CRANE®

brands you trust.

# CRANE® - Automation
# Actuators and Instrumentation

CRANE®
Energy Flow Solutions

www.craneenergy.com

CRANE

# Automation Capabilities Overview

CRANE Energy Flow Solutions® provides a variety of valve automation products, including pneumatic and electric actuators, and gives you a single source for automated valve packages. Our team of actuation experts can help you solve your valve and actuation adjustment and control needs.

## Actuators

CRANE Air

**CRANE® Air - Pneumatic**

- Rack and Pinion
- Size Range: ¼" - 24"
- Torque: 30 in-lb to 107,531 in-lb
- Spring Return (CW, CCW)
- Double Acting
- Direct Mount 2" - 14"
- Bracket Mount
- Special Configurations
  - · Rotation 90° to 270°
  - · Stainless Steel and other specialty coatings

CRANE Air

**CRANE® Air - Scotch Yoke**

- Size Range: 16" - 48"
- Double Acting
- Spring Return
- Output Torque: Double Acting: 612 – 184,400 foot-pounds
  Spring Return: 230 – 53,000 foot-pounds

revo

**Revo® - Pneumatic**

- Rack and Pinion
- Size Range: ¼" - 48"
- Torque: 30 in-lb to 107,531 in-lb
- Spring Return (CW, CCW)
- Double Acting
- Direct Mount to RS Valve
- Bracket Mount
- Special Configurations

CRANE

**Electric**

**CRANE® - Electric**

- Size Range: ¼" - 24"
- Torque: 347 in-lb to 17,359 in-lb
- Temperature: -13°F to +131°F (-25°C to +55°C)
- AC Voltage: 24,120 or 240 1 phase
- DC Voltage: 12 or 24
- Certifications: CSA-NRTL/C
- Direct Mount to Center Line® Valves
- Special Configurations
- On-off or Modulating Service

**Custom Capabilities**

- Mounting Hardware*
- Stem Extension*
- 3-Way Assemble

* Only available with either CRANE® supplied valve and or actuator.

## Instrumentation

**Limit Switches**

- Economy, Conventional and Explosion Proof

**Positioners**

- Pneumatic, Electric Versions Available
- Explosion Proof

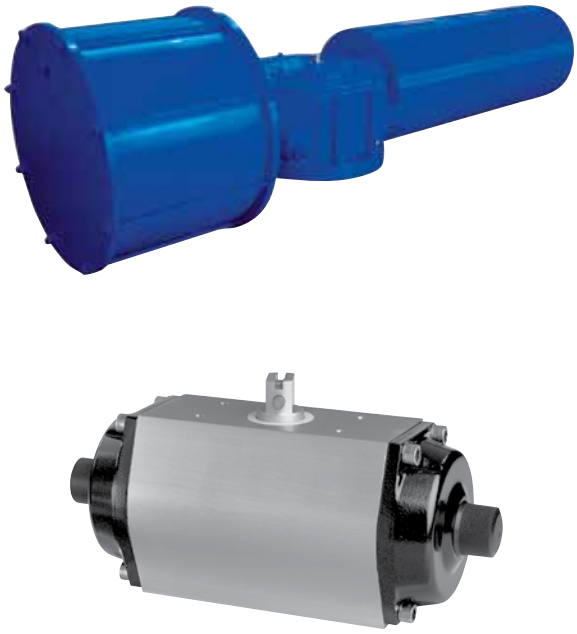
**Solenoids**

- 3 and 4-way Configurations
- NEMA, UL, FM and Explosion Proof

**Special Applications**

- Speed Controls
- Emergency Shut Down
- Manual Overrides
- Complete Assemblies Mounted and Tested

# Pneumatic Actuators Overview



## Rack & Pinion and Scotch Yoke

Downtime means lost profits, so reliable automation is a key to maintaining optimum performance. CRANE®'s pneumatic actuators offer a number of features to assure reliable operation including a patented three-point guiding system and high precision machining for exceptionally close tolerances. These actuators can mount directly to Center Line® valves, eliminating the added cost of a separate bracket and mounting kit.

### Features

❶ Aluminum alloy construction provides superior corrosion resistance and durability
❷ Available in single and double-acting models
❸ Precision machining for tight tolerances to minimize gear backlash
❹ Standard NAMUR accessory interfaces
❺ ISO 5211 mounting flange
❻ Twelve sizes available with torques ranging from 30 in-lb to 107,531 in-lb (12 Nm to 4000 Nm)

### Specifications

**Pressure**: 40 psi to 120 psi (2.75 bar to 8.27 bar)
**Temperature:** -4°F to 176°F (-20°C to +80°C)
**Materials:** Housing – aluminum alloy, Shaft – hard anodized aluminum alloy
**Finish:** Two-component polyurethane
**Lifespan Standards:** Minimum of 500,000 cycles
**Quality Assurance:** DIN ISO 9001/EN 29001
**Mounting Flange:** ISO 5211
**Drive Connection:** ISO 5211 (DIN 3337 optional)
**Solenoid Connection:** VDI/VDE 3845 (NAMUR)
**Positioner, Limit Switch Connections:** VDI/VDE, 3845 (NAMUR)

### Instrumentation Options

Solenoids
Limit Switches
Positioners
Special Applications

# CRANE® Air Rack and Pinion Pneumatic Actuator Features

**Compact Design**
The CRANE® Air rack and pinion pneumatic actuator produces linear torque output in a compact design utilizing the same body and end caps for double acting and spring return units.

**Namur Mounting**
Namur VDI/VDE 3845 and ISO 5211 dimensions on all sizes. No special blocks are required to mount solenoid valves, limit switches or positioners.

**Degree of Travel**
The standard angle of rotation is 90°. Additional travel rotations of 120°, 135°, 150° and 180° are available. For sizes from CA02 and larger, CRANE® Air features dual travel stops that provide ± 10° stroke registration on both the opening and closing phases of the actuator stroke. 110° of travel in a standard 90° actuator.

**Flexible Output Shafts**
The female pinion drive is standard with a double-D drive, keyed drive and other designs are available upon request.

**High Cycle Bearings**
Shaft bearings isolate the pinion gear from the housing and support the shaft for high cycle applications. Many competitive manufacturers do not provide this critical feature.

**Rugged Tooth Design**
The pinion teeth are engaged the full length and stroke of the piston. The pinion height allows manual override without disturbing the indicated positions.

**High Visibility Position Indication**
External open/close indicator as standard, available for all the rotations.

**High Cycle Life Wear Pads**
Pistons incorporate double wear pads to separate the rack from the actuator wall and serve as both guide and wear bearings.

**Pre-Loaded Spring Cartridges**
Epoxy coated special steel springs are pre-loaded with non-metallic meterials. The stainless steel end cap fasteners are extra long to allow for spring relaxation. All parts are corrosion resistant.

**Alternative Operating Media**
Air pressure operation from 40 - 100 PSI. Water, nitrogen and compatible hydraulic fluids may also be used to power the actuator.

**Stainless Steel Fasteners**
All external fasteners are corrosion resistant stainless steel.

**Honed Bore for High Cycle Life**
Extruded aluminum body is internally machined and lapped to extract specifications. Honing prevents dry spots from forming within the actuator bore and therefore eliminates premature seal failure - a critical aspect to long cycle life. All internal and extenal surfaces are hard anodized for corrosion resistance, with all units permanently lubricated at the factory with non-silicone grease.

**Traceability**
All units are externally stamped with a progressive traceable serial number

**Quality Assurance**
100% of all units are factory pressure and leak tested, and individually boxed for shipment.

**Warranty**
CRANE® Air products are covered by our unlimited cycle life warranty. Contact your representative for more details.

**Accessories**
CRANE® Air offers a wide range of adapters for many different types of valves, including butterfly, ball and plug valves. Please contact CRANE® for more details.

# CRANE® Air Spring Return Torque Values

## CA01 to CA08

### Spring Return Torque Table Summary (in/lbs)

| | | Pos. 1 Closing Torque (Spring) | | Pos. 2 - Opening Torque | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 40 PSIG | | 60 PSIG | | 80 PSIG | | 100 PSIG | | 120 PSIG | |
| | # Springs | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End |
| CA01 | 1+1 | 33 | 22 | 40 | 29 | 72 | 61 | 103 | 92 | 134 | 123 | 165 | 154 |
| | 2+2 | 66 | 44 | -- | -- | 50 | 28 | 81 | 59 | 112 | 90 | 143 | 121 |
| | 3+3 | 99 | 66 | -- | -- | -- | -- | 58 | 27 | 90 | 66 | 121 | 88 |
| CA02 | 2+2 | 75 | 53 | 84 | 62 | 153 | 131 | 222 | 200 | 291 | 269 | 359 | 337 |
| | 3+3 | 112 | 81 | 56 | 25 | 125 | 94 | 194 | 163 | 263 | 232 | 331 | 300 |
| | 4+4 | 150 | 107 | -- | -- | 99 | 56 | 168 | 125 | 237 | 194 | 305 | 262 |
| | 5+5 | 187 | 134 | -- | -- | 72 | 19 | 141 | 88 | 210 | 157 | 278 | 225 |
| | 7+5 | 224 | 160 | -- | -- | -- | -- | 115 | 51 | 184 | 120 | 252 | 188 |
| CA03 | 2+2 | 93 | 64 | 116 | 87 | 206 | 177 | 296 | 267 | 386 | 357 | 476 | 447 |
| | 3+3 | 139 | 96 | 84 | 41 | 174 | 131 | 264 | 221 | 354 | 311 | 444 | 401 |
| | 4+4 | 185 | 128 | -- | -- | 142 | 85 | 232 | 175 | 322 | 265 | 412 | 355 |
| | 5+5 | 232 | 160 | -- | -- | 110 | 38 | 200 | 128 | 290 | 218 | 380 | 308 |
| | 7+5 | 278 | 192 | -- | -- | -- | -- | 168 | 82 | 258 | 172 | 349 | 262 |
| CA04 | 2+2 | 122 | 92 | 158 | 128 | 283 | 253 | 408 | 378 | 533 | 503 | 358 | 628 |
| | 3+3 | 184 | 138 | 112 | 66 | 237 | 191 | 362 | 316 | 487 | 441 | 612 | 566 |
| | 4+4 | 245 | 184 | 66 | 5 | 191 | 130 | 316 | 255 | 441 | 380 | 566 | 505 |
| | 5+5 | 307 | 230 | -- | -- | 145 | 68 | 270 | 193 | 395 | 318 | 520 | 443 |
| | 7+5 | 369 | 278 | -- | -- | 97 | 6 | 222 | 131 | 347 | 256 | 472 | 381 |
| CA05 | 2+2 | 196 | 124 | 251 | 179 | 438 | 366 | 626 | 554 | 813 | 741 | 1001 | 929 |
| | 3+3 | 294 | 185 | 190 | 81 | 377 | 268 | 565 | 456 | 752 | 643 | 940 | 831 |
| | 4+4 | 392 | 247 | -- | -- | 315 | 170 | 503 | 358 | 690 | 545 | 878 | 733 |
| | 5+5 | 490 | 309 | -- | -- | 253 | 72 | 441 | 260 | 628 | 447 | 816 | 635 |
| | 7+5 | 588 | 372 | -- | -- | -- | -- | 378 | 162 | 565 | 349 | 753 | 537 |
| CA06 | 2+2 | 251 | 187 | 313 | 249 | 563 | 499 | 813 | 749 | 1063 | 999 | 1313 | 1249 |
| | 3+3 | 376 | 280 | 220 | 124 | 470 | 374 | 720 | 624 | 970 | 874 | 1220 | 1124 |
| | 4+4 | 502 | 374 | -- | -- | 376 | 248 | 626 | 498 | 876 | 748 | 1126 | 998 |
| | 5+5 | 627 | 467 | -- | -- | 283 | 123 | 533 | 373 | 783 | 623 | 1033 | 873 |
| | 7+5 | 753 | 560 | -- | -- | -- | -- | 440 | 247 | 690 | 497 | 940 | 747 |
| CA07 | 2+2 | 412 | 306 | 494 | 388 | 894 | 788 | 1294 | 1188 | 1694 | 1588 | 2094 | 1988 |
| | 3+3 | 617 | 461 | 339 | 183 | 739 | 583 | 1139 | 983 | 1539 | 1383 | 1939 | 1783 |
| | 4+4 | 824 | 614 | -- | -- | 586 | 376 | 986 | 776 | 1396 | 1176 | 1786 | 1576 |
| | 5+5 | 1029 | 767 | -- | -- | 433 | 171 | 833 | 571 | 1233 | 971 | 1633 | 1371 |
| | 7+5 | 1236 | 921 | -- | -- | -- | -- | 679 | 364 | 1079 | 764 | 1479 | 1164 |
| CA08 | 2+2 | 505 | 371 | 629 | 495 | 1129 | 995 | 1629 | 1495 | 2129 | 1195 | 2629 | 2495 |
| | 3+3 | 757 | 556 | 444 | 243 | 944 | 743 | 1444 | 1243 | 1944 | 1743 | 2444 | 2243 |
| | 4+4 | 1011 | 741 | -- | -- | 759 | 489 | 1259 | 989 | 1759 | 1489 | 2259 | 1989 |
| | 5+5 | 1263 | 929 | -- | -- | 572 | 237 | 1072 | 737 | 1572 | 1237 | 2072 | 1737 |
| | 7+5 | 1516 | 1113 | -- | -- | -- | -- | 887 | 484 | 1387 | 984 | 1887 | 1484 |

For torque table help see page 7.

CRANE®

# CRANE® Air Spring Return Torque Values

## CA09 to CA15

### Spring Return Torque Table Summary (in/lbs)

| | | Pos. 1 - Closing Torque (Spring) | | Pos. 2 - Opening Torque | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 40 PSIG | | 60 PSIG | | 80 PSIG | | 100 PSIG | | 120 PSIG | |
| | # Springs | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End |
| CA09 | 2+2 | 890 | 560 | 1002 | 672 | 1784 | 1454 | 2565 | 2235 | 3346 | 3016 | 4127 | 3797 |
| | 3+3 | 1334 | 840 | 722 | 228 | 1504 | 1010 | 2285 | 1791 | 3066 | 2572 | 3847 | 3353 |
| | 4+4 | 1779 | 1120 | -- | -- | 1224 | 565 | 2005 | 1346 | 2786 | 2127 | 3567 | 2908 |
| | 5+5 | 2224 | 1399 | -- | -- | 945 | 120 | 1726 | 901 | 2507 | 1682 | 3288 | 2463 |
| | 7+5 | 2669 | 1679 | -- | -- | -- | -- | 1446 | 456 | 2227 | 1237 | 3008 | 2018 |
| CA10 | 2+2 | 1101 | 869 | 1381 | 1149 | 2506 | 2274 | 3631 | 3399 | 4756 | 4524 | 5881 | 5649 |
| | 3+3 | 1652 | 1304 | 946 | 598 | 2071 | 1723 | 3196 | 2848 | 4321 | 3973 | 5446 | 5098 |
| | 4+4 | 2203 | 1738 | 512 | 47 | 1637 | 1172 | 2762 | 2297 | 3887 | 3422 | 5012 | 4547 |
| | 5+5 | 2754 | 2173 | -- | -- | 1202 | 621 | 2327 | 1749 | 3452 | 2871 | 4577 | 3996 |
| | 7+5 | 3303 | 2607 | -- | -- | 768 | 72 | 1893 | 1197 | 3018 | 2322 | 4143 | 3447 |
| CA11 | 2+2 | 1487 | 1055 | 1945 | 1513 | 3445 | 3013 | 4945 | 4513 | 6445 | 6013 | 7945 | 7513 |
| | 3+3 | 2231 | 1583 | 1417 | 769 | 2917 | 2269 | 4417 | 3769 | 5917 | 5296 | 7417 | 6769 |
| | 4+4 | 2974 | 2111 | 889 | 26 | 2389 | 1526 | 3889 | 3026 | 5389 | 4526 | 6889 | 6026 |
| | 5+5 | 3718 | 2638 | -- | -- | 1862 | 782 | 3362 | 2282 | 4862 | 3782 | 6362 | 5282 |
| | 7+5 | 4462 | 3166 | -- | -- | 1334 | 38 | 2834 | 1538 | 4334 | 3038 | 5834 | 4538 |
| CA12 | 2+2 | 2146 | 1711 | 2839 | 2404 | 5114 | 4679 | 7389 | 6954 | 9664 | 9229 | 11929 | 11504 |
| | 3+3 | 3220 | 2566 | 1984 | 1330 | 4259 | 3605 | 6534 | 5880 | 8809 | 8155 | 11084 | 10430 |
| | 4+4 | 4293 | 3422 | 1128 | 257 | 3403 | 2532 | 5678 | 4807 | 7953 | 7082 | 10228 | 9657 |
| | 5+5 | 5366 | 4277 | -- | -- | 2548 | 1459 | 4823 | 3734 | 7098 | 6009 | 9373 | 8284 |
| | 7+5 | 6438 | 5133 | -- | -- | 1692 | 387 | 3967 | 2662 | 6242 | 4937 | 8517 | 7212 |
| CA13 | 2+2 | 2810 | 2084 | 3916 | 3190 | 6916 | 6190 | 9916 | 9190 | 12916 | 12190 | 15916 | 15190 |
| | 3+3 | 4215 | 3126 | 2874 | 1785 | 5874 | 4785 | 8874 | 7785 | 11874 | 10785 | 14874 | 13785 |
| | 4+4 | 5619 | 4269 | 1831 | 381 | 4831 | 3381 | 7831 | 6381 | 10831 | 9381 | 13831 | 12381 |
| | 5+5 | 7024 | 5211 | -- | -- | 3789 | 1976 | 6789 | 4976 | 9789 | 7976 | 12789 | 10976 |
| | 7+5 | 8430 | 6252 | -- | -- | -- | -- | 5748 | 3570 | 8748 | 6570 | 11748 | 9570 |
| CA14 | 1+1 | 2123 | 1534 | 10216 | 9627 | 16091 | 15502 | 21966 | 21377 | 27841 | 27252 | 33716 | 33127 |
| | 2+2 | 4247 | 3068 | 8682 | 7503 | 14557 | 13378 | 20432 | 19253 | 26307 | 25128 | 32182 | 31003 |
| | 3+3 | 6370 | 4602 | 7148 | 5380 | 13023 | 11255 | 18898 | 17130 | 27773 | 23005 | 30648 | 28880 |
| | 4+4 | 8493 | 6136 | 5614 | 3257 | 11489 | 9132 | 17364 | 15007 | 23239 | 20882 | 29114 | 26757 |
| | 5+5 | 10617 | 7670 | -- | -- | 9955 | 7008 | 15830 | 12883 | 21705 | 18758 | 27580 | 24633 |
| | 6+6 | 12740 | 9204 | -- | -- | 8421 | 4885 | 14296 | 10760 | 20171 | 16635 | 26046 | 22510 |
| | 7+7 | 14863 | 10737 | -- | -- | -- | -- | 12763 | 8637 | 18638 | 14512 | 24513 | 20387 |
| | 8+8 | 16987 | 12271 | -- | -- | -- | -- | 11229 | 6513 | 17104 | 12388 | 22979 | 18263 |
| CA15 | 1+1 | 2843 | 1784 | 13966 | 12907 | 21841 | 20782 | 29716 | 28657 | 37591 | 36532 | 45466 | 44407 |
| | 2+2 | 5686 | 3569 | 12181 | 10064 | 20056 | 17939 | 27931 | 25814 | 35806 | 33689 | 43681 | 41564 |
| | 3+3 | 8530 | 5353 | 10397 | 7220 | 18272 | 15095 | 26147 | 22970 | 34022 | 30845 | 41897 | 38720 |
| | 4+4 | 11373 | 7137 | 8613 | 4377 | 16488 | 12252 | 24363 | 20127 | 32238 | 28002 | 40113 | 35877 |
| | 5+5 | 14216 | 8922 | -- | -- | 14703 | 9409 | 22578 | 17284 | 30453 | 25159 | 38328 | 33034 |
| | 6+6 | 17059 | 10706 | -- | -- | 12919 | 6566 | 20794 | 14441 | 28669 | 22316 | 36544 | 30191 |
| | 7+7 | 19902 | 12490 | -- | -- | -- | -- | 19010 | 11598 | 26885 | 19473 | 34760 | 27384 |
| | 8+8 | 22746 | 14275 | -- | -- | -- | -- | 17225 | 8754 | 25100 | 16629 | 32975 | 24504 |

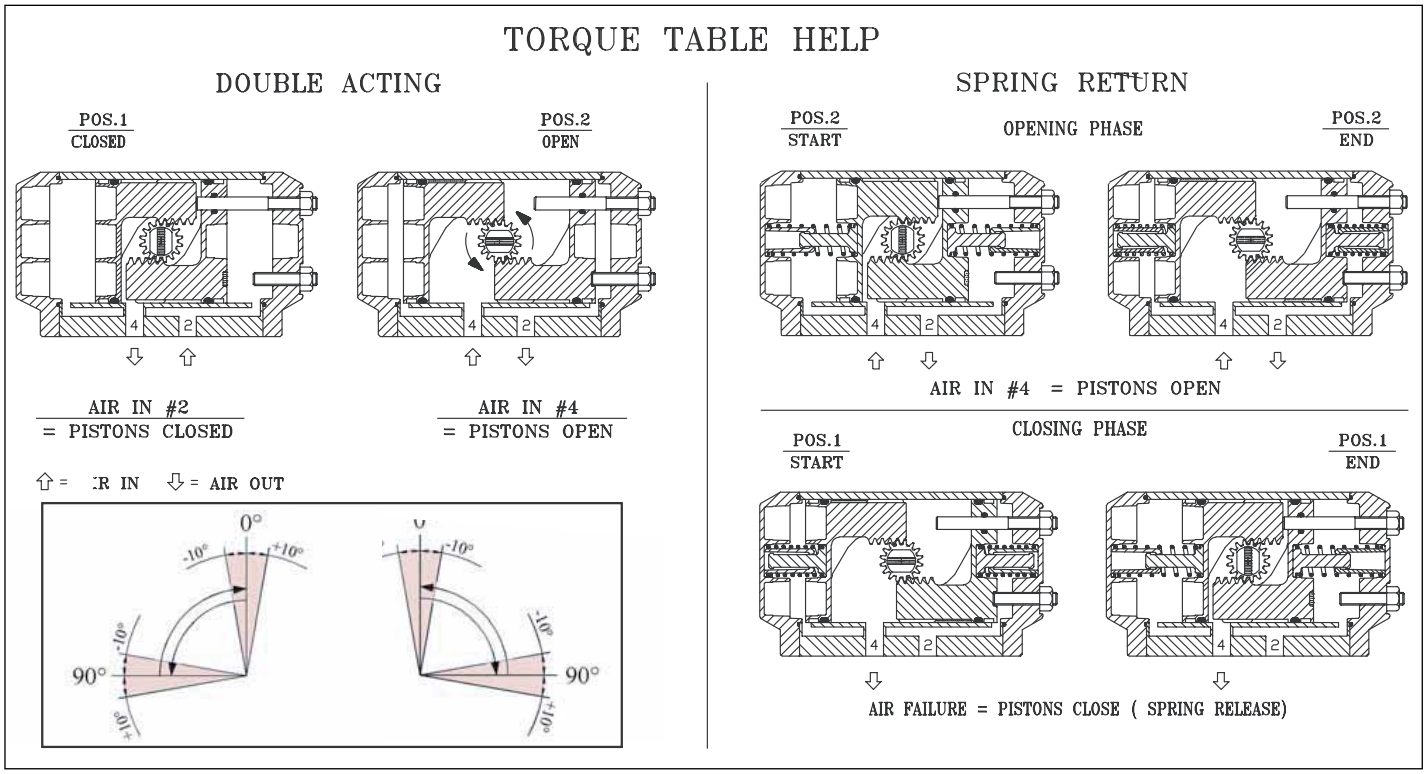
For torque table help see page 7.

# CRANE® Air Double Acting Torque Values

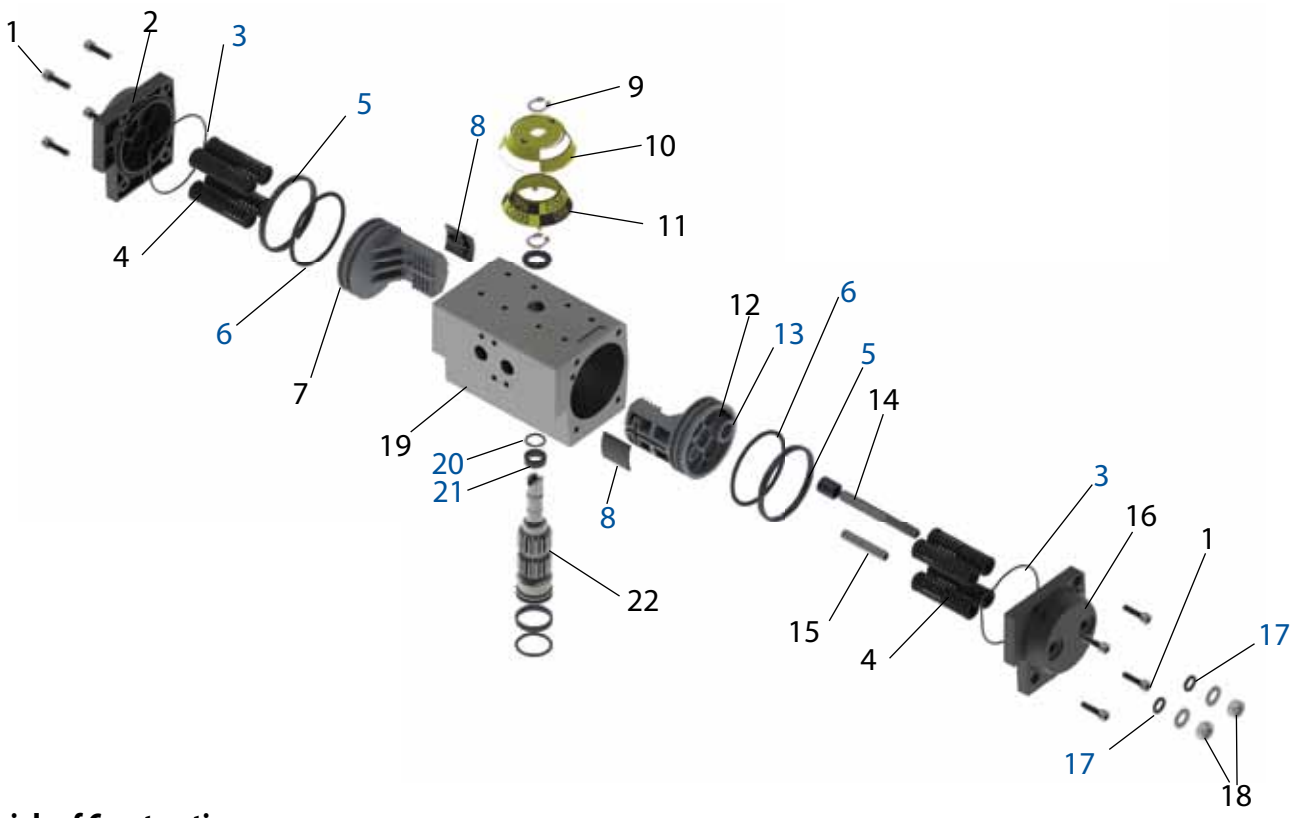
## CA01 to CA15

### Double Acting Torque Table Summary (in/lbs)

| TYPE | 40 PSIG | 60 PSIG | 80 PSIG | 100 PSIG | 120 PSIG |
|---|---|---|---|---|---|
| CA01 | 62 | 94 | 125 | 156 | 187 |
| CA02 | 137 | 206 | 275 | 344 | 412 |
| CA03 | 180 | 270 | 360 | 450 | 540 |
| CA04 | 250 | 375 | 500 | 625 | 750 |
| CA05 | 375 | 562 | 750 | 937 | 1125 |
| CA06 | 500 | 750 | 1000 | 1250 | 1500 |
| CA07 | 800 | 1200 | 1600 | 2000 | 2400 |
| CA08 | 1000 | 1500 | 2000 | 2500 | 3000 |
| CA09 | 1562 | 2344 | 3125 | 3906 | 4687 |
| CA10 | 2250 | 3375 | 4500 | 5625 | 6750 |
| CA11 | 3000 | 4500 | 6000 | 7500 | 9000 |
| CA12 | 4550 | 6825 | 9100 | 11375 | 13650 |
| CA13 | 6000 | 9000 | 12000 | 15000 | 18000 |
| CA14 | 11750 | 17625 | 23500 | 29375 | 35250 |
| CA15 | 15750 | 23625 | 31500 | 39375 | 47250 |



# CRANE® Air Materials of Construction



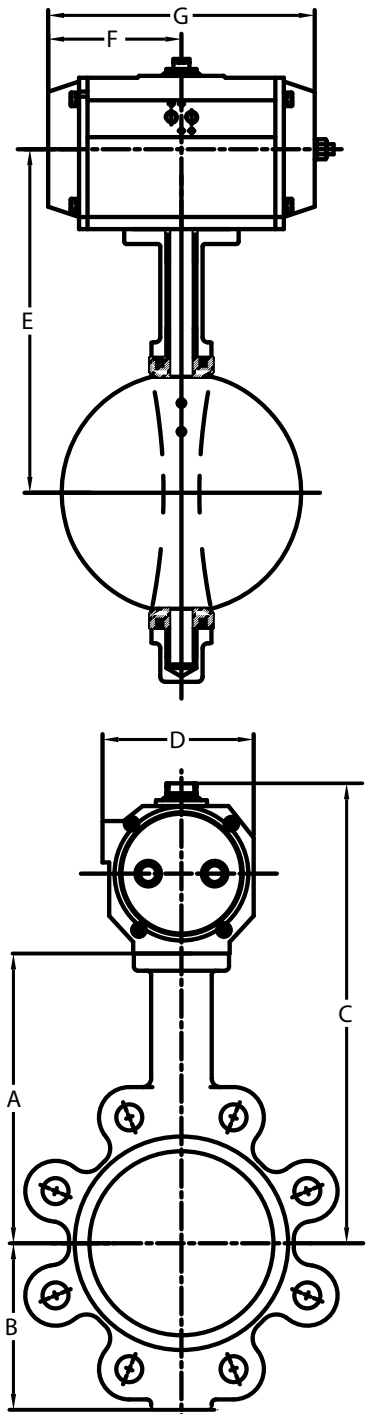

## Materials of Construction

| ITEM | DESCRIPTION | MATERIALS |
|---|---|---|
| 1 | End Cap Screw | AISI 303 Stainless Steel |
| 2 | Left End Cap | * |
| 3 | End Cap O-Ring | BUNA-N |
| 4 | Spring Cartridge | Spring Steel Epoxy Coated |
| 5 | Piston O-Ring | BUNA-N |
| 6 | Guide Ring | Techno-Polymer |
| 7 | Left Piston | * |
| 8 | Piston Thrust Block | Techno-Polymer |
| 9 | Indicator Snap Ring | AISI 304 Stainless Steel |
| 10 | Indicator (Rotating Part) | Techno-Polymer |
| 11 | Indicator (Fix Part) | Techno-Polymer |
| 12 | Right Piston | * |

| ITEM | DESCRIPTION | MATERIALS |
|---|---|---|
| 13 | Stop Bolt O-Ring | BUNA-N |
| **14** | Internal Reg. Screw | AISI 304 Stainless Steel |
| **15** | Stop Bold | AISI 304 Stainless Steel |
| **16** | Right End Cap | Die Cast Aluminum |
| **17** | Washer | AISI 304 Stainless Steel |
| **18** | Stop Bolt Nut | AISI 304 Stainless Steel |
| **19** | Actuator Body | Extruded Aluminum ASTM B210 (6063) |
| **20** | Upper Pinion O-Ring | BUNA-N |
| **21** | Upper Pinion Bearing | Techno-Polymer |
| **22** | Pinion | ASTM A314 (303) Stainless Steel or SAE 11L14 Nickel Plated acc. ASTM B733 |
| **30** | Optional Flange Bolts | (upon request only) |

**Notes:** * Techno-Polymer thru CA02, die cast aluminum for larger sizes. Items in blue are wear parts.

# CRANE® Air Direct Mount on Center Line®




## Double Acting

| Valve Data | | | | | | Actuator Data | | Dimensions (in) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Line Pressure (psig) | Torque Inch # | Top Flange | Double D (In) | Shaft (In) | Part Number | Min Air Supply (psig) | A | B | C | D | E | F | G | Wafer Valve + Actuator (Lbs) | Lugged Valve + Actuator (Lbs) |
| 2 | 200 | 117 | F07 | 0.39 | 1.25 | CA03DA-23 | 40 | 6.4 | 3.2 | 11.2 | 3.3 | 8.2 | 3.9 | 7.8 | 11.2 | 12.2 |
| 2.5 | 200 | 189 | F07 | 0.39 | 1.25 | CA03DA-23 | 60 | 6.9 | 3.7 | 11.7 | 3.3 | 8.7 | 3.9 | 7.8 | 12.2 | 13.2 |
| 3 | 200 | 244 | F07 | 0.39 | 1.25 | CA03DA-23 | 80 | 7.1 | 4.0 | 11.9 | 3.3 | 8.9 | 3.9 | 7.8 | 15.2 | 19.2 |
| 3 | 200 | 244 | F07 | 0.39 | 1.25 | CA04DA-3 | 60 | 7.1 | 4.0 | 12.7 | 3.8 | 9.3 | 3.5 | 7.0 | 16.3 | 20.3 |
| 4 | 200 | 390 | F07 | 0.47 | 1.25 | CA04DA-4 | 80 | 7.9 | 4.9 | 13.5 | 3.8 | 10.1 | 3.5 | 7.0 | 19.3 | 32.3 |
| 4 | 200 | 390 | F07 | 0.47 | 1.25 | CA05DA-4 | 60 | 7.9 | 4.9 | 13.5 | 3.8 | 10.1 | 4.7 | 9.4 | 21.8 | 34.8 |
| 5 | 200 | 598 | F07 | 0.55 | 1.25 | CA05DA-5 | 80 | 8.4 | 5.4 | 14.0 | 3.8 | 10.6 | 4.7 | 9.4 | 26.8 | 36.8 |
| 5 | 200 | 598 | F07 | 0.55 | 1.25 | CA06DA-56 | 60 | 8.4 | 5.4 | 14.8 | 4.5 | 11.0 | 4.5 | 9.1 | 28.7 | 38.7 |
| 6 | 200 | 875 | F07 | 0.55 | 1.25 | CA06DA-56 | 60 | 8.9 | 5.9 | 15.3 | 4.5 | 11.5 | 4.5 | 9.1 | 30.7 | 41.7 |
| 8 | 200 | 1430 | F10 | 0.67 | 1.75 | CA08DA-8 | 80 | 10.2 | 7.8 | 17.9 | 5.4 | 13.4 | 5.7 | 11.4 | 51.9 | 68.9 |
| 8 | 200 | 1430 | F10 | 0.67 | 1.75 | CA09DA-8 | 60 | 10.2 | 7.8 | 18.4 | 5.9 | 13.7 | 6.9 | 13.8 | 59.5 | 76.5 |
| 10 | 200 | 2275 | F10 | 0.87 | 1.75 | CA09DA-10 | 80 | 11.5 | 8.2 | 19.7 | 5.9 | 15.0 | 6.9 | 13.8 | 69.5 | 99.5 |
| 10 | 200 | 2275 | F10 | 0.87 | 1.75 | CA10DA-10 | 60 | 11.5 | 8.2 | 21.3 | 7.3 | 16.4 | 7.1 | 14.2 | 81.2 | 111.2 |
| 12 | 200 | 3250 | F10 | 0.95 | 1.75 | CA10DA-1214 | 80 | 13.2 | 9.7 | 23.0 | 7.3 | 17.5 | 7.1 | 14.2 | 109.2 | 144.2 |
| 12 | 200 | 3250 | F10 | 0.95 | 1.75 | CA11DA-1214 | 60 | 13.2 | 9.7 | 23.0 | 7.3 | 17.5 | 8.2 | 16.5 | 118.9 | 153.9 |
| 14 | 150 | 3500 | F10 | 0.95 | 1.75 | CA11DA-1214 | 60 | 14.5 | 11.0 | 24.3 | 7.3 | 18.8 | 8.2 | 15.5 | 143.9 | 203.9 |
| 14 | 150 | 3500 | F10 | 0.95 | 1.75 | CA10DA-1214 | 80 | 14.5 | 11.0 | 24.3 | 7.3 | 18.8 | 7.1 | 14.2 | 134.2 | 194.2 |

## Spring Return Fail Closed

| Valve Data | | | | | | Actuator Data | | Dimensions (in) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Line Pressure (psig) | Torque Inch # | Top Flange | Double D (In) | Shaft (In) | Part Number | Min Air Supply (psig) | A | B | C | D | E | F | G | Wafer Valve + Actuator (Lbs) | Lugged Valve + Actuator (Lbs) |
| 2 | 200 | 117 | F07 | 0.39 | 1.25 | CA04SC4-2 | 60 | 6.4 | 3.2 | 12.0 | 3.8 | 8.6 | 3.5 | 7.0 | 13.2 | 14.2 |
| 2.5 | 200 | 189 | F07 | 0.39 | 1.25 | CA05SC4-2.5 | 60 | 6.9 | 3.7 | 12.5 | 3.8 | 9.1 | 4.7 | 9.4 | 17.0 | 18.0 |
| 3 | 200 | 244 | F07 | 0.39 | 1.25 | CA06SC4-3 | 60 | 7.1 | 4.0 | 13.5 | 4.5 | 9.7 | 4.5 | 9.1 | 22.3 | 26.3 |
| 4 | 200 | 390 | F07 | 0.47 | 1.25 | CA07SC4-4 | 60 | 7.9 | 4.9 | 15.6 | 5.4 | 11.1 | 4.8 | 9.7 | 32.9 | 45.9 |
| 5 | 200 | 598 | F07 | 0.55 | 1.25 | CA08SC4-5 | 60 | 8.4 | 5.4 | 16.1 | 5.4 | 11.6 | 5.7 | 11.4 | 41.6 | 51.6 |
| 6 | 200 | 875 | F07 | 0.55 | 1.25 | CA09SC4-6 | 60 | 8.9 | 5.9 | 17.1 | 5.9 | 12.4 | 6.9 | 13.8 | 53.1 | 64.1 |
| 8 | 200 | 1430 | F10 | 0.67 | 1.75 | CA10SC5-8 | 80 | 10.2 | 7.8 | 20.0 | 7.3 | 14.5 | 7.1 | 14.2 | 81.9 | 98.9 |
| 8 | 200 | 1430 | F10 | 0.67 | 1.75 | CA11SC4-8 | 60 | 10.2 | 7.8 | 20.0 | 7.3 | 14.5 | 8.2 | 16.5 | 91.5 | 108.5 |
| 10 | 200 | 2275 | F10 | 0.87 | 1.75 | CA12SC4-10 | 60 | 11.5 | 8.2 | 23.5 | 9.3 | 16.9 | 8.7 | 17.5 | 143.2 | 173.2 |
| 12 | 200 | 3250 | F10 | 0.95 | 1.75 | CA13SC4-12 | 60 | 13.2 | 9.7 | 25.2 | 9.3 | 18.6 | 9.9 | 19.8 | 185.5 | 220.5 |
| 14 | 150 | 3500 | F10 | 0.95 | 1.75 | CA14SC4-14 | 60 | 14.5 | 11.0 | 28.8 | 13.1 | 21.0 | 11.6 | 23.1 | 277.9 | 337.9 |
| 14 | 150 | 3500 | F10 | 0.95 | 1.75 | CA13SC5-14 | 80 | 14.5 | 11.0 | 28.8 | 13.1 | 21.0 | 11.6 | 23.1 | 277.9 | 337.9 |

## Spring Return Fail Open

| Valve Data | | | | | | Actuator Data | | Dimensions (in) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Line Pressure (psig) | Torque Inch # | Top Flange | Double D (In) | Shaft (In) | Part Number | Min Air Supply (psig) | A | B | C | D | E | F | G | Wafer Valve + Actuator (Lbs) | Lugged Valve + Actuator (Lbs) |
| 2 | 200 | 117 | F07 | 0.39 | 1.25 | CA04SO3-2 | 60 | 6.4 | 3.2 | 12.0 | 3.8 | 8.6 | 3.5 | 7.0 | 13.2 | 14.2 |
| 2.5 | 200 | 189 | F07 | 0.39 | 1.25 | CA05SO3-2.5 | 60 | 6.9 | 3.7 | 12.5 | 3.8 | 9.1 | 4.7 | 9.4 | 17.0 | 18.0 |
| 3 | 200 | 244 | F07 | 0.39 | 1.25 | CA06SO3-3 | 60 | 7.1 | 4.0 | 13.5 | 4.5 | 9.7 | 4.5 | 9.1 | 22.3 | 26.3 |
| 4 | 200 | 390 | F07 | 0.47 | 1.25 | CA07SO3-4 | 60 | 7.9 | 4.9 | 15.6 | 5.4 | 11.1 | 4.8 | 9.7 | 32.9 | 45.9 |
| 5 | 200 | 598 | F07 | 0.55 | 1.25 | CA08SO3-5 | 60 | 8.4 | 5.4 | 16.1 | 5.4 | 11.6 | 5.7 | 11.4 | 41.6 | 51.6 |
| 6 | 200 | 875 | F07 | 0.55 | 1.25 | CA09SO3-6 | 80 | 8.9 | 5.9 | 17.1 | 5.9 | 12.4 | 6.9 | 13.8 | 53.1 | 64.1 |
| 6 | 200 | 875 | F07 | 0.55 | 1.25 | CA10SO4-6 | 60 | 8.9 | 5.9 | 17.1 | 5.9 | 13.2 | 7.1 | 13.8 | 69.9 | 80.0 |
| 8 | 200 | 1430 | F10 | 0.67 | 1.75 | CA10SO4-8 | 80 | 10.2 | 7.8 | 20.0 | 7.3 | 14.5 | 7.1 | 14.2 | 81.9 | 98.9 |
| 8 | 200 | 1430 | F10 | 0.67 | 1.75 | CA11SO3-8 | 60 | 10.2 | 7.8 | 20.0 | 7.3 | 14.5 | 8.2 | 16.5 | 91.5 | 108.5 |
| 10 | 200 | 2275 | F10 | 0.87 | 1.75 | CA12SO3-10 | 60 | 11.5 | 8.2 | 23.5 | 9.3 | 16.9 | 8.7 | 17.5 | 143.2 | 173.2 |
| 12 | 200 | 3250 | F10 | 0.95 | 1.75 | CA13SO3-12 | 60 | 13.2 | 9.7 | 25.2 | 9.3 | 18.6 | 9.9 | 19.8 | 185.5 | 220.5 |
| 14 | 150 | 3500 | F10 | 0.95 | 1.75 | CA14SO4-14 | 60 | 14.5 | 11.0 | 28.8 | 13.1 | 21.6 | 11.6 | 23.1 | 277.9 | 337.9 |
| 14 | 150 | 3500 | F10 | 0.95 | 1.75 | CA14SO4-14 | 80 | 14.5 | 11.0 | 28.8 | 13.1 | 21.6 | 11.6 | 23.1 | 277.9 | 337.9 |

**NOTE:** Actuator sizing is for single valve, on/off applications and include sizing margins appropriate for normal liquid applications. For all other applications, please consult factory for appropriate sizing.

# CRANE® Air Engineering Data

**Documentation of the no-load cycle times of CRANE® Air 90 degree actuators.**

The data listed below is the amount of seconds required to cause each size actuator to stroke from the open to the closed position, or from the closed to the open position with an air supply pressure of 80psig.

| CRANE® Air Size | DA Stroke To Open | DA Stroke To Close | SR Stroke To Open | SR Stroke To Close |
|---|---|---|---|---|
| CA01 | 0.25 | 0.25 | 0.25 | 0.25 |
| CA02 | 0.30 | 0.30 | 0.30 | 0.30 |
| CA03 | 0.30 | 0.30 | 0.30 | 0.30 |
| CA04 | 0.50 | 0.50 | 0.50 | 0.50 |
| CA05 | 0.60 | 0.60 | 0.75 | 0.75 |
| CA06 | 0.75 | 0.75 | 1.00 | 1.00 |
| CA07 | 0.80 | 0.80 | 1.00 | 1.00 |
| CA08 | 1.00 | 1.00 | 1.30 | 1.30 |
| CA09 | 1.00 | 1.00 | 1.40 | 1.40 |
| CA10 | 1.50 | 1.50 | 2.00 | 1.50 |
| CA11 | 1.50 | 1.50 | 2.00 | 2.00 |
| CA12 | 1.75 | 1.75 | 3.50 | 2.00 |
| CA13 | 2.00 | 2.00 | 4.00 | 2.00 |
| CA14 | 3.50 | 3.75 | 7.00 | 2.00 |
| CA15 | 3.75 | 4.00 | 8.50 | 3.00 |

**Note:** Cycle times are approximate and tested in a no-load condition.

# CRANE® Air Scotch Yoke Overview

CRANE® Air Scotch Yoke pneumatic actuators, including double acting and spring return pneumatic models CASY14XXX; CASY16XXX; CASY25XXX; CASY30XXX; CASY35XXX; CASY40XXX; CASY48XXX; CASY60XXX.

These products can be used to automate most types of quarter turn valves including ball valves, butterfly valves, plug valves, etc. and are widely used in many industries, including chemical processing, food & beverage, oilfield, pharmaceutical, power generation, refining, paper processing and chemical fiber industry, etc.

**Environmental Conditions and Applications**

Operating temperatures
Standard Temperature: -4°F - 180°F (-20°C to + 80°C)
Low Temperature: -40°F - 180°F (-40°C to + 80°C)
High Temperature: -4°F - 300°F (-20°C to + 150°C)
Operating pressure: 40psi – 100psi (3-7 Bar)
Working Medium: Clean, Dry Compressed Air, lubricated or non-lubricated.

Technical Data
Output Torque: Double Acting: 612 – 184,400 foot-pounds (830-250000 Nm)
Spring Return: 230 – 53,000 foot-pounds (307-71753 Nm)

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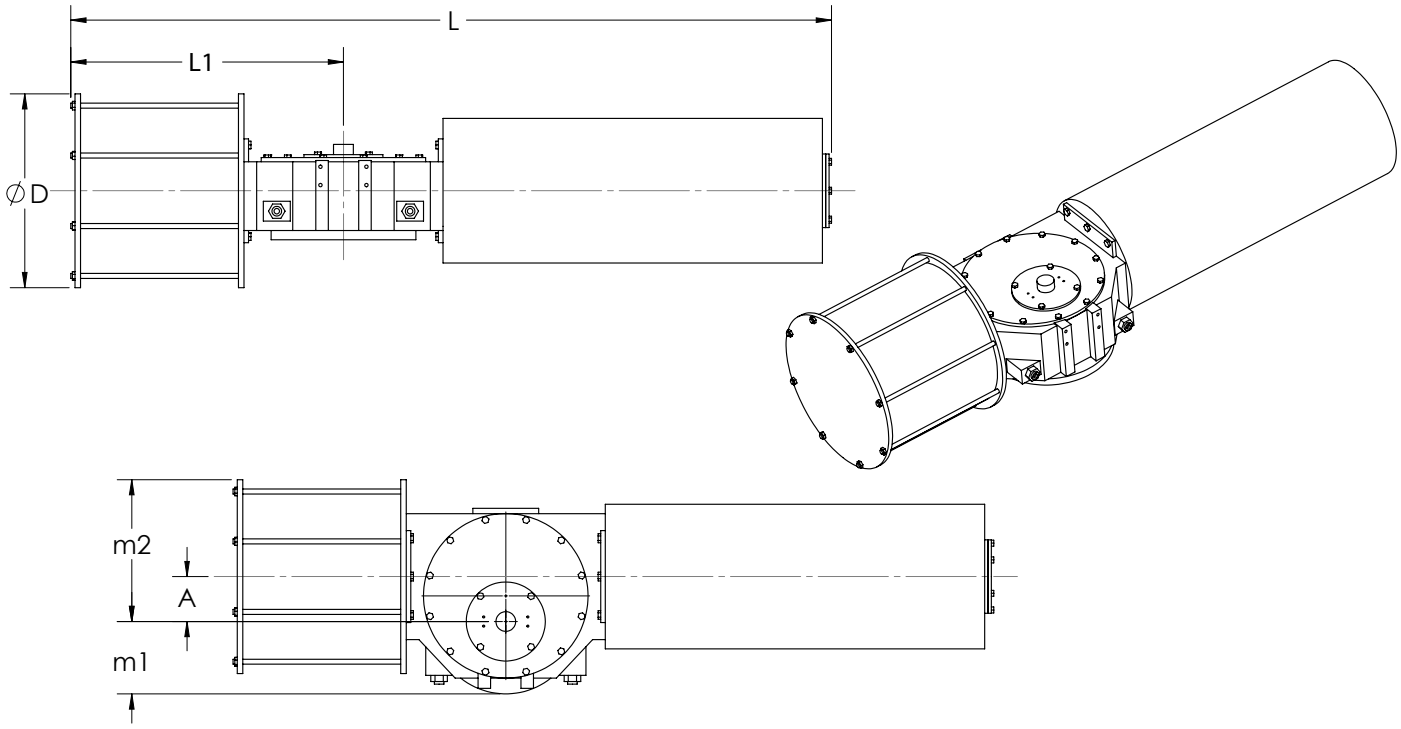
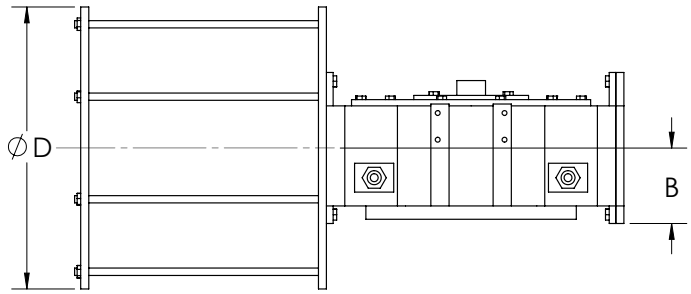
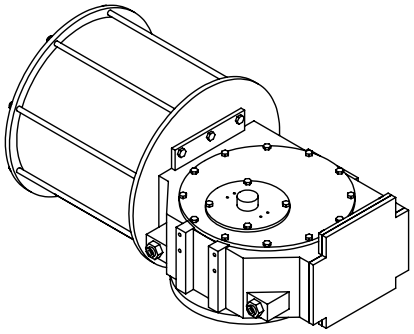
# CRANE® Air Scotch Yoke Dimensions

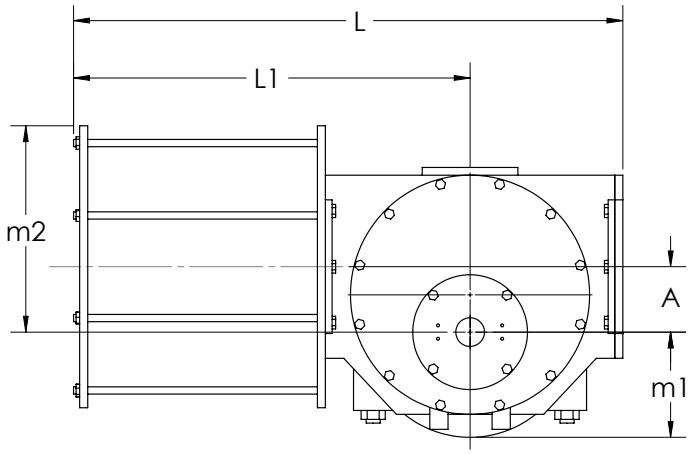



| Model No. | Connect Flange | L | L1 | m1 | m2 | A | B | D | Pressure Port (in) |
|---|---|---|---|---|---|---|---|---|---|
| CASY14-SR*-20-F14 | F14 | 43.5 | 17.7 | 3.4 | 7.4 | 2.4 | 3.5 | 10.0 | 3/8 |
| CASY14-SR*-25-F14 | | 43.5 | 17.7 | 3.4 | 8.4 | 2.4 | 3.5 | 12.0 | ½ |
| CASY14-SR*-30-F14 | | 43.5 | 17.7 | 3.4 | 9.4 | 2.4 | 3.5 | 14.0 | ½ |
| CASY16-SR*-25-F16 | F16 | 50.7 | 19.6 | 4.1 | 8.8 | 2.8 | 3.6 | 12.0 | ½ |
| CASY16-SR*-30-F14 | | 50.7 | 19.6 | 4.1 | 9.7 | 2.8 | 3.6 | 14.0 | ½ |
| CASY16-SR*-35-F16 | | 51.9 | 19.6 | 4.1 | 10.7 | 2.8 | 3.6 | 15.9 | ½ |
| CASY25-SR*-35-F25 | F25 | 62.0 | 21.9 | 5.9 | 11.5 | 3.5 | 4.1 | 15.9 | ½ |
| CASY25-SR*-40-F25 | | 62.0 | 21.9 | 5.9 | 12.5 | 3.5 | 4.1 | 17.9 | ¾ |
| CASY25-SR*-45-F25 | | 65.9 | 21.9 | 5.9 | 13.8 | 3.5 | 4.1 | 20.5 | ¾ |
| CASY30-SR*-45-F30 | F30 | 71.1 | 26.1 | 6.9 | 14.6 | 4.3 | 5.1 | 20.5 | ¾ |
| CASY30-SR*-50-F30 | | 71.1 | 26.1 | 6.9 | 15.6 | 4.3 | 5.1 | 22.4 | ¾ |
| CASY30-SR*-55-F30 | | 71.1 | 26.1 | 6.9 | 16.5 | 4.3 | 5.1 | 24.4 | ¾ |
| CASY35-SR*-55-F35 | F35 | 78.9 | 32.2 | 8.2 | 17.7 | 5.5 | 6.5 | 24.4 | 1 |
| CASY35-SR*-60-F35 | | 78.9 | 32.2 | 8.2 | 17.7 | 5.5 | 6.5 | 26.4 | 1 |
| CASY35-SR*-70-F35 | | 78.9 | 32.2 | 8.2 | 18.7 | 5.5 | 6.5 | 30.3 | 1 |
| CASY35-SR*-60-F35 | F40 | 106.1 | 37.8 | 9.4 | 19.9 | 6.7 | 7.9 | 26.4 | 1 |
| CASY35-SR*-70-F35 | | 106.1 | 37.8 | 9.4 | 21.9 | 6.7 | 7.9 | 30.3 | 1 |
| CASY40-SR*-80-F40 | | 106.1 | 37.8 | 9.4 | 23.9 | 6.7 | 7.9 | 34.4 | 1½ |
| CASY48-SR*-80-F48 | F48 | 133.7 | 44.5 | 11.0 | 25.1 | 7.9 | 8.3 | 34.4 | 1½ |
| CASY48-SR*-90-F48 | | 133.7 | 44.5 | 11.0 | 27.1 | 7.9 | 8.3 | 38.4 | 2 |
| CASY48-SR*-100-F48 | | 141.1 | 44.5 | 11.0 | 31.0 | 7.9 | 8.3 | 42.3 | 2 |
| CASY60-SR*-80-F60 | F60 | 164.8 | 54.3 | 13.5 | 27.9 | 10.6 | 9.1 | 34.4 | 1½ |
| CASY60-SR*-90-F60 | | 164.8 | 54.3 | 13.5 | 29.8 | 10.6 | 9.1 | 38.4 | 2 |
| CASY60-SR*-100-F60 | | 187.0 | 54.3 | 13.5 | 31.8 | 10.6 | 9.1 | 42.3 | 2 |
| CASY60-SR*-110-F60 | | 187.0 | 54.3 | 13.5 | 33.8 | 10.6 | 9.1 | 46.3 | 2 |

# CRANE® Air Scotch Yoke Dimensions






| Model No. | Connect Flange | L | L1 | m1 | m2 | A | B | D | Pressure Port |
|---|---|---|---|---|---|---|---|---|---|
| CASY14-SR*-20-F14 | F14 | 23.4 | 17.7 | 3.4 | 7.4 | 2.4 | 3.5 | 10.0 | 3/8 |
| CASY14-SR*-25-F14 | | 23.4 | 17.7 | 3.4 | 8.4 | 2.4 | 3.5 | 12.0 | ½ |
| CASY14-SR*-30-F14 | | 23.4 | 17.7 | 3.4 | 9.4 | 2.4 | 3.5 | 14.0 | ½ |
| CASY16-SR*-25-F16 | F16 | 26.7 | 19.6 | 4.1 | 8.8 | 2.8 | 3.6 | 12.0 | ½ |
| CASY16-SR*-30-F14 | | 26.7 | 19.6 | 4.1 | 9.7 | 2.8 | 3.6 | 14.0 | ½ |
| CASY16-SR*-35-F16 | | 26.7 | 19.6 | 4.1 | 10.7 | 2.8 | 3.6 | 15.9 | ½ |
| CASY25-SR*-35-F25 | F25 | 30.2 | 21.9 | 5.9 | 11.5 | 3.5 | 4.1 | 15.9 | ½ |
| CASY25-SR*-40-F25 | | 30.2 | 21.9 | 5.9 | 12.5 | 3.5 | 4.1 | 17.9 | ¾ |
| CASY25-SR*-45-F25 | | 30.2 | 21.9 | 5.9 | 13.8 | 3.5 | 4.1 | 20.5 | ¾ |
| CASY30-SR*-45-F30 | F30 | 36.3 | 26.1 | 6.9 | 14.6 | 4.3 | 5.1 | 20.5 | ¾ |
| CASY30-SR*-50-F30 | | 36.3 | 26.1 | 6.9 | 15.6 | 4.3 | 5.1 | 22.4 | ¾ |
| CASY30-SR*-55-F30 | | 36.3 | 26.1 | 6.9 | 16.5 | 4.3 | 5.1 | 24.4 | ¾ |
| CASY35-SR*-55-F35 | F35 | 44.5 | 32.2 | 8.2 | 17.7 | 5.5 | 6.5 | 24.4 | 1 |
| CASY35-SR*-60-F35 | | 44.5 | 32.2 | 8.2 | 17.7 | 5.5 | 6.5 | 26.4 | 1 |
| CASY35-SR*-70-F35 | | 44.5 | 32.2 | 8.2 | 18.7 | 5.5 | 6.5 | 30.3 | 1 |
| CASY35-SR*-60-F35 | F40 | 52.0 | 37.8 | 9.4 | 19.9 | 6.7 | 7.9 | 26.4 | 1 |
| CASY35-SR*-70-F35 | | 52.0 | 37.8 | 9.4 | 21.9 | 6.7 | 7.9 | 30.3 | 1 |
| CASY40-SR*-80-F40 | | 52.0 | 37.8 | 9.4 | 23.9 | 6.7 | 7.9 | 34.4 | 1½ |
| CASY48-SR*-80-F48 | F48 | 62.2 | 44.5 | 11.0 | 25.1 | 7.9 | 8.3 | 34.4 | 1½ |
| CASY48-SR*-90-F48 | | 62.2 | 44.5 | 11.0 | 27.1 | 7.9 | 8.3 | 38.4 | 2 |
| CASY48-SR*-100-F48 | | 62.2 | 44.5 | 11.0 | 31.0 | 7.9 | 8.3 | 42.3 | 2 |
| CASY60-SR*-80-F60 | F60 | 77.2 | 54.3 | 13.5 | 27.9 | 10.6 | 9.1 | 34.4 | 1½ |
| CASY60-SR*-90-F60 | | 77.2 | 54.3 | 13.5 | 29.8 | 10.6 | 9.1 | 38.4 | 2 |
| CASY60-SR*-100-F60 | | 77.2 | 54.3 | 13.5 | 31.8 | 10.6 | 9.1 | 42.3 | 2 |
| CASY60-SR*-110-F60 | | 77.2 | 54.3 | 13.5 | 33.8 | 10.6 | 9.1 | 46.3 | 2 |

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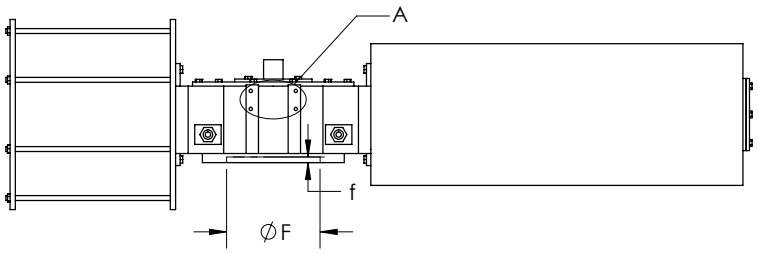
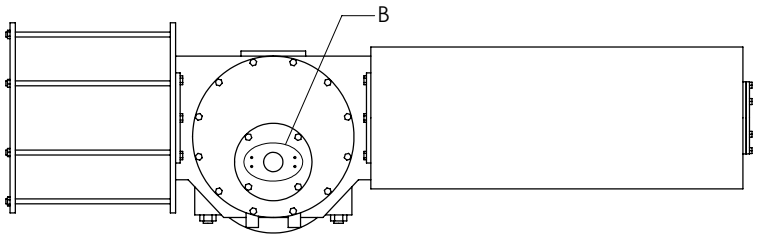
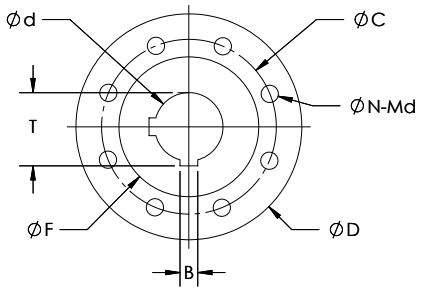
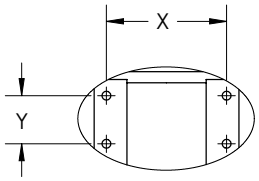
# CRANE® Air Scotch Yoke Connecting Dimensions



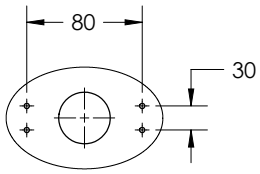




Connecting Dimension of Bottom Flange




DETAIL A
SCALE 1 : 3

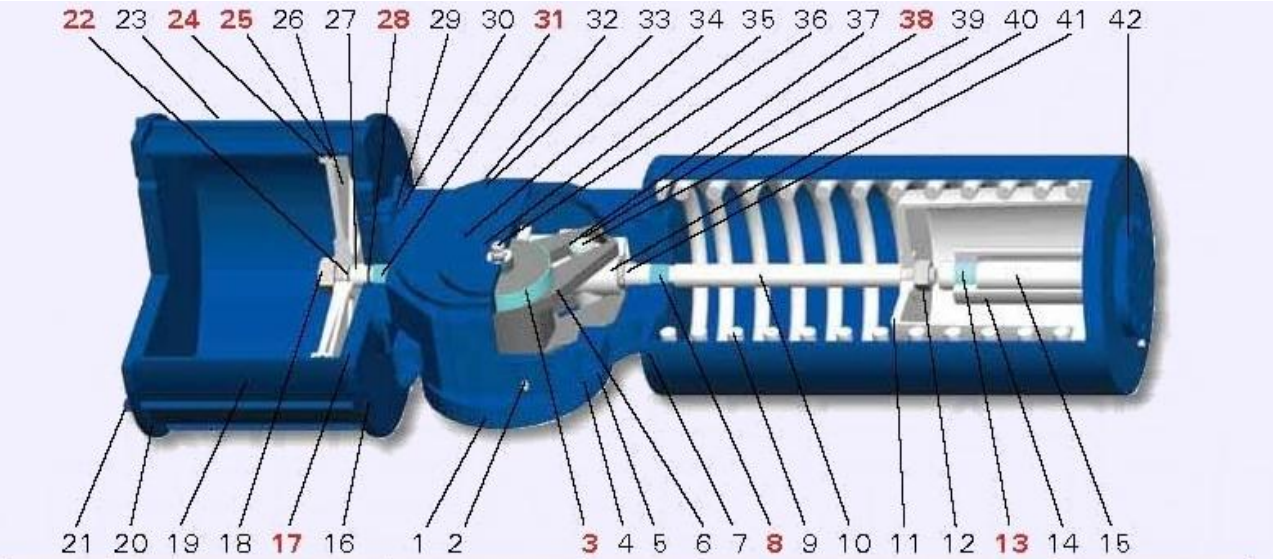



DETAIL B
SCALE 1 : 3

| Model No. | ISO Size | ØD | ØC | Ød | f | ØF | N | Md | T | B | X (mm) | Y (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CASY14-20 | F14 | 5.12* Sq. | 5.51 | 2.36 | 0.16 | 3.94 | 4 | 5/8-11 UNC | 2.54 | 0.71 | 100 | 60 |
| CASY14-25 | | | | | | | | | | | | |
| CASY14-30 | | | | | | | | | | | | |
| CASY16-25 | F16 | 8.27 | 6.50 | 3.15 | 0.16 | 5.12 | 4 | ¾-10 UNC | 3.36 | 0.87 | 100 | 60 |
| CASY16-30 | | | | | | | | | | | | |
| CASY16-35 | | | | | | | | | | | | |
| CASY25-35 | F25 | 11.81 | 10.00 | 3.94 | 0.20 | 7.87 | 8 | 5/8-11 UNC | 4.19 | 1.10 | 100 | 60 |
| CASY25-40 | | | | | | | | | | | | |
| CASY25-45 | | | | | | | | | | | | |
| CASY30-45 | F30 | 13.78 | 11.73 | 4.72 | 0.20 | 9.06 | 8 | ¾-10 UNC | 5.02 | 1.26 | 140 | 70 |
| CASY30-50 | | | | | | | | | | | | |
| CASY30-55 | | | | | | | | | | | | |
| CASY35-55 | F35 | 16.34 | 14.02 | 6.30 | 0.24 | 10.24 | 8 | 1"-8 UNC | 6.67 | 1.57 | 140 | 70 |
| CASY35-60 | | | | | | | | | | | | |
| CASY35-70 | | | | | | | | | | | | |
| CASY40-60 | F40 | 18.70 | 15.98 | 7.09 | 0.24 | 11.81 | 8 | 1¼-7 UNC | 7.50 | 1.77 | 140 | 70 |
| CASY40-70 | | | | | | | | | | | | |
| CASY40-80 | | | | | | | | | | | | |
| CASY48-80 | F48 | 22.05 | 19.02 | 7.87 | 0.31 | 14.57 | 12 | 1¼-7 UNC | 8.28 | 1.77 | 140 | 70 |
| CASY48-90 | | | | | | | | | | | | |
| CASY48-100 | | | | | | | | | | | | |
| CASY60-80 | F60 | 27.01 | 23.74 | 11.02 | 0.31 | 18.50 | 20 | 1¼-7 UNC | 11.51 | 2.48 | 140 | 70 |
| CASY60-90 | | | | | | | | | | | | |
| CASY60-100 | | | | | | | | | | | | |

Dimensions in inches unless otherwise noted.

# CRANE® Air Scotch Yoke Materials of Construction




| Item | Item Name | Item Material | Item | Item Name | Item Material |
|---|---|---|---|---|---|
| 1 | Body | Ductile Iron | 22 | Rod NBR O-Ring Seals | NBR |
| 2 | Vent Valve | WCB | 23 | Screw | Steel Alloy |
| 3 | Rod Slide Bearing | WCB + TFE | 24 | Piston Guide Ring | TFE |
| 4 | Adjusting Rod | Steel Alloy | 25 | Piston NBR O-Ring Seals | NBR |
| 5 | Adjusting Rod Nut | 2H | 26 | Piston | Ductile Iron |
| 6 | Yoke | WCB | 27 | Center Cylinder Bar | Steel Alloy |
| 7 | Spring Housing | WCB | 28 | Center Cylinder Bar O-Ring Seal | NBR |
| 8 | Yoke Slide Bearing | WCB + TFE | 29 | Stud | Steel Alloy |
| 9 | Spring Housing | Steel Alloy | 30 | Stud Nut | 2H |
| 10 | Tension Rod | Steel Alloy | 31 | Sliding Bearing | WCB + PTFE |
| 11 | Spring Seat | WCB | 32 | Bolt | WCB |
| 12 | Yoke Slide Bearing Nut | 2H | 33 | Body Cap | Ductile Iron |
| 13 | Pivot Slide Bearing | WCB + TFE | 34 | Bolt | WCB |
| 14 | Hydraulic Cylinder | WCB | 35 | Cover | Ductile Iron |
| 15 | Hydraulic Piston | WCB | 36 | Drive Shaft | Steel Alloy |
| 16 | Adapter | Ductile Iron | 37 | Roller | Steel Alloy |
| 17 | Cylinder NBR O-Ring Seal | NBR | 38 | Sliding Bearing | WCB + PTFE |
| 18 | Yoke Slide Bearing Nut | 2H | 39 | Pin | Steel Alloy |
| 19 | Cylinder | WCB | 40 | Guide Block | Ductile Iron |
| 20 | Cylinder End Cap | Ductile Iron | 41 | Guide Block Nut | WCB |
| 21 | Cylinder End Cap Nut | 2H | 42 | Spring Housing Cover Plate | WCB |

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# CRANE® Air Scotch Yoke Spring Return Torque Values

## Spring Return: 43.5 psi/3 bar (in/lbs)

| Model No. | Air Supply Pressure | Max Drive Torque | Spring Start | Spring End | Air Start | Air End |
|---|---|---|---|---|---|---|
| CASY14-SR3-20-F14 | 43.5 psi | 17,700 | 4,523 | 2,717 | 4,629 | 2,815 |
| CASY14-SR3-25-F14 | 43.5 psi | | 6,983 | 4,478 | 7,001 | 4,496 |
| CASY14-SR3-30-F14 | 43.5 psi | | 9,550 | 5,965 | 10,568 | 6,992 |
| CASY16-SR3-25-F16 | 43.5 psi | 35,400 | 9,665 | 5,346 | 8,975 | 4,682 |
| CASY16-SR3-30-F14 | 43.5 psi | | 1 | 7,895 | 12,780 | 7,983 |
| CASY16-SR3-35-F16 | 43.5 psi | | 16,781 | 10,860 | 17,286 | 11,356 |
| CASY25-SR3-35-F25 | 43.5 psi | 70,800 | 19,905 | 12,807 | 20,764 | 13,869 |
| CASY25-SR3-40-F25 | 43.5 psi | | 26,517 | 16,772 | 27,340 | 16,843 |
| CASY25-SR3-45-F25 | 43.5 psi | | 35,049 | 22,428 | 33,403 | 20,782 |
| CASY30-SR3-45-F30 | 43.5 psi | 141,600 | 42,360 | 25,570 | 42,669 | 25,880 |
| CASY30-SR3-50-F30 | 43.5 psi | | 53,494 | 31,287 | 52,963 | 30,756 |
| CASY30-SR3-55-F30 | 43.5 psi | | 60,778 | 38,492 | 63,451 | 41,165 |
| CASY35-SR3-55-F35 | 43.5 psi | 283,200 | 81,250 | 47,794 | 81,958 | 48,502 |
| CASY35-SR3-60-F35 | 43.5 psi | | 97,500 | 56,450 | 97,969 | 56,910 |
| CASY35-SR3-70-F35 | 43.5 psi | | 127,884 | 78,834 | 131,345 | 82,294 |
| CASY35-SR3-60-F35 | 43.5 psi | 557,596 | 116,219 | 71,815 | 115,688 | 71,284 |
| CASY35-SR3-70-F35 | 43.5 psi | | 144,789 | 90,915 | 164,305 | 110,431 |
| CASY40-SR3-80-F40 | 43.5 psi | | 189,636 | 120,954 | 212,400 | 143,718 |
| CASY48-SR3-80-F48 | 43.5 psi | 1,106,340 | 235,598 | 144,984 | 247,201 | 156,579 |
| CASY48-SR3-90-F48 | 43.5 psi | | 299,545 | 184,335 | 312,024 | 196,814 |
| CASY48-SR3-100-F48 | 43.5 psi | | 405,267 | 257,530 | 355,269 | 207,524 |
| CASY60-SR3-80-F60 | 43.5 psi | 2,212,685 | 325,708 | 201,841 | 316,848 | 192,991 |
| CASY60-SR3-90-F60 | 43.5 psi | | 417,030 | 246,423 | 423,659 | 253,061 |
| CASY60-SR3-100-F60 | 43.5 psi | | 561,120 | 338,639 | 488,623 | 266,151 |
| CASY60-SR3-110-F60 | 43.5 psi | | 698,129 | 435,607 | 565,395 | 302,864 |

## Spring Return: 58.0 psi/4 bar (in/lbs)

| Model No. | Air Supply Pressure | Max Drive Torque | Spring Start | Spring End | Air Start | Air End |
|---|---|---|---|---|---|---|
| CASY14-SR4-20-F14 | 58.0 psi | 17,700 | 6,010 | 3,859 | 5,939 | 3,788 |
| CASY14-SR4-25-F14 | 58.0 psi | | 9,550 | 5,965 | 9,346 | 5,762 |
| CASY14-SR4-30-F14 | 58.0 psi | | 13,073 | 8,391 | 13,666 | 8,984 |
| CASY16-SR4-25-F16 | 58.0 psi | 35,400 | 11,338 | 7,240 | 11,904 | 7,806 |
| CASY16-SR4-30-F14 | 58.0 psi | | 16,781 | 10,860 | 16,710 | 10,789 |
| CASY16-SR4-35-F16 | 58.0 psi | | 22,968 | 14,418 | 23,109 | 14,559 |
| CASY25-SR4-35-F25 | 58.0 psi | 70,800 | 26,517 | 16,772 | 28,260 | 18,516 |
| CASY25-SR4-40-F25 | 58.0 psi | | 35,049 | 22,428 | 36,394 | 23,773 |
| CASY25-SR4-45-F25 | 58.0 psi | | 43,855 | 26,543 | 47,900 | 30,588 |
| CASY30-SR4-45-F30 | 58.0 psi | 141,600 | 56,016 | 33,810 | 57,185 | 34,978 |
| CASY30-SR4-50-F30 | 58.0 psi | | 70,178 | 43,094 | 69,248 | 42,156 |
| CASY30-SR4-55-F30 | 58.0 psi | | 82,976 | 51,547 | 84,383 | 52,954 |
| CASY35-SR4-55-F35 | 58.0 psi | 283,200 | 108,838 | 66,212 | 106,793 | 64,168 |
| CASY35-SR4-60-F35 | 58.0 psi | | 127,884 | 78,834 | 127,061 | 78,002 |
| CASY35-SR4-70-F35 | 58.0 psi | | 168,775 | 102,217 | 178,024 | 111,466 |
| CASY35-SR4-60-F40 | 58.0 psi | 557,596 | 144,789 | 90,915 | 159,101 | 105,218 |
| CASY35-SR4-70-F40 | 58.0 psi | | 189,636 | 120,954 | 219,339 | 150,666 |
| CASY40-SR4-80-F40 | 58.0 psi | | 265,655 | 166,014 | 278,453 | 178,812 |
| CASY48-SR4-80-F48 | 58.0 psi | 1,106,340 | 299,545 | 184,335 | 338,577 | 223,366 |
| CASY48-SR4-90-F48 | 58.0 psi | | 405,267 | 257,530 | 404,276 | 256,548 |
| CASY48-SR4-100-F48 | 58.0 psi | | 507,573 | 311,546 | 505,511 | 309,493 |
| CASY60-SR4-80-F60 | 58.0 psi | 2,212,685 | 417,030 | 246,423 | 459,513 | 288,906 |
| CASY60-SR4-90-F60 | 58.0 psi | | 561,120 | 338,639 | 554,809 | 332,328 |
| CASY60-SR4-100-F60 | 58.0 psi | | 698,129 | 435,607 | 667,426 | 404,895 |
| CASY60-SR4-110-F60 | 58.0 psi | | 848,707 | 514,910 | 819,756 | 485,959 |

# CRANE® Air Scotch Yoke Spring Return Torque Values

## Spring Return: 72.5 psi/5 bar (in/lbs)

| Model No. | Air Supply Pressure | Max Drive Torque | Spring Start | Spring End | Air Start | Air End |
|---|---|---|---|---|---|---|
| CASY14-SR5-20-F14 | 72.5 psi | 17,700 | 6,983 | 4,478 | 7,762 | 5,257 |
| CASY14-SR5-25-F14 | 72.5 psi | | 11,904 | 7,213 | 11,922 | 7,240 |
| CASY14-SR5-30-F14 | 72.5 psi | | 16,639 | 10,674 | 16,887 | 10,931 |
| CASY16-SR5-25-F16 | 72.5 psi | 35,400 | 13,745 | 8,948 | 14,975 | 10,178 |
| CASY16-SR5-30-F14 | 72.5 psi | | 21,428 | 12,878 | 21,578 | 13,028 |
| CASY16-SR5-35-F16 | 72.5 psi | | 28,269 | 18,454 | 28,455 | 18,640 |
| CASY25-SR5-35-F25 | 72.5 psi | 70,800 | 35,049 | 22,428 | 33,863 | 21,242 |
| CASY25-SR5-40-F25 | 72.5 psi | | 43,855 | 26,543 | 46,989 | 29,668 |
| CASY25-SR5-45-F25 | 72.5 psi | | 55,990 | 32,978 | 60,079 | 37,067 |
| CASY30-SR5-45-F30 | 72.5 psi | 141,600 | 70,178 | 43,094 | 69,850 | 43,563 |
| CASY30-SR5-50-F30 | 72.5 psi | | 82,976 | 51,547 | 88,879 | 57,441 |
| CASY30-SR5-55-F30 | 72.5 psi | | 101,129 | 62,770 | 107,147 | 68,788 |
| CASY35-SR5-55-F35 | 72.5 psi | 283,200 | 127,884 | 78,834 | 137,426 | 88,366 |
| CASY35-SR5-60-F35 | 72.5 psi | | 160,951 | 95,163 | 162,208 | 96,420 |
| CASY35-SR5-70-F35 | 72.5 psi | | 211,214 | 124,875 | 225,429 | 139,090 |
| CASY35-SR5-60-F40 | 72.5 psi | 557,596 | 189,636 | 120,954 | 191,566 | 122,884 |
| CASY35-SR5-70-F40 | 72.5 psi | | 265,655 | 166,014 | 259,362 | 159,721 |
| CASY40-SR5-80-F40 | 72.5 psi | | 313,538 | 191,875 | 363,722 | 242,059 |
| CASY48-SR5-80-F48 | 72.5 psi | 1,106,340 | 405,267 | 257,530 | 396,115 | 248,379 |
| CASY48-SR5-90-F48 | 72.5 psi | | 507,573 | 311,546 | 515,724 | 319,698 |
| CASY48-SR5-100-F48 | 72.5 psi | | 616,030 | 377,201 | 644,122 | 405,294 |
| CASY60-SR5-80-F60 | 72.5 psi | 2,212,685 | 561,120 | 338,639 | 543,781 | 321,300 |
| CASY60-SR5-90-F60 | 72.5 psi | | 698,129 | 435,607 | 681,216 | 418,685 |
| CASY60-SR5-100-F60 | 72.5 psi | | 848,707 | 514,910 | 863,877 | 530,080 |
| CASY60-SR5-110-F60 | 72.5 psi | | 994,550 | 635,165 | 1,033,175 | 673,781 |

## Spring Return: 58.0 psi/6 bar (in/lbs)

| Model No. | Air Supply Pressure | Max Drive Torque | Spring Start | Spring End | Air Start | Air End |
|---|---|---|---|---|---|---|
| CASY14-SR6-20-F14 | 87.0 psi | 17,700 | 9,099 | 5,514 | 9,178 | 5,603 |
| CASY14-SR6-25-F14 | 87.0 psi | | 13,073 | 8,391 | 14,586 | 9,895 |
| CASY14-SR6-30-F14 | 87.0 psi | | 20,277 | 12,904 | 20,180 | 12,807 |
| CASY16-SR6-25-F16 | 87.0 psi | 35,400 | 16,781 | 10,860 | 17,861 | 11,931 |
| CASY16-SR6-30-F14 | 87.0 psi | | 22,968 | 14,418 | 26,942 | 18,383 |
| CASY16-SR6-35-F16 | 87.0 psi | | 34,146 | 21,649 | 34,642 | 22,145 |
| CASY25-SR6-35-F25 | 87.0 psi | 70,800 | 43,855 | 26,543 | 41,006 | 23,693 |
| CASY25-SR6-40-F25 | 87.0 psi | | 55,990 | 32,978 | 55,255 | 32,243 |
| CASY25-SR6-45-F25 | 87.0 psi | | 73,116 | 41,776 | 69,894 | 38,563 |
| CASY30-SR6-45-F30 | 87.0 psi | 141,600 | 82,976 | 51,547 | 84,949 | 53,512 |
| CASY30-SR6-50-F30 | 87.0 psi | | 101,129 | 62,770 | 105,873 | 67,381 |
| CASY30-SR6-55-F30 | 87.0 psi | | 124,619 | 73,851 | 130,053 | 79,276 |
| CASY35-SR6-55-F35 | 87.0 psi | 283,200 | 160,951 | 95,163 | 164,350 | 98,562 |
| CASY35-SR6-60-F35 | 87.0 psi | | 198,885 | 112,546 | 196,301 | 109,962 |
| CASY35-SR6-70-F35 | 87.0 psi | | 256,256 | 153,012 | 267,355 | 164,119 |
| CASY35-SR6-60-F40 | 87.0 psi | 557,596 | 235,695 | 148,940 | 226,084 | 136,930 |
| CASY35-SR6-70-F40 | 87.0 psi | | 313,538 | 191,875 | 318,583 | 196,911 |
| CASY40-SR6-80-F40 | 87.0 psi | | 422,553 | 259,327 | 407,391 | 253,069 |
| CASY48-SR6-80-F48 | 87.0 psi | 1,106,340 | 507,573 | 311,546 | 472,807 | 276,807 |
| CASY48-SR6-90-F48 | 87.0 psi | | 616,030 | 377,201 | 615,525 | 376,697 |
| CASY48-SR6-100-F48 | 87.0 psi | | 731,780 | 460,027 | 765,563 | 493,810 |
| CASY60-SR6-80-F60 | 87.0 psi | 2,212,685 | 698,129 | 435,607 | 625,960 | 360,774 |
| CASY60-SR6-90-F60 | 87.0 psi | | 848,707 | 514,910 | 825,270 | 491,473 |
| CASY60-SR6-100-F60 | 87.0 psi | | 635,165 | 1,019,385 | 660,000 | 994,551 |
| CASY60-SR6-110-F60 | 87.0 psi | | N/A | N/A | N/A | N/A |

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# CRANE® Air Scotch Yoke Double Acting Torque Values

## Double Acting (in/lbs)

| Model No. | Max Drive Torque | 43.5 psi (3 Bar) | | 58.0 psi (4 Bar) | | 72.5 psi (5 Bar) | | 87 psi (6 Bar) | | 101.5 psi (7 Bar) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Start | Run | Start | Run | Start | Run | Start | Run | Start | Run |
| SY14-DA-20-F14 | 17,700 | 7,346 | 4,461 | 9,798 | 5,948 | 12,249 | 7,426 | 14,692 | 8,913 | 17,144 | 10,400 |
| SY14-DA-25-F14 | | 11,488 | 6,966 | 15,312 | 9,284 | 19,144 | 11,612 | - | - | - | - |
| SY14-DA-30-F14 | | 16,471 | 9,992 | - | - | - | - | - | - | - | - |
| SY16-DA-25-F16 | 35,400 | 14,356 | 8,709 | 19,144 | 11,612 | 23,932 | 14,515 | 28,721 | 17,418 | 33,509 | 20,321 |
| SY16-DA-30-F14 | | 20,675 | 12,542 | 27,570 | 16,719 | 34,465 | 20,905 | - | - | - | - |
| SY16-DA-35-F16 | | 28,145 | 17,073 | 37,527 | 22,764 | - | - | - | - | - | - |
| SY25-DA-35-F25 | 70,800 | 34,748 | 21,074 | 46,334 | 28,101 | 57,910 | 35,129 | 69,496 | 42,156 | - | - |
| SY25-DA-40-F25 | | 44,112 | 26,756 | 58,822 | 35,677 | 73,523 | 44,599 | - | - | - | - |
| SY25-DA-45-F25 | | 55,839 | 33,872 | 74,453 | 45,165 | - | - | - | - | - | - |
| SY30-DA-45-F30 | 141,600 | 68,239 | 41,395 | 90,986 | 55,193 | 113,732 | 68,992 | 136,479 | 82,790 | - | - |
| SY30-DA-50-F30 | | 84,250 | 51,104 | 112,343 | 68,151 | 140,426 | 85,188 | - | - | - | - |
| SY30-DA-55-F30 | | 101,952 | 61,849 | 135,939 | 82,462 | - | - | - | - | - | - |
| SY35-DA-55-F35 | 283,200 | 129,752 | 78,710 | 173,006 | 104,952 | 216,250 | 131,186 | 259,504 | 157,428 | 302,758 | 183,671 |
| SY35-DA-60-F35 | | 154,419 | 93,676 | 205,895 | 124,902 | 257,362 | 156,127 | 308,838 | 187,362 | - | - |
| SY35-DA-70-F35 | | 210,188 | 127,513 | 280,250 | 170,014 | - | - | - | - | - | - |
| SY40-DA-60-F40 | 557,596 | - | - | - | - | 312,520 | 189,592 | 375,033 | 227,517 | 437,537 | 265,434 |
| SY40-DA-70-F40 | | - | - | 340,302 | 206,444 | 425,385 | 258,061 | 510,458 | 309,670 | 595,532 | 361,288 |
| SY40-DA-80-F40 | | 333,355 | 267,956 | 444,476 | 357,269 | 555,597 | 446,591 | - | - | - | - |
| SY48-DA-80-F48 | 1,106,340 | - | - | - | - | 653,646 | 396,540 | 784,380 | 475,852 | 915,106 | 555,163 |
| SY48-DA-90-F48 | | - | - | 661,815 | 401,497 | 827,262 | 501,891 | 992,718 | 602,240 | 1,158,174 | 702,617 |
| SY48-DA-100-F48 | | 612,799 | 371,758 | 817,066 | 495,695 | 1,021,332 | 619,606 | - | - | - | - |
| SY60-DA-80-F60 | 2,212,685 | - | - | - | - | - | - | 1,058,913 | 642,405 | 1,235,397 | 749,473 |
| SY60-DA-90-F60 | | - | - | 893,457 | 542,029 | 1,116,814 | 677,534 | 1,340,181 | 813,039 | 1,563,547 | 948,544 |
| SY60-DA-100-F60 | | 827,271 | 501,873 | 1,103,034 | 669,170 | 1,378,788 | 836,458 | 1,654,550 | 1,003,755 | 1,930,304 | 1,171,043 |
| SY60-DA-110-F60 | | 1,000,993 | 607,268 | 1,334,667 | 809,693 | 1,668,331 | 1,012,119 | 2,001,995 | 1,214,580 | 2,335,660 | 1,416,961 |

# CRANE® Electric Actuators Overview

## CRANE® Electric Actuators

With nearly maintenance-free operation, the CRANE® 44000 electric actuator is ideal for small to medium diameter valves in high frequency applications. These actuators allow precise positioning of the valve and provide modulating service as well as on/off. Maintenance is simplified because no lubrication service or changing of brakes is required. The CRANE® 44000 actuator mounts directly to Center Line® valves and mounting to Flowseal valves is accomplished by using a separate mount kit.

### Features

❶ Compact and lightweight
❷ Available for on/off or modulating duty
❸ Self-locking final reduction worm gear holds last position if power is lost
❹ Valve position indicator built into actuator
❺ Maintenance-free design
❻ Instantaneous motion stop circuit (modulating version) eliminates hunting and overrun and guarantees 250 steps over entire 90° range
❼ All circuitry encapsulated to protect against moisture, heat and vibration

### Common Specifications

**Power:** 24 VAC / 120 VAC / 240 VAC
**Temperature:** -13°F to +131°F (-25°C to +55°C)
**Housing:** NEMA 4/4X
**Speed Range:** 13-50 sec./90° (depending on model)
**Condensation Protection:** Space heater equipped

### On/Off Model Specifications

**Torque Range:** 347 in-lb to 17,360 in-lb
**Duty Rating:** 50-100% (depending on model)

### Modulating Model Specifications

**Torque Range:** 347 in-lb to 17,360 in-lb
**Output Shaft Resolution:** Over 1/250 for 0°-90° (Max. 1/400)
**Duty Rating:** 50-100% (depending on model)

### Standards

**Quality Assurance:** ISO 9001
**Electrical Safety:** CSA C/US and CE
**Enclosure:** UL50 Type-4, 4X

### Instrumentation Options

Limit Switches
Extra Positioner 4-20 MA

CRANE

# Series 44000 On/Off Rotary Electric Actuators

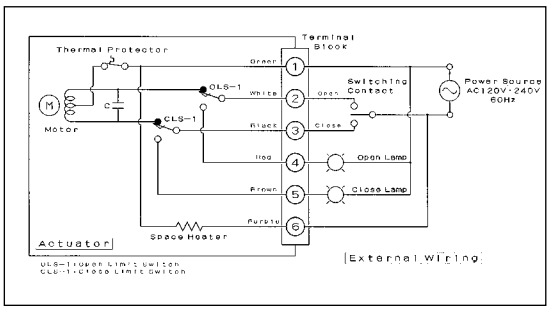
**Basic Actuator:**

- Torque Output Range - 347 lb.in. to 17,359 lb.in.
- Housing - NEMA 4X, watertight, corrosion-resistant, robust aluminum die-casting
- Electric Monitor - 120 VAC, single phase, 60 Hz totally enclosed, non-ventilated high starting torque, reversible induction type, Class E insulation
- Thermal Overload Motor Protection - auto reset thermal switches embedded in the motor windings trip when the maximum winding temperature limit is exceeded
- Position Limit Switches - 2 x SPDT for Open and Close travel limit are easily adjustable, and cam-operated
- Position Indicator - mechanical dial type with highly visible yellow graduated indicator
- Space Heater - in the controls compartment
- Terminal Strip - refer to wiring diagrams for details
- Conduit Entry - 1 x ½" NPT
- Power Gears - alloy steel spur gears to final stage aluminum bronze worm sector gear
- Brake - an electro-mechanical brake is NOT required. The worm gear drive prevents back driving and hunting
- Bearings - high quality alloy steel sleeve and ball bearings
- Manual Override - direct acting detachable handle
- Adjustable Mechanical Travel Stops
- Mounting Attitude - suitable for any attitude mounting
- Ambient Temperature Range - minus 13°F to +131°F (-25°C to +55°C)
- Valve Mounting - directly to Center Line® Valves, Series 200, 225, and 250 without brackets or drive adapters
- Certification and Approvals - CSA-C/US, NEMA 4, 4X

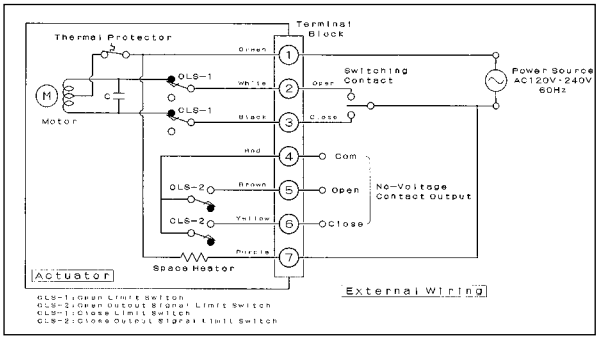
**Optional Features:**

- 240 VAC/1/50-60Hz power
- 24 VDC 44005 through 44300
- 24 VAC/1/50-60Hz 44005 through 44300
- 2 x SPDT Auxiliary Switches
- Torque Limit Switches for Open and Close directions of travel (44005 Close directions only)
- Feedback Potentiometer - 500 ohm, 135 ohm, 1K ohm
- Feedback Transmitter - 4-20 mA DC 44200-44900
- Declutchable Handwheel Override 44200 and 44300
- Speed controller for slower travel speed 44200-44900

## 44000 (On/Off) Standard Wiring




## 44000 (On/Off) With Open/Close Contact Output



## Center Line® Actuator Selection Guide (Applies to Series 200 Center Line® Butterfly Valves)

| Size | Differential Pressure (psi) | | | | |
|---|---|---|---|---|---|
| | 50 | 75 | 100 | 150 | 200 |
| 2 | 44005-05A | N/A | 44005-05A | | |
| 2 ½ | | | | | |
| 3 | | | | | |
| 4 | 44200-10A | | 44200-10A | | |
| 5 | 44200-10B | | 44200-10B | | |
| 6 | | | 44200-10B | 44300-20A | |
| 8 | 44300-20B | | | | |
| 10 | 44400-20C | | | | |
| 12 | 44400-20D | 44300-20D | 44400-20D | 44600-60A | |
| 14 | 44400-20D | | 44600-60A | | N/A |
| 16 | 44600M-60B | | 44700-60B | | |
| 18 | 44700-60C | | | 44800-60C | |
| 20 | 44800-60D | 44700-60D | 44800-60D | | |
| 24 | N/A | 44800-200A | N/A | | |

## Modulating Service

| Size | Differential Pressure (psi) | | | | |
|---|---|---|---|---|---|
| | 50 | 75 | 100 | 150 | 200 |
| 2 | 44010M-10C | N/A | 44010M-10C | | |
| 2 ½ | | | | | |
| 3 | | | | | |
| 4 | 44010M-10A | | 44010M-10A | | 44200M-10A |
| 5 | 44200M-10B | | 44200M-10B | | |
| 6 | | | 44200M-10B | 44300M-20A | |
| 8 | 44300M-20B | | | | |
| 10 | 44400M-20C | | | | |
| 12 | 44400M-20D | | | 44700M-60A | |
| 14 | 44400M-20D | | | 44700M-60A | N/A |
| 16 | 44700M-60B | | | | |
| 18 | 44700M-60C | 44700M-60B | 44800M-60C | | |
| 20 | 44800M-60D | 44700M-60D | 44800M-60D | | |
| 24 | N/A | 44800M-60E | N/A | | |

Please consult factory for "dry" service (non-lubricating, dry gas media).

CRANE

# Instrumentation Overview

**Limit Switches**

CLS Series

- Economical Resin Housing (CCR Series)
- Stainless or Epoxy Coated Aluminum (CCA Series)
- Explosion Proof Housing (CXA Series)
- Visual and Remote Indication
- 2-wire ASi Interface
- NEMA 4, 4X Class I Division 2
- ATEX, Cenelec, UL and CUL Certifications
- Mechanical or Inductive Proximity Switches
- Wireless, Dribble Control Options


**Positioners**

C100 Series

- Single Cast Aluminum Housing for All Types
  - – Pneumatic (C100P)
  - – Electro-pneumatic (C100E)
  - – Explosion Proof (C100EX)
- Powder-polyester Coated Housing
- Stainless Steel, Retained Fasteners
- NEMA 4X and IP66 Protection
- Available Drives: NAMUR, ½" Square and Others
- Maintenance-friendly Pilot Valve
- Simple Calibration – External Zero Adjustment
- D400 Digital Positioner
- D400 IS
- D400 EX


**Solenoids**

- 3-way
- 4-way
- UL Listed
- FM Approved/Cenelec
- NEMA - Water Tight Types 1, 2, 3, 3.5, 4, and 4X
- Explosion Proof and Water Tight Types 3, 4, 4X, 6, 6P, 7 and 9
  Voltage AC/DC

## CCR Series

The CCR Series Limit Switch provides a compact design and the most economical solution for both visual and remote electrical indication of rotary valve/actuator position. Integral NAMUR mounting legs provide additional cost savings by eliminating the need for a separate mounting bracket. The CCR Series Limit Switch is designed for use in NEMA 4x weather proof applications and also intrinsically safe applications.

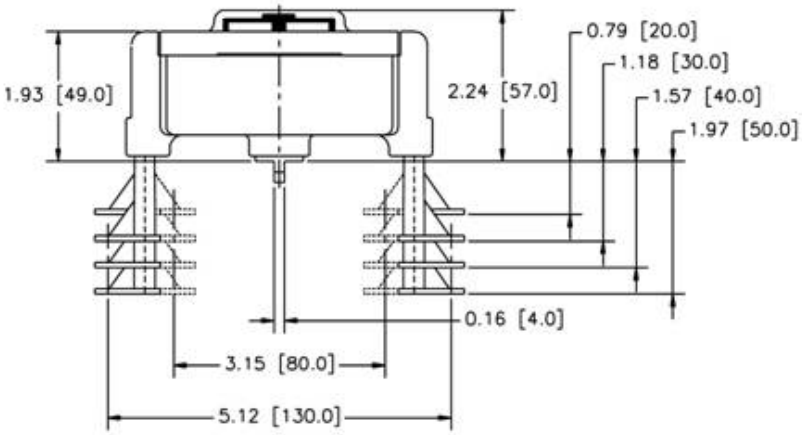
### Features:

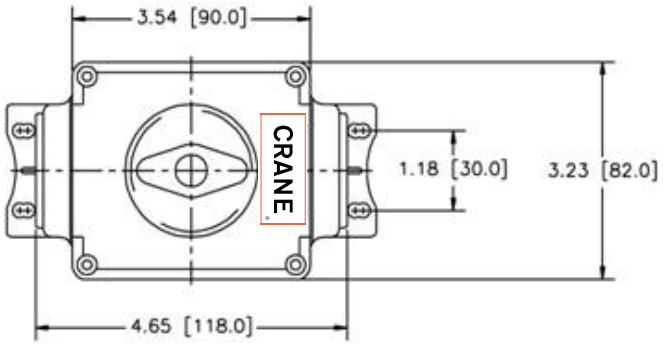
- Engineered resin housing
- 3D position indicator
- Designed for use in NEMA 4, 4x environments
- General purpose and intrinsically safe options
- Mechanical or inductive switches

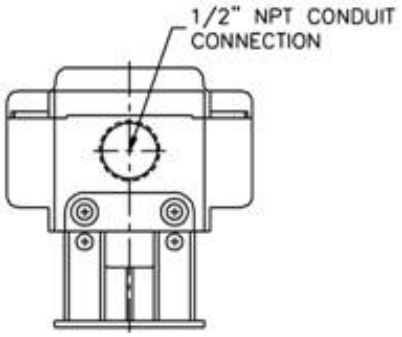
### Materials of Construction:

| DESCRIPTION | MATERIAL |
|---|---|
| Housing | Reinforced Noryl |
| NAMUR Mounting Legs | Reinforced Noryl |
| Shaft | Stainless Steel |
| Cam/Splines | UV Resistant Polycarbonate |
| Housing Cover | UV Resistant Polycarbonate |
| Terminal Block | Stainless Steel screws & PVC housing |
| Internal Brackets | Polycarbonate |
| Fasteners | Stainless Steel |
| Temperature Range | +14°F to +176°F (-10°C to +80°C) |
| Weight | 0.5 lbs. |
| Approvals | IP65 waterproof |

### Dimensional Specifications inches [mm]:



## CCR Series: (Example on page 13 CCR-01-1-H)

**SWITCH TYPE**
01 – Mechanical SPDT
03 – Mechanical SPDT (gold plated contacts)
70 – Proximity V3 P&F NJ2-V3-N
71 – Proximity V3 P&F NBB2-V3-US
73 – Proximity V3 P&F NBB2-V3-E2

**RATING** (see note)
5 amp @ 250VAC, 0.5amp @ 24VDC, resistive/inductive
0.1 amp @ 120VAC, resistive
2-wire, NAMUR Output, 15mA max, not amplified
2-wire, 5 to 200mA, 20 to 140 volts (AC or DC)
3-wire, PNP, 5 to 100mA @ 30VDC, Amplified

**SWITCH QUANTITY**
1 – One Switch
2 – Two Switch

**TERMINAL STRIP**
H – Standard Circuit Board Strip (6 Poles)

**Note:** The recommended minimum load for switch type 01, is 50mA. All other switch types are suitable for applications as low as 1mA.

# Limit Switches Conventional with Multiple Options

## CCA Series


The CCA Series Limit Switch provides a compact design and low cost for both visual and remote electrical indication of rotary valve/actuator position. The wide variety of options make the CCA Series the ideal multi-purpose Limit Switch for use in NEMA 4X general purpose applications. Hermetically sealed and solid state switch options also make the CCA series suitable for use in intrinsically safe applications and Class I & II Division 2 Groups A, B, C, D, F & G hazardous applications.

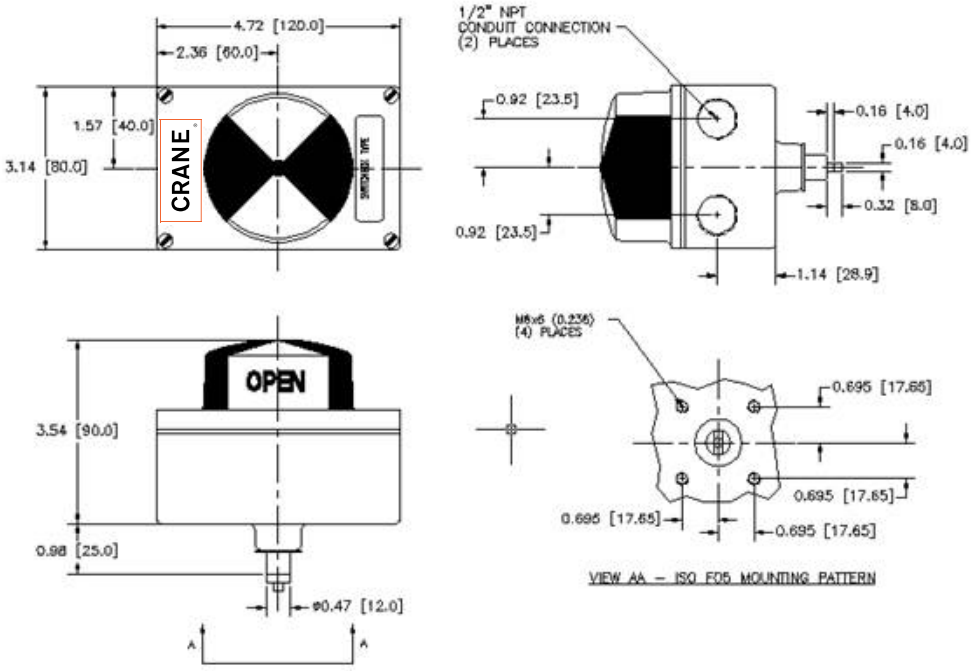
### Features:

- Epoxy coated aluminum or stainless steel housing
- 3D, Disk, or No position indicator
- NEMA 4, 4x, Class I Division 2 & intrinsically safe
- Mechanical, proximity or inductive switches
- World's first wireless option
- Three position dribble control option
- 4 to 20 mA feedback transmitter option
- Actuator Sensor interface option

### Materials of Construction:

| DESCRIPTION | MATERIAL |
|---|---|
| Housing | Aluminum – Polyester Coated or Stainless Steel |
| Cover | Polycarbonate, Aluminum or Stainless Steel |
| Shaft | Stainless Steel |
| Cam/Splines | UV Resistant Polycarbonate |
| 3D Rotor | UV Resistant Polycarbonate |
| Terminal Block | Stainless Steel screws & PVC housing |
| Internal Brackets | Stainless Steel |
| Fasteners | Stainless Steel |
| Temperature Range | -40°F to +176°F (-40°C to +80°C)<br>-14°F to +212°F (-26°C to +100°C) for P&F switches only. Low and High temperature versions also available |
| Weight | 1.25 lbs. |
| Enclosure Approvals | UL and CUL, NEMA 4,4X also CENELEC IP65 |
| Switch Approvals | **Mechanical Switches:** are suitable for general purpose applications. Gold plated versions can also be used on intrinsically safe applications.<br>**Proximity Switches:** are suitable for intrinsically safe applications and also hazardous locations<br>Class I & II Division 2 Groups A, B, C, D, F & G |

### Dimensional Specifications inches [mm]:



## CCA Series: (Example on page 15 CCA-B-14-2-1-0-E)

**VISUAL POSITION INDICATION**

A – Aluminum cover with no position indicator
B – Polycarbonate cover with 3D indicator
C – Aluminum cover with Disk indicator
F – Metallic cover with 3D indicator
L – Polycarbonate cover & three-way 3D indicator ('L' Port)
T – Polycarbonate cover & three-way 3D indicator ('T' Port)

| SWITCH TYPE | RATING (see note) |
|---|---|
| 01 – Mechanical SPDT | 5 amp @ 250VAC, 0.5amp @ 24VDC, resistive/inductive |
| 03 – Mechanical SPDT (gold plated contacts) | 0.1 amp @ 120VAC, resistive |
| 05 – Mechanical DPDT | 5 amp @ 250VAC, ¼ HP @ 125VAC, resistive/inductive |
| 10 – Proximity SPST | 0.25 amp @ 120VAC, 0.7amp @ 42VAC, resistive |
| 13 – Proximity SPST, Bifurcated | 1.5 amp @ 120VAC, 0.55amp @ 24VDC, resistive/inductive |
| 14 – Proximity SPDT (standard) | 0.25 amp @ 120VAC, 0.416amp @ 48VDC, resistive |
| 16 – Proximity DPDT | 0.25 amp @ 120VAC, 0.416amp @ 48VDC, resistive |
| 70 – Proximity V3 P&F NJ2-V3-N | 2-wire, NAMUR Output, 15mA max, not amplified |
| 71 – Proximity V3 P&F NBB2-V3-US | 2-wire, 5 to 200mA, 20 to 140 volts (AC or DC) |
| 73 – Proximity V3 P&F NBB2-V3-E2 | 3-wire, PNP, 5 to 100mA @ 30VDC, Amplified |
| 82 – Three-way pneumatic valve | |
| AS – AS-interface | Two inputs plus one 100 mA output |
| DC – Mechanical SPDT | 3-postion control, no position indication, for DA actuator<br>Same switch rating as type 01 |
| DD – Mechanical SPDT | Dribble control, no position indication, for SR actuator<br>Same switch rating as type 01 |
| MA – Transmitter plus two Mechanical SPDT switches | 4-20mA, 9-30 VDC plus switch rated same as type 01 |
| MX – Transmitter only | 4-20mA, 9-30 VDC |

**SWITCH QUANTITY**

0 – No Switches (use with 'MX' option)
1 – One Switch
2 – Two Switches
3 – Three Switches (only available with switch types 01 & 03)

**TERMINAL STRIP**

0 – Standard Circuit Board Strip
1 – Standard AS-i Terminal Connections
2 – Blue Circuit Board Strip (10 poles)
5 – 1/8" Pneumatic Connections

**COLOR/COATING**

0 – Black Housing Polyester Powder Coated (Standard)
S – Stainless Steel

**CABLE ENTRY/CONNECTION & OPTIONS**

E – Two ½" NPT
F – M12 Connector ('AS' option only)
HA – 5 watt heater (120VAC)
HD – 5 watt heater (24VDC)

**Note:** The recommended minimum load for switch type 01, TX and MA is 50mA. All other switch types are suitable for applications as low as 1mA.

# Limit Switches Explosion Proof

## CXA Series


The CXA Series hazardous location Limit Switch provides a compact design and low cost for both visual and remote electrical indication of rotary valve/actuator position. The heavy duty design and wide variety of options make the CXA Series the ideal multi-purpose Limit Switch for use in NEMA 4, 4X, 7 & 9 applications.

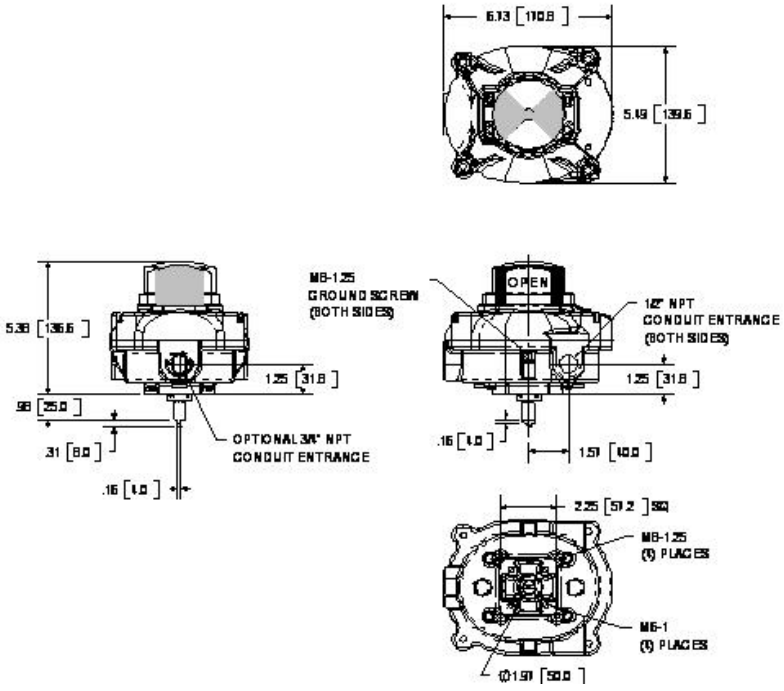
### Features:

- Epoxy coated aluminum housing
- 3D position indicator
- NEMA 4, 4x, 7 & 9
- Non-incentive and intrinsically safe options
- Mechanical, proximity or inductive switches
- Three position dribble control option
- 4 to 20 mA feedback transmitter option
- Actuator Sensor interface option

### Materials of Construction:

| DESCRIPTION | MATERIAL |
|---|---|
| Housing | Aluminum – Polyester Powder Coated |
| Cover | Aluminum – Polyester Powder Coated |
| Shaft | Stainless Steel |
| Cam/Splines | Thermo-resistant ABS |
| 3D Rotor | UV Resistant Polycarbonate |
| Terminal Block | Stainless Steel screws & PVC housing |
| Internal Brackets | Stainless Steel |
| Fasteners | Stainless Steel |
| Temperature Range | -40°F to +176°F (-40°C to +80°C)<br>-14°F to +212°F (-26°C to +100°C) for P&F switches only<br>Low and High temperature versions also available |
| Weight | 3.5 lbs. |
| Enclosure Approvals | UL and CUL, NEMA 4, 4X, 7 & 9 also CENELEC IP65 & 67 |
| Switch Approvals | **Mechanical Switches:** are suitable for Class I & II Division 1 Groups C, D, E, F & G. Gold plated versions can also be used on intrinsically safe applications.<br>**Proximity Switches:** are suitable for intrinsically safe applications and also hazardous locations<br>Class I & II Division 1 Groups C, D, E, F & G<br>Class I & II Division 2 Groups A, B, C, D, F & G |

### Dimensional Specifications inches [mm]:



## CXA Series: (Example on page 17 CXA-B-14-2-1-0-G)

**VISUAL POSITION INDICATION**

B – 3D
L – Three-way 3D indicator ('L' Port)
T – Three-way 3D indicator ('T' Port)
Z – Three-way 3D indicator ('T' Port, blocked center)

| SWITCH TYPE | RATING (see note) |
|---|---|
| 01 – Mechanical SPDT | 5 amp @ 250VAC, 0.5amp @ 24VDC, resistive/inductive |
| 03 – Mechanical SPDT (gold plated contacts) | 0.1 amp @ 120VAC, resistive |
| 05 – Mechanical DPDT | 5 amp @ 250VAC, ¼ HP @ 125VAC, resistive/inductive |
| 10 – Proximity SPST | 0.25 amp @ 120VAC, 0.7amp @ 42VAC, resistive |
| 13 – Proximity SPST, Bifurcated | 1.5 amp @ 120VAC, 0.55amp @ 24VDC, resistive/inductive |
| 14 – Proximity SPDT (standard) | 0.25 amp @ 120VAC, 0.416amp @ 48VDC, resistive |
| 16 – Proximity DPDT | 0.25 amp @ 120VAC, 0.416amp @ 48VDC, resistive |
| 70 – Proximity V3 P&F NJ2-V3-N | 2-wire, NAMUR Output, 15mA max, not amplified |
| 71 – Proximity V3 P&F NBB2-V3-US | 2-wire, 5 to 200mA, 20 to 140 volts (AC or DC) |
| 73 – Proximity V3 P&F NBB2-V3-E2 | 3-wire, PNP, 5 to 100mA @ 30VDC, Amplified |
| AS – AS-interface | Two inputs plus one 100mA output |
| DA – Mechanical Two DPDT plus Two SPDT | 3-position control + position feedback, for double acting actuator<br>Same switch rating as type 01 |
| DB – Mechanical Two DPDT plus Two SPDT | 3-position control + position feedback, for spring return actuator<br>Same switch rating as type 01 |
| DC – Mechanical SPDT | 3-position control, no position indication, for double acting actuator<br>Same switch rating as type 01 |
| DD – Mechanical SPDT | Dribble control, no position indication, for spring return actuator<br>Same switch rating as type 01 |
| MA – Transmitter plus two Mechanical SPDT switches | 4-20mA, 9-30 VDC plus switch rated same as type 01 |
| MX – Transmitter only | 4-20mA, 9-30 VDC |

**SWITCH QUANTITY**

0 – No Switches (use with MX option)
1 – One Switch
2 – Two Switches
3 – Three Switches
4 – Four Switches

**TERMINAL STRIP**

0 – Standard Circuit Board Strip (12 poles)
1 – Standard AS-i Terminal Connections

**COLOR/COATING**

0 – Black Housing Polyester Powder Coated

**CABLE ENTRY/CONNECTION & OPTIONS**

E – Two ½" NPT
F – M12 Connector ('AS' option only)
G – Two ½" NPT plus one ¾" NPT
HA – 5 watt heater (120VAC)
HD – 5 watt heater (24VDC)

**Note:** The recommended minimum load for switch type 01 and switch type 05 is 50mA. All other switch types are suitable for applications as low as 1mA.

# Limit Switch Options

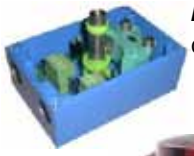
## All Models:

**Mechanical switches** offer the most economical choice for general-purpose applications. Available in many contact configurations.

**Proximity switches** are hermetically sealed to provide maximum environmental protection and extended cycle life. Bifurcated versions can be used effectively on both high and low current applications. Low current versions are available with optional LED.

**Inductive proximity switches,** Pepperl & Fuchs brand, are available in multiple configurations and are ideal for intrinsically safe applications.

## CCA Options:



**AS-i (Actuator Sensor interface)** option utilizes 2-wire digital communication to simplify wiring plus significantly reduce wiring and commissioning costs.

**3-Position and Dribble Control** is achieved by utilizing special cams and wiring. Dribble control units can also be provided with optional position feedback switches.

**Housings** are available in polyester powder coated aluminum or unpainted stainless steel. All housings have two ½" NPT conduit entries.

**Housing Cover** options include a 3D high profile position indicator with a polycarbonate or aluminum housing cover, a low profile flat disk indicator or a low profile aluminum cover with no position indication.

**Feedback Transmitter** provides 4-20mA confirmation of valve/actuator position. The transmitter option can be used with or without limit switches.

## CXA Options:

**AS-i (Actuator Sensor interface)** option utilizes 2-wire digital communication to simplify wiring plus significantly reduce wiring and commissioning costs.

**3-Position and Dribble Control** is achieved by utilizing special cams and wiring. Dribble control units can also be provided with optional position feedback switches.

**Feedback Transmitter** provides 4-20mA confirmation of valve/actuator position. The transmitter option can be used with or without limit switches.

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# Positioners Technical Specificiations C100P and C100E

| Specifications | C100P | C100E |
|---|---|---|
| Input range | 3-15 PSI (20-100kPa) | 4-20 mA ($R_1$<250 ohms) |
| Supply pressure | <145 PSI (<1MPa) | 21.8-145 PSI (0.15-1MPa) |
| Linearity error | <0.7% f.s. | <1.0% f.s. |
| Hysteresis | <0.4% f.s. | <0.6% f.s. |
| Repeatability | <0.3% f.s. | <0.5% f.s. |

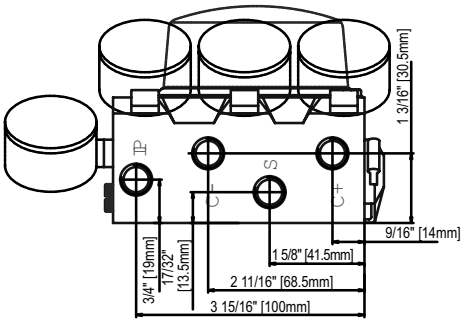
| Specifications | Air Capacity | Bleed Rate | |
|---|---|---|---|
| | C100P/C100E SCFM | C100P SCFM | C100E SCFM |
| @29 PSI (200kPa) | 9.5 | 0.18 | 0.2 |
| @87 PSI (600kPa) | 28.3 | 0.53 | 0.6 |
| @145 PSI (1MPa) | 47.1 | 0.88 | 1.0 |

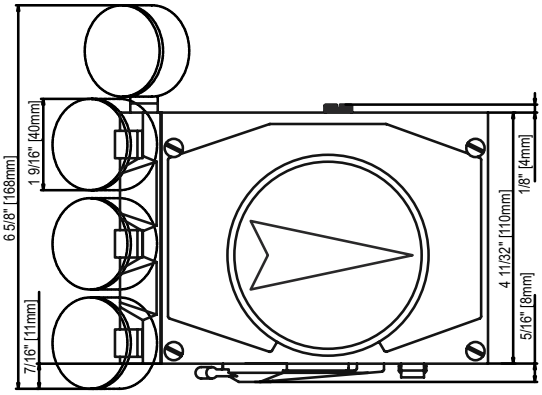
**Weight:** C100P 3.5 lbs (1.6kg), C100E 3.8 lbs (1.7kg)
**Temp range:** -40ºF to 185ºF
**Air connectors:** Positioner ¼" NPT
**Gauges:** 1/8" NPT
**Cable entry:** ½" NPT
**Ingress & corrosion protection:**
NEMA 4X and IP66—Powder Polyester Coated

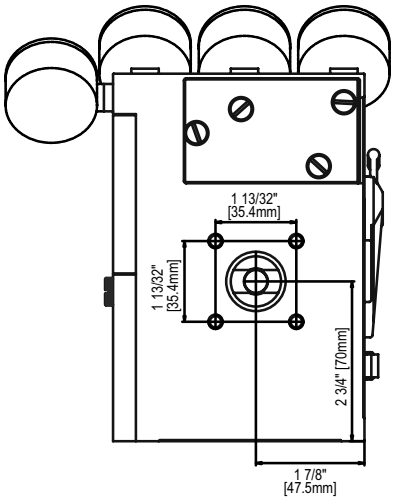
## Ordering Codes

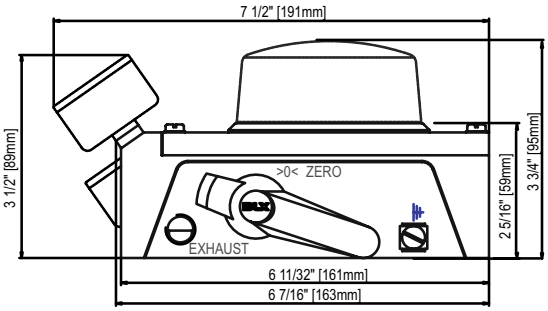
| Positioner | Type | Drive | Indicator | Cam |
|---|---|---|---|---|
| C100 | **P** Pneumatic<br>**E** Electropneumatic<br>**EX** Explosion Proof<br>**FF** Fail Freeze<br>**IS** Intrinsically Safe | **D1** Namur<br>**D2** ½" square<br>(others available) | **A** arrow<br>**B** beacon | **C1** Standard-90°<br>(others available) |

**Example: C100E-D1-B-C1** Electropneumatic positioner, with Namur drive, beacon indicator, and standard 90° cam.



# Positioners Technical Specifications C100EX - Explosion Proof

| Specifications | C100EX |
|---|---|
| Input range | 4-20 mA ($R_1$<250 ohms) |
| Supply pressure | 30-145 PSI (0.2-1MPa) |
| Linearity error | <1.0% f.s. |
| Hysteresis | <0.6% f.s. |
| Repeatability | <0.5% f.s. |

| Specifications | Air Capacity | Bleed Rate |
|---|---|---|
| | SCFM | SCFM |
| @29 PSI (200kPa) | 9.5 | 0.2 |
| @87 PSI (600kPa) | 28.3 | 0.6 |
| @145 PSI (1MPa) | 47.1 | 1.0 |

## Ordering Codes

| Positioner | Type | Drive | Indicator | Cam |
|---|---|---|---|---|
| C100 | **P** Pneumatic<br>**E** Electropneumatic<br>**EX** Explosion Proof<br>**FF** Fail Freeze<br>**IS** Intrinsically Safe | **D1** Namur<br>**D2** ½" square<br>(others available) | **A** arrow<br>**B** beacon | **C1** Standard-90°<br>(others available) |

**Example: C100EX-D1-A-C1** Electropneumatic explosion proof, namur drive, arrow indicator, and standard 90° cam.

**Weight:** 4.9 lbs (2.2kg)
**Temp range:** Depending on electrical rating
**Product rating:** -40°F to +185°F
**Air connections:** Positioner ¼" NPT
**Gauges:** 1/8" NPT
**Cable entry:** ½" NPT
**Ingress & corrosion protection:**
NEMA 4X and 1P66—Powder Polyester Coated

**Approvals**
Ratings for hazardous locations:

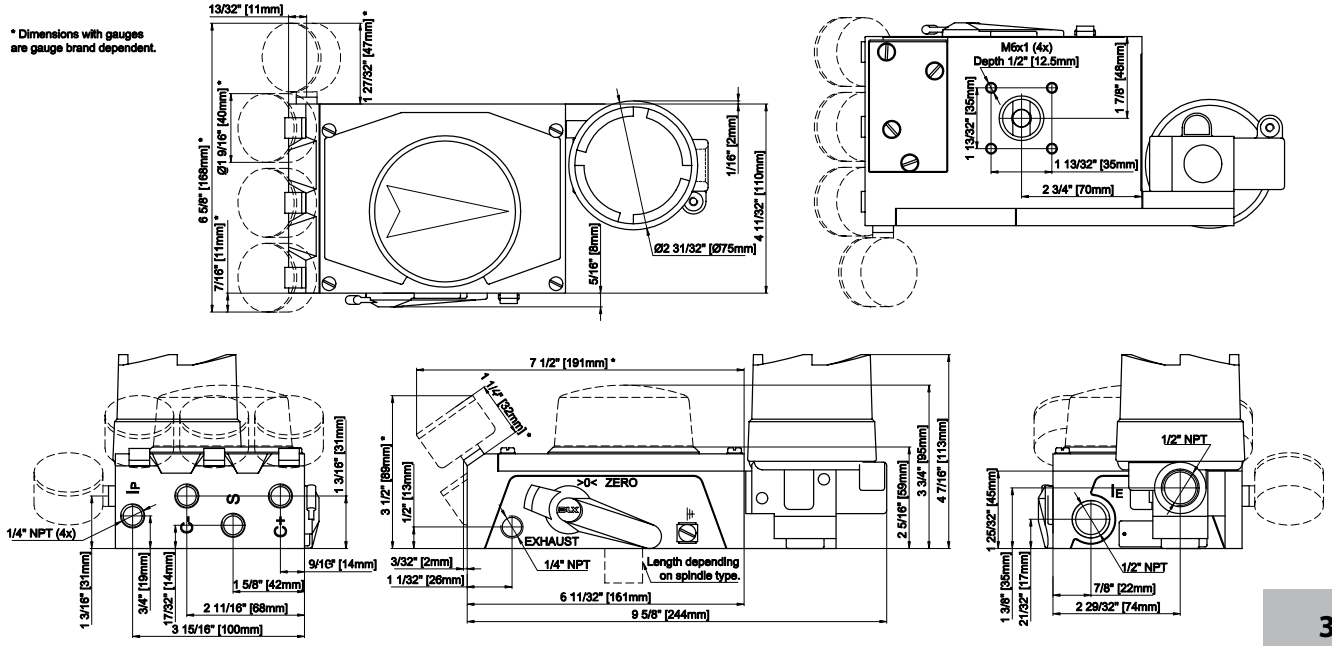
**CENELEC**
Instrinsically safe: EEx ia IIC T4/T5/T6
Flameproof: EEx d IIC T4/T5/T6

**British Standard**
Non incendive: Ex N II T6 for Zone 2

**FM**
Intrinsically safe: CL I-II-III/Div. 1/Grp A B C D E F G
Non incendive: CL I/Div. 2/Grp A B C
Explosion proof: CL I/Div. 1/Grp B C D
CL I II III/Div. 1/Grp E F G

**CSA**
Intrinsically safe: CL I/Div. 1/Grp A B C D
CL II/Div. 1/Grp E F G
CL III
CL I/Div. 2/Grp A B C D
CL II/Div. 2/Grp E F G

Explosion proof: CL I/Div. 1/Grp B C D
CL II/Div. 1/Grp E F G



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