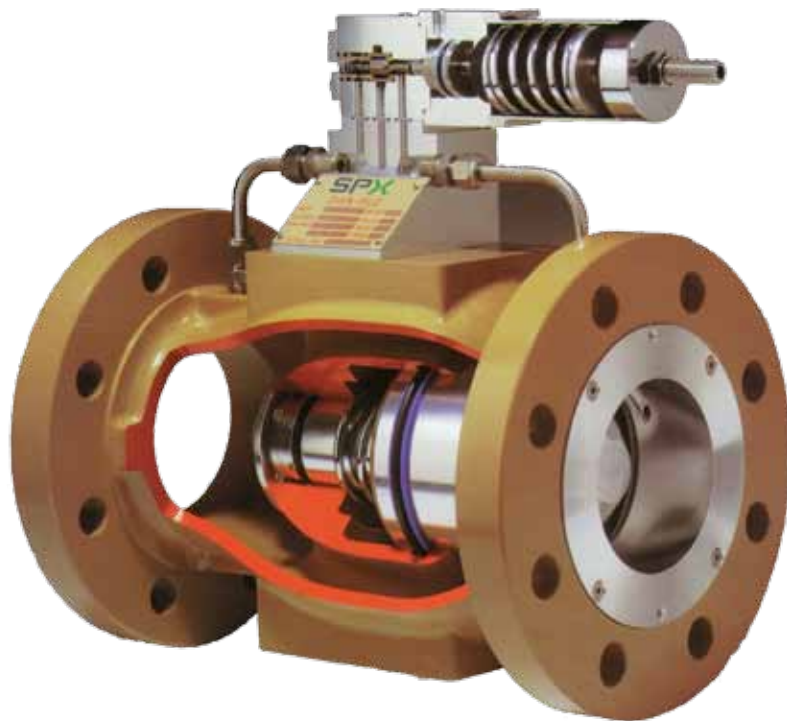


DANFLO Family of Control Valves



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 SPX Flow Technology, M&J Valve 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, ball, and swing check valves. M&J Valve 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 M&J Valve in a leadership position within the valve industry.

Finding innovative ways to help the world meet its ever growing demand for energy is a key focus for SPX. As a multi industry manufacturer, we provide creative solutions that serve global energy markets in a myriad of ways. At SPX, we combine an aggressive product development program with state-of-the-art manufacturing practices. The SPX product portfolio includes a wide array of heavy-duty pumps, valves, filters, mixers, and other equipment for use in a variety of upstream and downstream processing of oil and gas. SPX off-the-shelf and customized solutions are supporting all phases of oil, gas and biofuel production, from exploration, extraction and processing to transport and storage.

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:

P_u = Pressure upstream

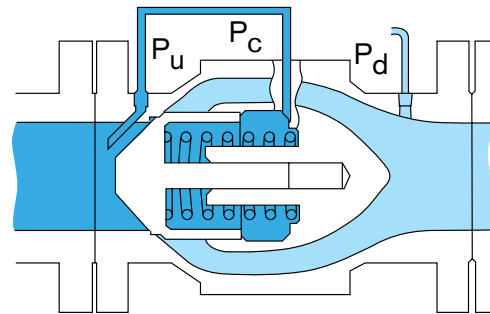
P_c = Pressure in plug cavity

P_d = Pressure downstream

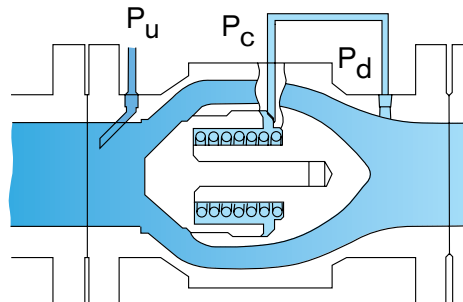
TYPICAL VALVE ACTION

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

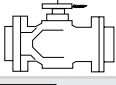
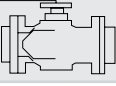
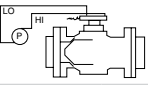
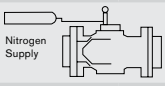
By connecting P_c to P_d the plug cavity is vented. Upstream line pressure overcomes the spring force, and the plug is forced open.



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



Ports P_c and P_u 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.								
BODY STYLE 42	PILOT OPERATED	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.					
		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

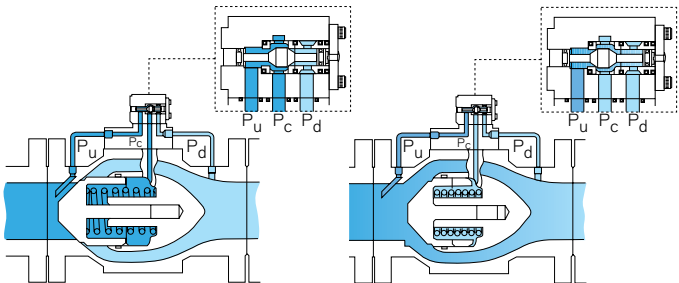
400 Series – Body Style 41

The pilot connects P_c to either P_u or P_d 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 left

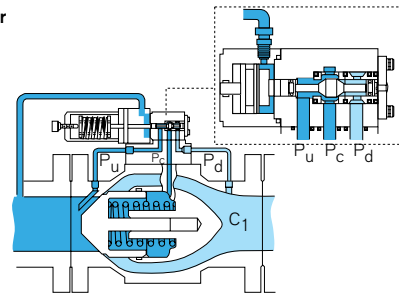
- Pressure differential is created
- Plug moves right
- VALVE IS OPEN

Poppet right

- Pressure is equalized across the plug,
- Plug moves left
- VALVE IS CLOSED

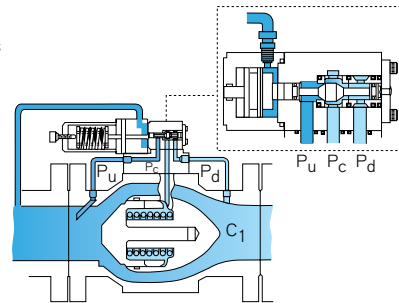
Pressure drop in pilot chamber

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

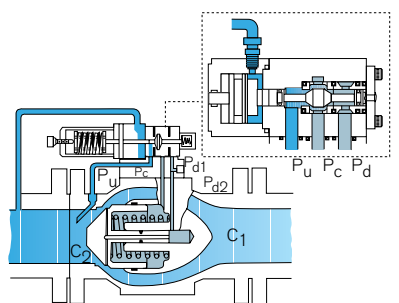


Pressure rise

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



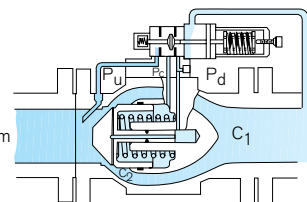
Velocity is higher and pressure is lower at point C_2 than it is at point C_1 . In regulating service, plug chamber is exhausted to point C_2 for faster response to changing pressure.



IMPORTANT NOTE: Reversing the direction on the DAN-FLO pilot sensing unit reverses the direction of valve plug response.

In pressure reducing/ regulating conditions

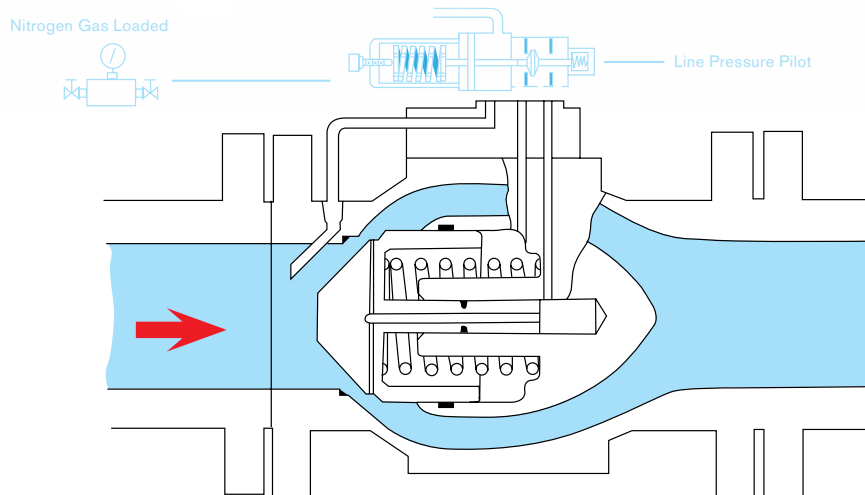
- Operational characteristics are reversed
- A drop in pressure downstream
- Poppet moves left
- Valve plug moves right
- VALVES IS OPEN





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

ABOUT SPX

Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global multi-industry manufacturing leader. For more information, please visit www.spx.com.

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