

Mark 80

Self-Operated Temperature Regulators

The MK80 Series is completely self-operated and requires no external power source or other expensive instrumentation to operate the valve.

The operation of the MK80 is fairly simple. A pre-measured amount of liquid fill is drawn into the thermal system filling the upper diaphragm chamber, the capillary tube, and most of the bulb. As the controlled temperature increases, the volatile liquid fill in the sensing bulb begins to vaporize and creates pressure on the sealed system. This pressure drives the valve stem, closing direct acting valves, or opening reverse acting valves.

Because of the shorter stroke length of the sliding gate seats, the MK80 is able to utilize a sealed actuator with a stainless steel diaphragm, and does not require a bellows to operate. To seal the actuator, the upper and lower casings and diaphragm are heli-arc welded around the circumference to create a solid bond. This seal eliminates the need for any type of gasket. All sealing surfaces on the MK80 are metal to metal.

Accurate temperature control begins with a reliable actuator.

A temperature regulator is only as good as its actuator and a great deal of research has gone into the development of Jordan's stainless steel SWA actuator. That is why the SWA, combined with Jordan's sliding gate regulator design, provides the finest temperature control available in a self-operated design. Among the features of the SWA actuator:

- **Heliarc welded construction:** the upper and lower casings, and diaphragm, are heliarc welded around the circumference to fuse a solid bond and eliminate the need for a gasket, a common source for leakage.
- **Stainless Steel diaphragm:** pre-formed from AISI 347 SST to eliminate rupturing caused by metal fatigue brought about by constant stress, the most common failure in bellows actuators.
- **Sensitive control:** because of the stroke length, the span of an SWA is about 1/3 that of a typical bellows actuator.



- **Simple replacement:** attached to the yoke by just four screws, the actuator can be replaced in less than five minutes. Control ranges can be changed with the valve in line by simply replacing the actuator.
- **Liquid/vapor thermal system:** to obtain the force needed to position the valve seats, Jordan uses a liquid/vapor thermal system that is capable of delivering far more operating power than the simple liquid expansion systems used on other temperature regulators. As the sensed temperature increases, the liquid fill in the bulb begins to vaporize and creates pressure within the sealed system. This pressure, exerted on the diaphragm, drives the valve stem to modulate the valve seats to the proper position.

FEATURES

- High rangeability — controls flows from 5% to 100% of rated capacity
- Sliding gate seats provide —
 - Straight-through flow for reduced turbulence and quiet operation
 - Short stroke for fast response and accurate temperature control
 - Easily interchangeable Cv's
 - Tight shutoff due to overlap of seat closure area
- Available with capillaries up to 100 feet in length



Jordan Valve

Jordan Valve, a Division of Richards Industries

3170 Wasson Road • Cincinnati, Ohio 45209

Telephone 513-533-5600 • Fax 513-871-0105

Toll-Free Telephone: 800-543-7311 (U. S. A. & Canada)

E-Mail: info@richardsind.com • URL: www.jordanvalve.com

SPECIFICATIONS

Line Sizes: 1/2" (DN15) through 2" (DN50)

End Connections

- Threaded — FNPT, BSPT, BSPP
- ANSI Flanges — 150#, 300#
- DIN Flanges — PN10/16, PN25/40

Body Materials

- Ductile Iron
- Bronze
- Carbon Steel
- Stainless Steel

Trim Materials

- 303 SS for DI, BRZ & CS body valves
- 316SS for SS body valves

Seat Materials

- Jorcote on SST — Standard
- Jorcote/Jordanic on SST — For severe service
- Chrome Plated SST — Optional

Yoke Material: Cast Iron

Stem Packing Materials

- Spring-loaded Teflon (to 450°F max/232°C max)
- braided (above 500°F/260°C up to 650°F/343°C)

Service: steam, water, oil, gas, air and chemicals

Shutoff: ANSI Class IV

Action

- Direct (increase in temperature closes valve)
- Reverse (increase in temperature opens valve)

Body Rating:

- Ductile Iron: 988 psi @ 100°F; 510 psi @ 450°F (68,1 bar @ 37,8°C; 35,2 bar @ 232,2°C)
- Carbon Steel: 1480 psi @ 100°F; 1235 psi @ 450°F (102,0 bar @ 37,8°C; 85,2 bar @ 232,2°C)
- Stainless Steel: 1480 psi @ 100°F; 990 psi @ 450°F (102,0 bar @ 37,8°C; 68,3 bar @ 232,2°C)
- Bronze: 500 psi @ 100°F; 350 psi @ 450°F (34,5 bar @ 37,8°C; 24,1 bar @ 232,2°C)
- -20°F (-28,9°C) temperature limit on all materials
- For other temperatures, consult factory

Overheat Protection: 100°F (56°C) above top of control range

Cv Values & Maximum Differential Pressure

| Size | | Flow Coef. | | Seat Material | Max ΔP | |
|--------------|----------|------------|--------------|---------------|--------|-------|
| Inches | DN | Cv | Kv | | PSI | BAR |
| 1/2" or 3/4" | 15 or 20 | 2.5 or 4.4 | 2,15 or 3,78 | SST | 125 | 8,62 |
| | | | | Jorcote | 300 | 20,68 |
| 1" or 1-1/4" | 25 or 32 | 6.4 or 9.5 | 5,50 or 8,17 | SST | 125 | 8,62 |
| | | | | Jorcote | 250 | 17,24 |
| 1-1/2" | 40 | 15 | 12,9 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |
| 2" | 50 | 25 or 30 | 21,5 or 25,8 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |

Low Flow Cv's Available

Reduced Cv's can be used in a valve of any size so long as the required Cv is a smaller value than the standard for that particular size. In addition, the following Cv values can be provided:

| | | | | | |
|-----------------|------------------|------------------|-------------------|-----------------------------------|----------------|
| 1.6 (1,4) | 0.84 (0,72) | 0.42 (0,36) | 0.21 (0,18) | 0.08 (0,07) | 0.04 (0,03) |
| 0.02 (0,017) | 0.008 (0,007) | 0.004 (0,003) | 0.002 (0,0017) | 0.0008 (0,0007) (N/A in 316SS) | |

Available Temperature Control Ranges & Spans

| Range °F (°C) | Thermal Fill | Temperature span from closed to open °F (°C) with standard spring ** | | |
|-----------------------------|-------------------|---|-------------|-------------|
| | | 1/4" - 3/4" | 1" - 1-1/4" | 1-1/2" - 2" |
| | | -20 to 20 (-29 to -7) | Freon 22 | 8 (4) |
| 10 to 55 (-12 to 13) | Freon R134A | 9 (5) | 14 (8) | 17 (9) |
| 35 to 90 (2 to 32) | Iso Butane | 11 (6) | 15 (8) | 18 (10) |
| 55 to 115 (13 to 46) | N-Butane | 11 (6) | 15 (8) | 18 (10) |
| 80 to 140 (27 to 60) | Ethyl Chloride | 11 (6) | 15 (8) | 18 (10) |
| 110 to 165 (43 to 74) | Freon R123 | 15 (8) | 22 (12) | 26 (14) |
| 120 to 185 (49 to 85) | Ethyl Ether | 15 (8) | 22 (12) | 26 (14) |
| 160 to 225 (71 to 107) | Acetone | 15 (8) | 22 (12) | 26 (14) |
| 205 to 260 (96 to 127) | Isopropyl Alcohol | 9 (5) | 14 (8) | 17 (9) |
| 230 to 290 (110 to 143) | N-Propyl Alcohol | 11 (6) | 15 (8) | 18 (10) |
| 265 to 325 (129 to 163) | N-Butyl Alcohol | 11 (6) | 15 (8) | 18 (10) |
| 315 to 400+ (157 to 204) | M-Xylene | 12 (7) | 19 (11) | 21 (12) |
| 380 to 450+ (193 to 232) | P-Cymene | 12 (7) | 19 (11) | 21 (12) |

** Lower spans and ranges available with optional light spring

* Requires 1" x 14" bulb

THERMAL SYSTEM SPECIFICATIONS

Actuator: Type SWA

Capillary Material

- Standard — Copper
- Optional — SST

Armor/Bulb Material

- Standard — SST with copper bulb
- Optional — SST with SST bulb; Teflon with Teflon/SST bulb

Capillary/Armor Length

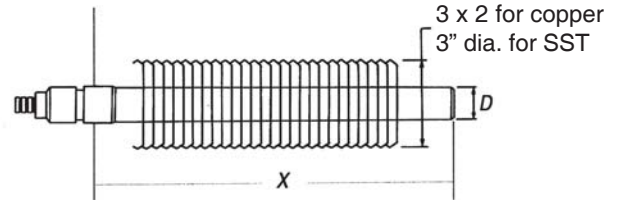
- Standard — 8 feet
- Optional — lengths to 100 feet

Standard Bulb Dimensions

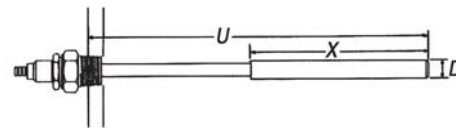
| Bulb Type | Nominal Bulb Size (Diameter x Length) for ranges beginning... | |
|-----------|---|--|
| | 101°F (38,3°C) or above | 100°F (37,7°C) or below |
| A & B | 1" x 12" (standard) (2,5cm x 30,5cm) | 1" x 14" (standard) (2,5cm x 35,6cm) |
| | 3/4" x 23" (optional) (1,9cm x 58,4cm) | 3/4" x 27" (optional) (1,9cm x 68,6cm) |
| C | 1" x 12" (SST only) (2,5cm x 30,5cm) | 1" x 14" (SST only) (2,5cm x 35,6cm) |
| | 1-1/8" x 14" (CU only) (2,9cm x 35,6cm) | 1-1/8" x 14" (CU only) (2,9cm x 35,6cm) |
| D, E & F | 1" x 12" (2,5cm x 30,5cm) | 1" x 14" (2,5cm x 35,6cm) |

TYPES OF BULBS

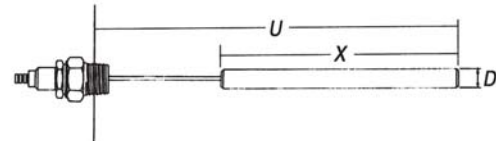
- Type C: *Finned Bulb*



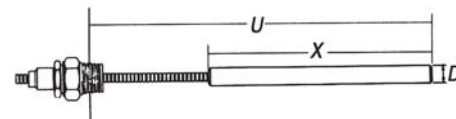
- Type D: *Bulb with Rigid "Dead" Extension*



- Type E: *Bulb with Pressure-tight Extension (well required for support when mounted horizontally)*

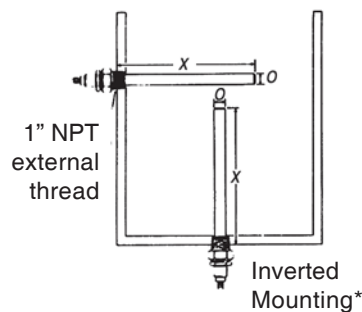


- Type F: *Bulb Extension with Adjustable Union*

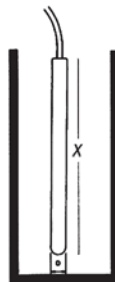


TYPES OF BULBS

- Type A: *Standard Bulb*
- Type B: *Plain Bulb*

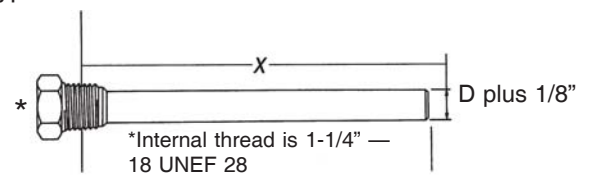


* must be specified on order

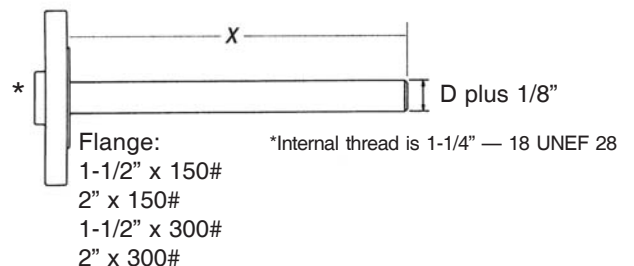


TYPES OF THERMAL WELLS

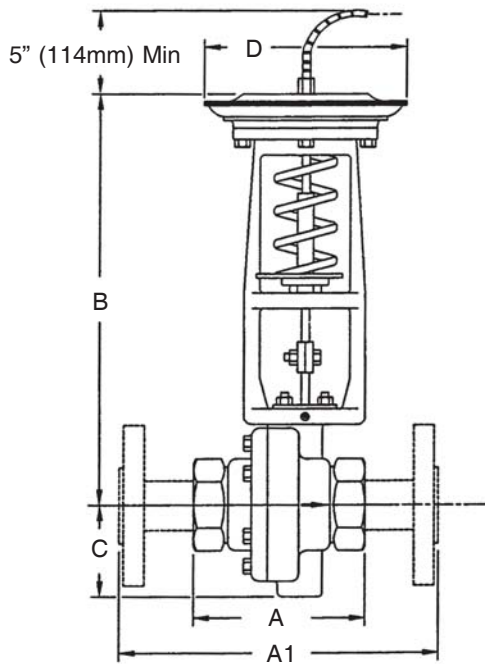
- Type A: *standard threaded connection*



- Type B: *optional flanged connection*



DIMENSIONS



■ Mark 80 Threaded Ends

| Flanged Ends: MK80 | | | | | | | |
|--------------------|-------------|---------------------|-------|------|------|--------------|-------|
| Size | ANSI Flange | Dimensions — Inches | | | | Weight — Lbs | |
| | | A1 | B | C | D | DI/BRZ | CS/SS |
| 1/2" | 150# | 7.25 | 12.00 | 2.81 | 7.00 | 21 | 23 |
| | 300# | 7.50 | 12.00 | 2.81 | 7.00 | 22 | 24 |
| 3/4" | 150# | 7.25 | 12.00 | 2.81 | 7.00 | 22 | 25 |
| | 300# | 7.62 | 12.00 | 2.81 | 7.00 | 23 | 28 |
| 1" | 150# | 7.25 | 12.25 | 2.62 | 7.00 | 24 | 28 |
| | 300# | 7.75 | 12.25 | 2.62 | 7.00 | 25 | 30 |
| 1-1/4" | 150# | 7.87 | 12.25 | 2.62 | 7.00 | 25 | — |
| | 300# | 8.37 | 12.25 | 2.62 | 7.00 | 26 | — |
| 1-1/2" | 150# | 8.75 | 12.75 | 2.75 | 7.00 | 27 | 32 |
| | 300# | 9.25 | 12.75 | 2.75 | 7.00 | 30 | 38 |
| 2" | 150# | 10.00 | 12.81 | 3.00 | 7.00 | 29 | 38 |
| | 300# | 10.50 | 12.81 | 3.00 | 7.00 | 31 | 42 |

■ Mark 80 Threaded Ends, Metric

| Flanged Ends: MK80, DIN | | | | | | | |
|-------------------------|-------------|-----------------|-----|----|-----|-------------|-------|
| Size (DN) | Flange (PN) | Dimensions — mm | | | | Weight — Kg | |
| | | A1 | B | C | D | DI/BRZ | CS/SS |
| 15 | 10/16 | 130 | 305 | 55 | 178 | 9,5 | 10,4 |
| | 25/40 | 130 | 305 | 55 | 178 | 10 | 10,9 |
| 20 | 10/16 | 150 | 305 | 55 | 178 | 10 | 11,3 |
| | 25/40 | 150 | 305 | 55 | 178 | 10,4 | 12,7 |
| 25 | 10/16 | 160 | 311 | 67 | 178 | 10,9 | 12,7 |
| | 25/40 | 160 | 311 | 67 | 178 | 11,3 | 13,6 |
| 32 | 10/16 | 180 | 311 | 67 | 178 | 11,3 | — |
| | 25/40 | 180 | 311 | 67 | 178 | 11,8 | — |
| 40 | 10/16 | 200 | 324 | 70 | 178 | 12,2 | 14,5 |
| | 25/40 | 200 | 324 | 70 | 178 | 13,6 | 17,2 |
| 50 | 10/16 | 230 | 325 | 76 | 178 | 13,2 | 17,2 |
| | 25/40 | 230 | 325 | 76 | 178 | 14,1 | 19,1 |

■ Mark 80 Threaded Ends

| Threaded Ends: MK80 | | | | | | |
|---------------------|----------|---------------------|-------|------|------|--------------|
| Size | Material | Dimensions — Inches | | | | Weight — lbs |
| | | A | B | C | D | |
| 1/2" & 3/4" | DI/BRZ | 3.62 | 12.00 | 2.18 | 7.00 | 20 |
| | CS/SS | 3.65 | 12.00 | 2.18 | 7.00 | 21 |
| 1" | DI/BRZ | 4.12 | 12.25 | 2.62 | 7.00 | 22 |
| | CS/SS | 4.12 | 12.25 | 2.62 | 7.00 | 23 |
| 1-1/4" | DI/BRZ | 4.12 | 12.25 | 2.62 | 7.00 | 22 |
| 1-1/2" | DI/BRZ | 4.50 | 12.75 | 2.75 | 7.00 | 24 |
| | CS/SS | 4.65 | 12.75 | 2.75 | 7.00 | 25 |
| 2" | DI/BRZ | 4.50 | 12.81 | 3.00 | 7.00 | 24 |
| | CS/SS | 5.50 | 12.81 | 3.00 | 7.00 | 27 |

■ Mark 80 Threaded Ends, Metric

| Threaded Ends: MK80, DIN | | | | | | |
|--------------------------|----------|-----------------|-----|----|-----|-------------|
| Size (DN) | Material | Dimensions — mm | | | | Weight — kg |
| | | A | B | C | D | |
| 15 & 20 | DI/BRZ | 92 | 305 | 55 | 178 | 9,1 |
| | CS/SS | 93 | 305 | 55 | 178 | 9,5 |
| 25 | DI/BRZ | 105 | 311 | 67 | 178 | 10,0 |
| | CS/SS | 105 | 311 | 67 | 178 | 10,4 |
| 32 | DI/BRZ | 105 | 311 | 67 | 178 | 10,0 |
| 40 | DI/BRZ | 114 | 324 | 70 | 178 | 10,9 |
| | CS/SS | 118 | 324 | 70 | 178 | 11,3 |
| 50 | DI/BRZ | 114 | 325 | 76 | 178 | 10,9 |
| | CS/SS | 140 | 325 | 76 | 178 | 12,2 |

ORDER SCHEMATIC

| | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | | | | | | | | | | |

| 1 | Model | |
|----------|------------------|--|
| 80 | Standard | |
| 80T | with Thermometer | |

| 2 | Size | | |
|----------|-------------|---------------|-----------|
| | | Inches | DN |
| | 050 | 1/2" | DN15 |
| | 075 | 3/4" | DN20 |
| | 100 | 1" | DN25 |
| | 125 | 1-1/4" | DN32 |
| | 150 | 1-1/2" | DN40 |
| | 200 | 2" | DN50 |

| 3 | Body Material | |
|----------|----------------------|--|
| DI | Ductile Iron | |
| BR | Bronze | |
| CS | Carbon Steel | |
| S6 | Stainless Steel | |

| 4 | End Connections | | | |
|----------|------------------------|--------------------|----|--------------------|
| | PT | NPT | I7 | PN10 DIN IFE |
| | BT | BSPT | F7 | PN10 FE (exc. IFE) |
| | BP | BSPP | I6 | PN16 DIN IFE |
| | SW | FSW | F6 | PN16 FE (exc. IFE) |
| | F1 | 125# FE | I8 | PN25 DIN IFE |
| | I5 | 150# IFE | F8 | PN25 FE (exc. IFE) |
| | F5 | 150# FE (exc. IFE) | I4 | PN40 DIN IFE |
| | F2 | 250# FE | F4 | PN40 FE (exc. IFE) |
| | I3 | 300# IFE | ZZ | Non-Standard) |
| | F3 | 300# FE (exc. IFE) | | |

| 5 | Trim | |
|----------|------------------------------|--|
| T3 | 303SS / Teflon Packing | |
| T6 | 316SS / Teflon Packing | |
| TM | Monel / Teflon Packing | |
| TA | Alloy 20 / Teflon Packing | |
| TH | Hastelloy C / Teflon Packing | |
| I3 | 303SS / 287-I Packing | |
| I6 | 316SS / 287-I Packing | |
| IM | Monel / 287-I Packing | |
| IA | Alloy 20 / 287-I Packing | |
| IH | Hastelloy C / 287-I Packing | |
| ZZ | Non-Standard | |

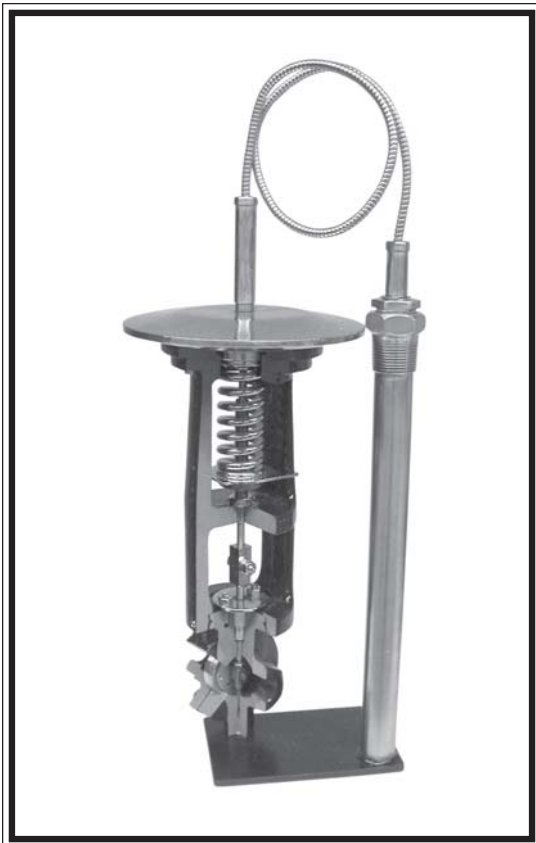
| 6 | Seats | | | |
|----------|-----------------|------------------------|-----------|--------|
| | Material | | Cv | |
| | A | 303SST | Y | 0.0008 |
| | B | 316SST | E | 0.0002 |
| | Q | 303 / Teflon | F | 0.004 |
| | R | 316 / Teflon | G | 0.008 |
| | S | Monel / Teflon | H | 0.02 |
| | T | Alloy 20 / Teflon | I | 0.04 |
| | U | HastelloyC Teflon | J | 0.08 |
| | V | 303SS / Jorcote | 1 | 0.21 |
| | W | 316SS / Jorcote | 2 | 0.42 |
| | X | 303SS/Jorcote/Jordanic | 3 | 0.84 |
| | Y | 316SS/Jorcote/Jordanic | 4 | 1.6 |
| | 1 | 303SST w/std. WH | 5 | 2.5 |
| | 2 | 316SST w/std. W.H. | 6 | 4.4 |
| | | | 7 | 6.4 |
| | | | 8 | 9.5 |
| | | | 9 | 15 |
| | | | A | 25 |
| | | | B | 30 |
| | ZZ | Non-Standard | | |

| 8 | Range | | | |
|----------|---------------------------|-----------|---------------------------|-----------|
| | Standard Spring °F | | Standard Spring °C | |
| | 06 | -20 ~ 20* | A6 | -29 ~ -7 |
| | 12 | 10 ~ 55 | B2 | -12 ~ 10 |
| | 19 | 35 ~ 90 | B9 | 2 ~ 32 |
| | 27 | 55 ~ 115 | C7 | 13 ~ 46 |
| | 35 | 80 ~ 140 | D5 | 27 ~ 60 |
| | 42 | 110 ~ 165 | E2 | 43 ~ 74 |
| | 49 | 120 ~ 185 | E9 | 49 ~ 85 |
| | 58 | 160 ~ 225 | F8 | 71 ~ 107 |
| | 66 | 205 ~ 260 | G6 | 96 ~ 127 |
| | 72 | 230 ~ 290 | H2 | 110 ~ 143 |
| | 81 | 265 ~ 325 | J1 | 129 ~ 163 |
| | 88 | 315 ~ 400 | J8 | 157 ~ 204 |
| | 93 | 380 ~ 450 | K3 | 193 ~ 232 |
| | Light Spring °F | | Light Spring °C | |
| | 05 | -25 ~ -5* | A5 | -32 ~ -21 |
| | 11 | 5 ~ 35 | B1 | -15 ~ 2 |
| | 17 | 30 ~ 70 | B7 | -1 ~ 21 |
| | 24 | 50 ~ 90 | C4 | 10 ~ 32 |
| | 32 | 75 ~ 115 | D2 | 24 ~ 46 |
| | 41 | 105 ~ 140 | E1 | 41 ~ 60 |
| | 46 | 115 ~ 160 | E6 | 46 ~ 71 |
| | 56 | 155 ~ 200 | F6 | 68 ~ 93 |
| | 64 | 195 ~ 235 | G4 | 91 ~ 113 |
| | 71 | 225 ~ 270 | H1 | 107 ~ 132 |
| | 79 | 260 ~ 300 | H9 | 127 ~ 149 |
| | 86 | 310 ~ 370 | J6 | 154 ~ 188 |
| | 92 | 375 ~ 440 | K2 | 191 ~ 227 |

Continued on page 6

ORDER SCHEMATIC (CONTINUED FROM PAGE 5)

| 9 | Thermowell | | | |
|--------------------------|--------------------------|-------------------------------|------------------------------|--------------------------------|
| | Type, Fitting & Material | | Size: for Bulb Dia. x Length | |
| | A | Type A, 1" NPT, Cu | A | 1" x 12" (24,5mm x 304,8mm) |
| | B | Type A, 1" NPT, SST | B | 1" x 14" (24,5mm x 355,6mm) |
| | E | Type B, 1-1/2" x 150#, SST | | |
| | F | Type B, 1-1/2" x 300#, SST | | |
| | G | Type B, 2" x 150#, SST | | |
| | H | Type B, 2" x 300#, SST | | |
| Tank Fitting Only | | | | |
| | 11 | 1" NPT Brass for 1" Bulb | | |
| | 12 | 1" NPT SST for 1" Bulb | | |
| | NN | None | | |



| 10 | Thermowell System | | | |
|----|-------------------|---|-------------------|-------------------|
| | | Bulb Refer to the stan- dard bulb dimensions chart for metrics | Cap/Arm ft (m) | Actuator |
| | N1N1Q | 1"X12" | 8 (2,4) | SWA |
| | N2N1Q | 1"X14" | 8 (2,4) | |
| | A1A2A | 1"X12" | 10 (3,1) | |
| | A2A2A | 1"X14" | 10 (3,1) | |
| | A1A4A | 1"X12" | 15 (4,6) | |
| | A2A4A | 1"X14" | 15 (4,6) | Reinforced SWA |
| | A2A1R | 1"X14" | 8 (2,4) | |
| | A2A2R | | 10 (3,1) | |
| | A2A3R | | 12 (3,7) | |
| | A2A4R | | 15 (4,6) | |
| | A2A5R | | 20 (6,1) | |
| | Q1N1Q | 1"X12" | 8 (2,4) | SWA |
| | Q2N1Q | 1"X14" | 8 (2,4) | |
| | G1B2A | 1"X12" | 10 (3,1) | |
| | G2B2A | 1"X14" | 10 (3,1) | |
| | G1B3A | 1"X12" | 12 (3,7) | |
| | G2B3A | 1"X14" | 12 (3,7) | |
| | G1B4A | 1"X12" | 15 (4,6) | |
| | G2B4A | 1"X14" | 15 (4,6) | |
| | G1B5A | 1"X12" | 20 (6,1) | |
| | G2B5A | 1"X14" | 20 (6,1) | |
| | G2B1R | 1"X14" | 8 (2,4) | Reinforced SWA |
| | G2B2R | | 10 (3,1) | |
| | G2B3R | | 12 (3,7) | |
| | G2B4R | | 15 (4,6) | |
| | G2B5R | | 20 (6,1) | |
| | H1B1A | 1"x12" | 8 (2,4) | SWA |
| | H2B1A | 1"x14" | 8 (2,4) | |
| | H1B2A | 1"x12" | 10 (3,1) | |
| | H2B2A | 1"x14" | 10 (3,1) | |
| | H1B3A | 1"x12" | 12 (3,7) | |
| | H2B3A | 1"x14" | 12 (3,7) | |
| | H1B4A | 1"x12" | 15 (4,6) | |
| | H2B4A | 1"x14" | 15 (4,6) | |
| | H1B5A | 1"x12" | 20 (6,1) | |
| | H2B5A | 1"x14" | 20 (6,1) | |
| | H2B1R | 1"x14" | 8 (2,4) | Reinforced SWA |
| | H2B2R | | 10 (3,1) | |
| | H2B3R | | 12 (3,7) | |
| | H2B4R | | 15 (4,6) | |
| | H2B5R | | 20 (6,1) | |
| | J3T1A | 1"x17" | 8 (2,4) | SWA |
| | J3T4A | | 10 (3,1) | |
| | J3T5A | | 12 (3,7) | |

| 11 | | Action |
|----|---|---------|
| | D | Direct |
| | R | Reverse |

Mark 801/802

Self-Operated Temperature Regulators

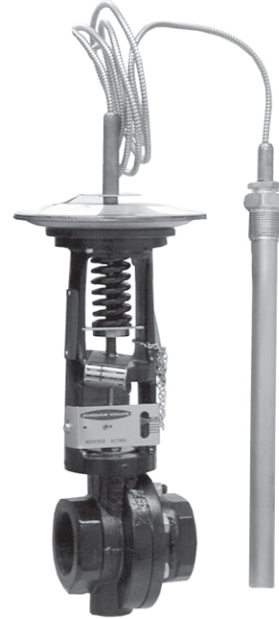
The MK801/802 Series is completely self-operated and requires no external power source or other expensive instrumentation to operate the valve.

The Mark 801/802 Series is the high-flow and super-high flow versions of our Mark 80 Series temperature regulator.

Accurate temperature control begins with a reliable actuator.

A temperature regulator is only as good as its actuator and a great deal of research has gone into the development of Jordan's stainless steel SWA actuator. That is why the SWA, combined with Jordan's sliding gate regulator design, provides the finest temperature control available in a self-operated design. Among the features of the SWA actuator:

- **Heliarc welded construction:** the upper and lower casings, and diaphragm, are heliarc welded around the circumference to fuse a solid bond and eliminate the need for a gasket, a common source for leakage.
- **Stainless Steel diaphragm:** pre-formed from AISI 347 SST to eliminate rupturing caused by metal fatigue brought about by constant stress, the most common failure in bellows actuators.
- **Sensitive control:** because of the stroke length, the span of an SWA is about 1/3 that of a typical bellows actuator.
- **Simple replacement:** attached to the yoke by just four screws, the actuator can be replaced in less than five minutes (without the need to adjust the stroke after replacement). Control ranges can be changed with the valve in line by simply replacing the actuator.
- **Liquid/vapor thermal system:** to obtain the force needed to position the valve seats, Jordan uses a liquid/vapor thermal system that is capable of delivering far more operating power than the simple liquid expansion systems used on other temperature regulators. As the sensed temperature increases, the liquid fill in the bulb begins to vaporize and creates pressure within the sealed system. This pressure, exerted on the diaphragm, drives the valve stem to modulate the valve seats to the proper position.



FEATURES

- Sliding gate seats provide —
 - Straight-through flow for reduced turbulence and quiet operation
 - Short stroke for fast response and accurate temperature control
 - Easily interchangeable Cv's
 - Tight shutoff due to overlap of seat closure area
- Available with capillaries up to 100 feet (30m) in length

SPECIFICATIONS

Line Sizes: 1/2" (DN15) through 2" (DN50)

End Connections

- Threaded — FNPT, BSPT, BSPP
- ANSI Flanges — 150#, 300#
- DIN Flanges — PN10/16, PN25/40

Body Materials

- Ductile Iron
- Bronze
- Carbon Steel
- Stainless Steel

Trim Materials

- 303 SS for DI, BRZ & CS body valves
- 316SS for SS body valves

Seat Materials

- Jorcote on SST — Standard
- Jorcote/Jordanic on SST — For severe service
- Chrome Plated SST — Optional

Yoke Material: Cast Iron

Stem Packing Materials

- Spring-loaded Teflon (to 450°F max/232°C max)
- braided (above 500°F/260°C up to 650°F/343°C)

Service: steam, water, oil, gas, air and chemicals

Shutoff: ANSI Class IV

Action

- Direct (increase in temperature closes valve)
- Reverse (increase in temperature opens valve)

Body Rating:

- Ductile Iron: 988 psi @ 100°F; 510 psi @ 450°F (68,1 bar @ 37,8°C; 35,2 bar @ 232,2°C)
- Carbon Steel: 1480 psi @ 100°F; 1235 psi @ 450°F (102,0 bar @ 37,8°C; 85,2 bar @ 232,2°C)
- Stainless Steel: 1480 psi @ 100°F; 990 psi @ 450°F (102,0 bar @ 37,8°C; 68,3 bar @ 232,2°C)
- Bronze: 500 psi @ 100°F; 350 psi @ 450°F (34,5 bar @ 37,8°C; 24,1 bar @ 232,2°C)
- -20°F (-28,9°C) temperature limit on all materials
- For other temperatures, consult factory

Overheat Protection: 100°F (56°C) above top of control range

Cv Values & Maximum Differential Pressure

- Mark 801

| Size | | Flow Coef. | | Seat Material | Max ΔP | |
|-------------|---------|------------|-------|---------------|--------|-------|
| Inches | DN | Cv | Kv | | PSI | BAR |
| 1/2" & 3/4" | 15 & 20 | 6.4 | 5,50 | SST | 75 | 5,17 |
| | | | | Jorcote | 200 | 13,79 |
| 1/2" | 15 | 7.0 | 6,02 | SST | 75 | 5,17 |
| | | | | Jorcote | 200 | 13,79 |
| 3/4" | 20 | 9.5 | 8,17 | SST | 75 | 5,17 |
| | | | | Jorcote | 200 | 13,79 |
| 1" & 1-1/4" | 25 & 32 | 15 | 12,90 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |
| 1" | 25 | 18 | 15,48 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |
| 1-1/4" | 32 | 25 | 21,50 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |
| 1-1/2" & 2" | 40 & 50 | 30 | 25,80 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |
| 1-1/2" | 40 | 45 | 38,70 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |
| 2" | 50 | 50 | 43,00 | SST | 75 | 5,17 |
| | | | | Jorcote | 175 | 12,07 |

- Mark 802

| Size | | Flow Coef. | | Seat Material | Max ΔP | |
|--------|----|------------|------|---------------|--------|------|
| Inches | DN | Cv | Kv | | PSI | BAR |
| 1-1/2" | 40 | 65 | 55,9 | SST | 75 | 5,17 |
| | | | | Jorcote | 100 | 6,89 |
| 2" | 50 | 70 | 60,2 | SST | 75 | 5,17 |
| | | | | Jorcote | 100 | 6,89 |

Available Temperature Control Ranges & Spans

| Range °F (°C) | Thermal Fill | Temperature span from closed to open °F (°C) w/ standard spring ** | |
|--------------------------|-------------------|--|-------------------|
| | | 1/2" - 3/4" (DN15-20) | 1" - 2" (DN25-32) |
| -10 to 20 (-23 to -7) | Freon 22 | 18 (10) | 30 (17) |
| 20 to 55 (-7 to 13) | Freon R134A | 20 (11) | 32 (18) |
| 45 to 90 (7 to 32) | Iso Butane | 21 (12) | 33 (18) |
| 65 to 115 (18 to 46) | N-Butane | 21 (12) | 33 (18) |
| 90 to 140 (32 to 60) | Ethyl Chloride | 21 (12) | 33 (18) |
| 120 to 165 (49 to 74) | Freon R123 | 31 (17) | 38 (21) |
| 130 to 185 (54 to 85) | Ethyl Ether | 31 (17) | 38 (21) |
| 170 to 225 (77 to 107) | Acetone | 31 (17) | 38 (21) |
| 215 to 260 (102 to 127) | Isopropyl Alcohol | 20 (11) | 32 (18) |
| 240 to 290 (116 to 143) | N-Propyl Alcohol | 21 (12) | 33 (18) |
| 275 to 325 (135 to 163) | N-Butyl Alcohol | 21 (12) | 33 (18) |
| 325 to 400 (163 to 204) | Xylene | 25 (14) | 50 (28) |
| 390 to 450+ (199 to 232) | P-Cymene | 25 (14) | 50 (28) |

** Lower spans and ranges available with optional light spring

* Requires 1" x 17" bulb

THERMAL SYSTEM SPECIFICATIONS

Actuator: Type SWA

Capillary Material

- Standard — Copper
- Optional — SST

Armor/Bulb Material

- Standard — SST with copper bulb
- Optional — SST with SST bulb; Teflon with Teflon/SST bulb

Capillary/Armor Length

- Standard — 8 feet (2,4 meters)
- Optional — Lengths to 100 feet (30,5 meters)

Standard Bulb Dimensions

| Bulb Type | Nominal Bulb Size (Dia. x Length) for ranges beginning... | |
|-----------|---|---|
| | 101°F (38,3°C) or above | 100°F (37,7°C) or below |
| A & B | 1" x 14" (std.) (2,5cm x 35,6cm) | 1" x 17" (Std.) (2,5cm x 43,2cm) |
| | 3/4" x 27" (optional) (1,9cm x 68,6cm) | 3/4" x 33" (optional) (1,9cm x 83,8cm) |
| C | 1" x 14" (SST only.) (2,5cm x 35,6cm) | 1" x 17" (SST only) (2,5cm x 43,2cm) |
| | 1-1/8" x 14" (CU only.) (2,9cm x 35,6cm) | 1-1/8" x 14" (CU only.) (2,9cm x 35,6cm) |
| D, E & F | 1" x 14" (std.) (2,5cm x 35,6cm) | 1" x 17" (Std.) (2,5cm x 43,2cm) |

Types of Bulbs

- Type A: Standard Bulb
- Type B: Plain Bulb
- Type C: Finned Bulb
- Type D: Bulb with Rigid "Dead" Extension
- Type E: Bulb with Pressure-tight Extension (*well required for support when mounted horizontally*)
- Type F: Bulb Extension with Adjustable Union

Thermal Wells

- Type A: Standard Threaded Connection
- Type B: Optional Flanged Connection

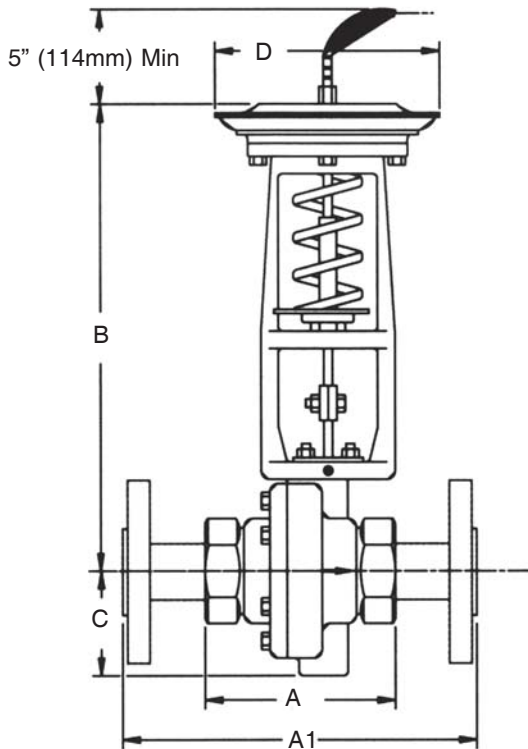
DIMENSIONS

■ Mark 801/802 Threaded Ends

| Threaded Ends: MK801/802 | | | | | | |
|--------------------------|----------|---------------------|-------|------|------|--------------|
| Size | Material | Dimensions — Inches | | | | Weight — lbs |
| | | A | B | C | D | |
| 1/2" & 3/4" | DI/BRZ | 3.62 | 12.00 | 2.18 | 7.00 | 20 |
| | CS/SS | 3.65 | 12.00 | 2.18 | 7.00 | 21 |
| 1" | DI/BRZ | 4.12 | 12.25 | 2.62 | 7.00 | 22 |
| | CS/SS | 4.12 | 12.25 | 2.62 | 7.00 | 23 |
| 1-1/4" | DI/BRZ | 4.12 | 12.25 | 2.62 | 7.00 | 22 |
| 1-1/2" | DI/BRZ | 4.50 | 12.81 | 3.00 | 7.00 | 24 |
| | CS/SS | 5.50 | 12.81 | 3.00 | 7.00 | 27 |
| 2" | DI/BRZ | 4.50 | 12.81 | 3.00 | 7.00 | 24 |
| | CS/SS | 5.50 | 12.81 | 3.00 | 7.00 | 27 |

■ Mark 801/802 Threaded Ends, Metric

| Threaded Ends: MK801/802, DIN | | | | | | |
|-------------------------------|----------|-----------------|-----|----|-----|-------------|
| Size (DN) | Material | Dimensions — mm | | | | Weight — kg |
| | | A | B | C | D | |
| 15 & 20 | DI/BRZ | 92 | 305 | 55 | 178 | 9,1 |
| | CS/SS | 93 | 305 | 55 | 178 | 9,5 |
| 25 | DI/BRZ | 105 | 311 | 67 | 178 | 10,0 |
| | CS/SS | 105 | 311 | 67 | 178 | 10,4 |
| 32 | DI/BRZ | 105 | 311 | 67 | 178 | 10,0 |
| 40 | DI/BRZ | 114 | 325 | 76 | 178 | 10,9 |
| | CS/SS | 140 | 325 | 76 | 178 | 12,2 |
| 50 | DI/BRZ | 114 | 325 | 76 | 178 | 10,9 |
| | CS/SS | 140 | 325 | 76 | 178 | 12,2 |



DIMENSIONS

■ Mark 801/802 Flanged Ends

| Flanged Ends: MK801/802 | | | | | | | |
|-------------------------|-------------|---------------------|-------|------|------|--------------|-------|
| Size | ANSI Flange | Dimensions — Inches | | | | Weight — Lbs | |
| | | A1 | B | C | D | DI/BRZ | CS/SS |
| 1/2" | 150# | 7.25 | 12.00 | 2.18 | 7.00 | 21 | 23 |
| | 300# | 7.50 | 12.00 | 2.18 | 7.00 | 22 | 24 |
| 3/4" | 150# | 7.25 | 12.00 | 2.18 | 7.00 | 22 | 25 |
| | 300# | 7.62 | 12.00 | 2.18 | 7.00 | 23 | 28 |
| 1" | 150# | 7.25 | 12.25 | 2.62 | 7.00 | 24 | 28 |
| | 300# | 7.75 | 12.25 | 2.62 | 7.00 | 25 | 30 |
| 1-1/4" | 150# | 7.87 | 12.25 | 2.62 | 7.00 | 25 | — |
| | 300# | 8.37 | 12.25 | 2.62 | 7.00 | 26 | — |
| 1-1/2" | 150# | 8.75 | 12.75 | 3.00 | 7.00 | 29 | 38 |
| | 300# | 9.25 | 12.75 | 3.00 | 7.00 | 31 | 42 |
| 2" | 150# | 10.00 | 12.81 | 3.00 | 7.00 | 29 | 38 |
| | 300# | 10.50 | 12.81 | 3.00 | 7.00 | 31 | 42 |

■ Mark 801/802 Flanged Ends, Metric

| Flanged Ends: MK801/802, DIN | | | | | | | |
|------------------------------|-------------|-----------------|-----|----|-----|-------------|-------|
| Size (DN) | Flange (PN) | Dimensions — mm | | | | Weight — Kg | |
| | | A1 | B | C | D | DI/BRZ | CS/SS |
| 15 | 10/16 | 130 | 305 | 55 | 178 | 9,5 | 10,4 |
| | 25/40 | 130 | 305 | 55 | 178 | 10 | 10,9 |
| 20 | 10/16 | 150 | 305 | 55 | 178 | 10 | 11,3 |
| | 25/40 | 150 | 305 | 55 | 178 | 10,4 | 12,7 |
| 25 | 10/16 | 160 | 311 | 67 | 178 | 10,9 | 12,7 |
| | 25/40 | 160 | 311 | 67 | 178 | 11,3 | 13,6 |
| 32 | 10/16 | 180 | 311 | 67 | 178 | 11,3 | — |
| | 25/40 | 180 | 311 | 67 | 178 | 11,8 | — |
| 40 | 10/16 | 200 | 324 | 76 | 178 | 12,2 | 17,2 |
| | 25/40 | 200 | 324 | 76 | 178 | 13,6 | 19,1 |
| 50 | 10/16 | 230 | 325 | 76 | 178 | 13,2 | 17,2 |
| | 25/40 | 230 | 325 | 76 | 178 | 14,1 | 19,1 |

ORDER SCHEMATIC

To specify a MK801/802 Series Temperature Regulator, build a model number by making a selection from each category in the product Designator Coding System below.

| | | | | | | | | | | | | | | |
|----------|---|----------|---|----------|---|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| 1 | — | 2 | — | 3 | / | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | | | | | | | | | | | | | | |

| 1 | Model | |
|----------|-------|--|
| | 801 | High-Flow |
| | 801T | High-Flow with Temperature Gauge |
| | 802 | Super High-Flow |
| | 802T | Super High-Flow with Temperature Gauge |

| 2 | Size | |
|----------|--------|--------|
| | Inches | DN |
| | 050 | 1/2" |
| | 075 | 3/4" |
| | 100 | 1" |
| | 125 | 1-1/4" |
| | 150 | 1-1/2" |
| | 200 | 2" |

| 3 | Body Material | |
|----------|---------------|------------------------|
| | DI | Ductile Iron |
| | BR | Bronze |
| | CS | Carbon Steel (WCB) |
| | S6 | Stainless Steel (CF8M) |

| 4 | End Connections | |
|----------|-----------------|---------------------|
| | PT | NPT |
| | BT | BSPT |
| | BP | BSPP |
| | SW | FSW |
| | F1 | 125# IFE |
| | I5 | 150# IFE |
| | F5 | 150# FE (exc. IFE) |
| | F2 | 150# FE |
| | I3 | 300# IFE |
| | F3 | 300# FE (exc. IFE) |
| | I7 | PN10 DIN IFE |
| | F7 | PN 10 FE (exc. IFE) |
| | I6 | PN 16 DIN IFE |
| | F6 | PN 16 FE (exc. IFE) |
| | I8 | PN 25 FE DIN IFE |
| | F8 | PN 25 FE (exc. IFE) |
| | I4 | PN 40 DIN IFE |
| | F4 | PN 40 FE (exc. IFE) |
| | ZZ | Non-Standard |

Continued on page 11

ORDER SCHEMATIC (CONTINUED FROM PAGE 10)

| 5 | Trim | |
|---|------|------------------------------|
| | T3 | 303SS / Teflon Packing |
| | T6 | 316SS / Teflon Packing |
| | TM | Monel / Teflon Packing |
| | TA | Alloy 20 / Teflon Packing |
| | TH | Hastelloy C / Teflon Packing |
| | I3 | 303SS / 287-I Packing |
| | I6 | 316SS / 287-I Packing |
| | IM | Monel / 287-I Packing |
| | IA | Alloy 20 / 287-I Packing |
| | IH | Hastelloy C / 287-I Packing |
| | ZZ | Non-Standard |

| 6 | Seats | | | |
|---|----------|------------------------|----|-----|
| | Material | | Cv | |
| | A | 303SST | K | 6.1 |
| | B | 316SST | 7 | 6.4 |
| | Q | 303 / Teflon | L | 7.0 |
| | R | 316 / Teflon | M | 9.0 |
| | S | Monel / Teflon | 8 | 9.5 |
| | T | Alloy 20 / Teflon | Q | 14 |
| | U | HastelloyC Teflon | 9 | 15 |
| | V | 303SS / Jorcote | R | 18 |
| | W | 316SS / Jorcote | T | 24 |
| | X | 303SS/Jorcote/Jordanic | A | 25 |
| | Y | 316SS/Jorcote/Jordanic | B | 30 |
| | 1 | 303SST w/std. WH | V | 35 |
| | 2 | 316SST w/std. W.H. | W | 45 |
| | | | C | 50 |
| | | | Y | 65 |
| | | | E | 70 |
| | ZZ | Non-Standard | | |

| 7 | Range | | | |
|---|--------------------|--------------|--------------------|-----------|
| | Standard Spring °F | | Standard Spring °C | |
| | 08 | -10 ~ 20* | AB | -23 ~ 7 |
| | 14 | 20 ~ 55 | B4 | -7 ~ 13 |
| | 23 | 45 ~ 90 | C3 | 7 ~ 32 |
| | 30 | 65 ~ 115 | DD | 18 ~ 46 |
| | 37 | 90 ~ 140 | D7 | 32 ~ 60 |
| | 47 | 120 ~ 165 | E7 | 49 ~ 74 |
| | 52 | 130 ~ 185 | F2 | 54 ~ 85 |
| | 60 | 170 ~ 225 | GG | 77 ~ 107 |
| | 68 | 215 ~ 260 | G8 | 102 ~ 127 |
| | 75 | 240 ~ 290 | H5 | 116 ~ 143 |
| | 84 | 275 ~ 325 | J4 | 135 ~ 163 |
| | 90 | 325 ~ 400 | KK | 163 ~ 204 |
| | 95 | 390 ~ 450 | K5 | 199 ~ 232 |
| | ZZ | Non-Standard | | |
| | Light Spring °F | | Light Spring °C | |
| | 07 | -15 ~ -5* | A7 | -26 ~ -21 |
| | 13 | 15 ~ 35 | B3 | -9 ~ 2 |
| | 21 | 40 ~ 70 | C1 | 41 ~ 21 |
| | 28 | 60 ~ 90 | C8 | 16 ~ 32 |
| | 36 | 85 ~ 115 | D6 | 29 ~ 46 |
| | 44 | 115 ~ 140 | E4 | 52 ~ 60 |
| | 50 | 125 ~ 160 | FF | 46 ~ 71 |
| | 56 | 155 ~ 200 | F6 | 68 ~ 93 |
| | 65 | 205 ~ 235 | G5 | 96 ~ 113 |
| | 73 | 235 ~ 270 | H3 | 113 ~ 132 |
| | 83 | 270 ~ 300 | J3 | 132 ~ 149 |
| | 89 | 320 ~ 370 | J9 | 160 ~ 188 |
| | 94 | 385 ~ 440 | K4 | 196 ~ 227 |

* Reinforced actuator required

Continued on page 12

ORDER SCHEMATIC (CONTINUED FROM PAGE 11)

| 8 | Thermowell | | | |
|--------------------------|--------------------------|----------------------------|------------------------------|--------------------------------|
| | Type, Fitting & Material | | Size: for Bulb Dia. x Length | |
| | A | Type A, 1" NPT, Cu | B | 1" x 14" (24,5mm x 355,6mm) |
| | B | Type A, 1" NPT, SST | C | 1" x 17" (24,5mm x 431,8mm) |
| | E | Type B, 1-1/2" x 150#, SST | | |
| | F | Type B, 1-1/2" x 300#, SST | | |
| | G | Type B, 2" x 150#, SST | | |
| | H | Type B, 2" x 300#, SST | | |
| | NN | None | | |
| | ZZ | Non-Standard | | |
| Tank Fitting Only | | | | |
| | 11 | 1" NPT Brass for 1" Bulb | | |
| | 12 | 1" NPT SST for 1" Bulb | | |
| | NN | None | | |
| | ZZ | Non-Standard | | |

| 10 | Capillary/Armor | | | |
|----|-----------------|---------------|--------|------------|
| | Material | | Length | |
| | A | Cu | 1 | 8' (2,4m) |
| | B | SST | 2 | 10' (3,0m) |
| | T | Teflon Coated | 3 | 12' (3,7m) |
| | | | 4 | 15' (4,6m) |
| | | | 5 | 20' (6,1m) |
| | ZZ | Non-Standard | | |

| 11 | Actuator | |
|----|----------|---------------------------------------|
| | A | Standard |
| | R | SWA/Reinforced req'd below 0°F (18°C) |
| | ZZ | Non-Standard |

| 12 | Action | |
|----|--------|---------|
| | D | Direct |
| | R | Reverse |

| 9 | Bulb | | | |
|--------------------|-----------------|-----------------|------------------------------------|--------------------------------|
| | Type & Material | | Dia. x Length | |
| | A | Type A Cu | 2 | 1" x 14" (24,5mm x 355,6mm) |
| | G | Type A SST | 3 | 1" x 17" (24,5mm x 431,8mm) |
| | H | Type B SST | | |
| | J | Teflon Coated B | | |
| | ZZ | Non-Standard | | |
| Type C Bulb | | | | |
| | C9 | Type C Cu | 1-1/8" x 14" (28,6mm x 355,6mm) | |
| | C2 | Type C SST | 1" x 14" (24,5mm x 355,6mm) | |
| | ZZ | Non-Standard | | |