



## Pressure Independent Control Series 2-Way Valves and Electronic Valve Actuators

### Description

The 1/2- to 1-1/4-inch Pressure Independent Control Valves have a 2.5, 5, or 5.5 mm stroke, and work with the SSD Series Electronic Actuators. The 1-1/2 to 2-inch normally open valves have a 15 mm stroke and work with the SAY Series Electronic Actuators. SAY Actuators for 1-1/2- and 2-inch Normally Open Valves can also be set for Normally Closed operation (reverse acting). The SSD and SAY Actuators require a 24 Volt power supply to provide floating or 0 to 10 Vdc control.

Typical applications include control of hot or chilled water or water-glycol solutions up to 50% in closed loop systems.

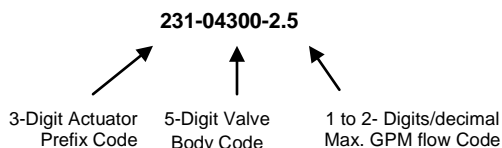
### Features

The Pressure Independent Control Valves include a pressure regulator, a flow limiter, and a control valve in a single device.

SSD, and SAY Actuators have a direct-coupled installation, manual override and visual position indication.

### Product Numbers

Use the product numbers in the tables to order the valve and the actuator assembled together. The product number consists of a 3-digit prefix code, a hyphen, a 5-digit code, a hyphen, and a 1 to 2-digit suffix with or without a decimal. The prefix specifies an actuator. The middle code specifies the valve body. The suffix specifies the factory preset maximum GPM flow setting. See Table 2 through Table 8.



### Technical Data

#### Typical Specifications

Flow shall be varied by actuator position. At any given position, flow through the valve shall not vary more than  $\pm 5\%$  from 5 to 58 psi due to system pressure fluctuations across the valve in the selected operating range. Valves shall be pressure independent between a differential pressure of 2.3 or 5 PSID (depending on valve size) and 58 PSID. Length of stroke shall be consistent and independent of flow setting.

### Valve Specifications

Body material:	Brass (1/2- to 1-1/4-inch) Ductile Iron (1-1/2- and 2-inch)
Stem:	Stainless Steel
Line size:	1/2-inch to 2-inch (15 mm to 50 mm)
Action:	2-Way
Valve body rating:	ANSI 250
Close-off pressure/Leakage rate:	
1/2- to 1-1/4-inch, NO	200 psi/ANSI Class IV (0.01%)
1-1/2 and 2-inch NO	100 psi/ANSI Class IV (p.01%)
1/2- to 1-1/4-inch, NC	45 psi/ANSI Class IV (0.01%)
Medium temperature range:	34°F to 248°F (1°C to 120°C)
Flow characteristic:	Linear
Connection:	NPT threaded

### Actuator Specifications

Operating voltage:	
SSD81U/SSD81.5U	24 Vac
SSD61U	24 Vac/dc
SSD61.5U	24 Vac
SAY	24 Vac/dc
Frequency:	60 Hz
Power consumption (normal operation):	
SSD81U	0.8 VA
SSD81.5U	2 VA
SSD61U	2.5 VA
SSD61.5U	2 VA
SAY61.03U	8 VA
SAY81.03U	5 VA
Signal:	
SSD81U, SSD81.5U	Floating
SAY81.03U	
SSD61U, SSD61.5U	0 to 10 Vdc
SAY61.03U	0 to 10 Vdc or 4 to 20 mA

### Run time (in seconds):

	<b>Stroke</b>		
	<b>2.5 mm</b>	<b>5/5.5 mm</b>	<b>15 mm</b>
SSD81U	75	150	—
SSD81.5U	70	125	—
SSD61U	45	90	—
SSD61.5U	15	30	—
SAY	—	—	30

### Force:

SSD (NSR)	>56 lb (250 N)
SSD (SR)	67 lb (300 N)
SAY	45 lb (200 N)

### Additional References:

Technical Instructions	
PICV Valves	155-774
SSD Actuators	155-773
SAY Actuators	155-580, 155-581

### Agency Certification:

UL	Meets UL 873
cUL	Certified to Canadian Standard C22.2 No. 24.93



### Mounting Location

NEMA 1 (Interior only)



**Table 1. Valve Body Flow Range.**

Valve Body	Normally Open/Closed	Line Size Inch (mm)	GPM Flow Range
599-04310	Open	1/2 (15)	0.2 to 0.9
599-04311	Open		0.5 to 2.5
599-04300	Closed		0.3 to 2.7
599-04301	Closed		1.0 to 7.5
599-04302	Closed	3/4 (20)	0.5 to 4.5
599-04312	Open		1.0 to 5.8
599-04303	Closed		1.0 to 8.9
599-04304	Closed	1 (25)	1.0 to 8.9
599-04313	Open		1.2 to 8
599-04305	Closed	1-1/4 (32)	2.5 to 13.2
599-04314	Open		3 to 18
599-04315	Open	1-1/2 (40)	10 to 40
599-04316	Open	2 (50)	10 to 50


**Table 2. 1/2-Inch and 3/4-Inch 2-Way Normally Open Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04310-0.5	1/2 (15)	0.5	230-04310-0.5	231-04310-0.5	232-04310-0.5	233-04310-0.5
599-04311-1		1.0	230-04311-1	231-04311-1	232-04311-1	233-04311-1
599-04311-1.5		1.5	230-04311-1.5	231-04311-1.5	232-04311-1.5	233-04311-1.5
599-04311-2		2.0	230-04311-2	231-04311-2	232-04311-2	233-04311-2
599-04311-2.5		2.5	230-04311-2.5	231-04311-2.5	232-04311-2.5	233-04311-2.5
599-04312-1	3/4 (20)	1.0	230-04312-1	231-04312-1	232-04312-1	233-04312-1
599-04312-1.5		1.5	230-04312-1.5	231-04312-1.5	232-04312-1.5	233-04312-1.5
599-04312-2		2.0	230-04312-2	231-04312-2	232-04312-2	233-04312-2
599-04312-2.5		2.5	230-04312-2.5	231-04312-2.5	232-04312-2.5	233-04312-2.5
599-04312-3		3.0	230-04312-3	231-04312-3	232-04312-3	233-04312-3
599-04312-3.5		3.5	230-04312-3.5	231-04312-3.5	232-04312-3.5	233-04312-3.5
599-04312-4		4.0	230-04312-4	231-04312-4	232-04312-4	233-04312-4
599-04312-4.5		4.5	230-04312-4.5	231-04312-4.5	232-04312-4.5	233-04312-4.5
599-04312-5		5.0	230-04312-5	231-04312-5	232-04312-5	233-04312-5
599-04312-5.5		5.5	230-04312-5.5	231-04312-5.5	232-04312-5.5	233-04312-5.5

**Table 3. 1-Inch and 1-1/4-Inch 2-Way Normally Open Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04313-5	1 (25)	5	230-04313-5	231-04313-5	232-04313-5	233-04313-5
599-04313-6		6	230-04313-6	231-04313-6	232-04313-6	233-04313-6
599-04313-7		7	230-04313-7	231-04313-7	232-04313-7	233-04313-7
599-04313-8		8	230-04313-8	231-04313-8	232-04313-8	233-04313-8
599-04314-9	1-1/4 (32)	9	230-04314-9	231-04314-9	232-04314-9	233-04314-9
599-04314-10		10	230-04314-10	231-04314-10	232-04314-10	233-04314-10
599-04314-11		11	230-04314-11	231-04314-11	232-04314-11	233-04314-11
599-04314-12		12	230-04314-12	231-04314-12	232-04314-12	233-04314-12
599-04314-13		13	230-04314-13	231-04314-13	232-04314-13	233-04314-13
599-04314-14		14	230-04314-14	231-04314-14	232-04314-14	233-04314-14
599-04314-15		15	230-04314-15	231-04314-15	232-04314-15	233-04314-15
599-04314-16		16	230-04314-16	231-04314-16	232-04314-16	233-04314-16
599-04314-17		17	230-04314-17	231-04314-17	232-04314-17	233-04314-17
599-04314-18		18	230-04314-18	231-04314-18	232-04314-18	233-04314-18



**Table 4. 1-1/2-Inch and 2-Inch 2-Way Normally Open Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return	
			SAY81.03U Floating	SAY61.03U 0 to 10V and 4 to 20 mA
				
			Actuator Prefix Code	
			334	335
599-04315-15	1-1/2 (40)	15	334-04315-15	335-04315-15
599-04315-20		20	334-04315-20	335-04315-20
599-04315-25		25	334-04315-25	335-04315-25
599-04315-30		30	334-04315-30	335-04315-30
599-04315-35		35	334-04315-35	335-04315-35
599-04315-40		40	334-04315-40	335-04315-40
599-04316-20	2 (50)	20	334-04316-20	335-04316-20
599-04316-25		25	334-04316-25	335-04316-25
599-04316-30		30	334-04316-30	335-04316-30
599-04316-35		35	334-04316-35	335-04316-35
599-04316-40		40	334-04316-40	335-04316-40
599-04316-45		45	334-04316-45	335-04316-45
599-04316-50		50	334-04316-50	335-04316-50



**NOTE:**

See SAY Series Valve Actuators Technical Instructions (155-580 and 155-581) and Installation Instructions (129-583) for reverse-acting (normally closed) operation.



**Table 5. 1/2-Inch 2-Way Normally Closed Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04300-0.5	1/2 (15)	0.5	230-04300-0.5	231-04300-0.5	232-04300-0.5	233-04300-0.5
599-04300-1		1.0	230-04300-1	231-04300-1	232-04300-1	233-04300-1
599-04300-1.5		1.5	230-04300-1.5	231-04300-1.5	232-04300-1.5	233-04300-1.5
599-04300-2		2.0	230-04300-2	231-04300-2	232-04300-2	233-04300-2
599-04300-2.5		2.5	230-04300-2.5	231-04300-2.5	232-04300-2.5	233-04300-2.5
599-04301-3		3.0	230-04301-3	231-04301-3	232-04301-3	233-04301-3
599-04301-3.5		3.5	230-04301-3.5	231-04301-3.5	232-04301-3.5	233-04301-3.5
599-04301-4		4.0	230-04301-4	231-04301-4	232-04301-4	233-04301-4
599-04301-4.5		4.5	230-04301-4.5	231-04301-4.5	232-04301-4.5	233-04301-4.5
599-04301-5		5.0	230-04301-5	231-04301-5	232-04301-5	233-04301-5
599-04301-5.5		5.5	230-04301-5.5	231-04301-5.5	232-04301-5.5	233-04301-5.5
599-04301-6		6.0	230-04301-6	231-04301-6	232-04301-6	233-04301-6
599-04301-6.5		6.5	230-04301-6.5	231-04301-6.5	232-04301-6.5	233-04301-6.5
599-04301-7		7.0	230-04301-7	231-04301-7	232-04301-7	233-04301-7
599-04301-7.5		7.5	230-04301-7.5	231-04301-7.5	232-04301-7.5	233-04301-7.5



**Table 6. 3/4-Inch 2-Way Normally Closed Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04302-1	3/4 (20)	1.0	230-04302-1	231-04302-1	232-04302-1	233-04302-1
599-04302-1.5		1.5	230-04302-1.5	231-04302-1.5	232-04302-1.5	233-04302-1.5
599-04302-2		2.0	230-04302-2	231-04302-2	232-04302-2	233-04302-2
599-04302-2.5		2.5	230-04302-2.5	231-04302-2.5	232-04302-2.5	233-04302-2.5
599-04302-3		3.0	230-04302-3	231-04302-3	232-04302-3	233-04302-3
599-04302-3.5		3.5	230-04302-3.5	231-04302-3.5	232-04302-3.5	233-04302-3.5
599-04302-4		4.0	230-04302-4	231-04302-4	232-04302-4	233-04302-4
599-04302-4.5		4.5	230-04302-4.5	231-04302-4.5	232-04302-4.5	233-04302-4.5
599-04303-5		5.0	230-04303-5	231-04303-5	232-04303-5	233-04303-5
599-04303-5.5		5.5	230-04303-5.5	231-04303-5.5	232-04303-5.5	233-04303-5.5
599-04303-6		6.0	230-04303-6	231-04303-6	232-04303-6	233-04303-6
599-04303-6.5		6.5	230-04303-6.5	231-04303-6.5	232-04303-6.5	233-04303-6.5
599-04303-7		7.0	230-04303-7	231-04303-7	232-04303-7	233-04303-7
599-04303-7.5		7.5	230-04303-7.5	231-04303-7.5	232-04303-7.5	233-04303-7.5
599-04303-8		8.0	230-04303-8	231-04303-8	232-04303-8	233-04303-8
599-04303-8.5	8.5	230-04303-8.5	231-04303-8.5	232-04303-8.5	233-04303-8.5	

**Table 7. 1-Inch 2-Way Normally Closed Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04304-1	1 (25)	1	230-04304-1	231-04304-1	232-04304-1	233-04304-1
599-04304-2		2	230-04304-2	231-04304-2	232-04304-2	233-04304-2
599-04304-3		3	230-04304-3	231-04304-3	232-04304-3	233-04304-3
599-04304-4		4	230-04304-4	231-04304-4	232-04304-4	233-04304-4
599-04304-5		5	230-04304-5	231-04304-5	232-04304-5	233-04304-5
599-04304-6		6	230-04304-6	231-04304-6	232-04304-6	233-04304-6
599-04304-7		7	230-04304-7	231-04304-7	232-04304-7	233-04304-7
599-04304-8		8	230-04304-8	231-04304-8	232-04304-8	233-04304-8
599-04304-9		9	230-04304-9	231-04304-9	232-04304-9	233-04304-9

**Table 8. 1-1/4 Inch 2-Way Normally Closed Valve and Actuator Assemblies.**

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04305-3	1-1/4 (32)	3	230-04305-3	231-04305-3	232-04305-3	233-04305-3
599-04305-4		4	230-04305-4	231-04305-4	232-04305-4	233-04305-4
599-04305-5		5	230-04305-5	231-04305-5	232-04305-5	233-04305-5
599-04305-6		6	230-04305-6	231-04305-6	232-04305-6	233-04305-6
599-04305-7		7	230-04305-7	231-04305-7	232-04305-7	233-04305-7
599-04305-8		8	230-04305-8	231-04305-8	232-04305-8	233-04305-8
599-04305-9		9	230-04305-9	231-04305-9	232-04305-9	233-04305-9
599-04305-10		10	230-04305-10	231-04305-10	232-04305-10	233-04305-10
599-04305-11		11	230-04305-11	231-04305-11	232-04305-11	233-04305-11
599-04305-12		12	230-04305-12	231-04305-12	232-04305-12	233-04305-12
599-04305-13		13	230-04305-13	231-04305-13	232-04305-13	233-04305-13

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