

## Actuators Series

Cartidge Cylinders  
Ø 6-16 mm



**CA - CAF Series**

Pg. 20.3

Mini Cylinders ISO 6432  
Ø 8-25 mm



**Mini Series**

Pg. 20.5

Mini Stainless Steel Cylinders  
ISO 6432 Ø 16-25 mm



**Mini Stainless Steel Series**

Pg. 20.13

Limited Space  
Ø 32-63 mm



**A95 Series**

Pg. 20.16

Compact Cylinders  
Ø 12-100 mm



**Q Series**

Pg. 20.23

ISO 15552 Cylinders  
Ø 32-125 mm



**L Series**

Pg. 20.36

ISO 6431 Cylinders  
Ø 160-320 mm



**E Series**

Pg. 20.45

Stainless Steel ISO 15552 Cylinders  
Ø 32-125 mm



**V Series**

Pg. 20.47

Twin Rod Cylinders  
Ø 32-100 mm



**NHA Series**

Pg. 20.50

Compact Cylinders ISO 21287  
Ø 20-100 mm



**W Series**

Pg. 20.54

Cylinder Accessories  
ISO 6431 - ISO 15552 - ISO 21287



**Accessories**

Pg. 20.62

Magnetic Poition Sensing Switches



**Sensor**

Pg. 20.72

## Rodless Actuators Series

Rodless Cylinders Standard Version



**S1 Series**

Pg. 20.78

Rodless Cylinder with Integrated  
Guides in Tecnopolymer



**S5 Series**

Pg. 20.87

Click here to view the **Actuators Series** on our Website



## PNEUMATIC ACTUATORS

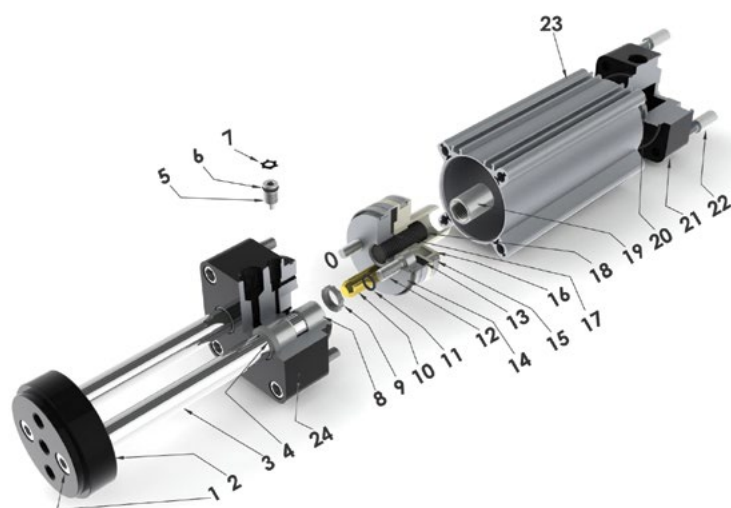


# Actuators Series

# SERIES NHA - TWIN ROD CYLINDER - ISO 15552



## TECHNICAL CHARACTERISTICS



## Component Parts and Materials

- 1 Galvanized steel fixing screw
- 2 Anodized aluminium tooling plate
- 3 Chromium plated steel or stainless steel piston rods
- 4 Polyurethane rod seal
- 5 Galvanized steel cushion adjustment screw
- 6 NBR o-ring
- 7 Steel elastic ring
- 8 Steel bearing
- 9 Polyurethane cushion seal
- 10 Brass cushion spear
- 11 NBR o-ring
- 12 Galvanized steel fixing screw
- 13 Bonded ferrite magnet
- 14 Aluminium front piston
- 15 Polyurethane piston seal
- 16 Acetal resin piston
- 17 NBR o-ring
- 18 Steel grub screw
- 19 Galvanized steel nut
- 20 Polyurethane cushion seal
- 21 Die-cast aluminium end cap
- 22 Galvanized steel fixing screw
- 23 Anodized aluminium tube
- 24 Die-cast aluminum end cap



## Reference Standard

1907/2006  
REACH ✓

2011/65/CE  
RoHS ✓

PED  
2014/68/UE

SILICON  
FREE

ATEX  
2014/34/UE



## Pressures

- 1 bar** (0.1 MPa) / 14.5 psi  
**10 bar** (0.7 MPa) / 145 psi



## Temperatures

- 0 °C** / 32 °F (-20 °C / -4 °F with dry air)  
**+ 80 °C** / 176 °F



## Media

Filtered and lubricated or non-lubricated compressed air.



## Functions

Double-acting cushioned magnetic.  
Single or through piston rod magnetic.



## Bores

**from 32 to 100 mm**



## Standard Strokes

**from 25 to 500 mm**  
Strokes on demand.

| Series                                                                                                                                                                                                  | Ø (mm)                                                            | Stroke (mm)                                                                                                                                                                                           | Mounting type                                                    | Special version                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------|
| <b>N H A</b>                                                                                                                                                                                            | <b>0 3 2</b>                                                      | <b>0 0 2 5</b>                                                                                                                                                                                        | <b>G</b>                                                         | <b>I S</b>                           |
| <p>▲ <b>NHA</b> Double acting - cushioned - magnetic</p> <p>▲ <b>NLA</b> Double acting - double rod cushioned magnetic</p> <p>▲ <b>NQA</b> Double acting - cushioned - magnetic with double rod end</p> | <p>032</p> <p>040</p> <p>050</p> <p>063</p> <p>080</p> <p>100</p> | <p>0025</p> <p>0050</p> <p>0080</p> <p>0100</p> <p>0125</p> <p>0160</p> <p>0200</p> <p>0250</p> <p>0320</p> <p>0350</p> <p>0400</p> <p>Intermediate or longer strokes are available upon request.</p> | <p><b>G</b> Anodized aluminium tube lobed profile with slots</p> | <p><b>IS</b> Stainless steel rod</p> |

| Ø (mm) | Stroke (mm) |    |    |     |     |     |     |     |     |     |     |     |
|--------|-------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|        | 25          | 50 | 80 | 100 | 125 | 160 | 200 | 250 | 320 | 350 | 400 | 500 |
| 32     | ▲           | ▲  | ▲  | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   |     |     |     |
| 40     | ▲           | ▲  | ▲  | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   |     |     |
| 50     | ▲           | ▲  | ▲  | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   |     |     |
| 63     | ▲           | ▲  | ▲  | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   |     |
| 80     | ▲           | ▲  | ▲  | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   |
| 100    | ▲           | ▲  | ▲  | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   | ▲   |



## FORCES AND AIR CONSUMPTION

### Extend and Retract Forces

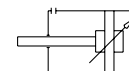
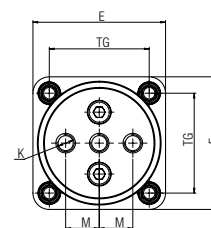
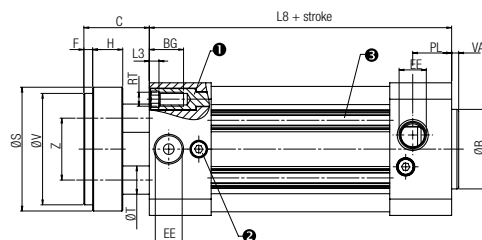
| Cylinder          | Piston Rod | Piston Area | Operating pressure |     |      |      |      |
|-------------------|------------|-------------|--------------------|-----|------|------|------|
| Ø                 | Ø          | mm²         | mm²                | bar |      |      |      |
|                   |            |             |                    | 1   | 2    | 3    | 4    |
| Output force<br>N |            |             |                    |     |      |      |      |
| 32                | 8          | 100.48      | Extend = 804       | 72  | 144  | 215  | 287  |
|                   |            |             | Retract = 703.52   | 54  | 108  | 161  | 215  |
| 40                | 10         | 157         | Extend = 1257      | 110 | 220  | 330  | 440  |
|                   |            |             | Retract = 1100     | 84  | 168  | 252  | 336  |
| 50                | 12         | 226.08      | Extend = 1963      | 175 | 350  | 526  | 701  |
|                   |            |             | Retract = 1736.92  | 135 | 270  | 404  | 539  |
| 63                | 16         | 401.92      | Extend = 3117      | 280 | 560  | 840  | 1120 |
|                   |            |             | Retract = 2715.08  | 206 | 413  | 619  | 826  |
| 80                | 20         | 628         | Extend = 5027      | 450 | 900  | 1350 | 1800 |
|                   |            |             | Retract = 4399     | 336 | 673  | 1009 | 1345 |
| 100               | 20         | 628         | Extend = 7854      | 700 | 1400 | 2100 | 2800 |
|                   |            |             | Retract = 7226     | 589 | 1177 | 1766 | 2355 |

### Air Consumption

| Cylinder                                       | Piston Rod | Piston Area | Operating pressure |       |       |       |       |
|------------------------------------------------|------------|-------------|--------------------|-------|-------|-------|-------|
| Ø                                              | Ø          | mm²         | mm²                | bar   |       |       |       |
|                                                |            |             |                    | 1     | 2     | 3     | 4     |
| Air consumption for each 10 mm of stroke<br>NI |            |             |                    |       |       |       |       |
| 32                                             | 8          | 100.48      | Extend = 804       | 0.016 | 0.032 | 0.048 | 0.064 |
|                                                |            |             | Retract = 703.52   | 0.012 | 0.024 | 0.036 | 0.048 |
| 40                                             | 10         | 157         | Extend = 1257      | 0.025 | 0.050 | 0.075 | 0.100 |
|                                                |            |             | Retract = 1100     | 0.019 | 0.038 | 0.057 | 0.075 |
| 50                                             | 12         | 226.08      | Extend = 1963      | 0.039 | 0.079 | 0.118 | 0.157 |
|                                                |            |             | Retract = 1736.92  | 0.030 | 0.060 | 0.091 | 0.121 |
| 63                                             | 16         | 401.92      | Extend = 3117      | 0.062 | 0.125 | 0.187 | 0.249 |
|                                                |            |             | Retract = 2715.08  | 0.046 | 0.092 | 0.139 | 0.185 |
| 80                                             | 20         | 628         | Extend = 5027      | 0.100 | 0.201 | 0.301 | 0.402 |
|                                                |            |             | Retract = 4399     | 0.075 | 0.151 | 0.226 | 0.301 |
| 100                                            | 20         | 628         | Extend = 7854      | 0.157 | 0.314 | 0.471 | 0.628 |
|                                                |            |             | Retract = 7226     | 0.132 | 0.264 | 0.396 | 0.528 |

## NHA

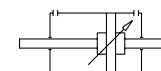
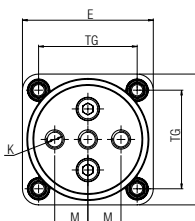
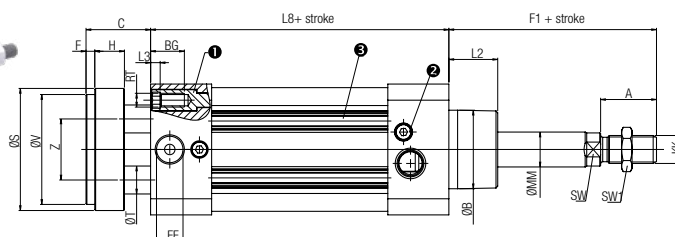
DOUBLE ACTING - CUSHIONED - MAGNETIC



| Ø   | ØB <sup>d11</sup> | C  | E   | F | H  | K   | M     | S   | T  | V   | Z  | F1 | VA | L2 | WH   | Ømm | SW | KK       | L8  | BG | RT  | E   | TG   | EE   | PL | L3 | ZM  |
|-----|-------------------|----|-----|---|----|-----|-------|-----|----|-----|----|----|----|----|------|-----|----|----------|-----|----|-----|-----|------|------|----|----|-----|
| 32  | 30                | 26 | 47  | 4 | 15 | M6  | 9.5   | 35  | 8  | 32  | 18 | 48 | 4  | 20 | 26   | 12  | 10 | M10X1.25 | 94  | 16 | M6  | 47  | 32.5 | G1/8 | 14 | 5  | 146 |
| 40  | 35                | 30 | 53  | 4 | 15 | M8  | 11.25 | 45  | 10 | 40  | 22 | 54 | 4  | 22 | 30   | 16  | 13 | M12X1.25 | 105 | 16 | M6  | 53  | 38   | G1/4 | 16 | 5  | 165 |
| 50  | 40                | 37 | 65  | 5 | 18 | M8  | 15    | 55  | 12 | 50  | 26 | 69 | 4  | 28 | 37   | 20  | 17 | M16X1.5  | 106 | 16 | M8  | 65  | 46.5 | G1/4 | 21 | 5  | 180 |
| 63  | 45                | 37 | 75  | 5 | 22 | M10 | 19    | 70  | 16 | 63  | 35 | 69 | 4  | 28 | 37   | 20  | 17 | M16X1.5  | 121 | 16 | M8  | 75  | 56.5 | G3/8 | 22 | 5  | 195 |
| 80  | 45                | 46 | 95  | 5 | 22 | M12 | 25    | 85  | 20 | 80  | 40 | 86 | 4  | 34 | 46   | 25  | 22 | M20X1.5  | 128 | 18 | M10 | 95  | 72   | G3/8 | 23 | 6  | 220 |
| 100 | 55                | 51 | 115 | 5 | 22 | M12 | 35    | 105 | 20 | 100 | 50 | 91 | 4  | 38 | 51.5 | 25  | 22 | M20X1.5  | 138 | 18 | M10 | 115 | 89   | G1/2 | 26 | 6  | 240 |

## NLA

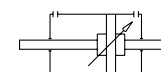
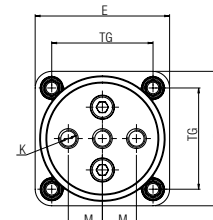
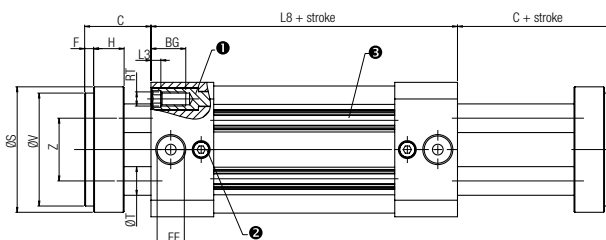
DOUBLE ACTING - DOUBLE ROD - CUSHIONED - MAGNETIC



| Ø   | A  | ØB <sup>d11</sup> | C  | E   | F | H  | K   | M     | S   | T  | V   | Z  | F1 | VA | L2 | WH   | Ømm | SW | KK       | L8  | BG | RT  | E   | TG   | EE   | PL | L3 | ZM  |
|-----|----|-------------------|----|-----|---|----|-----|-------|-----|----|-----|----|----|----|----|------|-----|----|----------|-----|----|-----|-----|------|------|----|----|-----|
| 32  | 22 | 30                | 26 | 47  | 4 | 15 | M6  | 9.5   | 35  | 8  | 32  | 18 | 50 | 4  | 20 | 26   | 12  | 10 | M10X1.25 | 94  | 16 | M6  | 47  | 32.5 | G1/8 | 14 | 5  | 146 |
| 40  | 24 | 35                | 30 | 53  | 4 | 15 | M8  | 11.25 | 45  | 10 | 40  | 22 | 54 | 4  | 22 | 30   | 16  | 13 | M12X1.25 | 105 | 16 | M6  | 53  | 38   | G1/4 | 16 | 5  | 165 |
| 50  | 32 | 40                | 37 | 65  | 5 | 18 | M8  | 15    | 55  | 12 | 50  | 26 | 69 | 4  | 28 | 37   | 20  | 17 | M16X1.5  | 106 | 16 | M8  | 65  | 46.5 | G1/4 | 21 | 5  | 180 |
| 63  | 32 | 45                | 37 | 75  | 5 | 22 | M10 | 19    | 70  | 16 | 63  | 35 | 69 | 4  | 28 | 37   | 20  | 17 | M16X1.5  | 121 | 16 | M8  | 75  | 56.5 | G3/8 | 22 | 5  | 195 |
| 80  | 40 | 45                | 46 | 95  | 5 | 22 | M12 | 25    | 85  | 20 | 80  | 40 | 86 | 4  | 34 | 46   | 25  | 22 | M20X1.5  | 128 | 18 | M10 | 95  | 72   | G3/8 | 23 | 6  | 220 |
| 100 | 40 | 55                | 51 | 115 | 5 | 22 | M12 | 35    | 105 | 20 | 100 | 50 | 91 | 4  | 38 | 51.5 | 25  | 22 | M20X1.5  | 138 | 18 | M10 | 115 | 89   | G1/2 | 26 | 6  | 240 |

## NQA

DOUBLE ACTING - CUSHIONED - MAGNETIC WITH DOUBLE ROD ENDS



| Ø   | ØB <sup>d11</sup> | C  | E   | F | H  | K   | M     | S   | T  | V   | Z  | F1 | VA | L2 | WH   | Ømm | SW | KK       | L8  | BG | RT  | E   | TG   | EE   | PL | L3 | ZM  |
|-----|-------------------|----|-----|---|----|-----|-------|-----|----|-----|----|----|----|----|------|-----|----|----------|-----|----|-----|-----|------|------|----|----|-----|
| 32  | 30                | 26 | 47  | 4 | 15 | M6  | 9.5   | 35  | 8  | 32  | 18 | 48 | 4  | 20 | 26   | 12  | 10 | M10X1.25 | 94  | 16 | M6  | 47  | 32.5 | G1/8 | 14 | 5  | 146 |
| 40  | 35                | 30 | 53  | 4 | 15 | M8  | 11.25 | 45  | 10 | 40  | 22 | 54 | 4  | 22 | 30   | 16  | 13 | M12X1.25 | 105 | 16 | M6  | 53  | 38   | G1/4 | 16 | 5  | 165 |
| 50  | 40                | 37 | 65  | 5 | 18 | M8  | 15    | 55  | 12 | 50  | 26 | 69 | 4  | 28 | 37   | 20  | 17 | M16X1.5  | 106 | 16 | M8  | 65  | 46.5 | G1/4 | 21 | 5  | 180 |
| 63  | 45                | 37 | 75  | 5 | 22 | M10 | 19    | 70  | 16 | 63  | 35 | 69 | 4  | 28 | 37   | 20  | 17 | M16X1.5  | 121 | 16 | M8  | 75  | 56.5 | G3/8 | 22 | 5  | 195 |
| 80  | 45                | 46 | 95  | 5 | 22 | M12 | 25    | 85  | 20 | 80  | 40 | 86 | 4  | 34 | 46   | 25  | 22 | M20X1.5  | 128 | 18 | M10 | 95  | 72   | G3/8 | 23 | 6  | 220 |
| 100 | 55                | 51 | 115 | 5 | 22 | M12 | 35    | 105 | 20 | 100 | 50 | 91 | 4  | 38 | 51.5 | 25  | 22 | M20X1.5  | 138 | 18 | M10 | 115 | 89   | G1/2 | 26 | 6  | 240 |

KEY

① = Socket head screw with female thread for mounting attachments.

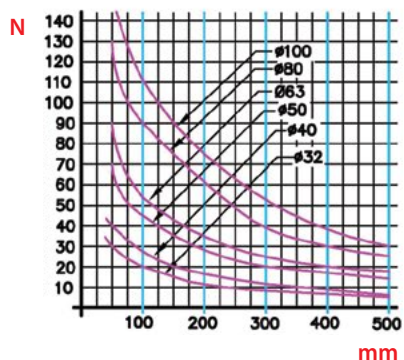
② = Adjustment screw for adjustable end-position cushioning.

③ = Slot for proximity sensor.

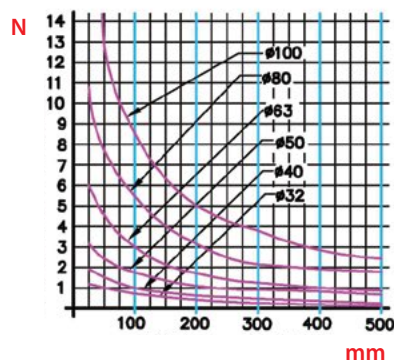
**NHA CYLINDER LOAD CHARTS**



**Transverse Moment**



**Torsional Moment**



**N**

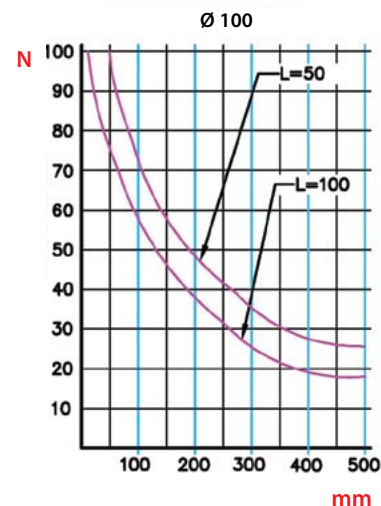
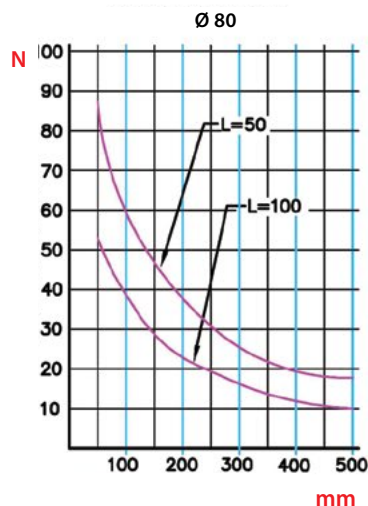
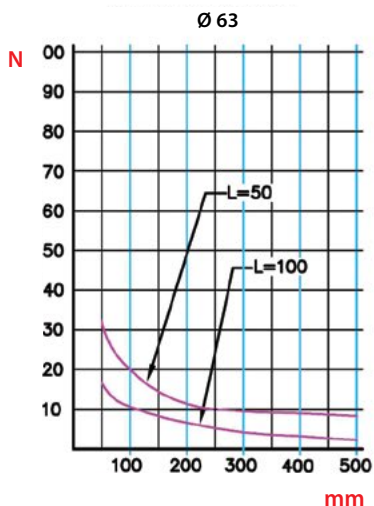
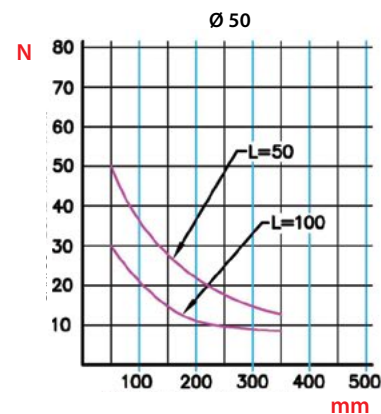
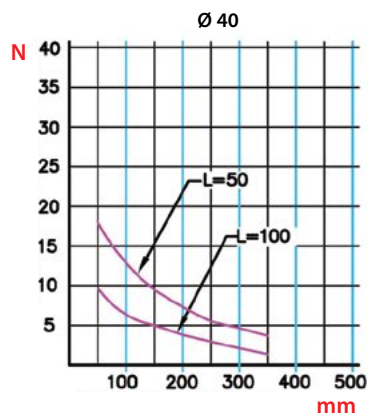
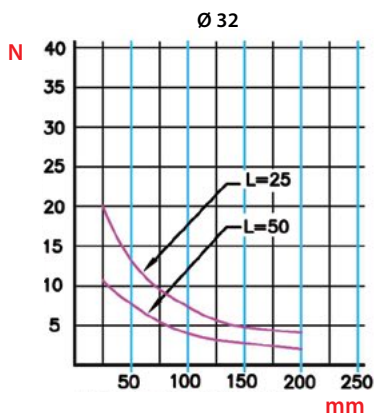
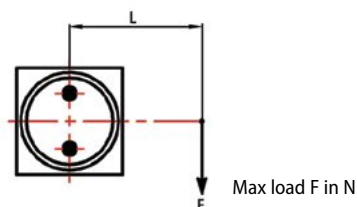
Max admitted load

**mm**

Stroke



**Maximum Transverse and Torsional Loads by bore**





## FORCES, SPRING LOADS AND AIR CONSUMPTION

Compatible for Series E - V - N - L

### Extend and Retract Forces

| Cylinder<br>Ø     | Piston Rod<br>Ø | Piston Area<br>mm <sup>2</sup> | Operating pressure |       |       |       |       |       |       |       |       |       |
|-------------------|-----------------|--------------------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                   |                 |                                | bar                |       |       |       |       |       |       |       |       |       |
|                   |                 |                                | 1                  | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
| Output force<br>N |                 |                                |                    |       |       |       |       |       |       |       |       |       |
| 32                | 12              | Extend = 804                   | 72                 | 144   | 216   | 288   | 360   | 432   | 504   | 576   | 648   | 720   |
|                   |                 | Retract = 691                  | 62                 | 124   | 186   | 248   | 310   | 372   | 434   | 496   | 558   | 620   |
| 40                | 16              | Extend = 1257                  | 110                | 220   | 330   | 440   | 550   | 660   | 770   | 880   | 990   | 1100  |
|                   |                 | Retract = 1056                 | 95                 | 190   | 285   | 380   | 475   | 570   | 665   | 760   | 855   | 950   |
| 50                | 20              | Extend = 1963                  | 175                | 350   | 525   | 700   | 875   | 1050  | 1225  | 1400  | 1575  | 1750  |
|                   |                 | Retract = 1649                 | 148                | 296   | 444   | 592   | 740   | 888   | 1036  | 1184  | 1332  | 1480  |
| 63                | 20              | Extend = 3117                  | 280                | 560   | 840   | 1120  | 1400  | 1680  | 1960  | 2240  | 2520  | 2800  |
|                   |                 | Retract = 2803                 | 250                | 500   | 750   | 1000  | 1250  | 1500  | 1750  | 2000  | 2250  | 2500  |
| 80                | 25              | Extend = 5027                  | 450                | 900   | 1350  | 1800  | 2250  | 2700  | 3150  | 3600  | 4050  | 4500  |
|                   |                 | Retract = 4536                 | 405                | 810   | 1215  | 1620  | 2025  | 2430  | 2835  | 3240  | 3645  | 4050  |
| 100               | 25              | Extend = 7854                  | 700                | 1400  | 2100  | 2800  | 3500  | 4200  | 4900  | 5650  | 6360  | 7000  |
|                   |                 | Retract = 7363                 | 660                | 1320  | 1980  | 2640  | 3300  | 3960  | 4620  | 5280  | 5940  | 6600  |
| 125               | 32              | Extend = 12270                 | 1104               | 2208  | 3312  | 4416  | 5520  | 6624  | 7728  | 8832  | 9936  | 11040 |
|                   |                 | Retract = 11468                | 1032               | 2064  | 3096  | 4128  | 5160  | 6192  | 7224  | 8256  | 9288  | 10320 |
| 160               | 40              | Extend = 20096                 | 1774               | 3548  | 5322  | 7097  | 8871  | 10645 | 12419 | 14194 | 15968 | 17742 |
|                   |                 | Retract = 18840                | 1663               | 3326  | 4990  | 6653  | 8316  | 9980  | 11643 | 13307 | 14970 | 16633 |
| 200               | 40              | Extend = 31440                 | 2772               | 5544  | 8316  | 11089 | 13861 | 16633 | 19406 | 22178 | 24950 | 27723 |
|                   |                 | Retract = 30144                | 2661               | 5322  | 7984  | 10645 | 13307 | 15968 | 18629 | 21291 | 23952 | 26614 |
| 250               | 50              | Extend = 48750                 | 4331               | 8663  | 12995 | 17326 | 21658 | 25990 | 30322 | 34653 | 38985 | 43317 |
|                   |                 | Retract = 46800                | 4158               | 8316  | 12475 | 16663 | 20792 | 24950 | 29109 | 33267 | 37426 | 41584 |
| 320               | 63              | Extend = 78872                 | 7097               | 14194 | 21291 | 28388 | 35485 | 42582 | 49679 | 56776 | 63873 | 70971 |
|                   |                 | Retract = 76776                | 6822               | 13644 | 20466 | 27288 | 34110 | 40932 | 47754 | 54576 | 61398 | 68220 |

### Spring Loads

| Cylinder          |                           | Spring load |     | Stroke (mm) |      |      |
|-------------------|---------------------------|-------------|-----|-------------|------|------|
| Ø                 |                           | 25          | 50  | 75          | 80   | 100  |
| Output force<br>N |                           |             |     |             |      |      |
| 32                | Load of spring at rest    | 50          | 41  | 33          | 31.5 | 24.5 |
|                   | Load of compressed spring | 58          | 58  | 58          | 58   | 58   |
| 40                | Load of spring at rest    | 52          | 43  | 34          | 32   | 25   |
|                   | Load of compressed spring | 61          | 61  | 61          | 61   | 61   |
| 50                | Load of spring at rest    | 92          | 77  | 64          | 60   | 49   |
|                   | Load of compressed spring | 110         | 110 | 110         | 110  | 110  |
| 63                | Load of spring at rest    | 92          | 77  | 64          | 60   | 49   |
|                   | Load of compressed spring | 110         | 110 | 110         | 110  | 110  |
| 80                | Load of spring at rest    | 117         | 98  | 79          | 75   | 59   |
|                   | Load of compressed spring | 138         | 138 | 138         | 138  | 138  |
| 100               | Load of spring at rest    | 117         | 98  | 79          | 75   | 59   |
|                   | Load of compressed spring | 138         | 138 | 138         | 138  | 138  |

## Air Consumption

| Cylinder                                 | Piston Rod | Piston Area     | Operating pressure |       |       |       |       |       |       |       |       |       |
|------------------------------------------|------------|-----------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ø                                        | Ø          | mm²             | bar                |       |       |       |       |       |       |       |       |       |
|                                          |            |                 | 1                  | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
| Air consumption for each 10 mm of stroke |            |                 |                    |       |       |       |       |       |       |       |       |       |
| NI                                       |            |                 |                    |       |       |       |       |       |       |       |       |       |
| 32                                       | 12         | Extend = 804    | 0.016              | 0.024 | 0.032 | 0.040 | 0.048 | 0.056 | 0.064 | 0.072 | 0.080 | 0.088 |
|                                          |            | Retract = 691   | 0.014              | 0.021 | 0.028 | 0.035 | 0.041 | 0.048 | 0.055 | 0.062 | 0.069 | 0.076 |
| 40                                       | 16         | Extend = 1257   | 0.025              | 0.038 | 0.050 | 0.063 | 0.075 | 0.088 | 0.101 | 0.113 | 0.126 | 0.138 |
|                                          |            | Retract = 1056  | 0.021              | 0.032 | 0.042 | 0.053 | 0.063 | 0.074 | 0.084 | 0.095 | 0.106 | 0.116 |
| 50                                       | 20         | Extend = 1963   | 0.039              | 0.059 | 0.079 | 0.098 | 0.118 | 0.137 | 0.157 | 0.177 | 0.196 | 0.216 |
|                                          |            | Retract = 1649  | 0.033              | 0.049 | 0.066 | 0.082 | 0.099 | 0.115 | 0.132 | 0.148 | 0.165 | 0.181 |
| 63                                       | 20         | Extend = 3117   | 0.062              | 0.094 | 0.125 | 0.156 | 0.187 | 0.218 | 0.249 | 0.281 | 0.312 | 0.343 |
|                                          |            | Retract = 2803  | 0.056              | 0.084 | 0.112 | 0.140 | 0.168 | 0.196 | 0.224 | 0.252 | 0.280 | 0.308 |
| 80                                       | 25         | Extend = 5027   | 0.101              | 0.151 | 0.201 | 0.251 | 0.302 | 0.352 | 0.402 | 0.452 | 0.503 | 0.553 |
|                                          |            | Retract = 4536  | 0.091              | 0.136 | 0.181 | 0.227 | 0.272 | 0.318 | 0.363 | 0.408 | 0.454 | 0.499 |
| 100                                      | 25         | Extend = 7854   | 0.157              | 0.236 | 0.314 | 0.393 | 0.471 | 0.550 | 0.628 | 0.707 | 0.785 | 0.864 |
|                                          |            | Retract = 7363  | 0.147              | 0.221 | 0.295 | 0.368 | 0.442 | 0.515 | 0.589 | 0.663 | 0.736 | 0.810 |
| 125                                      | 32         | Extend = 12270  | 0.245              | 0.368 | 0.491 | 0.614 | 0.736 | 0.859 | 0.982 | 1.104 | 1.227 | 1.350 |
|                                          |            | Retract = 11468 | 0.229              | 0.344 | 0.459 | 0.573 | 0.688 | 0.803 | 0.917 | 1.032 | 1.147 | 1.261 |
| 160                                      | 40         | Extend = 20096  | 0.402              | 0.603 | 0.804 | 1.005 | 1.206 | 1.407 | 1.608 | 1.809 | 2.010 | 2.211 |
|                                          |            | Retract = 18840 | 0.377              | 0.565 | 0.754 | 0.942 | 1.130 | 1.319 | 1.507 | 1.696 | 1.884 | 2.072 |
| 200                                      | 40         | Extend = 31440  | 0.628              | 0.942 | 1.256 | 1.570 | 1.884 | 2.198 | 2.512 | 2.826 | 3.140 | 3.454 |
|                                          |            | Retract = 30144 | 0.603              | 0.904 | 1.206 | 1.507 | 1.809 | 2.110 | 2.412 | 2.713 | 3.014 | 3.316 |
| 250                                      | 50         | Extend = 48750  | 0.981              | 1.472 | 1.963 | 2.453 | 2.948 | 3.434 | 3.925 | 4.415 | 4.906 | 5.400 |
|                                          |            | Retract = 46800 | 0.942              | 1.413 | 1.884 | 2.355 | 2.826 | 3.297 | 3.768 | 4.239 | 4.710 | 5.181 |
| 320                                      | 63         | Extend = 78872  | 1.610              | 2.411 | 3.215 | 4.020 | 4.820 | 5.626 | 6.430 | 7.234 | 8.038 | 8.843 |
|                                          |            | Retract = 76776 | 1.545              | 2.320 | 3.100 | 3.863 | 4.630 | 5.408 | 6.181 | 6.954 | 7.726 | 8.450 |