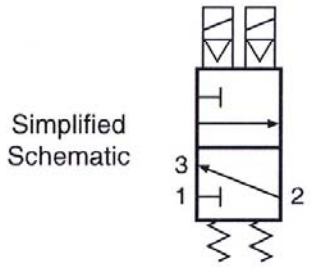
LEWIS AUTOMATION PTY LTD

New Product

Series DM¹E

Size 2 Control Reliable Double Valves with Dynamic Monitoring



Model Number*	Port Size In-Out	Port Size Exh.	C_v In-Out	C_v Out-Exh.	Weight lbs (Kg)
DM1ENA20**31	1/4	1/2	1.34	2.43	5 (2.27)
DM1ENA21**31	3/8	1/2	1.92	2.43	5 (2.27)

* NPT port threads. For BSPP threads , replace "N" in the model number with a "D".
** Insert voltage code: "A" = 24 VDC, "B" = 110 VAC, "C" = 220 VAC, "D" = 12 VDC.

This valve is not designed for controlling clutch/brake mechanisms on mechanical power presses.

FEATURES:

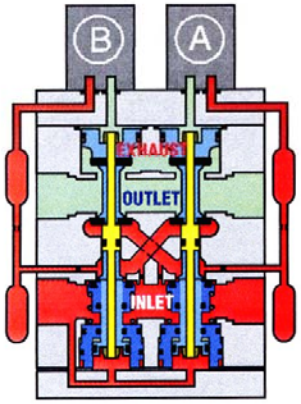
- **Dynamic Monitoring:** Monitoring and air flow control functions are integrated into two identical valve elements for CAT 3 applications. The valve exhausts downstream air if asynchronous movement of valve elements occurs during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply. If the abnormality clears itself, the valve will return to the ready-to-run state; there is no memory of the abnormal behavior, as in ROSS' DM²®E and DM²®C products that require an intentional reset following lock-out.
- **Basic 3/2 Normally Closed Valve Function:** Dirt tolerant, wear compensating poppet design for quick response and high flow capacity. Teflon® back-up rings on pistons to enhance valve endurance – operates with or without inline lubrication.
- **Ready-to-run:** If an abnormality clears itself upon the removal of electricity to both solenoids, it will be ready-to-run again. It does not remember the abnormality & stay in a locked-out state until intentionally reset. Therefore, cumulative abnormalities may go undetected.
- **Status Indicator:** The above products include a pressure switch with both N.O. & N.C. contacts to provide status feedback to the control system indicating whether the valve is in the "ready-to-run" condition or has experienced abnormal function. This indicator only reports status it is not part of a lockout function.
- **Silencers:** All models include high flow, clog resistant silencers.
- **Mounting:** Inline mounted – with BSPP or NPT pipe threads. Inlet and outlet ports on both sides provide for flexible piping (plugs for unused ports included).

APPLICATIONS:

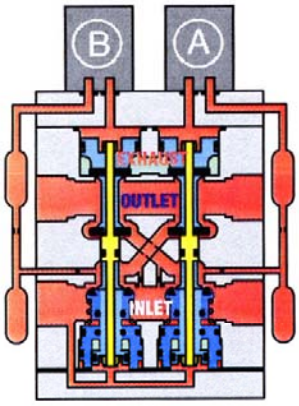
Category 3 applications - e.g. Air Dump/Release

Overview of *DM*[1]E Double Valve Function

Valve de-actuated (ready-to-run):
The flow of inlet air pressure into the crossover passages from the inlet chamber is restricted by orifices that allow air pressure to bypass the lower inlet poppets. Flow is sufficient to quickly pressurize the pilot supply/timing chambers on both sides A and B. The upper inlet poppets prevent air flow from the crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the de-actuated position. (Internal air passages shown out of the valve body for clarity.)



Valve ready-to-run.

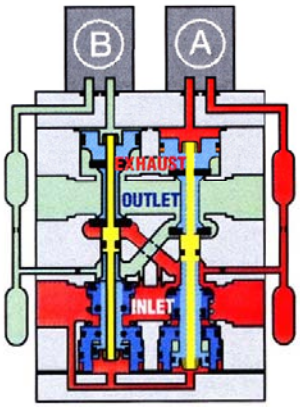


Valve actuated.

Valve actuated:
Energizing the pilot solenoids simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated position, where inlet air flow to outlet is open and both exhaust poppets are closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. De-energizing the main solenoids causes the valve elements to return to the ready-to-run (de-actuated) position.

Asynchronous operation:
If the valve elements operate in a sufficiently asynchronous manner on ACTUATION, the valve will shift into a position where one crossover and its related timing chambers will be exhausted, and the other crossover and its related timing chambers will be pressurized.

In the illustration, side B is in the de-actuated position, but has no pilot air available to actuate with and has full pressure on its upper and lower inlet poppets and return piston to hold it in place. Inlet air flow on side B into its crossover is restricted and flows through the open upper inlet poppet on side A, through the outlet into the the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure.

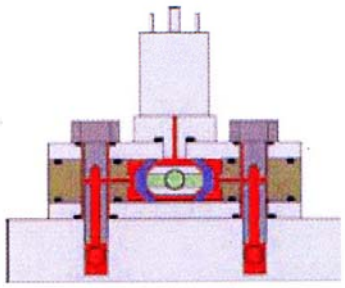


Valve in restricted outlet to exhaust state.

Once the main solenoids are de-energized, actuating pressure is removed from the top of the main pistons and then the lower inlet poppet return spring along with inlet air pressure acting on the side A return piston will push side A back into the de-actuated position. Inlet air pressurizes the crossovers and volume chambers. Pressure in the crossovers helps hold the upper inlet poppets on seat. The valve will then be in the ready-to-run position. On the next attempt to actuate normally, if side B is still unable to actuate synchronously with side A, the same sequence of events described above will occur again.

WARNING:
If asynchronous operation occurs while DE-ACTUATING, the pilot supply/timing chambers on one side will still be exhausted as described above. However, this could be a temporary situation because the cause of the asynchronous operation may be able to correct itself allowing the stuck or slow acting side of the valve to eventually move back into the de-actuated position. Once the slow or stuck side has de-actuated, the pilot supply/timing chambers that were exhausted will then repressurize. If an external monitoring system is only checking the status indicator periodically this fault signal could be missed. The machine's safety system must be designed to ensure that this does not cause a hazardous situation.

Status indicator:
The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve operation is sufficiently asynchronous or inlet pressure is removed. This device is not part of the valve lock-out function, but, rather, only reports the status of the main valve.


Status indicator in normal ready-to-run position.

STANDARD SPECIFICATIONS

Pilot Solenoid Power Consumption (each solenoid): 6.0 W on DC; 13.6 VA inrush and 8.5 VA holding on AC.

Solenoids: According to VDE 0580. Enclosure rating according to DIN 400 50 IP 65. Connector socket according to DIN 43650 Form A. Three solenoids, rated for continuous duty.

Standard Voltages: 110 VAC, 50/60 Hz; 24 VDC.

Temperature Range:

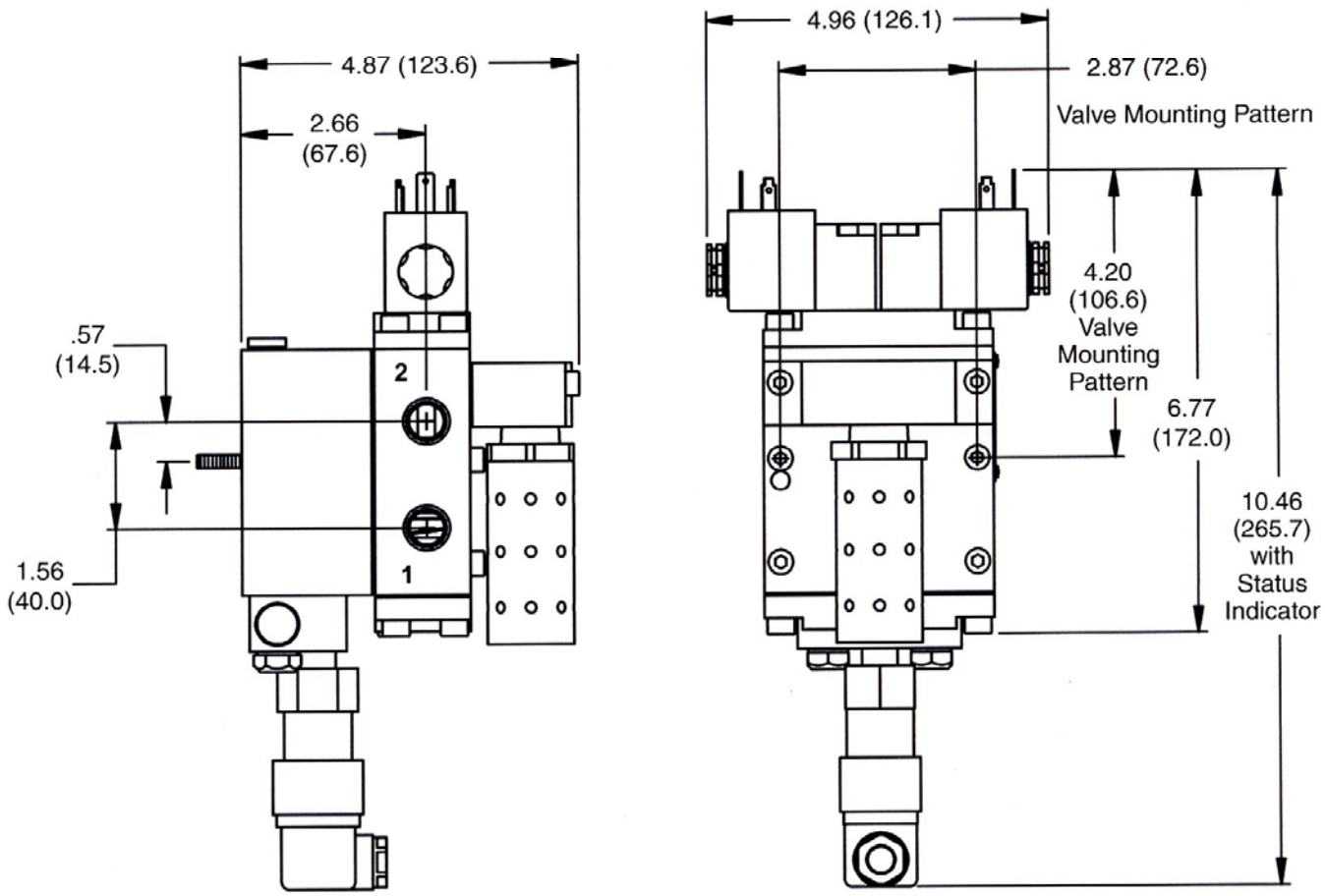
Ambient: 15 to 122° F (4 to 50° C).
Media: 40 to 175° F (4 to 80° C).

Flow Media: Filtered (5 micron recommended), lubricated or unlubricated air (mineral oils according to DIN 51519, viscosity classes 32-46).

Inlet Pressure: 30 to 116 psig (2 to 8 bar).

Pressure Switch (Status Indicator) Rating: Contacts - 5 amps at 250 volts AC, or 5 amps at 30 volts DC.

DIMENSIONS – inches (mm)



Series DM[1]E
Control Reliable Size 2

Accessories and Replacements Parts

ELECTRICAL CONNECTORS

Wired connectors have a 2-meter (6 1/2 ft.) cord with three 18-gauge conductors. Cord is available in either 6-mm or 10-mm diameter and with or without indicator light.

	Without Light	With Light 24 VDC	With Light 110 VAC
Wired with 6-mm cord	**721K77**	**720K77-W**	**720K77-Z**
Wired with 10-mm cord	**371K77**	**383K77-W**	**383K77-Z**
For threaded conduit	**723K77**	**724K77-W**	**724K77-Z**
For use with drop cord (cord not included)	**937K87**	**936K87-W**	**936K87-Z**

For additional wiring kit accessories, please see Form NPS011 available at www.rosscontrols.com/rosslit.htm

STATUS INDICATOR

The Status Indicator pressure switch actuates when the valve is in a ready-to-run condition and de-actuates when the valve is in a lockout condition or when the inlet air pressure has been removed. Although, the valves can be purchased with this option already installed, the Status Indicator can be purchased separately by ordering part number: **Y670B94**

For more information on control-reliable valves or other pneumatic safety equipment, please contact our office or visit our website: