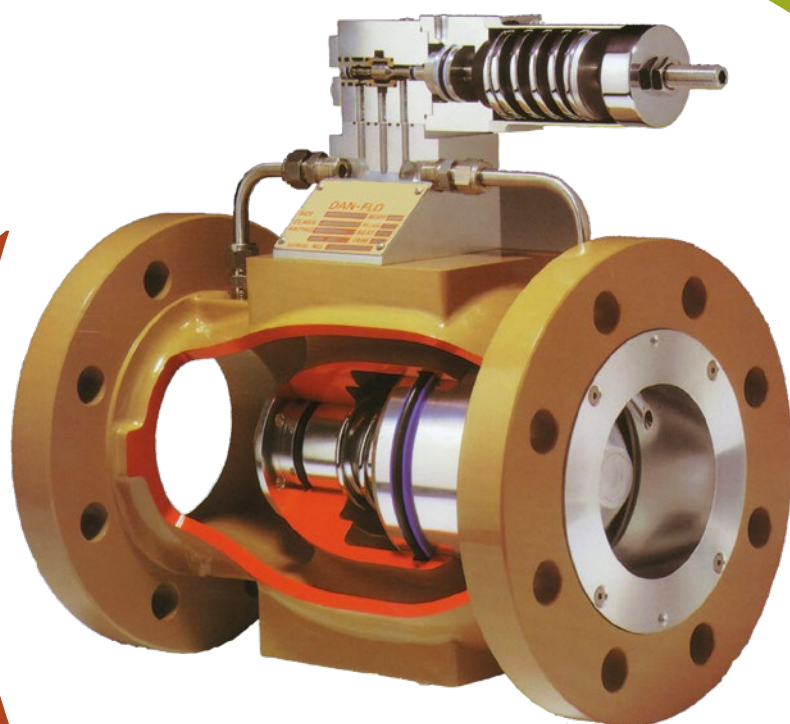
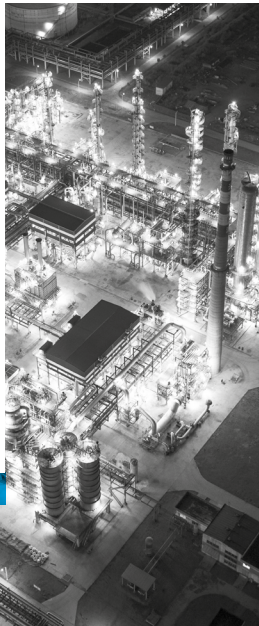


## DANFLO FAMILY OF CONTROL VALVES

OM&J VALVE®



M&J Valve was founded in 1962 by Marvin Grove and has been a leader in the pipeline valve industry since its inception. Now part of Celeros Flow Technology. The M&J Valve brand meets or exceeds the quality standards of our customers and the valve industry. With a product offering of slab and expanding through-conduit gate valves, axial surge valves and rotary control valves, piston and swing check valves. Celeros can provide a wide variety of flow control solutions for liquid, geothermal and gas markets. This combination of products, technical know-how and field experience has allowed for a history of product innovation which has positioned Celeros in a leadership position within the valve industry.



# DANFLO 400 SERIES

## PRINCIPLE OF OPERATION

A 400 Series DANFLO valve, in its simplest form, consists of a dynamically balanced-plug assembly that slides back and forth easily and rapidly to open, close, and throttle.

- Pressure in the plug cavity closes the valve.
- With no pressure in the cavity, the valve opens.

Pressures are applied through three ports: upstream, downstream, and to the plug cavity “behind the plug.” Downstream port provides for venting plug-cavity pressures rapidly to speed up valve response. The port leads to the point of lowest internal pressure in the valve.

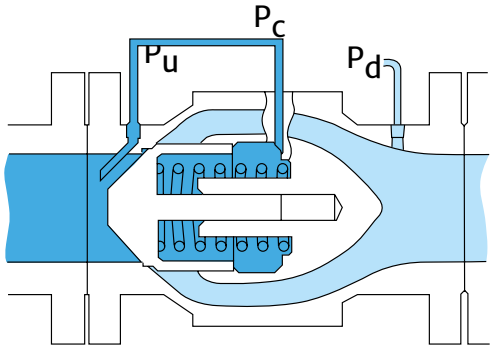
For convenience, the ports (and related pressures) are identified:

Pu = Pressure upstream  
Pc = Pressure in plug cavity  
Pd = Pressure downstream

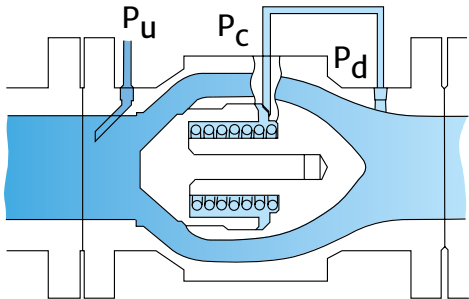
## TYPICAL VALVE ACTION

Pc is connected to Pu. This equalizes pressures on upstream and downstream faces of the plug. The internal-spring force closes the valve.

By connecting Pc to Pd the plug cavity is vented. Upstream line pressure overcomes the spring force, and the plug is forced open.



Ports Pu and Pc connected. Upstream pressure is equalized across the valve. Spring pressure forces plug to seat VALVE CLOSED.



Ports Pc and Pd connected. A differential pressure exists across the plug Upstream pressure greater than mechanical spring pressure moves the plug downstream – away from the seat – VALVE OPEN

NOTE: CAVITATION AND LOW-NOISE TRIM AVAILABLE	BODY STYLE 41 PILOT OPERATED	SIZE (IN)	2	3	4	6	8	10	12	16
		SIZE (MM)	50	75	100	150	200	250	30	400
		CV (1)	120	330	480	1200	1900	3100	4200	7630
		(1) The Volume of water in GPM at 60°F that will flow with 1 psi pressure drop across the valve.								
		MODEL N. & PRESSURE RANGES	CONTROL FUNCTION		SIMPLIFIED SCHEMATIC		PRINCIPAL APPLICATION			
		10 ANSI 150-1500	Pressure Reducing				Pressure control in process streams and pipelines. Over-pressure protection of meters, manifold systems, etc.			
BODY STYLE 42		20 ANSI 150-1500	Back Pressure/ Pressure Relief				Hold back pressure for pump, meter, etc. Pressure relief and control of line-pressure surges.			
		35 ANSI 150-1500	Minimum Differential Pressure				Pump ΔP and ΔP by-pass control; also strainers, filters. Vapor-pressure control (LPG and similar products)			
		40 ANSI 150-1500	Surge Relief (Nitrogen Loaded)				Protect pipeline, pumps, and other devices from transient surge overpressures.			

## PILOT OPERATION

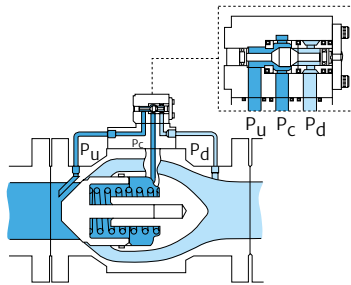
### 400 Series – Body Style 41

The pilot connects Pc to either Pu or Pd to close or open the valve. The connection is made in the pilot by an internal poppet that shuttles back and forth depending on whether force from the pressure provided by a “sense line” is larger or smaller than pilot spring force. (Differential-pressure pilots are also available.)

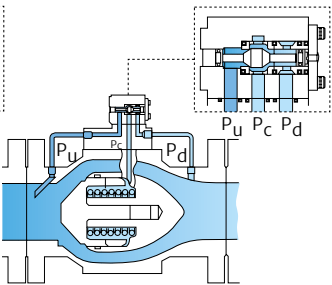
An easy way to remember how the pilot works is that the valve, after the initial start-up sequence, will normally be closed if the spring “points” upstream (back-pressure or relief operation), normally open if “pointed” downstream (pressure-reducing service).

Use of the pilot is therefore:

- “Point” the spring so the valve is normally open or closed, as desired.
- Connect the “sense line” upstream or downstream to “sense” the pressure you want to actuate the pilot.



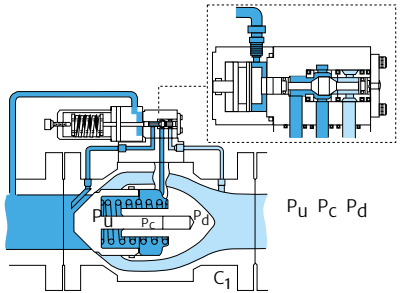
**Poppet right**  
Pressure differential is created  
Plug moves left  
**VALVE IS CLOSED**



**Poppet left**  
Pressure is equalized across the plug,  
Plug moves right  
**VALVE IS OPEN**

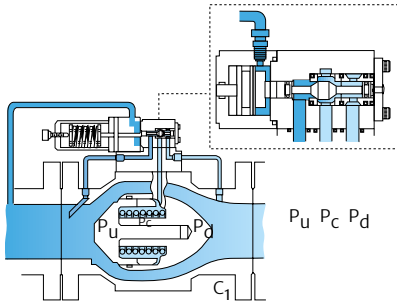
### Pressure drop in pilot chamber

- Mechanical spring pressure is greater
- Poppet moves right
- Valve plug moves left
- VALVE IS CLOSED.

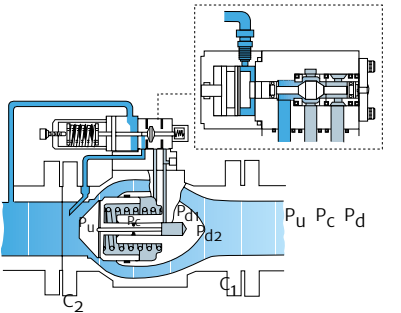


### Pressure rise

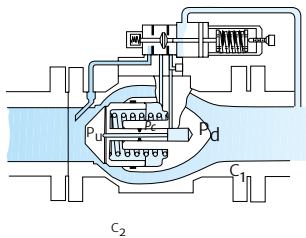
- Pressure in the sensing unit is greater than the mechanical spring force
- Poppet moves left
- Valve plug moves right
- VALVE IS OPEN



Velocity is higher and pressure is lower at point C2 than it is at point C1. In regulating service, plug chamber is exhausted to point C2 for faster response to changing pressure.



**IMPORTANT NOTE:** Reversing the direction on the DANFLO pilot sensing unit reverses the direction of valve plug response.



### In pressure reducing/regulating conditions

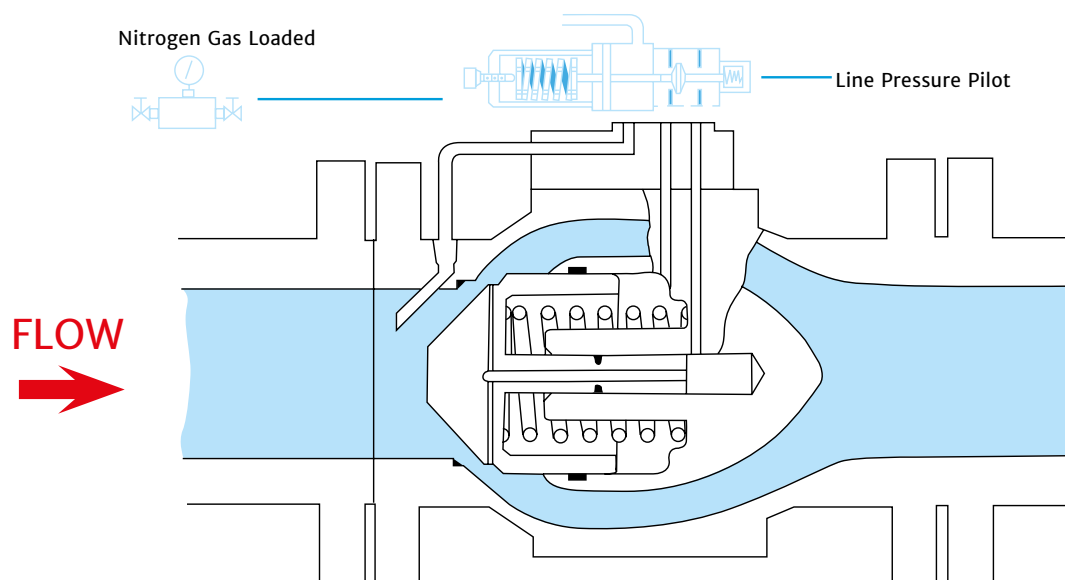
- Operational characteristics are reversed
- A drop in pressure downstream
- Poppet moves left
- Valve plug moves right
- VALVES IS OPEN

| SPEED  
| EXCELLENCE  
| PARTNERSHIP

**M&J VALVE®**

## THE VERSATILE, EFFICIENT, COST-EFFECTIVE DANFLO CONTROL VALVE

400 SERIES (Illustrated) For use with pilots and controllers MODELS 10, 20, 35 & 40



Two basic designs with balanced, guided plug assemblies

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Houston, TX 77041

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