

Swing Check Valve

## ECOLINE SCF 150-600

Class 150-600  
NPS ½"-2"  
Forged Steel  
Bolted Cover  
Flanged Ends

### Type Series Booklet



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Type Series Booklet ECOLINE SCF 150-600

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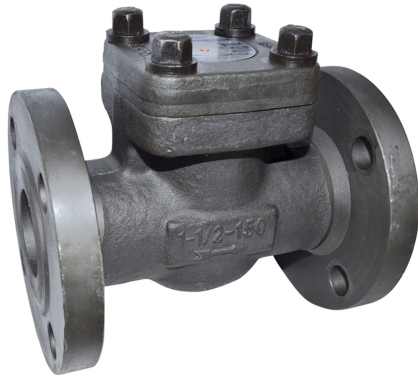
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## Check Valves and Strainers

### Swing Check Valves

## ECOLINE SCF 150-600



### Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

### Fluids handled

- Steam
- Fluids containing gas
- Gas
- High-temperature hot water
- Volatile fluids
- Feed water

### Operating data

Operating properties

| Characteristic               | Value              |
|------------------------------|--------------------|
| Nominal pressure             | Class 150 - 600    |
| Nominal size                 | NPS ½" - 2"        |
| Max. permissible pressure    | 104 bar / 1480 PSI |
| Max. permissible temperature | 816 °C / 1500 °F   |

Selection as per pressure/temperature ratings (⇒ Page 5)

### Body materials

Overview of available materials

| Material         | Temperature limit      |
|------------------|------------------------|
| ASTM A 105       | Up to 427 °C / 800 °F  |
| ASTM A 182 F11   | Up to 593 °C / 1100 °F |
| ASTM A 182 F22   | Up to 593 °C / 1100 °F |
| ASTM A 182 F304  | Up to 816 °C / 1500 °F |
| ASTM A 182 F316  | Up to 816 °C / 1500 °F |
| ASTM A 182 F304L | Up to 427 °C / 800 °F  |
| ASTM A 182 F316L | Up to 450 °C / 850 °F  |

Other materials on request.

### Design details

#### Design

- Swing check valve to API 602
- Tested to API 598
- Body made of forged steel
- Bolted cover
- Reduced bore
- Fully confined cover gasket
- Seat ring ST6(HF) swaged
- Solid disc
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

### Variants

- Seal-welded body/cover joint
- Full bore
- Butt weld ends
- NACE standard
- Other flanged end designs or butt weld ends to ASME B16.25
- Other trims

### Product benefits

Long service life and high functional reliability

- Hard-faced body seat and solid disc seat made of wear-resistant and corrosion-proof materials for handling all kinds of corrosive and erosive fluids.

Reliable sealing and longer service life

- Male/female joint between body and cover prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.
- Internal hinge pin design eliminates additional leakage points, substantially improving sealing reliability.

Reliable protection against unintentional loosening of valve disc and hanger arm

- Hexagon nut on valve disc stem prevents unintentional loosening of hanger arm. Nut secured by washer and tack welding, preventing it from working loose as a result of repeated and abrupt fluid impact.

Extended maintenance-free service life

- Hard-facing applied to disc and seat rings by deposit welding provides extra wear allowance and ensures reliable long-term shut-off even with frequent opening/closing cycles.

**Related documents**

- Swing check valve, type ECOLINE SCF 800, see type series booklet 7361.16
- Operating manual 7361.81

**On all enquiries/orders please specify**

- Type
- Class
- Nominal size
- Pressure rating
- Temperature rating
- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Reduced or full bore
- Variants
- Number of type series booklet

**Pressure/temperature ratings**

Permissible operating pressures in bar at a temperature of °C (to ASME B16.34)

| Class | Material      | 0 to 38 | 93    | 149   | 204  | 260  | 316  | 343  | 371  | 399  | 427  | 454  | 482  | 510  | 538  | 566    | 593    | 621    | 649    | 677    | 704    | 732    | 760    | 788    | 816    |
|-------|---------------|---------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 150   | A 105         | 19,7    | 17,9  | 15,9  | 13,8 | 11,7 | 9,7  | 8,6  | 7,6  | 6,6  | 5,5  |      |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 300   |               | 51,0    | 46,9  | 45,2  | 43,8 | 41,7 | 39,3 | 37,9 | 36,5 | 34,8 | 28,3 |      |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 600   |               | 102,0   | 93,8  | 90,3  | 87,2 | 83,1 | 78,3 | 75,8 | 73,1 | 70,0 | 56,9 |      |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 150   | A 182 F11 1)  | 20,0    | 17,9  | 15,9  | 13,8 | 11,7 | 9,7  | 8,6  | 7,6  | 6,6  | 5,5  | 4,5  | 3,4  | 2,4  | 1,4  | 1,4 2) | 1,4 2) |        |        |        |        |        |        |        |        |
| 300   |               | 51,7    | 51,7  | 49,6  | 47,9 | 45,9 | 41,7 | 40,7 | 39,3 | 36,5 | 35,2 | 33,4 | 31,0 | 22,1 | 14,8 | 10,0   | 6,6    |        |        |        |        |        |        |        |        |
| 600   |               | 103,4   | 103,4 | 99,6  | 95,5 | 91,7 | 83,4 | 81,0 | 78,3 | 73,4 | 70,0 | 67,2 | 62,1 | 44,1 | 29,6 | 20,0   | 13,1   |        |        |        |        |        |        |        |        |
| 150   | A 182 F304 3) | 19,0    | 15,9  | 14,1  | 13,1 | 11,7 | 9,7  | 8,6  | 7,6  | 6,6  | 5,5  | 4,5  | 3,4  | 2,4  | 1,4  | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,0 2) |
| 300   |               | 49,6    | 41,4  | 37,2  | 34,1 | 32,1 | 30,3 | 29,6 | 29,0 | 28,6 | 27,9 | 27,2 | 26,9 | 26,2 | 24,5 | 22,4   | 17,6   | 14,1   | 11,4   | 9,3    | 7,9    | 6,6    | 5,2    | 4,1    | 2,8    |
| 600   |               | 99,3    | 82,7  | 74,1  | 68,6 | 64,1 | 61,0 | 59,6 | 58,3 | 56,9 | 55,8 | 54,5 | 53,8 | 52,7 | 49,0 | 44,8   | 35,5   | 28,3   | 22,8   | 18,3   | 15,5   | 12,8   | 10,3   | 7,9    | 5,9    |
| 150   | A 182 F22     | 20,0    | 17,9  | 15,9  | 13,8 | 11,7 | 9,7  | 8,6  | 7,6  | 6,6  | 5,5  | 4,5  | 3,4  | 2,4  | 1,4  | 1,4 2) | 1,4 2) |        |        |        |        |        |        |        |        |
| 300   |               | 51,7    | 51,7  | 50,3  | 48,6 | 45,9 | 41,7 | 40,7 | 39,3 | 36,5 | 35,2 | 33,4 | 31,0 | 26,5 | 18,3 | 12,1   | 7,6    |        |        |        |        |        |        |        |        |
| 600   |               | 103,4   | 103,4 | 100,3 | 97,2 | 91,7 | 83,4 | 81,0 | 78,3 | 73,4 | 70,0 | 67,2 | 62,1 | 52,1 | 36,9 | 24,1   | 15,2   |        |        |        |        |        |        |        |        |
| 150   | A 182 F316 3) | 19,0    | 16,2  | 14,8  | 13,4 | 11,7 | 9,7  | 8,6  | 7,6  | 6,6  | 5,5  | 4,5  | 3,4  | 2,4  | 1,4  | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,4 2) | 1,0 2) |
| 300   |               | 49,6    | 42,7  | 38,6  | 35,5 | 33,1 | 31,0 | 30,3 | 30,0 | 29,3 | 29,0 | 29,0 | 28,6 | 26,5 | 25,2 | 24,8   | 21,0   | 16,2   | 12,8   | 10,0   | 7,9    | 6,6    | 5,2    | 4,1    | 2,8    |
| 600   |               | 99,3    | 85,5  | 77,2  | 70,7 | 65,8 | 62,1 | 61,0 | 60,0 | 59,0 | 58,3 | 57,6 | 57,2 | 53,4 | 50,0 | 49,6   | 42,1   | 32,8   | 25,5   | 20,3   | 16,2   | 13,1   | 10,3   | 7,9    | 5,9    |
| 150   | A 182 F304L   | 15,9    | 13,4  | 12,1  | 11,0 | 10,3 | 9,7  | 8,6  | 7,6  | 7,6  | 5,5  |      |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 300   |               | 41,4    | 35,2  | 31,4  | 30,0 | 27,2 | 25,5 | 25,2 | 24,8 | 24,5 | 23,8 |      |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 600   |               | 82,7    | 70,3  | 62,7  | 57,9 | 54,1 | 51,4 | 50,3 | 49,6 | 48,6 | 47,6 |      |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 150   | A 182 F316L   | 15,9    | 13,4  | 12,1  | 11,0 | 10,3 | 9,7  | 8,6  | 7,6  | 7,6  | 5,5  | 4,5  |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 300   |               | 41,4    | 35,2  | 31,4  | 29,0 | 27,2 | 25,5 | 25,2 | 24,8 | 24,5 | 23,8 | 23,4 |      |      |      |        |        |        |        |        |        |        |        |        |        |
| 600   |               | 82,7    | 70,3  | 62,7  | 57,9 | 54,1 | 51,4 | 50,3 | 49,6 | 48,6 | 47,6 | 46,5 |      |      |      |        |        |        |        |        |        |        |        |        |        |

Permissible operating pressures in PSI at a temperature of °F (to ASME B16.34)

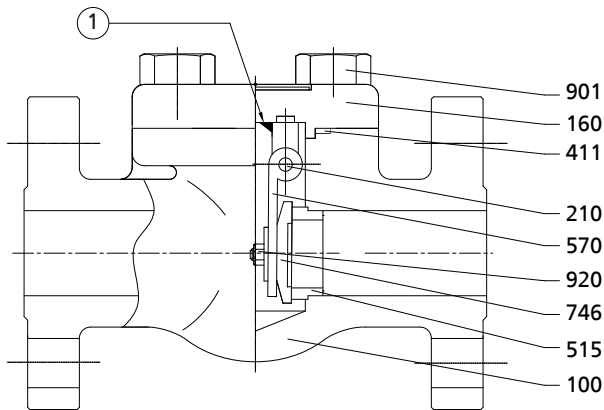
| Class | Material      | 32 to 100 | 200  | 300  | 400  | 500  | 600  | 650  | 700  | 750  | 800  | 850 | 900 | 950 | 1000 | 1050  | 1100  | 1150  | 1200  | 1250  | 1300  | 1350  | 1400  | 1450  | 1500  |
|-------|---------------|-----------|------|------|------|------|------|------|------|------|------|-----|-----|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 150   | A 105         | 285       | 260  | 230  | 200  | 170  | 140  | 125  | 110  | 95   | 80   |     |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 300   |               | 740       | 680  | 655  | 635  | 605  | 570  | 550  | 530  | 505  | 410  |     |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 600   |               | 1480      | 1360 | 1310 | 1265 | 1205 | 1135 | 1100 | 1060 | 1015 | 825  |     |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 150   | A 182 F11 1)  | 290       | 260  | 230  | 200  | 170  | 140  | 125  | 110  | 95   | 80   | 65  | 50  | 35  | 20   | 20 2) | 20 2) |       |       |       |       |       |       |       |       |
| 300   |               | 750       | 750  | 720  | 695  | 665  | 605  | 590  | 570  | 530  | 510  | 485 | 450 | 320 | 215  | 145   | 95    |       |       |       |       |       |       |       |       |
| 600   |               | 1500      | 1500 | 1445 | 1385 | 1330 | 1210 | 1175 | 1135 | 1065 | 1015 | 975 | 900 | 640 | 430  | 290   | 190   |       |       |       |       |       |       |       |       |
| 150   | A 182 F304 3) | 275       | 230  | 205  | 190  | 170  | 140  | 125  | 110  | 95   | 80   | 65  | 50  | 35  | 20   | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 15 2) |
| 300   |               | 720       | 600  | 540  | 495  | 465  | 440  | 430  | 420  | 415  | 405  | 395 | 390 | 380 | 355  | 325   | 255   | 205   | 165   | 135   | 115   | 95    | 75    | 60    | 40    |
| 600   |               | 1440      | 1200 | 1075 | 995  | 930  | 885  | 865  | 845  | 825  | 810  | 790 | 780 | 765 | 710  | 650   | 515   | 410   | 330   | 265   | 225   | 185   | 150   | 115   | 85    |
| 150   | A 182 F22     | 290       | 260  | 230  | 200  | 170  | 140  | 125  | 110  | 95   | 80   | 65  | 50  | 35  | 20   | 20 2) | 20 2) |       |       |       |       |       |       |       |       |
| 300   |               | 750       | 750  | 730  | 705  | 665  | 605  | 590  | 570  | 530  | 510  | 485 | 450 | 385 | 265  | 175   | 110   |       |       |       |       |       |       |       |       |
| 600   |               | 1500      | 1500 | 1455 | 1410 | 1330 | 1210 | 1175 | 1135 | 1065 | 1015 | 975 | 900 | 755 | 535  | 350   | 220   |       |       |       |       |       |       |       |       |
| 150   | A 182 F316 3) | 275       | 235  | 215  | 195  | 170  | 140  | 125  | 110  | 95   | 80   | 65  | 50  | 35  | 20   | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 20 2) | 15 2) |
| 300   |               | 720       | 620  | 560  | 515  | 480  | 450  | 440  | 435  | 425  | 420  | 420 | 415 | 385 | 365  | 360   | 305   | 235   | 185   | 145   | 115   | 95    | 75    | 60    | 40    |
| 600   |               | 1440      | 1240 | 1120 | 1025 | 955  | 900  | 885  | 870  | 855  | 845  | 835 | 830 | 775 | 725  | 720   | 610   | 475   | 370   | 295   | 235   | 190   | 150   | 115   | 85    |
| 150   | A 182 F304L   | 230       | 195  | 175  | 160  | 150  | 140  | 125  | 110  | 110  | 80   |     |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 300   |               | 600       | 510  | 455  | 420  | 395  | 370  | 365  | 360  | 355  | 345  |     |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 600   |               | 1200      | 1020 | 910  | 840  | 785  | 745  | 730  | 720  | 705  | 690  |     |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 150   | A 182 F316L   | 230       | 195  | 175  | 160  | 150  | 140  | 125  | 110  | 110  | 80   | 65  |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 300   |               | 600       | 510  | 455  | 420  | 395  | 370  | 365  | 360  | 355  | 345  | 340 |     |     |      |       |       |       |       |       |       |       |       |       |       |
| 600   |               | 1200      | 1020 | 910  | 840  | 785  | 745  | 730  | 720  | 705  | 690  | 675 |     |     |      |       |       |       |       |       |       |       |       |       |       |

**Test pressures**

| Test             | Test medium | Class 150 |     | Class 300 |      | Class 600 |      |
|------------------|-------------|-----------|-----|-----------|------|-----------|------|
|                  |             | bar       | psi | bar       | psi  | bar       | psi  |
| Shell            | Water       | 31,0      | 450 | 77,6      | 1125 | 153,4     | 2225 |
| Leak test (seat) |             | 22,4      | 325 | 56,9      | 825  | 113,8     | 1650 |

- 1) Use normalised and tempered materials only.
- 2) Flanged end ratings terminate at 538 °C (1000 °F).
- 3) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.

Materials

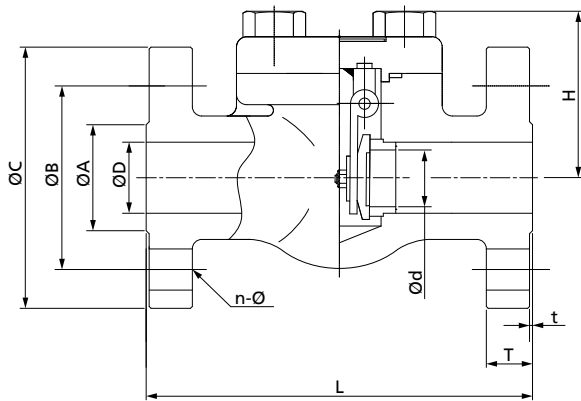


① Tack weld

Overview of available materials

| Part No. | Description | Material         |                  |                  |                   |                    |
|----------|-------------|------------------|------------------|------------------|-------------------|--------------------|
|          |             | A 105 Trim 8     | A 182 F11 Trim 5 | A 182 F22 Trim 5 | A 182 F304 Trim 2 | A 182 F316 Trim 10 |
| 100      | Body        | A 105            | A 182 F11        | A 182 F22        | A 182 F304        | A 182 F316         |
| 160      | Cover       | A 105            | A 182 F11        | A 182 F22        | A 182 F304        | A 182 F316         |
| 746      | Disc        | A 182 F6a        | A 182 F6a + STL6 | A 182 F6a + STL6 | A 182 F304        | A 182 F316         |
| 411      | Joint ring  | 304 + graphite   | 304 + graphite   | 304 + graphite   | 304 + graphite    | 316 + graphite     |
| 515      | Seat ring   | A 276 410 + STL6 | A 276 410 + STL6 | A 276 410 + STL6 | A 276 304         | A 276 316          |
| 210      | Hinge pin   | A 276 304        | A 276 304        | A 276 304        | A 276 304         | A 276 316          |
| 570      | Hanger arm  | A 351 CF8        | A 351 CF8        | A 351 CF8        | A 351 CF8         | A 351 CF8M         |
| 901      | Bolt        | A 193 B7         | A 193 B16        | A 193 B16        | A 193 B8          | A 193 B8M          |
| 920      | Nut         | A 194 8          | A 194 8          | A 194 8          | A 194 8           | A 194 8M           |

### Dimensions



Dimensions in mm

| Class | NPS  | L   | T    | t   | n-Ø  | Ød   | ØD | ØA | ØB    | ØC  | H   | [kg]  |
|-------|------|-----|------|-----|------|------|----|----|-------|-----|-----|-------|
| 150   | ½"   | 108 | 11,5 | 1,6 | 4-16 | 9,5  | 15 | 35 | 60,5  | 89  | 53  | 2,00  |
|       | ¾"   | 117 | 13,0 | 1,6 | 4-16 | 12,7 | 20 | 43 | 70,0  | 98  | 56  | 2,45  |
|       | 1"   | 127 | 14,5 | 1,6 | 4-16 | 17,5 | 25 | 51 | 79,5  | 108 | 69  | 3,70  |
|       | 1 ½" | 165 | 17,5 | 1,6 | 4-16 | 28,6 | 40 | 73 | 98,5  | 127 | 100 | 6,20  |
|       | 2"   | 178 | 19,5 | 1,6 | 4-19 | 36,5 | 50 | 92 | 120,5 | 152 | 118 | 10,40 |
| 300   | ½"   | 152 | 14,5 | 1,6 | 4-16 | 9,5  | 15 | 35 | 66,5  | 95  | 53  | 2,22  |
|       | ¾"   | 178 | 16,0 | 1,6 | 4-19 | 12,7 | 20 | 43 | 82,5  | 117 | 56  | 3,67  |
|       | 1"   | 203 | 17,5 | 1,6 | 4-19 | 17,5 | 25 | 51 | 89,0  | 124 | 69  | 4,93  |
|       | 1 ½" | 229 | 21,0 | 1,6 | 4-22 | 28,6 | 40 | 73 | 114,5 | 156 | 100 | 9,82  |
|       | 2"   | 267 | 22,5 | 1,6 | 8-19 | 36,5 | 50 | 92 | 127,0 | 165 | 118 | 14,02 |
| 600   | ½"   | 165 | 20,7 | 6,4 | 4-16 | 9,5  | 15 | 35 | 66,5  | 95  | 53  | 2,38  |
|       | ¾"   | 190 | 22,3 | 6,4 | 4-19 | 12,7 | 20 | 43 | 82,5  | 117 | 56  | 3,92  |
|       | 1"   | 216 | 23,9 | 6,4 | 4-19 | 17,5 | 25 | 51 | 89,0  | 124 | 69  | 5,41  |
|       | 1 ½" | 241 | 28,7 | 6,4 | 4-22 | 28,6 | 40 | 73 | 114,5 | 156 | 100 | 10,66 |
|       | 2"   | 292 | 31,8 | 6,4 | 8-19 | 36,5 | 50 | 92 | 127,0 | 165 | 118 | 15,72 |

### Mating dimensions - Standards

Face-to-face lengths: ASME B16.10  
Flanges: ASME B16.5

Swing check valves should preferably be installed in horizontal pipes. When installing them in vertical pipes, make sure that the flow direction is upward, so that in the unpressurised condition the disc will be closed by its own weight.

### Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.



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