SIEMENS

Technical Instructions

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Pressure Independent Control Series

wo-Way, Bra odies, 1/2-Ir Inch, ANSI	ass Va nch to 250	alve 1/2	to 1-1/4	4 Inch NC	1/2- to 1-1/4-Inch NO	1-1/2 to2-Inch NC
Description	Siemens device: c 1/2-inch I for use w and 1/2 to threaded inch Norr Actuators	Pressure Inde ontrol valve, a Normally Oper ith SSD Electro o 1-1/4 inch No valve bonnet nally Open Va S.	ependen djustable onic Val ormally for use v lves hav	t Control Va e flow limite have a 2.5 lve Actuato Closed Val with SSD E ve a 15 mm	alves integrate three func- er, and automatic pressur mm stroke, and a thread rs. The 3/4- to 1-1/4-inch ves have a 5 or 5.5 mm s lectronic Valve Actuators stroke and use the SAY	ctions into a single re regulator. The led valve bonnet Normally Open stroke, and a a. The 1-1/2 and 2- Electronic Valve
Features	 Cont ANS 200 100 45 p Line Stair 1-1/2 SAY Norr 	rol valve with I Class 250 va psi close-off w psi close-off wit si close-off wit ar Flow Chara hless Steel Ste 2- and 2-Inch N actuators for nally Closed o	integrate alve bod ith ANS ith ANS cteristic em. Normally 1-1/2- and peration	ed pressure y. I Class IV I Class I V	e regulator and adjustable eakage (1/2 to 1-1/4-inch eakage (1-1/2- and 2-incl akage (1/2 to 1-1/4 inch f ves include P/T ports. lormally Open Valves car cting). See note on page	e flow limiter. Normally Open). h Normally Open). Normally Closed). n also be set for 2.
Application	For use in Electronic closed lo	n HVAC applic c Actuators, to op systems.	cations v control	vith Pressu hot or chille	re Independent Control S ed water or 50% water-gl	SD, or SAY ycol solution in
Product Numbers and Ordering	Valves ca orderable numbers Actuators	an be ordered e valve part nu , see <i>Pressure</i> s <i>Submittal Sh</i>	with or with or with or with or with or with the	without an a n Table 1. F <i>ndent Cont</i> I-087).	actuator assembly from th For all valve/actuator asso frol 2-Way Valves and Ele	ne factory. See all embly part ectronic Valve
Warning/Cautic Notations	on	WARNING:		Personal perform a	injury or loss of life may or procedure as specified.	occur if you do not
		CAUTION:		Equipmer a procedu	nt damage may occur if yo re as specified.	ou do not perform

Product Numbers

Table 1. Product Numbers.

Line Size	Factory Preset Max GPM	Normally Closed	Normally Open
	0.5	599-04300-0.5	599-04310-0.5
	1	599-04300-1	599-04311-1
	1.5	599-04300-1.5	599-04311-1.5
	2	599-04300-2	599-04311-2
	2.5	599-04300-2.5	599-04311-2.5
	3	599-04301-3	—
	3.5	599-04301-3.5	—
1/2 (15)	4	599-04301-4	—
	4.5	599-04301-4.5	—
	5	599-04301-5	—
	5.5	599-04301-5.5	—
	6	599-04301-6	—
	6.5	599-04301-6.5	—
	7	599-04301-7	—
	7.5	599-04301-7.5	—
	1	599-04302-1	599-04312-1
	1.5	599-04302-1.5	599-04312-1.5
	2	599-04302-2	599-04312-2
	2.5	599-04302-2.5	599-04312-2.5
	3	599-04302-3	599-04312-3
	3.5	599-04302-3.5	599-04312-3.5
	4	599-04302-4	599-04312-4
3/4 (20)	4.5	599-04302-4.5	599-04312-4.5
5/4 (20)	5	599-04303-5	599-04312-5
	5.5	599-04303-5.5	599-04312-5.5
	6	599-04303-6	—
	6.5	599-04303-6.5	—
	7	599-04303-7	—
	7.5	599-04303-7.5	—
	8	599-04303-8	—
	8.5	599-04303-8.5	—
	1	599-04304-1	—
	2	599-04304-2	—
	3	599-04304-3	—
	4	599-04304-4	—
1 (25)	5	599-04304-5	599-04313-5
	6	599-04304-6	599-04313-6
	7	599-04304-7	599-04313-7
	8	599-04304-8	599-04313-8
	9	599-04304-9	—

Line Size	Factory Preset Max GPM	Normally Closed	Normally Open
	3	599-04305-3	—
	4	599-04305-4	_
	5	599-04305-5	—
	6	599-04305-6	—
	7	599-04305-7	—
	8	599-04305-8	—
	9	599-04305-9	599-04314-9
1 1/4 (22)	10	599-04305-10	599-04314-10
1-1/4 (32)	11	599-04305-11	599-04314-11
	12	599-04305-12	599-04314-12
	13	599-04305-13	599-04314-13
	14	—	599-04314-14
	15	—	599-04314-15
	16	—	599-04314-15
	17	—	599-04314-17
	18	—	599-04314-18
	15	*	599-04315-15
	20	*	599-04315-20
1 1/2 (40)	25	*	599-04315-25
1-1/2 (40)	30	*	599-04315-30
	35	*	599-04315-35
	40	*	599-04315-40
	20	*	599-04316-20
	25	*	599-04316-25
	30	*	599-04316-30
2 (50)	35	*	599-04316-35
	40	*	599-04316-40
	45	*	599-04316-45
	50	*	599-04316-50

* See SAY Electronic Valve Actuator, NSR, 24 Vac Proportional Control Technical Instructions (155-580), SAY Electronic Valve Actuator, NSR, 24 Vac, 3-Position Control Technical Instructions (155-581), and SAY Electronic Valve Actuator Installation Instructions (129-583) for reverse-acting (normally closed) operation.

Line sizes 1/2- to 2-inch (15 to 50 mm) **Specifications** See Table 2 Capacity Body style 2-way Action Normally Closed and Normally Open ANSI Class 250 Valve body rating Connection Internal NPT thread Stem travel (Stroke) 1/2-inch NO 2.5 mm 3/4-inch NO and 1/2 to 1-1/4 inch NC 5 mm 1- and 1-1/4-inch NO 5.5 mm 1-1/2 to 2-inch NO 15 mm

Table 2. Reference: Valve Body Flow Range.

Action	Valve Body	Line Size, Inch (mm)	GPM Flow Range
	599-04300	1/2 (15)	0.3 to 2.7
	599-04301	1/2 (13)	1.0 to 7.5
Normally	599-04302	2/4 (20)	0.5 to 4.5
Closed	599-04303	3/4 (20)	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
	599-04310	1/2 (15)	0.2 to 0.9
	599-04311	1/2 (15)	0.5 to 2.5
N	599-04312	3/4 (20)	1 to 5.8
Normally Open	599-04313	1 (25)	1.2 to 8
	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

Material	Body 1/2- to 1-1/4-inch 1-1/2- and 2-inch	Brass Ductile Iron
	Plug	Brass
	Stem, spring	Stainless Steel
	Seals	EPDM 281 O-ring
Operating	Controlled medium	Hot/chilled water or 50% water-glycol solutions in closed loop systems
	Medium temperature range	34°F to 248°F (1°C to 120°C)
	Leakage rate 1/2- to 1-1/4-inch NO 1-1/2- and 2-inch NO 1/2- to 1-1/4 inch NC	ANSI Class IV (0.01%) @ 200 psi ANSI Class IV (0.01%) @ 100 psi ANSI Class IV (0.01%) @ 45 psi
	Flow characteristics	Linear
	Pressure regulation flow accuracy	+/- 5% from 5 to 58psi +/-10% from Δp min. to 5 psi
	Range of Pressure Independence	See Table 3.

		Table 3. Pres	ssure ind	ependence Rai	nge.	
	Action	Valve	Size	∆p _{min (psi)}	Δp _{max (psi)}	
		599-04300	4/0	2.3		
		599-04301	1/2	2.6		
	Normally	599-04302	2/4	2.3		
	Closed	599-04303	3/4	3.2		
		599-04304	1	3.2		
		599-04305	1-1/4	2.6		
		599-04310	4/0	2.3	58	
		599-04311	1/2	2.7		
	N a mar a lle c	599-04312	3/4	3.1		
	Normally	599-04313	1	4.0		
	Open	599-04314	1-1/4	4.1		
		599-04315	1-1/2	3.6		
		599-04316	2	5.0		
Mountir	na location			NEMA	1 (interior only	<u>/)</u>
Dimens	sions and w	eiaht		See F	igure 2 and Fig	ure 3.
P/T por	t set for PIC	2.V		599-10	0079	
One set ports to	t of high and replace bla	d low pressure ank caps in val	measuri ves	ng	0075	
The low of the v	v-pressure F alve. The h	P/T port (blue i igh pressure P	ndicator /T port (r	ring) should be ed indicator rir	e located on the ng) will be locat	e downstream side ed on the upstream
NOTE: 1-1/2- a	and 2-inch n	ormally open v	valves sh	ip with P/T por	rts installed.	
The low with the located	The low-pressure P/T port (blue indicator ring) should be located on the side of the valve with the raised lettering and label. The high-pressure P/T port (red indicator ring) will be located on the opposite side.					
Prior to number	mounting t	he actuator, ve	erify the v	alve is set to c	ordered flow set	ting (suffix of part
To char gallons	nge the valv per minute	ve flow setting, (gpm) on all va	see Step alves):	os 2, 3, and 4 b	pelow (Flow set	ting scales are in
1. On 1 the b	//2- to 1-1/4-i prass knurled	nch valves, loos I nut. On 1-1/2 a	en 2 nd 2- 3	2. Adjust the de 8. Retighten the	sired dial setting	with the white knob. ut or valve stem by
	Mountin Dimens P/T por One se ports to The low of the v or inlet NOTE: 1-1/2- a The low with the located Prior to number To chan gallons	Action Normally Closed Normally Closed Normally Open Mounting location Dimensions and w P/T port set for PIC One set of high an ports to replace bla The low-pressure F of the valve. The h or inlet side of the v NOTE: 1-1/2- and 2-inch r The low-pressure F with the raised lette located on the opp Prior to mounting t number). To change the valv gallons per minute 1. On 1/2- to 1-1/4-i the brass knurled	ActionValveAction599-04300Normally599-04302S99-04304599-04303S99-04304599-04304S99-04305599-04305S99-04310599-04310S99-04311599-04312S99-04313599-04313S99-04314599-04313S99-04315599-04316Mounting location599-04316Mounting locationDimensions and weightP/T port set for PICVOne set of high and low pressureports to replace blank caps in valThe low-pressure P/T port (blue i of the valve. The high pressure P or inlet side of the valve.NOTE: 1-1/2- and 2-inch normally open valueThe low-pressure P/T port (blue i with the raised lettering and label located on the opposite side.Prior to mounting the actuator, venumber).To change the valve flow setting, gallons per minute (gpm) on all venumber).1. On 1/2- to 1-1/4-inch valves, loos the brass knurled nut. On 1-1/2 a	ActionValveSize599-043001/2599-043011/2Sold599-043023/4599-04303599-043031599-043031599-043051-1/4599-043051-1/4599-043101/2599-043111/2599-043123/4599-043131599-043141-1/4599-043151-1/2599-043151-1/2599-043162Mounting locationDimensions and weightP/T port set for PICVOne set of high and low pressure measuriports to replace blank caps in valvesThe low-pressure P/T port (blue indicator for or inlet side of the valve.NOTE:1-1/2- and 2-inch normally open valves shThe low-pressure P/T port (blue indicator for with the raised lettering and label. The hig located on the opposite side.Prior to mounting the actuator, verify the v number).To change the valve flow setting, see Step gallons per minute (gpm) on all valves):1. On 1/2- to 1-1/4-inch valves, loosen the brass knutled nut. On 1-1/2 and 2- the brass knutled nut. On 1-1/2 and 2-	Action Valve Size Appmin (psi) 599-04300 1/2 2.3 599-04301 1/2 2.6 Normally 599-04302 3/4 3.2 599-04305 1-1/4 2.6 599-04305 1-1/4 2.6 599-04305 1-1/4 2.6 599-04310 1/2 2.7 599-04311 1/2 2.7 599-04312 3/4 3.1 599-04313 1 4.0 599-04315 1-1/4 4.1 599-04316 2 5.0 Mounting location NEMA Dimensions and weight See F P/T port set for PICV 599-10 One set of high and low pressure measuring ports to replace blank caps in valves The low-pressure P/T port (blue indicator ring) should be of the valve. The high pressure P/T port (red indicator ring) should be of the valve. The high pressure P/T port (blue indicator ring) should be with the raised lettering and label. The high-pressure P/T port located on the opposite side. Prior to mounting the actuator, verify the valve is set to conumber). To change the valve flow setting, see Steps 2, 3, and 4 b gallons per minute (gpm) on all valves): <t< td=""><td>Action Valve Size Apmin (psi) Apmax (psi) 599-04300 1/2 2.3 4 5 5 1/2 2.6 5</td></t<>	Action Valve Size Apmin (psi) Apmax (psi) 599-04300 1/2 2.3 4 5 5 1/2 2.6 5

Table 3 Pr Inde do Ra

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Presetting Adjustment, Continued	CAUTION: On 1-1/2- and 2-inch valves, do NOT use tools to tighten the valve stem. Hand-tighten only or damage will occur.					
	CAUTION: Do NOT rotate the actuator on the valve once the actuator and valve stem are connected. Doing so will inadvertently adjust the flow setting of the valve or damage the stem.					
Mounting and Installation	Install the valve so the flow follows the direction of the arrow indicated on the valve body.					
	For best performance, install the valve assembly with the actuator above the valve body. The valve and actuator can be installed in any position between vertical and horizontal. See Figure 1.					
	Do not install the valve assembly with the actuator below horizontal or upside down.					
	90°) 90°					

EA1261R1

Figure 1. Recommended Installation Orientations.

NOTE: Allow sufficient space for servicing the valve and actuator. Instructions for field mounting an actuator, wiring diagrams, and start-up are covered in the SSD Series Electronic Valve Actuator Installation Instructions (129-540), and SAY Electronic Valve Actuators Installation Instructions (129-583).

Commissioning Notes



CAUTION:

The Pressure Independent Control Valves must be open when flushing or pressure testing the system. Strong pressure impacts can damage closed Pressure Independent Control Valves.



CAUTION:

Differential pressure across the valve greater than 58 psi will result in damage to the pressure regulator.

Dimensions in Inches (mm)





VF0338R1

Valve P/N	Valve Size Inch	S	L1	L3	L4	H2	H3	Н	Weight Ib (kg)
599-04310	1/0	1.1 (27)	3.0 (75)	1.6 (41)	1.5 (38)	2.6 (67.3)	3.2 (82.4)	14.6 (371)	1.1 (0.50)
599-04311	1/2	1.1 (27)	3.0 (75)	1.6 (41)	1.5 (38)	2.6 (67.3)	3.2 (82.4)	14.6 (371)	1.1 (0.50)
599-04312	3/4	1.25 (32)	3.1 (79)	1.6 (41)	1.5 (38)	2.7 (67.5)	3.3 (82.5)	14.7 (374)	1.2 (0.53)
599-04313	1	1.5 (40)	4.0 (100)	1.7 (44)	1.5 (38)	2.8 (71)	3.3 (82.5)	14.7 (374)	2.5 (1.14)
599-04314	1-1/4	1.8 (46)	4.1 (104)	2.1 (53)	2.5 (65)	3.4 (86)	4.0 (100)	15.4 (391)	2.8 (1.27)
599-04315	1-1/2	2.3 (58)	5.4 (138)	2.7(68)	3.7 (94)	5.9 (149)	-	20 (508)	7.2 (3.28)
599-04316	2	2.8 (72)	5.4 (138)	2.9 (74)	3.7 (94)	5.9 (149)	-	20 (508)	8.2 (3.71)

Figure 2.	Two-Way	Normally Ope	n Valves	Dimensions.
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Valve P/N	Valve Size Inch	Α	В	L	H1	H2	H3	Н	Weight Ib (kg)
599-04300	1/2	.50 (15)	1.1 (27)	3.5 (88)	2.1 (53)	4.8 (123)	5.3 (135)	16.3 (414)	2.0 (0.9)
599-04301	1/2	.50 (15)	1.1 (27)	3.5 (88)	2.1 (53)	4.8 (123)	5.3 (135)	16.3 (414)	2.0 (0.9)
599-04302	2/4	.75 (20)	1.3 (32)	3.5 (88)	2.1 (53)	4.8 (123)	5.3 (135)	16.3 (414)	2.0 (0.9)
599-04303	3/4	.75 (20)	1.3 (32)	3.5 (88)	2.1 (53)	4.8 (123)	5.3 (135)	16.3 (414)	2.0 (0.9)
599-04304	1	1.0 (25)	1.5 (39)	3.6 (92)	2.1 (53)	4.8 (123)	5.3 (135)	16.3 (414)	2.0 (0.9)
599-04305	1-1/4	1.25 (32)	1.8 (46)	5.0 (128)	2.7 (69)	5.7 (145)	6.2 (158)	19.9 (505)	3.3 (1.5)

Figure 3. Two-Way Normally Closed Valves Dimensions.

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Siemens Industry, Inc. Building Technologies Division 1000 Deerfield Parkway Buffalo Grove, IL 60089-4513 USA +1-847-215-1000 Your feedback is important to us. If you have comments about this document, please send them to <u>sbt_technical.editor.us.sbt@siemens.com</u> Document No. 155-774 Printed in the USA **Page 7**