

## PNEUMATIC CYLINDER ACTUATORS, SERIES B1

Metso's Neles double acting and spring return B1-Series piston type actuators are designed for use in both modulating control and on-off service. The series B1C and B1J are designed to ISO 5211/1 when Metso linkages are utilized. These actuators offer an extremely long cycle life and are well suited to operate almost any type of rotary valve.

When "stay put" is the requirement, the double acting B1C series is the choice. This series is available in several sizes with torque outputs from 40 Nm to 100 000 Nm (29.5 lbf ft to 73 756 lbf ft) for maximum supply pressure of 10 bar (145 psi).

If a failure mode is required, the spring return B1J series should be selected. This line offers a self-contained spring cartridge to provide failure in either the open or closed position. The spring return actuators are available with a mid-range spring for a 4 bar (58 psi) supply range, a lighter spring for lower supply pressure of 3 bar (44 psi) range and a stronger spring for a 5.5 bar (80 psi) range. These actuators offer torque outputs from 25 Nm to 12000 Nm (18,5 lbf ft to 8851 lbf ft) for maximum supply pressure of 8.5 bar (124 psi).

### Adjustable travel stops

As with any Neles pneumatic/hydraulic actuator, adjustable travel stops are standard for both the open and closed positions. End of stroke turning angle range is 85° to 95°. Optional travel stops 0° to 90° are also available.

### Wear resistant bearings

High quality bearings provide support on the upper and lower portions of the lever arm to reduce friction and expand the life of both the lever arm and the housing.

### Corrosion resistance

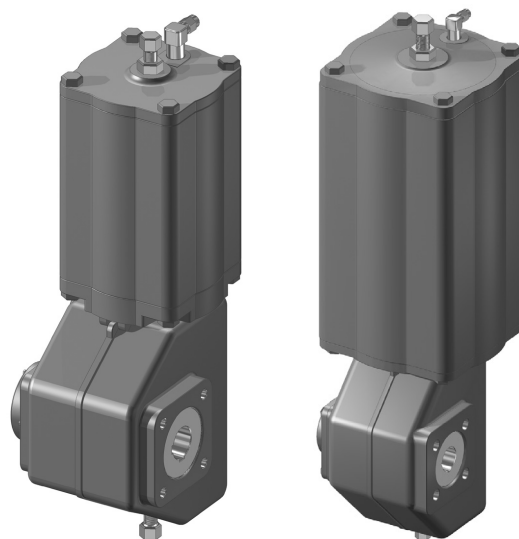
The epoxy painted actuators have housings of rugged cast iron, with light-weight aluminum cylinders anodized for added corrosion resistance. Travel stops are stainless steel.

### Self-contained spring cartridge

The springs in the B1J actuator are contained in a cartridge for added reliability and easy maintenance.

### Spring to open or close capability

The standard spring return actuator on the ball valve can provide spring-to-close or spring-to-open operation simply by changing the mounting position by 90°. On a high performance butterfly valve, the standard unit offers spring-to-close operation. An optional B1JA model is available for spring-to-open requirements.



### High-and-low temperature construction

The standard unit can be used in temperatures up to 70 °C (158 °F). High temperature construction is available for temperatures up to 120 °C (248 °F). The standard unit can be used down to -20 °C (-4 °F). A low temperature design is available for -40° to +70 °C (-40° to 158 °F), arctic service please refer type coding.

### High cycle option

For applications where very fast and high sequency operation is required.

### ATEX compatibility

Actuator construction ATEX approved.

### Oversized cylinder options

The oversized cylinders (B1C 60, 75, 602, 752) are used whenever the supply pressure is limited, thus the actuators can achieve the required torques with a lower supply pressure level.

### Override options

Available override devices include a manual centerpiece handle, a manual handwheel override, and a manual hydraulic override for high torque applications.

### Emergency shut-down

Emergency Shut-Down (ESD) valves utilizing B1J actuators are offered to assure operation in the event of a fire or plant malfunction. The ESD device enables valve operational testing without cycling, see bulletin 6B21.

## HOW TO ORDER

### Pneumatic double-acting cylinder actuator, Series B1C

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
B1	C	-	S	Y	U	50/120	HL	E	X	M

Signs 1, 2, 6 and 7 are obligatory: other marks are options

1. sign	PRODUCT GROUP
B1	Cylinder actuator with attachment dimensions acc. to ISO 5211.

2. sign	SERIES
C	Double acting, pneumatic, protection class IP66.

3. sign	CONSTRUCTIONS
-	Standard construction without sign.
H	Manual hydraulic override.

4. sign	CYLINDER AND HOUSING MATERIALS
-	Aluminium cylinder and EN 1561-GJL-200 housing, standard materials, without sign. Except if sign 8. is arctic version "A" then housing and piston always EN 1563-GJS-400-15.
S	Steel cylinder and EN 1561-GJL-200 housing and piston. Except if sign 8. is arctic version "A" then housing and piston always EN 1563-GJS-400-15. (Not available with size 6).
B	Aluminium cylinder and EN 1563-GJS-400-15 housing and piston. (Not available with size 6).
X	Steel cylinder and EN 1563-GJS-400-15 housing and piston. (Not available with size 6).

5. sign	SPECIAL CONSTRUCTION
-	Standard construction without sign
Q	Mechanical locking device for piston movement limit on housing end. Locking with long screw to <u>close</u> position.
W	Mechanical locking device for piston movement limit on cylinder end. Locking with long screw to <u>open</u> position.
QW	Mechanical locking device for piston movement limit on housing and cylinder ends. Locking with long screws to close as well as to open position.
Z	Actuator equipped with shock absorber on cylinder end, (-20 ... +120 °C)
N	Actuator equipped with shock absorber on housing end, (-20 ... +120 °C)
P	Actuator equipped with automatic latching device for closed position. Design is made mainly for actuator locking device of capping valve. No free motion.
T	Actuator equipped with manual latching device. Actuator can be locked to <u>open</u> position allowing about 20 degrees' motion.
K	Handwheel on cylinder end (sizes 9 to 25).
L	Handwheel on housing end (sizes 9 to 25).
R	Handwheel both on cylinder end and housing end (sizes 9 to 25).
RK	Handwheel on cylinder end with wormgear (sizes 32 - 75). Not used in 502, 602 and 752.
RL	Handwheel on housing end with wormgear (sizes 32 - 75). Not used in 502, 602 and 752.
RR	Handwheel both on cylinder end and housing end with wormgear (sizes 32 - 75). Not used in 502, 602 and 752.
Y	Special, to be specified, e.g. special material or stop screw.

6. sign	INTERFACE FOR ADDITIONAL DEVICES (positioner, limit switch)
U	Interface engineered to VDI/VDE with the use of Metso linkages.

7. sign	ACTUATOR SIZE
	E.g. 50/ 120 = actuator size / shaft bore diameter. Note special sizes (BC 50 and 502 with oversized cylinder): 60 - max. operating pressure 8.5 bar (cylinder Ø 600 mm/24") 75 - max. operating pressure 5 bar (cylinder Ø 750 mm/30") 602 - max. operating pressure 8.5 bar (cylinder Ø 600 mm/24") 752 - max. operating pressure 5 bar (cylinder Ø 750 mm/30")

8. sign	MATERIALS OF SEALS AND BEARINGS (all versions ATEX II 2 G c and ATEX II 3 G c)
-	Standard construction without sign (-20° to +70 °C).
HL	For temperatures -20 ... +120 °C and long-run option L .
CL	For temperatures -40 ... +70 °C, and long-run option L.
C	For temperatures -40 ... +70 °C.
A	For temperatures -55 ... +70 °C, Arctic service model. Not available if 3. sign "H" or 11. sign "M". Size 6 not available.
F	Oversized NPT connections: fast operation.
F1	Large oversized NPT connections: faster operation.
S	Super long-run option. (-20 ... +70 °C)
L	Long-run option .
D	DU-bearings - for sizes 32...502. Note: Not applicable with L, CL and HL options

9. sign	SCREW MATERIAL
-	Stainless steel (standard) without sign for sizes 6 through 32 Steel, zinc coated and passivated (standard) without sign for sizes 40 and bigger.
E	With aluminium cylinder screw material stainless steel for sizes 25 and bigger. With steel cylinder screw material stainless steel for all sizes.

10. sign	NON-STANDARD OPERATION RANGE e.g. 30° - 70° (standard operation range e.g. for ball valves 0° - 90°, without sign)
X	Valve closed position is limited. When closed position is limited to 30°, X = 30 (never fully closed).
Z	Valve open position is limited. When open position is limited to 70°, Z = 70 (never fully open).

11. sign	SPECIAL CONSTRUCTION
6	Protection class IP66M
7	Protection class IP67/IP67M
G	Oxygen service model
M	K-mass fire protection.
T	Tropicalization

## Pneumatic, single-acting cylinder actuator, Series, B1J and B1JA

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
B1	J	K	A	R	S	Y	U	20/70	HL	E	Z	M

Signs 1, 2, 8 and 9 are obligatory, other signs are options

1. sign	PRODUCT GROUP
B1	Cylinder actuator with attachment dimensions acc. to ISO 5211.

2. sign	SERIES
J	Pneumatic, spring-return, protection class IP66.

3. sign	SPRING OPTIONS
-	Standard construction without sign.
K	Light spring.
V	Strong spring.

4. sign	FUNCTION CODE
-	Spring-to-close operation, without sign.
A	Spring-to-open operation.

5. sign	CONSTRUCTION
-	Standard construction without sign.
R	Secondary handwheel operation (sizes 6 - 16).
RR	Secondary handwheel with wormgear (sizes 20 - 40).
H	Manual hydraulic override. Not available with B1J(A)6.

6. sign	CYLINDER AND HOUSING MATERIALS
-	Aluminium cylinder and EN 1561-GJL-200 housing, standard materials without sign. Except if sign 10. is arctic version "A" then housing and piston always EN 1563-GJS-400-15.
S	Steel cylinder and EN 1561-GJL-200 housing and piston. Except if sign 10. is arctic version "A" then housing and piston always EN 1563-GJS-400-15.
B	Aluminum cylinder and EN 1563-GJS-400-15 and piston. When 10. sign is "A", without sign, standard material.
X	Steel cylinder and EN 1563-GJS-400-15 and piston.

7. sign	SPECIAL CONSTRUCTION
-	Standard construction without sign.
Q	Mechanical locking device for piston movement limit on housing end. Locking with long screw to <u>close</u> position.
W	Mechanical locking device for piston movement limit on cylinder end. Locking with long screw to <u>open</u> position.
Z	Actuator equipped with shock absorber on cylinder end, (-20 ... +120 °C).
N	Actuator equipped with shock absorber on housing end, (-20 ... +120 °C).
QW	Mechanical locking device for piston movement limit on housing and cylinder ends. Locking with long screws to close as well as to open position.
T	Actuator equipped with manual latching device. The actuator can be locked in series B1J for open position and in series B1JA for closed position allowing about 20 degrees' motion. Not available with B1J(A)6.
Y	Special, to be specified e.g. special material or stop screw.

8. sign	INTERFACE FOR ADDITIONAL DEVICES (positioner, limit switch)
U	Interface engineered to VDI/VDE with the use of Metso linkages.

9. sign	ACTUATOR SIZE
-	6/15 6/20 6/25 - 8/15 8/20 8/25 8/35 - 10/20 10/25 10/35 10/40 - 12/55 - 16/55 - 20/70 25/95 - 32/105 - 40/95 40/105 40/120 - 322/95 322/105 322/120 E.g. 20 / 70 = actuator size / shaft bore diameter

10. sign	MATERIALS OF SEALS AND BEARINGS (all versions ATEX II 2 G c and ATEX II 3 G c)
-	Standard construction without sign (-20° to +70 °C).
HL	For temperatures -20 ... +120 °C and long-run option L.
CL	For temperatures -40 ... +70 °C, and long-run option L.
C	For temperatures -40 ... +70 °C.
A	For temperatures -55 ... +70 °C, Arctic service model. Not available if 5. sign "H" or 13. sign "M".
F	Oversized NPT connections: fast operation. Not available with B1J(A)6
F1	Large oversized NPT connections: faster operation. Not available with B1J(A)6
F2	Largest oversize NPT connections: fastest operation. Not available with B1J(A)6
S	Super long-run option. (-20 ... +70 °C)
L	Long-run option
D	DU-bearings - for sizes 32...322. Note: Not applicable with L, CL and HL options.

11. sign	SCREW MATERIAL
-	Stainless steel (standard) with out sign for sizes 6 through 20 Steel zinc coated and passivated (standard) without sign for sizes 25 and bigger.
E	Stainless steel for sizes 25 and bigger.

12. sign	NON-STANDARD OPERATION RANGE e.g. 30° - 70° standard operation range e.g. for ball valves 0° - 90°, without sig
X	Valve closed position is limited. When closed position is limited to 30°, X = 30 (never fully closed).
Z	Valve open position is limited. When open position is limited to 70°, Z = 70 (never fully open).

13. sign	SPECIAL CONSTRUCTION
6	Protection class IP66M
7	Protection class IP67/IP67M
G	Oxygen service model
M	K-mass fire protection.
T	Tropicalization

### Metso Corporation

Töölönlahdenkatu 2, PO Box 1220, 00100 Helsinki, Finland  
Tel. +358 20 484 100

### Metso Flow Control Inc.

Vanha Porvoontie 229, P.O. Box 304, FI-01301 VANTAA, Finland.  
Tel. +358 20 483 150. Fax +358 20 483 151

[www.metso.com/valves](http://www.metso.com/valves)

Subject to change without prior notice. Product names in this bulletin are all trademarks of Metso Flow Control Inc.

