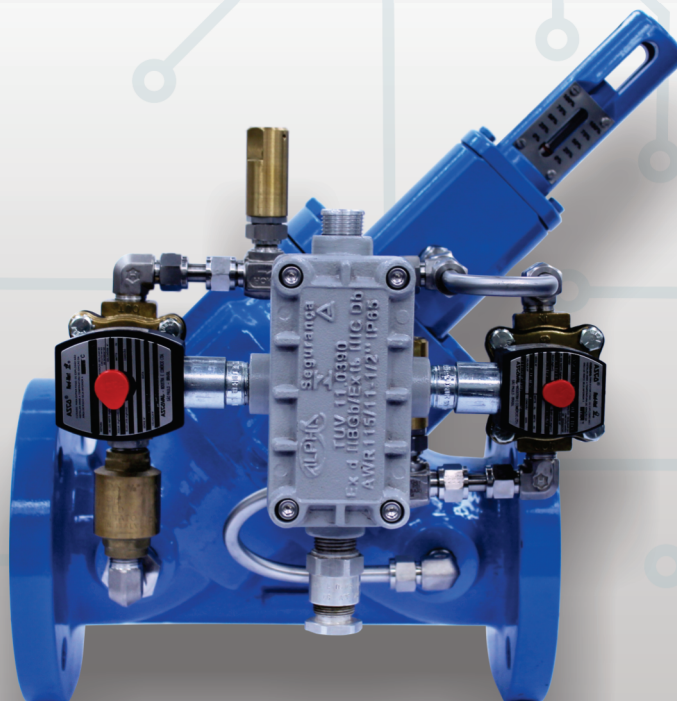


VCDM  
DIGITAL  
CONTROL  
VALVE



## VCDM - DIGITAL CONTROL VALVE

### Application

This type of control valve is installed downstream of the flow meter in the measurement systems (figures 1 and 2), used in fuel loading and unloading bases. Its features allow these operations to be performed at low flow, both at the beginning and at the end of loading / unloading a preset volume, and at the same time minimize the effects of pressure peaks in the line, resulting from the flow variation.

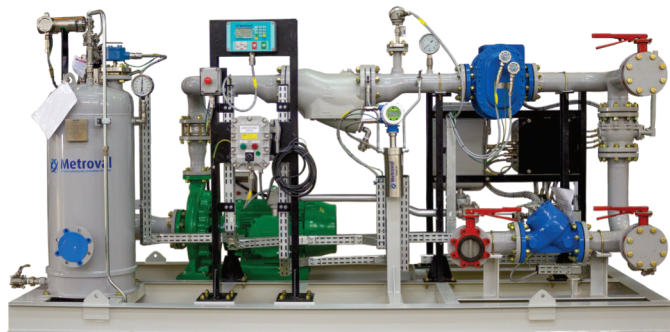


Figure 1



Figure 2

### Fuel loading and unloading

In processes for loading and unloading fuels contained in fixed or mobile tanks, in trucks, wagons, barges and ships, the flow control in the measurement systems is essential to ensure that the system reaches its full performance in terms of measurement accuracy.

To serve this market segment, Metroval developed the Metroval Digital Control Valve (VCDM), with the ability to automatically perform the control of the programmed flow (required during the process), as well as ensuring the exact measurement of the transfer of volumes when associated with an electronic preset / volume preset.

### Operation

To perform the flow control function, VCDM uses the line pressure to open and close a piston located inside (figure 5/7). When the pressures on both sides of the piston are equal, a spring acts as the main force to keep the piston in the closed position.

When the pressure against the lower part of the piston increases, exceeding the pressure of the line against the upper part of the piston plus the spring pressure, the valve starts to have its opening controlled to the open or control position.

The pressure differential is achieved by the actuation of two solenoid valves positioned in a hydraulic by-pass circuit located on the outside of the valve, one of which is normally open (NA) and the other normally closed (NF) (figure 6). In this same circuit, a self-cleaning filter (figure 7/6) is installed to protect the solenoids and two needle valves to control the piston opening and closing speed.

### Flow control

The electronic preset controls in 4 stages the opening or closing of the two solenoid valves by means of a step-by-step actuation of the piston (figure 7/5).

By modifying the frequency or amplitude of the pulses generated by the electronic preset, programmed flow control is achieved, such as low flow opening, high flow control, low flow closing and final closing of the pre-set volume.

### Typical VCDM functional diagram

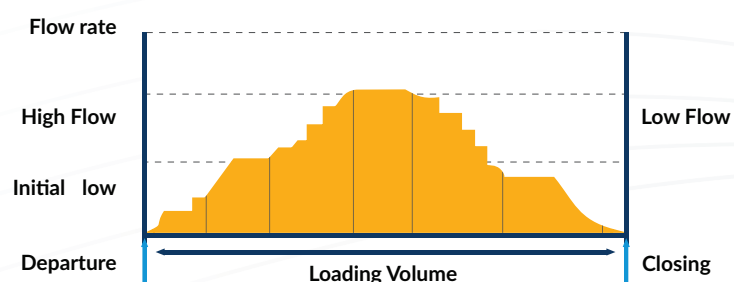


Figure 3

### Pressure Drop

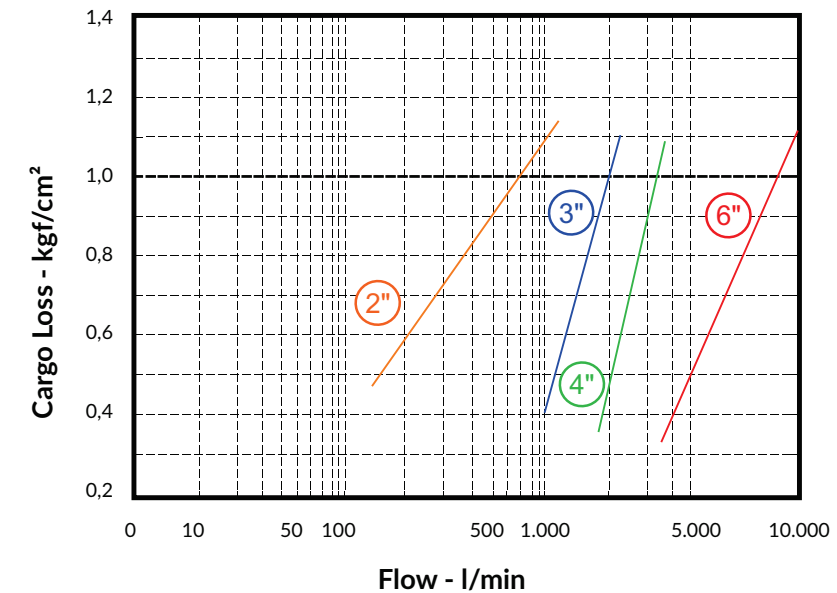


Figure 4

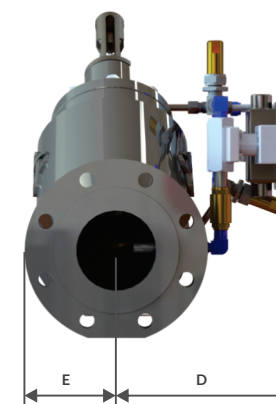


Figure 5

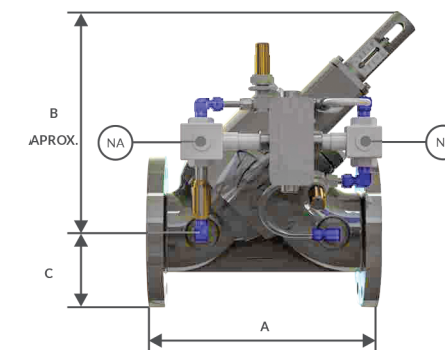
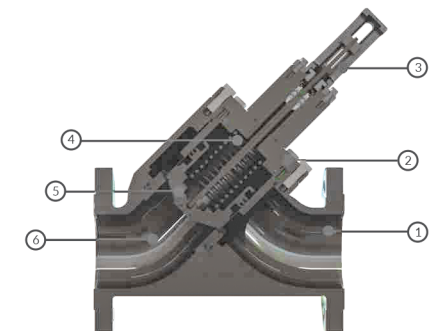


Figure 6



1 - Body | 2 - Cover | 3 - Mechanical position indicator | 4 - Spring | 5 - Piston | 6 - Filter

Figure 7

DIMENSIONS AND WEIGHT				
MODEL	VCDM-50	VCDM-80	VCDM-100	VCDM-150
DN	2"	3"	4"	6"
A (mm)	280	300	340	500
B (mm)	294	280	300	466
C (mm)	71	90	109	135
D (mm)	216	220	240	270
E (mm)	76	95	115	156
WEIGHT (kg)	25	36	47	115

CONSTRUCTION MATERIAL	
Body	ASTM A 216 GR. WCB
Cover	SAE 8620
Internal part	AISI 420   A252304
Seal	FKM - Fluorcarbon (Viton®) / EPDM
Solenoid valves	Stainless steel AISI 316

WORK CONDITIONS				
MODEL	VCDM 50	VCDM 80	VCDM 100	VCDM 150
Operation temperature	Maximum 70°C			
Work pressure	Maximum 9 bar			
KV/Q. Nominal m³/h	42	120	210	490
Solenoid feeding	127 VAC / 220 VAC / 24 VCC			



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