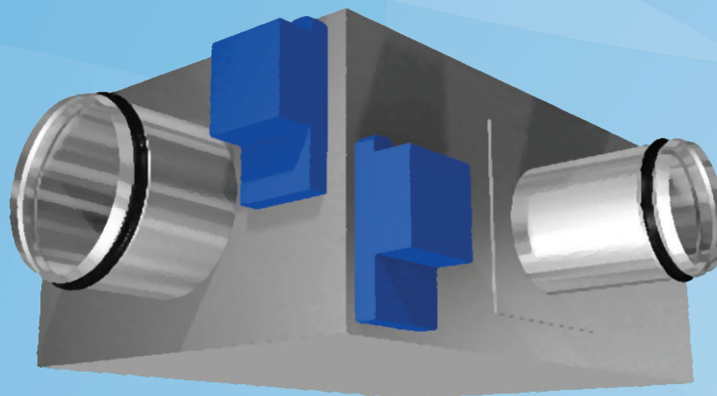


## Halton HFD

Airflow Management Damper for Dual Duct Systems



- Control damper for variable and constant airflow control applications in dual duct systems
- Pressure-independent operation
- Galvanised steel construction with insulation
- Tight shut-off operation at closed damper position
- Circular duct connection equipped with rubber gaskets
- Factory-set airflow range limits (min./max. airflow rates)

### Product models and Accessories

- Additional insulation option
- Sound attenuator
- Different outlet plenum options
- Access hatch available as an option

### MATERIAL AND FINISHING

PART	MATERIAL	NOTE
Casing	Galvanised steel	
Sound attenuation material	Mineral wool	Surface protection layer
Damper blade	Galvanised steel	
Blade gasket	Neoprene	Sizes 100...315
Blade gasket	EPDM rubber	Sizes 400 and 355
Seals between accessories	PVC rubber	
Duct gasket	EPDM rubber	
Measurement probe	Aluminium	

## QUICK SELECTION

D [mm]	qmin(Special)		qmin(Standard)		qmax		qnom	
	[l/s]	[m³/h]	[l/s]	[m³/h]	[l/s]	[m³/h]	[l/s]	[m³/h]
100	8	28	16	57	47	170	73	263
125	12	44	25	88	74	265	121	436
160	20	72	40	145	121	434	208	749
200	31	113	63	226	188	679	336	1210
250	49	177	98	353	295	1060	539	1940
315	78	281	156	561	468	1683	874	3146
400	126	452	251	905	754	2714	1433	5159
500	196	707	393	1414	1178	4241	2267	8161

qmin (special) 1 m/s duct velocity. Special actuator and calibration needed at the factory

qmin (standard) 2 m/s duct velocity. Standard factory calibration

qmax 6 m/s duct velocity - recommended maximum airflow for comfort applications

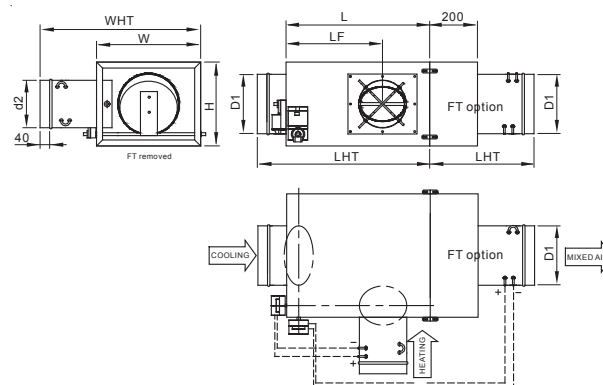
qnom nominal airflow of airflow controller at which the control signal is maximum 10V

NOTE D corresponds to specific dimension of each connection - Heating connection is one size smaller than cooling

## DIMENSIONS

HFD/S, mm								
NS	L	L1	L2	W	W1	H	ØD	ØD1
125	720	600	285	486	330	225	125	100
160	720	600	285	486	330	260	160	125
200	720	600	333	611	435	300	200	160
250	720	600	403	641	435	350	250	200
315	1020	900	453	744	500	415	315	250
355	1020	900	525	829	585	455	355	250
400	1020	900	570	1021	715	500	400	315
500	1020	900	713	1296	950	500	500	355

HFD/B, mm								
NS	L	L1	L2	W	W1	H	ØD	ØD1
125	760	640	325	486	410	305	125	100
160	760	640	325	486	410	340	160	125
200	760	640	373	611	515	380	200	160
250	760	640	443	641	515	430	250	200
315	1060	940	453	784	580	495	315	250
355	1060	940	525	869	665	535	355	250
400	1060	940	570	1051	795	580	400	315
500	1060	940	713	1326	1030	680	500	355



## Version

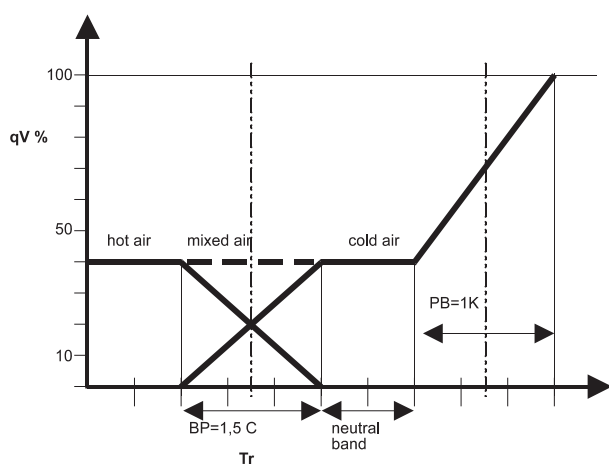
S = Standard insulation, B = Extra insulation

## Function

### Variable airflow setting

The cold and warm air ducts are connected to the mixing box. The cold duct connection size is equal to the nominal size of the device, and the warm duct connection is one duct size smaller. The mixing box is equipped with two electric airflow controllers.

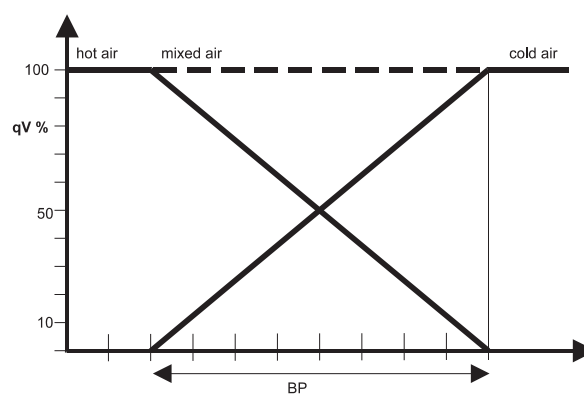
In variable airflow application, the warm duct inlet is equipped with the airflow rate measurement probe, and the measurement probe of the outlet of the mixing box measures the total airflow rate. Based on the outlet airflow measurement, the mixed airflow rate is controlled so as to correspond to the total airflow setpoint regardless of the mixing ratio and duct pressure changes. The warm duct airflow rate, and consequently the mixing ratio, is controlled by the room temperature control signal according to the control sequence presented in the figure below. The control signals (heating and total flow) can be received from a stand-alone room controller or from a building management system.



### Constant total airflow setting

The cold and warm air ducts are connected to the mixing box, and both duct connections are of equal size to the nominal size of the unit. The mixing box is equipped with two electric airflow controllers.

In constant airflow application, both duct inlet connections are equipped with airflow measurement probes. The mixing ratio and total airflow rate are controlled by building management system control signals (heating and cooling) so that the desired supply air temperature and airflow rate are obtained as described for the control sequence in the figure below.



## SOUND DATA, AIRBORNE SOUND

100 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR			
										dB(A)dB(A)			
		63	125	250	500	1000	2000	4000	8000				
100	47	13	34	37	32	29	24	16	17	14	30	26	21
	158	44	39	51	46	41	32	21	20	17	42	38	33
	212	59	40	54	50	44	34	22	21	18	45	41	37
	263	73	41	57	52	46	36	22	22	19	48	44	39
125	79	22	36	43	38	34	28	18	18	16	35	31	26
	266	74	41	57	52	46	36	22	22	19	48	44	39
	349	97	42	60	55	49	38	23	22	19	51	47	43
	436	121	43	62	58	51	39	24	23	20	53	49	46
160	137	38	37	44	40	37	31	22	21	15	38	34	29
	457	127	45	55	52	46	35	27	26	20	47	43	39
	601	167	46	58	54	48	36	28	27	21	49	45	41
	749	208	48	60	56	50	37	28	28	22	51	47	43
200	220	61	40	44	41	37	33	31	24	17	40	36	30
	734	204	47	56	54	48	38	35	30	24	49	45	41
	972	270	49	59	57	50	40	36	32	26	52	48	44
	1210	336	50	61	59	52	41	37	33	27	54	50	47
250	353	98	40	47	43	38	35	36	30	20	42	38	35
	1181	328	49	58	54	48	41	40	34	27	50	46	41
	1559	433	52	61	56	50	42	41	35	29	52	48	44
	1940	539	53	63	58	52	43	41	36	31	54	50	46
315	576	160	40	44	43	38	30	35	28	19	41	37	34
	1915	532	51	57	55	48	40	38	32	25	50	46	43
	2531	703	54	60	58	50	43	38	33	27	53	49	46
	3146	874	56	62	60	52	45	39	33	28	55	51	48
355	736	204	45	50	47	38	37	40	35	25	45	41	39
	2452	681	57	60	56	48	42	46	42	34	53	49	44
	3244	901	59	63	58	50	43	47	43	37	55	51	46
	4032	1120	61	65	60	52	44	48	45	39	56	52	48
400	943	262	45	50	48	39	41	43	37	30	48	44	42
	3139	872	59	62	55	47	45	49	44	38	54	50	47
	4147	1152	63	65	56	49	46	50	46	40	56	52	49
	5159	1433	65	67	58	50	47	51	47	41	57	53	50

200 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR			
										dB(A)dB(A)			
		63	125	250	500	1000	2000	4000	8000				
100	47	13	36	38	34	31	26	23	26	22	34	30	27
	158	44	41	52	49	43	34	27	30	25	45	41	35
	212	59	42	55	52	46	36	28	30	26	47	43	39
	263	73	43	57	55	48	38	29	31	27	50	46	42
125	79	22	38	44	41	36	30	25	28	24	38	34	29
	266	74	43	58	55	48	38	29	31	27	50	46	42
	349	97	44	61	58	51	40	30	32	27	53	49	45
	436	121	45	63	60	53	41	31	32	28	55	51	48
160	137	38	38	46	44	40	34	29	29	25	41	37	32
	457	127	46	57	55	50	38	34	35	30	50	46	42
	601	167	48	60	57	52	39	35	36	31	53	49	45
	749	208	49	62	59	53	40	36	37	32	54	50	47
200	220	61	41	46	44	41	36	37	33	26	44	40	36
	734	204	48	59	57	51	41	42	39	34	53	49	44
	972	270	50	61	59	54	42	43	41	36	55	51	47
	1210	336	51	64	62	56	43	43	42	37	57	53	50
250	353	98	42	50	46	42	38	42	38	29	47	43	41
	1181	328	52	61	57	51	43	46	42	37	54	50	44
	1559	433	54	63	59	54	45	46	44	39	56	52	47
	1940	539	56	65	61	56	46	47	44	40	58	54	49
315	576	160	41	46	46	42	32	42	37	30	47	43	41
	1915	532	52	59	59	51	43	45	41	36	54	50	46
	2531	703	55	63	61	53	45	45	42	37	56	52	49
	3146	874	57	65	64	55	47	46	42	38	58	54	51
355	736	204	48	54	53	43	41	46	43	34	51	47	44
	2452	681	59	65	62	52	46	51	50	44	59	55	51
	3244	901	62	67	64	54	47	53	52	47	61	57	53
	4032	1120	64	69	66	56	48	54	53	48	62	58	54
400	943	262	48	54	54	45	44	48	45	40	53	49	47
	3139	872	62	66	60	52	48	54	53	47	60	56	53
	4147	1152	65	68	62	54	49	55	54	49	62	58	55
	5159	1433	68	70	63	55	50	56	56	51	63	59	56

500 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR			
										dB(A)dB(A)			
		63	125	250	500	1000	2000	4000	8000				
100	47	13	39	39	38	35	29	32	39	35	43	39	40
	158	44	44	53	52	47	38	37	42	38	50	46	43
	212	59	45	56	56	50	40	38	43	39	52	48	44
	263	73	46	59	58	52	41	39	44	40	54	50	46
125	79	22	41	45	44	40	33	34	40	37	45	41	41
	266	74	46	59	58	52	41	39	44	40	54	50	46
	349	97	47	62	61	55	43	40	45	41	56	52	49
	436	121	48	65	64	57	44	40	45	41	59	55	52
160	137	38	41	49	48	45	38	39	42	40	49	45	43
	457	127	49	60	59	54	43	44	47	44	56	52	48
	601	167	51	63	62	57	44	45	48	45	58	54	50
	749	208	52	65	64	58	45	46	49	46	60	56	52
200	220	61	43	49	48	45	41	47	45	40	52	48	46
	734	204	51	62	61	56	46	51	51	48	59	55	52
	972	270	53	65	63	59	47	52	53	48	61	57	53
	1210	336	54	67	66	60	48	53	54	51	63	59	54
250	353	98	46	54	51	47	42	50	50	43	55	51	50
	1181	328	55	65	62	57	47	53	54	51	61	57	55
	1559	433	58	68	65	59	49	54	55	52	63	59	56
	1940	539	59	70	67	61	50	55	56	54	64	60	57
315	576	160	44	50	51	47	36	52	50	44	56	52	51
	1915	532	55	64	63	56	46	54	54	50	61	57	54
	2531	703	58	67	66	59	49	55	5	51	63	59	5
	3146	874	60	69	68	60	51	56	55	53	64	60	56
355	736	204	51	60	61	52	48	54	55	48	60	56	56
	2452	681	63	71	70	62	53	59	62	58	68	64	63
	3244	901	66	73	72	64	54	61	64	60	70	66	64
	4032	1120	68	75	74	66	55	62	65	62	71	67	66
400	943	262	52	60	63	55	51	56	57	53	63	59	58
	3139	872	67	72	70	63	55	61	65	61	70	66	65
	4147	1152	70	74	72	64	56	63	67	63	72	68	67
	5159	1433	73	77	73	66	57	64	68	64	73	69	68

750 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR			
										dB(A)dB(A)			
		63	125	250	500	1000	2000	4000	8000				
100	47	13	40	40	40	37	31	37	45	42	48	44	46
	158	44	45	54	54	49	39	41	48	45	53	49	49
	212	59	46	57	57	52	41	42	49	46	55	51	50
	263	73	47	59	60	54	42	43	50	47	57	53	50
125	79	22	42	46	46	42	34	39	46	44	50	46	47
	266	74	47	60	60	54	43	43	50	47	57	53	50
	349	97	49	63	63	57	44	44	51	47	59	55	51
	436	121	49	65	66	59	46	45	51	48	61	57	54
160	137	38	43	51	50	47	40	44	48	47	53	49	49
	457	127	50	62	62	57	45	48	53	51	60	56	54
	601	167	52	65	64	59	46	49	55	52	62	58	55
	749	208	53	67	66	61	47	50	55	53	63	59	56
200	220	61	45	51	50	48	44	51	51	47	56	52	52
	734	204	53	63	62	58	49	55	57	54	63	59	57
	972	270	54	66	65	61	50	56	58	56	65	61	59
	1210	336	56	69	68	63	51	57	59	57	66	62	60
250	353	98	48	56	54	50	44	54</					

## SOUND DATA, RADIATED SOUND

100 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR		
		63	125	250	500	1000	2000	4000	8000	dB(A)dB(A)		
100	47	13	34	26	18	17	17		20	16	13	
	158	44	39	40	32	29	25		31	27	21	
	212	59	40	43	35	32	27	16	34	30	24	
	263	73	41	46	38	34	28	16	36	32	26	
125	79	22	36	32	24	22	20	12	25	21	16	
	266	74	41	46	38	34	28	16	36	32	26	
	349	97	42	49	41	37	30	17	39	35	29	
	436	121	43	51	44	39	32	18	41	37	31	
160	137	38	37	33	26	25	24	16	27	23	20	
	457	127	45	44	37	34	28	21	35	31	26	
	601	167	46	47	40	37	29	22	38	34	29	
	749	208	48	49	42	38	30	22	39	35	30	
200	220	61	40	33	27	26	26	25	31	27	24	
	734	204	47	45	39	36	31	29	38	34	28	
	972	270	49	48	42	39	32	30	40	36	31	
	1210	336	50	50	45	41	33	31	42	38	33	
250	353	98	40	36	28	26	28	30	34	30	29	
	1181	328	49	47	39	36	33	34	40	36	33	
	1559	433	52	50	42	39	35	35	42	38	34	
	1940	539	53	52	44	40	36	35	43	39	34	
315	576	160	40	33	29	27	23	29	32	28	28	
	1915	532	51	46	41	36	33	32	40	36	31	
	2531	703	54	49	44	38	36	32	42	38	32	
	3146	874	56	51	46	40	37	33	43	39	33	
355	736	204	45	39	33	27	29	34	37	33	33	
	2452	681	57	49	42	36	34	39	43	39	38	
	3244	901	59	52	44	38	36	41	45	41	40	
	4032	1120	61	54	46	40	36	42	46	42	41	
400	943	262	45	39	34	28	33	37	40	36	36	
	3139	872	59	51	40	35	38	43	46	42	41	
	4147	1152	63	54	42	37	39	44	47	43	43	
	5159	1433	65	56	43	38	39	45	48	44	44	

500 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR		
		63	125	250	500	1000	2000	4000	8000	dB(A)dB(A)		
100	47	13	39	28	24	23	22		33	29	29	
	158	44	44	42	38	35	30		39	35	32	
	212	59	45	45	41	38	32	32	41	37	33	
	263	73	46	48	44	40	34	33	42	38	34	
125	79	22	41	34	30	28	26	28	35	31	30	
	266	74	46	48	44	40	34	33	42	38	34	
	349	97	47	51	47	43	36	34	45	41	35	
	436	121	48	54	50	45	37	34	47	43	37	
160	137	38	41	38	34	33	31	33	39	35	32	
	457	127	49	49	45	43	35	38	45	41	37	
	601	167	51	52	48	45	36	39	47	43	38	
	749	208	52	54	50	47	37	40	48	44	39	
200	220	61	43	38	33	34	34	41	44	40	39	
	734	204	51	51	46	44	39	45	49	45	44	
	972	270	53	54	49	47	40	46	51	47	45	
	1210	336	54	56	51	49	41	47	52	48	45	
250	353	98	46	43	37	35	35	44	47	43	43	
	1181	328	55	54	48	45	40	47	52	48	46	
	1559	433	58	57	50	48	41	48	53	49	47	
	1940	539	59	59	52	49	42	49	54	50	48	
315	576	160	44	39	36	35	29	46	48	44	45	
	1915	532	55	53	49	45	39	48	52	48	47	
	2531	703	58	56	52	47	42	49	53	49	48	
	3146	874	60	58	54	49	43	49	54	50	48	
355	736	204	51	49	47	41	40	48	51	47	46	
	2452	681	63	60	56	50	45	53	54	52	52	
	3244	901	66	62	58	52	47	55	56	53	53	
	4032	1120	68	64	59	54	47	56	54	51	50	
400	943	262	52	49	49	43	44	50	52	48	48	
	3139	872	67	61	56	51	48	55	54	50	50	
	4147	1152	70	63	57	53	49	57	56	52	52	
	5159	1433	73	66	58	54	49	58	57	53	53	

200 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR		
		63	125	250	500	1000	2000	4000	8000	dB(A)dB(A)		
100	47	13	36	27	20	19	19		24	20	16	
	158	44	41	41	34	31	27		33	29	23	
	212	59	42	44	38	34	29	22	36	32	26	
	263	73	43	46	40	36	31	23	38	34	28	
125	79	22	38	33	26	25	22	19	28	24	18	
	266	74	43	47	40	36	31	23	38	34	29	
	349	97	44	50	43	39	32	24	41	37	31	
	436	121	45	52	46	41	34	25	43	39	33	
160	137	38	38	35	29	28	26	23	31	27	22	
	457	127	46	46	40	38	31	28	39	35	30	
	601	167	48	49	43	40	32	29	41	37	32	
	749	208	49	51	45	42	33	30	43	39	34	
200	220	61	41	35	29	29	29	31	35	31	30	
	734	204	48	48	42	40	34	36	42	38	35	
	972	270	50	50	45	42	35	37	44	40	36	
	1210	336	51	53	47	44	36	37	46	42	36	
250	353	98	42	39	31	30	31	36	39	35	35	
	1181	328	52	50	42	40	36	39	44	40	38	
	1559	433	54	52	45	42	37	40	46	42	38	
	1940	539	56	54	47	44	38	41	47	43	40	
315	576	160	41	35	32	30	25	36	39	35	35	
	1915	532	52	48	44	40	35	39	44	40	38	
	2531	703	55	52	47	42	38	39	46	42	38	
	3146	874	57	54	49	44	40	40	47	43	39	
355	736	204	48	43	39	31	34	40	43	39	38	
	2452	681	59	54	48	41	39	45	49	45	44	
	3244	901	62	56	50	43	40	47	51	47	45	
	4032	1120	64	58	51	44	41	48	52	48	46	
400	943	262	48	43	39	33	37	42	46	41	41	
	3139	872	62	55	46	41	41	48	51	47	47	
	4147	1152	65	57	48	42	42	49	53	49	48	
	5159	1433	68	59	49	44	43	50	54	50	49	

750 Pa	qv (m³/h) (l/s)	F (Hz)								LwA LpA NR		
		63	125	250	500	1000	2000	4000	8000	dB(A)dB(A)		
100	47	13	40	29	25	25	24		38	34	35	
	158	44	45	43	39	37	32		43	39	38	
	212	59	46	46	43	40	34	36	44	40	39	
	263	73	47	48	45	42	35	37	45	41	39	
125	79	22	42	35	31	30	27	32	39	35	36	
	266	74	47	49	45	42	35	37	46	42	40	
	349	97	49	52	49	45	37	38	47	43	40	
	436	121	49	54	51	47	39	39	49	45	41	
160	137	38	43	40	36	36	33	38	43	39	38	
	457	127	50	51	47	45	38	42	49	45	43	
	601	167	52	54	50	47	39	43	51	47	44	
	749	208	53	56	52	49	40	44	52	48	45	
200	220	61	45	40	35	36	36	45	48	44	44	
	734	204	53	52	48	47	41	49	53	49	48	
	972	270	54	55	51	49	43	50	55	51	49	
	1210	336	56	58	53	51	44	51	56	52	50	
250	353	98	48	45	39	38	37	48	51	47	46	
	1181	328	57	56	50	48	42	51	56	52	50	
	1559	433	60	59	53	51	43	52	57	53	51	
	1940	539	61	61	55	52	44	52	58	54	51	
315	576	160	46	41	39	37	31	50	53	49	49	
	1915	532	57	55	51	47	41	53	56	52	52	
	2531	703	60	58	54	49	44	53	57	53	52	
	3146	874	62	60	56	51	45	54	58	54	53	
355	736	204	53	52	51	47	44	51	54	50	50	
	2452	681	65	63	60	56	49	57	60	56	55	
	3244	901	67	65	62	58	50	58	64	60	59	
	4032	1120	70	67	63	60	51	59	67	62	60	
400	943	262	55	53	54	49	48	53	56	52	53	
	3139	872	69	64	61	57	52	59	63	59	58	
	4147	1152	72	67	62	59	53	60	66	62	62	
	5159	1433	75	69	63	60	53	61	69	64	63	

## Product models

The HFD airflow management unit is available in several versions. An integral blade gasket enables tight shut-off operation, and external insulation is used to attenuate radiated sound into the space.

MODEL	FEATURE	COMMENT
HFD/S	Supply air	Standard insulation: 25 mm
HFD/B	Supply air with extra insulation	Insulation: 65 mm

## Control units (CU)

EE = Halton NMV-D2-MP

ED = Belimo VRD2+NM24A

EG = Siemens GLB181.1E/3

Controllers EE and ED include a dynamic differential pressure sensor with a low airflow rate through the sensor element. Therefore, these controllers shall not be used in highly contaminated environments. The pressure sensor of the ED unit is based on a membrane with no flow through the sensor element. Controller ED includes two potentiometers for minimum and maximum airflow setpoint adjustment (ranges: minimum = 0...80% and maximum = 30...100%).

## Sound attenuators (SA)

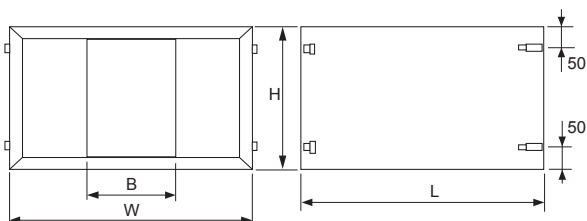
Sound attenuators are available 600 or 900 mm in length, with insulation material of mineral wool. External insulation thickness corresponds to the HFD model, 25 mm or 65 mm.

Attenuator length:

- 600 mm is used for duct size range 100...250 mm.
- 900 mm is used for duct size range 315...500 mm.

SA = Attenuator with baffle

SX = Attenuator without baffle



### SA/SX-HFD/S, attenuation material thickness of 25 mm

NS	L	H	W	B	kg
100	600	225	330	160	10.0
125	600	225	330	160	10.0
160	600	260	330	120	10.0
200	600	300	435	160	11.5
250	600	350	435	120	11.0
315	900	415	500	120	18.0
355	900	455	585	2x120	27.0
400	900	500	715	2x120	33.0
500	900	600	950	3x120	53.5

### SA/SX-HFD/B, attenuation material thickness of 65 mm

NS	L	H	W	B	kg
100	600	305	410	160	14.0
125	600	305	410	160	14.0
160	600	340	410	120	15.0
200	600	380	515	160	16.5
250	600	430	515	120	16.0
315	900	495	580	120	21.0
355	900	535	665	2x120	32.0
400	900	580	795	2x120	42.0
500	900	680	1030	3x120	63.5

## Connections

There are eight (8) different outlet connection options available for the HFD dual duct airflow management damper.

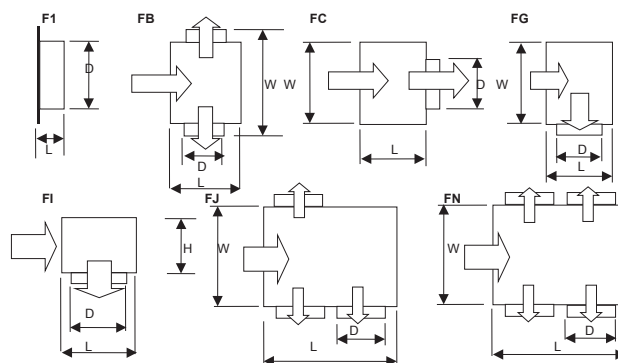
For constant airflow applications seven (7) connection models can be used:

- F1: This connection model is developed to connect circular duct directly to the HFD unit, without sound attenuator. If sound attenuator is used, please select the FC connection model in order to allow proper air mixing after sound attenuator.
- FB, FC, FG, FJ and FN: To connect one or more ducts to HFD unit. All these can also be used with sound attenuator.
- FI: This model is used to connect the HFD directly to a diffuser.

For variable airflow applications outlet duct connection model FT is used.

The connection module FT is equipped with a total airflow rate measurement probe.

e = attenuation material thickness [mm]



HFD	e = 25		e = 65		F1		FB		FC		FG	
	H	W	H	W	1 x D	L1	2 x D	L1	1 x D	L1	1 x D	L1
100	225	330	305	410	125	65	125	225	125	200	160	260
125	225	330	305	410	160	65	125	225	160	200	160	260
160	260	330	340	410	200	65	160	260	200	200	200	300
200	300	435	380	515	250	65	200	300	250	200	250	350
250	350	435	430	515	315	65	250	350	315	200	315	415
315	415	500	495	580	355	65	315	415	355	200	355	455
355	455	585	535	665	400	80	355	455	400	200	400	500
400	500	715	580	795	450	80	400	500	450	200	450	660
500	600	950	680	1030	500	80	500	660	500	300	500	660

HFD	e = 25		e = 65		FI		FJ		FN		FT	
	H	W	H	W	1 x D	L1	3 x D	L1	4 x D	L1	D	L
100	225	330	305	410	<=160	260	100	350	100	350	-	-
125	225	330	305	410	<=200	260	100	350	100	350	125	395
160	260	330	340	410	<=250	300	125	400	125	400	160	425
200	300	435	380	515	<=315	350	160	470	160	470	200	425
250	350	435	430	515	<=355	415	200	550	200	550	250	425
315	415	500	495	580	<=400	455	250	650	250	650	315	425
355	455	585	535	665	<=400	500	315	780	315	780	355	465
400	500	715	580	795	<=500	660	355	860	355	860	400	465
500	600	950	680	1030	<=500	660	400	950	400	950	500	465

## Installation

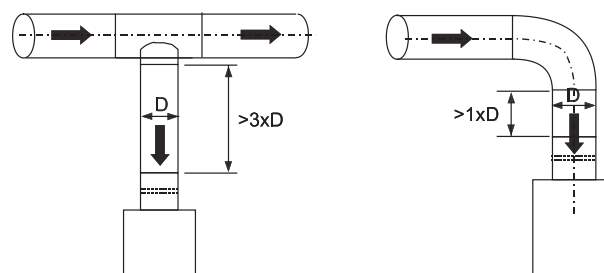
### Safety distances

The airflow control damper is installed with attention to required safety distances (see figure).

### Wiring

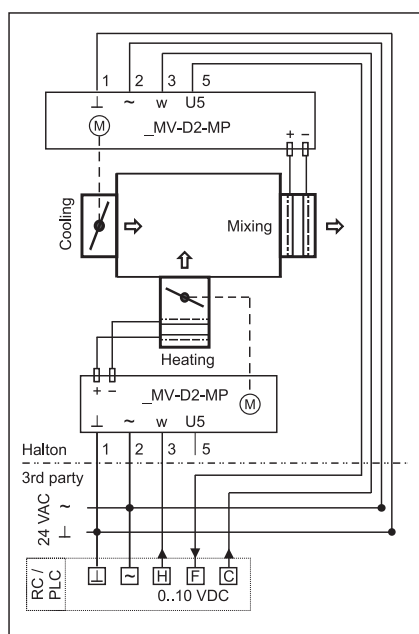
The wiring shall be carried out in accordance with local regulations and by professional technicians.

For the power supply of all control options a safety-isolating transformer shall be used.



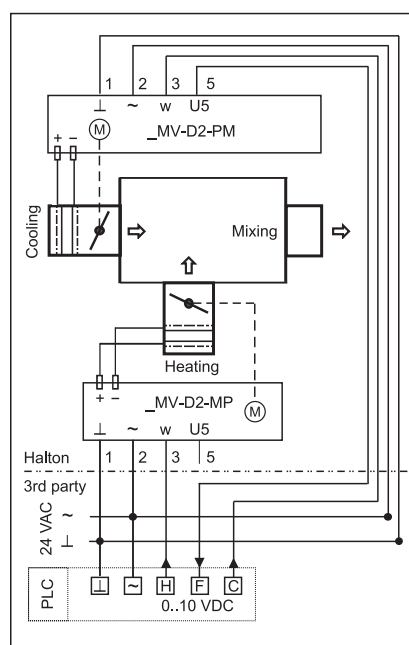
HFD; CU=EE (NMV-D2-MP) - variable airflow control

HFD; CU=EE (NMV-D2-MP) - constant airflow control



HFD; CU=EE (NMV-D2-MP) - variable airflow control

HFD; CU=EE (NMV-D2-MP) - constant airflow control



### CODE DESCRIPTION

Halton	Delivered by Halton
3 <sup>rd</sup> party	Delivered by a third party
1 (⊥)	24 VAC system neutral
2 (~)	24 VAC live
3 (w)	0...10-VDC airflow setpoint signal input
5 (U5)	0...10-VDC airflow feedback signal output
RC	Room controller
PLC	Building management system
C(AO)	Airflow setpoint, unit total airflow
H(AO)	Airflow setpoint, heating
F(AI)	Actual airflow feedback input

### CODE DESCRIPTION

Halton	Delivered by Halton
3 <sup>rd</sup> party	Delivered by a third party
1 (⊥)	24 VAC system neutral
2 (~)	24 VAC live
3 (w)	0...10-VDC airflow setpoint signal input
5 (U5)	0...10-VDC airflow feedback signal output
RC	Room controller
PLC	Building management system
C(AO)	Airflow setpoint control signal
F(AI)	Actual airflow feedback input



## Commissioning

### Airflow control

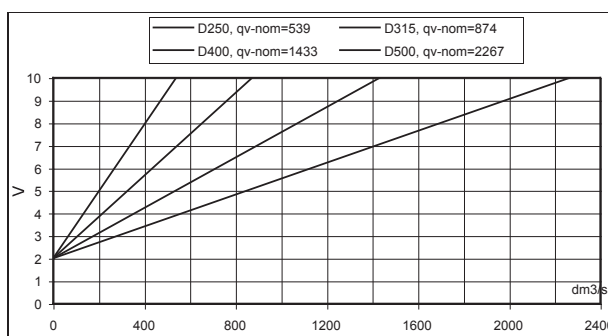
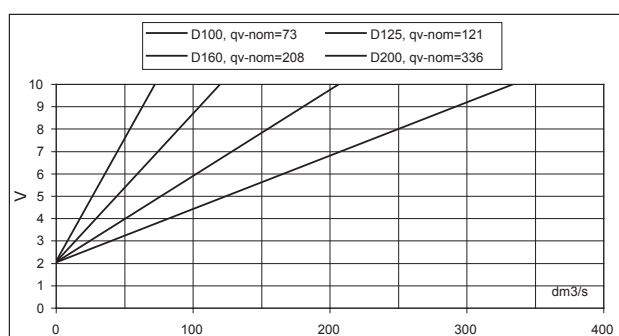
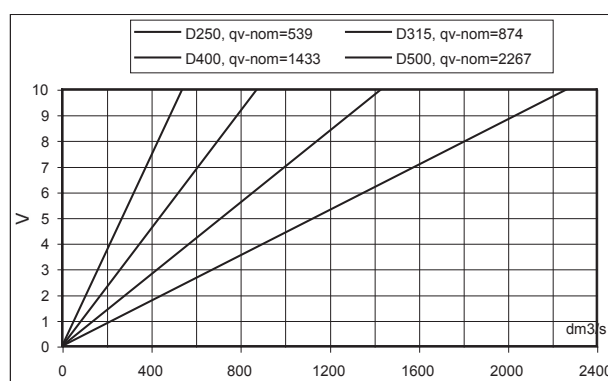
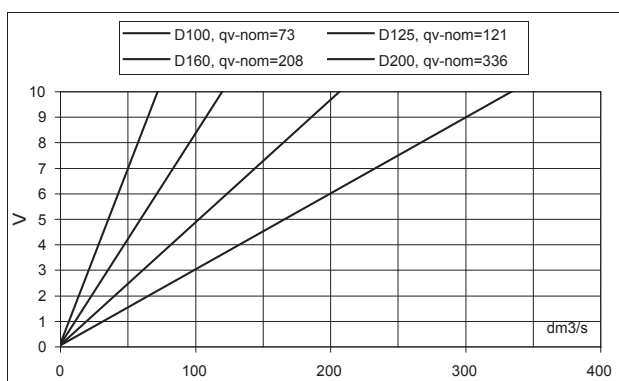
Nominal airflow rates of the HFD are presented in the table below.

The actual measured airflow rate (qv) can be defined by the controller feedback signal (U or U5) and airflow controller nominal airflow (qv\_nom).

NS	qv_nominal
100	73 l/s 263 m <sup>3</sup> /h
125	121 l/s 436 m <sup>3</sup> /h
160	208 l/s 1749 m <sup>3</sup> /h
200	336 l/s 1210 m <sup>3</sup> /h
250	539 l/s 1940 m <sup>3</sup> /h
315	874 l/s 3145 m <sup>3</sup> /h
355	1120 l/s 4035 m <sup>3</sup> /h
400	1433 l/s 5159 m <sup>3</sup> /h
500	2267 l/s 8161 m <sup>3</sup> /h

SIGNAL	FORMULA	CONTROLLER TYPE AND MODE	TERMINALS SYSTEM NEUTRAL	TERMINALS SIGNAL
0...10 VDC	$qv=qv\_nom*U/10$	HFD;CU=EE (NMV-D2-MP), mode 0...10V HFD;CU=EG (GLB181.1E/3)	1 ( ) 2(G0)	5 (U5) 9 (U)
2...10 VDC	$qv=qv\_nom*(U-2)/8$	HFD;CU=EE (NMV-D2-MP), mode 2...10 V HFD;CU=ED (VRD2+NM24-V)	1 ( ) 1 ( )	5 (U5) 5 (U5)

The actual airflow rate can also be determined from the pictures.



The actual airflow rate can be calculated as a function of differential pressure at the measurement probe and the measurement probe k factor. The proper k factor can be found in an attachment for the product.

$$q_v = k * \sqrt{\Delta P_m}$$

q<sub>v</sub> actual airflow rate [l/s]  
 k k value of the product  
 ΔP<sub>m</sub> differential pressure of measurement probe [Pa]

The EE and ED airflow controllers are equipped with a dynamic pressure differential sensor, and there is a low airflow rate through the pressure sensor. Therefore, a manual manometer cannot be connected in parallel with the airflow controller for differential

pressure measurement. If a manometer will be used, the airflow controller power supply shall be switched off in order to stop damper movement during measurement of airflow probe differential pressure. Note that the duct pressure might vary during the measurement.

The EG airflow controller is equipped with a static membrane pressure sensor including automatic zero point calibration, and there is no airflow through the differential pressure sensor of the controller. Therefore, a manual differential measurement manometer can be connected in parallel to the airflow controller (for example with tube T-branches) and both measurements can operate in parallel with continuous control.

### Suggested specifications

The dual duct mixing unit shall be made of galvanised steel with airflow measurement probes of aluminium. Duct connections D = 100...500 mm shall include airtight neoprene or EPDM rubber gaskets. Damper blades shall include rubber gaskets.

The dual duct unit shall comprise airflow measurements, flow controllers and damper actuators. Design airflow range limits shall be calibrated at the factory.

The casing shall be acoustically insulated with 25-mm-thick mineral wool to avoid airborne noise emission into the duct and radiation of noise through the damper casing. When specified, unit design shall have additional external insulation containing 40 mm of acoustic material and a galvanised steel cover applied over the standard casing.

The dual duct unit shall be equipped with a sound attenuator in order to meet the sound level requirement for the room. As an option, the sound attenuator shall contain a central baffle.

## Product code

HFD/S-D

S = Model

S	Standard insulation
B	Extra insulation

D = Diameter of duct connection

125, 160, 200, 250, 315, 355, 400, 500

Specifics and accessories

CU = Control unit

EE	NMV-D2-MP (Belimo)
ED	VRD2+NM24A-V (Belimo)
EG	GLB181.1E/3 (Siemens)

SA = Sound attenuator

NA	Not assigned
H1	HFD, Standard insulation, With baffle
H2	HFD, Standard insulation, Without baffle
H3	HFD, Extra insulation, With baffle
H4	HFD, Extra insulation, Without baffle

HT = Outlet connection type

F1	CAV: Outlet plenum, 1 pc., direct duct connection
FB	CAV: Outlet plenum, 2 pcs., side duct connections
FC	CAV: Outlet plenum, 1 pc., back duct connection
FG	CAV: Outlet plenum, 1 pc., side duct connection
FI	CAV: Outlet plenum, 1 pc., side diffuser connection
FJ	CAV: Outlet plenum, 3 pcs., side duct connections
FN	CAV: Outlet plenum, 4 pcs., side duct connections
FT	VAV: Outlet plenum with measurement probe, 1 pc, direct duct connection

HD = Outlet connection size

HT=F1 or HT=FB or HT=FT: D
HT=FC or HT=FG and D=125: 160
HT=FC or HT=FG and D=160: 200
HT=FC or HT=FG and D=200: 250
HT=FC or HT=FG and D=250: 315
HT=FC or HT=FG and D=315: 355
HT=FC or HT=FG and D=355: 400
HT=FC or HT=FG and D=400: 450
HT=FC or HT=FG and D=500: 500
HT=FI and D=125: 100,125,160
HT=FI and D=160: 100,125,160,200
HT=FI and D=200: 100,125,160,200,250
HT=FI and D=250: 100,125,160,200,250,315
HT=FI and D=315:
100,125,160,200,250,315,355
HT=FI and D=355:
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HT=FI and D=400:
100,125,160,200,250,315,355,400
HT=FI and D=400:
100,125,160,200,250,315,355,400
HT=FI and D=500:
100,125,160,200,250,315,355,400
HT=FJ or HT=FN and D=125: 100
HT=FJ or HT=FN and D=160: 125
HT=FJ or HT=FN and D=200: 160
HT=FJ or HT=FN and D=250: 200
HT=FJ or HT=FN and D=315: 250
HT=FJ or HT=FN and D=355: 315
HT=FJ or HT=FN and D=400: 355
HT=FJ or HT=FN and D=500: 400

AH = Access hatch

N	No
Y	Yes

Code example

HFD/S-125, CU=EE, SA=NA, HT=F1, HD=125, AH=N