REGAL™ SMARTVALVE

SERIES 7000
SMARTVALVE™

The REGAL SMARTVALVE is designed to automatically regulate the gas feed rate needed to maintain the chemical residual level determined for a specific water treatment application. The main factors involved when selecting the proper SMARTVALVE system include the volume of water being treated in conjunction with the quality and flow (fixed or variable) of the water. Different models are available to be used for chlorine, sulfur dioxide or ammonia applications. All of the Series 7000 models are listed below with an explanation of the control scheme(s) and conditions that apply when determining the proper model to purchase for each system.

Models 7001, 7001A and 7006 are used exclusively for **FLOW PROPORTIONAL Control**. Flow Proportional Control applies when the flow rate of the water continuously varies but the quality remains the same. The SMARTVALVE receives 4-20mA signals from an upstream water flow meter and adjusts the gas feed rate accordingly. The 7001 and 7006 models may be used for either Chlorine or Sulfur Dioxide applications, whereas, the Model 7001A is used specifically for Ammonia.

The capacities for each model are as follows:
Model 7001: 10, 25, 50, 100, 250 & 500 PPD
(200, 500g/hr & 1, 2, 5, 10 kg/hr)
Model 7001A (Ammonia): 10, 25, 50 & 100 PPD
(200, 500 g/hr & 1, 2 kg/hr)
Model 7006: 1000 & 2000 PPD (20 & 40 kg/hr)

Models 7002, 7002A and 7007 are used for **STEP RATE Control**. Step Rate Control applies when multiple water lines with separate, fixed speed pumps (4 maximum) lead to one main water supply. Based upon demand, the pumps will cycle on and off at various times and combinations, thus changing the overall water flow in incremental STEPS relative to the fixed flow rate of each pump. Models 7002 and 7007 may be used for Chlorine or Sulfur Dioxide. Model 7002A is strictly for Ammonia.

Capacities are as follows:
Model 7002: Same as Model 7001
Model 7002A (Ammonia): Same as Model 7001A
Model 7007: Same as Model 7006

Models 7009 and 7010 are more advanced models that can be configured for use in multiple Control Schemes. If desired, these models may be used for standard Flow Proportional Control, however, the Model 7009 and 7010 are designed specifically for more complex Chlorination and De-chlorination applications which include:

1) RESIDUAL ONLY Control - Applies when the water flow rate is constant but the quality varies. The SMARTVALVE continuously receives 4-20mA signals from a downstream chlorine residual analyzer and responds by adjusting the gas feed rate accordingly.

2) COMPOUND LOOP Control - Applies when both the water flow rate and quality continuously vary. Under these conditions, the SMARTVALVE point of application is located between a water flow meter (upstream) and a chlorine residual analyzer (downstream). Both devices continuously feed 4-20mA signals to the SMARTVALVE which converts the signals and adjusts the gas feed rate accordingly.

3) FEED FORWARD DE-CHLORINATION Control - Operates similarly to Compound Loop Control but requires two SMARTVALVES, one for chlorination (CL_2) and one for de-chlorination (SO_2). The first SMARTVALVE (chlorine) is located upstream from the residual analyzer and the second (sulfur dioxide) is located downstream. The water flow and residual signals are simultaneously fed to both valves which adjust the gas feed rates proportionally for each point of application.

Capacities for the 7009 and 7010 are:
Model 7009: Same as Model 7001
Model 7010: Same as Model 7006

GENERAL SPECIFICATIONS

The REGAL SMARTVALVE shall include a four phase linear, heavy duty stepper motor, feedback potentiometer and modulating gas flow valve. The rotary motion of the motor will be converted into the linear motion required to drive the valve plug. The circuitry will produce a series of pulses such that the motor position is a function of the number of pulses generated. The shaft direction will be a function of phase sequence while the speed will be a function of pulse ratio.

The SMARTVALVE shall provide a total of four (4) means of operation:

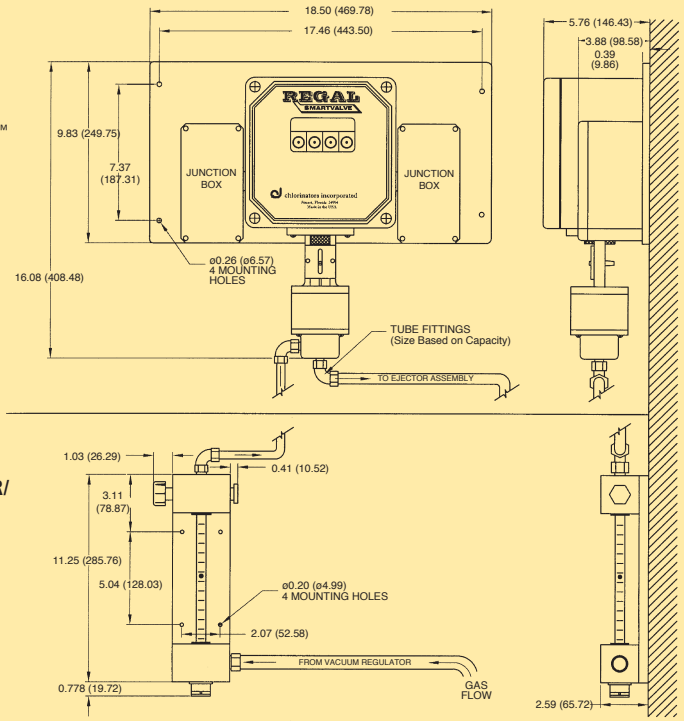
1. Fully Automatic.
2. Electric/Manual via a keypad used to change the gas feed rates which will be shown on the display screen.
3. Manual via the adjustment knob which will drive the lead screw of the valve plug. The gas feed rate will be monitored by the remote meter and/or an indicator pin attached to the lead screw.
4. Manual via the rate valve furnished with the gas feed system.

A unique "linearization" program shall be included to assure the SMARTVALVE'S digital display reading matches the reading indicated on the gas feed system's metering tube.

Operator interface shall be via a four-button integrated keypad vertically aligned with a two-line alphanumeric display (LCD). Basic operator information including water flow, residual level (if applicable) and gas feed rates will be continuously displayed in the preferable units of measurement. All parameters pertaining to operation, calibration (engineering) and configuration shall be accessible for review and/or change via the main menu. Parameters in the Engineering and Configuration modes will be password protected to prevent access and change by unauthorized personnel. The primary Engineering and Configuration parameters will be factory calibrated and set based upon information provided at the time of purchase. Additional, and optional, parameters shall be activated and set at the job site based upon conditions exclusive to the application. A complete list of all parameters with full explanations and instructions shall be provided for installation and startup of the system.

SERIES 7000 SMARTVALVE™ DIMENSIONS

Dimensions = Inches (mm)



7500 REMOTE METER/ RATE VALVE ASSEMBLY (not included)

Recommended for 10, 25, 50 and 100 PPD Systems

Required for 250 and 500 PPD

ADDITIONAL SPECIFICATIONS

Power Requirements Field selectable 115/230 VAC ± 15%, single phase

Fusing 1/4A @ 230V, 1/2A @ 115V

Power Consumption 45 Watts absolute max

Input Signals 4-20 milliamps DC (unpowered)

Input Impedance 250 Ohms

Output Signals 4-20 milliamps DC, 12 Volt compliance (600 Ohms) isolated and powered

Micro-Controller MC9S12 with 128kB FEEPROM, 2kB EEPROM, 8kB SRAM, 16 bit

Display 20-character, 2-line, LCD

Decimal Point Setting 0, 0.0, 0.00

Operator Interface Four (4) button keypad integrated into overlay

Relays Three (3) each, 10A, 250 VAC

Calibration Accuracy ±0.25% from zero

Speed of Response Variable and field adjustable between 0.5 & 10.0 seconds per revolution of motor

Control Modes Automatic, electric manual and manual

Operating Range 10:1

Dosage Ratio 4:1, keypad adjustable

Environmental Limits 32° to 120° F (0-50° C)

Monitor Enclosure
Wall Mounted Polycarbonate or ABS NEMA 4X (7.87" X 7.87" X 5.25")

Serial Communications OPTIONAL Isolated RS232, RS422 and RS485 (2/4-wire) module

Step Rate Inputs Active, designed for 100 ft., 20 AWG minimum. Remote contact closure with a voltage drop of no more than 0.8 volts at the valve terminals. Less than 5 mA flows through the contact.

Stepper Motor Unipolar (5/6-Wire), 12 Volt, 1 Amp winding size 23

FOR MODELS 7009/7010 ONLY

Gain Setting 0.1 to 500

Lag Time Setting 1 to 7200 seconds

Residual Full Scale Setting 0.1 to 100 PPM

CONTENTS GUIDE

Standard package consists of:

1 each SMARTVALVE complete with wall mounting plate and junction boxes for electrical connections

1 each Instruction Bulletin 17000 or Instruction Bulletin 17009/17010

Approximate Shipping Weight: 16 - 18 lbs.

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