

MODEL CR

ROTO-LEVEL CONTROL™

TOTAL RELIABILITY, DURABLE CONSTRUCTION AND ECONOMICAL PROTECTION...

You get them all with the ROTO-LEVEL CONTROL™ from Conveyor Components Company. Evolved from over 35 years of experience with level controls, it's the finest electro-mechanical indicator available.

The Model CR is designed for use in the aggregate, mining, chemical, plastics and other bulk-handling industries. It functions as a perpetual sentinel, monitoring storage bins and eliminating such nagging problems as material overflow, empty bins, abnormally high or low levels, plugged chutes, jammed conveyors and damaged equipment.

OPERATION

Operation of the Model CR is surprisingly simple. A paddle sensor is connected to a low torque, 5 watt synchronous motor. This sensor rotates continuously inside the bin at a slow 1 RPM. When the paddle meets the resistance of accumulated material it transfers its torque to actuate one or more microswitches.

Now actuated, these switches can be used to control the start-stop operations of conveyors, elevators, or feeders, and provide audible or visual warning signals.

Actuation continues as long as the paddle motion is restricted. There's no harm to the monitoring unit or its motor while in this stalled condition. As soon as bin material moves away, the paddle turns freely once more and the switches are deactivated. Model CR units mount at the top or side levels of the bin, or in both positions simultaneously to automatically control material level.



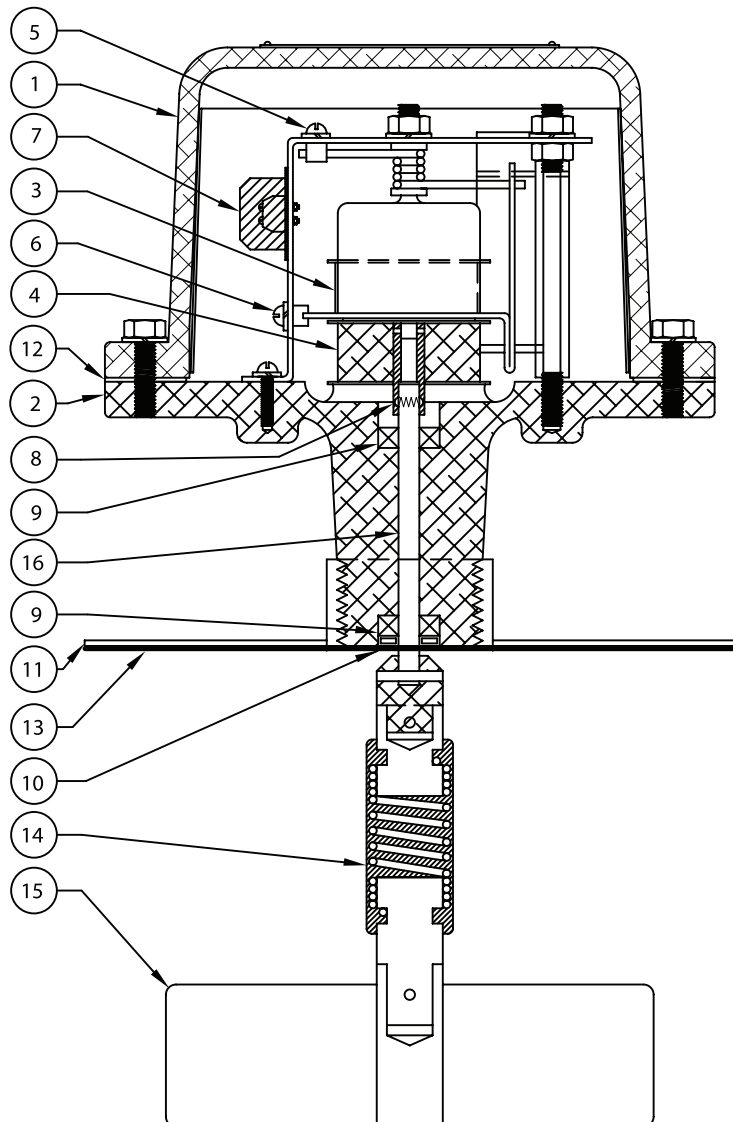
CR ADVANTAGES



- Simple, rugged construction with fewer parts.
- Switches and motor completely independent for long life.
- Up to three 20 amp switches in one Model CR for control of three separate circuits.
- Field adjustable sensitivity and time delay.
- Stainless steel shaft and paddle.
- Shaft seal protected at 30 P.S.I. with particle size as low as ½ micron.
- Standard housing is UL and cUL Certified NEMA Type 4, 4X.
- UL and cUL Certified for explosion proof model NEMA Type 7: Class I, Groups C and D; NEMA Type 9: Class II, Groups E, F and G.

CONSTRUCTION FEATURES COMMON TO ALL CR MODELS

1. **COVER** — Cast aluminum used for both NEMA Type 4, 4X general purpose models and NEMA Type 7: Class I, Groups C and D; NEMA Type 9: Class II, Groups E, F and G explosion proof models. Optional epoxy and polyester coatings available.
2. **BASE** — Cast aluminum standard with 1 1/4" NPT thread on neck for installation in 1/2 coupling or standard mounting plate. Conduit connection is 3/4" NPT thread.
3. **MOTOR** — Power: 5 Watts, Frequency: 50/60 Hertz, Speed: 1 RPM, Voltage: 120V or 240V. Other Voltages available.
4. **MICROSWITCHES** — SP/DT, rated at 20 amps. Unit can be furnished with 1, 2 or 3 switches. All microswitches can be wired for single throw operation, either normally open or normally closed as required.
5. **SENSITIVITY ADJUSTMENT** — Spring tension is adjustable to product density.
6. **TIME DELAY ADJUSTMENT** — Variable to prevent false signals.
7. **TERMINAL BLOCK** — For CR motor voltage.
8. **CLUTCH** — Slips to prevent damage to motor gears.
9. **BEARINGS** — Sealed, permanently lubricated precision ball bearings.
10. **SHAFT SEAL** — Dust and moisture-tight. Rated 1/2 micron dust at 30 P.S.I.
11. **MOUNTING PLATE** — 8" diameter with 1 1/4" welded pipe coupling. Powder coated steel is standard. Stainless steel is optional. Flexible to conform to curved bins.
12. **COVER GASKET** — 1/16" thick neoprene.
13. **MOUNTING GASKET** — 1/16" thick fiber.
14. **SHAFT** — Optional flexible or solid with all metal parts made of stainless steel.
15. **PADDLE** — All metal parts made of stainless steel. Various types interchangeable in field.
16. **DRIVE SHAFT** — Precision machined stainless steel. Impervious to moisture and corrosion build-up.



ELECTRICAL SPECIFICATIONS

The Roto-Level Control™ is available with either 120V or 240V single phase, 5 watt synchronous motor. One, two or three 20 amp microswitches can be supplied in one control. Explosion Proof models are available in all configurations.

ENCLOSURES

GENERAL PURPOSE — Designed to be dust and weather tight. For use outdoors. Meets requirements of NEMA Type 4, 4X. UL and cUL Certified.



EXPLOSION PROOF — Designed for use in hazardous atmospheres. Meets requirements of NEMA Type 7: Class I, Groups C, D; NEMA Type 9: Class II, Groups E, F and G. UL and cUL Certified.



MICROSWITCHES

Microswitches are rated 20 amps @ 125, 250 or 480 VAC; 1 HP, 125 VAC; 2 HP, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC. Single pole, double throw.

MOTOR

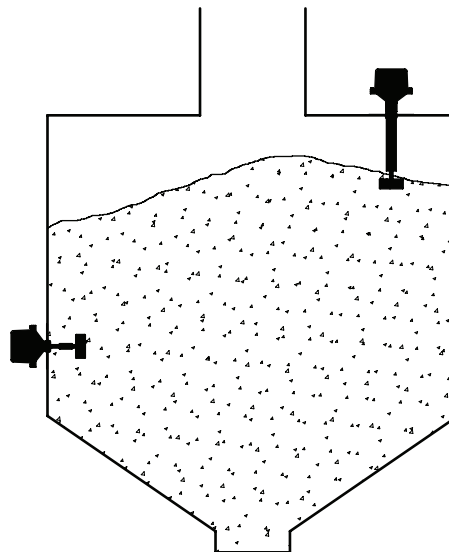
5 Watts, 120VAC or 240VAC, 50/60 HZ, 1 RPM synchronous. 24VAC, non UL unit is available.

FOLLOW THESE 5 STEPS TO DETERMINE THE PROPER **ROTO-LEVEL CONTROL™** FOR YOUR APPLICATION:

1. SELECT PROPER MODEL

Selection of the proper Model CR Roto-Level Control™ should begin with the electrical requirements. Use the chart below to select the model number that will give the motor voltage, number of microswitches, and type of housing construction required.

		MODEL NUMBER		
Enclosure	Number of 20 AMP SP/DT Microswitches	120 VAC Motor	240 VAC MOTOR	24 VAC (non-UL) MOTOR
NEMA Type 4, 4X UL and cUL Certified	One	CR-1A	CR-1B	CR-1C
	Two	CR-2A	CR-2B	CR-2C
	Three	CR-3A	CR-3B	CR-3C
Explosion Proof NEMA Type 7 & 9 UL and cUL Certified	One	CRX-1A	CRX-1B	CRX-1C
	Two	CRX-2A	CRX-2B	CRX-2C
	Three	CRX-3A	CRX-3B	CRX-3C



2. DETERMINE MOUNTING PLATE

It must be decided whether the unit is to be mounted on the top or the side of the bin and which mounting plate is to be used.

- The paddle and shaft must be at a point on the bin where the material will flow freely both to and away from them.
- The paddle and shaft must be away from the direct flow of incoming material.

➡ **HIGH LEVEL CONTROL.** Top mounting is recommended. It simplifies installation, accessibility and wiring. Top mounting is suggested for:

- Light materials where large paddles must be used.
- Large lump materials where long flexible paddles must be used.
- Avoiding stagnation areas which can occur with moist materials.

PART NUMBER: CR-83 Standard mounting plate for most top mount applications.

PART NUMBER: CR-84 Stainless steel mounting plate for most top mount applications.

➡ **LOW LEVEL CONTROL.** Side mounting is customary but top mounting may be easier in smaller or medium sized bins.

PART NUMBER: CR-81: Standard side mounting plate for most applications.

PART NUMBER: CR-82: Stainless Steel mounting plate. Use where corrosion is a problem.

PART NUMBER: CR-85: Half coupling welded directly to the bin wall. Used with the CR-62 or CR-63 paddles, it allows unit to be mounted directly in the coupling without a mounting plate. Paddles are inserted into the bin through the coupling.

It is sometimes necessary to install protective baffles over the paddles at the low level to protect paddle and shaft from surges in the product.

3. CHOOSE CORRECT PADDLE

- PART NUMBER CR-61: Stainless Steel 4 vane 6" O.D. paddle. For use on materials up to 75 lbs./cu. ft. Used at high and low level, top and side mounted.
- PART NUMBER CR-62: 1 vane curved paddle. For use with materials 30 lbs./cu. ft. Inserted through half coupling Part Number CR-85.
- PART NUMBER CR-63: 1 vane paddle. Extends 3 1/2" in to bin. For materials over 75 lbs./cu. ft. and temperature ranges up to 350°F. Side mounted.
- PART NUMBER CR-64: Flexible neoprene paddle. 1 1/2" wide, 24" long. For large lump materials up to 50 lbs./cu. ft. Located so product pins paddle to bin wall.
- PART NUMBER CR-65: Stainless steel; flexible; top mounted. For materials up to 50 lbs. long. For materials up to 50 lbs./cu ft. and/or sticky materials.

4. PICK SHAFT COMPONENTS

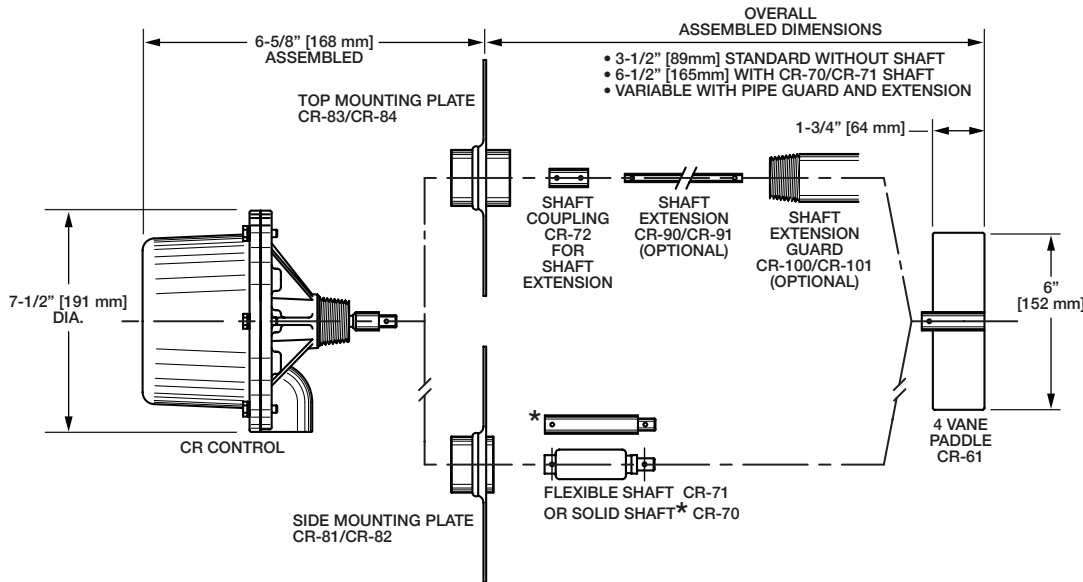
- PART NUMBER CR-71: Flexible shaft; top and side mounting. Adds 3" to overall shaft and paddle assembly. Withstands bin temperature to 160°F and shock loads from product surge.*
- PART NUMBER CR-90: 1/8" pipe extension for top mounting.
- PART NUMBER CR-100: 1 1/4" protective guard for top mounting.
- PART NUMBER CR-72: Shaft extension coupling.
- PART NUMBER CR-91 and CR-101: Stainless steel extension and guard.

*Flexible shaft is not necessary on many side mounted applications. Bin temperature limit is Raised to 350°F.

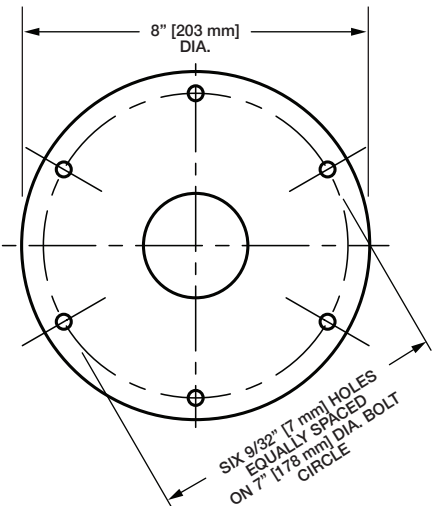
5. CHECK THE FOLLOWING

- Specify stainless steel option on mounting plates and shaft extensions where corrosion is a problem. The shaft and paddle assembly come standard in stainless steel.
- Units should be side mounted at both high and low levels where high temperatures are encountered. Temperature in housing is UL and cUL rated for up to 104°F.
- Bin pressure should not exceed 30 P.S.I. Check with factory when this is a problem.
- Mount unit on bin where there is a minimum vibration. Use rubber washers or a soft rubber mounting gasket when vibration is severe.

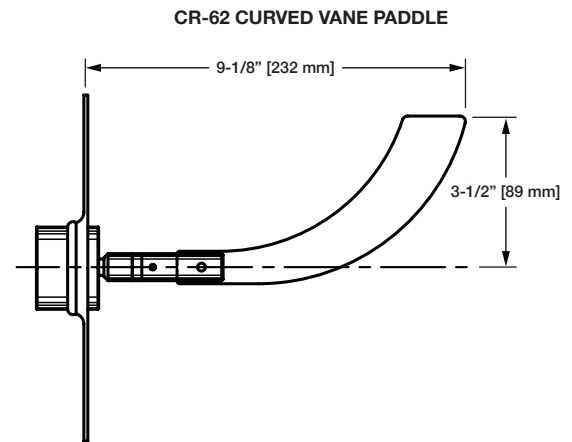
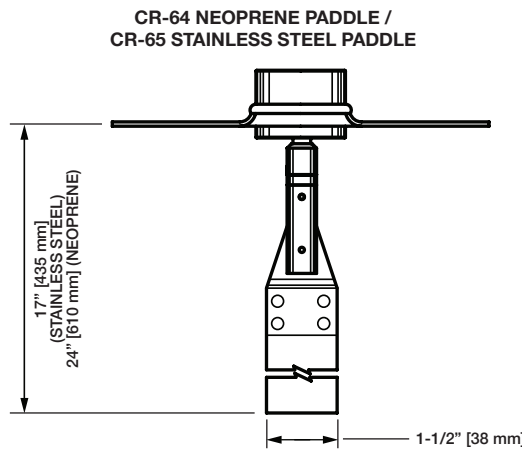
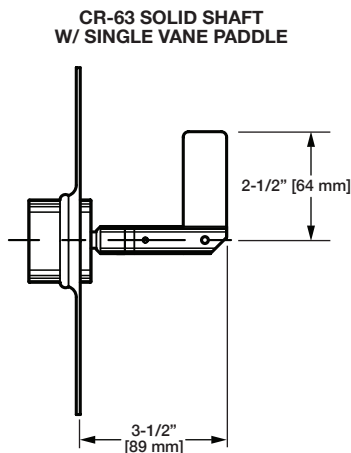
TECHNICAL INFORMATION



MOUNTING PLATE



OPTIONAL PADDLES



INSTALLATION AND WIRING INSTRUCTIONS

LOCATION: The control should be located at a point on the bin where there is a free flow of material to and away from the paddle. The unit should be out of the direct flow of incoming material.

MOUNTING PLATE OR COUPLING: If a mounting plate is used at either the top or side mounting positions, it will be necessary to lay out a 7" bolt circle, drill and tap or drill six (6) equally spaced holes in the bin wall for 1/4" bolts or cap screws. If bolts are used, they should be tack welded to the inner bin wall. A 5" diameter hold should be cut to pass the paddle. It may be required that a protective baffle be installed approximately 6" above the center line of the paddle on the inner bin wall.

If instead of the mounting plate a pipe coupling is used to mount the unit to the bin wall, the 1 1/4" NPT coupling should be welded so that only half the coupling protrudes inside the bin. Half couplings are used for side bin mounting.

Full couplings are used for top bin mounting.

SIDE MOUNTING: Install the unit so that the conduit opening is pointed down. Mount the unit on the bin so that the gasket is between the mounting plate and the bin wall. Use rubber and steel washers under the mounting bolts.

TOP MOUNTING: The mounting plate should be installed with rubber and steel washers. The 1/8" pipe required for the shaft extension should be cut to length after deducting the length of the optional **Part Number: CR-71** flexible shaft, if used, and the height of the paddle. A 1/8" hole should be drilled through the pipe extension 7/16" from each end. The extension is then assembled to the unit or flexible shaft using **Part Number: CR-72** coupling and lock pins.

The 1 1/4" NPT guard should be cut to 5" shorter than the overall extended shaft and paddle length. One end is threaded 1 1/4" NPT. The guard is then screwed securely into the mounting plate over the shaft extension.

The final step is to assemble the paddle to the extension.

If the extension is long, the 1 1/4" NPT pipe guard should be braced to the bin wall at 6' vertical intervals.

WIRING:

- Connect correct power directly to the motor terminal block. An un-interrupted continuous power supply must be used.
- Wiring of the control circuit to the relay is done separately from the motor.
- Operation of the unit should be checked both with regard to the motor and the microswitch or relay before the cover is installed.

