



The 22VMU is a self-contained, electronic flow measuring and flow control system. Based upon the variables of valve differential pressure and valve position, the ValveMeter Ultra automatically calculates, displays and controls the flow to the control set point. With the ValveMeter Ultra, there is no need for a separate flow meter in the line.

Typical examples include:

- Water transmission lines
- Water treatment plants
- Pump stations

*\*NOTE: for clarification of Electronic terminology, refer to the OCV Electronic Glossary*

◀ **Model 22VMU Controller with a Model 115-3 Digital Control Valve**

## THEORY OF OPERATION

### Model 22VMU Controller with a Model 115-3 Digital Control Valve

The Model 115-3 control valve is positioned based on the discrete electrical signals applied to the solenoid pilots (2 and 3) from the Model 22VMU Electronic Controller. With the measurement of the valve degree of opening (Cv), and the differential pressure (DP) across the valve, ValveMeter Ultra (VMU) can then calculate the water flow (Q) thru the valve with the following formula:

$$Q = C_v \times \sqrt{DP}$$

Once the valve flow is calculated, the VMU will compare it to the set point then position the valve to control the flow. If the system flow drops below the set point, the controller will open the valve by closing solenoid 2, blocking inlet pressure to the valve diaphragm chamber. Simultaneously, solenoid 3 is opened, allowing pressure on the diaphragm to vent downstream. **The valve opens and the system flow increases.**

If the flow rises above the set point, the VMU will close the valve by opening solenoid 2, routing inlet pressure to the diaphragm chamber. At the same time, solenoid 3 is closed, preventing any discharge from the diaphragm chamber. **The valve closes and system flow decreases.**

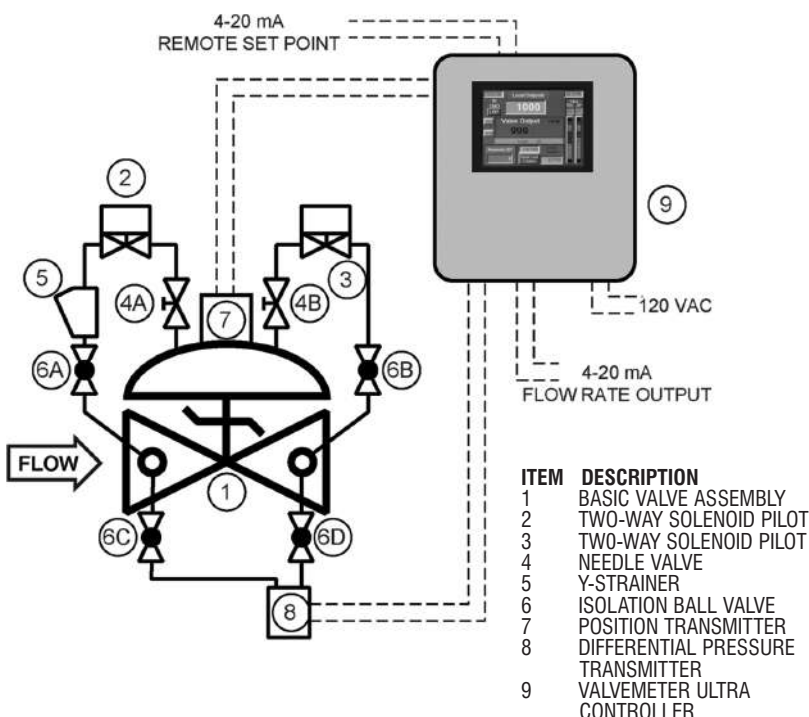
Finally, when flow is at the set point, the VMU closes both solenoids, thus no flow is allowed either on or off the diaphragm chamber. **The valve is "hydraulically locked" in position and flow is stable.**

The solenoids can be supplied to give one of the following "default" modes on absence or loss of electrical power:

- Default to closed
- Default to open
- Default in last position

## MODEL FEATURES

- ▶ Overall accuracy of +/- 2%
- ▶ Complete package, no additional hardware required
- ▶ Sizes 4"-24"
- ▶ Wider range of flow control than standard hydraulic systems
- ▶ User-friendly color touch screen operation
- ▶ Full function PID controller
- ▶ User-selectable flow units (USGPM, m3/hr, L/S, MGD)
- ▶ Allows for frequent set point change
- ▶ Local (touch screen) or remote (4-20 mA or digital) set point selection
- ▶ Valve scheduling for control parameter modification (Time, Day of Week, Process variables)
- ▶ 4-20 mA output of metered flow rate
- ▶ Includes totalizer (sums the total number of gallons that have flown through the valve since the totalizer reset. Measured in USGPM, m3/hr, L/S or MGD)
- ▶ RS232/RS485 communications (CANBUS, MODBUS)
- ▶ 100-260Vac 50-60Hz with 24/12 VDC, or solar Powered units available
- ▶ Optional
  - ▶ Intranet monitoring control and e-mailing
  - ▶ Configuration for low pressure operation
  - ▶ Ethernet and logging options
  - ▶ Consult factory for others



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# Model 22VMU ValveMeter Ultra



**SIZES** Grooved Ends: 4" (globe and angle); Flanged Ends: 4"-24" (globe); 4"-16" (angle)

**FLUID OPERATING TEMPERATURE RANGE** (Valve Elastomers)

EPDM: 32°F to 230°F\*

**MATERIALS** - Consult factory for others.

**Body/Bonnet:** Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, low-lead Bronze.

Others available (consult factory)

**Seat Ring:** low-lead Bronze, Stainless Steel

**Stem:** Stainless Steel, Monel

**Spring:** Stainless Steel

**Diaphragm:** EPDM\*

**Seat Disc:** EPDM\*

**Pilot:** low-lead Bronze, Stainless Steel

-Other pilot system components:

low-lead Bronze/Brass, All Stainless Steel

**Tubing & Fittings:** Copper/Brass, Stainless Steel

**Solenoid:**

**Enclosure:** Weatherproof NEMA 4X / Explosion Proof NEMA 4X, 6P, 7, 9

**Body:** Brass, Stainless Steel

**Voltages:** 24, 120, 240, 480 VAC / 12, 24 VDC

**Note:** Working pressures of solenoids vary greatly, consult factory on application of OCV Model 115-3 valves.

## CONTROLLER SPECIFICATIONS:

### Power Requirements:

Standard 100-260 VAC 50-60Hz; Optional 24VDC or 12VDC

**Inputs From Transducer:** Standard 4-20 mA

### Outputs To Solenoids:

Standard 110-120VAC; Optional 220-240VAC, 12VDC, 24VDC

**Model 22VMU Panel Dimensions:** 16.00" (406mm) High x 13.39" (340mm) Wide x 8.38" (213mm) Deep

**Enclosure:** Nema 4X (weather tight, corrosion resistant)

**Application Engineering Assistance:** Consult Factory

\*Others available upon request.

\*\*Valves 1-1/4" through 24" are certified to NSF/ANSI 372.

Valves 4" through 24" are also certified to NSF/ANSI 61-G.

## SPECIFICATIONS (Typical Water Application)

The electronic flow measurement and control valve shall operate to measure the flow rate without the use of external transducers.

### DESIGN

The electronic flow measurement and control valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled <globe, angle> valve. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall the pistons be used as an operating means. The pilot system shall be furnished complete and installed on the main valve. It shall include two needle valves, a Y-strainer, two solenoid valves and isolation ball valves. The valve position transmitter and valve differential transmitter shall be part of the main valve assembly. The controller shall be furnished separately for installation at a convenient location. The electronic flow measurement and control valve shall be operationally and hydrostatically tested prior to shipment.

### MATERIALS OF CONSTRUCTION

The main valve body and bonnet shall be ductile iron per ASTM A536, Grade 65-45-12. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be low-lead Bronze. Elastomers (diaphragms, resilient seats and O-rings) shall be EPDM. The needle valve and isolation ball valves shall be brass, and control line tubing shall be copper. The solenoid valves shall have brass bodies, weatherproof enclosures and be suitable for operation on <voltage>.

### OPERATING CONDITIONS

The electronic flow measurement and control valve shall be suitable for pressures of <X to X> psi, controlling flow rates up to <X> gpm.

### ACCEPTABLE PRODUCTS

The electronic measurement and control valve shall be a <size> 22VMU <globe pattern, angle pattern>, with <150# flanged, 300# flanged, grooved> end connections, as manufactured by OCV Control Valves, Tulsa, Oklahoma, USA.

## SIZING

Size	4"	6"	8"	10"	12"	14"	16"	24"
GPM	800	1,800	3,100	4,900	7,000	8,450	11,000	25,000
M <sup>3</sup> /hr	180	410	700	1,110	1,600	1,920	2,500	5,680

Valves are typically line sized; however, a velocity of 20 ft/sec is the recommended maximum flow rate.

Reduced port valves available. Consult the factory or refer to ValveMaster Premier on the OCV website: [www.controlvalves.com](http://www.controlvalves.com)

## MAX. PRESSURE

END CONNECTIONS	DUCTILE IRON	STEEL/STN STL	BRONZE
Grooved	300 psi	300 psi	300 psi
150# Flanged	250 psi	285 psi	225 psi
300# Flanged	300 psi	300 psi	300 psi

The pressures listed here are maximum pressures at 100°F. Also, working pressures of solenoids vary greatly, consult factory on application of OCV Model 115-3 valves when pressures exceed those stated in chart.

For maximum efficiency, the OCV control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 8" and larger valves, or any valves with a limit switch, in positions other than described. Space should be taken into consideration when mounting valves and their pilot systems.

A routine inspection & maintenance program should be established and conducted yearly by a qualified technician. Consult our factory @ 1-888-628-8258 for parts and service.

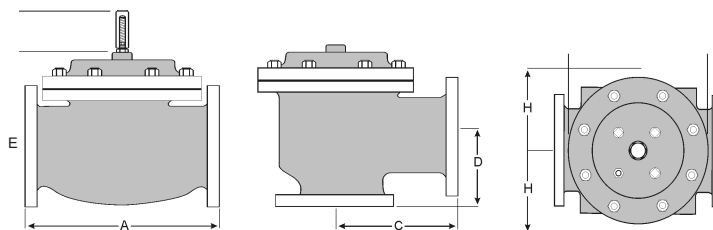
### How to order your 22VMU valve

When Ordering please provide:

Fluid to be controlled - Model Number - Size - Globe or Angle - End Connection - Body Material - Trim Material - Solenoid & Controller Voltages - Power failure mode: Open / Close / Hold last position - Solenoid enclosure Weatherproof or Explosion Proof - Solenoid exhaust to downstream or atmosphere - Controller Options - Special Requirements / Installation Requirements

		U.S. DIMENSIONS - INCHES							
DIM	END CONN.	4	6	8	10	12	14	16	24
A	GROOVED	15 1/4	20	--	--	--	--	--	--
	150# FLGD	15	17 3/4	25 3/8	29 3/4	34	39	40 3/8	62
	300# FLGD	15 5/8	18 5/8	26 3/8	31 1/8	35 1/2	40 1/2	42	63 3/4
C	GROOVED	7 5/8	--	--	--	--	--	--	--
	150# FLGD	7 1/2	10	12 11/16	14 7/8	17	--	20 13/16	--
	300# FLGD	7 13/16	10 1/2	13 3/16	15 9/16	17 3/4	--	21 5/8	--
D	GROOVED	5 5/8	--	--	--	--	--	--	--
	150# FLGD	5 1/2	6	8	11 3/8	11	--	15 11/16	--
	300# FLGD	5 13/16	6 1/2	8 1/2	12 1/16	11 3/4	--	16 1/2	--
E	ALL	8	10	11 7/8	15 3/8	17	18	19	27
F	ALL	7 1/2	8	9	10	11	12	14	16
H	ALL	12	13	14	17	18	20	20	28 1/2

\*GROOVED END NOT AVAILABLE IN 1 1/4"



Represented by:



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