Private: Halton HFB – Airflow management damper

Overview

- Control damper for different airflow and duct pressure control applications
- Pressure-independent operation
- Galvanized steel design
- Circular duct connection equipped with integrated rubber gaskets
- Minimum airflow is related to 1 m/s on specific product models

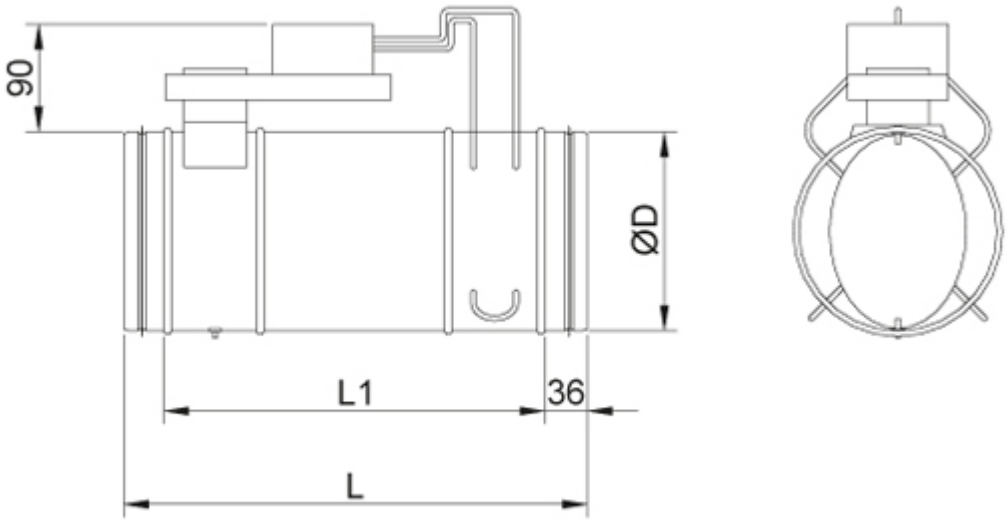
Product Models and Accessories

- Model with shut-off operation; tightness fulfills EN 1751, class 4 requirements (HFB/G and HFB/I)
- Casing tightness fulfills EN 1751, class C requirements
- Model with external insulation
- Several sound attenuator models
- Several airflow controller options
- 1 m/s – minimum airflow – the HFB/G and HFB/I with one of following controller options of EM, EK, EC, EE
- 2 m/s – minimum airflow – any HFB models with controller option of EM, EK, EC, EE, ED, EG
- Electric reheat coil options
- Factory-set airflow range limits (min./max. airflow rates) as an option

Halton reserves the right to alter products without notice.

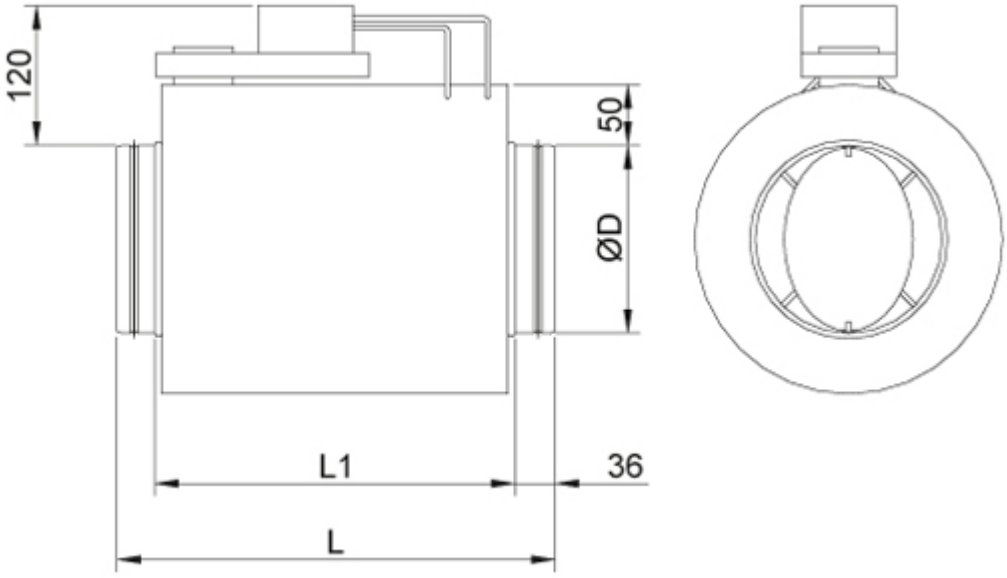
Dimensions

Halton HFB/G, HFB/H



NS	L	L1	ØD
100	370	298	99
125	370	298	124
160	370	298	159
200	470	398	199
250	470	398	249
315	470	398	314
400	625	553	399
500	625	553	499

Halton HFB/I, HFB/J



NS	L	L1	ØD
100	365	293	99
125	365	293	124
160	365	293	159
200	465	393	199
250	465	393	249
315	465	393	314
400	675	603	399
500	675	603	499

Material

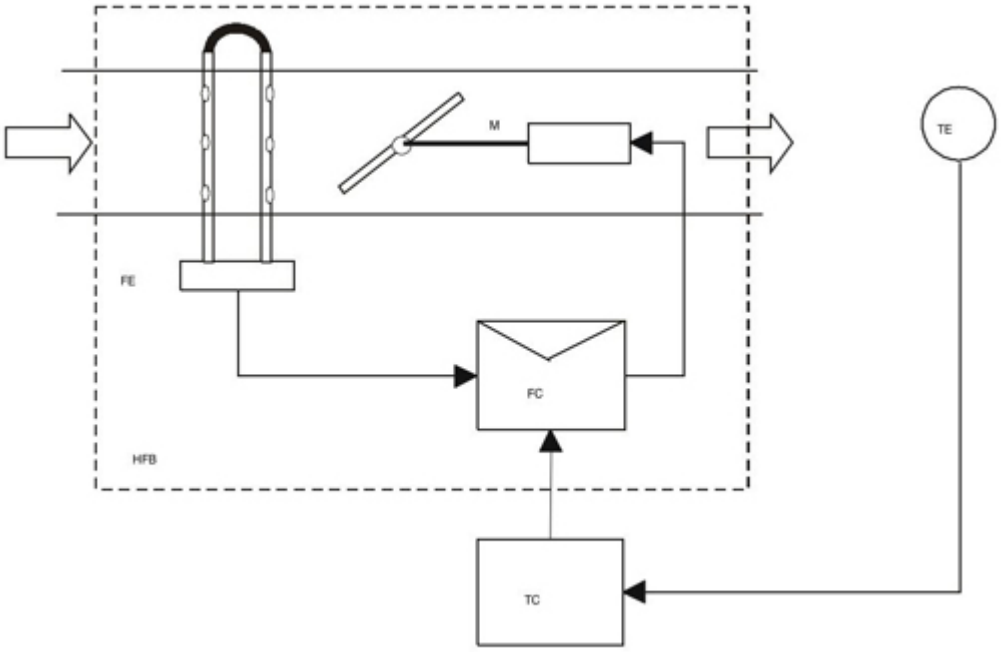
Part	Material
Casing	Galvanised steel
Damper blade	Galvanised steel
Shaft	Zinc coated steel
Bearings	Plastic
Blade gasket	EPDM Rubber
Duct gaskets	1C-polyurethane hybrid
Measurement probe	Aluminium
External insulation	Mineral wool (models HFB/I, HFB/J)

Duct connection gaskets are vulcanised to the casing.

Function

The variable airflow damper Halton HFB contains an averaging airflow measurement probe, airflow controller and actuator. Airflow is controlled based on actual flow measurement by changing the damper blade position. The airflow setpoint can be modified between minimum and maximum settings by, e.g., a room controller with an analogue signal (0...10 or 2...10 VDC). Flow control damper Halton HFB maintains the required airflow independent of duct pressure variation.

The static pressure control damper option maintains the desired constant duct pressure based on a static pressure measurement.



Product Models

The Halton HFB airflow control damper is available in several versions.
The blade gasket enables airtight shut-off operation, and external insulation is used to attenuate radiated sound into the space.

Model	Feature	Tightness
HFB/G	With blade gasket	EN 1751, class C and class 4
HFB/ I	With blade gasket and 50 mm external insulation	EN 1751, class C and class 4
HFB/H	No blade gasket	EN 1751, class C
HFB/J	No blade gasket, with 50 mm external insulation	EN 1751, class C

Minimum torque for different Halton HFB models:

Product	5 Nm	10 Nm
HFB/G and HFB/I 100...250	x	
HFB/G and HFB/I 315...500		x
HFB/H and HFB/J 100...500	x	

Control units (CU)

The Halton HFB airflow control damper can be equipped with several different control units for either airflow or duct pressure control.

Airflow control

- For supply and exhaust installations.
- Complete shut-off function (HFB/G and HFB/I).
- Maximum differential pressure over the damper of 1000 Pa.
- Operating range: ambient temperature of 0 to 50 °C.
- Ambient relative humidity < 95%, non-condensing.

Airflow controller options:
EM Halton LMV-D3-MF-F.1 HI (5 Nm – for sizes 100...250)
EK Halton NMV-D3-MF-F.1 HI (10 Nm)
EC Halton LMV-D3-MP-F.1 HI (5 Nm – for sizes 100...250)
EE Halton NMV-D3-MP-F.1 HI (10 Nm)
ED Belimo VRD3 + NM24A-V (10 Nm)
EG Siemens GLB181.1E/3 (10 Nm)

Controller ED includes two potentiometers for minimum and maximum airflow setpoint adjustment (ranges: minimum = 0...80% and maximum = 30...100%).

The adjustable airflow control range is presented in the table below. For airflow controllers EM, EK, EC, EE and EG, the highest available minimum airflow rate equals the specified maximum airflow rate.
Minimum and maximum airflow rates are calculated as percentage of damper's nominal airflow.

For the ED controller, the highest minimum airflow rate is 80% of the specified maximum airflow rate.
Maximum airflow is calculated as percentage of nominal airflow and minimum airflow as percentage of maximum airflow.

NS	qv_min/qv_max	qv_min/qv_max	
	EM, EC	ED, EG	qv_nominal
100	6... 70 l/s	12... 70 l/s	70 l/s
	21... 251 m3/h	44... 251 m3/h	251 m3/h
125	10... 115 l/s	19... 115 l/s	115 l/s
	34... 414 m3/h	68... 414 m3/h	414 m3/h
160	17... 211 l/s	35... 211 l/s	211 l/s
	62... 758 m3/h	124... 758 m3/h	758 m3/h
200	28... 340 l/s	56... 340 l/s	340 l/s
	100... 1226 m3/h	200... 1226 m3/h	1226 m3/h
250	44... 538 l/s	88... 538 l/s	538 l/s
	158... 1936 m3/h	316... 1936 m3/h	1936 m3/h
NS	qv_min/qv_max EK, EE		
315	73... 885 l/s	145... 885 l/s	885 l/s
	260... 3188 m3/h	521... 3188 m3/h	3188 m3/h
400	127... 1555 l/s	254... 1555 l/s	1555 l/s
	457... 5600 m3/h	914... 5600 m3/h	5600 m3/h
500	200... 2449 l/s	400... 2449 l/s	2449 l/s
	720... 8818 m^3/h	1440... 8818 m^3/h	8818 m^3/h

Remarks regarding table above :

Minimum airflows

For EM, EK, EC, EE with HFB/G and HFB/I, the minimum airflows are given for 1m/s
For EM, EC with HFB/H and HFB/J, the minimum airflows are given for 2 m/s
For ED, EG with all HFB types, the minimum airflows are given for 2 m/s

Maximum airflows

Maximum airflows are given for 9 m/s
For offices applications, maximum airflows adviced as general selection are given for 6m/s
Maximum airflows possible (sensor range limit) are given for 12 m/s

Pressure control for supply and exhaust installations

- Complete shut-off function (HFB/G and HFB/I).
- Static pressure setpoint range of 30...100 Pa or 90...300 Pa.
- Maximum differential pressure over the damper of 500 Pa.
- Operating range: ambient temperature of 0 to 50 °C.
- Ambient relative humidity < 95%, non-condensing

Sound Attenuators

Sound attenuators are available with optional outlet diameters with mineral wool (MW) or polyester fibre (PEF) insulation materials and with 600 mm and 1000 mm lenghts. Optionally the

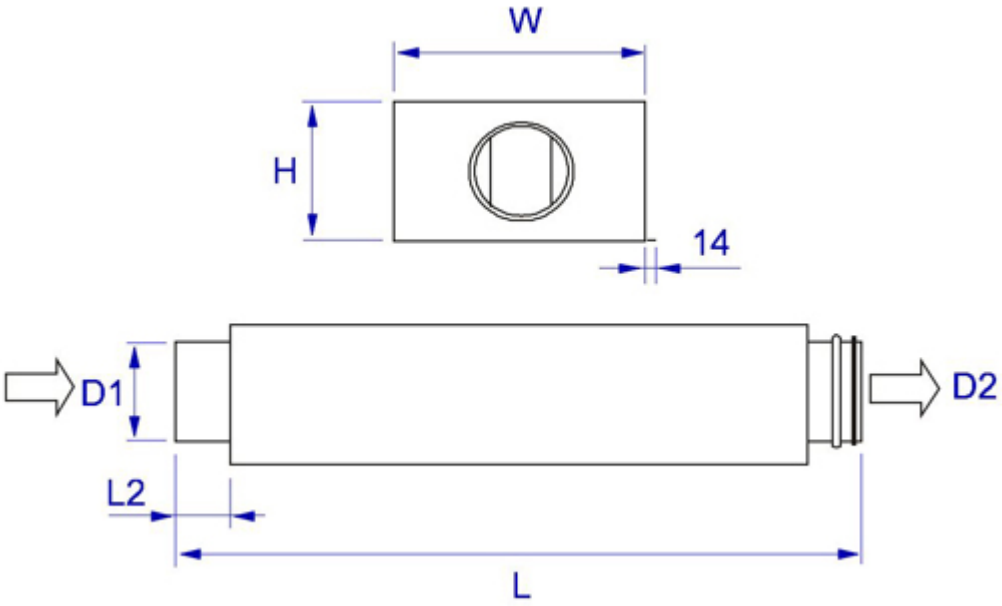
attenuator can be equipped with an access panel for cleaning and inspection purposes.

H1...H8 Attenuator without access panel
H11...H18 Attenuator with access panel

The connection (D1) is female type for direct connection to the Halton HFB airflow control damper. The duct connection (D2) is male type and either damper size or one size larger. Technical information is based on bigger of the duct connections (D2).

	Diameter D1<= D2	**Material**	**Lenght mm**	**Access panel**
H1	D1 = D2	MW	600	No
H2	D1 = D2	MW	1000	No
H3	D1 = D2	PEF	600	No
H4	D1 = D2	PEF	1000	No
H5	D1 < D2	MW	600	No
H6	D1 < D2	MW	1000	No
H7	D1 < D2	PEF	600	No
H8	D1 < D2	PEF	1000	No
H11	D1 = D2	MW	600	Yes
H12	D1 = D2	MW	1000	Yes
H13	D1 = D2	PEF	600	Yes
H14	D1 = D2	PEF	1000	Yes
H15	D1 < D2	MW	600	Yes
H16	D1 < D2	MW	1000	Yes
H17	D1 < D2	PEF	600	Yes
H18	D1 < D2	PEF	1000	Yes

Attenuator dimensions



The picture above describes supply air installation. In exhaust installation the airflow direction is vice versa, from D2 to D1.

D1/D2	D1/D2	L nominal	L mm	L2 mm	W mm	H mm	MW Weight kg	PEF Weight kg
100/100		600	626	22	252	154	5.1	4.6
		1000	1036	22	252	165	7.8	7.0
125/125	100/125	600	626	22	265	179	5.7	5.1
		1000	1036	22	265	179	8.6	7.6
160/160	125/160	600	626	22	282	214	6.5	5.7
		1000	1036	22	282	214	9.8	8.6
200/200	160/200	600	626	22	341	254	8.2	7.2
		1000	1036	22	341	254	12.3	10.7
250/250	200/250	600	626	32	392	304	10.0	8.8
		1000	1036	32	392	304	14.8	12.8
315/315	250/315	600	626	32	458	369	12.3	10.7
		1000	1036	32	458	369	18.0	15.4
400/400	315/400	600	626	57	519	455	18.9	16.9
		1000	1036	57	519	455	27.6	24.1
500/500	400/500	600	626	57	702	555	28.6	24.2
		1000	1036	57	702	555	39.1	36.1
500/630		600	626	67	832	685	32.3	28.4
		1000	1036	67	832	685	50.3	43.8

Attenuation data

Material: Mineral wool (MW), frequency band (Hz)

	L = 600								L = 1000							
D2	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
100	8	14	18	30	46	47	41	33	12	20	27	42	50	50	50	50
125	6	12	16	27	47	46	40	27	13	15	23	41	50	50	50	35
160	8	10	13	25	37	39	28	20	9	12	21	35	44	50	46	30
200	9	15	13	22	33	34	25	17	9	11	21	36	45	50	33	19
250	6	7	11	18	27	27	18	14	8	9	19	29	41	40	21	16
315	5	5	11	15	19	15	12	8	7	7	18	25	38	28	18	12
400	3	2	9	14	20	15	9	7	4	6	15	22	34	22	13	12
500	4	6	7	10	15	11	8	5	5	8	13	28	44	40	25	18
630	2	3	8	17	25	20	16	12	4	6	16	22	27	22	19	11

Material: Polyester fibre (PEF), frequency band (Hz)

	L = 600								L = 1000							
D2	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
100	9	12	15	20	33	34	37	29	15	17	24	32	43	40	41	40
125	9	11	14	18	33	29	32	24	14	16	23	29	43	43	44	37
160	8	10	12	17	30	24	26	20	12	13	17	25	37	40	39	30
200	6	8	10	18	28	26	23	17	9	12	17	28	40	41	34	23
250	6	7	9	16	22	22	18	12	9	10	15	24	34	36	27	19
315	5	6	10	17	20	17	13	8	8	10	15	25	31	28	20	13
400	2	3	8	11	17	13	8	6	4	6	12	19	27	21	11	10
500	4	6	7	10	14	11	8	5	5	8	10	17	24	19	10	9
630	2	3	6	9	12	10	7	5	4	6	9	14	21	17	10	9

Reheat Coils

The Halton HFB electric reheat coil is available for duct sizes 100...400 mm, and it is always a single-phase heater (230 VAC, less than 16 A).

Two electric reheater options are available:

- RM = Electric reheater without internal heating controller, PWM control signal input (230 VAC, pulse width modulation)
- RC = Electric reheater with internal heating controller, 0...10-VAC control signal input

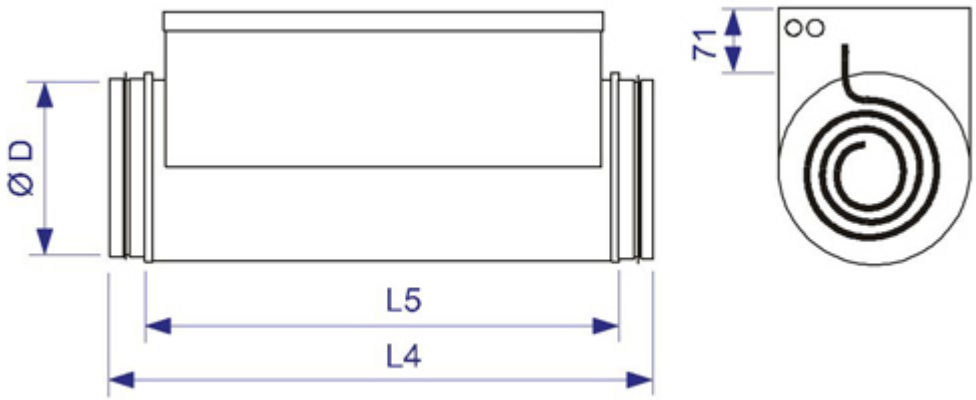
Both heaters (RM and RC) have two internal overheating protection devices connected in series, one automatic and one with manual reset. This increases heater safety.

The RC heater also includes a built-in alarm relay with potential-free changeover contact for remote alarm monitoring. The alarm is triggered by manual overheating protection or heater power loss.

Ensure that the airflow velocity is above 2 m/s to guarantee proper control function when selecting the airflow control damper and reheat coil.

Electric duct heater operation shall always be interlocked with the fan or with airflow rate measurement through the heater. The power supply to the duct heater must be switched off if the fan is switched off or airflow rate is too low. This function can be connected to the duct heater power supply (switch I for both heaters RM and RC), or in the case of the RC heater, also with potential-free contact P.

Dimensions

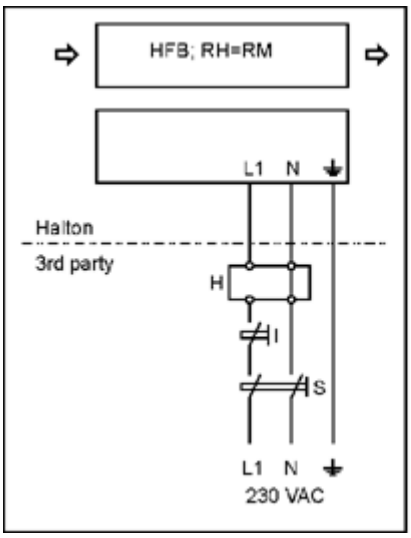


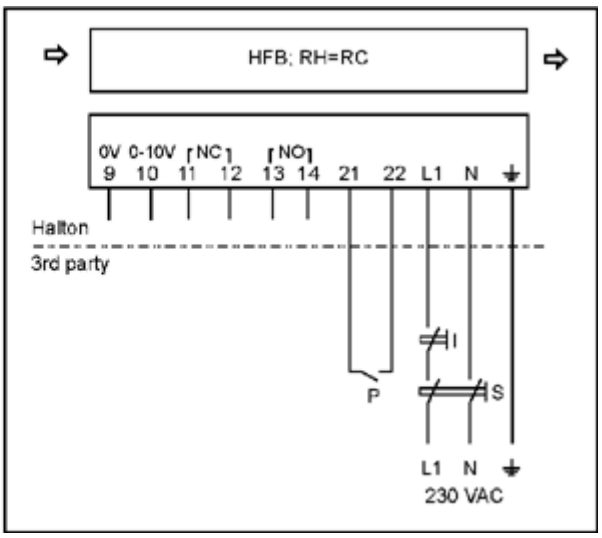
Size	D (mm)	L (mm)	L1 (mm)
100	99	375	291
125	124	375	291
160	159	375	291
200	199	375	291
250	249	375	291
315	314	375	291
400	399	375	291

Heating capacity

NS	Power W	qv_min v m/s	qv l/s	qv m3/h	dT (max) K	qv_max example v m/s	qv l/s	qv m3/h	dT (max) K
100	600	2.0	16	57	32	6.0	47	170	11
125	900	2.0	25	88	31	6.0	74	265	10
160	1500	2.0	40	145	31	6.0	121	434	10
200	2100	2.0	63	226	28	6.0	188	679	9
250	3000	2.0	98	353	25	6.0	295	1060	8
315	3000	2.1	156	561	16	6.0	468	1683	5
400	3000	2.0	251	905	10	6.0	754	2714	3

Electrical information





Code description

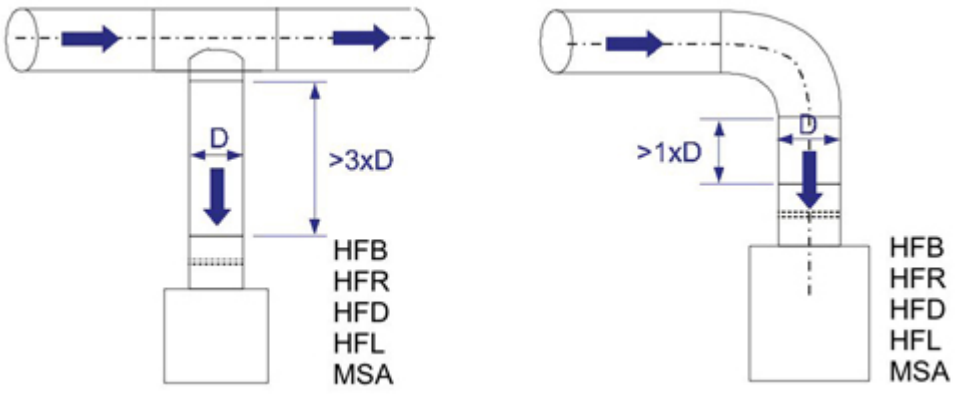
Halton	Delivered by Halton
3rd party	Delivered by a third party
S	All-pole switch for power supply
I	Fan interlock switch
P	Airflow or duct pressure interlock switch
H	Heating power controller
L1	230 VAC live
N	Neutral
0	Protective earthing

Heater power supply switch (S)	All-pole switch, 230 VAC, max. 16 A
Fan interlock function (I)	230 VAC, max. 16 A
Airflow or duct pressure interlock (P) **– Indication** **– Contact open** **– Contact closed**	Potential-free contact 10 V, max. 500 mA Heating disabled Heating enabled
Heating power controller H **– Voltage** **– On/off cycle**	PWM 230 VAC, max. 16 A, according to heater power 60 s recommended
Control signal input 9, 10 **– Voltage** **– Internal impedance**	0...10 VDC 100 ohms
Alarm output 11, 12 (NC) and 13, 14 (NO) **– Max. indication voltage** **– Max. current** **– NC**– NO	Potential-free contact 230 VAC 500 mA Contact closed if manual overheating protection is triggered or in the event of power failure Contact open if manual overheating protection is triggered or in the event of power failure
Overheating protection **– Automatic reset** **– Manual reset**	Triggered at 60 °C, reset at 48 °C Triggered at 120 °C

Installation

Safety distances

The Halton HFB airflow control damper is installed taking into account the required safety distances. Install the unit into ductwork in such a way that the air flow direction through the unit is as indicated with the arrow in the unit casing.



For the pressure control damper the minimum safety distance for the static measurement tab after

the control damper is 5 x D. Please refer to job drawings.

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.

The wiring instructions are presented following applications:

1 A HFB; CU=EM / EK / EC / EE Typical variable airflow control application
1 B HFB; CU=EM / EK / EC / EE Overriding controls
1 C HFB; CU=EM / EK / EC / EE Example;
Variable airflow control with a room controller
1 D HFB; CU=EM / EK / EC / EE Example;
Variable airflow control with a building management system
1 E HFB; CU=EM / EK / EC / EE Example:
Parallel airflow control with a building management system

2 A HFB; CU=ED Typical variable airflow control application
2 B HFB; CU=ED Overriding controls
2 C HFB, CU=ED Constant airflow control

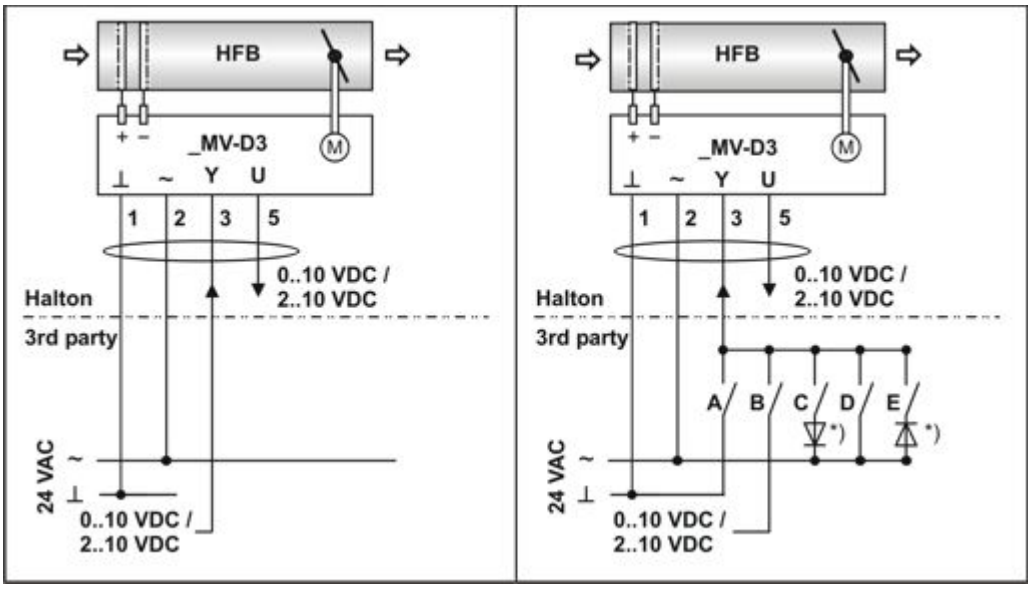
3 A HFB; CU=EG Typical variable airflow controll
3 B HFB; CU=EG Position & constant airflow control

4 A HFB; CU=EM / EK / EC / EE, RH=RM Cooling with airflow and heating with electric heater, pulse width modulation (PWM)
4 B HFB; CU=EM / EK / EC / EE, RH=RC Cooling with airflow and heating with electric heater

Control units

CU	Description	Note
EM	Halton LMV-D3-MF-F.1 HI	(5 Nm)
EK	Halton NMV-D3-MF-F.1 HI	(10 Nm)
EC	Halton LMV-D3-MP-F.1 HI	(5 Nm, with Belimo MP-bus)
EE	Halton NMV-D3-MP-F.1 HI	(10 Nm, with Belimo MP-bus)
ED	Belimo VRD3 + NM24A-V	(10 Nm)
EG	Siemens GLB181.1E/3	(10 Nm)
ES	Belimo VRP-STP + VFP-100 + NM24A-V	(10 Nm, 30...100 Pa)
ER	Belimo VRP-STP + VFP-300 + NM24A-V	(10 Nm, 90...300 Pa)

1A & 1B: HFB; CU = EM / EC (LMV-D3-MP/MF HI) or EK / EE (NMV-D3-MP/MF HI) – typical application and overriding controls



1A. Typical variable airflow control application **1B.** Overrides All options

Code description

Halton	Delivered by Halton
3rd party	Delivered by a third party
ACD	HFB
1	(G0) 24 VAC system neutral
2	(~) 24 VAC live
3	(w) 2...10- or 0...10-VDC airflow setpoint signal input
5	(U5) 2...10- or 0...10-VDC airflow feedback signal output
*)	Diode 1N 4007

Operating mode

2...10 VAC	0...10 VAC	A	B	C	D	E	
NA	NA	*On*	Off	Off	Off	Off	
qv_min	qv_min	Off	Off	Off	Off	Off	Constant flow
Variable qv_min...qv_max	Variable qv_min...qv_max	Off	*On*	Off	Off	Off	
CLOSED	CLOSED	Off	Off	*On*	Off	Off	
qv_max	qv_max	Off	Off	Off	*On*	Off	Constant flow
OPEN	OPEN	Off	Off	Off	Off	*On*	

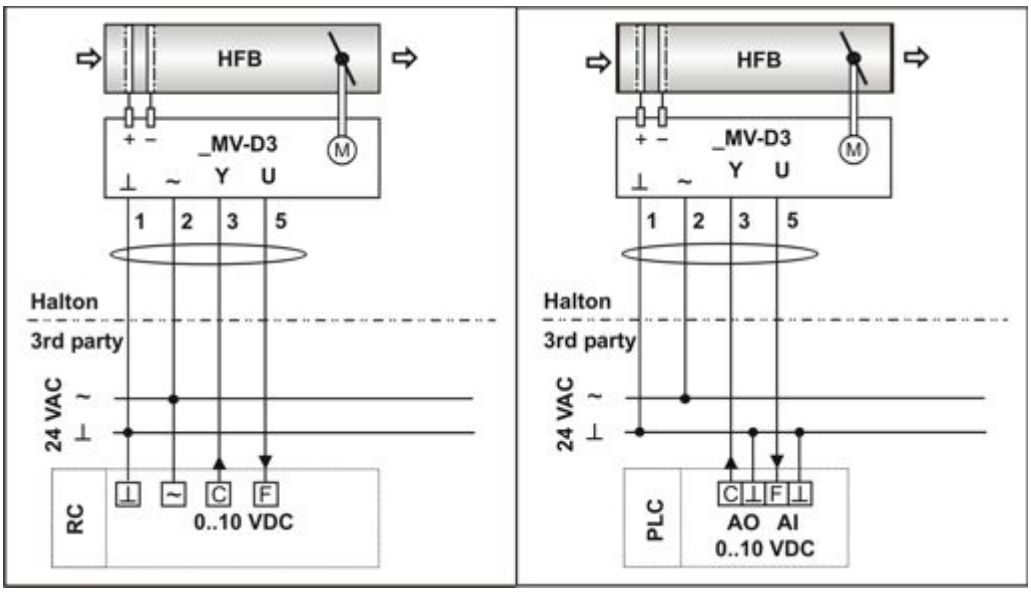
Shut-off with control signal w:

In addition to relay override command situations, the damper will be fully closed if:

- **0...10 VDC:** the HFB minimum airflow is set to 0% (0 l/s or 0 m3/h) and control signal w falls below 0.45 VDC
- **2...10 VDC** : HFB control signal w falls below 0.5 VDC
- **Both 0...10 VDC and 2...10 VDC:** the airflow setpoint voltage falls below a value corresponding to an air velocity of less than 0.5 m/s

Mode	Voltage OF w, VDC	Function
0...10 VDC	0.0...0.45	Minimum airflow (closed if qv_min = 0%)
	0.5...10.0	Modulating, qv_min ... qv_max
	10.0	Maximum airflow
2...10 VDC	0.0...0.5	Damper closed
	0.5...2.0	Minimum airflow
	2.0...10.0	Modulating, qv_min...qv_max
	10.0	Maximum airflow

1C & 1D, example:
HFB; CU = EM / EC (LMV-D2-MP/MF HI) or EK / EE (NMV-D2-MP/MF HI)
– variable airflow control with a room controller or a building management system



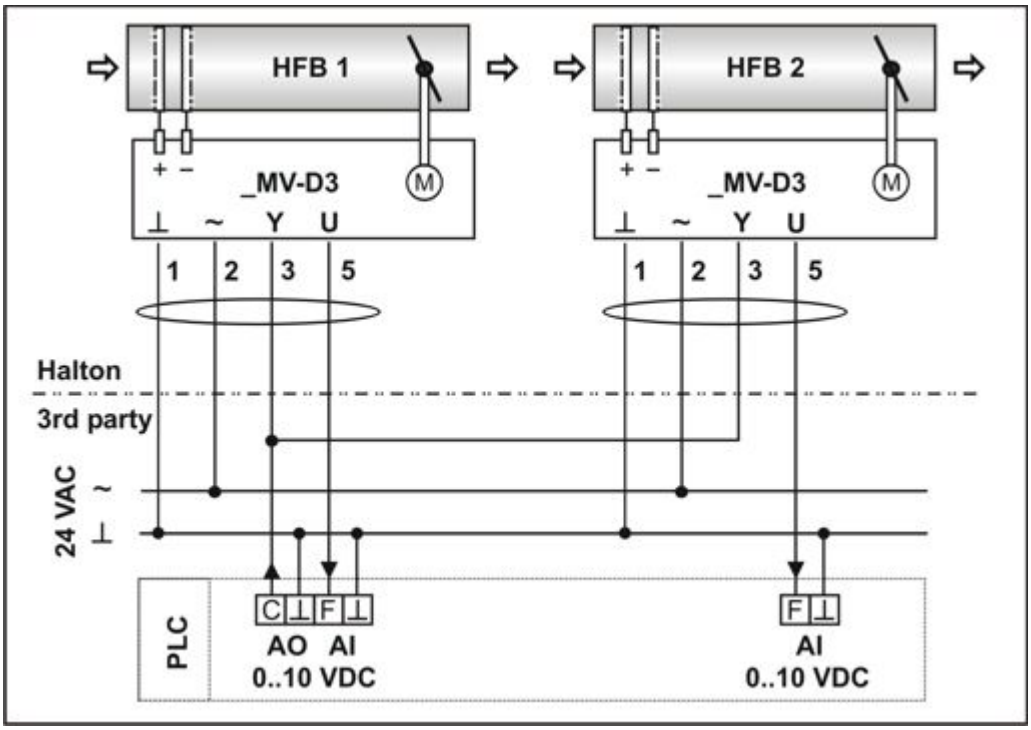
1C. Room controller application **1D.** Building management system application

Code description

Halton	Delivered by Halton
3rd party	Delivered by a third party
ACD	HFB
1 (G0)	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

1E, example:
HFB; CU = EM / EC (LMV-D2-MP/MF HI) or EK / EE (NMV-D2-MP/MF HI)

– parallel airflow control with a building management system

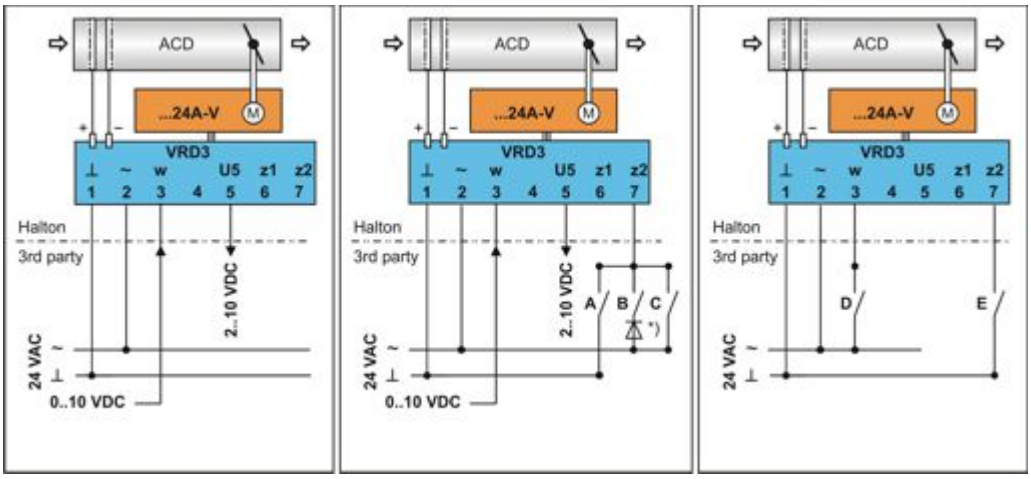


1D. Parallel airflow control with building management system

Code description

Halton	Delivered by Halton
3rd party	Delivered by a third party
ACD1	HFB supply
ACD2	exhaust
1 (G0)	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
PLC	Building management system
C (AO)	Airflow setpoint control signal
F (AI)	Actual airflow feedback input

2A, 2B & 2C:
HFB; CU=ED (VRD3 + NM24A-V)
– typical, overriding controls and constant airflow control



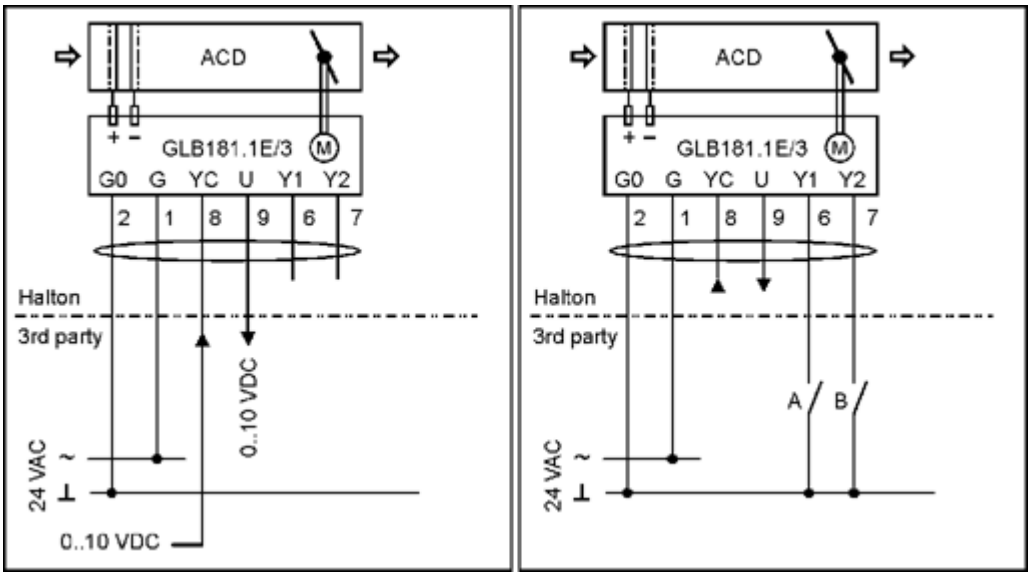
2A. Typical application **2B.** Overriding controls **2C.** Constant airflow control

Code description

Halton	Delivered by Halton
3rd party	Delivered by a third party
ACD	HFB
1 (G0)	24 VAC system neutral
2 (~)	24 VAC live
3 (w)	2...10- or 0...10-VDC airflow setpoint signal input
5 (U5)	2...10- or 0...10-VDC airflow feedback signal output
6 y	Actuator signal
7 z	Override input
*)	Diode 1N 4007

Override	**A**	**B**	**C**
CLOSED	ON	Off	Off
Variable flow	Off	Off	Off
Min. flow	Off	ON	Off
Max. flow	Off	Off	ON
Constant flow	**D**	**E**	
CLOSED	Off	ON	
Min. flow	Off	Off	
Max. flow	ON	Off	

3A & 3B: HFB; CU=EG (GLB181.1E/3)
– typical variable airflow control and position & constant airflow control



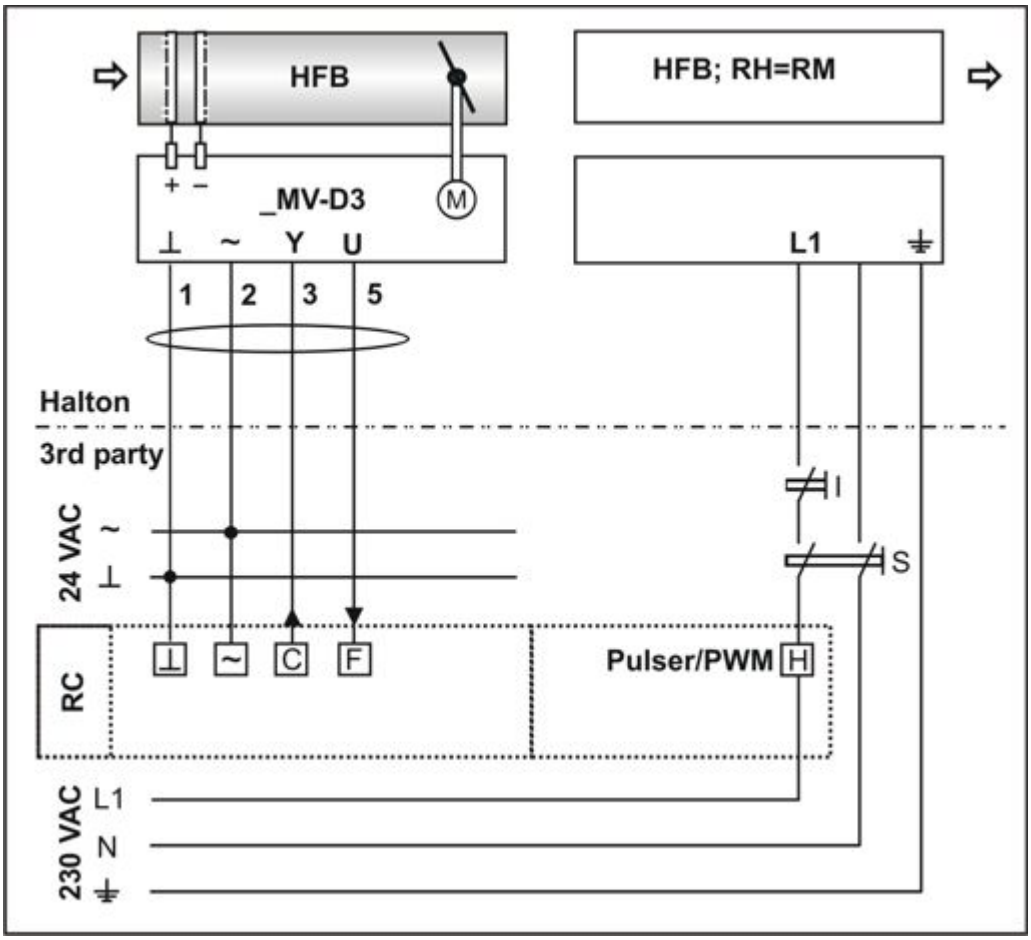
3A. Typical airflow control application **3B.** Position & constant airflow control

Code description

Halton	Delivered by Halton
3rd party	Delivered by a third party
ACD	HFB
2 (G0)	24 VAC system neutral
1 (G)	24 VAC live
8(YC)	2...10- or 0...10-VDC airflow setpoint signal input
9 (U)	2...10- or 0...10-VDC airflow feedback signal output
6 (Y1)	Override input
7 (Y2)	Override input

Constant flow	A	B
CLOSED	Off	ON
Min. flow	Off	Off
Max. flow	ON	ON
OPEN	ON	Off

4A: HFB; CU=EM, EK, EC or EE, RH=RM
– cooling with airflow and heating with electric heater

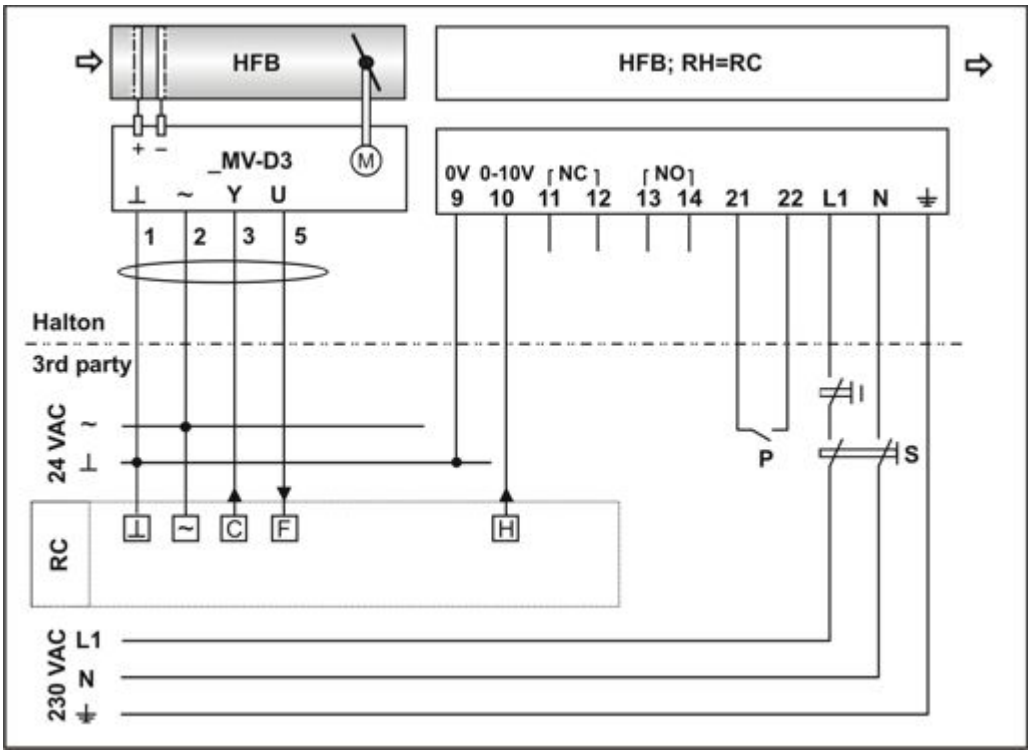


4A. Cooling with airflow and heating with electric heater

Code description

Halton Delivered by Halton
3rd party Delivered by a third party
RH RM electric reheater
1 (G0) 24 VAC system neutral
2 (~) 24 VAC live
3 (w) 2...10- or 0...10-VDC airflow setpoint signal input
5 (U5) 2...10- or 0...10-VDC airflow feedback signal output
RC Room controller
C Airflow setpoint control signal for cooling
F Actual airflow feedback input
S All-pole switch for power supply
I Fan interlock switch
H Heating power output, 230 VAC PWM,
60-second cycle time recommended
L1 230 VAC live
N Neutral
0 Protective earthing

4B: HFB; CU=EM, EK, EC or EE, RH=RC
– cooling with airflow and heating with electric heater

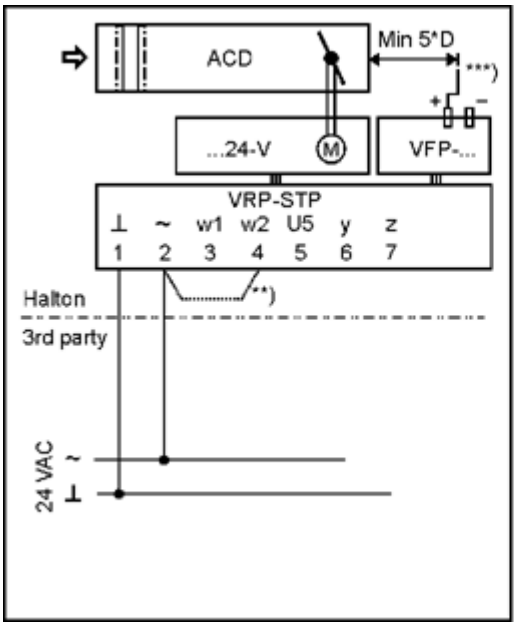


4B. Cooling with airflow and heating with electric heater

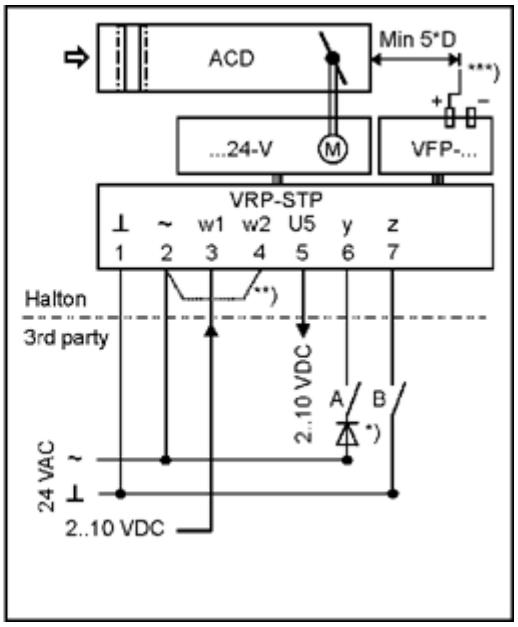
Code description

Halton	Delivered by Halton
3rd party	Delivered by a third party
RH	RC electric reheater
1 (G0)	24 VAC system neutral
2 (~)	24 VAC live
3 (w)	2...10- or 0...10-VDC airflow setpoint signal input
5 (U5)	2...10- or 0...10-VDC airflow feedback signal output
RC	Room controller
C	Airflow setpoint control signal for cooling
F	Actual airflow feedback input
S	All-pole switch for power supply
I	Fan interlock switch
H	Heating power output, 0...10 VDC
P	Airflow or duct pressure interlock switch
L1	230 VAC live
N	Neutral
0	Protective earthing
9	24 VAC system neutral
10	Heating power input, 0...10 VAC
11,12	Alarm output (NC), potential-free, contact closed in alarm
13,14	Alarm output (NO), potential-free, contact open in alarm
21,22	Airflow or duct pressure interlock indication

5A & 5B: HFB; CU=ES or CU=ER
– Typical duct pressure control and overriding controls



5A. Typical duct pressure control



5C. Overriding controls

Code description

Halton Delivered by Halton
3rd party Delivered by a third party
ACD HFB
1 (G0) 24 VAC system neutral
2 (~) 24 VAC live
3 (w1) 0...10 VDC pressure setpoint signal input
5 (U5) 2...10 VDC pressure feedback signal output
6 y Actuator signal
7 z Override input
*) Diode 1N 4007
**) Jumper 2-4 factory-fitted for potentiometer setpoint; remove if 0...10-VDC input w1 is used
**) Minimum safety distance for pressure tab after pressure control damper: 5 x D

Override	A	B
CLOSED	Off	On
Pressure control	Off	Off
OPEN	On	Off

The pressure controller has a setpoint potentiometer for pressure setpoint adjustment.

Commissioning

Airflow control

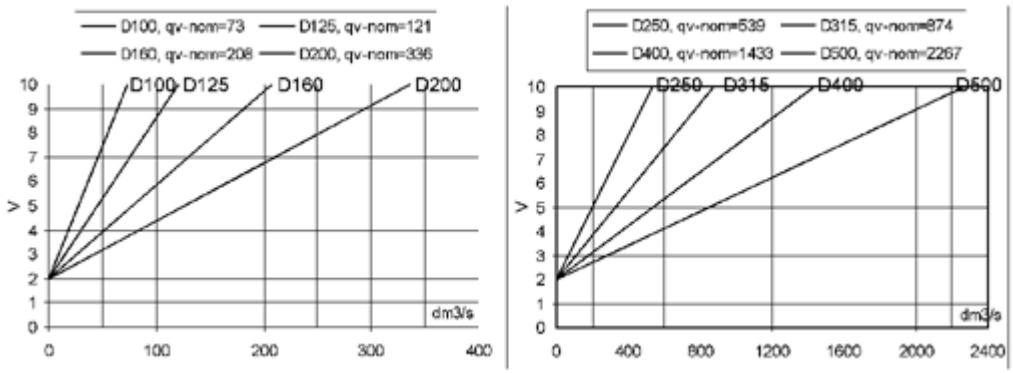
Nominal airflow rates of the Halton HFB are presented in the table below:

NS	qv_nominal l/s	qv_nominal m3/h		NS	qv_nominal l/s	qv_nominal m3/h
100	70	251		250	538	1936
125	115	414		315	885	3188
160	211	758		400	1555	5600
200	340	1226		500	2449	8818

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

Signal	Formula	Controller type and mode	Terminals system neutral	Terminals signal
0...10 VDC	qv=qv_nom*U/10	HFB;CU=EM, EK, EC or EE (LMV-D2-MP/MF HI or NMV-D2-MP/MF HI), mode 0...10 V HFB;CU=EG (GLB181.1E/3)	1 (GND) 2(G0)	5 (U5) 9(U)
2...10 VDC	qv=qv_nom*(U-2)/8	HFB;CU=EM, EK, EC or EE (LMV-D2-MP/MF HI or NMV-D2-MP/MF HI), mode 2...10 V HFB;CU=ED (VRD2+NM24A-V)	1 (GND) 1 (^)	5 (U5) 5 (U5)

The actual airflow rate can also be determined from the pictures below:



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.

$$q_v = k * \sqrt{\Delta P\_m}$$

qv Actual airflow rate [l/s]
k k value of the product

Δp_m Differential pressure of measurement probe [Pa]

The Halton HFB airflow controller is equipped with a pressure sensor, and there is a very low 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.

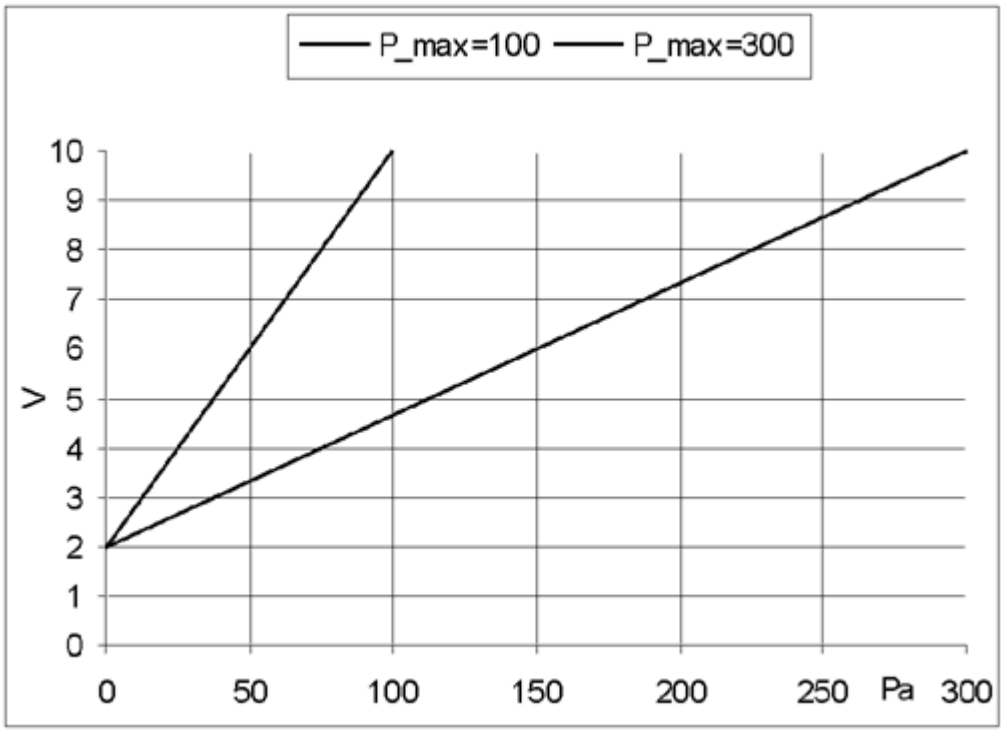
If Halton HFB is ordered without factory pre-set minimum and maximum flow values (FS=NA), minimum flow value will be set to 0 and maximum flow value is equal to nominal flow value.

Duct pressure control

The actual measured airflow rate can be defined by the controller feedback signal and airflow controller nominal airflow.

Signal	Formula	Controller type and mode	Terminals system neutral	Terminals signal
2...10 VDC	Pst=100 Pa * (U-2)/8 Pst=300 Pa * (U-2)/8	HFB;CU=ES (VRP-STP+VFP-100) HFB;CU=ER (VRP-STP+VFP-300)	1 (GND) 1 (GND)	5 (U5) 5(U5)

The actual duct static pressure can also be read from the picture:



Specification

The pressure-independent variable airflow control damper is made of galvanised steel, with an airflow measurement probe of aluminium.

The tightness of the control damper in closed position conforms to standard EN1751 class 4 and casing tightness to EN 1751/C.
Duct connection includes integral airtight rubber gaskets.

The management damper section contains airflow measurement, flow controller and damper actuator.

Design airflow range limits are calibrated at the factory.
Controller settings canbe adjustable on site with a PC or a handheld tool.
The airflow controller has control signal input 0...10 VDC or 2 ...10 VDC and output 0...10 VDC for airflow feedback.
Supply power is 24 VAC.

The damper is equipped with a sound attenuator in order to meet the sound level requirement for the room. As an optional extra, the sound attenuator has an access panel for cleaning purposes.

The airflow controller comprises an electric reheat coil with power supply of 230 VAC. Incorporated within the reheat coil has a safety overheat thermostat with both automatic and manual reset. A 3rd party room controller is needed to control the duct heater with 0...10 VDC control signal.

Order code

HFB/S-D

S = Model
G Damper with blade gasket
H Damper without blade gasket
I Blade gasket, insulation 50 mm
J No blade gasket, insulation 50 mm

D = Connection size
100, 125, 160, 200, 250, 315, 400, 500

Other optios and accessories

MA = Material
CS Steel

CU = Control unit
EM LMV-D3-MF HI

EK NMV-D3-MF HI
EC LMV-D3-MP HI (includes Belimo MP-bus)
EE NMV-D3-MP HI (includes Belimo MP-bus)
ED VRD3+NM24A-V (Belimo)
EG GLB181.1E/3 (Siemens)

FS = Min-max flow values presetting in factory
NA Not assigned
Y Yes

SA = Sound attenuator, connection sizes
NA Not assigned
H1 L = 600 mm; Outlet = inlet; Mineral wool
H2 L = 1000 mm; Outlet = inlet; Mineral wool
H3 L = 600 mm; Outlet = inlet; Polyester fibre
H4 L = 1000 mm; Outlet = inlet; Polyester fibre
H5 L = 600 mm; Outlet > Inlet; Mineral wool
H6 L = 1000 mm; Outlet > inlet; Mineral wool
H7 L = 600 mm; Outlet > inlet; Polyester fibre
H8 L = 1000 mm; Outlet > inlet; Polyester fibre
H11 L = 600 mm; Outlet = inlet; Mineral wool; Access panel
H12 L = 1000 mm; Outlet = inlet; Mineral wool; Access panel
H13 L = 600 mm; Outlet = inlet; Polyester fibre; Access panel
H14 L = 1000 mm; Outlet = inlet; Polyester fibre; Access panel
H15 L = 600 mm; Outlet > Inlet; Mineral wool; Access panel
H16 L = 1000 mm; Outlet > inlet; Mineral wool; Access panel
H17 L = 600 mm; Outlet > inlet; Polyester fibre; Access panel
H18 L = 1000 mm; Outlet > inlet; Polyester fibre; Access panel

RH = Electric reheat coil
NA Not assigned
RM Electric reheater with PWM control signal input (230 VAC, pulse width modulation)
RC Electric reheater with 0...10-VAC control signal input

ZT = Tailored product
N No
Y Yes

Code example

HFB/G-100, MA=CS, CU=EE, FS=NA, SA=NA, RH=NA