

Fugitive emission solutions

Background

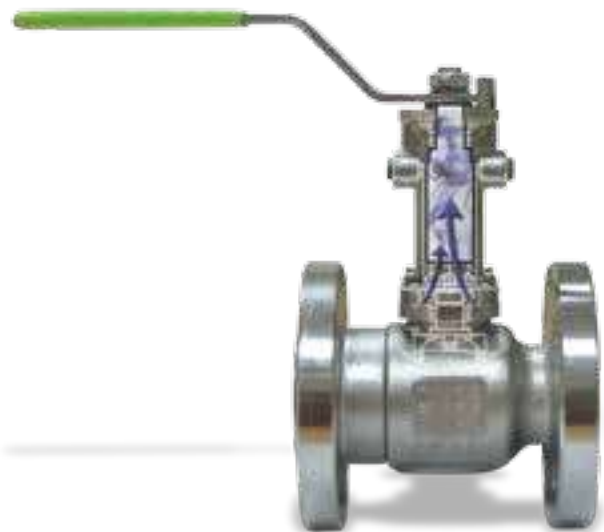
Industry is making major contributions towards improving our global environment by reducing hazardous emissions, reducing product losses and addressing environmental concerns. Since the advent of the "Clean Air Act Amendment" of 1990 (CAAA), introduced by the U.S. Environmental Protection Agency (EPA), industrial plants have revised their specifications regarding fugitive emissions.

The Challenge

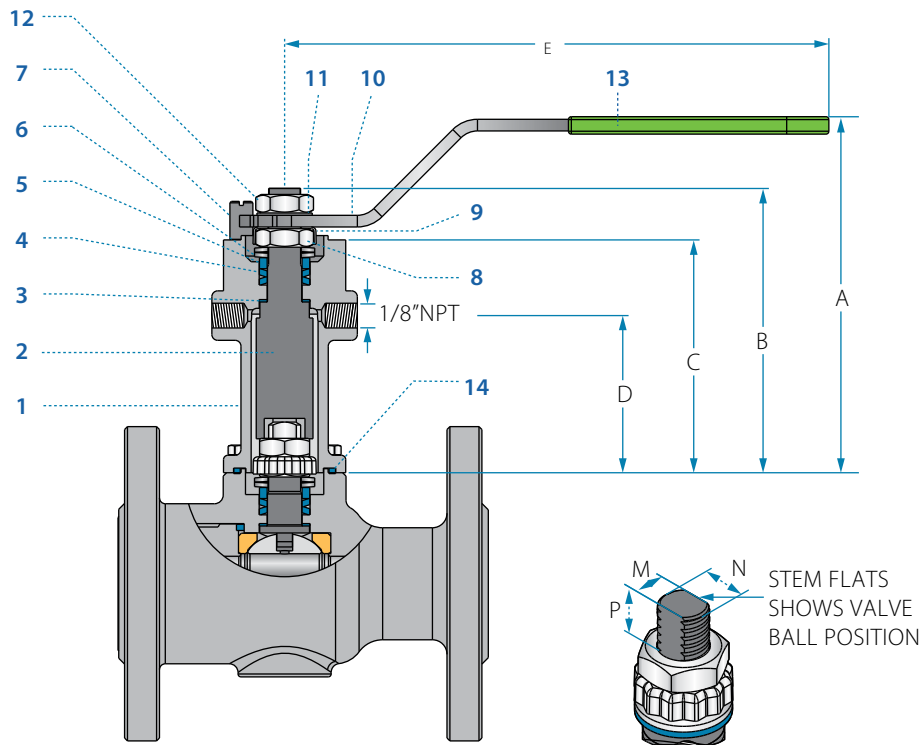
Eliminating product emissions is one of the most serious challenges for process industry and consequently can be most costly to control. As part of its Health & Safety initiative campaign Habonim has introduced additional Security to the valve stem design for critical applications.

Design features

- Modular design uses a double defence sealing concept. The first defence line is based on the valve stem seal arrangement, while the second line is integral with the F.E. bonnet.
- A machined lip on the bonnet bottom plane will ensure a safe fit over the valve ISO pad. A static seal will provide security to the atmosphere.
- The bonnet design allows a sensing device to be fitted between the two sealing arrangements, In case of first defence line failure an alert can be immediately identified.
- Any media is contained within the F.E. bonnet until valve maintenance can be safely held.
- Double blowout proof stems.
- Linear alignment between valve stem, extension and actuator to reduce side load.
- Rigid construction.
- Precision stem and packing bore finish.
- Fire-safe valve stem packing and valve connection to bonnet (upon request)
- Stainless steel cast CF8M housing material as standard.
- Exotic materials Alloy-20, Hasteloy-C22, Monel and more (upon request).
- Various solutions are offered by Habonim when sizing F.E. bonnets to customer applications: HC (high cycle), N (Control valves), KG (fire-safe and thermal applications), and the HermetiX™ Habonim patented stem packing.



Size 1/2"-2 1/2" | DN15-DN65



Components & materials

Item	Description	Material specification	Qty.
1	Body	ASTM A351 CF8M	1
2	Stem	ASTM A479 316/316L	1
3	Stem thrust seal	Virgin PEEK	1
4	Stem seal	TFM	1
5	Follower	B783 316L	1
6	Disc spring	17-7PH	2
7	Stop pin	ASTM A582 303	1

Item	Description	Material specification	Qty.
8	Stem nut	ASTM A194 316	1
9	Locking clip	A167 304	1
10	Handle	ASTM A240 430	1
11	Serrated washer	A240 410	1
12	Handle nut	ASTM A194 316	1
13	Handle sleeve	PVC	1
14	Bonnet seal	PTFE / GRAPHITE	1

Dimensions

Valve size		FE Size	A	B	C	D	S	M	N	P	F
DN15 & DN20	mm	05	114.00	89.10	80.00	55.25	150.00	5.50	3/8" UNF	7.20 (F03)	36.00
1/2" & 3/4"	inch		4.48	3.50	3.15	2.17	5.90	0.21		0.28	1.42
DN25 & DN32	mm	10	122.00	97.40	80.00	54.00	187.00	7.54	7/16" UNF	7.20 (F04)	42.00
1" & 1 1/4"	inch		4.83	3.83	3.15	2.12	7.36	0.29		0.28	1.65
DN40 & DN50	mm	15	154.00	129.40	100.00	77.00	236.00	8.71	9/16" UNF	8.00 (F05)	50.00
1 1/2" & 2"	inch		6.03	5.09	3.93	3.03	9.29	0.34		0.31	1.97
DN65	mm	25	144.00	118.10	100.00	76.50	236.00	8.71	9/16" UNF	13.50 (F07)	70.00
2 1/2"	inch		5.66	4.65	3.93	3.01	9.29	0.34		0.53	2.76

F.E. Stem operating torque

Reduced port Valve size	FE Size	HC / HermetiX™		AI packing		Control valves (N) / Graphite packing (KG)	
		N*m	lbf*inch	N*m	lbf*inch	N*m	lbf*inch
DN15 & DN20	1/2" & 3/4"	2.00	17.70	3.00	26.50	4.00	35.40
DN25 & DN32	1" & 1 1/4"	5.00	44.20	7.00	62.00	9.00	79.60
DN40 & DN50	1 1/2" & 2"	7.00	62.00	11.00	97.30	13.00	115.00
DN65	2 1/2"	7.00	62.00	11.00	97.30	13.00	115.00

Note: When sizing an actuator add the above figures to the valve operating torque

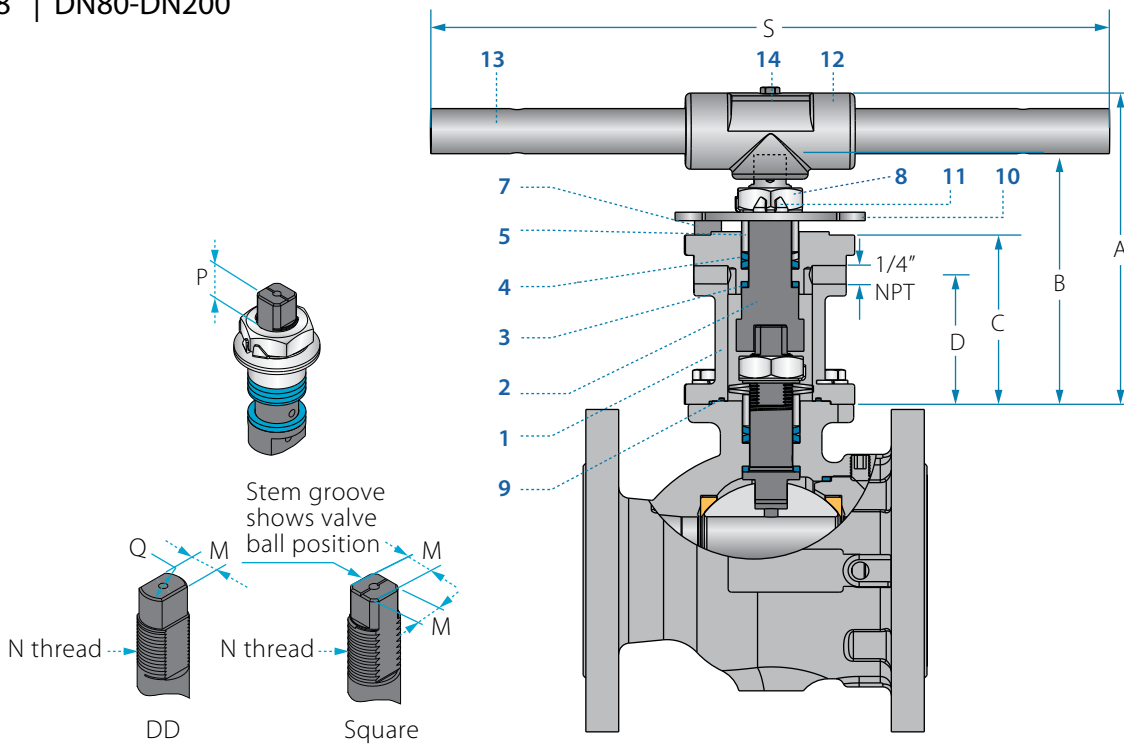
Valve accessories

Locking device

Fugitive Emission (FE)

Spring Return Handle (SRH)

Size 3"-8" | DN80-DN200



Components & materials

Item	Description	Material specification	Qty.
1	Body	CF8M	1
2	Stem	316/316L	1
3	Stem thrust seal	Virgin PEEK	1
4	Stem seal	TFM	1
5	Follower	B783 316L	1
6	Disc spring	17-7PH	2
7	Stop pin	ASTM A582 303	1
8	Stem nut	ASTM A194 316	1

Item	Description	Material specification	Qty.
9	Bonnet seal	PTFE / GRAPHITE	1
10	Stop plate	ASTM A240 430	1
11	Tab lock washer	ASTM A240 304	1
12	Wrench head	ASTM A47 MALEABLE IRON	1
13	Wrench handle	304	1
14	Wrench handle bolt	ISO 4014 A2-70	1

FE dimensions

Valve size	FE Size	A	B	C	D	S	M	M-DD	QB	N	P	F	
DN80 & DN100	30	mm	87.00	196.00	150.00	76.50	401.00	18.90	15.90	22.70	1" -14	16.70 (F10)	102.00
3" & 4"		inch	7.36	7.74	5.90	3.01	15.79	0.74	0.63	0.89	UNS-2A	0.66	4.02
DN150 & DN200	60	mm	273.00	219.00	150.00	100.00	401.00	18.90	15.90	35.20	1" -14	16.70 (F12)	125.00
6" & 8"		inch	10.74	8.62	5.90	3.93	15.79	0.74	0.63	1.36	UNS-2A	0.66	4.92

F.E. Stem operating torque

Reduced port Valve size	FE Size	HC / HermetiX™		Al packing		Control valves (N) / Graphite packing (KG)	
		N*m	lbf*inch	N*m	lbf*inch	N*m	lbf*inch
DN80 & DN100 3" & 4"	30	13.00	115.00	18.00	159.30	25.00	221.20
DN150 & DN200 6" & 8"	60	32.00	283.00	43.00	380.50	60.00	531.00

Note: When sizing an actuator add the above figures to the valve operating torque

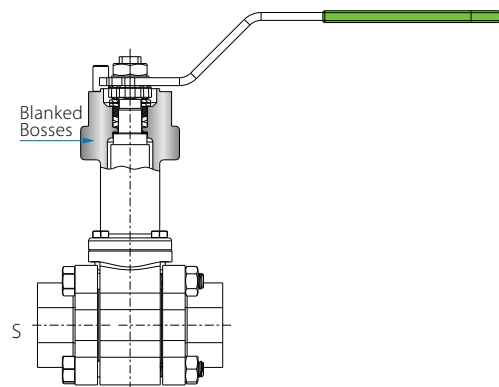
Additional options

Media Containment Unit (MCU)

Suitable for critical applications when:

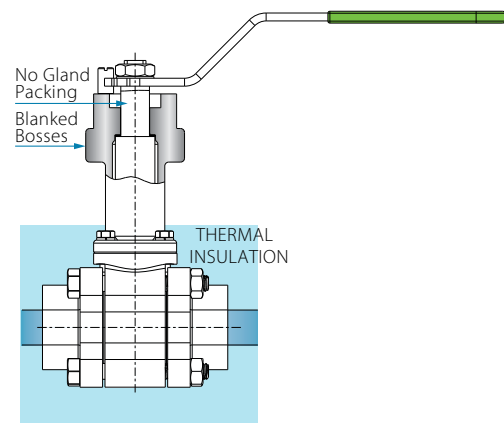
- Valve stem maintenance needs to be programmed
- A combination of high temperature and high cycle conditions
- Valve is in low temperature applications (down to -70 °C / -57 °F)

Caution!: MCU is not to be used with toxic media



Extended Bonnet (EXT)

- When valve and pipe lines need to be insulated
- When valve operation must be elevated from extreme temperature areas
- When direct mounting of actuator to a valve is not suitable

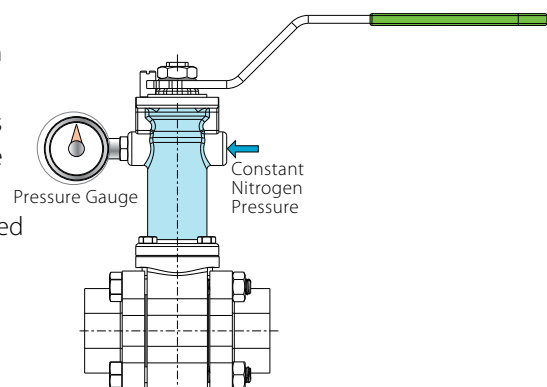


Pressure Box Sealing

A special F.E. bonnet was designed for a fire safe, high cycle operation within a highly aggressive and explosive application. The chamber between the two seals was pressurized with inert gas, which eliminates the presence of oxygen inside the FE bonnet and the risk of explosive conditions.

Constant pressure of inert gas, 1 bar above the line pressure, eliminated any possible stem leak of the aggressive media. A pressure gauge connected to one of the FE tapped holes detect any pressure loss which correlates to the valve stem packing condition.

Caution!: Pressure within the bonnet must not exceed 50 bar!



Ordering code system

Fugitive Emission Bonnet (FE)

- **870763XX9** HermetiX™ Habonim patented stem packing
- **870763XX9-AC** Virgin PTFE Chevron packing
- **870763XX9-N** Control application
- **870763XX9-HC** High cycle
- **870763XX9-KG** Thermal flow
- **870763XX9-AI** TFM thrust, Impregnated graphite packing

Media Containment Unit (MCU)

- **870764XX9** (Suffix adder as per the above 763 F.E. bonnet)
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Extended Bonnet (EXT)

- **870769XX9** (No suffix required)

Reduced port Valve size	FE size (XX)
DN15 & DN20	mm
1/2" & 3/4"	inch
DN25 & DN32	mm
1" & 1 1/4"	inch
DN40 & DN50	mm
1 1/2" & 2"	inch
DN65	mm
2 1/2"	inch
DN80 & DN100	mm
3" & 4"	inch
DN150 & DN200	mm
6" & 8"	inch