Patent No. : (ZL201210050534. 6)

ALLTORQUE® CE Ex

Patent No. : (ZL201210050534. 6)

## Model Guide

DFA25 - 350 - S - 5 - P - HY - FC

1. Actuator Size : DFA 16 ~ DFA35
2. Cylinder Size : 300 ~ 700
3. Actuator Type : DA-Double Acting,
   S-Spring Return
4. Spring Module Working Pressure : 4/5 bar, 5/6bar
5. Working Temp. : P ~Normal Temp. NBR O-ring
   P1~High Temp. VITON O-ring
   P2~Low Temp. SILICONE O-ring
6. Accessories : HW-Jack Screw Manual Override
   EX-Extend Travel Stop
   HY-Hydraulic Manual Override
7. Air failure position(Single Action Only):
   FC–Failure Close
   FO–Failure Open

# DFA Series Scotch Yoke Pneumatic Actuator

## (Spring module Output torque adjustable)




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# Advantages

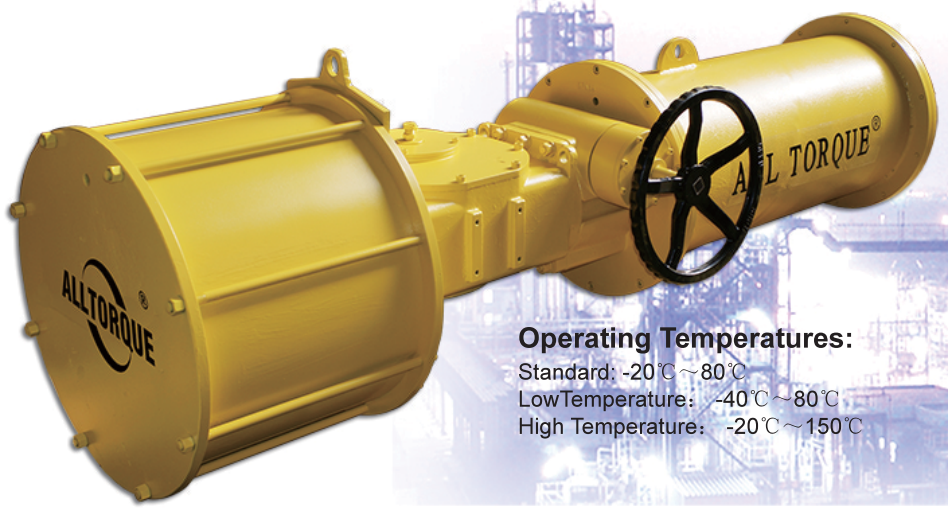
## Water Ingress Protected
O-rings are fitted on bodies,caps and so on,this ensure water ingress protected.

## ISO Valve Mounting
The DFA Series actuators interface meets ISO standard,and meets the dimensional requirements of ISO defined for each torque range.

## Standardization
The shaft driven accessory interface conforms to NUMAR and is identical on all DFA Series,allowing standardization of accessory mounting hardware and installation practices.

## Wear Resistant
The guide rod and piston rod have an advanced surface treatment,which combined with self-lubricating bearings,provides superior wear resistance and extends the life of all sliding components.

## High Efficiency
The piston rod and guide block connection superior surface finishes and self-lubricating bearings maximize input energy transfer directly to the valve stem,efficiency is further enhanced by the tension-loaded spring ,minimizing radial loads on the piston rod.




## Operating Temperatures:
Standard: -20℃～80℃
LowTemperature： -40℃～80℃
High Temperature： -20℃～150℃

Spring module Output torque adjustable



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## Distinguished Characteristics
Patented spring module, output torque adjustable， Springs replaceable，fit different type of valve's torque.

## Corrosion Resistant
The DFA series actuators incorporate over three stages of internal and external coatings to resist severe weather,chemical and petroleum environments. The inner surface of cylinder is coated by PTFE,enhanced corrosion resistant and self-lubricating.

## Modular Design
DFA series actuators have available,field-serviceable drive,power,spring and override modules,the modules are removable,serviceable and interchangeable when mounted to the valve. Modules are available for separate purchase to reduce spare parts inventory.

## Safe Spring Module
To ensure the safety of personnel during installlation and maintenance,the spring module has been designed so that it can only be removed from the power module with the spring in the fully extended position. This prevents accidental release of the spring force, protecting personnel from injury and the actuator from accidental damage.

## Torque outputs(guaranteed)
Double acting: 1,417-31,640Nm
Spring return end torques:1,700-9,725Nm

## Operating Pressures
Pneumatic:3-7Bar
Hydraulic:100Bar(Over 100bar hydraulic pressure is available upon request)

Spring module Output torque adjustable

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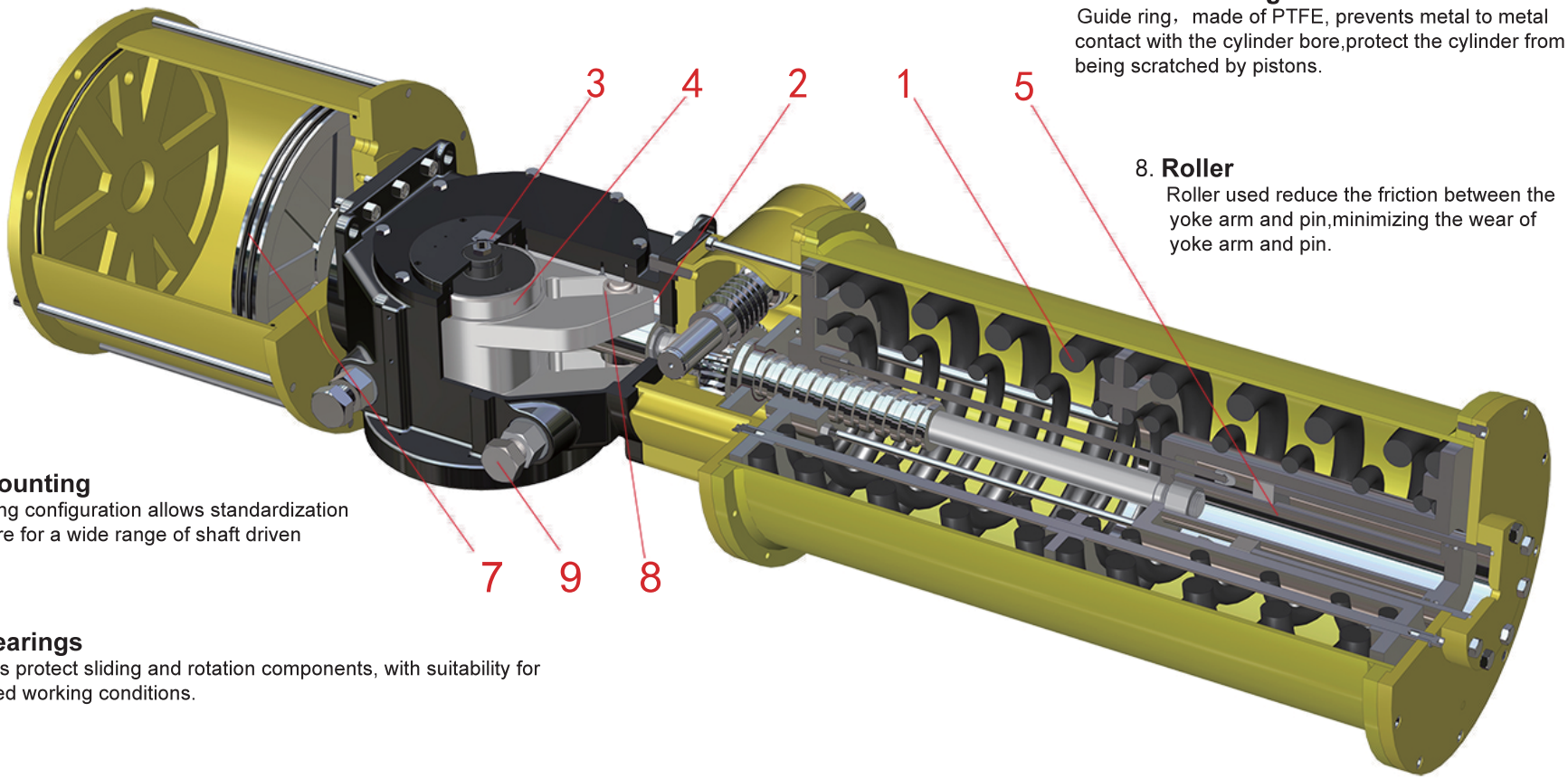
## Design Features Offer Unique Benefits

1. **Precompressed spring unit**
Precompressed spring unit easy to exchange, to ensure safe operation.

2. **Reduced Wear**
Connects the piston rod with the guide block,compensating for side load deflection and reducing wear on rod,bearings and seals.

6. **Easy lifting**
DFA series actuators equipped with lifting eyes for safe actuator handing during shipping,installation and removal.

7. **PTFE Guide Ring**
Guide ring， made of PTFE, prevents metal to metal contact with the cylinder bore,protect the cylinder from being scratched by pistons.




8. **Roller**
Roller used reduce the friction between the yoke arm and pin,minimizing the wear of yoke arm and pin.

3. **Standardized Mounting**
The NAMUR mounting configuration allows standardization of mounting hardware for a wide range of shaft driven accessories.

4. **Replaceable Bearings**
Replaceable Bearings protect sliding and rotation components, with suitability for either dry or lubricated working conditions.

5. **Hydraulic Overrides for Spring Module**
Inside hydraulic override cylinder module for spring-return models does not increase actuator length.

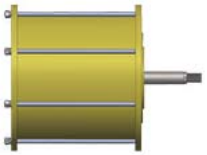
9. 80°-100° Traval Adjustment
Bi-Directional Travel Stops integral to the actuator, the stops allow 80°-100°total travel adjustment.


Spring module Output torque adjustable ④

## Modular Versatility



Blind End Cap



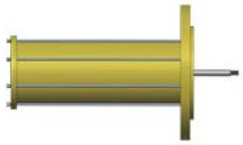


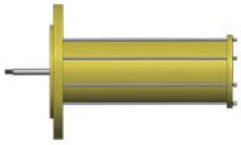
Spring exchangeable

Pneumatic Power Module



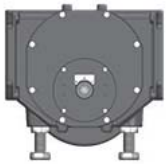
Spring Module with Patented Adjustable Output Torque and Integral Override gear operator.

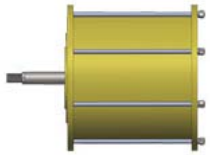




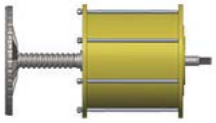
Hydraulic Power Module or Override for Hydaulic Actuators Module

Hydraulic Power Module or Override for Hydaulic Actuators Module





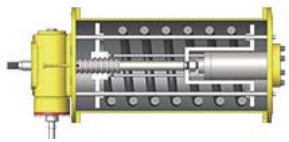
Pneumatic Power Module





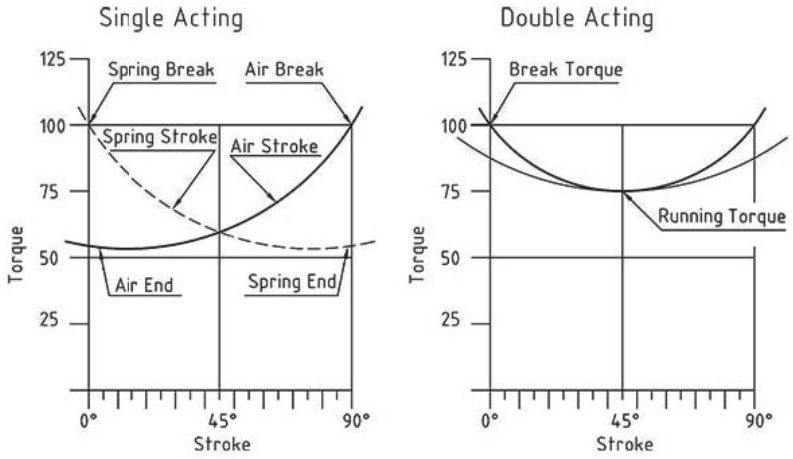
Spring Module with Patented Adjustable Output Torque

Pneumatic Power Module with Extended Travel Stops

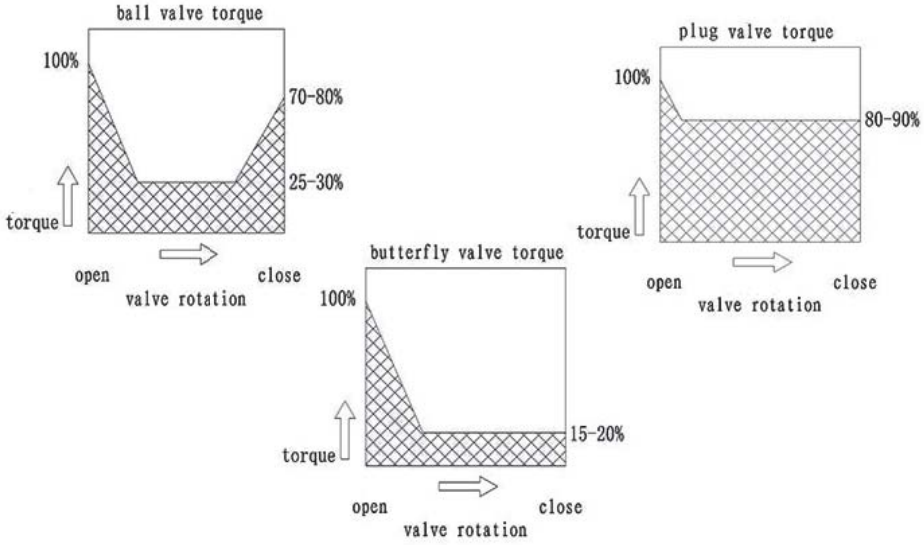


Spring Module with Patented Adjustable Output Torque and Integral Override Hydraulic Cylinder

## Torque Characteristics




Ball Valve,Butterfly Valve,Plug Valve Torque Characteristics

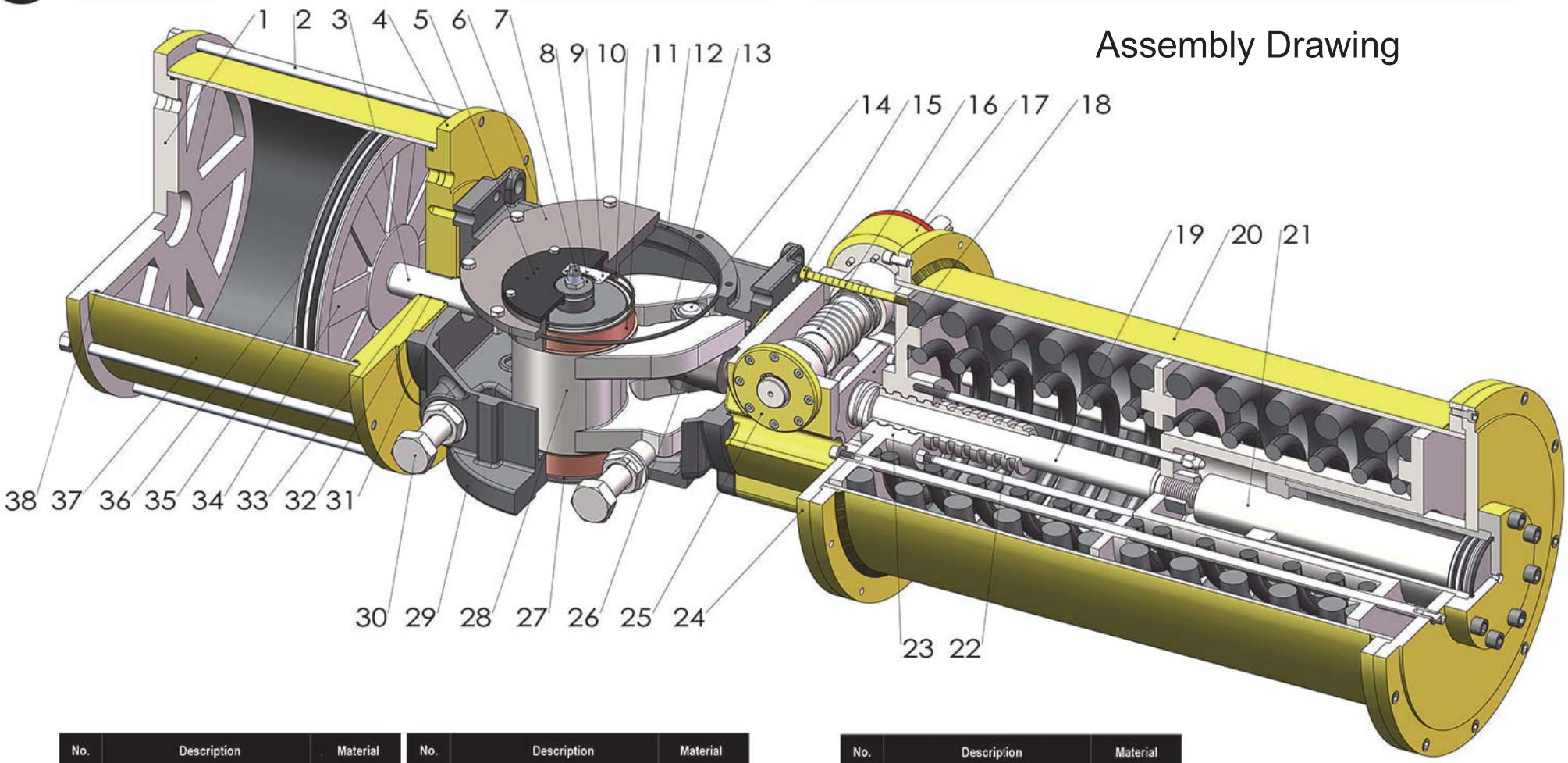





Spring module Output torque adjustable 

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## Assembly Drawing




| No. | Description | Material |
|---|---|---|
| 1 | Cylinder End Cap | QT500-7 |
| 2 | Stud | C45 |
| 3 | Piston Rod | Alloy Steel |
| 4 | Cylinder End Cap | QT500-7 |
| 5 | Up Cover | HT200 |
| 6 | Cover | QT500-7 |
| 7 | Indicator shaft | C45 |
| 8 | Small Cover | HT200 |
| 9 | Indicator Board | Al |
| 10 | O-ring | NBR |

| No. | Description | Material |
|---|---|---|
| 11 | Bearing | H62 |
| 12 | O-ring | NBR |
| 13 | Roller | GCr15 |
| 14 | Pin | GCr15 |
| 15 | torque indicator pin | 45 |
| 16 | Worm | 45 |
| 17 | Energy Saving Unit | / |
| 18 | Supporting Seat | 45 |
| 19 | Tension Rod | 45 |
| 20 | Spring Module | / |

| No. | Description | Material |
|---|---|---|
| 21 | Hydraulic Module | / |
| 22 | Lead Screw | C45 |
| 23 | Spring Seat | C45 |
| 24 | End Cap | Carbon Steel |
| 25 | End Cap | C45 |
| 26 | Guide Block | QT500-7 |
| 27 | O-ring | NBR |
| 28 | Yoke | Carbon Steel |
| 29 | Body | Carbon Steel |
| 30 | Ajust Bolt | C45+Ni |

| No. | Description | Material |
|---|---|---|
| 31 | Circlip | 65Mn |
| 32 | Bearing | H62 |
| 33 | O-ring | NBR |
| 34 | Piston | Carbon Steel |
| 35 | O-ring | NBR |
| 36 | Guide Ring | PTFE |
| 37 | Cylinder | C20 |
| 38 | O-ring | NBR |

## Torque Sheet

Spring Return Acting （Air Pressure 3bar） N.m

| Model | Max Torque of Drive Module | Spring break | Spring end | Air break | Air end |
|---|---|---|---|---|---|
| DFA16-250 | 4,000 | 1,010 | 673 | 961 | 640 |
| DFA16-300 | | 1,436 | 957 | 1,366 | 911 |
| DFA16-350 | | 1,937 | 1,292 | 1,843 | 1,229 |
| DFA25-350 | 8,000 | 2,445 | 1,630 | 2,326 | 1,551 |
| DFA25-400 | | 3,151 | 2,100 | 2,997 | 1,998 |
| DFA25-450 | | 3,945 | 2,630 | 3,753 | 2,502 |
| DFA30-450 | 16,000 | 4,836 | 3,224 | 4,600 | 3,067 |
| DFA30-500 | | 5,919 | 3,946 | 5,630 | 3,753 |
| DFA30-550 | | 7,112 | 4,742 | 6,766 | 4,510 |
| DFA35-550 | 32,000 | 9,226 | 6,151 | 8,776 | 5,851 |
| DFA35-600 | | 10,916 | 7,277 | 10,383 | 6,922 |
| DFA35-700 | | 14,721 | 9,814 | 14,003 | 9,335 |

Spring Return Acting （Air Pressure 4bar） N.m

| Model | Max Torque of Drive Module | Spring break | Spring end | Air break | Air end |
|---|---|---|---|---|---|
| DFA16-250 | 4,000 | 1,347 | 898 | 1,281 | 854 |
| DFA16-300 | | 1,915 | 1,277 | 1,822 | 1,214 |
| DFA16-350 | | 2,583 | 1,722 | 2,457 | 1,638 |
| DFA25-350 | 8,000 | 3,260 | 2,173 | 3,101 | 2,067 |
| DFA25-400 | | 4,201 | 2,801 | 3,996 | 2,664 |
| DFA25-450 | | 5,261 | 3,508 | 5,005 | 3,336 |
| DFA30-450 | 16,000 | 6,448 | 4,298 | 6,133 | 4,089 |
| DFA30-500 | | 7,892 | 5,262 | 7,507 | 5,005 |
| DFA30-550 | | 9,483 | 6,322 | 9,021 | 6,014 |
| DFA35-550 | 32,000 | 12,085 | 8,057 | 11,496 | 7,664 |
| DFA35-600 | | 14,299 | 9,533 | 13,601 | 9,068 |
| DFA35-700 | | 19,283 | 12,856 | 18,343 | 12,228 |

*Note: The output torque of the patented spring module is adjustable within a certain torque range.
Please contact our Sales Representative if you need more details.

Spring Return Acting （Air Pressure 5bar） N.m

| Model | Max Torque of Drive Module | Spring break | Spring end | Air break | Air end |
|---|---|---|---|---|---|
| DFA16-250 | 4,000 | 1,684 | 1,123 | 1,602 | 1,068 |
| DFA16-300 | | 2,394 | 1,596 | 2,277 | 1,518 |
| DFA16-350 | | 3,229 | 2,153 | 3,071 | 2,048 |
| DFA25-350 | 8,000 | 4,076 | 2,717 | 3,877 | 2,585 |
| DFA25-400 | | 5,251 | 3,501 | 4,995 | 3,330 |
| DFA25-450 | | 6,576 | 4,384 | 6,255 | 4,170 |
| DFA30-450 | 16,000 | 8,059 | 5,373 | 7,666 | 5,111 |
| DFA30-500 | | 9,865 | 6,577 | 9,384 | 6,256 |
| DFA30-550 | | 11,854 | 7,903 | 11,276 | 7,517 |
| DFA35-550 | 32,000 | 15,376 | 10,251 | 14,626 | 9,751 |
| DFA35-600 | | 18,192 | 12,128 | 17,305 | 11,537 |
| DFA35-700 | | 24,535 | 16,357 | 23,338 | 15,559 |

Spring Return Acting （Air Pressure 6bar） N.m

| Model | Max Torque of Drive Module | Spring break | Spring end | Air break | Air end |
|---|---|---|---|---|---|
| DFA16-250 | 4,000 | 2,021 | 1,347 | 1,922 | 1,282 |
| DFA16-300 | | 2,873 | 1,916 | 2,733 | 1,822 |
| DFA16-350 | | 3,875 | 2,583 | 3,686 | 2,457 |
| DFA25-350 | 8,000 | 4,891 | 3,261 | 4,653 | 3,102 |
| DFA25-400 | | 6,302 | 4,201 | 5,994 | 3,996 |
| DFA25-450 | | 7,892 | 5,261 | 7,507 | 5,004 |
| DFA30-450 | 16,000 | 9,671 | 6,448 | 9,200 | 6,133 |
| DFA30-500 | | 11,839 | 7,893 | 11,261 | 7,508 |
| DFA30-550 | | 14,225 | 9,483 | 13,531 | 9,021 |
| DFA35-550 | 32,000 | 18,128 | 12,086 | 17,244 | 11,496 |
| DFA35-600 | | 21,448 | 14,299 | 20,402 | 13,601 |
| DFA35-700 | | 28,925 | 19,284 | 27,514 | 18,343 |

## Torque Sheet

双作用型 Double Acting　　N.m

| Model | Max Torque of Drive Module | Air Pressure | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3Bar | | 4 Bar | | 5 Bar | | 6 Bar | | 7 Bar | |
| | | Break | Run | Break | Run | Break | Run | Break | Run | Break | Run |
| DFA16-250DA | 4,000 | 1,642 | 977 | 2,190 | 1,302 | 2,738 | 1,628 | 3,286 | 1,954 | 3,834 | 2,279 |
| DFA16-300DA | | 2,335 | 1,388 | 3,114 | 1,852 | 3,893 | 2,315 | - | - | - | - |
| DFA16-350DA | | 3,150 | 1,873 | 4,200 | 2,497 | - | - | - | - | - | - |
| DFA25-350DA | 8,000 | 3,976 | 2,349 | 5,301 | 3,133 | 6,627 | 3,917 | 7,953 | 4,700 | - | - |
| DFA25-400DA | | 5,123 | 3,027 | 6,831 | 4,037 | 8,539 | 5,047 | - | - | - | - |
| DFA25-450DA | | 6,415 | 3,791 | 8,555 | 5,055 | - | - | - | - | - | - |
| DFA30-450DA | 16,000 | 7,863 | 4,651 | 10,484 | 6,203 | 13,104 | 7,753 | 15,726 | 9,304 | - | - |
| DFA30-500DA | | 9,624 | 5,694 | 12,833 | 7,593 | 16,041 | 9,491 | - | - | - | - |
| DFA30-550DA | | 11,565 | 6,842 | 15,420 | 9,123 | - | - | - | - | - | - |
| DFA35-550DA | 32,000 | 15,002 | 8,904 | 19,651 | 11,752 | 25,002 | 14,839 | 29,477 | 17,630 | 35,004 | 20,775 |
| DFA35-600DA | | 17,749 | 10,535 | 23,250 | 13,906 | 29,581 | 17,557 | 34,875 | 20,859 | - | - |
| DFA35-700DA | | 23,936 | 14,206 | 31,355 | 18,753 | - | - | - | - | - | - |

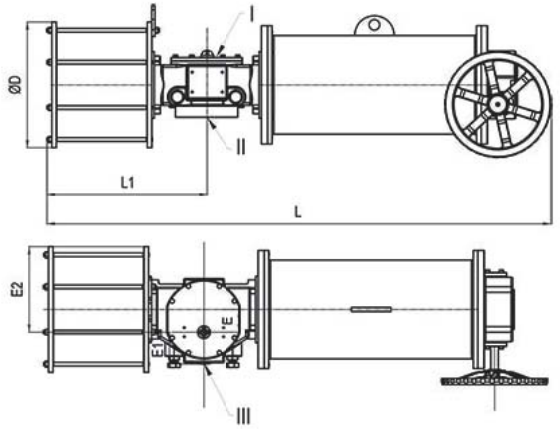
## Dimension

Metric Unit：mm

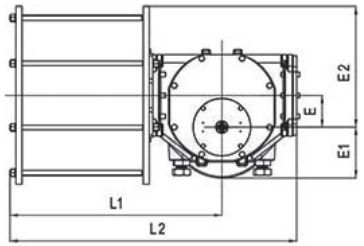
| MODEL | D | E | E1 | E2 | H | L1 | L2 | L | M | D1 | D2 | n | M1 | B | T | Air Connection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DFA16-250 | 310 | 75 | 105 | 230 | 107 | 507 | 682 | 1634 | M6 | 80 | 165 | 4 | M20 | 22 | 85.4 | RC 1/2 |
| DFA16-300 | 370 | 75 | 105 | 260 | 107 | 507 | 682 | 1634 | M6 | 80 | 165 | 4 | M20 | 22 | 85.4 | RC 1/2 |
| DFA16-350 | 420 | 75 | 105 | 285 | 107 | 507 | 682 | 1634 | M6 | 80 | 165 | 4 | M20 | 22 | 85.4 | RC 1/2 |
| DFA25-350 | 440 | 90 | 150 | 310 | 103 | 570 | 779 | 1862 | M6 | 100 | 254 | 8 | M16 | 28 | 106.4 | RC 1/2 |
| DFA25-400 | 490 | 90 | 150 | 335 | 103 | 570 | 779 | 1862 | M6 | 100 | 254 | 8 | M16 | 28 | 106.4 | RC 3/4 |
| DFA25-450 | 540 | 90 | 150 | 360 | 103 | 570 | 779 | 1862 | M6 | 100 | 254 | 8 | M16 | 28 | 106.4 | RC 3/4 |
| DFA30-450 | 540 | 110 | 176 | 380 | 137 | 700 | 947 | 1923 | M8 | 120 | 298 | 8 | M20 | 32 | 127.4 | RC 3/4 |
| DFA30-500 | 590 | 110 | 176 | 405 | 137 | 700 | 947 | 1923 | M8 | 120 | 298 | 8 | M20 | 32 | 127.4 | RC 3/4 |
| DFA30-550 | 650 | 110 | 176 | 435 | 137 | 700 | 947 | 1923 | M8 | 120 | 298 | 8 | M20 | 32 | 127.4 | RC 3/4 |
| DFA35-550 | 650 | 143 | 208 | 468 | 155 | 895 | 1205 | 2543 | M8 | 160 | 356 | 8 | M30 | 40 | 169.4 | RC 3/4 |
| DFA35-600 | 710 | 143 | 208 | 498 | 155 | 895 | 1205 | 2543 | M8 | 160 | 356 | 8 | M30 | 40 | 169.4 | RC 1 |
| DFA35-700 | 820 | 143 | 208 | 553 | 155 | 895 | 1205 | 2543 | M8 | 160 | 356 | 8 | M30 | 40 | 169.4 | RC 1 |

## Dimension

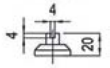
Spring Return DFA16/DFA25

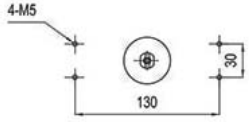



Double Acting

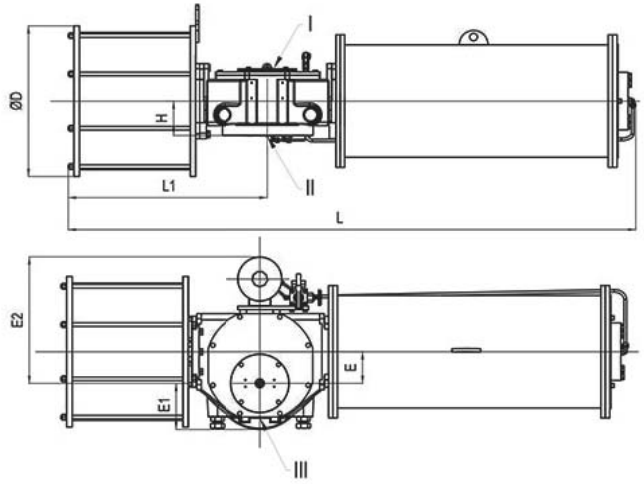



Detail I

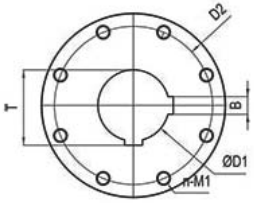



Spring Return DFA30/DFA35




Detail II




Detail III

