



Sales Manual Section 160
PRODUCT SPECIFICATION RT-1001-BI & C1
Self-Actuated
Temperature Regulator
RT-1001-BI & RT-1001-C1

FEATURES:

1. Two-ply, seamless bellows used for long life
2. Over-temperature protection is standard feature.
3. Chevron "Lifetime" stem packing made of Teflon or EPT Rubber U-Cup for water service.
4. Quick-detach valve stem construction permits easy valve change.
5. Sturdy construction with cast iron frame.
6. Variety of sensing bulb forms and materials available.
7. Valves in wide range of sizes, action, styles, materials, etc. for many services.
8. Capillary selection.
9. Setpoint Adjustment Wheel.

GENERAL

Without need for external power, Robertshaw Self-Actuated Temperature Regulators (SATR) offer final control of the temperature of a liquid, an air space or flow, or gas flow for domestic, equipment, process, space, etc. on heating or cooling service.

The SATR sensing bulb is installed in the medium being controlled while the SATR valve is located on the supply line of the medium used as the heating (steam, hot water) or cooling (water, ethylene glycol, brine) agent. The SATR regulates the heating or cooling medium flow to maintain the desired temperature at the sensing bulb location. Robertshaw SATRs are usually cataloged to detail the two-way direct acting (close on temperature rise) type valves for heating service. Two-way reverse-acting (open on temperature rise) and three-way valves are equally available for cooling service.

The Robertshaw SATR series offers a selection of: **Throttling bands, Temperature Indication, Fail-safe** to prevent overheating, Manual Positioning in addition to automatic control, **Corrosive atmosphere resistant type, Small overall size** and **instantaneous heat exchanger service.**

Most cataloged Robertshaw SATR specifications are starting points from which many alternates to cataloged capillary, sensing bulb, separable well and valve may be **FURNISHED TO MEET YOUR SPECIFIC** application's needs.



*Valve Sizes 1/2" through 4"
with Port Sizes down to 1/4"*

SMALL BULB SIZE - WIDE THROTTLING BAND

HOW TO ORDER:

1. Quantity
2. Size
3. Series Number
4. Setpoint and/or setpoint range
5. Capillary specs
6. Sensing bulb specs
7. Valve type, action, ends, etc.
8. Other Features
9. Shipping - Invoice instructions

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RT-1001-BI SERIES

The RT-1001-BI series features a wide throttling band a small bulb size. It is particularly suited for applications where the heating surface is large while the storage capacity of the heated medium is small; such as a heat exchanger. It is designed for lower pressure drops when an unbalanced valve design is selected.

RT-1001-CI SERIES

The RT-1001-C1 series is a RT-1001-B1 series supplied with temperature indication.

For cataloging and pricing purposes, the RT-1001-B1 series is detailed with direct acting valves for heating service, 8 ft. capillary (copper tube/ brass armor), 12B type (threaded

bushing) copper sensing bulb and cast iron frame. Other non-listed parts are made of nonferrous materials. Alternate specifications are available.

Valve size, Inches	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
Valve type, Direct acting (closes with rising temperature at bulb)	Single-Seated, Unbalanced			Single-Seated, Balanced				Double Seated, Semi-Balanced			
	A	A	A	MA	MA	MA	MA	MA	FA	FA	FA
End Connections	1/2" Screwed Unions			Screwed Unions				Flanged (125 lbs. ANSI)			
Valve trim (poppet and seat), material	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.
Valve stem (highly finished), material	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.	S. S.
Stem packing (spring loaded chevrons)	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon
Valve body material	Bronze	Bronze	Bronze	Bronze	Bronze	Bronze	Bronze	Cast Iron	Cast Iron	Cast Iron	Cast Iron
Body rating, psi	225	225	225	250	250	250	250	175	175	175	175
Pressure drop limit, psi (For higher pressures, consult our representative)	125	115	65	250	250	250	250	100	25	20	15
Approx. Full open Cv	1.0	1.6	2.1	9.5	13.0	18.6	26.0	47.8	82.5	130.0	226.0

The RT-1001-B1 series is available with any of the temperature ranges listed below. The range should be selected so that the setpoint falls within the upper third of the range span.

15° - 70° F.	125° - 190° F.	235° - 295° F.
40° - 100° F.	165° - 230° F.	255° - 315° F.
60° - 120° F.	175° - 230° F.	270° - 330° F.
85° - 145° F.	200° - 255° F.	
115° - 180° F.	205° - 265° F.	

Alternates include:

Temperature indication: on special order under RT-1001-CI Series.

Capillary:

Length 1 ft. up to 50 ft. or more
Materials Copper tube with brass armor (standard) or 304 stainless steel tube with SS braid

Sensing Bulbs:

Type 12BCopper (standard)
Type 12 BP316 stainless steel
Type 12B or 12BPwith dead extension
Type 54 Copper, externally finned, plain (54A), bushed (54J) or flanged (54K)
Type 6Plain for open vessels, Copper with copper tube and brass armor (6A), 316 SS with 304 SS tube and no braid (6AP)

Separable Wells: (For sensing bulb protection or ease of removal)

Material 316 SS
Type GA or GA with Lagging Extension Mounting thread one size larger than bulb size

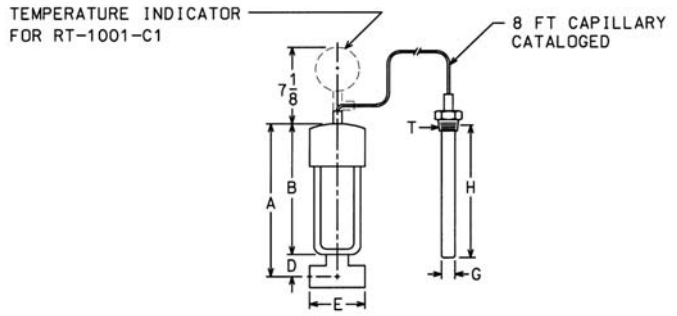
Type GB Mounting thread same as bulb size

Valves: Types A, MA, MAS, FA, WA, WD as illustrated

Note 1 - IMPORTANT - If valve seat leakage can cause a problem or a hazard, the following should be taken into account, Maximum leakage of new valves: single-seated Types A, WA - 0.05% of full open valve capacity; single-seated balanced Types MA, MAS - 0.01% of full open valve capacity; double-seated Types FA - 0.5% of full open valve capacity; single seated Type WD – 1% of full open valve capacity. This leakage will usually increase somewhat as the valve seats wear in service.

Note 2 - IMPORTANT - Damage to, or failure of, the thermal element with loss of charge will ordinarily result in the regulator going to the "cold" position. The valve stem moves "up" (toward the bellows - thus a "direct-acting" valve will fully open, a "reverse-acting" valve will close, and a 3-way valve will open the Normally Open port).

Valve Sizing is critical to control and life of regulator. Use Robertshaw's "FLO-RULE" Valve Sizing Slide Rule and valve Cv chart or contact our representative or factory.



RT-1001-BI Series
Dimensions, Shipping Weights and Sensing Bulb Sizes

Valve Size, Inches	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
Direct-Acting Valve, Type	A	A	A	MA	MA	MA	MA	MA	FA	FA	FA
Shipping wt., Lbs.	26	26	27	29	32	37	43	77	97	122	152
A	13-7/16	13-7/16	13-7/16	15-5/16	15-5/16	15-11/2	16	16-3/16	16-5/8	16-5/8	17-11/16
B	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8
D	1-9/16	1-9/16	1-9/16	3-7/16	3-7/16	3-5/8	4-1/8	4-15/16	4-3/4	4-3/4	5-13/16
E	4-3/4	4-3/4	4-3/4	6-15/16	7-1/8	7-1/2	8-1/2	7	7-3/4	8-5/8	10-1/4

Standard bulb for temperature ranges beginning at 120°F. or above.

G	3/4	3/4	3/4	3/4	3/4	1	1	1	1	1	1
H	10	10	10	10	10	11	11	11	11	11	11
T*	3/4	3/4	3/4	3/4	3/4	1	1	1	1	1	1

****Standard bulb for temperature ranges beginning below 120° F.**

G	1	1	1	1	1	1	1	1	1	1	1
H	14	14	14	14	14	18	18	18	18	18	18
T*	1	1	1	1	1	1	1	1	1	1	1

* Standard pipe thread.

** Bulb sizes for ranges beginning below 120° F. are necessary to provide "cross ambient" charge. This assures operation with ambient temperatures either above or below the control setting. Under some conditions, smaller bulbs may be used with lower ranges. If the larger bulb cannot be used, consult the factory or nearest representative.

SATR Valves for RT-1001-BI Series
 (See Valve Spec Sheet for full details)

Two Way			Three Way	
Style A Union Ends Single Seated Unbalanced Bronze Body SS Trim Direct Acting Sizes 1/4" – 1" Reverse Acting Sizes 1/4" – 1-1/2"	Style MA & MAS Single Seated Fully Balanced Direct Acting only SS Trim MA Sizes 3/4" – 1-1/2" Union Ends, Bronze Body MA Size 2", Flanged Bronze or CI Body MAS Sizes 1" – 2" Flanged, Steel Body MAS Sizes 3/4" – 1-1/2" Threaded Ends, Steel Body	Style FA Double Seated, Semi-Balanced Rev. Acting: 3/4" – 1-1/2" Bronze unions, Bronze Body Bronze or Monel Trim Rev. Acting: 2", Flgd, Br Body Bronze or Monel Trim Rev. Acting: 2", Flgd, CI Body Bronze or SS Trim Rev. Acting: 2-1/2" – 4" Flgd, Br Body, Monel Trim Rev. Acting: 2-1/2" – 4" Flanged, CI Body, SS Trim Dir. Acting: 2-1/2" - 4" Flanged, CI Body, SS Trim	Style WA Union Ends (2) Threaded End (Bottom) Unbalanced Sizes 1/2" – 1-1/2" Bronze Body SS Trim	Style WD Balanced Sizes 2" – 2-1/2" Flanged Bronze Body Bronze Trim



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Self -Actuated Temperature Regulator RT-1001-P, Q, R, S Quick Ship

Features

1. Short lead time, quick delivery.
2. Two-ply, seamless Robertshaw bellows used for long life.
3. Over-temperature protection is standard feature.
4. Chevron "Lifetime" stem packing made of Teflon for directing acting valves and EPT Rubber U-Cup packing for reverse acting valves.
5. Quick-detach valve stem construction permits easy valve change.
6. Sturdy construction with cast iron frame.
7. Capillary selection (see back).
8. Setpoint Adjustment Wheel.

General

Without need for external power, Robertshaw Self-actuated Temperature Regulators (SATR) offer final control of the temperature of a liquid, an air space or flow, or gas flow for domestic, equipment, process, space, etc. on heating service.

The SATR sensing bulb is installed in the medium being controlled while the SATR valve is located on the supply line of the medium used as the heating (steam, hot water) or cooling (water, ethylene glycol, brine) agent. The SATR regulates the heating or cooling medium flow to maintain the desired temperature at the sensing bulb location. RT-1001-P, Q, R, S, SATR are cataloged to detail the two-way direct acting (close on temperature rise) type valves for heating service with reverse acting available.

For service or features not found in RT-1001 specifications, the cataloged Robertshaw SATR series offer a selection of **Throttling bands, Temperature Indication, Fail-safe** to prevent overheating, **Manual Positioning** in addition to automatic control, **Corrosive atmosphere resistant type, Small overall size, and instantaneous heat exchanger service.**

Most cataloged Robertshaw SATR specifications are starting points from which many alternates to cataloged capillary, sensing bulb, separable well and valve may be FURNISHED TO MEET YOUR SPECIFIC application's needs.



Sizes 1/2" through 2"
Small Bulb Size - Wide Throttling Band

RT-1001 P, Q, R, S

The RT-1001 series regulators feature a wide throttling band with a small bulb size. This is a general purpose style sized for both small & large capacity systems.

For cataloging and pricing purposes, the RT-1001 series is detailed with direct acting valves for heating service, capillary (copper tube/brass armor), 12B type (threaded bushing) copper sensing bulb and cast iron frame. Other non-listed parts are made of nonferrous materials. Alternate specifications are available.

**RT-1001 P, Q, R, S "Quick Ship"
Temperature Regulator Series
(Replaces I-6001)**

Ordering Information and Model Number Coding

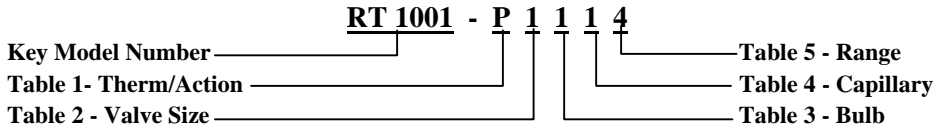


Table 1- Action/Indication

DESIG.	ACTION	TEMP. INDICATION
P	Direct	No
Q	Direct	Yes
R	Reverse	No
S	Reverse	Yes

Table 2 – Valve

DESIG.	SIZE
1	1/2"
2	3/4"
3	1"
4	1-1/4"
5	1-1/2"
6	2"

Table 3 - Bulb

DESIG.	SIZE
1	3/4 x 10"
2	1 x 11"
3	1 x 14"
4	1 x 18"
5	1-1/4 x 18"
6	1-1/4 x 20"
7	1-1/4 x 24"

Table 4 - Capillary

DESIG.	LENGTH
1	10 ft.
2	20 ft.

Table 5 - Range

DESIG.	TEMP.
1*	60 - 120° F
2*	85 - 145° F
3*	115 - 180° F
4	165 - 230° F
5	200 - 255° F

* When using cross-ambient charge (Table 5, desig. 1, 2, or 3) the 1/2", 3/4", and 1" valves must use a 1" x 14" or a 1" x 18" bulb (Table 3, desig. 3 & 4) and the 1-1/4", 1-1/2", and 2" valves must use a 1" x 18" bulb (Table 3, desig. 4) or larger.

Directing Acting Valves

Valve size Inches	1/2	3/4	1	1-1/4	1-1/2	2
Valve type, Direct acting (closes with rising temperature at bulb)	Single-Seated	Single-Seated, Balanced				
	A	MA	MA	MA	MA	MA
End Connections	Screwed Brass Unions					Flanged (125 lbs. ANSI)
Valve trim (poppet and seat) material	S.S.	S.S.	S.S.	S.S.	S.S.	S.S.
Valve stem (highly finished) material	S.S.	S.S.	S.S.	S.S.	S.S.	S.S.
Stem packing (spring loaded chevrons)	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon
Valve body material	Bronze	Bronze	Bronze	Bronze	Bronze	Cast Iron
Body rating, psi	225	250	250	250	250	100
Pressure drop limit, psi (For higher pressures consult our representative)	65	250	250	250	250	125
Approximate Full open Cv	2.1	9.5	13.0	18.6	25.0	45.0

Reverse Acting Valves

Valve size Inches	1/2	3/4	1	1-1/4	1-1/2	2
Valve type, Reverse acting (opens with rising temperature at bulb)	Single-Seated	Double-Seated, Balanced				
	A	FA	FA	FA	FA	FA
End Connections	Screwed Brass Unions					Flanged (125 lbs. ANSI)
Valve trim (poppet and seat) material	S.S.	Brass	Brass	Brass	Brass	Brass
Valve stem (highly finished) material	S.S.	S.S.	S.S.	S.S.	S.S.	S.S.
Stem packing (spring loaded chevrons)	Rubber	Rubber	Rubber	Rubber	Rubber	Rubber
Valve body material	Bronze	Bronze	Bronze	Bronze	Bronze	Cast Iron
Body rating, psi	225	200	200	200	200	175
Pressure drop limit, psi (For higher pressures consult our representative)	65	50	50	50	50	50
Approximate Full open Cv	2.1	9.3	17.6	22.5	30.4	59.3

The RT-1001 P, Q, R, S series is available with any of the temperature ranges listed below. The range should be selected so that the setpoint falls within the upper third of the range span.

Setpoint Adjustment Range	Matching Setpoint Temperature Indicator
60 - 120° F	-10 - 130° F
85 - 145° F	10 - 160° F
115 - 180° F	30 - 195° F
165 - 230° F	80 - 245° F
200 - 255° F	130 - 265° F

Separable Wells:

(For sensing bulb protection or ease of removal)

Material 316 S.S.

Type GA (Mounting thread one size larger than bulb size)

Valves:Types A, FA and MA, as illustrated.

Valve Sizing is critical to control and life of regulator. Use Robertshaw's "FLO-RULE" Valve Sizing Slide Rule and valve Cv chart or contact our representative or factory.

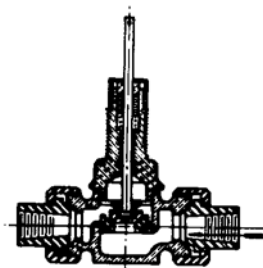
Note 1 - IMPORTANT - If valve seat leakage can cause a problem or hazard, the following should be taken into account, Maximum leakage of new valves: single-seated Type A - 0.05% of full open valve capacity; single-seated balanced Type MA - 0.01% of full open valve capacity; double seated Type FA - 0.5% of full open valve capacity. This leakage will usually increase somewhat as the valve seats wear in service.

Note 2 - IMPORTANT - Damage to or failure of the thermal element with loss of charge will ordinarily result in the regulator going to the "cold bulb" position. The "direct-acting" valve will fully open.

CAUTION:

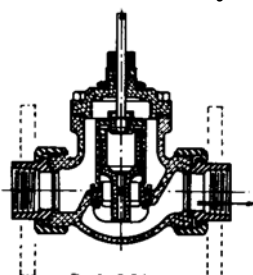
On heating service, this will result in full heat applied to process. If this constitutes a dangerous situation, safety precautions should be implemented.

RT-1001 Valves (See Valve Spec Sheet for full details)

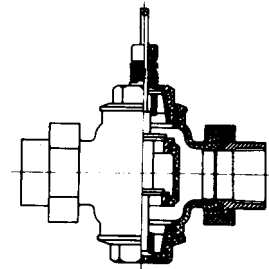


Style A
 Union Ends.
 Single-Seated
 Unbalanced
 Direct & Rev. Acting
 Size 1/2"
 Bronze Body
 SS Trim

Two Way

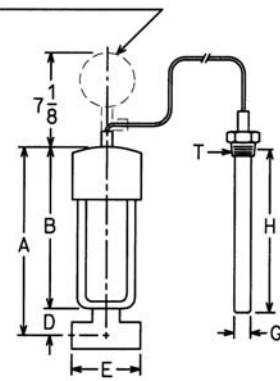


Style MA
 Single-Seated, SS Trim
 Fully Balanced
 Direct Acting only
 Sizes 3/4" - 1-1/2"
 Bronze Body
 Union ends
 Size 2" CI Body
 Flanged End



Style FA
 Double Seated
 Semi-balanced
 Reverse Acting only
 Sizes 3/4" - 1-1/2"
 Union Ends
 Bronze Body, Br Trim
 Size 2"
 Flanged Ends
 CI Body, Trim SS

TEMPERATURE INDICATOR
FOR RT-1001 Q.S



RT-1001 P, Q, R, S
Dimensions, Shipping Weights and Sensing Bulb Sizes

Valve Size Inches	1/2	3/4	1	1-1/4	1-1/2	2
Direct-Acting Valves						
Valve Type	A	MA	MA	MA	MA	MA
Shipping Wt., Lbs.	27	29	32	37	43	77
A	13-7/16	15-5/16	15-5/16	15-1/2	16	16-3/16
B	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8
D	1-9/16	3-7/16	3-7/16	3-5/8	4-1/8	4-15/16
E	4-3/4	6-15/16	7-1/8	7-1/2	8-1/2	7
Reverse-Acting Valves						
Valve Type	A	FA	FA	FA	FA	FA
Shipping Wt., Lbs.	27	29	32	37	43	77
A	13-7/16	13-15/16	14-11/16	14-11/16	15	15-11/16
B	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8	11-7/8
D	1-9/16	2-1/16	2-13/16	2-13/16	3-1/8	3-13/16
E	4-3/4	5-5/8	7-1/4	7-13/16	8-1/2	7
Standard bulb for temperature ranges beginning at 120°F or above.						
G	3/4	3/4	3/4	1	1	1
H	10	10	10	11	11	11
T*	3/4	3/4	3/4	1	1	1
**Standard bulb for temperature ranges beginning below 120°F.						
G	1	1	1	1	1	1
H	14	14	14	18	18	18
T*	1	1	1	1	1	1

*Standard pipe thread.

**Bulb sizes for ranges beginning below 120°F are necessary to provide "cross ambient" charge. This assures operation with ambient temperatures either above or below the control setting.

NOTE:

Special consideration has been given for field replacements of RT 1003 Series to accommodate applications where larger bulbs have been used. (Rule: May substitute larger bulb, but only under some conditions may smaller bulbs be substituted).



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