

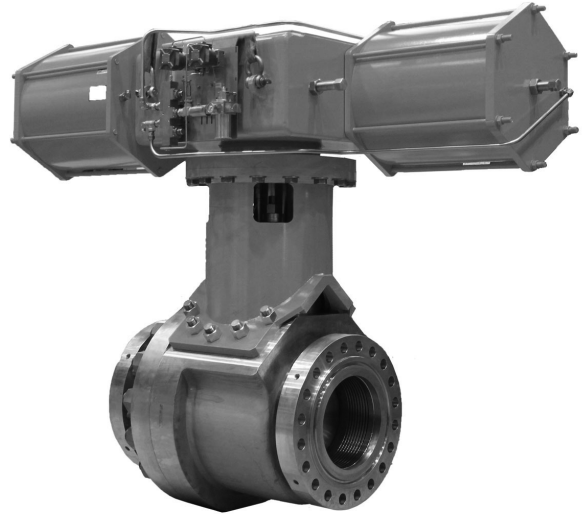
# Neles™ trunnion mounted ball valves, ASME Class 900 Series XH

We have over 50 years experience of trunnion mounted ball valves. Based on this experience we have designed this ball valve to comply with latest product specifications and performance standards.

Valve performance complies with ISO 15848 fugitive emissions providing sustainable valve performance.

Enhanced reliability and cycle life to meet the industry target extended maintenance interval.

The trunnion mounted XH valve can be used for safety, high cycle shut-off and throttling service with high pressure differentials. The modular design incorporates two large, low-friction trunnion bearings, with the spring-loaded seat in continuous contact with the ball surface.



## Applications

- Chemical and petrochemical plants.
- Oil and gas production.
- Power plants.
- Natural gas.
- Crude oil.
- Coal gasification
- Hydrocarbons.
- Polymers.
- Catalyst handling.
- Liquids, gas and steam.
- From cryogenic to high temperature services.
- Control and shut-off.
- LNG.

## Pressure classes

- ASME 900 / EN PN 160

## Trunnion mounted

- Low operating torque.
- Fully rated seats.
- Smooth control.
- Double block & bleed.
- Quick operations.
- High cycle capability.
- Full bore
- Maximum Cv per nominal size.
- Cylindrical flow path allows low flow resistance.
- Full bore design for API requirements.

## Increased safety

- Live-loaded construction as standard.
- Spiral wound body joint gasket.
- Anti-blowout shaft.

## Tightness

- Durable two-way ISO 5208 Rate C or ANSI Class V tightness as standard with spring-loaded metal seats.
- Available with improved tightness rates.
- ISO 5208 Rate B or ANSI Class VI shut-off as standard with soft seats.

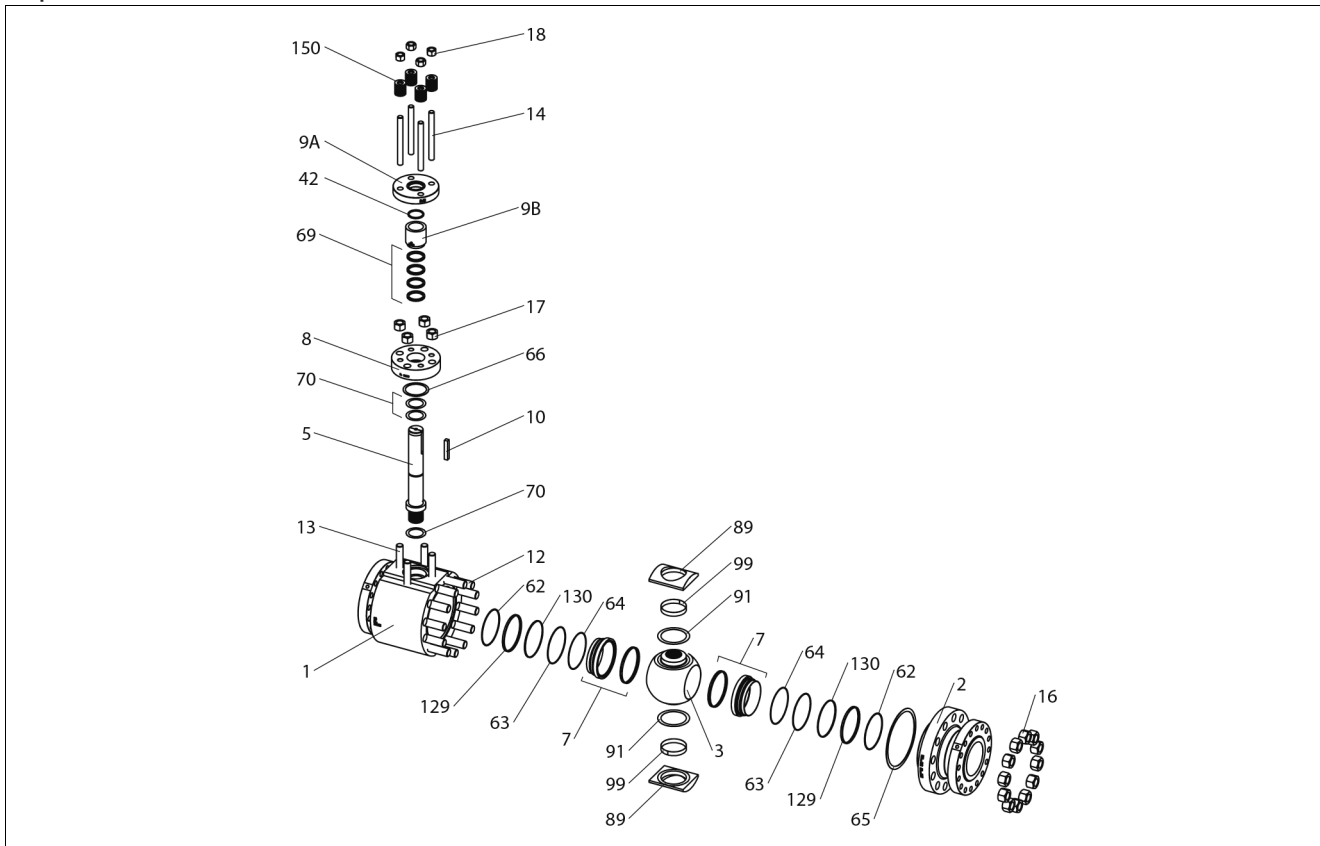
## Minimized emissions

- Live-loaded gland packing.
  - ISO 15848 with graphite packing.
- Side entry, two-piece bolted body.
  - Uninterrupted circular spiral wound body gasket.
  - No bending forces to gland packing.

## Excellent control characteristics

- Equal percentage inherent characteristic.
- Self flushing, low noise anti-cavitation Q2-Trim™ is optional.
- High noise reduction Q2-Trim for gas applications.

Exploded view



Parts list

Item	Part description	Material	
1	Body	Stainless steel CF8M	Carbon steel LF2
2	Body cap	Stainless steel CF8M	Carbon steel LF2
3	Ball	Stainless steel AISI 316 / CF8M	Stainless steel 410
5	Shaft	Stainless steel XM-19	Stainless steel 17-4PH
7	Ball seat	Stainless steel + cobalt based alloy / PTFE or filled PTFE	Stainless steel 410 +CrC
8	Bonnet	Stainless steel CF8M	Carbon steel LF2
9A	Gland	AISI 316	
9B	Compression sleeve	AISI 316	
10	Key	EN 10088-1.4460	
12	Stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
13	Stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
14	Stud	ASTM A 193 gr. B8M	ASTM A 320 gr. L7M
16	Hexagon nut	ASTM A 193 gr. 8M	ASTM A 194 gr. 2 HM
17	Hexagon nut	ASTM A 193 gr. 8M	ASTM A 194 gr. 2 HM
18	Hexagon nut	ASTM A 193 gr. 8M	ASTM A 194 gr. 2 HM
42	Retainer ring	Inconel X-750	
62	Spring	UNS N06625	
63	O-ring	FKM	
64	Strip	PTFE	
65	Body gasket	AISI 316L + graphite filled spiral wound	
66	Bonnet gasket	AISI 316L + graphite filled spiral wound	
69	Packing ring	Graphite	
70	Thrust bearing	Cobalt based alloy	
89	Trunnion plate	Stainless steel, ASTM A 351 gr. CF8M	
91	Thrust bearing	AISI 316L	
99	Trunnion bearing	PTFE + AISI316 or cobalt based alloy	
129	Support ring	AISI 316	
130	Back seal	Graphite	
150	Disc spring set	EN 10083-1.8159+ENP	

## Technical specification

### Product type

Full bore trunnion mounted ball valve.  
Side entry, two-piece bolted body.  
Flanged.

### Pressure ratings

ASME 900 / EN PN 160

### Size range

2"...24" in ASME Class 900.

### Standard temperature range

-50 ... +425 °C, consult factory for higher temperature applications

### Material and test certification

EN10204-3.1 material certificates for body and bonnet.

### Design standard

Valve body            ASTM B16.34.  
Valve flanges        ASTM B16.5.  
Face-to-face        ASTM B16.10 long pattern.  
Actuator mounting   ISO 5211.

### Standard materials

Body                 ASTM A350 gr. LF2.  
                          ASTM A351 gr. CF8M.  
Ball                 ASTM A351 gr. CF8M/AISI 316 +  
                          Carbide with metal seats.  
Bearings            PTFE or cobalt based alloy.

### Seats

AISI 316+cobalt based alloy.  
Soft seats with PA material.  
AISI 316+PTFE insert.

### Seals/gaskets

Graphite.

### Body gaskets

Spiral wound with graphite filler.

### Gland packing

Graphite with live loaded construction.

### Bolting

B8M/8M with stainless steel body.  
L7M/2HM with carbon steel body.

### Valve testing

Each valve is tested for body integrity and seat tightness. The body test pressure is 1,5 x pressure class. The seat test is done according to selected standard. Test medium is inhibited water or air depending on standard.

### Standard tightness

ISO 5208 Rate C or Class V for metal seats.  
ISO 5208 Rate B or Class VI for soft seats.  
Other tightness rates upon request.

### Standard options

Oxygen cleaning  
Non-metallic materials compliance to Oxygen service  
BAM compatible  
High temperature linkages.  
High temperature design.  
Carbide or NiBo ball coating  
MR 0103 and MR 0175.

## Actuator selection

XH series valve can be equipped with the following Neles actuator types:

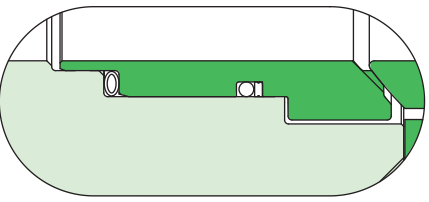
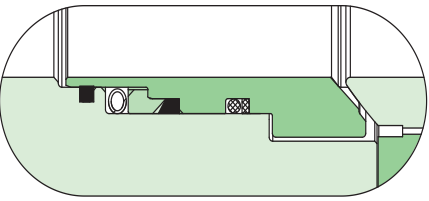
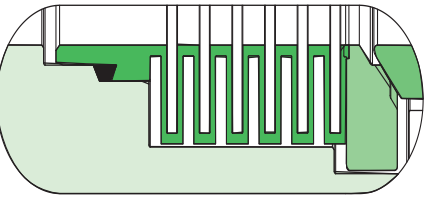
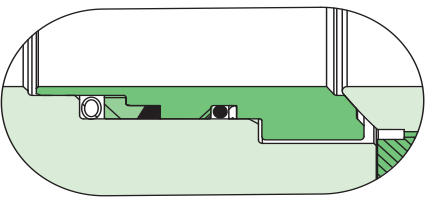
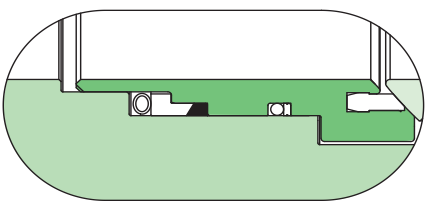
B1C/B1J            Pneumatic double acting or spring return actuator with ISO 5211 mounting face.  
                          B1C actuators available for size range DN 50 - 500 / 2"-20"  
                          B1J actuators available for size range DN 50 - 250 / 2"-10"  
N1                 Spring return scotch yoke actuator with ISO 5211 mounting face.

When selecting other actuators, please contact your local Valmet representative.

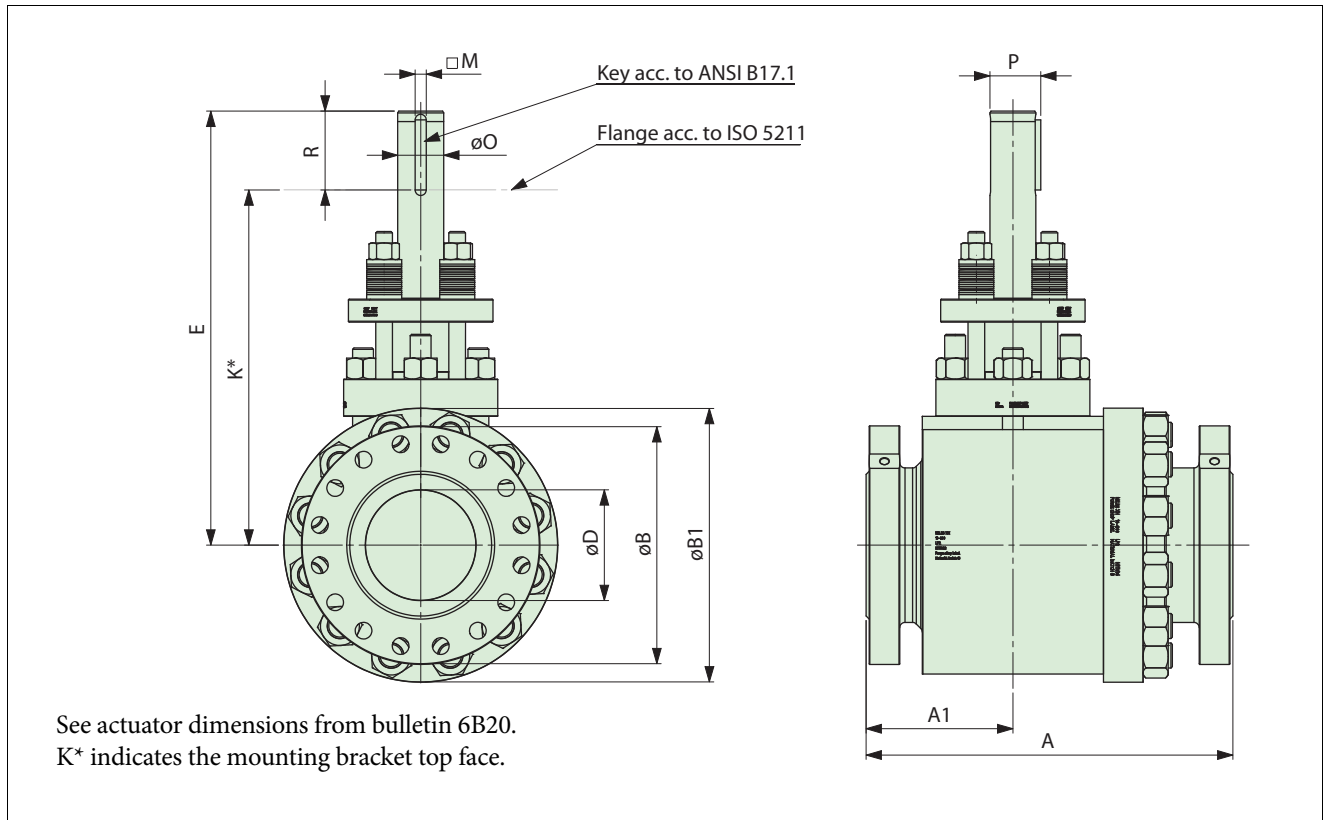
For the correct actuator selection in on-off service, you need to know the following process data:

- valve size and seat type
- supply pressure for the actuator
- maximum shut-off pressure across the valve

Standard seat constructions and materials

<p><b>S</b>      <b>Metal seats</b></p> 	<p>Ball seat:            Stainless steel + hard facing                      Seat seal:            Viton GF O-ring                      Spring:                Inconel 625                      Temp. range:        -30 °C... +200 °C</p>
<p><b>B</b>      <b>Solids proof metal seat</b></p> 	<p>Ball seat:            Stainless steel + hard facing                      Seat seal:            Graphite, Viton GF O-rings                      Spring:                Inconel 625                      Temp. range:        -30 °C... +200 °C</p> <p>Note:                    For temperature higher than +200 °C,                      please contact product center.</p>
<p><b>F</b>      <b>Bellows seat</b></p> 	<p>Ball seat:            Stainless steel + cobalt based hard facing                      Seat seal:            Graphite                      Spring:                Inconel 625                      Temp. range:        -75 °C... +425 °C</p>
<p><b>R</b>      <b>Fire safe metal seat</b></p> 	<p>Ball seat:            Stainless steel + hard facing                      Seat body:            Stainless steel                      Seat seal:            Viton GF O-ring / Graphite                      Spring:                Inconel 625                      Temp. range:        -30 °C... +200 °C</p>
<p><b>D</b>      <b>Soft seat, fire safe</b></p> 	<p>Ball seat:            PA 12                      Seat body:            Stainless steel                      Seat seal:            Viton GF O-ring                      Spring:                Inconel 625                      Temp. range:        -30 °C... +80 °C                      Note:                    Only for sizes 4" - 24".</p>

### DIMENSIONS AND WEIGHTS



	NPS	DN	A	A1	ØB	ØB1	ØD	E	K	M	R	O	P	Weight [kg]	Weight [kg] (with bracket & adapter)
"XHG Class 900 Raised Face"	02	50	368	144	215	225	49	353	308	6,35	46	25	27,8	85	95
	03	80	381	145	240	285	74	434	383	6,35	51	30	32,9	140	160
	04	100	457	173	290	348	100	541	462	12,70	80	45	50,4	230	250
	06	150	610	237	380	433	150	629	539	12,70	90	55	60,6	470	540
	08	200	737	303	470	508	201	847	701	22,23	146	85	94,6	850	980
	10	250	838	325	545	630	252	1045	866	25,40	180	105	116,1	1430	1640
	12	300	965	389	610	728	303	1110	905	31,75	205	120	133,8	2150	2480
	14	350	1029	416	640	804	322	1279	1054	31,75	225	135	149,0	2890	3340
	16	400	1130	443	705	922	373	1401	1153	38,10	250	150	166,6	3950	4460
	18	450	1219	504	785	1010	423	1474	1195	38,10	280	165	181,8	5020	5610
"XHG Class 900 Ring Type Joint"	02	50	371	145	215	225	49	353	308	6,35	46	25	27,8	85	95
	03	80	384	146	240	285	74	434	383	6,35	51	30	32,9	140	160
	04	100	460	175	290	348	100	541	462	12,70	80	45	50,4	230	250
	06	150	613	239	380	433	150	629	539	12,70	90	55	60,6	470	540
	08	200	740	304	470	508	201	847	701	22,23	146	85	94,6	850	980
	10	250	841	327	545	630	252	1045	866	25,40	180	105	116,1	1430	1640
	12	300	968	390	610	728	303	1110	905	31,75	205	120	133,8	2150	2480
	14	350	1039	420	640	804	322	1279	1054	31,75	225	135	149,0	2890	3340
	16	400	1140	448	705	922	373	1401	1153	38,10	250	150	166,6	3950	4460
	18	450	1232	510	785	1010	423	1474	1195	38,10	280	165	181,8	5020	5610
	20	500	1334	556	855	1114	471	1508	1194	44,45	315	180	199,5	6530	7390
	24	600	1568	652	1040	1300	570	1720	1350	50,80	370	220	242,4	10190	11120

## Modular ball valves, Series XH, trunnion valves

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
XH	06	G	W	TA	AB	RX	S	B	D	F	A

1. sign	VALVE SERIES & STYLE & FACE-TO-FACE	
	Flanged	
XH	Full bore, trunnions, f-to-f ASME B 16.10, Table 4 & 5, long pattern, ASME 900-1500	
XJ	Reduced bore, trunnions f-to-f ASME B 16.10, Table 4 & 5, long pattern, ASME 900-1500	

2. sign	SIZE	
	ASME VALVES with unified threads	
	NPS	#900
02	2"	x
03	3"	x
04	4"	x
06	6"	x
08	8"	x
10	10"	x
12	12"	x
14	14"	x
16	16"	x
18	18"	x
20	20"	x
24	24"	x

3. sign	PRESSURE CLASS
G	ASME class 900
B	PN 160

4. sign	END CONNECTION STYLE	
	ASME rated flanges:	
W	Raised face, ASME B 16.5 (Ra 3.2-6.3), standard	
Z	Ring joint, ASME B 16.5	
Y	Special form or surface, to be specified, e.g. weld ends	
EN flanges:		
C	EN 1092-1 Type B1 (Ra 3.2 – 12.5).	

5. sign	CONSTRUCTION & APPLICATION
TA	Standard construction. Double seated. Live loaded packing.
TE	Single seated. Otherwise standard.
EQ	Single seated, QX-Trim construction. Max. QX-trim size is 10", consult Product Management for bigger sizes.
2G	Q2G-trim for gas application, single seated construction, otherwise standard const.
LH	TA construction with AISI410 lined flow bore
TZ	BAM tested non-metallic materials, for oxygen service. Double seated. Metal bearings. Live loaded graphite packing.

6. sign	BODY MATERIALS, FORGINGS / CASTINGS		
	STANDARD materials		
AB	ASTM A350 LF2 (CS)	S6	ASTM A351 gr CF8M (SS)
NON-STANDARD materials			
CH	ASTM A182 gr F22 Cl. 3 (CS)	S1	ASTM A351 gr CF3M (SS)
DA	ASTM A182 gr F9 (CS)	S8	ASTM A351 gr CF8C(SS)
BX	ASTM A182 gr F11 Cl. 2 (LS)		

7. sign	BALL / COATING & STEM MATERIAL	
	XH, STANDARD materials	
RX	316SS / Chrome carbide & XM-19 or 17-4PH	
RR	316SS / Tungsten carbide & XM-19 or 17-4PH	
SL	316SS / NiBo & XM-19 or 17-4PH	
SP	316SS, no coating & XM-19 or 17-4PH (soft seats only)	

Standard shaft materials for XH-valve series	
Body material: carbon steel	Shaft material
Valve size: 02-03"	ASTM A479 XM-19
Valve size: 04-24"	ASTM A564 gr 630 H1150D (17-4PH)
Body material: stainless steel	Shaft material
Valve size: 02-24"	ASTM A479 XM-19

8. sign	SEAT AND BACK SEAL TYPES / SPRING MATERIALS SEAT CONSTRUCTIONS ARE SHOWN ON PAGE 9			
	Seat type	Back seal type	Spring	Back-up ring
S	Metal, general service	O-ring	Inconel 625	PTFE
R	Metal, firesafe service	Graphite + O-ring	Inconel 625	PTFE
B	Metal, solids proof	Graphite + O-ring	Inconel 625	PTFE
F	Metal, bellows	Graphite	----	----
D*	Soft, fire-safe service	Graphite + O-ring	Inconel 625	PTFE

\*) Only for sizes 4" - 24"

9. sign	SEAT MATERIAL	
	Metal seats	
	Seat material	Coating
B	Type 316 stainless steel with S/B/R type seats	Chrome Carbide, CrC-LF*
R	Type 316 stainless steel with S/B/R type seats AVESTA 248SV + SS316 with F type seat	Tungsten Carbide, WC-CO
F	F6NM bellow + SS316 with F type seat	Chrome Carbide, CrC-LF**
D	Inconel 718 bellow + Inconel 625 with F type seat	Tungsten Carbide, WC-CO
N	Type 316 stainless steel with S/B/R type seat F6NM bellow + SS316 with F type seat	NiBo2
Soft seats		
Seat material		Insert
N	Type 316 stainless steel	Polyamid

\*\*) if seat coating is Chrome Carbide, CrC-LF, then use Chrome Carbide, CrC as ball coating

10. sign	BEARING AND SEAL MATERIALS				
	Trunnion bearing	Packings	Body gaskets	O-rings	Thrust bearing
B	PTFE / SS net	Graphite	Graphite	Viton GF	Cobalt based alloy
D	Cobalt based alloy	Graphite	Graphite	Viton GF	Cobalt based alloy

11. sign	BOLTING MATERIALS	
	Bolting material with unified (XH) threads	
	Studs	Nuts
D *	B8M	8M
F **	L7M	2HM

\*) Bolting materials for stainless steel body

\*\*) Bolting materials for carbon and low alloy steel body

12. sign	MODEL CODE
A	XH model code A



**Valmet Flow Control Oy**

Vanha Porvoontie 229, 01380 Vantaa, Finland.

Tel. +358 10 417 5000.

[www.valmet.com/flowcontrol](http://www.valmet.com/flowcontrol)

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