

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 599-0361XNX Series Rack and Pinion spring return actuators, and 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). All 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.

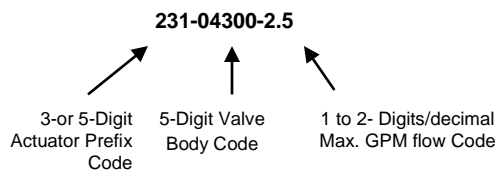
Features

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

All 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- or 5-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 10.



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/NC	100 psi/ANSI Class IV (0.01%)
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
Rangeability	$\geq 100:1$

Actuator Specifications

Operating voltage:	
SSD81U/SSD81.5U	24 Vac
SSD61U	24 Vac/dc
SSD61.5U	24 Vac
599-0361XNX	24 Vac/dc
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
599-0361XNX	≤ 3.5 VA

Signal:	
SSD81U, SSD81.5U	Floating
SAY81.03U, 599-03616NX	
SSD61U, SSD61.5U, 599-03617NX	0 to 10 Vdc
SAY61.03U	0 to 10 Vdc or 4 to 20 mA

Run time (in seconds):	Stroke		
	2.5 mm	5/5.5 mm	15 mm
SSD81U	75	150	—
SSD81.5U	70	125	—
SSD61U	45	90	—
SSD61.5U	15	30	—
SAY	—	—	30
599-0361XNX	—	—	60

Force:	
SSD (NSR)	>56 lb (250 N)
SSD (SR)	67 lb (300 N)
SAY	45 lb (200 N)
599-0361XNX	< 155 lb (622N)

Additional References:

Technical Instructions	
PICV Valves	155-774
SSD Actuators	155-773
SAY Actuators	155-580, 155-581
599-0361XNX	A6V11637981
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.

Action	Valve Body	Line Size, Inch (mm)	GPM Flow Range
Normally Closed	599-04300	1/2 (15)	0.3 to 2.7
	599-04301		1.0 to 7.5
	599-04302	3/4 (20)	0.5 to 4.5
	599-04303		1.0 to 8.9
	599-04304	1 (25)	1.0 to 8.9
	599-04305	1-1/4 (32)	2.5 to 13.2
Normally Open	599-04310	1/2 (15)	0.2 to 0.7
	599-04320		0.3 to 1.6
	599-04321		1.0 to 5.8
	599-04322	3/4 (20)	1.3 to 8
	599-04323	1 (25)	2.6 to 16
	599-04314	1-1/4 (32)	3 to 18
	599-04315	1-1/2 (40)	10 to 40
	599-04316	2 (50)	10 to 50

Table 2. 1/2-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
599-04320-0.5			230-04320-0.5	231-04320-0.5	232-04320-0.5	233-04320-0.5
599-04320-1		1	230-04320-1	231-04320-1	232-04320-1	233-04320-1
599-04321-1			230-04321-1	231-04321-1	232-04321-1	233-04321-1
599-04320-1.5		1.5	230-04320-1.5	231-04320-1.5	232-04320-1.5	233-04320-1.5
599-04321-1.5			230-04321-1.5	231-04321-1.5	232-04321-1.5	233-04321-1.5
599-04321-2		2	230-04321-2	231-04321-2	232-04321-2	233-04321-2
599-04321-2.5		2.5	230-04321-2.5	231-04321-2.5	232-04321-2.5	233-04321-2.5
599-04321-3		3	230-04321-3	231-04321-3	232-04321-3	233-04321-3
599-04321-3.5		3.5	230-04321-3.5	231-04321-3.5	232-04321-3.5	233-04321-3.5
599-04321-4		4	230-04321-4	231-04321-4	232-04321-4	233-04321-4
599-04321-4.5		4.5	230-04321-4.5	231-04321-4.5	232-04321-4.5	233-04321-4.5
599-04321-5		5	230-04321-5	231-04321-5	232-04321-5	233-04321-5
599-04321-5.5		5.5	230-04321-5.5	231-04321-5.5	232-04321-5.5	233-04321-5.5

Table 3. 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
599-04322-2	3/4 (20)	2	230-04322-2	231-04322-2	232-04322-2	233-04322-2
599-04322-2.5		2.5	230-04322-2.5	231-04322-2.5	232-04322-2.5	233-04322-2.5
599-04322-3		3	230-04322-3	231-04322-3	232-04322-3	233-04322-3
599-04322-3.5		3.5	230-04322-3.5	231-04322-3.5	232-04322-3.5	233-04322-3.5
599-04322-4		4	230-04322-4	231-04322-4	232-04322-4	233-04322-4
599-04322-4.5		4.5	230-04322-4.5	231-04322-4.5	232-04322-4.5	233-04322-4.5
599-04322-5		5	230-04322-5	231-04322-5	232-04322-5	233-04322-5
599-04322-5.5		5.5	230-04322-5.5	231-04322-5.5	232-04322-5.5	233-04322-5.5
599-04322-6		6	230-04322-6	231-04322-6	232-04322-6	233-04322-6
599-04322-6.5		6.5	230-04322-6.5	231-04322-6.5	232-04322-6.5	233-04322-6.5
599-04322-7		7	230-04322-7	231-04322-7	232-04322-7	233-04322-7
599-04322-7.5		7.5	230-04322-7.5	231-04322-7.5	232-04322-7.5	233-04322-7.5
599-04322-8		8	230-04322-8	231-04322-8	232-04322-8	233-04322-8

Table 4. 1-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
599-04323-4	1 (25)	4	230-04323-4	231-04323-4	232-04323-4	233-04323-4
599-04323-5		5	230-04323-5	231-04323-5	232-04323-5	233-04323-5
599-04323-6		6	230-04323-6	231-04323-6	232-04323-6	233-04323-6
599-04323-7		7	230-04323-7	231-04323-7	232-04323-7	233-04323-7
599-04323-8		8	230-04323-8	231-04323-8	232-04323-8	233-04323-8
599-04323-9		9	230-04323-9	231-04323-9	232-04323-9	233-04323-9
599-04323-10		10	230-04323-10	231-04323-10	232-04323-10	233-04323-10
599-04323-11		11	230-04323-11	231-04323-11	232-04323-11	233-04323-11
599-04323-12		12	230-04323-12	231-04323-12	232-04323-12	233-04323-12
599-04323-13		13	230-04323-13	231-04323-13	232-04323-13	233-04323-13
599-04323-14		14	230-04323-14	231-04323-14	232-04323-14	233-04323-14
599-04323-15		15	230-04323-15	231-04323-15	232-04323-15	233-04323-15
599-04323-16		16	230-04323-16	231-04323-16	232-04323-16	233-04323-16

Table 5. 1-1/4-Inch 2-Way Normally Open Valve and Actuator Assemblies.




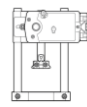
Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04314-9	1-1/4 (32)	9	230-04314-9	231-04314-9	232-04314-9	233-04314-9
599-04314-10		10	230-04314-10	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 6. 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		Spring Return	
			SAY81.03U Floating	SAY61.03U 0 to 10V and 4 to 20 mA	599-03616NO Floating	599-03617NO 0 – 10V
						
			Actuator Prefix Code			
			334	335	336NO	337NO
599-04315-15	1-1/2 (40)	15	334-04315-15	335-04315-15	336NO-04315-15	337NO-04315-15
599-04315-20		20	334-04315-20	335-04315-20	336NO-04315-20	337NO-04315-20
599-04315-25		25	334-04315-25	335-04315-25	336NO-04315-25	337NO-04315-25
599-04315-30		30	334-04315-30	335-04315-30	336NO-04315-30	337NO-04315-30
599-04315-35		35	334-04315-35	335-04315-35	336NO-04315-35	337NO-04315-35
599-04315-40		40	334-04315-40	335-04315-40	336NO-04315-40	337NO-04315-40
599-04316-20	2 (50)	20	334-04316-20	335-04316-20	336NO-04316-20	337NO-04316-20
599-04316-25		25	334-04316-25	335-04316-25	336NO-04316-25	337NO-04316-25
599-04316-30		30	334-04316-30	335-04316-30	336NO-04316-30	337NO-04316-30
599-04316-35		35	334-04316-35	335-04316-35	336NO-04316-35	337NO-04316-35
599-04316-40		40	334-04316-40	335-04316-40	336NO-04316-40	337NO-04316-40
599-04316-45		45	334-04316-45	335-04316-45	336NO-04316-45	337NO-04316-45
599-04316-50	50	334-04316-50	335-04316-50	336NO-04316-50	337NO-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 7. 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	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	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	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	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	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	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	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 8. 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	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	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	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	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	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	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	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	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 9. 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 10. 1-1/4 Inch 2-Way Normally Closed Valve and Actuator Assemblies.



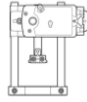
Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Non-Spring Return		Spring Return	
			SSD81U Floating	SSD61U 0-10V	SSD81.5U Floating	SSD61.5U 0-10V
						
			Actuator Prefix Code			
			230	231	232	233
599-04305-3	1-1/4 (32)	3	230-04305-3	231-04305-3	232-04305-3	233-04305-3
599-04305-4		4	230-04305-4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

Table 11. 1-1/2-Inch and 2-Inch 2-Way Normally Closed Valve and Actuator Assemblies.

Valve Body	Line Size, Inch (mm)	Factory Preset Max. GPM	Spring Return	
			599-03616NC Floating	599-03617NC 0 – 10V
				
			Actuator Prefix Code	
			336NC	337NC
599-04315-15	1-1/2 (40)	15	336NC-04315-15	337NC-04315-15
599-04315-20		20	336NC-04315-20	337NC-04315-20
599-04315-25		25	336NC-04315-25	337NC-04315-25
599-04315-30		30	336NC-04315-30	337NC-04315-30
599-04315-35		35	336NC-04315-35	337NC-04315-35
599-04315-40		40	336NC-04315-40	337NC-04315-40
599-04316-20	2 (50)	20	336NC-04316-20	337NC-04316-20
599-04316-25		25	336NC-04316-25	337NC-04316-25
599-04316-30		30	336NC-04316-30	337NC-04316-30
599-04316-35		35	336NC-04316-35	337NC-04316-35
599-04316-40		40	336NC-04316-40	337NC-04316-40
599-04316-45		45	336NC-04316-45	337NC-04316-45
599-04316-50		50	336NC-04316-50	337NC-04316-50

Disposal



The actuators are considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the actuators through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Do not dispose of valves as household waste.

- Special handling of individual components may be mandated by law or make ecological sense.
- Observe all local and currently applicable laws and regulations.

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