

Halton MEI Product Catalogue

Robust HVAC Products for
Naval Vessels



Ventilation fire safety

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Cabin ventilation

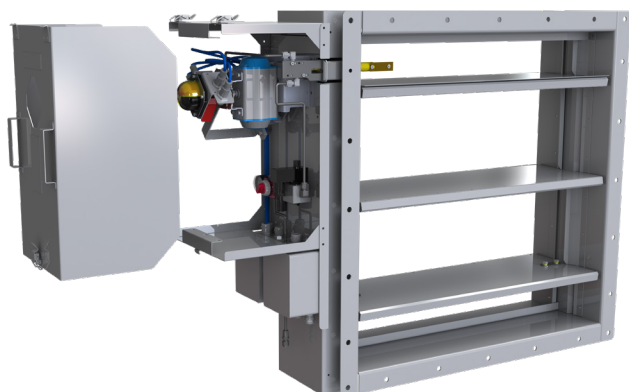
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FDA**A0(A60) FIRE AND GAS DAMPER**

For offshore, marine and navy ventilation systems

**APPLICATIONS**

Halton FDA fire dampers are type-approved class A0(A60) fire and gas dampers for use in offshore, marine and navy ventilation systems. The FDA can be installed in rectangular or circular ducts. All fire dampers have a fusible link and they prevent the spread of fire and gases within the ventilation ductwork. When the blades are in the open position, the device does not cause significant pressure loss, noise or flow disturbance. An open-closed indicator is visible on the outside of the damper. Fire dampers with non-standard dimensions can be supplied on request.

MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Maintenance-free bearings	Oil bronze, Stainless steel EN 1.4404 (AISI316L) available as an option	-
Shafts	Stainless steel EN 1.4404 (AISI316L)	-

FDA PRODUCT OPTIONS

Halton FDA is available with following actuators:

- FDA-EL: Electrical spring return actuator; standard actuators being 24 VAC/DC or 230 VAC or 120 VAC. Depending of the choice of actuator, the actuator might contain built-in open-closed limit switches. Separate junction box included in the EL-model. A wide range of Ex actuators available, including a one second closing time function as an option.
- FDA-PNR: Pneumatic rotating actuator

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

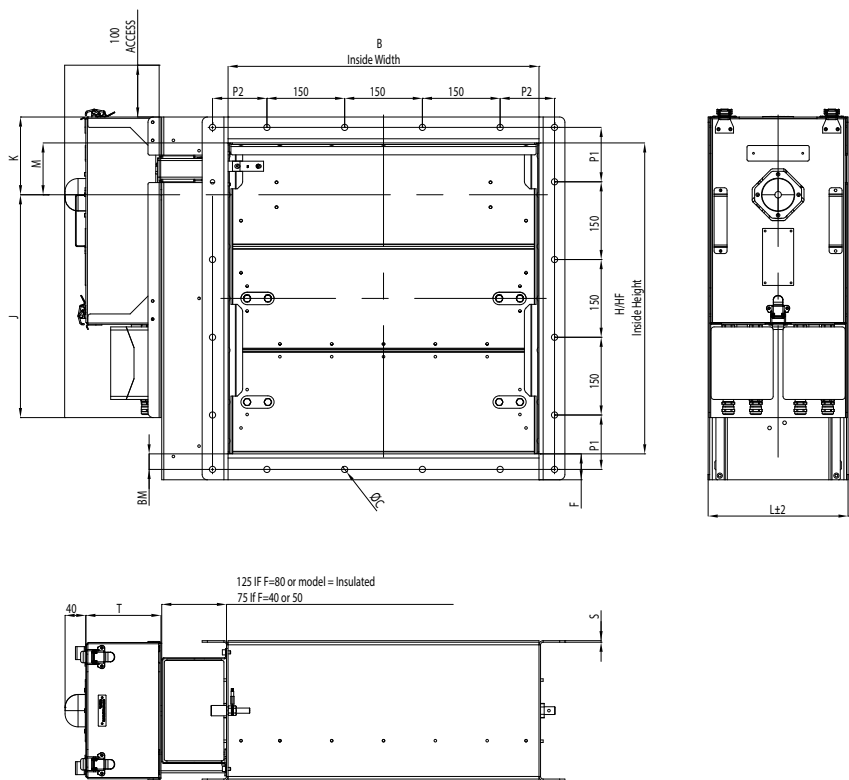
FEATURES

- Type-approved by most recognized classification societies: A0 without insulation, A-15 to A-60 when suitably insulated
- Blades contain stainless steel spring seals for low leakage in normal conditions and thermal expansion graphite seals (effective from 150°C) to seal the damper in case of fire. Silicon sealing as an option
- Closed damper fulfills the requirement of leakage class 3 (EN1751:2014) for size > 300x300 mm and for size > 200x200 mm (silicon seals). Casing leakage class C
- The nominal strip fuse release temperature is 50 °C, 74 °C or 100 °C. Other temperatures available
- Nominal glass bulb fuse release is available as an option with temperatures of 68 °C or 93 °C. Other temperatures available
- Low weight due to double skin blade structure
- Electrical or pneumatic operation system available
- Maximum duct pressure for damper construction 5000 Pa and maximum air velocity 15 m/s
- Normal operation temperature for damper between -50 °C to +80 °C. Actuator and component selection can affect this temperature range. Other temperatures available on request
- Available as ATEX certified
- SIL 2 safety assessment certificate available on specific terms

INSTALLATION

Installation on wall or roof. At wall installation, the blade orientation must always be in a horizontal plane.

GENERAL FDA DRAWINGS



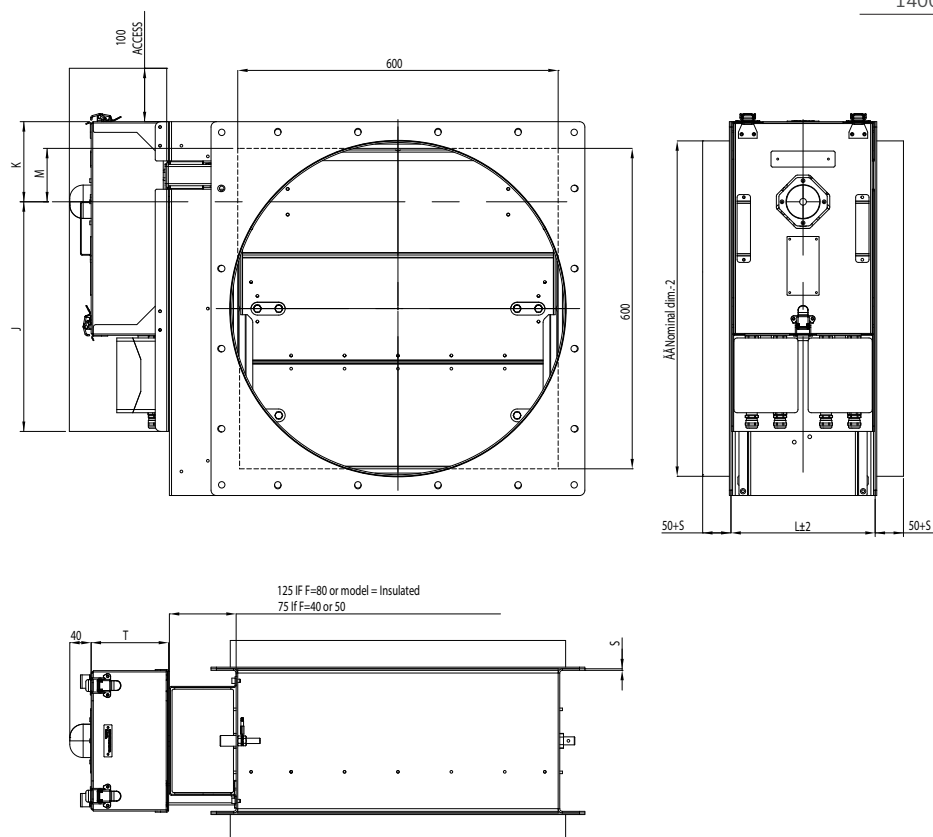
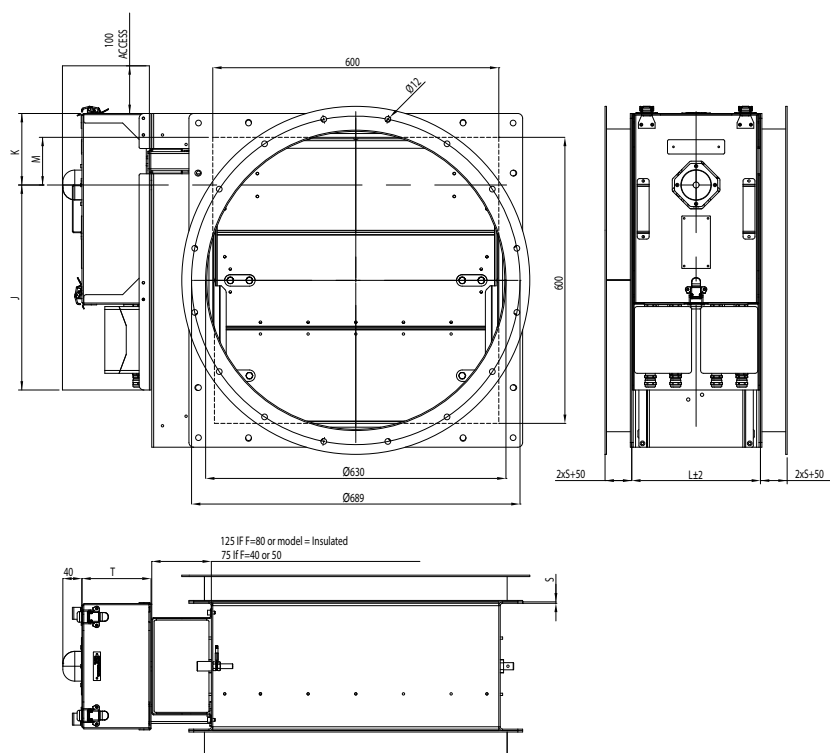
ACTUATOR	J	K	T
AT100	430	150	145
AT100 + Halton smart override	510	150	255
AT200	510	150	165
AT200 + Halton smart override	510	150	275
AT300	510	180	190
AT300 + Halton smart override	510	180	300
Belimo BF	430	150	125
Belimo BF (damper height <200)	430	90	125
Schischek S	430	150	145
Schischek S (damper height <200)	430	90	145
Schischek S + Halton smart override	440	220	235
Schischek M	510	150	175
Schischek M + Halton smart override	440	220	165

MATERIAL THICKNESS	DEPTH
S	L
3	270
4	272
5	275

H NOMINAL HEIGHT	HF FREE HEIGHT	M DRIVE
200	200	100
250	250	125
300	250	125
350	250	125
400	400	100
450	450	125
500	500	125
550	500	125
600	600	100
650	650	125
700	700	125
750	750	125
800	800	100
850	850	125
900	900	125
950	950	125
1000	1000	125
1050	1050	125
1100	1100	125
1150	1150	125
1200	1200	125
1250	1250	125
1300	1300	125
1350	1350	125
1400	1400	125
1450	1450	125
1500	1500	125
1550	1500	125
1600	1500	125

FLANGE DIMENSIONS ACCORDING TO ISO 15138

Nominal duct size (Ø D)	Bolt circle (Ø E)	Bolt hole size (Ø C)	Number of bolts
100	145	10	4
125	170	10	4
150	195	10	4
160	205	10	4
200	245	10	8
250	295	10	8
275	320	10	8
300	345	10	8
315	360	10	8
355	400	10	8
400	459	12	8
450	509	12	12
500	559	12	12
560	619	12	12
600	659	12	16
630	689	12	16
700	759	12	16
710	769	12	16
800	859	12	24
900	959	12	24
1000	1059	12	24
1120	1209	14	24
1200	1289	14	32
1250	1339	14	32
1400	1489	14	32



FDA DIMENSIONS AND MATERIAL THICKNESS

FDA fire dampers meet international standards for both rectangular (width B 200-1200 mm with 25 mm division and height H 200-1600 mm with 50 mm division) and circular ducts (Ø200-1250 mm). Modular constructions up to 2500x2600 mm available.

Non-standard dimensions and flange drilling available on request. Standard flanges and drilling according to ISO 15138 standards. Frame thickness 3 mm or 3-5 mm according to SOLAS. Blades are made of two sheets, each of being 1 mm thick (sandwich design).

FRAME THICKNESS ACCORDING TO SOLAS

DIMENSIONS	S
If B or H $\geq$ 100 and $\leq$ 449	3
If B or H $\geq$ 450 and $\leq$ 649	4
If B or H $\geq$ 650	5

EDITION DEC. 2015

DIMENSIONS	S
If A < 0.075 m ²	3
If A $\geq$ 0.075 and A $\leq$ 0.45 m ²	4
If A > 0.45 m ²	5

FLANGE DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	ØC	F	P1	P2	BM
If longest side < 350	10	40	75...150	75...150	20
If longest side 351...1000	12	50	75...150	75...150	30
If longest side > 1001	14	80	75...150	75...150	40

CIRCULAR FLANGE DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	Ø C	F
If Ø D $\leq$ 355	10	40
If Ø D 356...1000	12	50
If Ø D $\geq$ 1001	14	80

OPERATION PRINCIPLE

In the event of a temperature rise in ductwork:

- FDA-EL: fusible link releases and cuts off operating voltage to the spring return motor, allowing the spring to close the damper blades. The fire damper opens automatically when the fuse has been changed and the operating voltage to the motor is re-established.
- FDA-PNR: fusible link releases and cuts off operating pressure to the spring return actuator, allowing springs to close the damper blades. The fire damper opens automatically when the fuse has been changed and the pneumatic air supply is re-established.

WEIGHTS**STANDARD HALTON FDA DAMPERS (KG) WITHOUT AN ACTUATOR. FRAME THICKNESS 3 MM.**

H / HEIGHT (mm)	B / WIDTH (mm)										
	200	300	400	500	600	700	800	900	1000	1100	1200
200	18	20	23	26	29	32	35	38	40	43	46
300	21	24	27	29	32	35	38	41	44	47	49
400	26	29	33	36	39	42	46	49	52	56	59
500	30	33	36	40	43	46	50	53	56	59	63
600	35	39	42	46	50	54	57	61	65	69	72
700	39	42	46	50	54	57	61	65	69	72	76
800	44	48	52	56	60	65	69	73	77	81	86
900	47	52	56	60	64	68	73	77	81	85	89
1000	51	55	60	64	68	72	76	81	85	89	93
1100	56	61	66	70	75	80	84	89	93	98	103
1200	60	65	69	74	79	83	88	93	97	102	106
1300	65	70	75	80	86	91	96	101	106	111	116
1400	69	74	79	84	89	94	99	105	110	115	120
1500	73	78	83	88	93	98	103	108	113	119	124
1600	76	82	87	92	97	102	107	112	117	122	127

Approximate weights without an actuator. Flanges according to ISO 15138.

**STANDARD HALTON FDA DAMPERS (KG) WITHOUT AN ACTUATOR.
FRAME THICKNESS ACCORDING TO SOLAS (BASED ON LONGEST DUCT SIDE).**

H / HEIGHT (mm)	B / WIDTH (mm)										
	200	300	400	500	600	700	800	900	1000	1100	1200
200	18	21	24	31	34	43	48	52	56	60	65
300	21	24	27	35	38	48	52	57	61	65	69
400	26	30	33	42	46	57	62	66	71	76	80
500	34	38	42	46	50	62	67	72	76	81	86
600	40	45	49	54	58	71	76	81	86	92	97
700	50	56	61	66	71	76	81	87	92	97	102
800	57	63	68	74	79	85	91	96	102	107	113
900	62	68	73	79	85	90	96	101	107	113	118
1000	68	73	79	84	90	95	101	107	112	118	123
1100	74	80	86	92	98	104	110	116	122	128	134
1200	79	85	91	97	103	110	116	122	128	134	140
1300	86	92	99	105	112	118	125	131	138	144	151
1400	91	98	104	111	117	124	130	137	143	150	156
1500	96	103	109	116	122	129	135	142	148	155	161
1600	102	108	115	121	128	134	141	147	154	160	166

Approximate weights without an actuator. Flanges according to ISO 15138.

STANDARD HALTON FDA DAMPERS (KG) WITHOUT AN ACTUATOR.
FRAME THICKNESS ACCORDING TO SOLAS EDITION DEC. 2015 (BASED ON DUCT CROSS-SECTION AREA).

H / HEIGHT (mm)	B / WIDTH (mm)										
	200	300	400	500	600	700	800	900	1000	1100	1200
200	18	21	27	31	34	38	41	45	48	52	55
300	21	28	31	35	38	42	45	49	52	56	60
400	30	34	38	42	46	50	54	58	62	66	80
500	34	38	42	46	50	54	58	62	76	81	86
600	40	45	49	54	58	62	76	81	86	92	97
700	45	49	54	58	63	76	81	87	92	97	102
800	51	56	60	65	79	85	91	96	102	107	113
900	55	60	65	70	85	90	96	101	107	113	118
1000	60	65	70	84	90	95	101	107	112	118	123
1100	66	71	76	92	98	104	110	116	122	128	134
1200	70	75	91	97	103	110	116	122	128	134	140
1300	76	82	99	105	112	118	125	131	138	144	151
1400	80	86	104	111	117	124	130	137	143	150	156
1500	85	91	109	116	122	129	135	142	148	155	161
1600	90	108	115	121	128	134	141	147	154	160	166

Approximate weights without an actuator. Flanges according to ISO 15138.

PNEUMATIC ACTUATORS FOR FDA ACCORDING TO SIZE OF THE DAMPER

H / HEIGHT (mm)	B / WIDTH (mm)										
	200	300	400	500	600	700	800	900	1000	1100	1200
200	AT100	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200
300	AT100	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200
400	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200
500	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200
600	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT300	AT300
700	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT300	AT300
800	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300
900	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300
1000	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300
1100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300
1200	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300
1300	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300
1400	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300
1500	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300
1600	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300

Approximate weights of pneumatic rotary actuator Air Torque. FDA-PNR AT101 as aluminium +1,8 kg, AT104 as stainless steel 4,0 kg, AT201 as aluminium +3,2kg, AT204 as stainless steel +6,4 kg, AT301 as aluminium +6,0 kg, AT304 as stainless steel +13,3 kg.
Other actuators available on request.

ELECTRIC ACTUATORS FOR FDA ACCORDING TO SIZE OF THE DAMPER

H / HEIGHT (mm)	B / WIDTH (mm)										
	200	300	400	500	600	700	800	900	1000	1100	1200
200	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF
300	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF
400	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF
500	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF
600	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF
700	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF
800	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
900	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1000	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1100	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1200	Ex/Inmax-15-SF	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1300	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1400	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1500	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1600	Ex/Inmax-15-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-30-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF

Electric rotary actuator Schischek ExMax or InMax.

Actuator options	Closing time	Material	Weight (appr.)
Ex/InMax-15-SF	3 seconds	Aluminium	3,5 kg
Ex/InMax-15-SF	3 seconds	Stainless steel	7,0 kg
Ex/InMax-15-SF1	1 second	Aluminium	3,5 kg

Electric rotary actuator Schischek ExMax or InMax.

Actuator options	Closing time	Material	Weight (appr.)
Ex/InMax-15-SF1	1 second	Stainless steel	7,0 kg
Ex/InMax-30-SF3	3 seconds	Aluminium	9,5 kg
Ex/InMax-50-SF3	3 seconds	Aluminium	9,5 kg

FDO A0(A60) FIRE AND GAS DAMPER

For offshore, marine and navy ventilation systems



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI316L)	-
Shafts	Stainless steel EN 1.4404 (AISI316L)	-

FDO PRODUCT OPTIONS

Halton FDO is available with following actuators:

- FDO-EL: Electrical spring return motor; standard actuators being 24 V or 230 V or 120 V. The motor contains built-in open-closed limit switches. Separate junction box included in the EL-model. A wide range of Ex actuators available, including a one second closing time function as an option.
- FDO-PNR: Pneumatic rotating actuator
- FDO-SP: Manual spring-actuated damper with fusible link

DOT: manual override function available for PNR and EL models.

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

APPLICATIONS

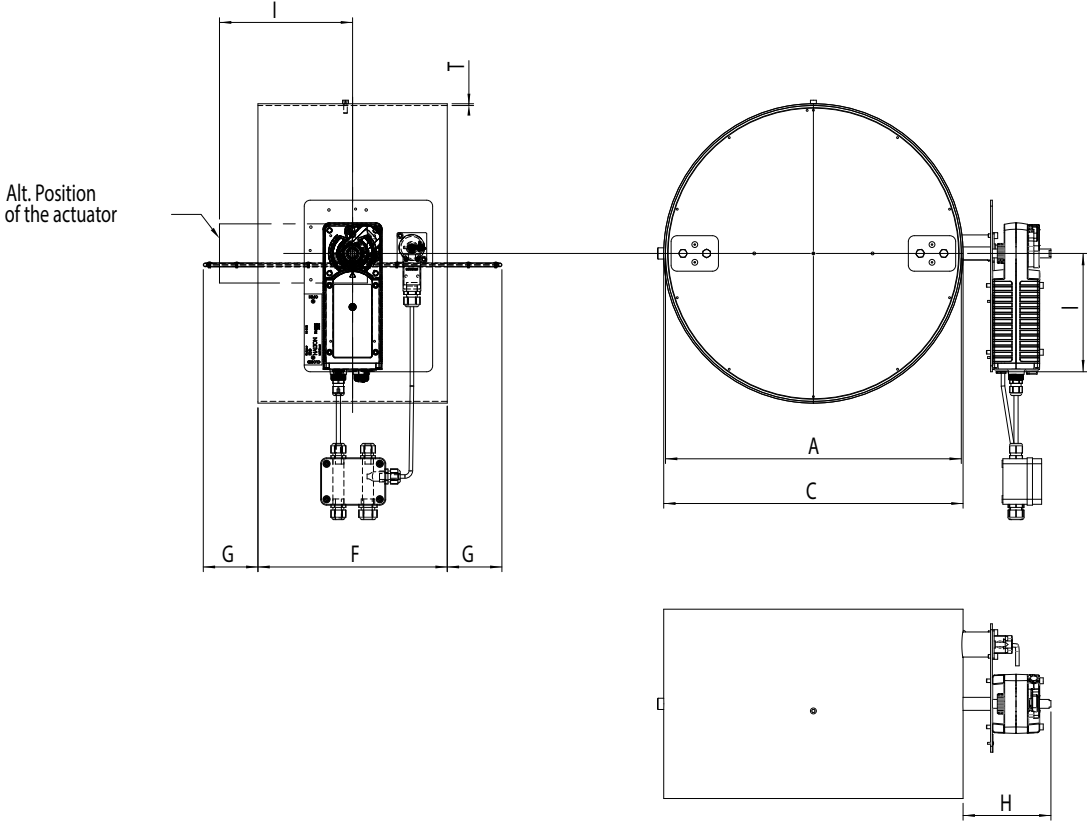
Halton FDO fire dampers are type-approved class A0(A60) fire dampers for use in offshore, marine and navy ventilation systems. The FDO can be installed in circular ducts. All fire dampers have a fusible link and they prevent the spread of fire within the ventilation ductwork. When the blade is in the open position, the device does not cause significant pressure loss, noise or flow disturbance. Fire dampers are set from outside and can be installed in any position. An open-closed indicator is visible on the outside of the damper.

FEATURES

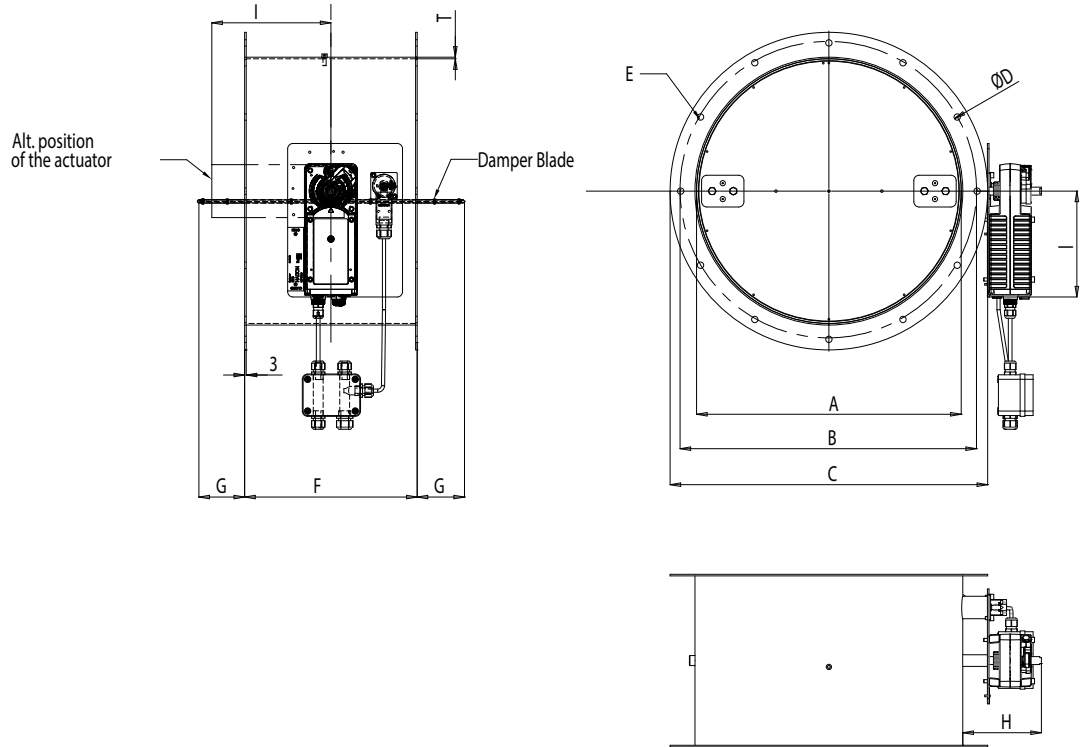
- Type-approved by the most recognized classification societies: class A0 - A60 fire damper when suitably insulated
- Fixed frame of painted, galvanized or stainless steel. Blades stainless or galvanized steel. Flanges available as an option
- The blade contains seals (effective up to 270 °C)
- The nominal fuse release temperature is 50 °C, 74 °C or 100 °C. Other temperatures available
- Very low leakage. See below table
- Automatic electrical, pneumatic or spring operation system available
- Maximum duct pressure for damper construction
- 5000 Pa and maximum air velocity 15 m/s
- The normal operating temperature for the damper is between -50 °C to +80 °C. Actuator and component selection can affect this temperature range. Other temperatures available on request
- Available as ATEX approved
- SIL 2 safety assessment certificate available on specific terms

GENERAL FDO DRAWINGS

WITHOUT FLANGES



WITH FLANGES



FDO LEAKAGE CLASS ACCORDING TO STANDARD**EN1751:2014**

SIZE ØD (mm)	CLOSED DAMPER LEAKAGE	CASING LEAKAGE
100	2	C
125	2	C
160	3	C
200	3	C
250	3	C
315	3	C
400	3	C
500	4	C

FDO DIMENSIONS AND MATERIAL THICKNESS

FDO fire dampers meet international standards for circular ducts (Ø100-500 mm). Sizes Ø100 and Ø125 are not available of stainless steel. Sizes starting from Ø160 can be manufactured with 1 mm division. Flanges and drilling available as an option and according to ISO 15138 standards. Special flanges and drilling available on request. Frame material thickness 3 mm or according to SOLAS. Flap is made of two sheets, each of being 1 mm thick (riveted together).

FDO DIMENSIONS WITHOUT FLANGES (STANDARD)

Damper size Ø	Inside dimensions A	Outside dimensions C	Material thickness T	Housing Length F	Blade G	FDO-EL				FDO-PNR				FDO-SP	
						Elodrive CSQP /Schischek		Belimo BF		Air Torque AT50		Air Torque AT100		Spring	
						H	I	H	I	H	I	H	I	H	I
100	100,8	108	3,6	200	-	150	200	115	200	145	215	165	215	150	115
125	125	133	4	200	-	150	200	115	200	145	215	165	215	150	115
160	160	166	3	200	-	150	200	115	200	145	215	165	215	150	115
200	200	206	3	320	-	150	200	115	200	145	215	165	215	150	115
250	250	256	3	320	-	150	200	115	200	145	215	165	215	150	115
315	315	321	3	320	-	150	200	115	200	145	215	165	215	150	115
400	400	408	4	320	43	150	200	115	200	145	215	165	215	150	115
500	500	508	4	320	93	150	200	115	200	145	215	165	215	150	115

FDO DIMENSIONS WITH FLANGES (AS AN OPTION)

Damper size Ø	Inside dimensions A	Bolt circle B	Outside dimensions C	Material thickness T	Bolt holes D	Bolt holes Qty E	Housing Length F	Blade G	FDO-EL				FDO-PNR		FDO-SP	
									Elodrive CSQP /Schischek		Belimo BF		Air Torque AT 50		Spring	
									H	I	H	I	H	I	H	I
100	100,8	120	200	3,6	8,5	4	206	-	150	200	115	200	135	105	150	115
125	125	150	225	4	8,5	4	206	-	150	200	115	200	135	105	150	115
160	160	185	260	3	8,5	4	206	-	150	200	115	200	135	105	150	115
200	200	225	300	3	8,5	4	326	-	150	200	115	200	135	105	150	115
250	250	280	350	3	12	4	326	-	150	200	115	200	135	105	150	115
315	315	355	415	3	12	8	326	-	150	200	115	200	135	105	150	115
400	400	450	500	3	12	8	326	40	150	200	115	200	135	105	150	115
500	500	560	600	3	12	12	326	90	150	200	115	200	135	105	150	115

OPERATION PRINCIPLE

In the event of a temperature rise in ductwork:

- FDO-EL: fusible link releases and cuts off operating voltage to the spring return motor, allowing the spring to close the damper blades. The fire damper opens automatically when the fuse has been changed and the operating voltage to the motor is re-established.
- FDO-PNR: fusible link releases and cuts off operating pressure to the spring return actuator, allowing springs to close the damper blades. The fire damper opens automatically when the fuse has been changed and the pneumatic air supply is re-established.
- FDO-SP: fusible link releases allowing the spring to close the damper blades. When the fuse has been changed, the fire damper must be reset into open position manually.

WEIGHTS

STANDARD HALTON FDO DAMPERS (KG) WITHOUT AN ACTUATOR

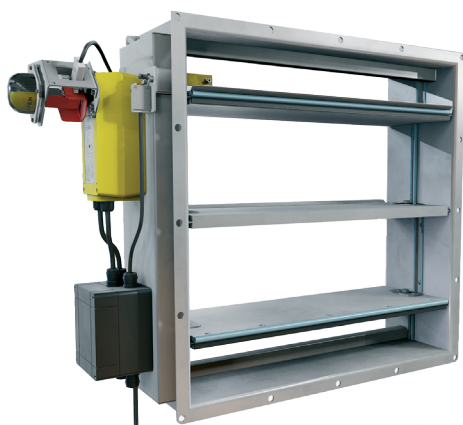
FDO WEIGHT WITHOUT FLANGES	
Size ØD (mm)	KG
100	4
125	4,5
160	4,6
200	7,5
250	9
315	12
400	17
500	22,5

FDO WEIGHT WITH FLANGES	
Size ØD (mm)	KG
100	5
125	5,7
160	6,1
200	9,5
250	11
315	14,5
400	20,1
500	26,3

Weights stated above do not include flanges or any actuator.
Examples of actuator weights: FDO-EL CSQP +3,5 kg, BF230 +3,2 kg, BLF230 +1,7 kg, ExMax or RedMax or InMax +3,5 kg, FDO-PNR AT100 (AISI) +6,2 kg, AT50 (AISI) +3 kg, FDO-SP +1 kg.

FDB2 A0(A60) FIRE AND GAS DAMPER

For offshore, marine and navy ventilation systems



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI316L)	-
Shafts	Stainless steel EN 1.4404 (AISI316L)	-

FDA PRODUCT OPTIONS

Halton FDB2 is available with following actuators:

- FDB2-EL: Electrical spring return motor; standard actuators being 24 V or 230 V or 120 V. The motor contains built-in open-closed limit switches. Separate junction box included in the EL-model. A wide range of Ex actuators available, including a one second closing time function as an option.
- FDB2-PNR: Pneumatic rotating actuator
- FDB2-SP: Manual spring-actuated damper with fusible link

DOT: manual override function available for PNR and EL models.

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

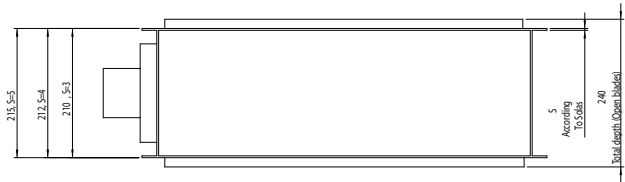
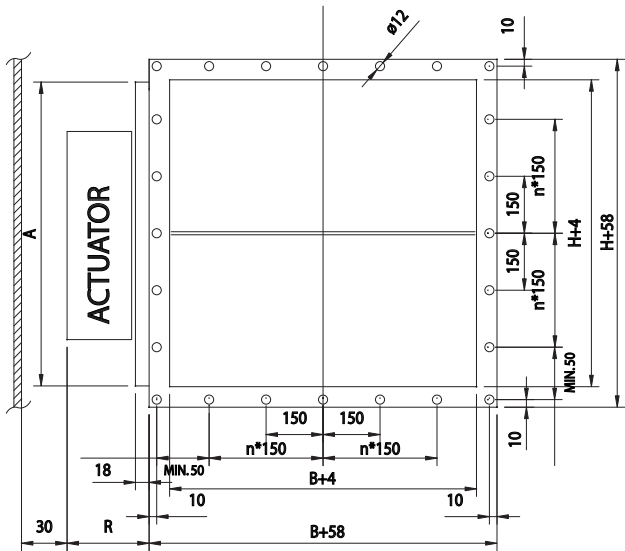
APPLICATIONS

Halton FDB2 fire dampers are type-approved class A0(A60) fire and gas dampers for use in offshore, marine and navy ventilation systems. The FDB2 can be installed in rectangular or circular ducts. All fire dampers have a fusible link and they prevent the spread of fire and gases within the ventilation ductwork. When the blades are in the open position, the device does not cause significant pressure loss, noise or flow disturbance. Fire dampers are set from outside and can be installed in any position. An open-closed indicator is visible on the outside of the damper. Fire dampers with non-standard dimensions can be supplied on request.

FEATURES

- Type-approved by the most recognized classification societies: class A0 without insulation, A15-A60 when suitably insulated
- Shock and vibration tested
- Blades contain silicone seals (effective up to 300 °C) for low leakage in normal conditions and thermal expansion graphite seals (effective from 150 °C) to increase tightness even up to 50% in a case of fire
- A closed damper fulfils the requirement of leakage (EN1751:2014) from class 1 to class 3 depending on the size. Details available from Halton
- Casing leakage (EN1751:2014) class B
- The nominal fuse release temperatures are 50 °C, 74 °C or 100 °C. Other temperatures available
- Low weight due to patented double skin blade structure
- Automatic electrical, pneumatic or spring operation system available
- Maximum duct pressure for damper construction 5000 Pa and maximum air velocity 15 m/s
- The normal operating temperature for the damper is between -50 °C to +80 °C. Actuator and component selection can affect this temperature range. Other temperatures available on request
- Available as ATEX certified
- SIL 2 safety assessment certificate available on specific terms

GENERAL FDB2 DRAWINGS



DAMPER HEIGHT	TOTAL DEPTH WITH BLADES OPEN
< 250 mm	210 mm
≥ 250 mm < 300 mm	250 mm
≥ 300 mm < 349 mm	210 mm
≥ 350 mm	240 mm

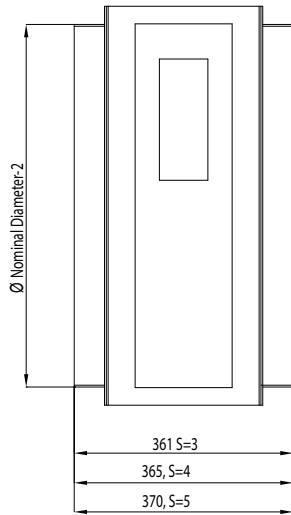
FDB2 DIMENSIONS AND MATERIAL THICKNESS

FDB2 fire dampers meet international standards for both rectangular (width B 100-1200 mm and height H 100-1600 mm, 1 mm division) and circular ducts (Ø100-1250 mm). Modular constructions are available for bigger sizes. Non-standard dimensions and flange drilling available on request. Standard flange width 27 mm. Flanges and drilling also available according to ISO 15138 standards. Frame thickness 3 mm or 3-5 mm according to SOLAS. Also 6, 8 and 10 mm frame thicknesses are available on request. Blades are made of two sheets, each of them being 1 mm thick (sandwich design).

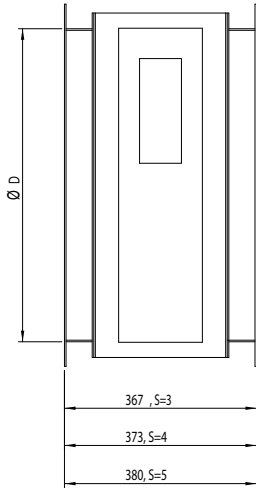
FRAME THICKNESS ACCORDING TO SOLAS

DIMENSIONS	S
If B or H ≥ 100 and ≤ 449	3
If B or H ≥ 450 and ≤ 649	4
If B or H ≥ 650	5

FDB2 CIRCULAR CONNECTIONS



FDB2 CIRCULAR, WITH CONNECTION FLANGES



ACTUATOR EFFECT ON DIMENSIONS

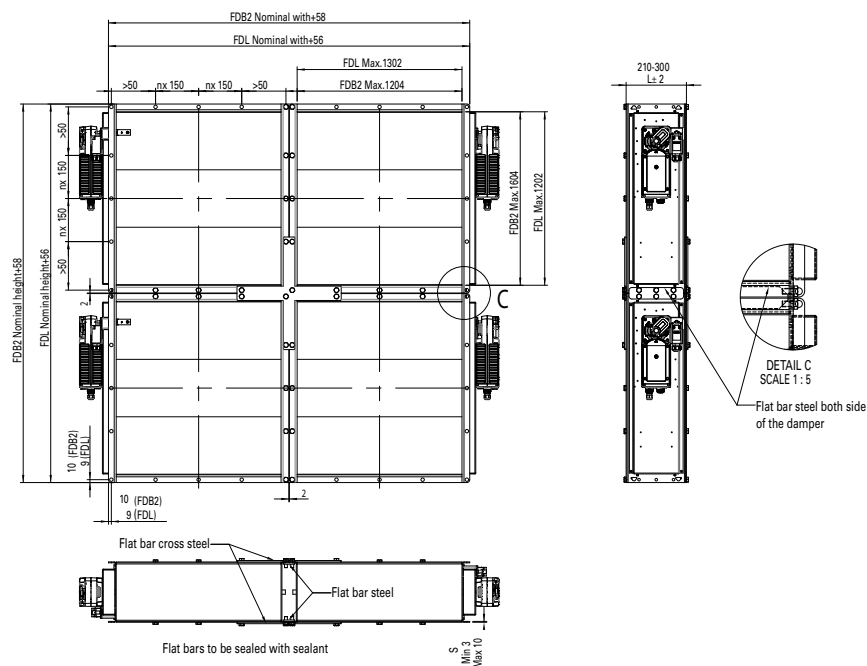
ACTUATOR		DIMENSIONS	
		R	A
Electrical	BF230, BF24, BF120	100	H ≤ 300 = 300 H > 300 = H
Pneumatic PNR	Pneumatic rotating actuator AT100	170	H ≤ 300 = 300 H > 300 = H
Pneumatic PNR	Pneumatic rotating actuator AT200	190	H ≤ 350 = 350 H > 350 = H
Spring	Spring	140	H

The above table contains only some examples of actuators and their effect on dimensions.

EDITION DEC. 2015

DIMENSIONS	S
If A < 0.075 m2	3
If A ≥ 0.075 and A ≤ 0.45 m2	4
If A > 0.45 m2	5

GENERAL FDB2 MODULE ASSEMBLY



Size limitation: nominal width 2060 mm x nominal height 3260 mm or nominal width 2460 mm x nominal height 2860 mm

OPERATION PRINCIPLE

In the event of a temperature rise in ductwork:

- FDB2-EL: fusible link releases and cuts off operating voltage to the spring return motor, allowing the spring to close the damper blades. The fire damper opens automatically when the fuse has been changed and the operating voltage to the motor is re-established.
- FDB2-PNR: fusible link releases and cuts off operating pressure to the spring return actuator, allowing springs to close the damper blades. The fire damper opens automatically when the fuse has been changed and the pneumatic air supply is re-established.
- FDB2-SP: fusible link releases allowing the spring to close the damper blades. When the fuse has been changed, the fire damper must be reset into open position manually.

WEIGHTS

STANDARD HALTON FDB2 DAMPERS (KG) WITHOUT AN ACTUATOR

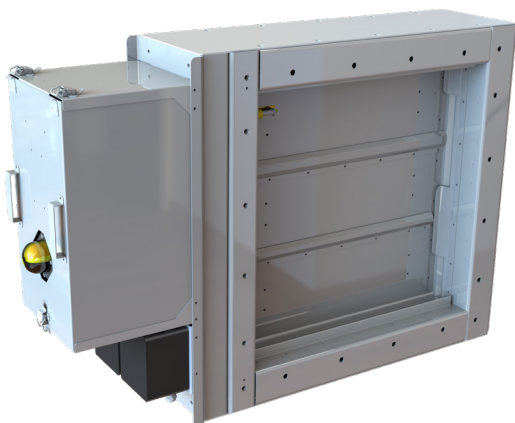
H / HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	WEIGHT (kg)
	100	200	300	400	500	600	700	800	900	1000	1100	1200		
100	5 (5)	7 (7)	9 (9)	10 (10)	12 (13)	14 (15)	15 (22)	17 (25)	19 (27)	20 (30)	22 (32)	24 (35)	100	8 (8)
200	7 (7)	9 (9)	11 (11)	12 (12)	14 (16)	16 (18)	18 (26)	20 (28)	22 (31)	23 (34)	25 (36)	27 (39)	125	8 (8)
300	9 (9)	11 (11)	13 (13)	15 (15)	17 (19)	19 (21)	21 (30)	23 (32)	25 (35)	27 (38)	29 (41)	31 (43)	160	12 (12)
400	11 (11)	13 (13)	15 (15)	17 (17)	20 (22)	22 (24)	24 (33)	26 (36)	28 (39)	30 (42)	32 (45)	34 (48)	200	13 (13)
500	13 (16)	16 (19)	18 (22)	21 (25)	23 (27)	25 (30)	28 (38)	30 (41)	32 (44)	35 (47)	37 (50)	39 (54)	250	19 (19)
600	15 (18)	18 (21)	20 (24)	23 (27)	25 (30)	28 (33)	30 (41)	33 (45)	35 (48)	38 (51)	40 (55)	43 (58)	315	20 (20)
700	18 (25)	21 (28)	23 (32)	26 (35)	29 (39)	32 (42)	34 (46)	37 (50)	40 (53)	42 (57)	45 (60)	48 (64)	400	27 (27)
800	20 (27)	23 (31)	25 (35)	28 (38)	31 (42)	34 (46)	37 (50)	40 (53)	43 (57)	46 (61)	49 (64)	51 (68)	500	35 (43)
900	22 (31)	25 (35)	28 (39)	32 (42)	35 (46)	38 (50)	41 (54)	44 (58)	47 (62)	50 (66)	53 (70)	56 (74)	630	46 (62)
1000	24 (33)	27 (37)	31 (41)	34 (45)	37 (50)	40 (54)	44 (58)	47 (62)	50 (66)	53 (70)	57 (74)	60 (78)	800	62 (89)
1100	26 (36)	30 (41)	33 (45)	37 (49)	40 (54)	44 (58)	47 (62)	51 (67)	54 (71)	58 (75)	61 (79)	65 (84)	1000	83 (118)
1200	28 (39)	32 (44)	36 (48)	39 (52)	43 (57)	46 (61)	50 (66)	54 (70)	57 (75)	61 (79)	65 (84)	68 (88)	1250	113 (162)
1300	31 (42)	35 (47)	38 (52)	42 (56)	46 (61)	50 (66)	54 (70)	58 (75)	62 (80)	65 (84)	69 (89)	73 (94)		
1400	32 (45)	37 (50)	41 (55)	45 (59)	49 (64)	53 (69)	57 (74)	61 (79)	65 (84)	69 (88)	73 (93)	77 (98)		
1500	35 (48)	39 (53)	43 (58)	48 (63)	52 (68)	56 (73)	60 (78)	65 (83)	69 (89)	73 (94)	77 (99)	82(104)		
1600	36 (51)	41 (56)	45 (61)	50 (66)	54 (72)	59 (77)	63 (82)	67 (87)	72 (92)	76 (98)	81 (103)	85 (108)		

(Frame thickness according to SOLAS)

Examples of actuator weights: FDB2-EL GGA 326.1E 2,3 kg, GNA 326.1E 1,3 kg, BF230 +3,2 kg, BLF230 +1,7 kg, ExMax/Redmax +3,5 kg, CSQP +3 kg, FDB2-PNR AT100 +2,1 kg, AT100 as AISI316 4,4 kg, AT200 +3,2 kg, AT200 as AISI316 +6,2 kg, FDB2-SP +1 kg.
Control enclosure +4 kg.

FDH H0(H120) FIRE AND GAS DAMPER

For offshore and onshore ventilation systems



MATERIALS

PART	MATERIAL	FINISHING
Frame	Stainless steel EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Blades	Stainless steel EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI316L)	-
Shafts	Stainless steel EN 1.4404 (AISI316L)	-

FDH PRODUCT OPTIONS

Halton FDH is available with following actuators:

- FDH-EL: Electrical spring return motor; standard actuators being 24 VAC/DC or 230 VAC or 120 VAC. Depending of the choice of actuator, the actuator might contain built-in open-closed limit switches. Separate junction box included in the EL-model. A wide range of ex-proof actuators available, including a one second closing time function as an option.
- FDH-PNR: Pneumatic rotating actuator. Junction box available as an option.

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

APPLICATIONS

Halton FDH fire and gas dampers are type-approved class H0(H120) fire and gas dampers for use in offshore and onshore ventilation systems. FDH dampers are used to protect the integrity of bulkheads and decks where they are penetrated by ventilation ducts. The Halton FDH dampers can be installed in rectangular or circular ducts. Dampers have a fusible link and they prevent the spread of fire and gases within the ventilation ductwork. When the blades are in a open position, the device does not cause significant pressure loss, noise or flow disturbance. An open-closed beacon is visible on the outside of the damper.

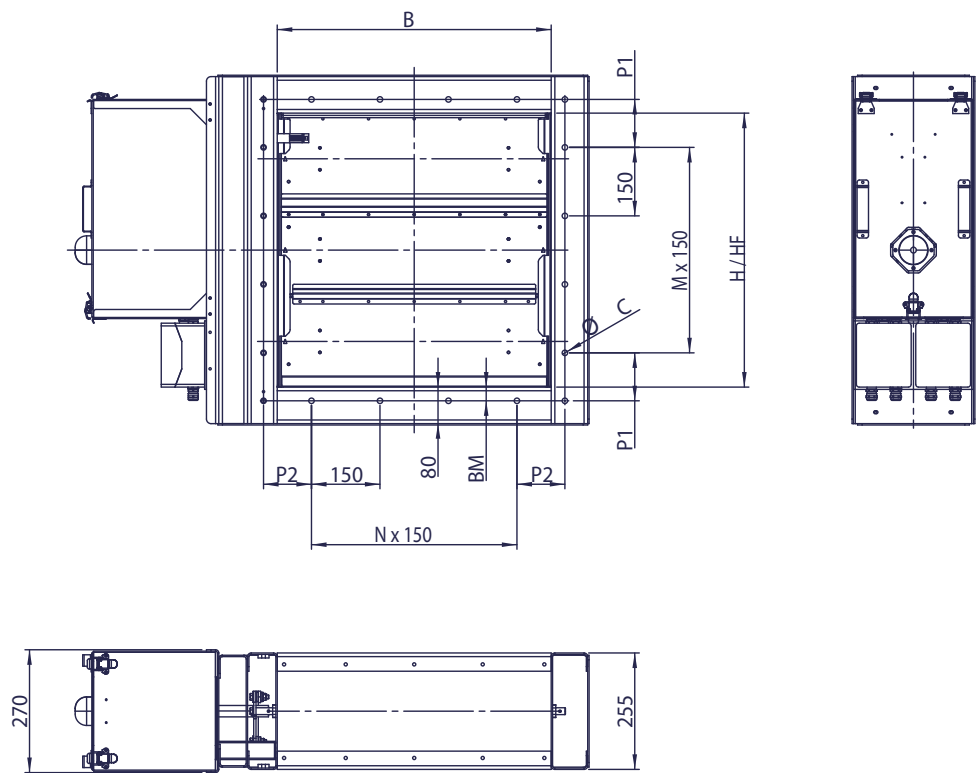
FEATURES

- Type-approved by the most recognized classification societies: class H0(H120) fire damper when suitably insulated. Pre-insulated H0(H60) with ceramic wool at the factory. H0(H120) with additional insulation on site. Blades insulated with ceramic wool
- Blades contain stainless spring steel seals for low leakage in normal conditions and thermal expansion graphite seals (effective from 150 °C) to seal the damper in case of fire
- A closed damper fulfils the requirement of leakage class 3 (EN1751:2014) for size > 300x300 mm. Casing leakage class C
- Fixed frame and blades of stainless steel
- The nominal fuse release temperatures are 50 °C or 74 °C
- With automatic electrical or pneumatic operation system
- Maximum duct pressure for damper construction 5000 Pa and maximum air velocity 15 m/s
- Available as ATEX certified
- SIL 2 safety assessment certificate available on specific terms

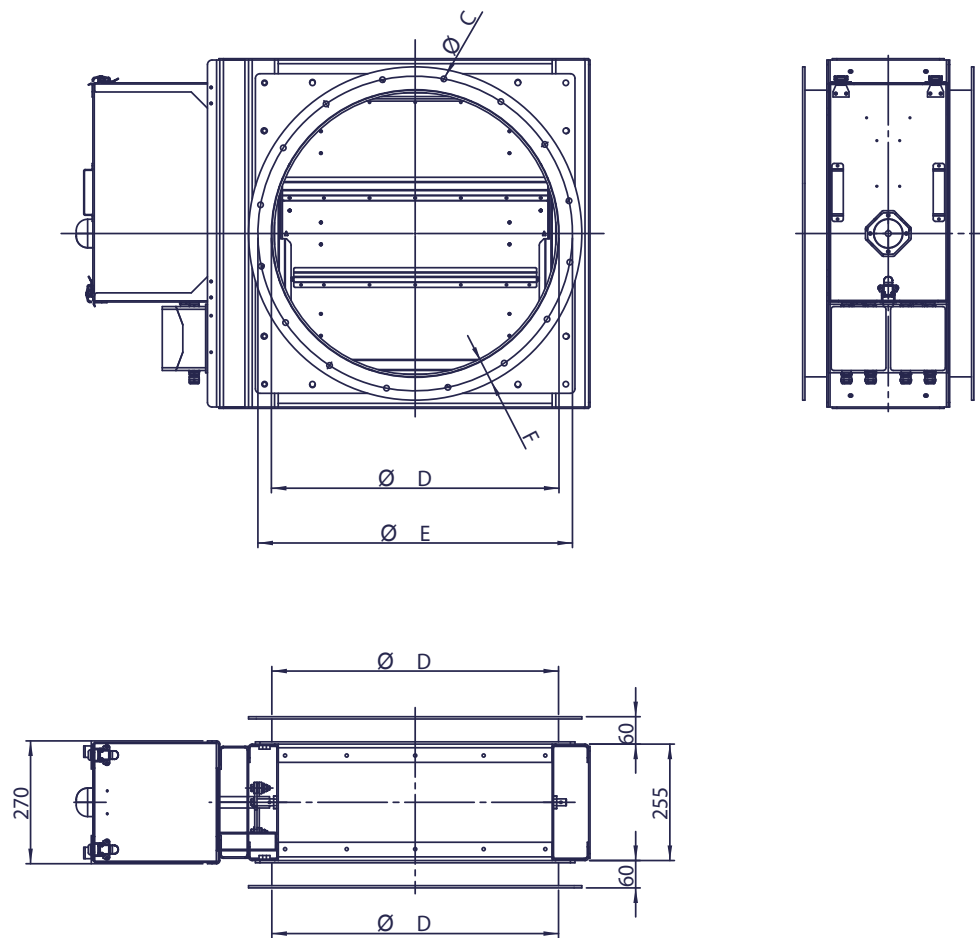
INSTALLATION

Installation on wall or roof. At wall installation, the blade orientation must always be in a horizontal plane.

GENERAL FDH DRAWINGS



FDH CIRCULAR CONNECTIONS



FDH DIMENSIONS AND MATERIAL THICKNESS

FDH fire dampers are manufactured for both rectangular (width B 250-1200 mm with 25 mm division and height H 250-1200 mm with 50 mm division) and circular ducts (Ø250-1250 mm).

Non-standard dimensions and flange drilling available on request. Standard flange drilling pattern according to ISO 15138.

Standard frame material thickness 3 mm for size < 600 mm and 5 mm for sizes over 600 mm. Blades are made of two sheets each of them being 1 mm thick. Blades are pre-insulated with ceramic wool.

STANDARD FDH DIMENSIONS (BXH)

B	H	HF
250	250	250
300	300	250
350	350	250
400	400	400
450	450	400
500	500	400
550	550	550
600	600	600
650	650	650
700	700	700
750	750	750
800	800	800
850	850	850
900	900	900
950	950	950
1000	1000	1000
1050	1050	1050
1100	1100	1100
1150	1150	1150
1200	1200	1200

H = nominal height, HF = free height

Blades sizes 150/200/250, 1-6 pcs depending on the size

FLANGE DRILLING PATTERN DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	Ø C	F	P1	P2	BM
If longest side ≤ 350	10	80	75...150	75...150	20
If longest side 351...1000	12	80	75...150	75...150	30
If longest side ≥ 1001	14	80	75...150	75...150	40

CIRCULAR FLANGE DIMENSIONS AND DRILLING PATTERN ACCORDING TO ISO 15138

DIMENSIONS	Ø C	F
If Ø D ≤ 355	10	40
If Ø D 356...1000	12	50
If Ø D ≥ 1001	14	80

OPERATION PRINCIPLE

In the event of a temperature rise in ductwork:

- FDH-EL: fusible link releases and cuts off operating voltage to the spring return motor, allowing the spring to close the damper blades. The fire damper opens automatically when the fuse has been changed and the operating voltage to the motor is re-established.
- FDH-PNR: fusible link releases and cuts off operating pressure to the spring return actuator, allowing springs to close the damper blades. The fire damper opens automatically when the fuse has been changed and the pneumatic air supply is re-established.

WEIGHTS

STANDARD HALTON FDH DAMPERS (KG) WITHOUT AN ACTUATOR*

H / HEIGHT (mm)	B / WIDTH (mm)									
	300	400	500	600	700	800	900	1000	1100	1200
300	46	51	57	62	83	90	97	103	110	117
400	54	59	65	71	94	102	109	116	124	131
500	61	68	74	81	105	113	121	129	137	145
600	67	73	80	86	112	120	128	136	144	152
700	90	98	107	115	123	132	140	149	157	165
800	97	105	113	122	130	139	147	155	164	172
900	105	114	123	132	141	150	159	168	177	186
1000	112	121	130	139	148	157	166	175	184	193
1100	121	131	140	150	159	169	178	188	197	207
1200	128	138	147	157	166	176	185	195	204	214

*Approximate weights without an actuator.

- Flange height is always 80 mm, flange drilling pattern is according to ISO 15138
- Frame thickness is 3 mm (longest side up to 600 mm) and 5 mm (longest side 601 mm or more)

Approximate weights of pneumatic rotary actuator Air Torque FDH-PNR:

- AT101 as aluminium: +1.8 kg
- AT104 as stainless steel: +4.0 kg
- AT201 as aluminium: +3.2kg
- AT204 as stainless steel: +6.4 kg
- AT301 as aluminium: +6.0 kg
- AT304 as stainless steel: +13.3 kg

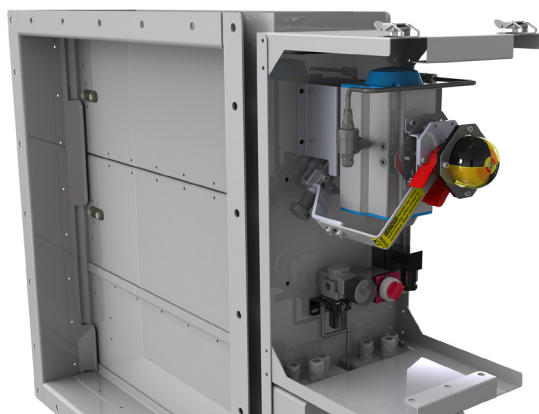
Other actuators available on request.

Electric rotary actuator Schischek ExMax or InMax.			
Actuator options	Closing time	Material	Weight (appr.)
Ex/InMax-15-SF	3 seconds	Aluminium	3,5 kg
Ex/InMax-15-SF	3 seconds	Stainless steel	7,0 kg
Ex/InMax-15-SF1	1 second	Aluminium	3,5 kg

Electric rotary actuator Schischek ExMax or InMax.			
Actuator options	Closing time	Material	Weight (appr.)
Ex/InMax-15-SF1	1 second	Stainless steel	7,0 kg
Ex/InMax-30-SF3	3 seconds	Aluminium	9,5 kg
Ex/InMax-50-SF3	3 seconds	Aluminium	9,5 kg

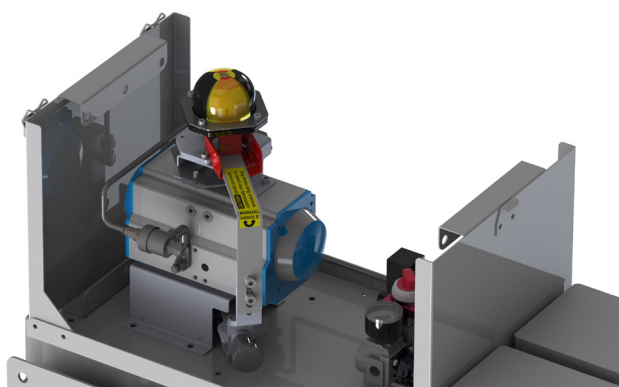
HSO HALTON SMART OVERRIDE FUNCTION

For Halton pneumatically and electrically operated dampers

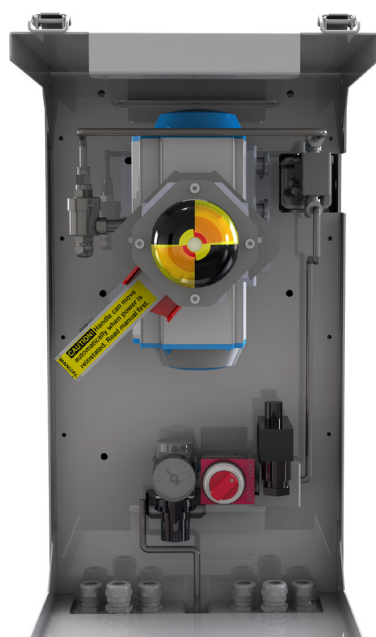


APPLICATIONS

During a power outage on an offshore platform, critical HVAC equipment such as fans may stop working, and HVAC dampers will close. When emergency generators start producing power, fans become one of the first components to resume operation, which is crucial for safety in pressure-critical areas. However, the pneumatic supply to the HVAC damper actuator may take several minutes to be reinstated, resulting in fans running against closed dampers. Traditionally, operators manually open the dampers using a temporary pneumatic air supply from a portable compressed air bottle, a process known as HVAC damper black-start.



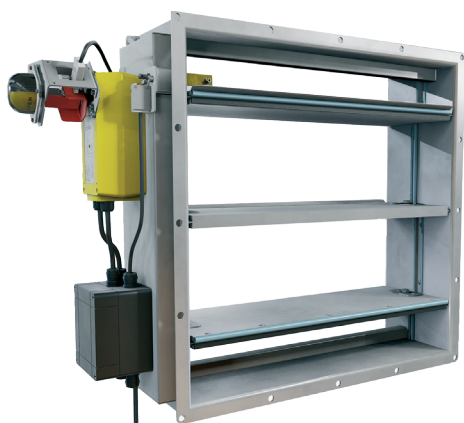
The Halton Smart Override (HSO) feature offers a patented alternative method to manually open HVAC dampers during black-start scenarios without the need for a cumbersome portable compressed air bottle. By pulling the locking knob and rotating the handle, the damper can be opened in seconds. This action disconnects the actuator from the damper drive shaft. Once power and/or pneumatic air supply is restored, the auto-reset functionality of the Halton Smart Override tool automatically resets the damper to normal operation. This auto-reset feature is critical to prevent unintentional or erroneous disengagement or leaving the damper open.



Additionally, this feature is beneficial during the construction phase when power is unavailable, allowing for the opening of ventilation ducts.

HALTON MEI ATEX CERTIFIED HVAC DAMPERS

Enhancing safety in explosive environments



OVERVIEW

Halton MEI provides durable and reliable ATEX certified HVAC dampers for demanding environments. ATEX is a European directive that sets the standards for equipment and protective systems intended for use in potentially explosive atmospheres. Halton MEI collaborates with an accredited ATEX/IECEx certification body to ensure that its HVAC dampers meet the highest quality and safety requirements. Halton MEI's ATEX certified HVAC dampers are suitable for gas (G), dust (D) and mining (M2) environments, covering a wide range of applications and conditions.

PRODUCT OPTIONS

	FDB2	FDO	FDL	FDA	FDH	FCE
Product						
Damper type	A0(A60) fire and gas damper	A0(A60) fire and gas damper	A0(A60) fire damper	A0(A60) fire and gas damper	H0(H120) fire and gas damper	EI 60 S fire damper
Applications	Offshore oil and gas; Offshore wind; Ships and ferries	Offshore oil and gas; Offshore wind; Ships and ferries	Offshore oil and gas; Offshore wind; Ships and ferries	Heavy industry; Offshore oil and gas; Offshore wind; Renewable energy; Ships and ferries	Heavy industry; Offshore oil and gas; Offshore wind; Renewable energy; Ships and ferries	Airports; Heavy industry; Hospitals; Laboratories; Office buildings
ATEX suitability	II 2 G Ex h IIA, IIB, IIC T1...T6 Gb	II 2 G Ex h IIA, IIB, IIC T1...T6 Gb	II 2 G Ex h IIA, IIB, IIC T1...T6 Gb	II 2 G Ex h IIA, IIB, IIC T1...T6 Gb	II 3 G Ex h IIA, IIB, IIC T6...T4 Gc II 2 G Ex h IIA, IIB, IIC T6...T4 Gb II 3 D Ex h IIIC T80°C...T130°C Dc II 2 D Ex h IIIC T80°C...T130°C Db	II 3 G Ex h IIA, IIB, IIC T6...T4 Gc II 2 G Ex h IIA, IIB, IIC T6...T4 Gb II 3 D Ex h IIIC T80°C...T130°C Dc II 2 D Ex h IIIC T80°C...T130°C Db
	UTA	UTG	UTP	BRD	BLD	BDH
Product						
Damper type	Gastight shut-off damper	Gastight shut-off damper	Balancing damper	Pressure-relief damper	Non-return damper	Blast damper
Applications	Airports; Heavy industry; Offshore oil and gas; Offshore wind; Renewable energy; Ships and ferries	Airports; Heavy industry; Offshore oil and gas; Offshore Wind; Ships and ferries	Airports; Heavy industry; Office buildings; Offshore oil and gas; Offshore wind; Ships and ferries; Tunnels	Airports; Heavy industry; Laboratories; Offshore oil and gas; Offshore wind; Ships and ferries	Airports; Heavy industry; Laboratories; Offshore oil and gas; Offshore wind; Ships and ferries	Heavy industry; Offshore oil and gas; Renewable energy
ATEX suitability	II 2 G Ex h IIA, IIB, IIC T6...T4 Gb	II 2 G Ex h IIA, IIB, IIC T6...T4 Gb	II 2 G c IIA, IIB, IIC T1...T6	II 2 G Ex h IIA, IIB, IIC T6...T3 Gb II 2 D Ex h IIIC T85°C...T200°C Db I M 2 Ex h I Mb	II 2 G Ex h IIA, IIB, IIC T6...T3 Gb II 2 D Ex h IIIC T85°C...T200°C Db I M 2 Ex h I Mb	II 2 G Ex h IIA, IIB, IIC T6...T3 Gb II 2 D Ex h IIIC T85°C...T200°C Db I M 2 Ex h I Mb



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI 304), EN 1.4404 (AISI 316L), EN 1.4432 (AISI 316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI 304), EN 1.4404 (AISI 316L), EN 1.4432 (AISI 316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI 316L)	-
Shafts	Stainless steel EN 1.4404 (AISI 316L)	-

PRODUCT OPTIONS

Halton UTP is available with following actuators:

- UTP-EL: Electrical spring return actuator; standard actuators being 24 VAC/DC or 230 VAC or 120 VAC. Depending on the choice of actuator, the actuator might contain built-in open-closed limit switches. A wide range of Ex actuators available, including a one second closing time function as an option (for limited sizes).
- UTP-PNR: Pneumatic rotating actuator
- UTP-MAN: Manual handle

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

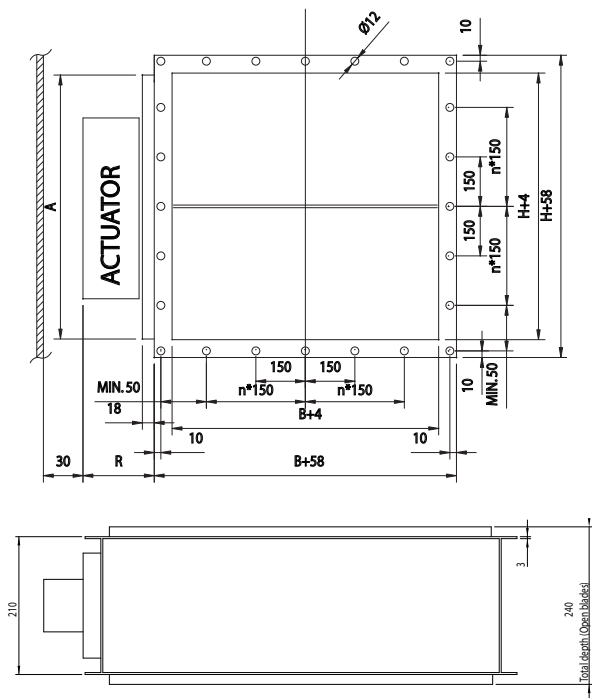
APPLICATIONS

Halton UTP dampers are used to balance airflow rates in high pressure ductwork. Dampers meet international standards for rectangular and round ducts. In the open position, the blades face the direction of flow and do not cause a significant pressure loss. The UTP is used as a balancing damper in applications where reliability is important.

FEATURES

- For balancing air intake and exhaust
- Shock tested
- Leakage class of a closed damper according to EN 1751:2014 class 1. Tested size 1000x1000 mm
- Classification of casing leakage (EN 1751:2014) class B
- The outer frame of galvanised, painted or stainless steel. Blades of galvanised or stainless steel with double sheet construction. Maintenance-free stainless steel bearings and shafts
- Electrical, pneumatic or manual operation system available
- UTP dampers can be supplied with connection pieces for round duct
- The maximum duct pressure for damper construction is 5000 Pa. The maximum air velocity is 15 m/s. In case of high duct pressure, contact Halton for finding the most suitable solution
- Temperature operation range up to +100°C, optionally up to +180°C
- Available as ATEX certified
- SIL 2 safety assessment certificate available on specific terms

GENERAL DRAWINGS



DAMPER H	TOTAL DEPTH WHEN BLADES OPEN
< 350 mm	210 mm
> 350 mm	240 mm

DIMENSIONS AND MATERIAL THICKNESS

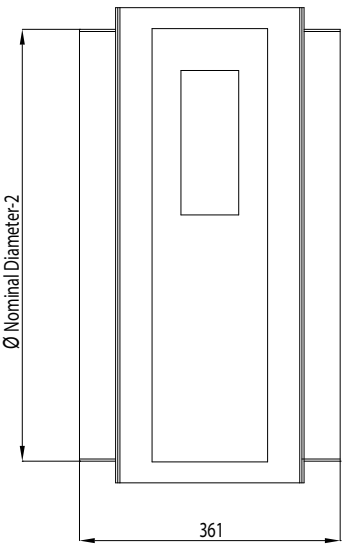
UTP balancing dampers are manufactured to international standards for both rectangular (width B 100-1200 mm and height H 100-1600 mm, 1 mm division) and circular ducts (Ø100-1250 mm). Non-standard dimensions available on request. Modular construction sizes available up to 2400x3200 mm. Standard flange width 27 mm. Flanges and drilling also available according to ISO 15138 standards. Frame thicknesses from 3 mm to 10 mm. Standard frame thickness is 3 mm. Blades are made of two sheets, each of being 1 mm thick (sandwich design).

ACTUATOR EFFECT ON DIMENSIONS

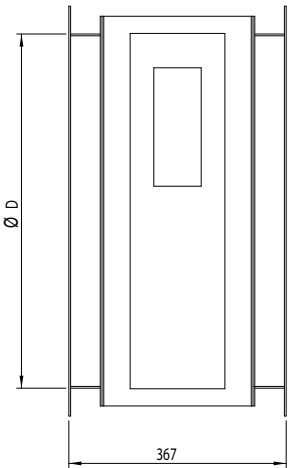
ACTUATOR		DIMENSIONS	
		R	A
Manual	Handle	95	H
Electrical	BF230, BF24, BF120	100	H < 300 = 300 H > 300 = H
Pneumatic PNR	Pneumatic rotating actuator AT100	170	H < 300 = 300 H > 300 = H

The above table contains only some examples of actuators and their effect on dimensions.

UTP CIRCULAR CONNECTIONS



UTP CIRCULAR, WITH CONNECTION FLANGES



WEIGHTS

STANDARD HALTON UTP DAMPERS (KG) WITHOUT AN ACTUATOR. FRAME THICKNESS 3 MM.

H / HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	WEIGHT (kg)
	100	200	300	400	500	600	700	800	900	1000	1100	1200		
100	4	6	7	9	10	12	13	15	16	17	19	20	100	7
200	6	8	9	11	13	14	16	17	19	21	22	24	125	8
300	8	10	12	14	15	17	19	21	22	24	26	28	160	11
400	10	12	14	16	18	20	22	23	25	27	29	31	200	12
500	13	15	17	19	21	23	25	28	30	32	34	36	250	17
600	15	17	19	21	24	26	28	30	33	35	37	39	315	19
700	17	20	22	25	27	29	32	34	37	39	42	44	400	26
800	19	22	24	27	29	32	35	37	40	43	45	48	500	34
900	21	24	27	30	33	36	38	41	44	47	50	53	630	44
1000	23	26	29	32	35	38	41	44	47	50	53	56	800	59
1100	26	29	32	35	38	42	45	48	51	55	58	61	1000	80
1200	27	31	34	37	41	44	48	51	54	58	61	64	1250	110
1300	30	33	37	41	44	48	51	55	58	62	66	69		
1400	32	35	39	43	47	50	54	58	61	65	69	73		
1500	34	38	42	46	50	54	58	62	66	70	74	77		
1600	36	40	44	48	52	56	60	65	69	73	77	81		

Examples of actuator weights:

- **UTP-EL** BF230 + 3.2 kg, ExMax/Redmax + 3.5 kg, CSQP + 3 kg.
- **UTP-PNR** AT100 + 2.1 kg, AT100 in AISI316 + 4.4 kg, AT50 + 1.2 kg.
- **UTP-MAN** + 1 kg.
- **Control enclosure** + 4 kg.

UTA GASTIGHT SHUT-OFF DAMPER

For high pressure ductworks



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI 304), EN 1.4404 (AISI 316L), EN 1.4432 (AISI 316L)	Painted as an option
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI 304), EN 1.4404 (AISI 316L), EN 1.4432 (AISI 316L)	-
Maintenance-free bearings	Oil bronze Stainless steel EN 1.4404 (AISI 316L) available as an option	-
Shafts	Stainless steel EN 1.4404 (AISI 316L)	-

PRODUCT OPTIONS

Halton UTA is available with following actuators:

- UTA-EL: Electrical spring return actuator; standard actuators being 24 VAC/DC, 230 VAC or 120 VAC. Depending on the choice of actuator, the actuator might contain built-in open-closed limit switches. A wide range of Ex actuators available, including a one second closing time function as an option (for limited sizes).
- UTA-PNR: Pneumatic rotating actuator
- UTA-MAN: Manual handle

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

APPLICATIONS

Halton UTA dampers are used to shut off and balance airflow rates in high-pressure ductwork. The dampers meet international standards for rectangular and round ducts. In the open position, the blades align with the direction of flow and do not cause significant pressure loss. The UTA functions as a shut-off, gas, and balancing damper in applications where tightness and reliability are crucial.

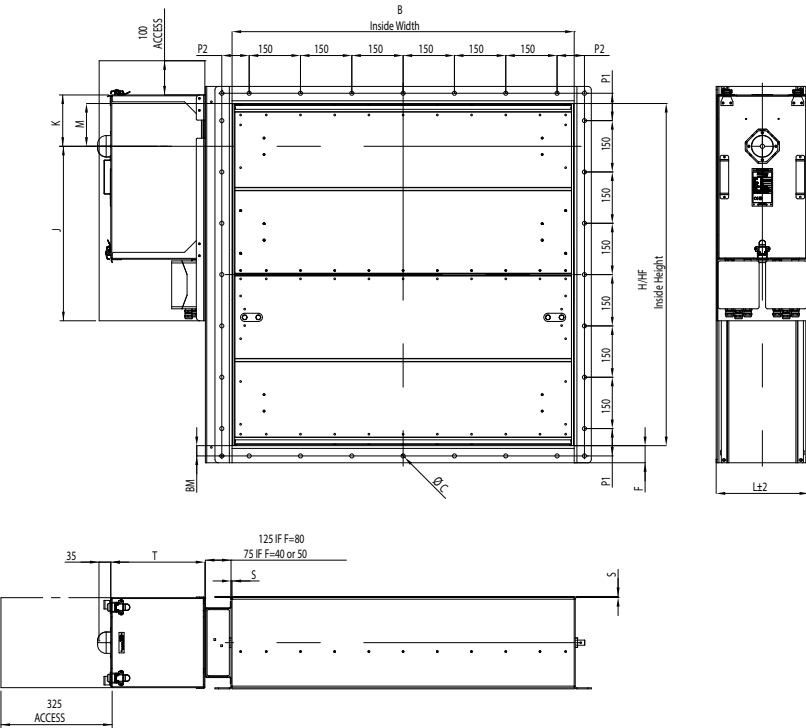
FEATURES

- For shutting off and balancing air intake and exhaust ducts
- A closed damper fulfils the requirement of leakage class 3 (EN1751:2014) for sizes $\geq 300 \times 300$ mm (stainless steel seals) and sizes $\geq 150 \times 150$ mm (silicon seals)
- Classification of casing leakage (EN1751:2014) class C
- The outer frame is available in galvanised, painted, or stainless steel. Blades are made of galvanised or stainless steel with double-sheet construction. Blades contain stainless steel spring seals for low leakage, with silicon sealing as an option
- Earthing stud included as standard
- Electrical, pneumatic, or manual operation systems available
- UTA dampers can be supplied with connection pieces for round ducts
- Maximum duct pressure for damper construction: 5000 Pa, and maximum air velocity: 15 m/s
- Normal operating temperature for the damper ranges from -50°C to $+80^{\circ}\text{C}$. Actuator and component selection can affect this temperature range. Other temperatures available on request
- Available as ATEX certified
- SIL 2 safety assessment certificate available under specific terms

INSTALLATION

For installation on a wall or roof. When installed on a wall, the blade orientation must always be in a horizontal plane.

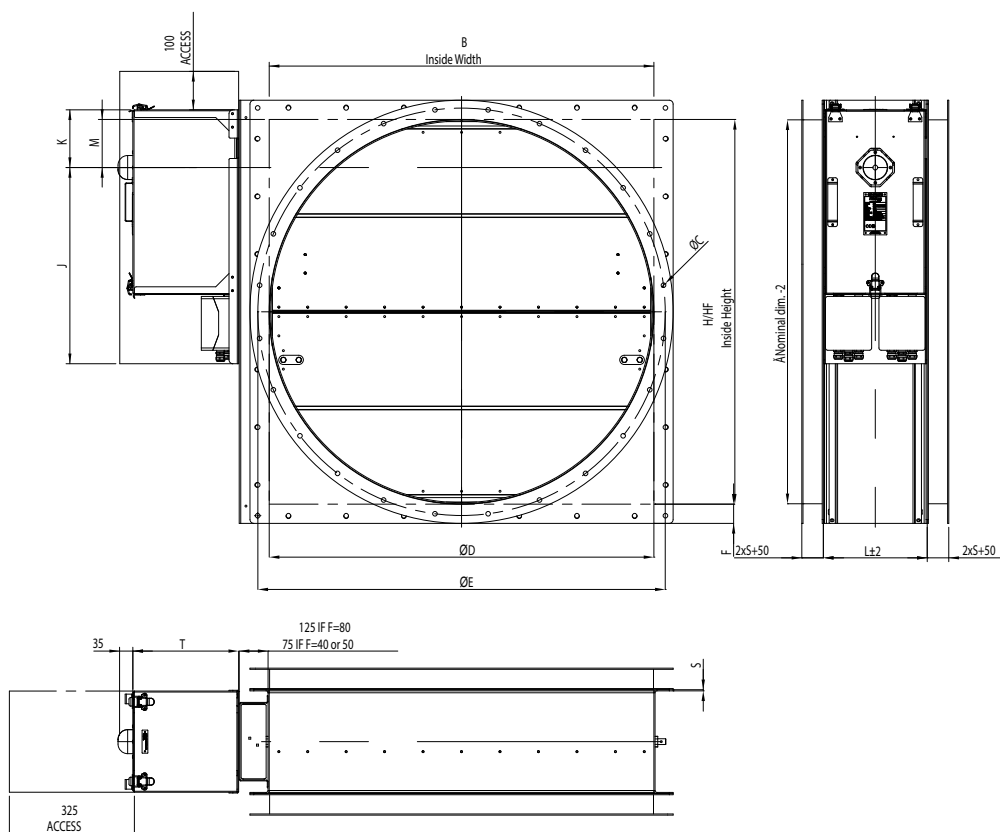
GENERAL DRAWINGS



ACTUATOR	J	K	T
AT100	430	150	145
AT100 + Halton smart override	510	150	255
AT200	510	150	165
AT200 + Halton smart override	510	150	275
AT300	510	180	190
AT300 + Halton smart override	510	180	300
Belimo BF	430	150	125
Belimo BF (damper height <200)	430	90	125
Schischek S	430	150	145
Schischek S (damper height <200)	430	90	145
Schischek S + Halton smart override	440	220	235
Schischek M	510	150	175
Schischek M + Halton smart override	440	220	165

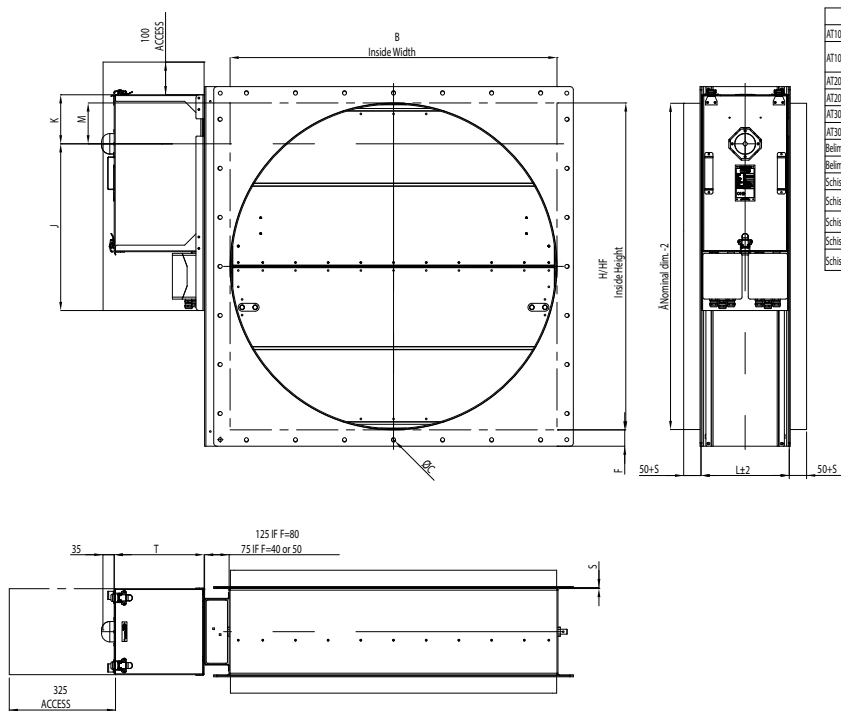
MATERIAL THICKNESS	DEPTH
S	L
3	270
5	275

H NOMINAL HEIGHT	HF FREE HEIGHT	M DRIVE
100	100	50
150	150	75
200	200	100
250	250	125
300	250	125
350	250	125
400	400	100
450	450	125
500	500	125
550	500	125
600	600	100
650	650	125
700	700	125
750	750	125
800	800	100
850	850	125
900	900	125
950	950	125
1000	1000	125
1050	1050	125
1100	1100	125
1150	1150	125
1200	1200	125
1250	1250	125
1300	1300	125
1350	1350	125
1400	1400	125
1450	1450	125
1500	1500	125
1550	1500	125
1600	1500	125



Flange dimensions according to ISO 15138

Nominal Duct Size (Ø D)	Bolt Circle (Ø E)	Bolt hole Size	No. Of Bolts
100	145	10	4
125	170	10	4
150	195	10	4
160	205	10	4
200	245	10	8
250	295	10	8
275	320	10	8
300	345	10	8
315	360	10	8
335	400	10	8
400	459	12	8
450	509	12	12
500	559	12	12
560	619	12	12
600	659	12	16
630	689	12	16
700	759	12	16
710	769	12	16
800	859	12	24
900	959	12	24
1000	1059	12	24
1120	1209	14	24
1200	1289	14	32
1250	1339	14	32
1400	1489	14	32



Actuator	J	K	T
AT100	450	150	145
AT100-Halton smart override	510	150	225
AT200	510	150	165
AT200-Halton smart override	510	150	275
AT300	510	180	190
AT300-Halton smart override	510	180	300
Belimo BF	430	150	125
Belimo BF (Damper height < 200)	430	90	125
Schischek S	430	150	145
Schischek S (Damper height < 200)	430	90	145
Schischek S-Halton smart override	440	220	235
Schischek M	510	150	175
Schischek M-Halton smart override	440	220	165

H	HF	M
Nominal height	Free height	Drive
100	100	50
150	150	75
200	200	100
250	250	125
300	250	125
350	250	125
400	400	100
450	450	125
500	500	125
550	500	125
600	600	100
650	650	125
700	700	125
750	750	125
800	800	100
850	850	125
900	900	125
950	950	125
1000	1000	125
1050	1050	125
1100	1100	125
1150	1150	125
1200	1200	125
1250	1250	125
1300	1300	125
1350	1350	125
1400	1400	125
1450	1450	125
1500	1500	125
1550	1500	125
1600	1500	125

DIMENSIONS AND MATERIAL THICKNESS

UTA dampers meet international standards for both rectangular (width B 100-1200 mm with 25 mm division and height H 100-1600 mm with 50 mm division) and circular ducts (Ø200-1250 mm). Modular constructions up to 2500x2600 mm available. For bigger sizes, contact Halton.

Non-standard dimensions and flange drilling available on request. Standard flanges and drilling according to ISO 15138 standards. Frame thickness 3 or 5 mm.

FLANGE DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	ØC	F	P1	P2	BM
If longest side ≤ 350	10	40	75...150	75...150	20
If longest side 351...1000	12	50	75...150	75...150	30
If longest side ≥ 1001	14	80	75...150	75...150	40

CIRCULAR FLANGE DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	ØC	F
If ØD ≤ 355	10	40
If ØD 356...1000	12	50
If ØD ≥ 1001	14	80

WEIGHTS

STANDARD HALTON UTA DAMPERS (KG) WITHOUT AN ACTUATOR. FRAME THICKNESS 3 MM.

H / HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	WEIGHT (kg)
	100	200	300	400	500	600	700	800	900	1000	1100	1200		
100	7.5	10.3	13.2	16.0	18.8	21.7	24.5	27.4	30.2	33.0	35.9	38.7	100	9
200	10.8	13.6	16.5	19.3	22.2	25.0	27.8	30.7	33.5	36.4	39.2	42.0	125	10
300	14.1	17.0	19.8	22.7	25.5	28.3	31.2	34.0	36.9	39.7	42.5	45.4	160	14
400	18.7	22.0	25.3	28.6	31.9	35.2	38.5	41.8	45.1	48.4	51.6	54.9	200	18
500	22.5	25.8	29.1	32.4	35.7	39.0	42.3	45.6	48.8	52.1	55.4	58.7	250	22
600	27.1	30.9	34.6	38.3	42.1	45.8	49.6	53.3	57.0	60.8	64.5	68.3	315	25
700	30.9	34.6	38.4	42.1	45.9	49.6	53.3	57.1	60.8	64.6	68.3	72.0	400	38
800	35.5	39.7	43.9	48.1	52.3	56.5	60.7	64.8	69.0	73.2	77.4	81.6	500	47
900	39.3	43.5	47.7	51.9	56.1	60.2	64.4	68.6	72.8	77.0	81.2	85.4	630	59
1000	43.1	47.3	51.5	55.6	59.8	64.0	68.2	72.4	76.6	80.8	85.0	89.2	800	86
1100	47.7	52.3	57.0	61.6	66.2	70.9	75.5	80.2	84.8	89.4	94.1	98.7	1000	109
1200	51.5	56.1	60.7	65.4	70.0	74.7	79.3	83.9	88.6	93.2	97.9	102.5	1250	148
1300	56.1	61.2	66.2	71.3	76.4	81.5	86.6	91.7	96.8	101.9	107.0	112.1		
1400	59.8	64.9	70.0	75.1	80.2	85.3	90.4	95.5	100.6	105.7	110.7	115.8		
1500	63.6	68.7	73.8	78.9	84.0	89.1	94.2	99.3	104.3	109.4	114.5	119.6		
1600	67.4	72.5	77.6	82.7	87.8	92.9	97.9	103.0	108.1	113.2	118.3	123.4		

Flanges according to ISO 15138.

STANDARD HALTON UTA DAMPERS (KG) WITHOUT AN ACTUATOR. FRAME THICKNESS 5 MM.

H / HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	WEIGHT (kg)
	100	200	300	400	500	600	700	800	900	1000	1100	1200		
100	9.0	13.2	17.5	21.7	26.0	30.2	34.5	38.7	42.9	47.2	51.4	55.7	100	12
200	13.7	18.0	22.2	26.5	30.7	34.9	39.2	43.4	47.7	51.9	56.2	60.4	125	13
300	18.5	22.7	26.9	31.2	35.4	39.7	43.9	48.2	52.4	56.7	60.9	65.2	160	19
400	24.5	29.2	33.9	38.5	43.2	47.9	52.6	57.3	62.0	66.7	71.4	76.1	200	24
500	29.6	34.3	39.0	43.7	48.4	53.1	57.8	62.5	67.2	71.9	76.6	81.3	250	26
600	35.7	40.8	46.0	51.1	56.2	61.4	66.5	71.7	76.8	82.0	87.1	92.3	315	36
700	40.8	46.0	51.1	56.3	61.4	66.6	71.7	76.9	82.0	87.2	92.3	97.5	400	54
800	46.9	52.5	58.0	63.6	69.2	74.8	80.4	86.0	91.6	97.2	102.8	108.4	500	68
900	52.0	57.6	63.2	68.8	74.4	80.0	85.6	91.2	96.8	102.4	108.0	113.6	630	84
1000	57.2	62.8	68.4	74.0	79.6	85.2	90.8	96.4	102.0	107.6	113.2	118.8	800	121
1100	63.2	69.3	75.3	81.4	87.4	93.5	99.5	105.6	111.6	117.7	123.7	129.7	1000	154
1200	68.4	74.5	80.5	86.6	92.6	98.7	104.7	110.7	116.8	122.8	128.9	134.9	1250	212
1300	74.4	80.9	87.4	93.9	100.4	106.9	113.4	119.9	126.4	132.9	139.4	145.9		
1400	79.6	86.1	92.6	99.1	105.6	112.1	118.6	125.1	131.6	138.1	144.6	151.1		
1500	84.8	91.3	97.8	104.3	110.8	117.3	123.8	130.3	136.8	143.3	149.8	156.3		
1600	90.0	96.5	103.0	109.5	116.0	122.5	129.0	135.5	142.0	148.5	155.0	161.4		

Flanges according to ISO 15138.

PNEUMATIC ACTUATORS FOR UTA ACCORDING TO THE SIZE OF THE DAMPER

DAMPER BLADES WITH STAINLESS STEEL SEALS

H / HEIGHT (mm)	B / WIDTH (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200
200	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200
300	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200
400	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200
500	AT100	AT100	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200
600	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT300	AT300
700	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT300	AT300
800	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300
900	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300
1000	AT100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300
1100	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300
1200	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300
1300	AT100	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300
1400	AT100	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300
1500	AT100	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300
1600	AT100	AT100	AT200	AT200	AT200	AT200	AT300	AT300	AT300	AT300	AT300	AT300

Approximate weights of pneumatic rotary actuator Air Torque: UTA-PNR AT101 as aluminium +1,8 kg, AT104 as stainless steel 4,0 kg, AT201 as aluminium +3,2kg, AT204 as stainless steel +6,4 kg, AT301 as aluminium +6,0 kg, AT304 as stainless steel +13,3 kg. Other actuators available on request.

PNEUMATIC ACTUATORS FOR UTA ACCORDING TO THE SIZE OF THE DAMPER

DAMPER BLADES WITH SILICON SEALS

H / HEIGHT (mm)	B / WIDTH (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
200	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
300	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
400	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
500	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
600	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
700	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
800	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
900	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
1000	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
1100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
1200	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100	AT100
1300	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200
1400	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200
1500	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200
1600	AT100	AT100	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200	AT200

Approximate weights of pneumatic rotary actuator Air Torque: UTA-PNR AT101 as aluminium +1,8 kg, AT104 as stainless steel 4,0 kg, AT201 as aluminium +3,2kg, AT204 as stainless steel +6,4 kg, AT301 as aluminium +6,0 kg, AT304 as stainless steel +13,3 kg. Other actuators available on request.

ELECTRIC ACTUATORS FOR UTA ACCORDING TO THE SIZE OF THE DAMPER

BLADES WITH STAINLESS STEEL SEALS

H / HEIGHT (mm)	B / WIDTH (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
200	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
300	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
400	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
500	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
600	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
700	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF
800	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
900	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1000	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1100	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1200	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1300	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1400	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1500	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF
1600	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-15-SF Belimo BF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-30-SF Belimo EF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF	Ex/Inmax-50-SF

Actuator options	Closing time	Material	Weight (appr.)
ExMax 8-SF1	1 second	Aluminium	3.5 kg
Ex/InMax-15-SF	3 seconds	Aluminium	3.5 kg
Ex/InMax-15-SF	3 seconds	Stainless steel	7.0 kg
Ex/InMax-15-SF1	1 second	Aluminium	3.5 kg
Ex/InMax-15-SF1	1 second	Stainless steel	7.0 kg
Ex/InMax-30-SF3	3 seconds	Aluminium	9.5 kg
Ex/InMax-50-SF3	3 seconds	Aluminium	9.5 kg

Note! Schischek
15 Nm > 0.09 m ²
8 Nm < 0.09 m ²

Actuator options	Material	Weight (appr.)
Ex/InMax-15-F	Aluminium	3.5 kg
Ex/InMax-30-F	Aluminium	9.5 kg
Ex/InMax-50-F	Aluminium	9.5 kg
Ex/InMax-15-F	Stainless steel	7.0 kg
Belimo BF	Steel	3.1 kg
Belimo EF	Steel	4.2 kg

BLADES WITH SILICON SEALS

[illegible]

Actuator options	Closing time	Material	Weight (appr.)
ExMax 8-SF1	1 second	Aluminium	3.5 kg
Ex/InMax-15-SF	3 seconds	Aluminium	3.5 kg
Ex/InMax-15-SF	3 seconds	Stainless steel	7.0 kg
Ex/InMax-15-SF1	1 second	Aluminium	3.5 kg
Ex/InMax-15-SF1	1 second	Stainless steel	7.0 kg
Ex/InMax-30-SF3	3 seconds	Aluminium	9.5 kg
Ex/InMax-50-SF3	3 seconds	Aluminium	9.5 kg

Note! Schischek F1 Model (1 sec.)

15 Nm > 0.36 m ²
8 Nm < 0.36 m ²

Actuator options	Material	Weight (appr.)
Ex/InMax-15-F	Aluminium	3.5 kg
Ex/InMax-30-F	Aluminium	9.5 kg
Ex/InMax-50-F	Aluminium	9.5 kg
Ex/InMax-15-F	Stainless steel	7.0 kg
Belimo BF	Steel	3.1 kg
Belimo EF	Steel	4.2 kg

For high pressure ductworks



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI 304), EN 1.4404 (AISI 316L), EN 1.4432 (AISI 316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI 304), EN 1.4404 (AISI 316L), EN 1.4432 (AISI 316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI 316L)	-
Shafts	Stainless steel EN 1.4404 (AISI 316L)	-

PRODUCT OPTIONS

Halton UTG is available with following actuators:

- UTG-EL: Electrical spring return actuator; standard actuators being 24 VAC/DC, 230 VAC or 120 VAC. Depending on the choice of actuator, the actuator might contain built-in open-closed limit switches. A wide range of Ex actuators available, including a one second closing time function as an option (for limited sizes)
- UTG-PNR: Pneumatic rotating actuator
- UTG-MAN: Manual handle

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

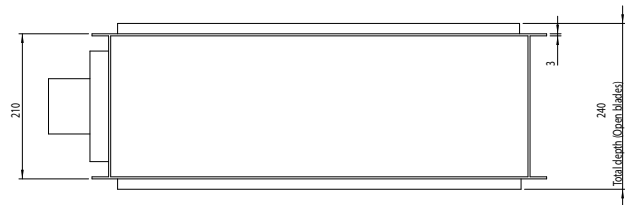
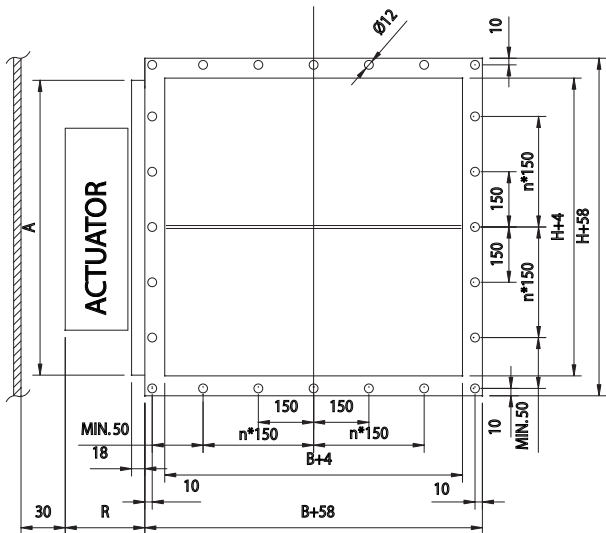
APPLICATIONS

Halton UTG dampers are used to shut off and balance airflow rates in high-pressure ductwork. The dampers meet international standards for rectangular and round ducts. In the open position, the blades align with the direction of flow and do not cause significant pressure loss. The UTG functions as a shut-off, gas, and balancing damper in applications where tightness and reliability are crucial.

FEATURES

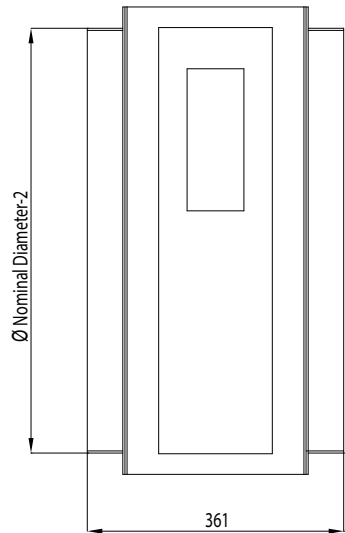
- For shutting off and balancing air intake and exhaust ducts
- Shock tested
- A closed damper fulfils the requirement of leakage class 3 (EN1751:2014). Details available from Halton
- Classification of casing leakage (EN1751:2014): class B
- The outer frame is available in galvanised, painted, or stainless steel. Blades are made of galvanised or stainless steel with double-sheet construction and silicon sealings. Maintenance-free stainless steel bearings and shafts
- Electrical, pneumatic, or manual operation systems available
- UTG dampers can be supplied with connection pieces for round ducts
- Maximum duct pressure for damper construction: 5000 Pa, and maximum air velocity: 15 m/s. In case of high duct pressure, contact Halton sales for the most suitable solution
- Normal operating temperature for the damper ranges up to +100°C, optionally up to +180°C
- Available as ATEX certified
- SIL 2 safety assessment certificate available under specific terms

GENERAL DRAWINGS

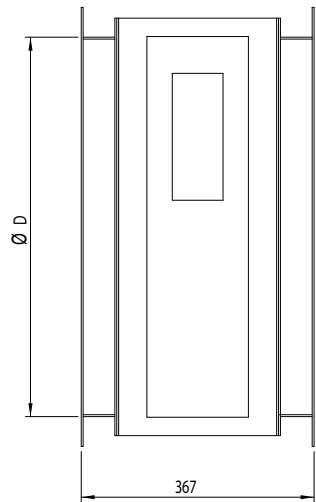


DAMPER H	TOTAL DEPTH WHEN BLADES OPEN
< 350 mm	210 mm
≥ 350 mm	240 mm

UTG CIRCULAR CONNECTIONS



UTG CIRCULAR, WITH CONNECTION FLANGES



DIMENSIONS AND MATERIAL THICKNESS

UTG shut-off, gas and balancing dampers meet international standards for both rectangular (width B 100-1200 mm and height H 100-1600 mm, 1 mm division) and circular ducts (Ø100-1250 mm). Non-standard dimensions are available on request. Standard flange width 27 mm. Flanges and drilling also available according to ISO 15138 standards. Modular construction sizes available up to 2400X3200 mm. Frame thicknesses from 3 mm to 10 mm. Standard frame thickness is 3 mm. Blades are made of two sheets, each of being 1 mm thick (sandwich design).

ACTUATOR EFFECT ON DIMENSIONS

ACTUATOR		DIMENSIONS	
		R	A
Manual	Handle	95	H
Electrical	BF230, BF24, BF120	100	H ≤ 300 = 300 H > 300 = H
Pneumatic PNR	Pneumatic rotating actuator AT100	170	H ≤ 300 = 300 H > 300 = H
Pneumatic PNR	Pneumatic rotating actuator AT200	190	H ≤ 350 = 350 H > 350 = H

The above table contains only some examples of actuators and their effect on dimensions.

WEIGHTS

STANDARD HALTON UTG DAMPERS (KG) WITHOUT AN ACTUATOR. FRAME THICKNESS 3 MM.

H / HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	WEIGHT (kg)
	100	200	300	400	500	600	700	800	900	1000	1100	1200		
100	4	6	7	9	10	12	13	15	16	17	19	20	100	7
200	6	8	9	11	13	14	16	17	19	21	22	24	125	8
300	8	10	12	14	15	17	19	21	22	24	26	28	160	11
400	10	12	14	16	18	20	22	23	25	27	29	31	200	12
500	13	15	17	19	21	23	25	28	30	32	34	36	250	17
600	15	17	19	21	24	26	28	30	33	35	37	39	315	19
700	17	20	22	25	27	29	32	34	37	39	42	44	400	26
800	19	22	24	27	29	32	35	37	40	43	45	48	500	34
900	21	24	27	30	33	36	38	41	44	47	50	53	630	44
1000	23	26	29	32	35	38	41	44	47	50	53	56	800	59
1100	26	29	32	35	38	42	45	48	51	55	58	61	1000	80
1200	27	31	34	37	41	44	48	51	54	58	61	64	1250	110
1300	30	33	37	41	44	48	51	55	58	62	66	69		
1400	32	35	39	43	47	50	54	58	61	65	69	73		
1500	34	38	42	46	50	54	58	62	66	70	74	77		
1600	36	40	44	48	52	56	60	65	69	73	77	81		

Examples of actuator weights: UTG-EL BF230 +3,2 kg, ExMax/Redmax +3,5 kg, CSQP +3 kg, UTG-PNR AT100 +2,1 kg, AT100 as AISI316 4,4 kg, AT50 1,2 kg, UTG-MAN + 1 kg. Control enclosure +4 kg.

UTK, UTT

MULTI-BLADE AIRFLOW MANAGEMENT DAMPERS

For rectangular ducts



MATERIALS

PART	MATERIAL	NOTE
Casing	Galvanised steel	Available as an option: stainless steel EN 1.4404 (AISI 316L)
Blades (sandwich design)	Galvanised steel	Available as an option: stainless steel EN 1.4404 (AISI 316L)
Blades insulation (only UTT)	Polyurethane	CFC-free
Blade gaskets	Silicon	Heat-proof model: LTE rubber
Gasket inside the casing (only UTT)	Silicon	Fixed in an aluminium profile. Heat-proof model: LTE rubber
Duct gasket	Rubber compound	Circular connections
Slide bearings	Alloy of polyamide and molybdenum sulphide	Self-lubricated. Heat-proof model: stainless steel EN 1.4404 (AISI 316L) also available
Drive shaft	Galvanised steel	Rectangular (15x15 mm) bar

PRODUCT MODELS AND ACCESSORIES

- Model with stainless steel EN 1.4404 (AISI 316L) design
- Model with mineral wool (20 mm) insulated casing
- Model with heat-proof design
- Circular duct connections
- Various actuator options

APPLICATIONS

Halton UTK dampers are used to shut off, adjust, or control airflow in ductwork for applications where damper leakage is not significantly important. In the closed position, the UTK damper leakage class is 1 in accordance with the EN 1751:2014 standard.

Halton UTT dampers are used to shut off or control airflow in ductwork where tightness, thermal insulation, and reliability are important. In the closed position, the UTT damper leakage class is up to 3 in accordance with the EN 1751:2014 standard (tested size 1000x1000 mm).

In the open position, the blades are turned in the direction of flow and do not cause significant pressure losses. Damper sizes conform with the international standards EN 1505, EN 1506, and ISO 1707 for rectangular and circular ducts.

FEATURES: UTK

- Temperature operation range up to +100°C, optionally up to +180°C
- Classification of casing leakage EN 1751:2014 class B
- Shut-off, adjustment, balancing, or control damper with opposed blade construction
- Tightness in closed position meets class 1 requirements (EN 1751:2014)

FEATURES: UTT

- Temperature operation range up to +100°C, optionally up to +180°C
- Classification of casing leakage EN 1751:2014 class B
- Shut-off and balancing damper for outdoor air intake and exhaust air with opposed blade design
- Damper blades include thermal insulation
- Tightness in closed position up to class 3 (EN 1751:2014). Details available from Halton.

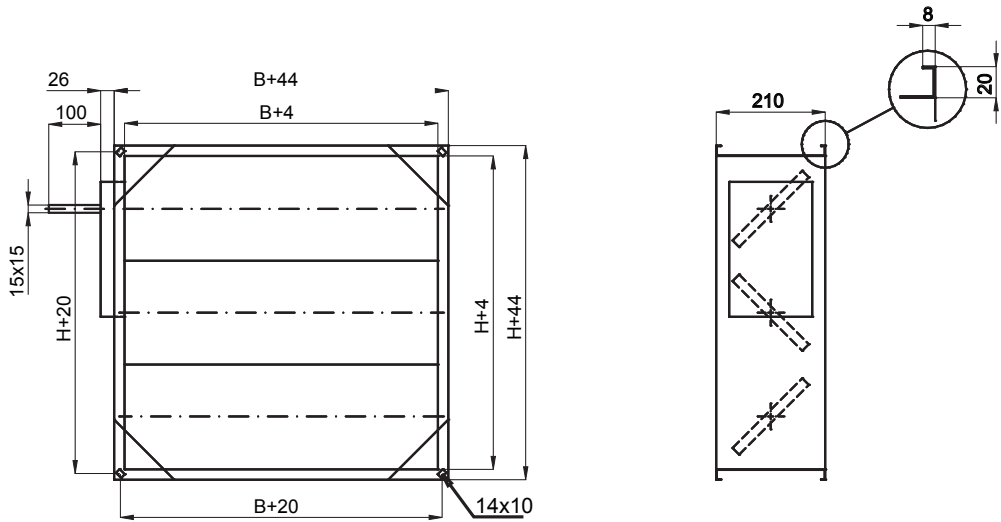
UTK, UTT DIMENSIONS AND MATERIAL THICKNESS

UTK and UTT dampers are manufactured for both rectangular ducts (width B 100-2400 mm and height H 100-2400 mm, with 1 mm increments) and circular ducts (Ø100-1250 mm). Special non-standard dimensions and flange drilling are available on request. Modular construction sizes up to 4900x4900 mm are available. The standard frame material thickness is 1 mm.

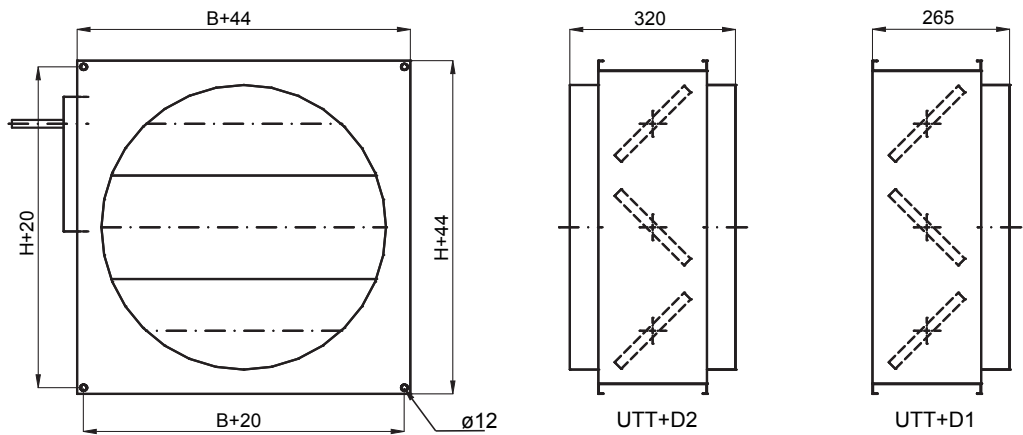
CIRCULAR CONNECTIONS

ØD	WxH (mm)
100	150x150
125	150x150
160	200x200
200	200x200
250	250x250
315	300x300
400	400x400
500	500x500
630	600x600
800	800x800
1000	1000x1000
1250	1250x1250

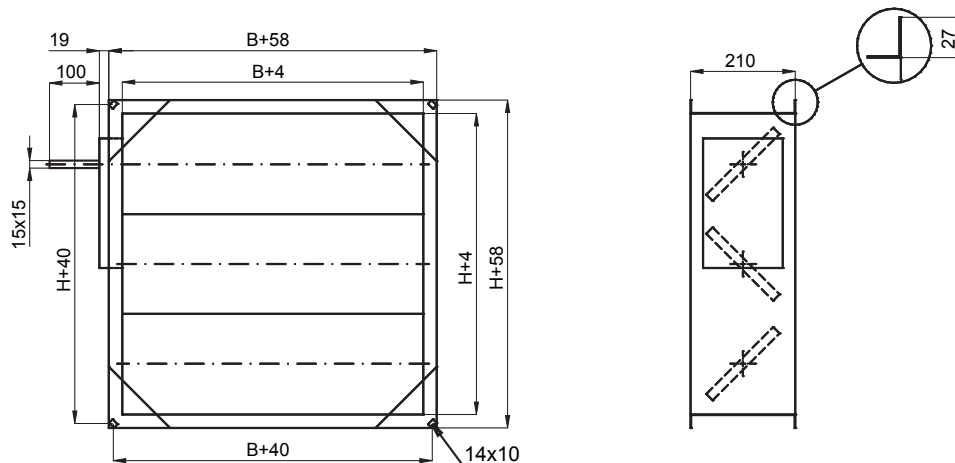
GENERAL UTK, UTT DRAWINGS



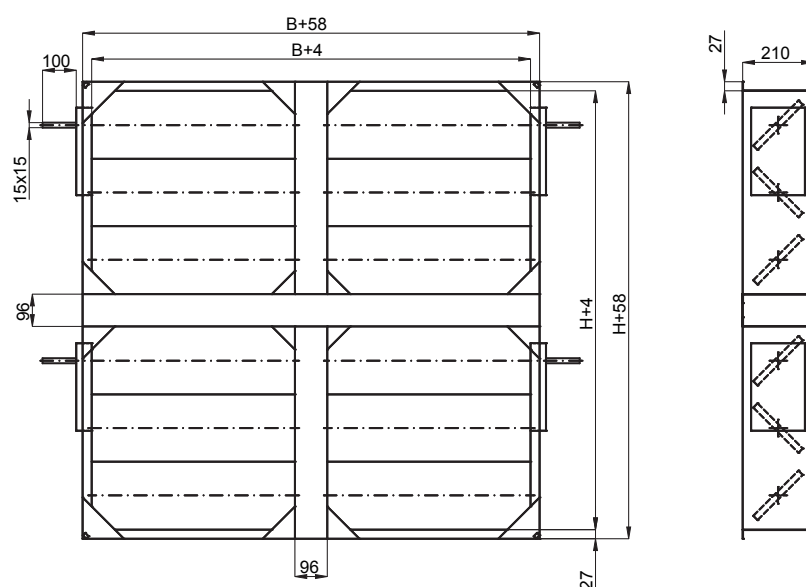
UTK, UTT DRAWING, CIRCULAR CONNECTIONS



UTK, UTT DRAWING, FLANGE CONNECTION



GENERAL UTK, UTT MODULE ASSEMBLY



THE ADJUSTMENT AND CONTROL OPTIONS

TYPE	CODE	NOTE
Manual handle adjustment	MO = MA	-
Manual extension bar adjustment	AC = BA	Handle extension arrangement
Actuator operation	MO =	A wide range of actuators available

WEIGHTS

STANDARD HALTON UTK DAMPERS (KG) WITHOUT AN ACTUATOR

H / HEIGHT (mm)	B / WIDTH (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
200	3	3	4	5	6	6	7	8	8	9	10	16
300	4	5	6	6	7	8	9	9	10	11	12	18
400	5	5	6	7	8	9	10	10	11	12	13	20
500	5	6	7	8	9	10	11	12	13	14	15	21
600	6	7	8	9	10	11	12	13	14	15	17	23
700	7	8	9	9	11	12	13	15	16	17	18	25
800	7	9	10	11	12	14	15	16	18	19	20	27
900	8	9	11	12	13	15	16	18	19	20	22	29
1000	9	10	12	13	15	16	18	19	21	22	24	31
1100	9	11	13	14	16	17	19	20	22	24	25	32
1200	10	12	14	15	17	19	20	22	24	25	27	35
1300	11	13	14	16	18	20	22	23	25	27	29	36
1400	12	14	16	17	19	21	23	25	27	29	31	38
1500	12	14	16	18	20	22	24	26	28	30	32	40
1600	13	15	17	20	22	24	26	28	30	32	34	42
1700	14	16	18	20	23	25	27	29	31	34	36	44
1800	15	17	19	22	24	26	29	31	33	35	38	46
1900	15	18	20	22	25	27	30	32	34	37	39	47
2000	16	19	21	24	26	29	30	34	36	39	41	49
2100	17	19	22	25	27	30	32	35	38	40	43	51
2200	18	20	23	26	28	31	34	37	39	42	45	53
2300	18	21	24	27	29	32	35	38	41	44	46	55
2400	19	22	25	28	31	34	37	40	42	45	48	57

H / HEIGHT (mm)	B / WIDTH (mm)											
	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
200	17	17	18	21	21	22	23	25	26	27	27	28
300	20	20	21	24	25	26	26	29	30	31	32	32
400	21	22	23	26	27	27	28	31	32	33	34	35
500	23	24	25	28	29	30	31	34	35	36	37	38
600	25	26	27	31	32	33	34	37	38	39	40	41
700	27	28	29	33	34	35	36	40	41	42	43	44
800	29	31	32	35	37	38	39	43	44	45	47	48
900	31	33	34	38	39	40	42	45	47	48	50	51
1000	34	35	37	40	42	43	45	49	50	52	53	55
1100	35	37	39	42	44	46	47	51	53	54	56	58
1200	38	40	41	45	47	49	51	54	56	58	60	62
1300	40	41	43	47	49	51	53	57	59	61	63	65
1400	42	44	46	50	52	54	56	60	62	64	66	68
1500	44	46	48	52	54	56	59	63	65	67	69	71
1600	46	48	51	55	57	59	62	66	68	70	73	75
1700	48	50	53	57	59	62	64	69	71	73	76	78
1800	50	53	55	60	62	65	67	72	74	77	79	82
1900	52	55	57	62	65	67	70	74	77	79	82	85
2000	55	57	60	65	67	70	73	78	80	83	86	88
2100	56	59	62	67	70	72	75	80	83	86	89	91
2200	59	62	65	70	73	76	78	83	86	89	92	95
2300	61	64	67	72	75	78	81	86	89	92	95	98
2400	63	66	69	75	78	81	84	89	92	95	99	102

UTK D1

D1 ØD (mm)	WEIGHT (kg)	D1 ØD (mm)	WEIGHT (kg)
160	4	500	12
200	4	630	16
250	5	800	23
315	7	1000	32
400	9	1250	51

UTK D2

D2 ØD (mm)	WEIGHT (kg)	D2 ØD (mm)	WEIGHT (kg)
160	4	500	15
200	5	630	21
250	6	800	30
315	9	1000	42
400	11	1250	66

WEIGHTS

STANDARD HALTON UTT DAMPERS (KG) WITHOUT AN ACTUATOR

H / HEIGHT (mm)	B / WIDTH (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
200	3	3	4	5	6	7	7	8	9	9	10	16
300	4	5	6	7	7	8	9	10	11	11	12	19
400	5	6	6	7	8	9	10	11	12	13	13	20
500	5	6	7	8	9	10	11	12	13	14	15	22
600	6	7	8	9	11	12	13	14	15	16	17	24
700	7	8	9	10	11	13	14	15	16	18	19	26
800	8	9	10	12	13	14	16	17	18	20	21	28
900	8	10	11	12	14	15	17	18	20	21	23	30
1000	9	11	12	14	15	17	18	20	22	23	25	32
1100	10	11	13	15	16	18	20	21	23	25	26	34
1200	11	12	14	16	18	19	21	23	25	27	28	36
1300	11	13	15	17	19	21	22	24	26	28	30	38
1400	12	14	16	18	20	22	24	26	28	30	32	40
1500	13	15	17	19	21	23	25	27	30	32	34	42
1600	14	16	18	20	22	25	27	29	31	34	36	44
1700	14	16	19	21	23	26	28	30	33	35	38	46
1800	15	17	20	22	25	27	30	32	35	37	40	48
1900	16	18	21	23	26	28	31	34	36	39	41	50
2000	16	19	22	25	27	30	33	35	38	41	43	52
2100	17	20	23	25	28	31	34	37	39	42	45	54
2200	18	21	24	27	30	33	36	38	41	44	47	56
2300	19	22	25	28	31	34	37	40	43	46	49	58

H / HEIGHT (mm)	B / WIDTH (mm)											
	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
200	17	17	18	21	21	22	23	25	26	27	27	28
300	20	20	21	24	25	26	26	29	30	31	32	32
400	21	22	23	26	27	27	28	31	32	33	34	35
500	23	24	25	28	29	30	31	34	35	36	37	38
600	25	26	27	31	32	33	34	37	38	39	40	41
700	27	28	29	33	34	35	36	40	41	42	43	44
800	29	31	32	35	37	38	39	43	44	45	47	48
900	31	33	34	38	39	40	42	45	47	48	50	51
1000	34	35	37	40	42	43	45	49	50	52	53	55
1100	35	37	39	42	44	46	47	51	53	54	56	58
1200	38	40	41	45	47	49	51	54	56	58	60	62
1300	40	41	43	47	49	51	53	57	59	61	63	65
1400	42	44	46	50	52	54	56	60	62	64	66	68
1500	44	46	48	52	54	56	59	63	65	67	69	71
1600	46	48	51	55	57	59	62	66	68	70	73	75
1700	48	50	53	57	59	62	64	69	71	73	76	78
1800	50	53	55	60	62	65	67	72	74	77	79	82
1900	52	55	57	62	65	67	70	74	77	79	82	85
2000	55	57	60	65	67	70	73	78	80	83	86	88
2100	56	59	62	67	70	72	75	80	83	86	89	91
2200	59	62	65	70	73	76	78	83	86	89	92	95
2300	61	64	67	72	75	78	81	86	89	92	95	98
2400	63	66	69	75	78	81	84	89	92	95	99	102

UTT D1

D1 ØD (mm)	WEIGHT (kg)	D1 ØD (mm)	WEIGHT (kg)
160	4	500	12
200	4	630	17
250	5	800	24
315	7	1000	33
400	9	1250	52

UTT D2

D2 ØD (mm)	WEIGHT (kg)	D2 ØD (mm)	WEIGHT (kg)
160	4	500	15
200	5	630	21
250	6	800	30
315	9	1000	43
400	11	1250	67

MORE INFORMATION

For more detailed information, visit the product pages at the Halton website:

- UTK: https://www.halton.com/products/rectangular-multi-blade-damper-utk-en_us/
- UTT: https://www.halton.com/products/tight-shut-off-damper-utt-en_us/

Or download the Halton HIT Design tool:

- <https://www.halton.com/product-selection-tools/>

PRA AIRFLOW MANAGEMENT DAMPER

For circular ducts



MATERIALS

PART	MATERIAL
Casing	Galvanised steel
Blades	Galvanised steel
Operating mechanism (sizes 100...315)	ABS and PBT plastic
Operating mechanism (sizes 350...800)	Steel
Duct gaskets	1C-polyurethane hybrid
Measurement taps	Polyurethane (PU)

PRODUCT OPTIONS

PRA unit (PRA/R) integrated with a cleaning access panel. RLA enables removal of the adjustment damper and access to ductwork for cleaning.

QUICK SELECTION

D (mm)	qmin (l/s)	qmin (m³/h)	qmax (l/s)	qmax (m³/h)
100	8	28	47	170
125	12	44	74	265
160	20	72	121	434
200	31	113	188	679
250	49	177	295	1060
315	78	281	468	1683
350	96	346	577	2078
400	126	452	754	2714
500	196	707	1178	4241
630	312	1122	1870	6733
800	503	1810	3016	10857

- qmin: 1 m/s duct velocity
- qmax: 6 m/s duct velocity (recommended maximum airflow for comfort applications)

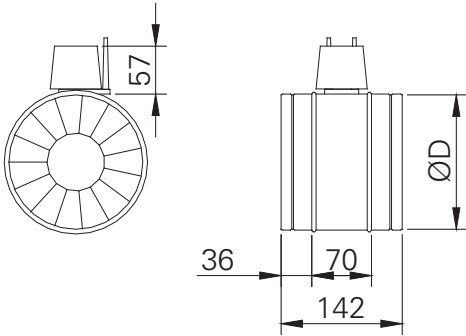
APPLICATIONS

Halton PRA is an airflow balancing, adjustment and measurement unit for circular ducts.

FEATURES

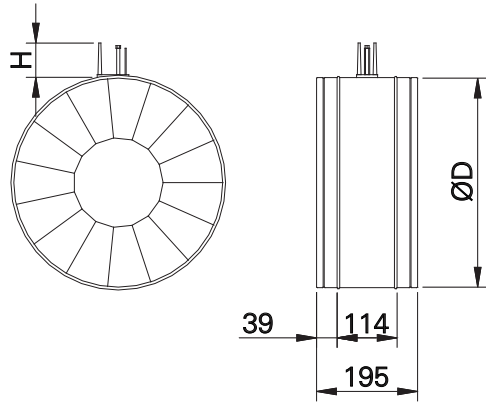
- Airflow balancing, adjustment and measurement unit
- Manual adjustment, no tools required
- Accurate airflow measurement based on the flow nozzle principle
- Minimised sound generation due to conical adjustment section
- Temperature operation range from -30 °C to +70 °C
- Self-locking adjustment mechanism; position can be secured with locking screw
- Duct cleaning enabled through the unit up to size 315
- Adjustment position marker indicates proper position (e.g. repositioning after cleaning)
- Inlet and outlet spigots equipped with integral rubber gaskets
- Application option as supply air jet nozzle for air diffusion in large spaces
- Classification of casing leakage EN 1751 class C

GENERAL PRA DRAWINGS



PRA 100...315

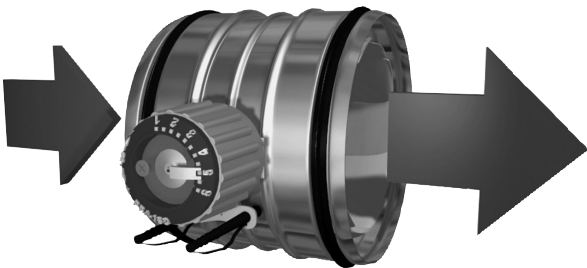
NS	ØD
100	99
125	124
160	159
200	199
250	249
315	314



PRA 350...800

NS	ØD	H
350	349	70
400	399	70
500	499	70
630	629	70
800	799	70

FUNCTION



The airflow rate is adjusted by turning the adjustment knob in order to change the aperture size of the adjustment cone formed by iris blades. Once the opening area is reduced, the airflow rate decreases and the total pressure loss caused by the device increases. The airflow can be determined by measuring the differential pressure in the measurement taps.

PRA 100...315

The operating mechanism is positioned partly outside the device and between the adjustment cone and casing. The unit can be cleaned with normal duct sweeping equipment when the device is fully opened.

PRA 350...800

The operating mechanism is located partly outside the device and inside the adjustment cone. The device can be cleaned with normal duct sweeping equipment, when the device is fully opened and the cleaning equipment is passed carefully through the operating mechanism.

SUPPLY AIR JET NOZZLE PRA/S

The PRA-unit can also be used as a supply air nozzle in e.g. industrial spaces. Refer to the technical data for PRA/S -model presented in the technical performance chapter.

MORE INFORMATION

For more detailed information, visit the product pages at the Halton website:

- https://www.halton.com/products/adjustment-and-measurement-unit-pra-en_us/

Or download the Halton HIT Design tool:

- <https://www.halton.com/product-selection-tools/>

For offshore and marine ventilation systems



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI316L)	-
Shafts	Stainless steel EN 1.4404 (AISI316L)	-

BLD PRODUCT OPTIONS

- Models for horizontal and vertical installation available
- Circular connection pieces are available
- Standard construction places weights on the right hand side. Weights on the left hand side available as an option

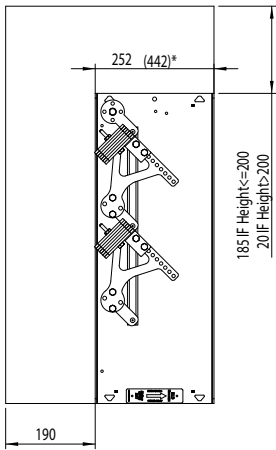
APPLICATIONS

Halton BLD non-return dampers are used in offshore and marine applications to prevent backflow through ventilation ductwork system. The BLD dampers do not need an actuator or motor. Non-return dampers can be installed in rectangular or circular ducts, horizontally or vertically. If required, they can easily be set by adjusting the weight of each damper/installation. When the blades are in the open position, the device does not cause significant pressure loss, noise or flow disturbance.

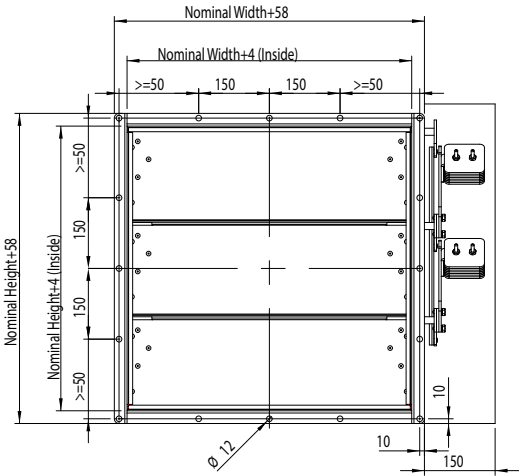
FEATURES

- Fixed frame in painted, galvanized or stainless steel. Blades of galvanized or stainless steel
- Models for horizontal or vertical installation
- Available as ATEX certified
- Leakage class (EN1751:2014) of closed damper up to class 2. Details available from Halton
- Blades contain silicone seal to lower the leakage through blades
- Blades linked and open in parallel
- Adjustable by changing the position of counterweights. Standard construction places weights on the right hand side, weights on the left hand side available as an option
- Maximum duct pressure for damper construction 5000 Pa and maximum air velocity 15 m/s. In case of high duct pressure, contact Halton for finding the most suitable solution
- Temperature operation range up to +100°C, optionally up to +180°C

GENERAL BLD DRAWINGS

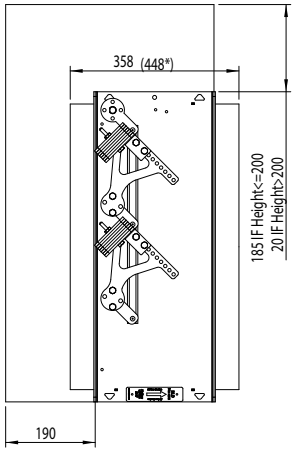


*THIS DIMENSION AS OPTION
WHEN ACTUATING MECHANISM
NEEDS TO BE INSIDE DAMPER DEPTH

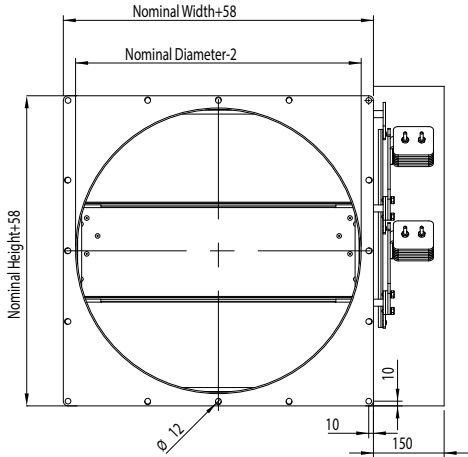


OPERATION AREA

BLD DRAWING, CIRCULAR CONNECTIONS

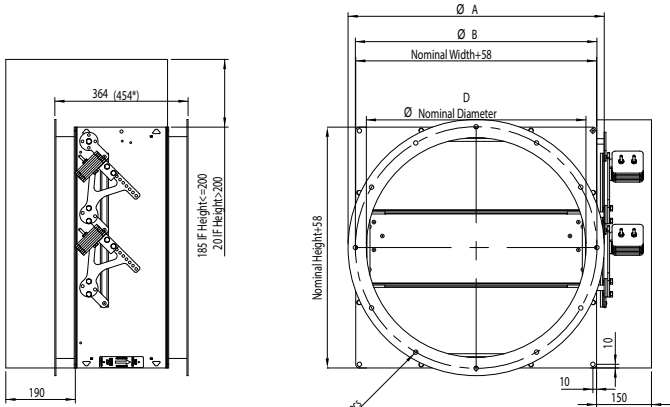


*THIS DIMENSION AS OPTION
WHEN ACTUATING MECHANISM
NEEDS TO BE INSIDE DAMPER DEPTH



OPERATION AREA

BLD CIRCULAR, WITH CONNECTION FLANGES



*THIS DIMENSION AS OPTION
WHEN ACTUATING MECHANISM
NEEDS TO BE INSIDE DAMPER DEPTH

OPERATION AREA

D	B	A	d	N
200	225	300	8,5	4
250	280	350	12	4
315	355	415	12	8
400	450	500	12	8
500	560	600	12	12
630	690	730	12	12
800	860	900	12	16
1000	1070	1100	15	16
1250	1320	1350	15	20

BLD DIMENSIONS AND MATERIAL THICKNESS

BLD non-return dampers meet international standards for both rectangular (width B 150-1200 and height H 150-1400 mm, 1mm division) and circular ducts (Ø100 - 1250 mm). Non-standard dimensions are available on request. Standard flange width 27 mm. Flanges and drilling also available according to ISO 15138 standards. Modular construction sizes up to 2400x2800 mm. Standard frame material thickness 3 mm. Blades made of two sheets, each being 0.8 mm thick (sandwich design).

BLD OPERATION PRINCIPLE

Non-return damper will allow one-way airflow in the ductwork. This feature is based on imbalanced blades. When the pressure in the ductwork drops below minimum opening force required, the blades close and seal the duct to prevent backflow. The minimum opening force can be adjusted with weights. Minimum opening pressure 30 Pa.

WEIGHTS**STANDARD HALTON BLD DAMPERS (KG) INCLUDING COUNTER WEIGHTS. FRAME THICKNESS 3 MM**

H/ HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	Weight (kg)
	150	200	300	400	500	600	700	800	900	1000	1100	1200		
150	8	9	11	13	15	16	18	20	22	24	25	27	100	12
200	10	12	12	14	16	19	20	22	24	26	28	29	160	12
300	12	13	15	18	20	21	24	26	29	31	34	35	200	15
400	14	15	18	20	23	25	28	30	33	36	37	40	250	17
500	17	17	21	24	27	29	32	35	37	40	43	45	315	21
600	19	20	24	26	29	32	36	39	42	45	47	51	400	26
700	21	23	26	30	33	37	40	43	47	50	53	57	500	36
800	22	24	27	33	36	40	43	47	51	54	58	62	630	45
900	26	28	32	36	39	44	48	52	56	60	63	67	800	63
1000	28	30	34	39	43	48	51	55	60	64	68	72	1000	87
1100	31	33	38	42	47	51	56	60	65	70	72	78	1250	116
1200	33	35	40	45	50	54	59	64	69	74	78	84		
1300	36	38	44	48	53	58	64	69	74	79	83	89		
1400	38	40	46	51	56	62	67	73	78	83	88	94		

For offshore and marine ventilation systems



APPLICATIONS

Halton BRD pressure-relief dampers are used in offshore and marine applications to regulate the pressure in the ductwork system. The Halton pressure relief dampers do not need an actuator or motor. The BRD dampers can be installed in rectangular or circular ducts horizontally or vertically. The damper is in closed position when the pressure in the duct is lower than the adjusted opening pressure. Opening pressure can easily be set by adjusting weight of each damper/installation. Weights are included in the delivery. Pressure relief dampers can be supplied with non-standard dimensions on request.

MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Blades	Steel	Galvanised
Blades	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	-
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI316L)	-
Shafts	Stainless steel EN 1.4404 (AISI316L)	-

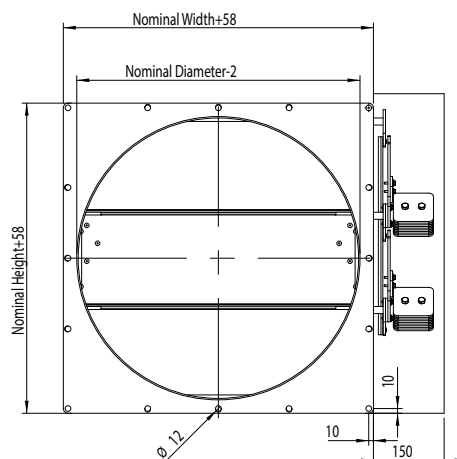
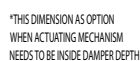
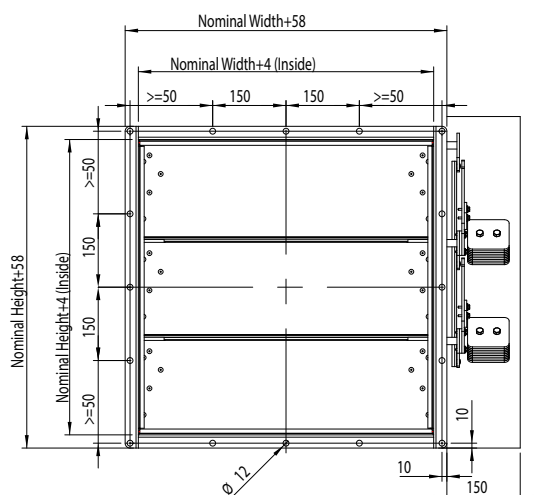
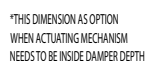
BRD PRODUCT OPTIONS

- Models for horizontal and vertical installation available
- Circular connection pieces are available.
- Standard construction places weights on the right hand side. Weights on the left hand side available as an option.

FEATURES

- Fixed frame in painted, galvanized or stainless steel. Blades of galvanized or stainless steel.
- Models for horizontal or vertical installation
- Blades contain silicone seal to lower the leakage through blades
- Available as ATEX certified
- Leakage class (EN1751:2014) of closed damper up to class 2. Contact Halton for more details.
- Blades linked and open in parallel
- Opening pressure adjusted by changing the position of counterweight(s)
- Minimum opening pressure between 30 Pa and 200 Pa depending on damper size
- Opening pressure can be adjusted up to 300 Pa. For higher opening pressure, contact Halton
- Counterweights included
- Standard construction places weights on the right hand side, weights on the left hand side available as an option
- Final adjustment of counterweights carried out during commissioning onsite
- Maximum duct pressure for damper construction 5000 Pa and maximum air velocity 15 m/s. In case of high duct pressure, contact Halton for finding the most suitable solution.
- Temperature operation range up to +100°C, optionally up to +180°C

BRD DRAWING, CIRCULAR CONNECTIONS



D	B	A	d	N
200	225	300	8,5	4
250	280	350	12	4
315	355	415	12	8
400	450	500	12	8
500	560	600	12	12
630	690	730	12	12
800	860	900	12	16
1000	1070	1100	15	16
1250	1320	1350	15	20

BRD DIMENSIONS AND MATERIAL THICKNESS

BRD pressure relief dampers meet international standards for both rectangular (width B 150-1200 mm and height H 150-1400 mm, 1 mm division) and circular ducts (Ø100 - 1250 mm). Non-standard dimensions are available on request. Standard flange width 27 mm. Flanges and drilling also available according to ISO 15138 standards. Modular construction sizes up to 2400x2800 mm are available. Standard frame material thickness 3 mm. Blades are made of two sheets, each of being 0.8 mm thick (sandwich design).

BRD OPERATION PRINCIPLE

The pressure-relief damper will allow one-way pressure relief in the ductwork. This feature is based on imbalanced blades. When the pressure in the duct rises above a certain value the damper blades begin to open and allow pressure relief. As the pressure increases the blade angle opening increases. The size of the damper, without counterweights, determines the minimum pressure needed (see the table below). The opening force can be adjusted with weights. When the pressure in the ductwork drops below the minimum opening force required, the blades close and seal the duct.

BRD MINIMUM OPENING PRESSURE (WITHOUT COUNTERWEIGHTS)**OPENING DEFINED AS 5 DEGREES BLADE MOVEMENT**

H / HEIGHT					B / WIDTH (mm)																
(mm)	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200	100	80	70	65	55	50	50	45	45	40	40	35	35	35	35	35	30	30	30	30	30
250	130	105	90	80	70	65	60	55	50	50	45	45	45	40	40	40	35	35	35	35	35
300	100	85	75	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	30	30	30
350	85	70	60	55	50	45	45	40	40	40	35	35	35	35	30	30	30	30	30	30	30
400	70	60	55	50	45	40	40	35	35	35	30	30	30	30	30	30	30	30	30	30	30
450	125	105	90	80	70	65	60	55	50	50	45	45	45	40	40	40	40	35	35	35	35
500	110	90	80	70	65	55	55	50	45	45	45	40	40	40	35	35	35	35	35	35	30
550	95	80	70	60	55	50	50	45	45	40	40	40	35	35	35	35	30	30	30	30	30
600	85	70	60	55	50	45	45	40	40	40	35	35	35	35	30	30	30	30	30	30	30
650	120	100	85	75	70	65	60	55	50	50	45	45	45	40	40	40	40	35	35	35	35
700	110	90	80	70	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	35	30
750	100	85	70	65	60	55	50	45	45	40	40	40	40	35	35	35	35	35	30	30	30
800	90	75	65	60	55	50	45	45	40	40	40	35	35	35	35	30	30	30	30	30	30
850	120	100	85	75	70	60	60	55	50	50	45	45	40	40	40	40	35	35	35	35	35
900	110	90	80	70	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	35	30
950	100	85	75	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	30	30	30
1000	95	80	70	60	55	50	50	45	45	40	40	35	35	35	35	35	30	30	30	30	30
1050	120	100	85	75	65	60	55	55	50	50	45	45	40	40	40	40	35	35	35	35	35
1100	110	90	80	70	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	35	30
1150	105	85	75	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	30	30	30
1200	100	80	70	65	55	55	50	45	45	40	40	40	35	35	35	35	35	30	30	30	30
1250	115	95	85	75	65	60	55	55	50	50	45	45	40	40	40	40	35	35	35	35	35
1300	110	90	80	70	65	60	55	50	50	45	45	40	40	40	40	35	35	35	35	35	30
1350	105	85	75	65	60	55	50	50	45	45	40	40	40	35	35	35	35	35	35	30	30
1400	100	85	70	65	60	55	50	45	45	40	40	40	35	35	35	35	35	30	30	30	30

WEIGHTS

STANDARD HALTON BRD DAMPERS (KG) INCLUDING COUNTER WEIGHTS. FRAME THICKNESS 3 MM

H/ HEIGHT (mm)	B / WIDTH (mm)												D2 ØD (mm)	Weight (kg)
	150	200	300	400	500	600	700	800	900	1000	1100	1200		
150	8	9	11	13	15	16	18	20	22	24	25	27	100	12
200	10	12	12	14	16	19	20	22	24	26	28	29	160	12
300	12	13	15	18	20	21	24	26	29	31	34	35	200	15
400	14	15	18	20	23	25	28	30	33	36	37	40	250	17
500	17	17	21	24	27	29	32	35	37	40	43	45	315	21
600	19	20	24	26	29	32	36	39	42	45	47	51	400	26
700	21	23	26	30	33	37	40	43	47	50	53	57	500	36
800	22	24	27	33	36	40	43	47	51	54	58	62	630	45
900	26	28	32	36	39	44	48	52	56	60	63	67	800	63
1000	28	30	34	39	43	48	51	55	60	64	68	72	1000	87
1100	31	33	38	42	47	51	56	60	65	70	72	78	1250	116
1200	33	35	40	45	50	54	59	64	69	74	78	84		
1300	36	38	44	48	53	58	64	69	74	79	83	89		
1400	38	40	46	51	56	62	67	73	78	83	88	94		

For offshore, onshore and heavy industry ventilation systems



MATERIALS

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or hot-dip galvanised
Frame	Stainless steel EN 1.4404 (AISI 316L)	-
Blades	Carbon steel	Hot-dip galvanised
Blades	Stainless steel EN 1.4404 (AISI 316L)	-
Setting, closing and locking mechanism	Stainless steel EN 1.4404 (AISI 316L) and some parts EN 1.4305 (AISI 303) or similar	-
Maintenance- free bearings	Stainless steel EN 1.4404 (AISI 316L)	-
Shafts	Stainless steel EN 1.4404 (AISI 316L)	-
Debris catcher	Carbon steel	Hot-dip galvanised
Debris catcher	Stainless steel EN 1.4404 (AISI 316L)	-

INSTALLATION

The damper can be installed vertically outside of the building wall or between duct flanges. Also, horizontal installation is possible on the duct, floor or roof but only in the top-down blast direction.

The wall (or floor/roof) material can be concrete or steel. For concrete wall installation, a wide-flange version is used and the damper is installed using anchor bolts. For steel wall installation, the damper is installed using bolts or by welding.

Detailed installation information is available in the BDH installation, operation and maintenance manual.

APPLICATIONS

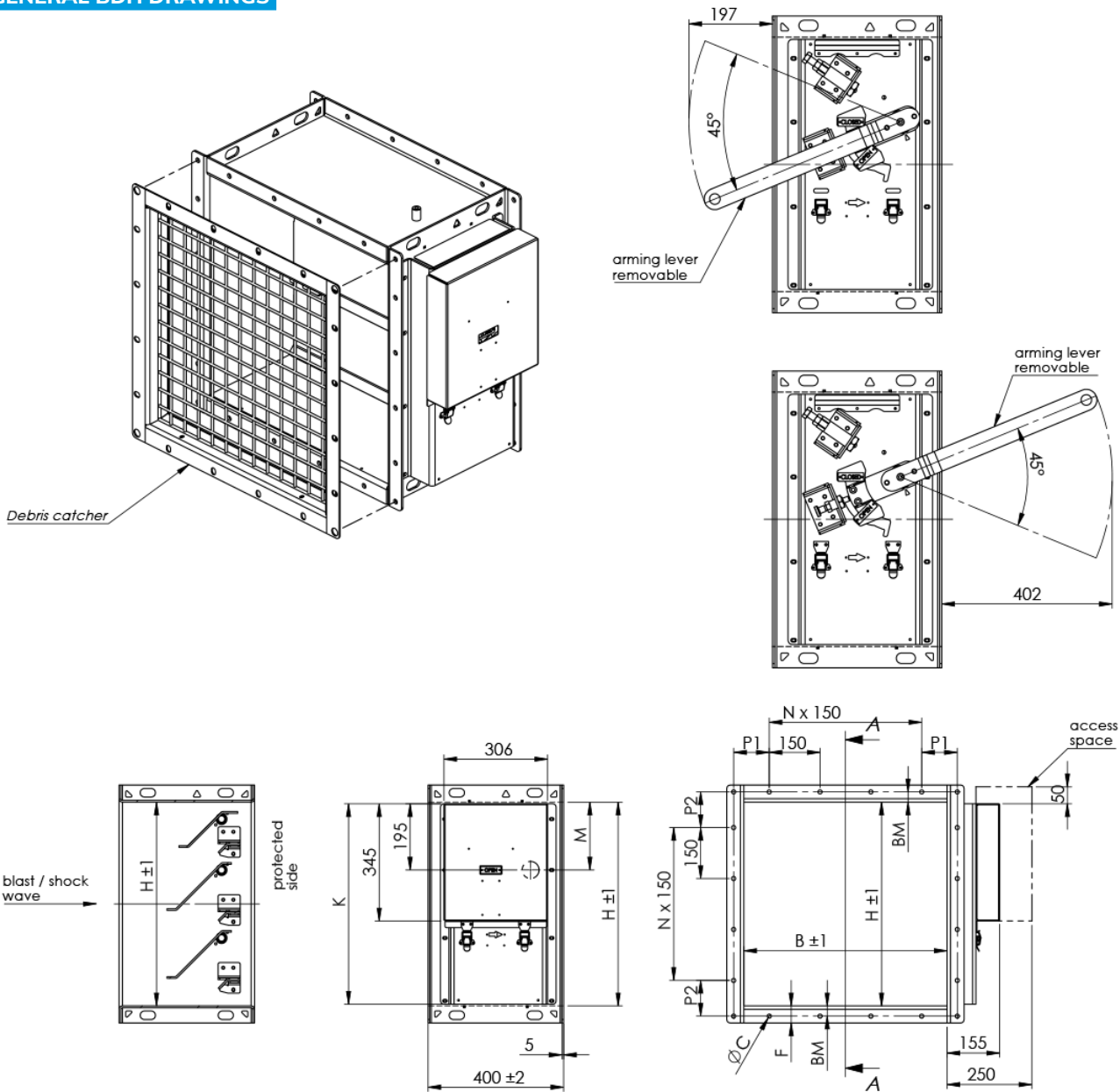
Halton BDH blast dampers protect against overpressure in offshore, onshore and heavy industry ventilation systems. The BDH blast damper can be installed in rectangular ducts or wall openings. When the blades are in the open position, the device does not cause significant pressure loss, noise or flow disturbance. The BDH has an adjustable arming mechanism to cope with different air velocity and closing pressure requirements. An open-closed indicator is visible on the outside of the damper.

There is no external power source needed to operate the damper. In case of a blast incident, the pressure wave closes the blades. There is a locking mechanism preventing the blades from opening during the negative phase. After a blast incident, the blades remain locked in the closed position, until the damper is set (armed) again.

FEATURES

- Shock tube tested for detonation (shock) type pressure wave
- Shock tube tested for deflagration (blast) type pressure wave
- Shock tube testing in compliance with GSA TS01 and ASTM F 1642-04(2010)
- Debris (steel balls and wood plank missile) impact tested
- Debris impact testing in compliance with ASTM E 1886-13a and ASTM E 1996-14a
- Aerodynamic testing according to EN 1751
- The normal open position of the blade angle is 45 degrees
- ATEX certified
- Recommended maximum air velocity is 10 m/s
- Maximum shock and blast wave pressure is 1.0 bar
- The normal operating temperature for a stainless steel damper is between -60 °C to +80 °C
- The normal operating temperature for a carbon steel damper is between -20 °C to +80 °C

GENERAL BDH DRAWINGS



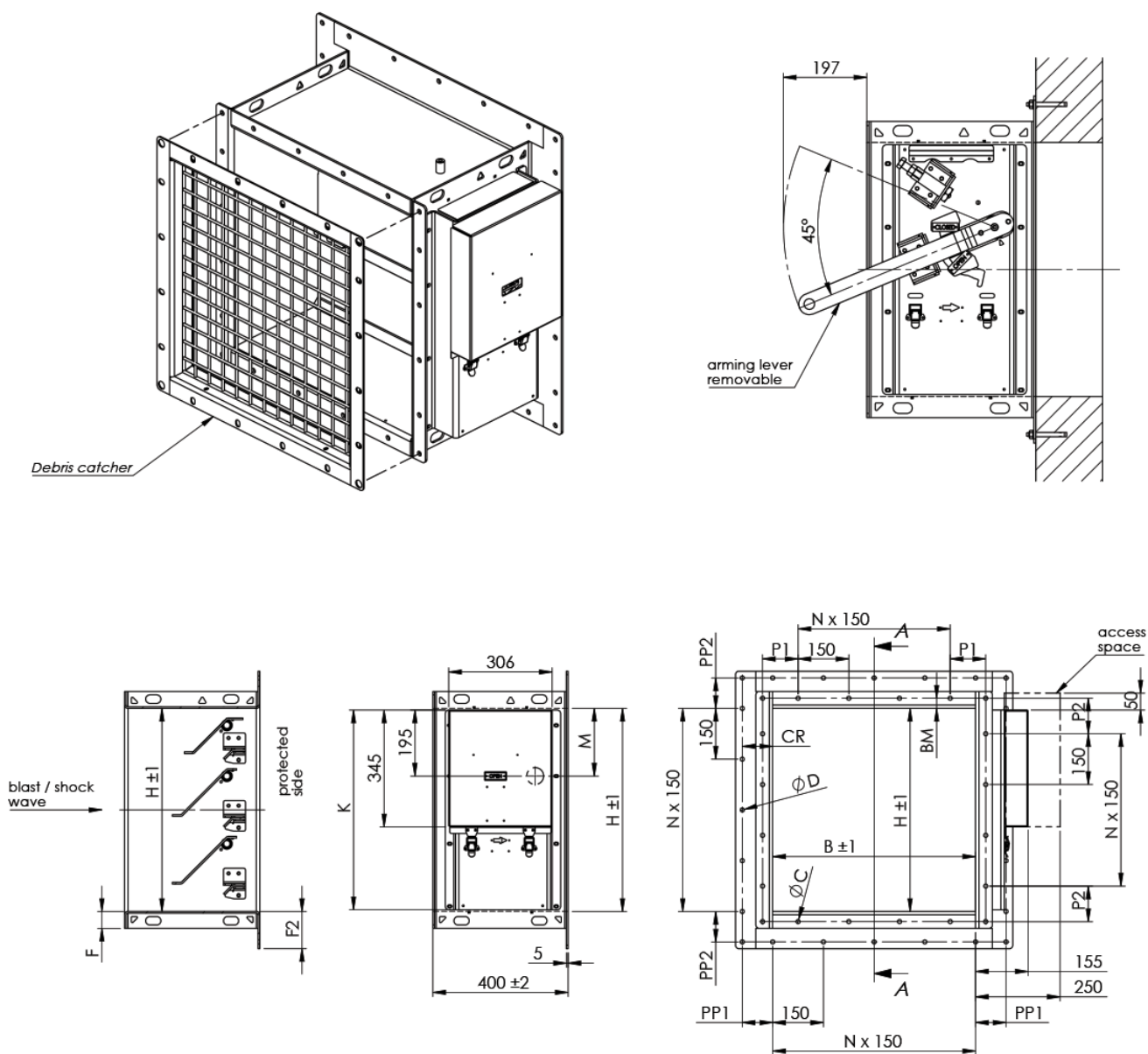
H	M	K
1200	200	1190
1150	200	1140
1100	200	1090
1050	200	1040
1000	200	990
950	200	940
900	200	890
850	200	840
800	200	790
750	200	740
700	200	690

H	M	K
650	200	640
600	200	590
550	200	540
500	200	490
450	250	440
400	200	435
350	200	435
300	50	440
250	50	435
200	50	435

DAMPER SIZE BXH	OPENING SIZE STEEL WALL / DUCT COAMING (MAX) BXH
300x300	300x300
400x400	400x400
500x500	500x500
600x600	600x600
700x700	700x700
800x800	800x800
900x900	900x900
1000x1000	1000x1000
1100x1100	1100x1100
1200x1200	1200x1200

FLANGE DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	ØC	BOLT	P1, P2	BM	F
If longest side < 350	10	M8	75...150	20	40
If longest side 351...1000	12	M10	75...150	30	50
If longest side > 1001	14	M12	75...150	40	80



H	M	K
1200	200	1190
1150	200	1140
1100	200	1090
1050	200	1040
1000	200	990
950	200	940
900	200	890
850	200	840
800	200	790
750	200	740
700	200	690

H	M	K
650	200	640
600	200	590
550	200	540
500	200	490
450	250	440
400	200	435
350	200	435
300	50	440
250	50	435
200	50	435

DAMPER SIZE BXH	OPENING SIZE CONCRETE WALL BXH
300x300	300x300
400x400	400x400
500x500	500x500
600x600	600x600
700x700	700x700
800x800	800x800
900x900	900x900
1000x1000	1000x1000
1100x1100	1100x1100
1200x1200	1200x1200

FLANGE DIMENSIONS ACCORDING TO ISO 15138

DIMENSIONS	ØC	BOLT	P1, P2	BM	F	P1, P2	CR	F2
If longest side < 350	10	M8	75...150	20	40	75...150	75	95
If longest side 351...1000	12	M10	75...150	30	50	75...150	90	110
If longest side > 1001	14	M12	75...150	40	80	75...150	105	145

BDH DIMENSIONS AND MATERIAL THICKNESS

BDH blast protection dampers are available for rectangular ducts and wall openings. Width B is 300-1200 mm, 25 mm division. Height H is 200-1200 mm, 50 mm division. Modular construction is available for larger sizes.

As a standard, flange width and bolt-hole drilling are according to ISO 15138 standards.

The frame depth is 400 mm, frame thickness is 5 mm.

The blade thickness is 5 mm, blade shaft diameter is 25 mm. Blades are bolted to shafts.

The damper has 1-6 blades. In a multiblade damper (2-6 blades), blades are connected via linkage and operate in parallel. The linkage thickness is 8 mm.

The debris catcher is a diameter of 6 mm wire. The open area between wires is 40x40 mm.

ACCESSORIES

Arming tool to open the damper, at least one tool per building.

Debris catcher to prevent large objects from entering the protected area.

Mesh finger guard for personnel safety to prevent touching armed blades. Can be installed on the protected side, exposed side or both.

WEIGHTS

STANDARD HALTON BDH DAMPERS (KG)

H/HEIGHT	B / WIDTH (MM)									
MM	300	400	500	600	700	800	900	1000	1100	1200
200	41	43	46	49	52	55	57	60	63	66
300	52	56	60	63	67	71	75	79	83	87
400	63	68	73	78	83	88	93	98	103	108
500	74	80	86	92	99	105	111	117	123	129
600	85	92	100	107	114	122	129	136	143	151
700	96	105	113	122	130	138	147	155	164	172
800	107	117	126	136	146	155	165	174	184	193
900	122	133	143	154	165	175	186	197	207	218
1000	133	145	157	168	180	192	204	216	227	239
1100	144	157	170	183	196	209	222	235	248	260
1200	155	169	183	197	211	226	240	254	268	282

STANDARD HALTON BDH DAMPERS FOR CONCRETE WALL (KG)

H/HEIGHT	B / WIDTH (MM)									
MM	300	400	500	600	700	800	900	1000	1100	1200
200	44	47	50	53	56	59	62	65	68	71
300	55	60	64	68	72	76	80	84	89	93
400	67	72	78	83	88	94	99	104	110	115
500	79	85	92	98	105	111	118	124	131	137
600	90	98	106	113	121	129	136	144	152	159
700	102	111	120	129	137	146	155	164	173	181
800	114	124	134	144	154	164	174	184	193	203
900	129	140	151	162	173	185	196	207	218	229
1000	141	153	165	177	190	202	214	227	239	251
1100	152	166	179	193	206	219	233	246	260	273
1200	164	179	193	208	222	237	252	266	281	295

KW3 GALLEY WATER WASH HOOD

With Capture Jet™ 3 technology



MATERIALS

PART	MATERIAL	NOTE
Front and side walls	Stainless steel EN 1.4301 (AISI 304)*	Available as an option: stainless steel EN 1.4404 (AISI 316L)
Main body	Stainless steel EN 1.4301 (AISI 304)*	Available as an option: stainless steel EN 1.4404 (AISI 316L)
Light fixture	Painted steel	-
Wash piping	Stainless steel, brass	-
Cables	Halogen-free	-

* Thickness 1.25 mm

KW3 CONSTRUCTION

The KW3 hood consists of a Capture Jet™ air supply module, a light fixture, adjustment dampers, airflow measurement taps, and KSA grease filters. All components are made from polished stainless steel EN 1.4301 (AISI 304), with watertight joints at the lower edges. The exhaust plenum is equipped with a drain pipe connection, facilitating the removal of grease, dirt extracted by the KSA multi-cyclone filters, and the drainage of washing water. The Capture Jet™ supply plenum is thermally insulated with mineral wool material to prevent condensation on the inner face above the cooking equipment.

APPLICATIONS

The Halton KW3 is a galley water wash hood designed for marine and offshore applications. Utilizing the advanced Halton Capture Jet™ 3 technology, this highly efficient hood operates with up to 45% lower exhaust airflow rates compared to traditional hoods. The KW3 galley hood features an automatic washing system that cleans the grease filters without the need for their removal from the hood. The washing cycle is fully automated and programmable to accommodate various operating conditions, and there's an option to manually override the process if needed.

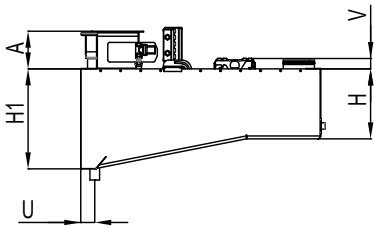
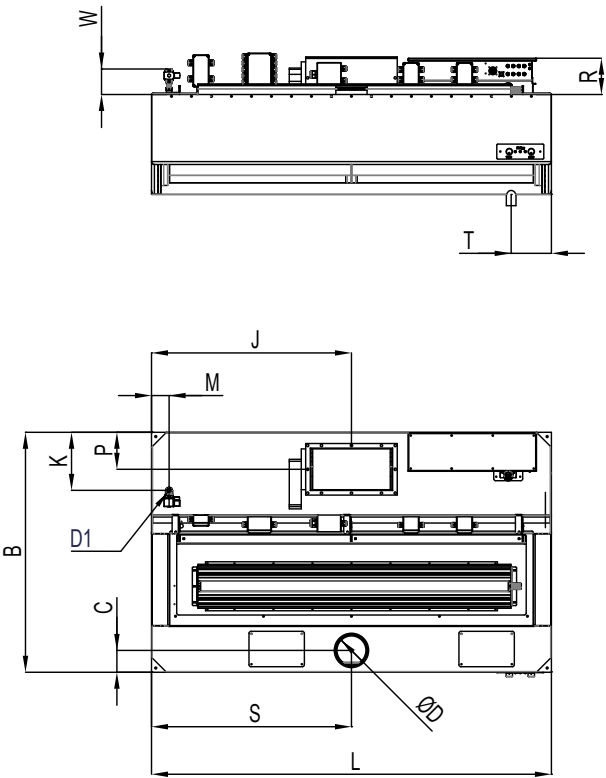
FEATURES

- Halton Capture Jet™ 3 technology, significantly reducing exhaust airflow rates, improving capture and containment efficiencies, and minimizing energy consumption.
- Designed in accordance with USPHS guidelines.
- Automatic periodic cleaning of the exhaust plenum and KSA grease filters (and UV tubes, where applicable).
- Low maintenance requirements, reducing the workload for personnel cleaning the filters and ductwork.
- Ensures a high level of hygiene and prevents the buildup of grease deposits, which could pose a serious fire hazard.
- Equipped with Halton KSA multi-cyclone filters for highly efficient grease filtration.
- Standard features include lighting, balancing dampers for both capture and exhaust air, and T.A.B.™ airflow measurement taps, enabling accurate and effective balancing of airflows, as well as efficient commissioning.
- Constructed with durable welded stainless steel.
- Option to include UV-light filtration technology.
- Option for a modulating Halton fire damper or shut-off damper in the exhaust connection.

KW3 PRODUCT OPTIONS

- Non-standard spigots: customers can choose from different sizes and positions to meet specific requirements.
- UV-light filtration: an option to combine KSA filter, mesh filter, and ultraviolet-light technology for enhanced filtration.
- Option for construction using EN 1.4404 (AISI 316L) stainless steel.
- Option for a modulating fire damper made of either EN 1.4301 (AISI 304) or EN 1.4404 (AISI 316L), or a shut-off damper in the exhaust connection.
- Option to include a wet chemical fire suppression system for added safety.
- An option for a M.A.R.V.E.L. demand-based ventilation system for optimized airflow and energy efficiency.

GENERAL KW3 DRAWINGS



KW3 DIMENSIONS (mm)			
A	195	L	1000-3000
B	1100-1900	M	87
C	110	P	185
D	100-200	S	1/2L
D1	3/4"	T	100-200
H	350	U	70
H1	500	R	185
J	1/2L	V	max 50
K	291	W	~130

WEIGHTS

KW3 HOODS (KG)

B/L	1200	1600	2000	2500	3000
1100	107	130	156	182	211
1300	112	137	163	191	220
1500	118	144	171	199	230
1700	124	150	178	208	240
1900	130	158	189	218	250

The table above provides an indication of the average weights of different sizes of KW3 hoods. Please note that the weight mentioned does not include the fire damper.

KW3 HOODS WITH UV-LIGHT TECHNOLOGY (KG)

B/L	1250	1600	2000	2500	3000
1100	132	155	183	215	249
1300	137	162	191	223	258
1500	143	169	198	232	268
1700	149	175	206	240	278
1900	155	183	217	251	288

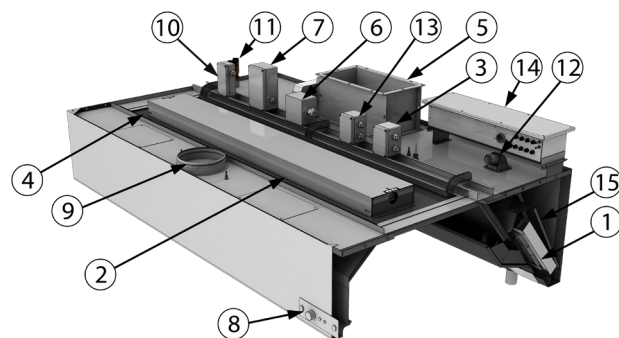
The table above provides an indication of the average weights of different sizes of KW3 hoods with UV-light technology. Please note that the weight mentioned does not include the fire damper.

KW3 PARTS

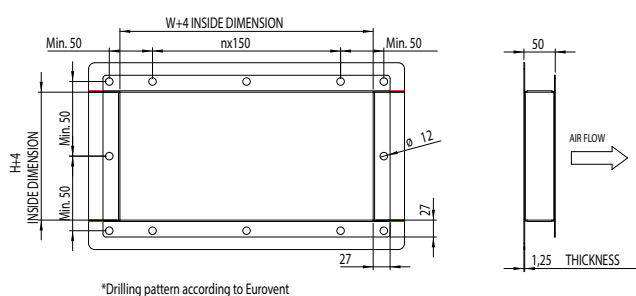
1. KSA grease filters; 2. Lighting fixture; 3. Lighting fixture power supply junction box; 4. Maintenance hatch; 5. Exhaust air connection, fire damper, or shut-off damper* (available as an option) and adjustment damper; 6. Fire damper junction box; 7. Actuator power and fuse info junction box; 8. Damper switch and indication (available as an option); 9. Capture air connection and adjustment damper; 10. Washing solenoid valve junction box; 11. Water wash piping connection R3/4" (G3/4" solenoid valve as an option); 12. UV system (available as an option); 13. UV power supply junction box (available as an option); 14. UV control junction box (location may vary, available as an option); 15. Mesh filter (available as an option).

*If fire or shut-off damper is located at the duct, Halton suggests two default solutions for duct connection:

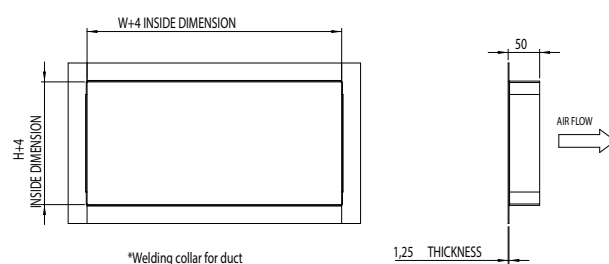
- Eurovent-collar with flange
- Welded L-collar



EUROVENT-COLLAR WITH FLANGE

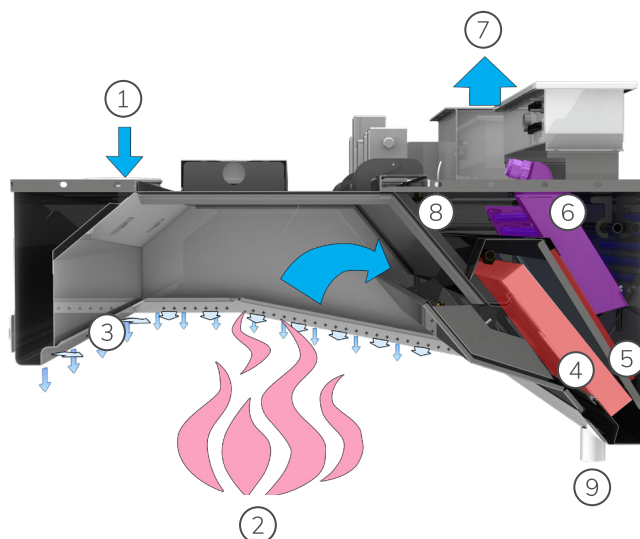


WELDED L-COLLAR



KW3 FUNCTION

1. Supply air enters the Capture Jet™ plenum.
2. Contaminated air and heat rise from the cooking appliances.
3. Halton's patented Capture Jet™ technology directs contaminated air into the hood from three different sides.
4. The KSA multi-cyclone filters efficiently remove grease and contaminants from the air stream using centrifugal force. Independent laboratory tests have proven KSA to be the most efficient mechanical grease filter on the market.
5. The optional mesh filter helps balance airflow inside the exhaust plenum and provides additional air filtration. When combined with the KSA filter, filtration efficiency is doubled.
6. The scheduled maintenance includes the use of UV-light technology, which combines Halton's patented highly efficient Capture Jet™ solution with advanced mechanical KSA filter technology. The UV-light system keeps the plenum and duct virtually grease-free, reducing cooking odor and emissions. Grease vapor and effluents not captured by the high-efficiency filters pass over the lamps, causing a chemical reaction that converts the grease into carbon dioxide and water vapor. This chemical action continues into the duct, helping to keep it and the exhaust fan clean. UV-filtration is available as an option.
7. The cleaned exhaust air contains small amounts of ozone, which further cleans the ducts downstream. Any excess ozone reverts back into oxygen.
8. During scheduled times, the washing control cabinet halts the hood's operation and initiates a washing cycle. Hot water with a mild detergent is pumped into the hood's spray nozzles, effectively cleaning the essential components of the exhaust plenum, including UV-lights and filters. To achieve an improved washing result, it is necessary to modulate the fire or shut-off damper of the hood to minimal airflow during the washing cycle. Subsequently, the waste from the washing cycle is drained from the hood via the drain connection.



SUGGESTED SPECIFICATIONS

The water wash galley hoods shall be constructed using stainless steel EN 1.4301 (AISI 304). Each galley hood will be supplied complete with an outer casing/main body, Capture Jet™ plenum, airflow measurement taps, supply and exhaust air spigot connections with adjustment dampers, maintenance hatch, light fixture, capture air jet, grease filters, drain connection, and an automatic washing system controlled by a separate control cabinet with interfaces to the ship's safety systems. Additionally, classified fire dampers shall be installed in each exhaust connection. The manufacturing process of all galley hoods shall adhere to ISO 3834-2:2005, ISO 9001, ISO 14001, and OHSAS 18001 standards. Furthermore, the design of the hoods shall be in accordance with USPHS guidelines.

CONSTRUCTION

All parts of the hoods shall be constructed using stainless steel sheet EN 1.4301 (AISI 304) with a polished finish and a thickness of 1.25 mm. The inside corners of the hood shall be rounded to ensure easy cleanability as per USPHS guidelines. The joints at the lower edges of the device shall be welded watertight. Visible screws shall be of the thumb screw type. A drain connection shall be integrated into the hood for the removal of dirty water. Maintenance hatches shall be present in each hood, allowing easy access above the hood for maintenance purposes.

WASHING MODULE

The grease filters shall have an automatic washing cycle that utilizes warm water and detergent through nozzles. Detergent mixing will take place within a separate control cabinet. The wastewater resulting from the washing cycle shall be efficiently removed from the hood through a direct drain connection. The casing of the control cabinet shall be constructed using stainless steel sheet EN 1.4301 (AISI 304).

CAPTURE JET™ PLENUM

The Capture Jet™ plenum shall be insulated with sealed mineral wool. Maintenance hatches shall provide access to the plenum when required.

CAPTURE JET™ SYSTEM

The hood shall be designed with Capture Jet™ technology to reduce the required exhaust airflow rate and increase the capture and containment efficiencies of the hood while also reducing energy consumption.

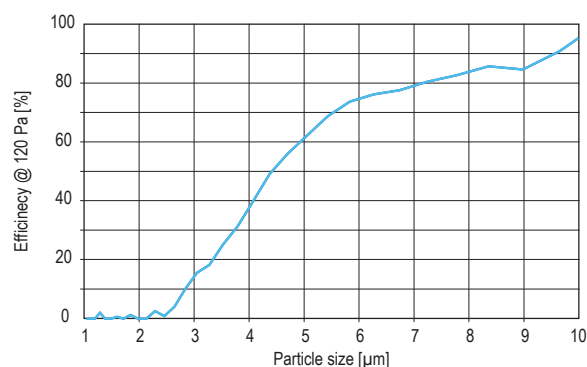
AIRFLOW MEASUREMENT TAPS

Measurement taps shall be located on top of the hood to facilitate the measurement of capture air and exhaust air.

HALTON KSA FILTER

- Minimisation of grease deposits in the ducts
- Enhanced hygiene and safety

The KSA grease filters shall be constructed using stainless steel EN 1.4301 (AISI304). These grease filters shall be supplied in a modular size of 500x330x50 mm and designed to be easily removable via two folding handles. The honeycomb design of the grease filters shall ensure high grease filtration efficiency through the use of centrifugal effect within the filter honeycombs.



Mechanical filtration is recommended for hoods with low utilization rates and cooking processes that primarily produce large grease particles (> 8 microns), such as food prepared with gas fryers, griddles, and broilers (source ASHRAE).

UV-LIGHT FILTRATION

Halton's UV-light technology is the most efficient solution for hoods with medium to high utilization rates and cooking processes that produce all sizes of grease particles, including food prepared with electric ranges, griddles, and all types of broilers. In the UV-light concept, most of the grease particles are initially filtered using mechanical filtration (type KSA). The mesh filter behind the KSA spreads the airflow, allowing the remaining grease particles inside the hood chamber to be more effectively captured. This enhances filtration efficiency by up to 50% for grease particles sized between 5-8 microns. Leveraging Halton's patented highly efficient Capture Jet™ solution and advanced mechanical KSA filter technology, the UV-light technology, with scheduled maintenance, ensures the plenum and duct remain virtually grease-free, effectively mitigating cooking odors and emissions.

Any grease vapor and effluents not captured by the high-efficiency filters pass over the lamps, resulting in a chemical reaction that converts the grease into carbon dioxide and water vapor. This chemical action extends into the duct, significantly contributing to the cleanliness of both the duct and the exhaust fan.

DUCT CONNECTIONS

Duct connections and adjustment dampers for supply and exhaust air shall be constructed using stainless steel. The dampers shall be adjustable.

LIGHT FIXTURES

Each hood shall be delivered with energy-efficient LED light fixtures, providing an average illuminance of approximately 500 lux at the work surfaces of the cooking appliances. The light fixtures shall be designed for a single-phase 230-VAC power supply and have a protection class of IP67. The ballast and capacitor shall be located within the light frame, and the core electric cables connecting the light fixture to the junction box shall be provided. The light fixture shall be installed on a hinged maintenance hatch, allowing access to the hood roof.

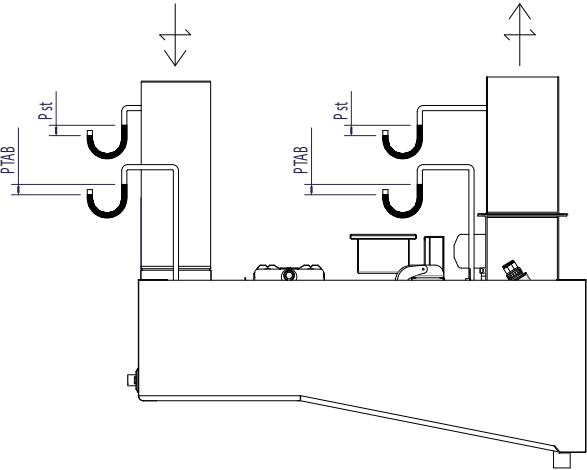
LED LIGHT FIXTURE SIZES

HOOD DIMENSION	LENGTH	WIDTH
L < 1400 mm, 1x28 W	720 mm	175 mm
L ≥ 1400 mm, < 2000 mm, 1x42 W	1020 mm	175 mm
L ≥ 2000 mm, 1x69 W	1620 mm	175 mm

MAINTENANCE HATCH

Each hood shall be equipped with a maintenance hatch made of stainless steel EN 1.4301 (AISI 304) with a shock-resistant plastic window capable of withstanding temperatures up to +115 °C. The hatch shall be easily opened and closed, and the size of the maintenance/light fixture hatch shall be as large as the construction allows.

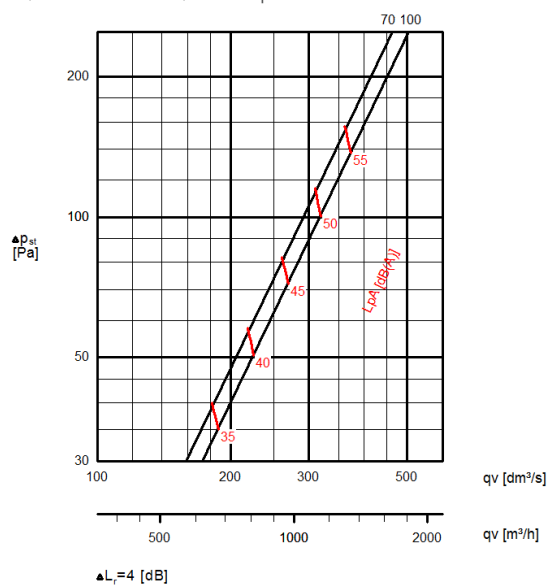
AIRFLOW MEASUREMENT



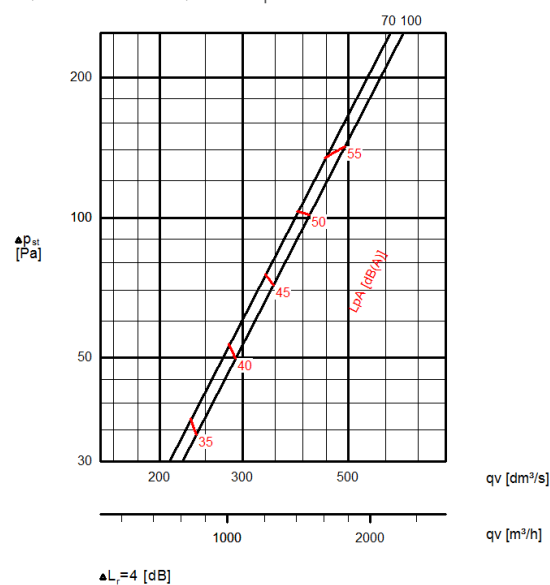
ΔP_{st} = Static pressure loss
 ΔP_{TAB} = TAB pressure for airflow rate measurement
70, 100 = Damper opening in %

PRESSURE DROP AND SOUND DATA WITH RECOMMENDED EXHAUST CONNECTION SIZE

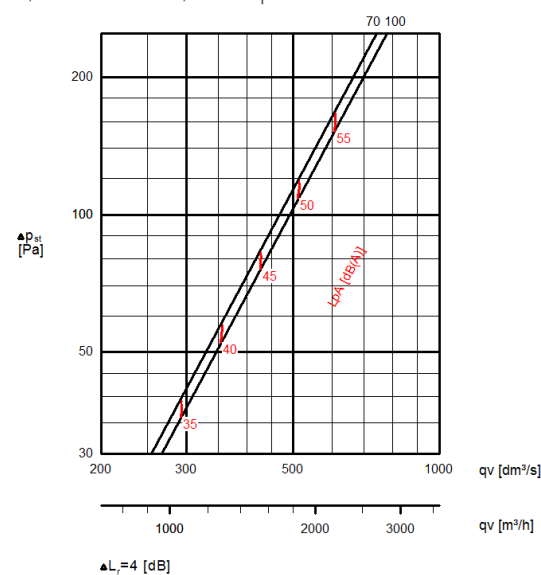
KW3, section 1000, static pressure loss and sound data



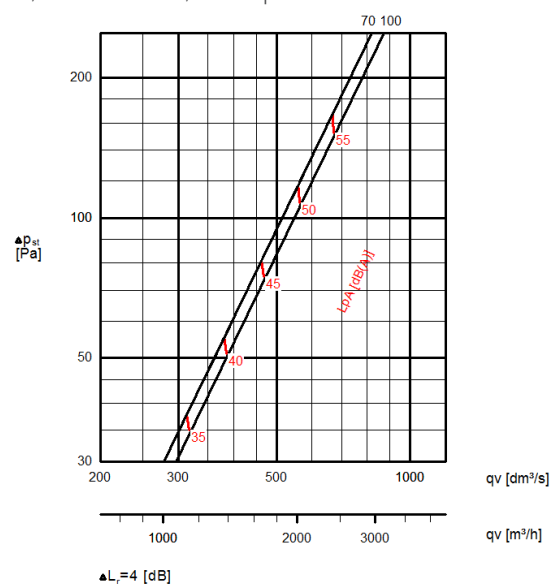
KW3, section 1500, static pressure loss and sound data



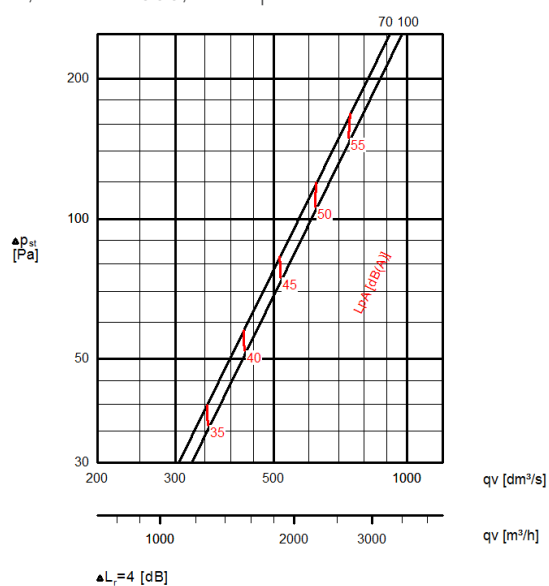
KW3, section 2000, static pressure loss and sound data



KW3, section 2500, static pressure loss and sound data

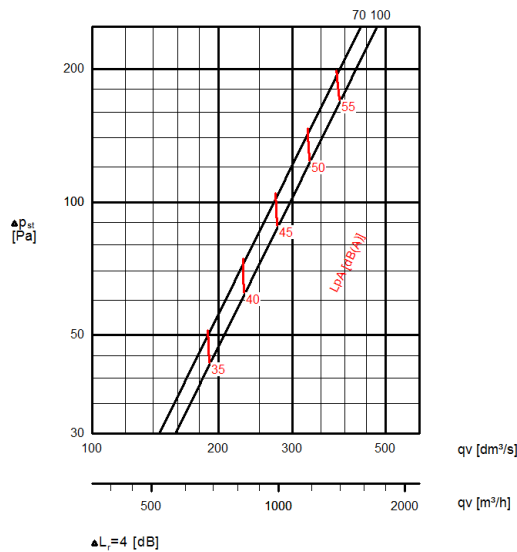


KW3, section 3000, static pressure loss and sound data

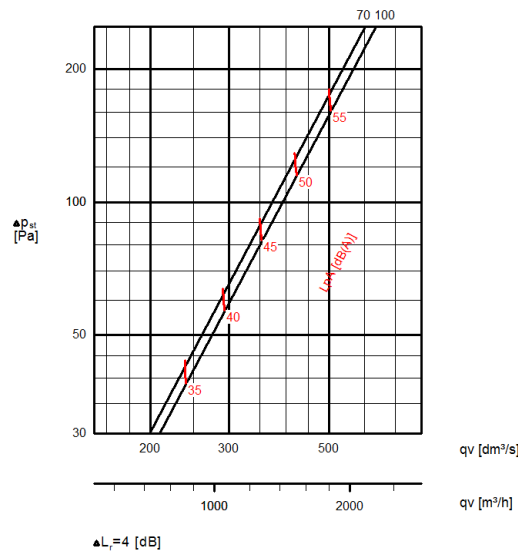


PRESSURE DROP AND SOUND DATA WITH RECOMMENDED EXHAUST CONNECTION SIZE

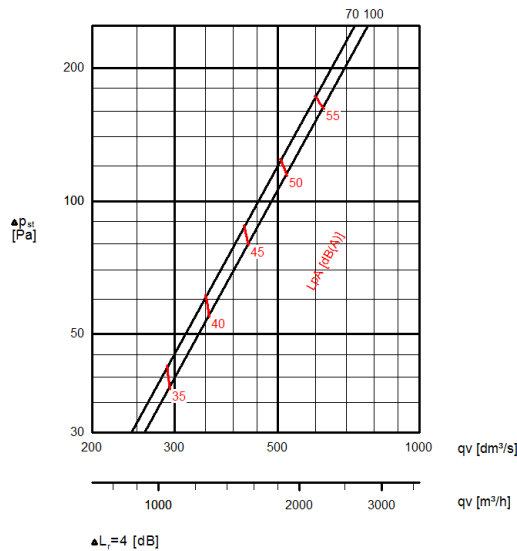
KW3 with UV-light technology, section 1000, static pressure loss and sound data



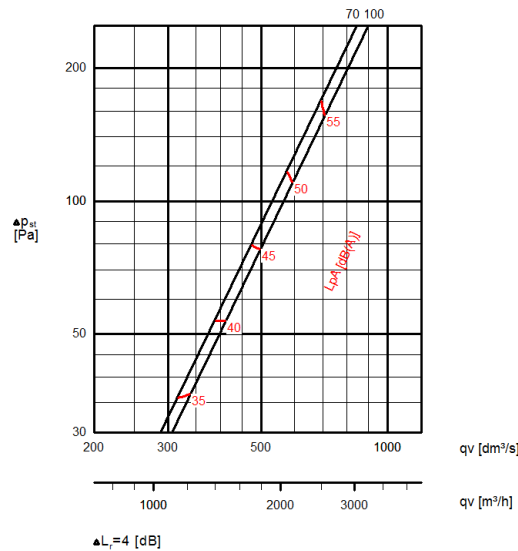
KW3 with UV-light technology, section 1500, static pressure loss and sound data



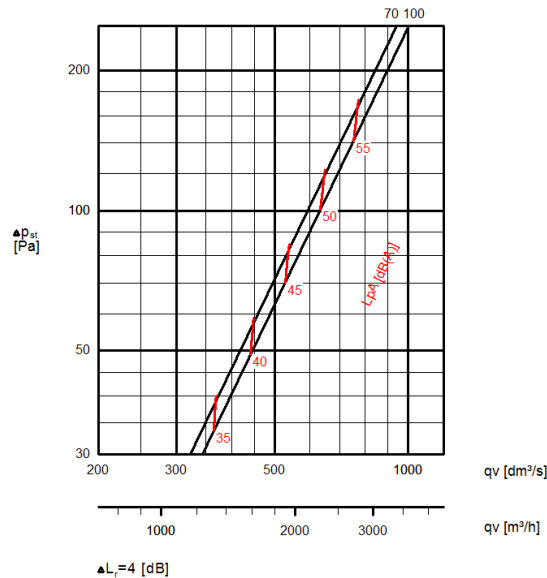
KW3 with UV-light technology, section 2000, static pressure loss and sound data



KW3 with UV-light technology, section 2500, static pressure loss and sound data



KW3 with UV-light technology, section 3000, static pressure loss and sound data



Δp_{st} = exhaust static pressure loss
70, 100 = damper opening in %
 ΔL_r = room attenuation

EXHAUST AIRFLOW RATE MEASUREMENT USING K-FACTORS

KSA (NUMBER OF FILTERS)	KW3 HOOD K-FACTOR (m³/h)	KW3 HOOD K-FACTOR (l/s)	KW3 WITH UV K-FACTOR (m³/h)	KW3 WITH UV K-FACTOR (l/s)
1	105.7	29.4	88.1	24.5
2	133.2	37.0	121.3	33.7
3	170.3	47.3	158.4	44.0
4	211.3	58.7	197.5	54.9
5	232.9	64.7	229.3	63.7
6	262.4	72.9	261.7	72.7

With the T.A.B. pressure measurement, it is also possible to check the exhaust airflow with the following formula. Above values are with recommended exhaust connection size.

$$q_{v,e} = k \times \sqrt{\Delta P_{TAB} [\text{Pa}]}$$

$q_{v,e}$ = Airflow
 k = K-factor
 ΔP_{TAB} = Pressure difference

RECOMMENDED EXHAUST AIRFLOW FOR KW3

NUMBER OF KSA FILTERS	MINIMUM l/s	MAXIMUM l/s	MINIMUM m³/h	MAXIMUM m³/h
1	130	201	468	724
2	259	402	932	1447
3	389	602	1400	2167
4	518	803	1865	2891
5	648	1004	2333	3614
6	778	1205	2801	4338

Note: KSA filter size 500x330x50 mm

KW3 CAPTURE FOR ONE METER

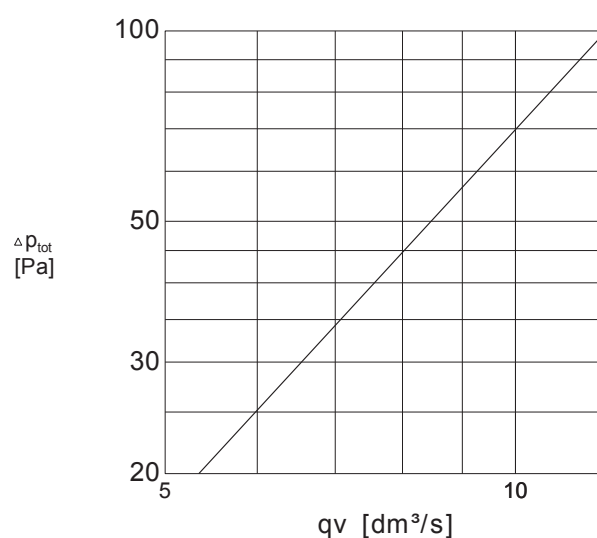
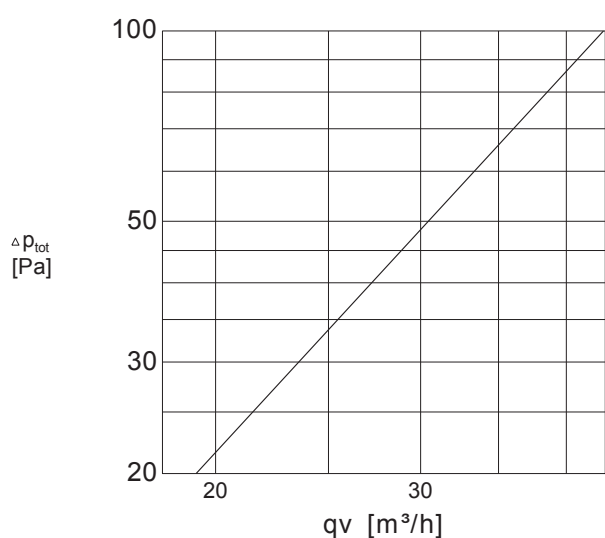
STATIC PRESSURE		TAB PRESSURE	
K-FACTOR (m³/h)	K-FACTOR (l/s)	K-FACTOR (m³/h)	K-FACTOR (l/s)
4.23	1.18	4.35	1.21

Recommended pressure for capture is 60Pa, corresponding approximately 34 m³/h (9,5l/s) for one meter of capture chamber.

$$q_{v,e} = k \times l_{eff} \times \sqrt{\Delta P_m [\text{Pa}]}$$

$q_{v,e}$ = Airflow
 k = K-factor
 l_{eff} = Length of effective capture
 ΔP_m = Pressure difference

KW3 CAPTURE DIAGRAMS FOR ONE METER



KWH GALLEY WATER WASH HOOD

With Capture Jet™ technology



MATERIALS

PART	MATERIAL	NOTE
Front and side walls	Stainless steel EN 1.4301 (AISI 304)*	Available as an option: EN 1.4404 (AISI 316L)
Main body	Stainless steel EN 1.4301 (AISI 304)**	Available as an option: EN 1.4404 (AISI 316L)
Light fixture	Painted steel	-
Wash piping	Stainless steel, brass	-
Cables	Halogen-free	-

* Thickness 2.0 mm

** Thickness 1.25 mm

CONSTRUCTION

The KWH hood consists of a Capture Jet™ air supply module, a light fixture, adjustment dampers, airflow measurement taps, and KSA grease filters. All components are made from polished stainless steel EN 1.4301 (AISI 304), with watertight joints at the lower edges. The exhaust plenum is equipped with a drain pipe connection to facilitate the removal of grease and dirt extracted by the KSA multi-cyclone filters, as well as the drainage of washing water. The Capture Jet™ supply plenum is thermally insulated with mineral wool material to prevent condensation on the inner surface above the cooking equipment.

APPLICATIONS

The Halton KWH is a galley water wash hood designed for use in marine and offshore applications. This highly efficient hood uses Halton Capture Jet™ technology, allowing it to operate with up to 30% lower exhaust airflow rates compared to traditional hoods. The KWH galley hood automatically washes down the grease filters without the need for their removal. The washing cycle, controlled by a CCW-M or WR control cabinet, is fully automatic and programmable for various operating conditions. The washing process can also be manually overridden if necessary.

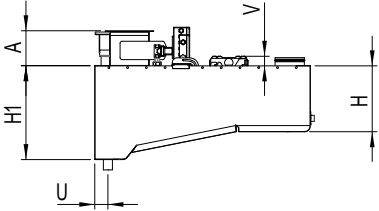
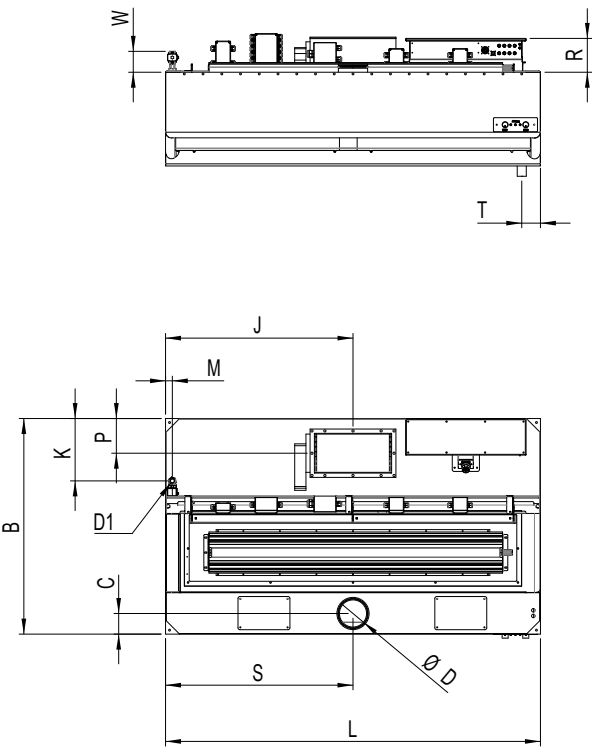
FEATURES

- The hood utilises Halton Capture Jet™ technology, significantly reducing exhaust airflow rates, improving capture and containment efficiency, and minimising energy consumption.
- Designed in accordance with USPHS guidelines.
- Automatic periodic cleaning of the exhaust plenum and KSA grease filters (and UV tubes, where applicable).
- Low maintenance requirements, reducing the workload for personnel cleaning the filters and ductwork.
- Ensures a high level of hygiene and prevents the build-up of grease deposits, which could pose a serious fire hazard.
- Equipped with Halton KSA multi-cyclone filters for highly efficient grease filtration.
- Standard features include lighting, balancing dampers for both capture and exhaust air, and T.A.B.™ airflow measurement taps, enabling accurate and effective balancing of airflows, as well as efficient commissioning.
- Constructed with durable welded stainless steel.

PRODUCT OPTIONS

- Non-standard spigots: customers can choose from different sizes and positions to meet specific requirements.
- UV-light filtration: an option to combine KSA filter, mesh filter, and ultraviolet-light technology for enhanced filtration.
- Option for construction using EN 1.4404 (AISI 316L) stainless steel.
- Option for a certified fire damper made of either EN 1.4301 (AISI 304) or EN 1.4404 (AISI 316L)
- Option to include a wet chemical fire suppression system for added safety.
- An option for a M.A.R.V.E.L. demand-based ventilation system for optimized airflow and energy efficiency.

GENERAL DRAWINGS



KWH DIMENSIONS (mm)			
A	195	L	1000-3000
B	1100-1900	M	37
C	110	P	185
D	100-200	S	1/2L
D1	3/4"	T	100-200
H	350	U	70
H1	500	R	185
J	1/2L	V	max 50
K	332	W	~130

Note: The maintenance/light fixture hatch is as large as the construction allows. The minimum length with UV-light technology is 1250 mm.

WEIGHTS

KWH HOODS (KG)

B/L	1200	1600	2000	2500	3000
1100	105	127	148	176	203
1300	110	133	155	184	212
1500	116	140	162	193	221
1700	122	146	169	201	230
1900	127	153	177	209	240

The table above provides an indication of the average weights of different sizes of KWH hoods. Please note that the weight mentioned does not include the fire damper.

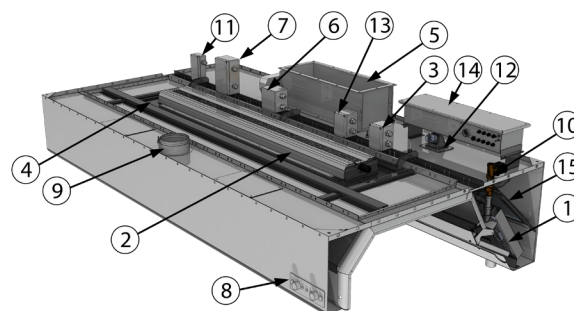
KWH HOODS WITH UV-LIGHT TECHNOLOGY (KG)

B/L	1250	1600	2000	2500	3000
1100	149	172	198	232	264
1300	155	179	205	240	274
1500	161	185	212	249	283
1700	166	192	220	257	292
1900	172	198	227	265	301

The table above provides an indication of the average weights of different sizes of KWH hoods with UV-light technology. Please note that the weight mentioned does not include the fire damper.

KWH PARTS

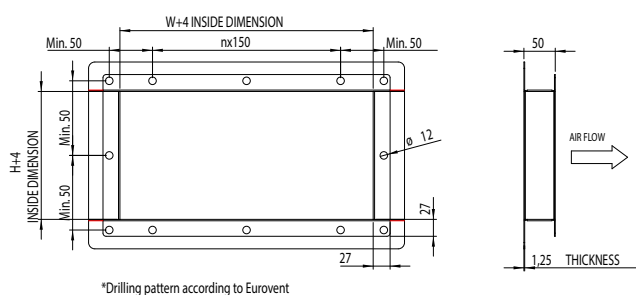
1. KSA grease filters; 2. Lighting fixture; 3. Lighting fixture power supply junction box; 4. Maintenance hatch; 5. Exhaust air connection, fire damper, or shut-off damper* (available as an option) and adjustment damper; 6. Fire damper junction box; 7. Actuator power and fuse info junction box; 8. Damper switch and indication (available as an option); 9. Capture air connection and adjustment damper; 10. Water wash piping connection R3/4" (G3/4" solenoid valve as an option); 11. Washing solenoid valve junction box; 12. UV system (available as an option); 13. UV power supply junction box (available as an option); 14. UV control junction box (location may vary, available as an option); 15. Mesh filter (available as an option).



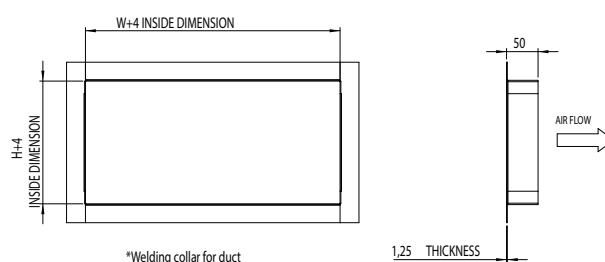
*If fire or shut-off damper is located at the duct, Halton suggests two default solutions for duct connection:

- Eurovent-collar with flange
- Welded L-collar

EUROVENT-COLLAR WITH FLANGE

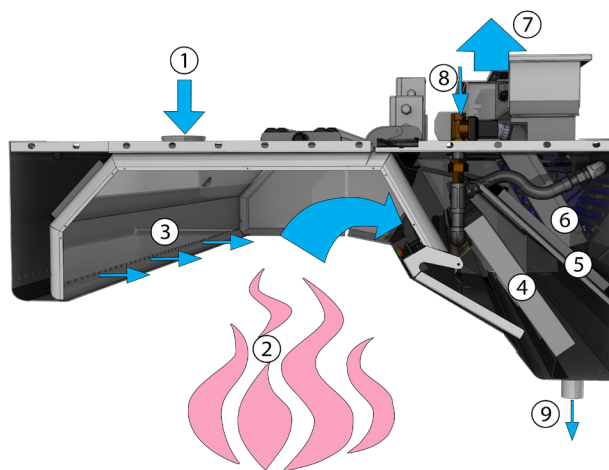


WELDED L-COLLAR



FUNCTION

1. Capture air enters the Capture Jet™ plenum.
2. Contaminated air and heat rise from the cooking appliances.
3. Halton's patented Capture Jet™ technology directs contaminated air into the hood.
4. The KSA multi-cyclone filters efficiently remove grease and contaminants from the air stream using centrifugal force. Independent laboratory tests have proven KSA to be the most efficient mechanical grease filter on the market.
5. The optional mesh filter helps balance airflow inside the exhaust plenum and provides additional air filtration. When combined with the KSA filter, filtration efficiency is doubled.
6. Based on Halton's patented highly efficient Capture Jet™ solution and advanced mechanical KSA filter technology, the UV-light technology, with scheduled maintenance, keeps the plenum and duct virtually grease-free and mitigates cooking odours and emissions.
Grease vapor and effluents not captured by the high-efficiency filters pass over the lamps, causing a chemical reaction that converts the grease into carbon dioxide and water vapor. This chemical action continues into the duct, helping to keep it and the exhaust fan clean. UV-filtration is available as an option.
7. The cleaned exhaust air contains small amounts of ozone, which further cleans the ducts downstream. Any excess ozone reverts back into oxygen.
8. During scheduled times, the washing control cabinet halts the hood's operation and initiates a washing cycle. Hot water with a mild detergent is pumped into the hood's spray nozzles, effectively cleaning the essential components of the exhaust plenum, including UV-lights and filters.
9. The waste from the washing cycle is drained from the hood via the drain connection.



SUGGESTED SPECIFICATIONS

The water wash galley hoods shall be constructed from stainless steel EN 1.4301 (AISI 304). The galley hoods shall be supplied complete with an outer casing/main body, Capture Jet™ plenum, airflow measurement taps, supply and exhaust air spigot connections with an adjustment damper, maintenance hatch, light fixture, capture air jet, grease filters, drain connection, and automatic washing system controlled by a separate control cabinet with interfaces to the ship's safety systems. Each exhaust connection shall include a classified fire damper. The manufacture of all galley hoods shall adhere to ISO 9001, ISO 3834-2, ISO 14001, and ISO 45001 standards. The design of the hoods shall comply with USPHS guidelines.

CONSTRUCTION

All parts shall be constructed of stainless steel sheet EN 1.4301 (AISI 304) with a thickness of 1.25-2.0 mm and a polished finish. The inside corners of the hood shall be rounded for easy cleanability, in accordance with USPHS guidelines. The joints at the lower edges of the device shall be welded watertight. All visible screws shall be of the thumb screw type. The hood shall be equipped with a drain connection for removing dirty water. Each hood shall have a maintenance hatch for easy access.

WASHING MODULE

Grease filters shall have an automatic washing cycle utilising warm water and detergent via nozzles. The detergent shall be mixed within a separate control cabinet. Wastewater shall be removed from the hood via a direct drain connection. The casing of the control cabinet shall be constructed of stainless steel sheet EN 1.4301 (AISI 304).

CAPTURE JET™ PLENUM

The Capture Jet™ plenum shall be insulated with sealed mineral wool. The plenum shall be accessible through maintenance hatches.

CAPTURE JET™ SYSTEM

The hood shall be designed with Capture Jet™ technology to reduce the exhaust airflow rate required and to increase the capture and containment efficiencies of the hood, thereby reducing energy use.

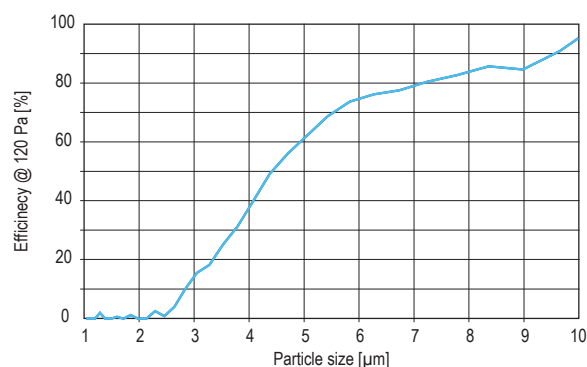
AIRFLOW MEASUREMENT TAPS

Measurement taps shall be located on top of the hood for capture air and exhaust air measurement.

HALTON KSA FILTER

- Minimisation of grease deposits in the ducts
- Enhanced hygiene and safety

The KSA grease filters shall be constructed of stainless steel EN 1.4301 (AISI 304). The grease filters shall be supplied in a modular size of 500 x 330 x 50 mm and shall be removable via two folding handles. The grease filters shall have a honeycomb design to allow high grease filtration efficiency via the centrifugal effect in filter honeycombs.



Mechanical filtration is recommended for hoods with low utilisation rates and cooking processes producing mainly large grease particles (> 8 microns), e.g., food prepared with gas fryers, griddles, and broilers (source ASHRAE).

UV-LIGHT FILTRATION

Halton's UV-light technology is the most efficient solution for hoods with medium to high utilisation rates and cooking processes producing all sizes of grease particles, e.g., food prepared with electric ranges, griddles, and all types of broilers. In the UV-light concept, most grease particles are first filtered with mechanical filtration (type KSA). The mesh filter behind the KSA spreads the airflow and the remaining grease particles inside the hood chamber, increasing filtration efficiency up to 50% for grease particle sizes between 5-8 microns. Based on Halton's patented highly efficient Capture Jet™ solution and advanced mechanical KSA filter technology, the UV-light technology, with scheduled maintenance, keeps the plenum and duct virtually grease-free and mitigates cooking odours and emissions. The grease vapour and effluents not collected by high-efficiency filters pass over the lamps, causing a chemical reaction that destroys the grease and converts it into carbon dioxide and water vapour. The chemical action carries over into the duct, helping to keep the duct and exhaust fan clean.

DUCT CONNECTIONS

The duct connections and adjustment dampers for supply and exhaust air shall be constructed from stainless steel. The dampers shall be adjustable.

LIGHT FIXTURES

Each hood shall be delivered with energy-efficient LED light fixtures providing approximately an average illuminance of 500 lux at the work surfaces of the cooking appliances. The light fixtures shall be suitable for a single-phase 230-VAC power supply and manufactured to protection class IP67. The ballast and capacitor shall be located within the light frame. The core electric cables connecting the light fixture to the junction box shall be provided. The light fixture shall be installed on a hinged maintenance hatch, allowing access to the hood roof.

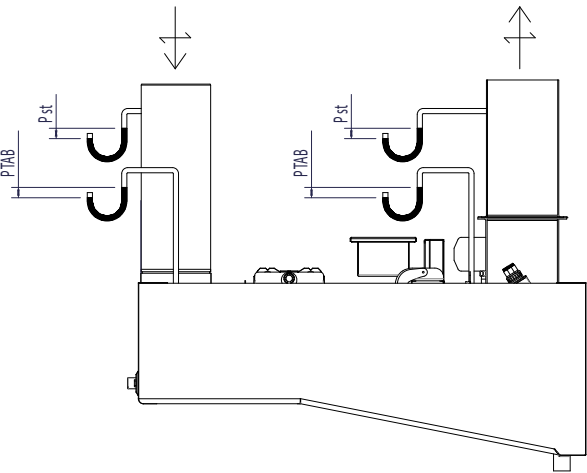
LED LIGHT FIXTURE SIZES

HOOD DIMENSION	LENGTH	WIDTH
L < 1250 mm, 1x28 W	720 mm	175 mm
L > 1250 mm, < 2000 mm, 1x42 W	1020 mm	175 mm
L > 2000 mm, 1x69 W	1620 mm	175 mm

MAINTENANCE HATCH

Each hood shall be provided with a maintenance hatch made of stainless steel EN 1.4301 (AISI 304) with a shock-resistant plastic window. The window shall have a heat tolerance of up to +115 °C. The hatch shall be easily opened and closed. The maintenance/light fixture hatch shall be as large as the construction allows.

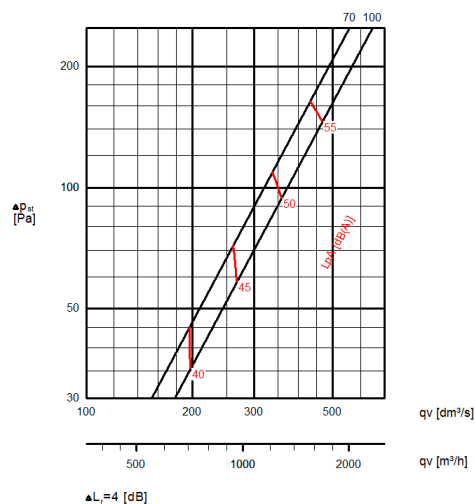
AIRFLOW MEASUREMENT



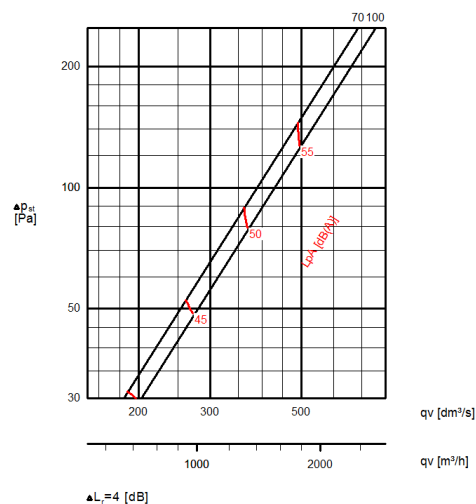
ΔP_{st} = Static pressure loss
 ΔP_{TAB} = TAB pressure for airflow rate measurement
70, 100 = Damper opening in %

PRESSURE DROP AND SOUND DATA WITH RECOMMENDED EXHAUST CONNECTION SIZE

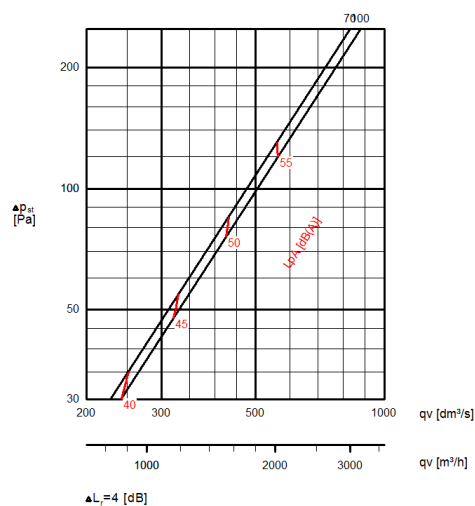
KWH, section 1000, static pressure loss and sound data



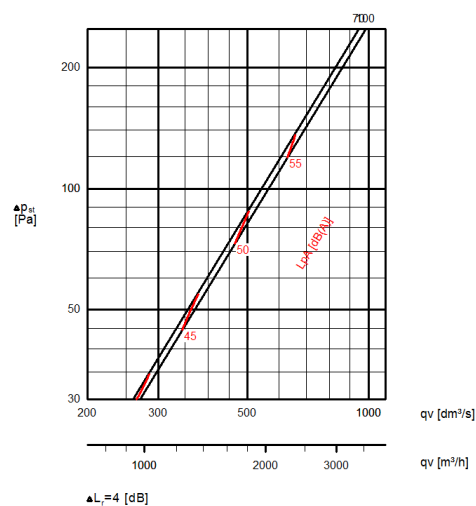
KWH, section 1500, static pressure loss and sound data



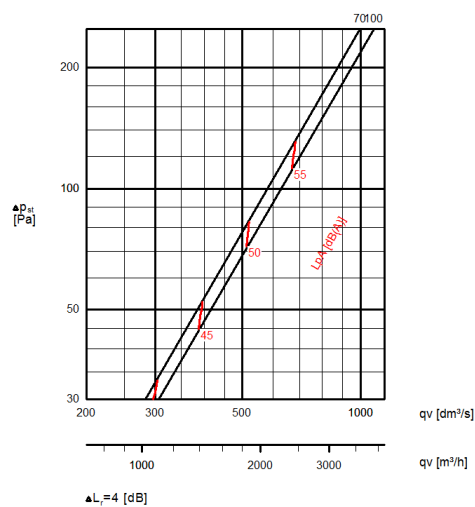
KWH, section 2000, static pressure loss and sound data



KWH, section 2500, static pressure loss and sound data

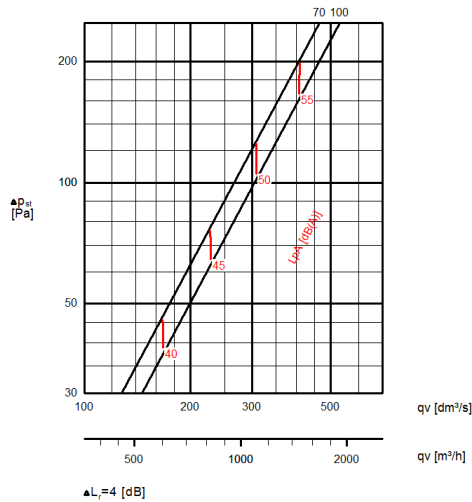


KWH, section 3000, static pressure loss and sound data

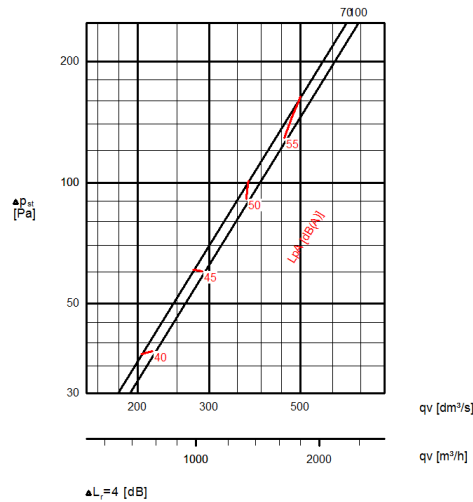


PRESSURE DROP AND SOUND DATA WITH RECOMMENDED EXHAUST CONNECTION SIZE

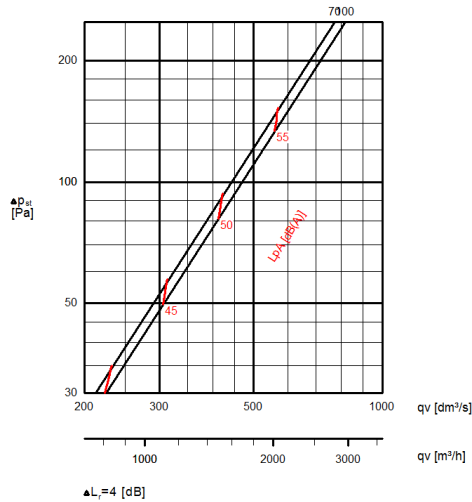
KWH with UV-light technology, section 1000, static pressure loss and sound data



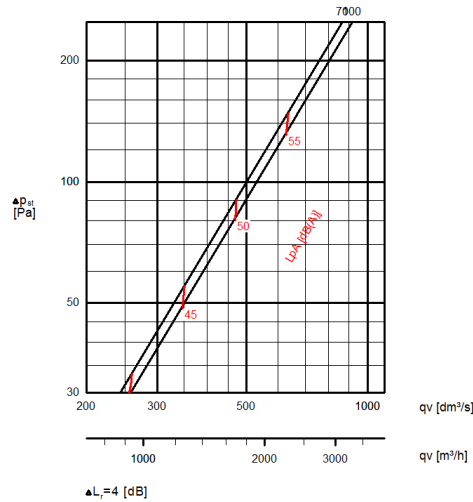
KWH with UV-light technology, section 1500, static pressure loss and sound data



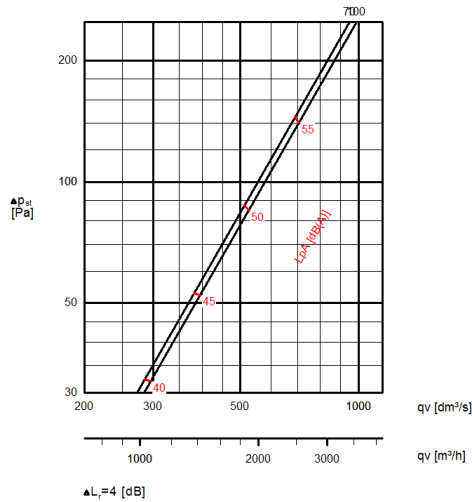
KWH with UV-light technology, section 2000, static pressure loss and sound data



KWH with UV-light technology, section 2500, static pressure loss and sound data



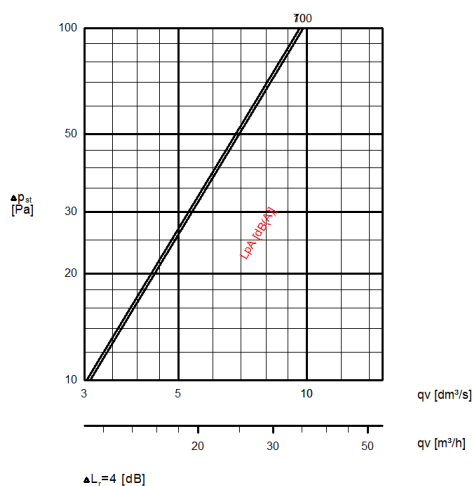
KWH with UV-light technology, section 3000, static pressure loss and sound data



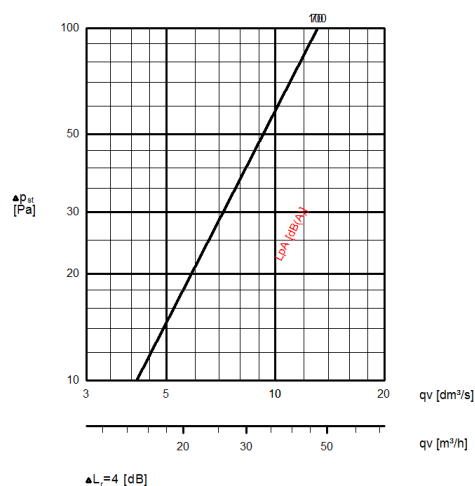
Δp_{st} = exhaust static pressure loss
 70, 100 = damper opening in %
 ΔL_r = room attenuation

PRESSURE DROP AND SOUND DATA WITH RECOMMENDED CAPTURE CONNECTION SIZE

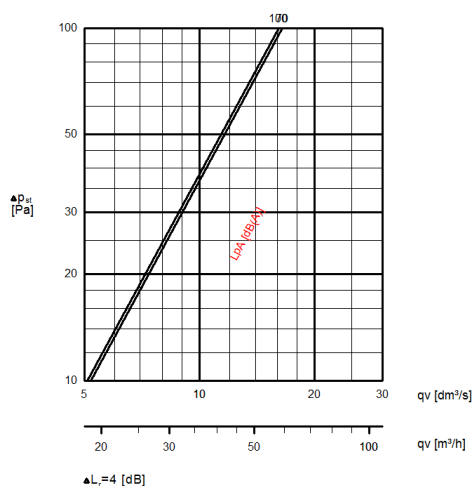
KWH, section 1000, static pressure loss and sound data



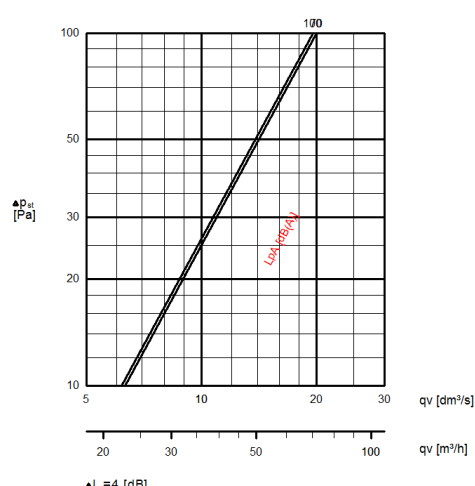
KWH, section 1500, static pressure loss and sound data



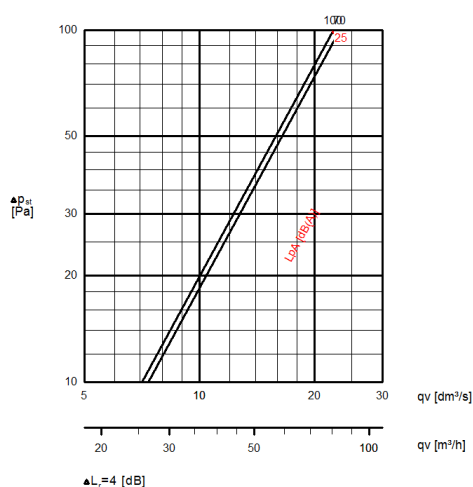
KWH, section 2000, static pressure loss and sound data



KWH, section 2500, static pressure loss and sound data



KWH, section 3000, static pressure loss and sound data



Δp_{st} = exhaust static pressure loss

70, 100 = damper opening in %

ΔL_r = room attenuation

EXHAUST AIRFLOW RATE MEASUREMENT USING K-FACTORS

KSA (NUMBER OF FILTERS)	KWH HOOD k factor [m3/h]	KWH HOOD k factor [l/s]	KWH WITH UV k factor [m3/h]	KWH WITH UV k factor [l/s]
1	116.3	32.3	77.6	21.5
2	142.9	39.7	117.9	32.8
3	169.4	47.1	158.3	44.0
4	203.2	56.4	198.0	55.0
5	237.3	65.9	232.5	64.6
6	269.2	74.8	259.6	72.1

With the T.A.B. pressure measurement, it is also possible to check the exhaust airflow with the following formula. Above values are with recommended exhaust connection size.

$$q_{v,e} = k \times \sqrt{\Delta P_{TAB} \text{ [Pa]}}$$

$q_{v,e}$ = Airflow
k = K-factor
 ΔP_{TAB} = Pressure difference

RECOMMENDED EXHAUST AIRFLOW FOR KWH

NUMBER OF KSA FILTERS	MINIMUM l/s	MAXIMUM l/s	MINIMUM m3/h	MAXIMUM m3/h
1	130	201	468	724
2	259	402	932	1447
3	389	602	1400	2167
4	518	803	1865	2891
5	648	1004	2333	3614
6	778	1205	2801	4338

Note: KSA filter size 500 x 330 x 50 mm



HIGHLIGHTED FEATURES



Capture Jet™ technology
Achieve up to 40% reduction in airflow rates



Cyclonic filter (KSA)
Provides 95% efficiency on particles of 10 µm and above



Integrated supply air
Ensures superior smoke capture and enhanced comfort



T.A.B.™ technology
Enables quick measurement of airflow rates

RECOMMENDED ADDITIONAL FEATURES



M.A.R.V.E.L. (MRV)
Extend airflow reduction to up to 64% for even greater energy savings



Built-in Fire Suppression (FSS)
Engineered and pre-installed from the factory for added safety



Capture Ray™ technology
Effectively neutralizes grease vapors and particles



Duct safety monitoring (KGS)
Continuously assesses grease deposit levels to maintain safety and efficiency

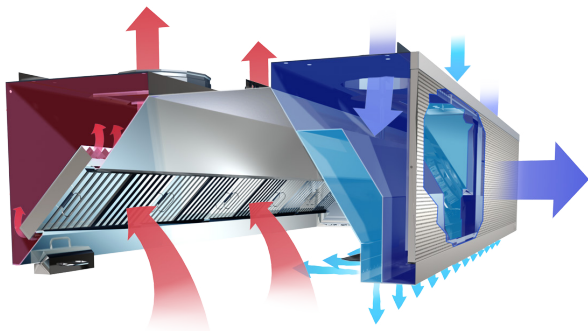
APPLICATIONS

The KVF hoods are particularly suitable for LEED (Leadership in Energy and Environmental Design) projects and can be used in all types of kitchens, including closed, open, or show kitchens in hotels, hospitals, gastronomic restaurants, central kitchens, and more. These hoods incorporate the latest patented Capture Jet™ technology and come equipped with a low-velocity makeup air system built into the front face.

FEATURES

- HACCP (Hazard Analysis Critical Control Point) certified.
- Significantly reduce energy consumption: Capture Jet™ technology allows for 30 to 40% less exhaust airflow rates.
- Maintenance cost savings and enhanced safety: The highly-efficient KSA cyclonic filters, certified by UL, NSF, and LPS 1263, effectively prevent the accumulation of grease deposits, which can pose serious hygiene and fire hazards, leading to reduced ductwork cleaning expenses.
- Improved capture and comfort: The inclusion of a low-velocity diffuser at the front ensures the provision of makeup air without causing draughts.
- Independently performance tested according to the ASTM 1704 standard. The exhaust airflow rates are calculated based on this performance, as well as the calculation of heat loads from cooking appliances.
- Quick and easy commissioning: The hoods are delivered "ready to install" with all necessary accessories, including light fittings, T.A.B.™ taps, and balancing dampers for convenient on-site balancing.
- Sturdier and easier to clean: The hoods are constructed with fewer parts and joints, using stainless steel materials for enhanced durability and easy maintenance.

DIMENSIONS



Please note that the dimensions provided are for modular sections only. Longer hoods are assembled using a combination of separate modules to facilitate delivery and on-site handling. Other Capture Jet™ air supply possibilities or connections are available upon request.

LOCATION OF CONNECTIONS (MM):

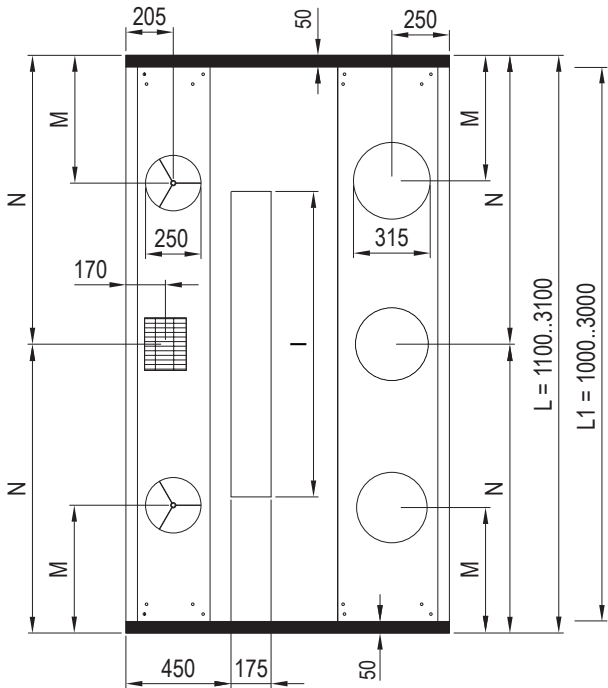
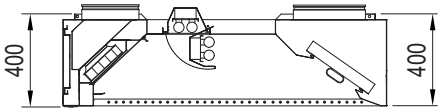
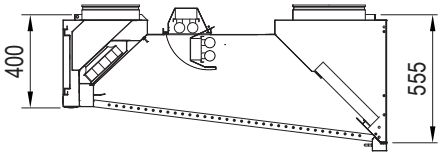
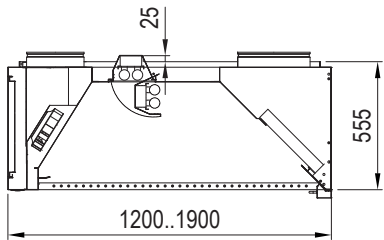
The number of exhaust and supply connections should be assessed based on the length of the modules and the calculation of airflow rates, depending on the configuration of the cooking appliances.

	Exhaust			Supply		Light
	1 Ø315	2 Ø315	3 Ø315	2 Ø250	4 Ø250	
L	M	N	M, N	O	O, P	Q*
1600	L1/2	450	-	450	-	720
2100	L1/2	450	-	450	450, 500	1320
2600	-	450	L1/2, 450	450	450, 500	1320
3100	-	450	L1/2, 450	-	450, 500	1320

* 720 (L1<=1500, 2x18W), 1320 (L1>1500, 2x36W)

WEIGHT (H=555 MM, KG)

L/W	1100	1300	1500	1700	1900
1100	86	91	97	107	113
1600	114	119	125	136	141
2100	141	147	152	164	170
2600	169	174	180	193	199
3100	196	202	207	222	228



RECOMMENDED ADDITIONAL FEATURES



M.A.R.V.E.L. (MRV)
This technology enables independent and adjustable exhaust airflow hood by hood, leading to significant cost savings.



Capture Ray™ technology
Allows kitchen placement flexibility while ensuring safety through UV neutralization of grease, resulting in a drastic reduction of odour emissions.

With solid front face



HIGHLIGHTED FEATURES



Capture Jet™ technology
Achieve up to 40% reduction in airflow rates



Cyclonic filter (KSA)
Provides 95% efficiency on particles of 10 µm and above



T.A.B.™ technology
Enables quick measurement of airflow rates

RECOMMENDED ADDITIONAL FEATURES



M.A.R.V.E.L. (MRV)
Extend airflow reduction to up to 64% for even greater energy savings



Built-in Fire Suppression (FSS)
Engineered and pre-installed from the factory for added safety



Capture Ray™ technology
Effectively neutralizes grease vapors and particles



Duct safety monitoring (KGS)
Continuously assesses grease deposit levels to maintain safety and efficiency

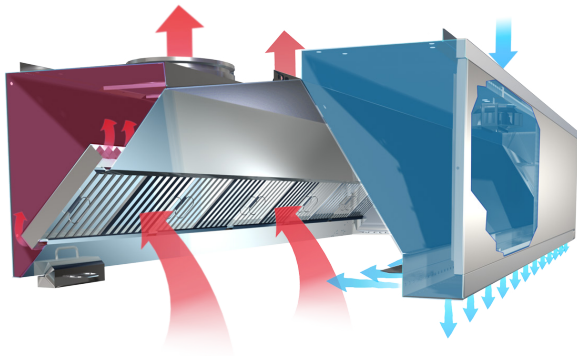
APPLICATIONS

The KVI hoods are specially designed for LEED (Leadership in Energy and Environmental Design) projects and are well-suited for various kitchen types, such as closed, open, or show kitchens found in hotels, hospitals, gastronomic restaurants, central kitchens, and more. These hoods feature the latest patented Capture Jet™ technology and are complemented by Halton's draft-free low-velocity diffusers, ensuring maximum capture efficiency.

FEATURES

- HACCP (Hazard Analysis Critical Control Point) certified.
- Significantly reduce energy consumption: Capture Jet™ technology allows for 30 to 40% less exhaust airflow rates.
- Maintenance cost savings and enhanced safety: The highly-efficient KSA cyclonic filters, certified by UL, NSF, and LPS 1263, effectively prevent the accumulation of grease deposits, which can pose serious hygiene and fire hazards, leading to reduced ductwork cleaning expenses.
- Independently performance tested according to the ASTM 1704 standard. The exhaust airflow rates are calculated based on this performance, as well as the calculation of heat loads from cooking appliances.
- Quick and easy commissioning: The hoods are delivered "ready to install" with all necessary accessories, including light fittings, T.A.B.™ taps, and balancing dampers for convenient on-site balancing.
- Sturdier and easier to clean: The hoods are constructed with fewer parts and joints, using stainless steel materials for enhanced durability and easy maintenance.

DIMENSIONS



Please note that the dimensions provided are for modular sections only. Longer hoods are assembled using a combination of separate modules to facilitate delivery and on-site handling. Other Capture Jet™ air supply possibilities or connections are available upon request.

LOCATION OF CONNECTIONS (MM):

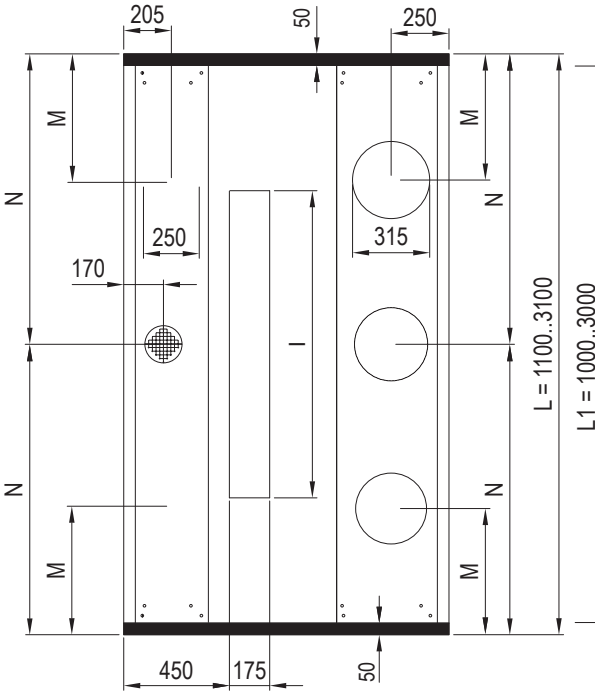
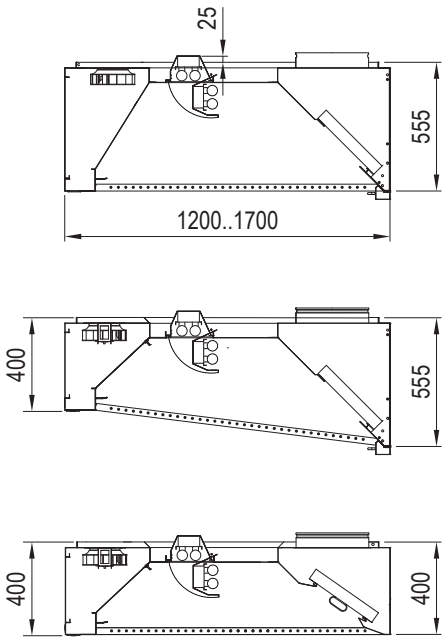
The number of exhaust connections should be assessed based on the length of the modules and the calculation of airflow rates, depending on the configuration of the cooking appliances.

	Exhaust			Light
	1 Ø315	2 Ø315	3 Ø315	
L	M	N	M, N	Q*
1600	L1/2	450	-	720
2100	L1/2	450	-	1320
2600	-	450	L1/2, 450	1320
3100	-	450	L1/2, 450	1320

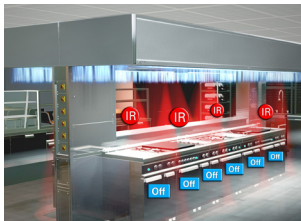
* 720 (L1<=1500, 2x18W), 1320 (L1>1500, 2x36W)

WEIGHT (H=555 MM, KG)

L/W	1100	1300	1500	1700	1900
1100	78	83	88	93	98
1600	103	108	113	118	123
2100	128	133	138	143	148
2600	153	158	163	168	173
3100	178	183	188	193	198



RECOMMENDED ADDITIONAL FEATURES



M.A.R.V.E.L. (MRV)
This technology enables independent and adjustable exhaust airflow hood by hood, leading to significant cost savings.



Capture Ray™ technology
Allows kitchen placement flexibility while ensuring safety through UV neutralization of grease, resulting in a drastic reduction of odour emissions.

KFM

GALLEY GREASE HOOD

With Capture Jet™ technology



MATERIALS

PART	MATERIAL	NOTE
Casing	Hot galvanised steel	Available as an option: stainless steel EN 1.4404 (AISI316L)
Spigots	Hot galvanised steel and EPDM rubber	Available as an option: stainless steel EN 1.4404 (AISI316L)
Insulation	Mineral wool, s=25 mm, MED approved	-
I/O unit	Aluminium/plastic/electronics	-
Cables	Halogen-free	-
Airflow measurement probes and tubes	Aluminium/polyurethane	-

KFM CONSTRUCTION

The KFM hood consists of a Capture Jet™ air supply module, a light fixture, adjustment dampers, airflow measurement taps, and KSA grease filters. All components are constructed from polished stainless steel EN 1.4301 (AISI304) to ensure durability and resistance to corrosion. The Capture Jet™ supply plenum is thermally insulated with mineral wool material to prevent condensation on the inner surface above the cooking equipment. Additionally, the hood includes a removable grease cup for easy collection of grease.

APPLICATIONS

The Halton KFM is a galley grease hood designed for use in marine and offshore applications to effectively remove contaminated air released by cooking equipment. The hood utilizes Halton's advanced Capture Jet™ technology, allowing it to operate with up to 30% lower exhaust airflow rates compared to traditional hoods.

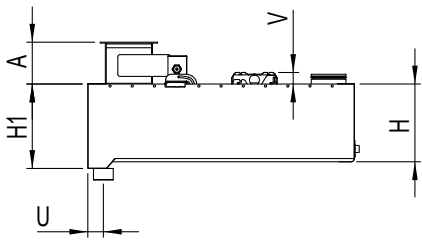
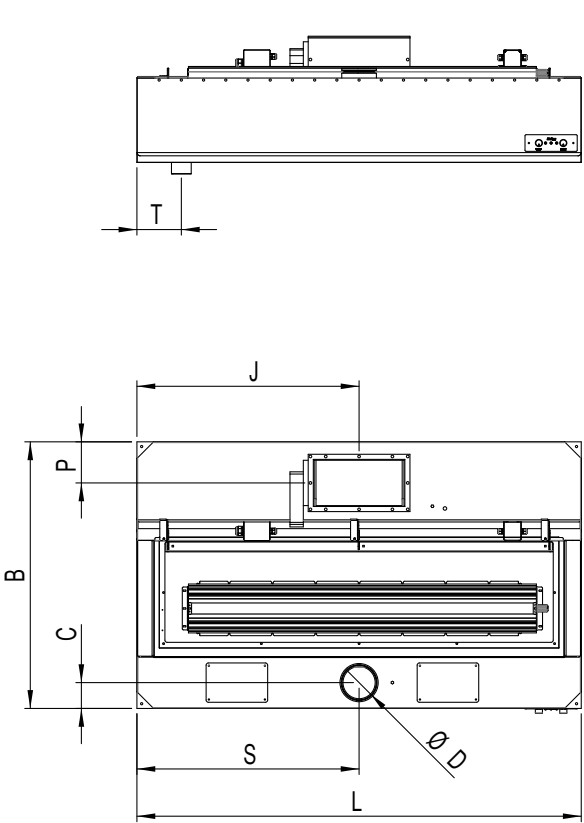
FEATURES

- Compliant with USPHS guidelines for optimal performance.
- Easily removable filters for convenient cleaning, promoting high levels of hygiene.
- Prevents the accumulation of grease deposits, significantly reducing the risk of fire hazards.
- Incorporates Halton Capture Jet™ technology, which enhances capture and containment efficiencies while reducing the required exhaust airflow, resulting in lower energy consumption.
- Utilizes Halton KSA multi-cyclone filters for high-efficiency grease filtration.
- Comes with standard lighting, balancing dampers for capture and exhaust air, and T.A.B.™ airflow measurement taps for accurate and efficient airflow balancing and commissioning.
- Durable stainless steel welded construction ensures long-lasting performance.

KFM PRODUCT OPTIONS

- Non-standard spigots available in various sizes and positions.
- Option for EN 1.4404 (AISI316L) construction.
- Certified fire damper manufactured from EN 1.4301 (AISI304) or EN 1.4404 (AISI316L).
- Option for a wet chemical fire suppression system.
- M.A.R.V.E.L. demand-based ventilation system.

GENERAL KFM DRAWINGS



KFM DIMENSIONS (mm)

A	195
B	1100-1900
C	115
D	100-200
H	350
H1	380
J	1/2L
L	1000-3000
P	185
S	1/2L
T	200
U	70
V	Max 50

Please note that the maintenance/light fixture hatch is as large as the construction allows.

KFM WEIGHTS

KFM HOODS (KG) WITH CAPTURE JET™ TECHNOLOGY

B/L	1000	1500	2000	2500	3000
1100	50	74	100	124	138
1300	56	80	105	129	146
1500	61	86	111	135	154
1700	67	92	117	141	162
1900	73	97	122	147	170

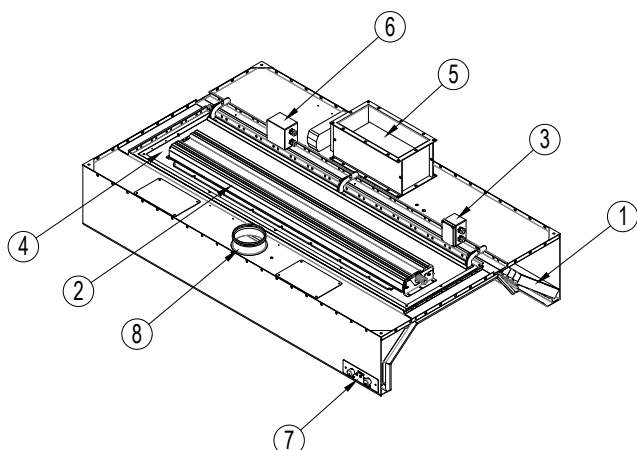
The table above provides an indication of the various sizes of average KFM hoods with Capture Jet™ technology. Please note that the weight mentioned does not include the fire damper.

KFM HOODS (KG)

B/L	1000	1500	2000	2500	3000
1100	40	60	80	100	110
1300	46	66	86	106	118
1500	51	71	92	111	126
1700	57	77	98	117	134
1900	63	83	103	123	142

The table above provides an indication of the various sizes of average KFM hoods without Capture Jet™ technology. Please note that the weight mentioned does not include the fire damper.

KFM PARTS

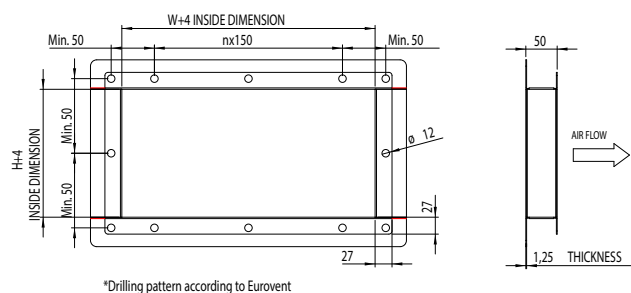


PARTS: 1. KSA grease filters; 2. Lighting fixture; 3. Lighting fixture power supply junction box; 4. Maintenance hatch; 5. Exhaust air connection, fire damper, or shut-off damper* (available as an option) and adjustment damper; 6. Fire damper junction box (available as an option); 7. Damper switch and indication (available as an option); 8. Capture air connection and adjustment damper.

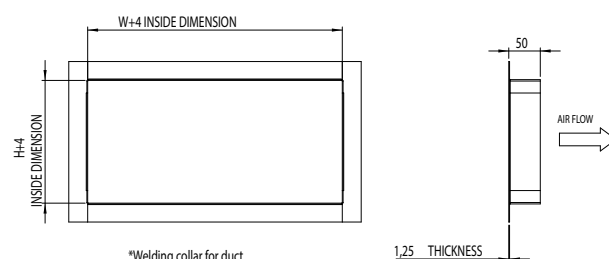
*If the fire or shut-off damper is located at the duct, Halton suggests two default solutions for duct connection:

- Eurovent-collar with flange
- Welded L-collar

EUROVENT-COLLAR WITH FLANGE

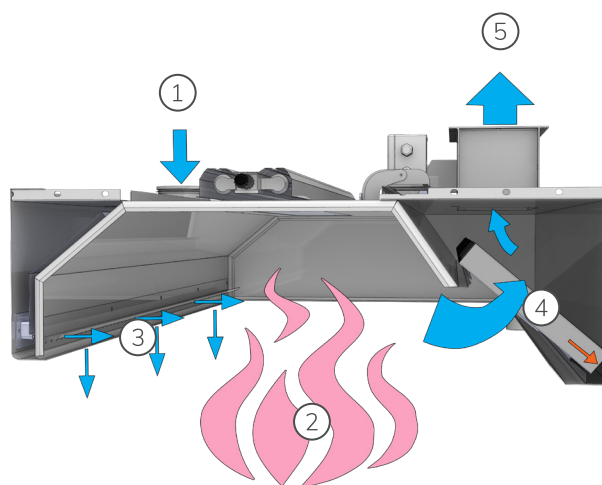


WELDED L-COLLAR



KFM FUNCTION

1. Supply air enters the Capture Jet™ plenum.
2. Contaminated air and heat rise from the cooking appliances.
3. Halton's patented Capture Jet™ technology directs contaminated air into the hood effectively.
4. KSA multi-cyclone filters utilize centrifugal force to efficiently remove grease and contaminants from the air stream. Independent laboratory tests confirm KSA as the most efficient mechanical grease filter available.
5. The hood then exhausts the filtered air, leaving the cooking area fresh and clean.



SUGGESTED SPECIFICATIONS

The galley hoods shall be constructed from stainless steel EN 1.4301 (AISI304). They shall be supplied complete with an outer casing/main body, airflow measurement taps, exhaust air spigot connection with an adjustment damper, maintenance hatch, light fixture, grease filters, and grease cup. An optional classified fire damper in each exhaust connection is available. The manufacture of all galley hoods shall comply with ISO 3834-2:2005, ISO 9001, ISO 14001, and OHSAS 18001 standards. The design of the hoods shall follow USPHS guidelines.

CONSTRUCTION

All parts shall be constructed of stainless steel sheet (thickness 1.25 mm) with a polished finish. The inside corners of the hood shall be rounded for easy cleanability, adhering to USPHS guidelines. The joints at the lower edges of the device shall be welded, and visible screws shall be of the thumb screw type. The hood shall be equipped with a grease cup for grease removal, and a maintenance hatch shall be included in each hood for easy access above the hood.

CAPTURE JET™ PLENUM

The Capture Jet™ plenum shall be insulated with sealed mineral wool and accessible through maintenance hatch(es).

CAPTURE JET™ SYSTEM

The hood shall be designed with Capture Jet™ technology to reduce the required exhaust airflow rate and increase the capture and containment efficiencies of the hood, resulting in reduced energy use.

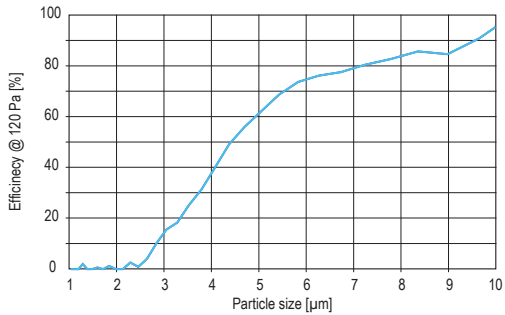
AIRFLOW MEASUREMENT TABS

Measurement taps shall be located on top of the hood for capturing air and exhaust air measurement.

HALTON KSA FILTER

- Minimizes grease deposits in the ducts.
- Enhances hygiene and safety.

The KSA grease filters shall be constructed of stainless steel in a modular size of 500x330x50 mm and shall be removable via two folding handles. The grease filters shall have a honeycomb design to allow high grease filtration efficiency with the aid of the centrifugal effect in filter honeycombs.



Mechanical filtration is recommended for hoods with low utilization rates and cooking processes producing mainly large grease particles (> 8 microns), e.g., food prepared with fryers, griddles, and broilers (source ASHRAE).

DUCT CONNECTIONS

The duct connections and adjustment dampers for exhaust air shall be constructed from stainless steel, and the dampers shall be adjustable.

LIGHT FIXTURES

Each hood shall be delivered with energy-efficient LED light fixtures providing an average illuminance of approximately 500 lux at the work surfaces of the cooking appliances. The light fixtures shall be suitable for a single-phase 230-VAC power supply and shall be manufactured to be of protection class IP67. The ballast and capacitor shall be located within the lighting fixture. Core electric cables connecting the light fixture to the junction box shall be provided. The light fixture shall be installed on a hinged maintenance hatch, allowing access to the hood roof.

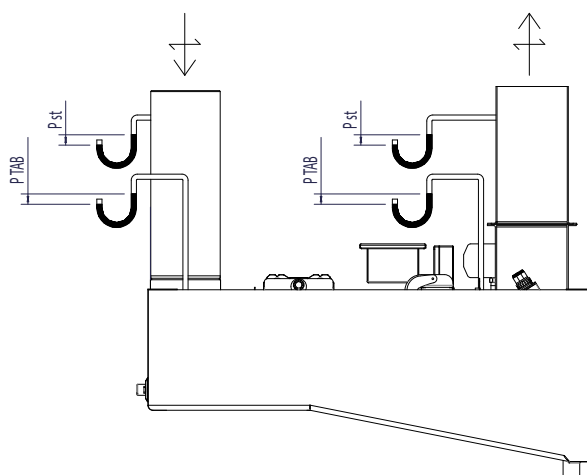
LED LIGHT FIXTURE SIZES

HOOD DIMENSION	LENGTH	WIDTH
$L < 1250 \text{ mm}, 1 \times 28 \text{ W}$	720 mm	175 mm
$L \geq 1250 \text{ mm}, < 2000 \text{ mm}, 1 \times 42 \text{ W}$	1020 mm	175 mm
$L \geq 2000 \text{ mm}, 1 \times 69 \text{ W}$	1620 mm	175 mm

MAINTENANCE HATCH

Each hood shall be provided with a maintenance hatch made of stainless steel with a shock-resistant plastic window. The window shall have a heat tolerance of up to +115 °C. The hatch shall be easily opened and closed. The maintenance/light fixture hatch shall be as large as the construction allows.

AIRFLOW MEASUREMENT



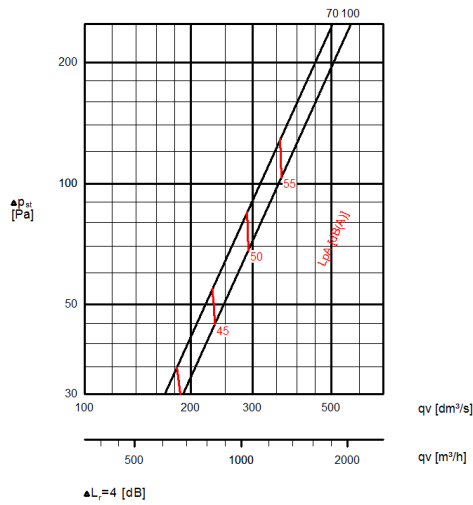
ΔP_{st} = Static pressure loss

ΔP_{TAB} = TAB pressure for airflow rate measurement

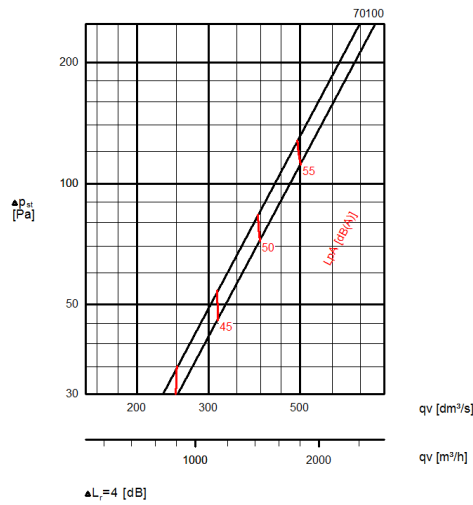
70, 100 = Damper opening in %

PRESSURE DROP AND SOUND DATA WITH RECOMMENDED EXHAUST CONNECTION SIZE

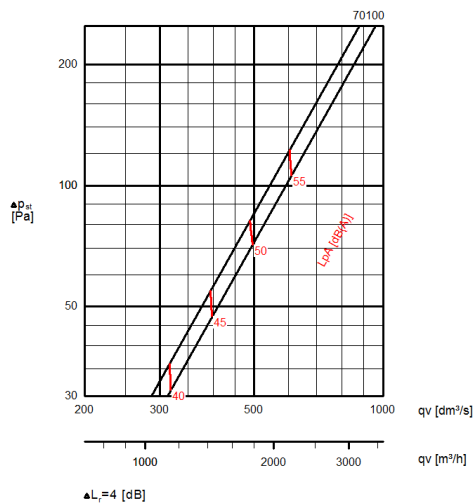
KFM, SECTION 1000, STATIC PRESSURE LOSS AND SOUND DATA



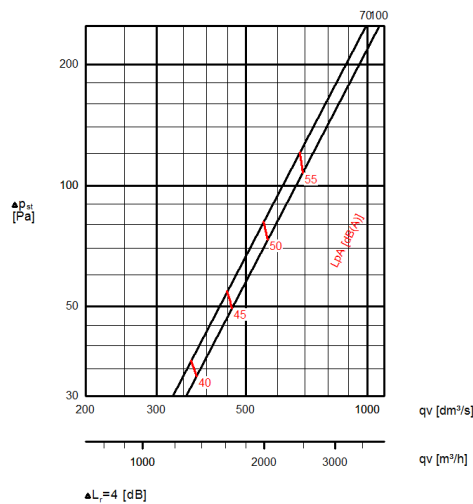
KFM, SECTION 1500, STATIC PRESSURE LOSS AND SOUND DATA



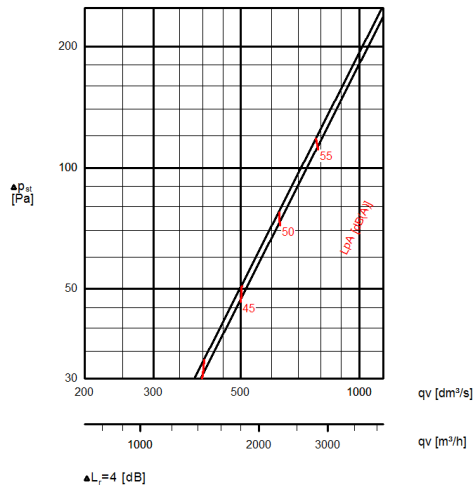
KFM, SECTION 2000, STATIC PRESSURE LOSS AND SOUND DATA



KFM, SECTION 2500, STATIC PRESSURE LOSS AND SOUND DATA



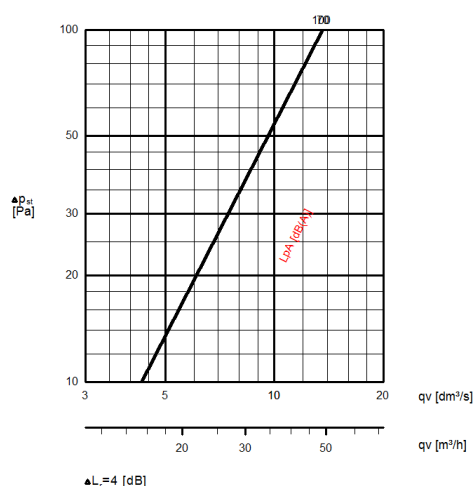
KFM, SECTION 3000, STATIC PRESSURE LOSS AND SOUND DATA



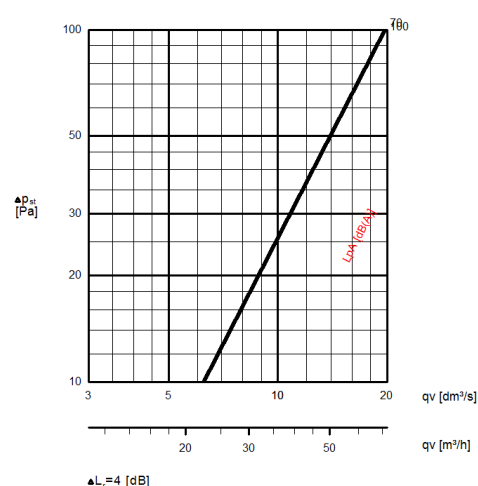
Δp_{st} = exhaust static pressure loss
70, 100 = damper opening in %
 ΔL_r = room attenuation

PRESSURE DROP AND SOUND DATA WITH RECOMMENDED CAPTURE CONNECTION SIZE

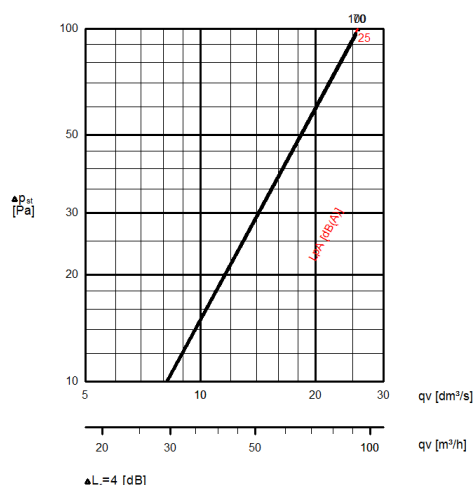
KFM, SECTION 1000, STATIC PRESSURE LOSS AND SOUND DATA



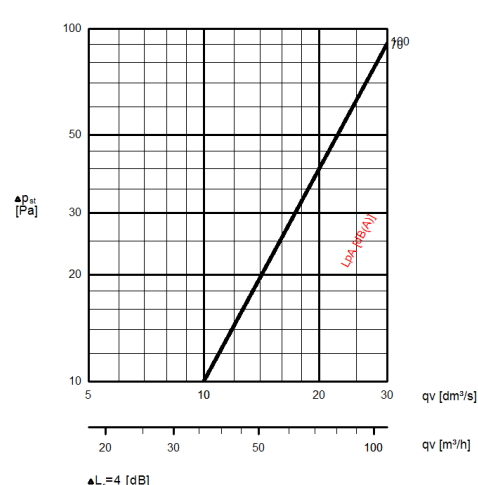
KFM, SECTION 1500, STATIC PRESSURE LOSS AND SOUND DATA



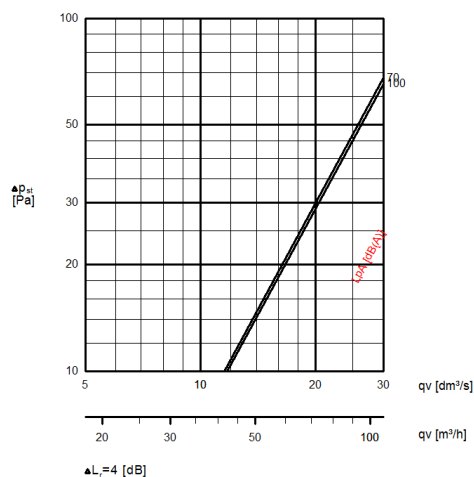
KFM, SECTION 2000, STATIC PRESSURE LOSS AND SOUND DATA



KFM, SECTION 2500, STATIC PRESSURE LOSS AND SOUND DATA



KFM, SECTION 3000, STATIC PRESSURE LOSS AND SOUND DATA



Δp_{st} = capture static pressure loss
70, 100 = damper opening in %
 ΔL_r = room attenuation

EXHAUST AIRFLOW RATE MEASUREMENT USING

K-FACTORS

KSA (NUMBER OF FILTERS)	KFM HOOD K-FACTOR (m³/h)	KFM HOOD K-FACTOR (l/s)
1	87.0	24.2
2	139.6	38.8
3	192.3	53.4
4	287.8	80.0
5	333.4	92.6
6	394.9	109.7

With the T.A.B. pressure measurement, it is also possible to check the exhaust airflow with the following formula. Above values are with recommended exhaust connection size.

$$q_{v,e} = k \times \sqrt{\Delta P_{TAB} [Pa]}$$

$q_{v,e}$ = Airflow
 k = K-factor
 ΔP_{TAB} = Pressure difference

RECOMMENDED EXHAUST AIRFLOW FOR KFM

NUMBER OF KSA FILTERS	MINIMUM (l/s)	MAXIMUM (l/s)	MINIMUM (m³/h)	MAXIMUM (m³/h)
1	130	201	468	724
2	259	402	932	1447
3	389	602	1400	2167
4	518	803	1865	2891
5	648	1004	2333	3614
6	778	1205	2801	4338

Note: KSA filter size 500x330x50 mm



MATERIALS

PART	MATERIAL	NOTE
Main body	Stainless steel EN 1.4301 (AISI 304)*	Available as an option: EN 1.4404 (AISI 316L)
Light fixture	Painted steel	-
Cables	Halogen-free	-

*) Thickness 1.25 mm

KVM CONSTRUCTION

The KVM canopy parts are manufactured from polished stainless steel EN 1.4301 (AISI304) with fully welded joints on the lower edge.

CONNECTIONS

The amount, location, and sizes of exhaust connections are defined by the customer. Both square and circular connections in various sizes can be accommodated, including a net hatch.

KVM PRODUCT OPTIONS

- Material EN 1.4404 (AISI 316L)
- Special light fixtures according to customer needs
- DSH droplet separator in a ductwork
- Supply air plenum

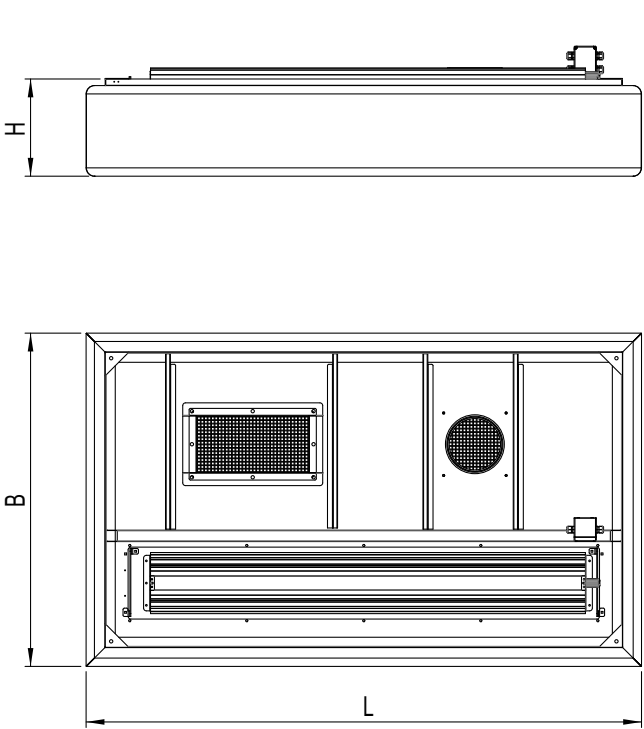
APPLICATIONS

Halton offers KVM canopies, designed according to USPHS guidelines, for capturing and removing steam and heat from industrial dishwashers and bain-maries. These canopies are ideal for non-grease applications and are constructed with high-quality materials to ensure hygiene and durability.

FEATURES

- High level of hygiene facilitated
- Supplied as standard with lighting
- Stainless steel, welded construction
- The design follows USPHS guidelines

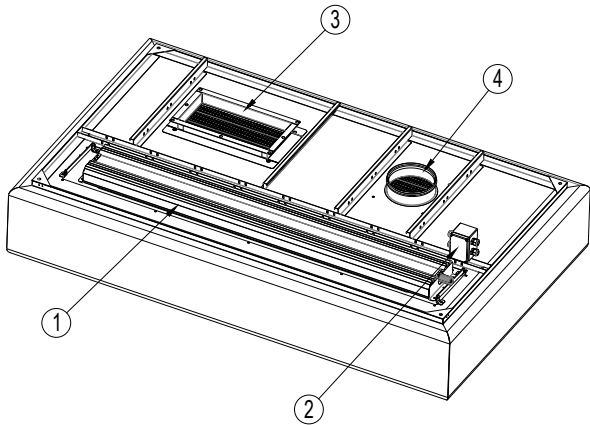
GENERAL KVM DRAWINGS



KVM DIMENSIONS (mm)	
L	600...3000
B	1100-1900
H	150...600
V	Max 50

The dimensions presented above are for modular sections only. Larger canopies are assembled using separate module vanes to simplify transportation and on-site handling.

KVM PARTS



PARTS: 1. Lighting fixture; 2. Lighting fixture power supply junction box; 3. Eurovent-collar with flange, L-collar available as an option; 4. Round duct connection, available as an option.

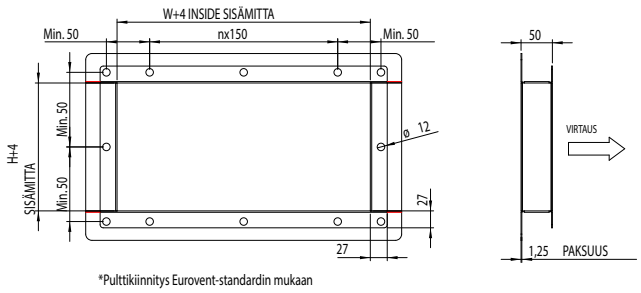
WEIGHTS

KVM CANOPIES (KG)

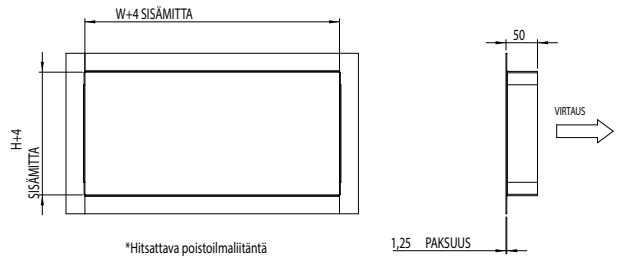
B/L	1000	1500	2000	2500	3000
1000	32	40	49	57	66
1500	40	51	62	73	84
2000	49	62	75	89	102

The table represents an indication of different sizes of KVM canopies.
The height of the canopy is 300 mm.

EUROVENT-COLLAR WITH FLANGE

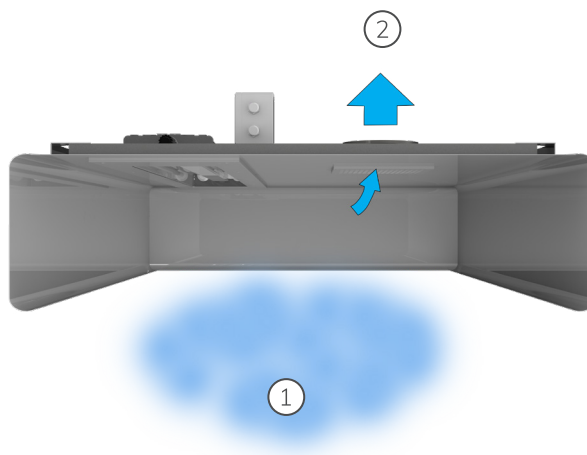


WELDED L-COLLAR



KVM FUNCTION

1. Contaminated air and heat rise from the cooking appliances.
2. Exhaust air.

**SUGGESTED SPECIFICATIONS**

The galley steam canopies shall be constructed from stainless steel EN 1.4301 (AISI304) with a material thickness of 1.25 mm. Canopies shall be supplied complete with outer casing/main body, light fitting, and exhaust collar with net hatch. Manufacturing shall adhere to ISO 3834-2:2005, ISO 9001, ISO 14001, and OHSAS 18001 standards. The design shall follow USPHS guidelines.

OUTER CASING/MAIN BODY

Outer casing panels shall be constructed of polished stainless steel sheet EN 1.4301 (AISI 304) with fully welded joints.

SPIGOT CONNECTIONS

Exhaust air spigot connections shall be made from stainless steel EN 1.4301 (AISI 304) and include a net hatch.

LIGHT FIXTURES

Each canopy shall be equipped with LED light fixtures, ensuring an approximate average illuminance of 500 lux at the cooking appliance work surfaces. These light fixtures are designed to be compatible with a single-phase 230-VAC power supply and shall be manufactured to meet the protection class IP67 standards. The ballast and capacitor shall be conveniently located within the light frame for ease of maintenance. Core electric cables connecting the light fixture to the junction box shall be provided. Furthermore, the light fixture shall be installed on a maintenance hatch, providing easy access to the canopy roof for any necessary servicing.

LED LIGHT FIXTURE SIZES

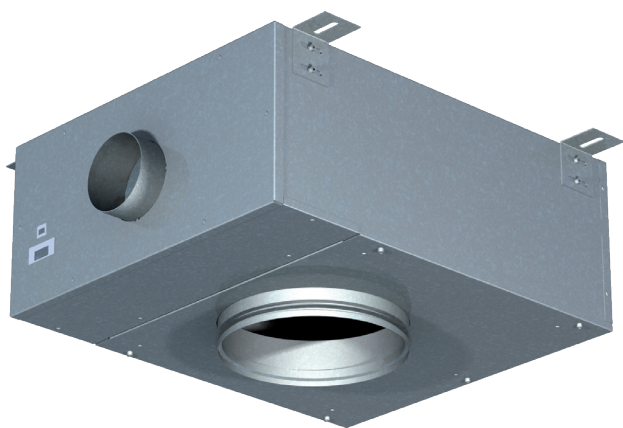
HOOD DIMENSIONS	LENGHT	WIDTH
L < 1250 mm, 1x28 W	720 mm	175 mm
L > 1250 mm, < 2000 mm, 1x42 W	1020 mm	175 mm
L > 2000 mm, 1x69 W	1620 mm	175 mm

MAINTENANCE HATCH

Each canopy shall be equipped with a maintenance hatch made of stainless steel EN 1.4301 (AISI 304) with a shock-resistant plastic window. The window can tolerate heat up to +115 °C and allows for easy opening and closing.

HMF SINGLE DUCT CABIN UNIT

For passenger and crew cabins



MATERIALS

PART	MATERIAL	NOTE
Casing	Hot galvanised steel	Available as an option: stainless steel EN 1.4404 (AISI316L)
Casing thickness	0.5 mm	As an option: 0.75/1.0 mm
Spigots	Hot galvanised steel and EPDM rubber	Available as an option: stainless steel EN 1.4404 (AISI316L)
Insulation	Mineral wool, s=20 mm, MED approved	As an option: s=25 mm
I/O unit	Aluminium/plastic/electronics	-
Reheat coil	Stainless steel EN 1.4301 (AISI304)	-
Cables	Halogen-free	-
Airflow measurement probes and tubes	Aluminium/polyurethane	-

HMF PRODUCT OPTIONS

- Pressure independent model (VAV/CAV)
- Pressure dependent model (VAV)
- Inputs for external switches such as balcony door and key card switches available as an option
- Network compatible with adapter for advanced energy efficiency and supervision system available as an option
- Energy efficiency functions to reduce unnecessary cooling / heating costs available as an option

APPLICATIONS

Halton HMF is pressure independent (VAV/CAV) or pressure dependent (VAV) single duct cabin unit with integrated reheater. Pressure independent VAV or CAV operation is facilitated by continuous airflow measurement and damper regulation by intelligent controller. Pressure independent HMF adapts to variations in supply ductwork pressure levels and maintains individual fresh supply airflow rate to each cabin. Pressure dependent VAV operation is facilitated only by damper regulation by intelligent controller. Pressure dependent HMF adapts to room temperature changes by regulating airflow between pre-set minimum and maximum damper positions.

FEATURES

- Pressure range from 200 Pa up to 1000 Pa
- Airflow range 120 m³/h...500 m³/h
- 230 VAC ±10%, 50/60 Hz
- Inbuilt airflow measurement (pressure independent models)
- Damper min. / max. position settings (pressure dependent models)
- Triac controlled reheating coil(s), adjustable heating power (PWM) 0...100%
- Master/slave functionality: several cabin units can be controlled by one control panel
- Internal fuses included
- All parameters can be set onsite during commissioning by external device or preset at the factory
- All cable connections with fast connectors
- Easily tailored for different types of installations
- 90 °C safety switch with state detection and manual reset
- Minimum flow alarm (pressure independent model) and inbox temperature measurement with overheat limit to cut-off reheater power
- HMF cabin unit is supplied with control panel and interconnection cable
- MED approved for B-0/B-15 installations

AVAILABLE REHEATERS

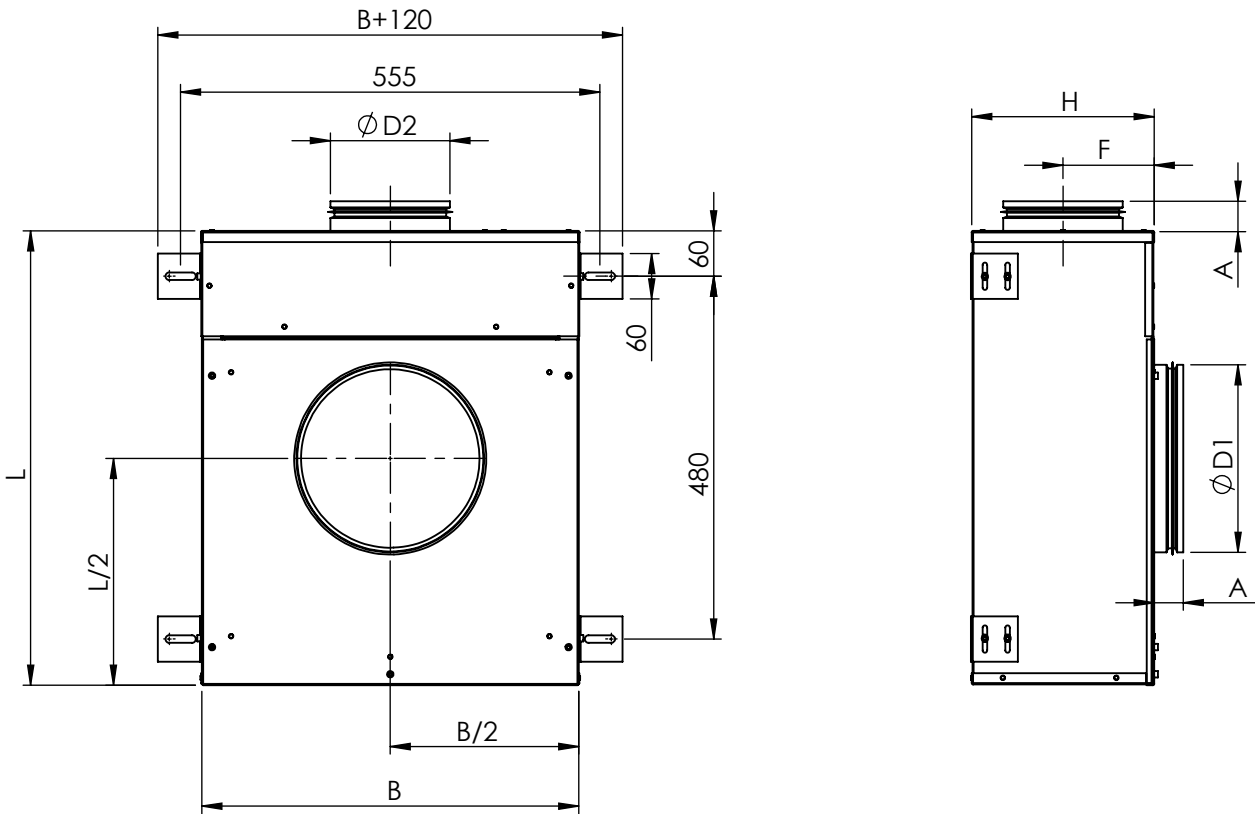
- Standard reheaters: 400W, 800W, 400+800W, 1200W, 1500W, 1800W
- Offshore reheaters: 400W, 800W, 1200W, 1600W (surface temperature below 90°C on operating airflow)

Practical power level may be software adjusted cabin by cabin. Cable and power supply design has to be done according to maximum available heating power.

HMF WEIGHTS, KG

Casing thickness	HMF-100	HMF-125
0,5 mm	11	11,5
0,75/1,0 mm	17	18

GENERAL HMF DRAWINGS



HMF DIMENSIONS,
UNIT MATERIAL THICKNESS 0.5 MM

	L	B	H	F	A	ØD1 male/ female	ØD2 male
HMF-100	590	490	190	88	45	199/201	99
HMF-125	590	490	230	118	45	249/251	124
HMF-160	590	490	230	118	45	249/251	159

Note: male connection: outer dimension, female connection: inner dimensions. Note: Standard dimensions, modifications possible

HMF DIMENSIONS,
UNIT MATERIAL THICKNESS 0.75/1.0 MM

	L	B	H	F	A	ØD1 male/ female	ØD2 male
HMF-100	600	500	200	88	40	199/201	99
HMF-125	600	500	240	120	40	249/251	124
HMF-160	600	500	240	120	40	249/251	159

Note: male connection: outer dimension, female connection: inner dimensions. Note: Standard dimensions, modifications possible

FUNCTION

Control panel includes also a number of special features such as diagnostics function, room brightness measurement and re-programmability. The power supply and data transfer between cabin unit and control panel is carried out via interconnection cable. Temperature range is software adjustable between 10 and 30°C.

FUNCTION OF VAV UNIT

When passenger demands lower temperature by using control panel unit, the damper opens in order to increase the flow of cold air towards the maximum value. When the required temperature in the cabin is achieved, the damper reference is held until the temperature demand changes. In heating mode, the damper restricts the airflow towards its minimum rate, and if the required temperature in the cabin is not thus achieved, the controller activates the electric reheater inside the unit in a stepless manner.

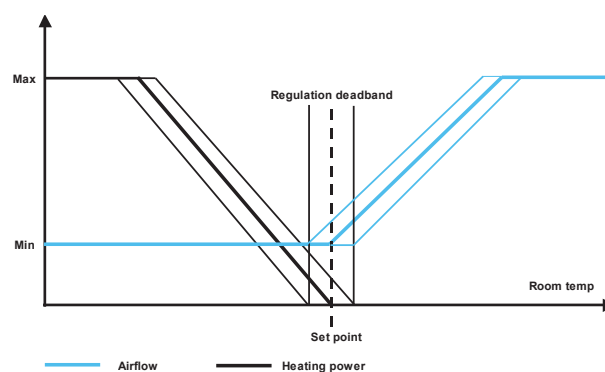
FUNCTION OF CAV UNIT

Airflow is kept in pre-set level in any condition. When passenger demands for a higher temperature by using control panel, the electric reheater inside the cabin unit will be activated in a stepless manner towards to maximum heating capacity or until desired temperature is achieved. When passenger demands for a lower temperature by using control panel, the electric reheater inside the unit will be deactivated in a stepless manner towards to zero heating capacity or until desired temperature is achieved.

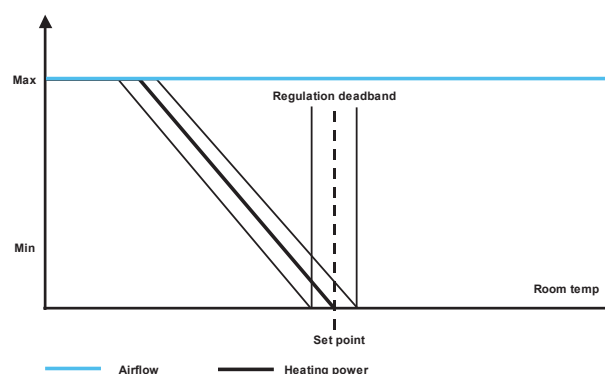
OPERATING RANGE FOR HMF

HMF-100	HMF-125
120 m ³ /h - 350 m ³ /h	150 m ³ /h - 500 m ³ /h

REGULATION DIAGRAM, VAV



REGULATION DIAGRAM, CAV



CABIN UNIT'S AIRFLOW MEASUREMENT

	AIRFLOW (m ³ /h)				
	120-150	151-200	201-300	301-400	401-500
Accuracy*	±20%	±15%	±10%	±8%	±6%

* ductwork pressure 200-1000 Pa (optimal)

Note: When comparing airflow measurements between cabin unit and other device, cabin unit's airflow regulation dead-band has to be taken into account (6 10 m³/h).

CONTROL PANEL FEATURES

Halton Marine HMF cabin units are available with three different control panel models; with rotating knob, push buttons with LED bar graph (available as option: IP54) and push buttons with LCD-display (available as option: IP54).

COMMON FEATURES

- Cabin temperature measurement
- Connector for bluetooth / communication adapter to set cabin parameters
- Software for parameter setting and trouble shooting
- Different colour options and custom labeling available as an option
- Delivered with IC-Cable (interconnection cable)
 - For control panel - cabin unit connection
 - Prefabricated with plugs on both ends
 - Cable plug on panel side is designed to be pulled through standard installation pipe
 - Halogen free and flame-retardant
 - Standard length 7 meters. Other lengths available.

CONTROL PANEL WITH ROTATING KNOB

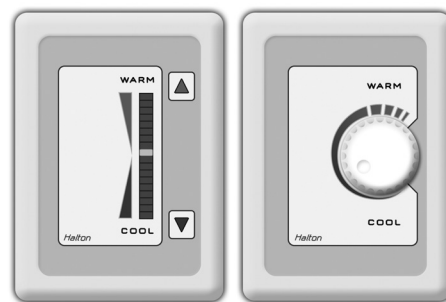
- Temperature adjustment by rotating knob

CONTROL PANEL WITH PUSH BUTTONS AND LED BAR GRAPH

- Temperature adjustment by push buttons
- Self diagnose function
- LED intensity control and auto dimming

CONTROL PANEL WITH PUSH BUTTONS AND LCD-DISPLAY

- Temperature adjustment by buttons
- Self diagnose function
- LCD intensity control and auto dimming
- Display for actual and set point temperatures available as an option
- Time display available as an option
- A customized background picture available as an option
- Several frame options available



Control panel models; push button and rotating knob



LCD control panel

CABIN VENTILATION CONFIGURATION TABLE

	UNIT	HMM	HMM	HME	HME	HMF	HMF	HMF	HFR/M	HFR/M	HFR/M	HMR	HMR	HML
	CONTROL PACKAGE	K01	D03	K01	D03	M00	M01	M02	M00	M01	M02	D21	H21	B00
TERMINAL UNIT WITH JUNCTION BOX	Damper	Manual	Manual	Manual	Manual	Electric	Electric	Electric	Electric	Electric	Electric	Electric	Electric	Electric
	Airflow measurement and control (VAV, CAV)	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	In-box temperature measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Reheater safety switch, manual reset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Safety switch state detection	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Spare inputs (balcony door etc.)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Parameter setting by service tool	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CONTROL PANEL	Cabin temperature measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Controller with push buttons, 18 led bar	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Controller with knob	Yes	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	No
	LCD room thermostat	No	Optional	No	Optional	Optional	No	No	Optional	No	No	Optional	No	Optional
	LED intensity control and auto dimming	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Self diagnose functionality	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Network compatible with adapter	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	CO2 sensor available as an option	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
CABLES	Interconnection cable	IC4-X	IC6-X	IC4-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X
	Master-slave cable	MS4-X	MS2-X	MS4-X	MS2-X	MS2-X (MS5-X)	MS3-X	MS3-X	MS2-X (MS5-X)	MS3-X	MS3-X	MS2-X	MS3-X	MS2-X

Please note: HMM and HME units are also available without a control package.

MANUALLY CONTROLLED AIRLOWS

- Single duct units; HMM, HME

PRESSURE DEPENDENT UNITS

- Single duct units; HMF, HFR/M

PRESSURE INDEPENDENT UNITS

- Single duct units; HMF, HFR/M, HML
- Dual duct units; HMR

ACCESSORIES FOR HMF CABIN UNITS**MS-CABLE (MASTER-SLAVE CABLE)**

- For master cabin unit - slave cabin unit/units connection
- Prefabricated with plugs on both ends
- Halogen free and flame-retardant
- Standard length is 7 meters. Other lengths available as an option.

COMMUNICATION ADAPTER

- Bluetooth communication to external device
- For wireless connection to set cabin unit parameters and trouble shooting

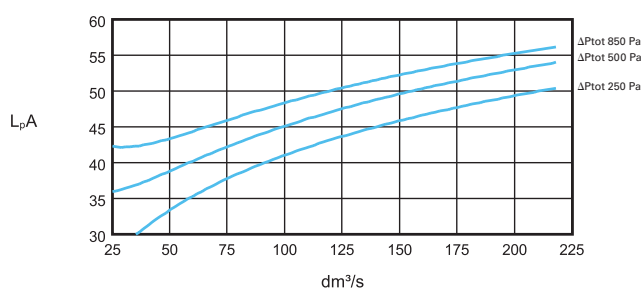
NETWORK ADAPTERS

- Network adapter (also available as WiFi) expands a stand-alone unit to network compatible unit (LON or Ethernet network)
- Enables supervision and advanced energy efficiency functions
- For more information, see Halton Networks for cabin ventilation -brochure or contact Halton Marine Sales office.

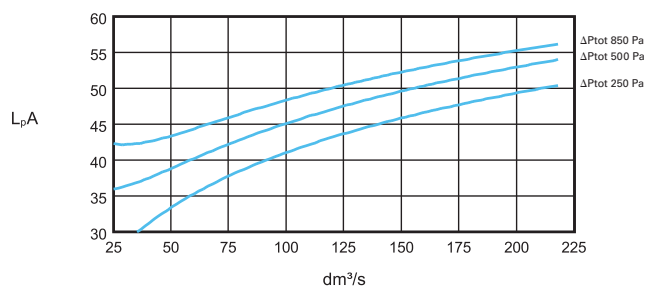
PERFORMANCE DATA

SOUND LEVELS, CABIN SOUND ABSORPTION 4 DB(A)

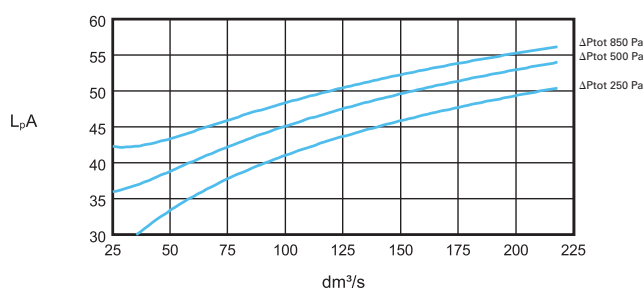
HMF-100-160



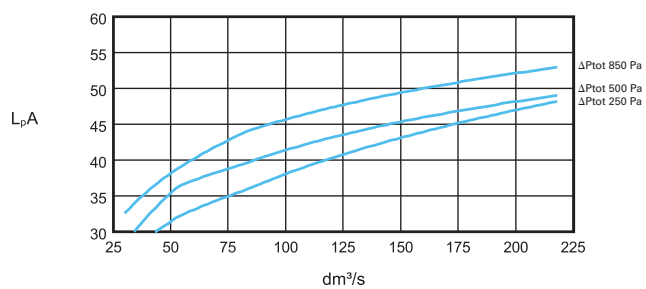
HMF-100-200



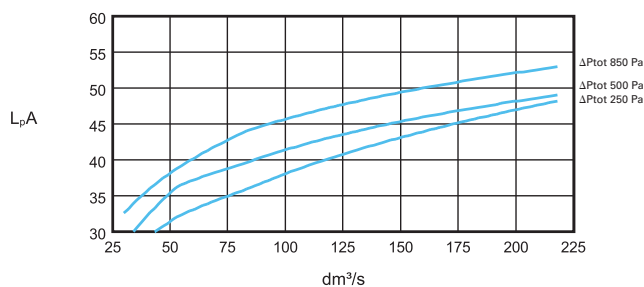
HMF-100-250



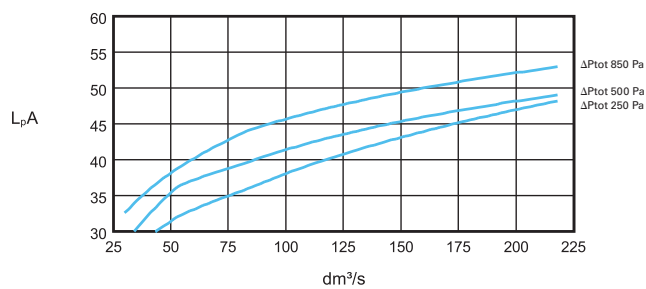
HMF-125-160



HMF-125-200



HMF-125-250



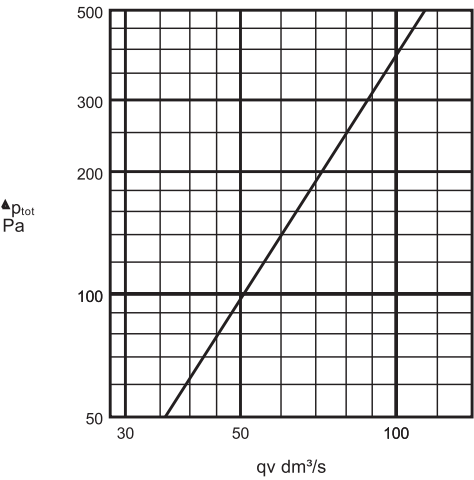
SOUND ATTENUATION (DB)

	f(Hz)	63	125	250	500	1000	2000	4000	8000
HMF-100	ΩL (dB)	6,4	11,3	15,9	25,8	34,8	37,9	35,3	34,7
HMF-125	ΩL (dB)	4,9	9,6	16,2	24,9	33,4	36,8	35,4	35,6

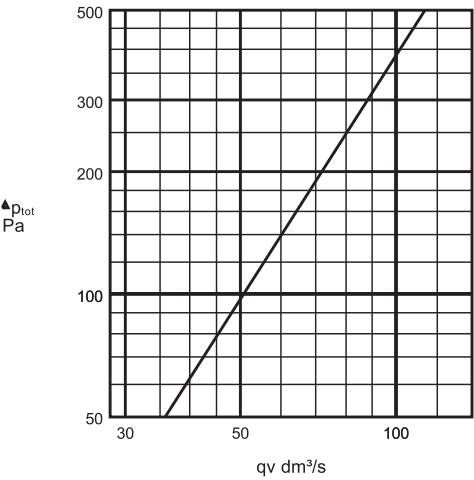
ΩL : Sound attenuation not including end reflection

PRESSURE DROP

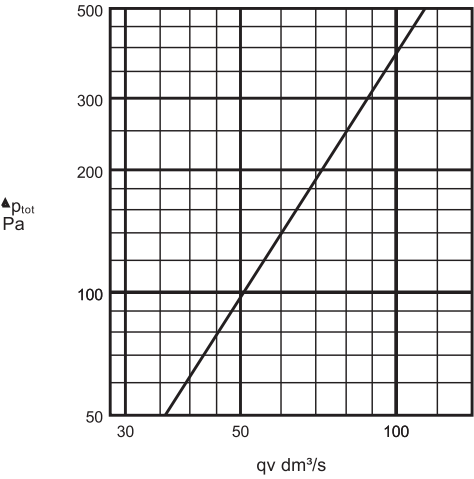
HMF-100-160



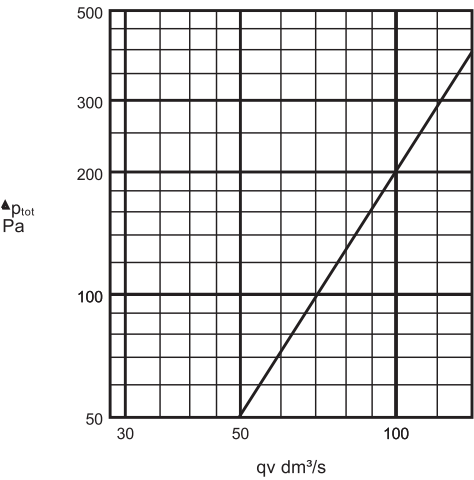
HMF-100-200



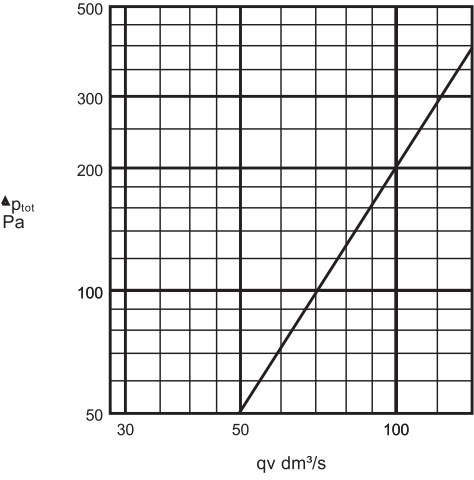
HMF-100-250



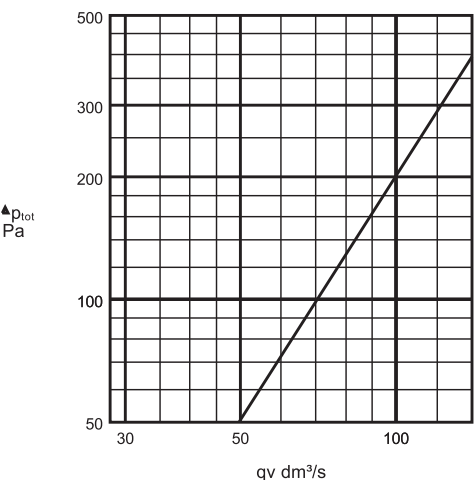
HMF-125-160



HMF-125-200

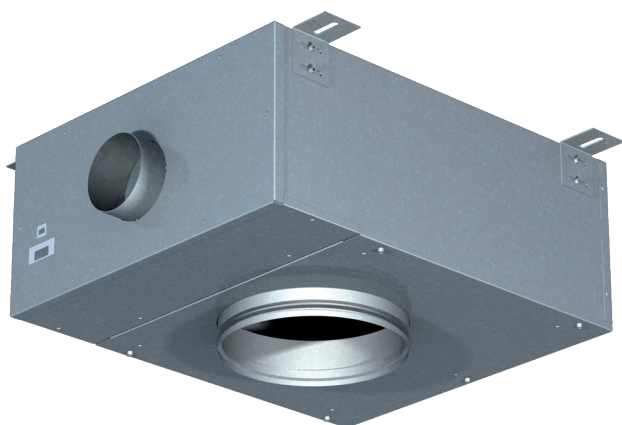


HMF-125-250



HME SINGLE DUCT CABIN UNIT

Sound attenuator and balancing box



MATERIALS

PART	MATERIAL	NOTE
Casing	Hot galvanised steel	Available as an option: stainless steel EN 1.4404 (AISI316L)
Casing thickness	0.5 mm	As an option: 0.75/1.0 mm
Spigots	Hot galvanised steel and EPDM rubber	Available as an option: stainless steel EN 1.4404 (AISI316L)
Insulation	Mineral wool, s=20 mm, MED approved	As an option: s=25 mm
I/O unit	Aluminium/plastic/electronics	-
Reheat coil	Stainless steel EN 1.4301 (AISI304)	-
Cables	Halogen-free	-
Measurement and adjustment module (MSM) (supply units)	Body: aluminium; plate: hot galvanized; spindle: stainless steel; tubes: polypropylene	-
Adjustment module (MEM) (exhaust units)	Spindle; stainless steel	

HME PRODUCT OPTIONS

- For supply (with MSM module)
- For supply with reheater and MSM module
- For exhaust (with MEM module)

AVAILABLE REHEATERS

- Standard reheaters: 400W, 800W, 1200 W, 1500W with K01 control package
- Standard reheaters: 400W, 800W, 1200W, 1500W, 1800W with D03 control package

Practical power level may be software adjusted cabin by cabin. Cable and power supply design has to be done according to maximum available heating power.

APPLICATIONS

Halton HME can be used for air distribution and sound attenuation in various applications such as suites and pantries. The unit operates as a plenum box with a balancing and measurement module inside but also fulfils fire safety requirements as standard cabin unit. The supply volume flow rate is determined during commissioning by using the measurement and adjustment device. The airflow measurement tubes and control spindle can be accessed through the unit's outlet. Using the pressure difference readings between the measurement taps and the k coefficient, the corresponding volume flow rate can be calculated. Rotating the control spindle adjusts the volume flow rate until the desired setting is achieved.

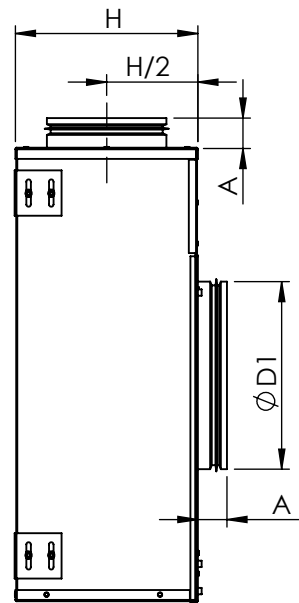
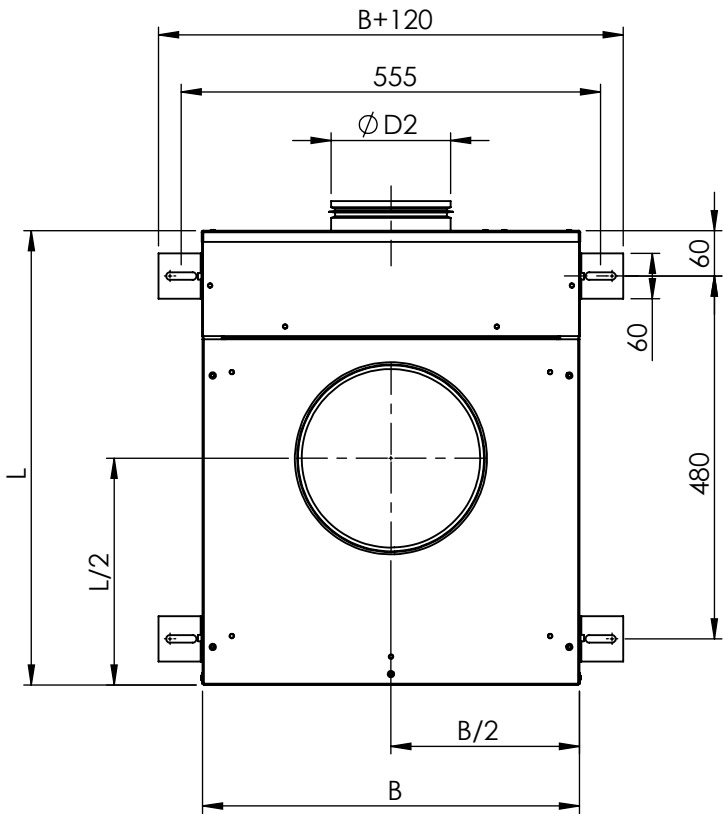
FEATURES

- Recommended pressure range from 0 Pa to 200 Pa
- Airflow range 0 m³/h...500 m³/h
- Excellent choice to be used together with HFR/M
- Airflow adjustment with control spindle (MSM module)
- Airflow measurement tubes
- Can be used also as exhaust plenum with MEM airflow adjustment device
- MED approved for B-0/B-15 installations

FEATURES WITH REHEAT MODELS

- 230 VAC ±10%, 50/60 Hz
- Triac controlled reheating coil(s), adjustable heating power (PWM) 0...100%
- Master/slave functionality: several cabin units can be controlled by one control panel
- Internal fuses included
- All parameters can be set onsite during commissioning by external device or preset at the factory
- All cable connections with fast connectors
- Easily tailored for different types of installations
- 90°C safety switch with state detection and manual reset
- HME cabin unit is supplied with control panel and interconnection cable

GENERAL HME DRAWINGS



HME DIMENSIONS,
UNIT MATERIAL THICKNESS 0.5 MM

	L	B	H	A	ØD1 male/ female	ØD2 male
HME-100	590	490	190	45	159/161	99
HME-125	590	490	190	45	199/201	124
HME-160	590	490	210	45	249/251	159

Note: male connection: outer dimension, female connection: inner dimensions. Note: Standard dimensions, modifications possible

HME WEIGHTS, KG

Casing thickness	HME-100	HME-125	HME-160
0,5 mm	9,5	10	10,5
0,75/1,0 mm	13,5	14	14,5

Reheater + I/O unit +1Kg

HME DIMENSIONS,
UNIT MATERIAL THICKNESS 0.75/1.0 MM

	L	B	H	A	ØD1 male/ female	ØD2 male
HME-100	600	500	200	40	159/161	99
HME-125	600	500	200	40	199/201	124
HME-160	600	500	220	40	249/251	159

Note: male connection: outer dimension, female connection: inner dimensions. Note: Standard dimensions, modifications possible

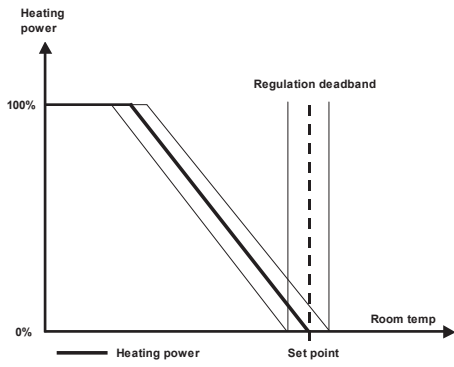
FUNCTION

Correct airflow for HME unit is set during commissioning by adjusting MSM/MEM device in inlet spigot. MSM/MEM is operated by flexible spindle which is easy to access from outlet.

MODELS WITH REHEATER

When passenger demands for warmer temperature by using control panel, the controller activates the electric reheater inside the cabin unit. When the required temperature in the cabin is achieved, the reference is held until the temperature demand changes.

REGULATION DIAGRAM WITH REHEATER



OPERATING RANGE FOR HME WITHOUT REHEATER

HME-100	HME-125	HME-160
50 m ³ /h - 200 m ³ /h	50 m ³ /h - 350 m ³ /h	50 m ³ /h - 500 m ³ /h

OPERATING RANGE FOR HME WITH REHEATER

HME-100	HME-125	HME-160
100 m ³ /h - 200 m ³ /h	100 m ³ /h - 350 m ³ /h	100 m ³ /h - 500 m ³ /h

CONTROL PANEL FEATURES

Halton Marine HME cabin units are available with three different control panel models; with rotating knob, push buttons with LED bar graph (available as option: IP54) and push buttons with LCD-display (available as option: IP54).

COMMON FEATURES

- Cabin temperature measurement
- Connector for bluetooth / communication adapter to set cabin parameters
- Software for parameter setting and trouble shooting
- Different colour options and custom labeling available as an option
- Delivered with IC-Cable (interconnection cable)
 - For control panel - cabin unit connection
 - Prefabricated with plugs on both ends
 - Cable plug on panel side is designed to be pulled through standard installation pipe
 - Halogen free and flame-retardant
 - Standard length 7 meters. Other lengths available.

CONTROL PANEL WITH ROTATING KNOB

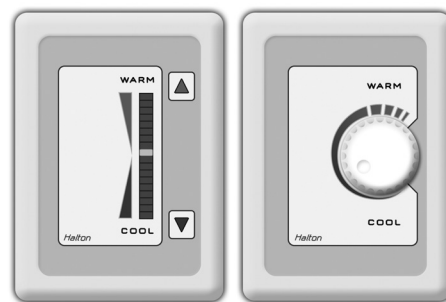
- Temperature adjustment by rotating knob

CONTROL PANEL WITH PUSH BUTTONS AND LED BAR GRAPH

- Temperature adjustment by push buttons
- Self diagnose function
- LED intensity control and auto dimming

CONTROL PANEL WITH PUSH BUTTONS AND LCD-DISPLAY

- Temperature adjustment by buttons
- Self diagnose function
- LCD intensity control and auto dimming
- Display for actual and set point temperatures available as an option
- Time display available as an option
- A customized background picture available as an option
- Several frame options available



Control panel models; push button and rotating knob



LCD control panel

CABIN VENTILATION CONFIGURATION TABLE

	UNIT	HMM	HMM	HME	HME	HMF	HMF	HMF	HFR/M	HFR/M	HFR/M	HMR	HMR	HML
	CONTROL PACKAGE	K01	D03	K01	D03	M00	M01	M02	M00	M01	M02	D21	H21	B00
TERMINAL UNIT WITH JUNCTION BOX	Damper	Manual	Manual	Manual	Manual	Electric	Electric	Electric	Electric	Electric	Electric	Electric	Electric	Electric
	Airflow measurement and control (VAV, CAV)	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	In-box temperature measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Reheater safety switch, manual reset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Safety switch state detection	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Spare inputs (balcony door etc.)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Parameter setting by service tool	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CONTROL PANEL	Cabin temperature measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Controller with push buttons, 18 led bar	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Controller with knob	Yes	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	No
	LCD room thermostat	No	Optional	No	Optional	Optional	No	No	Optional	No	No	Optional	No	Optional
	LED intensity control and auto dimming	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Self diagnose functionality	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Network compatible with adapter	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	CO2 sensor available as an option	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
CABLES	Interconnection cable	IC4-X	IC6-X	IC4-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X
	Master-slave cable	MS4-X	MS2-X	MS4-X	MS2-X	MS2-X (MS5-X)	MS3-X	MS3-X	MS2-X (MS5-X)	MS3-X	MS3-X	MS2-X	MS3-X	MS2-X

Please note: HMM and HME units are also available without a control package.

MANUALLY CONTROLLED AIRLOWS

- Single duct units; HMM, HME

PRESSURE DEPENDENT UNITS

- Single duct units; HMF, HFR/M

PRESSURE INDEPENDENT UNITS

- Single duct units; HMF, HFR/M, HML
- Dual duct units; HMR

ACCESSORIES FOR HFR/M CABIN UNITS**MS-CABLE (MASTER-SLAVE CABLE)**

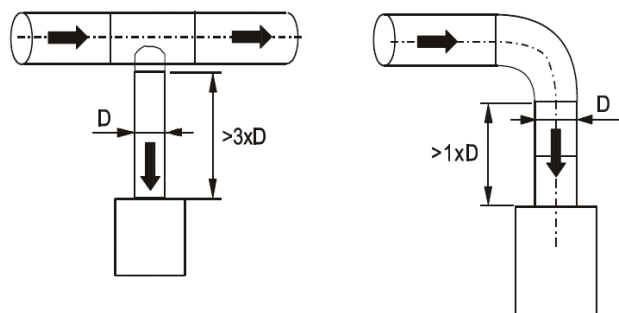
- For master cabin unit - slave cabin unit/units connection
- Prefabricated with plugs on both ends
- Halogen free and flame-retardant
- Standard length is 7 meters. Other lengths available as an option.

COMMUNICATION ADAPTER

- Bluetooth communication to external device
- For wireless connection to set cabin unit parameters and trouble shooting

NETWORK ADAPTERS

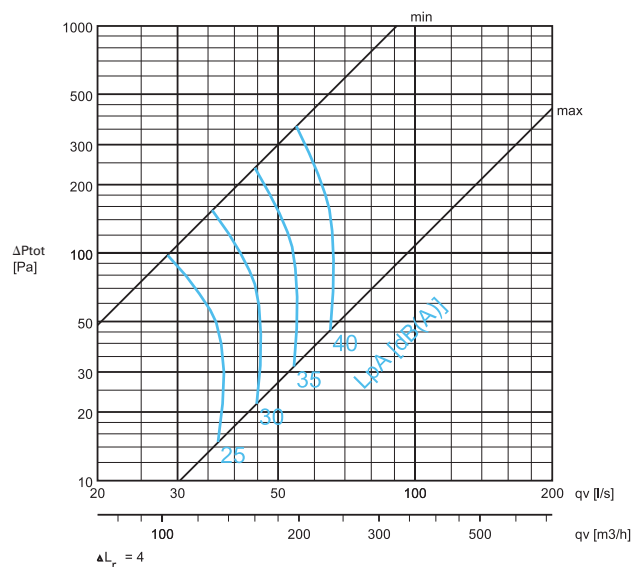
- Network adapter (also available as WiFi) expands a stand-alone unit to network compatible unit (LON or Ethernet network)
- Enables supervision and advanced energy efficiency functions
- For more information, see Halton Networks for cabin ventilation -brochure or contact Halton Marine Sales office.

MINIMUM SAFETY DISTANCES BEFORE AIRFLOW**MEASUREMENT**

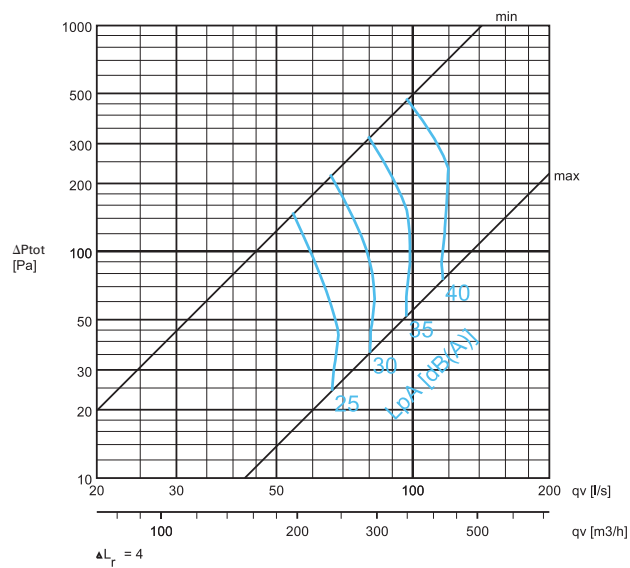
PERFORMANCE DATA

SOUND LEVELS, CABIN SOUND ABSORPTION 4 DB(A)

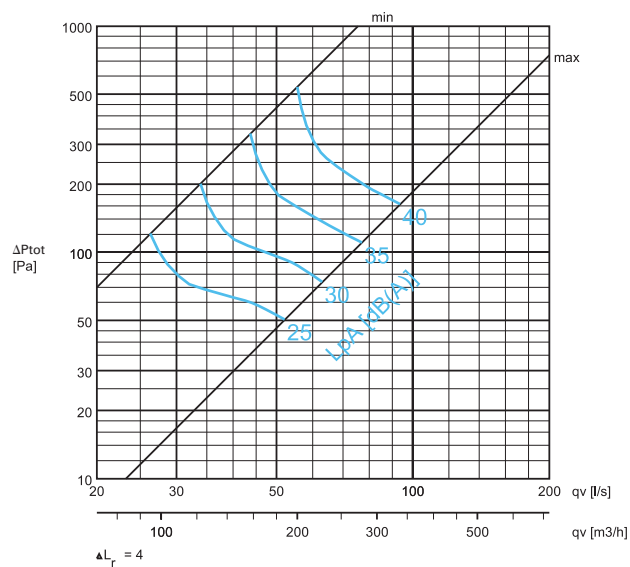
HME/A-125-200



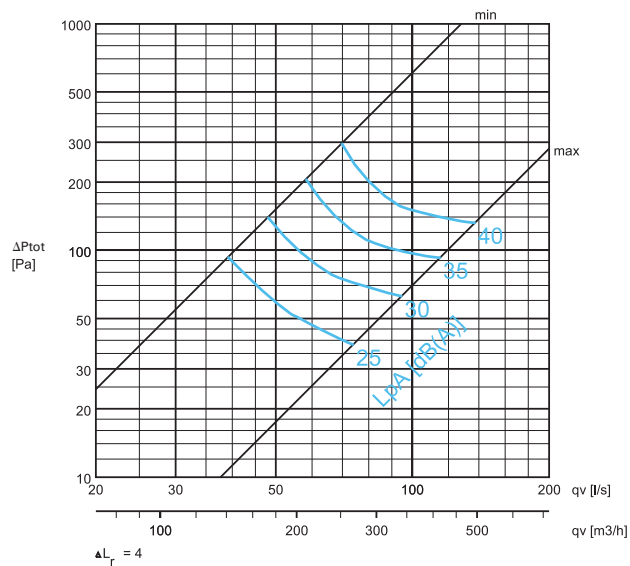
HME/A-160-250



HME/D-125-200



HME/D-160-250



SOUND ATTENUATION (DB)

	f(Hz)	63	125	250	500	1000	2000	4000	8000
HME-125	ΩL(dB)	6,4	11,3	15,9	25,8	34,8	37,9	35,3	34,7
HME-160	ΩL(dB)	7,2	7,2	17,2	26,7	36,4	40,7	38,5	34,3

ΩL: Sound attenuation not including end reflection

HMM SINGLE DUCT CABIN UNIT

For crew cabins, manual model



MATERIALS

PART	MATERIAL	NOTE
Casing	Hot galvanised steel	Available as an option: stainless steel EN 1.4404 (AISI316L)
Casing thickness	0.5 mm	As an option: 0.75/1.0 mm
Spigots	Hot galvanised steel and EPDM rubber	Available as an option: stainless steel EN 1.4404 (AISI316L)
Insulation	Mineral wool, s=20 mm, MED approved	As an option: s=25 mm
I/O unit	Aluminium/plastic/electronics	-
Reheat coil	Stainless steel EN 1.4301 (AISI304)	-
Cables	Halogen-free	-
Airflow measurement probes and tubes	Aluminium/polyurethane	-

HMM PRODUCT OPTIONS

- Manual cabin unit without reheater
- Manual cabin unit with reheater
- Network compatible with adapter. Available as an option with D03 control package

AVAILABLE REHEATERS

- Standard reheaters: 400W, 800W, 1200 W, 1500W with K01 control package
- Standard reheaters: 400W, 800W, 1200W, 1500W, 1800W with D03 control package

Practical power level may be software adjusted cabin by cabin. Cable and power supply design has to be done according to maximum available heating power.

APPLICATIONS

Halton HMM is a manually operated cabin unit for single duct applications. Airflow is controlled via an adjusting knob installed on the diffuser. The control mechanism has mechanical limits for minimum and maximum airflows. These limits can be easily set during commissioning. HMM is recommended to be used in conjunction with Halton's diffusers, as the mechanism has to be fixed to the diffuser's structure. The airflow is adjusted with diffuser knob. The HMM cabin unit can be supplied with reheater - controlled by a control panel.

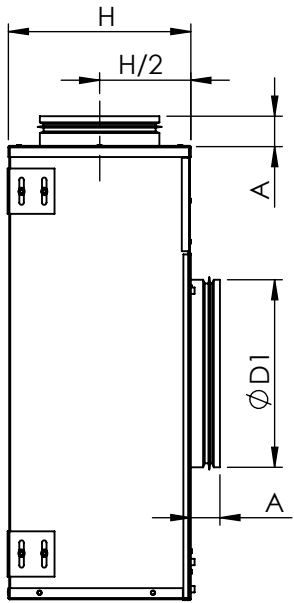
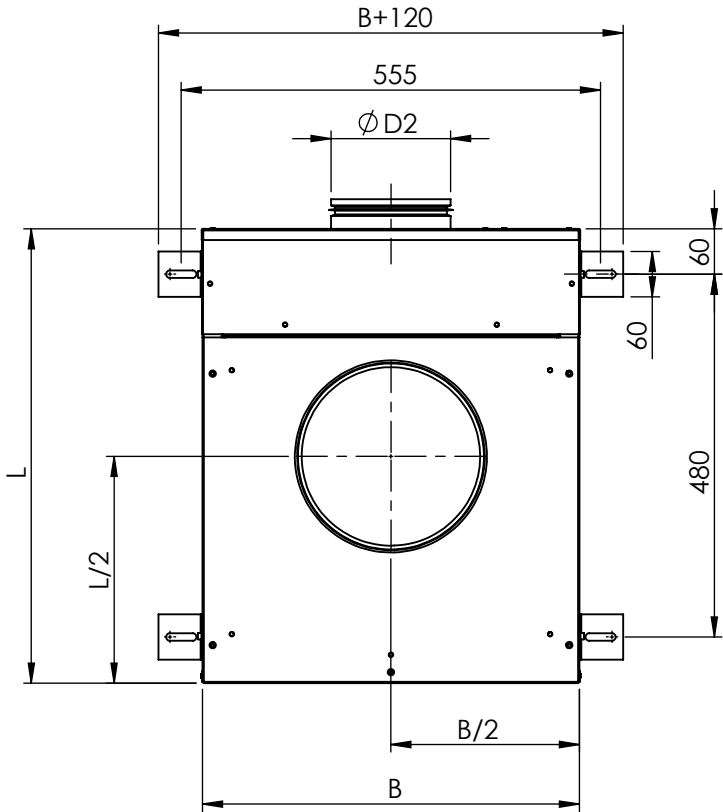
FEATURES

- Pressure range from 50 Pa up to 1000 Pa
- Airflow range 0 m³/h...500 m³/h
- Airflow adjustment with diffuser knob
- Mechanical max./min. airflow limits for easy commissioning
- Airflow measurement probes
- MED approved for B-0 and B-15 installations

FEATURES WITH REHEAT MODELS

- 230 VAC ±10%, 50/60 Hz
- Triac controlled reheating coil(s), adjustable heating power (PWM) 0...100%
- Master/slave functionality: several cabin units can be controlled by one control panel
- Internal fuses included
- All parameters can be set onsite during commissioning by external device or preset at the factory
- All cable connections with fast connectors
- Easily tailored for different types of installations
- 90°C safety switch with state detection and manual reset
- HMM cabin unit is supplied with control panel and interconnection cable

GENERAL HMM DRAWINGS



HMM DIMENSIONS, UNIT MATERIAL THICKNESS 0.5 MM

	L	B	H	A	ØD1 male/ female	ØD2 male
HMM-100	590	490	190	45	199/201	99
HMM-125	590	490	230	45	249/251	124
HMM-160	590	490	230	45	249/251	159

Note: male connection: outer dimension, female connection: inner dimensions. Special dimensions available for inlet 80 or 160 and outlet 160, 200 or 250. Sound and pressure drop data is limited for special dimensions.

HMM DIMENSIONS, UNIT MATERIAL THICKNESS 0.75/1.0 MM

	L	B	H	A	ØD1 male/ female	ØD2 male
HMM-100	600	500	200	40	199/201	99
HMM-125	600	500	240	40	249/251	124
HMM-160	600	500	240	40	249/251	159

Note: male connection: outer dimension, female connection: inner dimensions. Special dimensions available for inlet 80 or 160 and outlet 160, 200 or 250. Sound and pressure drop data is limited for special dimensions.

HMM WEIGHTS, KG

Casing thickness	HMM-100	HMM-125	HMM-160
0.5 mm	10.5	11.5	12
0.75/1.0 mm	15	16	16.5

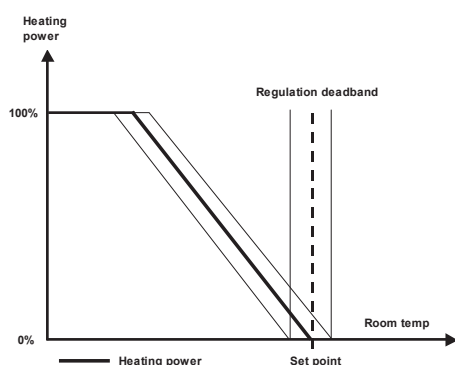
Reheater + I/O unit +1kg

FUNCTION

Airflow is controlled via an adjustment knob between the preset limits.

MODELS WITH REHEATER

When passenger demands for warmer temperature by using control panel, the controller activates the electric reheater inside the cabin unit. When the required temperature in the cabin is achieved, the reference is held until the temperature demand changes. Mechanical maximum and minimum limits are set during commissioning.

REGULATION DIAGRAM WITH REHEATER**ADJUSTMENT**

The supply flow rate is determined by using the measurement probes and manometer.

The diffuser front plate are removed and tubes are passed through the diffuser. Measure the differential pressure with a manometer. The flow rate is calculated using the shown formula. Adjust the minimum airflow rate by rotating the D-shape bar until the desired setting is achieved. Move the minimum airflow mechanical limiter against the stand and tighten socket cap screw. Adjust the maximum airflow rate by rotating the D-shape bar until desired setting is achieved. Move the maximum airflow mechanical limiter against the stand and tighten socket cap screw.

K-FACTORS TABLE

HMM	k
HMM-100	48.2
HMM-125	74.2

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

q_v = airflow (m³/h)

k = k-factor

Δp_m = measured pressure (Pa)

OPERATING RANGE FOR HMM WITHOUT REHEATER

HMM-100	HMM-125	HMM-160
0 m ³ /h - 350 m ³ /h	0 m ³ /h - 500 m ³ /h	0 m ³ /h - 500 m ³ /h

OPERATING RANGE FOR HMM WITH REHEATER

HMM-100	HMM-125	HMM-160
100 m ³ /h - 350 m ³ /h	100 m ³ /h - 500 m ³ /h	100 m ³ /h - 500 m ³ /h

CONTROL PANEL FEATURES

Halton Marine HMM cabin units are available with three different control panel models; with rotating knob, push buttons with LED bar graph (available as option: IP54) and push buttons with LCD-display (available as option: IP54).

COMMON FEATURES

- Cabin temperature measurement
- Connector for bluetooth / communication adapter to set cabin parameters
- Software for parameter setting and trouble shooting
- Different colour options and custom labeling available as an option
- Delivered with IC-Cable (interconnection cable)
 - For control panel - cabin unit connection
 - Prefabricated with plugs on both ends
 - Cable plug on panel side is designed to be pulled through standard installation pipe
 - Halogen free and flame-retardant
 - Standard length 7 meters. Other lengths available.

CONTROL PANEL WITH ROTATING KNOB

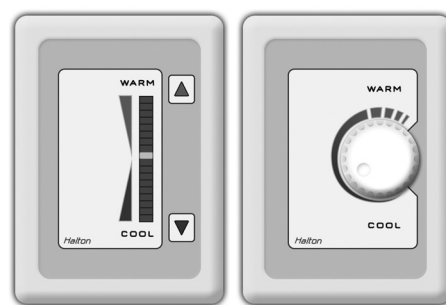
- Temperature adjustment by rotating knob

CONTROL PANEL WITH PUSH BUTTONS AND LED BAR GRAPH

- Temperature adjustment by push buttons
- Self diagnose function
- LED intensity control and auto dimming

CONTROL PANEL WITH PUSH BUTTONS AND LCD-DISPLAY

- Temperature adjustment by buttons
- Self diagnose function
- LCD intensity control and auto dimming
- Display for actual and set point temperatures available as an option
- Time display available as an option
- A customized background picture available as an option
- Several frame options available



Control panel models; push button and rotating knob



LCD control panel

CABIN VENTILATION CONFIGURATION TABLE

	UNIT	HMM	HMM	HME	HME	HMF	HMF	HMF	HFR/M	HFR/M	HFR/M	HMR	HMR	HML
	CONTROL PACKAGE	K01	D03	K01	D03	M00	M01	M02	M00	M01	M02	D21	H21	B00
TERMINAL UNIT WITH JUNCTION BOX	Damper	Manual	Manual	Manual	Manual	Electric	Electric	Electric	Electric	Electric	Electric	Electric	Electric	Electric
	Airflow measurement and control (VAV, CAV)	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	In-box temperature measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Reheater safety switch, manual reset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Safety switch state detection	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Spare inputs (balcony door etc.)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Parameter setting by service tool	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CONTROL PANEL	Cabin temperature measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Controller with push buttons, 18 led bar	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Controller with knob	Yes	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	No
	LCD room thermostat	No	Optional	No	Optional	Optional	No	No	Optional	No	No	Optional	No	Optional
	LED intensity control and auto dimming	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Self diagnose functionality	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
	Network compatible with adapter	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	CO2 sensor available as an option	No	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
CABLES	Interconnection cable	IC4-X	IC6-X	IC4-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X	IC6-X
	Master-slave cable	MS4-X	MS2-X	MS4-X	MS2-X	MS2-X (MS5-X)	MS3-X	MS3-X	MS2-X (MS5-X)	MS3-X	MS3-X	MS2-X	MS3-X	MS2-X

Please note: HMM and HME units are also available without a control package.

MANUALLY CONTROLLED AIRLOWS

- Single duct units; HMM, HME

PRESSURE DEPENDENT UNITS

- Single duct units; HMF, HFR/M

PRESSURE INDEPENDENT UNITS

- Single duct units; HMF, HFR/M, HML
- Dual duct units; HMR

ACCESSORIES FOR HMM CABIN UNITS**MS-CABLE (MASTER-SLAVE CABLE)**

- For master cabin unit - slave cabin unit/units connection
- Prefabricated with plugs on both ends
- Halogen free and flame-retardant
- Standard length is 7 meters. Other lengths available as an option.

COMMUNICATION ADAPTER

- Bluetooth communication to external device (only with D03 control package)
- For wireless connection to set cabin unit parameters and trouble shooting (only with D03 control package)

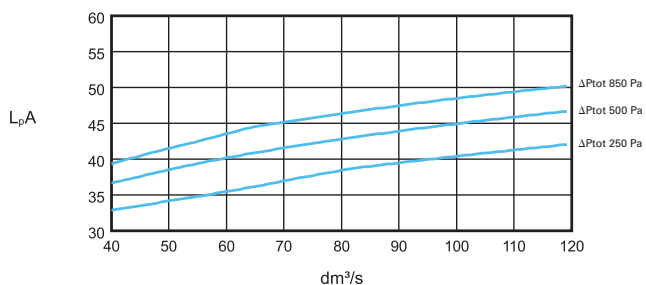
NETWORK ADAPTERS

- Network adapter (also available as WiFi) expands a stand-alone unit to network compatible unit (LON or Ethernet network)
- Enables supervision and advanced energy efficiency functions
- For more information, contact Halton Marine Sales

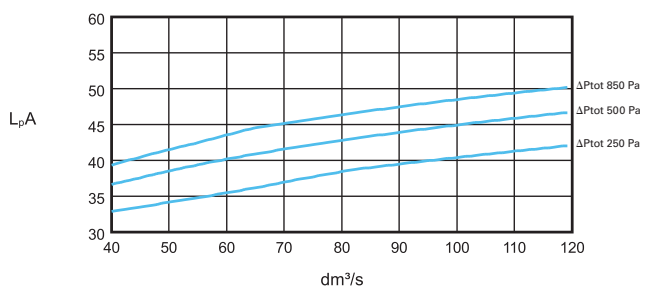
PERFORMANCE DATA

SOUND LEVELS, CABIN SOUND ABSORPTION 4 DB(A)

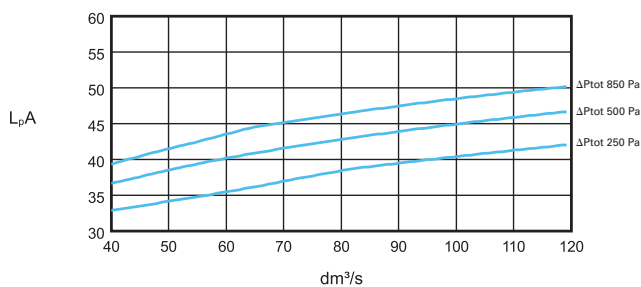
HMM-100-160



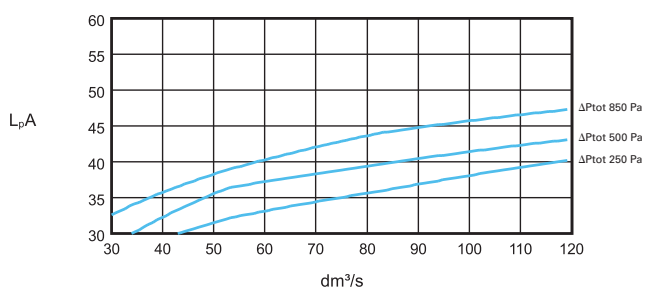
HMM-100-200



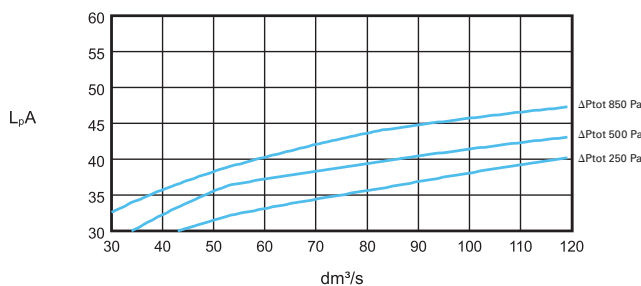
HMM-100-250



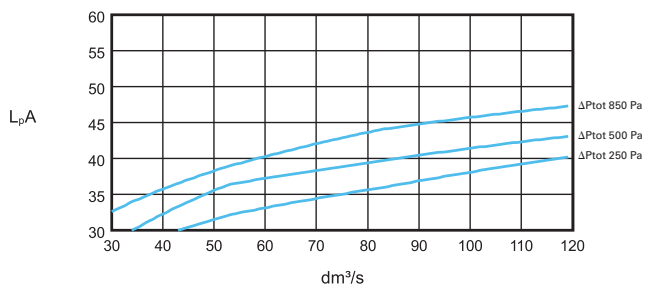
HMM-125-160



HMM-125-200

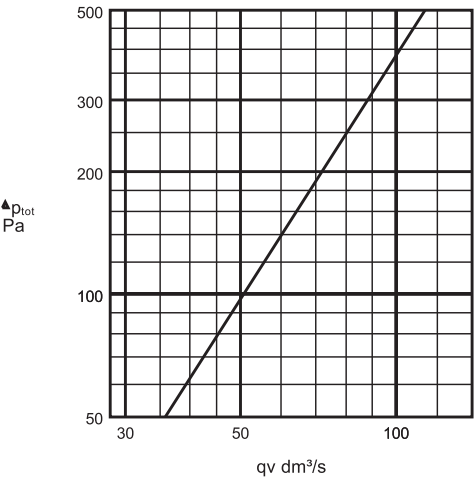


HMM-125-250

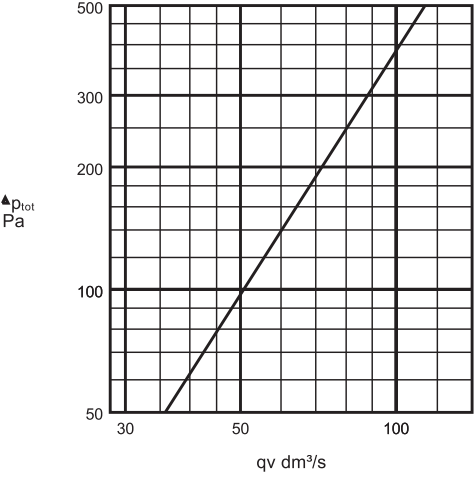


PRESSURE DROP

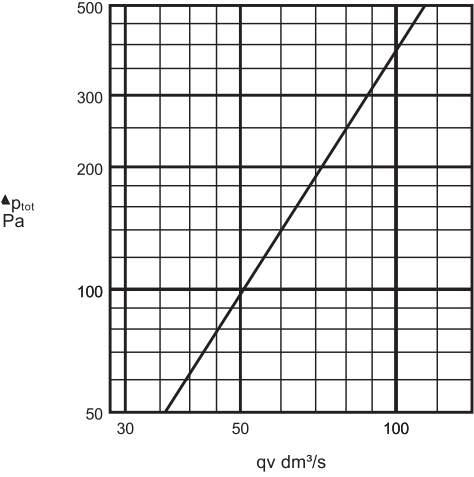
HMM-100-160

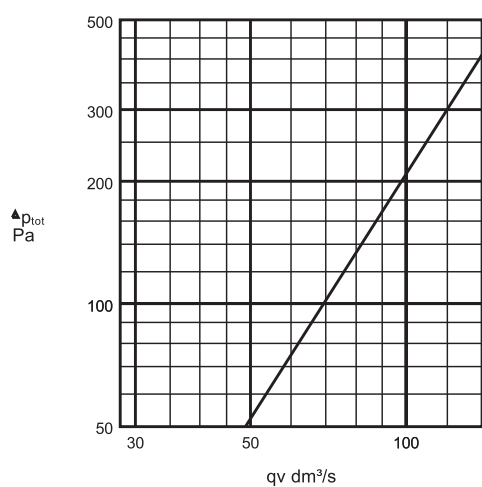
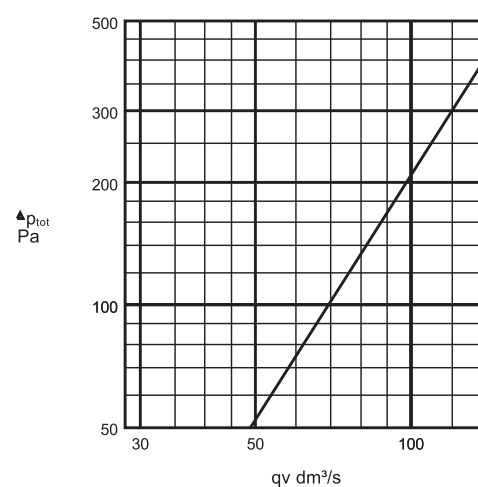
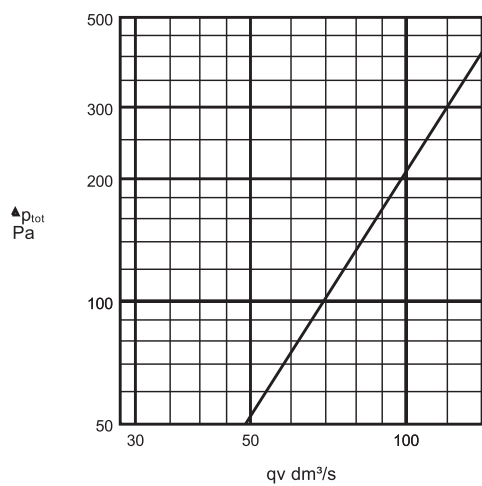


HMM-100-200



HMM-100-250



HMM-125-160**HMM-125-200****HMM-125-250****SOUND ATTENUATION (DB)**

	f(Hz)	63	125	250	500	1000	2000	4000	8000
HMF-100	ΩL(dB)	6.4	11.3	15.9	25.8	34.8	37.9	35.3	34.7
HMM-125	ΩL(dB)	4.9	9.6	16.2	24.9	33.4	36.8	35.4	35.6

ΩL: Sound attenuation not including end reflection

DSH HIGH-EFFICIENCY DROPLET SEPARATOR

For demanding applications



MATERIALS

PART	MATERIAL	FINISHING
Droplet separator	Aluminium EN AW 6060	Painted RAL9010, C3 acc. standard* ISO 12944-2 as standard
Droplet separator	Stainless steel EN 1.4404 (AISI316L)	Painted as an option
Mask louvre	Aluminium EN AW 5754 / AW 6060	Painted RAL9010, C3 acc. standard* ISO 12944-2 as standard
Mask louvre	Stainless steel EN 1.4404 (AISI316L)	Painted as an option
Frame	Aluminium EN AW 5754	Painted RAL9010, C3 acc. standard* ISO 12944-2 as standard
Frame	Stainless steel EN 1.4404 (AISI316L)	Painted as an option
Net	Stainless steel EN 1.4404 (AISI316L)	-
Filter	ISO Coarse 70% panel filter or ePM2,5 65% bag filter, other types available on request	-

*) C3 durability of 7-15 years. C5-M with the durability of 15-25 years durability, available as an option.

PRODUCT OPTIONS

Halton DSH is commonly delivered as a single-stage, two-stage or three-stage model:

- The single-stage unit comprises DSH vane section only, vane pitch can be 28mm, 23mm or 18mm
- The two-stage units comprise DSH+panel filter or DSH+bag filter
- The three-stage units comprise DSH+panel filter+DSH or DSH+bag filter+DSH

Special configurations are available.

APPLICATIONS

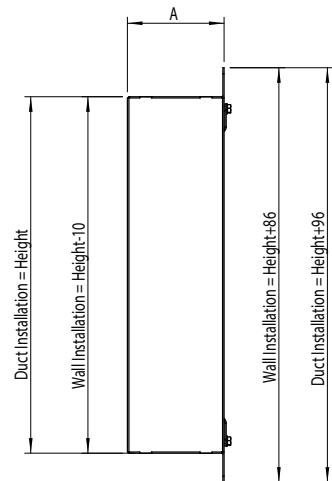
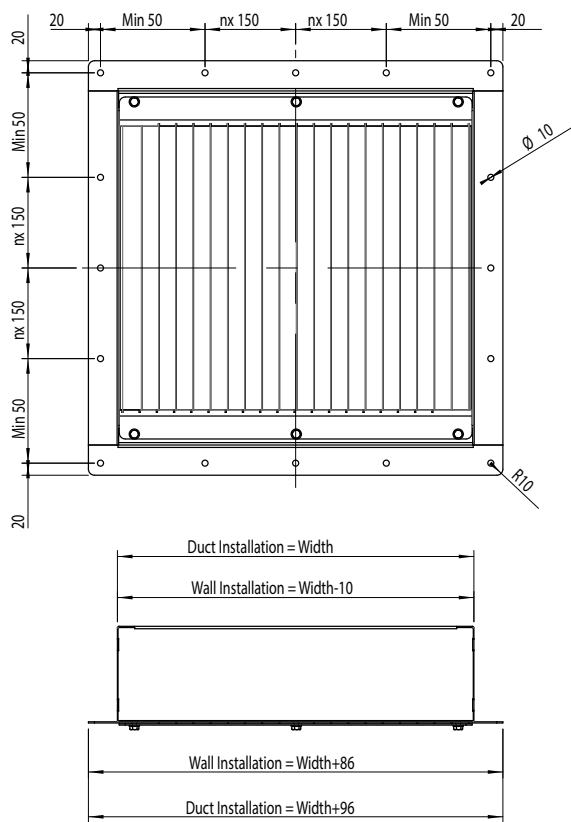
Halton's DSH high-efficiency droplet separators are designed for demanding applications such as marine, oil & gas, chemical, energy industries, where reliability, easy installation and special design play an important role. Droplet separators operate on the principle of inertial vane separation and are designed to restrict the penetration of moisture, salt spray, rainwater and airborne aerosol particles into HVAC systems, engine room intakes, machinery spaces, and diesel and gas turbine engine air intakes.

Three configurations are commonly used according to the level of droplet removal efficiency required, single-stage, two-stage, and three-stage, but special configurations are also available. Two and three-stage units will include a coalescing and particulate filter. Halton can assist in the design and selection of the droplet separator according to the application with special consideration to the pressure drop, velocity, wind speed and direction, turbulence, and drainage.

FEATURES

- High droplet and moisture separation efficiency
 - Class A results (EN 13030:2001)
 - Minimum pressure drop
- Performance tested according to EN 13030:2001 test for louvres subjected to simulated rain, at the independent laboratory
- Independent droplet removal efficiency testing carried out for single-stage, two-stage and three-stage configurations
- Tailored sizes and designs, such as modular construction, according to customer's needs
- For wall and duct installations
- Two and three-stage units will include a coalescing and particulate filter. Normally these are an ISO Coarse 70% panel filter or ePM2,5 65% bag filter
- The option of a mask louvre (ML) is available to architecturally disguise the vertical vane sections
- A possibility to connect with Halton fire or shut-off dampers resulting in saving of the space
- Easy installation and commissioning. No special maintenance required

GENERAL DSH DRAWINGS



Please note that flanges in accordance with Norsok / ISO15138 are available as an option.

Special flange configurations available on request.

DSH DIMENSIONS

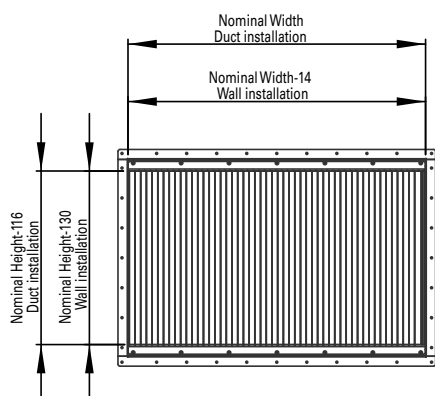
TYPE	A	
	Wall installation	Duct installation
DSH	160	170
DSH+ML	210	-
DSH+panel filter	225	235
DSH+panel filter+ML	275	-
DSH+bag filter	595	605
DSH+ML+bag filter	645	-

- DSH = droplet separator
- DSH+ML = droplet separator + mask louvre
- DSH+panel filter = droplet separator + ISO Coarse 70% panel filter
- DSH+panel filter+ML = droplet separator + ISO Coarse 70% panel filter with depth 360mm + mask louvre
- DSH+bag filter = droplet separator + ePM2,5 65% bag filter with depth of 300 mm
- DSH+ML+bag filter = droplet separator + mask louvre + ePM2,5 65% bag filter with depth of 360 mm
- Net available as an option.

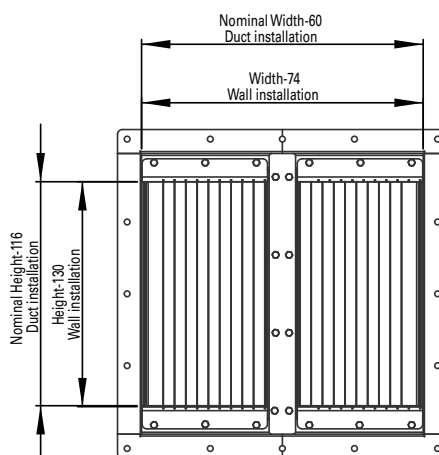
MATERIAL THICKNESS

Standard frame thickness of 2 mm. 3 mm available as an option.

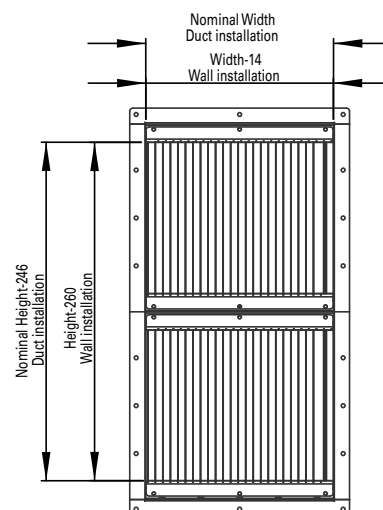
DSH SINGLE UNIT



DSH MODULE UNIT (WIDTH)

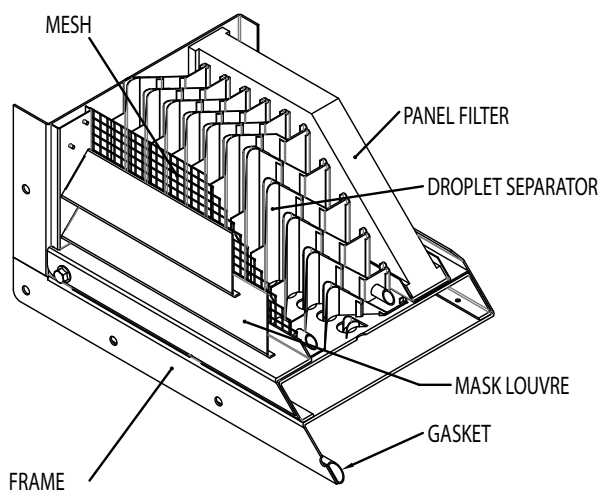


DSH MODULE UNIT (HEIGHT)



For example wall installation DSH
Size: width 600 mm, height 600 mm
= face area: width 586 mm, height 470 mm

GENERAL CONSTRUCTION

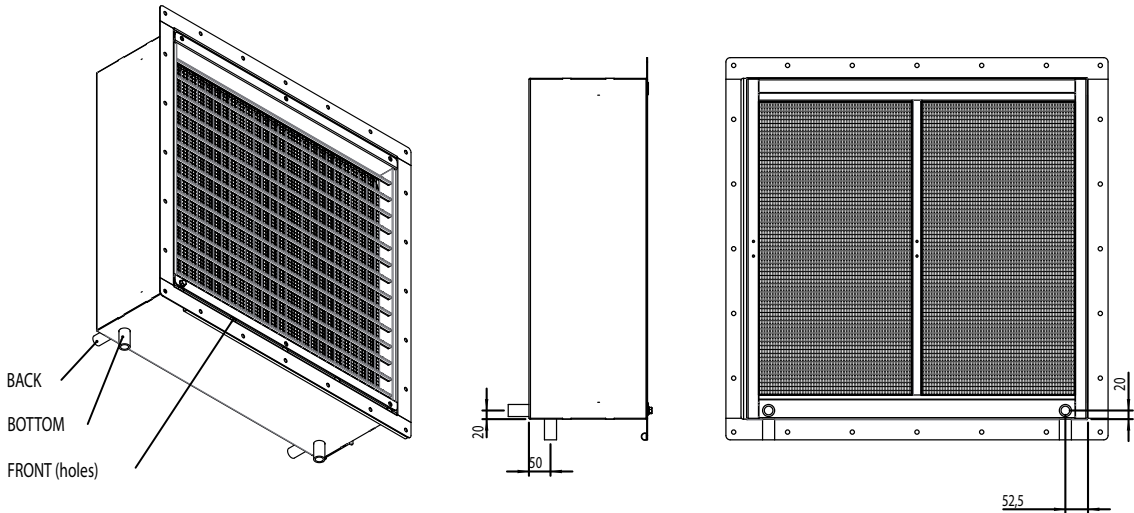


- The single-stage unit comprises DSH vane section only, vane pitch can be 28mm, 23mm or 18mm
- Two-stage units comprise DSH+panel filter or DSH+bag filter
- Three-stage units comprise DSH+panel filter+DSH or DSH+bag filter+DSH
- Special configurations are available
- Mask Louvre (ML) and mesh (ME) are available as an option
- The mesh (ME) prevents objects from entering the air intake system
- The mask louvre (ML) is available to architecturally disguise the vertical vane sections
- Access to filter for removal and maintenance is LH (left hand) or RH (right hand) as standard

DRAINAGE

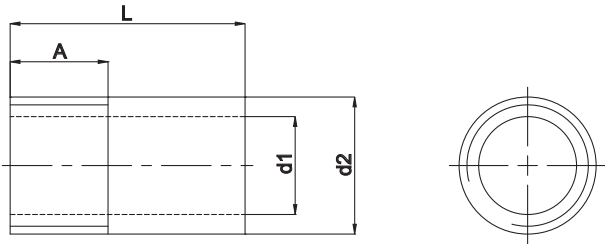
Single-stage units are supplied with front drain holes or with drainage pipes. Two and three-stage units are normally supplied with a EN 1.4404 manometric drain trap to prevent unfiltered air by-passing the droplet separator.

DRAIN LOCATIONS



DRAIN PIPE SIZES

Weld-on nipple	Size	L	A	d1	d2
		mm	mm	mm	mm
Aluminium	1/2	50	20	15	22
	3/4	50	20	20	28
	1	60	25	25	35
Stainless steel AISI 316	1/2	35	15	16	21
	3/4	40	15	22	27
	1	40	20	26.5	34

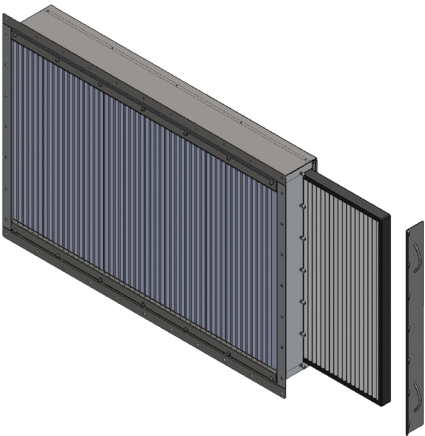


Standard size is 3/4". 1/2" and 1" are available as an option. Thread type BSPT (male).

OPTIONAL FEATURES

SERVICE HATCH (SH)

Enables easy access to the filter from the side of the unit. Hatch can be placed to the left side (HL) or the right side (HR) of the DSH. (ISO Coarse 70% panel filter in the picture).



ISO COARSE 70% PANEL FILTER

Panel filters are manufactured of progressive thermally smoothened synthetic polyester having high dust holding capacity and constancy for humidity. The filters are used in the general ventilation system for air purification.

EPM10 70%, EPM2,5 65% AND EPM1 50% BAG FILTERS

The materials of the synthetic fine filters are high-quality and durable, progressive mounted synthetic fibres. The filters can be used in example for air purification of the intake air.

ATEX APPROVED FILTERS

Halton also offers ATEX approved filters for droplet separators.

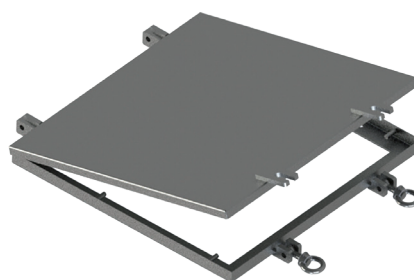
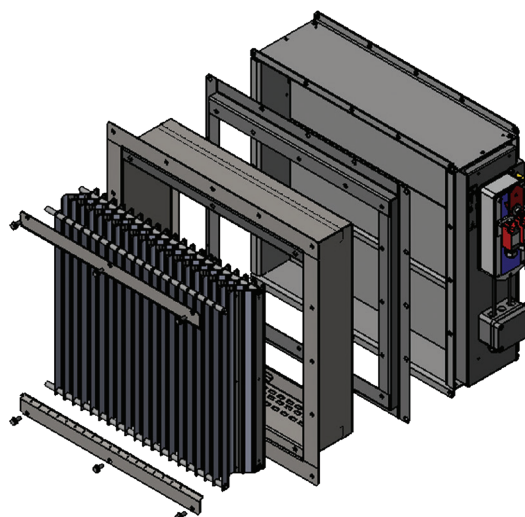
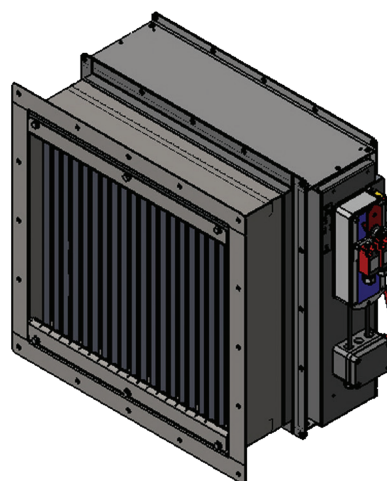
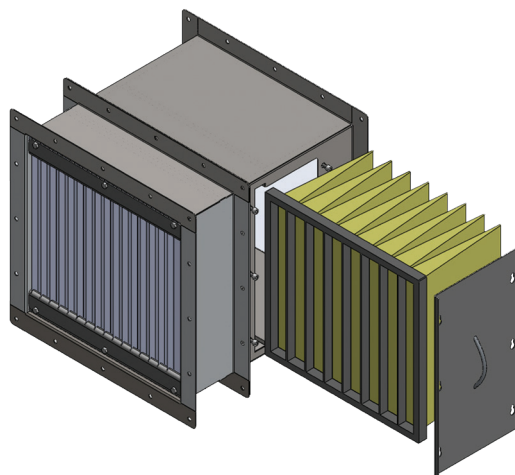
INSTALLATION IN CONJUNCTION WITH A DAMPER

Halton droplet separator can be connected to a Halton damper with or without a connection piece. In both cases, the construction is modified to fit the damper. Connecting DSH with a fire damper must be mentioned when ordering products. Special flanges and drilling patterns are available for all models on request. The structural flexibility of dampers and high-quality combined with a wide range of accessories (ex-actuators) and special steels, enable Halton to offer tailored solutions for its customers.

Combining Halton droplet separator to damper offers customers a compact solution for air intake that also saves space. The products are recommended to be connected at Halton factory.

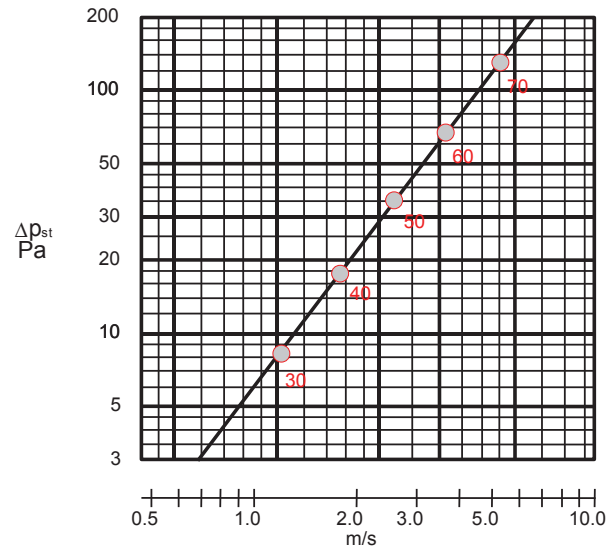
WEATHERTIGHT HATCH

Weathertight hatch is used e.g. to shut down the intake close to the waterline in the event of rough seas. See a separate brochure on weathertight hatch called Halton WTH.

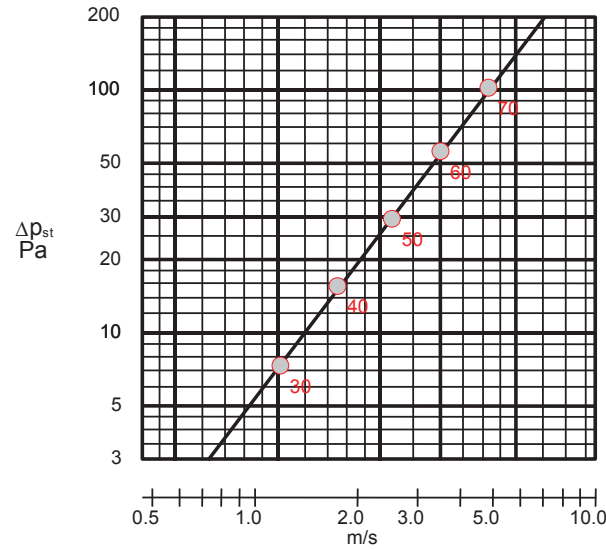


PRESSURE DROP AND SOUND DATA LWA[DB(A)], PITCH SPACING 28. VELOCITY IS BASED ON FACE AREA

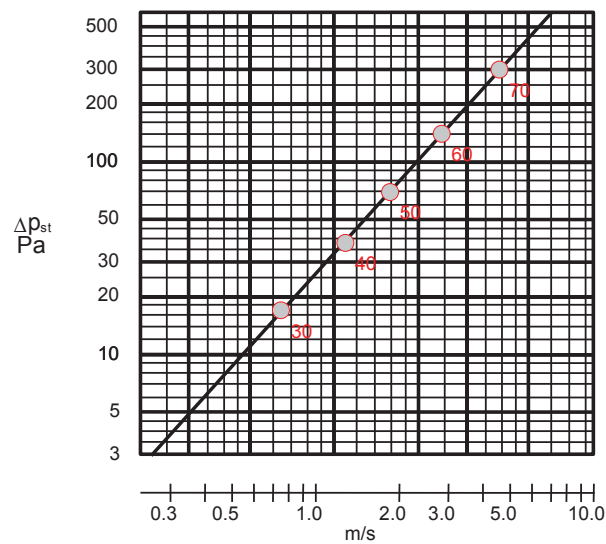
DSH aluminium



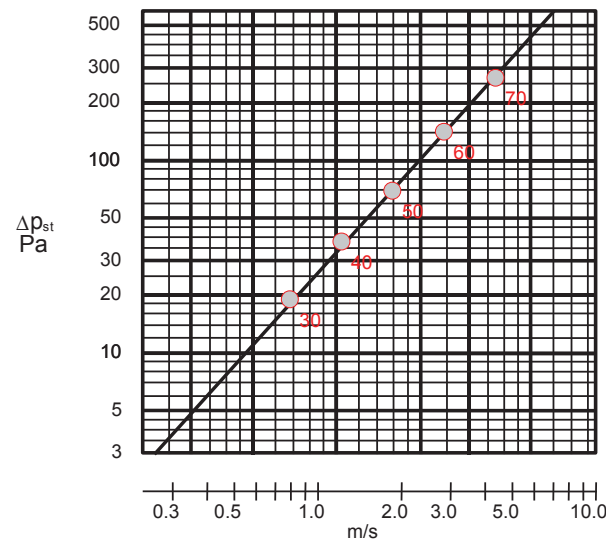
DSH stainless steel



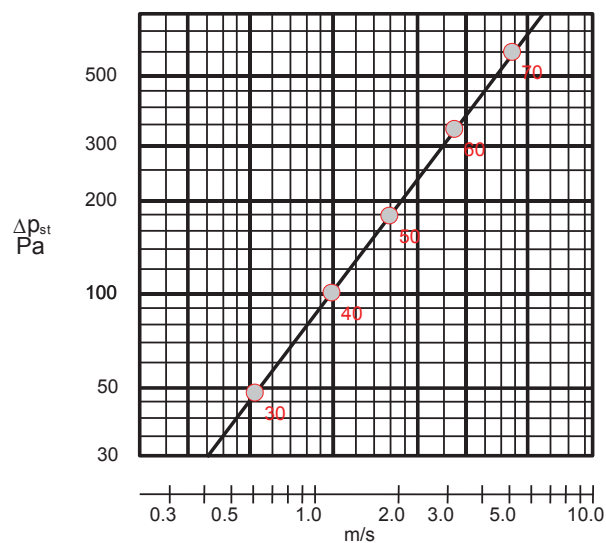
DSH aluminium with ISO Coarse 70% panel filter



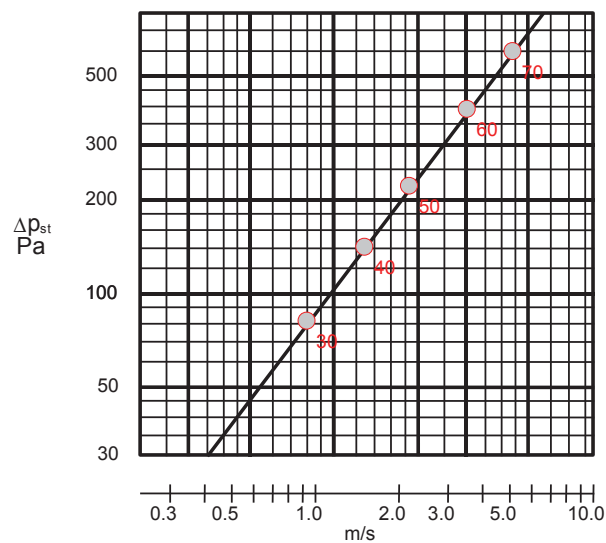
DSH stainless steel with ISO Coarse 70% panel filter



DSH aluminium with ePM2,5 65% bag filter

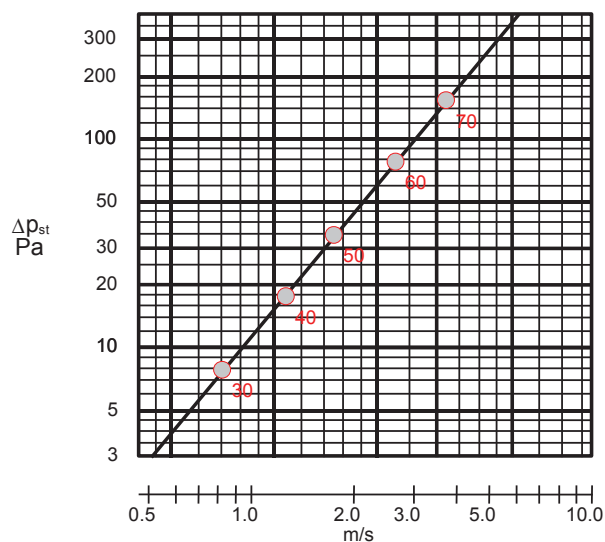


DSH stainless steel with ePM2,5 65% bag filter

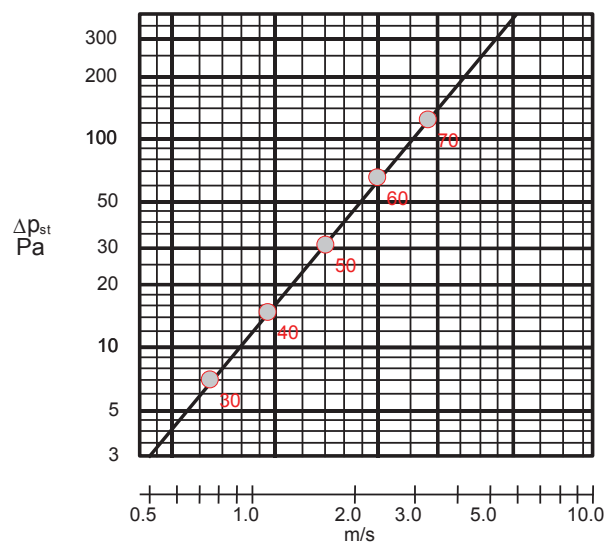


PRESSURE DROP AND SOUND DATA LWA[DB(A)], PITCH SPACING 28. VELOCITY IS BASED ON FACE AREA

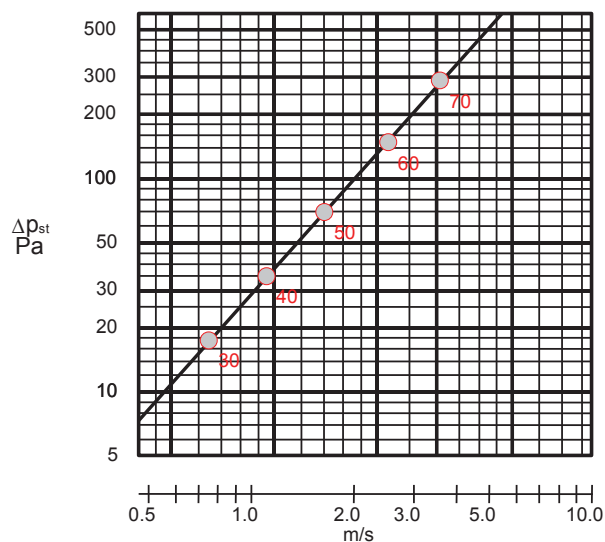
DSH aluminium with mask louvre



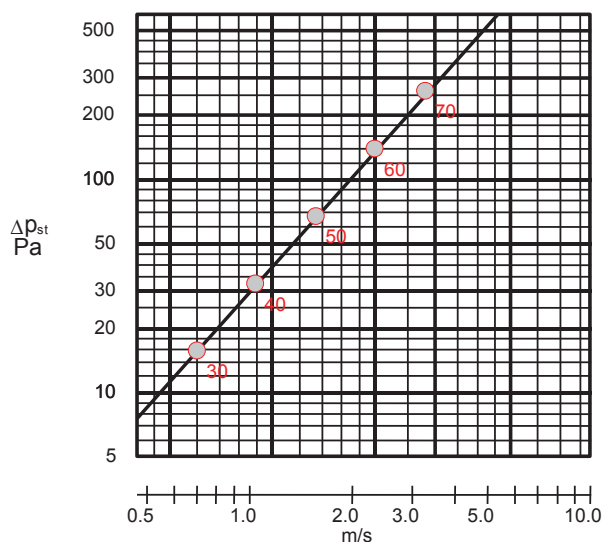
DSH stainless steel with mask louvre



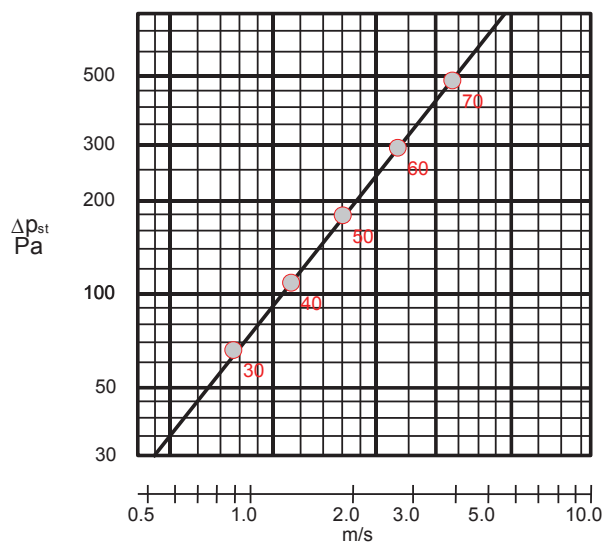
DSH aluminium with mask louvre and ISO Coarse 70% panel filter



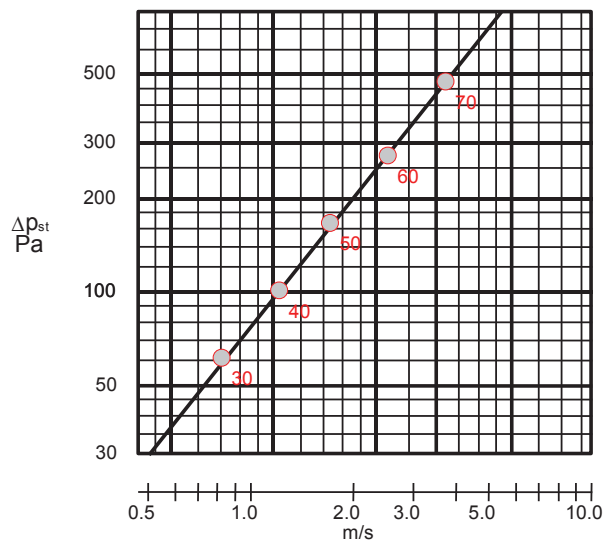
DSH stainless steel with mask louvre and ISO Coarse 70% panel filter



DSH aluminium with mask louvre and ePM2,5 65% bag filter



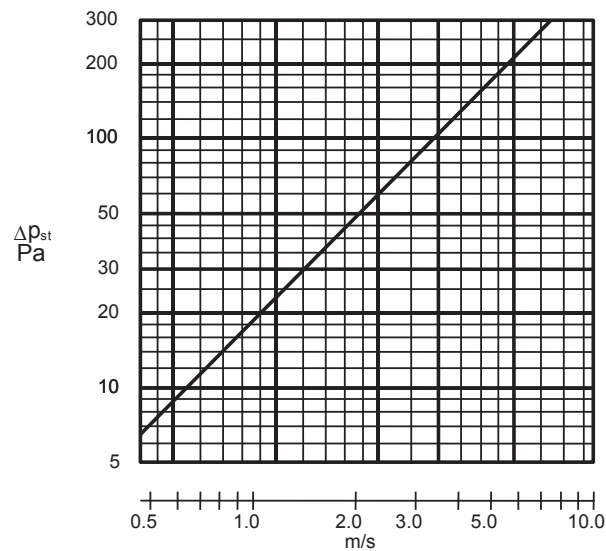
DSH stainless steel with mask louvre and ePM2,5 65% bag filter (measured size 1000 x 1000 mm)



PRESSURE DROP, PITCH SPACING 18 MM.

VELOCITY IS BASED ON FACE AREA

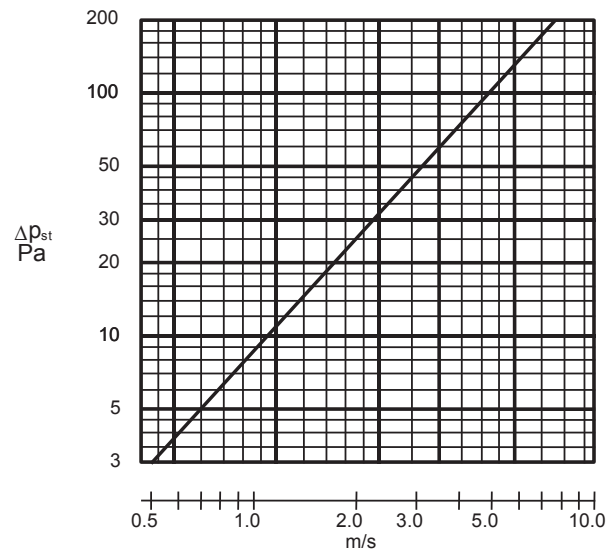
DSH stainless steel



PRESSURE DROP, PITCH SPACING 23 MM.

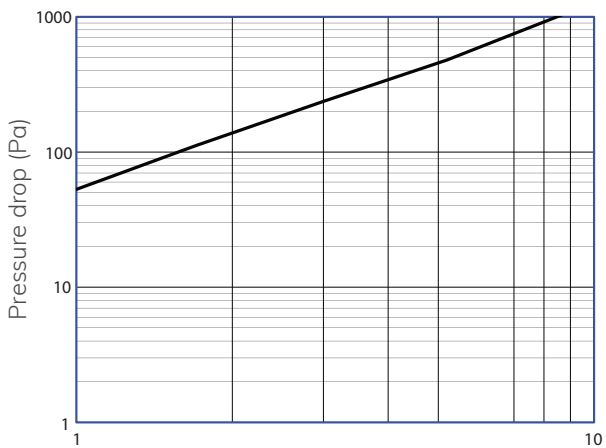
VELOCITY IS BASED ON FACE AREA

DSH stainless steel



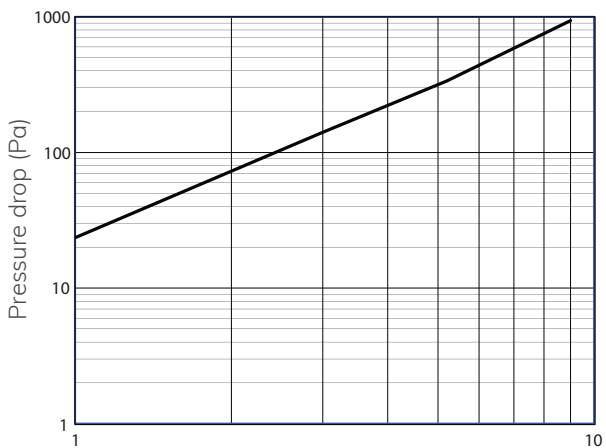
DSH PRESSURE DROP, PITCH SPACING 18 MM, THREE STAGE DROPLET

DSH stainless steel with ePM2,5 65% bag filter and DSH stainless steel



Air velocity at the face area of the droplet separator (m/s).

DSH stainless steel with ISO Coarse 70% panel filter and DSH stainless steel

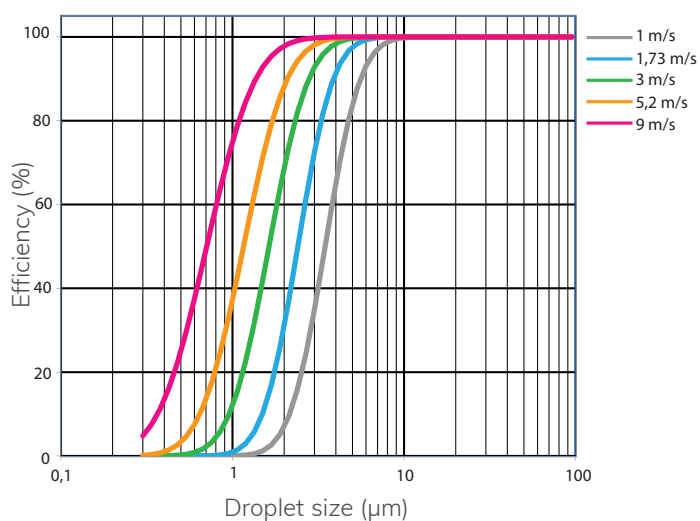


Air velocity at the face area of the droplet separator (m/s).

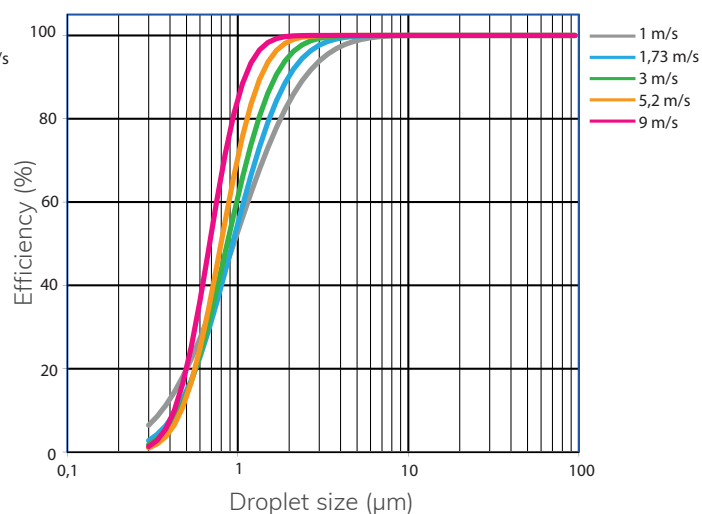
Please note: Pressure drop is dependent on total configuration. Please contact Halton for further information.

DSH EFFICIENCY RESULTS

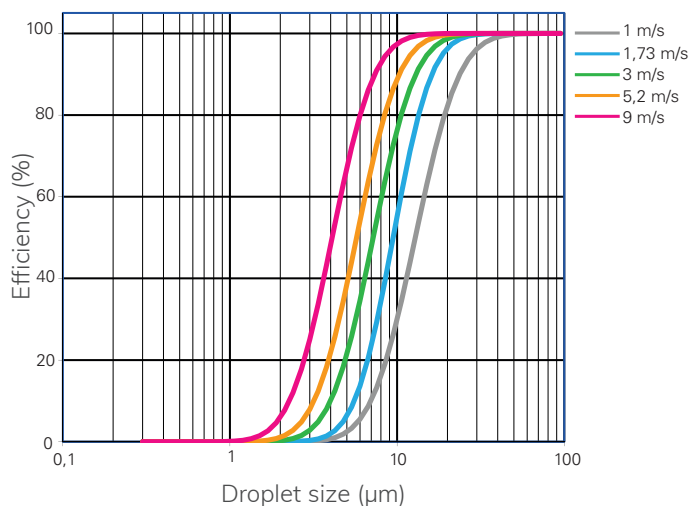
Three-stage droplet separator
with ISO Coarse 70% panel filter



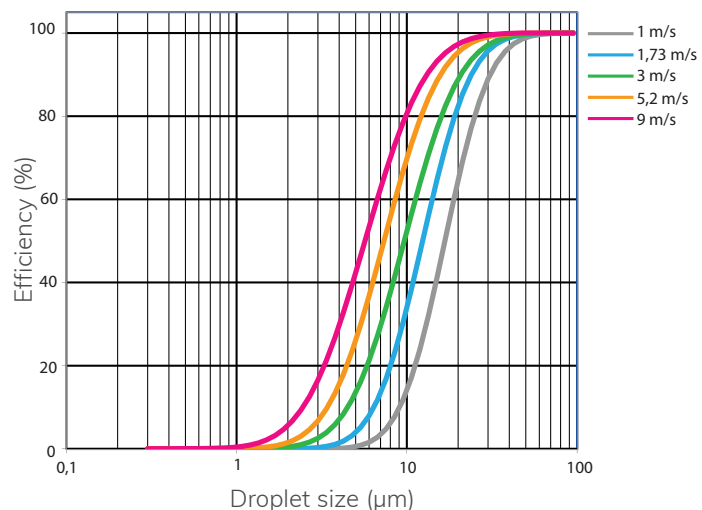
Three-stage droplet separator
with ePM2,5 65% bag filter



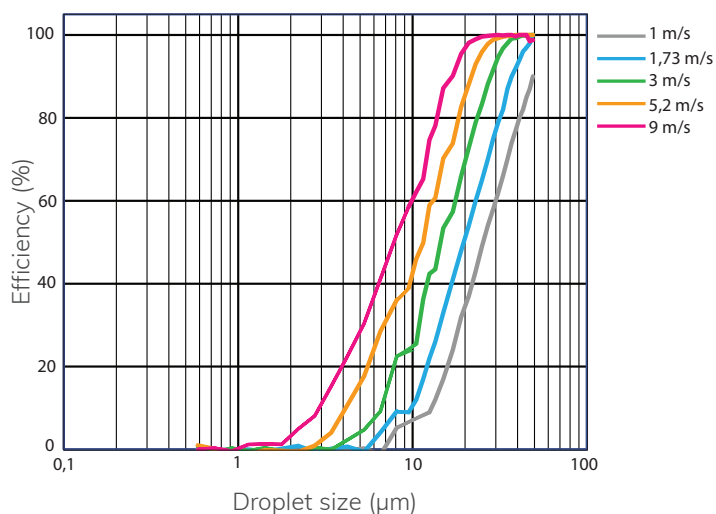
Single-stage DSH, pitch spacing 18 mm



Single-stage DSH, pitch spacing 23 mm

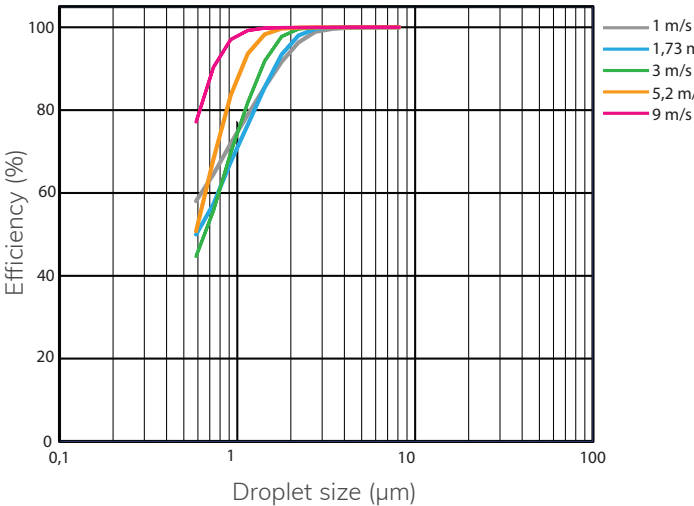


Single-stage DSH, pitch spacing 28 mm

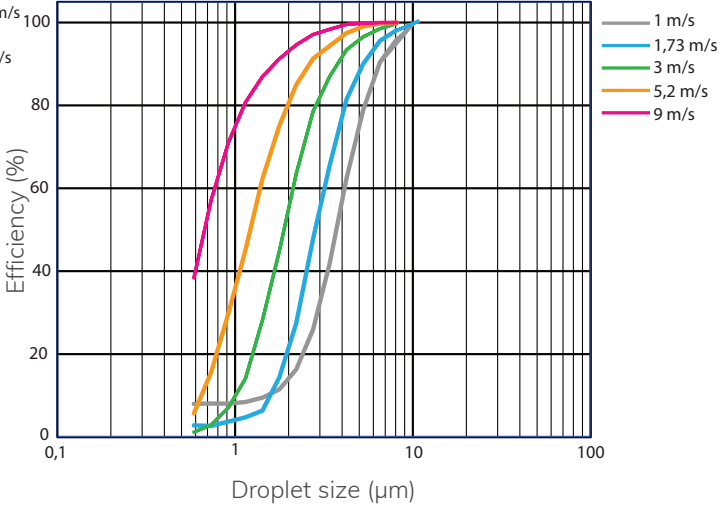


DSH EFFICIENCY RESULTS

Two-stage DSH with ePM2,5 65% bag filter



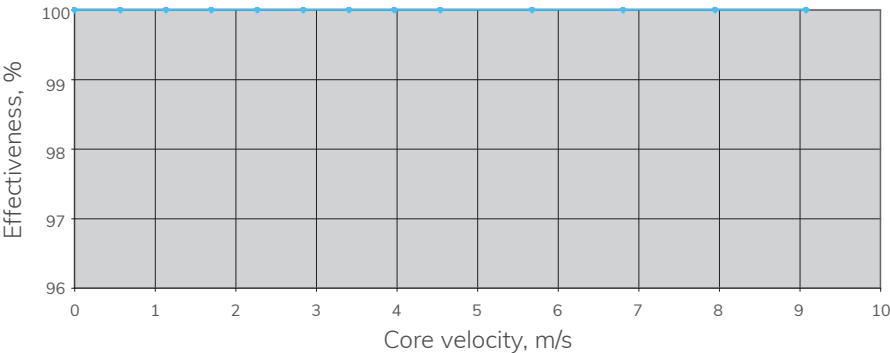
Two-stage DSH with ISO Coarse 70% panel filter (filter depth 48 mm)



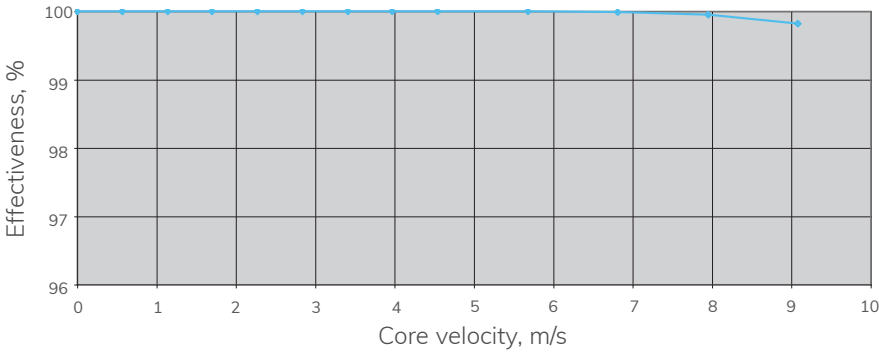
PERFORMANCE DATA

- Effectiveness for removal of simulated rain
- EN 13030:2001
- Rainfall rate: 75 (l/h)/m², (75 mm/h)
- Vertical installation

Rainwater effectiveness, material aluminium



Rainwater effectiveness, material stainless steel



WEIGHTS

WEIGHTS OF DSH INCLUDING FRAME, ALUMINIUM (KG), PITCH SPACING 28 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	1,7	2,1	3,1	3,9	4,8	5,8	6,7	7,6	8,6	9,4	10,3	11,3	12,2	13,0
300	2,4	2,9	4,4	5,6	6,8	8,3	9,5	10,8	12,2	13,5	14,7	16,2	17,4	18,6
400	3,1	3,7	5,7	7,3	8,9	10,8	12,4	14,0	15,9	17,5	19,1	21,0	22,6	24,2
500	3,9	4,6	7,0	8,9	10,9	13,3	15,2	17,2	19,6	21,5	23,5	25,9	27,8	29,8
600	4,6	5,4	8,3	10,6	12,9	15,8	18,1	20,4	23,3	25,6	27,9	30,8	33,0	35,3
700	5,3	6,3	9,6	12,3	14,9	18,3	20,9	23,6	27,0	29,6	32,2	35,6	38,3	40,9
800	6,0	7,1	10,9	13,9	16,9	20,8	23,8	26,8	30,6	33,6	36,6	40,5	43,5	46,5
900	6,7	7,9	12,3	15,6	19,0	23,3	26,6	30,0	34,3	37,7	41,0	45,4	48,7	52,1
1000	7,5	8,8	13,6	17,3	21,0	25,8	29,5	33,2	38,0	41,7	45,4	50,2	53,9	57,6
1100	8,2	9,6	14,9	19,0	23,0	28,3	32,4	36,4	41,7	45,7	49,8	55,1	59,1	63,2
1200	8,9	10,5	16,2	20,6	25,0	30,8	35,2	39,6	45,4	49,8	54,2	59,9	64,4	68,8

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH INCLUDING FRAME, ALUMINIUM (KG), PITCH SPACING 23 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	2,3	3,3	4,5	5,5	6,5	7,5	8,6	9,6	10,6	11,6	12,8	13,8	14,8	15,8
300	3,4	4,9	6,6	8,1	9,6	11,1	12,8	14,3	15,7	17,2	18,9	20,4	21,9	23,4
400	4,5	6,4	8,8	10,7	12,7	14,6	16,9	18,9	20,8	22,8	25,1	27,1	29,0	31,0
500	5,6	8,0	10,9	13,3	15,8	18,2	21,1	23,5	25,9	28,4	31,3	33,7	36,1	38,6
600	6,6	9,5	13,0	15,9	18,8	21,7	25,2	28,1	31,0	33,9	37,5	40,3	43,2	46,1
700	7,7	11,1	15,2	18,6	21,9	25,3	29,4	32,8	36,1	39,5	43,6	47,0	50,4	53,7
800	8,8	12,6	17,3	21,2	25,0	28,9	33,6	37,4	41,2	45,1	49,8	53,6	57,5	61,3
900	9,9	14,2	19,5	23,8	28,1	32,4	37,7	42,0	46,4	50,7	56,0	60,3	64,6	68,9
1000	10,9	15,7	21,6	26,4	31,2	36,0	41,9	46,7	51,5	56,2	62,1	66,9	71,7	76,5
1100	12,0	17,3	23,8	29,0	34,3	39,6	46,0	51,3	56,6	61,8	68,3	73,6	78,8	84,1
1200	13,1	18,8	25,9	31,6	37,4	43,1	50,2	55,9	61,7	67,4	74,5	80,2	85,9	91,7

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH INCLUDING FRAME, ALUMINIUM (KG), PITCH SPACING 18 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	2,6	3,7	4,9	6,0	7,2	8,3	9,4	10,6	11,7	12,9	14,0	15,1	16,3	17,4
300	3,9	5,7	7,4	9,1	10,8	12,6	14,3	16,0	17,8	19,5	21,2	23,0	24,7	26,4
400	5,2	7,6	9,9	12,2	14,5	16,8	19,2	21,5	23,8	26,1	28,5	30,8	33,1	35,4
500	6,5	9,5	12,4	15,3	18,2	21,1	24,0	27,0	29,9	32,8	35,7	38,6	41,5	44,4
600	7,9	11,4	14,9	18,4	21,9	25,4	28,9	32,4	35,9	39,4	42,9	46,4	49,9	53,4
700	9,2	13,3	17,4	21,5	25,6	29,7	33,8	37,9	42,0	46,1	50,2	54,3	58,4	62,5
800	10,5	15,2	19,9	24,6	29,2	33,9	38,6	43,3	48,0	52,7	57,4	62,1	66,8	71,5
900	11,8	17,1	22,4	27,6	32,9	38,2	43,5	48,8	54,1	59,3	64,6	69,9	75,2	80,5
1000	13,1	19,0	24,9	30,7	36,6	42,5	48,4	54,2	60,1	66,0	71,9	77,7	83,6	89,5
1100	14,4	20,9	27,4	33,8	40,3	46,8	53,2	59,7	66,2	72,6	79,1	85,6	92,0	98,5
1200	15,7	22,8	29,9	36,9	44,0	51,0	58,1	65,1	72,2	79,3	86,3	93,4	100,4	107,5

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH+ML INCLUDING FRAME, ALUMINIUM (KG), PITCH SPACING 28 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	2,8	4,1	5,2	6,3	7,6	8,7	9,9	11,1	12,2	13,4	14,6	15,8	16,9	18,2
300	3,8	5,6	7,2	8,8	10,6	12,1	13,7	15,5	17,1	18,6	20,4	22,0	23,6	25,4
400	4,8	7,2	9,2	11,2	13,5	15,5	17,5	19,9	21,9	23,9	26,2	28,2	30,2	32,6
500	5,9	8,8	11,2	13,6	16,5	19,0	21,4	24,3	26,7	29,1	32,1	34,5	36,9	39,8
600	6,9	10,3	13,2	16,0	19,5	22,4	25,2	28,7	31,5	34,4	37,9	40,7	43,6	47,0
700	7,9	11,9	15,2	18,5	22,5	25,8	29,1	33,1	36,4	39,6	43,7	46,9	50,2	54,2
800	8,9	13,5	17,2	20,9	25,5	29,2	32,9	37,5	41,2	44,9	49,5	53,2	56,9	61,5
900	9,9	15,0	19,2	23,3	28,4	32,6	36,7	41,9	46,0	50,2	55,3	59,4	63,6	68,7
1000	10,9	16,6	21,2	25,8	31,4	36,0	40,6	46,2	50,8	55,4	61,1	65,6	70,2	75,9
1100	12,0	18,2	23,2	28,2	34,4	39,4	44,4	50,6	55,6	60,7	66,9	71,9	76,9	83,1
1200	13,0	19,7	25,2	30,6	37,4	42,8	48,3	55,0	60,5	65,9	72,7	78,1	83,6	90,3

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH+ML INCLUDING FRAME, ALUMINIUM (KG), PITCH SPACING 23 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	3,1	4,3	5,7	7,0	8,3	9,5	10,9	12,2	13,5	14,7	16,1	17,4	18,7	19,9
300	4,3	6,1	8,2	10,0	11,8	13,7	15,7	17,5	19,4	21,2	23,2	25,0	26,9	28,7
400	5,6	7,9	10,7	13,0	15,4	17,8	20,5	22,9	25,2	27,6	30,3	32,7	35,1	37,4
500	6,8	9,7	13,2	16,1	19,0	21,9	25,3	28,2	31,1	34,0	37,4	40,4	43,3	46,2
600	8,1	11,6	15,6	19,1	22,6	26,0	30,1	33,6	37,0	40,5	44,5	48,0	51,5	54,9
700	9,3	13,4	18,1	22,1	26,1	30,1	34,9	38,9	42,9	46,9	51,7	55,7	59,7	63,7
800	10,6	15,2	20,6	25,1	29,7	34,3	39,7	44,2	48,8	53,4	58,8	63,3	67,9	72,4
900	11,9	17,0	23,0	28,2	33,3	38,4	44,5	49,6	54,7	59,8	65,9	71,0	76,1	81,2
1000	13,1	18,8	25,5	31,2	36,8	42,5	49,2	54,9	60,6	66,2	73,0	78,6	84,3	90,0
1100	14,4	20,6	28,0	34,2	40,4	46,6	54,0	60,2	66,5	72,7	80,1	86,3	92,5	98,7
1200	15,6	22,4	30,5	37,2	44,0	50,7	58,8	65,6	72,3	79,1	87,2	93,9	100,7	107,5

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH+ML INCLUDING FRAME, ALUMINIUM (KG), PITCH SPACING 18 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	3,3	4,7	6,1	7,5	8,9	10,3	11,7	13,1	14,5	15,9	17,3	18,7	20,1	21,5
300	4,8	6,9	9,0	11,0	13,1	15,2	17,2	19,3	21,4	23,4	25,5	27,6	29,7	31,7
400	6,3	9,1	11,8	14,5	17,3	20,0	22,7	25,5	28,2	30,9	33,7	36,4	39,2	41,9
500	7,8	11,2	14,6	18,0	21,4	24,8	28,2	31,6	35,0	38,5	41,9	45,3	48,7	52,1
600	9,3	13,4	17,5	21,5	25,6	29,7	33,7	37,8	41,9	46,0	50,0	54,1	58,2	62,2
700	10,8	15,5	20,3	25,0	29,8	34,5	39,2	44,0	48,7	53,5	58,2	62,9	67,7	72,4
800	12,3	17,7	23,1	28,5	33,9	39,3	44,7	50,1	55,6	61,0	66,4	71,8	77,2	82,6
900	13,8	19,9	25,9	32,0	38,1	44,2	50,2	56,3	62,4	68,5	74,5	80,6	86,7	92,8
1000	15,3	22,0	28,8	35,5	42,3	49,0	55,7	62,5	69,2	76,0	82,7	89,5	96,2	102,9
1100	16,8	24,2	31,6	39,0	46,4	53,8	61,2	68,6	76,1	83,5	90,9	98,3	105,7	113,1
1200	18,3	26,3	34,4	42,5	50,6	58,7	66,7	74,8	82,9	91,0	99,1	107,1	115,2	123,3

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH INCLUDING FRAME, STAINLESS STEEL AISI316 (KG), PITCH SPACING 28 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	4,9	6,7	8,6	10,4	12,3	14,1	16,0	17,8	19,7	21,5	23,4	25,2	27,1	28,9
300	6,4	8,5	10,9	13,1	15,5	17,7	20,1	22,2	24,6	26,8	29,2	31,3	33,8	35,9
400	7,9	10,4	13,3	15,8	18,7	21,2	24,1	26,7	29,6	32,1	35,0	37,5	40,4	43,0
500	9,3	12,2	15,6	18,5	21,9	24,8	28,2	31,1	34,5	37,4	40,8	43,7	47,1	50,0
600	10,8	14,1	18,0	21,2	25,1	28,4	32,3	35,6	39,5	42,7	46,6	49,9	53,8	57,1
700	12,3	15,9	20,3	23,9	28,3	32,0	36,4	40,0	44,4	48,1	52,5	56,1	60,5	64,1
800	13,7	17,7	22,6	26,6	31,5	35,6	40,5	44,5	49,4	53,4	58,3	62,3	67,2	71,2
900	15,2	19,6	25,0	29,4	34,8	39,1	44,5	48,9	54,3	58,7	64,1	68,5	73,9	78,3
1000	16,7	21,4	27,3	32,1	38,0	42,7	48,6	53,4	59,3	64,0	69,9	74,7	80,6	85,3
1100	18,1	23,3	29,7	34,8	41,2	46,3	52,7	57,8	64,2	69,3	75,7	80,9	87,2	92,4
1200	19,6	25,1	32,0	37,5	44,4	49,9	56,8	62,3	69,2	74,7	81,5	87,0	93,9	99,4

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH INCLUDING FRAME, STAINLESS STEEL AISI316 (KG), PITCH SPACING 23 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	5,1	7,0	9,0	10,9	12,9	14,8	16,8	18,8	20,7	22,6	24,7	26,6	28,5	30,4
300	6,6	9,1	11,7	14,2	16,6	19,0	21,7	24,1	26,5	28,9	31,6	34,0	36,4	38,8
400	8,2	11,2	14,5	17,4	20,3	23,2	26,5	29,4	32,3	35,2	38,5	41,4	44,3	47,3
500	9,8	13,2	17,2	20,6	24,0	27,4	31,3	34,7	38,1	41,5	45,5	48,9	52,3	55,7
600	11,4	15,3	19,9	23,8	27,7	31,6	36,1	40,0	43,9	47,8	52,4	56,3	60,2	64,1
700	13,0	17,4	22,6	27,0	31,4	35,8	41,0	45,4	49,8	54,2	59,3	63,7	68,1	72,5
800	14,6	19,5	25,3	30,2	35,1	40,0	45,8	50,7	55,6	60,5	66,3	71,2	76,1	81,0
900	16,2	21,6	28,0	33,4	38,8	44,2	50,6	56,0	61,4	66,8	73,2	78,6	84,0	89,4
1000	17,8	23,7	30,7	36,6	42,5	48,4	55,4	61,3	67,2	73,1	80,1	86,0	91,9	97,8
1100	19,4	25,8	33,4	39,8	46,2	52,6	60,2	66,6	73,0	79,4	87,1	93,4	99,8	106,2
1200	21,0	27,9	36,1	43,0	49,9	56,8	65,1	72,0	78,8	85,7	94,0	100,9	107,8	114,6

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH INCLUDING FRAME, STAINLESS STEEL AISI316 (KG), PITCH SPACING 18 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	5,3	7,5	9,6	11,8	13,9	15,9	18,1	20,2	22,4	24,4	26,5	28,7	30,8	33,0
300	7,2	10,1	12,8	15,8	18,4	21,1	24,1	26,7	29,7	32,4	35,0	38,0	40,7	43,6
400	9,0	12,7	16,0	19,7	23,0	26,3	30,0	33,3	37,0	40,3	43,6	47,3	50,6	54,3
500	10,9	15,3	19,2	23,7	27,6	31,5	35,9	39,9	44,3	48,2	52,1	56,6	60,5	64,9
600	12,7	17,9	22,4	27,6	32,2	36,7	41,9	46,4	51,6	56,1	60,7	65,9	70,4	75,6
700	14,5	20,5	25,6	31,6	36,7	41,9	47,8	53,0	58,9	64,1	69,2	75,2	80,3	86,3
800	16,4	23,1	28,8	35,5	41,3	47,1	53,8	59,5	66,2	72,0	77,8	84,5	90,2	96,9
900	18,2	25,6	32,1	39,5	45,9	52,3	59,7	66,1	73,5	79,9	86,3	93,8	100,2	107,6
1000	20,1	28,2	35,3	43,4	50,4	57,5	65,6	72,7	80,8	87,9	94,9	103,0	110,1	118,2
1100	21,9	30,8	38,5	47,4	55,0	62,7	71,6	79,2	88,1	95,8	103,4	112,3	120,0	128,9
1200	23,8	33,4	41,7	51,3	59,6	67,9	77,5	85,8	95,4	103,7	112,0	121,6	129,9	139,6

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH+ML INCLUDING FRAME, STAINLESS STEEL (KG), PITCH SPACING 28 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	7,2	9,8	12,5	15,0	17,7	20,2	22,9	25,5	28,2	30,7	33,4	36,0	38,6	41,2
300	9,1	12,1	15,4	18,4	21,7	24,7	28,0	31,0	34,3	37,3	40,6	43,6	46,9	49,9
400	11,0	14,5	18,4	21,9	25,7	29,2	33,1	36,6	40,5	43,9	47,8	51,3	55,2	58,7
500	12,9	16,9	21,3	25,3	29,8	33,7	38,2	42,1	46,6	50,6	55,0	59,0	63,4	67,4
600	14,8	19,2	24,3	28,7	33,8	38,2	43,3	47,7	52,7	57,2	62,2	66,7	71,7	76,1
700	16,7	21,6	27,3	32,1	37,8	42,7	48,3	53,2	58,9	63,8	69,4	74,3	80,0	84,9
800	18,6	24,0	30,2	35,6	41,8	47,2	53,4	58,8	65,0	70,4	76,6	82,0	88,3	93,6
900	20,5	26,3	33,2	39,0	45,8	51,7	58,5	64,3	71,2	77,0	83,9	89,7	96,5	102,3
1000	22,4	28,7	36,1	42,4	49,9	56,2	63,6	69,9	77,3	83,6	91,1	97,4	104,8	111,1
1100	24,3	31,1	39,1	45,9	53,9	60,7	68,7	75,4	83,5	90,2	98,3	105,0	113,1	119,8
1200	26,2	33,4	42,1	49,3	57,9	65,1	73,8	81,0	89,6	96,9	105,5	112,7	121,3	128,6

The weights on the table are indicative and do not include the filter.

WEIGHTS OF DSH+ML INCLUDING FRAME, STAINLESS STEEL (KG), PITCH SPACING 23 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	7,4	10,0	12,9	15,6	18,3	20,9	23,8	26,5	29,2	31,8	34,7	37,4	40,1	42,7
300	9,4	12,7	16,2	19,5	22,8	26,1	29,6	32,9	36,2	39,5	43,0	46,3	49,6	52,9
400	11,4	15,3	19,5	23,4	27,3	31,2	35,4	39,3	43,2	47,1	51,3	55,2	59,1	63,0
500	13,4	17,9	22,9	27,3	31,8	36,3	41,3	45,7	50,2	54,7	59,7	64,1	68,6	73,1
600	15,4	20,5	26,2	31,3	36,3	41,4	47,1	52,2	57,2	62,3	68,0	73,0	78,1	83,2
700	17,5	23,1	29,5	35,2	40,9	46,5	52,9	58,6	64,2	69,9	76,3	82,0	87,6	93,3
800	19,5	25,7	32,9	39,1	45,4	51,6	58,8	65,0	71,2	77,5	84,6	90,9	97,1	103,4
900	21,5	28,4	36,2	43,0	49,9	56,7	64,6	71,4	78,3	85,1	92,9	99,8	106,6	113,5
1000	23,5	31,0	39,5	47,0	54,4	61,8	70,4	77,8	85,3	92,7	101,3	108,7	116,1	123,6
1100	25,6	33,6	42,9	50,9	58,9	67,0	76,2	84,3	92,3	100,3	109,6	117,6	125,6	133,7
1200	27,6	36,2	46,2	54,8	63,4	72,1	82,1	90,7	99,3	107,9	117,9	126,5	135,2	143,8

The weights on the table are indicative and do not include the filter.

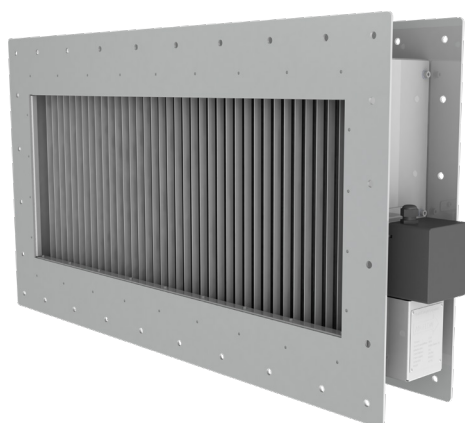
WEIGHTS OF DSH+ML INCLUDING FRAME, STAINLESS STEEL (KG), PITCH SPACING 18 MM

H/ HEIGHT (mm)	B / WIDTH (mm)													
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	7,6	10,6	13,4	16,4	19,2	22,1	25,1	27,9	30,9	33,7	36,5	39,5	42,3	45,3
300	9,9	13,7	17,3	21,1	24,6	28,2	32,0	35,5	39,4	42,9	46,5	50,3	53,8	57,6
400	12,2	16,8	21,1	25,8	30,0	34,3	38,9	43,2	47,9	52,1	56,4	61,1	65,3	70,0
500	14,5	20,0	24,9	30,4	35,4	40,4	45,9	50,9	56,4	61,4	66,3	71,8	76,8	82,3
600	16,7	23,1	28,8	35,1	40,8	46,5	52,8	58,5	64,9	70,6	76,3	82,6	88,3	94,7
700	19,0	26,2	32,6	39,8	46,2	52,6	59,8	66,2	73,4	79,8	86,2	93,4	99,8	107,0
800	21,3	29,3	36,4	44,4	51,6	58,7	66,7	73,9	81,9	89,0	96,2	104,2	111,3	119,3
900	23,5	32,4	40,3	49,1	57,0	64,8	73,7	81,5	90,4	98,2	106,1	115,0	122,8	131,7
1000	25,8	35,5	44,1	53,8	62,4	70,9	80,6	89,2	98,9	107,5	116,0	125,7	134,3	144,0
1100	28,1	38,6	47,9	58,5	67,7	77,0	87,6	96,9	107,4	116,7	126,0	136,5	145,8	156,3
1200	30,4	41,7	51,7	63,1	73,1	83,1	94,5	104,5	115,9	125,9	135,9	147,3	157,3	168,7

The weights on the table are indicative and do not include the filter.

DSA HIGH-EFFICIENCY DROPLET SEPARATOR

With heated vanes

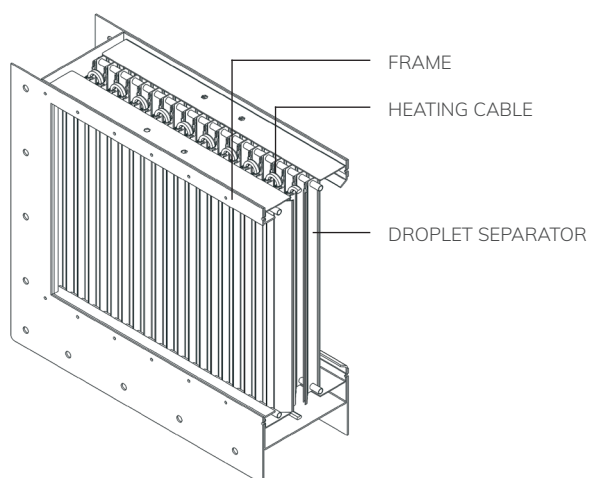


MATERIALS

PART	MATERIAL	FINISHING
Droplet separator	Aluminium EN AW 6060	-
Frame	Aluminium EN AW 5754	Painted RAL9010, C3 acc. standard* ISO 12944-2 as standard
Frame	Stainless steel EN 1.4404 (AISI316L)	Painted as an option
Heating cable	Nickel-plated copper wire, silicone rubber outer jacket (ATEX certified)	-
Junction box	GRP, Eex e II T6 IP66	-

*) C3 durability of 7-15 years. Please note about painting procedures; NORSOK C5-M and Norsok M501 available on request.
Please note: Stainless steel junction box available as an option.

GENERAL CONSTRUCTION



APPLICATIONS

Halton's DSA high-efficiency droplet separators are designed for demanding applications such as oil & gas, chemical, energy and marine industries, where reliability, easy installation and special design play an important role. Droplet separators are designed to restrict the passage of moisture, salt spray, rainwater and airborne aerosol particles e.g. into HVAC systems, engine room intakes, machinery spaces, and diesel and gas turbine air intakes.

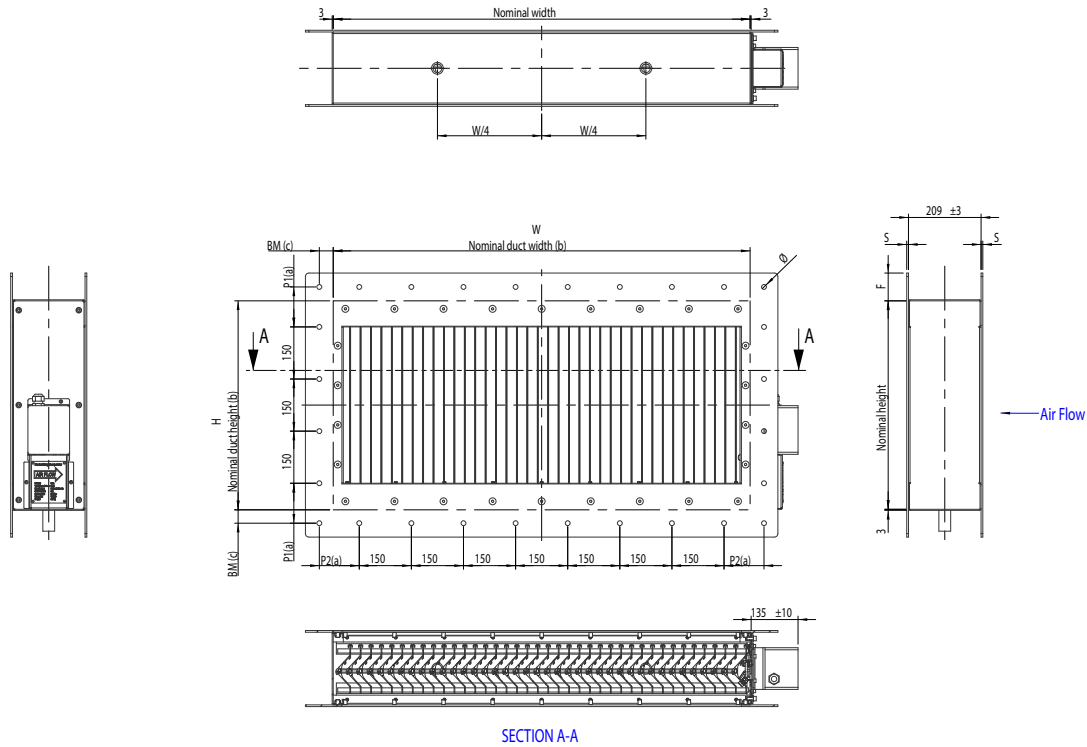
DSA droplet separators are fitted with heating elements. The regulated temperature is subject to the surrounding conditions. The actual surface temperature of the heated DSA depends on many variables such as the size of the separator, wind circumstances, face velocity, air temperature and relative humidity. Electrical heating capacities vary between 2,5 kW/m² - 3,7 kW/m², depending on these conditions. The cable heating does not prevent icing in the most severe conditions but it will help defrost the ice when the icing conditions have passed.

When intake air is crucial during extreme icing conditions the Halton ECS (Extreme Conditions Solution) keeps the air intake open. The ECS is available as an option.

FEATURES

- High droplet and moisture separation efficiency
 - Class A results (EN 13030:2001)
 - Minimum pressure drop
- Performance tested according to EN 13030:2001 test for louvres subjected to simulated rain, at the independent laboratory
- Tailored sizes and designs according to customer's needs. Modular construction is available.
- For wall and duct installations
- No special maintenance required
- ATEX certified components II 2 G/D EEx e II T3/T2
- Heating capacity 2,5 kW/m² - 3,7kW/m²
- Operating temperature for DSA -50 °C – +40 °C
- An Extreme Conditions Solution available
- Stainless steel junction box available as an option

GENERAL DSA DRAWINGS



PLEASE NOTE

- 75 mm <P1 & P2 <150 mm
- Width x Height = nominal duct size (internal)
- Back mark BM is the distance from the inside duct to centerline hole

FRAME OPTIONS

- Flange only in front
- Flange only in back
- Flange in front and back
- Without a flange

Flange drilling ISO15138 as standard.

Nominal duct Longest side (mm)	Back mark BM (mm)	Flange F (mm)	Bolt hole size Ø (mm)	Aluminium Flange thickness S (mm)	Stainless steel Flange thickness S (mm)
≤ 350	20	40	10	5	3
> 350 to ≤ 1000	30	50	12	5	3
> 1000	40	80	14	5	5

DSA MINIMUM AND MAXIMUM DIMENSIONS

Minimum size for Halton DSA droplet separator is 300x300 mm (WxH). Maximum size for a single separator is 1500x1200 mm (WxH). Sizes with 50 mm divisions. Modular construction is available up to 3000x2400 mm (WxH).

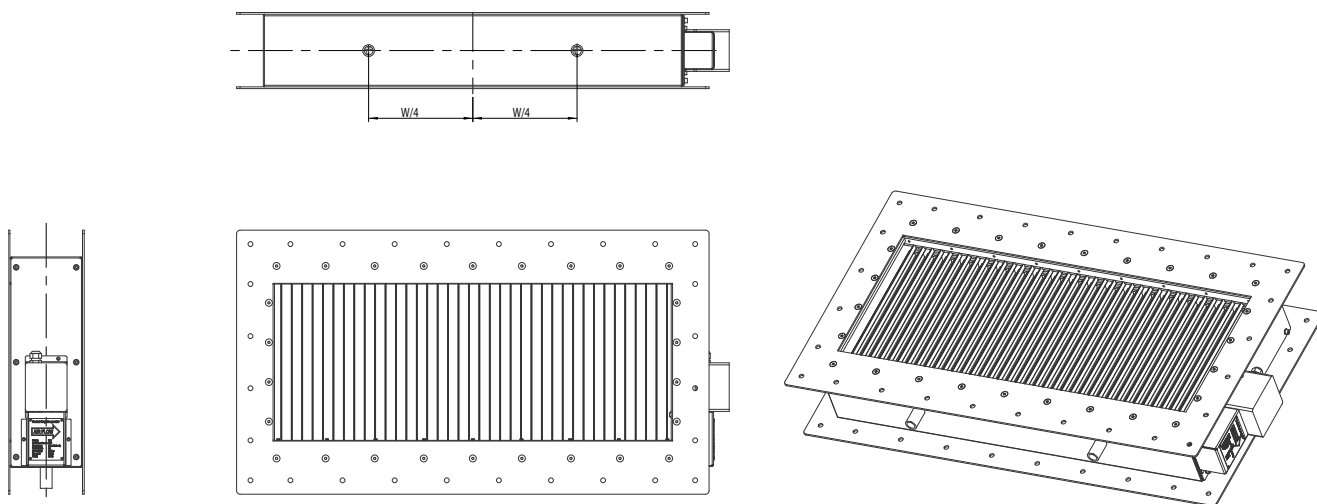
MATERIAL THICKNESS

Standard frame thickness of 3 mm. Larger thicknesses are available as an option.

DSA DRAIN PIPE

Threaded drain pipes are welded to the bottom of the droplet separator. The thread type is 1" BSPT (male).

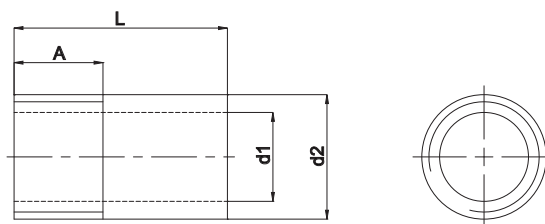
DRAIN LOCATIONS



DRAIN PIPE SIZES

WELD-ON PIPE	Ø Inch	L mm	A mm	d1 mm	d2 mm
Aluminium EN AW 6060	1	50	25	25	35
Stainless steel EN 1.4404 (AISI316L)	1	40	20	27	34

Other drain types available on request.



ELECTRICAL DATA AND CONTROL

- Power supply 230V, 1 Phase AC
- Electrical heating capacities vary between 2,5 kW/m² - 3,7 kW/m², depending on the ambient temperature
- For optimal performance and control, contact Halton

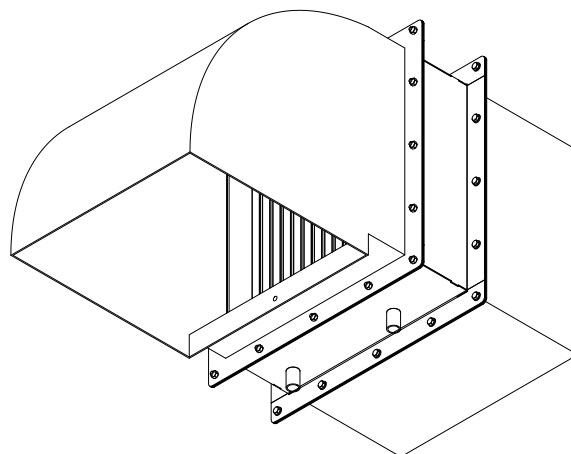
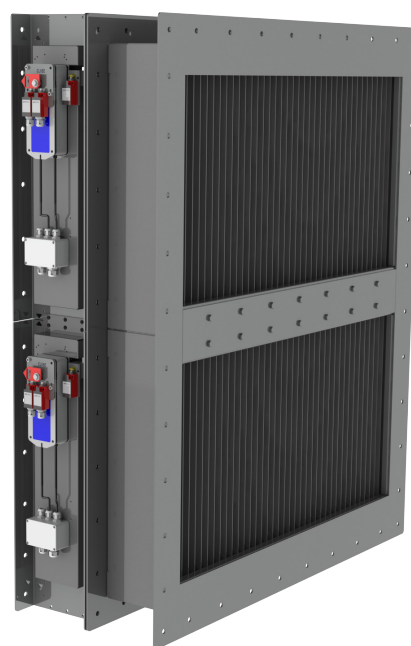
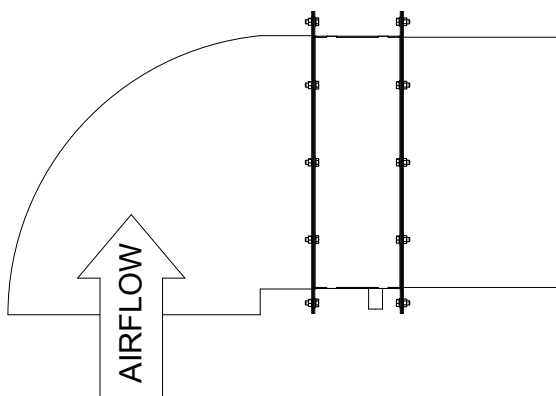
OPTIONAL FEATURES**THE EXTREME CONDITIONS SOLUTION (ECS)**

When intake air is crucial during extreme icing conditions, the Halton Extreme Condition Solution (ECS) keeps the air intake open. The Halton ECS combines the DSA heated droplet separators with either shut-off or fire dampers with an additional option for filter units. The solution can allow one or more separators to remain open and ice-free while the other separator is in defrost mode during critical atmospheric conditions. This is achieved by shutting-off a section of the DSA to allow the ice build-up to melt.

There are a few control methods available to alternate the opening/closing sequence of the ECS to ensure a free flow of unrestricted air.

"GOOSENECK" - REDUCING THE WIND EFFECT

Strong wind can adversely affect the performance of the droplet separator. In environments where stormy weather is regular Halton recommends using a "gooseneck" air intake with droplet separators. A gooseneck can be installed directly to a duct installation type of droplet separator.

**FILTERS****ISO COARSE 70% FILTER**

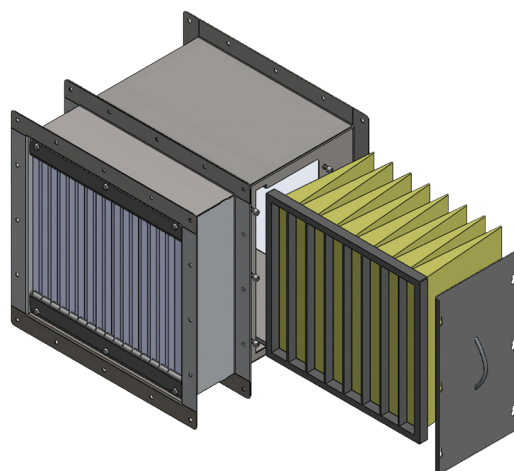
Panel filters are manufactured of progressive thermally smoothened synthetic polyester having high dust holding capacity and constancy for humidity. The filters are used in the general ventilation system for air purification.

EPM10 70%, EPM2,5 65%, EPM1 50% BAG FILTERS

The materials of the synthetic fine filters are high-quality and durable, progressive mounted synthetic fibres. The filters can be used in example for air purification of the intake air.

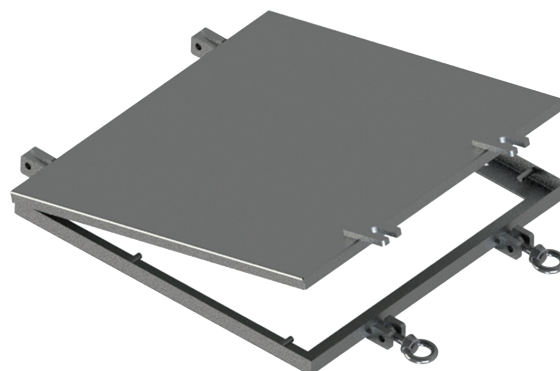
ATEX APPROVED FILTERS

Halton also offers ATEX approved filters for droplet separators.



INSTALLATION IN CONJUNCTION WITH A DAMPER

Halton droplet separator can be connected to a Halton damper with or without a connection piece. In both cases, the construction is modified to fit the damper. Connecting DSH with a fire damper must be mentioned when ordering products. Special flanges and drilling patterns are available for all models on request. The structural flexibility of dampers and high-quality combined with a wide range of accessories (ex-actuators) and special steels, enable Halton to offer tailored solutions for its customers. Combining Halton droplet separator to damper offers customers a compact solution for air intake that also saves space. The products are recommended to be connected at Halton factory.

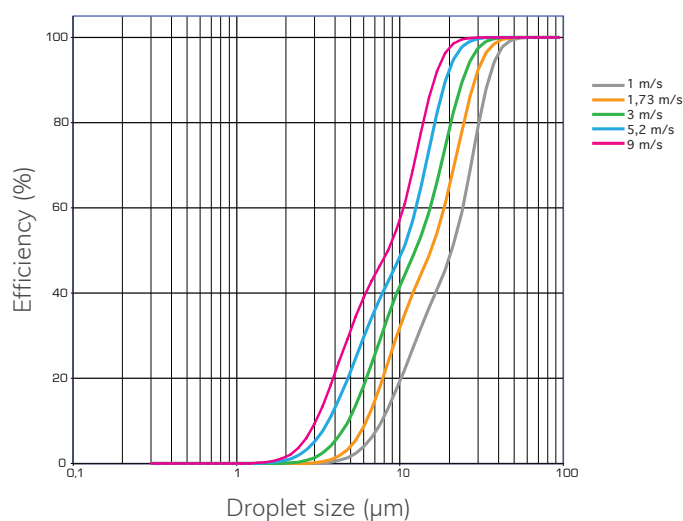
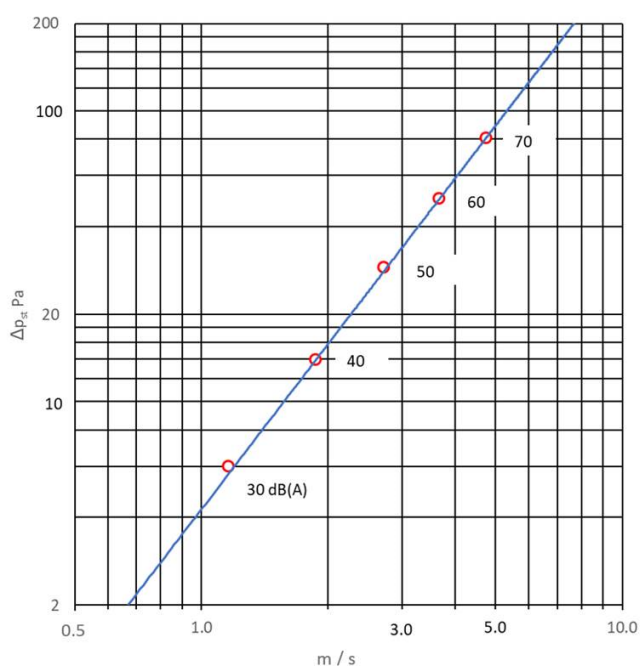


WEATHERTIGHT HATCH

Weathertight hatch is used e.g. to shut down the intake close to the waterline in the event of rough seas. See a separate brochure on weathertight hatch called Halton WTH.

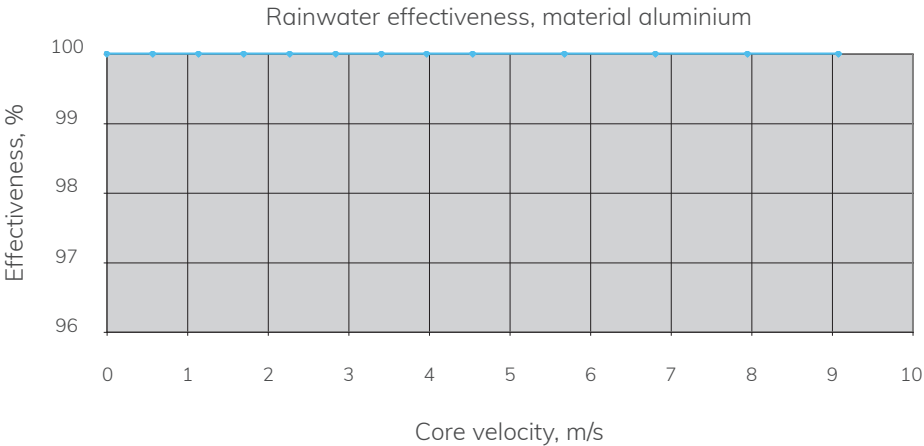
PRESSURE DROP AND SOUND DATA LPA[DB] DSA EFFICIENCY RESULTS

DSA aluminium, pitch spacing 28 mm. Velocity based on the face area. Single-stage DSA, pitch spacing 28 mm



PERFORMANCE DATA

- Effectiveness for removal of simulated rain
- EN 13030:2001
- Rainfall rate: 75 (l/h)/m2, (75 mm/h)
- Vertical installation



WEIGHTS

WEIGHTS OF DSA INCLUDING FRAME, 1 FLANGE, ALUMINIUM (KG), PITCH SPACING 28 MM

H/HEIGHT	B / WIDTH (mm)																								
(mm)	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
300	10	12	13	14	16	17	18	20	21	22	23	24	26	27	28	31	33	34	35	37	38	39	41	42	43
350	12	13	14	16	17	19	20	22	23	24	26	27	29	30	31	35	36	37	39	41	42	44	45	46	48
400	13	14	16	17	19	20	22	24	25	27	28	30	31	33	34	38	40	41	43	45	46	48	49	51	52
450	14	16	17	19	21	22	24	26	27	29	31	32	34	36	37	41	43	45	46	48	50	52	54	55	57
500	15	17	18	20	23	24	26	28	29	32	34	35	37	39	40	44	47	48	50	52	54	56	58	59	62
550	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	48	50	52	54	56	58	60	62	64	66
600	17	20	21	24	26	27	30	32	34	36	39	40	43	45	47	51	53	55	58	60	62	64	67	68	71
650	18	21	22	25	28	29	32	34	36	39	41	43	45	48	50	54	57	59	61	64	66	68	71	73	75
700	19	22	24	27	29	31	34	37	38	41	44	45	48	51	53	58	60	62	65	68	70	72	75	77	80
750	21	23	25	28	31	33	36	39	40	43	46	48	51	54	56	61	64	66	69	72	73	76	79	81	84
800	22	25	27	30	33	35	38	41	43	46	49	51	54	57	59	64	67	69	72	75	77	81	84	86	89
850	23	26	28	31	34	36	40	43	45	48	51	53	57	60	62	67	71	73	76	79	81	85	88	90	93
900	24	27	29	33	36	38	42	45	47	51	54	56	59	63	65	71	74	76	80	83	85	89	92	94	98
950	25	29	31	34	38	40	44	47	49	53	56	59	62	66	68	74	78	80	83	87	89	93	96	99	102
1000	26	30	32	36	40	42	46	49	52	55	59	61	65	69	71	77	81	83	87	91	93	97	101	103	107
1050	29	33	35	39	43	46	50	54	56	60	64	66	70	74	76	80	84	87	91	95	97	101	105	107	111
1100	30	34	37	41	45	47	52	56	58	62	66	69	73	77	80	84	88	90	94	99	101	105	109	112	116
1150	31	36	38	42	47	49	54	58	60	65	69	72	76	80	83	87	91	94	98	102	105	109	114	116	120
1200	32	37	40	44	48	51	56	60	63	67	72	74	79	83	86	90	95	97	102	106	109	113	118	121	125

The weights on the table are indicative and do not include a filter and damper.

Consult Halton for weights for different types of configurations and weights for modular constructions.
Minimum size for Halton DSA droplet separator is 300x300 mm (WxH). Maximum size for a single separator is 1500x1200 mm (WxH). Sizes with 50 mm divisions. Modular construction is available up to 3000x2400 mm (WxH).

For air intake and exhaust



MATERIALS

PART	MATERIAL	FINISHING	NOTE
Fixed blades	Steel	Painted*	Blade material thickness is 1.0 mm
Fixed blades	Stainless steel EN 1.4404 (AISI 316L)	-	-
Fixed blades	Aluminium EN AW 5754/ EN 6060	Painted*	-
Frame	Steel	Painted*	Frame material thickness is 3.0 mm as standard
Frame	Stainless steel EN 1.4404 (AISI 316L)	-	-
Frame	Aluminium EN AW 5754	Painted*	-
Mesh	Stainless steel EN 1.4404 (AISI 316L)	-	Mesh opening is 12.7 mm

*Painted RAL9010, C3 as standard. C3 average service life 7-15 years. C5 with average service life of 15-25 years available as an option.

USM PRODUCT OPTIONS

- Modular construction is available for larger sizes
- A mesh fitted behind the louvre is available as an option
- Non-standard dimensions and flange drilling are available as an option

APPLICATIONS

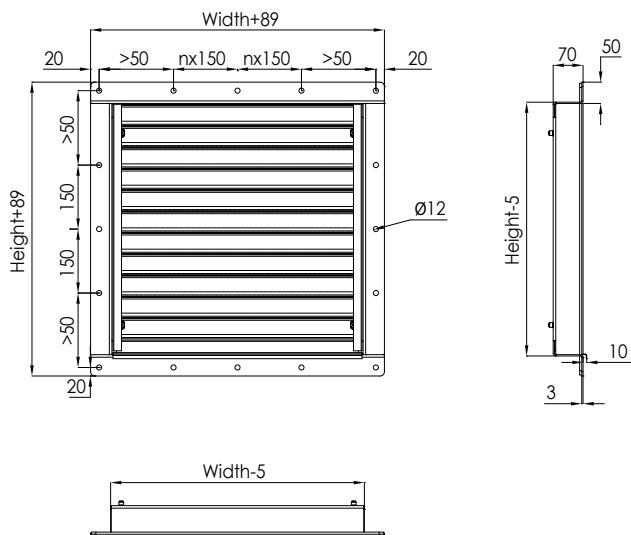
The Halton USM marine external louvre can function as either a primary air intake device or an exhaust air diverter.

These louvres are commonly installed in engine/machine rooms and HVAC equipment rooms to facilitate air control.

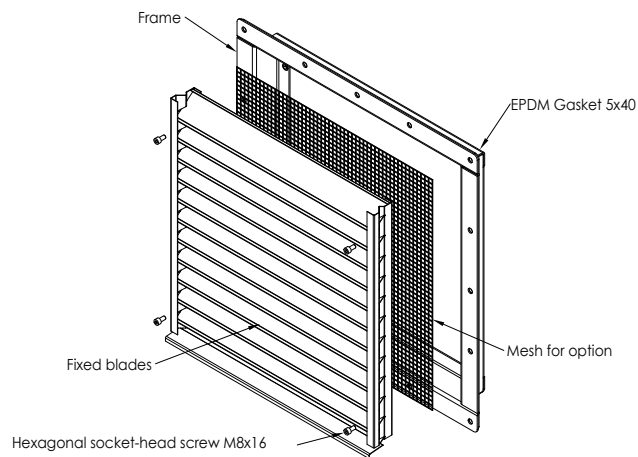
FEATURES

- External louvre designed for both air intake and exhaust
- The louvre effectively prevents rainwater, snow, leaves, animals, and other objects from entering the ductwork
- Its performance is achieved through a unique front-edge blade profile and side grooves
- Suitable for applications with medium and high airflow rates
- The blades have a depth of 70 mm, are spaced 50 mm apart, and provide a 50% free opening

GENERAL USM DRAWINGS



USM CONSTRUCTION



USM FUNCTION

Air is supplied or extracted through the horizontal blades. The design of the grille prevents rainwater from reaching the ductwork. The slot between the frame and the top blade is sealed, ensuring rainwater doesn't enter the ductwork from above. Drops of water are collected in the grooves at the front edge of the blades, and water flows into the side grooves, where it is directed downward.

TRADITIONAL OUTDOOR LOUVRE

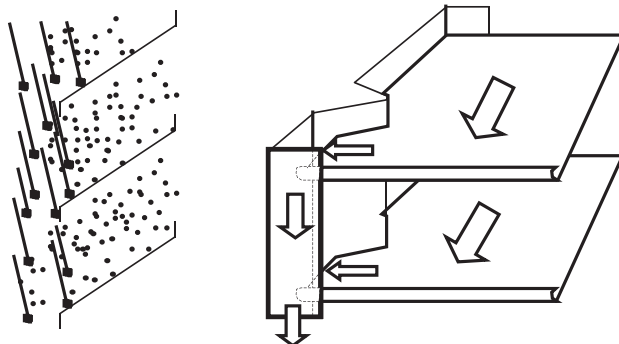
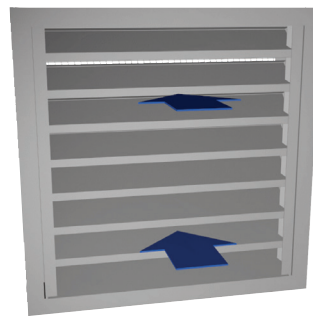
Rain falling on the vane flows downwards to the front edge of the vane. Drops formed at the edge fall onto the vane below and, upon contact with the vane surface, break into small droplets and spray that can be easily carried by the airflow through the louver. Water flowing along the wall onto the louver can penetrate the slot between the frame and the top vane unless the slot has been closed.

USM BLADE CONSTRUCTION

The vanes of the USM louver are specifically designed to collect water droplets in grooves at the front edge of the vanes. Once the slot between the frame and the top vane is securely closed, water flowing down the wall will not enter the louver. The top vane guides the water to the side grooves, where it then flows downward alongside the airflow.

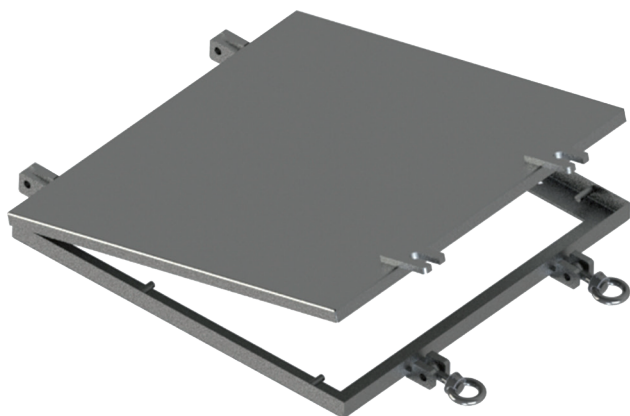
USM DIMENSIONS

The USM louvres are manufactured for rectangular openings with widths (B) ranging from 150 to 1500 mm and heights (H) from 150 to 2400 mm, with a 1 mm division. Modular construction is available for larger sizes. Special flange configurations are available on request.



WTH WEATHER TIGHT HATCH

A cover for droplet separators and louvres



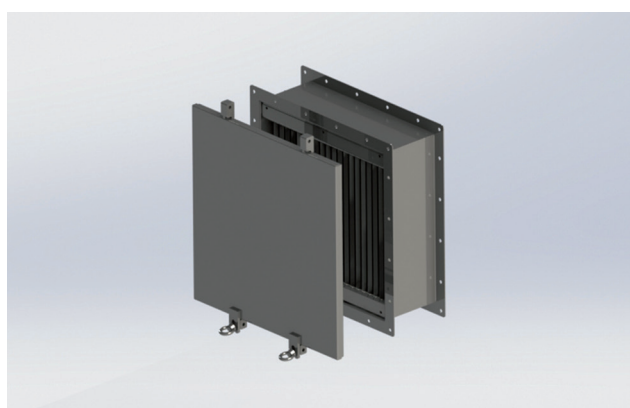
MATERIALS

PART	MATERIAL	FINISHING
Hatch cover	Steel	Painted or galvanised
Hatch cover	Stainless steel EN 1.4404 (AISI 316L)	-
Hatch frame	Steel	Painted or galvanised
Hatch frame	Stainless steel EN 1.4404 (AISI 316L)	-

PRODUCT OPTIONS

Halton WTH can be fitted with:

- Halton droplet separator
- Halton external louvre
- Halton droplet separator and dampers



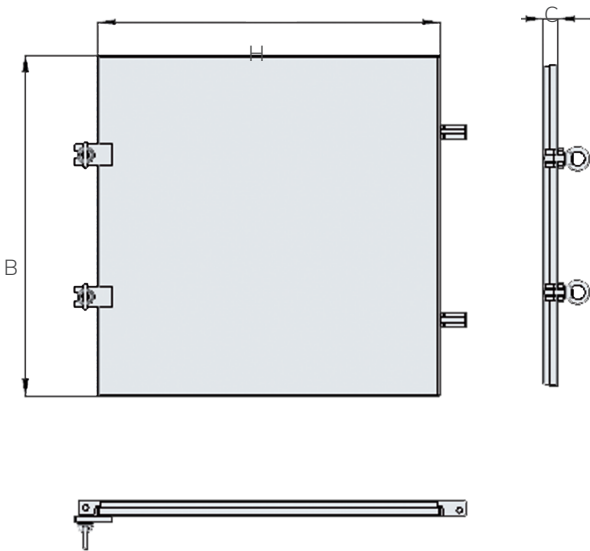
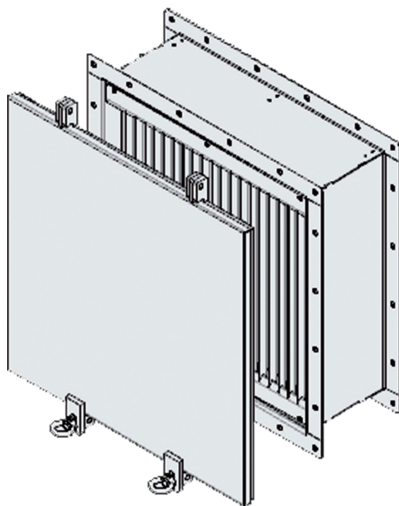
APPLICATIONS

Halton WTH weather tight hatch effectively prevents rainwater, snow, leaves, animals, and other objects from entering ductwork. The hatch can be used as a cover for droplet separators and outdoor louvres. It is designed for demanding applications such as marine, oil & gas, chemical, and energy industries where reliability and ease of installation play an important role. The hatch is used to seal ventilation openings in applications close to the waterline and even in rough seas.

FEATURES

- Weather tight cover for use with Halton Marine droplet separators, louvres, and dampers
- Easy to open and close
- Easy to install
- No special maintenance required
- Variable open position
- Lockable
- Customised size and module design available
- Stainless steel as standard, painted steel as an option

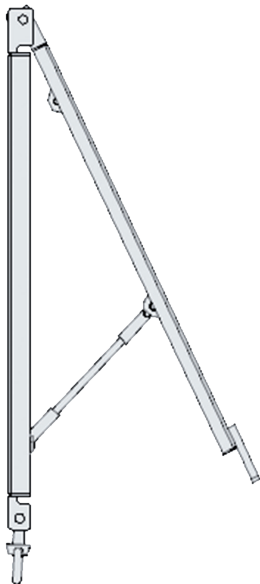
GENERAL WTH DRAWINGS



WTH hatches are manufactured for rectangular openings (width B: 100-1200 mm and height H: 100-1200 mm, with 1 mm increments). Modular construction for larger sizes is available.

Cover thickness (C) is a minimum of 34 mm but can vary based on material thickness.

HATCH OPENING



OPTION 1.

Hatch opening in different angle based on customer requirements.



OPTION 2.

Hatch opening 180 degrees with mounting brackets.

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About us

Halton MEI

Halton MEI (Marine, Energy and Infrastructure) is one of the world's leading suppliers of marine HVAC, develops, manufactures and markets reliable, high-quality ventilation solutions specifically designed for different types of ships, offshore oil & gas, heavy industry and offshore wind. Our track record includes deliveries to over 200 major cruise ships, 200 oil & gas projects and 150 naval vessels.

Halton Group

Halton Group specializes in indoor environment solutions, ranging from public and commercial buildings to foodservice facilities. Founded in Finland in 1969, Halton operates today in over 35 countries around the world, with annual sales of around €300 million and over 1900 employees. The company has production facilities in Brazil, Canada, China, France, Finland, Germany, Malaysia, the United Kingdom, and the USA.