

# 4-75 Position Indicator

## Installation, Operation and Maintenance

FCD WCENIM2070-01 AQ (Part 06525)

### 1. Description

The 4-75 position indicator is designed to be used with and mounted in the Series 75, 120 VAC actuator with many of its standard options including the I-75 Interface Kit and the DFC17 controller. Its output is suited for 4-20 mA DC meter with 0-100% scale (such as General Electric Type GE185), which is not part of the package. If properly calibrated, it indicates actuator shaft position from closed (0°, 0%) to open (90°, 100%). It is combined with standard Potentiometer Kit, which supplies information on shaft position. If feedback potentiometer is required for other functions such as remote resistance indication, or with a DFC17 controller, a dual Potentiometer Kit must be used. Each potentiometer can serve only one function. For installation procedures and wiring of potentiometer, see Potentiometer Kit Instructions (WCAIM2067) or 75 Actuator instructions (WCAIM2013) or DFC17 instructions (WCAIM2026). These instructions can be obtained from your local distributor/supplier or online at [www.flowserve.com](http://www.flowserve.com).

Parts included in kit:

Item	Qty.	Description
1	1	Circuit Board
2	1	Mounting Plate
3	5	Spacers (.06")
4	2	Spacers (.25")
5	2	#4-40 x 1 1/4" F.H. Screws
6	3	#4-40 x 3/8" R.H. Screws
7	3	#4-40 Nuts
8	1	Insulator
9	3	Cable Ties (Not Shown)
10	1	Potentiometer Kit (Not Shown)
11	1	Wiring Label (Figure 2)
12	1	Wire—White (Not Shown)
13	1	Closed End Splice (Not Shown)

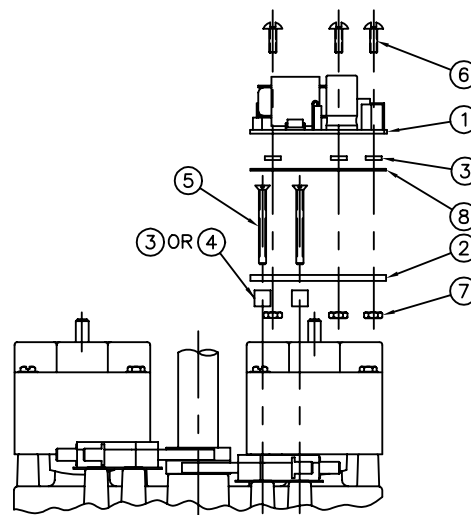
### 2. Installation

(See Figure 1.)

**NOTE:** This instruction sheet shows standard installation and wiring of a 4-75 Position Indicator only. For 25/30 75 actuator, mount 4-75 assembly on top of limit switch(es) using same procedure as shown below.

Remove the two mounting screws from right limit switch(es), as viewed from terminal strip. Place two spacers (4) (use two spacers (3) for M1 or M2 option) between limit switch and mounting plate (2), and fasten mounting plate in place with two longer flat head screws (5). Locate insulator (8) on top of mounting plate. Using three spacers (3) to separate circuit board (1) from mounting plate (2) and insulator (8), mount circuit board using #4-40 x 3/8" round head screws (6) and nuts (7). Check entire assembly and firmly secure all screws.

Figure 1—10-23 75 Installation



Worcester Actuation Systems

### 3. Wiring

(See Figure 2.)

**NOTES:** All wiring to terminal strip should be inserted only to mid-point of terminal strip.

When there are multiple wires going to terminal 1, use the short white wire included in kit. Connect it to terminal 1 and then splice it to the other white wires (common) using the closed end splice provided.

#### Internal Wiring

There is internal wiring between the actuator terminal strip, feedback potentiometer, and position indicator PC board. The white wire (common) from PC board is wired to terminal 1 on internal side; the brown wire (hot) from PC board is wired to terminal 2 on internal side. Connect feedback potentiometer wires to the 4-75 position indicator board terminal block (green to terminal 3, white/black to terminal 2, and purple to terminal 1).

Remove yellow wire from terminal 5 and brown wire from terminal 6, disconnect them from N.O. contacts of switches 1 and 2 and discard them. Output signal from PC board red wire (+) is wired to terminal 5 and black wire (-) is wired to terminal 6 on internal strip of terminal strip.

**NOTE:** Attach wiring diagram label, included with kit, on inside of cover, or modify existing label for the 4-75 option by marking terminal 5 "+", terminal 6 "-", and adding "4-20 mA output."

For actuator using a 4-75 Position Indicator with a DFC17 Controller, the red and black wires from the indicator board will have to be spliced directly to the external positive and negative output (Meter) wires, respectively.

**NOTE:** Prior to wiring, follow Position Indicator board output calibration instructions in Section 4.

#### External Wiring

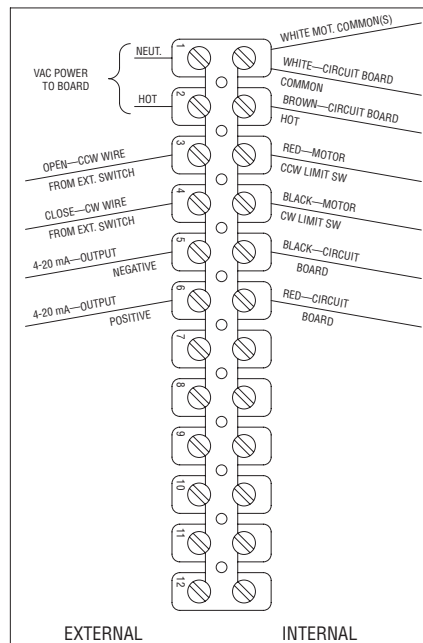
External wiring is between actuator terminal strip and outside power supply and various controls. Common wire of the power supply is wired to terminal 1 and hot wire of the power supply to terminal 2. The actuator motor windings are electrically powered through its own individual external single pole, double throw switch (supplied by customer); counterclockwise and/or "to open" wire is wired to terminal 3; clockwise and/or "to close" wire is wired to terminal 4, as shown in wiring diagram for actuator. An outside position indicator meter is wired with positive connection to terminal 5 and negative connection to terminal 6.

**NOTE:** External switch not needed when position indicator is used with DFC17 controller, as controller board will power motor windings.

Securely tighten all terminal screws. Secure all wires neatly with the cable ties (9). Keep wiring away from all rotating parts and ensure wiring is not pinched when actuator cover is installed.

Grounding wires should be connected to green-colored grounding screw (if present) on actuator base or to any base plate mounting screw in actuator.

Figure 2—Wiring of 4-75 120 VAC Position Indicator



## 4. Adjustment and Calibration

The feedback potentiometer has to be adjusted to obtain the proper resistance range. With the actuator either in the OPEN (full counterclockwise) or CLOSED (full clockwise) position, and **power off**, rotate the face gear, thus turning the potentiometer shaft, until the resistance between the white/black lead and the green lead (actuator full counterclockwise), or the white/black lead and the purple lead (actuator full clockwise), respectively, as measured by ohmmeter, is between 80 ohms and 90 ohms.

**NOTE:** It is not necessary to loosen or remove face gear snap ring(s) to rotate gear; it is a friction fit. If for any reason any snap ring is to be removed, do **not** overstretch it; use the minimum opening needed to allow it to slip over the gear.

Power the actuator to the opposite position from where resistance was measured. At this position, with **power off**, measure the resistance at the same terminals as stated above. The resistance reading should be greater than 700 ohms. If not, then power actuator back to original position and adjust pot again, as stated in paragraph above. If unsuccessful in getting proper resistance readings, pot is defective and should be replaced.

**NOTE:** For units with a DFC17 controller, do not use above instructions, as adjustment and calibration are accomplished through controller circuit board only. See DFC17 IOM (WCAIM2026).

To obtain proper 4-20 mA output, the indicator board output has to be calibrated. Using an ammeter connected to actuator terminals

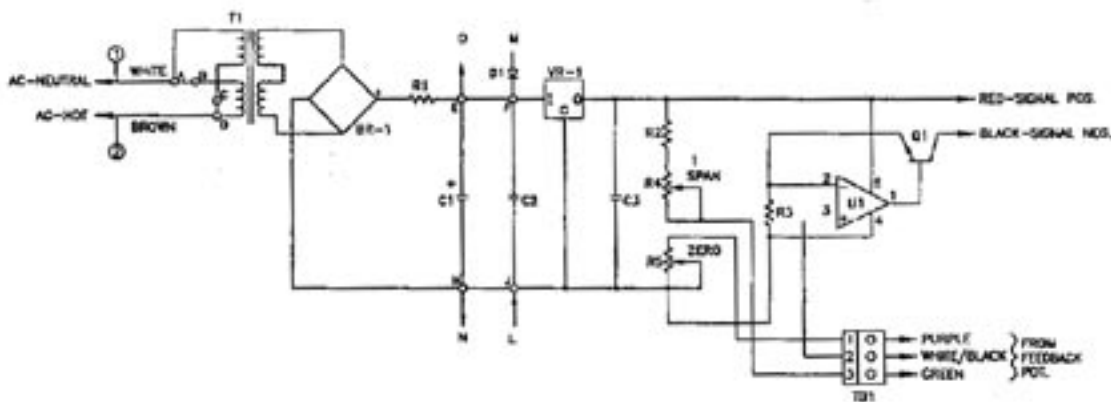
5 (positive) and 6 (negative)—or for DFC17 controller, connected directly to red and black wires of indicator board—adjust the two potentiometers R4 and R5 on the board. With the actuator in the closed position (0%), adjust R5 potentiometer (adjacent to the number “4” etched on the circuit board and closest to terminal block) to obtain 4 mA on the ammeter. Move the actuator to the open position (100%) and adjust R4 potentiometer (adjacent to the number “20” etched on the circuit board) to obtain 20 mA. Because adjustment of one potentiometer affects the other, repeat the procedure several times to obtain proper values.

**IMPORTANT:** The feedback potentiometer is calibrated for only one 90° quadrant of valve operation. If the output shaft is repositioned to another 90° quadrant—or if the output shaft is rotated a multiple of 360° from its original position, or if the position indicator is removed from the actuator—the feedback potentiometer will no longer be in calibration and must be recalibrated.

## 5. Repair

Schematic diagram in Figure 3 may be used for customer troubleshooting. If factory repair is necessary, contact factory and request an RMA (Return Material Authorization) number. After receiving a new circuit board, replace defective board (per instructions in section 2) and return it to factory with description of problem and application.

Figure 3—Wiring Schematic

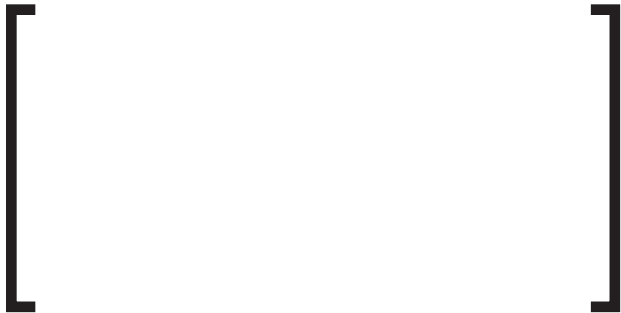




Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

**For more information about Flowserve Corporation, visit [www.flowserve.com](http://www.flowserve.com) or call USA 1-800-225-6989.**



**FLOWSERVE CORPORATION**  
1978 Foreman Drive  
Cookeville, TN38501  
Phone 931-432-4021  
Fax 931-432-5518  
[www.flowserve.com](http://www.flowserve.com)

(Part IOM 06525)  
FCD WCENIM2070-01 AQ 08/18  
Printed in USA.