

DECLUTCHABLE MANUAL OVERRIDE

Type BMO for Neles™ B1- series actuators

Installation, maintenance and
operating instructions

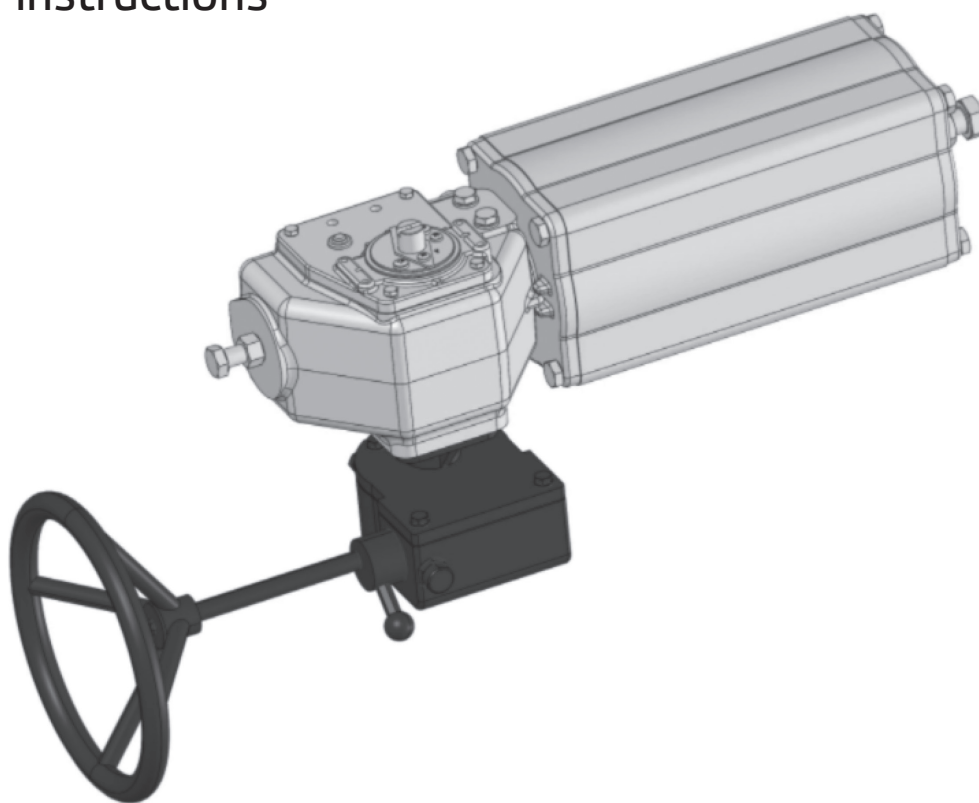


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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

This device is designed for use with Neles B1- series actuators. The declutchable manual override (BMO) is intended to be used for safely moving the valve to desired position in case of loss of air supply for the actuator. These instructions contain the information needed for installing and operating the device. Also included in this document are instructions on selecting the correct device to match BMO with B1 and maintenance of BMO.

Additional information on B1-actuators is available from the instructions on installation, operation and maintenance of the actuator model in question.

The B1 declutchable manual override for is called BMO in short and it has its own typecode, so the BMO type coding is selected irrespective of B1 actuator type coding. The BMO can be used instead of handwheel options in B1 actuator. Please note there exists certain physical limitations when BMO cannot be installed, as it may cause interfere with other B1 options. If any doubt, consult Valmet Flow Control experts.

1.1 Parts and fittings

The BMO assembly consists of the declutchable gear itself, adapter shaft inside the BMO (see typecoding sign 2.), and mounting parts to match for B1 actuator. See BMO assembly parts and descriptions in appendix 1. The BMO parts are presented in appendix 3.

1.2 Handwheel selection

Reference table for Handwheel sizes seen below also, as selected in typecode sign 5. Handwheel is delivered pre-installed to the BMO.

BMO model	Handwheel Diameter (mm)
BMO-100	110
BMO-250	200
BMO-450	300
BMO-750	400
BMO-1000	500
BMO-1500	500
BMO-2500	850
BMO-3500	850
BMO-5000	500
BMO-7500	600
BMO-10000	700
BMO-15000	750
BMO-35000	750

1.3 Sizing

Always select the BMO so that the BMO torque capacity is higher than the valve required torque. Check BMO torque capacity from appendix 4. For double-acting B1C the BMO selection is straightforward based on valve torque, but for spring return B1J version, the BMO must also overcome the spring torque when operated in reverse direction.

Follow the steps below for correct BMO sizing:

1. Select the BMO mounting faces according to those of valve and actuator
2. Calculate the required torque:
 - a. For B1C, the required BMO torque equals to valve/ actuator required torque according to Nelprof sizing

- b. For B1J, the required BMO torque equals to valve torque and B1J spring torque
3. Select the BMO so that it's torque capacity (Nm) is at least the same as the required torque.
 4. Verify the valve stem size, if valve stem is greater than MAX valve stem in table appendix 4, then that BMO size is not suitable with direct mounting. If smaller, then a bushing can be used. If larger, then please consult Valmet Flow Control for another solution.

2. SAFETY PRECAUTIONS

CAUTION:

Before installation or removal of the device make sure valve and actuator are de-energized.

CAUTION:

Air pressure must always be released from actuator before detaching any parts from the device!

Do not remove any parts while actuator is pressurized. It can cause an uncontrolled pressure release which may result in damage or personal injury.

CAUTION:

Use the BMO only within its torque and temperature limits.

Misuse may result in damage to equipment or personal injury.

CAUTION:

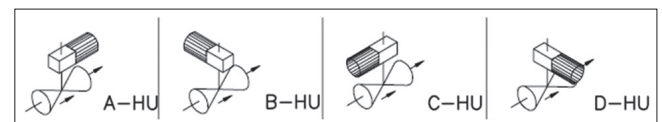
Before installing make sure BMO orientation matches the valve and actuator.

Misuse may result in damage to equipment or personal injury.

3. INSTALLATION AND OPERATION

The BMO is designed to be used only with Neles™ B1 series actuators and a compatible valve. The BMO features mounting face based on international standard ISO 5211, therefore the BMO is not suitable for old B-series actuator without ISO 5211 mounting face. See typecode sign 2 for valve mounting shaft size and keyway options. See typecode sign 3 for mounting face options, and please note it may not be the same mounting face for both valve and actuator in all cases.

Install the BMO so that it is on top of valve. See as in below image the allowed orientations for BMO with valve and single cylinder B1 actuator.



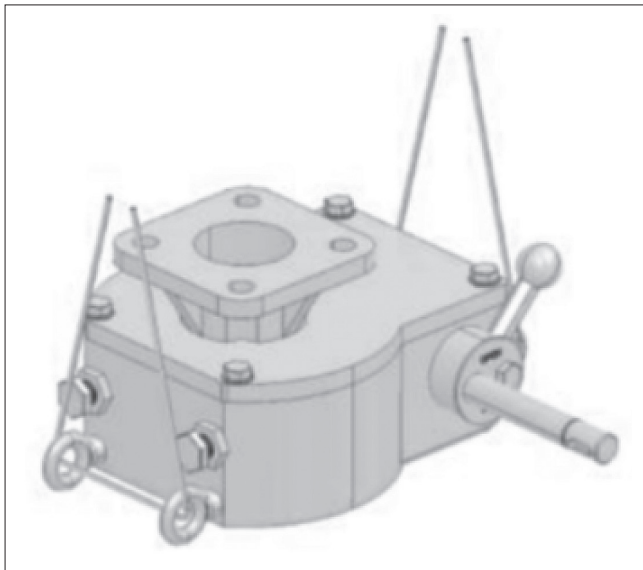
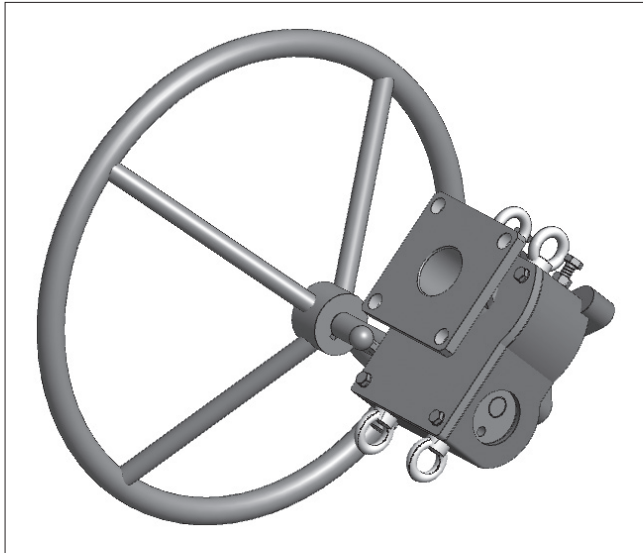
3.1 Lifting

CAUTION:

Do not lift from handwheel.

Always carefully plan lifting according to gearbox weight and dimensions.

Sizes above BMO-1000 are equipped with lifting points as seen in below. Use hook and sling at both ends of the gearbox to lift safely and to ensure proper balance of the device while lifting.



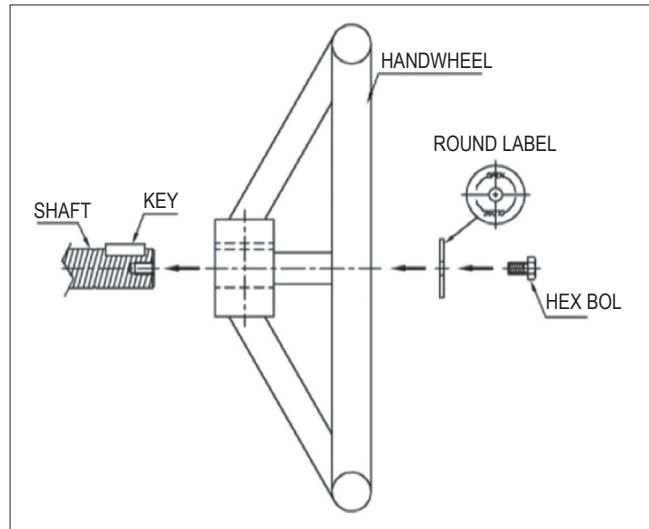
3.2 Installing the device

Please note that the ready-designed mounting parts and adapter are highly recommended when installing BMO to B1 i.e. BMO keyway and bore size are not the same as in the B1 without the BMO assembly included adapter. These required adapter and mounting parts are provided by Valmet Flow Control also.

See Appendix 1, for an exploded view of this BMO assembly structure when assembled together with B1 actuator and a valve.

See Appendix 2 for other dimensions of BMO.

The Handwheel is pre-installed to the BMO.



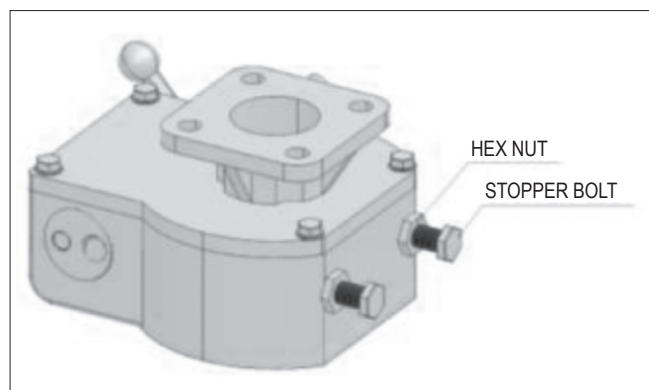
BMO mounting steps to valve:

1. Make sure the valve is in the desired position
2. Make sure the BMO handwheel matches the valve position, by rotating the handwheel if necessary.
3. Check the alignment of keyways and mounting holes
4. If needed, insert a required adapter to accommodate the BMO bore size to valve shaft and keyway design.
5. Install mounting parts and tighten the mounting bolts to required torques.

BMO mounting steps to actuator:

1. Make sure the actuator is de-energized
2. Make sure the BMO orientation matches the actuator (Please note the spring direction in B1J i.e. fail-to-open or fail-to-close in case of spring-return B1J actuator & fail-in-place if double acting version B1C)
3. Tighten the mounting bolts according to required torques

The BMO stopper bolts are adjustable to $\pm 5^\circ$ of total travel to allow for proper positioning of the worm gear quadrant.



Stopper Bolt Adjustment

1. Loosen the hex nut and turn it several turns to allow for stop screw adjustment.
2. Adjust the stopper bolt by turning it counterclockwise to back the screw away from the worm gear.
3. Move the valve to fully closed position.
4. Turn the stopper bolt in the clockwise direction until the end of the screw contacts the worm gear.
5. Tighten the hex nut to secure the closed set position.

6. Move the valve to fully open position.

CAUTION:

Do not install in unallowed orientation

Make sure BMO is installed only to the allowed orientation or damage to equipment or personal injury may occur.

CAUTION:

Do not exceed torque limitation

Make sure BMO is only installed between a valve-actuator assembly where it's torque limit is not exceeded. Otherwise damage to equipment or personal injury may occur.

CAUTION:

When installing BMO, take the weight into account.

Always carefully plan all lifting done during installation and secure all lifting devices. Failure in lifting may cause damage to equipment or personal injury.

3.3 Removing the device

The BMO can be removed after isolating or detaching the valve from process.

- Declutch the BMO
- De-energize the B1 actuator
- Remove the BMO from valve and actuator

CAUTION:

Before removing the device make sure the actuator is depressurized.

3.4 Clutch & declutch operation

The BMO can be manually operated with the handwheel. Prior to manual operation the BMO must be clutched to activate manual operation mode. Follow below points to achieve this:

- Pull the selector assembly outwards
- Secure the selector assembly to this position
- Turn the handle counterclockwise and release the knob
- Continue turning the handle until the selector assembly falls back into locking position.
- When the selector assembly cannot be locked, turn the handwheel slightly.

Steps to declutch and use pneumatic operation of B1:

- Pull the selector assembly outwards
- Secure the selector assembly in this position
- Turn the handle clockwise and release the knob
- Continue turning the handle until the selector assembly falls back into locking position

CAUTION:

Before clutching the BMO gear, make sure actuator is de-energized

Misuse may result in damage to equipment or personal injury.

4. MAINTENANCE

It is recommended to check the condition of the BMO yearly, and after each 1000 cycles.

Lubrication grease (according to typecode sign 4) and o-ring replacements may be needed as maintenance actions by end-user if wear and tear is noticed. Make sure that if disassembled the BMO is clean from any foreign matter or moisture before assembling again.

Otherwise the BMO is maintenance free for its lifecycle of 10 000 cycles.

Remove the device from process before conducting any maintenance.

5. TYPE CODE (HOW TO ORDER)

Dec clutchable manual override for B1 actuator				
1.	2.	3.	4.	5.
BMO	100/15	F0505	ST	110

1.	Product group
BMO	Series BMO, Dec clutchable Manual Gear for B1 Actuator 3rd party product manufactured by Q-Tork ATEX equipment group and category: II 2 GD Enclosure Rating: IP67

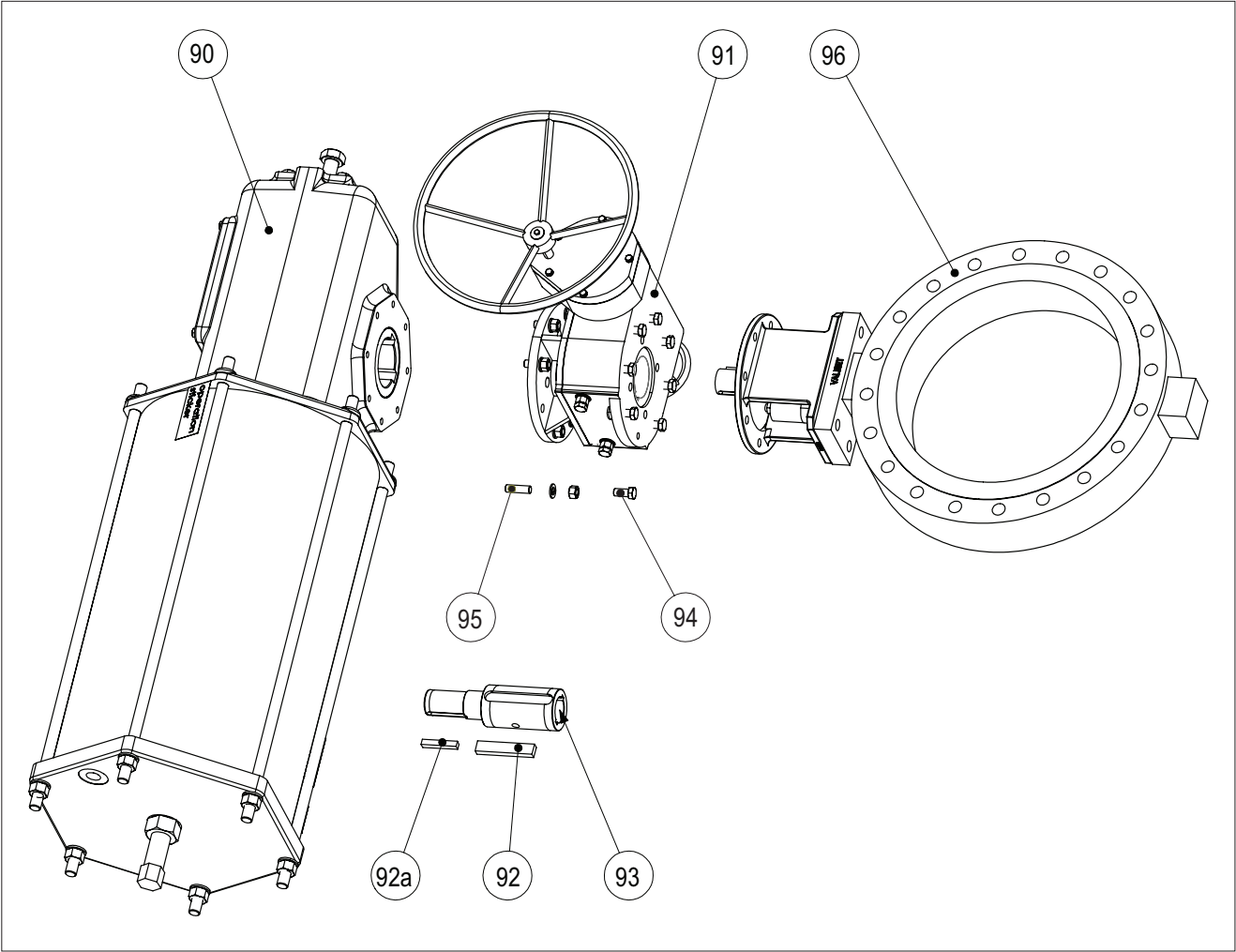
2.	Size (torque / shaft bore diameter)
*	100/15
	250/15
	450/15
	450/20
	750/40
	1000/50
	1500/50
	2500/65
	3500/80
	5000/90
*	7500/100
	10000/120
	15000/135
	35000/135
*	BMO size 450 and below: 2 keyways (90°) according to ANSI B 17.1-1967- Neles internal standard S-187 (square key)
	BMO size 750 and above: 2 keyways (90°) according to ISO773

3.	Valve and Actuator Mounting Face, acc. to ISO 5211 standard
F05F05	for size 100
F07F07	for size 250, 450
F07F10	for size 750
F10F10	for size 450,750,1000,1500
F12F12	for size 750,1000,1500,2500
F14F14	for size 1000,1500, 2500
F14F25	for size 3500
F16F16	for size 2500, 3500, 5000
F16F25	for size 7500
F25F25	for size 3500,5000,7500,10000,15000
F30F30	for size 10000,15000,35000
F35F35	for size 35000

4.	Temperature rating and service options
ST	Standard construction and temperature (-20° to +70 °C) Seal Material: NBR Housing: Ductile Iron Grease: SKF-LGMT3
HT	High temperature -20... +120 °C Seal Material: Viton Housing: Ductile Iron Grease: SKF-LGET
LT	Low temperature -40... +70 °C S Seal Material: Silicon Housing: Low Temperature Carbon Steel Grease: SKF-LGLT2
OX	Oxygen service and standard temperature -20° to +70 °C Seal Material: Viton Housing: Ductile Iron Grease: Krytox-GPL204
OL	Oxygen service and low temperature -40... +70 °C Seal Material: Silicon Housing: Low Temperature Carbon Steel Grease: Krytox-GPL204

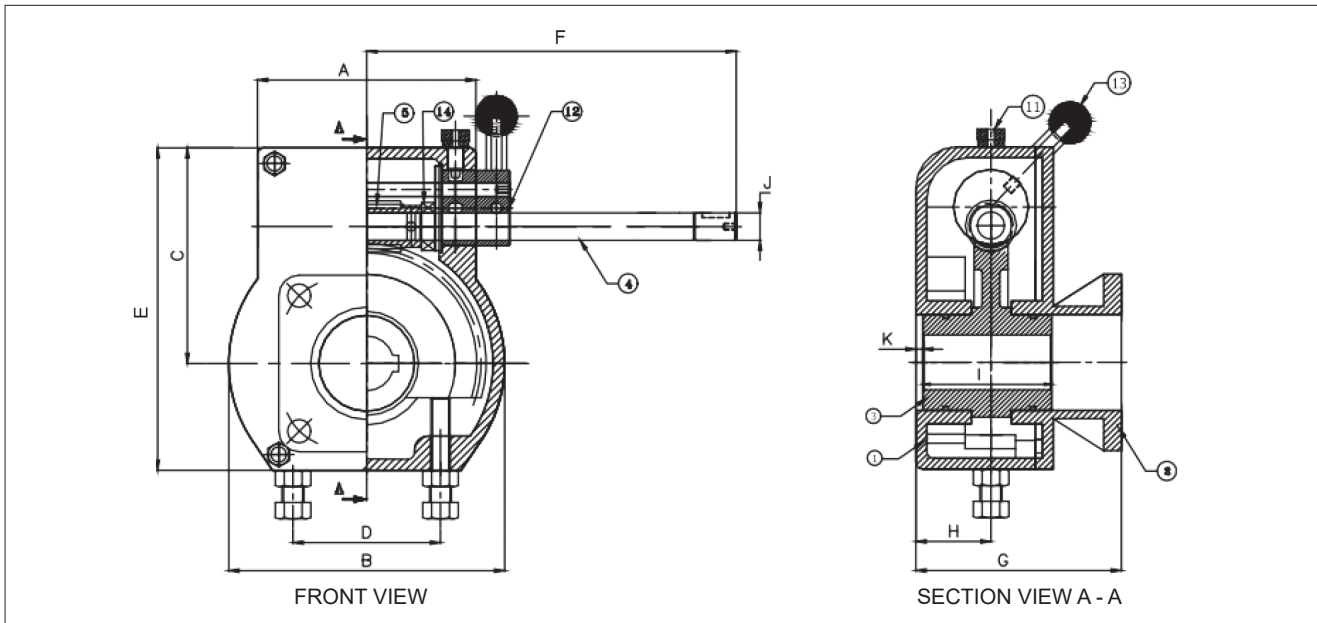
5.	Hand wheel diameter (mm)
110	110mm for BMO-100
200	200mm for BMO-250
300	300mm for BMO-450
400	400mm for BMO-750
500	500mm for BMO-1000-1500 and BMO-5000
600	600mm for BMO-7500
700	700mm for BMO-10000
750	750mm for BMO-15000-35000
860	850mm for BMO-2500-3500

Appendix 1: Exploded view of B1 actuator with valve and BMO gear and parts

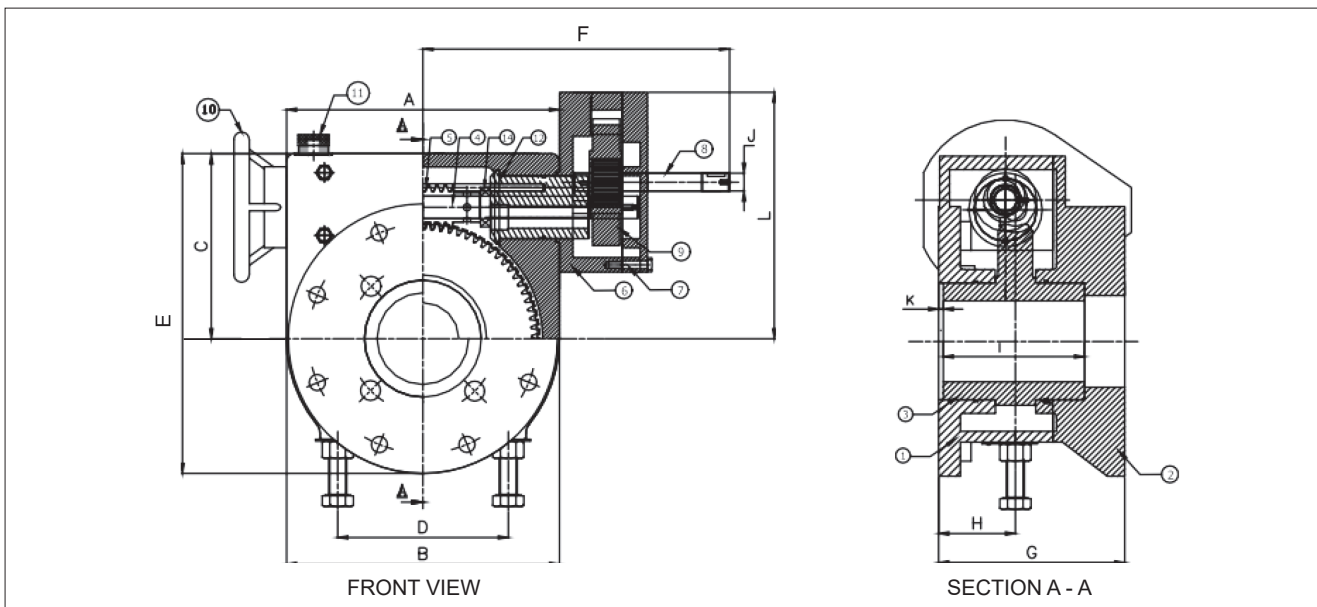


Part #	Part name
90	Neles™ B1-series actuator
91	BMO declutchable manual override
92	Key for BMO
92a	Key for B1
93	Adaptor shaft for B1 actuator connection to BMO and valve keyway
94	Hexagon screws
95	Mounting parts
96	Valve

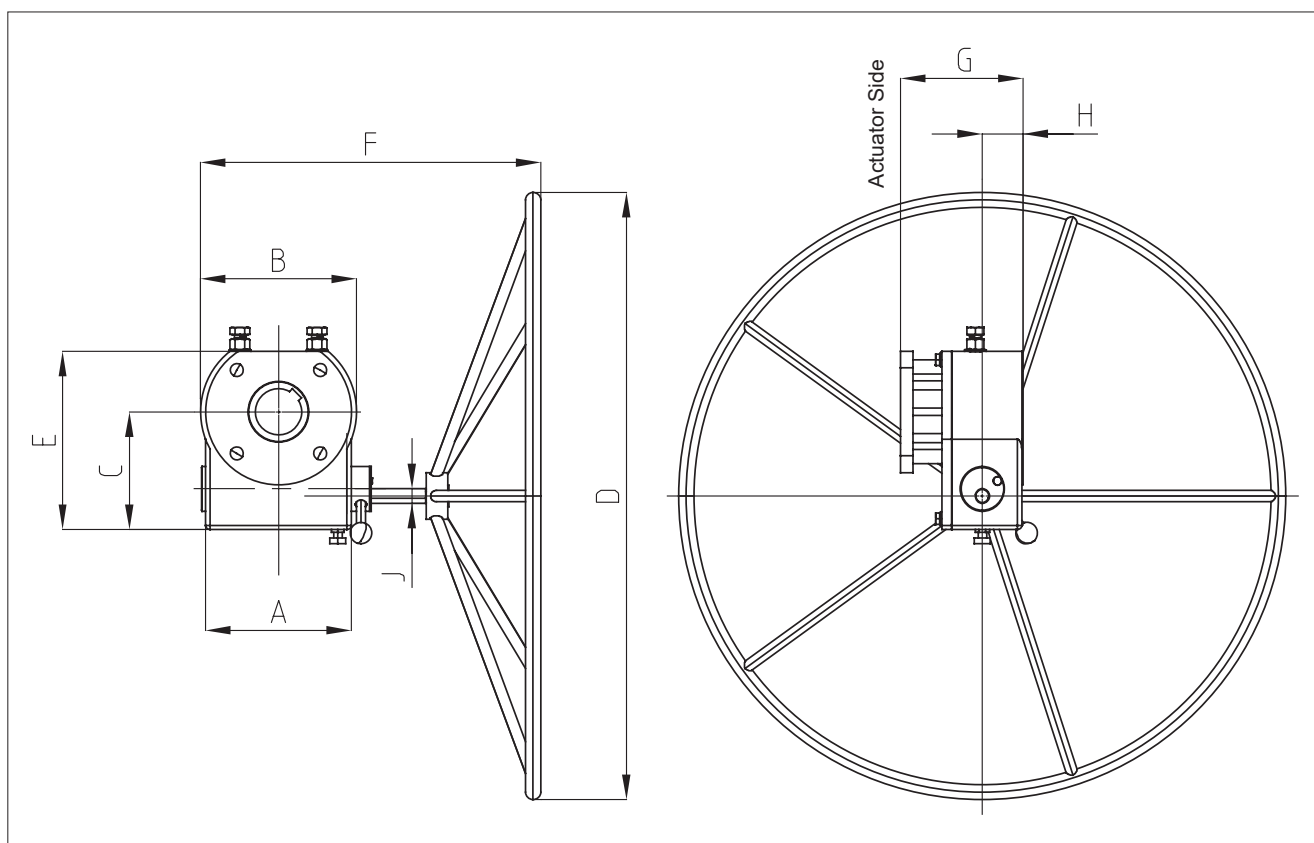
Appendix 2: BMO gear dimensions



Sr. No.	MODELS	A	B	C	D	E	F	G	H	I	J	K
1	BMO-100	89	72	66	40	93	119	86.5	32	47.5	10	2
2	BMO-250	106	98	81	44	121	215	86	28.5	50	12	2
3	BMO-450	115	132	97.5	70	142.5	165	123	41	73	15	2
4	BMO-750	117	125	109	70	165	185.5	123	45	72.5	17	2
5	BMO-1000	154	180	120.5	95	185.5	190	148.5	59	112.5	20	4
6	BMO-1500	160	202	157.5	108	235.5	230	150.5	55	94.5	20	5
7	BMO-2500	204	218	165	108	250	237	171	66	122	20	6
8	BMO-3500	185	296	203	150	351	265	195	78	128	20	7

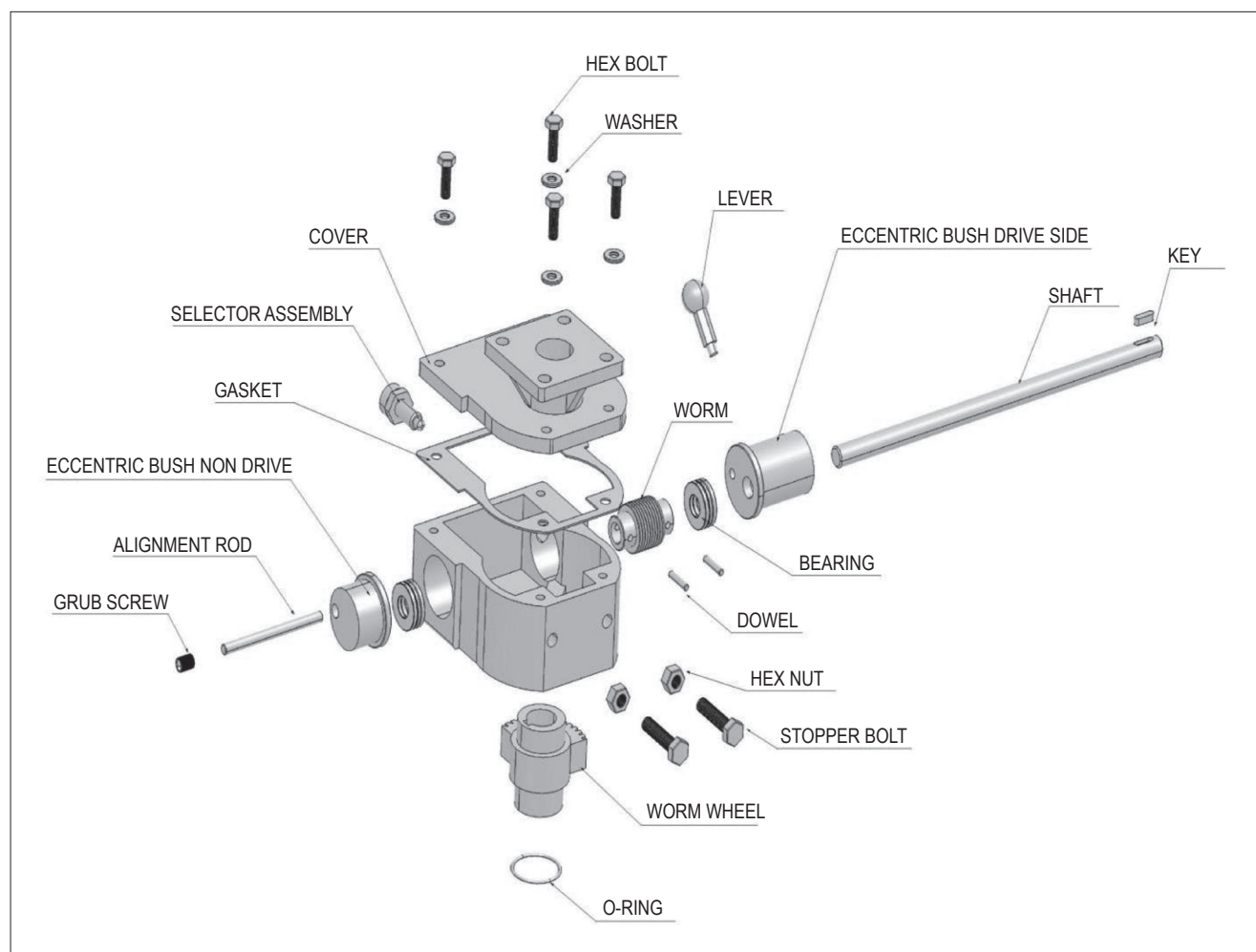


Sr. No.	MODELS	A	B	C	D	E	F	G	H	I	J	K	L
9	BMO-5000	270	300	193	180	343	284.5	204	84	156	20	5	234
10	BMO-7500	304	326	235	190	385	327	216	84	160	20	4	297
11	BMO-10000	362	367	367	210	440	370	242	98	198.5	20	6	362.5
12	BMO-15000	400	403	282	228	483.5	389.5	243	108	211	20	6.5	400
13	BMO-35000	460	510	360	300	567	500	330	119	292	20	8	429



Model	Actuator series B1C	Actuator series B1J	A	B	C	D	E	F	BMO Weight (kg)
BMO100	B1C6	B1J6	89	72	66	110	93	119	3,2
BMO250	B1C6, B1C9	B1J6, B1J8	106	98	81	200	121	230	4,2
BMO450	B1C9, B1C11	B1J8, B1J10	115	132	97,5	300	142,5	235	8
BMO750	B1C11, B1C13	B1J10, B1J12	117	125	109	400	165	285,5	9,7
BMO1000	B1C13, B1C17, B1C20	B1J12	154	180	120,5	500	185,5	270	15
BMO1500	B1C13, B1C17, B1C20	B1J12, B1J16	160	202	157,5	500	235,5	310	22
BMO2500	B1C13, B1C17, B1C20, B1C25	B1J12, B1J16, B1J20	204	218	165	850	250	367	39
BMO3500	B1C20, B1C25, B1C32	B1J20	185	296	203	850	351	395	58
BMO5000	B1C25, B1C32	B1J25	304	304	206	500	356	421,5	95
BMO7500	B1C25, B1C32	B1J25	304	326	235	600	385	441,5	115
BMO10000	B1C32, B1C40		362	367	367	700	440	480	130
BMO15000	B1C32, B1C40	B1J32	400	403	282	750	483,5	519,5	160
BMO35000	B1C40	B1J322, B1J40	460	510	360	750	597	684,5	380

Appendix 3: Exploded view of BMO



Appendix 4: B1 to BMO match table

Actuator	Mounting face	De-clutchable gear	BMO capacity (Nm)	MAX valve stem (mm)
B1C6; B1J6	F05	BMO100	100	15
B1C6; B1J6	F07	BMO250	250	15
B1C6; B1J6	F07	BMO450	450	20
B1C9; B1J8	F07	BMO450	450	20
B1C11; B1J10	F10	BMO450	450	20
B1C6; B1J6	F07	BMO750	750	25
B1C9; B1J8	F07	BMO750	750	25
B1C11; B1J10	F10	BMO750	750	25
B1C13; B1J12	F12	BMO750	750	25
B1C11; B1J10	F10	BMO1000	1000	35
B1C13; B1J12	F12	BMO1000	1000	35
B1C17; B1J16	F14	BMO1000	1000	35
B1C20; B1J20	F14	BMO1000	1000	35
B1C11; B1J10	F10	BMO1500	1500	35
B1C13; B1J12	F12	BMO1500	1500	35
B1C17; B1J16	F14	BMO1500	1500	35
B1C20; B1J20	F14	BMO1500	1500	35
B1C13; B1J12	F12	BMO2500	2500	45
B1C17; B1J16	F14	BMO2500	2500	45
B1C20; B1J20	F14	BMO2500	2500	45
B1C25; B1J25	F16	BMO2500	2500	45
B1C25; B1J25	F16	BMO3500	3500	55
B1C32; B1J32	F25	BMO3500	3500	55
B1C25; B1J25	F16	BMO5000	5000	55
B1C32; B1J32	F25	BMO5000	5000	55
B1C25; B1J25	F16	BMO7500	7500	70
B1C32; B1J32	F25	BMO7500	7500	70
B1C32; B1J32	F25	BMO10000	10000	85
B1C40; B1J40	F30	BMO10000	10000	85
B1C32; B1J32	F25	BMO15000	15000	95
B1C40; B1J40	F30	BMO15000	15000	95
B1C40; B1J40	F30	BMO35000	35000	95
B1C50; 60; 75	F35	BMO35000	35000	95

Valmet Flow Control Oy

Vanha Porvoontie 229, 01380 Vantaa, Finland.

Tel. +358 10 417 5000.

www.valmet.com/flowcontrol

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