MONITOR TECHNOLOGIES LLC
Practical solutions... at every level!
44W320 Keslinger Rd. ▼ P.O. Box 8048 ▼ Elburn, IL 60119-8048 ▼ 630-365-9403 ▼ Fax: 630-365-5646 ▼ www.monitortech.com

Practical Features – KA/KAX

DC Powered Rotary Paddles use Long-Life AC Motor

Introduction

Model KA and KAX rotary paddle bin monitors, powered by 12 or 24 VDC, incorporate an AC motor that ensures functional reliability and long operational life.

Description

In May of 2005, Monitor implemented a design change in the 12 and 24 VDC rotary paddle bin monitors. The change dramatically improved the performance of these models and made them a viable solution for process oriented systems requiring a low voltage power source, minimal installation cost, and frequent level cycling.

Rotary paddle bin monitors use a small motor to rotate a paddle that protrudes inside a silo or bin. As material surrounds the paddle, its rotation is halted. Within the bin monitor, the motor continues to rotate creating an internal cam action which actuates the output switch. In addition, the motor is shut off through the actuation of a second switch within the bin monitor.

Typically when specifying a rotary paddle bin monitor, the operating source of the sensor (115vac, 230vac, 24vdc, etc.) matches the operating requirements of the internal motor. This results in AC powered bin monitors using AC motors, and DC powered bin monitors using DC motors.

Economical DC motors are not designed to run continuously, and therefore their use in rotary paddle indicators result in compromised longevity. These motors use internal brushes and commutators which physically wear as the motor rotates. Life expectancy is only 5,000 hours (e.g. six months of continuous operation) depending on application load and temperature. (**Figure 1** shows Monitor p/n 1-1318).

Figure 1

Economical AC motors can be sourced that have a long operational life. The permanent magnet synchronous AC motor uses technology that has no physical wear characteristics. Applications have operated successfully using this motor within the Monitor Model KA rotary paddle bin monitor for over 20 years. (Figure 2 shows Monitor p/n 1-1316).

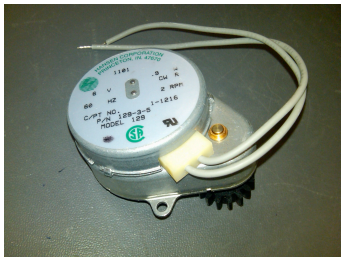

Figure 2

DC Powered Rotary Paddles use Long-Life AC Motor (Continued)

How/Why it functions

The internal construction of Monitor's 12/24vdc powered KA and KAX bin monitors is different. Instead of compromising the design with an inferior DC motor, the rotary paddle bin monitor includes electronics that converts the 12/24vdc power source to 6vac energy that is used to operate a 6v AC motor. Note in **Figure 3** how the grey motor leads connect to a separate electrical terminal block from that of the field wire (DC voltage input) terminal block. (**Figure 3** shows the internal construction of Monitor KA model 1-8331-1, 12/24vdc power source.)

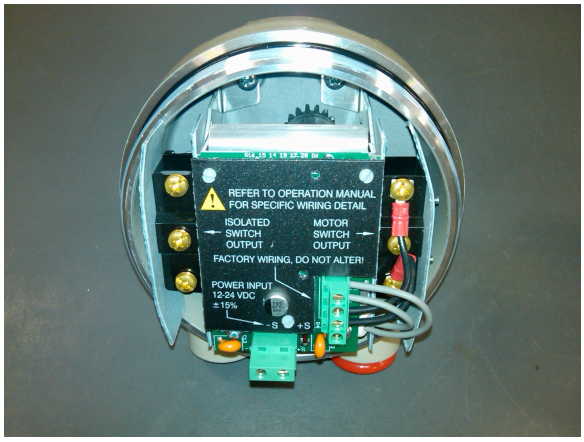

Figure 3

With a conventional AC rotary paddle bin monitor configuration, the power source applied to the product is also used to operate the motor. Note in **Figure 4** how the motor leads connect to the motor shut-off switch as well as connect directly to the terminal block where the field wires (for the AC input voltage) are attached. (**Figure 4** shows the internal construction of Monitor KA model p/n 1-8301-1, 115vac power source.)

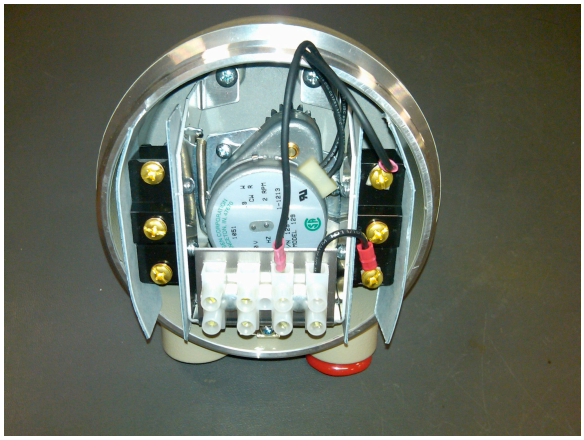

Figure 4

Why this is a distinguishing Feature/Benefit?

1. Maintain application knowledge and product reliability. As end-users evolve their systems to a low-voltage 24vdc environment, they can maintain their years of practical experience with rotary paddle bin monitors without sacrificing the product reliably they have learned to expect. The majority of other rotary paddle brands do not offer Monitor's reliable solution for their 24vdc rotary paddle models.

2. Cost-effective transition to 24vdc systems. End-users are very familiar with rotary paddle bin monitors but they desire to implement a low-voltage system to reduce installation costs and safety "shock" concerns. Selection of other technologies requires a greater product cost investment. The Monitor 12/24vdc powered rotary paddle bin monitor is a practical solution that saves cost without the sacrifice of product performance and life expectancy.