



VALVE SPECIFICATION SHEET

Version : V3.0.0 Date : 26/03/2014

Date : 17/09/2015

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Customer		Tag #	122-343
Project	BRAY DEMO	Item #	#1-[0]
Enquiry Ref.		Application	Mining
Quotation #		Function	Control

1	Process Fluid	Liquid / Water		Phase	Single	Critical Press. Pc	220.1768	bar[g]
		Units	Cond1	Cond2	Cond3	Cond4	Shut-Off	
2	Design Press. (Max.)	bar[g]	25					
3	Design Temp. (Min. / Max.)	°C	50 / 150					
4	Flow Rate (Liquid)	m³/hr	100	150	200			16
5	Inlet Pressure	bar[g]	16	16	16			
6	Outlet Pressure	bar[g]	10	14	15			
7	Inlet Temperature	°C	130	130	130			
8	Sp. Gravity		0.936	0.936	0.936			
9	Viscosity	cP (CentiPoise)	0.228	0.228	0.228			
10	Vapour Pressure	bar[g]	1.69	1.69	1.69			
11	Calculated Cv		45.6	119	224			
12	Travel	%	27.1	44.8	62.9			
13	Pressure Drop	bar	6	2	1			
14	Choke Drop	bar	10.925	9.052	6.219			
15	Noise (Allow / Predict)	dBA	77	< 70	< 70			
16	Outlet Velocity	m/s	3.382	5.073	6.764			
17	Velocity Warning							
18	Flow Warning							

19	PIPE	In Pipe Size / Sch.		100 mm / STD		Actuator Type	Pneumatic - Spring Return (Rack & Pinion)	
		Out Pipe Size / Sch.		100 mm / STD		Mfr. / Model	Bray / Series - 93	
21	VALVE BODY/ENDS	Valve Type	Double offset- McCannalok			Size / No. of Spring	119 / 4	
22		Size / Rating Standard	4" / ASME			Max. Allow. Pressure	8.27 bar[g]	
23		Rating	CL 300			Min. Req. Pressure	2.76 bar[g]	
24		Pressure Rating	Full Pressure rating			Min. Avl. Air Pressure	5.516 bar[g]	
25		Valve Series	Series 43			Max. Avl. Air Pressure	8.274 bar[g]	
26		Body Material	St. Steel, ASTM A 351 Gr CF8M			Fail Action	Close	
27		Extension Bonnet	N/A			Act. Orientation	Perpendicular	
28		End Connection	Lug			Manual Override	No	
29		Flg. Face Type / Finish	N/A			Pos. Mfr. / Model	Bray-Series 6A	
30		Flow Direction	Bi - directional			Pos. Type	Electro Pneumatic	
31	Body Bolting	B8 / Gr 8			Input Signal	4 - 20 mA		
32	INTERNALS	Disc	SS 316			Gauges	Yes	
33		Stem	17-4PH SS (H1075)			Signal Action	Direct	
34		Stem Packing	PTFE			Certification	None	
35		Seat Type	Soft			Air. Mfr. / Model / Range	Bray-Series 55 / 0 – 125 psig	
36		Seat Material	RTFE			Pos. Indi. Mfr. / Model	Bray / ProxSensor Position Indicator-Series 52	
37		Body Seal	N/A			L. Sw. Type / Contacts	Contacting / SPDT	
38		Liner	N/A			L. Sw. Rating / Pos'n	20A @120 VAC / Open	
39		Rated Cv	375			Solenoid Type / Vol.	Bray- Series 63 / 3 – Way / 12 VAC, 50-60 HZ	
40	Flow Characteristics	Equal Percentage			Air Lock Valve	Bray / 0-60 psig / 3/8" Connections		
41	TESTS	Fire Safe Valve	No			Volume Tank	Bray	
42		NACE Compliance	No			Volume Booster	Bray	
43		Leakage Class	Class VI					

Notes		Revisions		
1		Rev.	By	Date
2		0	Andrii MALYTSKYI	17.09.15
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VALVE SIZING CALCULATION SHEET

Date : 17/09/2015

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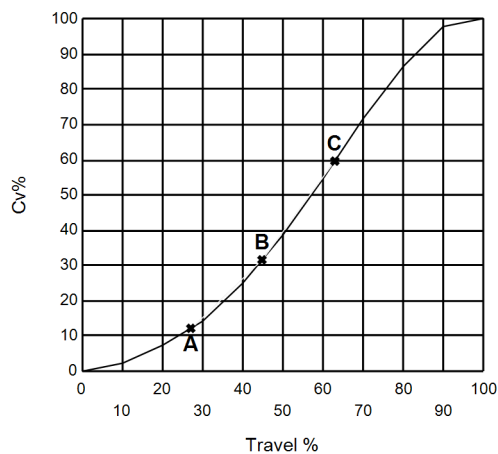
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Customer Project BRAY DEMO Enquiry Ref. Quotation #	Tag # 122-343 Item # #1-[0] Application Mining Function Control
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Item Description Series 43, 4", CL 300, Lug

SERVICE AND SIZING	Cond1	Cond2	Cond3	Cond4
Process Fluid Name	Water			
Inlet Pressure (bar[g])	16	16	16	
Outlet Pressure (bar[g])	10	14	15	
Liquid Flow (m³/hr)	100	150	200	
Vapour Pressure (bar[g])	1.69	1.69	1.69	
Specific Gravity	0.936	0.936	0.936	
Temperature (°C)	130	130	130	
Pressure Recovery Factor, FL	0.868	0.79	0.655	
Valve Style Modifier Factor, Fd	0.368	0.439	0.504	
Combined Recovery Factor, FLP	0.868	0.79	0.655	
Piping Correction Factor, Fp	1	1	1	
Critical Pressure Ratio Factor, Ff	0.929	0.929	0.929	
Valve Diameter, d (in)	4"	4"	4"	
Inlet Pipe Diameter, D1 (mm)	114.3	114.3	114.3	
Outlet Pipe Diameter, D2 (mm)	114.3	114.3	114.3	
Cavitation Index, Kc	0.419	0.14	0.07	
Sizing Coefficient, Cv	45.6	119	224	
Pressure Drop (bar)	6	2	1	
dP Choked (bar)	10.925	9.0519	6.2191	
Noise Calculation				
Valve Type	Butterfly	Butterfly	Butterfly	
Downstream Pipe Size (mm)	100	100	100	
Downstream Pipe Schedule	STD	STD	STD	
Valve SPL (dBA)	77	< 70	< 70	
Velocity				
Inlet Velocity (m/s)	3.382	5.073	6.764	
Outlet Velocity (m/s)	3.382	5.073	6.764	
Valve Velocity (m/s)	3.537	5.305	7.074	

Inherent Flow Characteristic Curve



% Opening, Calculated Cv
A - (27.1,45.6)
B - (44.8,119)
C - (62.9,224)

Valve Series :	Series 43
Valve Size:	4"
Rated Cv:	375
Flow Char:	Equal Percentage

Travel (%)	10	20	30	40	50	60	70	80	90	100
Cv	9	26.8	53.4	94.2	145	205	269.5	325	366	375

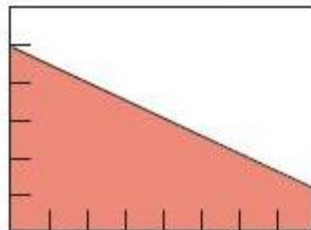
Customer		Tag #	122-343
Project	BRAY DEMO	Item #	#1-[0]
Enquiry Ref.		Application	Mining
Quotation #		Function	Control

Item Description Series 43, 4", CL 300, Lug, Pneumatic - Spring Return (Rack & Pinion), Series - 93

ACTUATOR SIZING

Valve Model	Series 43
Valve Size (in)	100
Media	Water
Temperature (°C)	150
Maximum Inlet Pressure (bar[g])	16
Maximum Pressure Drop (bar)	6
Shut off Pressure (bar[g])	16
MAST (Nm)	201
Basic Torque (Nm)	60
Safety Factor	1.2
Torque with Safety factor	72
Min. Available Air Supply Pressure (bar[g])	5.516
Max. Available Supply Pressure (bar[g])	8.274
Actuator Type	Pneumatic - Spring Return (Rack & Pinion)
Fail Safe Condition	Fail Close
Manual Override	No
Actuator Model & Size	Series - 93 & 119
No of Spring	4
Spring Start Torque (Nm)	133 Nm
Spring End Torque (Nm)	83 Nm
Pneumatic Start Torque (Nm)	163 Nm
Pneumatic End Torque (Nm)	112 Nm

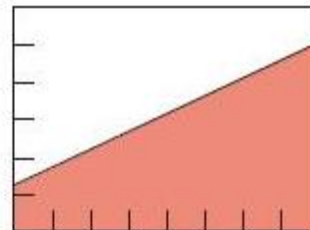
163 Nm



Counterclockwise (Air Stroke)

112 Nm

83 Nm



Clockwise (Spring Stroke)

133 Nm