

# FL SERIES

## RETRACTABLE, HEAVY SERVICE, FLANGED INJECTION QUILL



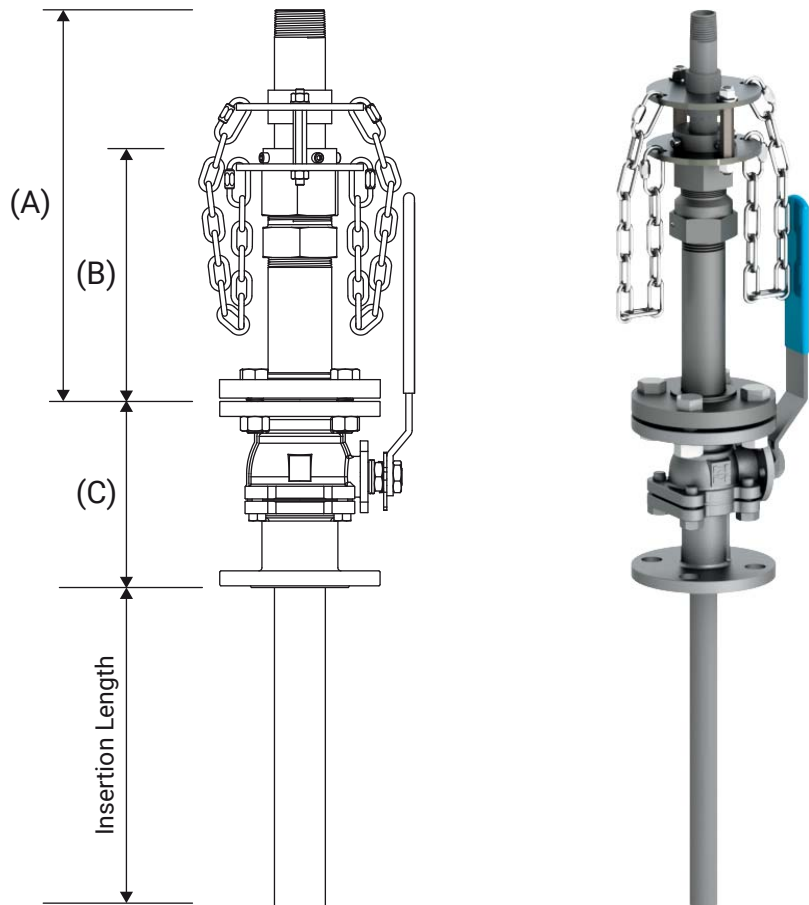
The FL series injection quill features the same dual bolt restraint as SAF-T-FLO HS and HC series quills. However, the FL series uses a flanged ball valve instead of a threaded valve for its main connection valve. The flanged ball valve, in combination with the guide pipe assembly and dual bolt restraint, provides superior support for solution tubes in applications with aggressive process flow dynamics or where there are longer insertion lengths (> 24").

| SPECIFICATIONS  | FL-075   | FL-100   | FL-125   | FL-150   | FL-200   | FL-250   | FL-300   |
|---|----------|----------|----------|----------|----------|----------|----------|
| SAFETY RATING (PSI)                                   | 250      | 250      | 250      | 250      | 250      | 250      | 250      |
| CHECK VALVE <sup>1</sup>                              | OPTIONAL | OPTIONAL | OPTIONAL | OPTIONAL | OPTIONAL | OPTIONAL | OPTIONAL |
| SAF-T-SEAL TIP  | OPTIONAL | OPTIONAL | N/A      | N/A      | N/A      | N/A      | N/A      |
| MINIMUM VALVE SIZE <sup>2</sup>                       | 3/4"     | 1"       | 1-1/2"   | 1-1/2"   | 2"       | 2-1/2"   | 3"       |
| INLET CONNECTION <sup>3</sup>                         | 3/8"     | 1/2"     | 3/4"     | 1"       | 1-1/2"   | 2"       | 2-1/2"   |
| SOLUTION TUBE SIZE                                    | 3/8"     | 1/2"     | 3/4"     | 1"       | 1-1/2"   | 2"       | 2-1/2"   |
| SOLUTION TUBE ID (W/SAF-T-SEAL)                       | .423"    | .546"    | .742"    | .957"    | 1.500"   | 1.939"   | 2.323"   |
| SOLUTION TUBE ID (W/O SAF-T-SEAL)                     | .493"    | .622"    | .824"    | 1.049"   | 1.610"   | 2.067"   | 2.469"   |
| SOLUTION TUBE OD                                      | .675"    | .840"    | 1.050"   | 1.315"   | 1.900"   | 2.375"   | 2.875"   |
| (A) OPERATING LENGTH                                  | 16.25"   | 16.75"   | 18.75"   | 19.75"   | 21"      | 21.25"   | 23.5"    |
| (B) GUIDE PIPE LENGTH                                 | 13"      | 13.75"   | 15.5"    | 15.75"   | 16.5"    | 16.75"   | 18.25"   |
| (C) VALVE LENGTH (SEE TABLE)                          | -        | -        | -        | -        | -        | -        | -        |
| EXTRACTED LENGTH = (A) + (B) + (C) + INSERTION LENGTH |          |          |          |          |          |          |          |

| (C) VALVE LENGTH<br>ANSI B16.10 |           |           |
|---------------------------------|-----------|-----------|
| Size                            | 150 Class | 300 Class |
| 3/4"                            | 4.61      | 5.98      |
| 1"                              | 5.00      | 6.50      |
| 1-1/2"                          | 6.50      | 7.48      |
| 2"                              | 7.01      | 8.50      |
| 2-1/2"                          | 7.48      | 9.49      |
| 3"                              | 7.99      | 11.14     |
| 4"                              | 9.02      | 12.00     |
| 6"                              | 15.51     | 16.00     |

### A QUICK NOTE ON INSERTION LENGTHS

When selecting the insertion length for a flanged retractable quill it is important to keep in mind that not only will you need to have the quill protrude to the center, middle 3rd of the main but you will also need to account for the stand-off distance from the sidewall of the main/vessel to the face of the mounting flange.



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## KEY FEATURES



### 1 INLET CONNECTION

Default connection type is male NPT with the size being the same as the solution tube.

### 2 DUAL-BOLT RESTRAINT

The 250 psi rated Dual-Bolt Restraint provides a positive locking mechanism, securing the solution tube to the main connection assembly.

### 3 PACKING NUT

The packing nut is the top half of the compression gland. When tightened, the nut compresses the o-ring, sealing off against the process pressure.

### 4 SOLUTION TUBE ADAPTER

The bottom half of the compression gland.

### 5 LIMIT CHAINS

The limit chains preventing the solution tube from fully retracting out of the compression gland when removing the tube for service. They also serve as a backup restraint to the dual-bolt system.

### 6 GUIDE PIPE

The guide pipe ties in the compression gland to the ball valve. On the interior, the port through which the solution tube passes is machined to a tight tolerance to the O.D. of the tube in order to provide additional support to the solution tube.

### 7 FLANGED BALL VALVE

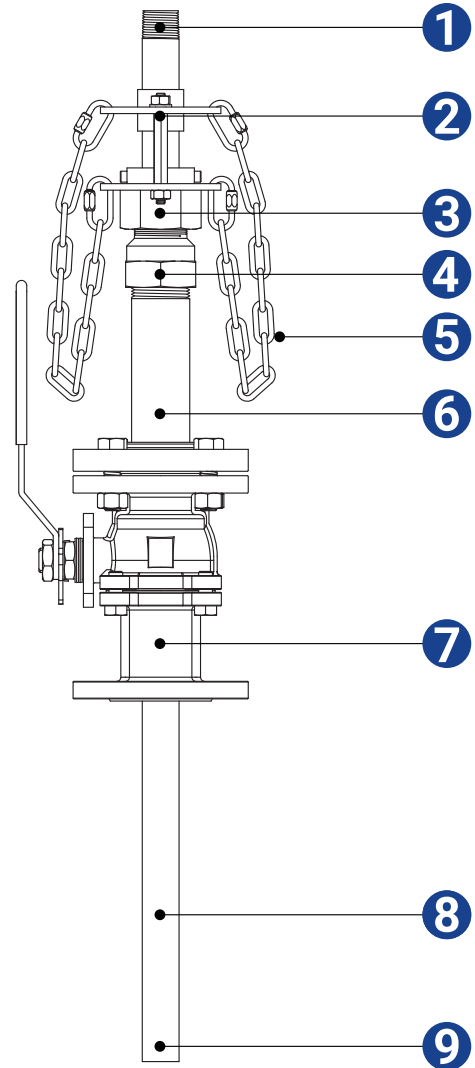
Available in 150 class or 300 class. Each FL series size has a corresponding minimum flange size. However, flanges larger than the minimum can be selected.

### 8 SOLUTION TUBE

The solution tube is the chemically wetted portion of the quill. It conveys the chemical on its interior from the inlet connection to the tip.

### 9 TIP

The tip is the point of discharge. There are various tip options depending on the exact model, including the SAF-T-Seal elastomeric tip, used to combat scaling.



# FL SERIES

## ORDERING INFORMATION



| SERIES | VALVE CLASS                    | VALVE SIZE   | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>4</sup>   | CHECK VALVE  |
|--------|--------------------------------|--|--|---|--------------------------|--|--|
| FL-075 | <input type="text"/>           | <input type="text"/>   | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>   | <input type="text"/>                               |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 075 = 3/4"<br>100 = 1"<br>150 = 1-1/2"<br>200 = 2"<br>250 = 2-1/2"<br>300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>CV = SAF-T-Seal, FKM<br>CE = SAF-T-Seal, EPDM | X = None<br>V = FKM<br>E = EPDM<br>K = KALREZ 6375 |

| SERIES | VALVE CLASS                    | VALVE SIZE   | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>4</sup>   | CHECK VALVE  |
|--------|--------------------------------|--|--|---|--------------------------|--|--|
| FL-100 | <input type="text"/>           | <input type="text"/>   | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>   | <input type="text"/>                               |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 100 = 1"<br>150 = 1-1/2"<br>200 = 2"<br>250 = 2-1/2"<br>300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>CV = SAF-T-Seal, FKM<br>CE = SAF-T-Seal, EPDM | X = None<br>V = FKM<br>E = EPDM<br>K = KALREZ 6375 |

| SERIES | VALVE CLASS                    | VALVE SIZE   | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>5</sup>                       | CHECK VALVE <sup>6</sup>   |
|--------|--------------------------------|--|--|---|--------------------------|--|--|
| FL-125 | <input type="text"/>           | <input type="text"/>   | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>                                 | <input type="text"/>   |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 150 = 1-1/2"<br>200 = 2"<br>250 = 2-1/2"<br>300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>DH = Diffuser Holes | 00 = None<br>01 = PVC, FKM<br>02 = PVC, EPDM<br>03 = CPVC, FKM<br>04 = CPVC, EPDM<br>05 = Alloy, FKM<br>06 = Alloy, EPDM |

| SERIES | VALVE CLASS                    | VALVE SIZE   | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>5</sup>                       | CHECK VALVE <sup>6</sup>   |
|--------|--------------------------------|--|--|---|--------------------------|--|--|
| FL-150 | <input type="text"/>           | <input type="text"/>   | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>                                 | <input type="text"/>   |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 150 = 1-1/2"<br>200 = 2"<br>250 = 2-1/2"<br>300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>DH = Diffuser Holes | 00 = None<br>01 = PVC, FKM<br>02 = PVC, EPDM<br>03 = CPVC, FKM<br>04 = CPVC, EPDM<br>05 = Alloy, FKM<br>06 = Alloy, EPDM |

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## ORDERING INFORMATION



| SERIES | VALVE CLASS                    | VALVE SIZE   | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>5</sup>                       | CHECK VALVE <sup>6</sup>   |
|--------|--------------------------------|--|--|---|--------------------------|--|--|
| FL-200 | <input type="text"/>           | <input type="text"/>   | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>                                 | <input type="text"/>   |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 200 = 2"<br>250 = 2-1/2"<br>300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>DH = Diffuser Holes | 00 = None<br>01 = PVC, FKM<br>02 = PVC, EPDM<br>03 = CPVC, FKM<br>04 = CPVC, EPDM<br>05 = Alloy, FKM<br>06 = Alloy, EPDM |

| SERIES | VALVE CLASS                    | VALVE SIZE                                       | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>5</sup>                       | CHECK VALVE <sup>6</sup>   |
|--------|--------------------------------|--|--|---|--------------------------|--|--|
| FL-250 | <input type="text"/>           | <input type="text"/>                             | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>                                 | <input type="text"/>   |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 250 = 2-1/2"<br>300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>DH = Diffuser Holes | 00 = None<br>01 = PVC, FKM<br>02 = PVC, EPDM<br>03 = CPVC, FKM<br>04 = CPVC, EPDM<br>05 = Alloy, FKM<br>06 = Alloy, EPDM |

| SERIES | VALVE CLASS                    | VALVE SIZE                       | VALVE MATERIAL                                       | SOLUTION TUBE MATERIAL  | INSERTION LENGTH         | TIP CONFIGURATION <sup>5</sup>                       | CHECK VALVE <sup>6</sup>   |
|--------|--------------------------------|----------------------------------|--|---|--------------------------|--|--|
| FL-300 | <input type="text"/>           | <input type="text"/>             | <input type="text"/>                                 | <input type="text"/>  | <input type="text"/>     | <input type="text"/>                                 | <input type="text"/>   |
|        | 1 = 150 CLASS<br>3 = 300 CLASS | 300 = 3"<br>400 = 4"<br>600 = 6" | S = Stainless Steel<br>H = HASTELLOY<br>A = ALLOY 20 | S = STAINLESS STEEL<br>H = HASTELLOY C<br>A = ALLOY 20<br>T = Titanium Gr.2 | Specify Length In Inches | 0 = Standard<br>B = 45° Bevel<br>DH = Diffuser Holes | 00 = None<br>01 = PVC, FKM<br>02 = PVC, EPDM<br>03 = CPVC, FKM<br>04 = CPVC, EPDM<br>05 = Alloy, FKM<br>06 = Alloy, EPDM |

### TECH NOTES

- The check valve for the FL-075 and FL-100 is integrated into the solution tube of the quill and is a spring loaded ball check valve. The cracking pressure of the spring is 10 psi (FL-075) 5 psi (FL-100). The optional check valve for all other sizes is a threaded check valve. For additional details see technical note 6.
- FL series quills have a minimum valve size needed to accommodate a given solution tube size. Valves can be larger than the minimum size (up to 6"). See individual FL model ordering information blocks for details specific to a given size.
- Inlet connection is threaded (NPT) by default. Flanged inlet options may also be available. Consult factory for details.
- For the FL-075, the SAF-T-Seal tip is not available when selecting Titanium solution tube material. For the FL-100, availability of the SAF-T-Seal tip when selecting Titanium solution tube material is subject to change with out notice. Please consult factory prior to selecting this configuration.
- Diffuser Hole configurations to be provided by customer. SAF-T-FLO does not provide recommendations regarding diffuser holes.
- For FL-125 through FL-300: PVC and CPVC check valves are threaded floating ball type check valves. Alloy check valves are threaded spring loaded check valves with a cracking pressure of .500 psi. When selecting alloy material the body material of the check valve will be the same as the solution tube material.