Catalog Highlight – Updated Discharge Sound with Duct End Reflection Corrections

Discharge sound power levels of all Price terminals have been updated to include duct end reflection corrections to comply with the 2011 version of ANSI/AHRI Standard 880 – Performance Rating of Air Terminals.

ANSI/AHRI Standard 880 - 2011 requires that duct end reflection corrections be added to terminal unit discharge sound power levels. AHRI Standard 885 defines end reflection as follows – "When plane wave sound passes from a small space such as a duct into a large space the size of a room, a certain amount of sound is reflected back into the duct, significantly reducing low frequency sound." When terminals are tested for discharge sound in accordance with Standard 880, end reflection occurs due to the test setup. The new 2011 calculation procedure takes this fact into account by adding duct end reflection corrections to the measured sound power level. This will be consistent with how sound power levels are calculated in other product programs.

How Does This Affect Data?

Discharge Sound Power Levels

Duct end reflection is a calculated value that is dependent on octave band center frequency and equivalent discharge duct diameter. The correction is highest at low frequencies and small discharge duct sizes. **As a result, the new published discharge sound power levels will be higher than they previously were, particularly for small terminals in the low octave bands.** For example, see the table below of duct end reflection corrections for Price single duct terminal model SDV. The updated catalog sound power levels will be higher than before by the decibel amount tabulated below.

DUCT END CORRECTION FACTORS

UNIT	Octave Band Center Frequency					
Size	125	250	500	1000	2000	4000
4	8	3	1	0	0	0
5	8	3	1	0	0	0
6	8	3	1	0	0	0
7	7	3	1	0	0	0
8	7	3	1	0	0	0
9	6	2	1	0	0	0
10	6	2	1	0	0	0
12	5	2	0	0	0	0
14	4	1	0	0	0	0
16	3	1	0	0	0	0
24x16	2	1	0	0	0	0

Discharge NC Levels

Note that the resultant catalog discharge Noise Criteria (NC) levels will also increase in most cases. This does **not** mean that actual room noise levels will be affected; the actual terminal sound output has not changed. Field measurements are not affected by this new calculation procedure. However, HVAC designers may find that a certain terminal model size at a certain flow rate may no longer meet their room NC specification based on the new cataloged values. **Remember that the terminal is not actually any louder than before and the same noise level will be heard or measured in the field**. Relaxing the room NC specification may be the best option. Another option is selecting a quieter terminal, but this usually carries a cost premium. The table below illustrates how the updated Price single duct terminal (SDV) NC values compare with previous cataloged values. Note that the small size units increase the most.

NC TABLE

Size	CFM	Old NC	New NC
4	225	27	34
6	400	23	27
8	700	24	28
10	1100	24	26
12	1800	27	31
14	2500	29	31
16	3500	30	33
24x16	6000	39	41

Comparing Data

According to the deadline imposed by AHRI, manufacturers have until January 1, 2013 to catalog discharge sound power levels with duct end reflection corrections. Until that time, it will be important to understand if catalog discharge performance data includes duct end reflection corrections or not. **Discharge sound power level or NC level comparisons cannot be made between manufacturers unless both are based on the same calculation procedure.**

New Price All-In-One Catalog Data Adheres to New ANSI/AHRI Standard 880 - 2011

As stated above, the new All-In-One catalog provides discharge sound data with duct end reflection corrections applied for all Price terminals. This fact is clearly stated in the performance notes on each page of the performance data, as shown on the following page.

Sound Power Levels Lw dB re 10^{-12} Watts

Unit	Air Flow		0.5 in. w.g. [125 Pa] Octave Band						1.0 in. w.g. [250 Pa] Octave Band						1.5 in. w.g. [375 Pa] Octave Band						3.0 in. w.g. [750 Pa] Octave Band					
Size	L/s	cfm	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
4	35	75	56	49	41	37	36	29	58	52	46	41	42	36	59	53	48	44	46	40	60	55	53	49	52	48
	59	125	64	57	47	43	40	32	65	59	52	47	46	40	66	61	54	50	50	44	68	63	59	55	56	52
	71	150	67	60	49	45	42	34	68	62	54	49	48	41	69	63	56	52	51	46	70	66	61	57	57	53
	106	225	73	66	54	49	45	37	74	68	58	54	51	44	75	70	61	57	55	49	76	72	65	61	61	56
5	59	125	57	46	43	38	36	32	60	50	48	43	42	39	62	53	51	46	46	43	64	57	56	51	52	51
	94	200	64	53	48	43	39	35	66	57	53	48	46	42	68	59	56	51	49	47	70	63	61	56	55	54
	118	250	66	56	50	45	41	37	69	60	55	50	47	44	71	62	58	53	51	48	73	66	63	58	57	55
	165	350	71	60	54	49	43	39	74	64	59	54	49	46	75	66	62	57	53	50	78	70	66	61	59	58
6	71	150	55	47	37	36	34	28	59	52	42	41	41	36	62	55	46	44	44	41	65	60	51	50	51	48
	106	225	60	52	42	40	37	31	63	57	48	45	44	39	66	60	51	49	47	43	70	65	57	54	54	51
	142	300	63	56	46	43	39	33	66	61	52	48	46	41	69	64	55	52	49	45	73	69	61	57	56	53
	189	400	65	60	50	46	41	35	69	65	56	51	48	42	72	68	59	55	51	47	76	73	65	60	58	55
	212	450	67	61	52	47	42	36	71	66	57	53	49	43	73	69	61	56	52	48	77	75	66	61	59	55
7	118	250	58	52	42	40	38	34	62	58	49	46	44	41	64	61	53	49	48	45	68	66	60	55	55	52
	165	350	61	56	46	43	40	36	65	61	53	48	46	43	67	65	57	52	50	47	71	70	64	58	57	54
	212	450	64	58	49	45	41	37	67	64	56	50	48	45	70	67	60	54	51	49	73	73	66	60	58	56
	260	550	66	61	51	46	42	39	69	66	58	52	49	46	71	69	62	56	53	50	75	75	69	61	59	57
	307	650	67	62	53	48	43	40	71	68	60	54	50	47	73	71	64	57	54	51	77	77	70	63	60	58
8	189	400	60	54	44	42	39	34	64	60	51	48	45	41	67	63	55	51	49	45	71	69	62	57	56	53
	236	500	62	56	46	44	40	35	66	62	53	50	47	42	69	65	57	53	50	47	73	71	64	59	57	54
	283	600	64	57	48	46	41	36	68	64	55	51	47	43	70	67	59	55	51	48	74	73	66	61	58	55
	330	700	65	59	50	47	42	37	69	65	57	53	48	44	72	69	61	56	52	49	76	75	68	62	59	56
	378	800	67	60	51	48	42	38	71	66	58	54	49	45	73	70	63	57	53	49	77	76	70	63	59	57
9	212	450	61	54	44	43	41	37	65	61	53	50	49	45	67	66	58	54	54	49	72	73	66	61	61	57
	307	650	63	56	46	45	43	39	68	63	55	52	51	47	70	68	60	57	55	51	74	76	68	64	63	59
	425	900	66	58	48	47	44	40	70	65	57	55	52	48	72	70	62	59	56	53	76	77	70	66	64	61
	496	1050	67	58	49	48	45	41	71	66	58	55	52	49	73	71	62	60	57	54	78	78	71	67	65	61
10	260	550	61	53	47	46	43	39	66	59	54	50	50	47	68	63	58	53	54	51	73	70	64	58	60	58
	354	750	64	55	49	48	44	40	68	62	56	53	51	48	71	65	60	56	55	52	75	72	66	60	61	60
	448	950	66	57	51	50	45	41	70	63	57	54	52	49	73	67	61	57	56	53	77	74	68	62	62	61
	519	1100	67	58	52	51	46	42	71	64	58	56	52	49	74	68	62	58	56	54	78	75	69	63	63	61
	637	1350	69	59	53	52	47	43	73	66	60	57	53	50	76	70	63	60	57	54	80	76	70	65	63	62
12	425	900	62	57	53	48	45	41	67	64	59	54	52	48	70	68	63	58	55	51	75	74	69	64	62	58
	566	1200	65	59	54	50	47	43	70	65	61	56	53	49	73	69	65	60	57	53	78	75	71	66	64	60
	755	1600	68	60	56	52	49	45	73	66	63	58	55	51	76	70	66	62	59	55	81	77	73	68	66	62
	850	1800	69	60	57	53	49	46	74	67	63	59	56	52	77	71	67	62	60	56	83	77	73	69	67	63
	991	2100	71	61	58	54	51	47	76	67	64	60	57	53	79	71	68	64	61	57	84	78	74	70	68	64
14	472	1000	59	54	48	46	43	39	66	61	54	53	50	46	69	65	57	57	54	50	76	73	63	63	60	56
	708	1500	63	56	52	49	46	42	69	64	58	55	53	49	73	68	62	59	57	53	79	75	68	66	63	59
	991	2100	66	59	56	51	49	45	72	66	62	58	56	51	76	70	66	62	59	55	82	78	72	68	66	62
	1180	2500	68	60	58	52	50	46	74	67	64	59	57	53	78	71	68	63	61	57	84	79	74	70	67	64
	1416	3000	69	61	60	53	52	48	75	68	66	60	58	54	79	72	70	64	62	58	86	80	76	71	69	65
16	708	1500	60	54	52	49	46	41	66	61	58	56	53	48	70	65	61	60	57	52	76	72	67	67	64	59
	944	2000	63	57	56	51	48	43	69	64	61	58	55	50	73	68	65	62	59	54	79	75	70	69	66	61
	1180	2500	65	59	59	52	50	45	72	66	64	59	57	52	75	70	68	63	61	56	82	77	73	70	67	63
	1321	2800	67	60	60	53	51	46	73	67	66	60	57	53	77	71	69	64	61	57	83	77	75	71	68	64
	1652	3500	69	62	63	55	52	48	75	68	69	62	59	55	79	72	72	66	63	59	85	79	78	73	70	66
	1888	4000	71	63	65	56	53	49	77	70	70	63	60	56	81	74	74	67	64	60	87	80	79	74	71	67
24x16	1416	3000	68	66	60	58	58	51	72	70	66	65	64	58	74	73	69	69	67	62	78	78	75	75	73	69
	1888	4000	72	69	62	60	60	53	76	73	68	67	65	60	78	76	71	71	69	64	82	81	77	77	75	71
	2501	5300	76	72	65	62	61	55	79	76	70	68	67	62	82	79	74	72	71	66	85	84	79	79	76	72
	2832	6000	77	73	66	62	62	55	81	77	71	69	68	62	83	80	75	73	71	66	87	85	80	79	77	73
	3304	7000	79	74	67	63	63	56	83	79	73	70	69	63	85	82	76	74	72	67	89	86	82	80	78	74
	3776	8000	81	76	68	64	64	57	85	81	74	71	70	64	87	83	77	75	73	68	90	88	83	81	79	75

Performance Notes:

1. Test data obtained in accordance with AHRI Standard 880-2011 and ASHRAE Standard 130-2008.
2. Sound power levels include duct end corrections per AHRI Standard 880-2011. Please refer to page F25 for more details.
3. Air flow given in L/s and cfm.
4. Pressure is given in Pa and in.w.g.
5. AHRI certified data is highlighted in blue. All other data are application ratings.
6. Application ratings are outside the scope of the AHRI 880 Certification Program.
7. Asterisks (*) indicate minimum static pressure of the unit exceeds the minimum operating pressure across the unit.