- Rugged aluminum or cast iron housing for full protection
- Heavy duty shaft and bearings
- Precise and easily adjusted signal point for underspeed or overspeed
- Advanced electronics eliminate problems of centrifugal and fluid type units
- Low cost
- One standard housing incorporates both NEMA 4 raintight and NEMA 7-9 Explosion Proof construction
- Built-in adjustable time delay



*Model CMS Compact Motion Switch safeguards the main conveyor feeding material from a crusher.*

## THE MODEL CMS Compact Motion Sensing Control

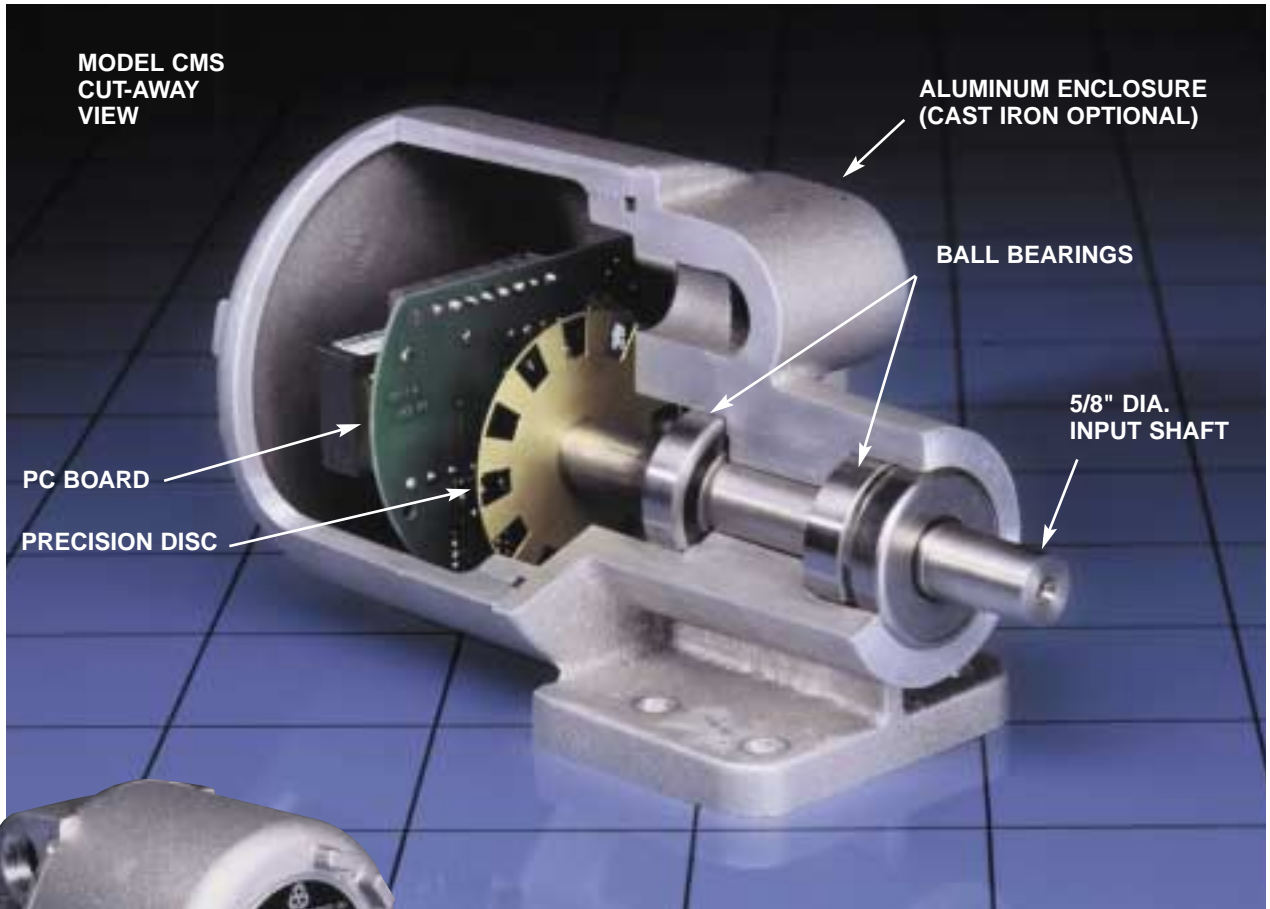
The Model CMS Motion Sensing Control is a compact unit designed to include all mechanical and electronic components in one housing. It will produce an output signal at a predetermined speed which may be either underspeed or overspeed. Rugged, heavy duty construction combined with solid state electronics and photo-electric technology, make this one of the most advanced detectors available.

Model CMS protects all valuable rotating equipment including belt conveyors, bucket elevators, rotary feeders, or screw conveyors. It operates in 2 either a clockwise or counterclockwise direction and mounts in any position.

### Operation:

- The Model CMS senses motion by means of a precision metal disc mounted on the input shaft. This disc generates measurable light pulses as a series of slots on its periphery rotate past an infra-red light source. A photo-electric sensor monitors the series of light pulses and converts them to a digital electronic signal. Solid state circuitry then analyzes the digital signal and activates or deactivates the output relay at the pre-set signal speed. The Model CMS has an adjustable built-in time delay eliminating the need for a separate start-up time delay relay.
- The Model CMS will sense underspeed or overspeed conditions. Three signal speed ranges are available with each unit. The low signal speed range is from 0.1 to 10 RPM. The medium signal speed range is 1 to 100 RPM, and the high speed range is 10 to 1000 RPM.
- Field adjustment of the signal set point is easily accomplished by means of an adjustment screw. The signal speed ranges are selected by a three position toggle switch on the printed circuit board. For UNDER-SPEED sensing, the signal point is set below the normal operating speed of the unit. The output relay will then de-energize if the speed drops below the signal set point. For OVERSPEED sensing the signal set point is set above the normal operating speed. The output relay will energize if the speed exceeds the signal set point. The output relay can be wired either normally open or normally close.
- Zero speed sensing can be accomplished by locking the signal set point adjustment screw at its lowest setting of 0.1 RPM. The output relay will then de-energize when the shaft speed of the unit approaches zero.

# Model CMS Motion Switch Specifications



MODEL CMS  
CUT-AWAY  
VIEW

ALUMINUM ENCLOSURE  
(CAST IRON OPTIONAL)

BALL BEARINGS

PC BOARD

PRECISION DISC

5/8" DIA.  
INPUT SHAFT



NEMA 4 raintight and NEMA 7-9 Explosion  
Proof construction are standard.

## WIRING

The output of Model CMS is a DP/DT relay connected to the terminal block at the rear of the unit. There are two sets of output contacts. Each set includes normally open, normally closed, and common. As a result, the unit can be used to control two separate circuits such as a motor starter and a signal light. Input power is connected from the source to contacts L<sub>1</sub> and L<sub>2</sub>. A ground connection is also furnished.

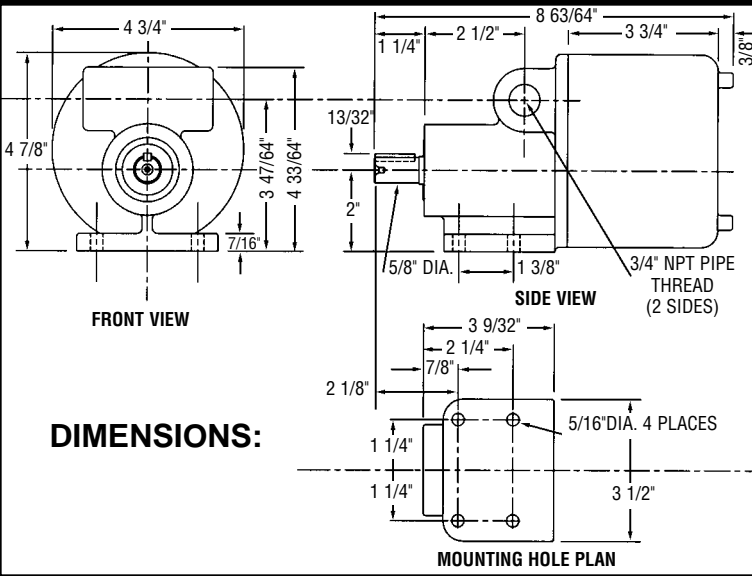
## MECHANICAL SPECIFICATIONS:

**RADIAL LOAD ON INPUT SHAFT:** 50 lb. max.  
**END THRUST ON INPUT SHAFT:** 100 lb. max.  
**ROTATION:** Either clockwise or counterclockwise  
**DRIVING TORQUE:** 1 inch-pound maximum  
**SHAFT:** 5/8" diameter with 3/16" x 1" square key  
**ENCLOSURE:** Aluminum with screw on cover or optional Cast Iron with screw on cover  
**MEETS:** NEMA 3S, 4, 4X, 7: Class I groups C & D, 9: Class II groups E, F & G  
**BEARINGS:** (2) Ball Bearings, permanently lubricated and sealed for life  
**SHAFT SEAL:** Leather type oil seal  
**WEIGHT:** 5 lb.  
**SIZE:** 5" high x 5" wide x 8 1/2" long

## ELECTRICAL SPECIFICATIONS:

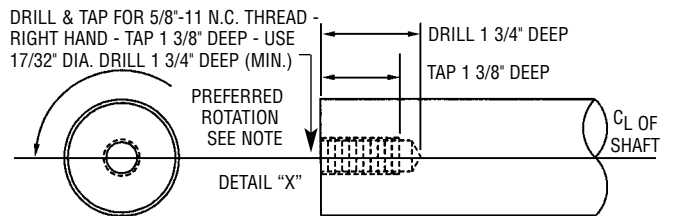
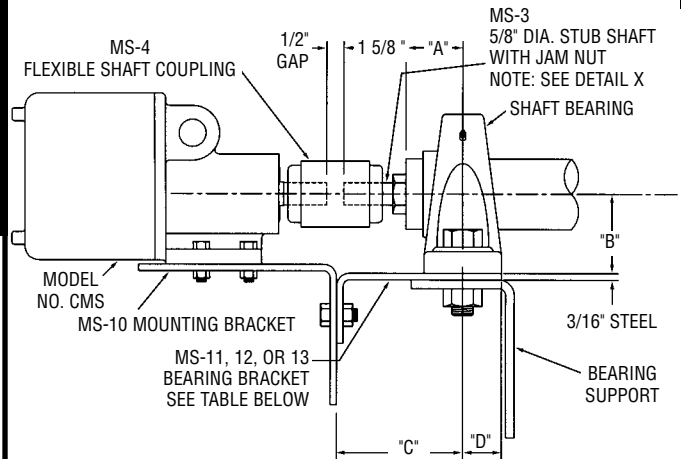
**INPUT VOLTAGE:** 105-135 A.C., 50/60 Hz.  
 210-250 volts A.C., 50/60 Hz. (Special Order)  
**OUTPUT:** DPDT relay 5 Amp. Resistive at 120 volts A.C.  
 DPDT relay 5 Amp. Resistive at 240 volts A.C.  
 DPDT relay 5 Amp. Resistive at 30 volts D.C.  
 1/10 Horse Power at 120 volts A.C.  
 1/10 Horse Power at 240 volts A.C.  
**OPERATING TEMPERATURE RANGE:** -50°F TO +150°F.  
**REPEATABILITY:** +2% max. at constant voltage and temperature  
**POWER CONSUMPTION:** 3 Watts maximum  
**SPEED RANGES:** 3 Signal Speed Ranges  
 LOW: 0.1 to 10 RPM  
 MEDIUM: 1 to 100 RPM  
 HIGH: 10 to 1000 RPM  
**SIGNAL POINT:** Speed at which relay will de-energize for Underspeed, or energize for Overspeed.  
 Recommended to be 15-20% lower than running speed.  
 This will eliminate nuisance shutdowns.  
**START UP DELAY:** Adjustable up to 45 seconds

# MODEL CMS TECHNICAL INFORMATION



## DIMENSIONS:

## MOUNTING DIMENSIONS: MS OR CMS



NOTE: When threaded stub shaft (Part MS-3 or equal) is to be used, it is recommended that the location of the stub be in the end of the shaft that rotates counterclockwise. This allows the threads to continue being under a constant fastening torque while the shaft turns. If the rotation is clockwise or the shaft is for reversing type service, make sure the jam nut is locked tight against the shaft.

Part No. MS-10 will fit parts No's. MS-11, 12, or 13

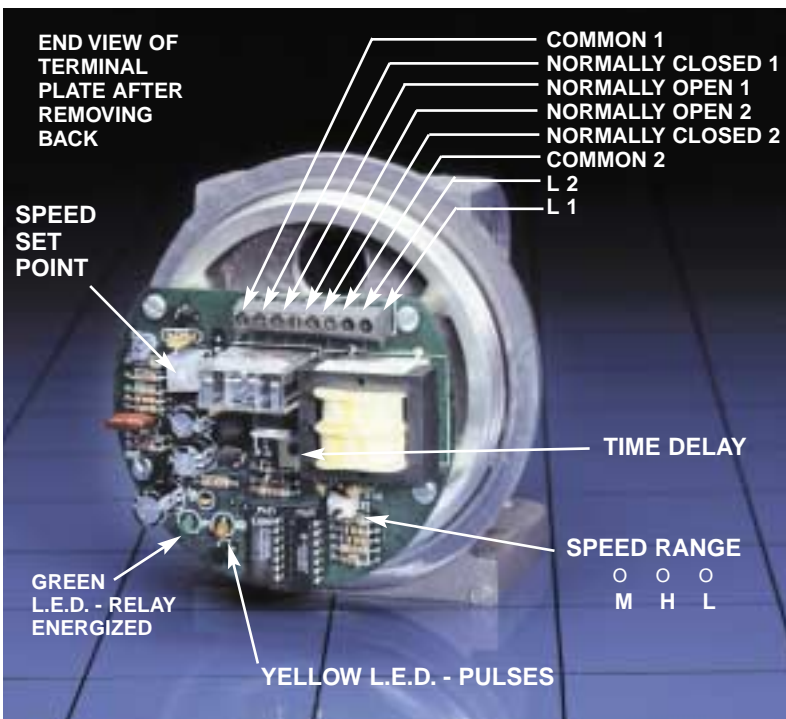
Bearing Bracket & Shim Plate	All Dimensions Are In Inches				
	Shaft Diameter	"A"	"B"	"C"	"D"
MS-11	1 7/16	1 1/4 to 2	17/8 to 2 1/8	3 1/8	1 1/8
MS-12	1 15/16 to 2 7/16	1 1/2 to 2 9/16	2 1/4 to 3	3 3/4	1 5/8
MS-13	2 15/16 to 3 15/16	3 to 3 3/4	3 1/8 to 4 1/8	4 1/2	2 3/16

MS BEARING BRACKETS AND SHIM PLATES

## MOUNTING

The switch can be mounted in any position, but the mounting surface should be flat and smooth. The bearing brackets and shim plates shown in the chart can be used to mount the unit directly to the pillow block supporting a shaft. Normally, only 1/4" mounting bolts and lock washers are required. If vibration is extreme two of the mounting holes should be doweled and bolts used in the others.

The shaft of the switch should be mounted in line with or parallel to the driving shaft. Model CMS can be driven by a flexible coupling, V-belt drive, chain drive, or gear drive.



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## ACCESSORIES for the Model CMS (and Model MSD shown on pages 7 and 8)



MS-3 STUB SHAFT 5/8" dia., threaded one end, keyed other end. With jam nut and 3/16" key.



MS-4 FLEXIBLE COUPLINGS. Available for connection of the MS sensor to the driven shaft.



MS-5 COUPLING GUARD. Protection cover for coupling connection.



MS-10 MOUNTING BRACKET for mounting MS sensor to rotary machinery.



MS-11, 12, 13 BEARING BRACKETS. Attaches MS-10 mounting bracket to pillow block bearing assembly.