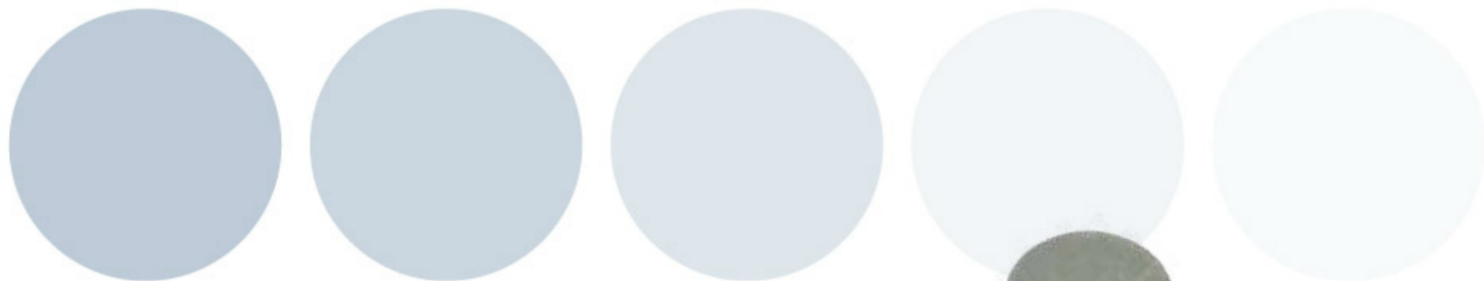


# CO-AXIAL DRIVES PNEUMA-HYDRAULIC

**ALMOTION**

DRIVE & CONTROL TECHNOLOGY



- Hydraulic pressure
- Pneumatic control
- Reduced operating noise level
- Hi-frequency operation
- Energy saving
- Clean-line



# UCC Series Co-Axial Drives Pneuma-Hydraulic

40mm - 200mm bore sizes



## Features

- Co-Axial Drives (UCC) consist of two integral elements; a pneumatic drive unit to provide power and an integrated, closed circuit hydraulic drive to provide accurate speed control.
- UCC Drives are used extensively in the field of automation, where traditionally, hydraulic, mechanical or electrical drives would have been used for the control of linear movement and positioning.
- Accurate positioning and speed control is ensured by a closed hydraulic circuit within a coaxial tube. Although power is provided by compressed air speed and positional accuracy are unaffected by the compressibility of the air. UCC Drives offer a clean, environmentally friendly, pollution free solution.
- Control is simple, with only two compressed air connections to power operate the unit. Options also include positional feedback for PLC interfacing. UCC Drives are compact and easy to install, and are also relatively simple to maintain. By reducing the number of components and simplifying the complexity of the system we have increased the level of overall reliability. All UCC Drives are 100 % tested.
- UCC Drives are designed in accordance with ISO standards making standardization and interchange ability with pre-existing systems simple. Ordering is also made simple using a single code which is dedicated to the particular User.
- UCC Drives are not just a component but a complete control solution.

## TECHNICAL DATA

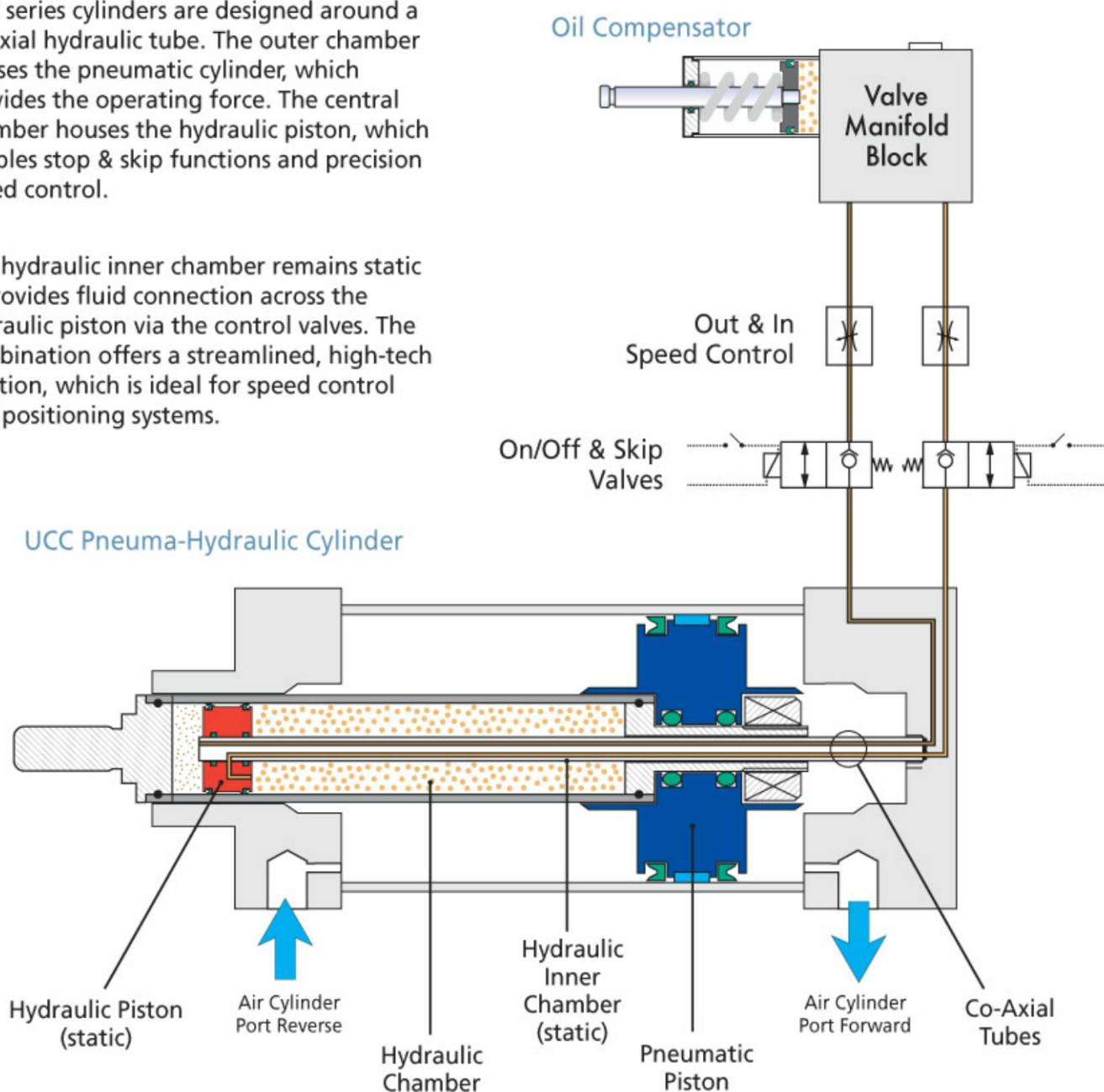
|                              |                                               |
|------------------------------|-----------------------------------------------|
| <b>Type</b>                  | Coaxial cylinder unit                         |
| <b>Bore (mm)</b>             | 50 / 63 / 80 / 100 / 125 / 160 / 200          |
| <b>Mounting</b>              | In accordance to ISO 6431                     |
| <b>Stroke</b>                | 1 metre (max)                                 |
| <b>Operating Pressure</b>    | 1 - 10 bar                                    |
| <b>Outer chamber fluid</b>   | Filtered 50µ. Use with or without lubrication |
| <b>Operating temperature</b> | Max + 80° Min -10° (according to fluid used)  |
| <b>Speed</b>                 | 40 - 6000 mm/min                              |

## OPERATIONAL SCHEMATIC

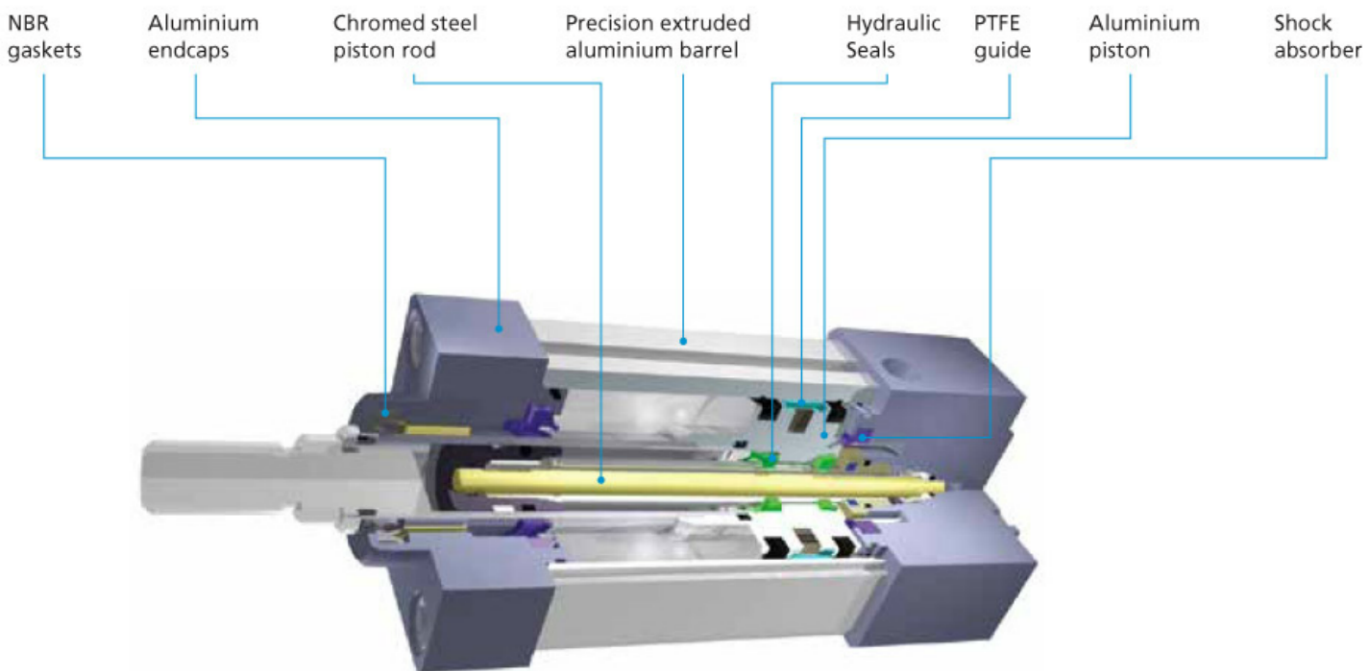
## Function

UCC series cylinders are designed around a co-axial hydraulic tube. The outer chamber houses the pneumatic cylinder, which provides the operating force. The central chamber houses the hydraulic piston, which enables stop & skip functions and precision speed control.

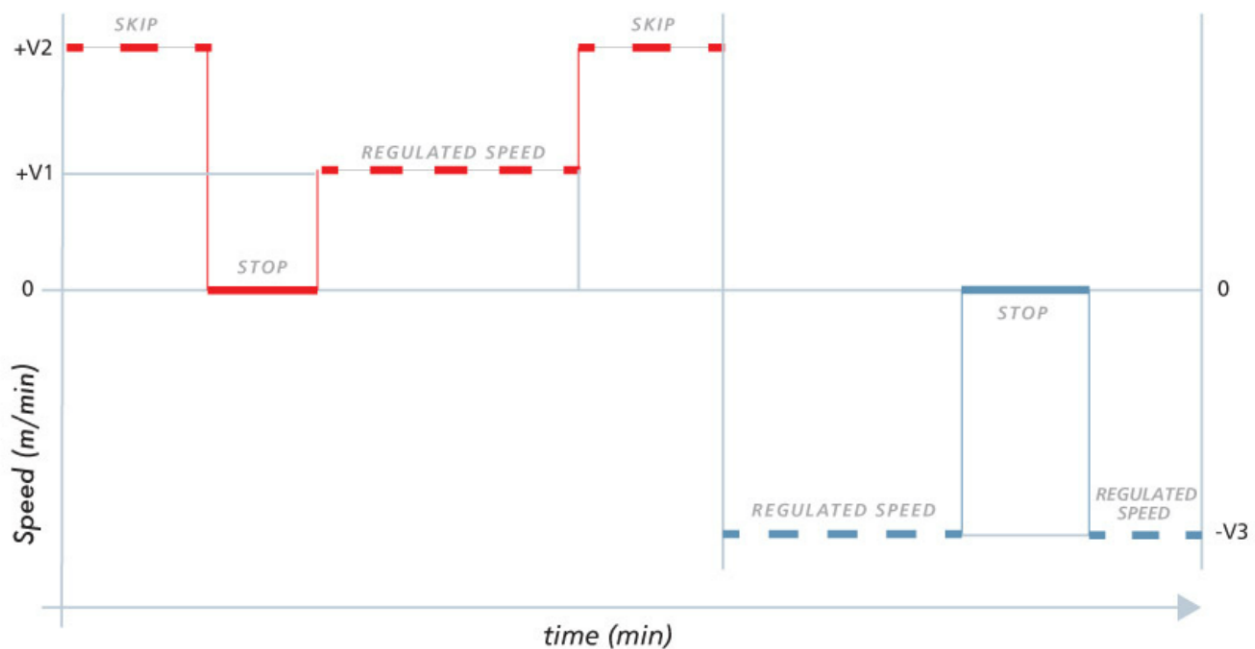
The hydraulic inner chamber remains static & provides fluid connection across the hydraulic piston via the control valves. The combination offers a streamlined, high-tech solution, which is ideal for speed control and positioning systems.



## CYLINDER SECTION



## CONTROL FUNCTION EXAMPLE



### Outward Motion

0 = Stop Mode  
+V1 = Regulated Speed  
+V2 = Fixed Speed

### Inward Motion

0 = Stop Mode  
-V3 = Regulated Speed

Skip function allows the speed regulator to be by-passed to achieve full operating speed. The stop function provides a hydraulic lock to achieve position control.



## SPEED CONTROL OPTIONS

|                                               |                    |
|-----------------------------------------------|--------------------|
| <b>Fast Speed</b>                             | (SKIP N.O.)        |
| <b>Stop Normally Open</b>                     | (STOP N.O.)        |
| <b>Stop Normally Closed</b>                   | (STOP N.C.)        |
| <b>Slow Forward</b> (outward regulation only) | (ON-BOARD CONTROL) |
| <b>Slow Reverse</b> (inward regulation only)  | (ON-BOARD CONTROL) |
| <b>Slow Forward and Reverse</b>               | (REMOTE CONTROL)   |

## TECHNICAL INFORMATION

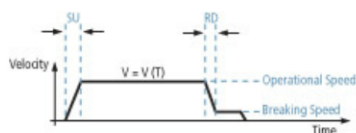
### FORCE TABLE (N)

| Bore<br>(mm) | Piston<br>rod<br>(mm) | Working surface<br>(cm2) |       | Working pressure in bar |        |        |        |        |         |         |         |         |         |
|--------------|-----------------------|--------------------------|-------|-------------------------|--------|--------|--------|--------|---------|---------|---------|---------|---------|
|              |                       |                          |       | 1                       | 2      | 3      | 4      | 5      | 6       | 7       | 8       | 9       | 10      |
| 50           | 25                    | Thrust                   | 18.5  | 181.3                   | 362.7  | 544.0  | 725.4  | 906.7  | 1088.0  | 1269.4  | 1450.7  | 1632.1  | 1813.4  |
|              |                       | Traction                 | 14.7  | 144.3                   | 288.6  | 433.0  | 577.3  | 721.6  | 865.9   | 1010.2  | 1154.5  | 1298.9  | 1443.2  |
| 63           | 35                    | Thrust                   | 30.0  | 294.4                   | 588.8  | 883.2  | 1177.6 | 1472.0 | 1766.4  | 2060.8  | 2355.3  | 2649.7  | 2944.1  |
|              |                       | Traction                 | 21.6  | 211.2                   | 422.4  | 633.6  | 844.8  | 1056.0 | 1267.2  | 1478.4  | 1689.6  | 1900.8  | 2112.0  |
| 80           | 35                    | Thrust                   | 49.1  | 481.5                   | 963.0  | 1444.6 | 1926.1 | 2407.6 | 2889.1  | 3370.6  | 3852.1  | 4333.7  | 4815.2  |
|              |                       | Traction                 | 40.6  | 398.3                   | 796.6  | 1194.9 | 1593.3 | 1991.6 | 2389.9  | 2788.2  | 3186.5  | 3584.8  | 3983.1  |
| 100          | 40                    | Thrust                   | 76.5  | 750.0                   | 1500.0 | 2250.0 | 2999.9 | 3749.9 | 4499.9  | 5249.9  | 5999.9  | 6749.9  | 7499.9  |
|              |                       | Traction                 | 66.0  | 646.5                   | 1293.1 | 1939.6 | 2586.2 | 3232.7 | 3879.2  | 4525.8  | 5172.3  | 5818.9  | 6465.4  |
| 125          | 40                    | Thrust                   | 120.7 | 1182.9                  | 2365.9 | 3548.8 | 4731.7 | 5914.7 | 7097.6  | 8280.6  | 9463.5  | 10646.4 | 11829.4 |
|              |                       | Traction                 | 110.2 | 1079.5                  | 2159.0 | 3238.5 | 4318.0 | 5397.5 | 6476.9  | 7556.4  | 8635.9  | 9715.4  | 10794.9 |
| 160          | 45                    | Thrust                   | 199.1 | 1950.7                  | 3901.4 | 5852.1 | 7802.8 | 9753.5 | 11704.2 | 13654.9 | 15605.6 | 17556.3 | 19507.0 |
|              |                       | Traction                 | 185.2 | 1814.5                  | 3629.1 | 5443.6 | 7258.2 | 9072.7 | 10887.3 | 12701.8 | 14516.4 | 16330.9 | 18145.4 |

### CYLINDER CONSUMPTION TABLE (NL per 1 cm of stroke)

| Bore<br>(mm) | Piston<br>rod<br>(mm) | Working surface<br>(cm2) |       | Working pressure in bar |        |        |        |        |        |        |        |        |        |
|--------------|-----------------------|--------------------------|-------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|              |                       |                          |       | 1                       | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     |
| 50           | 25                    | Thrust                   | 18.5  | 0.0370                  | 0.0555 | 0.0740 | 0.0925 | 0.1110 | 0.1295 | 0.1480 | 0.1665 | 0.1850 | 0.2035 |
|              |                       | Traction                 | 14.7  | 0.0295                  | 0.0442 | 0.0589 | 0.0736 | 0.0884 | 0.1031 | 0.1178 | 0.1325 | 0.1473 | 0.1620 |
| 63           | 35                    | Thrust                   | 30.0  | 0.0601                  | 0.0901 | 0.1202 | 0.1502 | 0.1802 | 0.2103 | 0.2403 | 0.2704 | 0.3004 | 0.3305 |
|              |                       | Traction                 | 21.6  | 0.0431                  | 0.0647 | 0.0862 | 0.1078 | 0.1293 | 0.1509 | 0.1724 | 0.1940 | 0.2155 | 0.2371 |
| 80           | 35                    | Thrust                   | 49.1  | 0.0983                  | 0.1474 | 0.1965 | 0.2457 | 0.2948 | 0.3439 | 0.3931 | 0.4422 | 0.4913 | 0.5405 |
|              |                       | Traction                 | 40.6  | 0.0813                  | 0.1219 | 0.1626 | 0.2032 | 0.2439 | 0.2845 | 0.3252 | 0.3658 | 0.4064 | 0.4471 |
| 100          | 40                    | Thrust                   | 76.5  | 0.1531                  | 0.2296 | 0.3061 | 0.3826 | 0.4592 | 0.5357 | 0.6122 | 0.6888 | 0.7653 | 0.8418 |
|              |                       | Traction                 | 66.0  | 0.1319                  | 0.1979 | 0.2639 | 0.3299 | 0.3958 | 0.4618 | 0.5278 | 0.5938 | 0.6597 | 0.7257 |
| 125          | 40                    | Thrust                   | 120.7 | 0.2414                  | 0.3621 | 0.4828 | 0.6035 | 0.7242 | 0.8450 | 0.9657 | 1.0864 | 1.2071 | 1.3278 |
|              |                       | Traction                 | 110.2 | 0.2203                  | 0.3305 | 0.4406 | 0.5508 | 0.6609 | 0.7711 | 0.8812 | 0.9914 | 1.1015 | 1.2117 |
| 160          | 45                    | Thrust                   | 199.1 | 0.3981                  | 0.5972 | 0.7962 | 0.9953 | 1.1943 | 1.3934 | 1.5924 | 1.7915 | 1.9905 | 2.1896 |
|              |                       | Traction                 | 185.2 | 0.3703                  | 0.5555 | 0.7406 | 0.9258 | 1.1109 | 1.2961 | 1.4813 | 1.6664 | 1.8516 | 2.0367 |

## POSITIONAL & SPEED CONTROL

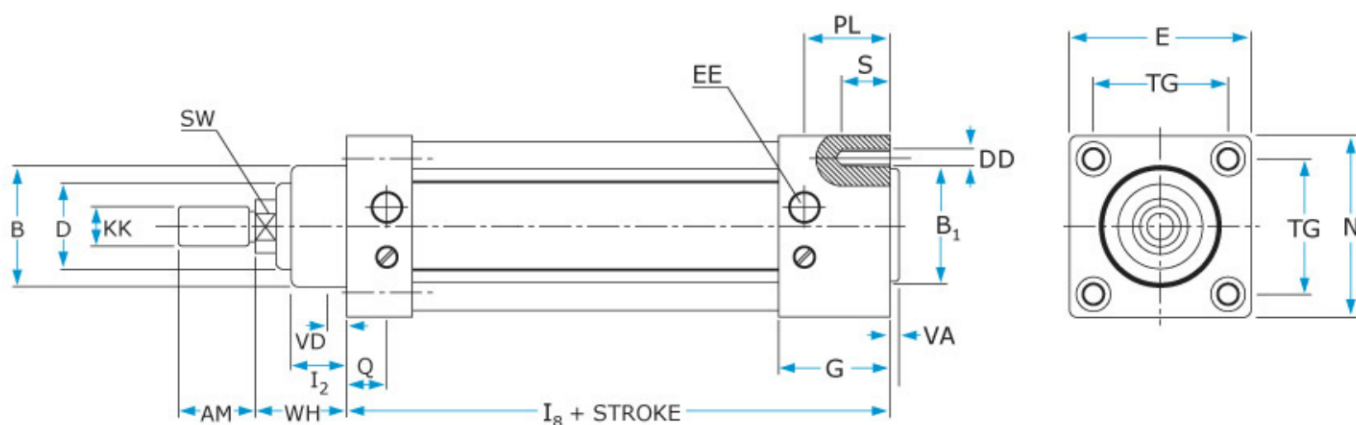


Using in-built speed control and stop/skip valves, movement and position can be precisely controlled. The diagram shows how start up (SU) speed and ramp down speed (RD) can be controlled independently.

## DIMENSIONAL INFORMATION

| Ø (mm) | KK      | AM              | WH | D  | B  | VA | G  | E   | B <sub>1</sub> | I <sub>8</sub> | DD  |
|--------|---------|-----------------|----|----|----|----|----|-----|----------------|----------------|-----|
|        | Thread  | Dimensions (mm) |    |    |    |    |    |     |                |                |     |
| 50     | M16x1,5 | 32              | 27 | 25 | 40 | 3  | 46 | 65  | 40             | 116            | M8  |
| 63     | M16x1,5 | 32              | 37 | 35 | 50 | 3  | 45 | 75  | 45             | 121            | M8  |
| 80     | M20x1,5 | 40              | 44 | 35 | 50 | 3  | 45 | 95  | 45             | 128            | M10 |
| 100    | M20x1,5 | 40              | 51 | 40 | 55 | 3  | 52 | 110 | 55             | 138            | M10 |
| 125    | M27X2   | 54              | 65 | 40 | 60 | 6  | 57 | 140 | 60             | 160            | M12 |
| 160    | M36X2   | 72              | 80 | 45 | 65 | 8  | 57 | 180 | 65             | 180            | M16 |

| Ø (mm) | EE   | TG              | Q  | VD | S  | I <sub>2</sub> | PL | SW |
|--------|------|-----------------|----|----|----|----------------|----|----|
|        | Port | Dimensions (mm) |    |    |    |                |    |    |
| 50     | 1/4  | 46,5            | 16 | 6  | 16 | 13             | 37 | 17 |
| 63     | 1/4  | 56,5            | 16 | 8  | 16 | 23             | 35 | 19 |
| 80     | 1/4  | 72              | 19 | 8  | 18 | 30             | 35 | 22 |
| 100    | 3/8  | 89              | 15 | 8  | 23 | 35             | 37 | 22 |
| 125    | 1/2  | 110             | 25 | 6  | 21 | 42             | 39 | 27 |
| 160    | 3/4  | 140             | 27 | 9  | 26 | 50             | 39 | 36 |

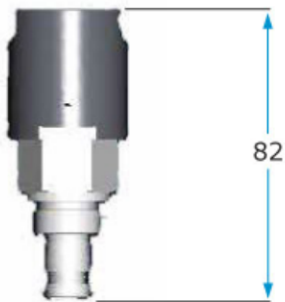


## INSTRUCTIONS FOR OIL REPLENISHMENT

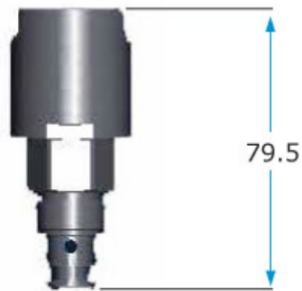
- 1 Make sure piston rod is fully returned
- 2 Unscrew filling valve cap
- 3 Carefully clean filling valve cap
- 4 Attach hydraulic pump to filling valve - 1/8 bsp
- 5 Fill with oil until cylinder rod notch aligns with shock absorber oil cap.

## DIMENSIONAL INFORMATION

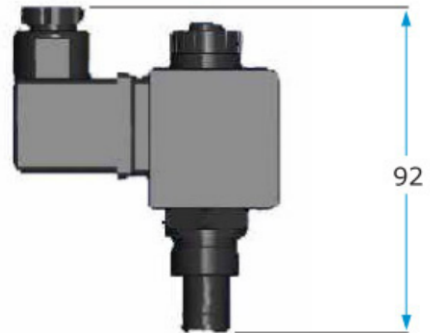
### MODULAR CONTROL ELEMENTS (fitted to Control Manifold)



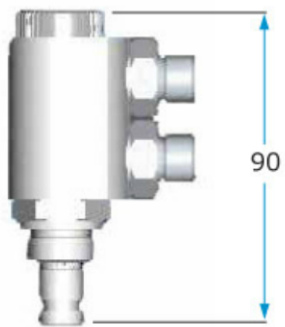
N.O. Pneumatic Control



N.C. Pneumatic Control



N.O. or N.C. Solenoid Valve Control



Remote Control



Single Turn Speed Control

Knurled Adjuster



87

Screw Adjuster

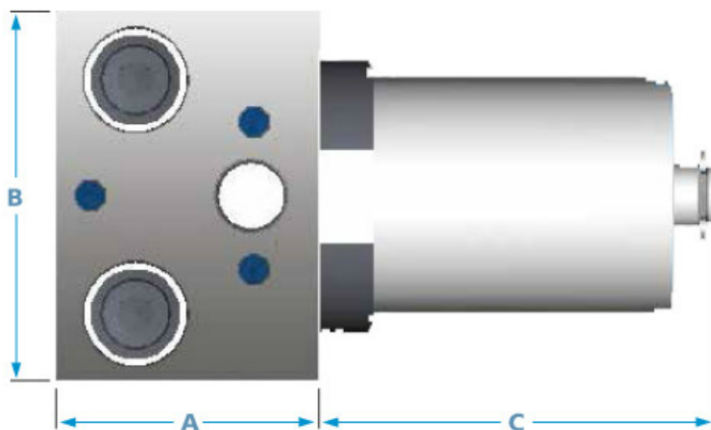


70

Multi Turn Speed Control

### CONTROL MANIFOLD DIMENSIONS

Accumulator Block dimensions vary according to bore size and depend on the number and dimensions of mounted components. Dimensions of the oil reservoir also depend on cylinder stroke.



| Type  | A  | B   |
|-------|----|-----|
| Small | 50 | 70  |
| Large | 70 | 150 |

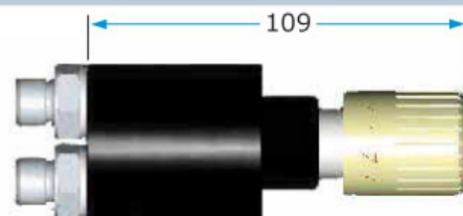
| C               |     | Compensator<br>Ø 40mm<br>for stroke |
|-----------------|-----|-------------------------------------|
| Cylinder Stroke |     |                                     |
| From            | To  | mm                                  |
| 67              | 75  | 0 - 50                              |
| 76              | 96  | 50 - 100                            |
| 102             | 131 | 100 - 200                           |
| 135             | 174 | 200 - 300                           |
| 163             | 211 | 300 - 400                           |
| 211             | 283 | 400 - 600                           |
| 238             | 320 | 600 - 800                           |
| 310             | 428 | 800 - 1000                          |

### Remote Speed Control Module



Multi Turn Speed Control

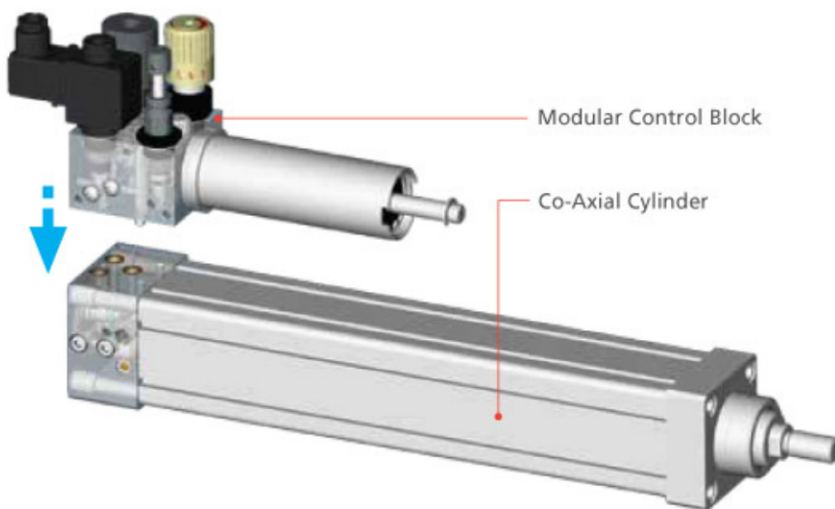
Optional tube  
lengths available



Single Turn Speed Control



## MODULAR CONTROL BLOCK

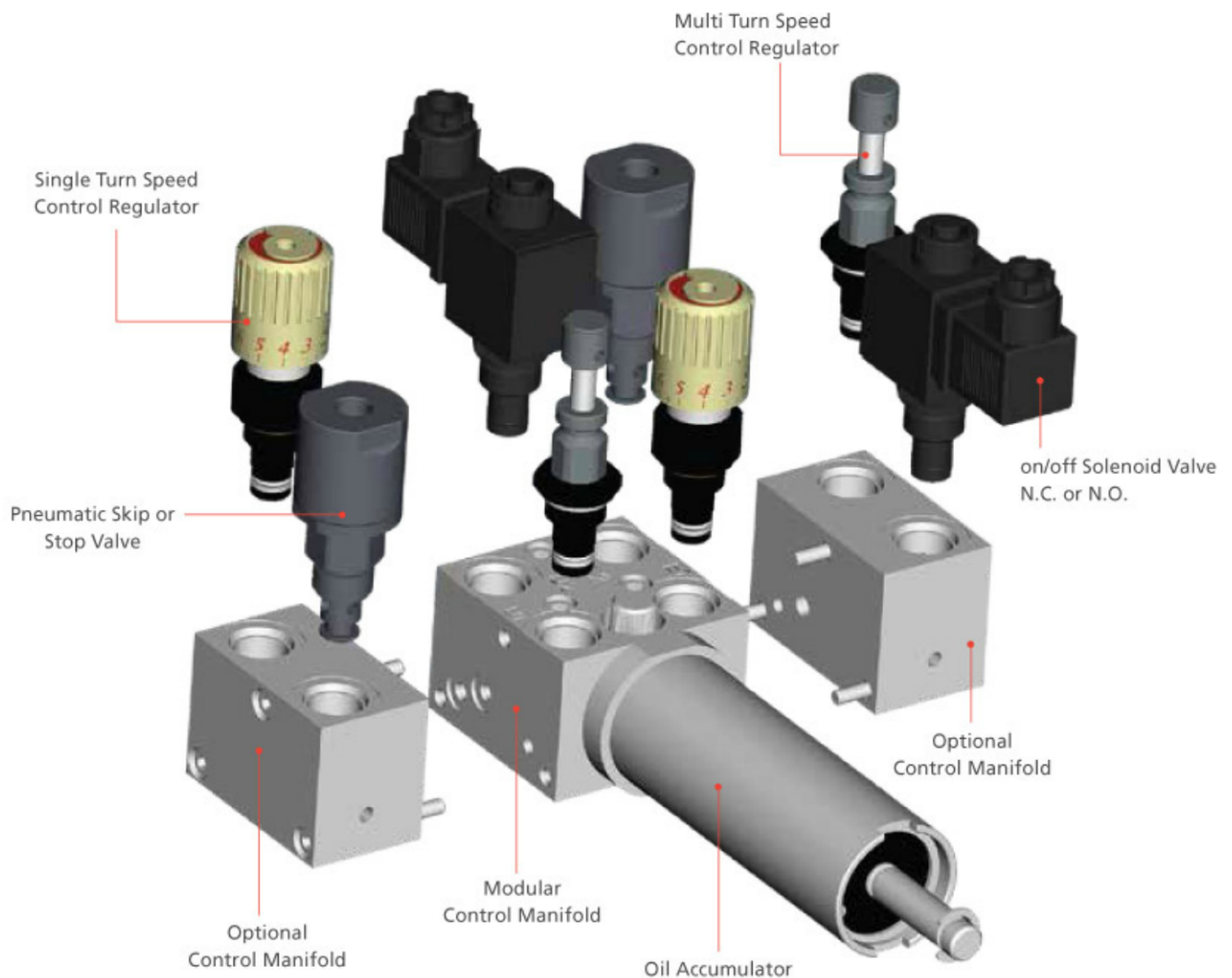


### REGULATION AND CONTROL SYSTEM

Modular control blocks are assembled onto the rear end cap and comprise of various control elements. Depending upon application requirements the modular control block can include in-built or remote speed regulation, stop function elements and skip function elements.

Using the speed regulation elements operational movement can be infinitely controllable and using the skip function element speed regulation can be by-passed allowing full operational speed. Using the stop function element the cylinder can be stopped and hydraulically locked in the desired position. Control can be electrical or pneumatic.

## MODULAR CONTROL ELEMENTS







Feed Cutting Systems



Automatic Scalper



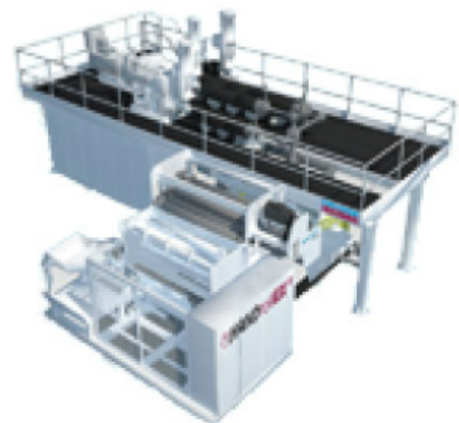
Palletisers



Stone Polishing



Autoclaves



Textile Machines



Drilling Machines

## UCC CODIFICATION KEY

|   |   |   |   |   |   |   |   |   |   |   |    |    |
|---|---|---|---|---|---|---|---|---|---|---|----|----|
| 0 | 6 | 3 | R | B | 1 | S | S | M | X | X | X  | X  |
| 1 |   |   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

### 1 Bore (mm)

**050** = 50mm  
**063** = 63mm  
**080** = 80mm  
**100** = 100mm  
**125** = 125mm  
**160** = 160mm  
**200** = 200mm

### 2 Control Options - IN Stroke

**X** = Not required  
**V** = Stop N.O.  
**T** = Stop N.C.  
**R** = Speed Control  
**A** = Speed Control + Stop N.O.  
**B** = Speed Control + Stop N.C.  
**E** = Speed Control + Skip N.O.  
**F** = Speed Control + Skip N.C.  
**G** = Speed Control + Skip N.O.  
**H** = Speed Control + Skip N.C.  
**I** = Speed Control + Skip + Stop N.O.  
**K** = Speed Control + Skip + Stop N.C.  
**L** = Speed Control + Skip + Stop N.O.  
**P** = Speed Control + Skip + Stop N.C.

### 3 Speed Control Block - IN Stroke

**X** = Not required  
**B** = Single Turn Control  
**C** = Multi Turn Control  
**D** = Single Turn Panel Mounted  
**G** = Multi Turn Panel Mounted

### 4 Skip / Stop Control

**X** = Not required  
**P** = Pilot Control  
**0** = 12V DC Coil  
**1** = 24V DC Coil  
**2** = 110V DC Coil  
**3** = 220V DC Coil  
**4** = 24V AC Coil  
**5** = 110V AC Coil  
**6** = 220V AC Coil  
**7** = 24V RAC Coil  
**8** = 110V RAC Coil  
**9** = 220V RAC Coil

### 5 Control Options - OUT Stroke

**X** = Not required  
**V** = Stop N.O.  
**T** = Stop N.C.  
**R** = Speed Control  
**A** = Speed Control + Stop N.O.  
**B** = Speed Control + Stop N.C.  
**E** = Speed Control + Skip N.O.  
**F** = Speed Control + Skip N.C.  
**G** = Speed Control + Skip N.O.  
**H** = Speed Control + Skip N.C.  
**I** = Speed Control + Skip + Stop N.O.  
**K** = Speed Control + Skip + Stop N.C.  
**L** = Speed Control + Skip + Stop N.O.  
**P** = Speed Control + Skip + Stop N.C.  
**S** = Same device as 'IN' Control Option

|    |   |   |   |    |    |   |   |    |    |   |   |
|----|---|---|---|----|----|---|---|----|----|---|---|
| 0  | 2 | 5 | 0 | X  | 0  | 0 | 0 | X  | -  | 0 | 0 |
| 12 |   |   |   | 13 | 14 |   |   | 15 | 16 |   |   |

## 6 Speed Control Block - OUT Stroke

- X** = Not required
- B** = Single Turn Control
- C** = Multi Turn Control
- D** = Single Turn Panel Mounted
- G** = Multi Turn Panel Mounted
- S** = Same device as 'IN' Control Option

## 7 Sensing Options

- M** = Magnetic
- N** = Non-Magnetic
- R** = Position Detector

## 8 Orientation FA

- X** = 90° Right
- S** = 90° left
- C** = 180°
- A** = 360°
- D** = 90°

## 9 Orientation FP

- X** = 90°
- S** = 90°
- C** = 180°
- A** = 360°
- D** = 90°

## 10 Tube Profile

- X** = M-Mouse Profile
- C** = M-Mouse Profile with Tie Rods
- A** = Round Profile
- T** = Round Profile with Tie Rods
- Q** = Square Profile
- S** = Square Profile with Tie Rods
- O** = Oval Profile

## 11 Bulk Type

- X** = Standard
- C** = Compact
- D** = Opposite

## 12 Stroke

**Max** = 3000mm  
(Show stroke in mm)

## 13 Cushion Type

- X** = Pneumatic
- U** = Hydraulic (In Stroke)
- E** = Hydraulic (Out Stroke)
- I** = Hydraulic (In + Out Stroke)
- N** = No Cushioning

## 14 Tube Length

(Show stroke in cm)

## 15 Block

- X** = Non-Remote
- R** = Remote

## 16 Internal Serial Number

**00** = Progressive Numbering