



Self-Actuated Temperature Regulator RT-1003 Series

FEATURES

1. Large two-ply, seamless bellows used for long life and extra power.
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. High quality indicating thermometer on regulators RT-1003-E1 and RT-1003-F1.
7. Variety of Sensing Bulb forms and materials available.
8. Valves in wide range of sizes, actions, styles, materials, etc. for many services.
9. Capillary Selection.
10. Setpoint adjustment wheel.

*Registered tradename of Dupont Company.

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.

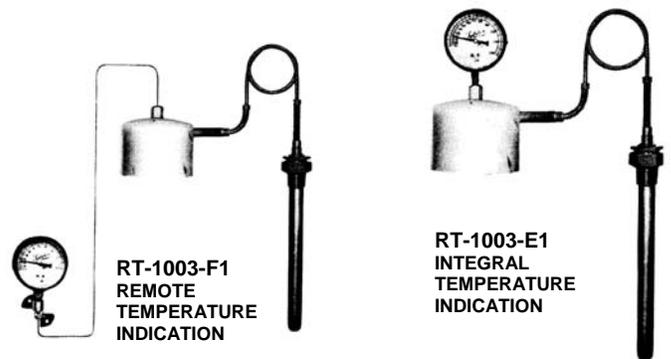
The SATR sensing bulb is installed in the medium being controlled while the SATR valve is located on the supply line of the medium used as the heating (steam, hot water) or cooling (water, ethylene glycol, brine) agent. The SATR regulates the heating or cooling medium flow to maintain the desired temperature 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.



RT-1003-D1
 NON-INDICATING



RT-1003-F1
 REMOTE
 TEMPERATURE
 INDICATION

RT-1003-E1
 INTEGRAL
 TEMPERATURE
 INDICATION

*Sizes 1/4" through 4"
 Medium 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

The RT-1003 Series

The RT-1003 series is a versatile design (the workhorse of the line) suitable for most SATR applications. It has more power and greater sensitivity than the RT-1001-B1 series but less than the RT-1004-A1 series. It offers integral or remote temperature indication whereas the other two series are cataloged as non-indicating. Related designs are the RT-1009-A1, B1, C1 for manual positioning in addition to automatic control; and RT-1011-B1 for corrosive atmosphere service.

VALVE SIZING

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. The application requirement can frequently be satisfied by one or two sizes smaller valve than the supply pipeline size.

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, CSS, WA & WCSS - 0.05% of full open valve capacity; single-seated Type WD - 1% of full open valve capacity; single-seated Types MA & MAS - 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" 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.

For cataloging and pricing purposes, the RT-1003-D1, E1, F1 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 non-ferrous 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			Single-Seated, Balanced				Double Seated, Semi-Balanced			
	A	A	A	MA	MA	MA	MA	MA	FA	FA	FA
End Connections	1/2" Screwed Brass Unions			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.	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	125	125	250	250	250	250	100	65	55	40
Full open Cv	1.0	1.6	2.1	9.5	13.0	18.6	25.0	45.0	82.5	130.0	226.0

Adjustable Ranges:

The RT-1003 series is available with any of the 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 Indication
10° - 55° F.	-60° - + 80° F.
30° - 80° F.	40° - +1 10° F.
50° - 105° F.	-10° - +130° F.
75° - 130° F.	10° - 160° F.
105° - 165° F.	30° - 195° F.
115° - 175° F.	40° - 205° F.
155° - 210° F.	80° - 245° F.
165° - 215° F.	100° - 240° F.
190° - 240° F.	130° - 265° F.
200° - 250° F.	130° - 280° F.
225° - 280° F.	160° - 310° F.
245° - 300° F.	170° - 330° F.
265° - 315° F.	180° - 350° F.

ALTERNATES INCLUDE:

Capillary:

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

Sensing Bulbs:

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

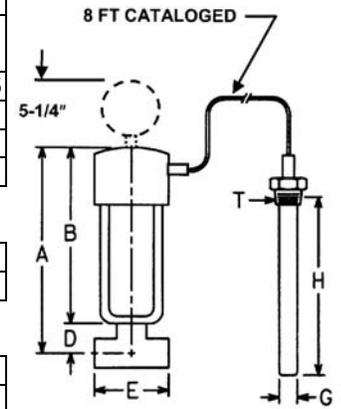
Separable Wells (For sensing bulb protection or ease of removal):

- Material* 316 SS
- Type GA or GA with lagging extension* mounting thread one size larger than bulb size
- Type GB* mounting thread same size as bulb size

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

RT-1003 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
A	13-7/16	13-7/16	13-7/16	15-5/16	15-5/16	15-1/2	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



Regulator No.	Shipping Weight, Lbs.										
RT-1003-D1	27	27	27	29	32	37	43	68	68	75	104
RT-1003-E1 F1	29	29	29	31	34	39	45	70	70	77	106

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

G	1	1	1	1	1	1	1	1	1	1	1
H	11	11	11	11	14	14	18	18	14	18	18
T*	1	1	1	1	1	1	1	1	1	1	1

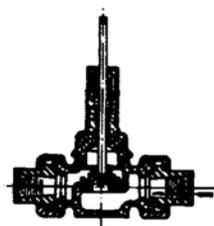
****Standard bulb for temperature ranges beginning below 120°F.**

G	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4
H	18	18	18	18	20	20	24	24	20	24	24
T*	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4

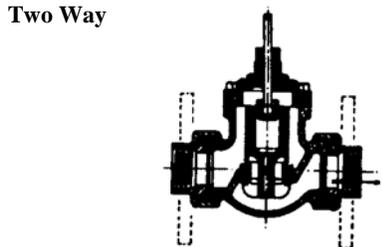
* Standard pipe thread

** 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-1003 series (See Valve Spec Sheet for details)

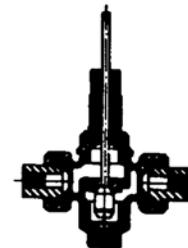


Style A
 Union Ends
 Single Seated, Unbalanced
 Bronze Body, SS Trim
 Direct Acting
 Sizes 1/4" – 1"
 Reverse Acting
 Sizes 1/4" – 1-1/2"

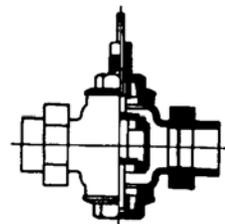


Style MA & MAS
 Single Seated, Fully Balanced
 Direct Acting Only
 SS Trim
 MA Sizes 3/4" – 1-1/2"
 Union Ends, Bronze Body
 MA Size 2", Flanged
 Bronze or CI Body
 MAS Sizes 1" – 2"
 Flanged, Steel Body
 MAS Sizes 3/4" – 1-1/2"
 Threaded Ends, Steel Body

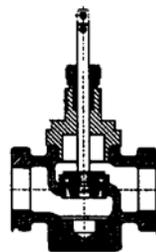
Three Way



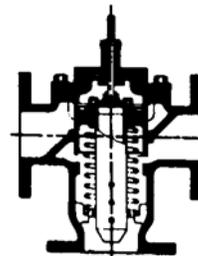
Style WA
 Single Seated, Unbalanced
 Union Ends (2)
 Threaded End (Bottom)
 Sizes 1/2" – 1-1/2"
 Bronze Body
 SS Trim



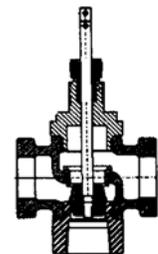
Style FA
 Double Seated, Semi-Balanced
 Rev. Acting: 3/4" – 1-1/2"
 Bronze Unions, Bronze Body
 Bronze or Monel Trim
 Rev. Acting: 2", Flgd, Br Body
 Bronze or Monel Trim
 Rev. Acting: 2", Flgd, CI Body
 Bronze or SS Trim
 Rev. Acting: 2-1/2" – 4"
 Flgd, Br Body, Monel Trim
 Rev. Acting: 2-1/2" – 4"
 Flanged, CI Body, SS Trim
 Dir. Acting: 2-1/2" – 4"
 Flanged, CI Body, SS Trim



Style CSS
 Single Seated, Unbalanced
 Teflon Seal
 Stainless Steel Body & Trim
 Sizes 1/2", 3/4" & 1"
 Direct & Rev. Acting
 Screwed Ends



Style WD
 Single Seated, Balanced
 Sizes 2" – 2-1/2"
 Flanged
 Bronze Body
 Bronze Trim



Style WCSS
 Single Seated, Unbalanced
 Stainless Steel Body & Trim
 Sizes 1/2", 3/4" & 1"
 Screwed Ends



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