

BHH and BL Series Hydraulic Actuators

Designed for compactness and reliability



BETTIS™


EMERSON™

Quarter-Turn or Linear — Double-Acting or Spring-Return

“Operates in the toughest environments”

“Adapts and mounts to all types of valves”

“Small footprint is perfect for use in tight areas”

Bettis BHH and BHHF

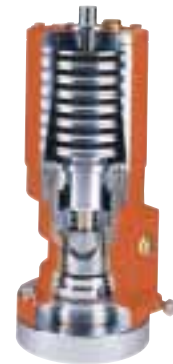
Hydraulic double-acting and spring-return helical quarter-turn actuator.

Compact and concentric, the proven design provides space savings and reliability.

Using the multiple helical spline engagement with reciprocal splines on the piston, the high torque output is constant throughout the 90 degree rotations. Converts hydraulic energy into rotation, with torque output proportional to the supply pressure.

The BHH and BHHF can be operated in the most severe conditions, from high vibrations to severe environment locations.

Easily adapted to all types of quarter-turn valves, dampers or louvers. The mounting positions are numerous, with the models ready for direct mount modular control functions.



Bettis BL and BLF/BLFR

Hydraulic linear double-acting and spring-return actuator, with optional hand pump.

The BL and BLF convert hydraulic energy into linear motion, with thrust proportional to the supply pressure. With no external moving parts during operation, it includes in its design a pressure maintaining function against temperature variations.

Designed to adapt easily to most globe valves, it provides direct visual position indication and integrated crossover valve.

The design includes pressure maintaining functions which compensate for temperature fluctuations.



Bettis BHH

Hydraulic Double-Acting Quarter-Turn Actuators

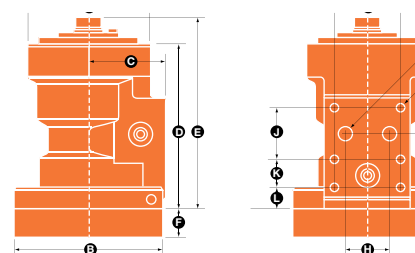


Technical Data

Working Pressure: 40-207 bar / 580-3000 psi
 Test Pressure: 1.5 x working pressure to a maximum of 250 bar / 3600 psi
 Temperature Range: -20° to +80° C / -5° to +180° F
 Low Temperature: Consult Factory
 Angle of Rotation: 90°
 Torque Range: 1000 to 142000 lb/in at 2000 psi
 Viscosity of Hydraulic Oil: 15 to 200 cSt

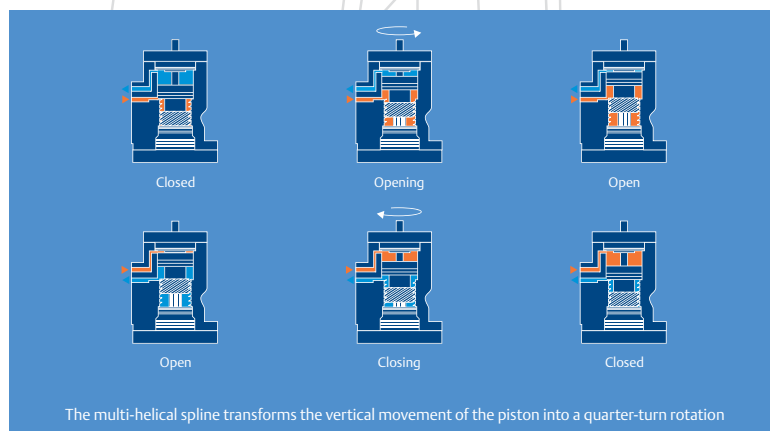
Features

- ATEX Certified
- Smallest footprint to torque ratio
- Compact & concentric design
- Balanced helical design eliminates side loading on valve assembly and stem
- High water ingress protection-IP68
- Integrated crossover valve
- Vibration resistant design
- Easy adaption standard valve bonnet design
- Unlimited mounting positions with built-in position adjustments
- Design ready for control functions

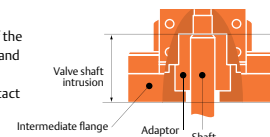


| | | |
|--------------|--------|--------|
| Weight | lb | kg |
| Displacement | cu.in. | litres |
| Dimensions | inches | mm |

| Model | Weight | Displacement | Dimensions Side View | | | | | | | Dimensions Front View | | | | | N | | P | |
|-----------|--------|--------------|----------------------|-------|------|-------|-------|------|------|-----------------------|------|------|------|------|----------|-------|--------|-------|
| | | | A | B | C | D | E | F | G | H | J | K | L | M | Thread | Depth | Thread | Depth |
| BHH 125 | 12 | 2 | 3.46 | 3.78 | 2.09 | 4.33 | 5.08 | 0.81 | 2.05 | 1.38 | 1.61 | 0.87 | 0.57 | 2.28 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 5.3 | 0.026 | 88 | 96 | 53 | 110 | 129 | 20.5 | 52 | 35 | 41 | 22 | 14.5 | 58 | 1/4" BSP | 13 | M8 | 12 |
| BHH 250 | 18 | 3 | 4.09 | 4.65 | 2.36 | 5.14 | 5.96 | 0.91 | 2.05 | 1.38 | 1.61 | 0.87 | 0.65 | 2.32 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 8.3 | 0.05 | 104 | 118 | 60 | 130.5 | 151.5 | 23 | 52 | 35 | 41 | 22 | 16.5 | 59 | 1/4" BSP | 13 | M8 | 12 |
| BHH 500 | 29 | 6 | 4.96 | 5.20 | 2.87 | 6.02 | 6.93 | 0.91 | 2.05 | 1.38 | 1.61 | 0.87 | 0.79 | 2.46 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 13 | 0.102 | 126 | 132 | 73 | 153 | 176 | 23 | 52 | 35 | 41 | 22 | 20 | 62.5 | 1/4" BSP | 13 | M8 | 12 |
| BHH 1000 | 44 | 13 | 5.71 | 6.30 | 3.35 | 6.20 | 7.91 | 1.10 | 2.05 | 1.38 | 1.61 | 0.87 | 0.93 | 2.60 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 19.9 | 0.209 | 145 | 160 | 85 | 157.5 | 201 | 28 | 52 | 35 | 41 | 22 | 23.5 | 66 | 1/4" BSP | 13 | M8 | 12 |
| BHH 2000 | 73 | 24 | 6.77 | 7.56 | 3.82 | 8.35 | 9.21 | 1.46 | 2.05 | 1.38 | 1.61 | 0.87 | 1.00 | 2.68 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 33.1 | 0.4 | 172 | 192 | 97 | 212 | 234 | 37 | 52 | 35 | 41 | 22 | 25.5 | 68 | 1/4" BSP | 13 | M8 | 12 |
| BHH 4000 | 152 | 49 | 8.46 | 11.81 | 4.92 | 10.04 | 10.98 | 1.57 | 2.05 | 1.38 | 1.61 | 0.87 | 1.24 | 2.91 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 68.9 | 0.8 | 215 | 300 | 125 | 255 | 279 | 40 | 52 | 35 | 41 | 22 | 31.5 | 74 | 1/4" BSP | 13 | M8 | 12 |
| BHH 8000 | 238 | 98 | 9.92 | 12.36 | 6.18 | 12.56 | 13.23 | 1.73 | 2.05 | 1.38 | 1.61 | 0.87 | 1.85 | 3.52 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 108 | 1.6 | 252 | 314 | 157 | 319 | 336 | 44 | 52 | 35 | 41 | 22 | 47 | 89.5 | 1/4" BSP | 13 | M8 | 12 |
| BHH 16000 | 387 | 189 | 11.81 | 13.78 | 7.09 | 15.35 | 16.14 | 2.36 | 2.05 | 1.38 | 1.61 | 0.87 | 2.42 | 4.09 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 176 | 3.1 | 300 | 350 | 180 | 390 | 410 | 60 | 52 | 35 | 41 | 22 | 61.5 | 104 | 1/4" BSP | 13 | M8 | 12 |



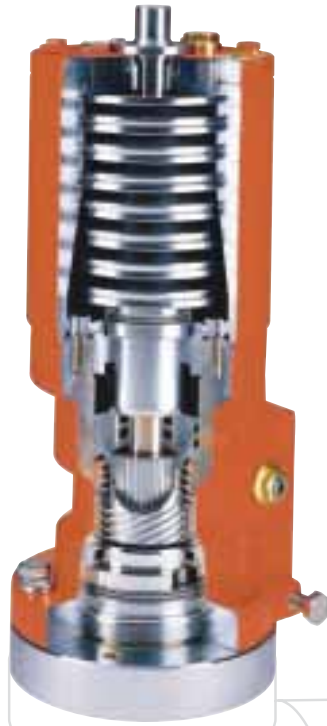
Valve spindle options:
 Limits for machining of the adaptor. Other shapes and valve shaft intrusions on request, please contact Bettis.



| Model | DIN 6885 | | DIN 79 | | Valve Shaft Intrusion | |
|-----------|-----------|-----------|-----------|-----------|-----------------------|-----|
| | in (max.) | mm (max.) | in (max.) | mm (max.) | in | mm |
| BHH 125 | 0.669 | 17 | 0.630 | 16 | 1.77 | 45 |
| BHH 250 | 0.984 | 25 | 0.945 | 24 | 1.97 | 50 |
| BHH 500 | 1.378 | 35 | 1.181 | 30 | 2.17 | 55 |
| BHH 1000 | 1.654 | 42 | 1.417 | 36 | 2.48 | 63 |
| BHH 2000 | 2.283 | 58 | 1.969 | 50 | 2.95 | 75 |
| BHH 4000 | 2.913 | 74 | 2.480 | 63 | 3.35 | 85 |
| BHH 8000 | 3.740 | 95 | 3.150 | 80 | 4.13 | 105 |
| BHH 16000 | 3.740 | 95 | 3.543 | 90 | 5.20 | 132 |

Bettis BHHF

Hydraulic Single-Acting Quarter-Turn Helical Actuators

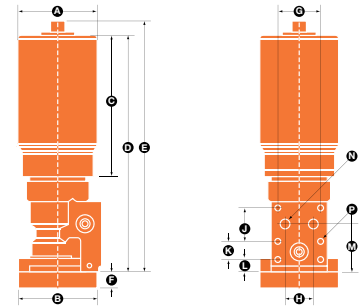


Technical Data

Working pressure: 90 to 202 bar / 1500 to 3000 psi
 Test pressure: 1.5 x working pressure to a maximum of 250 bar / 3600 psi
 Temperature range: -20 °C to +80 °C / -5 °F to +180 °F
 Low Temperature: Consult Factory
 Angle of rotation: 90 °
 End closing torque: 30 to 4800 Nm / 265 to 43000 lb/in
 Viscosity of hydraulic oil: 15 to 200 cSt

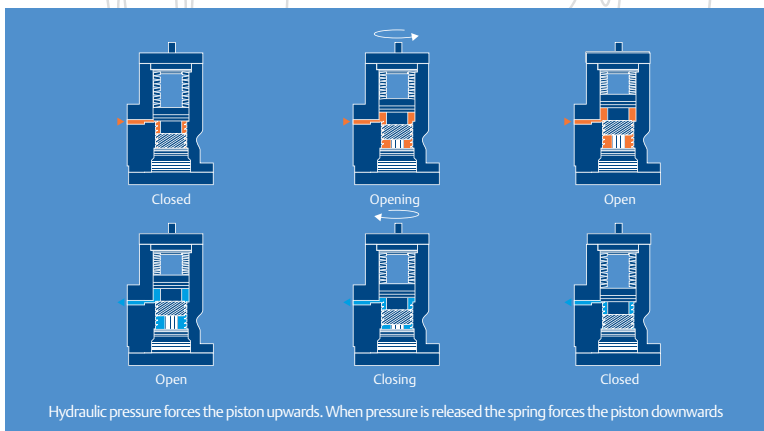
Features

- Available with choice of 1500 psi / 90 bar or 2000 psi / 135 bar spring set (SR1 & SR2)
- ATEX certified
- Smallest footprint to torque ratio
- Compact & concentric design
- Spring action by means of dished springs
- Balanced helical design eliminates side loading on valve assembly and stem
- High water ingress protection-IP68
- Integrated crossover design
- Easy adaption standard valve bonnet design
- Vibration resistant design
- Unlimited mounting positions with built-in position adjustments

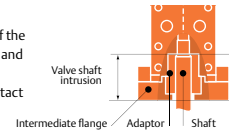


| | | |
|--------------|--------|--------|
| Weight | lb | kg |
| Displacement | cu.in. | litres |
| Dimensions | inches | mm |

| Model | Weight | Displacement | Dimensions Side View | | | | | | | Dimensions Front View | | | | | N | | P | |
|------------|--------|--------------|----------------------|-------|-------|-------|-------|------|------|-----------------------|------|------|------|------|----------|-------|--------|-------|
| | | | A | B | C | D | E | F | G | H | J | K | L | M | Thread | Depth | Thread | Depth |
| BHHF 125 | 19 | 2 | 3.66 | 3.78 | 3.62 | 7.95 | 8.78 | 0.81 | 2.05 | 1.38 | 1.61 | .087 | .057 | 2.28 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 8.6 | 0.026 | 93 | 96 | 92 | 202 | 223 | 20.5 | 52 | 35 | 41 | 22 | 14.5 | 58 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 250 | 30 | 3 | 4.25 | 4.65 | 4.72 | 9.88 | 10.71 | 0.91 | 2.05 | 1.38 | 1.61 | .087 | 0.65 | 2.32 | 1/4" BSP | .051 | M8 | 0.47 |
| | 13.6 | 0.05 | 108 | 118 | 120 | 251 | 272 | 23 | 52 | 35 | 41 | 22 | 16.5 | 59 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 500 | 50 | 6 | 5.35 | 5.20 | 5.91 | 11.93 | 12.76 | 0.91 | 2.05 | 1.38 | 1.61 | 0.87 | 0.79 | 2.46 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 22.5 | 0.102 | 136 | 132 | 150 | 303 | 324 | 23 | 52 | 35 | 41 | 22 | 20 | 62.5 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 1000 | 86 | 13 | 6.46 | 6.30 | 6.89 | 13.94 | 14.76 | 1.10 | 2.05 | 1.38 | 1.61 | 0.87 | 0.93 | 2.60 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 39.1 | 0.209 | 164 | 160 | 175 | 354 | 375 | 28 | 52 | 35 | 41 | 22 | 23.5 | 66 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 2000 | 147 | 24 | 7.68 | 7.56 | 8.23 | 16.57 | 17.40 | 1.46 | 2.05 | 1.38 | 1.61 | 0.87 | 1.00 | 2.68 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 66.7 | 0.4 | 195 | 192 | 209 | 421 | 442 | 37 | 52 | 35 | 41 | 22 | 25.5 | 68 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 4000 | 334 | 49 | 9.84 | 11.81 | 11.18 | 21.22 | 22.05 | 1.57 | 2.05 | 1.38 | 1.61 | 0.87 | 1.24 | 2.91 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 151.8 | 0.8 | 250 | 300 | 284 | 539 | 560 | 40 | 52 | 35 | 41 | 22 | 31.5 | 74 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 8000 | 638 | 98 | 12.20 | 12.36 | 15.75 | 27.40 | 28.19 | 1.73 | 2.05 | 1.38 | 1.61 | 0.87 | 1.85 | 3.48 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 290 | 1.6 | 310 | 314 | 400 | 696 | 716 | 44 | 52 | 35 | 41 | 22 | 47 | 88.5 | 1/4" BSP | 13 | M8 | 12 |
| BHHF 16000 | 1027 | 189 | 14.57 | 13.78 | 22.52 | 36.46 | 37.28 | 2.36 | 2.05 | 1.38 | 1.61 | 0.87 | 2.42 | 4.09 | 1/4" BSP | 0.51 | M8 | 0.47 |
| | 467 | 3.1 | 370 | 350 | 572 | 926 | 947 | 60 | 52 | 35 | 41 | 22 | 61.5 | 104 | 1/4" BSP | 13 | M8 | 12 |



Valve spindle options:
 Limits for machining of the adaptor. Other shapes and valve shaft intrusions on request, please contact Bettis.



| Model | DIN 6885 | | DIN 79 | | Shaft Intrusion | |
|------------|-----------|-----------|-----------|-----------|-----------------|-----|
| | in (max.) | mm (max.) | in (max.) | mm (max.) | in | mm |
| BHHF 125 | 0.669 | 17 | 0.630 | 16 | 1.77 | 45 |
| BHHF 250 | 0.984 | 25 | 0.945 | 24 | 1.97 | 50 |
| BHHF 500 | 1.378 | 35 | 1.181 | 30 | 2.17 | 55 |
| BHHF 1000 | 1.654 | 42 | 1.417 | 36 | 2.48 | 63 |
| BHHF 2000 | 2.283 | 58 | 1.969 | 50 | 2.95 | 75 |
| BHHF 4000 | 2.913 | 74 | 2.480 | 63 | 3.35 | 85 |
| BHHF 8000 | 3.740 | 95 | 3.150 | 80 | 4.13 | 105 |
| BHHF 16000 | 3.740 | 95 | 3.543 | 90 | 5.20 | 132 |

Torque Ratings – BHH/BHMF Series – Imperial

BHH – Double Acting

| Actuator Model | | Operating Pressure (psi) | | | | | | | | |
|----------------|--|--------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|
| | | 500 | 750 | 1000 | 1250 | 1500 | 1750 | 2000 | 2500 | 3000 |
| | | Hydraulic Torque Output, lb/in | | | | | | | | |
| BHH 125 | | 283 | 407 | 575 | 735 | 859 | 982 | 1106 | 1390 | 1699 |
| BHH 250 | | 575 | 814 | 1142 | 1469 | 1717 | 1965 | 2213 | 2779 | 3390 |
| BHH 500 | | 1142 | 1637 | 2292 | 2947 | 3434 | 3930 | 4425 | 5567 | 6780 |
| BHH 1000 | | 1965 | 3275 | 4585 | 5895 | 6877 | 7859 | 8851 | 11143 | 13568 |
| BHH 2000 | | 4585 | 6550 | 9178 | 11798 | 13763 | 15728 | 17701 | 22286 | 27136 |
| BHH 4000 | | 9178 | 13108 | 18356 | 23596 | 27535 | 31464 | 35403 | 44581 | 54282 |
| BHH 8000 | | 18356 | 26216 | 36713 | 47201 | 55069 | 62938 | 70806 | 89162 | 108563 |
| BHH 16000 | | 36713 | 52441 | 73426 | 94402 | 110139 | 125875 | 141612 | 178325 | 217135 |

BHMF – Single Acting

| Actuator Model | | Spring Torque | Operating Pressure (psi) | | | | | | | | |
|----------------|-------|---------------|--------------------------------|-----|------|-------|-------|-------|-------|--------|--------|
| | | | 500 | 750 | 1000 | 1250 | 1500 | 1750 | 2000 | 2500 | 3000 |
| | | | Hydraulic Torque Output, lb/in | | | | | | | | |
| BHMF 125-SR1 | Start | 336 | | | 230 | 398 | 522 | 646 | 770 | | |
| | End | 186 | | | 27 | 195 | 319 | 443 | 566 | | |
| BHMF 125-SR2 | Start | 549 | | | | 407 | 531 | 655 | 779 | 1062 | 1372 |
| | End | 266 | | | | 44 | 168 | 292 | 416 | 699 | 1009 |
| BHMF 250-SR1 | Start | 620 | | | 425 | 752 | 1000 | 1248 | 1487 | | |
| | End | 416 | | | 204 | 531 | 779 | 1027 | 1266 | | |
| BHMF 250-SR2 | Start | 1354 | | | | | 832 | 1080 | 1328 | 1859 | 2505 |
| | End | 575 | | | | | 35 | 212 | 460 | 1036 | 1637 |
| BHMF 500-SR1 | Start | 1319 | | | 947 | 1602 | 2098 | 2584 | 3080 | | |
| | End | 903 | | | 487 | 1142 | 1637 | 2124 | 2620 | | |
| BHMF 500-SR1 | Start | 2584 | | | | | 1682 | 2168 | 2664 | 3815 | 5027 |
| | End | 1239 | | | | | 239 | 726 | 1221 | 2372 | 3585 |
| BHMF 1000-SR1 | Start | 2797 | | | 1921 | 3231 | 4204 | 5195 | 6187 | | |
| | End | 1841 | | | 855 | 2195 | 3177 | 4160 | 5142 | | |
| BHMF 1000-SR2 | Start | 5372 | | | | 2788 | 3770 | 4753 | 5735 | 8028 | 10453 |
| | End | 2832 | | | | 221 | 1204 | 2186 | 3169 | 5461 | 7231 |
| BHMF 2000-SR1 | Start | 5585 | | | 3824 | 6443 | 8408 | 10373 | 12347 | | |
| | End | 3363 | | | 1903 | 4523 | 6488 | 8452 | 10426 | | |
| BHMF 2000-SR2 | Start | 8922 | | | | 4806 | 6780 | 8745 | 10709 | 15303 | 20153 |
| | End | 5355 | | | | 805 | 2779 | 4744 | 6709 | 11302 | 16153 |
| BHMF 4000-SR1 | Start | 11134 | | | 8364 | 13612 | 17542 | 21481 | 25410 | | |
| | End | 7125 | | | 4027 | 9276 | 13205 | 17144 | 21074 | | |
| BHMF 4000-SR2 | Start | 22569 | | | | | 13373 | 17312 | 21242 | 30420 | 40120 |
| | End | 11949 | | | | | 540 | 4478 | 8408 | 17586 | 27287 |
| BHMF 16000-SR1 | Start | 42484 | | | | | 26747 | 34615 | 42484 | 60840 | 80250 |
| | End | 21242 | | | | | 5505 | 10718 | 21242 | 39598 | 59008 |
| BHMF 16000-SR2 | Start | 73461 | | | | | 53494 | 69231 | 84967 | 121680 | 160491 |
| | End | 42484 | | | | | 11010 | 26747 | 42484 | 79196 | 118007 |

Torque Ratings – BHH/BHHF Series – Metric

BHH – Double Acting

| Actuator Model | | Operating Pressure (bar) | | | | | | | | |
|----------------|--|-----------------------------|------|------|-------|-------|-------|-------|-------|-------|
| | | 35 | 50 | 70 | 90 | 105 | 120 | 135 | 170 | 207 |
| | | Hydraulic Torque Output, Nm | | | | | | | | |
| BHH 125 | | 32 | 46 | 65 | 83 | 97 | 111 | 125 | 157 | 192 |
| BHH 250 | | 65 | 92 | 129 | 166 | 194 | 222 | 250 | 314 | 383 |
| BHH 500 | | 129 | 185 | 259 | 333 | 388 | 444 | 500 | 629 | 766 |
| BHH 1000 | | 222 | 370 | 518 | 666 | 777 | 888 | 1000 | 1259 | 1533 |
| BHH 2000 | | 518 | 740 | 1037 | 1333 | 1555 | 1777 | 2000 | 2518 | 3066 |
| BHH 4000 | | 1037 | 1481 | 2074 | 2666 | 3111 | 3555 | 4000 | 5037 | 6133 |
| BHH 8000 | | 2074 | 2962 | 4148 | 5333 | 6222 | 7111 | 8000 | 10074 | 12266 |
| BHH 16000 | | 4148 | 5925 | 8296 | 10666 | 12444 | 14222 | 16000 | 20148 | 24533 |

BHHF – Single Acting

| Actuator Model | | Spring Torque | Operating Pressure (bar) | | | | | | | | |
|----------------|-------|---------------|-----------------------------|----|-----|------|------|------|------|-------|-------|
| | | | 35 | 50 | 70 | 90 | 105 | 120 | 135 | 170 | 207 |
| | | | Hydraulic Torque Output, Nm | | | | | | | | |
| BHHF 125-SR1 | Start | 38 | | | 26 | 45 | 59 | 73 | 87 | | |
| | End | 21 | | | 3 | 22 | 36 | 50 | 64 | | |
| BHHF 125-SR2 | Start | 62 | | | | 46 | 60 | 74 | 88 | 120 | 155 |
| | End | 30 | | | | 5 | 19 | 33 | 47 | 79 | 114 |
| BHHF 250-SR1 | Start | 70 | | | 48 | 85 | 113 | 141 | 168 | | |
| | End | 47 | | | 23 | 60 | 88 | 116 | 143 | | |
| BHHF 250-SR2 | Start | 153 | | | | | 94 | 122 | 150 | 210 | 283 |
| | End | 65 | | | | | 4 | 24 | 52 | 117 | 185 |
| BHHF 500-SR1 | Start | 149 | | | 107 | 181 | 237 | 292 | 348 | | |
| | End | 102 | | | 55 | 129 | 185 | 240 | 296 | | |
| BHHF 500-SR1 | Start | 292 | | | | | 190 | 245 | 301 | 431 | 568 |
| | End | 140 | | | | | 27 | 82 | 138 | 268 | 405 |
| BHHF 1000-SR1 | Start | 316 | | | 217 | 365 | 475 | 587 | 699 | | |
| | End | 208 | | | 100 | 248 | 359 | 470 | 581 | | |
| BHHF 1000-SR2 | Start | 607 | | | | 315 | 426 | 537 | 648 | 907 | 1181 |
| | End | 320 | | | | 25 | 136 | 247 | 358 | 617 | 817 |
| BHHF 2000-SR1 | Start | 631 | | | 432 | 728 | 950 | 1172 | 1395 | | |
| | End | 380 | | | 215 | 511 | 733 | 955 | 1178 | | |
| BHHF 2000-SR2 | Start | 1008 | | | | 543 | 766 | 988 | 1210 | 1729 | 2777 |
| | End | 605 | | | | 91 | 314 | 536 | 758 | 1277 | 1825 |
| BHHF 4000-SR1 | Start | 1258 | | | 945 | 1538 | 1982 | 2427 | 2871 | | |
| | End | 805 | | | 455 | 1048 | 1492 | 1937 | 2381 | | |
| BHHF 4000-SR2 | Start | 2550 | | | | | 1511 | 1956 | 2400 | 3437 | 4533 |
| | End | 1350 | | | | | 61 | 506 | 950 | 1987 | 3083 |
| BHHF 16000-SR1 | Start | 4800 | | | | | 3022 | 3911 | 4800 | 6874 | 9067 |
| | End | 2400 | | | | | 622 | 1211 | 2400 | 4474 | 6667 |
| BHHF 16000-SR2 | Start | 8300 | | | | | 6044 | 7822 | 9600 | 13748 | 18133 |
| | End | 4800 | | | | | 1244 | 3022 | 4800 | 8948 | 13333 |

Bettis BL

Hydraulic Double-Acting Linear Actuators

Technical Data

Working pressure: 135 bar / 2000 psi

Test pressure: 1.5 x working pressure to a maximum of 250 bar / 3600 psi

Temperature range: -20° to +80 °C / -5° to +180 °F

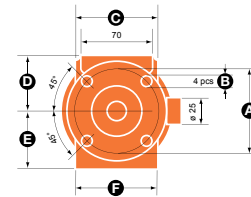
Closing thrust: 17000 - 92500 N / 12500-68000 lbf

Viscosity of hydraulic oil: 15 to 200 cSt

For intermediate position and fail set operation for globe valves

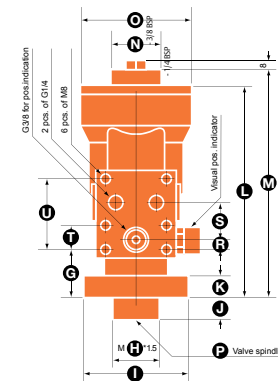
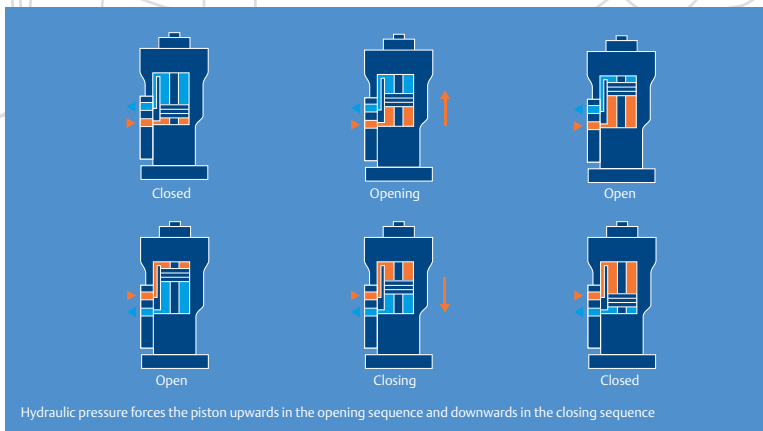
Features

- Unique and simple design with integrated crossover valve
- Easy installation on intermediate flange of globe valve
- Same unit for various size valves
- Water ingress protection - IP68
- No external moving parts
- Design ready for control functions
- Direct visual indication
- Integrated anti-creep design



| | | |
|---------------------|---------------|---------------|
| Thrust | lbf | N |
| Weight | lb | kg |
| Displacement | cu.in. | litres |
| Dimensions | inches | mm |

| Model | Thrust at 1550 psi (108 bar) | Thrust at 1950 psi (135 bar) | Stroke | Weight | Displacement | Dimensions Bottom View | | | | | | Dimensions Front View | | | | | | | | | | | | | |
|--------|------------------------------|------------------------------|--------|--------|--------------|------------------------|------|------|------|------|------|-----------------------|------|------|------|------|-------|-------|------|------|------|------|------|------|------|
| | | | | | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | R | S | T | U |
| BL 65 | 3057 | 3822 | 0.64 | 10 | 1 | 2.44 | 0.35 | 3.15 | 1.87 | - | - | 1.36 | 1.42 | 2.99 | 0.67 | 0.59 | 6.02 | 6.22 | - | 3.15 | 0.79 | 0.36 | 1.32 | 0.87 | 2.48 |
| | 13600 | 17000 | 16.25 | 4.5 | 0.021 | 62 | 9 | 80 | 47.5 | - | - | 34.5 | 36 | 76 | 17 | 15 | 153 | 158 | - | 80 | 20 | 9 | 33.5 | 22 | 63 |
| BL 125 | 6295 | 7868 | 1.23 | 15 | 5 | 2.95 | 0.35 | 3.07 | 1.97 | 2.05 | 2.83 | 1.67 | 1.65 | 3.54 | 0.75 | 0.79 | 7.44 | 7.95 | 1.77 | 3.84 | 0.98 | 0.36 | 1.32 | 0.87 | 2.48 |
| | 28000 | 35000 | 31.25 | 7 | 0.082 | 75 | 9 | 78 | 50 | 52 | 72 | 42.5 | 42 | 90 | 19 | 20 | 189 | 202 | 45 | 97.5 | 25 | 9 | 33.5 | 22 | 63 |
| BL 250 | 16636 | 20795 | 2.46 | 53 | 26 | 4.65 | 0.55 | 2.76 | 3.31 | 3.07 | 2.83 | 2.91 | 2.83 | 5.51 | 0.91 | 1.38 | 11.77 | 12.64 | 3.15 | 6.10 | 1.97 | 0.36 | 1.32 | 0.87 | 2.48 |
| | 74000 | 92500 | 62.5 | 24 | 0.428 | 118 | 14 | 70 | 84 | 78 | 72 | 74 | 72 | 140 | 23 | 35 | 299 | 321 | 80 | 155 | 50 | 9 | 33.5 | 22 | 63 |



Bettis BLF

Single-Acting Linear Actuator



Technical Data

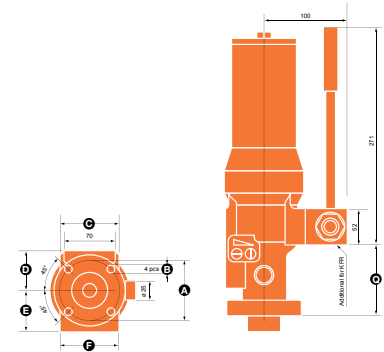
Working pressure: 135 bar / 2000 psi
 Test pressure: 1.5 x working pressure to a maximum of 250 bar / 3600 psi
 Temperature range: -20° to +80°C / -5° to +180°F
 End closing thrust (spring): 1500 - 16500 N / 1100 to 12000 lbf
 Viscosity of hydraulic oil: 15 to 200 cSt

The Bettis BLF/BLFR actuator for fail close operation of globe valves

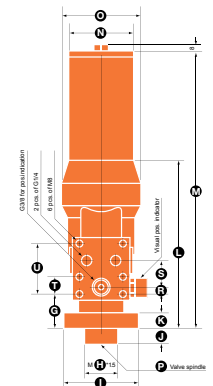
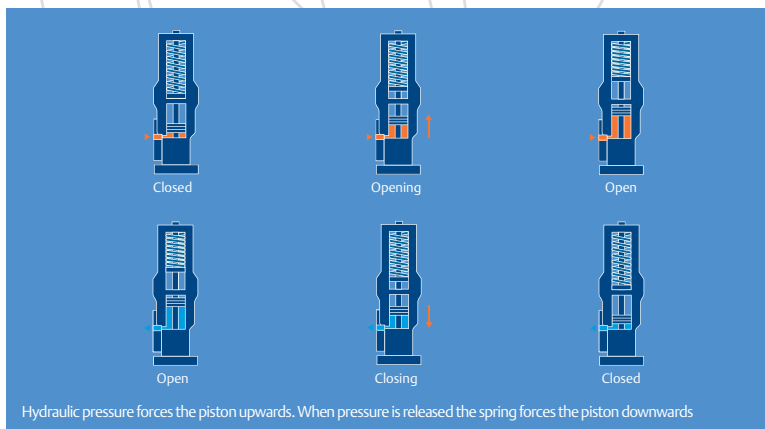
Features

- Unique and simple design with integrated crossover valve
- Easy installation on intermediate flange of globe valve
- Same unit for various valve sizes
- Water ingress protection - IP68
- No external moving parts
- Design ready for control functions
- Built-in hydraulic emergency operation for the BLFR
- Direct visual indication

| | | |
|---------------------|---------------|---------------|
| Thrust | lbf | N |
| Weight | lb | kg |
| Displacement | cu.in. | litres |
| Dimensions | inches | mm |



| Model | End Closing Thrust | Stroke | Weight | Displacement | Dimensions Bottom View | | | | | | Dimensions Front View | | | | | | | | | | | | | | |
|---------|--------------------|--------|--------|--------------|------------------------|----|------|------|------|------|-----------------------|------|------|------|------|-------|-------|------|------|------|------|------|------|------|------|
| | | | | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| BLF 65 | 337 | 0.64 | 13 | 1.28 | 2 | 0 | 3.15 | 1.87 | - | - | 1.36 | 1.42 | 2.99 | 0.67 | 0.59 | 6.30 | 8.86 | 2.52 | 3.15 | 0.79 | - | 0.36 | 1.32 | 0.87 | 2.48 |
| | 1500 | 16.25 | 6 | 0.021 | 62 | 9 | 80 | 47.5 | - | - | 34.5 | 36 | 76 | 17 | 15 | 160 | 225 | 64 | 80 | 20 | - | 9 | 33.5 | 22 | 63 |
| BLF 125 | 1079 | 1.23 | 24 | 5.00 | 3 | 0 | 3.07 | 1.97 | 2.05 | 2.83 | 1.67 | 1.65 | 3.54 | 0.75 | 0.79 | 8.23 | 13.58 | 3.15 | 3.84 | 0.98 | 3.50 | 0.36 | 1.32 | 0.87 | 2.48 |
| | 4800 | 31.25 | 11 | 0.082 | 75 | 9 | 78 | 50 | 52 | 72 | 42.5 | 42 | 90 | 19 | 20 | 209 | 345 | 80 | 97.5 | 25 | 89 | 9 | 33.5 | 22 | 63 |
| BLF 250 | 3709 | 2.46 | 112 | 26.12 | 5 | 1 | 2.76 | 3.31 | 3.07 | 2.83 | 2.91 | 2.83 | 5.51 | 0.91 | 1.38 | 12.95 | 23.70 | 5.91 | 6.10 | 1.97 | 6.10 | 0.36 | 1.32 | 0.87 | 2.48 |
| | 16500 | 62.5 | 51 | 0.428 | 118 | 14 | 70 | 84 | 78 | 72 | 74 | 72 | 140 | 23 | 35 | 329 | 602 | 150 | 155 | 50 | 155 | 9 | 33.5 | 22 | 63 |



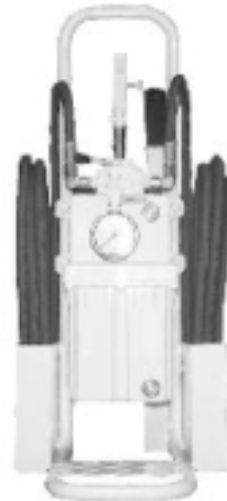
Hand Pumps

Hand pumps can be installed on all standard actuators – BHH, BHHF, BL, BLF. They are available for use with single acting or double acting configurations.

Depending on the actuator size, control type and valve location, the hand pumps can be used for emergency operation and standalone operation without other remote facilities.



Direct Mounted Hand Pump



Portable Hand Pump

Valve Position Indicators

The Bettis Valve Position Indicators (VPI) program is designed to locally or remotely indicate the position of hydraulically-operated actuators with determined displacement. It continuously indicates valve position by measuring the actual oil flow to and from the actuator. It can also include temperature and

pressure compensation blocks. When placed remotely from the actuator, the VPI can indicate valve position when the actuator is submerged or in a hazardous area.



VPI



VPI with temperature and pressure compensation blocks & solenoids

Other Options Available

- Hydraulic on/off indication
- Submersion cover
- Epoxy coating
- Flushing option without disconnection

- Low temperature—Consult Factory
- Solenoid solutions
- Intelligent hydraulic positioner

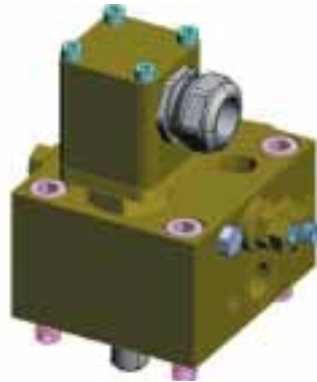
Hydraulic Control Blocks

The Bettis control block system is designed for mounting on, or close to, the BHH, BHHF, BL and BLF actuators. For use with any of the actuators for conventional, submerged, or

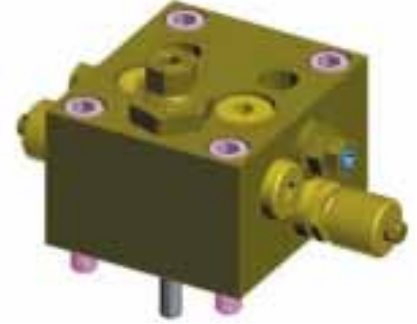
hazardous location service, the actuator can be connected to the pilot line by means of a B-block.



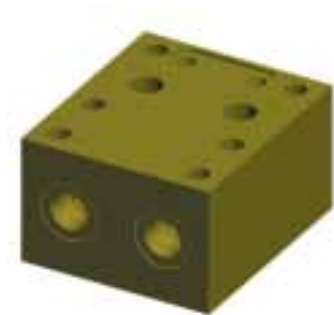
CB Standard Block



CBF Flushing Block

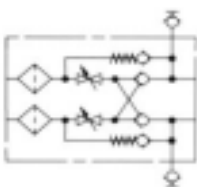


NG6 Block with Interface for CETOP 3 Valves

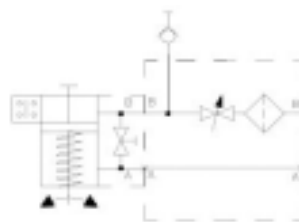


B Block

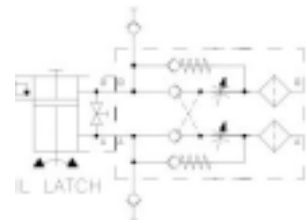
- Hydraulic Functions:**
- Pilot line connection
 - Flush system
 - Last chance filter
 - Throttle/stop valve
 - Pilot-operated check valve
 - Relief valve
 - Quick connections



Basic Block



**Block for Single Acting
CBI-S-H**



Block for Double Acting

Block Types and Functions

| Name | Block Function | Consequence |
|------|--|--|
| CB | Control Block | |
| 2 | 2-Line Actuator (BHH Actuator) | |
| 1 | 1-Line Actuator (BHFF Actuator) | |
| PCV | Pilot Operated Check Valve | Hydraulic lock of the piston on the actuator and prevent the actuator moving when it is required to be held stationary. |
| H | Quick Connection for Handpump | Used for emergency operation by means of a portable handpump on the actuator. |
| (H) | Connection for Auxiliary Handpump | Used for emergency operation by means of a portable handpump on the actuator. |
| S | Throttle/Stop Valve | Used to isolate the actuator if emergency operation is required. |
| T | Throttle | Control the speed of the actuators. Regulate flow in both directions. |
| R | Relief Valve | Releasing any overpressure in the actuator. The last chance filter is only for safety. Used on double acting actuators. When single acting actuator we don't need the release valve, because the oil can freely stream back from the actuator to the pipes, wherefore an overpressure is not possible. |
| NG6 | Interface for CETOP 3 Valves | According to ISO 4401/NG6. NG6 and Cetop3 has the same connection. |
| NG3 | Interface for NG3 Valves | Mounting a solenoid valve directly on the block or special function not build into blocks. |
| E | Interface for EL on/off or Potentiometer | To be used where there are no control components on the actuators, but EL indication is required. |
| 1A | 1-line (BHFF Fail Open) | Used instead of fail close - i.e. fire-fighting system. Can be used both to BHFF-FO and BL-FO. |
| F | Flush/Stop Valves | Flushing the pipe when starting up the hydraulic system to prevent impurity. |
| B | By-pass Hydraulic on/off indication | Connects actuator to pilot line in submerged or hazardous service. |

Common Configurations

| Block Type | PCV | H | (H) | S | T | R | NG6 | E | 1A | F |
|-------------------------|-----|---|-----|---|---|---|-----|-----|----|---|
| CB | | | | | | | | | | |
| CB 1-S-H | | X | | X | | | | | | |
| CB 1A-S-H | | X | | X | | | | | X | |
| CB 2-S | | | | X | | | | | | |
| CB2-S-H | | X | | X | | | | | | |
| CB2-PCV-R-T | X | | | | X | X | | | | |
| CB2-PCV-R-T-H | X | X | | | X | X | | | | |
| CB2-PCV-R-T-(H) | X | | X | | X | X | | | | |
| CB-E | | | | | | | | | | |
| CB1-S-H-E | | X | | X | | | | X | | |
| CB1A-S-H-E | | X | | X | | | | X | X | |
| CB2-PCV-R-T-H-E | X | X | | | X | X | | X | | |
| CB2-PCV-R-T-(H)-E | X | | X | | X | X | | X | | |
| CB2-PCV-R-T-E | X | | | | X | X | | X | | |
| CB2-S-H-E | | X | | X | | | | X | | |
| CB2-S-E | | | | X | | | | X | | |
| CB-F | | | | | | | | | | |
| CBF1-T-H-(E) | | X | | X | | | X | (X) | | X |
| CBF1A-T-H-(E) | | X | | X | | | X | (X) | X | X |
| CBF2-PCV-T-R-H-(E) | X | X | | X | X | X | X | (X) | | X |
| CBF2-PCV-T-R-(H)-(E) | X | | X | X | X | X | X | (X) | | X |
| CBF2-PCV-T-R-(E) | X | | | X | X | X | | (X) | | X |
| CBF2-PCV-T-H-R-(E) | | X | | X | X | X | | (X) | | X |
| CBF2-T-E | | | | X | | | | (X) | | X |
| CB-NG6 | | | | | | | | | | |
| CB1-NG6-S-H-(E) | | X | | X | | | X | (X) | | |
| CB1A-NG6-S-H-(E) | | X | | X | | | X | (X) | X | |
| CB2-NG6-S-H-(E) | | X | | X | | | X | (X) | | |
| CB2-NG6-S-E | | | | X | | | X | (X) | | |
| CBF-NG6 | | | | | | | | | | |
| CBF-2-NG6-PCV-R-T-H-(E) | X | X | | | X | X | X | (X) | | X |

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