

FEATURES

1. Extra large two-ply, seamless Robertshaw bellows used for greater operating power and closer control.
2. Chevron "Lifetime" stem packing made of Teflon* or EPT Rubber U-Cup for water service.
3. Quick-detach valve stem construction permits easy valve change.
4. Sturdy construction with cast iron frame.
5. Variety of sensing bulb forms and materials. (See page 2).
6. Valves in wide range of sizes, actions, styles, materials, etc. for many services. (see page 3).
7. Capillary selection (see page 2).
8. Setpoint adjustment wheel.
9. All components manufactured by a single source.

*Registered tradename of DuPont Company.

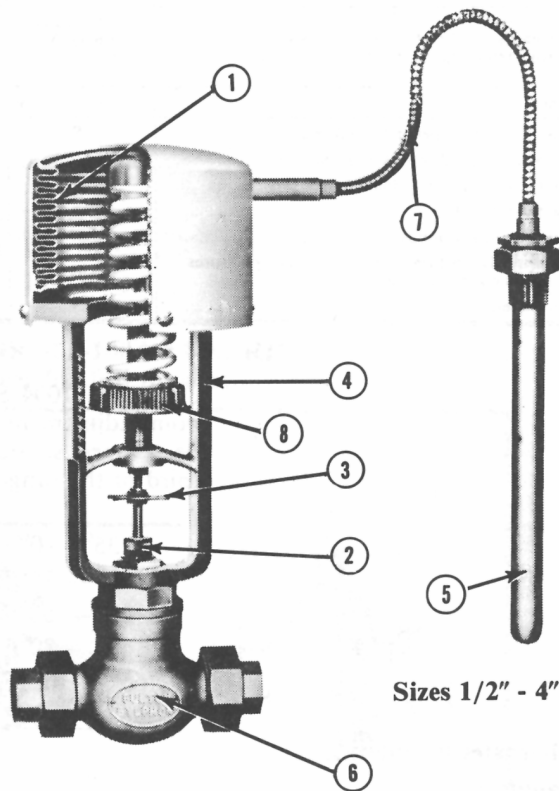
GENERAL

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 SATR 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.



*Extra power with
 Narrow 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 & invoicing instructions.

RT-1004-AI SERIES

The RT-1004-AI series is a non-indicating design suited to heating and cooling applications. The narrow throttling band means that the RT-1004-AI series is very sensitive to temperature changes at the large sensing bulb. It is particularly applicable where the storage capacity of medium

to be heated is great while the heating surface is relatively small. The extra large bellows develops power for more positive action on higher pressure drops on valve sizes above two inches.

For cataloging and pricing purposes, the RT-1004-AI series is detailed with direct-acting valves for heating service, 8 ft. capillary (copper with brass armor), 12B type (threaded

bushing) copper sensing bulb, cast iron frame and other non-listed parts of non-ferrous metals. Alternate specifications are available.

| Valve size, Inches | 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 | MA | MA | MA | MA | MA | FA | FA | RA | |
| End Connections | Screwed Brass Unions | | | | | Flanged (125 lbs. ANSI) | | | | |
| Valve Trim (poppet and seats), material | 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. | |
| Stem Packing (spring loaded chevrons) | Teflon | Teflon | Teflon | Teflon | Teflon | Teflon | Teflon | Teflon | Teflon | |
| Body Material | Bronze | Bronze | Bronze | Bronze | Bronze | Cast Iron | Cast Iron | Cast Iron | Cast Iron | |
| Body Rating, Pounds | 250 | 250 | 250 | 250 | 250 | 125 | 125 | 125 | 125 | |
| Pressure Drop Limit, psi (For higher pressures consult our representative) | 125 | 250 | 250 | 250 | 250 | 125 | 110 | 90 | 70 | |
| Full open Cv | 2.1 | 9.5 | 13.0 | 18.6 | 25.0 | 45.0 | 82.5 | 130.0 | 226.0 | |

The RT-1004 Series is available with any of the setpoint adjustment ranges listed below. The range should be selected so that the setpoint falls within the upper third of the range span.

| | | |
|--------------|--------------|--------------|
| 0° - 35°F | 115° - 160°F | 240° - 275°F |
| 20° - 60°F | 145° - 190°F | 255° - 295°F |
| 45° - 80°F | 160° - 195°F | 280° - 320°F |
| 65° - 105°F | 185° - 220°F | 300° - 355°F |
| 95° - 140°F | 190° - 225°F | 365° - 425°F |
| 110° - 150°F | 220° - 255°F | |

Alternates include:

Capillary:

Length 1 ft. to 50 ft. or more.

Materials Copper or 304 stainless steel, plain or with Plastisol sheathing and SS tube with SS armor.

Sensing Bulbs:

Type 12 BP 316 stainless steel

Type 12BP with "dead extension"

Type 54 Copper, externally finned (for some valve sizes, setpoint adjustment range and capillary length combinations).

(A) Plain

(B) Bushed

(C) Flanged

Type 6 Plain for open vessels. Copper or 304 SS plain or with Plastisol or Teflon sheathing.

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).

NOTE: Bulb diameter on lagging extension type is 1-1/4" maximum.

Type GB (Mounting thread same size as bulb size); for bulb sizes up to 1-1/4" diameter.

Valves: Types FA, WA, WD as illustrated.

VALVE SIZING

Valve sizing is critical to control and life of regulator. Use Robertshaw's "Flo-Rule" valve sizing slide rule and 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, WA, WD) - 0.05% of full open valve capacity; single-seated balanced (type MA or MAS) - 0.01%; double-seated (types FA, etc.) -0.5%. 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 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 fully open the bypass port(s).

DIMENSIONS, SHIPPING WEIGHTS AND SENSING BULB SIZES

| Valve Size, Inches | 1/2 | 3/4 | 1 | 1-1/4 | 1-1/2 | 2 | 2-1/2 | 3 | 4 |
|---------------------------|---------|---------|---------|--------|--------|----------|--------|--------|---------|
| Direct-Acting Valve, Type | A | MA | MA | MA | MA | MA | FA | FA | FA |
| Shipping Wt., Lbs. | 35 | 37 | 40 | 45 | 50 | 85 | 105 | 130 | 160 |
| A | 13-5/16 | 15-3/16 | 15-3/16 | 15-3/8 | 15-7/8 | 16-11/16 | 16-1/2 | 16-1/2 | 17-9/16 |
| B | 11-3/4 | 11-3/4 | 11-3/4 | 11-3/4 | 11-3/4 | 11-3/4 | 11-3/4 | 11-3/4 | 11-3/4 |
| D | 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 | 5-15/16 | 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.

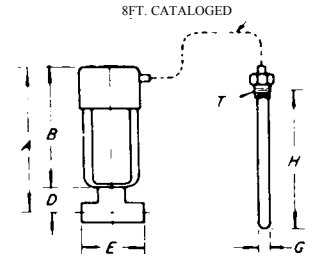
| | | | | | | | | | |
|----|----|----|-------|-------|-------|-------|-------|-------|-------|
| G | 1 | 1 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 |
| H | 18 | 18 | 18 | 18 | 18 | 24 | 18 | 18 | 24 |
| T* | 1 | 1 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 | 1-1/4 |

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

| | | | | | | | | | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| G | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 |
| H | 24 | 24 | 28 | 28 | 28 | 32 | 28 | 28 | 32 |
| T* | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 | 1-1/2 |

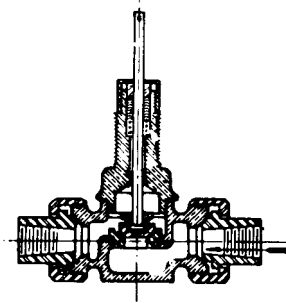
* Standard pipe thread.

** Bulb sizes for ranges beginning below 120° F. are necessary to provide "cross-ambient" charge. This assures operation with ambient temperature 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.

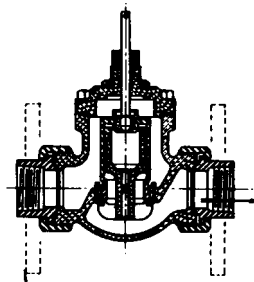


SATR VALVES FOR RT-1004-AI SERIES (See Valve Spec. Sheet for full details)

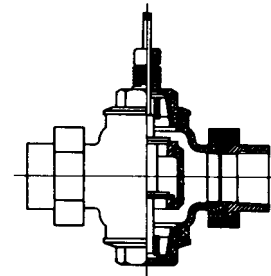
TWO WAY



Style A, Union Ends
Single Seated
Unbalanced
Direct & Rev. Acting
Sizes 3/4" - 1 1/2"
Bronze Body
SS Trim

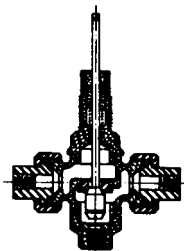


Style MA
Single Seated
Fully Balanced
Direct Acting only
Sizes 3/4" - 1 1/2"
Union Ends
Bronze or Steel body
Size 2"
Flanged
Bronze, C.I. or Steel body
SS Trim

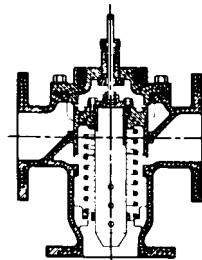


Style FA
Double Seated, Semi-balanced
Reverse Acting:
Sizes 3/4" - 1 1/2"
Bronze body, Bz unions
Trim Bronze or Monel.
Sizes 2" - 4"
CI or Bz body, Flanged
Trim Bronze, SS or Monel
Direct Acting:
Sizes 2 1/2" - 4"
CI or Bz body, Flanged
Trim Bronze or SS

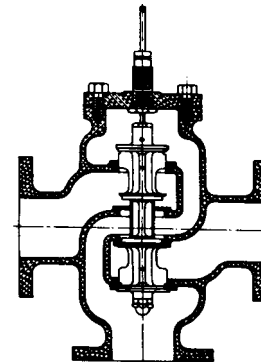
THREE WAY



Style WA, Union Ends
Unbalanced
Sizes 1/2" - 1 1/2"
Bronze body
SS trim



Style WD
Balanced
Sizes 2" - 3"
Bronze body, Flgd.
Bronze trim



Style WBI
Semi-balanced
Size: 3"
Cast Iron body
Bronze trim

Robertshaw

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