FLOWSERVE

# Worcester Controls
# WRG Series Heavy Duty Actuator

## Double Acting or Spring Return Scotch Yoke Actuator

### WRG Series Scotch Yoke

- *IP67M Approved*
- *SIL 3 Capable*

*Experience In Motion*

# Flow Control Division
# Valve Automation Systems

*Flowserve Corporation's Valve Automation Systems provides complete valve and damper automation to the worldwide processing industries. We provide maximum value to the end user through a broad offering of products, services, application engineering and our systematic approach to automation.*

### Quality, Dependability and Productivity

Recognized as a leader in valve automation systems, Worcester Controls pneumatic actuators can automate valves with torque values from 25 to 2.2 million in-lbs (2.8 - 248,566Nm).
Actuators are available in a wide range of materials suitable for use in the most demanding applications. Flowserve also offers a comprehensive range of NAMUR Controls and accessories such as lockout modules and gear overrides. To complete the package Flowserve can provide engineering design services for automation mounting brackets and mounting hardware.

# AutoSize 4.0

**AutoSize 4.0**

Automation sizing and selection software
http://www.flowserve.com

While reasonable attempts have been made to ensure the accuracy of the output from this program. Flowserve disclaims responsibility for the use of this program including but not limited to the

*Sales and service facilities are strategically located in industrial centers throughout the world.*

**Use AutoSize 4.0 to:**

- Ensure accurate actuator sizing
- Simplify and save time sizing actuators
- Create project files and data sheets
- Perform engineering calculations

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# WRG Series

## Heavy-Duty Scotch Yoke Actuator

*The Worcester WRG Series provides up to 2.2 million in-lbs of heavy-duty Scotch yoke torque. Enhanced performance is achieved by using a superior yoke support system that significantly reduces transverse loads.*

### Features

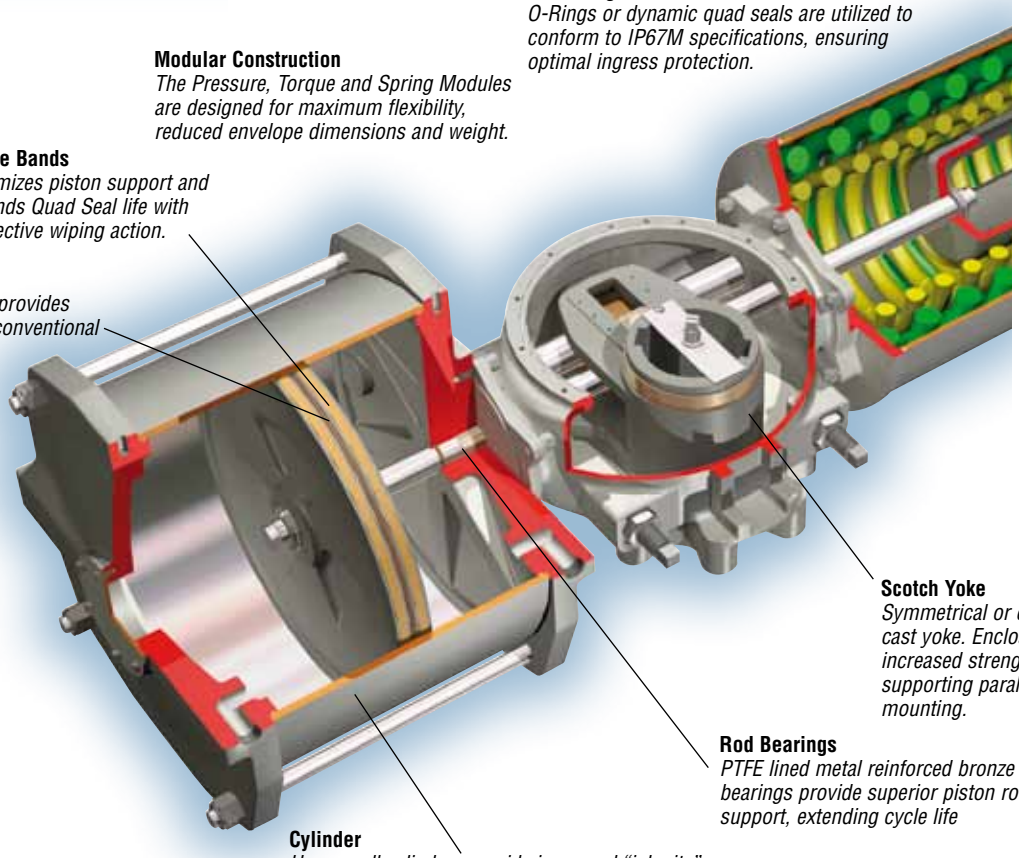
- True Modular Design
- On-Off, Multi-Position and Throttling
- Pneumatic, Gas and Hydraulic Models
- Spring Return "Fail Safe" and Double Acting
- Torque Outputs:
  - DA – 2.2M in-lbs (248K Nm)
  - SR – 1.2M in-lbs (124K Nm)
- Operating Pressures:
  - Pneumatic: 40-150psi
  - Hydraulic: 500-3000psi

**IP67M Ingress Protection**
*O-Rings or dynamic quad seals are utilized to conform to IP67M specifications, ensuring optimal ingress protection.*

**Modular Construction**
*The Pressure, Torque and Spring Modules are designed for maximum flexibility, reduced envelope dimensions and weight.*

**Guide Bands**
*Optimizes piston support and extends Quad Seal life with protective wiping action.*

**Piston Seals**
*Dynamic Quad Seal design provides enhanced cycle life versus conventional O-Rings.*



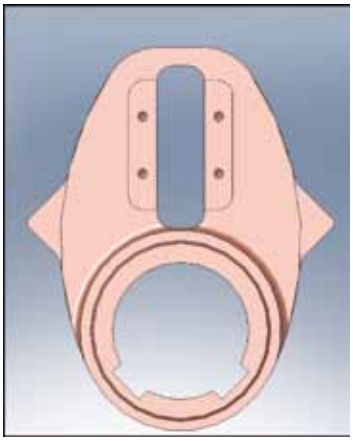
**Scotch Yoke**
*Symmetrical or canted ductile iron cast yoke. Enclosed yoke slot for increased strength with 2 keyways supporting parallel or perpendicular mounting.*

**Rod Bearings**
*PTFE lined metal reinforced bronze bearings provide superior piston rod support, extending cycle life*

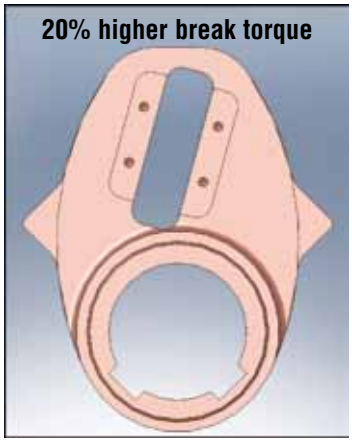
**Cylinder**
*Heavy wall cylinders provide increased "job site" durability. Interior surface is honed and hard chrome plated to provide superior corrosion and wear resistance.*

# WRG Series

## Heavy-Duty Scotch Yoke Actuator



Symmetrical Yoke




Canted Yoke

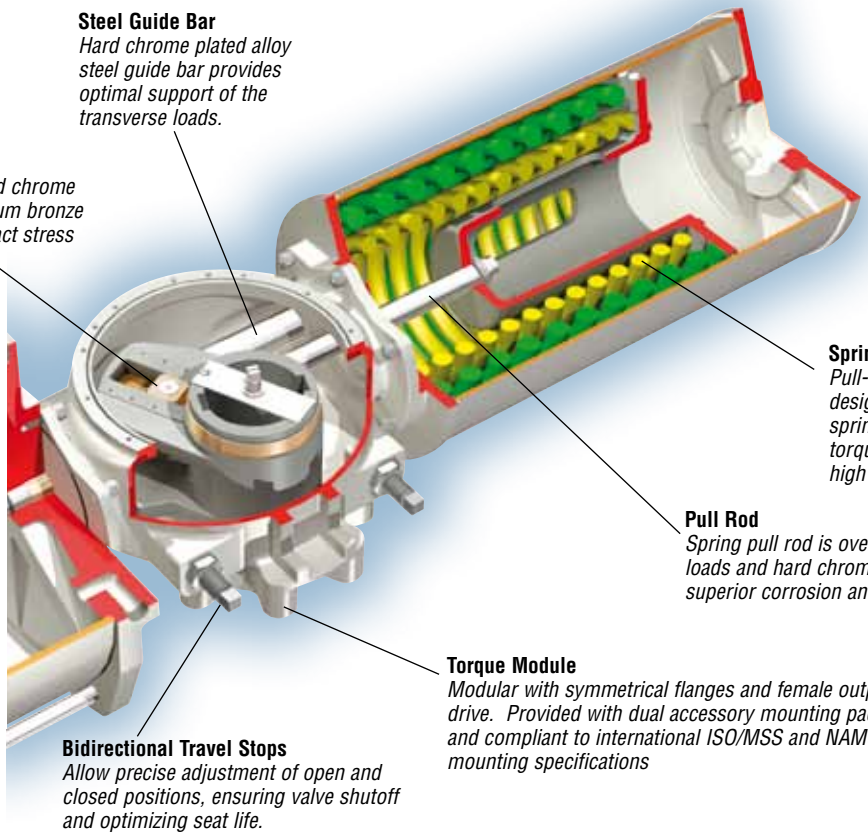
### Interchangeable Yoke System

- *Ductile iron casting*
- *Totally enclosed yoke slot for increased strength and cycle life*
- *Canted yoke results in approx. 20% higher break torque*
- *2 keyway provision for flexibility of parallel or perpendicular mounting*

### Features

- Hard Chrome Plated Cylinder Walls
- Symmetrical and Canted Yoke
- Guide Bar Yoke Support
- Dual DD Cylinder Option
- Field Reversible Action
- Overrides, Line Break and Special Controls
- ESD Performance

**Override Options**
*Spring Module design facilitates field retrofitting of jackscrew or hydraulic overrides*



**Steel Guide Bar**
*Hard chrome plated alloy steel guide bar provides optimal support of the transverse loads.*

**Slider Block**
*Induction hardened and hard chrome plated yoke pin with aluminum bronze slider blocks minimize contact stress and ensure high cycle life.*

**Spring Module**
*Pull-to-compress, concentric-nested design utilizes high strength alloy spring steel to maintain consistent torque output (over time) and promote high cycle life performance.*

**Pull Rod**
*Spring pull rod is over-sized to resist impact loads and hard chrome plated to provide superior corrosion and wear resistance.*

**Torque Module**
*Modular with symmetrical flanges and female output drive. Provided with dual accessory mounting pads and compliant to international ISO/MSS and NAMUR mounting specifications*

**Bidirectional Travel Stops**
*Allow precise adjustment of open and closed positions, ensuring valve shutoff and optimizing seat life.*

# WRG Series

## Accessories

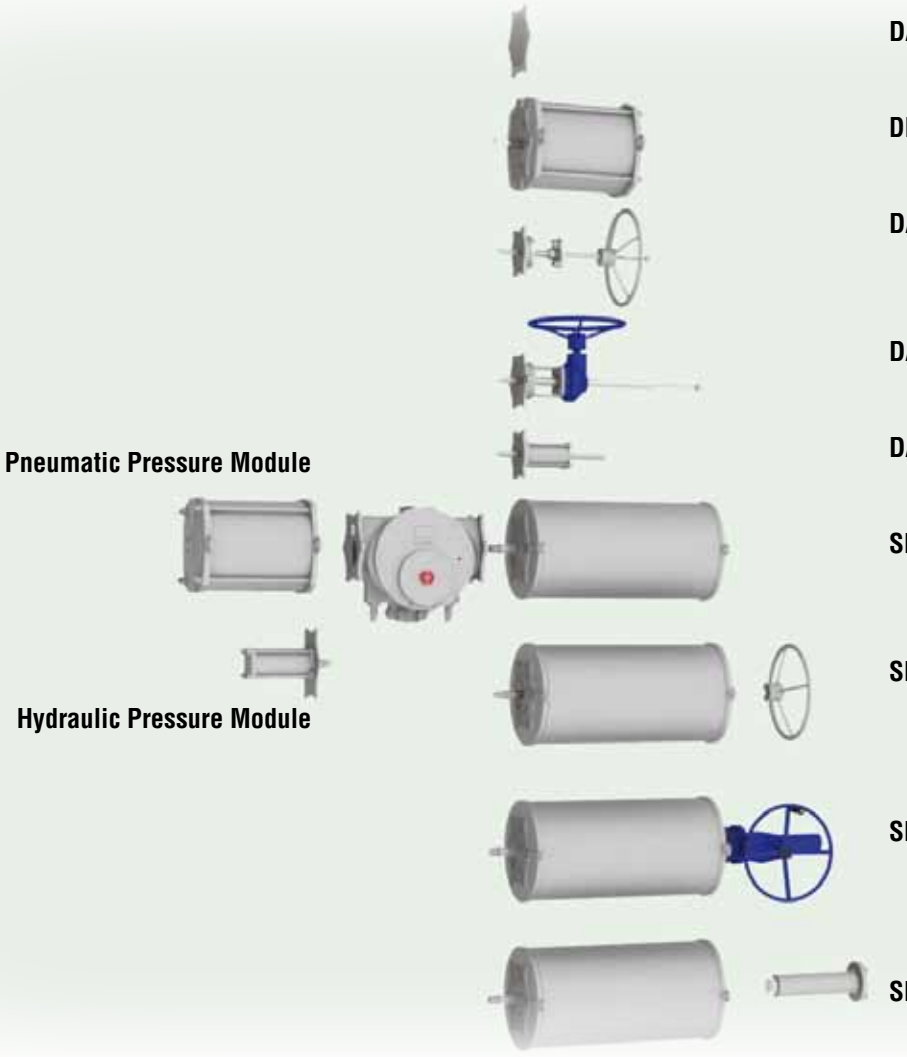
### Heavy-Duty Scotch Yoke Actuator

**Modular Construction**

- *Double Acting or Spring Return (FCW or FCCW)*
- *Pneumatic or Hydraulic Pressure Modules*
- *Torque Module with symmetrical or canted yokes*
- *Override Options – Direct Drive Jackscrew, Bevel Gear Jackscrew or Hydraulic Override*

SR with Direct Drive Jackscrew

DA with Hydraulic Override Cylinder



DA Endplate

DD Double Acting Dual Cylinder

DA Direct Drive Jackscrew

DA Bevel Gear Jackscrew

DA Hydraulic Override

Pneumatic Pressure Module

SR Spring Module

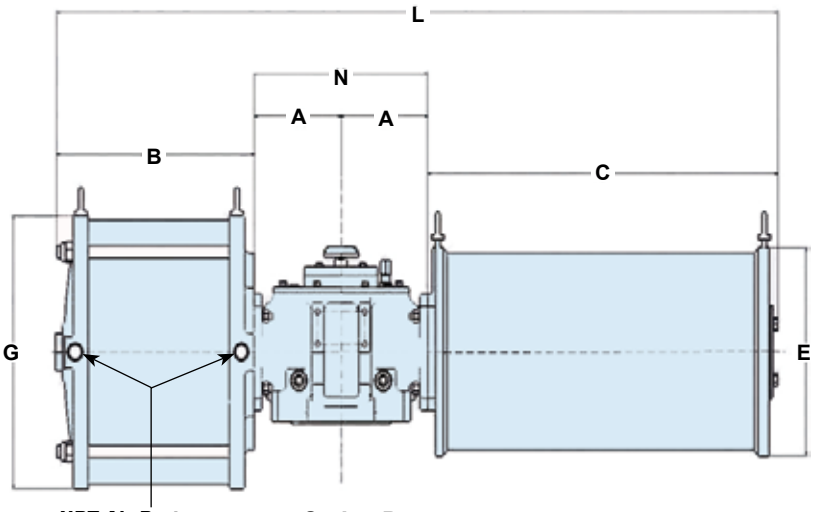
SR Direct Drive Jackscrew

Hydraulic Pressure Module

SR Bevel Gear Jackscrew

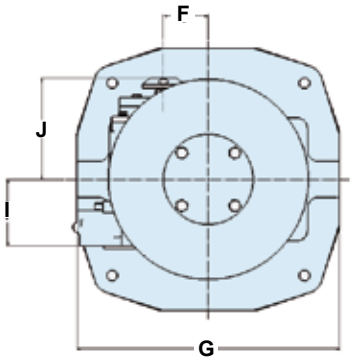
SR Hydraulic Override

# Dimensions

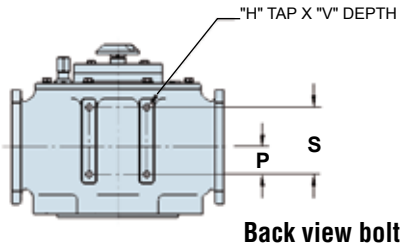



NPT Air Ports

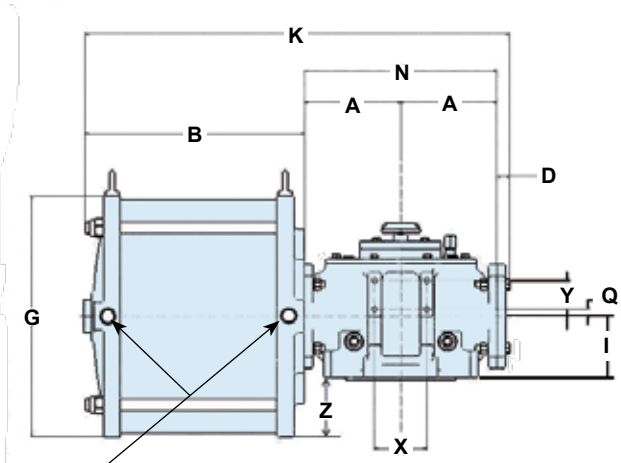
Spring Return




Side View

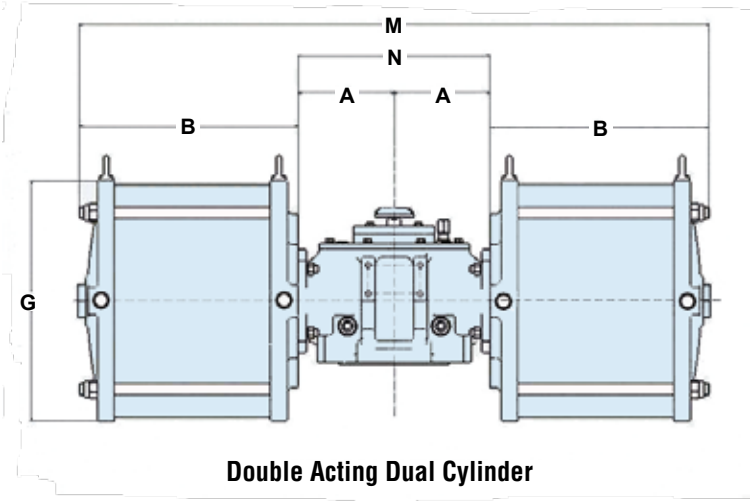



Back view bolt pitch
for accessory mountings




NPT Air Ports

Double Acting Single Cylinder

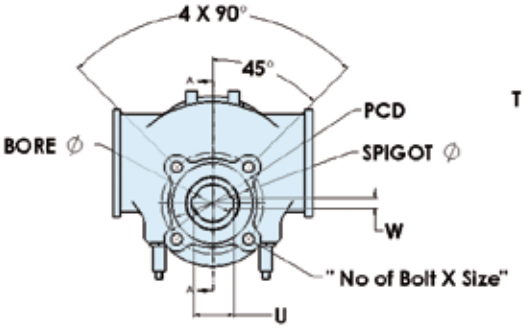



Double Acting Dual Cylinder

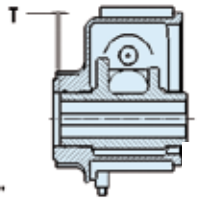
| Actuator Dimensions, mm (inch) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | A | B | C | D | E | F | I | J | K | L | M | N | X | Y | Q | S | P |
| WRG1 | 141 (5.55) | 310 (12.20) | 498 (19.61) | 18,5 (0.73) | 264 (10.39) | 55 (2.17) | 99 (3.90) | 129 (5.08) | 610,5 (24.04) | 1090 (42.91) | 902 (35.51) | 282 (11.10) | 68 (2.68) | 50 (1.97) | 9 (0.35) | 60 (2.36) | 30 (1.18) |
| WRG2 | 162 (6.38) | 368 (14.49) | 586 (23.07) | 20 (0.79) | 322 (12.68) | 65 (2.56) | 116 (4.57) | 144 (5.67) | 712 (28.03) | 1278 (50.31) | 1060 (41.73) | 324 (12.76) | 68 (2.68) | 50 (1.97) | 8 (0.31) | 60 (2.36) | 30 (1.18) |
| WRG3 | 175 (6.98) | 444 (17.48) | 706 (27.80) | 23 (0.91) | 380 (14.96) | 75 (2.95) | 111 (4.37) | 151 (5.94) | 817 (32.17) | 1500 (59.06) | 1238 (48.74) | 350 (13.78) | 95 (3.74) | 50 (1.97) | 15 (0.59) | 110 (4.33) | 45 (1.77) |
| WRG4 | 243 (9.57) | 565 (22.24) | 868 (34.17) | 23 (0.91) | 467 (18.39) | 91 (3.58) | 145 (5.71) | 175 (6.89) | 1074 (42.28) | 1919 (75.55) | 1616 (63.62) | 486 (19.13) | 95 (3.74) | 70 (2.76) | 0 (0.00) | 110 (4.33) | 55 (2.17) |
| WRG5 | 312 (12.28) | 716 (28.19) | 1008 (39.69) | 26 (1.02) | 568 (22.36) | 145 (5.71) | 175,5 (6.91) | 189,5 (7.46) | 1366 (53.78) | 2348 (92.44) | 2056 (80.94) | 624 (24.57) | 95 (3.74) | 70 (2.76) | 15.5 (0.61) | 110 (4.33) | 55 (2.17) |
| WRG6 | 394 (15.51) | 756 (29.76) | 1640 (64.57) | 28 (1.10) | 600 (23.62) | 185 (7.28) | 208 (8.19) | 218 (8.58) | 1572 (61.89) | 3184 (125.35) | 2300 (90.55) | 788 (31.02) | 95 (3.74) | 70 (2.76) | 25.5 (1.00) | 110 (4.33) | 55 (2.17) |
| WRG7 | 500 (19.69) | 810 (31.89) | 2030 (79.92) | 50 (1.97) | 615 (24.21) | 220 (8.66) | 265 (10.43) | 310 (12.20) | 1860 (73.23) | 3840 (151.18) | 2620 (103.18) | 1000 (39.37) | 266 (10.47) | 150 (5.91) | 11.5 (0.45) | 260 (10.24) | 130 (5.12) |
| WRG8 | 665 (26.18) | 860 (33.86) | 2600 (102.36) | 55 (2.17) | 680 (26.77) | 280 (11.02) | 306 (12.05) | 360 (14.17) | 2245 (88.39) | 4790 (188.58) | 3050 (120.08) | 1330 52.36) | 266 (10.47) | 200 (7.87) | 21 (0.83) | 260 (10.24) | 130 (5.12) |

| Cylinder Size | 5" | 6" | 7" | 8" | 9" | 10" | 12" | 14" | 16' | 18" | 20" | 22" | 24" | 28" | 32" | 36" | 40" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 178 (7.01) | 178 (7.01) | 196 (7.72) | 222 (8.74) | 248 (9.76) | 274 (10.79) | 324 (12.76) | 375 (14.76) | 438 (17.24) | 486 (19.13) | 532 (20.94) | 588 (23.15) | 648 (25.51) | 865 (34.06) | 967 (38.07) | 1069 (42.09) | 1170 (46.06) |
| Z | Dimension "Z" upon Request | | | | | | | | | | | | | | | | |
| Port Size NPT | 3/8″ | 3/8″ | 3/8″ | 3/8″ | 3/8″ | 1/2″ | 3/4″ | 3/4″ | 3/4″ | 1″ | 1″ | 1″ | 1″ | 1½″ | 1½″ | 1½″ | 2″ |

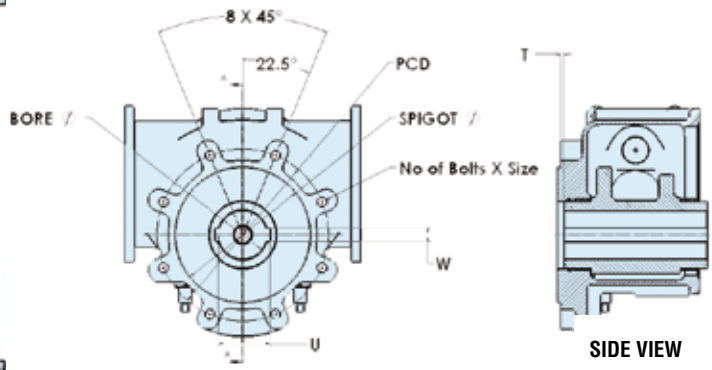
# Dimensions




ISO BASE DETAILS
(RG1, RG2)

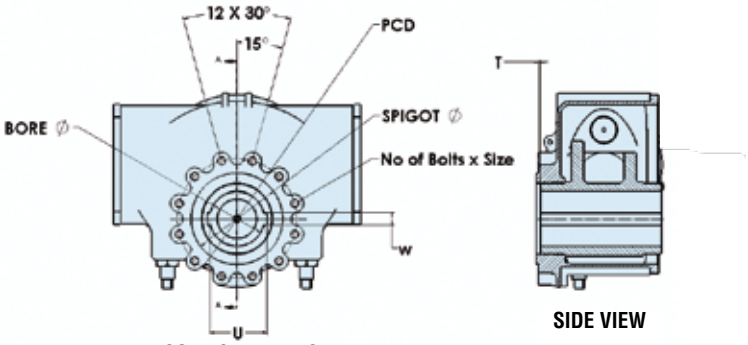



SIDE VIEW



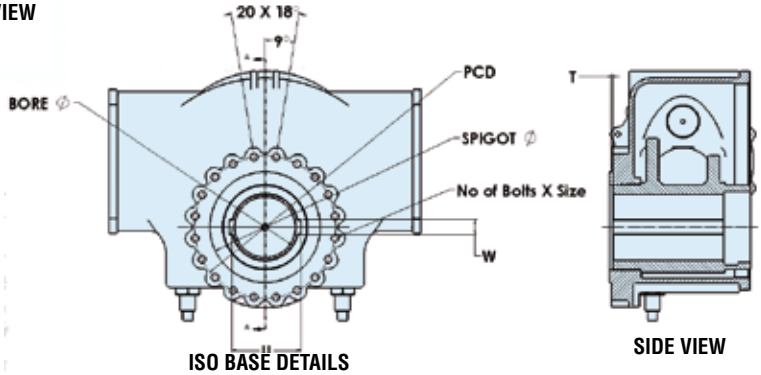

ISO BASE DETAILS
(RG3 TO RG6)

SIDE VIEW




ISO BASE DETAILS
(RG7)

SIDE VIEW

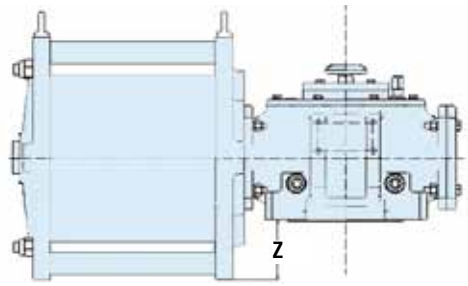



ISO BASE DETAILS
(RG8)

SIDE VIEW

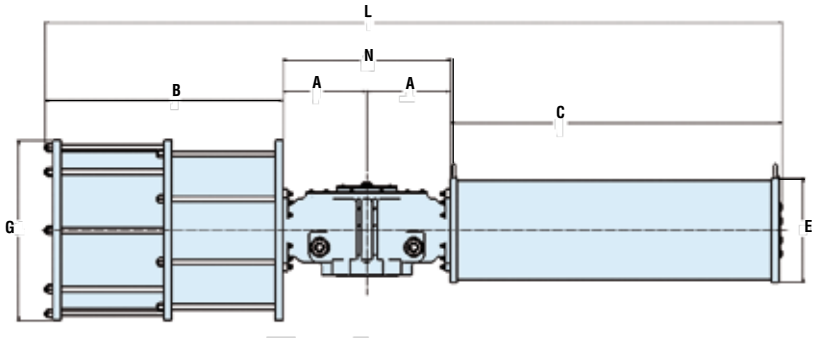
| Mounting Base Details & Dimensions, mm (inch) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | ISO base | SPIGOT Ø | PCD | Bore Ø | Bore Tol | W | W Tol | No of Bolt X Size | T | U | U Tol |
| WRG1 | F14 | 100 (3.94) | 140 (5.51) | 48 (1.89) | H9 | 14 (0.55) | +0.12/+0.05 | 4 X M16 | 5 (0.20) | 51,8 (2.04) | +0.2/+0.0 |
| WRG2 | F16 | 130 (5.12) | 165 (6.50) | 60 (2.36) | H9 | 18 (0.71) | +0.15/+0.07 | 4 X M20 | 5 (0.20) | 64,4 (2.54) | +0.2/+0.0 |
| WRG3 | F25 | 200 (7.87) | 254 (10.0) | 72 (2.83) | H9 | 20 (0.79) | +0.15/+0.07 | 8 X M16 | 5 (0.20) | 76,9 (3.03) | +0.2/+0.0 |
| WRG4 | F30 | 230 (9.06) | 298 (11.73) | 98 (3.86) | H9 | 28 (1.10) | +0.15/+0.07 | 8 X M20 | 5 (0.20) | 104,4 (4.11) | +0.2/+0.0 |
| WRG5 | F35 | 260 (10.24) | 356 (14.02) | 160 (6.30) | H9 | 40 (1.57) | +0.18/+0.08 | 8 X M30 | 5 (0.20) | 169,4 (6.67) | +0.2/+0.0 |
| WRG6 | F40 | 300 (11.81) | 406 (15.98) | 180 (7.09) | H9 | 45 (1.77) | +0.18/+0.08 | 8 X M36 | 8 (0.31) | 190,4 (5.50) | +0.2/+0.0 |
| WRG7 | F48 | 370 (14.57) | 483 (19.02) | 220 (8.66) | H9 | 50 (1.97) | +0.18/+0.08 | 12 X M36 | 8 (0.31) | 231,4 (9.11) | +0.3/+0.0 |
| WRG8 | F60 | 470 (18.50) | 603 (23.74) | 280 (11.02) | H9 | 63 (2.48) | +0.22/+0.10 | 20 X M36 | 8 (0.31) | 292,4 (11.51) | +0.3/+0.0 |

# Dimensions




**Double Acting Single Cylinder**

| Dimension Z, mm (inch) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Series** | **5"** | **6"** | **7"** | **8"** | **9"** | **10"** | **12"** | **14"** | **16'** | **18"** | **20'** | **22"** | **24"** | **28"** | **32"** | **36"** | **40"** |
| **WRG1** | 10 (0.39) | 10 (0.39) | 1 (0.04) | 12 (0.47) | 25 (0.98) | 38 (1.50) | 63 (2.48) | – | – | – | – | – | – | – | – | – | – |
| **WRG2** | – | – | – | 5 (0.20) | 8 (0.31) | 21 (0.83) | 46 (1.81) | 71,5 (2.81) | 103 (4.06) | – | – | – | – | – | – | – | – |
| **WRG3** | – | – | – | – | – | 26 (1.02) | 51 (2.01) | 76,5 (3.01) | 108 (4.25) | 132 (5.20) | 155 (6.10) | – | – | – | – | – | – |
| **WRG4** | – | – | – | – | – | – | – | 42,5 (1.67) | 74 (2.91) | 98 (3,86) | 121 (4.76) | 149 (5.87) | 179 (7.05) | – | – | – | – |
| **WRG5** | – | – | – | – | – | – | – | – | 43,5 (1.71) | 67,5 (2.66) | 90,5 (3.56) | 118,5 (4.67) | 148,5 (5.85) | 257 (10.12) | – | – | – |
| **WRG6** | – | – | – | – | – | – | – | – | – | 35 (1.38) | 58 (2.28) | 86 (3.39) | 116 (4.57) | 224,5 (8.84) | 275,5 (10.85) | 326,5 (12.85) | – |
| **WRG7** | – | – | – | – | – | – | – | – | – | – | – | – | 59 (2.32) | 167,5 (6.59) | 218,5 (8.6) | 269,5 (10.61) | 320 (12.60) |
| **WRG8** | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 177,5 (6.99) | 228,5 (9.00) | 279 (10.98) |



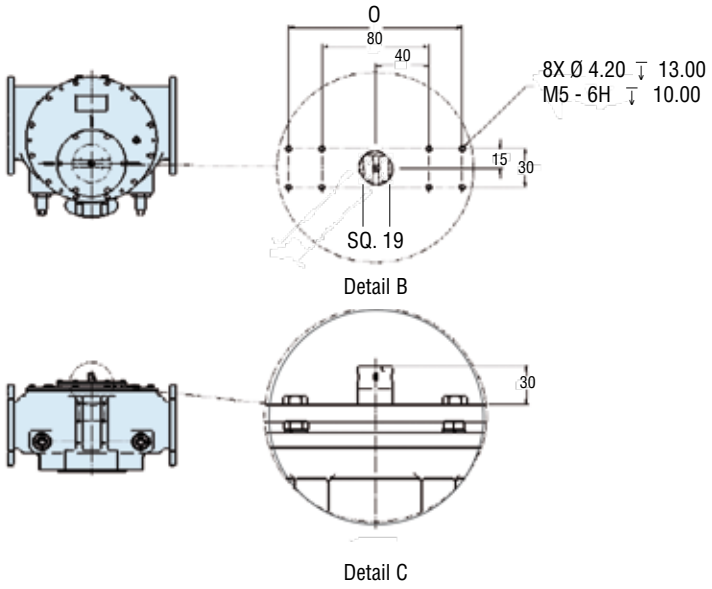

**Double Acting Tandem Cylinder**

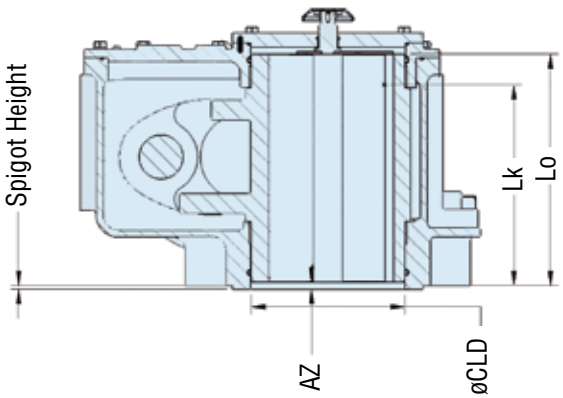
| Dimensions for Spring Return Tandem Cylinders, mm (inch) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Series** | **A** | **B** | **C** | **E** | **G** | **N** | **L** |
| **WRG8 32-32** | 665 (26.18) | 1715 (67.52) | 2600 (102.36) | 680 (26.77) | 1170 (46.06) | 1330 52.36) | 5645 (222.24) |
| **WRG8 36-36** | 665 (26.18) | 1740 (68.50) | 2600 102.36) | 680 (26.77) | 1170 (46.06) | 1330 52.36) | 5670 (223.23) |

# Module Weights

| Module Weights, Lbs (kgs) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Torque Module | Pressure Module | | | | | | | | | | | | | | | | | Spring Module | | | | | | | |
| | | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 28 | 32 | 36 | 40 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| WRG1 | 68 (31) | 31 (14) | 35 (16) | 47 (22) | 53 (24) | 66 (30) | 94 (43) | 139 (63) | – | – | – | – | – | – | – | – | – | – | 88 (40) | 97 (44) | 101 (46) | 103 (47) | 106 (48) | 114 (52) | 119 (54) | 119 (54) |
| WRG2 | 99 (45) | – | – | – | 56 (25) | 69 (32) | 99 (45) | 143 (65) | 209 (95) | 320 (145) | – | – | – | – | – | – | – | – | 128 (58) | 145 (66) | 154 (70) | 158 (72) | 158 (72) | 172 (78) | 180 (82) | 186 (85) |
| WRG3 | 143 (65) | – | – | – | – | – | 100 (45) | 142 (64) | 200 (91) | 318 (145) | 406 (185) | 561 (255) | – | – | – | – | – | – | 226 (103) | 260 (118) | 267 (121) | 269 (122) | 276 (125) | 330 (150) | 321 (146) | – |
| WRG4 | 295 (134) | – | – | – | – | – | – | – | 217 (99) | 339 (154) | 427 (194) | 586 (266) | 741 (337) | 942 (428) | – | – | – | – | 402 (183) | 442 (201) | 462 (210) | 477 (217) | 510 (232) | 545 (248) | 565 (257) | 581 (254) |
| WRG5 | 510 (231) | – | – | – | – | – | – | – | – | 356 (162) | 455 (207) | 610 (277) | 853 (388) | 994 (452) | 1634 (743) | – | – | – | 639 (290) | 737 (335) | 770 (350) | 783 (356) | 901 (410) | 955 (434) | – | – |
| WRG6 | 933 (423) | – | – | – | – | – | – | – | – | – | 493 (224) | 616 (280) | 861 (391) | 1051 (478) | 1732 (787) | 2321 (1055) | 3044 (1384) | – | 1283 (583) | 1738 (790) | 1671 (760) | 1730 (787) | 2061 (937) | 1995 (907) | – | – |
| WRG7 | 1881 (853) | – | – | – | – | – | – | – | – | – | – | – | – | – | 1824 (829) | 2411 (1096) | 3156 (1435) | 3913 (1779) | 2283 (1038) | 2946 (1339) | 3043 (1383) | 3177 (1444) | 3630 (1650) | 3709 (1686) | – | – |
| WRG8 | 3718 (1686) | – | – | – | – | – | – | – | – | – | – | – | – | – | 2165 (984) | 2819 (1282) | 3372 (1533) | 4159 (1891 | 4627 (2103) | 5800 (2637) | 6113 (2779) | 6227 (2830) | 7111 (3232) | 7423 (3374) | – | – |

# NAMUR shaft height and bracket mounting details



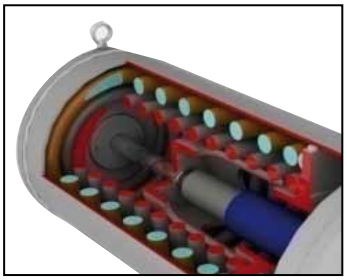




| Series | O | H | V | Lk (mm) | Lo (mm) | Spigot height | øCLD | AZ | Key Size | AY | AW X Bolt Size |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WRG1 | - | M10 | 14 | 165 | 180 | 4 | 70 | 9 | 14 x 9 | 95 | 4 x M6 |
| WRG2 | - | M10 | 14 | 195 | 210 | 5 | 85 | 10 | 18 x 11 | 110 | 4 x M6 |
| WRG3 | - | M12 | 14 | 200 | 215 | 5 | 100 | 10 | 20 x 12 | 125 | 4 x M6 |
| WRG4 | 130 | M12 | 14 | 255 | 270 | 5 | 135 | 10 | 28 x 16 | 160 | 4 x M6 |
| WRG5 | 130 | M12 | 20 | 300 | 315 | 5 | 210 | 10 | 40 x 22 | 240 | 6 x M10 |
| WRG6 | 130 | M12 | 20 | 350 | 375 | 8 | 240 | 16 | 45 x 25 | 270 | 6 x M10 |
| WRG7 | 130 | M16 | 20 | 500 | 515 | 8 | 286 | 16 | 50 x 28 | 326 | 8 x M10 |
| WRG8 | 130 | M16 | 20 | 585 | 610 | 8 | 361 | 16 | 63 x 32 | 400 | 9 x M12 |

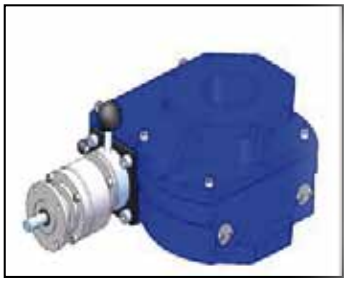
# Manual Override Options

Jackscrew

Hydraulic



Sandwich Gear



Bevel Gear

| Model | ISO Mounting | Torque | | DA | | | | SR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N-m | in-lb | Jackscrew | | Sandwich Declutchable Gear | Hydraulic | Jackscrew | | Sandwich Declutchable Gear | Hydraulic |
| | | | | Direct Operation | Bevel Gear | | | Direct Operator | Bevel Gear | | |
| WRG1 | F14 | 2000 | 17702 | ✓ | – | ✓ | – | ✓ | – | ✓ | – |
| WRG2 | F16 | 4000 | 35404 | ✓ | – | ✓ | – | ✓ | – | ✓ | – |
| WRG3 | F25 | 8000 | 70808 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| WRG4 | F30 | 16000 | 141616 | – | ✓ | ✓ | ✓ | – | ✓ | ✓ | ✓ |
| WRG5 | F35 | 32000 | 283232 | – | ✓ | ✓ | ✓ | – | ✓ | ✓ | ✓ |
| WRG6 | F40 | 63000 | 557613 | – | – | – | ✓ | – | – | – | ✓ |
| WRG7 | F48 | 125000 | 1106375 | – | – | – | ✓ | – | – | – | ✓ |
| WRG8 | F60 | 250000 | 2212750 | – | – | – | ✓ | – | – | – | ✓ |

## Product Specification

- Actuator shall be designed in accordance with EN15714-3 to define minimum cycle life performance and designed for on-off and modulating service.
- Actuator output shall meet ISO rated torque compliance to provide safe mounting interface and comply with ISO 5211/MSS SP-101 mounting standards and NAMUR VDI/VDE standards for accessory mounting.
- Actuator shall have a symmetrical torque module to simplify field service and interchangeability of spring and air modules. Manual overrides and mounting is consistent for both spring and torque module to simplify mounting.
- The actuator torque module shall utilize an interchangeable yoke system to allow simple field conversion of symmetrical and canted yokes.
- The spring module shall use a pull-to-compress motion with single or concentric-nested springs that are internally supported and guided and weld secured for safety.
- The spring module shall be designed for minimum length and weight to improve the center of gravity, reduce material stress and assembly support requirements.
- The actuator shall have hard chrome plated cylinder walls to provide superior corrosion and wear resistance.
- The actuator piston sealing should use advanced Quad Seal technology to provide enhanced cycle life compared to conventional O-Rings.
- The internal support guide rods, spring rods and piston rods shall be hard chrome plated for superior corrosion and wear resistance.
- The pneumatic cylinder shall use external retention rods to provide visual confirmation and inspection of rod integrity for increased safety.

## Agency & Environmental Approvals

- IP67M (1 meter depth for 30 minutes)
- IEC 61508 SIL 3 Suitable
- ATEX Certified

**Standard Paint Specification**

The standard external surface treatment consists of a 2 pack primer and 2 pack epoxy coating. This international marine coating is suitable for chemical, coastal and offshore environments providing superior corrosion resistance.

**Primer Coat:** Akzo Nobel Intergard 251, anticorrosive zinc phosphate epoxy primer, 75 microns DFT, color: KGA902-Red.
**Top Coat:** Akzo Nobel Intergard 740 epoxy finish, 2 mills DFT
**Finished Color:** ECK724 – Storm Grey, High Gloss

# Actuator Model Designation

| How to Order | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Series** | **Body Size** | **Cylinder Size** | **Action** | **Spring Module** | **Torque Pattern (Yoke)** | **Sealing/Temp** | **Manual Override** | **Material/ Coatings** | **Options** |
| WRG | **1** | 05 06 07 08 09 10 12 | **DA-** Double Acting Single Cylinder | **0** | **S-** Symmetrical | **N-** Nitrile, -20˚ F to 180˚ F | **0-** None | **GE-** Grey Epoxy (std) | **00-** None |
| | **2** | 08 09 10 12 14 16 | **DD-** Double Acting Dual Cylinder | **1** | **C-** Canted | | **G-** Sandwich Declutch Gbox | **PO-** Primer Only | **TC-** Ext. Stopper -CW |
| | **3** | 10 12 14 16 18 20 | **SR-** Spring Return Fail CW | **2** | | **H-** High Temp (Viton), 0˚ F to 300˚ F | **J-** Jackscrew | **WE-** White Epoxy | **TO-** Ext. Stopper -CCW |
| | **4** | 14 16 18 20 22 24 | **SO-** Spring Return Fail CCW | **3** | | | **D-** Bevel Gear Jackscrew | **SP-** Specials | **TB-** Ext. Stopper -Both Dir |
| | **5** | 16 18 20 22 24 28 | | **4** | | **L-** Low Temp, (material) -55˚ F to 180˚F | **H-** Hydraulic | | **S xxx-** Specials code |
| | **6** | 18 20 22 24 28 32 36 | | **5** | | | | | |
| | **7** | 24 28 32 36 40 | | **6** | | | | | |
| | **8** | 28 32 36 40 | | **7** | | | | | |
| | | | | **8** | | | | | |
| | | | | | | | | | |
| **Model Code Example:** | | | | | | | | | |
| **WRG** | **5** | **22** | **SR** | **6** | **C** | **N** | **D** | **GE** | **TC** |

# Maximum Cylinder Size

| Body Size | Maximum Cylinder Size | | |
|---|---|---|---|
| | DA | DD | SR/SO |
| 1 | 9 | 8 | 12 |
| 2 | 12 | 10 | 16 |
| 3 | 16 | 14 | 20 |
| 4 | 20 | 16 | 24 |
| 5 | 22 | 20 | 28 |
| 6 | 28 | 24 | 36 |
| 7 | 36 | 32 | 40 |
| 8 | 40 | 40 | 40 |



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