

FIGURE 31 / 41 BRONZE SERIES

SIZES 1/2" – 2 1/2"
PRESSURES to 300 PSIG at 422°F



FIGURE 31 BRONZE SERIES

APPLICATION DATA

- Steam Boilers
- Pressure Reducing Stations
- Unfired Steam Pressure Vessels & Lines
- Accumulators, Sterilizers, Steam Cleaners
- Air compressors, Cookers, Receivers
- Pneumatic Systems
- OEM Equipment

VALVE RATINGS *See Capacity Charts beginning on page 208*

Model	Pressure PSIG (bar)	Temperature °F (°C)
0031/0041/041A/41AT/41AA	5 to 250 (.3 to 17.2)	-20 to 406 (-29 to 208)
0032/0042/042A/42AT/42AA	5 to 300 (.3 to 20.7)	-20 to 422 (-29 to 216)
0033/0043/043A/43AT	5 to 250 (.3 to 17.2)	-20 to 406 (-29 to 208)

APPLICABLE CODES

- ASME Section I "V" for Steam
- ASME Section VIII "UV" for Steam/Air/Gas
- API 527
- Canadian Registration # OG0591.9C
- PED (Consult Factory)

- Meets ASME Section I & VIII Code for Steam, Air & Non-hazardous Gas Service
- "V" or "UV" National Board Certified
- Dual Ring Control See page 206
- Rugged Cast Unitized Bonnet
- SS Spring Supplied as Standard
- Full Nozzle
- Soft Seat Design Available See page 206
- Open Lever Assembly

OPTIONS

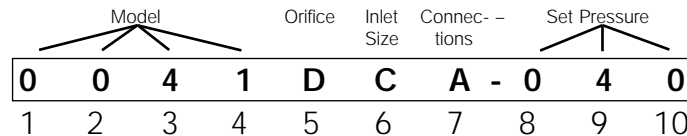
- Top Outlet Discharge
- BSP Connections
- Soft Seated Valves
- Plain Cap (on selected models)
- Test Reports Available

MODELS

- 0031 - ASME Section I Steam, Bronze Trim
- 0041 - ASME Section VIII Steam, Bronze Trim
- 041A - ASME Section VIII Air, Bronze Trim
- 41AT - Top Outlet on 041A
- 41AA - Plain Cap on 041A (D orifice only)
- 0032 - SS Base & Disc on 0031
- 0042 - SS Base & Disc on 0041
- 042A - SS Base & Disc on 041A
- 42AT - SS Base & Disc on 41AT
- 42AA - SS Base & Disc on 41AA (D orifice only)
- 0033 - EPDM Soft Seat on 0031
- 0043 - EPDM Soft Seat on 0041
- 043A - Viton Soft Seat on 041A
- 43AT - Viton Soft Seat on 41AT

FIGURE 31 / 41
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CODE SELECTION CHART



Model - Position 1, 2, 3 & 4
 0031 = ASME Section I Steam, Bronze Trim
 0041 = ASME Section VIII Steam, Bronze Trim
 041A = ASME Section VIII Air, Bronze Trim
 41AT = Top Outlet on 041A
 41AA = Plain Cap on 041A (D orifice only)
 0032 = SS Base & Disc on 0031
 0042 = SS Base & Disc on 0041
 042A = SS Base & Disc on 041A
 42AT = SS Base & Disc on 41AT
 42AA = SS Base & Disc on 41AA
 0033 = EPDM Soft Seat on 0031
 0043 = EPDM Soft Seat on 0041
 043A = Viton Soft Seat on 041A
 43AT = Viton Soft Seat on 41AT

Orifice - Position 5
 D
 E
 F
 G
 H
 J

Inlet Size - Position 6
 C = 1/2
 D = 3/4
 E = 1
 F = 1 1/4
 G = 1 1/2
 H = 2
 J = 2 1/2

Connections - Position 7
 A = MPT x FPT
 E = MPT x Top
 F = MBSP x FBSP
 Z = Other

Set Pressure - Position 8, 9 & 10
 _ _ _ = Actual Setting
 LAS - Loosely Assembled†

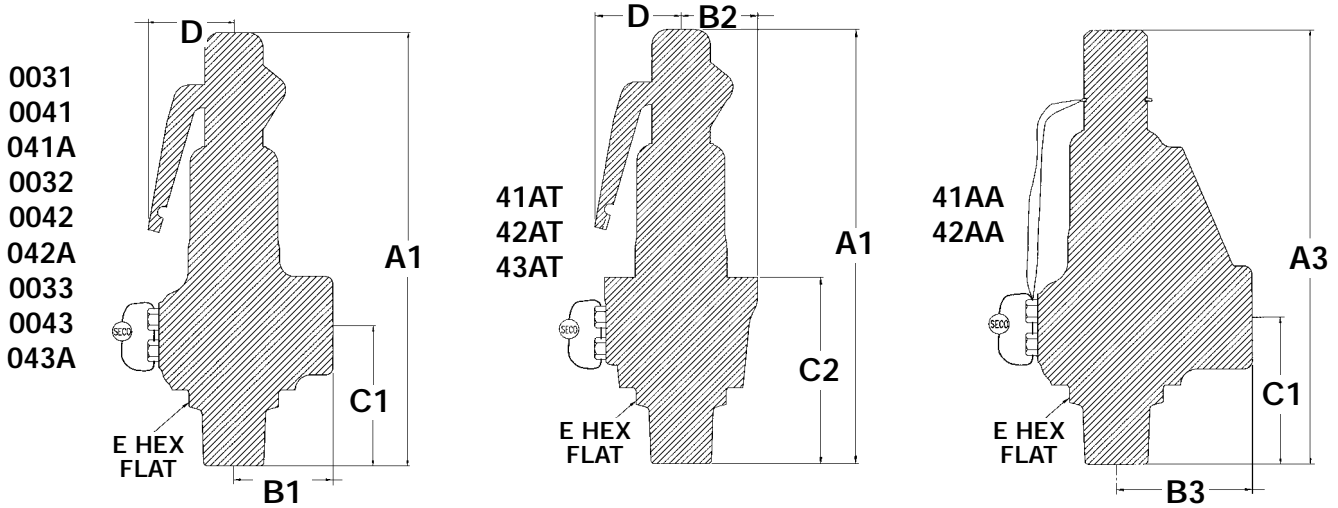
†Spence Certified Assemblers Only
 (use 0031, 0032, 0033, 41AT, 42AT,
 43AT, 41AA or 42AA only)

FIGURE 31 / 41

BRONZE SERIES

SPECIFICATION

The valve shall meet the ASME Section I or VIII Code for steam, air and gas services. It shall be "V" or "UV" National Board Certified. The valve shall have dual blowdown ring to allow better adjustment of the pop and blowdown. The valve shall consist of a unitized bonnet design guaranteeing proper guiding and making the valve extremely dependable in terms of pop action, seat tightness and repeatability. The valve shall be top guided and shall have a full nozzle for optimum flow performance. The valve shall have a stainless steel spring for better corrosion and yield strength. The valve shall meet the API 527 leakage standard requiring bubble tight shutoff up to 90% of set pressure.



DIMENSIONS* inches (mm) **AND WEIGHTS** pounds (kg)

Model	Inlet	Orifice	Outlet ⁽²⁾	A1	A3	B1	B2	B3	C1	C2	D ⁽¹⁾	E	Weight
****DCA	½ MPT (15)	D	¾ FPT (20)	6⅞ (166.7)	6¼ (158.8)	1⅜ (34.9)	1⅞ (27.0)	1⅞ (47.6)	2¼ (57.2)	2⅞ (73.0)	1⅜ (34.9)	1⅞ (28.6)	2 (0.91)
****DDA	¾ MPT (20)	D	¾ FPT (20)	6⅞ (166.7)	6¼ (158.8)	1⅜ (34.9)	—	1⅞ (47.6)	2¼ (57.2)	—	1⅜ (34.9)	1¼ (31.8)	2¼ (1.02)
****EDA	¾ MPT (20)	E	1 FPT (25)	7⅞ (181.0)	—	1⅞ (41.3)	1¼ (31.8)	—	2⅝ (58.7)	3⅞ (79.4)	1⅞ (34.9)	1¼ (31.8)	2½ (1.13)
****EEA	1 MPT (25)	E	1 FPT (25)	7⅞ (181.0)	—	1⅞ (41.3)	—	—	2⅝ (58.7)	—	1⅞ (34.9)	1½ (38.1)	2¾ (1.25)
****FEA	1 MPT (25)	F	1¼ FPT (32)	9 (228.6)	—	1⅞ (47.6)	1⅞ (36.5)	—	2 13⁄16 (71.4)	3½ (88.9)	1 11⁄16 (42.9)	1½ (38.1)	4 (1.81)
****FFA	1¼ MPT (32)	F	1¼ FPT (32)	9 (228.6)	—	1⅞ (47.6)	—	—	2 13⁄16 (71.4)	—	1 11⁄16 (42.9)	1¾ (44.5)	4¼ (1.93)
****GFA	1¼ MPT (32)	G	1½ FPT (40)	9 11⁄16 (246.1)	—	2⅞ (54.0)	1 11⁄16 (42.9)	—	3 (76.2)	3¾ (95.3)	1 11⁄16 (42.9)	1⅞ (47.6)	7 (3.18)
****GGA	1½ MPT (40)	G	1½ FPT (40)	9 11⁄16 (246.1)	—	2⅞ (54.0)	—	—	3 (76.2)	—	1 11⁄16 (42.9)	2 5⁄16 (52.4)	7¼ (3.29)
****HGA	1½ MPT (40)	H	2 FPT (50)	12⅞ (308.0)	—	2⅞ (65.1)	2 1⁄16 (52.4)	—	3½ (88.9)	4 1⁄16 (119.1)	2¼ (69.9)	2¼ (57.2)	13½ (6.12)
****HHA	2 MPT (50)	H	2 FPT (50)	12⅞ (308.0)	—	2 9⁄16 (65.1)	—	—	3½ (88.9)	—	2¾ (69.9)	2 5⁄16 (65.1)	13¾ (6.24)
****JHA	2 MPT (50)	J	2½ FPT (65)	13 9⁄16 (338.1)	—	3⅞ (79.4)	2½ (63.5)	—	3¾ (95.3)	5 (127.0)	2¾ (69.9)	2¾ (69.9)	17½ (7.94)
****JJA	2½ MPT (65)	J	2½ FPT (65)	13 9⁄16 (338.1)	—	3⅞ (79.4)	—	—	3¾ (95.3)	—	2¾ (69.9)	3 (76.2)	17¾ (8.05)

*Accurate to ±1/8".

**** Use appropriate Model Number.

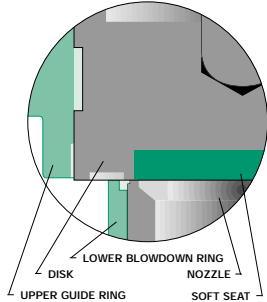
⁽¹⁾ Add 50% to D Dimension when lever is pulled out to manually operate valve.

⁽²⁾ Outlet connections do not apply for **AT top outlet valve.

FIGURE 31 / 41
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FIGURE 31 / 41 BRONZE SERIES SOFT SEATS

Safety Valves with metal seats will start to leak at 90% of set pressure. A Spence Safety Valve equipped with a soft seat seals on both the metal and soft seats (see illustration). As a result, it will not begin to leak until system pressure reaches 95% of set pressure, minimizing system energy loss.



The o-rings in standard soft seat safety valves tend to blow out during discharge. Spence Soft Seat Safety Valves utilize a flat soft seat insert in the disc assembly of the valve that stays in place during operation, thus providing hassle-free operation.

There are many troublesome applications where using a Spence Soft Seat Safety Valve can reduce costly downtime and repair costs. Consider a Spence Soft Seat Safety Valve for:

- Operating very close to set pressure
- Heavy vibration
- Hard-to-hold fluids
- Occasional foreign particles
- Icing problems
- Pipe strain due to excessive discharge

SERVICE RECOMMENDATIONS*

EPDM Soft Seat

WET - -20 to 422°F (-29 to 216°C)
DRY - -20 to 250°F (-29 to 121°C)

Acetone	Freon 22
Acetylene Gas	Hydrazine
Beer	Lindol Hydraulic Fluid
Bleach Liquor	Lye
Brake Fluid	Methanol
Calcium Chloride	Methyl Alcohol
Carbon Monoxide	Methyl Butyl Ketone
Carbonic Acid	Nitrogen
Citric Acid	STEAM
Denatured Alcohol	Sulfur Hexafluoride
Ethylene Diamine	WATER

Viton Soft Seat

-20 to 400°F (-29 to 204°C)

AIR	Dowtherm A	Iodine
Benzoic Acid	Ethane	Kerosene
Benzul Alcohol	Ethyl Alcohol	Linseed Oil
Butane	Ethyl Chloride	Methane
Butyl Alcohol	Ethylene	Mineral Oils
Carbon Disulfide	Ethylene Glycol	Natural Gas
Carbon Tetrachloride	Fuel Oil	Petroleum Oil
Castor Oil	Gasoline	Propane
Chlorine	Glucose	Propyl Alcohol
Chromic Acid	Glycerin	Propylene
Corn Oil	Helium	Sulfur Dioxide
Crude Oil	Hydraulic Oil	Turpentine
Diesel Oil	Hydrogen Gas	

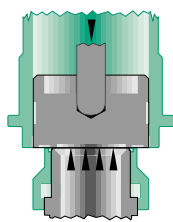
*These recommendations should be used as a guide only. It is the sole responsibility of the user to select suitable materials.

FIGURE 31 / 41
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FIGURE 31 BRONZE SERIES DUAL RING CONTROL

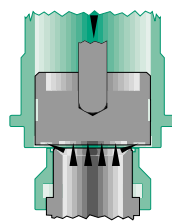
Safety Valves are pressure relief devices actuated by inlet static pressure and characterized by rapid opening or "pop" action. The difference between Safety Valves from different manufacturers is how well they do this.

Spence Figure 31 Safety Valves have Dual Ring Control which allows for finer adjustment of the "popping" action and length of "blowdown". This allows exceptional flow efficiency and maximum lifting force while minimizing system energy loss.



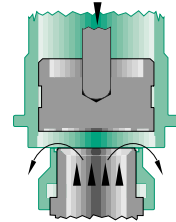
CLOSED

System pressure is pushing upward against the disk which is held closed by the downward force of the spring against the spindle.



OPENING

When system pressure rises above the set pressure of the spring, the disc begins to lift. This simmer/warn stage allows system pressure to enter the "huddling chamber" where it acts on a larger, secondary area of the disc. This magnified force causes the valve to "pop" open.



OPEN

As pressure increases, the disc continues to lift until fully open. When pressure is reduced to a level below the set point of the valve, the spring force against the spindle will snap shut the disc.

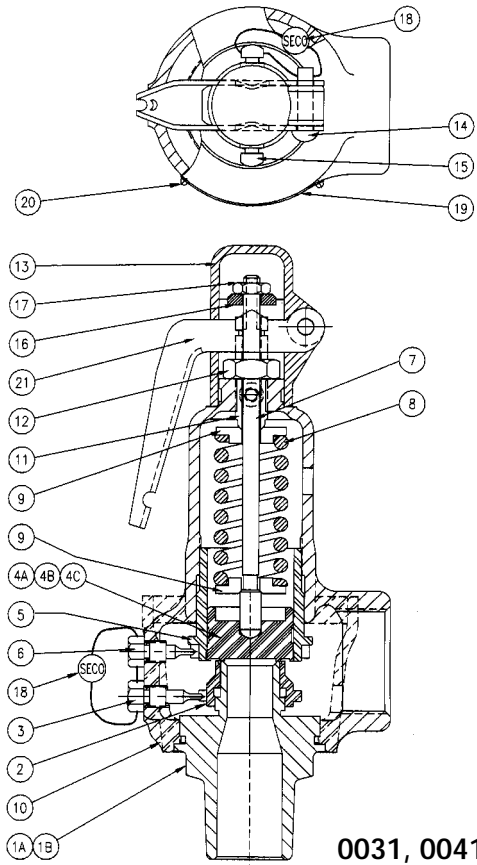


FIGURE 31 / 41 BRONZE SERIES

MATERIALS OF CONSTRUCTION

Ref	Part Name	Material
1A	Base/Nozzle - Bronze	Brass or Brz ASTM B283 or ASME SB62
1B	Base/Nozzle - SST	316 SST ASTM A276
2	Base Ring	Brass or Brz ASTM B283 or ASTM B62
3	Nozzle Ring Set Screw	Brass ASTM B16
4A	Disc - Bronze Metal	Brass or Brz ASTM B16 or ASTM B62
4B	Disc - SST Metal	316 SST ASTM A276
4C	Disc Assembly - Soft	Brass or Brz - EPDM/Viton
5	Guide Ring	Brass or Brz B283 or B584
6	Guide Ring Set Screw	Brass ASTM B16
7	Spindle	Steel ASTM A108
8	Spring	302 SST/17-7 SST
9	Spring Washer	Steel ASTM A108
10	Bonnet†	Cast Brz ASME SB62
11	Adjusting Bolt	Brass ASTM B16
12	Adjusting Bolt Locknut	Steel (Plated) SAE J995 GRD 2
13	Lifting Cap	Zinc Alloy
14	Lifting Cap Pin	Steel
15	Lifting Cap Lockscrew	Plated Steel
16	Spindle Nut	Steel ASTM
17	Spindle Nut Locknut	Plated Steel
18	Seal and Wire	Lead and SST
19	Nameplate	SST
20	Drive Screw	SST
21	Lever	Steel (Plated)

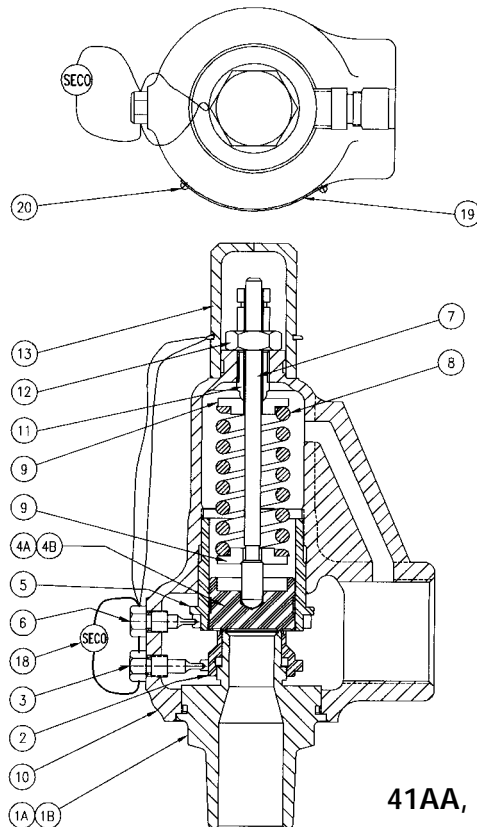
†41AT, 42AT, 43AT denoted by dotted line.



0031, 0041, 041A
0032, 0042, 042A
0033, 0043, 043A
41AT, 42AT, 43AT

FIGURE 31 / 41
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Ref	Part Name	Material
1A	Base/Nozzle - Bronze	Brass ASTM B283
1B	Base/Nozzle - SST	316 SST ASTM A276
2	Base Ring	Brass ASTM B283
3	Nozzle Ring Set Screw	Brass ASTM B16
4A	Disc - Bronze Metal	Brass ASTM B16
4B	Disc - SST Metal	316 SST ASTM A276
5	Guide Ring	Brass B283
6	Guide Ring Set Screw	Brass ASTM B16
7	Spindle	Steel ASTM A108
8	Spring	302 SST/17-7 SST
9	Spring Washer	Steel ASTM A108
10	Bonnet	Cast Brz ASME SB62
11	Adjusting Bolt	Brass ASTM B16
12	Adjusting Bolt Locknut	Steel (Plated) SAE J995 GRD 2
13	Cap	Brass ASTM B16
18	Seal and Wire	Lead and SST
19	Nameplate	SST
20	Drive Screw	SST



41AA, 42AA