

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 (figure 1) 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

- **Higher Performance**—Use of the WhisperFlo trim provides greater 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.

- **Longer Trim Life**—Hardened materials or patented wear surface construction are standard to provide excellent wear resistance. The patented, three dimensional flow path, pressure-staging, and special passage shapes uniquely combine to equalize energy dissipation.

- **Higher 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 / IL

WhisperFlo CAGE



W8916-1 / IL

Figure 1. Typical Valve with WhisperFlo Aerodynamic Trim



Table 1. Standard 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	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.

TYPICAL SOUND PRESSURE TRENDS OF WhisperFlo TRIMS



A70083 / IL

Figure 2. WhisperFlo $\Delta P/P_1$ Ranges

Coefficients

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

Valve Size, Inch	Port Diameter, Inch	Total Travel, Inch	Coefficients	Valve Opening—Percent of Maximum Travel										
				Min	10	20	30	40	50	60	70	80	90	100
4	3.4375	3	C _v	9	18	36	54	72	90	108	126	144	162	180
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
6x4	3.4375	4	C _v	9	24	48	72	96	120	144	168	192	216	240
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
8x4	3.4375	4	C _v	9	24	48	72	96	120	144	168	192	216	240
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
6	5.375	3	C _v	15	29	58	87	116	145	174	203	232	261	290
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
8x6	5.375	5	C _v	16	50	100	150	200	250	300	350	400	450	500
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
12x6	5.375	6.5	C _v	15	63	125	188	250	313	375	438	500	563	625
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
8	7	6	C _v	17	67	133	200	266	333	399	466	532	599	665
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
10x8	7	6	C _v	17	67	133	200	266	333	399	466	532	599	665
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
12x8	7	8	C _v	19	95	190	285	380	475	570	665	760	855	950
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
12	11	8	C _v	58	148	295	443	590	738	885	1033	1180	1328	1475
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
16x12	11	8	C _v	58	148	295	443	590	738	885	1033	1180	1328	1475
			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	14.75	8	C _v	84	215	429	644	858	1073	1287	1502	1716	1931	2145
			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	14.75	10.875	C _v	85	295	590	885	1180	1475	1770	2065	2360	2655	2950
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x16	14.75	14.875	C _v	85	405	810	1215	1620	2025	2430	2835	3240	3645	4050
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
20	18.25	14.875	C _v	102	485	970	1455	1940	2425	2910	3395	3880	4365	4850
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x20	18.25	14.875	C _v	59	282	563	845	1126	1408	1689	1971	2252	2534	2815
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532

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

Valve Size, Inch	Port Diameter, Inch	Total Travel, Inch	Coefficients	Valve Opening—Percent of Maximum Travel										
				Min	10	20	30	40	50	60	70	80	90	100
4	3.4375	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	3.4375	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	3.4375	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	5.375	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	5.375	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	5.375	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	7	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	7	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	7	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	11	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
16x12	11	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
16	14.75	8	C _v	51	132	263	395	526	658	789	921	1052	1184	1315
			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	14.75	10.875	C _v	52	180	360	540	720	900	1080	1260	1440	1620	1800
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x16	14.75	14.875	C _v	52	248	495	743	990	1238	1485	1733	1980	2228	2475
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
20	18.25	14.875	C _v	59	282	563	845	1126	1408	1689	1971	2252	2534	2815
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x20	18.25	14.875	C _v	59	282	563	845	1126	1408	1689	1971	2252	2534	2815
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532

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

Valve Size, Inch	Port Diameter, Inch	Total Travel, Inch	Coefficients	Valve Opening—Percent of Maximum Travel										
				Min	10	20	30	40	50	60	70	80	90	100
4	3.4375	3	C _v	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	3.4375	4	C _v	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	3.4375	4	C _v	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	5.375	3	C _v	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	5.375	5	C _v	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	5.375	6.5	C _v	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
8	7	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	7	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	7	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	11	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
16x12	11	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	14.75	8	C _v	30	76	152	228	304	380	456	532	608	684	760
			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	14.75	10-7/8	C _v	30	104	208	312	416	520	624	728	832	936	1040
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x16	14.75	14-7/8	C _v	30	144	288	432	576	720	864	1008	1152	1296	1440
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x20	18.25	14.875	C _v	38	183	366	549	732	915	1098	1281	1464	1647	1830
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
24x20	18.25	14.875	C _v	38	183	366	549	732	915	1098	1281	1464	1647	1830
			X _T	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532

WhisperFlo Trim

Specifications

Availability

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

Trim Material and Selection

- 316L Stainless Steel/Ultimet Wear Resistant Surfaces (7-inch port and smaller only)
 - 316L Stainless Steel/Chrome Coat Bore (11-inch port and larger)
 - Monel/Ultimet Wear Resistant Surfaces (7-inch port and smaller only)
 - Duplex Stainless Steel/Ultimet Wear Resistant Surfaces (7-inch port and smaller only)
 - 4130 Alloy Steel/Ultimet 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 Fisher sales office

Temperature Capability⁽¹⁾

- -73 to 538°C (-100 to 1000°F)
 - Cryogenic cages for use to -198°C (-324°F) are available. Please contact your Fisher 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 ANSI Class 2500 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 Fisher sales office)

Rangeability

Varies with size.

4-inch Design ET, level X: 30:1

24x20 inch Design EW, level X: 65:1

High rangeability in excess of 250:1 is available in some constructions.

Contact your Fisher 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 2).

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.

Note

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This product may be covered by the following patent: 6,382,253 or under pending patents.

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