

Condensers

# CCM



41 kW

532 kW



**FRIGA-BOHN**



[www.friga-bohn.com](http://www.friga-bohn.com)

105 basic models from 41 to 532 kW.  
 Available additional air pressure from 0 to 200 Pa.  
 Vertical or horizontal air intake and discharge on request.  
 Easy installation for outdoor operation or inside machine rooms.

## NOMENCLATURE



## DESCRIPTION

### • HIGH-TECH HEAT EXCHANGER

The air cooled condensers of the **CCM** range are equipped with high performance coils manufactured from  $\varnothing 1/2"$  (12,7 mm) copper tube in a staggered arrangement mechanically expanded into corrugated aluminium fins - 2,12 mm spacing - thus optimizing the heat transfer.

### • CASING

Made from galvanized steel sheets, it is particularly robust. All components are corrosion resistant, thus allowing outdoor installation.

Vertical or horizontal air inlet and discharge are available on request.

### • VENTILATION

240/400 V, 50 Hz, IP55, 1500 r.p.m., three phase motors.  
 Motors mounted on an adjustable base to allow for an easy belt tension adjustment.  
 Motor pulley with variable diameter allowing further adjustment of the r.p.m. of the fan in case of necessity.

### • PRECAUTIONS OF INSTALLATION

- The sound pressure level around a **CCM** air cooled condenser, not connected to ducts, is not homogeneous. It may be higher than the indicated values by about 4 dB(A) on the air intake side and 3 dB(A) on the air discharge side.

The indicated S.P.L. value corresponds to the average measured around the condenser.

It can be reduced if the condenser is connected to a ducting system.

The **IPH** option is efficient only in that last case.

- If the effective pressure drop in the duct system is lower than estimated, the centrifugal fans carry more air and consequently draw more electric power. Also check that the cycling of one (or several) fan(s) does not cause an increase of the amperage on other fan(s).

The installation of baffled duct or individual ducts may avoid future problems.

## OPTIONAL FEATURES

- Coil:
  - MCI** Multicircuiting.
  - BAE** Coated fins.
  - Fins** Other fin spacings.
- Miscellaneous:
  - PEI** RAL 7035 grey enamel.
  - VPS** Louvres at the air discharge.
  - FLA** Air intake filters: please, consult us.
  - IPH** Acoustic insulation.
  - ECB** Full crate.

## DT1 (2) = 15 K - R404A

### 0 Pa

Models	CCM ... /00		441	571	711	882	1122	1323	1422	1703	1774	2153	2215
0 Pa (1)	Capacity P <sub>1</sub>	kW	45,65	59,04	73,70	92,07	116,41	137,21	148,11	177,08	184,89	224,12	230,19
	Air flow	m <sup>3</sup> /h	9500	13300	18900	19000	26600	28500	37800	39900	38000	56700	47500
Surface		m <sup>2</sup>	200	200	200	400	400	600	400	600	800	600	1000
Circuit vol.		dm <sup>3</sup>	19,8	19,8	19,8	38,4	38,4	57,1	38,4	57,1	75,8	57,1	94,5
		No	1	1	1	2	2	3	2	3	4	3	5
Fan		kW/u	0,55	1,50	4,00	0,55	1,50	0,55	4,00	1,50	0,55	4,00	0,55
	230V/3/50 Hz	A max/u	2,46	5,89	14,38	2,46	5,89	2,46	14,38	5,89	2,46	14,38	2,46
	400V/3/50 Hz	A max/u	1,42	3,40	8,30	1,42	3,40	1,42	8,30	3,40	1,42	8,30	1,42
Acoustic		dB(A) (3)	44	53	63	47	56	49	66	58	50	68	51
Net weight		kg	318	326	343	563	579	810	614	834	1057	885	1302

Models	CCM ... /00		2254	2626	2815	2864	3097	3406	3585	3917	4226	5037
0 Pa (1)	Capacity P <sub>1</sub>	kW	234,36	272,93	293,18	297,69	321,48	353,83	373,04	407,43	439,58	524,27
	Air flow	m <sup>3</sup> /h	53200	57000	66500	75600	66500	79800	94500	93100	113400	132300
Surface		m <sup>2</sup>	800	1200	1000	800	1400	1200	1000	1400	1200	1400
Circuit vol.		dm <sup>3</sup>	75,8	113,2	94,5	75,8	131,9	113,2	94,5	131,9	113,2	131,9
		No	4	6	5	4	7	6	5	7	6	7
Fan		kW/u	1,50	0,55	1,50	4,00	0,55	1,50	4,00	1,50	4,00	4,00
	230V/3/50 Hz	A max/u	5,89	2,46	5,89	14,38	2,46	5,89	14,38	5,89	14,38	14,38
	400V/3/50 Hz	A max/u	3,40	1,42	3,40	8,30	1,42	3,40	8,30	3,40	8,30	8,30
Acoustic		dB(A) (3)	59	52	60	69	53	61	70	62	71	72
Net weight		kg	1087	1547	1340	1155	1792	1593	1425	1846	1694	1965

## DT1 (2) = 15 K - R404A

### 50 Pa

Models	CCM ... /50		441	601	701	882	1212	1323	1402	1774	1823	2103	2215
50 Pa (1)	Capacity P <sub>1</sub>	kW	45,65	63,00	72,46	92,07	126,08	137,21	145,55	184,89	189,72	218,95	230,19
	Air flow	m <sup>3</sup> /h	9500	14600	18300	19000	29200	28500	36600	38000	43800	54900	47500
Surface		m <sup>2</sup>	200	200	200	400	400	600	400	800	600	600	1000
Circuit vol.		dm <sup>3</sup>	19,8	19,8	19,8	38,4	38,4	57,1	38,4	75,8	57,1	57,1	94,5
		No	1	1	1	2	2	3	2	4	3	3	5
Fan		kW/u	0,75	2,20	4,00	0,75	2,20	0,75	4,00	0,75	2,20	4,00	0,75
	230V/3/50 Hz	A max/u	3,29	8,49	14,38	3,29	8,49	3,29	14,38	3,29	8,49	14,38	3,29
	400V/3/50 Hz	A max/u	1,90	4,90	8,30	1,90	4,90	1,90	8,30	1,90	4,90	8,30	1,90
Acoustic		dB(A) (3)	46	56	63	49	59	51	66	52	61	68	53
Net weight		kg	319	336	343	566	600	814	614	1062	864	885	1309

Models	CCM ... /50		2384	2626	2814	2985	3097	3505	3616	4136	4247	4917
50 Pa (1)	Capacity P <sub>1</sub>	kW	248,39	272,93	292,48	310,27	321,48	364,55	376,08	430,61	442,06	511,93
	Air flow	m <sup>3</sup> /h	58400	57000	73200	73000	66500	91500	87600	109800	102200	128100
Surface		m <sup>2</sup>	800	1200	800	1000	1400	1000	1200	1200	1400	1400
Circuit vol.		dm <sup>3</sup>	75,8	113,2	75,8	94,5	131,9	94,5	113,2	113,2	131,9	131,9
		No	4	6	4	5	7	5	6	6	7	7
Fan		kW/u	2,20	0,75	4,00	2,20	0,75	4,00	2,20	4,00	2,20	4,00
	230V/3/50 Hz	A max/u	8,49	3,29	14,38	8,49	3,29	14,38	8,49	14,38	8,49	14,38
	400V/3/50 Hz	A max/u	4,90	1,90	8,30	4,90	1,90	8,30	4,90	8,30	4,90	8,30
Acoustic		dB(A) (3)	62	54	69	63	55	70	64	71	65	72
Net weight		kg	1127	1556	1155	1390	1802	1425	1652	1694	1916	1965

(1) Additional air pressure available in pascals.

(2) DT1 = difference between the entering air temperature and the condensing temperature considered as being equal to the pressure equivalent at the condenser inlet.

(3) Sound pressure level in dB(A) at 10 meters in a free field 'without reflexion'.

## DT1 (2) = 15 K - R404A

## 100 Pa

Models	CCM ... /100		401	581	681	802	1172	1193	1372	1614	1763	1985	2063
<b>100 Pa</b> (1)	Capacity P <sub>1</sub>	kW	41,41	60,72	71,18	83,41	122,26	124,26	142,90	167,39	183,77	206,36	214,76
	Air flow	m <sup>3</sup> /h	8400	13900	17700	16800	27800	25200	35400	33600	41700	42000	53100
Surface		m <sup>2</sup>	200	200	200	400	400	600	400	800	600	1000	600
Circuit vol.		dm <sup>3</sup>	19,8	19,8	19,8	38,4	38,4	57,1	38,4	75,8	57,1	94,5	57,1
		No	1	1	1	2	2	3	2	4	3	5	3
Fan		kW/u	0,75	2,20	4,00	0,75	2,20	0,75	4,00	0,75	2,20	0,75	4,00
	230V/3/50 Hz	A max/u	3,29	8,49	14,38	3,29	8,49	3,29	14,38	3,29	8,49	3,29	14,38
	400V/3/50 Hz	A max/u	1,90	4,90	8,30	1,90	4,90	1,90	8,30	1,90	4,90	1,90	8,30
Acoustic		dB(A) (3)	45	56	62	48	59	50	65	51	61	52	67
Net weight		kg	319	336	343	566	600	814	614	1062	864	1309	885

Models	CCM ... /100		2324	2386	2744	2817	2885	3435	3496	4007	4076	4827
<b>100 Pa</b> (1)	Capacity P <sub>1</sub>	kW	241,93	247,65	285,55	292,48	300,25	357,74	363,14	416,31	423,76	501,88
	Air flow	m <sup>3</sup> /h	55600	50400	70800	58800	69500	88500	83400	97300	106200	123900
Surface		m <sup>2</sup>	800	1200	800	1400	1000	1000	1200	1400	1200	1400
Circuit vol.		dm <sup>3</sup>	75,8	113,2	75,8	131,9	94,5	94,5	113,2	131,9	113,2	131,9
		No	4	6	4	7	5	5	6	7	6	7
Fan		kW/u	2,20	0,75	4,00	0,75	2,20	4,00	2,20	2,20	4,00	4,00
	230V/3/50 Hz	A max/u	8,49	3,29	14,38	3,29	8,49	14,38	8,49	8,49	14,38	14,38
	400V/3/50 Hz	A max/u	4,90	1,90	8,30	1,90	4,90	8,30	4,90	4,90	8,30	8,30
Acoustic		dB(A) (3)	62	53	68	54	63	69	64	65	70	71
Net weight		kg	1127	1556	1155	1802	1390	1425	1652	1915	1694	1965

## DT1 (2) = 15 K - R404A

## 150 Pa

Models	CCM ... /150		431	561	721	872	1112	1293	1452	1693	1734	2185	2183
<b>150 Pa</b> (1)	Capacity P <sub>1</sub>	kW	45,01	58,77	75,08	90,75	115,91	133,98	150,94	176,17	180,14	226,85	227,43
	Air flow	m <sup>3</sup> /h	9300	13200	19400	18600	26400	27900	38800	39600	37200	46500	58200
Surface		m <sup>2</sup>	200	200	200	400	400	600	400	600	800	1000	600
Circuit vol.		dm <sup>3</sup>	19,8	19,8	19,8	38,4	38,4	57,1	38,4	57,1	75,8	94,5	57,1
		No	1	1	1	2	2	3	2	3	4	5	3
Fan		kW/u	1,10	2,20	5,50	1,10	2,20	1,10	5,50	2,20	1,10	1,10	5,50
	230V/3/50 Hz	A max/u	4,68	8,49	18,71	4,68	8,49	4,68	18,71	8,49	4,68	4,68	18,71
	400V/3/50 Hz	A max/u	2,70	4,90	10,80	2,70	4,90	2,70	10,80	4,90	2,70	2,70	10,80
Acoustic		dB(A) (3)	48	55	65	51	58	53	68	60	54	55	70
Net weight		kg	322	336	356	572	598	823	640	864	1074	1324	924

Models	CCM ... /150		2244	2596	2785	2904	3047	3386	3635	3877	4276	5117
<b>150 Pa</b> (1)	Capacity P <sub>1</sub>	kW	233,36	269,94	289,74	301,92	317,06	352,25	378,38	402,74	444,85	532,20
	Air flow	m <sup>3</sup> /h	52800	55800	66000	77600	65100	79200	97000	92400	116400	135800
Surface		m <sup>2</sup>	800	1200	1000	800	1400	1200	1000	1400	1200	1400
Circuit vol.		dm <sup>3</sup>	75,8	113,2	94,5	75,8	131,9	113,2	94,5	131,9	113,2	131,9
		No	4	6	5	4	7	6	5	7	6	7
Fan		kW/u	2,20	1,10	2,20	5,50	1,10	2,20	5,50	2,20	5,50	5,50
	230V/3/50 Hz	A max/u	8,49	4,68	8,49	18,71	4,68	8,49	18,71	8,49	18,71	18,71
	400V/3/50 Hz	A max/u	4,90	2,70	4,90	10,80	2,70	4,90	10,80	4,90	10,80	10,80
Acoustic		dB(A) (3)	61	56	62	71	57	63	72	64	73	74
Net weight		kg	1127	1573	1390	1207	1823	1652	1490	1915	1772	2056

(1) Additional air pressure available in pascals.

(2) DT1 = difference between the entering air temperature and the condensing temperature considered as being equal to the pressure equivalent at the condenser inlet.

(3) Sound pressure level in dB(A) at 10 meters in a free field 'without reflexion'.

## DT1 (2) = 15 K - R404A

## 200 Pa

Models	CCM ... /200		461	591	711	912	1182	1353	1422	1803	1834	2153	2275
<b>200 Pa</b> (1)	Capacity P <sub>1</sub>	kW	47,52	61,79	73,70	94,69	122,82	140,32	148,11	187,20	190,19	224,12	236,71
	Air flow	m <sup>3</sup> /h	9900	14300	18900	19800	28600	29700	37800	42900	39600	56700	49500
Surface		m <sup>2</sup>	200	200	200	400	400	600	400	600	800	600	1000
Circuit vol.		dm <sup>3</sup>	19,8	19,8	19,8	38,4	38,4	57,1	38,4	57,1	75,8	57,1	94,5
		No	1	1	1	2	2	3	2	3	4	3	5
Fan		kW/u	1,50	3,00	5,50	1,50	3,00	1,50	5,50	3,00	1,50	5,50	1,50
	230V/3/50 Hz	A max/u	5,89	11,09	18,71	5,89	11,09	5,89	18,71	11,09	5,89	18,71	5,89
	400V/3/50 Hz	A max/u	3,40	6,40	10,80	3,40	6,40	3,40	10,80	6,40	3,40	10,80	3,40
Acoustic		dB(A) (3)	51	58	65	54	61	56	68	63	57	70	58
Net weight		kg	325	338	356	579	602	833	640	870	1087	924	1340

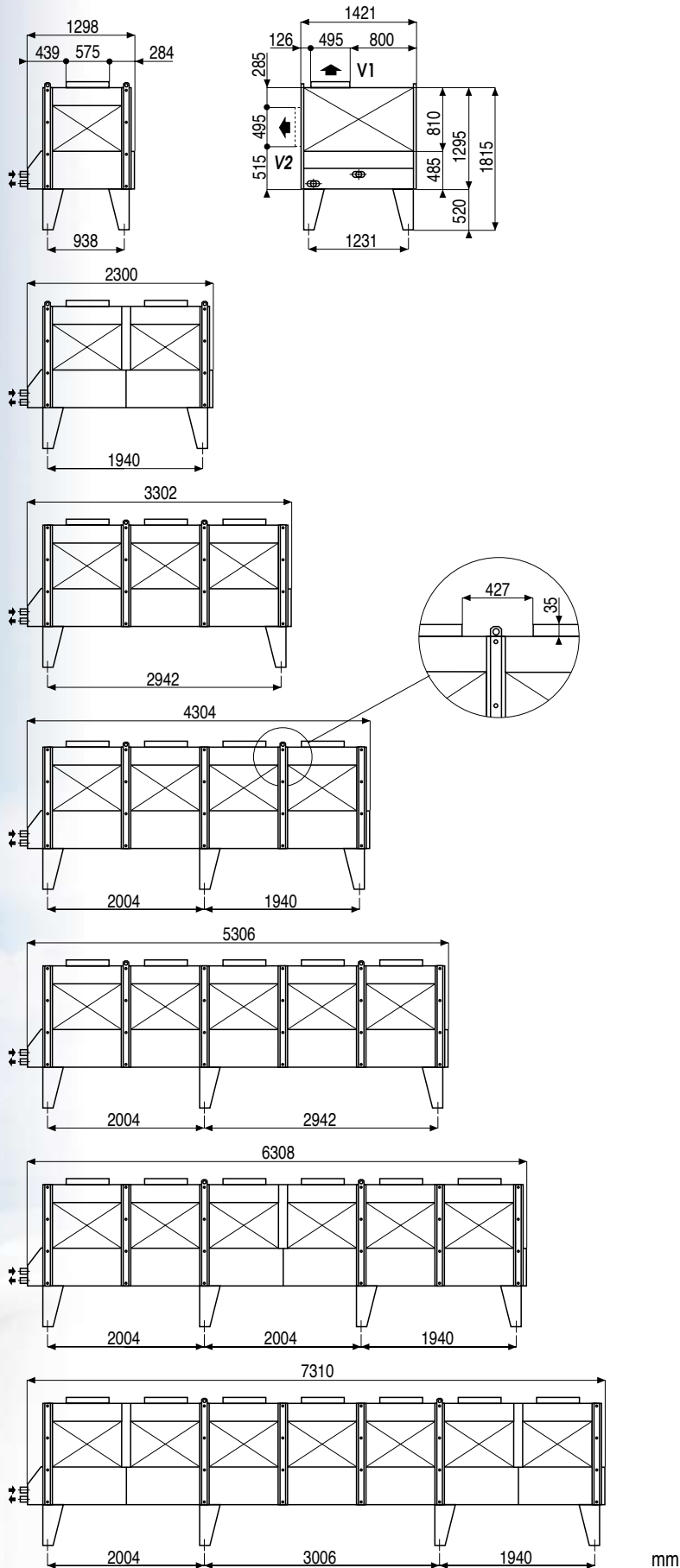
Models	CCM ... /200		2364	2716	2864	2955	3177	3576	3585	4087	4226	5037
<b>200 Pa</b> (1)	Capacity P <sub>1</sub>	kW	245,66	282,34	297,69	306,96	330,10	371,71	373,04	425,07	439,58	524,27
	Air flow	m <sup>3</sup> /h	57200	59400	75600	71500	69300	85800	94500	100100	113400	132300
Surface		m <sup>2</sup>	800	1200	800	1000	1400	1200	1000	1400	1200	1400
Circuit vol.		dm <sup>3</sup>	75,8	113,2	75,8	94,5	131,9	113,2	94,5	131,9	113,2	131,9
		No	4	6	4	5	7	6	5	7	6	7
Fan		kW/u	3,00	1,50	5,50	3,00	1,50	3,00	5,50	3,00	5,50	5,50
	230V/3/50 Hz	A max/u	11,09	5,89	18,71	11,09	5,89	11,09	18,71	11,09	18,71	18,71
	400V/3/50 Hz	A max/u	6,40	3,40	10,80	6,40	3,40	6,40	10,80	6,40	10,80	10,80
Acoustic		dB(A) (3)	64	59	71	65	60	66	72	67	73	74
Net weight		kg	1135	1593	1207	1400	1846	1664	1490	1929	1772	2056

(1) Additional air pressure available in pascals.

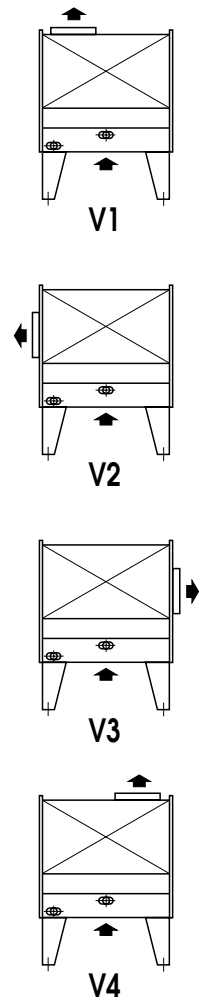
(2) DT1 = difference between the entering air temperature and the condensing temperature considered as being equal to the pressure equivalent at the condenser inlet.

(3) Sound pressure level in dB(A) at 10 meters in a free field 'without reflexion'.

## VERTICAL AIR FLOW



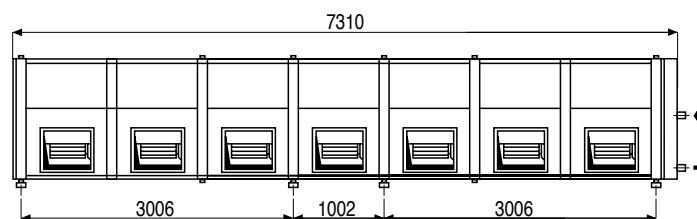
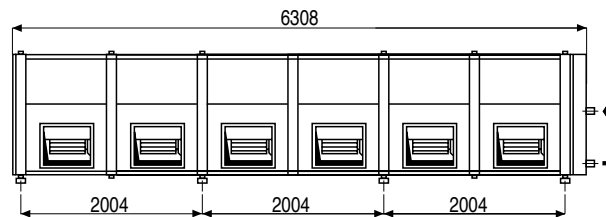
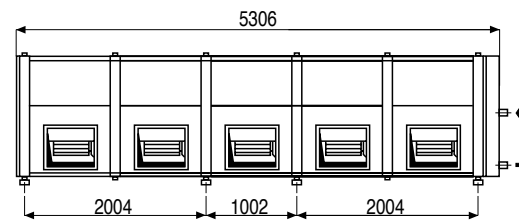
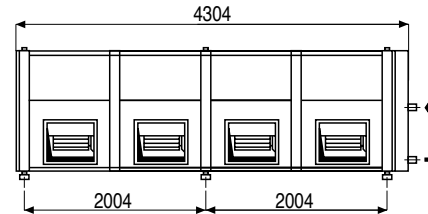
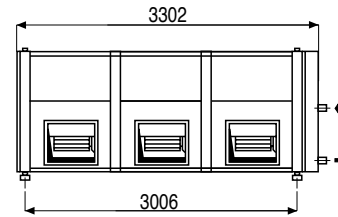
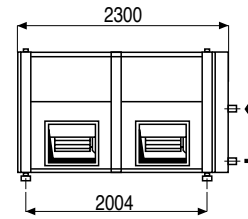
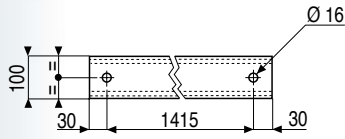
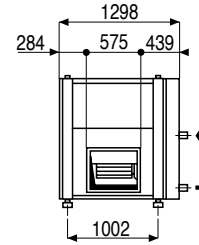
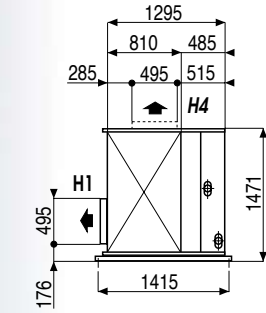
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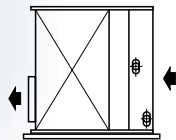
mm



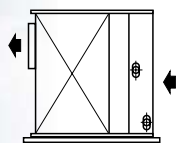
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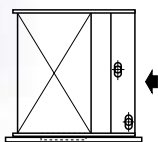
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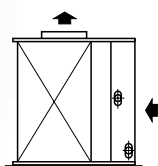
H1



H2



H3



H4

mm

