

MODEL CRU

LEVEL CONTROL

FAIL-TO-SAFE

The next generation of roto-level controls is here. Conveyor Components Company's newest rotating paddle level control, the Model CR*Ultra* is a significant advancement in instrumentation based on our time-proven motion control technology. The CR*Ultra* is designed to provide security from system power failures and motor failures. The unit uses a sophisticated circuitry to constantly monitor the rotation of the paddle.

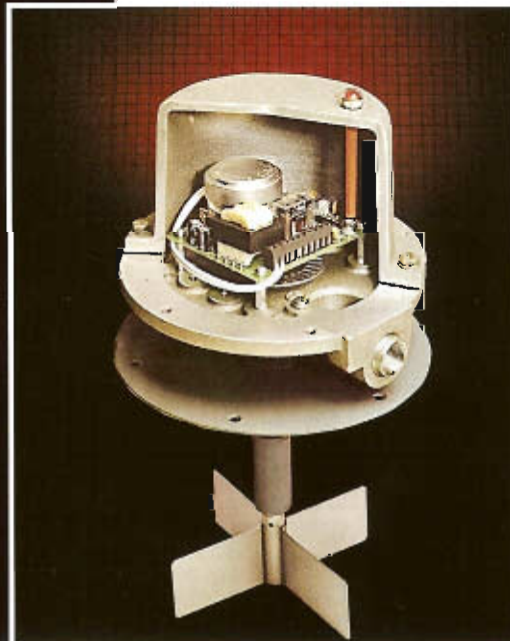
OPERATION:

The operation of the Model CR*Ultra* is based on our time tested motion switch technology. A rotating paddle sensor is driven by a low torque synchronous motor at 1 RPM. The rotation of the paddle is monitored by an optical-electronic sensor emitting an infrared signal which is interrupted by a rotating slotted disc. The disc is mounted to the rotating paddle shaft. This technology has been used successfully in our Model CMS motion switch. A sophisticated electronic circuit receives the digital input from the sensor and rotating disc and watches for the paddle to slow or stop. When material contacts the paddle and slows or stops the rotation, the circuit actuates an output relay to provide a signal.

The rotation of the paddle is monitored constantly. An external flashing LED light indicates the normal rotational operation of the paddle.

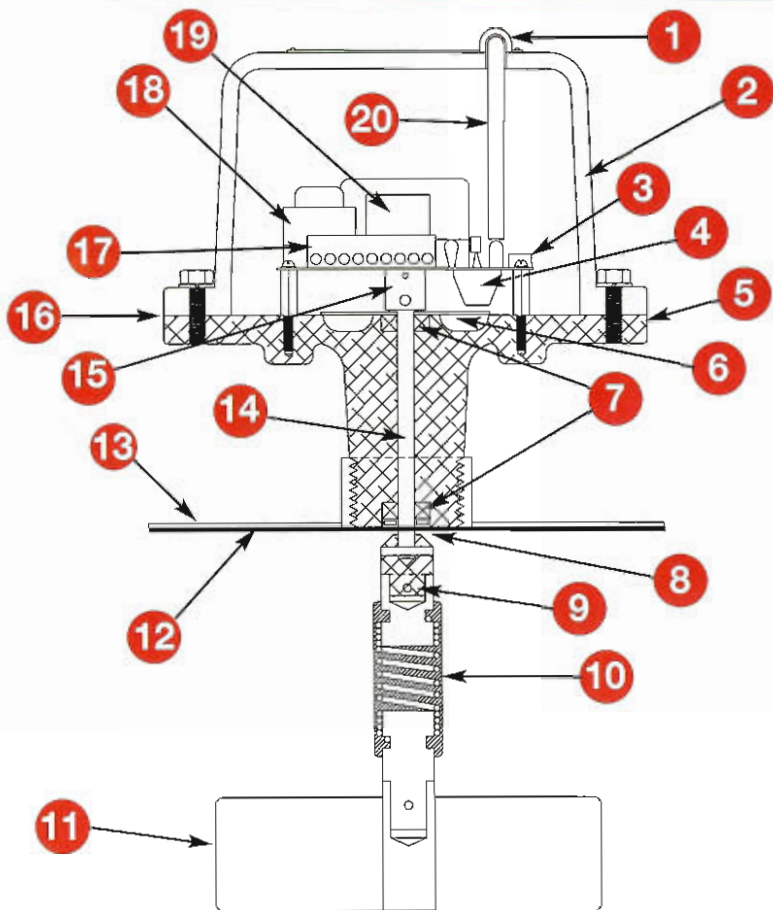
CRU ADVANTAGES

- Fail-to-Safe
- Field selectable high or low level fail-to-safe
- 3-45 second adjustable time delay
- Advanced optical-electronic technology
- Uses our proven motion control technology
- Highly visible LED flashing indicator light
- Simple compact design
- Easy access for installation and wiring



THE MODEL CR*Ultra* MECHANISM AND CIRCUITRY ARE EASILY ACCESSIBLE WHEN THE PROTECTIVE COVER IS REMOVED

3 year warranty
against defects in
materials and
workmanship



CONSTRUCTION FEATURES COMMON TO ALL CR *Ultra* MODELS

1. LED—flashes to indicate rotation.
2. Cover—Cast aluminum used for both NEMA 4 and NEMA 9 dust ignition. Cast iron optional.
3. Time delay adjustment—3 to 45 seconds varied to prevent false signals.
4. Rotation sensor.
5. 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. Cast iron optional.
6. Motion sensing.
7. Bearing—sealed, permanently lubricated precision ball bearing. (2)
8. Shaft Seal—dust and moisture-tight. Rated 1/2 micron dust at 30 P.S.I.
9. Output Shaft—standard
10. Shaft—optional flexible shaft shown or solid shaft available with all metal parts of stainless steel.
11. Paddle—all metal parts of stainless steel. Various types interchangeable in the field.
12. Mounting Gasket—1/16" thick fiber.
13. Mounting Plate—8" diameter with 1 1/4" welded pipe coupling. Painted steel is standard. Stainless steel is optional. Flexible to conform to curved bins.
14. Drive Shaft—precision machined Stainless steel. Impervious to moisture and corrosion build-up.
15. Clutch—slips to prevent damage to motor gears.
16. Cover Gasket—1/16" thick neoprene. NEMA 4 model only.
17. Terminal block.
18. Transformer—120 VAC or 240 VAC 50/60 Hz.
19. Relay—DPDT contacts rated 10 amps.
20. Light Pipe—transmits LED signal to outside cover.

ELECTRICAL SPECIFICATIONS:

Selection of the proper Model CR *Ultra* Roto-Level Control should begin with the electrical requirements. The Roto-Level Control is available for either 110V or 220V single phase.

ENCLOSURE:

- A. General Purpose—designed to be dust and weather-tight. For use outdoors. Meets requirements of NEMA 4.
- B. Dust Ignition—designed for use in hazardous atmospheres. Meets requirements of NEMA 9—Class II, Groups E, F and G.

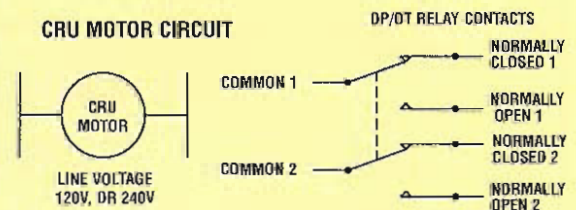
RELAY CONTACTS:

Double Pole, Double Throw rated 10 amp @ 125 or 250V AC; 1/2 HP @ 125V AC; 1 HP @ 250V AC; 1/2 amp @ 125V DC; 1/4 amp @ 250V DC.

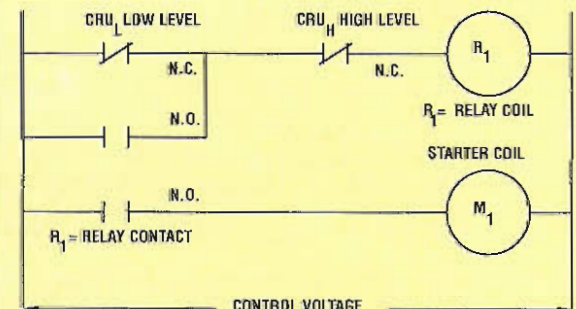
SUPPLY VOLTAGE:

115-120V @ 50/60 Hz or 230-240V AC @ 50/60 Hz.

CRU MOTOR CIRCUIT



WIRING FOR AUTOMATIC BIN FILLING



M₁ - STARTER COIL FOR FILLING MACHINERY
 R₁ - RELAY WITH TWO N.D. CONTACTS
 CRU - LOW LEVEL CRU N.C. CONTACT
 CRU - HIGH LEVEL CRU N.C. CONTACT

ENCLOSURE	MODEL NUMBER	
	110 VAC MOTOR	220 VAC MOTOR
NEMA 4	CRU-2A	CRU-2B
NEMA 9	CRUX-2A	CRUX-2B

Follow these 5 steps to determine the proper ROTO-LEVEL control for your application

1 SELECT PROPER MODEL

Turn to page 3 or 5 and use the chart to select the model number that will give the motor voltage, number of micro switches, and type of housing construction required.

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 such as occur with moist materials.

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

CR-84: Stainless steel top mount plate for high corrosion applications.

Side mounted high level units can be used if the material has no unusual characteristics. Care must be exercised that the unit be mounted to correctly intercept the angle of repose of the material at the high level.

- Low Level Indication.** Side mounting is customary but top mounting may be easier in smaller or medium-sized bins.

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

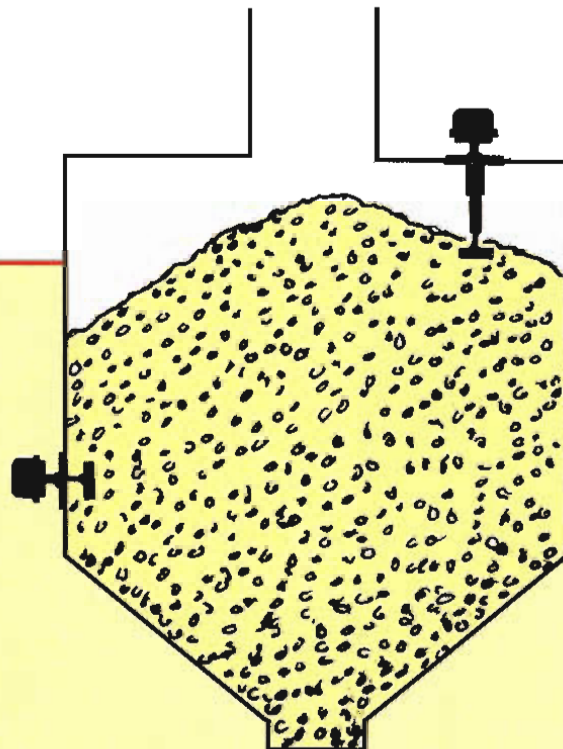
CR-82: Use where corrosion is a problem. (Stainless Steel)

CR-85: Half coupling welded directly to the bin wall. Used with 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

- CR-61: Stainless steel 4 vane paddle for use on materials up to 75 lbs./cu. ft. Used at high and low level, top and side mounted.
- CR-72: Curved; insertable; side mounted. For use with materials greater than 30 lbs./cu. ft. Inserted through half coupling CR-85.
- CR-63: Single vane; extends only 3 1/2" into bin. For materials over 75 lbs./cu. ft. and temperature ranges up to 350°F. Side mounted.



- CR-64: Flexible neoprene; top mounted; 1 1/2" wide, 24" long. For large lump materials up to 50 lbs./cu. ft. Located so product pins paddle to bin wall.
- CR-65: Stainless steel; flexible; top mounted. For materials up to 50 lbs./cu. ft. and/or sticky materials.

NOTE: Top mounted paddles are easily extended using standard 1/8" pipe and protective guard of 1 1/4" pipe. Extensions of more than 30' are not uncommon.

4 PICK SHAFT COMPONENTS

- 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.*
- CR-90: 1/8" extension pipe for top mounting.
- CR-100: 1 1/4" protective guard for top mounting.
- CR-72: Shaft-extension coupling.
- CR-91 and CR-101: Stainless steel extension and guard.

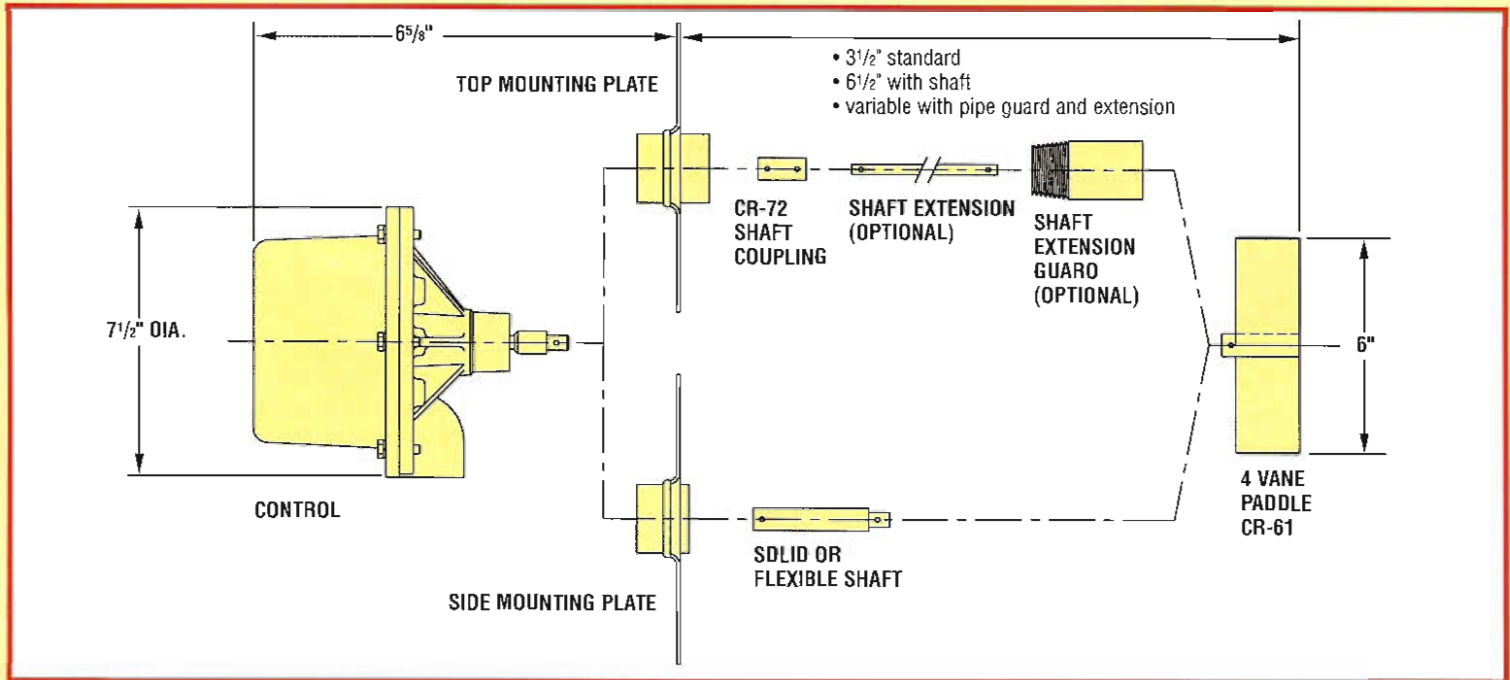
*Flexible shaft is not necessary on many side mounted applications. Bin temperature limit is then raised to 350°F.

NOTE: If paddle is extended at top mounted position, overall length from mounting plate to bottom of paddle must be specified.

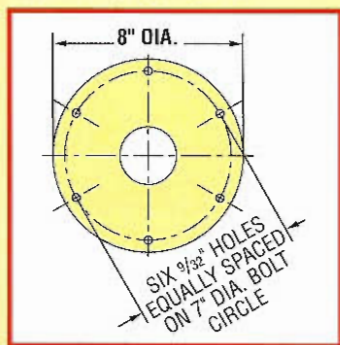
5 CHECK THE FOLLOWING

- Specify stainless steel mounting plates and shaft extension where corrosion is a problem. These parts are optional. All other metal parts of shaft and paddle assembly are normally stainless steel.
- Cast iron housing and cover available if required.
- Units should be side mounted at both high and low levels where high temperatures are encountered. Temperature in housing must never exceed 140°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 minimum vibration. Use rubber washers or a soft rubber mounting gasket when vibration is severe.

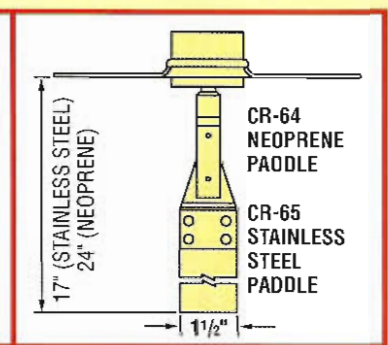
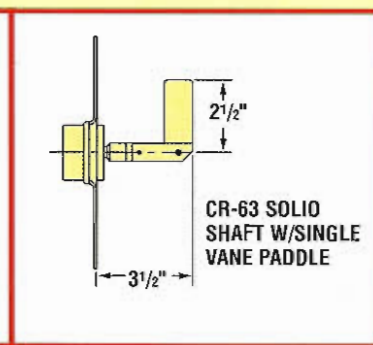
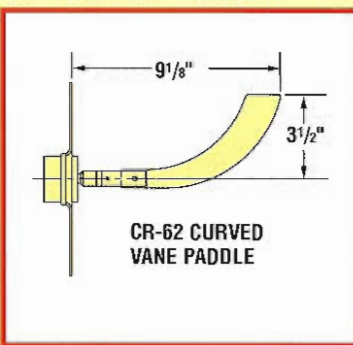
TECHNICAL INFORMATION



MOUNTING PLATE



OPTIONAL PADDLES



INSTALLATION AND WIRING INSTRUCTIONS

LOCATION: The control should be located at a point in 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 hole 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" 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.

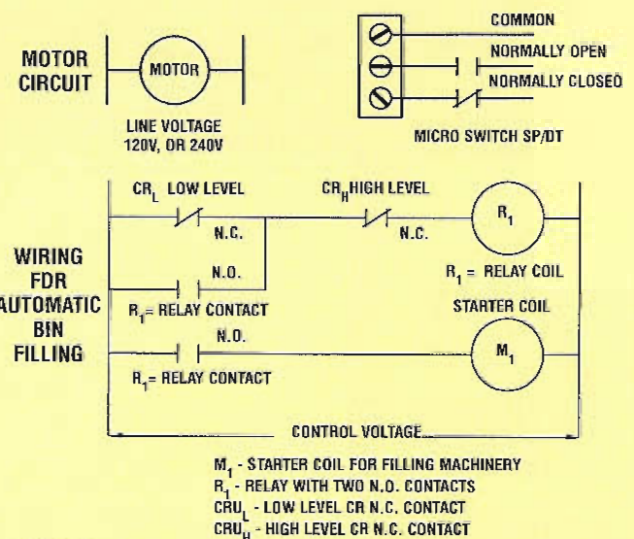
SIDE MOUNTING: Install the unit so that the conduit opening is pointed down. Mount the unit on the bin so that the gasket is between the mounting plate and the bin wall. Use rubber and steel washers under the mounting bolts.

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 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 the CR-72 coupling and lock pins.

The 1 1/4" pipe guard should be cut 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" pipe guard should be braced to the bin wall at 6' vertical intervals.



WIRING:

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