

# Self- operated Regulators Series 42



## Check Valve (Backflow Prevention)

**Type 42-10 RS** • The valve opens when pressure differential rises

### ANSI version

#### Application

For supply systems in **valve sizes ½" up to 6"**

**ANSI class 150 up to 300**

with **double diaphragm actuator**

### Special features

#### Operational Safety/ Back flow prevention

- Function guaranteed in the event of power failure.
- Ensured valve closing with redundant double diaphragm feature.
- No dependence on control signals and auxiliary power. Valve still functions regardless if an external component fails (ex. transmitter signal to DCS).
- Unlike a traditional control loop (transmitter, controller and valve) a regulators control loop is self contained, thereby eliminating increased chances of failure the extra components create.
- Double diaphragm minimizes regulator system failure.
- Self contained control loop requiring no outside Energy, set up or calibration.
- Each valve is specifically tested and certified for operation and performance.

#### Cost of ownership

- Low installation and start up costs as unit comes complete and ready to install.
- No additional wiring or tubing required
- No adjustment of set point or calibration required - ever.
- No peripheral equipment required i.e. transmitter, DCS etc.
- No auxiliary energy consumption when in operation

### Versions

Check Valves for installation in supply pipes.

**Type 42-10 RS, ANSI class 150** • With Type 2421 control Valve in sizes ½" to 6" and Type 2420 Actuator with double diaphragm and fixed set point 5<sup>1)</sup> psi (0.35 bar).

**Type 42-10 RS, ANSI class 300** • With Type 2421 control Valve in sizes ½" to 6" and Type 2420 Actuator with double diaphragm and fixed set point 5<sup>1)</sup> psi (0.35 bar).

<sup>1)</sup> 3 psi (0.2 bar): on request

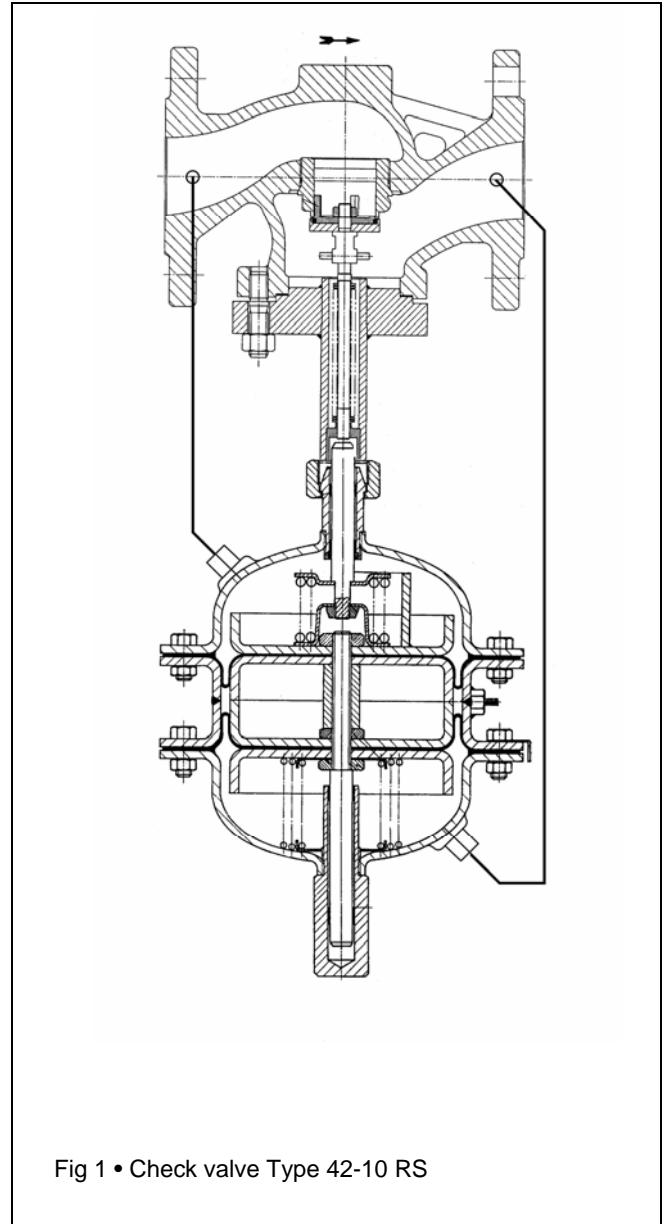


Fig 1 • Check valve Type 42-10 RS

## General Description

The Check valve Type 42-10 RS is designed to prevent backflow from directly connected systems, e.g. pressure vessels in nitrogen and compressed air supply networks. It is a modified version of the standard Differential Pressure Regulator Type 42-10 (Data Sheet T 3005). The regulator is completely open at a differential pressure of 5 psi (0.35 bar).

The regulator opens when the upstream pressure is higher than the downstream pressure. It closes automatically when the downstream pressure increases and equals the upstream pressure or exceeds it. The regulator closes reliably and thus prevents the flow from the system returning into the compressed air or nitrogen network.

## Installation

The valve is delivered completely assembled. Install the valve in the pipeline in the direction of flow and free of stress. A strainer must be installed upstream of the valve. The valve must be installed in horizontal pipes with actuator position vertically below the valve.

## Tests and certificates

Each regulator is specifically tested and certified according TV-SK 7603. Extend is to select.

**Table 1 • Technical data**

<b>Type 2421 Valve</b>										
Nominal size		½"	¾"	1"	1 ½"	2"	2 ½"	3"	4"	6"
Cv value	Cv	4.5	7.5	9.4	23	37	60	94	145	330
Maximum pressure	psig	According to ANSI class/Material (see Table 2)								
Maximum Temperature	°F/°C	175 °F/ 80 °C								
<b>Type 2420 Actuator</b>										
Size	cm <sup>2</sup>	320					640			
Δp min.	psi	5 <sup>1)</sup>					5 <sup>1)</sup>			
Δp max. P1>P2 & P2>P1	psi	650								
Maximum pressure	psig	According to ANSI class (see Table 2) <sup>2)</sup>								
Maximum Temperature	°F	Air and gases up to 175 °F								
	°C	Air and gases up to 80 °C								

<sup>1)</sup> 3 psi (0.2 bar): on request

<sup>2)</sup> also limited by ANSI/ASME standards according system temperatures

**Table 2 • Material and ANSI class**

<b>Type 2422 Valve</b>							
Nominal pressure	ANSI	class		150	300	150	300
Body material				A 216 WCB		A 351 CF 8M	
Seat and plug				Stainless steel with soft EPDM seal			
Plug stem & Bellow				Stainless steel			
Lower part of Body				Steel			
Body gasket				Graphite with metal core			
<b>Type 2420 Actuator</b>							
Actuator cases				Steel		Stainless steel	
Diaphragms				EPDM with fabric insert			

Table 3 • Selection table

Type 2422 Valve									
Item	01	02	03	04	05	06	07	08	09
Size	½"	¾"	1"	1 ½"	2"	2 ½"	3"	4"	6"
Cv value	4.5	7.5	9.4	23	37	60	94	145	330
Inlet pressure	Maximum flow of Nitrogen gas (70 °F) [x10 <sup>3</sup> SCFH]								
<b>5 psi maximum pressure drop across the check valve</b>									
75 psig	4.99	8.32	10.4	25.5	41.0	66.6	104	161	366
125 psig	6.29	10.5	13.1	32.2	51.7	83.9	131	203	461
275 psig	9.15	15.2	19.1	46.7	75.2	122	191	295	671
300 psig	9.54	15.9	19.9	48.7	78.4	127	199	307	699
350 psig	10.3	17.1	21.5	52.5	84.5	137	215	331	754
550 psig	12.8	21.4	26.8	65.5	105	171	268	413	940
<b>10 psi maximum pressure drop across the check valve</b>									
75 psig	6.86	11.4	14.3	35.1	56.4	91.5	143	221	503
125 psig	8.74	14.6	18.3	44.7	<b>71.9</b>	117	183	282	641
275 psig	12.8	21.4	26.8	65.5	105	171	268	413	940
300 psig	13.4	22.3	28.0	68.4	110	178	280	431	981
350 psig	14.4	24.1	30.2	73.8	119	193	302	465	1,059
550 psig	18.1	30.1	37.7	92.3	148	241	377	582	1,324
<b>15 psi maximum pressure drop across the check valve</b>									
75 psig	8.16	13.6	17.1	41.7	67.1	109	171	263	599
125 psig	10.5	17.5	22.0	53.7	86.4	140	220	339	771
275 psig	15.6	26.0	32.5	79.6	128	208	325	502	1,142
300 psig	16.3	27.1	34.0	83.1	134	217	340	524	1,193
350 psig	17.6	29.3	36.7	89.8	144	234	367	566	1,288
550 psig	22.0	36.7	46.0	113	181	294	460	709	1,614

**Example (Italic/bold):**

Size 2", Cv 37, Inlet pressure 125 psig, maximum pressure drop 10 psi, (Inlet temperature 70 °F):

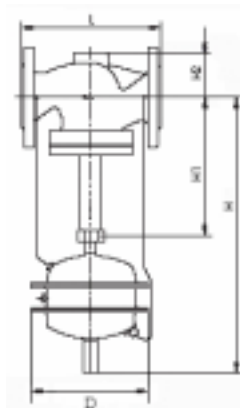
=> Maximum flow: 71,900.00 SCFH

**Table 4 • Dimensions and weights**

<b>Type 42-10 RS</b>												
<b>Nominal size</b>			<b>1/2"</b>	<b>3/4"</b>	<b>1"</b>	<b>1 1/2"</b>	<b>2"</b>	<b>2 1/2"</b>	<b>3"</b>	<b>4"</b>	<b>6"</b>	
Length L	ANSI class	150	inch	7.25			8.75	10.0	10.87	11.75	13.87	17.75
			Mm	184			222	254	276	298	352	451
	300	inch	7.50	7.62	7.75	9.25	10.50	11.50	12.50	14.50	18.62	
		mm	191	194	197	235	267	292	318	368	473	
Height H			inch	19,1			19,5	25,6		26,2	24,2	
			mm	485			495	~650		~665	~615	
Height H1			inch	7,3			7,7	9,8		11,8	15,7	
			mm	185			195	~250		~300	~400	
Height H2			inch	1.8			2.8	3.9		4.5	6.9	
			mm	45			72	98		113	175	
Diameter ØD			inch	11.22 <sup>1)</sup>				15.35 <sup>2)</sup>				
			mm	285 <sup>1)</sup>				390 <sup>2)</sup>				
Approx. weight	ANSI class	150	lb	57	58	62	78	87	131	144	165	360
			kg	26	26.5	28	35.5	39.5	59.5	65.5	75	163.5
	300	lb	60	61	65	82	91	137	151	173	376	
		kg	27	27.5	29.5	37	41.5	62	68.5	78.5	170.5	

<sup>1)</sup> Actuator size 320 cm<sup>2</sup>

<sup>2)</sup> Actuator size 640 cm<sup>2</sup>



**Table 5 • Item Numbers**

<b>Carbon steel, Class 150, Std certificate</b>				
<b>Item #</b>	<b>Material</b>	<b>Class</b>	<b>Size</b>	<b>Cv</b>
01.02.150.00	A 216 WCB	150	½"	4.5
02.02.150.00	A 216 WCB	150	¾"	7.5
03.02.150.00	A 216 WCB	150	1"	9.4
04.02.150.00	A 216 WCB	150	1 ½"	23
<b>05.02.150.00</b>	<b>A 216 WCB</b>	<b>150</b>	<b>2"</b>	<b>37</b>
06.02.150.00	A 216 WCB	150	2 ½"	60
07.02.150.00	A 216 WCB	150	3"	94
08.02.150.00	A 216 WCB	150	4"	145
09.02.150.00	A 216 WCB	150	6"	330
<b>Carbon steel, Class 300, Std certificate</b>				
<b>Item #</b>	<b>Material</b>	<b>Class</b>	<b>Size</b>	<b>Cv</b>
01.02.300.00	A 216 WCB	300	½"	4.5
02.02.300.00	A 216 WCB	300	¾"	7.5
03.02.300.00	A 216 WCB	300	1"	9.4
04.02.300.00	A 216 WCB	300	1 ½"	23
05.02.300.00	A 216 WCB	300	2"	37
06.02.300.00	A 216 WCB	300	2 ½"	60
07.02.300.00	A 216 WCB	300	3"	94
08.02.300.00	A 216 WCB	300	4"	145
09.02.300.00	A 216 WCB	300	6"	330

**Order Text**

Check valve Type 42-20 RS ,  
 Item number: AA.BB.CCC.DD (see below)  
 according to TD-US 30TDGE 0005.00

Optional:  
 Material, Class, Size, Cv, Certificate

- AA: Size/ Cv value
- BB: Material
- CCC: ANSI class
- DD: Inspection/certificate

<b>Stainless steel, Class 150, Std certificate</b>				
<b>Item #</b>	<b>Material</b>	<b>Class</b>	<b>Size</b>	<b>Cv</b>
01.03.150.00	A 351 CF 8M	150	½"	4.5
02.03.150.00	A 351 CF 8M	150	¾"	7.5
03.03.150.00	A 351 CF 8M	150	1"	9.4
04.03.150.00	A 351 CF 8M	150	1 ½"	23
05.03.150.00	A 351 CF 8M	150	2"	37
06.03.150.00	A 351 CF 8M	150	2 ½"	60
07.03.150.00	A 351 CF 8M	150	3"	94
08.03.150.00	A 351 CF 8M	150	4"	145
09.03.150.00	A 351 CF 8M	150	6"	330
<b>Stainless steel, Class 300, Std certificate</b>				
<b>Item #</b>	<b>Material</b>	<b>Class</b>	<b>Size</b>	<b>Cv</b>
01.03.300.00	A 351 CF 8M	300	½"	4.5
02.03.300.00	A 351 CF 8M	300	¾"	7.5
03.03.300.00	A 351 CF 8M	300	1"	9.4
04.03.300.00	A 351 CF 8M	300	1 ½"	23
05.03.300.00	A 351 CF 8M	300	2"	37
06.03.300.00	A 351 CF 8M	300	2 ½"	60
07.03.300.00	A 351 CF 8M	300	3"	94
08.03.300.00	A 351 CF 8M	300	4"	145
09.03.300.00	A 351 CF 8M	300	6"	330

**Example (Italic/bold)**

according to selection on page 3:

**Check valve Type 42-10 RS ,**  
**Item number: 05.02.150.00**  
**according to TD-US 30TDGE 0005.00**  
**Material A216 WCB, Class 150, Size 2" , Cv 37**  
 ( last row optional)

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SAMSON CONTROLS INC.  
4111 Cedar Boulevard  
Baytown • Texas • USA • 77520-8588  
Tel. (281) 383-3677 • Fax (281) 383-3690  
[www.samsoncontrols.com](http://www.samsoncontrols.com)

SAMSON CONTROLS INC.  
1-105 Riviera Drive  
Markham, Ontario L3R 5J7  
Tel. (905)-474-0354 • Fax (905) 474-0998  
[www.samsoncontrols.com](http://www.samsoncontrols.com)

**TD-US 30TDGE 0005.00**