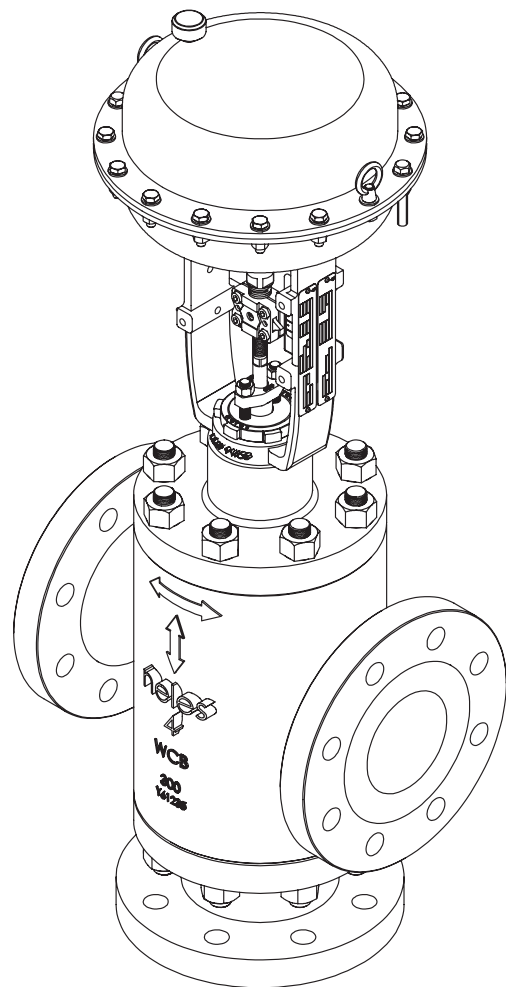


# 3-way globe valve

## Series GW

Installation, maintenance and  
operating instructions



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This product meets the requirements set by the Customs Union of the Republic of Belarus, the Republic of Kazakhstan and the Russian Federation.

#### **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.

Addresses and phone numbers are printed on the back cover.

#### **SAVE THESE INSTRUCTIONS!**

Subject to change without prior notice

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# 1 GENERAL

## 1.1 Scope of the manual

This manual provides essential information on series GW, Globe 3-way Diverting or Mixing type installed sliding stem valves. Actuators and positioners are only discussed briefly. Refer to the individual manuals for further information on their installation, operation and maintenance.

**NOTE:**

Selection and use of the valve in a specific application requires close consideration of detailed aspects. Due to the nature of the product, this manual cannot cover all the individual situations that may occur when the valve is used.

If you are uncertain about use of the valve or its suitability for your intended purpose, please contact Neles for more information.

For valves in oxygen service, please see also the separate installation, maintenance and operating instructions for oxygen service (see Neles document id:10O270EN.pdf).

## 1.2 Valve construction

Series GW valves are flanged (weld end available) 3-way sliding stem control valves. Two seat rings and the plug with stem is a module accessible through the bottom bonnet opening (bottom entry) of the body.

GW valves are available both diverting and mixing flow for a most primary application is in temperature control.

Our standard design combines the benefits of more strong guiding with a top and bottom seat rings, and the solid cylindrical plug makes strong support to ensure valve alignment.

GW valve is available with cylindrical plug trim and with various trim capacities.

The detailed structure is revealed by the type code shown on the valve identification plate. The type code is explained in Section 11.

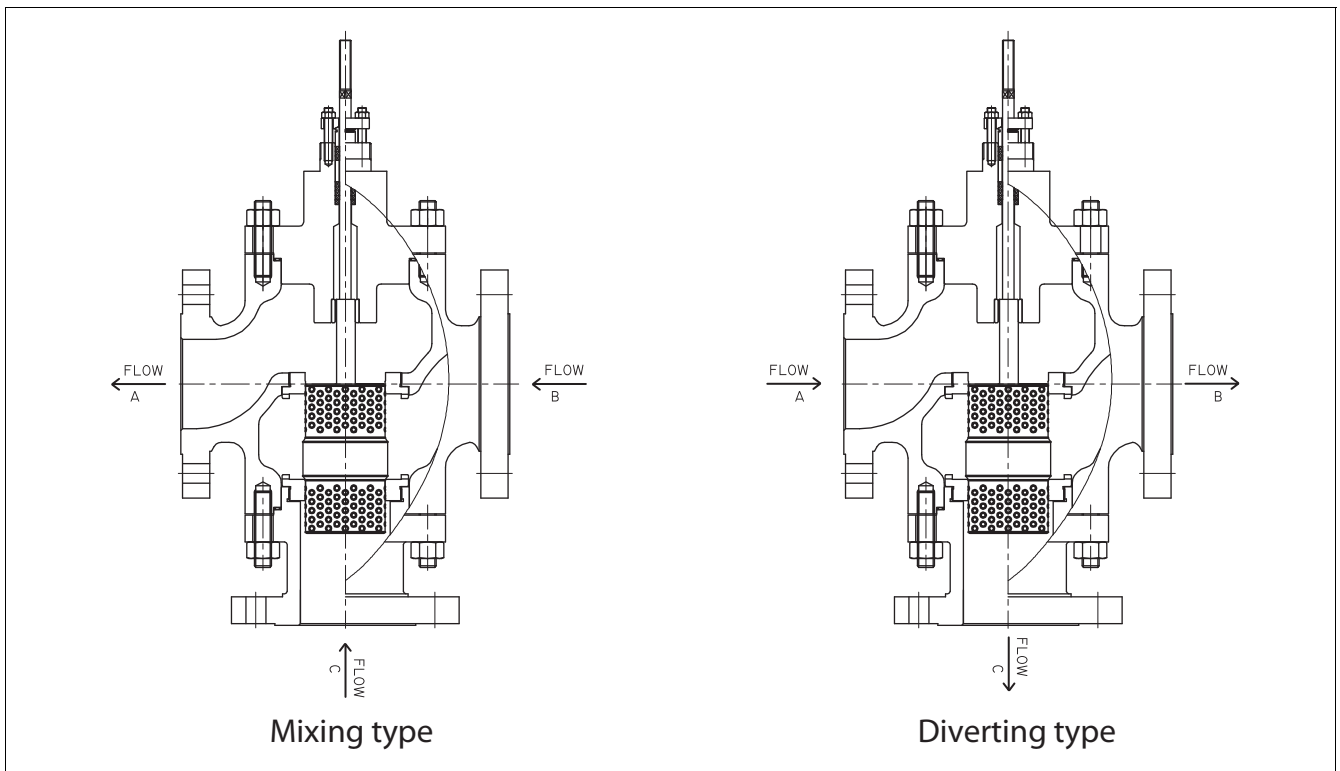


Fig. 1 Construction of the Neles GW series 3-way Valve

## 1.3 Valve markings

The body markings are: manufacturer's trademark, nominal size, pressure rating and material of the body. The identification plate is attached on an actuator yoke side, see Fig. 2.

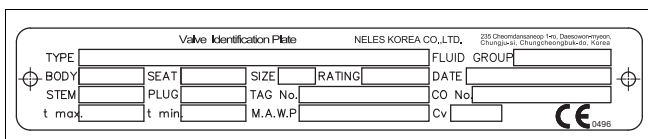


Fig. 2 Identification(name) plate example

Markings on the identification plate:

1. Type designation (Valve code)
2. Size, Rating
3. Cv
4. Body material
5. Plug, Stem material
6. Seat material
7. Temp. min./max.
8. Maximum (shut-off) pressure
9. Valve manufacturing date
10. Tag No.
11. CO No.

## 1.4 Technical specifications

Face-to-face length:	ANSI/ISA-75.08.01, 03, 05 & ANSI/ISA-75.08.06 (Long)
Body rating:	Class 150 to Class 600 PN 10 to PN 100
Max. pressure differential:	acc. to pressure class
Temperature range:	-196° to +425 °C
Flow direction:	indicated by an arrow on the body
Actuator mounting:	threaded bonnet with yoke nut or bolted yoke
Stem connection:	clamp with bolts/nuts
Dimensions:	see Section 10
Weights:	see Section 10

Note that the max. shut-off pressure is based on the mechanical maximum differential pressure at ambient temperature. You must always observe the fluid temperature when deciding on applicable pressure values. When selecting a valve you must also check the noise level, cavitation intensity, flow velocity, actuator load factor, etc. using Nelprof.

## 1.5 Valve seat leakage class

Standard seat tightness is class II, optional trim can meet class III, ANSI/FCI 70-2.

To meet the requirement of Class IV kindly contact factory.

## 1.6 Recycling and disposal

Most valve parts can be recycled if sorted according to material. Most parts have a material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal for a fee.

## 1.7 Safety precautions

### CAUTION:

#### Do not exceed the valve performance limitations!

Exceeding the limitations marked on the valve may cause damage and lead to uncontrolled pressure release. Damage or personal injury may result.

### CAUTION:

#### Do not dismantle the valve or remove it from the pipeline while the valve is pressurised!

Dismantling or removing a pressurised valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve.

Be aware of the type of medium involved. Protect yourself and the environment from any harmful or poisonous substances. Make sure that no medium can enter the pipeline during valve maintenance. Failure to do this may result in damage or personal injury.

### CAUTION:

#### Beware of the plug movement!

Keep fingers, other parts of the body, tools and other objects out of the open flow port. Leave no foreign objects inside the pipeline. When the valve is actuated, the plug functions as a cutting device. Close and detach the actuator pressure supply pipeline for valve maintenance. Failure to do this may result in damage or personal injury.

### CAUTION:

#### Protect yourself from noise!

The valve may produce noise in the pipeline. The noise level depends on the application. It can be measured or calculated using the Neles Nelprof software. Observe the relevant working environment regulations in terms of noise emission.

### CAUTION:

#### Beware of a very cold or hot valve!

The valve body may be very cold or very hot during use. Protect yourself against cold injuries or burns.

### CAUTION:

#### When handling the valve or the control valve assembly, take its weight into account!

Never lift the valve or control valve assembly by the positioner, the limit switch or their piping. Place the lifting ropes securely around the valve body (see Fig. 3). Damage or personal injury may result from falling parts.

### CAUTION:

#### Follow the proper procedures when handling and servicing Oxygen valves.

### CAUTION:

Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

### CAUTION:

Ensure that any weld splatter does not fall onto the valve trim. This may prevent proper trim movement or damage critical seating surfaces causing leaks.

### CAUTION:

Make sure the valve is not pressurized when removing the actuator.

## 2 TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully before installation, preferably indoors in a dry place.

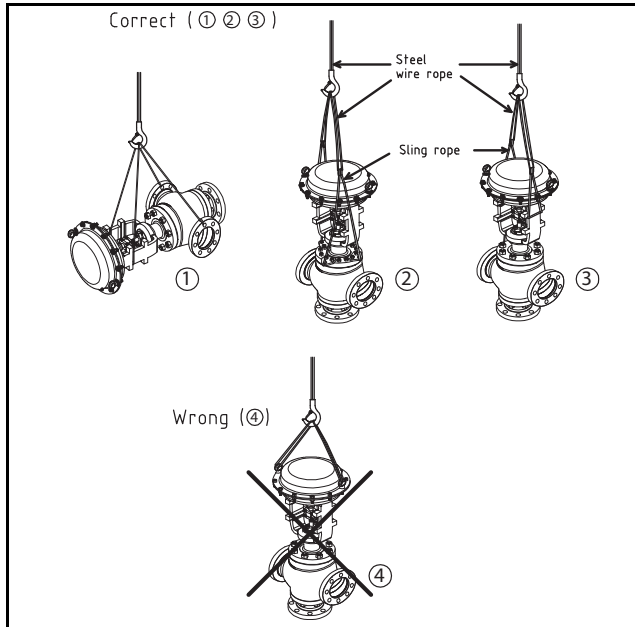


Fig. 3 Lifting the valve

Do not remove the flow port protectors until immediately before installation of the valve into the pipeline.

The valve is delivered in the closed position. A valve equipped with a spring-return actuator is delivered in the position determined by the spring.

## 3 VALVE INSTALLATION

### 3.1 General

Remove the flow port protectors and check that the valve is clean inside.

#### CAUTION:

**When handling the valve or the control valve assembly, take its weight into account!**

#### NOTE:

Heat insulation should be installed when valve design temperature is over 260°C to protect actuator, positioner and accessories from heat.

### 3.2 Installation into the pipeline

#### Pipeline cleaning

Make sure no foreign particles, such as sand or pieces of welding electrode, are in the pipeline, they may damage the sealing surfaces.

#### Installation valve

The valve has an arrow indicating the flow direction. Install the valve in the pipeline so that the flow direction of the valve corresponds to the flow direction marked on the pipe.

The mounting orientation of the valve should be vertical position as it is shown on Fig.4.

#### CAUTION:

Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

#### CAUTION:

Ensure that any weld splatter does not fall onto the valve trim. This may prevent proper trim movement or damage critical seating surfaces causing leaks.

#### NOTE:

For any other mounting position, please consult the factory.

Choose flange gaskets according to the operating conditions.

Do not attempt to correct a pipeline misalignment by means of flange bolting.

Loads on the valve body from pipeline vibrations can be reduced by supporting the pipeline properly. Reduced vibration also increases the lifetime of the positioner.

Where necessary, you can support the valve by the body, using regular pipe clamps and supports. Do not fasten supports to the valve or flange bolting or to the actuator, see Fig. 4.

### Hydrostatic testing and Line flushing

When the line is hydrostatic test and flushing, the control valve should not used as an isolating valve.

Make sure the control valve always be opened position before start this process.

Otherwise valve and trim damage or failure of the seals could result.

Flushing and hydrostatic test kit can be purchased from Neles.

#### CAUTION:

**Flushing trim kit should be installed in the valve (especially 'Tendril' application) to protect the original trim and the flow passages while the valve installation and line flushing.**

**Unless this caution could result in clogging trim, low flow rates, unstable control, valve leakage and excessive noise and other trouble.**

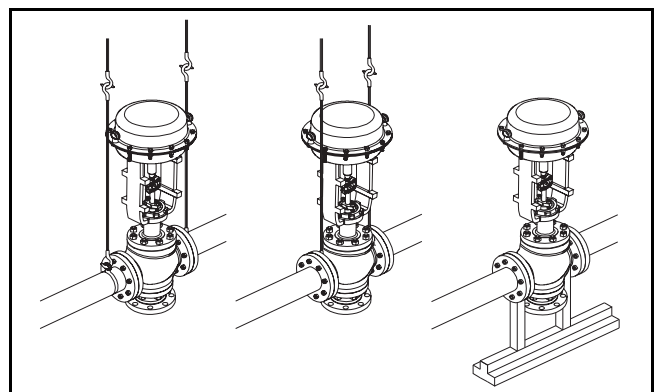


Fig. 4 Installing the control valve into pipeline using supports

### 3.3 Control valve assembly

Check all joints, piping and cables.

Check that the actuator stop screws, positioner and limit switches are calibrated. Refer to their installation, maintenance and operating manuals.

### 3.4 Valve insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve body, see Fig. 5.

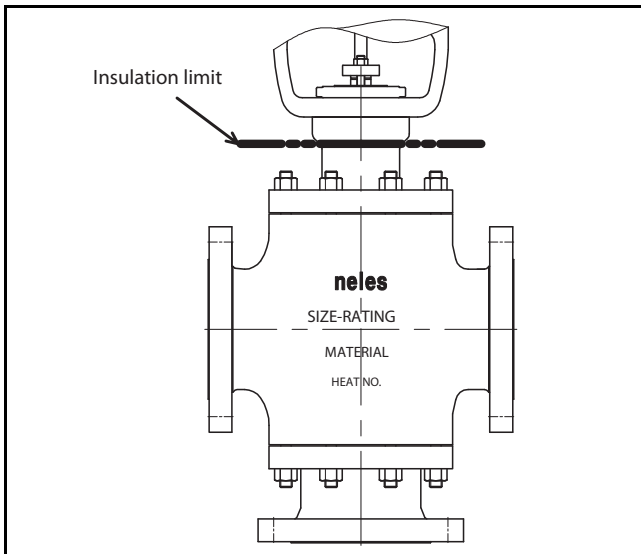


Fig. 5 Insulation of the valve

**NOTE:**

In case of the bellows seal bonnet construction, the gland packings are installed up at the top of the bellows bonnet(8L).

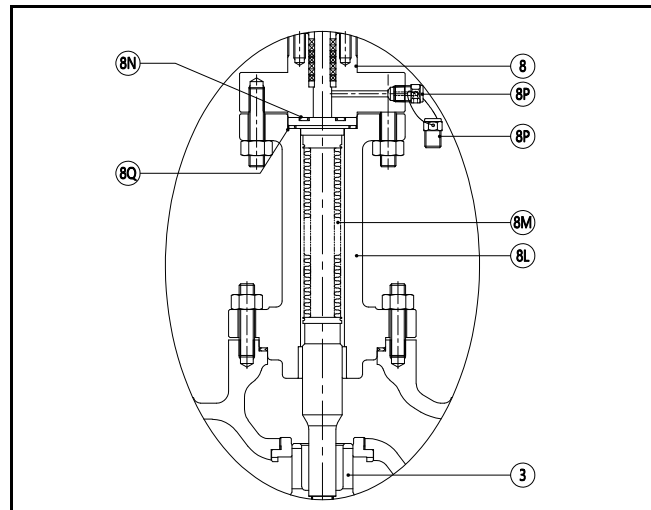


Fig. 6 Bellows seal construction

## 4 MAINTENANCE

**CAUTION:**

Observe the safety precautions listed in Section 1.7 before starting work!

**CAUTION:**

When handling the valve or the control valve assembly, take its weight into account!

### 4.1 General

The Neles series GW 3-way valves require no regular maintenance. However, check the gland packing for leakage. This section outlines the maintenance that can be carried out by the user.

The numbers in parentheses refer to the parts lists and the exploded views of the valve in Section 9.

**NOTE:**

If you send the valve to the manufacturer for repair, do not dismantle it. Clean the valve carefully, including the inside. For safety reasons, inform the manufacturer of the nature of the medium when you send the valve.

**NOTE:**

Always use original spare parts to make sure the valve functions as intended.

### 4.2 Gland packing adjustment & bellows seal

In the event of a packing leakage tighten the hexagon nuts (18) in ¼ turn steps each until the leakage is stopped. Do not tighten more than necessary.

**CAUTION:**

Bellows seal valve is shipped from the factory with a vent plug (8P) installed on the test connector. If there is any damage to the bellows, or external leakage occurred then replace the vent plug(8P) with an additional blind plug(8P) hanging. So that the fluid does not leak to the out side.

### 4.3 Replacing the gland packing

**CAUTION:**

Do not dismantle the valve or remove it from the pipeline while the valve is pressurised.

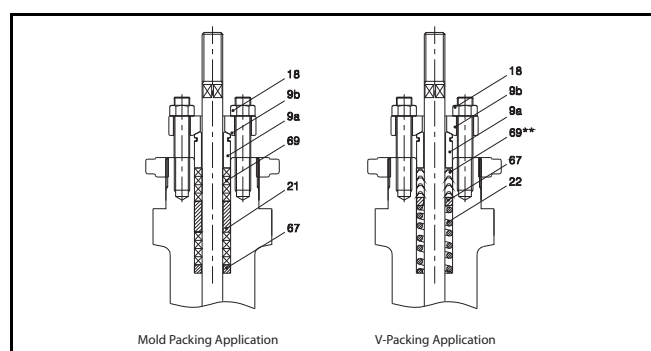


Fig. 7 Gland packing

- Make sure the valve is not pressurised.
- Remove the actuator from the valve stem according to the instructions given in the actuator manual.
- Loosen and remove the hexagon nuts (18).
- Remove the gland flange (9b), and gland (9a) up to the valve stem.
- Remove the old packing rings (69) using a pointed tool, avoid damaging the seal surfaces and valve stem.
- Clean the packing ring counterbore.

- Mount the new packing rings one by one into the packing gland box using the gland as a tool and mount the gland with hand-tightened nuts.
- Each packing ring (69) shall be firmly seated into the stuffing box using the packing tamping tool.

**CAUTION:**  
Be carefull when using a hammer

- Joints of successive braided type packing rings (69 & 69a if applicable) must be inserted 180 degrees against the previously inserted packing rings (69 & 69a if applicable).
- Apply lubricant suitable for process temperature to inner surface of all the packing rings except PTFE packing and emission packing. (69 & 69a if applicable).
- Apply lubricant suitable for process temperature to the gland studs (14) and nuts (18) properly.
- Fasten the gland with the hexagon nuts (18) and tighten them.
- Check leakage when the valve is pressurised.

Table 1 Required torques for bonnet nuts

Valve Size		Rating (ANSI)	Bonnet Stud Bolts		Required Torques (±5% allowable)	
mm	in		Size	Q'ty	Nm	lbf ft
25	1	150-300	1/2"-13UNC	4	45	33
		600	1/2"-13UNC	4	45	33
40	1.5	150-300	1/2"-13UNC	4	45	33
		600	1/2"-13UNC	4	45	33
50	2	150-300	1/2"-13UNC	8	45	33
		600	1/2"-13UNC	8	45	33
80	3	150-300	5/8"-11UNC	8	90	66
		600	5/8"-11UNC	8	90	66
100	4	150-300	3/4"-10UNC	8	160	118
		600	3/4"-10UNC	8	160	118
150	6	150-300	3/4"-10UNC	12	160	118
		600	3/4"-10UNC	12	160	118
200	8	150-300	7/8"-9UNC	12	250	184
		600	7/8"-9UNC	12	250	184
250	10	150-300	1"-8UNC	16	380	280
		600	1"-8UNC	16	380	280

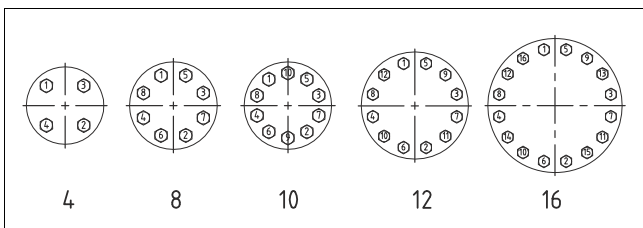


Fig. 8 Tightening sequence of the bonnet nuts

Table 2 Required torques for packing nuts

Packing Type	Stem Size mm	Rating (ANSI)	Required Torques		
			Min. Nm(lbf ft)	Max. Nm(lbf ft)	
Graphite & PTFE Carbon Fiber packing	Ø12.7	150-300	5 (4)	7 (5)	
		600	6 (4)	8 (6)	
		900	7 (5)	10 (7)	
		1500	9 (7)	12 (9)	
	Ø19.05	150-300	10 (7)	14 (10)	
		600	11 (8)	16 (12)	
		900	14 (10)	19 (14)	
		1500	17 (12)	23 (17)	
	Ø25.4	1500	19 (14)	27 (20)	
		2500	22 (16)	31 (23)	
		150-300	18 (13)	25 (18)	
		600	23 (17)	32 (24)	
	Ø36	900	27 (20)	38 (28)	
		1500	32 (24)	44 (32)	
		2500	36 (27)	51 (38)	
		150-300	26 (19)	36 (27)	
	V-ring packing (PTFE)	Ø12.7	150-300	3 (2)	5 (4)
			600	4 (3)	6 (4)
			900	5 (4)	7 (5)
			1500	6 (4)	8 (5)
		Ø19.05	2500	7 (5)	10 (7)
			150-300	8 (6)	11 (8)
			600	10 (7)	14 (10)
			900	12 (9)	16 (12)
Ø25.4		1500	14 (10)	19 (14)	
		2500	16 (12)	22 (16)	
		150-300	13 (10)	18 (13)	
		600	16 (12)	22 (16)	
Ø36		900	19 (14)	27 (20)	
		1500	22 (16)	31 (23)	
		2500	25 (18)	35 (26)	
		150-300	18 (13)	25 (18)	
Ø36		600	23 (17)	32 (24)	
		900	27 (20)	38 (28)	
		1500	32 (24)	44 (32)	
		2500	36 (27)	51 (38)	

## 4.4 Replacing the trim and body reassembly

**NOTE:**

The trim set consists of the seat rings, valve plug and stem, gaskets (for body).

- Make sure the valve is not pressurised.
- Remove the actuator from the valve stem according to the instructions given in the actuator manual and next Section 6.
- Turn the body (1) and remove the bottom hexagon nuts (17).
- Remove the bottom flange (26).
- Remove the body gasket (65).
- Remove the stem (5) and plug (3) sub-assembly. Avoid from damaging the seating and guiding line of the plug.
- Remove the each two seat rings (7 & 7a) from body (1) and bottom flange (26) using by fabricated wrenches to be engaged the seat ring lugs and adapted to shock wrench.  
This is threaded type, if the seat ring is extremely resistance to removal, the application of heat or penetrating oil will be helpful.
- Remove the hexagon nuts (18), gland flange (9b) and packing gland (9a) from the bonnet (8).
- Remove the old packing rings (69).
- Clean the body gasket surface.

**CAUTION:**

If using heating devices, insure that proper safety practices are observed. Such items as the flammability and toxicity of the controlled substance must be considered and proper precautions and permissions taken.

- Insert and tighten the each new top and bottom seat rings (7 & 7a) into the body (1) and bottom flange (26).
- Insert the stem (5) & plug (3) sub-assembly from top side into the body very carefully.
- Insert the body gasket (65) into bottom side of the body.
- Apply lubricant suitable for process temperature to the studs(13), gland studs (14), hexagon nuts(17), nuts (18), stem(5) thread area properly.
- Mount the bottom flange (26) on the body carefully maintaining alignment with the plug and stem in the closed position, so that the bonnet position in relation to the body is the same as the original position.
- Insert the hexagon nuts (17) into stud (13) and slightly fasten the nuts.

**CAUTION:**

Do not strongly tighten hexagon nuts (17) at this time.

**CAUTION:**

Do not reuse the spiral wound gaskets (65), this is need to be replace each time the valve is disassembled.

- Insert the packing rings (69) according to above 4.3

**CAUTION:**

The all related parts (seat ring, plug & stem, bonnet) must be properly aligned in the body.

- Tighten hexagon nuts (17) until plug and seat contact is obtained with proper bolt torque.

**NOTE:**

If the valve have excess leakage, the plug and seating surface need lapping and cleaning.

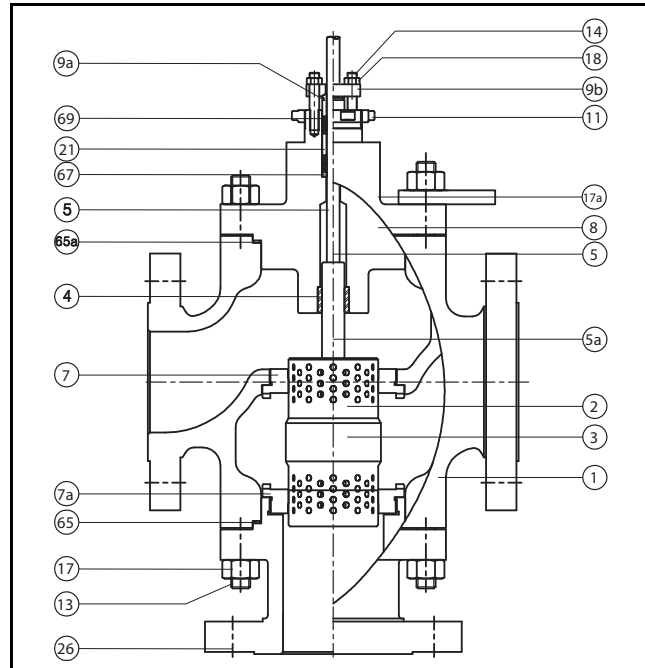


Fig. 9 Conventional Cylindrical Plug Trim

## 5 TESTING THE VALVE

**CAUTION:**

Pressure testing should be carried out using equipment conforming to the correct pressure class!

We recommend that the valve body is pressure-tested after the valve has been assembled.

The pressure test should be carried out in accordance with an applicable standard for the pressure rating. The valve must be in the open position during the test.

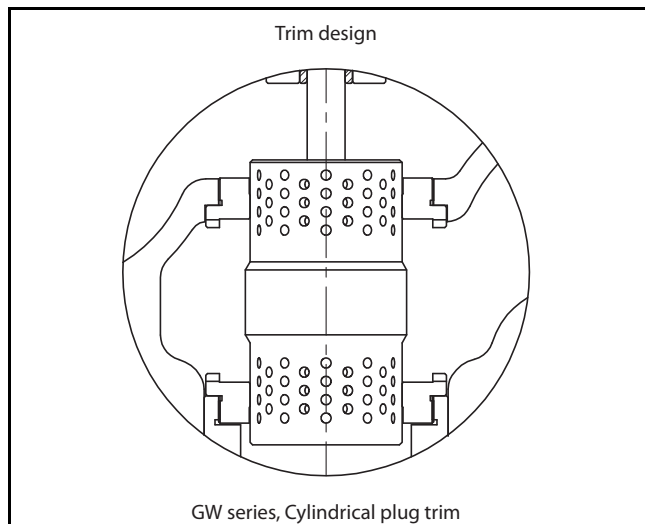


Fig. 10 Trim design



## 6 REMOVAL & MOUNTING THE ACTUATOR

The actuator is attached to the valve according to the manual for actuator with body assembly and plug stem adjustment . Several types of Neles actuators can be used with suitable clamps. GW valve can be assembled with VDD/R diaphragm actuator, VBD/R piston spring return actuator and VBC/VCC piston springless actuator. This IMO explains VD actuators removal and mounting, please refer to other actuators IMOs for further information.

### CAUTION:

Make sure the valve is not pressurized when removing the actuator.

### CAUTION:

#### Beware of the plug movement!

Do not use air pressure higher than what specified on the identification plate.

### NOTE:

Threaded area is required to apply lubricant suitable for process temperature to yoke nut(3\*\*) and clamp(1\*\*).

### A. Actuator removal for Reverse <air to top seat close, stem retract> actuator (Fig. 12)

- Lift up to the valve plug 100% from the seat ring, using by specified air pressure.
- Loosen the stem lock nut (5\*\*) and socket socket head screws (1a\*\*) and hexagon nuts (1b\*\*).
- Remove the clamp (1\*\*).
- Shut off and disconnect air supply line.
- Support actuator with the suitable lifting device.
- Remove the yoke nut (3\*\*).
- Remove the actuator from the valve body assembly.

### B. Actuator replacement (mounting) for Reverse <air to top seat close, stem retract> actuator (Fig. 12)

- Mount the new or repaired actuator on top of the bonnet, using a suitable lifting device.
- Insert the yoke nut and tightly fasten the yoke by turning the yoke nut (3\*\*) clockwise using tightening tools.
- Connect air line and accessories.
- Lift the top stem (18), using by specified air pressure.
- Adjustment stem length after clamping the clamp (1\*\*) according to rated travel(stroke) as 'open' and 'close' position as per pressurizing and depressurizing the lower diaphragm chamber.
- Tighten stem socket head screws (1a\*\*) and hexagon nuts (1b\*\*) with stem lock nut (5\*\*).

### Standard valve construction

- With the handwheel or pneumatically, push the valve stem and plug to be slightly touched with seat ring to make sure if valve is fully closed.
- With the handwheel or pneumatically, stroke the actuator to the fully open.
- Measure the maximum distance between the valve stem and actuator top stem.
- Calculate the gap (measured value – rated travel = gap 1).
- Move down the top stem so that the distance between the valve stem and actuator top stem should be gap 1.
- Fit the clamp to align with both stems thread.
- Line up the stroke indicator with the clamp indicator arrow and check actuator for operation.
- Tighten the socket head screws after adjusted the rated stroke.

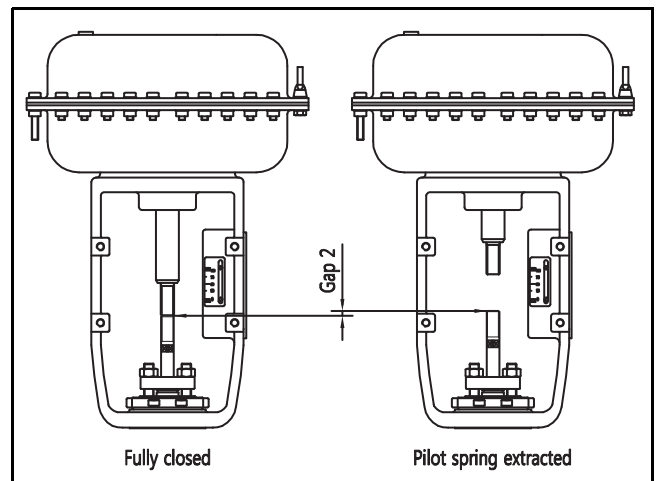


Fig. 11 Measurement of Gap 2

### C. Actuator replacement (mounting)

- Mount the new or repaired actuator on top of the bonnet, using a suitable lifting device.
- Insert the yoke nut and tightly fasten the yoke by turning the yoke nut clockwise using tightening tools.
- Connect air line and accessories.
- Tighten stem socket head screws (1a\*\*) and hexagon nuts (1b\*\*) with stem lock nut (5\*\*).

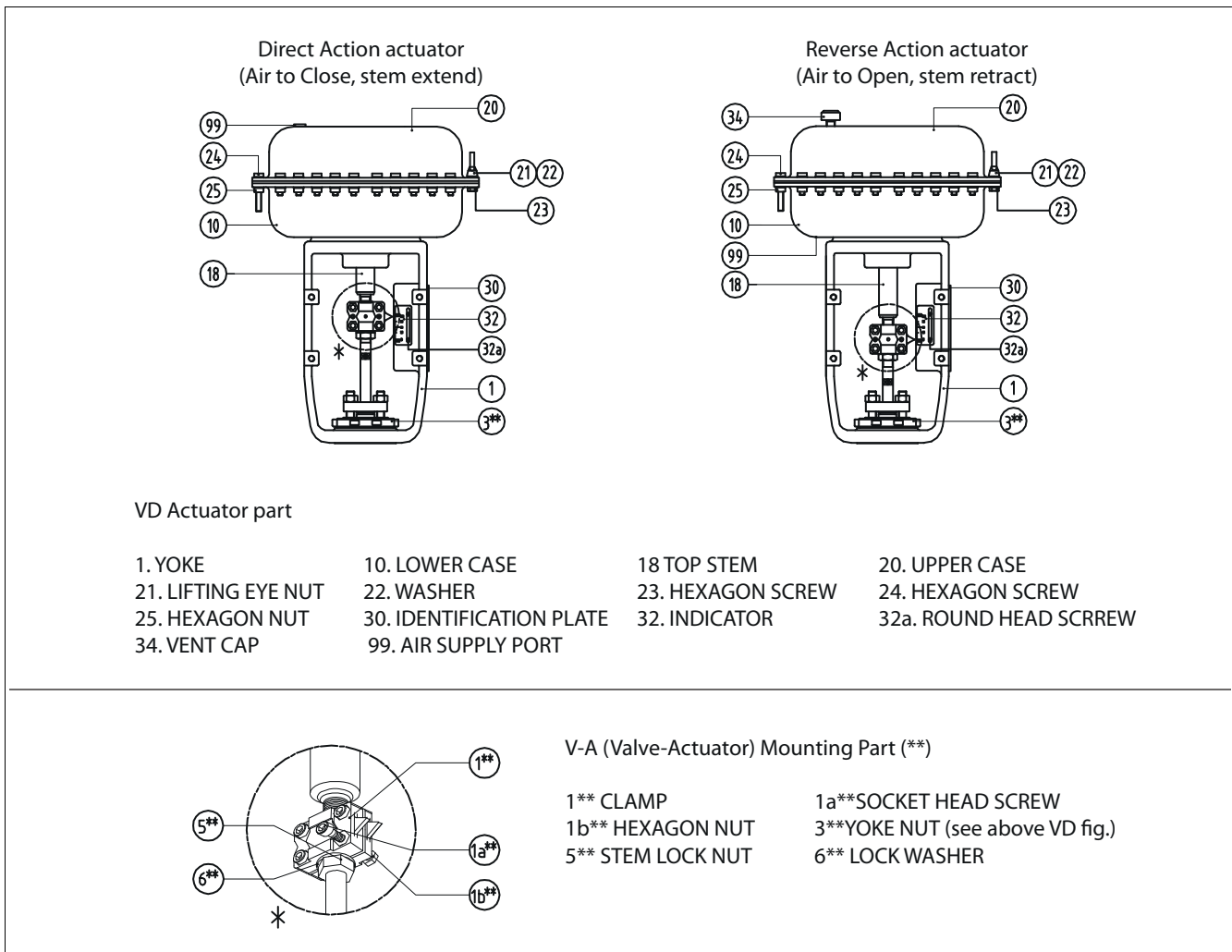


Fig. 12 VD Actuator

#### D. Type 'VC' Springless Cylinder, Double Acting Actuator

- This actuator is springless cylinder, double acting actuator, can use the 3/8", 1/2" NPT port according to specified on the data sheet for all air lines.
- Refer to the model VC double acting cylinder actuator manuals for further information on their installation, maintenance and operation.

#### CAUTION:

Avoid to turn the valve plug and stem when plug is on seat ring to prevent the seating line from being damaged.

## 7 TOOLS

Removal of the actuator

- L- wrench set (mm)
- Hex. socket wrench set
- Chisel and hammer (10 pound)
- +,- drivers

## 8 ORDERING SPARE PARTS

#### NOTE:

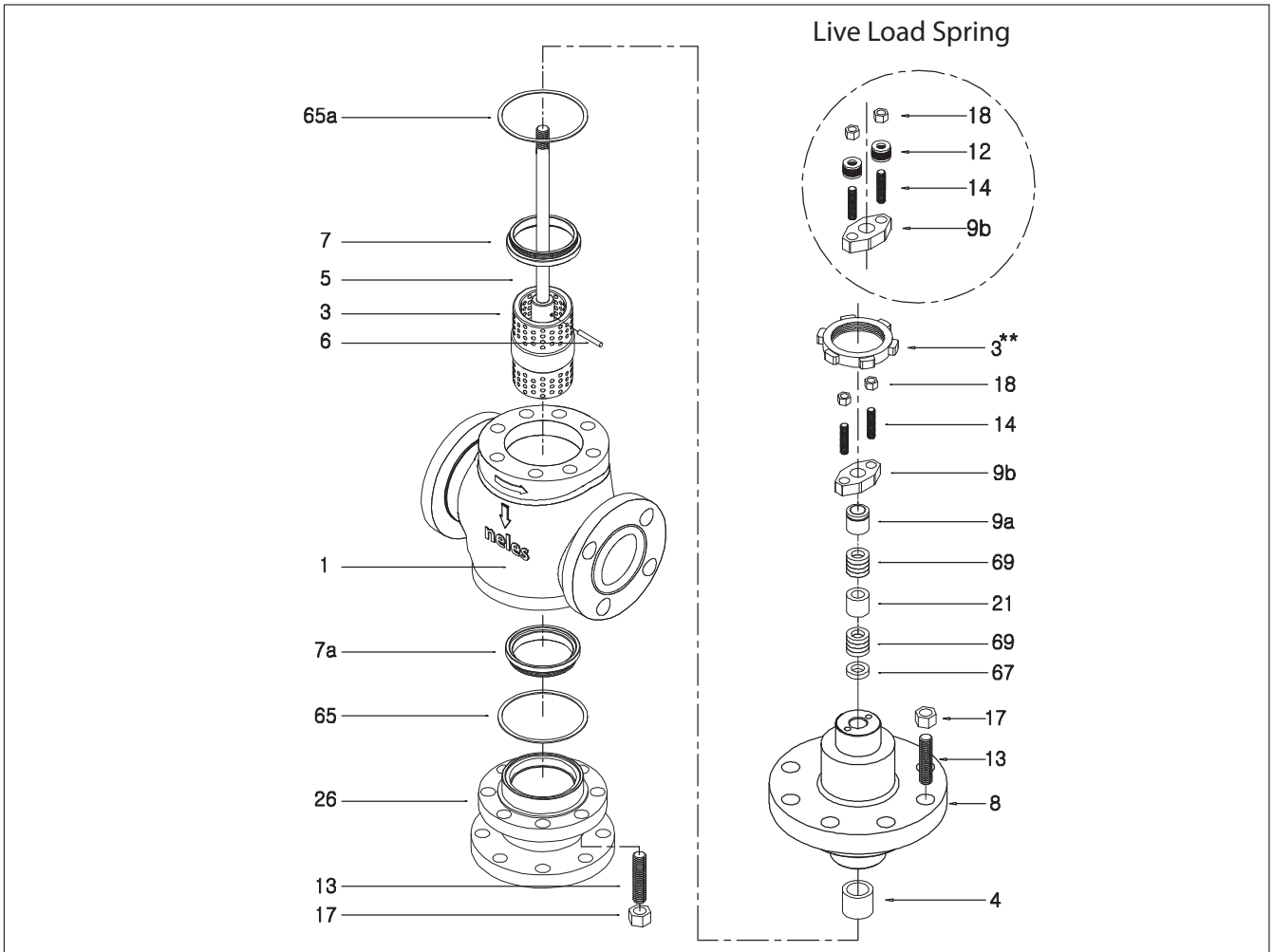
Always use original spare parts to make sure that the valve functions as intended.

When ordering spare parts, always include the following information:

- type code, sales order number, serial number
- number of the parts list, part number, name of the part and quantity required

This information can be found from the identification plate or documents.

# 9 EXPLODED VIEW AND PARTS LIST

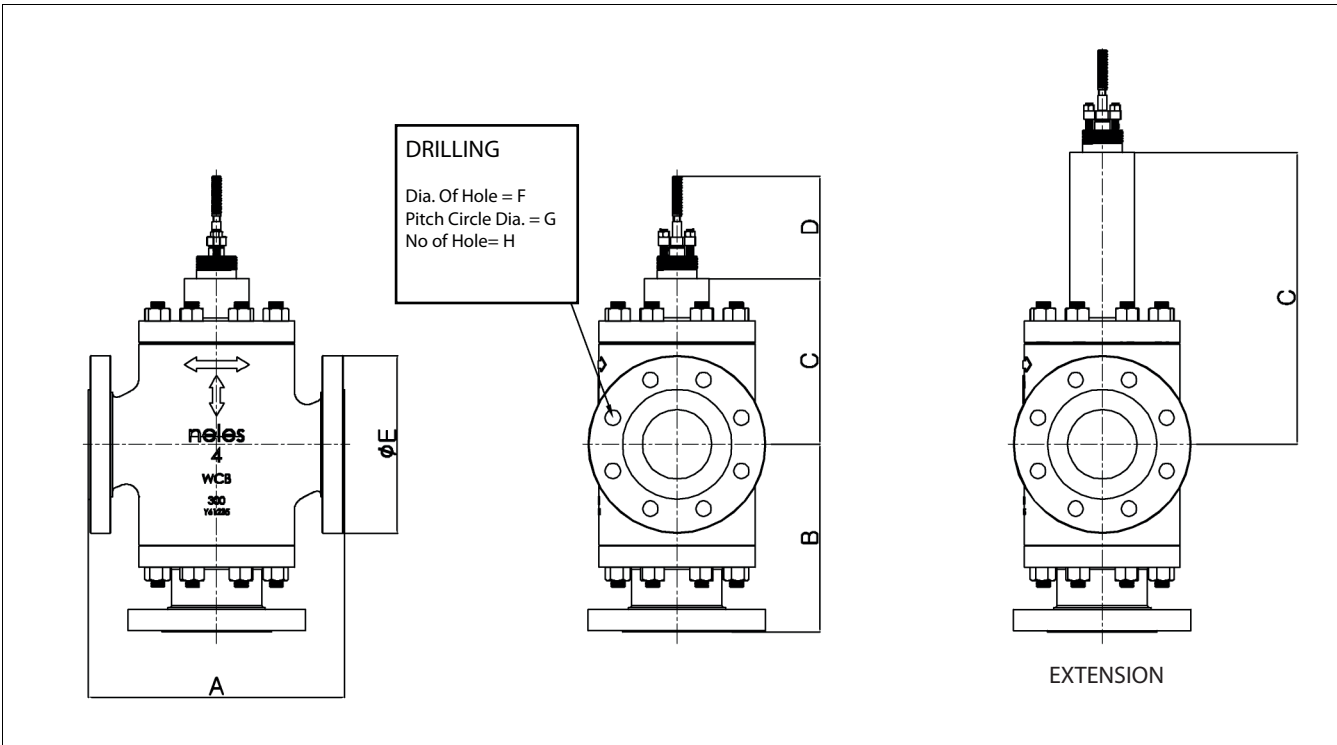


Item	Description	Recommended spare part
1	BODY	
2	PLUG SET	
3*	PLUG	
5*	STEM	
3**	YOKE NUT	
6*	PLUG PIN	
7	SEAT RING	
7a	SEAT RING	
8	BONNET	
4**	GUIDE BUSHING	
9a	GLAND	
9b	GLAND FLANGE	
12	DISK SPRING ASS'Y	
13	STUD	
14	STUD	
17	HEXAGON NUT	
18	HEXAGON NUT	
21	LANTERN RING	
26	BOTTOM FLANGE	
65	BODY GASKET	X
65 a	BODY GASKET	X
67	PACKING SPACER	
69	PACKING RING	X

\*) Delivered as a set  
 \*\*) V-A Mounting Parts

# 10 DIMENSIONS AND WEIGHTS

## 10.1 Valve GW



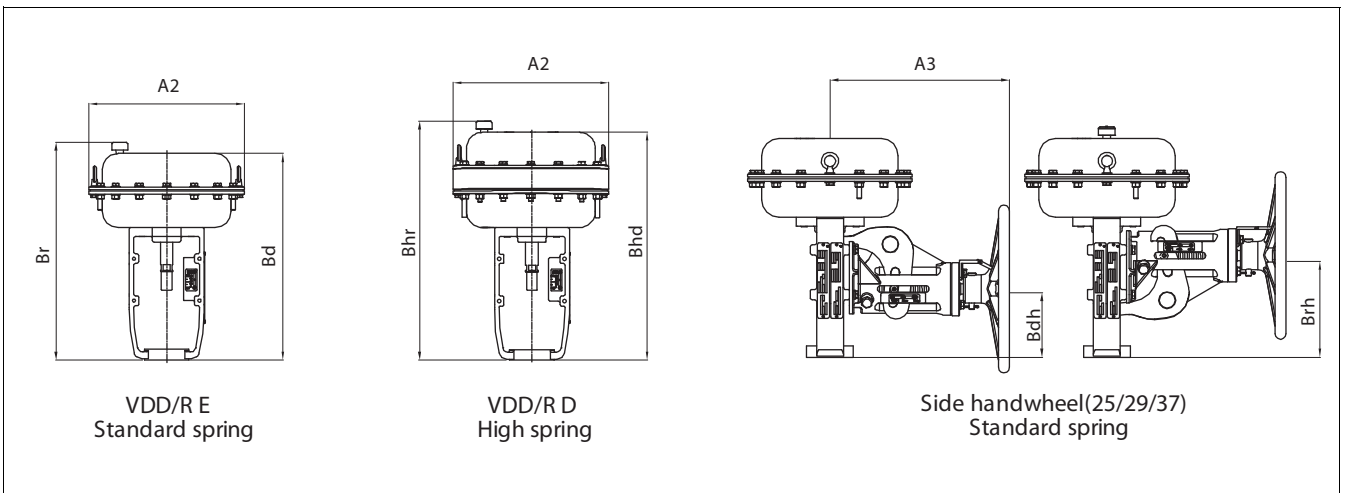
### 150 # / 300 # / 600 #

Dimension (mm)	A			B			C		D	E			F			G			H			Weight (kg)		
	150#	300#	600#	150#	300#	600#	STD	EXT	COMMON	150#	300#	600#	150#	300#	600#	150#	300#	600#	150#	300#	600#	150#	300#	600#
025	184	197	210	160	160	160	130	250	110	110	125	125	15.9	19.1	19.1	79.4	88.9	88.9	4	4	4	20	21	33
040	222	235	251	178	178	178	155	295	110	125	155	155	15.9	22.2	22.2	98.4	114.3	114.3	4	4	4	41	43	50
050	254	267	286	197	197	197	184	295	110	150	165	165	19.1	19.1	19.1	120.7	127	127	4	8	8	57	62	73
080	298	318	337	238	238	238	235	330	115	190	210	210	19.1	22.2	22.2	152.4	168.3	168.3	4	8	8	100	104	113
100	352	368	394	270	270	270	238	380	140	230	255	275	19.1	22.2	25.4	190.5	200	215.9	8	8	8	136	141	156
150	451	473	508	330	330	330	280	430	150	280	320	355	22.2	22.2	28.6	241.3	269.9	292.1	8	12	12	238	249	322
200	543	568	610	410	410	460	375	490	150	345	380	420	22.2	25.4	31.8	298.5	330.2	349.2	8	12	12	351	375	451
250	673	708	752	457	457	490	416	600	150	405	445	510	25.4	28.6	34.9	362	387.4	431.8	12	16	16	779	847	982

Dimension (inch)	A			B			C		D	E			F			G			H			Weight (lbs)		
	150#	300#	600#	150#	300#	600#	STD	EXT	COMMON	150#	300#	600#	150#	300#	600#	150#	300#	600#	150#	300#	600#	150#	300#	600#
1"	7.2	7.8	8.3	6.3	6.3	6.3	5.1	9.8	4.3	4.3	4.9	4.9	0.6	0.8	0.8	3.1	3.5	3.5	4	4	4	44	46	73
1-1/2"	8.7	9.3	9.9	7	7	7	6.1	11.6	4.3	4.9	6.1	6.1	0.6	0.9	0.9	3.9	4.5	4.5	4	4	4	90	95	110
2"	10	10.5	11.3	7.8	7.8	7.8	7.2	11.6	4.3	5.9	6.5	6.5	0.8	0.8	0.8	4.8	5	5	4	8	8	126	137	161
3"	11.7	12.5	13.3	9.4	9.4	9.4	9.3	13	4.5	7.5	8.3	8.3	0.8	0.9	0.9	6	6.6	6.6	4	8	8	221	229	249
4"	13.9	14.5	15.5	10.6	10.6	10.6	9.4	15	5.5	9.1	10	10.8	0.8	0.9	1	7.5	7.9	8.5	8	8	8	300	311	344
6"	17.8	18.6	20	13	13	13	11	16.9	5.9	11	12.6	14	0.9	0.9	1.1	9.5	10.6	11.5	8	12	12	525	549	710
8"	21.4	22.4	24	16.1	16.1	18.1	14.8	19.3	5.9	13.6	15	16.5	0.9	1	1.3	11.8	13	13.7	8	12	12	774	827	994
10"	26.5	27.9	29.6	18	18	19.3	16.4	23.6	5.9	15.9	17.5	20.1	1	1.1	1.4	14.3	15.3	17	12	16	16	1717	1867	2165

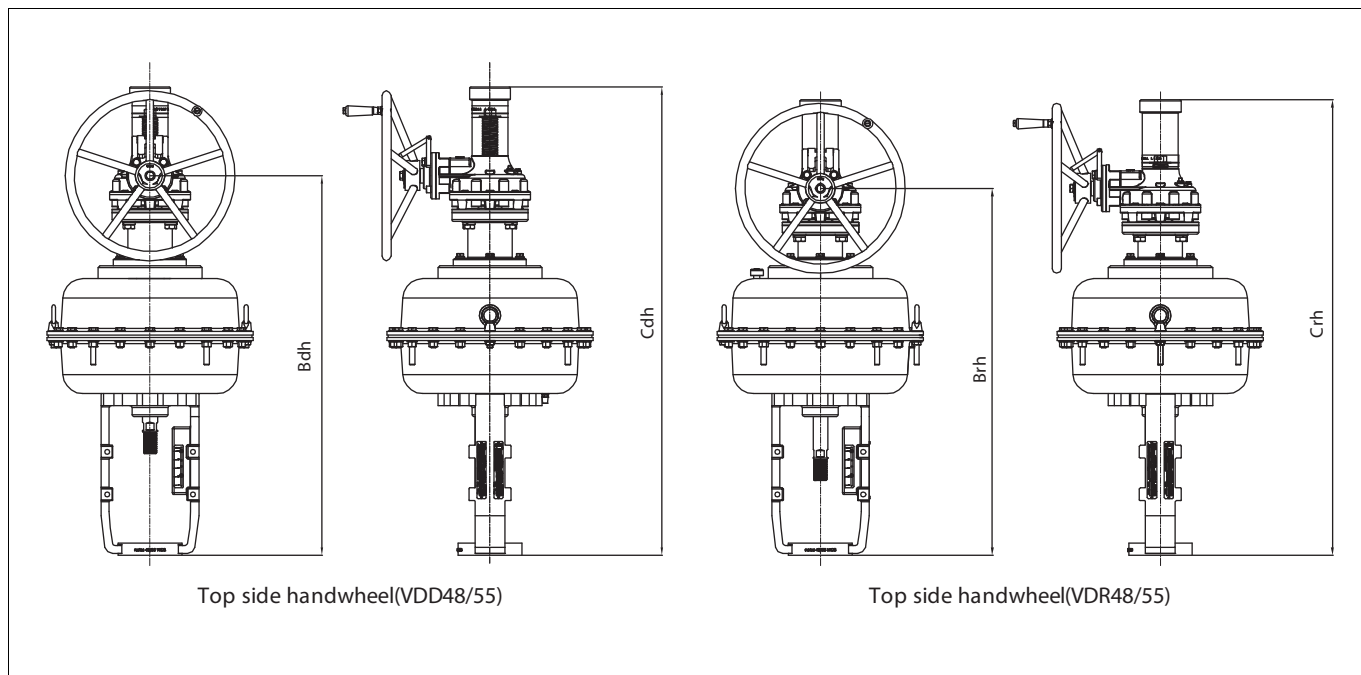
NOTE  
P.C.D = Pitch Circle Diameter

## 10.2 Actuator VDD/VDR



Dimension (mm)	Without handwheel				With handwheel					
	Size (mm)	A2	Bd / Bhd	Br / Bhr	Weight (kg)	A2	A3	Bdh	Brh	Weight (kg)
VD_25 E		255	348	373	12	255	312	110	170	23
VD_25 D		255	373	395	17	255	312	110	170	28
VD_29 E		295	391	416	18	295	312	122	182	29
VD_29 D		295	431	453	26	295	312	122	182	32
VD_37 E		375	464	489	28	375	352	131	211	43
VD_37 D		375	514	535	46					

Dimension (inch)	Without handwheel				With handwheel					
	Size (inch)	A2	Bd / Bhd	Br / Bhr	Weight (lbs)	A2	A3	Bdh	Brh	Weight (lbs)
VD_25 E		10	14	15	26	10	12	4	7	51
VD_25 D		10	15	16	37	10	12	4	7	62
VD_29 E		12	15	16	40	12	12	5	7	64
VD_29 D		12	17	18	57	12	12	5	7	82
VD_37 E		15	18	19	62	15	14	5	8	95
VD_37 D		15	20	21	101					



Top side handwheel(VDD48/55)

Top side handwheel(VDR48/55)

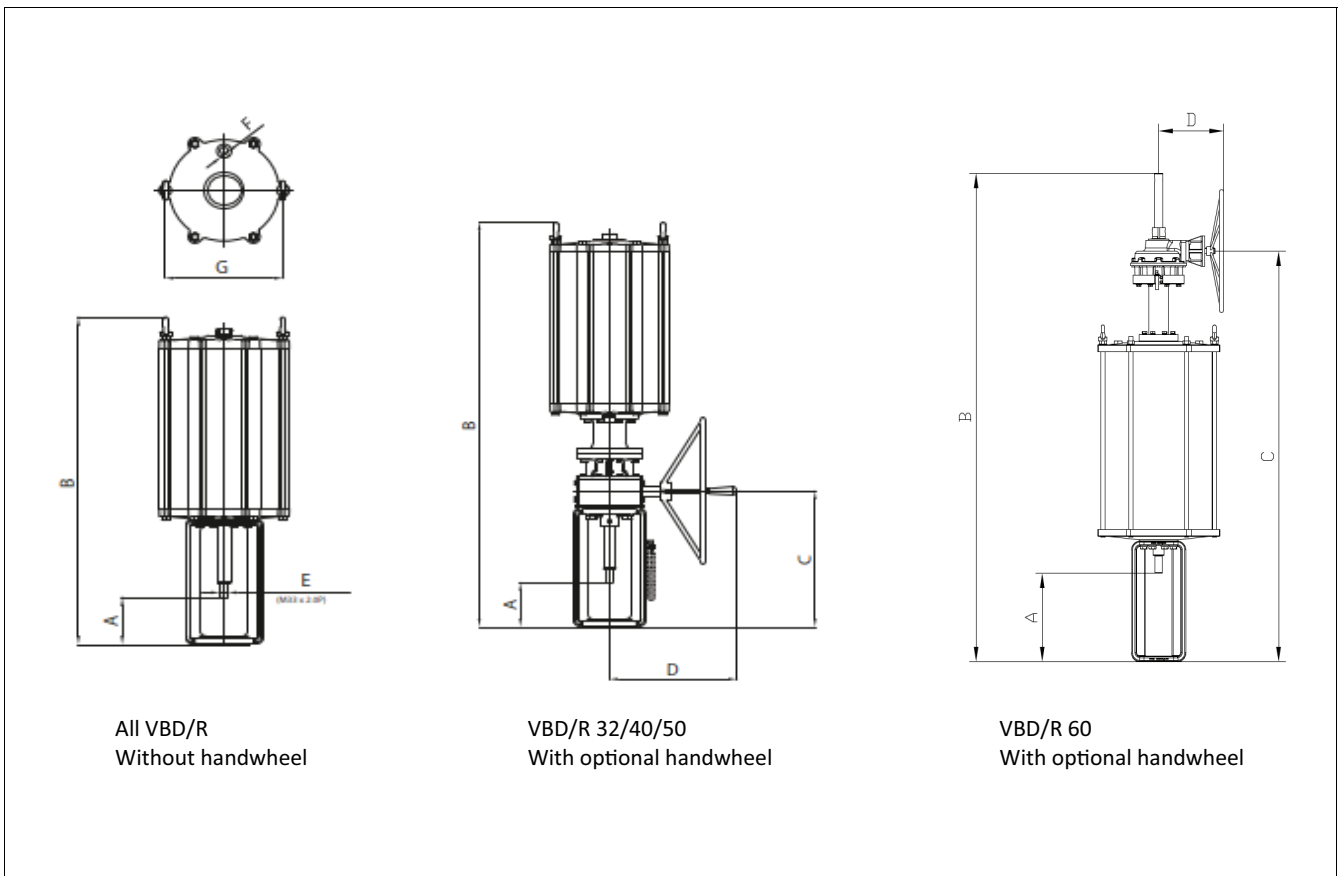
Dimension (mm)	Without handwheel				With handwheel					
	Size (mm)	A2	Bd / Bhd	Br / Bhr	Weight (kg)	Bdh	Brh	Cdh	Crh	Weight (kg)
VD_48 E		486	652	677	86	896	865	1102	1072	112
VD_48 D		486	702	724	118	946	915	1152	1122	144
VD_55 E		566	695	720	112	940	910	1145	1115	145
VD_55 D		566	745	767	152					

Dimension (inch)	Without handwheel				With handwheel					
	Size (inch)	A2	Bd / Bhd	Br / Bhr	Weight (lbs)	Bdh	Brh	Cdh	Crh	Weight (lbs)
VD_48 E		19	26	27	190	35	34	43	42	247
VD_48 D		19	28	29	260	37	36	45	44	317
VD_55 E		22	27	28	247	37	36	45	44	320
VD_55 D		22	29	30	335					

NOTE

1. "E" refers to Spring range 0.8-2.6
2. "D" refers to Spring range 1.5-3.4
3. "Br / Bhr" refers to reverse acting actuator, VDR E / D
4. "Bd / Bhd" refers to direct acting actuator, VDD E / D
5. "Cdh / Crh" Top side handwheel actuator, VD\_48/55

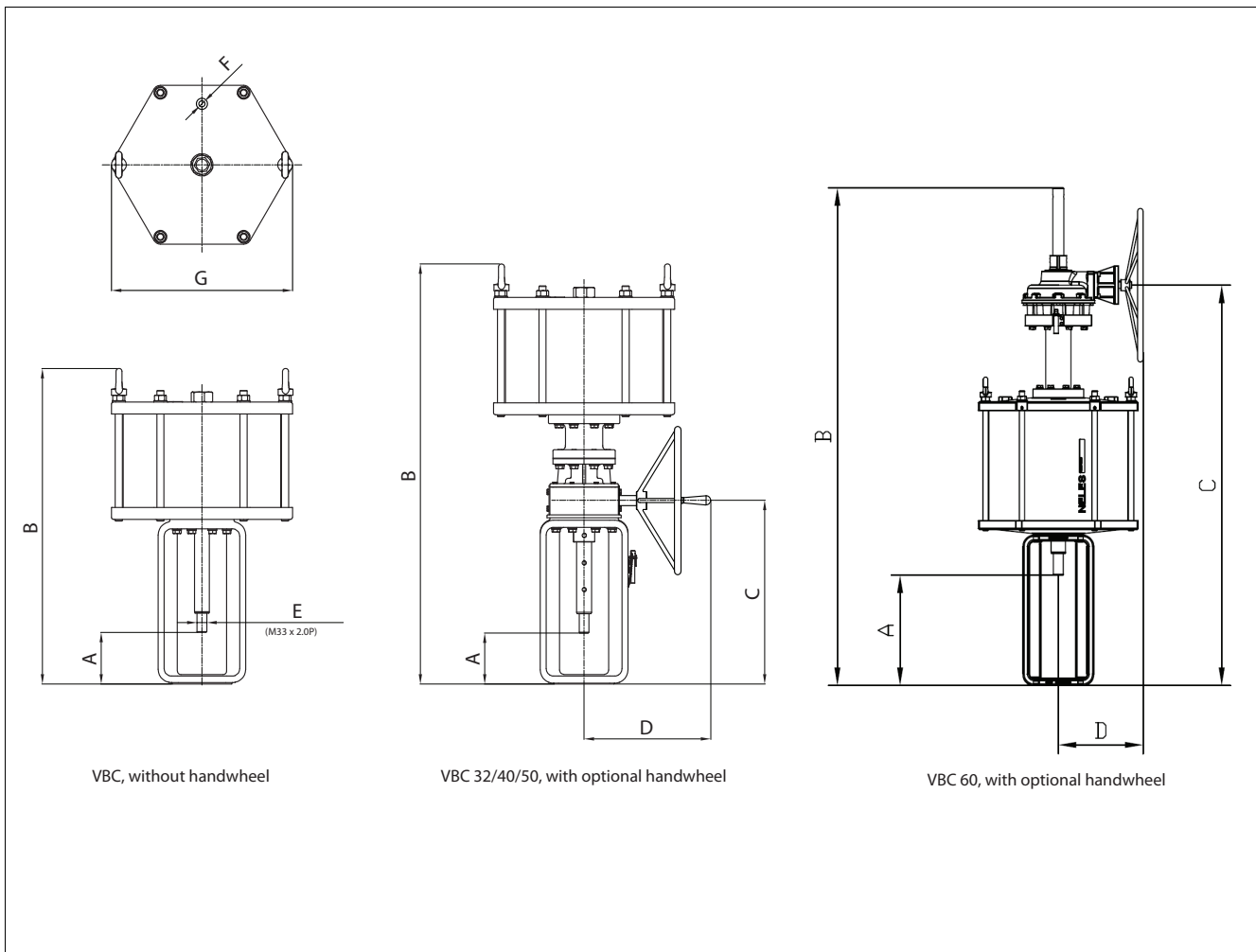
### 10.3 Actuator VBD/R



Dimension (mm)	Stroke Range	Without handwheel					With handwheel				
		A	B	F	G	Weight (kg)	A	B	C	D	Weight (kg)
VBD/R32	50,60,70,80,120	153	1064	3/4" NPT	392	145	155	1388	466	401	199
VBD/R40	60,70,80,120,140,160,180	185	1450	3/4" NPT	497	290	178	1800	619	427	268
VBD/R50	60,70,80,120,140,160,180	185	1535	1" NPT	610	485	178	1885	619	427	563

Dimension (inch)	Stroke Range	Without handwheel					With handwheel				
		A	B	F	G	Weight (lbs)	A	B	C	D	Weight (lbs)
VBD/R32	50,60,70,80,120	6	41.9	3/4" NPT	15.4	320	6.1	54.6	18.3	15.8	439
VBD/R40	60,70,80,120,140,160,180	7.2	57.1	3/4" NPT	19.6	639	7	70.9	24.4	16.8	591
VBD/R50	60,70,80,120,140,160,180	7.2	60.4	1" NPT	24	1069	7	74.2	24.4	16.8	1241

### 10.4 Actuator VBC

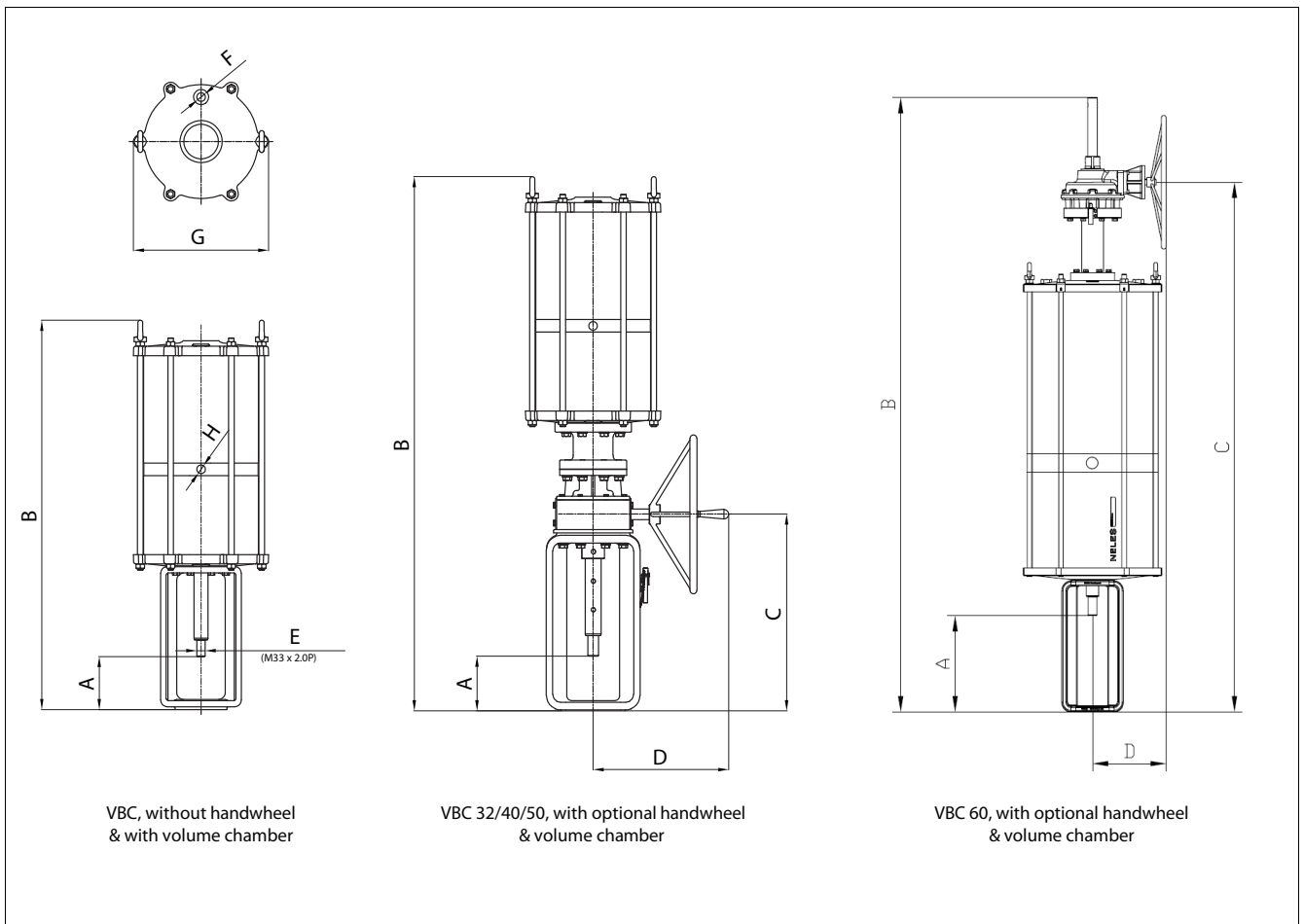


Dimension (mm) / Size	Stroke Range	Without handwheel					With handwheel				
		A	B	F	G	Weight (kg)	A	B	C	D	Weight (kg)
VBC32	50,60,70,80,120	153	769	3/4" NPT	392	96	158	1093	471	417	147
VBC40	60,70,80,120,140,160,180	185	1054	3/4" NPT	499	190	185	1403	619	427	263
VBC50	60,70,80,120,140,160,180	184	1066	1" NPT	610	297	179	1415	619	427	371

Dimension (mm) / Size	Stroke Range	Without handwheel					With handwheel				
		A	B	F	G	Weight (lbs)	A	B	C	D	Weight (lbs)
VBC32	50,60,70,80,120	6	30.3	3/4" NPT	15.4	212	6.2	43	18.5	16.4	324
VBC40	60,70,80,120,140,160,180	7.3	41.5	3/4" NPT	19.6	419	7.3	55.2	24.4	16.8	580
VBC50	60,70,80,120,140,160,180	7.2	42	1" NPT	24	655	7	55.7	24.4	16.8	818



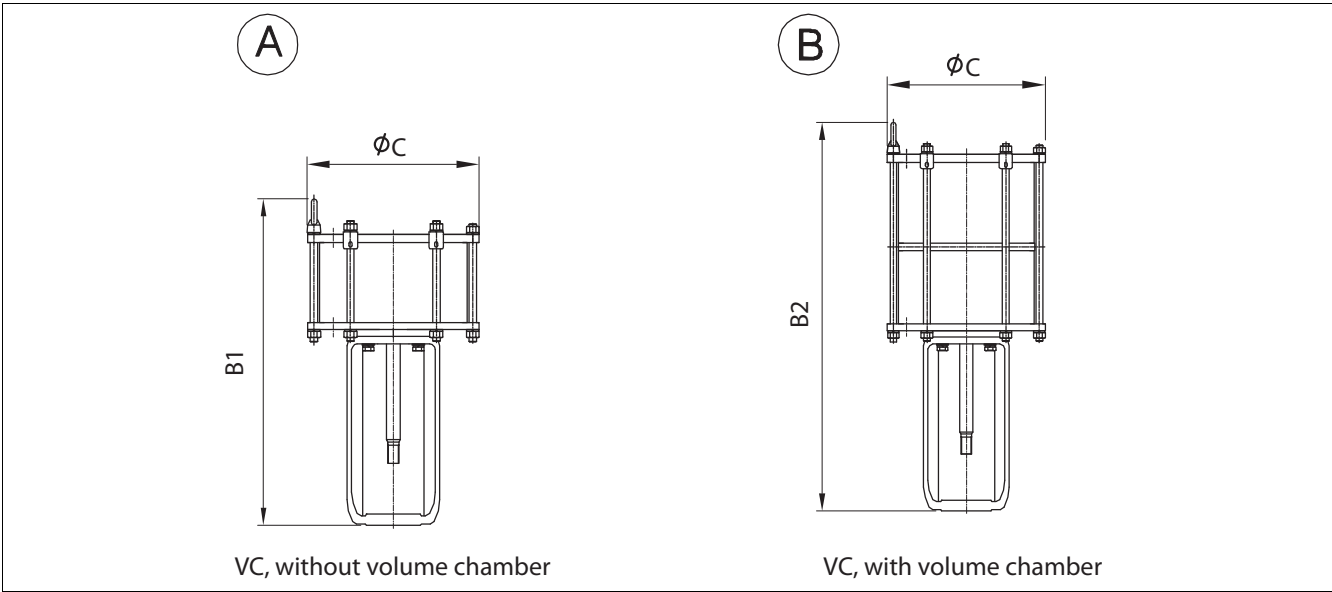
### 10.5 Actuator VBC with volume chamber



Dimension (mm) / Size	Stroke Range	Without handwheel					With handwheel					
		A	B	F	G	H	Weight (kg)	A	B	C	D	Weight (kg)
VBC32_V	50,60,70,80,120	153	1116	3/4" NPT	390	3/4" NPT	129	158	1440	471	417	180
VBC40_V	60,70,80,120,140,160,180	185	1550	3/4" NPT	499	3/4" NPT	255	185	1899	619	427	329
VBC50_V	60,70,80,120,140,160,180	184	1570	1" NPT	610	1" NPT	415	179	1919	619	427	490

Dimension (mm) / Size	Stroke Range	Without handwheel					With handwheel					
		A	B	F	G	H	Weight (lbs)	A	B	C	D	Weight (lbs)
VBC32_V	50,60,70,80,120	6	43.9	3/4" NPT	15.4	3/4" NPT	284	6.2	56.7	18.5	16.4	397
VBC40_V	60,70,80,120,140,160,180	7.3	61	3/4" NPT	19.7	3/4" NPT	562	7.3	74.8	24.4	16.8	725
VBC50_V	60,70,80,120,140,160,180	7.2	61.8	1" NPT	24	1" NPT	915	7	75.6	24.4	16.8	1080

### 10.6 Actuator VCC without handwheel



**VC actuator without handwheel**

Stroke (mm)	# 30			# 40			# 50		
	C	370		C	460		C	560	
	B1	Weight(kg)		B1	Weight(kg)		B1	Weight(kg)	
	B2	A	B	B2	A	B	B2	A	B
40	640	92	115	810	120	148	810	186	234
	760			935			935		
50	650	94	118	820	123	152	820	189	237
	790			965			965		
60	660	97	121	830	126	155	830	192	242
	820			995			995		
70	670	100	124	840	128	159	840	195	246
	850			1025			1025		
80	680	103	127	850	131	162	850	198	251
	880			1055			1055		
90	690	106	130	860	134	166	860	201	256
	910			1085			1085		
100	700	108	133	870	137	173	870	203	261
	940			1115			1115		
120	720	114	139	890	142	177	890	209	270
	1000			1175			1175		
140				910	148	184	910	215	279
				1235			1235		
180				950	159	198	950	227	298
				1355			1355		

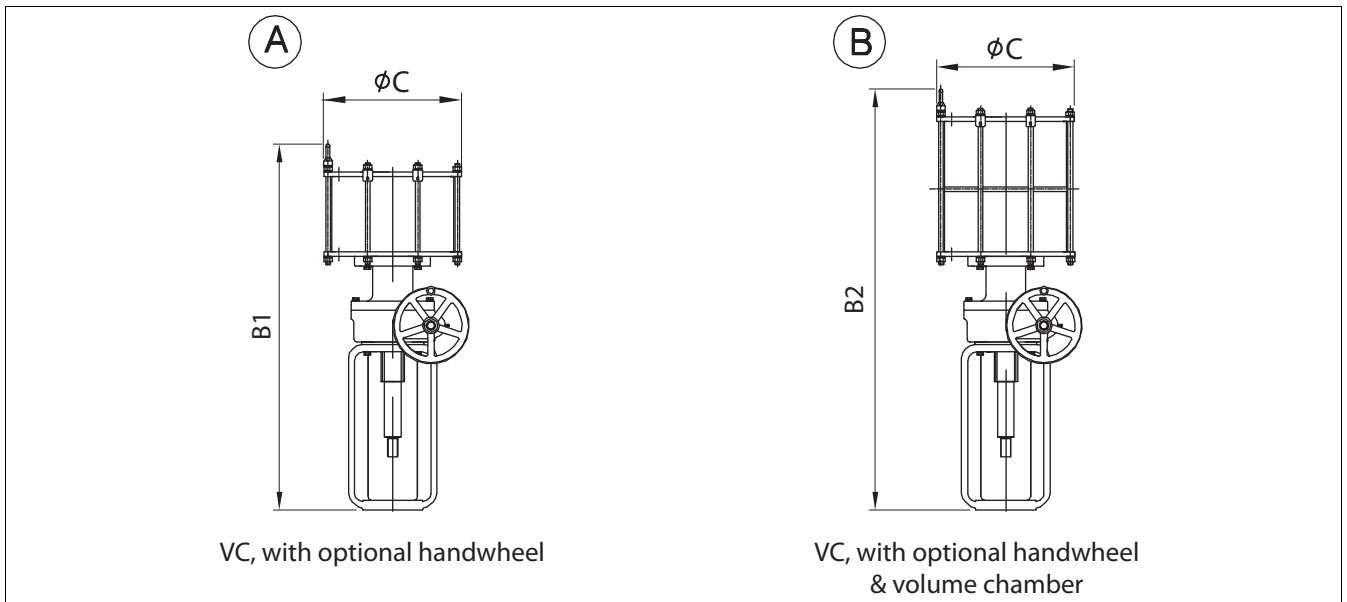
**VC actuator without handwheel**

Stroke (mm)	# 30			# 40			# 50		
	C	15		C	18		C	22	
	B1	Weight(lbs)		B1	Weight(lbs)		B1	Weight(lbs)	
	B2	A	B	B2	A	B	B2	A	B
40	25	203	254	32	265	326	32	410	516
	30			37			37		
50	26	207	260	32	271	335	32	417	522
	31			38			38		
60	26	214	267	33	278	342	33	423	534
	32			39			39		
70	26	220	273	33	282	351	33	430	542
	33			40			40		
80	27	227	280	33	289	357	33	437	553
	35			42			42		
90	27	234	287	34	295	366	34	443	564
	36			43			43		
100	28	238	293	34	302	381	34	448	575
	37			44			44		
120	28	251	306	35	313	390	35	461	595
	39			46			46		
140				36	326	406	36	474	615
				49			49		
180				37	351	437	37	500	657
				53			53		

Stroke (mm)	# 60			# 70			# 80		
	C	660		C	710		C	820	
	B1	Weight(kg)		B1	Weight(kg)		B1	Weight(kg)	
	B2	A	B	B2	A	B	B2	A	B
100	954	255	344	955	322	438	954	378	519
	1199			1203			1207		
120	974	262	355	975	330	450	974	386	531
	1259			1263			1267		
140	994	269	365	995	338	461	994	394	543
	1319			1323			1327		
180	1034	283	386	1035	354	484	1034	410	567
	1439			1443			1447		
240	1094	303	417	1095	377	518	1094	435	604
	1619			1623			1627		
280							1134	451	628
							1747		

Stroke (mm)	# 60			# 70			# 80		
	C	26		C	28		C	32	
	B1	Weight(lbs)		B1	Weight(lbs)		B1	Weight(lbs)	
	B2	A	B	B2	A	B	B2	A	B
100	38	562	758	38	710	966	37	833	1144
	47			47			48		
120	38	578	783	38	728	992	38	851	1171
	50			50			50		
140	39	593	805	39	745	1016	39	869	1197
	52			52			52		
180	41	624	851	41	780	1067	41	904	1250
	57			57			57		
240	43	668	919	43	831	1142	43	959	1332
	64			64			64		
280							45	994	1385
							69		

# 10.7 Actuator VCC with handwheel



VC, with optional handwheel

VC, with optional handwheel & volume chamber

## VC actuator with handwheel

Stroke (mm)	#30			#40			#50		
	C	370		C	460		C	560	
	B1	Weight(kg)		B1	Weight(kg)		B1	Weight(kg)	
	B2	A	B	B2	A	B	B2	A	B
40	930	134	157	1095	180	208	1095	246	294
	1055			1220			1220		
50	940	137	160	1105	183	212	1105	249	299
	1085			1250			1250		
60	950	139	163	1115	186	215	1115	252	303
	1115			1280			1280		
70	960	142	167	1125	188	219	1125	255	308
	1145			1310			1310		
80	970	144	170	1135	191	222	1135	258	313
	1175			1340			1340		
90	980	147	173	1145	194	226	1145	261	318
	1205			1370			1370		
100	990	150	176	1155	197	230	1155	263	322
	1235			1400			1400		
120	1010	155	183	1175	202	237	1175	269	332
	1295			1460			1460		
140				1195	208	244	1195	275	341
				1520			1520		
180				1235	219	258	1235	287	360
				1640			1640		

Stroke (mm)	#60			#70			#80		
	C	660		C	710		C	820	
	B1	Weight(kg)		B1	Weight(kg)		B1	Weight(kg)	
	B2	A	B	B2	A	B	B2	A	B
100	1239	315	404	1240	368	502	1289	438	579
	1484			1488			1542		
120	1259	322	415	1260	376	514	1309	446	591
	1544			1548			1602		
140	1279	329	425	1280	384	525	1329	454	603
	1604			1608			1662		
180	1319	343	446	1320	400	548	1369	470	627
	1724			1728			1782		
240	1379	363	477	1380	423	582	1429	495	664
	1904			1908			1962		
280							1469	511	688
							2082		

## VC actuator with handwheel

Stroke (mm)	#30			#40			#50		
	C	15		C	18		C	22	
	B1	Weight(lbs)		B1	Weight(lbs)		B1	Weight(lbs)	
	B2	A	B	B2	A	B	B2	A	B
40	37	295	346	43	397	459	43	542	648
	42			48			48		
50	37	302	353	44	403	467	44	549	659
	43			49			49		
60	37	306	359	44	410	474	44	556	668
	44			50			50		
70	38	313	368	44	414	483	44	562	679
	45			52			52		
80	38	317	375	45	421	489	45	569	690
	46			53			53		
90	39	324	381	45	428	498	45	575	701
	47			54			54		
100	39	331	388	45	434	507	45	580	710
	49			55			55		
120	40	342	403	46	445	522	46	593	732
	51			57			57		
140				47	459	538	47	606	752
				60			60		
180				49	483	569	49	633	794
				65			65		

Stroke (mm)	#60			#70			#80		
	C	26		C	28		C	32	
	B1	Weight(lbs)		B1	Weight(lbs)		B1	Weight(lbs)	
	B2	A	B	B2	A	B	B2	A	B
100	49	694	891	49	811	1107	51	966	1276
	58			58			61		
120	50	710	915	50	829	1133	52	983	1303
	61			61			63		
140	50	725	937	50	847	1157	52	1001	1329
	63			63			65		
180	52	756	983	52	882	1208	54	1036	1382
	68			68			70		
240	54	800	1052	54	933	1283	56	1091	1464
	75			75			77		
280							58	1127	1517
							82		

# 11 TYPE CODE

## Globe 3-Way, Diverting / Mixing type, Series GW

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
GW	02	C	W	A	J2	B	P1	X	BC	S2	P1	X	S	F	X	S	G	X	A	L	FC

### VALVE CONSTRUCTIONS

1.	<b>VALVE SERIES</b>
GW	Globe 3-way, Diverting type

2.	<b>BODY SIZE</b>		
01	1" / DN 25	1H	1-1/2" / DN 40
02	2" / DN 50	03	3" / DN 80
04	4" / DN 100	06	6" / DN 150
08	8" / DN 200	10	10" / DN 250
YY	Special		

3.	<b>PRESSURE RATING</b>		
C	ASME class 150	D	ASME class 300
F	ASME class 600	Y	Special
J	EN PN 10	K	EN PN 16
L	EN PN 25	M	EN PN 40
N	EN PN 63	P	EN PN 100

4.	<b>END CONNECTION</b>
W	Flanged RF, ASME B16.5
C	Flanged RF, EN 1092-1
V	Socket welding, ASME B16.11
Q	Butt welding, ASME B16.25
Y	Special

5.	<b>BONNET CONSTRUCTION</b>	
	Bonnet type	Actuator connection
A	General	Applicable for VD_25/29/37
B	General	Applicable for VD_48/55
C	General	Applicable for VC_30, VB_32
D	General	Applicable for VC/VB_40/50/60/70
E	Extension	Applicable for VD_25/29/37
F	Extension	Applicable for VD_48/55
G	Extension	Applicable for VC_30, VB_32
H	Extension	Applicable for VC/VB_40/50/60/70
P	Cryogenic	Applicable for VD_25/29/37
Q	Cryogenic	Applicable for VD_48/55
R	Cryogenic	Applicable for VC_30, VB_32
S	Cryogenic	Applicable for VC/VB_40/50/60/70
Y	Special	Special

6.	<b>MODEL CODE</b>		
J2	A216 gr. WCB	S6	A351 gr. CF8M
S1	A351 gr. CF3M	YY	Special

7.	<b>BEARINGS (TRUNNION / THRUST BEARING)</b>		
B	Model B	Y	Special

### TRIM CONSTRUCTIONS

8.	<b>PLUG MATERIAL</b>	
	Material	Description
P1	410 SS	Standard for carbon steel body
T6	316 SS	Standard for stainless steel body
YY	Special	Special materials

9.	<b>PLUG APPLICATION</b>
X	Not applicable
A	Cobalt based alloy
Y	Special

10.	<b>STEM MATERIAL</b>	
	Material	Description
BC	630 SS + HCr	General for carbon steel valve
TC	316 SS + HCr	General for stainless steel valve
VX	XM-19	

11.	<b>SEAT TYPE</b>
S2	Double metal seat
YY	Special

12.	<b>SEAT MATERIAL</b>	
	Seat	Description
P1	410 SS	Standard for carbon steel body
T6	316 SS	Standard for stainless steel body
YY	Special	Special materials

13.	<b>SEAT APPLICATION</b>
X	Not applicable
A	Cobalt based alloy
Y	Special

### OTHERS

14.	<b>PACKING / BELLOWS TYPE</b>
S	General packing
E	Low emission, Live loaded
C	Bellows Seal (316L SS, Formed)

15.	<b>PACKING MATERIAL</b>
G	PTFE + Carbon fiber
F	Graphite
T	PTFE V-Ring
C	PTFE + Carbon fiber (ATEX)
H	Hi-Graphite
Y	Special

16.	<b>SEAL RING MATERIAL</b>
X	Not applicable

17.	<b>GASKET MATERIAL</b>
S	S/W gasket type, 316 SS + Graphite for standard
L	S/W gasket type, 316L SS + PTFE
H	S/W gasket type, 316L SS + Hi-Graphite
Y	Special

18.	<b>STUD / NUT MATERIAL</b>
G	A193 gr. B7M / A194 gr. 2HM
D	A193 gr. B8M / A194 gr. 8M
K	A320 gr. B8M cl. 2 / A194 gr. 8M
H	A193 gr. B16 / A194 gr. 4
Y	Special

19.	<b>OPTIONS</b>
X	Not Applicable
M	Globe 3-Way, Mixing type
Y	Special

\* The body, bonnet, trim materials are subject to change as equivalent depending on detail design.

### TRIM TYPE & RATED Cv

20. Sign	TRIM TYPE	21. Sign	TRIM CHARACTERISTIC	22. Sign	RATED Cv														
					Description	Body Size and Stroke													
						1" Str.	1-1/2" Str.	2" Str.	3" Str.	4" Str.	6" Str.	8" Str.	10" Str.						
A	Cylindrical plug type	L	Linear	FC	Full capacity	10 (15)	22 (20)	36 (30)	76 (40)	126 (50)	274 (60)	490 (70)	760 (70)						
				1A	1-step reduction	6 (15)	14 (20)	22 (30)	46 (40)	76 (50)	168 (60)	300 (70)	460 (70)						
				2A	2-step reduction	4 (15)	10 (20)	14 (30)	28 (40)	46 (50)	100 (60)	180 (70)	280 (70)						
				3A	3-step reduction	2 (15)	6 (20)	10 (30)	16 (40)	30 (50)	64 (60)	120 (70)	170 (70)						
Y	Special	Y	Special	YY	Special	Contact Neles for Cv details													

\* Rated Cv is separated depending on the trim type & trim characteristic.

\* Available other flow characteristic.

\* (Str.) means the valve stroke.

\* FC: Full Capacity, 1A: 1-Step reduced, 2A: 2-Step reduced, 3A: 3-Step reduced





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