

KTM VIRGO SERIES S TORQUE VALVES

CAST FLOATING BALL VALVES FROM NPS ½ TO 10 (2004 DESIGN)



Legends

SS	Soft seated standard floater
SA	Soft seated standard with gland packing floater
SO	Soft seated oil patch floater
ST	Soft seated threaded / socket weld floater

Pressure class	Seat	Torque values (BTO) Nm (lbf-in)						
		NPS ½	NPS ¾	NPS 1	NPS 1½	NPS 2	NPS 2	NPS 2½
150	Series	SS	SS	SS	SS	SA	SS	SS
	Modified PTFE / RTFE	5 (44)	8 (71)	13 (115)	24 (212)	30 (266)	24 (212)	48 (425)
300	Series	SS	SS	SS	SS	SA	SS	SS
	Modified PTFE / RTFE	8 (71)	11 (97)	17 (150)	37 (327)	46 (407)	34 (301)	67 (593)
400	Series	ST	ST	ST	ST	ST	-	-
	Modified PTFE / RTFE	5 (44)	7 (62)	12 (106)	25 (221)	37 (327)	-	-
600	Series	SS	SS	SO	SO	SA	-	-
	Devlon	29 (257)	33 (292)	50 (443)	110 (974)	52 (460)	-	-
900	Series	SS	SS	SS	SS	SS	-	-
	Devlon	33 (292)	39 (345)	57 (504)	132 (1168)	171 (1513)	-	-
1500	Series	SS	SS	SS	SS	SS	-	-
	Devlon	39 (345)	50 (443)	88 (779)	182 (1611)	198 (1752)	-	-

Legends

SS	Soft seated standard floater
SA	Soft seated standard with gland packing floater
SO	Soft seated oil patch floater
ST	Soft seated threaded / socket weld floater

Pressure class	Seat	Torque values (BTO) Nm (lbf-in)						
		NPS 3	NPS 3	NPS 4	NPS 4	NPS 6	NPS 8	NPS 10
150	Series	SA	SS	SA	SS	SA	SA	SA
	Modified PTFE / RTFE	60 (531)	56 (496)	140 (1239)	152 (1345)	280 (2478)	840 (7435)	1260 (11152)
300	Series	SA	SS	SA	-	SA	SA	-
	Modified PTFE / RTFE	80 (708)	105 (929)	150 (1328)	-	500 (4425)	1050 (9293)	-
600	Series	SA	-	SA	-	-	-	-
	Devlon	150 (1328)	-	285 (2522)	-	-	-	-

KTM VIRGO SERIES S TORQUE VALVES

CAST FLOATING BALL VALVES FROM NPS ½ TO 10 (2004 DESIGN)

Legends	
SS	Soft seated standard floater
SA	Soft seated standard with gland packing floater
SO	Soft seated oil patch floater
ST	Soft seated threaded / socket weld floater

Pressure class	Seat	Torque values (BTO) Nm (lbf-in)									
		NPS ¾ x ½	NPS 1 x ¾	NPS 1½ x 1	NPS 2 x 1½	NPS 3 x 2	NPS 3 x 2½	NPS 4 x 3	NPS 6 x 4	NPS 8 x 6	NPS 10 x 8
150	Series	SS	SS	SS	SS	SS	-	SS	SS	SS	SA
	Modified PTFE / RTFE	5 (44)	8 (71)	13 (115)	24 (212)	24 (212)	-	56 (496)	152 (1345)	368 (3257)	840 (7435)
300	Series	SS	SS	SS	SS	-	SS	SS	SS	SS	SA
	Modified PTFE / RTFE	8 (71)	11 (97)	17 (150)	37 (327)	-	67 (593)	105 (929)	189 (1673)	578 (5116)	1050 (9293)
600	Series	SS	SS	-	SO	SO	-	SO	SO	-	-
	Devlon	29 (257)	33 (292)	-	110 (974)	147 (1301)	-	334 (2956)	550 (4868)	-	-

NOTES

1. BTO values are at maximum rated differential pressure as per valve class at ambient temperature.
2. Formulas used to calculate values of below mentioned torques based on BTO value:

Torque	Formula	Valve class
RUN - (Running Torque)	0.50 x BTO	All
ETO - (End To Open)	0.70 x BTO	All
BTC - (Break To Close)	0.85 x BTO	All
ETC - (End To Close)	0.90 x BTO	All

3.0 CALCULATION OF FINAL VALVE TORQUE (FBTO) FOR SELECTION OF GEARBOX OR ACTUATOR

3.1 Calculated final valve torque (FBTO) based on temperature and seat material:

Seat material at various temperature	Final valve torque (FBTO)
Modified PTFE / RTFE / Devlon from (-) 29°C to high temperature as per PT rating chart	= BTO (Refer Table A)
Modified PTFE / RTFE / Devlon from (-) 30°C to (-) 50 °C non operable valve	= 1.25 x BTO (Refer Table A)
Peek from (-) 29 °C to high temperature as per PT rating chart	= 1.5 x BTO (Refer Table A)

- 3.1.1 Torque values for valves with extended length up to 1 meter stem for underground application or insulation purpose, increase torque values by 1.1 times.

3.2 Consideration of safety factors for gearbox selection:

- 3.2.1 Maximum pull force required at the handwheel = 360 N considered on FBTO.
- 3.2.2 Gear box selection torque = FBTO x 1.5

3.3 Consideration of safety factors for actuator selection:

- 3.3.1 The Service fluid factor (SFF) has to be determined from table below:

Fluid	SFF
Clean, particle-free, non-viscous liquids	1
Dry gas, steam	1.2

- 3.3.2 The frequency of operation factor (FOF) shall be taken from project specification.
If it is not available in project specification, it has to be determined from table below:

Application	FOF
Process on-off valves	1.3
Emergency shutdown valves (ESDV)	1.5
ESDV Valves long stand still applications (operated once in 6 months or longer durations)	2

- 3.3.3 Actuator selection torque = FBTO x SFF x FOF

Emerson Automation Solutions

10707 Clay Road
Houston, TX 77041, USA
Phone: +1 713-986-4665

Emerson Automation Solutions

277, Hinjewadi Phase II, Maan (Mulshi)
Pune - 411 057, India
Phone: +91 20 6674 4000
Fax: +91 20 6674 4021

Emerson Automation Solutions

Via Castellanza, 47, 20027 Rescaldina Milan, Italy
Phone: +39 331 575200

Emerson Automation Solutions

PO Box 18748
Bldg B Jebel Ali Free Zone,
South Zone 2, Dubai, UAE
Phone: +971 4 8118100
Fax: +971 4 8865465

Emerson Automation Solutions

1 Pandan Crescent
Singapore 128461
Phone: +65 6777 8211

Emerson Automation Solutions

1803, YongSeong Biztel, 314-1
Hangganro 2ga, Yongsan-gu
Seoul, South Korea, 140-750
Phone: +82 70 8884 0630

Emerson Automation Solutions

Room No. C 38, 11th Floor,
Shanghai Mart, 2299 Yan An Rd (W),
Shanghai, China
Phone: +86 21 6207 6626

Neither Emerson, Emerson Automation Solutions, nor any of their affiliated entities assumes responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

KTM and Virgo are marks owned by one of the companies in the Emerson Automation Solutions business unit of Emerson Electric Co. Emerson Automation Solutions, Emerson and the Emerson logo are trademarks and service marks of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson.com/FinalControl