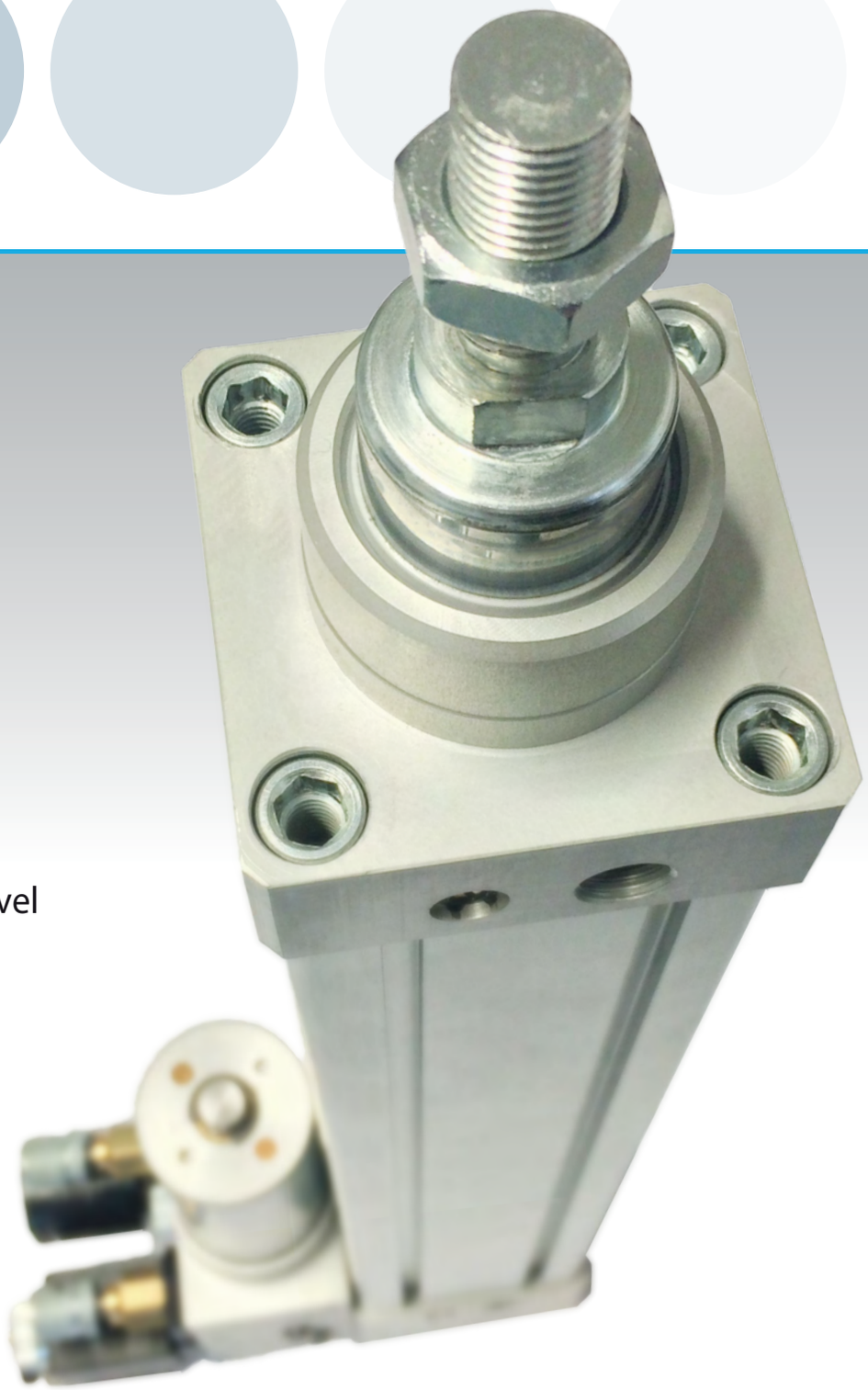
COAXIAL UNITS

TecnAir®

DRIVE TECHNOLOGY



- Pneumatic pressure
- Hydraulic control
- Reduced Operating noise level
- High frequency operation
- Energy saving
- Clean line

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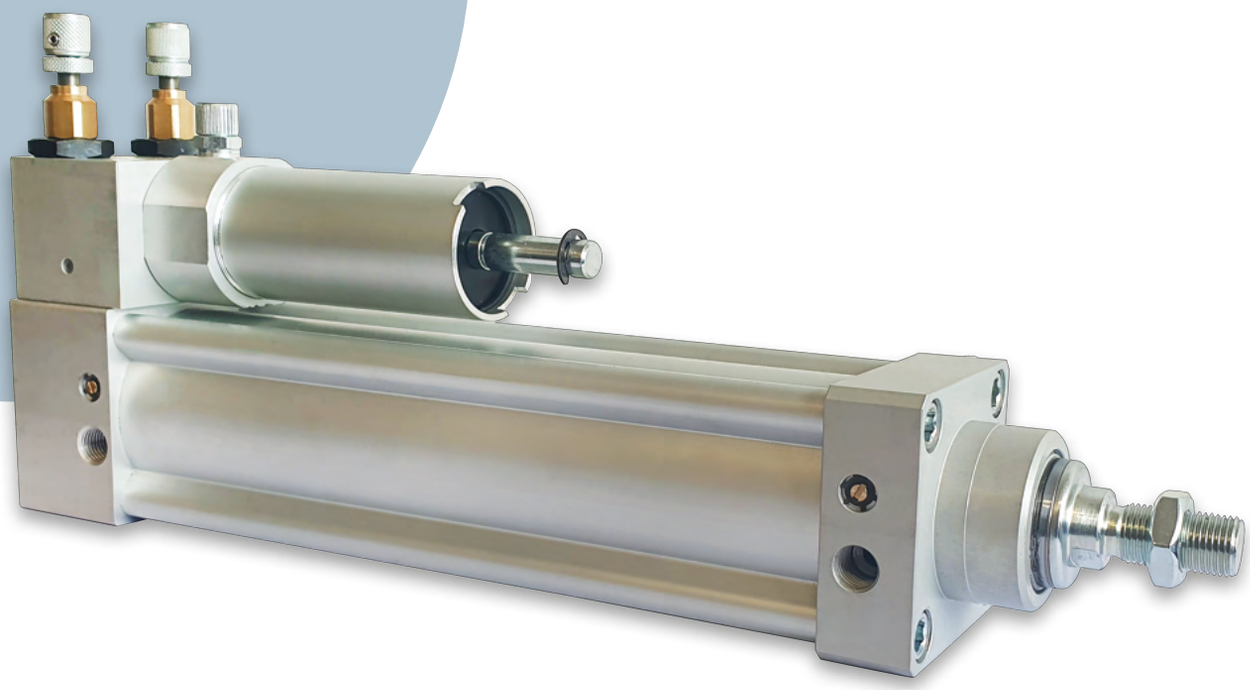
UCC SERIES PNEUMA-HYDRAULIC CYLINDERS



Characteristics

- Tecnair UCC units consist of two integrated elements:
  Pneumatic unit that supplies the necessary power to move loads;
  Hydraulic unit integrated in the pneumatic cylinder which implements position controls such as speed regulation or unit stop.

- UCC actuators are widely used in various fields of automation, where traditionally hydraulic, mechanical or electric drives carry out positioning operations.

- Accurate positioning of loads and speed control are ensured by a closed, pressurised, oil circuit integrated in the rod of the coaxial unit

- The power of the unit is supplied by compressed air. The movement speed of the rod and its accurate positioning are achieved by the pressurised oil in the closed circuit.

- Control is extremely simple, with two air connections to supply the unit as a traditional pneumatic cylinder, regulation configuration options include pneumatic or electrical solutions for interfacing with PLC systems.

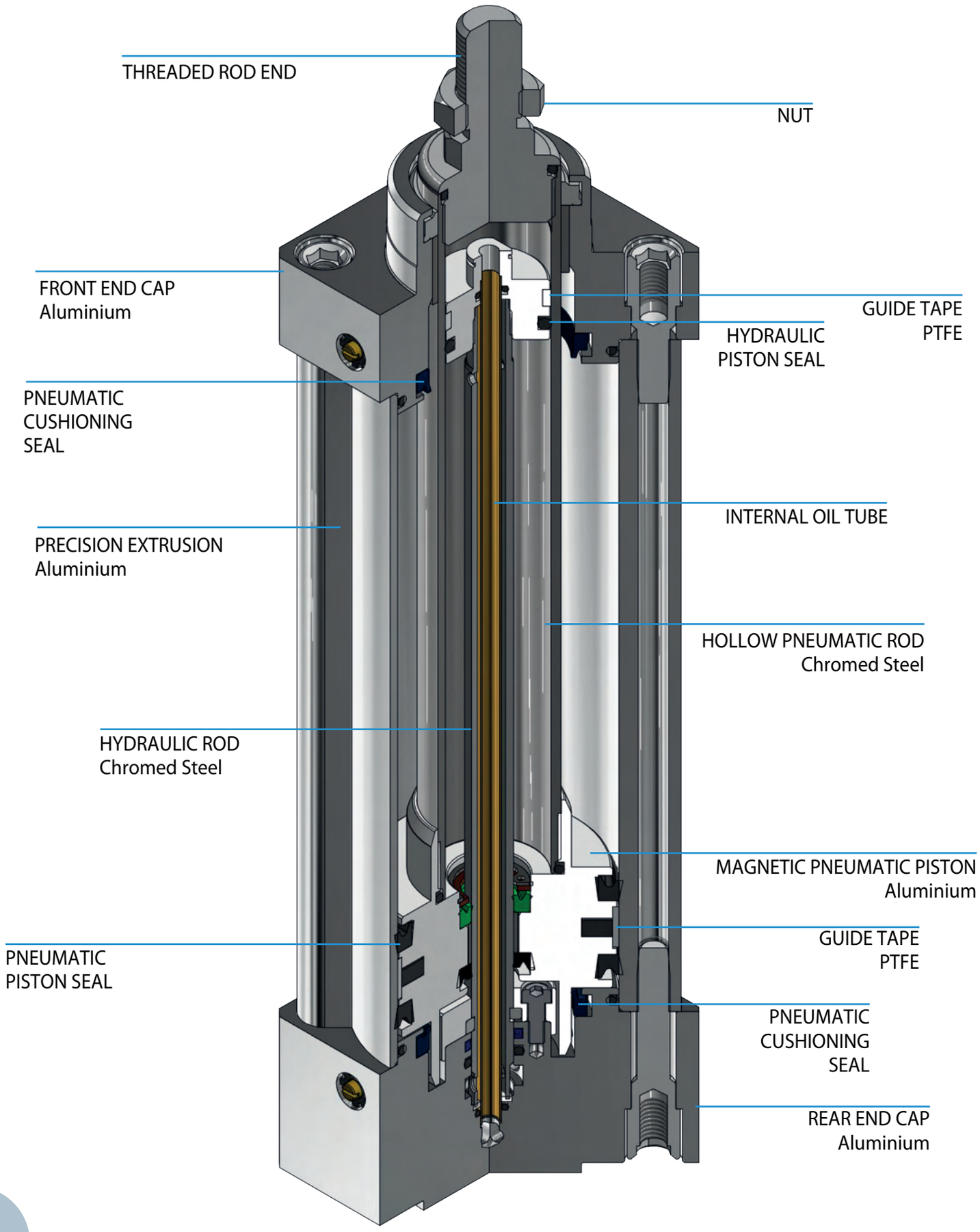
- UCC units present a compact system, easy to install with ISO mounting dimensions

- Maintenance of units is minimal and each cylinder is 100% tested following oil filling.

- UCC units are not just a component but a complete control solution.

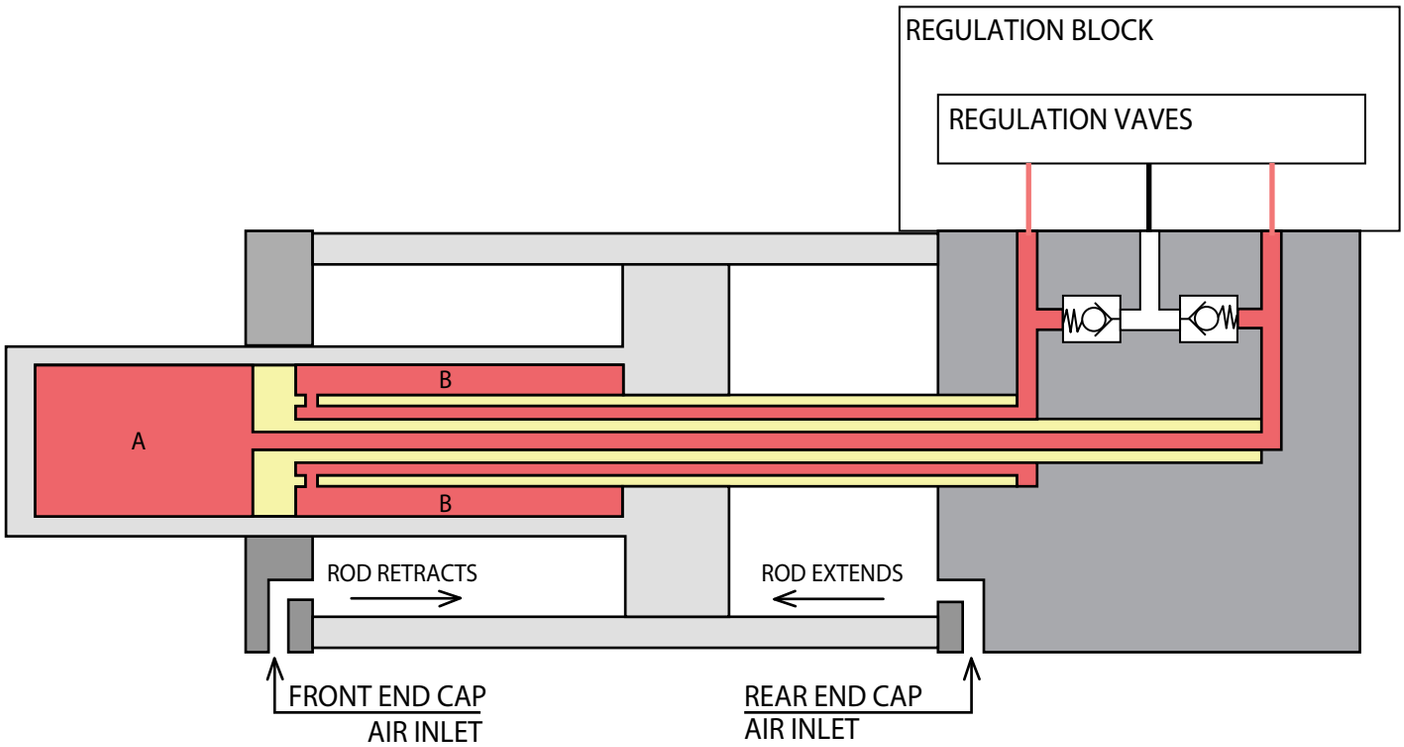
CYLINDER SECTION

A hydraulic cylinder is located inside the hollow piston rod.

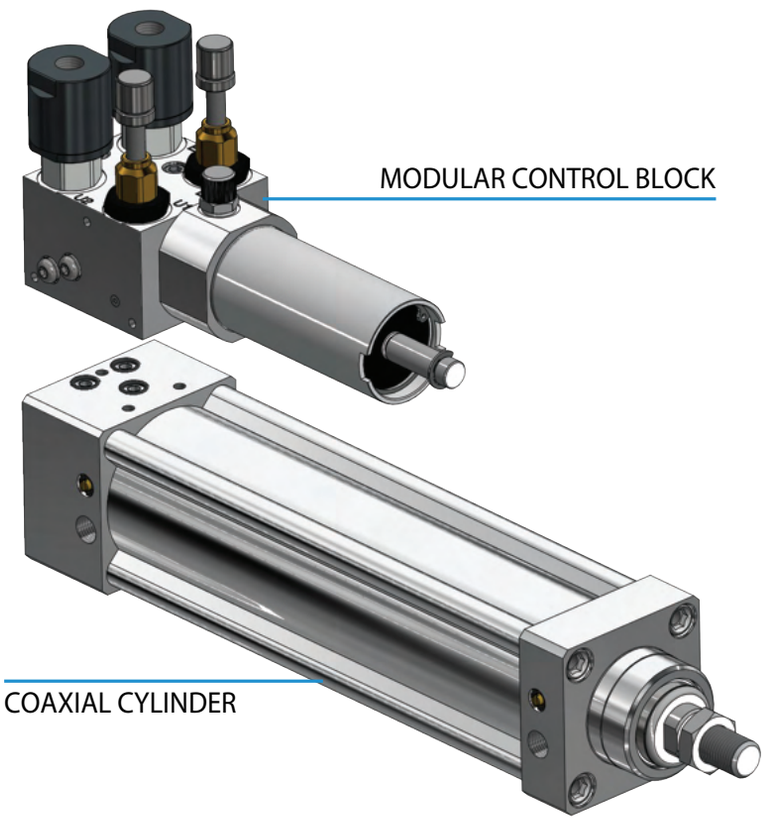


OPERATIONAL SCHEME

During rod retraction oil flows from chamber A to chamber B, while during rod extension oil flows from chamber B to chamber A.
During rod movement, oil flows through one-way valves positioned in the rear end cap, in the regulating block and in the respective valves which makes precise control of the movement possible. A compensator acts as an oil tank regulating the different volumes of oil between the two chambers during operation.



MODULAR CONTROL BLOCK



Regulations and control systems

The system of modular control blocks is installed on the rear end cap of the unit and consists of various elements.
Hydraulically connected to the oil cylinder within the rod of the air cylinder, it incorporates a spring-loaded oil tank, or pneumatic for cylinders with long strokes.
Depending on the application, the control system can include integrated or piped remote speed controls, Stop control valves to precisely stop the unit, or Skip control valves to by-pass set speed controls.
The entire block is mounted to the cylinder but has the potential to be fully remotely positioned for space-constrained applications.
The speed regulators, which control the flow of oil, can be single-turn or multi-turn, based on the required speed regulation sensitivity.

TECHNICAL INFORMATION

Coaxial units have a different piston and rod section compared to normal pneumatic cylinders, due to the oil circuit within the piston rod: Increasing the diameter of the piston rod to accommodate the oil circuit decreases the working surface area.
The cylinder will have slightly less force than a normal pneumatic cylinder.
Below is the table for Thrust and Traction forces (N) of the units based on the working surface area (cm2) and pressure (bar) used.

FORCES TABLE (N)

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

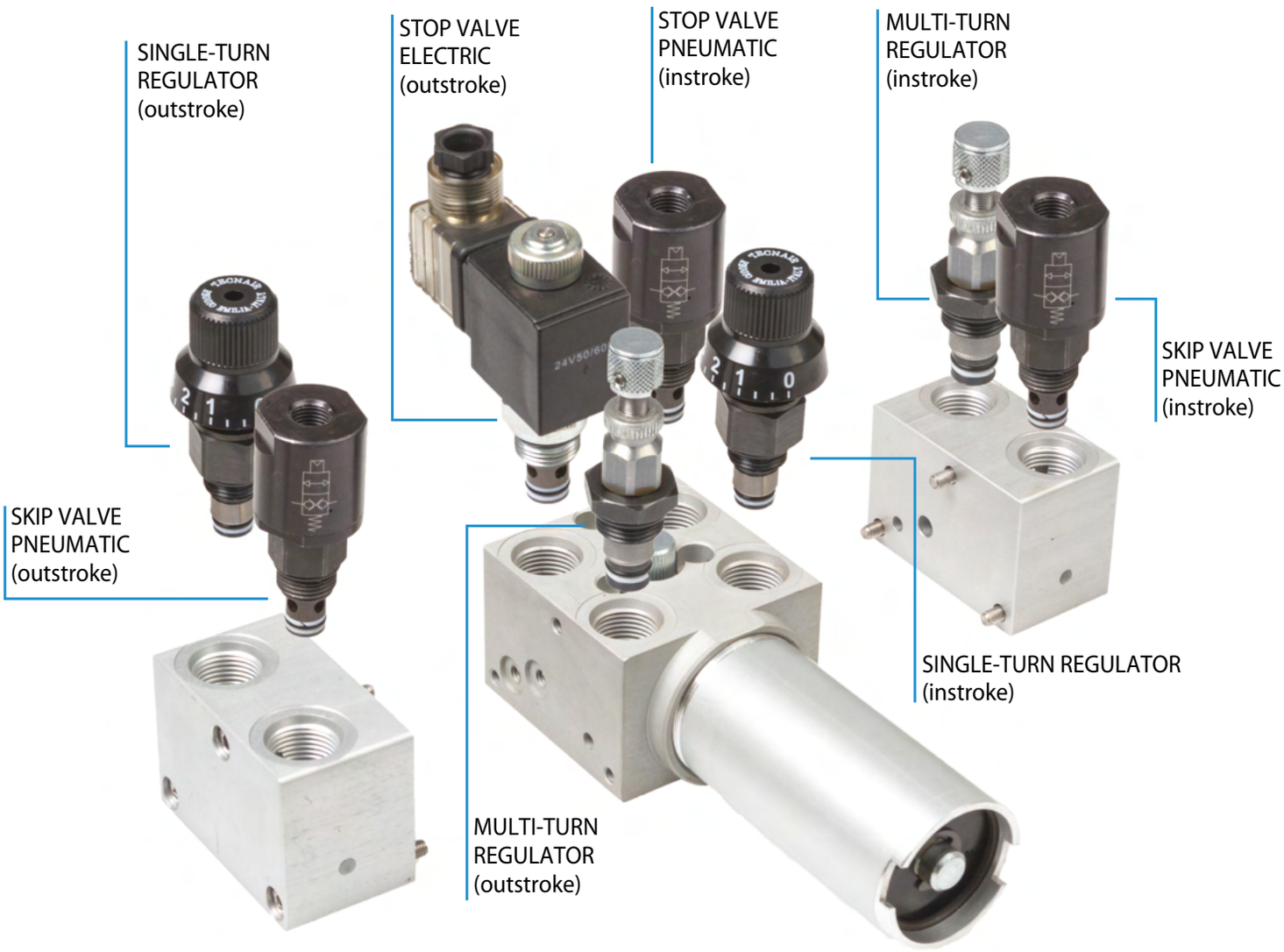
CYLINDER CONSUMPTION TABLE (NL per 1cm of stroke)

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

MODULAR BLOCK CONFIGURATIONS

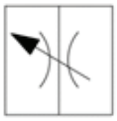
Oil circuit blocks can be divided in 3 types:
1) Compensator branch: connected to the oil accumulator block which compensates the two chambers.
2) Piston branch: controls the INSTROKE (E)
3) Stem branch: controls the OUTSTROKE (U)

Different positions of valves in the block, in series or parallel, can control different actions:
-1 valve slot: Speed or Stop
-2 valve slots in series: Speed + Stop
-2 valve slots in parallel: Speed + Skip
-2 valve slots in parallel + 1 valve slot in series: Speed +Skip + Stop
-2 valve slots in series + 1 valve slot in parallel + 1 valve slot in series: Speed + Regulated Skip + Stop.
The block codes shown below (in pairs) vary according to the type of hole closure.
Diameter up to 80mm: rivets.
Diameter 100mm to 160mm: screws.

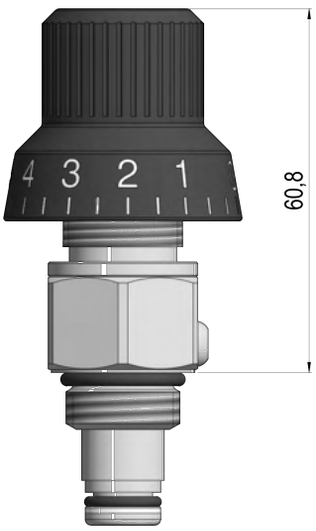


SPEED REGULATORS

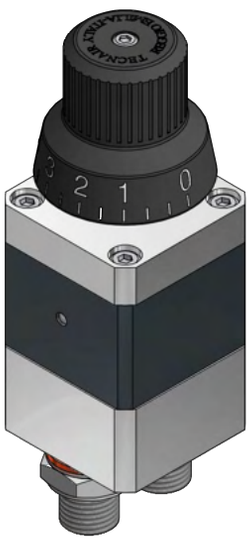
The speed is controlled using oil flowing through the flow regulator



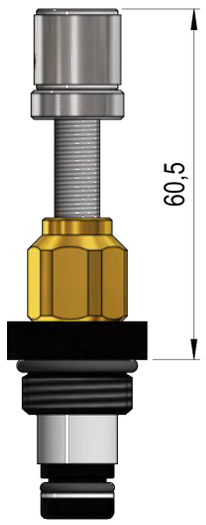
INTEGRATED SINGLE-TURN



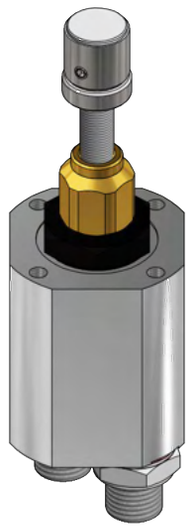
REMOTE SINGLE-TURN



INTEGRATED MULTI-TURN



REMOTE MULTI-TURN

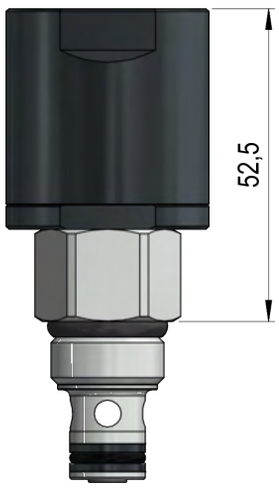


VALVE TYPES:

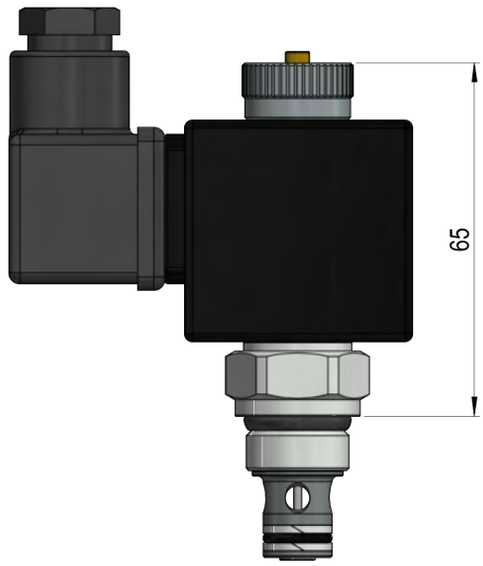
Stop/Skip valves:

STOP: Cylinder movement can be stopped by preventing the flow of oil.
NOTE: Stop using the oil circuit must not be used as a security system (i.e. Blocking Valve).
SKIP: In this case the valve is used in parallel with flow regulator and not in series, Skip valve function by-passes the flow regulator branch so the cylinder can operate at its maximum speed as if the regulator were not present.

Pneumatic skip-stop valves:
Normally closed - normally open



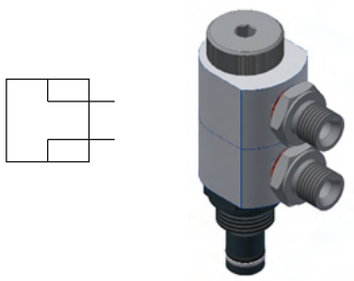
Skip-stop valves:
Direct current “DC coil” - Alternating current “AC coil”
Normally closed - normally open



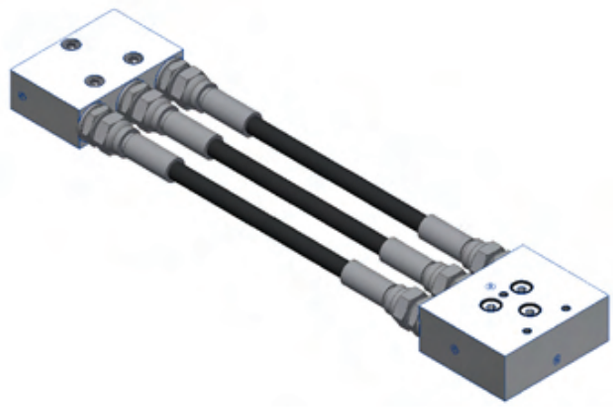
OTHER COMPONENTS

CONNECTION FOR REMOTE REGULATOR WITH HOSES:

Allows the possibility to remotely mount the full regulation block for reduced spaces applications.



REMOTE CONNECTION FOR THE WHOLE BLOCK

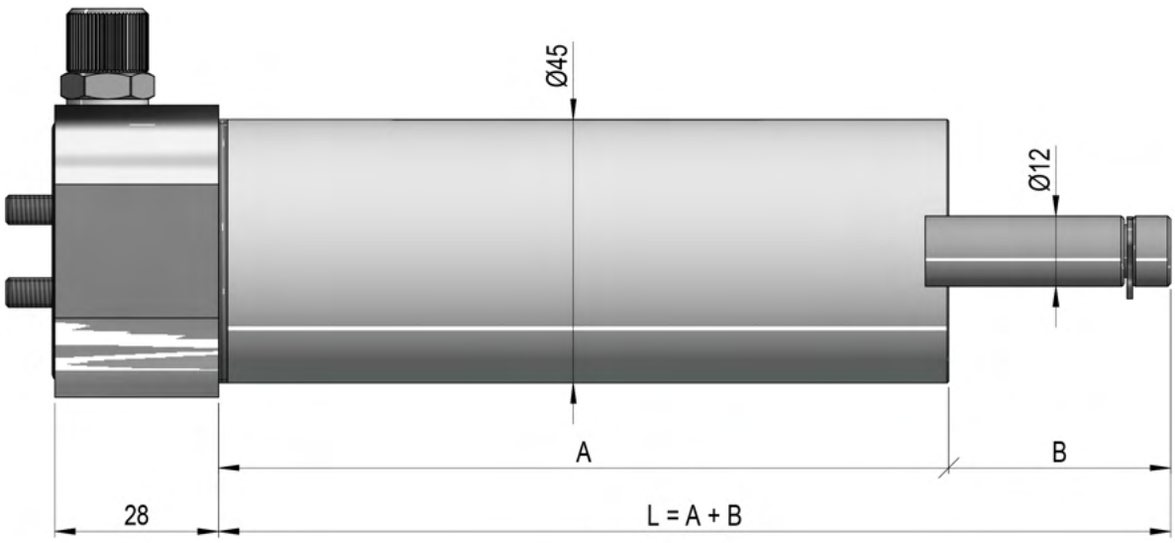


OIL COMPENSATOR

Bores 50/63
Use the cylinder stroke for the corresponding dimensions.

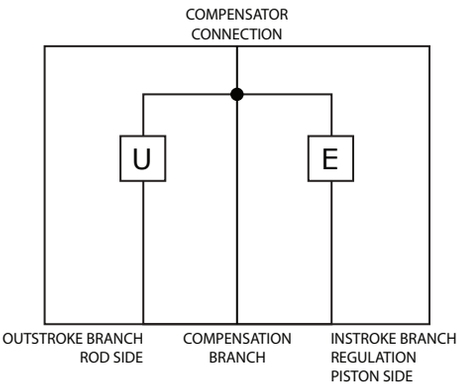
Bores 80/100/125/160:
Multiply the cylinder stroke x2 to obtain the corresponding dimensions

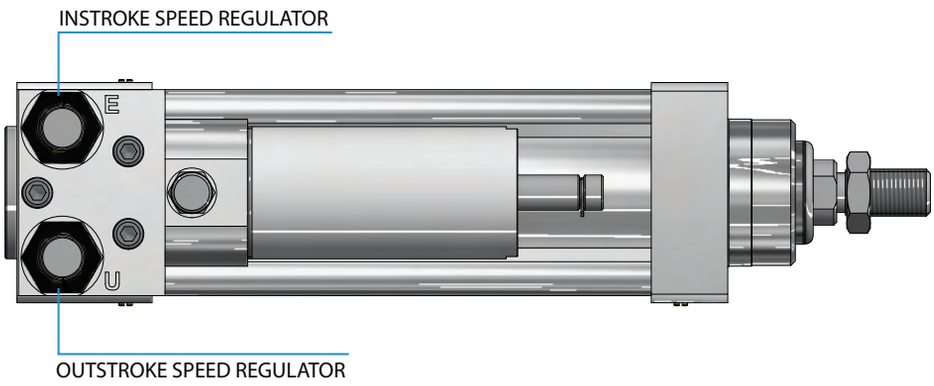
For cylinder with bore higher than 80 and strokes over 700mm, 63mm diameter pneumatic compensator can be considered.



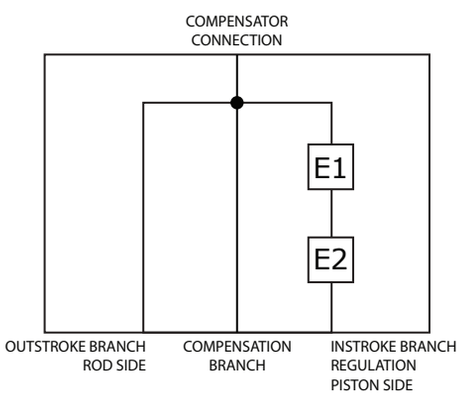
SPRING COMPENSATOR TABLE			
ITEM	CYLINDER STROKE (mm)	OIL VOLUME (cc)	L= A + B (mm)
COMP40-6	0 - 50	15,7	76 = 68 + 8
COMP40-7	50 - 100	25,7	97 = 77 + 20
COMP40-8	100 - 200	37	132 = 103 + 29
COMP40-9	200 - 300	48,3	174 = 136 + 38
COMP40-10	300 - 400	60,9	212 = 164 + 48
COMP40-11	400 - 600	91	284 = 212 + 72
COMP40-12	600 - 800	103,6	321 = 239 + 82
COMP40-13	800 - 1000	147,5	429 = 312 + 117
COMP40-14	1000 - 3000	179	519 = 377 + 142

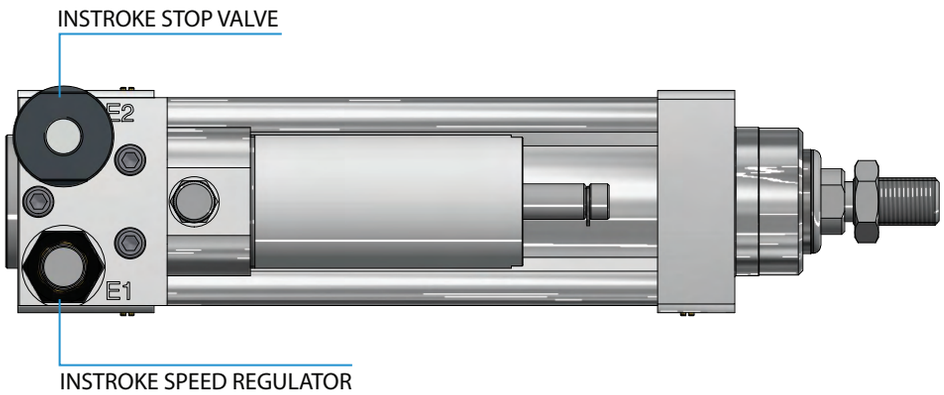
STOP INSTROKE AND OUTSTROKE SPEED ADJUSTMENT (BLK001 OR BLK036)



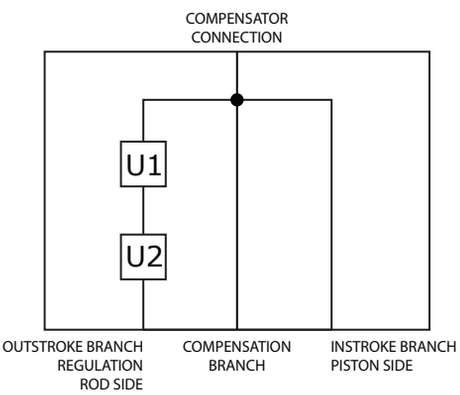


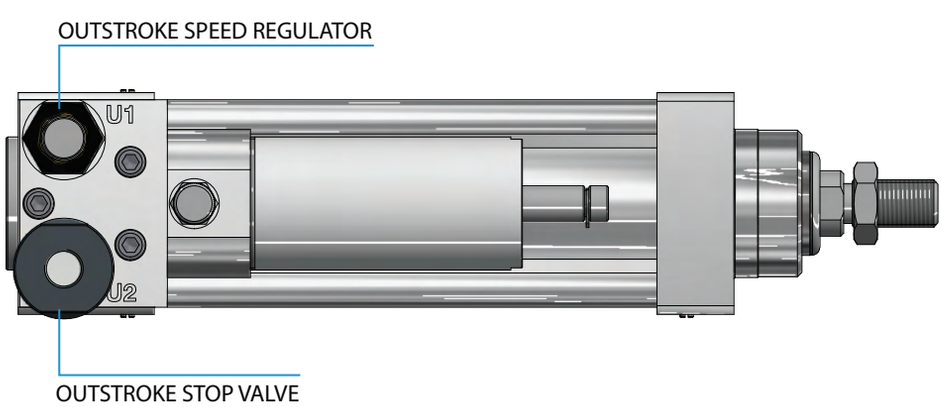
SPEED REGULATION + STOP: INSTROKE (BLK007 OR BLK037)



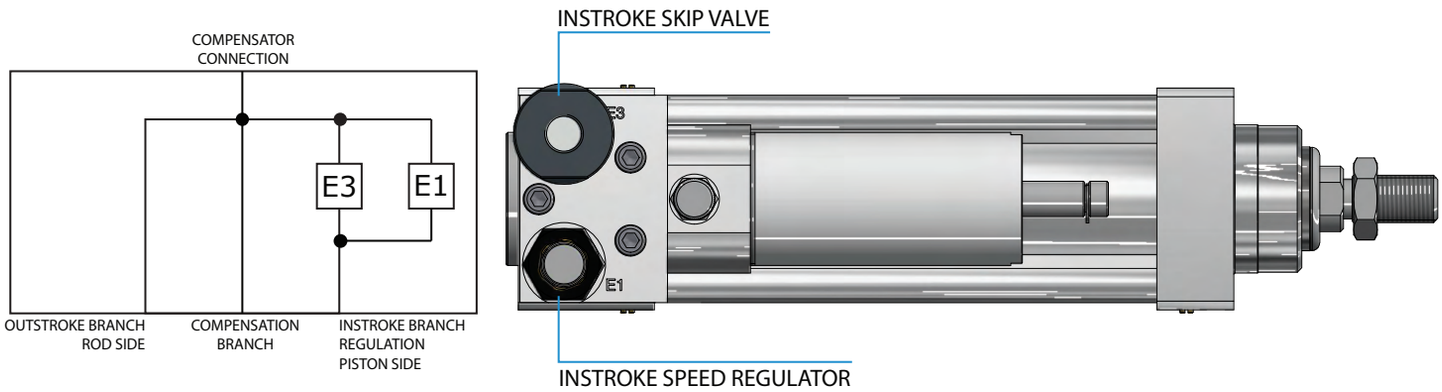


SPEED REGULATION + STOP: OUTSTROKE (BLK008 OR BLK038)

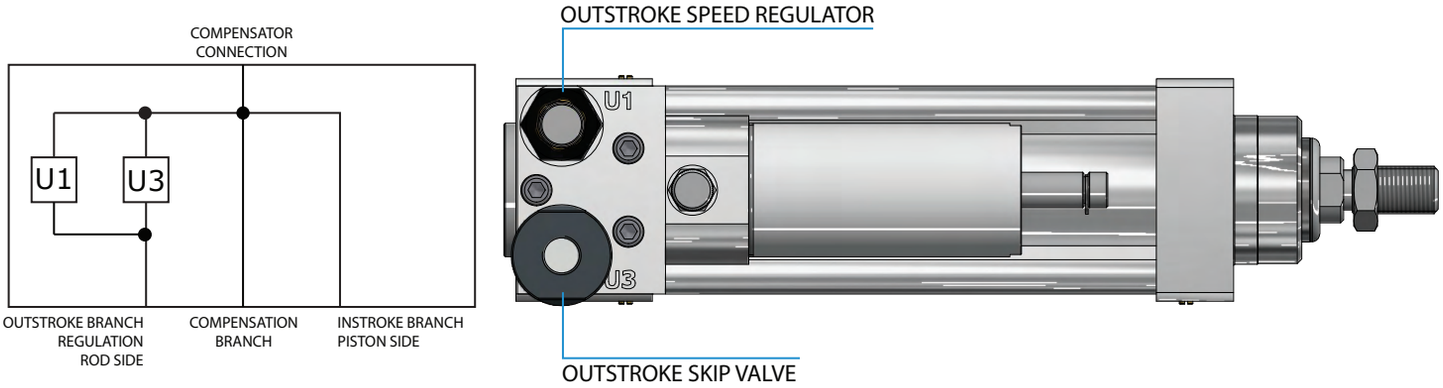




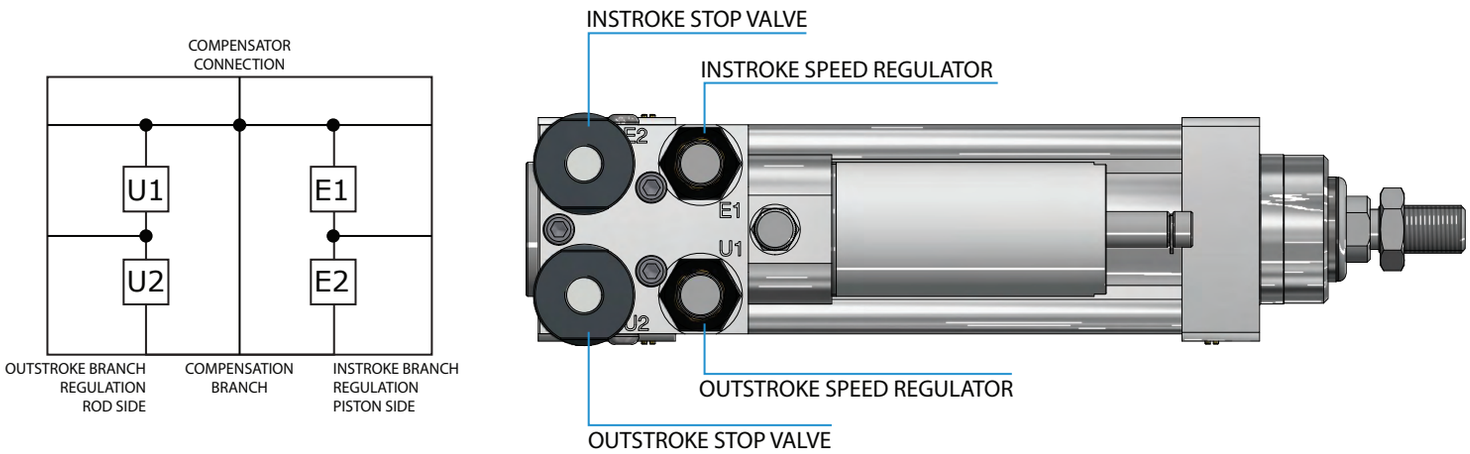
SPEED REGULATION + SKIP: INSTROKE (BLK009 OR BLK039)



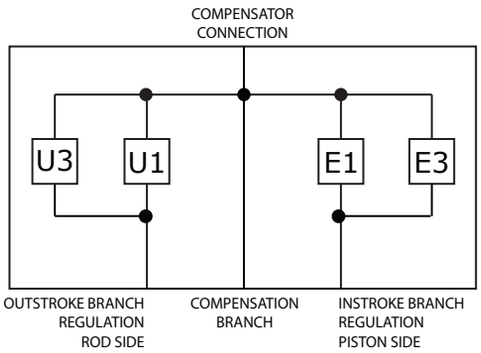
SPEED REGULATION + SKIP: OUTSTROKE (BLK010 OR BLK040)

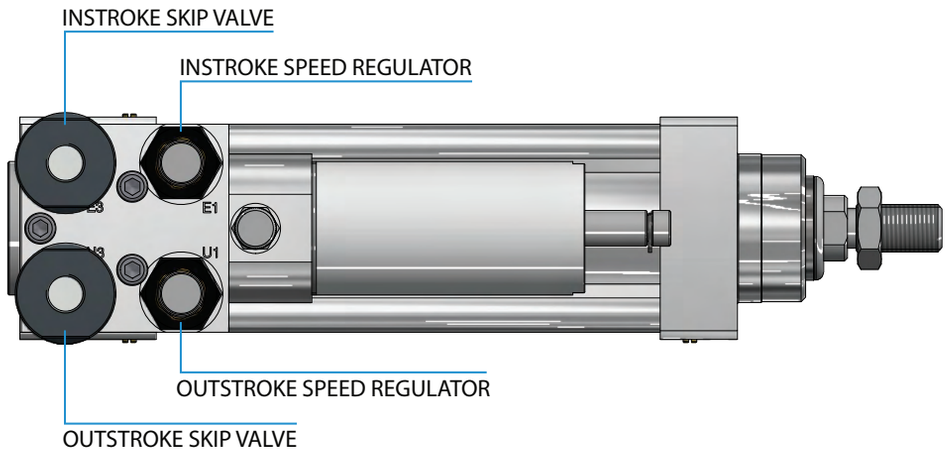


SPEED REGULATION + STOP: INSTROKE AND OUTSTROKE (BLK021 OR BLK041)

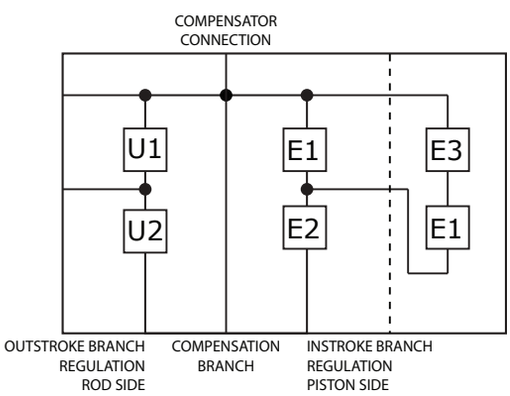


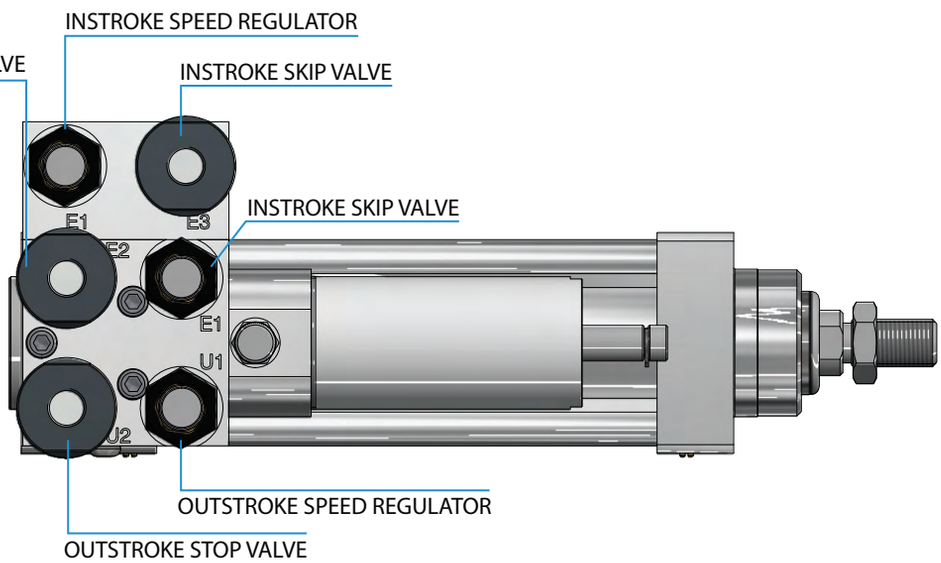
SPEED REGULATION + SKIP: INSTROKE AND OUTSTROKE (BLK003 OR BLK042)



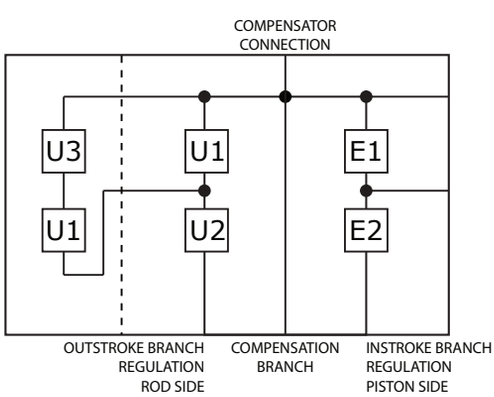


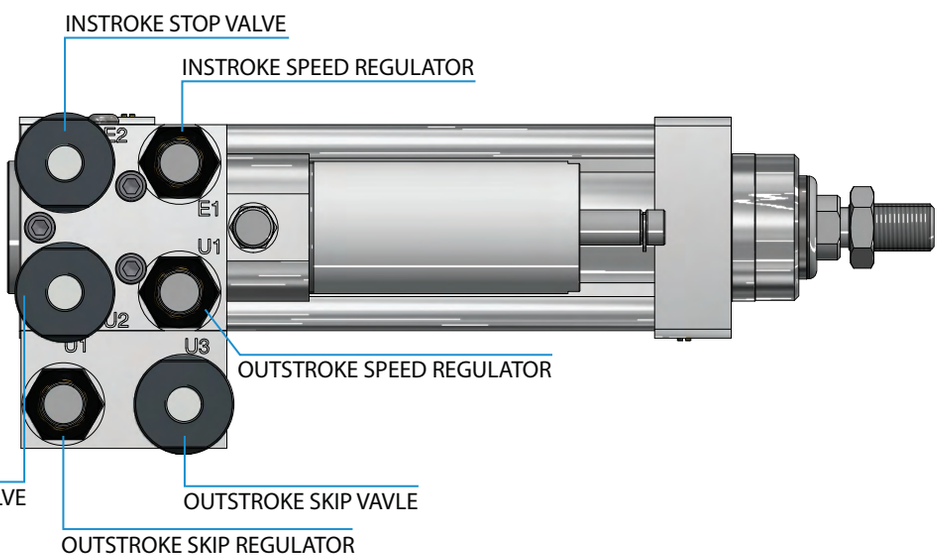
SPEED REGULATION + STOP + INSTROKE SKIP (ADJUSTABLE) (BLK021 OR BLK041 + BLK023)



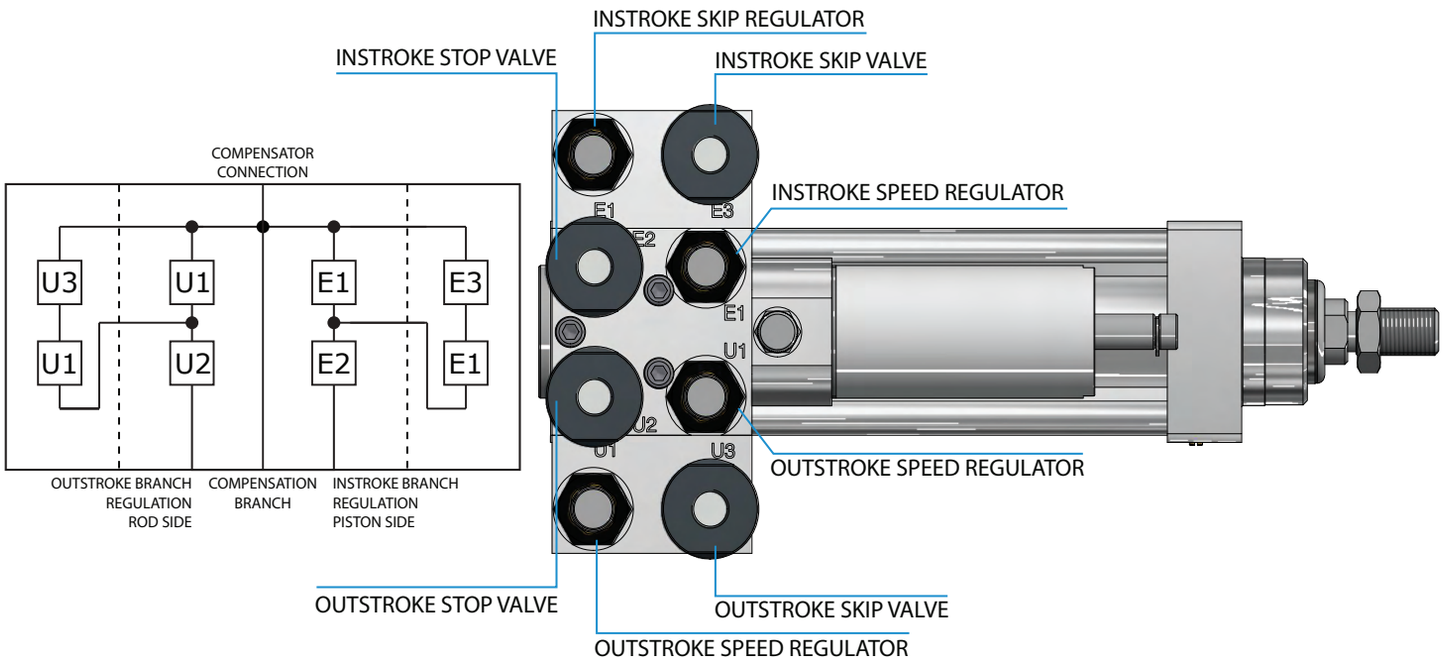


SPEED CONTROL + STOP + OUTSTROKE SKIP (ADJUSTABLE) (BLK021 OR BLK041 + BLK022)



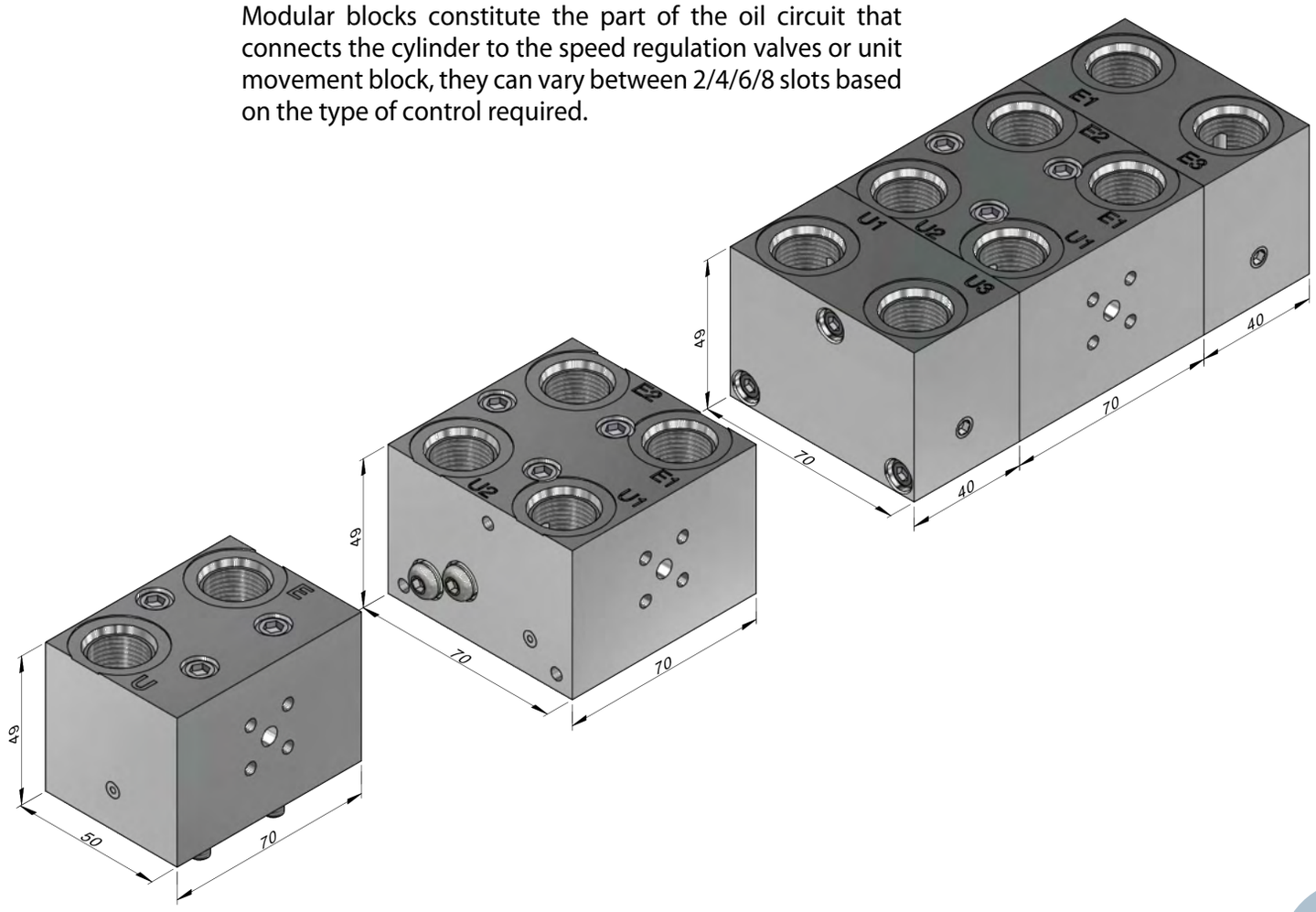


SPEED REGULATION + STOP + SKIP: IN/OUT STROKE (ADJUSTABLE) (BLK021 OR BLK041 + BLK022 + BLK023)



BLOCK DIMENSIONS

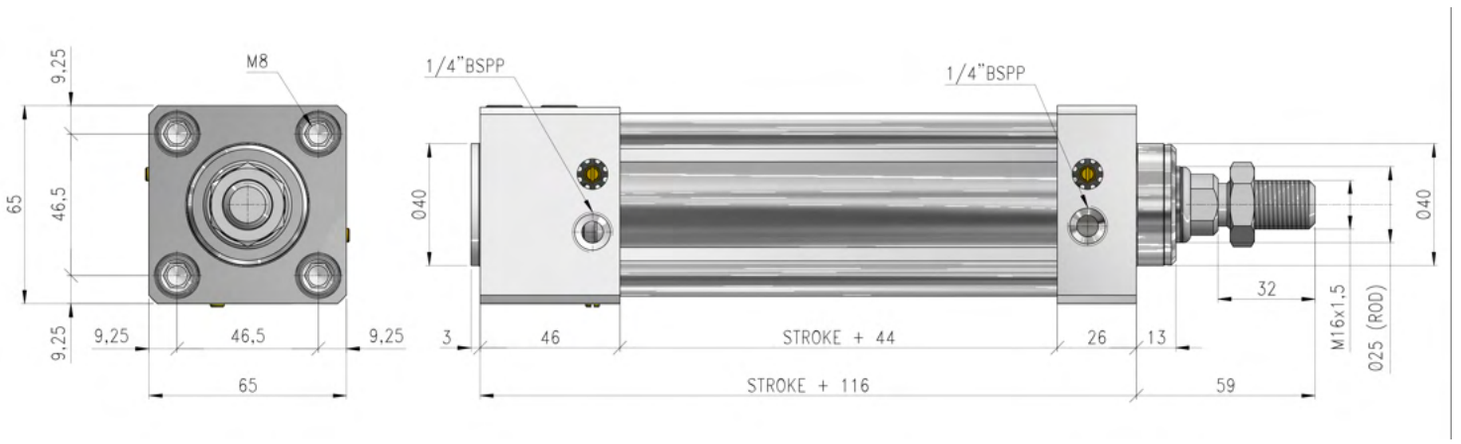
Modular blocks constitute the part of the oil circuit that connects the cylinder to the speed regulation valves or unit movement block, they can vary between 2/4/6/8 slots based on the type of control required.



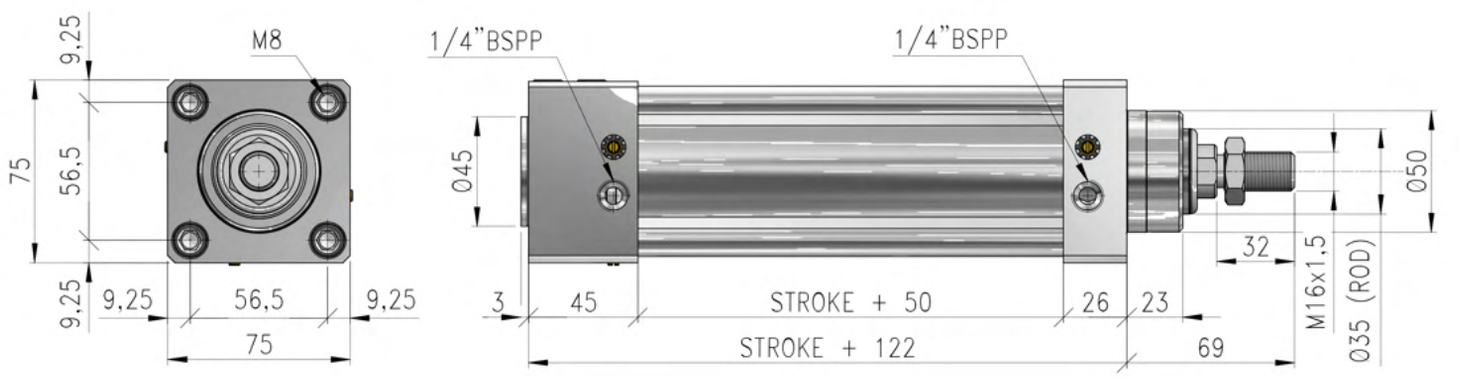
CYLINDER DIMENSIONS:

Sizes and air connections.
Add requested strokes in to "STROKE" dimensions for total length.

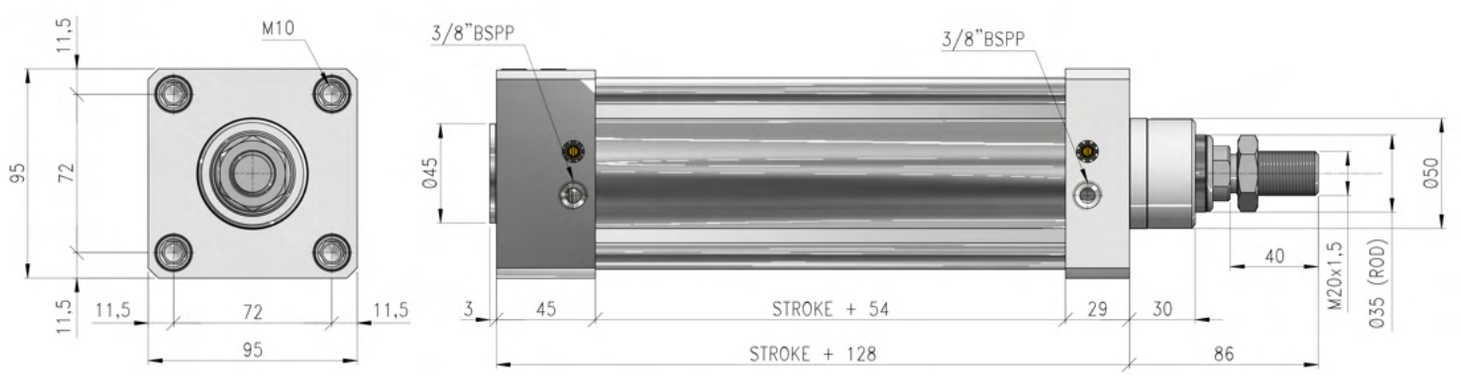
050 BORE



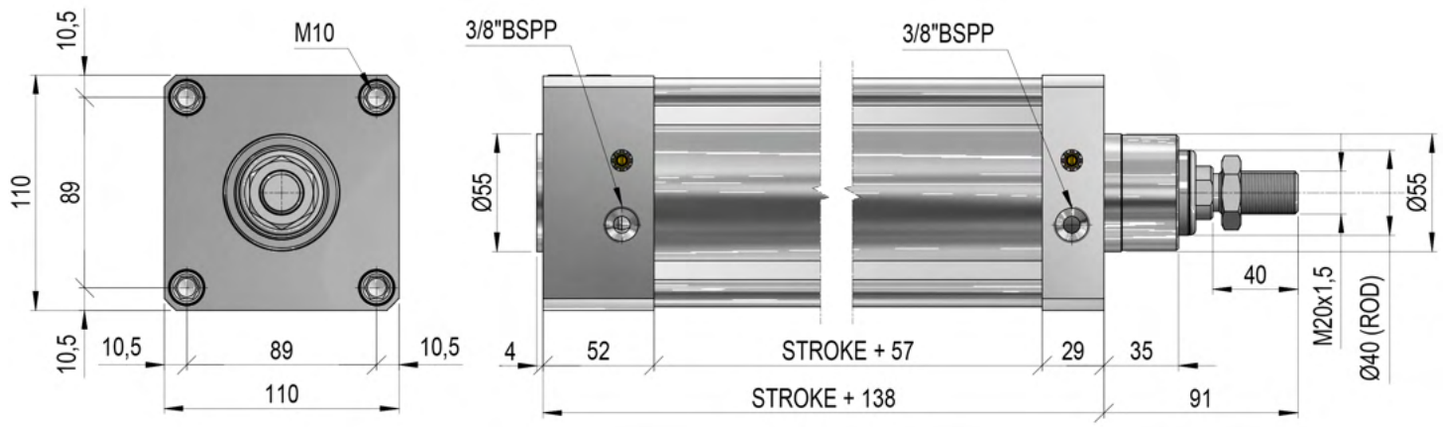
063 BORE



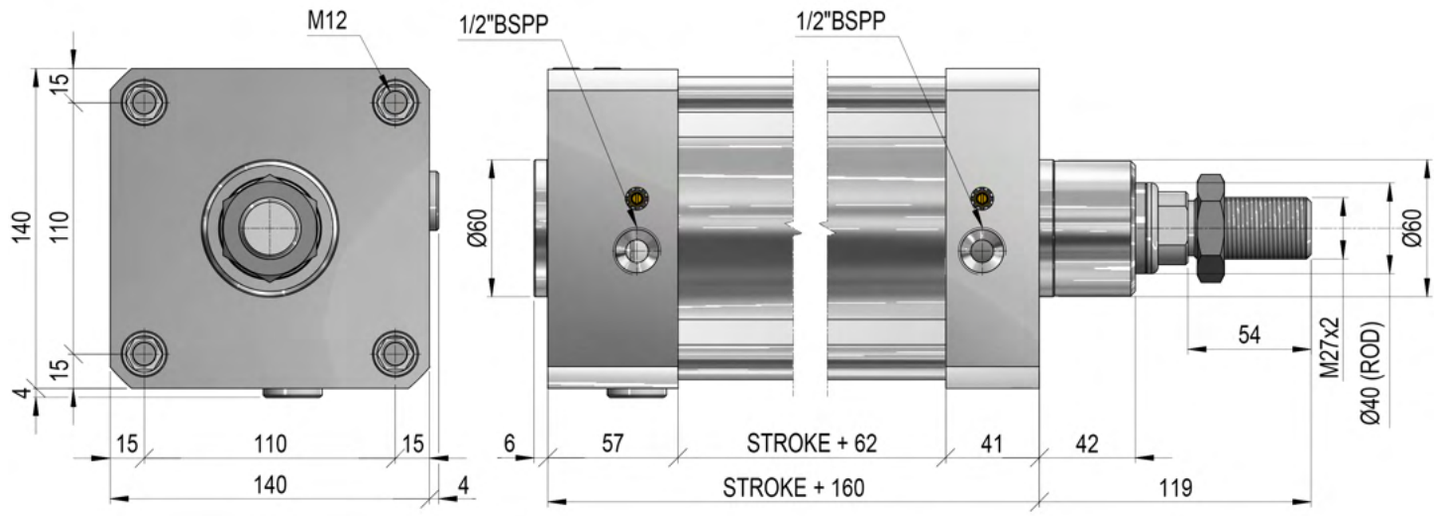
080 BORE



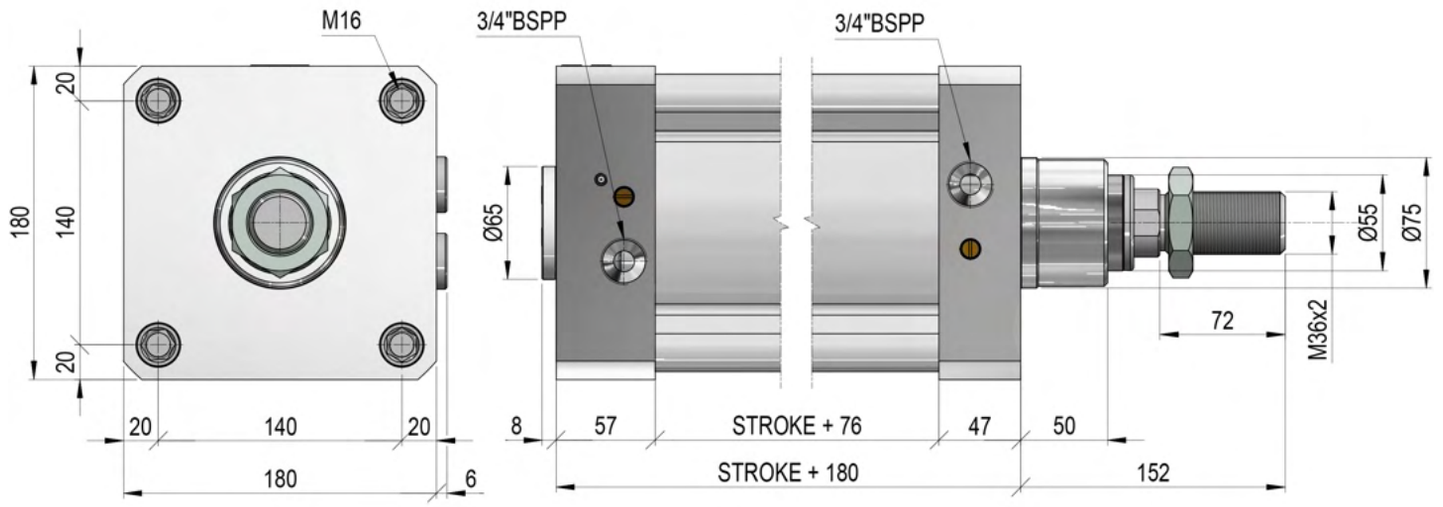
100 BORE



125 BORE



160 BORE



TecnAir® DRIVE TECHNOLOGY

CODE KEY

UCCM (050/063) UCCN (080/100/125/160)

Replace the number or character shown with that indicated in the list

0	5	0	R	C	X	R	C	M	X	X	X	X	0	1	0	0	X	0	0	0	X	-	0	1
1			2	3	4	5	6	7	8	9	10	11	12				13	14			15		16	

CONFIGURATIONS:

1 BORE:
- 050
- 063
- 080
- 100
- 125
- 160

2 INSTROKE CONTROL OPTIONS:
- X Not requested
- 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 + Reg. Skip N.O.
- H Speed control + Reg. Skip N.C.
- I Speed control + Skip + Stop N.O.
- K Speed control + Skip + Stop N.C.
- L Speed control + Reg. Skip + Stop N.O.
- P Speed control + Reg. Skip + Stop N.C.
- J Speed control + Reg. Skip N.O. + Stop N.C.

3 INSTROKE SPEED CONTROL OPTIONS:
- X Not requested
- B Single-turn control
- C Multi-turn control
- D Panel single-turn
- G Panel multi-turn

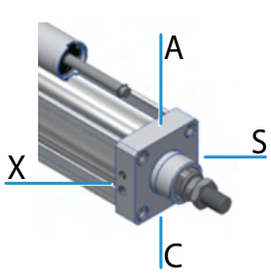
4 VALVES CONTROL:
- X Not requested
- P Pneumatic
- 0 12V DC Coil
- 1 24V DC Coil
- 2 110V DC Coil
- 3 220V DC Coil
- 7 24V AC Coil
- 8 110V AC Coil
- 9 220V AC Coil

5 OUTSTROKE CONTROL OPTIONS:
- X Not requested
- 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 + Reg. Skip N.O.
- H Speed control + Reg. Skip N.C.
- I Speed control + Skip + Stop N.O.
- K Speed control + Skip + Stop N.C.
- L Speed control + Reg. Skip + Stop N.O.
- P Speed control + Reg. Skip + Stop N.C.
- J Speed control + Reg. Skip N.O. + Stop N.C.

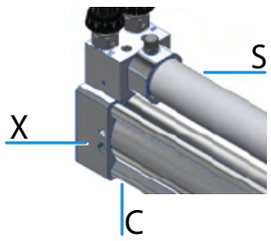
6 OUTSTROKE SPEED CONTROL OPTIONS:
- X Not requested
- B Single-turn control
- C Multi-turn control
- D Panel single-turn
- G Panel multi-turn

7 PISTON DETECTION:
- M Magnetic ring in piston
- N No magnet

8 FRONT PORT POSITION:
- X 90° Right (Standard)
- S 90° Left
- C 180° Down
- A 0° Up
- D Right+Left (double)



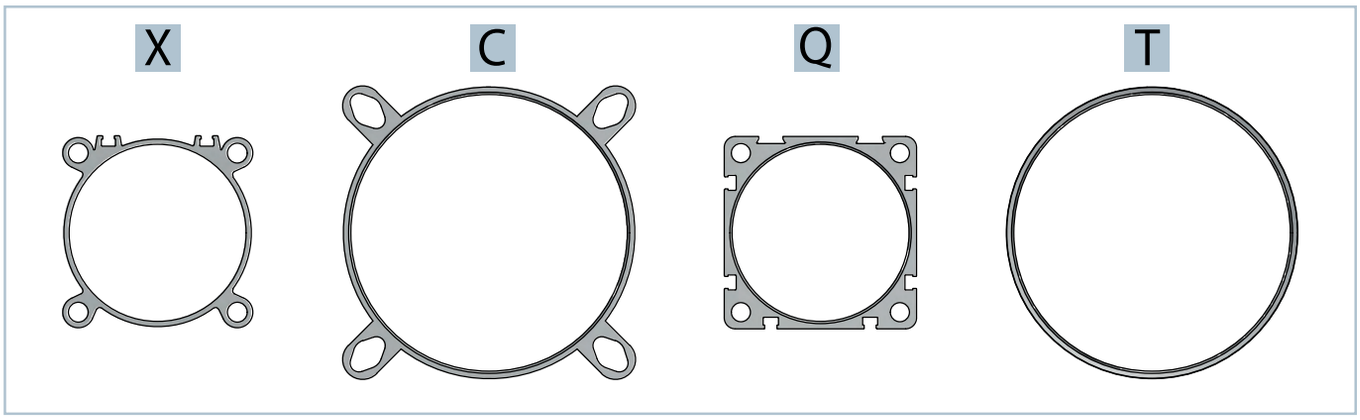
9 REAR PORT POSITION:
- X 90° Right (standard)
- S 90° Left
- C 180° Down
- D Right+Left (double)



10 TUBE PROFILE

X Light profile with screws (050-063-080-100)
C Light profile with rods (125-160)
Q Square profile with screws (050-063-080-100)
T Round profile with rods (from 050 to 125)

*Square and round profile are special on request



11 OVERALL TYPE:

X (STANDARD)

12 STROKE:

Stroke is in mm and comprises 4 numbers.
Example: stroke 150mm, is 0150.
The stroke intervals are 5mm.
Example: strokes 0150 - 0155 - 0160...
Strokes over 2000mm: longer strokes and special versions on request which can be evaluated by the technical office.

13 CUSHION TYPE:

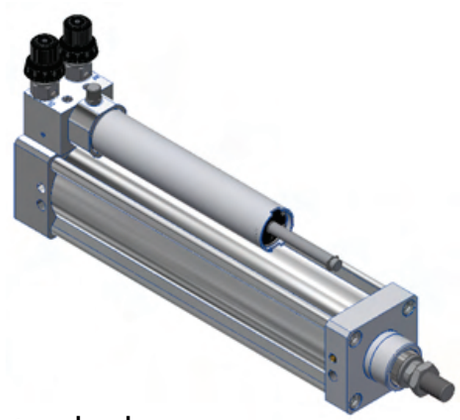
X Pneumatic (standard)
U Hydraulic (Outstroke, in rod end)
N No cushion

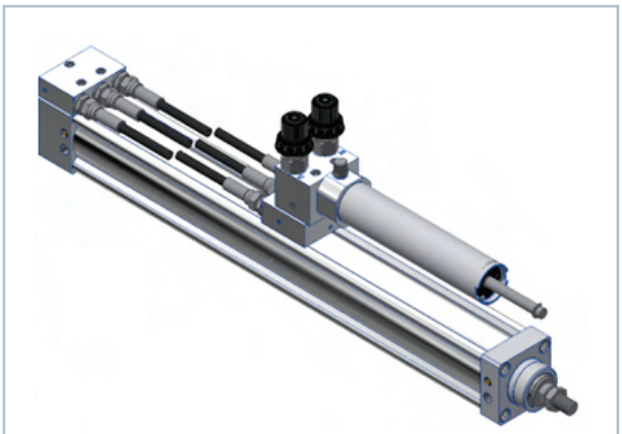
14 HOSES LENGTH:

If a panel regulator is requested at point 3 or 6, or a full remote block at point 15, it is necessary to specify hose lengths.
Hose lengths are in cm and comprisedes 3 numbers.
Example: 150mm hose, is 015.

15 REGLATION BLOCKS:

X Mounted on block (Standard)
R Remote


X-standard


R-Whole remote block

NOTE

TecnAir®

DRIVE TECHNOLOGY

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