

Fisher® WhisperFlo™ Aerodynamic Noise Attenuation Trim

Fisher WhisperFlo trim represents state of the art solutions for applications that demand ultimate noise attenuation.

Control valves with WhisperFlo cages provide additional attenuation for aerodynamic noise in very demanding vapor or gas applications with high-pressure drops. A WhisperFlo cage with an appropriately sized valve body is designed to reduce the noise level up to -40 dBA. For special applications, -50 dBA attenuation can be achieved.

Features

- **High Performance**—Use of the WhisperFlo trim provides excellent noise attenuation for very demanding applications. It should be considered for

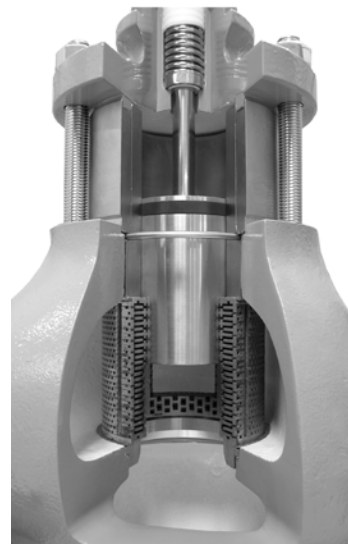
those applications that more conventional solutions can't reach.

- **Easy Maintenance**—Quick change trim allows fast and easy inspection of the cage without taking the valve body out of the line. WhisperFlo trim is interchangeable with standard control valve trim.
- **Long Trim Life**—Hardened materials or a unique wear surface construction are standard to provide excellent wear resistance. The three dimensional flow path, pressure-staging, and special passage shapes uniquely combine to equalize energy dissipation.
- **High Capacity**—WhisperFlo trim has higher capacity at conventional valve travels and port sizes than tortuous path designs.
- **Simple Retrofit**—Standardized port sizes provide capability to retrofit existing valves.



W6980

WhisperFlo CAGE



W8916-1

VALVE WITH WhisperFlo AERODYNAMIC TRIM



Specifications

Availability

For standard offerings, see table 1.
Designs are also available for Fisher HP, EH, FB, and TBX valves. Contact your Emerson Process Management sales office for details

Trim Material and Selection

- 316L Stainless Steel/R31233 Wear Resistant Surfaces (7-inch port and smaller only)
 - 316L Stainless Steel/Chrome Coat Bore (11-inch port and larger)
 - N04400/R31233 Wear Resistant Surfaces (7-inch port and smaller only)
 - Duplex Stainless Steel/R31233 Wear Resistant Surfaces (7-inch port and smaller only)
 - 4130 Alloy Steel/R31233 Wear Resistant Surfaces (7-inch port and smaller only)
 - 410 Stainless Steel (all port sizes)
 - Other materials available per application
- See appropriate valve bulletin or contact your Emerson Process Management sales office

Temperature Capability⁽¹⁾

- -73 to 593°C (-100 to 1100°F)
 - Cryogenic cages for use to -198°C (-324°F) are available. Contact your Emerson Process Management sales office for special information on specifying Cryogenic cages
 - Others per application
- See appropriate valve bulletin for complementary information

Maximum Pressure Drops⁽¹⁾

As shown in appropriate valve bulletin, do not exceed these limits. WhisperFlo trim is available up to CL2500 and higher

Velocity Limits

WhisperFlo trim is designed to control the throttling noise source in the control valve. A valve-outlet or

downstream velocity greater than 0.3 MACH1 may create a second noise source. IEC 60534-8-3 noise prediction will account for both sources

Flow Characteristic

Linear (restricted linear cages and characterized cages are available--consult your Emerson Process Management sales office)

Rangeability

Varies with size.
NPS 4 ET, level X: 30:1
NPS 24x20 EW, level X: 65:1
High rangeability in excess of 250:1 is available in some constructions.
Contact your Emerson Process Management sales office for details

Flow Direction

Flow up--through the seat ring and out through the cage orifices

Noise Attenuation

Approximately -40 dBA maximum depending on the $\Delta P/P_1$ ratio per IEC 60534-8-3 calculation procedure. WhisperFlo X, Y, and Z levels are optimized for a specific $\Delta P/P_1$ range, but each design is useable over the entire range (see figure 1).

Sizing Coefficients

See Coefficients section in this bulletin or Catalog 12, section 1

Shutoff Classification

- Class IV
 - Others per application
- See appropriate valve bulletin

1. Do not exceed the pressure/temperature limits in this bulletin. Any applicable standard or code limitations should not be exceeded.

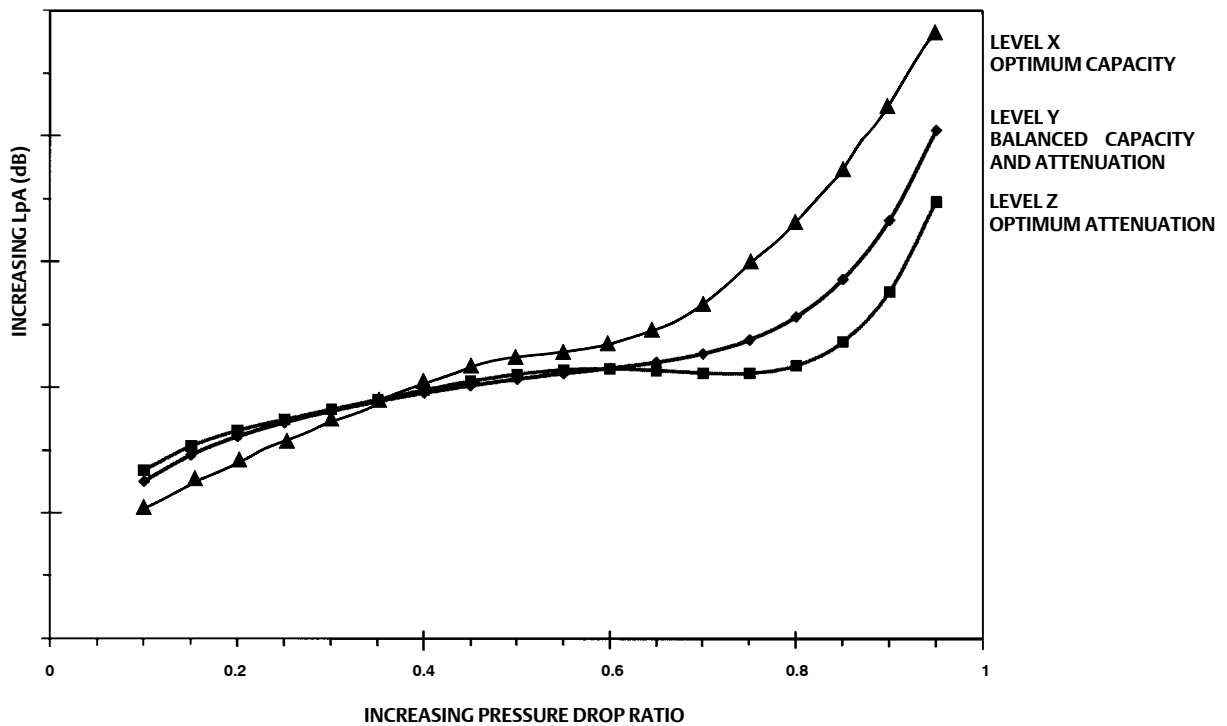
Table 1. Standard Fisher WhisperFlo Cages (Levels X, Y, and Z)

VALVE TYPE	VALVE SIZE ⁽¹⁾	PORT DIAMETER		MAXIMUM VALVE PLUG TRAVEL	
		mm	Inch	mm	Inch
easy-e™	4	87	3.4375	76	3
	6X4	87	3.4375	102	4
	8X4	87	3.4375	102	4
	6	136	5.375	76	3
	8X6 or 10X6 ⁽²⁾	136	5.375	127	5
	12X6	136	5.375	165	6.5
	8	178	7	152	6
	10X8	178	7	152	6
	12X8	178	7	203	8
	12	279	11	203	8
	16X12	279	11	203	8
	16	375	14.75	203	8
	20X16	375	14.75	276	10.875
	24X16	375	14.75	378	14.875
	20	464	18.25	378	14.875
	24X20	464	18.25	378	14.875

1. For a two-number valve size, the first number indicates nominal valve body size and the second number indicates nominal port size.
2. NPS 10x6 has a valve outlet area identical to the NPS 8x6.

Figure 1. Fisher WhisperFlo $\Delta P/P_1$ Ranges

TYPICAL SOUND PRESSURE TRENDS OF WhisperFlo TRIMS



A7083-1

Coefficients

Table 2. Fisher WhisperFlo, X Level, Flow Up through the Seat Ring and out through the Cage Orifices

WhisperFlo Level X															Linear Characteristic	
Valve Size, NPS	Port Diameter		Maximum Travel		Flow Coefficient	Valve Opening—Percent of Total Travel										
	mm	Inch	mm	Inch		Min	10	20	30	40	50	60	70	80	90	100
4	87.3	3.4375	76	3	C _v	6.4	12.7	27.8	41.9	55.4	68.5	81.4	91.9	101	108	114
					X _T	0.654	0.654	0.753	0.737	0.727	0.714	0.708	0.732	0.760	0.831	0.842
6x4	87.3	3.4375	102	4	C _v	6.4	16.7	35.3	52.5	69.5	87.6	105	121	136	154	164
					X _T	0.763	0.763	0.783	0.751	0.726	0.696	0.691	0.699	0.738	0.719	0.720
8x4	87.3	3.4375	102	4	C _v	6.4	17.8	35.8	52.5	69.7	86.9	104	121	137	153	165
					X _T	0.705	0.705	0.790	0.763	0.747	0.720	0.722	0.717	0.701	0.691	0.676
6	136.5	5.375	76	3	C _v	10.4	20.7	47.3	70.4	94.6	116	137	159	175	189	199
					X _T	0.638	0.638	0.673	0.716	0.688	0.692	0.723	0.708	0.735	0.747	0.770
8x6 or 10x6 ⁽¹⁾	136.5	5.375	127	5	C _v	10.4	45.7	92.0	138	181	223	265	299	331	350	365
					X _T	0.640	0.640	0.648	0.633	0.617	0.624	0.642	0.682	0.710	0.769	0.803
12x6	136.5	5.375	165	6.5	C _v	10.4	56.9	114	170	224	288	328	377	425	472	510
					X _T	0.735	0.735	0.759	0.741	0.726	0.661	0.699	0.707	0.706	0.718	0.724
8	177.8	7	152	6	C _v	30.4	60.9	120	179	237	287	331	368	397	421	441
					X _T	0.702	0.702	0.704	0.669	0.647	0.668	0.699	0.740	0.783	0.809	0.829
10x8	177.8	7	152	6	C _v	30.4	61.4	120	179	238	296	352	408	459	508	550
					X _T	0.694	0.694	0.713	0.662	0.641	0.629	0.637	0.632	0.640	0.667	0.673
12x8	177.8	7	203	8	C _v	30.4	103	188	277	353	432	515	583	652	703	736
					X _T	0.656	0.656	0.678	0.627	0.656	0.666	0.657	0.667	0.684	0.709	0.749
12	279.4	11	140	5.5	C _v	62.2	92	180	274	366	454	538	616	689	757	820
					X _t	0.53	0.71	0.7	0.69	0.68	0.68	0.69	0.69	0.7	0.71	0.73
			203	8	C _v	62.2	128	257	382	508	633	728	820	901	978	1019
					X _t	0.886	0.886	0.777	0.799	0.737	0.688	0.727	0.776	0.734	0.721	0.758
14	279.4	11	140	5.5	C _v	62.2	92	180	276	370	461	549	633	714	791	863
					X _t	0.53	0.71	0.70	0.69	0.68	0.67	0.68	0.67	0.68	0.68	0.69
			203	8	C _v	62.2	126	258	386	517	642	762	866	961	1049	1113
					X _t	0.69	0.69	0.66	0.69	0.66	0.65	0.66	0.71	0.70	0.70	0.73
16x12	279.4	11	203	8	C _v	62.2	124	258	388	523	648	784	896	1001	1096	1175
					X _T	0.556	0.556	0.580	0.614	0.612	0.629	0.615	0.665	0.678	0.691	0.719
16	279.4	11	140	5.5	C _v	62.2	92	180	277	372	465	556	645	730	813	892
					X _t	0.53	0.71	0.7	0.69	0.68	0.67	0.67	0.66	0.66	0.66	0.66
			203	8	C _v	62.2	124	258	388	523	648	784	896	1001	1096	1175
					X _T	0.556	0.556	0.58	0.614	0.612	0.629	0.615	0.665	0.678	0.691	0.719
20x16	374.7	14.75	203	8	C _v	60.2	170	359	546	731	912	1089	1260	1427	1587	1741
					X _T	0.534	0.713	0.699	0.687	0.677	0.669	0.663	0.659	0.656	0.655	0.654
20x16	374.7	14.75	276	10.875	C _v	60.2	238	494	745	990	1226	1452	1667	1870	2061	2240
					X _T	0.534	0.708	0.690	0.676	0.666	0.659	0.656	0.654	0.655	0.658	0.662
20x16	374.7	14.75	378	14.875	C _v	60.2	332	679	1015	1339	1633	1911	2165	2397	2606	2793
					X _T	0.534	0.701	0.679	0.665	0.657	0.654	0.656	0.660	0.667	0.676	0.686
24x16	374.7	14.75	203	8	C _v	60.2	170	360	548	735	921	1104	1285	1462	1636	1807
					X _T	0.534	0.716	0.703	0.692	0.682	0.673	0.665	0.658	0.652	0.647	0.642
24x16	374.7	14.75	276	10.875	C _v	60.2	238	495	750	1001	1248	1490	1725	1953	2173	2385
					X _T	0.534	0.711	0.695	0.681	0.669	0.659	0.651	0.644	0.639	0.635	0.632
24x16	374.7	14.75	378	14.875	C _v	60.2	333	683	1027	1363	1687	1999	2296	2578	2843	3092
					X _T	0.534	0.705	0.685	0.668	0.655	0.645	0.638	0.633	0.630	0.628	0.628

(continued)

Table 2. Fisher WhisperFlo, X Level, Flow Up through the Seat Ring and out through the Cage Orifices (continued)

WhisperFlo Level X																Linear Characteristic
Valve Size, NPS	Port Diameter		Maximum Travel		Flow Coefficient	Valve Opening—Percent of Total Travel										
	mm	Inch	mm	Inch		Min	10	20	30	40	50	60	70	80	90	100
20	463.6	18.25	203	8	C _v	86.5	207	431	655	834	1087	1294	1493	1683	1865	2036
					X _T	0.534	0.713	0.701	0.692	0.686	0.683	0.682	0.683	0.687	0.693	0.700
20	463.6	18.25	276	10.875	C _v	86.5	286	592	891	1179	1453	1712	1954	2179	2386	2576
					X _T	0.534	0.708	0.694	0.685	0.682	0.683	0.688	0.696	0.708	0.722	0.738
20	463.6	18.25	378	14.875	C _v	86.5	399	813	1208	1577	1917	2223	2497	2740	2954	3141
					X _T	0.534	0.702	0.687	0.682	0.685	0.695	0.711	0.731	0.755	0.781	0.809
24x20	463.6	18.25	203	8	C _v	86.5	207	431	658	882	1104	1322	1537	1747	1952	2152
					X _T	0.534	0.714	0.703	0.692	0.683	0.676	0.669	0.664	0.660	0.657	0.655
24x20	463.6	18.25	276	10.875	C _v	86.5	286	595	900	1200	1493	1779	2056	2322	2578	2823
					X _T	0.534	0.710	0.695	0.683	0.673	0.665	0.659	0.656	0.654	0.653	0.654
24x20	463.6	18.25	378	14.875	C _v	86.5	400	820	1231	1630	2012	2376	2720	3043	3343	3622
					X _T	0.534	0.704	0.686	0.672	0.662	0.656	0.653	0.653	0.655	0.659	0.665

1. NPS 10x6 has a valve outlet area identical to the NPS 8x6.

Table 3. Fisher WhisperFlo, Y Level, Flow Up through the Seat Ring and out through the Cage Orifices

WhisperFlo Level Y																Linear Characteristic
Valve Size, NPS	Port Diameter		Maximum Travel		Flow Coefficient	Valve Opening—Percent of Total Travel										
	mm	Inch	mm	Inch		Min	10	20	30	40	50	60	70	80	90	100
4	87.3	3.4375	76	3	C _v	6	12	23	35	47	59	70	82	94	105	117
					X _T	0.536	0.536	0.532	0.525	0.510	0.503	0.507	0.514	0.528	0.532	0.575
6x4	87.3	3.4375	102	4	C _v	6	16	31	47	63	79	94	110	126	141	157
					X _T	0.536	0.536	0.532	0.525	0.510	0.503	0.507	0.514	0.528	0.532	0.575
8x4	87.3	3.4375	102	4	C _v	6	16	31	47	63	79	94	110	126	141	157
					X _T	0.536	0.536	0.532	0.525	0.510	0.503	0.507	0.514	0.528	0.532	0.575
6	136.5	5.375	76	3	C _v	9	18	36	55	73	91	109	127	146	164	182
					X _T	0.536	0.536	0.532	0.525	0.510	0.503	0.507	0.514	0.528	0.532	0.575
8x6 or 10x6 ⁽¹⁾	136.5	5.375	127	5	C _v	10	31	61	92	123	154	184	215	246	276	307
					X _T	0.536	0.536	0.532	0.525	0.510	0.503	0.507	0.514	0.528	0.532	0.575
12x6	136.5	5.375	165	6.5	C _v	9	39	78	116	155	194	233	272	310	349	388
					X _T	0.536	0.536	0.532	0.525	0.510	0.503	0.507	0.514	0.528	0.532	0.575
8	177.8	7	152	6	C _v	11	42	84	125	167	209	251	293	334	376	418
					X _T	0.510	0.510	0.543	0.547	0.536	0.460	0.496	0.496	0.514	0.547	0.609
10x8	177.8	7	152	6	C _v	11	42	84	125	167	209	251	293	334	376	418
					X _T	0.510	0.510	0.543	0.547	0.536	0.460	0.496	0.496	0.514	0.547	0.609
12x8	177.8	7	203	8	C _v	12	59	118	177	236	295	354	413	472	531	590
					X _T	0.562	0.562	0.573	0.543	0.525	0.539	0.558	0.558	0.577	0.577	0.577
12	279.4	11	140	5.5	C _v	35	55	109	168	225	282	338	392	445	496	546
					X _t	0.53	0.56	0.55	0.55	0.54	0.54	0.54	0.54	0.54	0.54	0.55
			203	8	C _v	35	90	180	270	360	450	540	630	720	810	900
					X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
14	279.4	11	140	5.5	C _v	35	55	109	168	226	284	340	396	452	505	558
					X _t	0.53	0.56	0.56	0.55	0.54	0.54	0.54	0.53	0.53	0.53	0.54
			203	8	C _v	35	90	180	270	360	450	540	630	720	810	900
					X _t	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
16x12	279.4	11	203	8	C _v	35	90	180	270	360	450	540	630	720	810	900
					X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532

(continued)

Table 3. Fisher WhisperFlo, Y Level, Flow Up through the Seat Ring and out through the Cage Orifices (continued)

WhisperFlo Level Y																Linear Characteristic
Valve Size, NPS	Port Diameter		Maximum Travel		Flow Coefficient	Valve Opening—Percent of Total Travel										
	mm	Inch	mm	Inch		Min	10	20	30	40	50	60	70	80	90	100
16	279.4	11	140	5.5	Cv	35	55	109	168	227	285	342	399	456	511	566
					Xt	0.53	0.56	0.56	0.55	0.54	0.54	0.54	0.53	0.53	0.53	0.53
			203	8	Cv	35	90	180	270	360	450	540	630	720	810	900
					X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
20x16	374.7	14.75	203	8	Cv	53.4	124	259	394	529	662	794	923	1051	1176	1298
					X _T	0.534	0.617	0.608	0.601	0.594	0.588	0.584	0.580	0.577	0.575	0.573
20x16	374.7	14.75	276	10.875	Cv	53.4	171	356	539	720	897	1070	1239	1402	1560	1712
					X _T	0.534	0.614	0.603	0.594	0.586	0.581	0.577	0.574	0.573	0.573	0.574
20x16	374.7	14.75	378	14.875	Cv	53.4	239	491	738	979	1212	1435	1648	1849	2038	2216
					X _T	0.534	0.609	0.596	0.586	0.579	0.574	0.573	0.573	0.575	0.579	0.585
24x16	374.7	14.75	203	8	Cv	53.4	125	259	395	531	666	800	933	1065	1195	1324
					X _T	0.534	0.619	0.611	0.604	0.598	0.592	0.587	0.582	0.578	0.574	0.570
24x16	374.7	14.75	276	10.875	Cv	53.4	171	357	541	724	906	1085	1262	1436	1607	1774
					X _T	0.534	0.616	0.606	0.597	0.590	0.583	0.577	0.572	0.568	0.564	0.561
24x16	374.7	14.75	378	14.875	Cv	53.4	240	492	743	991	1234	1472	1703	1928	2146	2356
					X _T	0.534	0.612	0.600	0.589	0.580	0.573	0.567	0.562	0.559	0.556	0.555
20	463.6	18.25	203	8	Cv	77.3	148	294	448	601	751	899	1045	1188	1267	1462
					X _T	0.534	0.578	0.572	0.567	0.563	0.560	0.558	0.557	0.557	0.558	0.560
20	463.6	18.25	276	10.875	Cv	77.3	198	405	612	816	1016	1210	1397	1577	1750	1915
					X _T	0.534	0.576	0.568	0.562	0.559	0.557	0.557	0.559	0.562	0.567	0.574
20	463.6	18.25	378	14.875	Cv	77.3	272	558	837	1108	1367	1614	1849	2063	2265	2452
					X _T	0.534	0.573	0.564	0.558	0.557	0.559	0.563	0.571	0.581	0.593	0.607
24x20	463.6	18.25	203	8	Cv	77.3	148	294	449	603	757	909	1060	1209	1357	1503
					X _T	0.534	0.579	0.573	0.568	0.563	0.558	0.554	0.551	0.548	0.545	0.543
24x20	463.6	18.25	276	10.875	Cv	77.3	198	406	615	823	1029	1232	1433	1629	1822	2010
					X _T	0.534	0.577	0.569	0.562	0.556	0.552	0.548	0.544	0.542	0.540	0.539
24x20	463.6	18.25	378	14.875	Cv	77.3	272	560	845	1125	1401	1669	1931	2183	2427	2662
					X _T	0.534	0.574	0.564	0.556	0.550	0.545	0.542	0.540	0.539	0.540	0.541

1. NPS 10x6 has a valve outlet area identical to the NPS 8x6.

Table 4. Fisher WhisperFlo, Z Level, Flow Up through the Seat Ring and out through the Cage Orifices

WhisperFlo Level Z																Linear Characteristic
Valve Size, NPS	Port Diameter		Maximum Travel		Flow Coefficient	Valve Opening—Percent of Total Travel										
	mm	Inch	mm	Inch		Min	10	20	30	40	50	60	70	80	90	100
4	87.3	3.4375	76	3	Cv	3	6	13	19	25	32	38	44	50	57	63
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
6x4	87.3	3.4375	102	4	Cv	3	9	17	26	34	43	52	60	69	77	86
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
8x4	87.3	3.4375	102	4	Cv	3	9	17	26	34	43	52	60	69	77	86
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
6	136.5	5.375	76	3	Cv	5	10	20	30	40	51	61	71	81	91	101
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
8x6 or 10x6 ⁽¹⁾	136.5	5.375	127	5	Cv	5	17	35	52	69	87	104	121	138	156	173
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
12x6	136.5	5.375	165	6.5	Cv	5	23	45	68	90	113	135	158	180	203	225
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525

(continued)

Table 4. Fisher WhisperFlo, Z Level, Flow Up through the Seat Ring and out through the Cage Orifices (continued)

WhisperFlo Level Z																Linear Characteristic
Valve Size, NPS	Port Diameter		Maximum Travel		Flow Coefficient	Valve Opening—Percent of Total Travel										
	mm	Inch	mm	Inch		Min	10	20	30	40	50	60	70	80	90	100
8	177.8	7	152	6	C _v	7	26	52	78	104	130	156	182	208	234	260
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
10x8	177.8	7	152	6	C _v	7	26	52	78	104	130	156	182	208	234	260
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
12x8	177.8	7	203	8	C _v	7	35	71	106	141	177	212	247	282	318	353
					X _T	0.600	0.600	0.539	0.521	0.528	0.528	0.547	0.539	0.525	0.507	0.525
12	279.4	11	140	5.5	C _v	21	42	80	119	160	202	242	282	322	361	399
					X _t	0.53	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
			203	8	C _v	21	55	110	165	220	275	330	385	440	495	550
					X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
14	279.4	11	140	5.5	C _v	21	42	80	119	161	202	243	284	324	364	404
					X _t	0.53	0.44	0.44	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.42
			203	8	C _v	21	55	110	165	220	275	330	385	440	495	550
					X _t	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
16x12	279.4	11	203	8	C _v	21	55	110	165	220	275	330	385	440	495	550
					X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
16	279.4	11	140	5.5	C _v	21	42	80	119	161	202	244	285	326	366	407
					X _t	0.53	0.44	0.44	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.42
			203	8	C _v	21	55	110	165	220	275	330	385	440	495	550
					X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
20x16	374.7	14.75	203	8	C _v	48.1	91	179	273	367	460	553	645	737	827	917
					X _T	0.534	0.467	0.463	0.459	0.456	0.453	0.45	0.448	0.446	0.445	0.444
20x16	374.7	14.75	276	10.875	C _v	48.1	121	247	374	501	627	751	874	994	1113	1229
					X _T	0.534	0.465	0.46	0.456	0.452	0.449	0.446	0.444	0.443	0.442	0.442
20x16	374.7	14.75	378	14.875	C _v	48.1	166	341	514	685	854	1019	1180	1336	1488	1634
					X _T	0.534	0.463	0.457	0.451	0.447	0.444	0.443	0.442	0.442	0.443	0.445
24x16	374.7	14.75	203	8	C _v	48.1	91	179	273	368	462	555	649	742	834	926
					X _T	0.534	0.468	0.464	0.461	0.458	0.455	0.453	0.45	0.448	0.446	0.444
24x16	374.7	14.75	276	10.875	C _v	48.1	121	267	375	503	630	756	881	1006	1129	1251
					X _T	0.534	0.466	0.462	0.458	0.454	0.451	0.447	0.445	0.442	0.44	0.438
24x16	374.7	14.75	378	14.875	C _v	48.1	166	341	516	689	861	1032	1200	1365	1528	1688
					X _T	0.534	0.465	0.459	0.454	0.449	0.445	0.442	0.439	0.437	0.435	0.434
20	463.6	18.25	203	8	C _v	71.8	113	214	323	434	544	653	761	868	974	1078
					X _T	0.534	0.454	0.45	0.448	0.445	0.443	0.442	0.441	0.44	0.44	0.441
20	463.6	18.25	276	10.875	C _v	71.8	148	288	437	585	731	875	1016	1155	1290	1422
					X _T	0.534	0.453	0.448	0.445	0.443	0.441	0.44	0.44	0.441	0.442	0.445
20	463.6	18.25	378	14.875	C _v	71.8	200	403	607	808	1005	1196	1381	1560	1730	1894
					X _T	0.534	0.451	0.446	0.442	0.441	0.44	0.441	0.444	0.448	0.453	0.459
24x20	463.6	18.25	203	8	C _v	71.8	113	214	324	435	546	657	767	877	986	1094
					X _T	0.534	0.454	0.451	0.448	0.446	0.443	0.441	0.439	0.437	0.436	0.434
24x20	463.6	18.25	276	10.875	C _v	71.8	149	292	444	595	745	894	1042	1188	1333	1476
					X _T	0.534	0.453	0.449	0.446	0.442	0.44	0.437	0.435	0.433	0.432	0.431
24x20	463.6	18.25	378	14.875	C _v	71.8	200	404	610	815	1018	1218	1416	1609	1800	1986
					X _T	0.534	0.452	0.446	0.442	0.438	0.435	0.433	0.431	0.43	0.43	0.43

1. NPS 10x6 has a valve outlet area identical to the NPS 8x6.

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