

TECHNICAL DATA SHEET

REDUCING MAINTENANCE & INSTALLATION TIME BY 50%

SAUNDERS[®]
Hygenic Ball Valves

CRANE[®]

v in www.cranecpe.com

Content

The SAUNDERS® Sanitary Ball Valve series is a Class 300 Quarter Turn Floating Ball Valve Design. When mounted with an actuator the ball valve cartridge can be removed without removal of the actuator and sensor.



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Why SAUNDERS[®] Hygienic Ball Valves?



50%
↓ 

50% Reduction in installation time
Saunders innovative design allows for quick and easy installation



Delivering huge Savings
Saunders Ball Valves could deliver hundreds of thousands of dollars in annual maintenance savings

50%
↑ 

50% saving in maintenance time
The unique cartridge concept ensures quick and easy access to the valve & soft components

Key Features & Overview



Slot in Cartridge on a Vertical Plane

The compact cartridge design can be removed on a horizontal plane – reduced risk of clashing with adjacent piping



Self-Aligning Ends

Top adaptor supports to keep both ends aligned during the installation process



Reduction in valve Dimension

One package with direct mounting for all accessories, reducing the envelope dimensions

Type	Materials of Construction	Industries					
3-Piece	- Body: CF3M (Cast) / F316L (Forged) - Seat: TFM - Stem Seal: TFM / PTFE - Body Seal: TFM/ PTFE	 BiotechPharmaceutical  FoodCosmeticsBeverage					
Size Range							
DN15 (½”) to DN 100 (4”)							
Pressure Rating	End Connection						
Class 300	- Tri Clamp* (Conditions Apply) - ETO						
Temperature Range							
- Min: -30°C (-22°F) - Max: 200°C (392°F)	Operation						
Applications	Lever operated (Locking mechanism) or Revo Actuators (Pneumatic Rack & Pinion)						
- Gas Distribution - Steam Processing	Processes						
	- CIP / SIP - Storage & Distribution						
Other Options							
- Cavity Filler - V-port							

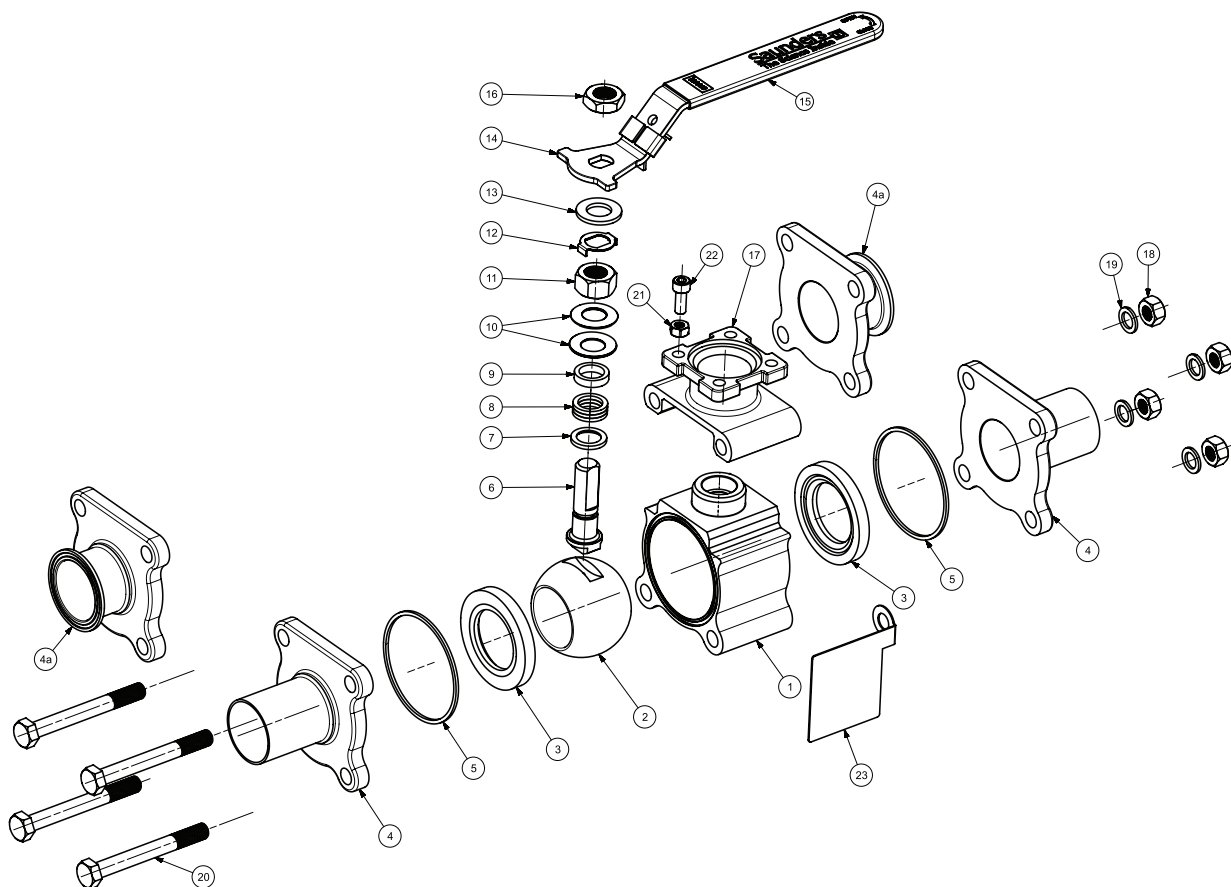
Materials of Construction

Part Name	Materials	
	Casting Variant (SB-C)	Forging Variant (SB-F)
Body*	ASTM A351 CF3M (Casting)	ASTM A182 F316L - Forging or Rolled Alloy (Bar)
End Connections*	ASTM A351 CF3M (Casting)	ASTM A182 F316L - Forging or Rolled Alloy (Bar)
Ball*	ASTM A182 F316L - Forging or Rolled Alloy (Bar)	ASTM A182 F316L - Forging or Rolled Alloy (Bar)
Stem*	Stainless Steel 316L (Bar)	Stainless Steel 316L (Bar)
Top Adapter	ASTM A351 CF3M (Casting)	ASTM A182 F316L - Forging or Rolled Alloy (Bar)
Gland	ASTM A479 316L	ASTM A479 316L
Lever & Lever Lock	ASTM A240 304	ASTM A240 304
Hardware- Bolts & Nuts	A2, A4 stainless steel	A2, A4 stainless steel
Surface Finish	Standard: SF1, Ra 20µin Max/0.51 µm or better (Internal) SF3, Ra 30µin Max/0.76 µm or better (Internal)	
Key Compliances	SF5, Ra 20µin Max/0.51 µm or better (Internal)- EP API598/ EN12266-1, ASME BPE, FDA, 3A, USP VI, ISO 5211, ASME, Class 300	

*Denotes "Controlled ferrite" component i.e., <2% for castings, <1% for Forgings

Product Structure

1.1. Manual Lever Product Structure (DN15- DN50) - Cast

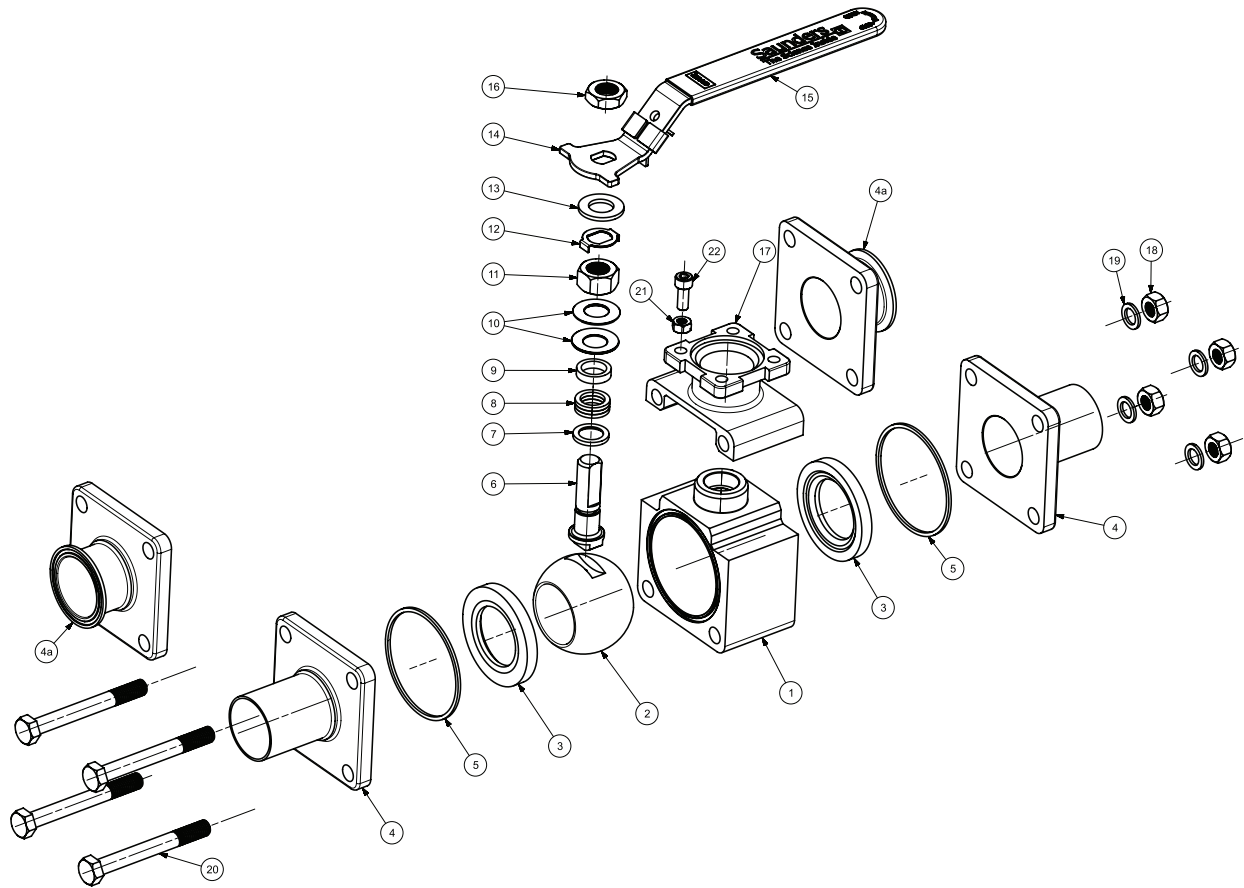


ITEM NO.	DESCRIPTION	QTY.
1	BODY	1
2	BALL	1
3	SEAT	2
4	END CONNECTION (BW)	2
4a	END CONNECTION (TC)	2
5	BODY SEAL	2
6	STEM	1
7	PRIMARY STEM SEAL	1
8	STEM PACKING	3
9	GLAND	1
10	BELLEVILLE WASHER	2
11	STEM HEX NUT	1

ITEM NO.	DESCRIPTION	QTY.
12	TAB LOCK WASHER	1
13	LEVER SPACER WASHER	1
14	LEVER WITH LOCK	1
15	LEVER SLEEVE	1
16	LEVER HEX NUT	1
17	TOP ADAPTER	1
18	BODY HEX NUT	4
19	END CONNECTION WASHER	4
20	BODY HEX BOLT	4
21	LEVER STOP HEX NUT	1
22	LEVER STOP CAP SCREW	1
23	MARKING TAG	1

Product Structure

Manual Lever Product Structure (DN15- DN50) - Forged

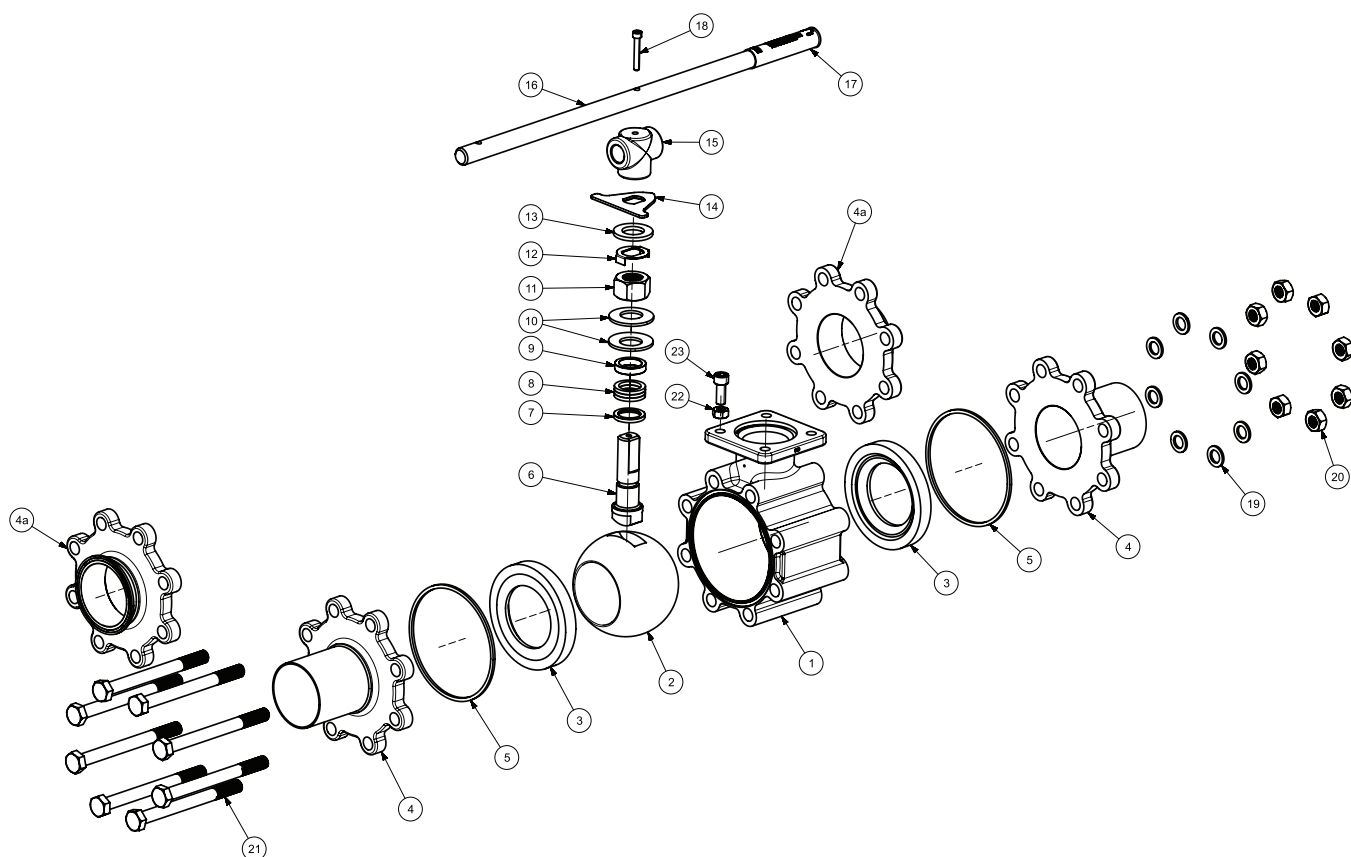


ITEM NO.	DESCRIPTION	QTY.
1	BODY	1
2	BALL	1
3	SEAT	2
4	END CONNECTION (BW)	2
4a	END CONNECTION (TC)	2
5	BODY SEAL	2
6	STEM	1
7	PRIMARY STEM SEAL	1
8	STEM PACKING	3
9	GLAND	1
10	BELLEVILLE WASHER	2

ITEM NO.	DESCRIPTION	QTY.
11	STEM HEX NUT	1
12	TAB LOCK WASHER	1
13	LEVER SPACER WASHER	1
14	LEVER WITH LOCK	1
15	LEVER SLEEVE	1
16	LEVER HEX NUT	1
17	TOP ADAPTER	1
18	BODY HEX NUT	4
19	END CONNECTION WASHER	4
20	BODY HEX BOLT	4
21	LEVER STOP HEX NUT	1
22	LEVER STOP CAP SCREW	1

Product Structure

Manual Lever Product Structure (DN65- DN100) – Cast

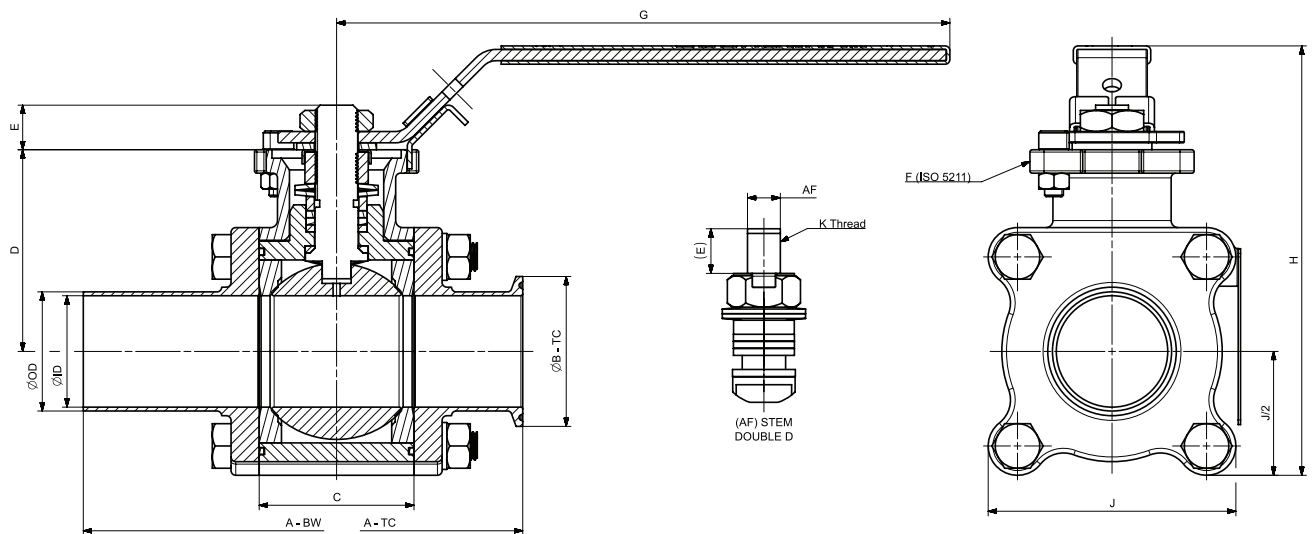


ITEM NO.	DESCRIPTION	QTY.
1	BODY	1
2	BODY	1
3	SEAT	2
4	END CONNECTION (BW)	2
4a	END CONNECTION (TC)	2
5	BODY SEAL	2
6	STEM	1
7	PRIMARY STEM SEAL	1
8	STEM PACKING	3
9	GLAND	1
10	BELLEVILLE WASHER	2
11	STEM HEX NUT	1

ITEM NO.	DESCRIPTION	QTY.
12	TAB LOCK WASHER	1
13	LEVER SPACER WASHER	1
14	LEVER STOPPER	1
15	LEVER HUB	1
16	LEVER BAR	1
17	LEVER BAR SLEEVE	1
18	LEVER CAP SCREW	1
19	END CONNECTION WASHER	8*
20	BODY HEX NUT	8*
21	BODY HEX BOLT	8*
22	LEVER STOP HEX NUT	1
23	LEVER STOP CAP SCREW	1
* Qty. 4 for DN65 SIZE		

Product Dimensions

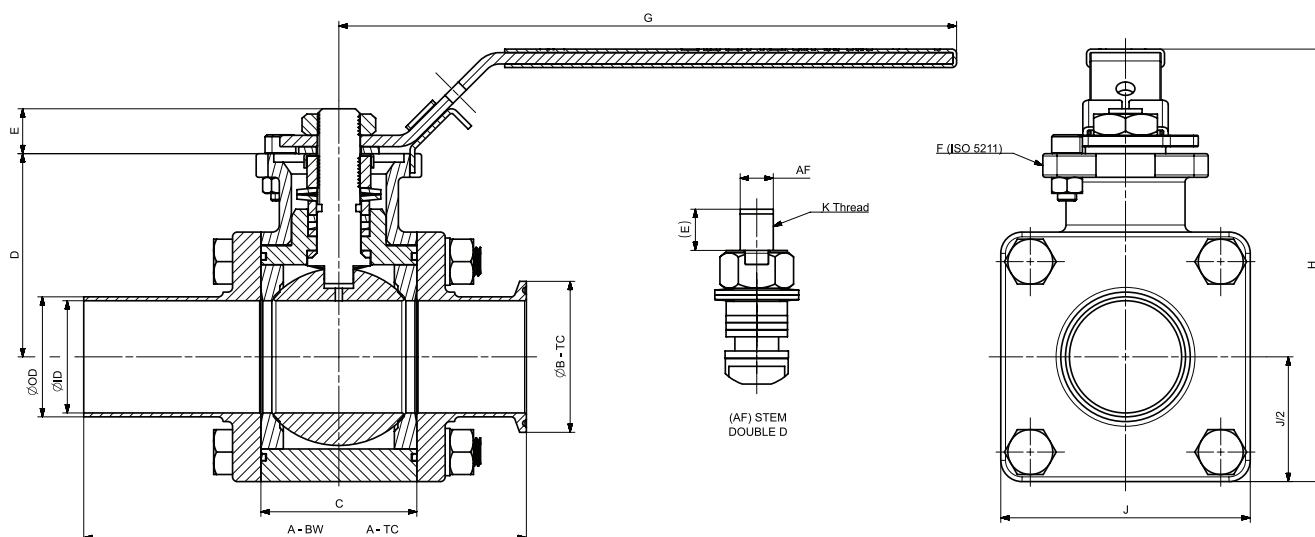
Manual Lever Product Dimension (DN15 – DN50) - Cast



Valve Size	Millimeters												K (Stem Threading)	F (ISO 5211)	Weight (kg) (BW/TC)
	ID	OD	A - BW	A - TC	B - TC	C	D	E	G	H	J	AF			
DN15	9.40	12.70	140.0	88.9	25.00	26.0	40.5	10.9	130	95	47.4	6	3/8 UNC-16	F04	0.8
DN20	15.75	19.05	152.0	101.6	25.00	26.0	40.5	11.4	130	95	47.4	6	3/8 UNC-16	F04	0.8
DN25	22.10	25.40	165.0	114.3	50.39	39.0	55.0	12.7	170	125	63.2	8	M12 x 1.75	F05	1.7
DN40	34.80	38.10	190.0	139.7	50.39	56.0	78.5	19.0	260	170	88.8	14	M18 x 2.5	F07	4.4
DN50	47.50	50.80	216.0	158.8	63.91	66.0	86.0	19.0	260	185	105.6	14	M18 x 2.5	F07	6.2

Product Dimensions

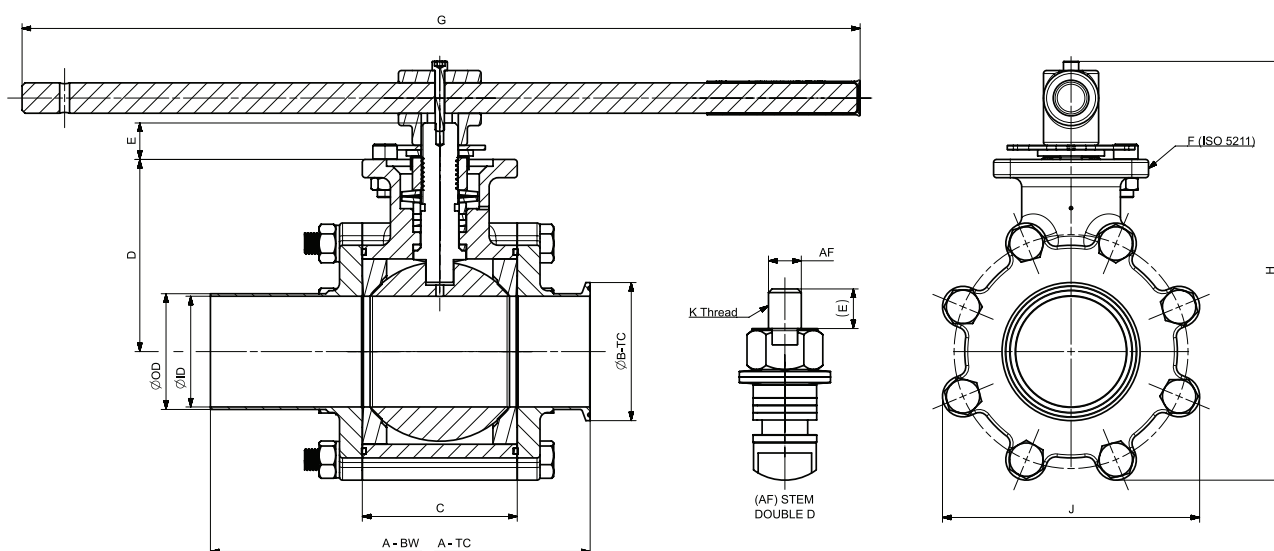
Manual Lever Product Dimension (DN15 – DN50) - Forged



Valve Size	Millimeters												K (Stem Threading)	F (ISO 5211)	Weight (kg) (BW/TC)
	ID	OD	A - BW	A - TC	B - TC	C	D	E	G	H	J	AF			
DN15	9.40	12.70	140.0	88.9	25.00	26.0	40.5	10.9	130	95	47.4	6	3/8 UNC-16	F04	0.9
DN20	15.75	19.05	152.0	101.6	25.00	26.0	40.5	11.4	130	95	47.4	6	3/8 UNC-16	F04	0.9
DN25	22.10	25.40	165.0	114.3	50.39	39.0	55.0	12.7	170	125	63.2	8	M12 x 1.75	F05	2.0
DN40	34.80	38.10	190.0	139.7	50.39	56.0	78.5	19.0	260	170	88.8	14	M18 x 2.5	F07	5.2
DN50	47.50	50.80	216.0	158.8	63.91	66.0	86.0	19.0	260	185	105.6	14	M18 x 2.5	F07	7.3

Product Dimensions

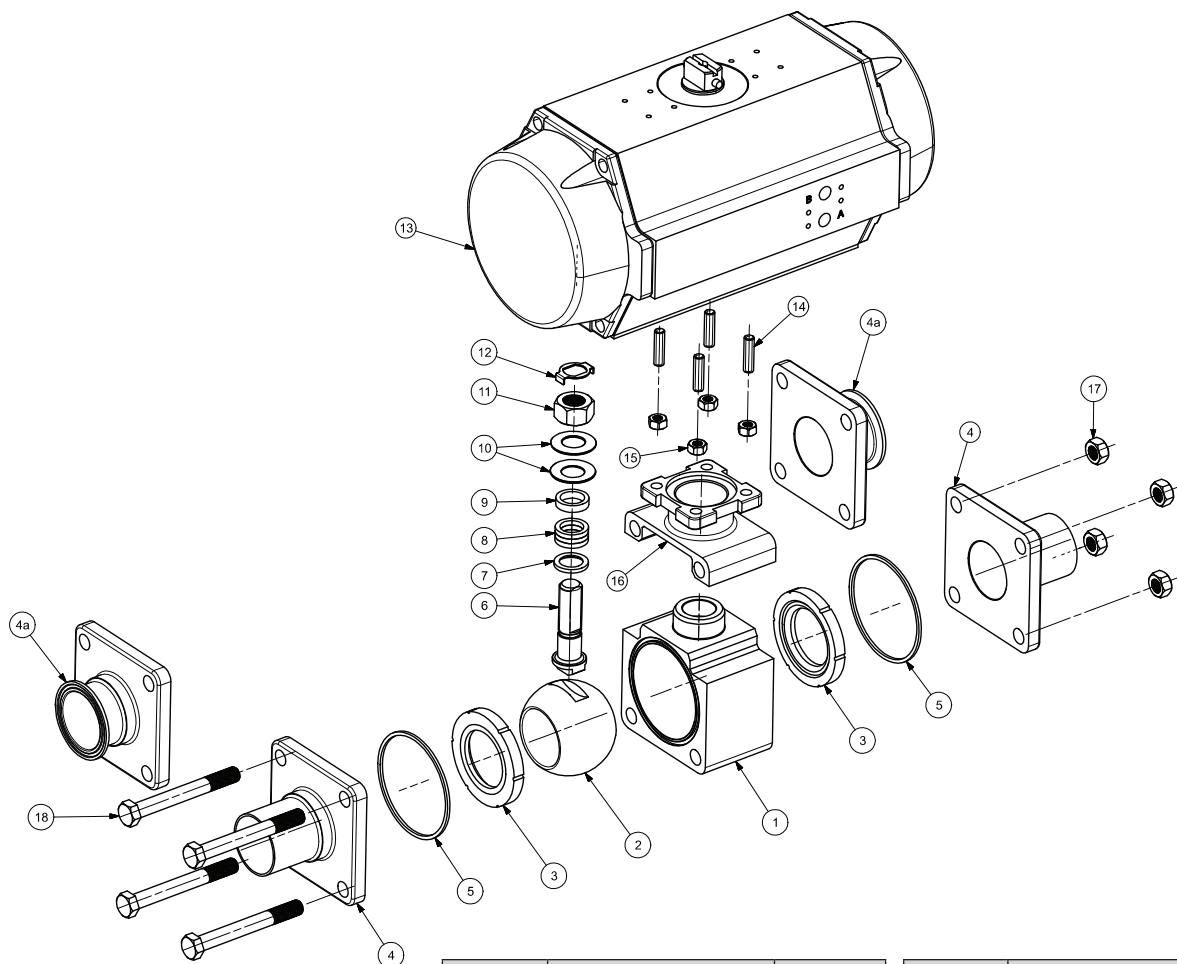
Manual Lever Product Dimension (DN65 – DN100) – Cast & Forged



Valve Size	Millimeters												K (Stem Threading)	F (ISO 5211)	Weight (kg) (BW/TC)
	ID	OD	A - BW	A - TC	B - TC	C	D	E	G	H	J	AF			
DN65	60.20	63.50	292.0	171.0	77.39	83.5	109.0	24	400	230	123	16	M20 x 2.5	F10	11
DN80	72.90	76.20	302.0	198.0	90.91	102.0	126.5	24	550	275	169	18	M24 x 3.0	F10	18
DN100	97.38	101.60	330.0	216.0	118.92	120.0	141.0	24	550	301	197	18	M24 x 3.0	F10	24

Product Structure

Actuated Product Structure (DN15 – DN50) - Cast

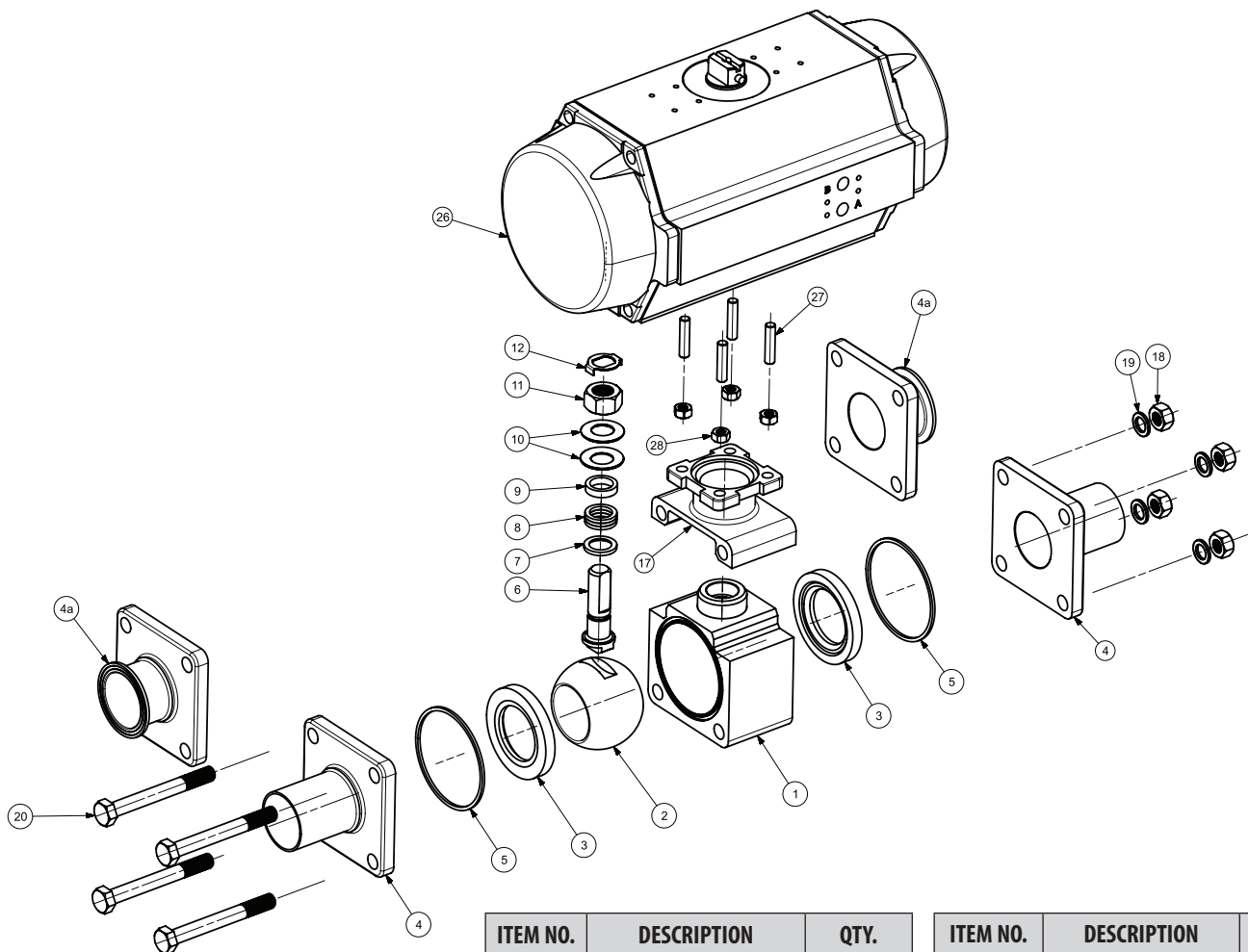


ITEM NO.	DESCRIPTION	QTY.
1	BODY	1
2	BALL	1
3	SEAT	2
4	END CONNECTION (BW)	2
4a	END CONNECTION (TC)	2
5	BODY SEAL	2
6	STEM	1
7	PRIMARY STEM SEAL	1
8	STEM PACKING	3
9	GLAND	1
10	BELLEVILLE WASHER	2
11	STEM HEX NUT	1

ITEM NO.	DESCRIPTION	QTY.
10	BELLEVILLE WASHER	2
11	STEM HEX NUT	1
12	TAB LOCK WASHER	1
17	TOP ADAPTER	1
18	BODY HEX NUT	4
19	END CONNECTION WASHER	4
20	BODY HEX BOLT	4
26	ACTUATOR	1
27	ACTUATOR STUD	4
28	ACTUATOR NUT	4
29	MARKING TAG	1

Product Structure

Actuated Product Structure (DN15 – DN50) - Forged

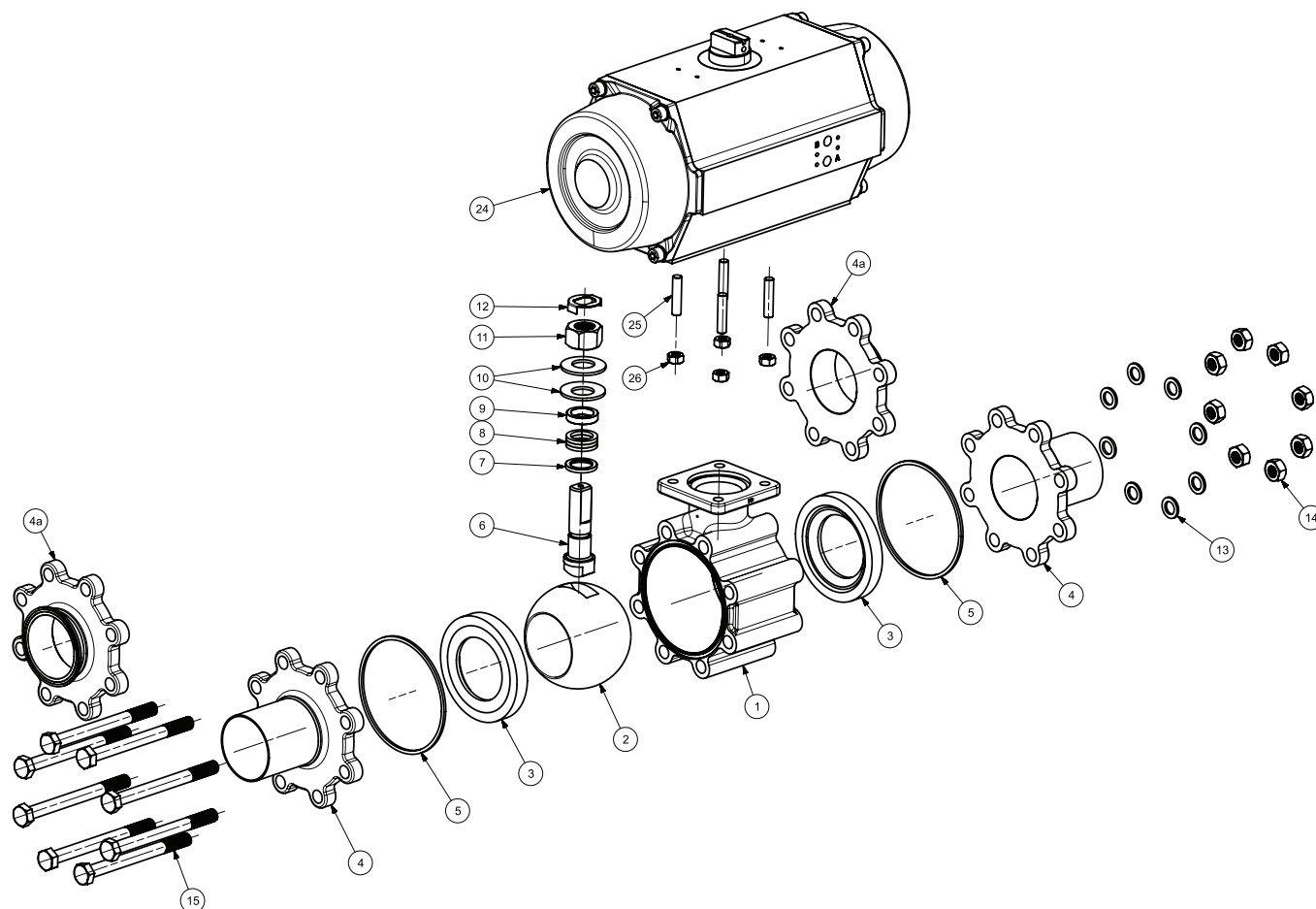


ITEM NO.	DESCRIPTION	QTY.
1	BODY	1
2	BALL	1
3	SEAT	2
4	END CONNECTION (BW)	2
4a	END CONNECTION (TC)	2
5	BODY SEAL	2
6	STEM	1
7	PRIMARY STEM SEAL	1
8	STEM PACKING	3
9	GLAND	1

ITEM NO.	DESCRIPTION	QTY.
10	BELLEVILLE WASHER	2
11	STEM HEX NUT	1
12	TAB LOCK WASHER	1
17	TOP ADAPTER	1
18	BODY HEX NUT	4
19	END CONNECTION WASHER	4
20	BODY HEX BOLT	4
26	ACTUATOR	1
27	ACTUATOR STUD	4
28	ACTUATOR NUT	4

Product Structure

Actuated Product Structure (DN65 – DN100) - Cast & Forged



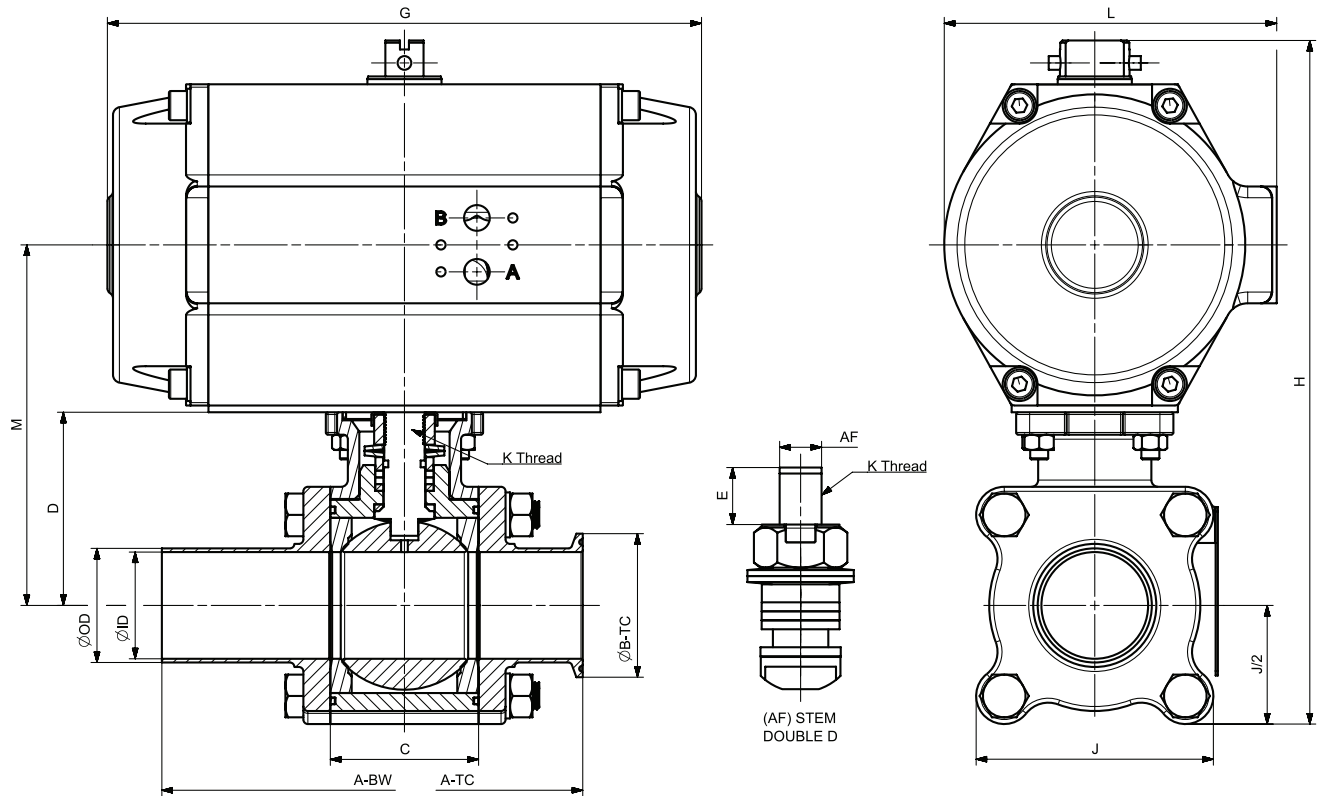
ITEM NO.	DESCRIPTION	QTY.
1	BODY	1
2	BALL	1
3	SEAT	2
4	END CONNECTION (BW)	2
4a	END CONNECTION (TC)	2
5	BODY SEAL	2
6	STEM	1
7	PRIMARY STEM SEAL	1
8	STEM PACKING	3
9	GLAND	1

ITEM NO.	DESCRIPTION	QTY.
10	BELLEVILLE WASHER	2
11	STEM HEX NUT	1
12	TAB LOCK WASHER	1
13	END CONNECTION WASHER	8*
14	BODY HEX NUT	8*
15	BODY HEX BOLT	8*
24	ACTUATOR	1
25	ACTUATOR STUD	4
26	ACTUATOR NUT	4

* Qty. 4 for DN65 SIZE

Product Structure

Actuated Product Dimensions (DN15-DN50) - Cast

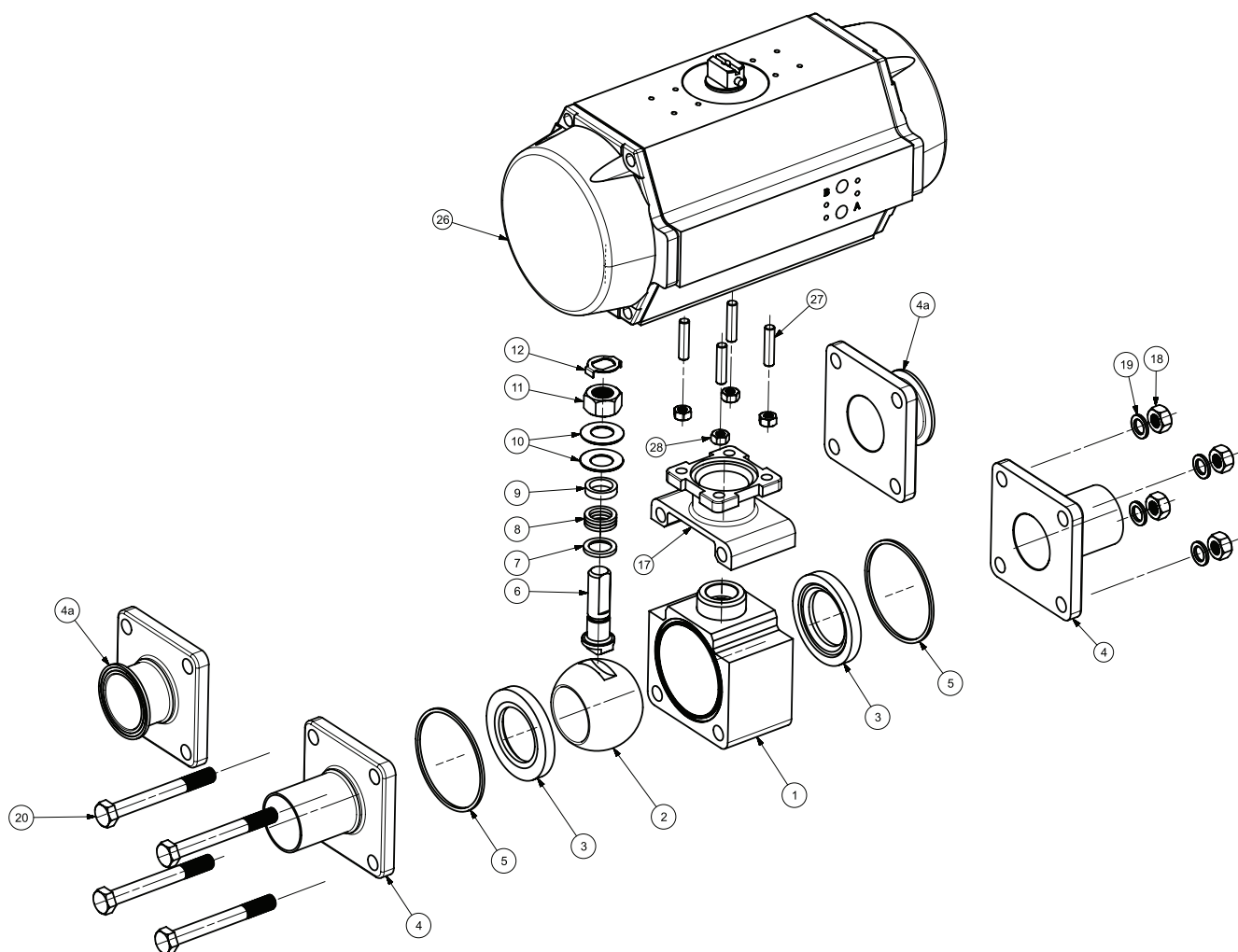


Valve Size	Millimeters														K (Stem Threading)	F (ISO 5211)	Weight (kg) (BW/TC)				
	ID	OD	A - BW	A - TC	B - TC	C	D	E	J	G		H		L			M		AF		
										60 psi	80 psi	60 psi	80 psi	60 psi			80 psi	60 psi		80 psi	
																					60 psi
DN15	9.40	12.70	140.0	88.9	25.00	26.0	40.5	10.9	47.4	200		161		76		80		6	3/8 UNC-16	F04	1.6
DN20	15.75	19.05	152.0	101.6	25.00	26.0	40.5	11.4	47.4	200		161		76		80		6	3/8 UNC-16	F04	1.6
DN25	22.10	25.40	165.0	114.3	50.39	39.0	55.0	12.7	63.2	207		197		97		102		8	M12 x 1.75	F05	4.2
DN40	34.80	38.10	190.0	139.7	50.39	56.0	78.5	19.0	88.8	270		288		148		153		14	M18 x 2.5	F07	11.4
DN50	47.50	50.80	216.0	158.8	63.91	66.0	86.0	19.0	105.6	270		304		148		161		14	M18 x 2.5	F07	13.5

* Actuator - Spring close operating mechanism

Product Dimensions

Actuated Product Dimensions (DN15-DN50) - Forged

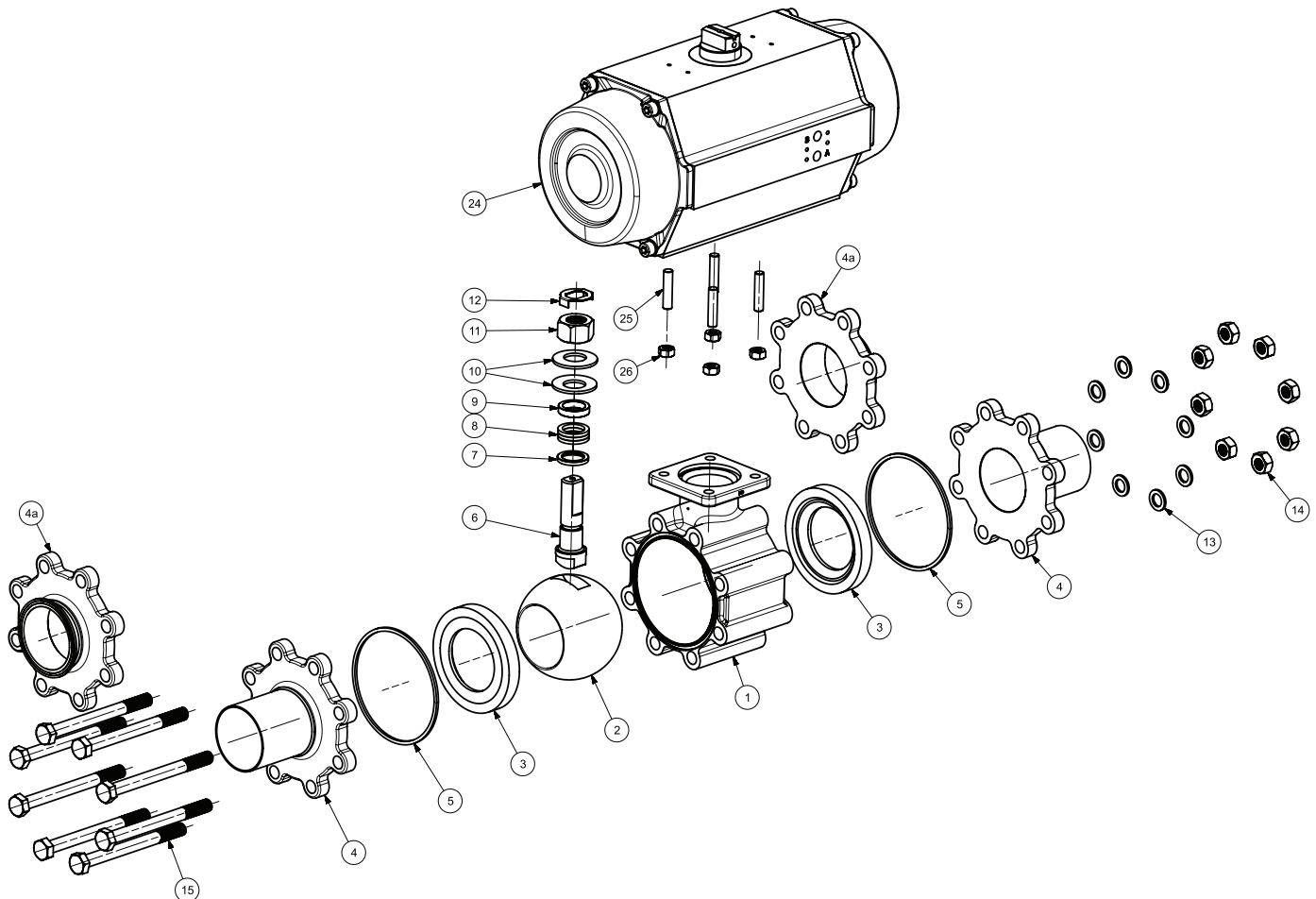


Valve Size	Millimeters														K (Stem Threading)	F (ISO 5211)	Weight (kg) (BW/TC)				
	ID	OD	A - BW	A - TC	B - TC	C	D	E	J	G		H		L			M		AF		
										60 psi	80 psi	60 psi	80 psi	60 psi			80 psi	60 psi		80 psi	
DN15	9.40	12.70	140.0	88.9	25.00	26.0	40.5	10.9	47.4	200		161		76		80		6	3/8 UNC-16	F04	1.4
DN20	15.75	19.05	152.0	101.6	25.00	26.0	40.5	11.4	47.4	200		161		76		80		6	3/8 UNC-16	F04	1.4
DN25	22.10	25.40	165.0	114.3	50.39	39.0	55.0	12.7	63.2	207		197		97		102		8	M12 x 1.75	F05	3.9
DN40	34.80	38.10	190.0	139.7	50.39	56.0	78.5	19.0	88.8	270		288		148		153		14	M18 x 2.5	F07	10.7
DN50	47.50	50.80	216.0	158.8	63.91	66.0	86.0	19.0	105.6	270		304		148		161		14	M18 x 2.5	F07	12.4

* Actuator - Spring close operating mechanism

Product Dimensions

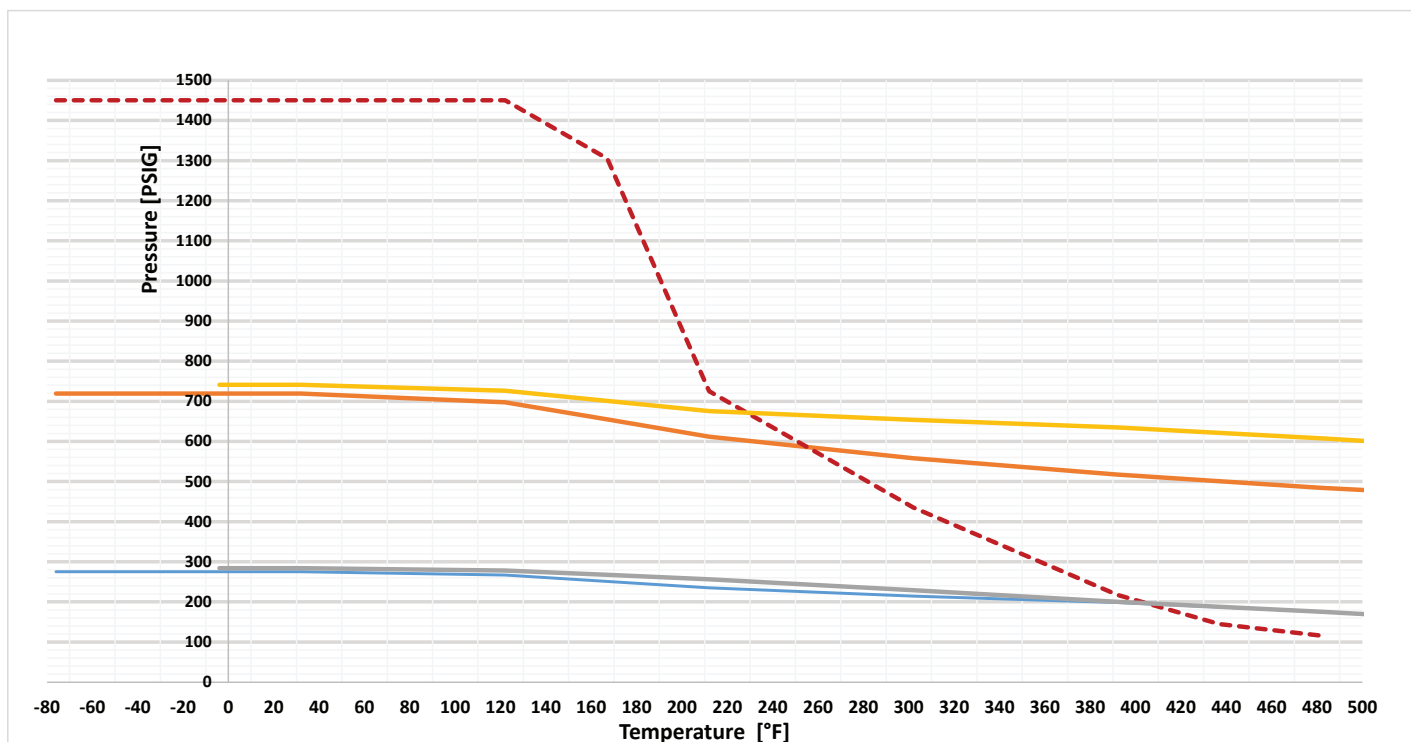
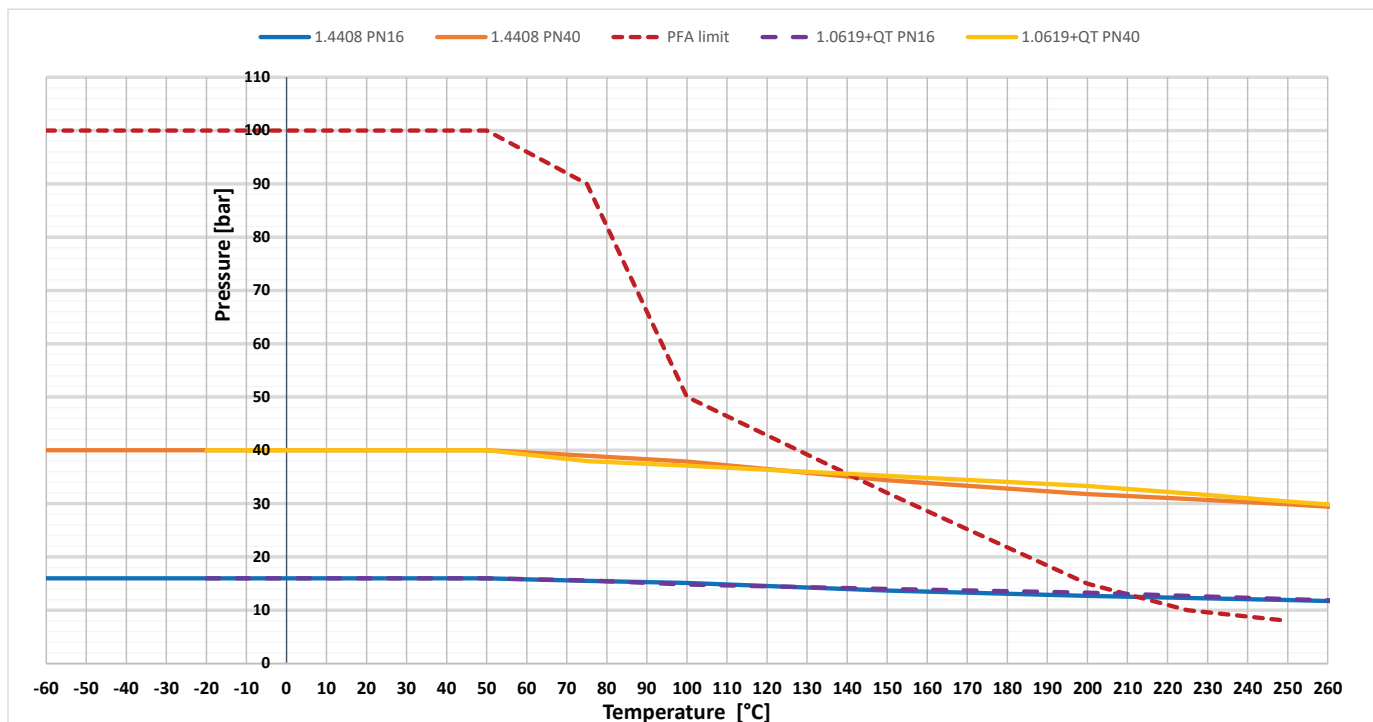
Actuated Product Structure (DN65 – DN100) - Cast & Forged



Valve Size	Millimeters														K (Stem Threading)	F (ISO 5211)	Weight (kg) (BW/TC)				
	ID	OD	A - BW	A - TC	B - TC	C	D	E	J	G		H		L			M		AF		
										60 psi	80 psi	60 psi	80 psi	60 psi			80 psi	60 psi		80 psi	
DN65	60.20	63.50	292.0	171.0	77.39	83.5	109.0	24	123	355		365		172		194		16	M20 x 2.5	F10	22
DN80	72.90	76.20	302.0	198.0	90.91	102.0	126.5	24	169	355		406		172		211		18	M24 x 3.0	F10	29
DN100	97.38	101.60	330.0	216.0	118.92	120.0	141.0	24	197	355		434		172		226		18	M24 x 3.0	F10	36

* Actuator - Spring close operating mechanism

Pressure & Temperature Graph



How to Order

S	B	0	2	5	C	T	Y	0	4	0	4	T	J	R	C	6	S	N	-	-	M	4	P	5	4	7	S	E
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Series & Design
Hygienic/
Sanitary Ball
Valve

SB

Size

Metric	Code
DN15	15
DN20	20
DN25	25
DN40	40
DN50	50
DN65	65
DN80	80
DN100	100

Component Materials
(Body/Ends/Ball/Stem)

Cast Body	C
Body: A351 CF3M	
Ends: A351 CF3M	
Ball: A182 F316L	
Stem: A182 F316L	F
Forged Body	
Body: A182 F316L	
Ends: A182 F316L	
Ball: A182 F316L	
Stem: A182 F316L	

Surface Finish (Internal/ External)

SF1	Forged: 0.5/1.0 Ra Cast: 0.5 Ra/As Cast	Y
SF5	Forged: 0.5/1.0 Ra EP Cast: 0.5 Ra/As Cast EP	J
SF3	Forged: 0.76/1.0 Ra Cast: 0.76 Ra/As Cast	V

**EP – Electropolished Additional Finish available upon request*

Seal Material
(Seat / Body / Stem / Primary stem seal)

Seat: TFM	T
Body seal: TFM	
Stem seal: TFM	
Stem Primary seal: TFM	

Ball Style

Full/True Bore	T
V-Ball 30°	3
V-Ball 45°	4
V-Ball 60°	6

Seat Style

Soft Seat Design	J
Cavity Filled	C

Operating Mechanism

Revo actuator operation
Manual lever operation

Automation

M4 Sense Switchbox
Weslock Switchbox
Weslock Positioner

SEE HOW TO ORDER (AUTOMATION) PAGE

End Connection (Port 1 / Port 2)

DN15 ASME BPE ETO END	02
DN20 ASME BPE ETO END	03
DN25 ASME BPE ETO END	04
DN40 ASME BPE ETO END	06
DN50 ASME BPE ETO END	07
DN65 ASME BPE ETO END	08
DN80 ASME BPE ETO END	09
DN100 ASME BPE ETO END	10
DN15 ASME BPE FERRULE TYPE A END	AC
DN20 ASME BPE FERRULE TYPE A END	AD
DN25 ASME BPE FERRULE TYPE B END	AE
DN40 ASME BPE FERRULE TYPE B END	AG
DN50 ASME BPE FERRULE TYPE B END	AH
DN65 ASME BPE FERRULE TYPE B END	AJ
DN80 ASME BPE FERRULE TYPE B END	AK
DN100 ASME BPE FERRULE TYPE B END	AL

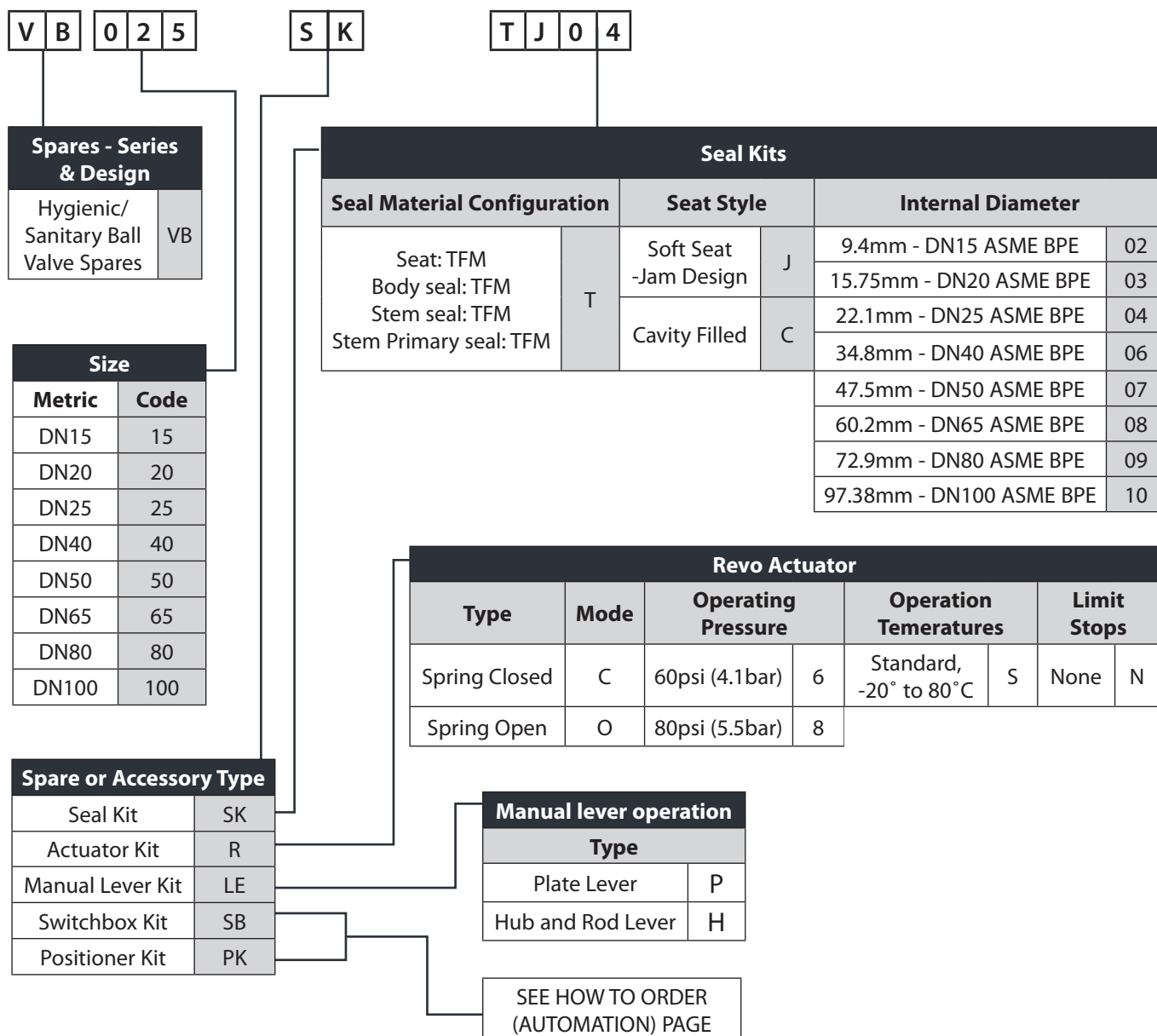
LE		P	
Component		Type	
Lever	LE	Plate Lever (DN15-DN50 only)	P
		Hub and Rod Lever (DN65-DN100 only)	H

R		C		6		S		N	
Type		Mode		Operating Pressure		Operation Temperatures		Limit Stops	
Revo Quarter-Turn Actuator	R	Spring Closed	C	60psi (4.1bar)	6	Standard, -20° to 80°C	S	None	N
		Spring Open	O	80psi (5.5bar)	8				

*Additional Material available upon request

Catalogue code example: (SB025CTY0404TJRC6SN) Code will contain 17-29 digits dependant on manual, actuated or automated operations

How to Order Spares



*Catalogue code example: (VB025SKTJ04) Code will contain 9 or 15 digits dependant on configuration

How to Order Automation

S B 0 2 5 C T Y 0 4 0 4 T J R C 6 S N - - M 4 P 5 4 7 S E

V B 0 2 5 S B M 4 P 5 4 7 S E

Weslock Positioner										Automation			
Switchbox		Hazardous Zone		Switch/Sensor		Solenoid		Pneumatic Tubing		Weslock Positioner			
K20	WK	Intrinsically Safe Ex ia (ATEX & IEC: Zone 1/21) (NEC: class I Div. I & II)		IA	SPDT gold plated mechanical switches	M1	Integrated solenoid BSP thread	B	PFA	P	Weslock Switchbox		
K20 Heart	WH				P&F NJ2-V3-N sensors	P1	Integrated solenoid NPT thread	N	Stainless Steel	S	M4 Sense Switchbox		
					Magnum XT-90 (Rhodium)	P3							
					Magnum XT-90 (Tugsten)	P4							
					None	N0							

Weslock Switchbox									
Switchbox		Hazardous Zone		Switch/Sensor		Solenoid		Pneumatic Tubing	
Accutrack	WA	Intrinsically Safe Ex ia <i>(ATEX & IEC: Zone 1/21)</i>	IA	SPDT gold plated mechanical switches	M1	None	E	PFA	P
						Integrated solenoid BSP thread	B		
		Intrinsically Safe Ex ia <i>(NEC: class I Div. I & II)</i>	IN	SPDT Silver plated mechanical switches	M2	Integrated solenoid NPT thread	N	Stainless Steel	S
		Explosion/Flame-proof Ex d IIB H2 (Aluminium enclosure) (ATEX & IEC: Zone 2/22)	EA	P&F NJ2-V3-N sensors	P1				
		Explosion/Flame-proof Ex d IIB H2 (Aluminium enclosure) (NEC: Mechanical switch - Class I Div. 1 & Class 2 Div. I Proximity sensors - Class 1 Div. I & Class 2 Div. II)	EN	NBB2-V3-E2 sensors	P2				
		Non-Hazardous (IP66/67)	NI	Magnum XT-90 (Rhodium)	P3				
		Non-Hazardous (NEMA 4/4X)	NN	Magnum XT-90 (Tugsten)	P4				
				None	N0				

*Catalogue code example: (Valve assembly and spares)

How to Order Automation

M 4 P 5 4 7 S E

Automation

Weslock Positioner

Weslock Switchbox

M4 Sense Switchbox

M4 Sense Switchbox

Version		Position signalling		Electrical Entrance		Integrated Solenoid		Pneumatic Tubing		Hazardous Zone	
Mechanical contact version	M4M	RDR two mechanical contacts	R	Two 1/2" NPT threaded cable entries (plug and cable gland not included)	1	5-2 aluminium solenoid NPT thread	1	PFA	P	Non-Hazardous	-
Smart version (Diagnostic & self-calibration)	M4S	PNP with I/O Link	I	Two 1/2" BSP threaded cable entries (plug and cable gland not included)	2	5-2 aluminium solenoid NPT thread with pressure sensor	2	Stainless Steel	S	Increased Safety Ex eb (ATEX & IEC: Zone 1/ 21, NEC: Div 2 class II and III)	E
		AS-interface v2	2	One 7/8" 5 pin male connector, & one PG13.5 thread cable entry (supplied with plastic plug)	3	5-2 aluminium solenoid BSP thread	3				
Smart Pro version (Bluetooth app, advanced diagnostics event record)	M4P	AS-interface v5	5	One M12 5 pin male connector, & one PG13.5 thread cable entry (supplied with plastic plug)	4	5-2 aluminium solenoid BSP thread with pressure sensor	4				
						5-2 stainless steel solenoid NPT thread	5				
		Device Net	D			5-2 stainless steel solenoid NPT thread with pressure sensor	6				
						5-2 stainless steel solenoid BSP thread	7				
						5-2 stainless steel solenoid BSP thread with pressure sensor	8				

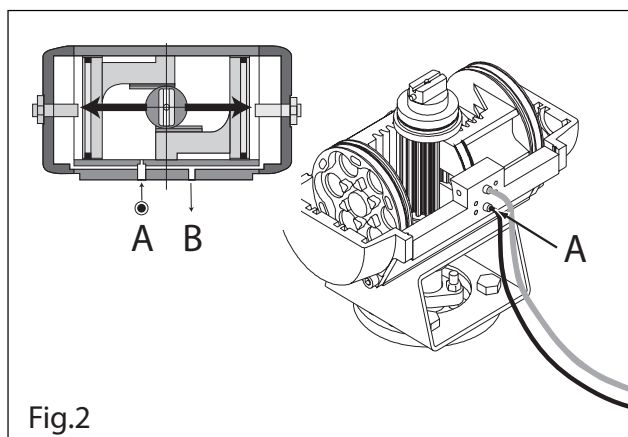
*Catalogue code example: (Valve assembly and spares)

Actuator Connection Description

Pneumatic Valve Actuator, Series R

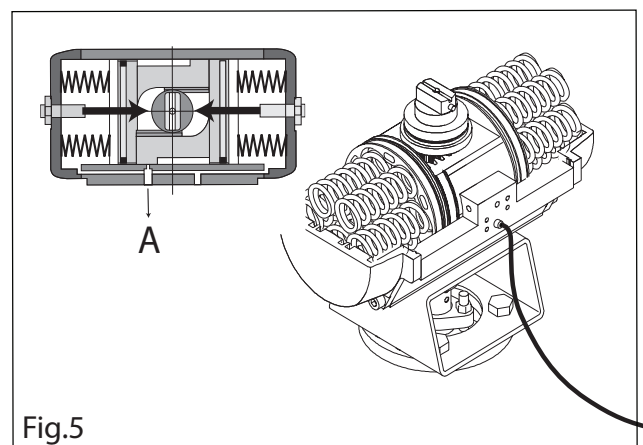
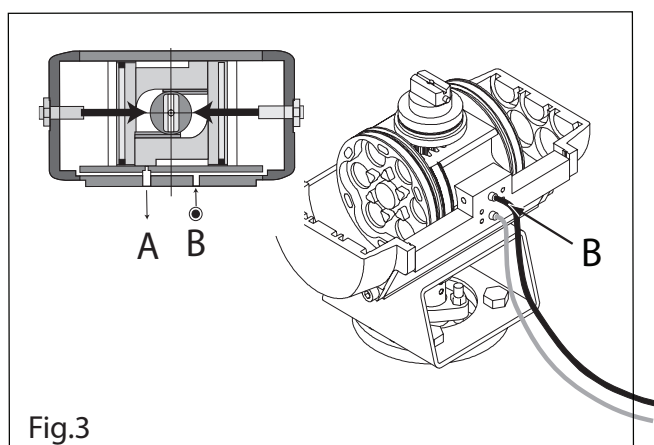
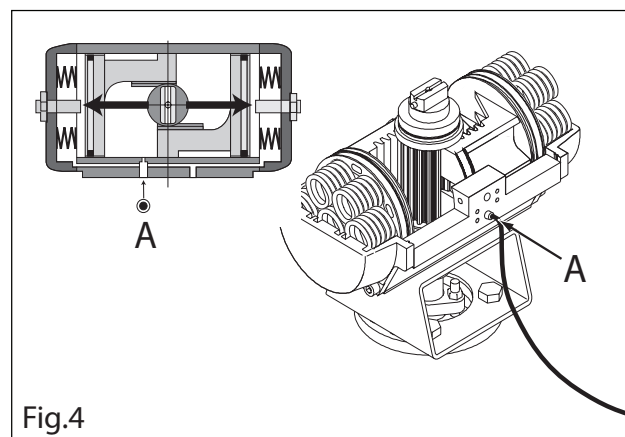
Air connections double-acting

Air supply to port A: anti-clockwise/open



Air connections with spring reset

Air supply to port A: anti-clockwise/open



Recommended Pipe Diameters for Compressed Air Lines

Actuator size	up to 1.20 m	longer than 1.20 m, max. upto 6 m
001 - 025	6 mm	6 mm
050 - 180	8 mm	8 mm
205 - H15	10 mm	15 mm

⚠ WARNING

1. Exceeding maximum actuator head pressure may result in damage.
2. Incorrect connection may cause damage.
3. Refer to Actuator IOM for additional information and safety requirements.

Technical Data

4. Technical data

4.1. Working data

Ambient temperature: 0~70°C

Class rating: Class 300

4.2. Mechanical data

Body material: Stainless Steel 316

Sealing material: TFM – modified polytetrafluoro-ethylene (PTFE)

4.3. Pneumatic data

Refer to REVO Actuator IOM

5. Attention

These instructions do not make allowance for:

- Contingencies and events, which may arise during the installation, operation, and maintenance of the valve.
- Local safety regulations: the operator is responsible for observing these regulations, also with reference to the installation personnel.

High Pressure

Before dismounting pneumatic lines and valves, turn off the pressure and vent the lines. To prevent damage, make sure that all the pneumatics connections are made correctly. Before removing, a valve from the line ensure the line is depressurized and drained. The valve should be cycled to relieve any pressure that could be trapped in the body/ball.

Moving Parts (Risk of Amputation)

The ball valve is a quarter turn actuator. Provisions must be made by the user to ensure the valve cannot be operated unintentionally. All personnel are restricted from inserting fingers or objects into the bore whilst the actuators are live. Accidental pressurization of the actuator whilst bore is exposed can result in serious harm.

Electrical Risks

Observe applicable accident prevention and safety regulations for electrical equipment.

WARNING

Do not connect or disconnect (equipment/sensors) while circuit is live unless location is known to be non-hazardous.

Hazardous Situation

To avoid injury, ensure:

- That the system cannot be activated unintentionally.
- Installation and maintenance may be carried out by authorized technicians only.
- After an interruption in the power or pneumatic supply, ensure that the process will be restarted in a defined and controlled manner.
- The valve must be operated according to the operating instructions

Trouble Shooting

Problem Observed	Potential Cause	Solution
Leakage at Stem	Loss of packing compression	Inspect the Belleville washers for damage. If condition is good, remove locking tab, tighten the gland nut to fully compress Belleville washers, then back the nut off by 1/16th of a turn and realign with locking tab.
		If damage is noted, dismantle valve stem assembly to gland, then replace disk springs in series with outer edges touching (doubles deflection). Replace gland nut and retighten.
	Damage/wear to packing/primary stem Seal	Full tear down and replacement of damaged/worn components
Leakage at body (Body seal)	Loss of body seal compression	Check tightness at body bolting connections. If loose, retighten.
		If leakage continues to occur, dismantle the valve in a safe condition and replace body seals.
Leakage in-line/downstream	Ball/stem misalignment	Ensure the valve is fully closing and orientation of stem is correct
	Ball/Seat damage	If leakage occurs downstream in the closed position, the seat or ball may be damaged. In this instance, the parts should be replaced. Maintenance of these components requires dismantling of valve in a safe condition.
Cartridge to actuator fitment issues	Stem to actuator misalignment	Ensure stem is aligned with actuator double D slot.
Cartridge does not eject from top adapter	Lower end connection to body bolts still fitted	Remove low end connection body bolts
	Top end connection to top adapter bolts too tight	Ensure top two end connection nuts have been slackened to facilitate removal
Lever fouling on ISO actuator mounting flange	Spacer washer missing	Place spacer washer between lever and locking washer
Loose lever	Serrated lock washer missing	Place serrated lock washer between lever and securing nut and retighten
	Securing nut loose	Tighten securing nut



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