INSTRUCTION MANUAL
INSTALLATION, OPERATION, AND MAINTENANCE

B-3724

REMOTE VALVE ACTUATOR CONTROLLER

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I. GENERAL DESCRIPTION

The B-3724 Remote Valve Controller provides the control to open and close Midland, ACF or Eagle brand angle valves. Midland's B-3715SW Air Actuator reports the valve brand to the controller which automatically selects a preset torque setting to close or open the valve. Also, the controller provides feedback as to whether the valve is opened or closed. These features simplify valve operation in addition to providing an active system to automatically close angle valves.

The B-3724 Remote Valve Controller uses an Allen Bradley MicroLogics Programmable Logic Controller to provide the main logic controls for the Remote Valve Actuator system.

Input power is 85-132 VAC. Panel display lamps and pushbuttons are all NEMA 4X corrosion resistant, capable of withstanding harsh outdoor conditions. A normally open contact, energized in the non-alarm state, is provided for external shutdown. This shutdown output is "opened" when the "Emergency Close" pushbutton is depressed or if any externally connected sensor contact is "opened".

Primary System Components are as follows:

B-3724 Remote Valve Actuator Controller
B-3724M Valve Actuator Manifold
B-3715SW Air Actuator

The B-3724 Remote Valve Controller provides pushbuttons to open and close the actuator, open/close valve position indicators, emergency close pushbutton and a system shutdown indicator. The system electronics can incorporate customer specific functionality (i.e. remote chlorine sensors to close valve upon chlorine detection, signals from a remote source to open and close the valve, etc.). Available options for the B-3724 include the ability to operate two angle valves, independently, per tank station, or a maximum of three angle valves, for 2 tank stations, simultaneously.

The B-3724 Remote Valve Controller is designed to operate with the B-3724M Valve Actuator Manifold. *The B-3724 system is engineered to CLOSE the unloading/loading angle valve upon loss of electrical power.*

The B-3724M Valve Actuator Manifold provides electric/pneumatic controls to operate the air actuators. The manifold assemblies include an air filter, regulators, lubricator, solenoid valves, air pressure switches and flow switches with readouts in an enclosed cabinet. This instrumented air manifold provides valve position feedback and facilitates system maintenance and troubleshooting.

II. SPECIFICATIONS

Primary Power:	85-132 VAC, 47-63 Hz, 2A
Operating Temperature:	32-130 °F
PLC:	Allen Bradley MicroLogics Suitable for use in Class I, Division 2 locations
Lights:	All lights rated NEMA 4 and/or 4X. POWER ON SHUTDOWN VALVE (1) - OPEN VALVE (1) – CLOSED VALVE (2) – OPEN VALVE (2) - CLOSED
Control Functions:	All pushbuttons rated NEMA 4 and/or 4X. VALVE 1 OPEN & CLOSE Pushbuttons RESET Pushbutton EMERGENCY CLOSE Pushbutton VALVE 2 OPEN & CLOSE Pushbuttons RESET Pushbutton EMERGENCY CLOSE Pushbutton
SHUTDOWN Inputs:	24 VDC. N.O. contact. Emergency Shutdown circuit must provide a closed contact under normal operating conditions.
Customer Specified Inputs:	Available upon request.
Customer Specified Outputs:	Available upon request.
Solenoid Control Voltage:	120 VAC
Enclosure:	NEMA 4X

III. INSTALLATION

A. General Wiring Installation

1. 120 VAC, 2A input power is required.

2. 120 VAC and 24 VDC interconnection wiring is required between the B-3724 Remote Valve Controller and the B-3724M Air Manifold.

3. See drawing 37X4(0)0F for wiring details.

B. Installation and Wiring Guidelines

1. Area Classification NEMA 4X enclosures are intended for installation in non-hazardous locations.

2. Field wiring should be installed in accordance with the National Electric Code as well as any applicable local codes.

3. Instrumentation cables approved for NEC Article 725, Class 2 and Class 3 Circuits are recommended.

IV. OPERATING INSTRUCTIONS

A. INITIAL POWER-UP

1. Turn manifold air supply OFF.
2. With all actuators NOT mounted on valves, apply AC system power.

Note: B-3724-1 Controllers have VALVE 1 components only.

System will perform a 2 second lamp test.

POWER ON lamp	ON
SHUTDOWN lamp	ON
MIDLAND (valve 1 & 2) lamp	ON
ACF (valve 1 & 2) lamp	ON
VALVE (1) OPEN and VALVE (1) CLOSED lamps	ON
VALVE (2) OPEN and VALVE (2) CLOSED lamps	ON

After 2 second lamp test is complete –

POWER ON lamp	ON
SHUTDOWN lamp	ON
MIDLAND (valve) lamp	OFF*
ACF (valve) lamp	ON*
VALVE (1) OPEN and VALVE (2) OPEN lamps	ON
VALVE (1) CLOSED and VALVE (2) CLOSED lamps	OFF

* The system default status is “ACF mode” (i.e. the ACF lamp is ON).

B. SYSTEM OPERATIONAL CHECK

C A U T I O N

Make sure all angle valves are CLOSED and all piping connections are secure and in place before initiating System Operational Test.

NOTE:

1. *The light status below will be indicated after adjustment of the inlet air pressure switch and valve closed feedback switches on the B-3724M Air Manifold.*
2. *Note: B-3724-1 Controllers have VALVE 1 components only, and step 10 can be excluded.*

1. Mount actuators on valve(s).

2. Open manifold air supply. Press RESET button.

SHUTDOWN lamp	OFF
VALVE (1) OPEN lamp	OFF
VALVE (1) CLOSED lamp	ON
VALVE (2) OPEN lamp	OFF
VALVE (2) CLOSED lamp	ON

If mounted on **MIDLAND** valve –

MIDLAND (valve 1) lamp	ON
MIDLAND (valve 2) lamp	ON
ACF (valve 1) lamp	OFF
ACF (valve 2) lamp	OFF

If mounted on an **ACF** valve –

MIDLAND (valve 1) lamp	OFF
MIDLAND (valve 2) lamp	OFF
ACF (valve 1) lamp	ON
ACF (valve 2) lamp	ON

(Depending on the angle valve brand on which the actuator is mounted, the corresponding light will be on throughout the remainder of the test (i.e. if the actuator is on a Midland or Eagle valve, the Midland light will remain ON.)

3. Depress VALVE (1) OPEN pushbutton

VALVE (1) Actuator starts to open valve	
VALVE (1) OPEN lamp	ON
VALVE (1) CLOSED lamp	OFF

4. Release VALVE (1) OPEN pushbutton
   VALVE (1) Actuator stops
   VALVE (1) OPEN lamp ON
   VALVE (1) CLOSED lamp OFF

   Note: If the valve reaches the upper limit of travel (i.e. fully open) before the "OPEN" pushbutton is released, the actuator will stall. Air will continue to flow through into the stalled actuator until the "OPEN" pushbutton is released.

5. Depress and release Valve (1) EMERGENCY CLOSE pushbutton
   VALVE (1) Actuator starts to close valve.
      Actuator will stall (i.e. stop rotating) when the valve is closed.
      Air will continue to flow through the stalled actuator until the "RESET" button is depressed.
   VALVE (1) OPEN lamp OFF
   VALVE (1) CLOSED lamp ON

6. Press VALVE (1) RESET.
   NOTE: System must be RESET after each EMERGENCY CLOSE or SHUTDOWN.

7. Depress VALVE (1) OPEN pushbutton and Release VALVE (1) OPEN pushbutton once Actuator has stalled (i.e. stop rotating)

8. Depress VALVE (1) CLOSED pushbutton
   VALVE (1) Actuator starts to close valve
   VALVE (1) OPEN lamp ON
   VALVE (1) CLOSED lamp OFF

9. Release VALVE (1) CLOSED pushbutton when actuator stalls on valve.
   VALVE (1) Actuator stops
   VALVE (1) OPEN lamp OFF
   VALVE (1) CLOSED lamp ON

   NOTE: If VALVE (1) CLOSED lamp is not on, the air manifold feedback settings or air pressure regulator must be checked. See B-3724M Air Manifold Manual.

10. Repeat steps 3-9 for VALVE (2).

C. CARGO LOADING/UNLOADING

NOTE

All startup procedures as recommended in Chlorine Institute Pamphlet 57: “Emergency Shut-Off Systems for Bulk Transfer of Chlorine” must be followed.

1. After mounting actuators on the angle valve(s), follow Steps 3-9 above to ensure proper system operation.

2. Upon completion of the System Operational Test, the B-3724 Remote Valve Actuator Controller is ready to open and close valves and activate the emergency SHUTDOWN system if required.

V. MAINTENANCE & TROUBLESHOOTING PROCEDURES

A. GENERAL

The Midland B-3724 Remote Valve Actuator Controller has been designed to provide trouble free service over a wide range of line voltages and temperature. Care should be taken however to protect the system from high voltage transients and excessive temperatures. If operating temperatures exceed those listed in the "Specifications" section of this manual, a heater must be installed. Contact the factory for assistance.

System maintenance & troubleshooting should be performed by an experienced electronic technician.

B. LAMP TEST

Upon initial power up, the B-3724 will perform a 2 second lamp test. All lights on the front panel will turn on for 2 seconds. If any lamp does not light during this time, the bulb should be replaced.

The green "POWER ON" light on the front panel is on if the power supply is providing 24 VDC output. If this light is not on when AC power is supplied to the panel, see the TROUBLESHOOTING section below.

C. TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
System will not operate. Green "POWER ON" Light on front panel is off.	AC main power OFF.	Check AC breaker.
	Excessive DC current. Power supply shutdown.	Determine cause of overload.
	Blown power supply internal fuse.	Replace power supply internal fuse. Green "POWER ON" light on front panel should be on.
Green "POWER ON" light is on but system still does not operate. OPEN and CLOSE pushbuttons inoperative, cannot RESET system.	PLC Malfunction.	Ensure "RUN" light on PLC is on.
	SHUTDOWN system contacts open.	Clear SHUTDOWN Condition. Ensure all shutdown inputs to the system are in the non-alarm condition.
	Insufficient air pressure. Inlet air pressure switch (P.S.-1) on B-3724M Air Manifold is OPEN.	Check air supply pressure. See B-3724M Air Manifold instructions for P.S.-1 settings.
Light will not switch between "MIDLAND" and "ACF" when mounted on the corresponding angle valve.	Cable to sensor on B-3715SW Air Actuator is open.	Check cable and connections to sensor.
	Sensor switch on B-3715SW Air Actuator has malfunctioned.	Check wiring terminations in B-3724 Remote Valve Controller Panel and B-3724M Air Manifold panel. Check for 24VDC.
VALVE CLOSED lamp does not turn on when valve is closed.	Lamp burned out.	Replace lamp.
	Flow switch and/or pressure switch on B-3724M out of adjustment.	See B-3724M Air Manifold instructions to check pressure and flow switch settings.
OPEN and CLOSE air solenoid inoperative	Open wiring to solenoid.	Check wiring from controller to air manifold.
	Solenoid coil open.	Replace solenoid.

VI. DRAWINGS

Drawing Number	Description
3724(0)0J	B-3724 Remote Valve Actuator System
3724(0)0I	B-3724 Control Panel for NEMA 4X Enclosure
37X4(0)0F	B-37X4 Valve Controller Interconnection Wiring Diagram
37X4(0)0H	B-37X4 Sub-panel assembly for NEMA 4X Enclosure

NOTE: Drawing numbers may be different due to customer-specific features.

VII. SPARE PARTS INFORMATION

The Midland Manufacturing Model B-3724 Remote Valve Controller is comprised of three major components. The small number of components allows for virtually maintenance free operation. However, in the event of a failure, the following parts should be stocked at the job site for minimum downtime.

Quantity	Part number	Description
1	Midland E3324	Power Supply
5	Midland E0704	Sylvania #757 Indicator Lamp

VIII. WARRANTY POLICY

STANDARD WARRANTY

Midland Manufacturing Corp. warrants that its products shall be free from defects in workmanship and materials, and shall conform to Midland Manufacturing Corp.'s published specifications, or other specifications accepted in writing, for a period of one (1) year after the product is placed into service, but no later than eighteen (18) months from the date of Midland Manufacturing Corp. shipment. Claims must be entered prior to the above dates.

LIMITS OF WARRANTY LIABILITY

This warranty does not apply to any products which have been subject to misuse, neglect, accident, modification, or otherwise installed outside the original application for which the Purchase of equipment was specified and intended. Midland Manufacturing Corp.'s sole obligation under its warranty shall be to repair, or supply a replacement for, the part, component or product, or issue credit at its sole discretion. Midland Manufacturing Corp.'s warranties and remedies are exclusive and are made expressly in lieu of all other warranties expressed or implied, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for use. Midland Manufacturing Corp. shall not be liable for damages due to delays in deliveries or use and shall in no event be liable for incidental or consequential damages of any kind, whether arising from contract, tort, or negligence, including but not limited to loss or profits, loss of customers, loss of goodwill, overhead or other like damages.