



# LOW PRESSURE MOTOR VALVES

Models MT, DA, ADA

Instruction Manual: IME2-MT-DA



**MT**  
Cast Iron, Ductile Iron,  
& Steel  
Normally Open



**DA**  
Cast Iron, Ductile Iron,  
& Steel  
Normally Closed



**DA**  
Cast Iron, Ductile Iron,  
& Steel  
Normally Closed

## DESCRIPTION:

Kimray low pressure motor valves are diaphragm operated valves designed to control flow in liquid or gas systems up to 300 psig (20.7 bar) working pressure from a 30 to 40 psig ( 2.0 to 2.7 bar) pneumatic actuating signal. They can be used for oil and water dump valves on low pressure separators and as burner valves for throttling or snap action service.

The actuator is available in either Pressure Opening, (normally closed) or Pressure Closing (normally open) configurations. Valve model designations indicate DA (direct acting) and ADA (adjustable double acting) for Pressure Opening or MT for pressure closing actuators.

Because of the nominal pressure range, a single O-Ring seal with back ups provides the packing for the stem.

The low pressure motor valves feature equal percentage trim for throttling service. The valve's full line-sized opening provides high flowing capacity. This large orifice allows the valve to be operated in on/of mode.

A name tag is attached to the actuator housing on each valve. The name tag lists the serial number, model number, and pressure rating. An additional tag is installed to indicate any special trim options, should they be required.

When servicing valves, always use only Kimray replacement parts. For specific model numbers, part numbers, and repair kit numbers, refer to the Kimray Catalog, Section E2, or to the packing slip which is enclosed with each valve.

## AVAILABLE MODELS

**Connection Size:** Model MT & DA 1", 2", 3", 4", 6"  
Model ADA 1", 2"

**Connection Style:** NPT or Flanged

**Body Style:** Thru

**Actuation:** Pressure Opening or Pressure Closing

**Body Material:** Cast Iron, Ductile Iron, Steel

## SPECIFICATIONS

**Normal Service:** Liquids or Gas

### Features:

- Equal Percentage trim for throttling service
- Can be used for on / off service
- Full line size port for high capacity
- Reduced orifice trim is available
- Soft seat for Class VI shut-off
- Available in Pressure Opening or Pressure Closing

### Construction Materials:

BODY	CAST IRON	DUCTILE IRON	STEEL
STEM	303 Stainless	303 Stainless	303 Stainless
PLUG	Ductile Iron	Ductile Iron	Steel
SEAT	Nitrile	Polyurethane	Polyurethane
DIAPHRAGM	Nitrile/Nylon	Nitrile/Nylon	Nitrile/Nylon

### Maximum Controlled Pressure:

Actuation	Orifice	Valve Size	Controlled Pressure
MT Pressure Closing	Line Size	1" - 6"	2 X Signal Pressure
	Reduced Port	1" 2" - 6"	8 X Signal Pressure 5 X Signal Pressure
DA Pressure Opening	Line Size	1" 2" - 4" 6"	10 psi 0.7 bar 22 psi 1.5 bar 5 psi 0.3 bar
		Reduced Port	1" 2" - 4" 6"
ADA Pressure Opening	Line Size	1" 2"	40 psi 2.7 bar 250 psi 17.2 bar
		Reduced Port	1"



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### SPECIFICATIONS - Continued

#### Body End Connections & Pressure Ratings:

##### Body Pressure Rating

Cast Iron:	1", 2", 3", 4" NPT .....	175 psig (12 bar)
	2", 3", 4" ANSI 125 Flanged .....	175 psig (12 bar)
Ductile Iron:	1", 2", 3", 4" NPT .....	300 psig (20.7 bar)
	2", 3", 4" ANSI 150 RF Flanged ...	250 psig (17.2 bar)
Steel:	2", 3", 4" ANSI 150 RF Flanged ...	285 psig (19.6 bar)

#### Normal Operating Temperature:

-20<sup>o</sup> to 200<sup>o</sup> F

-29<sup>o</sup> to 93<sup>o</sup> C

#### Options:

Elastomers: HSN, Viton®, Afplas®

Trim Material: 316 Stainless Steel internal parts

#### Installation:

Normally horizontal

### INSTALLATION:

#### BEFORE INSTALLATION:

Be sure you fully understand the application, operation, and connection of the device before installing.

#### WARNING:

Only trained personnel should install or service a control valve. Control valves and other control devices should be installed, operated, and maintained in accordance with international codes and regulations, manufacturer's instructions, and proven best practices.

Personal injury, equipment damage, property damage, leakage or bursting of pressure-containing parts may result if the valve is overpressured or installed where service conditions could exceed the limits given in the SPECIFICATIONS section.

Overpressure protection should also be provided if the valve inlet pressure may exceed the safe working pressure of the equipment downstream.

To avoid injury or damage, install pressure-relieving or pressure limiting devices to prevent service conditions from exceeding those limits. Consult the appropriate code, regulations, or standards.

Consideration should be given to the potential risk of injury or property damage due to escaping fluid. To avoid such risks, install the regulator in a safe location.

Inspect the openings in the valve for foreign material and clean the pipe lines to remove scale, chips, and debris.

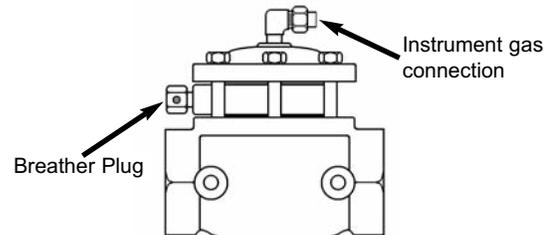
Install the valve with the arrow on the body pointing in the direction of flow. The arrow signifies that the device will operate properly in the direction of flow indicated and will not necessarily prevent flow in the opposite direction. If conditions indicate the possibility of backward flow you may wish to install check valves.

A person should never stand directly over or in front of a valve when the system is pressurized. Never look directly into a valve in a pressurized system. The valve could suddenly open, blowing gas, dirt, metal particles, or other debris into the person's face and eyes.

Install the valve using good piping practice. For flanged bodies use a suitable gasket between the body and the pipeline flanges. For threaded (NPT) bodies, use TFE tape or pipe thread sealant on external pipe threads.

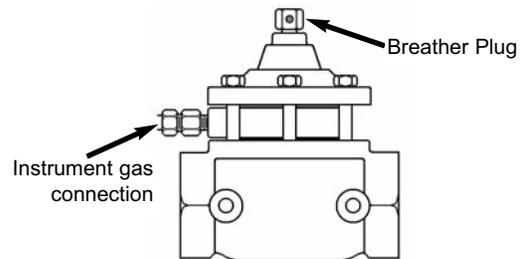
The flanged valve bodies are rated ANSI class 125 or 150. Do not install the valve in a system where the working pressure can exceed ANSI class ratings.

Connect instrument gas to the actuator connection. The maximum required instrument gas pressure is 30 psig (2 bar) to 40 psig (2.7 bar).

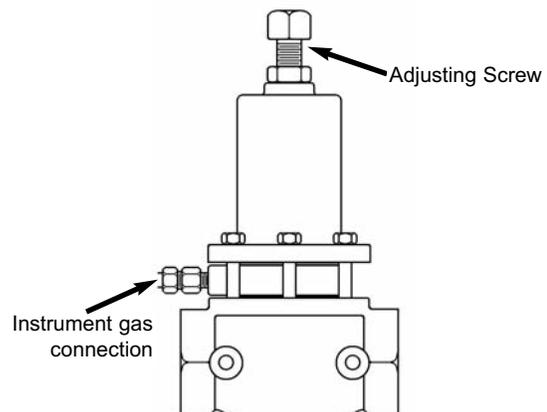


**Model MT Pressure Closing Valve**

**MT Pressure Closing Valve:** Remove the plastic stopper from the tapped hole in the top of the bonnet (1" valve) or the lip of the bonnet 2"-6" valve, and install a tubing fitting (not provided on 2"-6" valve). Tubing (not provided) must be installed from your source of instrument gas. The fitting in the lip of the housing immediately below the bonnet is a breather plug.



**Model DA Pressure Opening Valve**



**Model ADA Pressure Opening Valve**

**DA & ADA Pressure Opening Valve:** Remove the plastic stopper from the tapped hole in the lip of the housing immediately below the bonnet and install a tubing fitting (not provided on 2"-6" valve). Tubing (not provided) must be installed from your source of instrument gas. The fitting at the top of the bonnet on the model DA valve is a breather plug.



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### ADJUSTMENT: Model ADA Only

Loosen the locknut before adjusting pressure. Clockwise rotation of the adjusting screw increases set point pressure. Counter-clockwise rotation of the adjusting screw reduces set point pressure. Monitor the adjusted pressure during adjustment. Tighten the locknut after adjusting pressure.

### START-UP & TEST:

With installation completed and appropriate relief and check valves installed and set, slowly open the upstream and downstream shutoff valves. In order to test the function of the valve allow only a small amount of upstream fluid to flow through the upstream shutoff valve. Check for proper valve operation by cycling the actuator several times.

### WARNING:

Before performing any service be sure that the valve is fully isolated and that all pressure upstream and downstream has been relieved. Use bypass valves or fully shut off the process.

Be sure that any operating or instrument gas lines have been disconnected.

Never assume that a check valve is fully blocking the downstream line.

Never tighten any fitting or the main connections to the valve while there is pressure on the line.

### NOTE:

When a gasket seal is disturbed during disassembly a new gasket should be installed during reassembly to ensure proper sealing.

### MAINTENANCE:

Maintenance should be performed on a regular basis. An initial inspection interval of 12 months is recommended. Depending on the service conditions and the condition of the valve, the inspection interval may be decreased or increased.

**Warning: If the valve leaks fluid, it indicates that service is required. Failure to take the valve out of service immediately may create a hazardous condition.**

The valve can be repaired without being removed from the piping.

Detailed repair instructions are available for your specific valve.

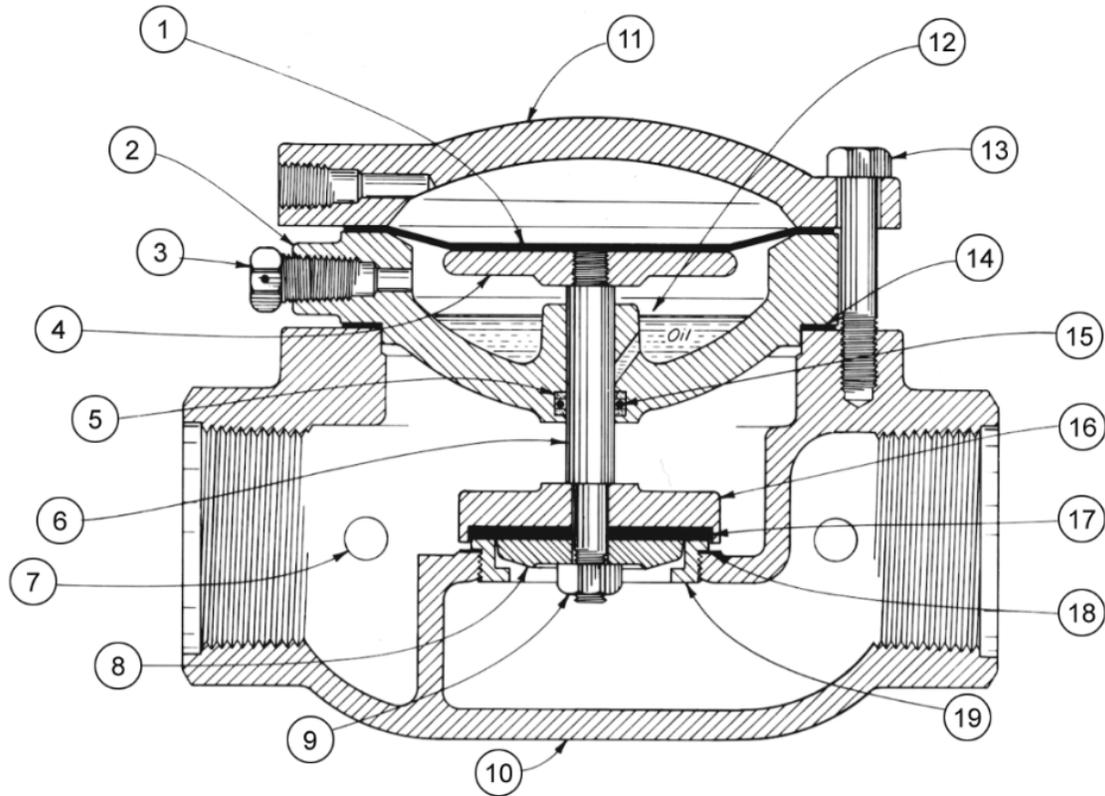
Repair Kits are available. Consult the Kimray Catalog, Section E2, or the packing slip which is enclosed with each valve for the correct Repair Kit number.

### REPAIR HINTS:

- Make sure there is minimum "play" of valve stem in the stem guide located in the upper end of the cylinder.
- Evenly tighten the screws which hold the bonnet to the valve body.
- Diaphragms will harden with age.

### TROUBLE SHOOTING:

SYMPTOM	POSSIBLE CAUSE
Fluid leaking from actuator	Stem packing or the stem itself is worn.
Fluid leaking from body/actuator joint.	Screws attaching actuator to body are loose.  Gasket between body and actuator is worn or damaged.
Valve will not cycle when instrument air is applied to actuator.	Diaphragm is ruptured or torn.  Valve stem is broken.  Diaphragm plate is loose.  Actuator vent is plugged.
Excessive trim leakage with the valve closed.	Debris is interfering with seat contact.  Insufficient shut-off force from actuator.  Seat surfaces are worn or damaged.
Instrument gas leaks from outer edge of diaphragm housing.	Screws holding the bonnet to the middle housing are loose.
Instrument gas leaks from actuator vent.	Diaphragm is torn or ruptured.
Valve stem movement is sticky or jerks.	Valve stem is bent or misaligned.



This is a general representation of a Low Pressure (Pressure Closing) Motor Valve model MT.  
 For specific parts and their orientation refer to the Kimray Catalog or the packing slip which is enclosed with each regulator.

**Key Description**

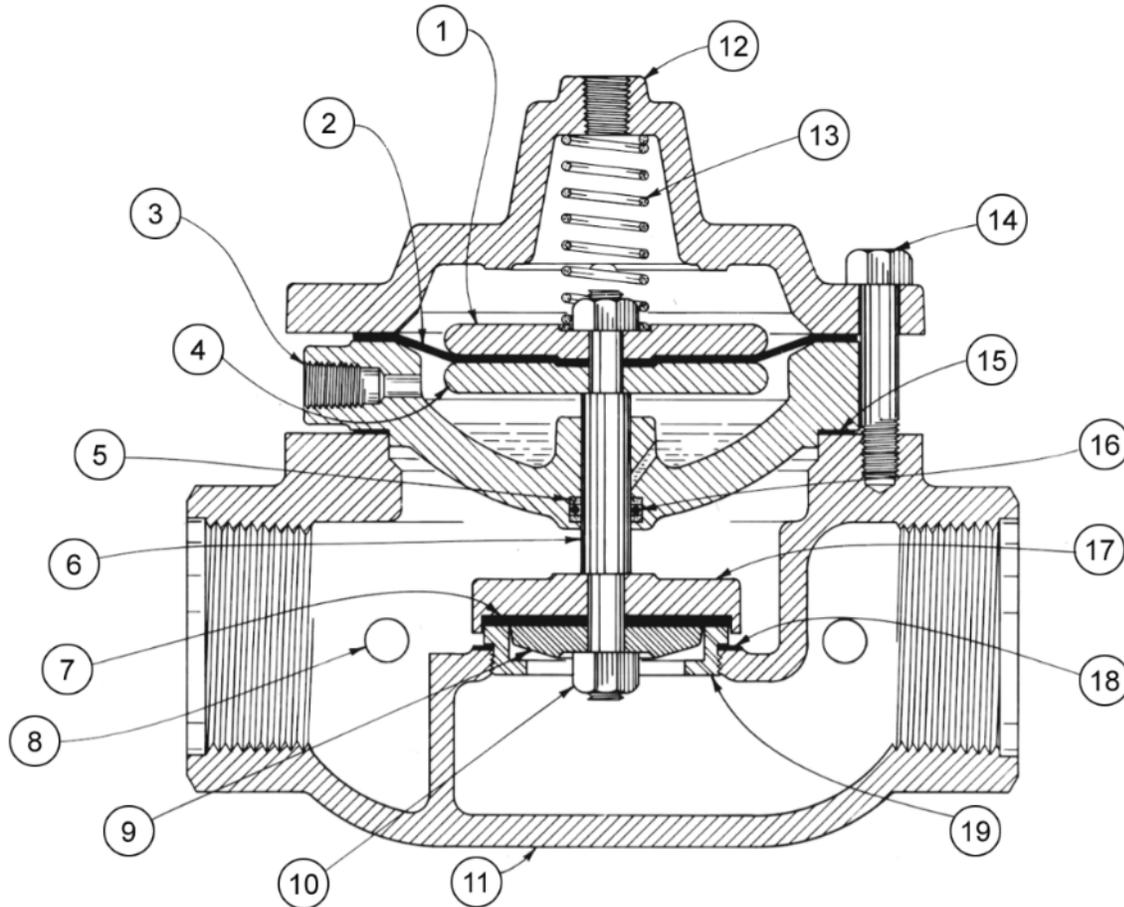
- 1 Diaphragm, nylon reinforced nitrile
- 2 Housing, cast iron, ductile iron, steel
- 3 Breather Plug, aluminum
- 4 Diaphragm Plate, ductile iron
- 5 Back Up, leather
- 6 Stem, stainless steel
- 7 Plug, plated steel
- 8 Ratio Plug, ductile iron
- 9 Lock Nut, plated steel
- 10 Body, cast iron, ductile iron, steel

**Key Description**

- 11 Bonnet, cast iron, ductile iron, steel
- 12 Spring, optional not shown
- 13 Screw, plated steel
- 14 Gasket
- 15 O-Ring, nitrile
- 16 Seat Disc, ductile iron
- 17 Seat, \*nitrile, \*\*polyurethane
- 18 Gasket
- 19 Removable Seat, Ductile Iron

\*Cast Iron Valves

\*\*Ductile Iron & Steel Valves



This is a general representation of a Low Pressure (Pressure Opening) Motor Valve model DA.  
 For specific parts and their orientation refer to the Kimray Catalog or the packing slip which is enclosed with each regulator.

**Key Description**

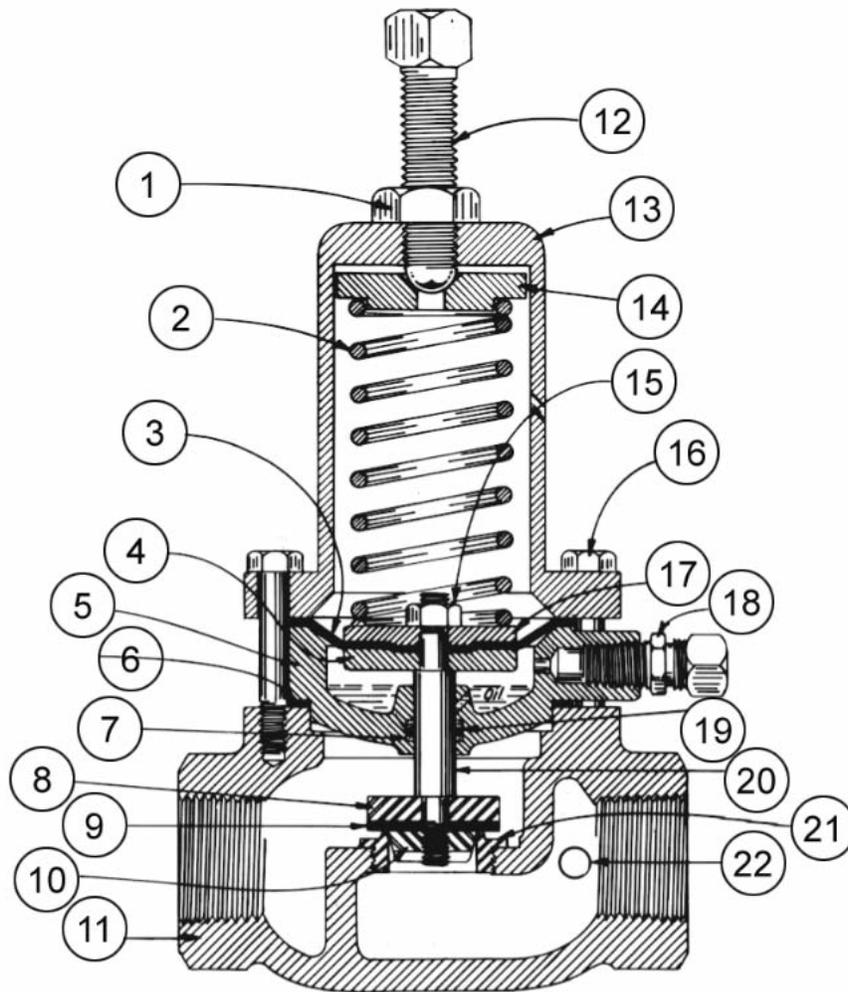
- 1 Upper Diaphragm Plate, ductile iron
- 2 Diaphragm, nylon reinforced nitrile
- 3 Housing, cast iron, ductile iron, steel
- 4 Lower Diaphragm Plate, ductile iron
- 5 Back Up, leather
- 6 Stem, stainless steel
- 7 Seat, \*nitrile, \*\*polyurethane
- 8 Plug, plated steel
- 9 Ratio Plug, ductile iron
- 10 Lock Nut, plated steel

**Key Description**

- 11 Body, cast iron, ductile iron, steel
- 12 Bonnet, cast iron, ductile iron, steel
- 13 Spring
- 14 Screw, plated steel
- 15 Gasket
- 16 O-Ring, nitrile
- 17 Seat Disc, ductile iron
- 18 Gasket
- 19 Removable Seat, Ductile Iron

\*Cast Iron Valves

\*\*Ductile Iron & Steel Valves



This is a general representation of a Low Pressure (Adjustable Pressure Opening) Motor Valve model ADA. For specific parts and their orientation refer to the Kimray Catalog or the packing slip which is enclosed with each regulator.

**Key Description**

- 1 Nut, plated steel
- 2 Spring
- 3 Diaphragm, nylon reinforced nitrile
- 4 Lower Diaphragm Plate, steel
- 5 Housing, cast iron, ductile iron
- 6 Gasket
- 7 Back Up, leather
- 8 Seat Disc, steel
- 9 Seat, polyurethane
- 10 Ratio Plug, stainless steel
- 11 Body, cast iron, ductile iron

**Key Description**

- 12 Screw, plated steel
- 13 Bonnet, steel
- 14 Spring Plate, plated steel
- 15 Lock Nut, plated steel
- 16 Screw, plated steel
- 17 Upper Diaphragm Plate, steel
- 18 Connector, \*brass, \*\*steel
- 19 O-Ring, nitrile
- 20 Stem, stainless steel
- 21 Removable Seat, steel
- 22 Plug, plated steel

\*Cast Iron Valves  
 \*\*Ductile Iron Valves