KOG LN

Low Noise Chilled Water Cassettes

Models 30 & 45

5.2 to 11.7kW

4.1 to 9.8kW

585 to 1560 m^3/h

EUROVENT CERTIFIED PERFORMANCE
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systemair

Design Features

Introduction

Chilled Water units of the "Cassette" type offer comfortable air conditioning at a low cost of installation.

They fit harmoniously into standard modules of a false ceiling thanks to their design and small space requirements.

They are easy to be connected with water chillers producing chilled or hot water, and are used for :

- Cooling (Chilled Water) and Heating (Electric Heating).
- Heating (Hot Water). Simultaneous operation of Heating (Hot Water) and Electric Heating is strictly FORBIDDEN.

Cassette air treatment unit

It combines excellent technical qualities, reliability and easiness of installation. It includes :

- A flat (287 mm thick), insulated unit, flash mounted to be fitted into the false-ceiling, of a size compatible with standard modules of a false-ceiling (600 x 600 mm).
- Three-speed ventilation.
- Built-in electric heating to be connected on site.
- Condensate pump to lift at the top of the cassette. Draining should be provided for by gravity.
- Electric box of control and overload protection to be mounted on site.
- Combined discharge/air return grille with airfilter, discharge adjustable by hand on all 4 sides, air return at the center.

Casing

- Panels and insulated sheet.
- Combined discharge/air return grille supplied separately for the Cassette.
- Possible hand operated adjustment of air distribution on all four sides. Possibility to close one or two faces of discharge.
- Air return at center with filter.
- Prepunched holes for connection with fresh air intake and connection with a stub duct to treat an adjacent room. In that case it becomes necessary to provide a decompres-sion in the adjacent room (grille ...) to allow air return on the Cassette.

Insulation

Heat and sound insulation throughout the indoor air treatment unit.

Ventilation

- Centrifugal turbine with direct drive.
- Motors mounted on rubbers and equipped with internal thermal safety devices. 3-speed (model 30 LN) or 4-speed (model 45 LN) motor (AC motor) or EC motor for the air treatment unit.

Filtration

Cleanable air filter accessible after opening the discharge/intake combined grille.

- Filter type : Rapidly removable cassettes
- Media : Woven synthetics
- Fire resistance : M4 (PV LNE N° 812 02 29 to 30/01/89)
- Efficiency : 55% (EUROVENT 4/5 - ASHRAE gravimetric 52-76 NF X 44-012)
- Maintenance : Washable (cold water with detergent not more than 25 washings) or dry dedusting.

Fan-motor assembly

Centrifugal turbine with direct drive. Motor resiliently mounted and equipped with internal thermal safety device. It can be dismounted by 3 screws and disconnection from electrical supply cable by pin type connector.

The chilled water cassettes sizes 30 and 45 LN can be supplied with 2 types of motor :

- The standard **AC motor** of direct drive type having 6 speeds, 3 of them are factory pre-wired. The motor is suitable for nominal voltage of 230V/1ph/50Hz and is equipped with a built-in normally closed thermal protection of automatic reset type.
- The **EC motor** of high efficiency and low electrical consumption type for a significant energy saving. The motor is suitable for 0-10 V input, ensuring variable speed capability. It is fitted with ECospeed3 interface card (supplied as standard) for a 3-speed optimized running

Electric heating

- The Cassettes are factory-equipped with electric heating to be connected on site.
- The electric heating equipped with heating resistances is heat protected against any abnormal raise of temperature by two thermostats :
  - a thermostat with automatic reset,
  - a thermostat with manual reset.

Available accessories and options

IRYS Diffuser

the modern design of the IRYS diffuser combines aesthetics and a flat appearance to meet the architectural constraints:

- Perfect integration into the standard false ceiling, exterior dimensions 1195x595.
- Metallic diffuser which keep colors over time. Epoxy paint RAL 9003

Air diffusion 360° with Coanda effect:

- Air diffusion in 360° avoiding any dead air zones.
- When the air is blown from a point near the ceiling, the air stream is pressed against the ceiling and has an improve air throw. IRYS Diffuser uses this principle of air diffusion "Coanda effect" in order to ensure a homogeneous distribution of the air in the room with a high induction rate and reduced temperatures stratification (less than 1°C).
- Definition of a comfort zone which eliminates air flow phenomena and temperature stratification (speed of air below 0.15m/s).

Air throw:

- The air throw is the distance between the cassette and the points where the speed of the spread air (approximately 0.2 m/s) is not longer felt by the human body. The IRYS diffuser possesses the blowing reach of air over of 5m in HS.

Easy maintenance:

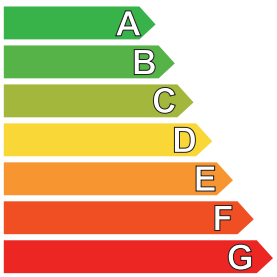
- Quick access to the filter.
- Access to internal components.
- Easy cleaning thanks to a perfectly smooth surface.

- Condensate tray kit.
- Motorized 3-way valve kit with by-pass.
- Controls : TRM-VP (kit), TRM-FA (kit), TAE 20 (kit), TAE 20 + SEH (kit), Aqu@Simp and Aqu@Net.

Advantages of Chilled Water Cassettes LN with EC motor

Energy class with standard motor

More efficient

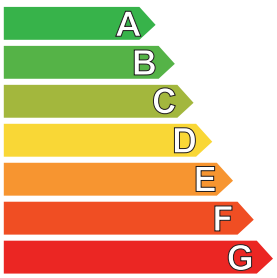


Less efficient

Models		30 LN	45 LN
FCEER	2-pipe	D	C
	4-pipe		C
FCCOP	2-pipe	D	C
	4-pipe		D

Energy class with EC motor

More efficient



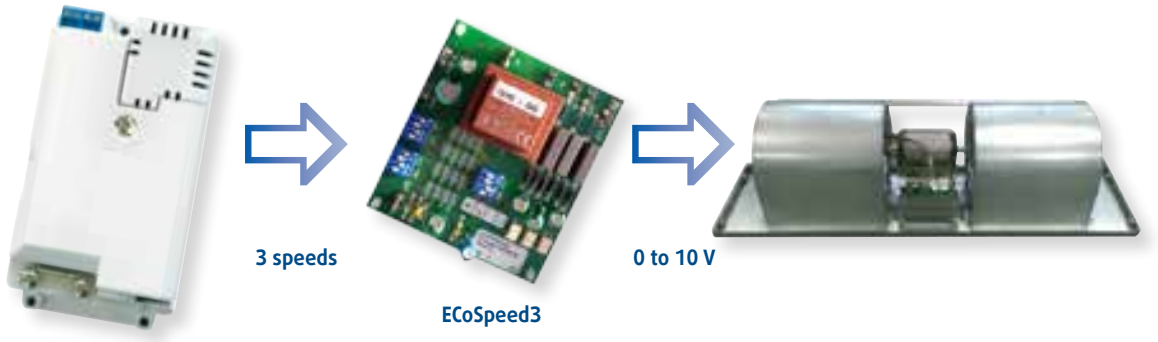
Less efficient

Models		30 LN	45 LN
FCEER	2-pipe	A	A
	4-pipe		A
FCCOP	2-pipe	A	A
	4-pipe		B

Energy class according Eurovent

3-speed control interface for EC motor

Aqu@Net	Interface card	EC motor



Technical Data

models		30 LN - 2-pipe	45 LN - 2-pipe	45 LN - 4-pipe
Nominal cooling capacity (1) - Nominal supply voltage 230V/50Hz	W	6840	9298	9887
Nominal heating capacity (2) - Nominal supply voltage 230V/50Hz	W	9375	11716	8980
air flow (average values) treated air - AC Fan Motor				
High Speed	m^3/h	1300	1560	1560
Medium Speed	m^3/h	905	1080	1080
Low Speed	m^3/h	585	790	790
Super Low Speed	m^3/h	-	540	540
Nominal water flow (cooling only)	l/h	1232	1602	1703
Pressure loss on water (3)	kPa	19.6	20.0	28.0
air flow (average values) treated air - EC Fan Motor				
High Speed	m^3/h	1313	1268	1268
Medium Speed	m^3/h	928	877	877
Low Speed	m^3/h	597	521	521
Nominal water flow (cooling only)	l/h	1171	1375	1481
Pressure loss on water (3) - V5	kPa	18,4	15,4	7
Contents	l	2,7	4	4
Power supply	V	230 V / 1~ / 50 Hz		
Voltage range	V	207 / 253 V		
Dimensions				
Casing (L x P x H)	mm	1171 x 571 x 287		
Grille (L x P x H)	mm	1225 x 625 x 40		
Diffuser IRYS (L x P x H)	mm	1195 x 595 x 34		
Net weight	kg	49	55	55
packing				
Gross weight	kg	51	58	58
Packed volume	m^3	0.31	0.31	0.31
accessories				
Electric heating nominal capacity	W	2800	2800	-
Motorized 3-way valve with by-pass		●	●	●
Condensate tray for valve		●	●	●

Note :
(1) Nominal conditions : Air : 27°C/19°C wet bulb (nominal HS airflow) - Chilled water : 7°C/12°C.
(2) Nominal conditions : Air : 20°C (nominal HS airflow) - Hot water : 50°C (nominal waterflow in chilled water mode).
(3) Pressure loss by corresponding nominal flow.
(4) Data based on units 2 tubes with AC motor
(*) The sound pressure levels Lp are based on (NR) characteristics of a room having volume of 100 m^3 with reverberation of 0.5 seconds.
These characteristics are for information only and are subject to change without advance.

Electrical Data

Models		30 LN - 2-pipe		45 LN - 2-pipe		45 LN - 2-pipe
		With BE	Without BE	With BE	Without BE	Without BE
Nominal current	A	6,7	0,3	8	0,3	10,8
Fuse rating gG	A	10	1 **	10	1 **	1 **
Fuse rating ASE/VDE**	A	16	2	16	2	16
Power supply		230 V / 1 Ph / 50Hz				
Cable section*	mm^2	3G1,5	3G1	3G2,5	3G1	3G2,5
Electric heater capacity	W	2800	-	2800	-	-

BE : Electric heater.
* Minimum section to be adapted according to local regulations and norms.
** aM or circuit breaker curve C.

AC Fan Motor Electrical Data

Models		30 LN		45 LN - 2-pipe		45 LN - 4-pipe	
		Absorbed current (A)	Absorbed power (W)	Absorbed current (A)	Absorbed power (W)	Absorbed current (A)	Absorbed power (W)
Fan speed	SLS	-	-	0.17	39	0.18	39
	LS	0.17	38	0.25	58	0.30	63
	MS	0.29	66	0.39	90	0.40	91
	HS	0.45	100	0.69	136	0.70	140

EC Fan Motor Electrical Data

Models		30 LN			45 LN - 2-pipe			45 LN - 4-pipe		
		Absorbed current (A)	Absorbed power (W)	Set Voltage (V)	Absorbed current (A)	Absorbed power (W)	Set Voltage (V)	Absorbed current (A)	Absorbed power (W)	Set Voltage (V)
Fan speed	V1	<0.10	9	3.09	<0.10	9	3.09	<0.10	9	3.09
	V2	<0.10	17	4.11	<0.10	17	4.11	<0.10	17	4.11
	V3	0.10	23	4.93	0.10	23	5.48	0.10	23	5.48
	V4	0.17	39	5.48	0.17	39	6.86	0.17	39	6.86
	V5	0.23	52	10	0.23	52	10	0.23	52	10

Condensate Pump

pump data		
Nominal voltage		230 V / 1~ / 50 Hz
Power input	W	16
Current input	A	0.12
Waterflow max.	l/h	240
Max. manometric head	mWG	0.5

Electric Heating

The electric heating of the cassettes is composed of heating resistances placed inside the tubes of the heat exchanger.
These resistances are heat protected against any abnormal temperature rise by two thermostats equipped with a "positive safety" device (mechanical or thermic destruction of the capillary switches off the heating permanently) :

- a thermostat with automatic reset,
- a thermostat with manual reset.

Electric heating capacity

Power supply : 1 ~ 230 V - 50 Hz or 3 N ~ 400 V - 50 Hz

Standard models	30 LN	45 LN
Capacity (W)	2800	2800

Thermal Performance

2-pipe system - AC Fan Motor

Models		Water in/out	7 °C/12 °C				50 °C/Qv (*)	
		Entering air temperature / HR	27 °C/47%				20 °C	
		Air flow	Total capacity	Sensible capacity	Water flow Qv	Water pressure drop	Heating capacity	Water pressure drop
		m^3/h	W	W	l/h	kPa	W	kPa
30 LN	LS	585	4150	3350	715	8	5210	7.5
	MS	905	5611	4591	966	14	7365	13.5
	HS	1300	6840	5660	1178	21	9375	19.6
45 LN	SLS	540	3858	3041	664	4.5	4832	4.5
	LS	790	5414	4329	933	8.0	6791	8.0
	MS	1080	7039	5728	1212	12.5	8842	12.5
	HS	1560	9298	7650	1602	20.0	11716	20.0

4-pipe system - AC Fan Motor

Models		Water in/out	7 °C/12 °C				70 °C/60 °C		
		Entering air temperature / HR	27 °C/47%				20 °C		
		Air flow	Total capacity	Sensible capacity	Water flow Qv	Water pressure drop	Heating capacity	Water flow Qv	Water pressure drop
		m^3/h	W	W	l/h	kPa	W	l/h	kPa
45 LN	SLS	540	4255	3254	733	6.0	4756	417	3.0
	LS	790	5716	4324	985	10.5	6586	577	5.0
	MS	1080	7925	6185	1365	18.5	7506	658	6.0
	HS	1560	9887	7655	1703	28.0	8980	788	8.0

2-pipe system - EC Fan Motor

Models		Water in/out	7 °C/12 °C				50 °C/Qv (*)	
		Entering air temperature / HR	27 °C/47%				20 °C	
		Air flow	Total capacity	Sensible capacity	Water flow Qv	Water pressure drop	Heating capacity	Water pressure drop
		m^3/h	W	W	l/h	kPa	W	kPa
30 LN	V1	597	4215	3400	725	8	5300	8
	V2	928	5700	4600	982	13	7500	13
	V3	1167	6509	5369	1121	17	8795	17
	V4	1313	6800	5700	1171	18	9400	18
	V5	2044	7632	6403	1315	22	11290	22
45 LN	V1	521	3730	2900	642	4	4600	4
	V2	877	5900	4700	1016	9	7400	9
	V3	1268	7980	6500	1375	15	10000	15
	V4	1560	9298	7667	1602	20	11716	20
	V5	1837	10360	8584	1785	24	13081	24

4-pipe system - EC Fan Motor

Models		Water in/out	7 °C/12 °C				70 °C/60 °C		
		Entering air temperature / HR	27 °C/47%				20 °C		
		Air flow	Total capacity	Sensible capacity	Water flow Qv	Water pressure drop	Heating capacity	Water flow Qv	Water pressure drop
		m^3/h	W	W	l/h	kPa	W	l/h	kPa
45 LN	V1	521	4000	3050	689	6	4700	405	3
	V2	877	6490	5000	1118	13	6790	585	5
	V3	1268	8600	6700	1481	22	8300	715	7
	V4	1560	9897	7685	1705	28	8937	770	8
	V5	1837	10776	8381	1856	33	9126	786	8

(*) water flow is the same as that in cooling mode

Acoustical Data

KOG with AC motor

		Acoustical power per octave band (dB(A))								
Type	Speeds	125	250	500	1000	2000	4000	Lw Global dB(A)	L p * dB(A)	NR*
KOG 30 LN	LS	26.9	30.0	31.2	27.0	33.4	23.2	37.5	30	27
	MS	34.9	39.7	40.8	39.4	40.2	22.1	46.4	38	34
	HS	44.1	47.7	49.4	49.0	48.8	35.1	55.2	47	43
KOG 45 LN	LS	37.6	40.6	40.9	37.8	38.2	25.5	46.3	38	33
	MS	45.1	47.7	48.4	45.9	45.2	35.4	53.7	46	40
	HS	51.0	54.6	56.7	55.0	52.7	47.4	61.6	54	48

KOG with EC motor

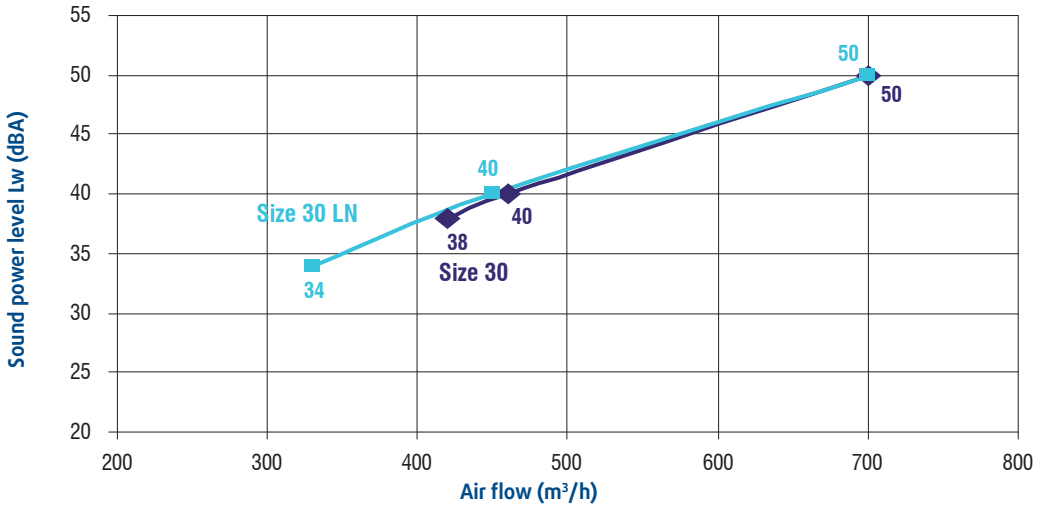
		Acoustical power per octave band (dB(A))								
Type	Speeds	125	250	500	1000	2000	4000	Lw Global dB(A)	L p * dB(A)	NR*
KOG 30 LN	LS	29.3	34.4	37.7	41.2	35.3	32.5	44.0	36	33
	MS	54.0	51.5	48.9	47.3	41.0	36.1	52.0	44	40
	HS	45.9	50.5	52.4	52.3	49.0	41.4	57.7	50	44
KOG 45 LN	LS	44.7	41.5	36.9	31.7	29.1	15.2	39.0	31	25
	MS	56.5	51.8	48.1	42.7	40.0	26.9	49.8	42	36
	HS	63.1	59.1	54.5	49.7	47.1	36.9	57.0	49	43

Data based on units 2 tubes

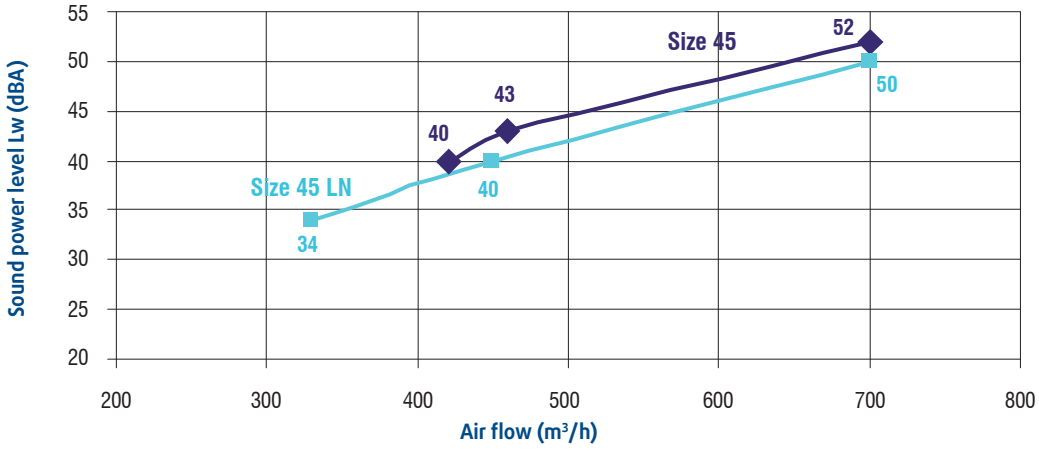
(*) The sound pressure levels Lp are based on (NR) characteristic of a room having volume of 100m³ with reverberation time of 0.5 seconds and a distance of 1 meter.

Comparison of Acoustic Performance

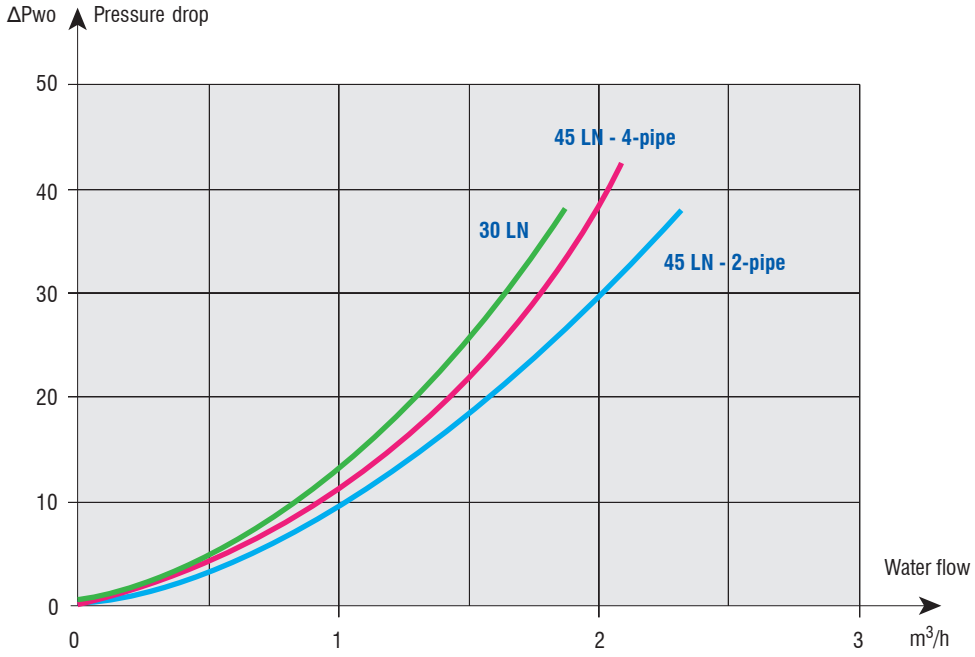
Sizes 30 and 30 LN



Sizes 45 and 45 LN



Pressure Drops



ΔPwo : Pressure drops of pure water.
ΔPw : Pressure drops of brine water.
ΔPw : K x ΔPwo.

K : Glycol coefficient					
Twm (°C)	% Glycol				
	10	20	30	40	50
3	1.135	1.234	1.385	1.53	1.85
5	1.13	1.23	1.38	1.51	1.77
10	1.12	1.22	1.37	1.47	1.66
15	1.11	1.19	1.36	1.46	1.64
20	1.1	1.18	1.35	1.44	1.59
25	1.09	1.17	1.33	1.43	1.57
30	1.08	1.16	1.31	1.42	1.56
35	1.07	1.15	1.29	1.41	1.54
40	1.06	1.14	1.28	1.4	1.52
45	1.05	1.13	1.25	1.37	1.49
50	1.04	1.12	1.22	1.34	1.47
55	0.99	1.1	1.2	1.31	1.44
60	0.94	1.09	1.19	1.28	1.42

Twm : Average temperature of the mixture.

Tse (°C)	% Glycol				
	10	20	30	40	50
-25					yes
-20				yes	yes
-15				yes	yes
-10			yes	yes	yes
-5		yes	yes	yes	yes
0	yes	yes	yes	yes	yes
5	yes	yes	yes	yes	yes

Tse : Outdoor dry temperature.

Field of Operation

Using chilled water

Indoor temperature	°C	Thi	13	MINIMUM TEMPERATURE
		Tsi	17	
Cooling water	°C	Twe	3	

Indoor temperature	°C	Thi	22	MAXIMUM TEMPERATURE
		Tsi	32	
Cooling water	°C	Tse	18	

Using hot water (electric heating forbidden)

Maximum indoor temperature	°C	Thi	22
		Tsi	32
Maximum entering water temperature	°C	Twe	60

Characteristics

Models		30	45
Contents	l	2.7	4
Max. pressure of operation	bar	15	15
Testing pressure	bar	24	24
Couplings - 2-pipe	inch	1" gas male	1" gas male
	mm	26-34 male	26-34 male
Couplings - 4-pipe	inch	-	1" gas male (Cooling) 1/2" gas male (Heating)
	mm	-	26-34 male (Cooling) 15-21 male (Heating)

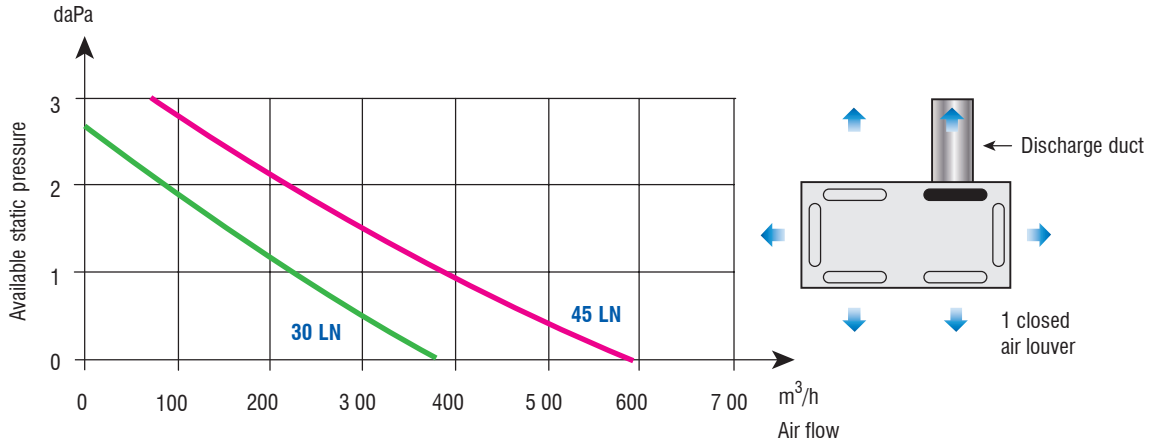
Thi : Indoor wet bulb.
Tsi : Indoor dry bulb.
Tse : Outdoor dry bulb.
Twe : Entering water temperature.

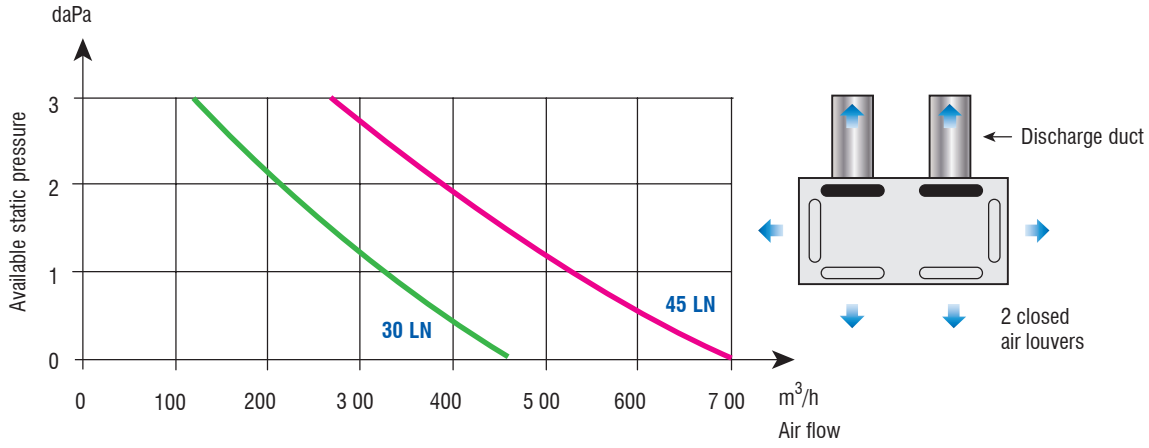
Fresh Air Intake

Fresh air flow should not exceed 12% of nominal air flow (See table hereunder).
NOTE : An anti-frost thermostat preset at +5 °C, installed on site on fresh air intake is mandatory for winter application. A filter, fan and insulated air duct (not supplied) are to be installed on site.

Treated air discharge in an adjacent room
In case of discharge towards an adjacent room, provide for decompression toward the air return of the treatment unit.

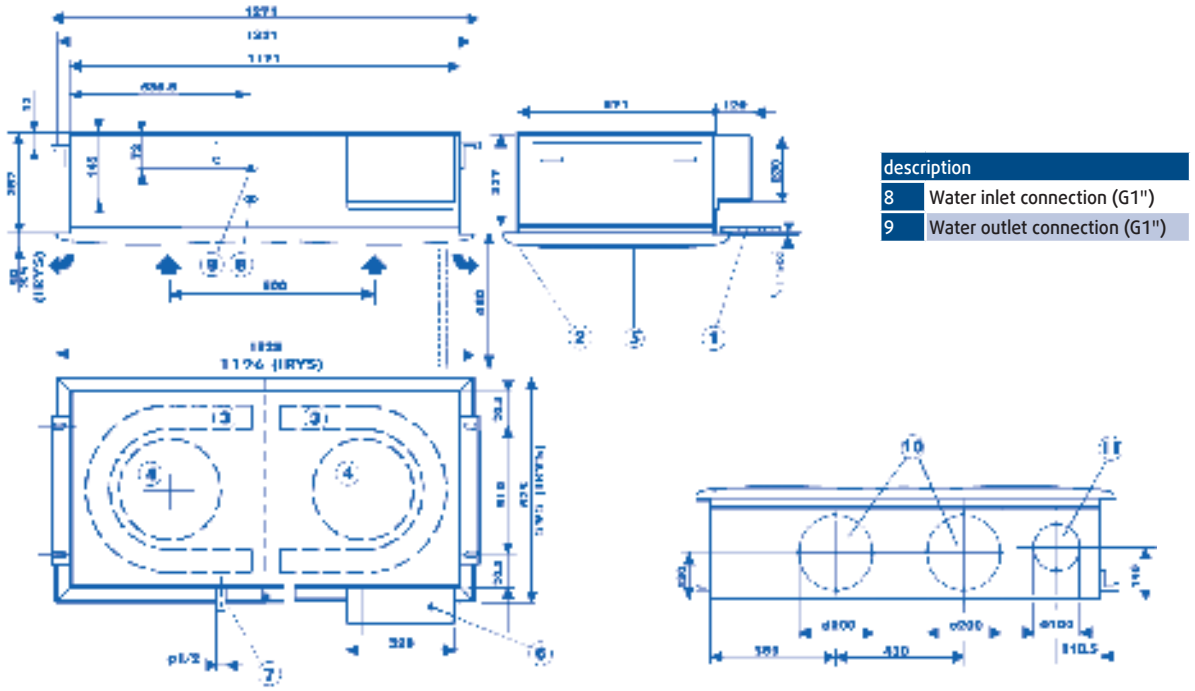
Models		30 LN	45 LN
Nominal air flow (HS)	m^3/h	1530	1630
Maximal fresh air flow	m^3/h	86	90





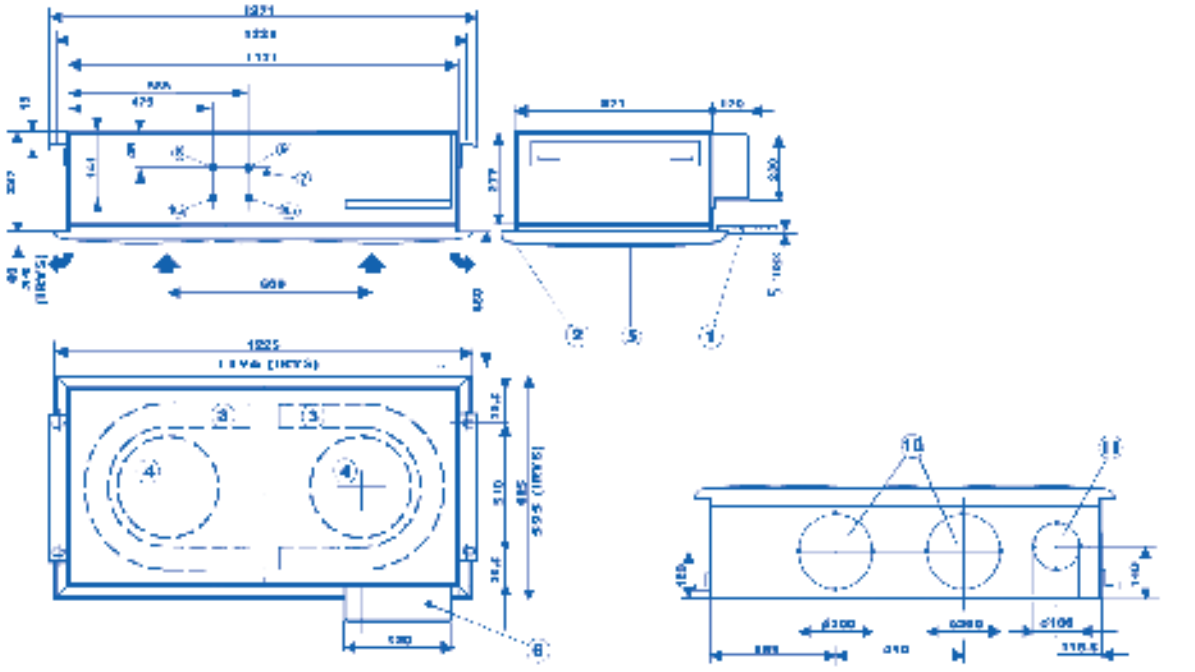
Dimensions

2-pipe units



description	
8	Water inlet connection (G1")
9	Water outlet connection (G1")

4-pipe units



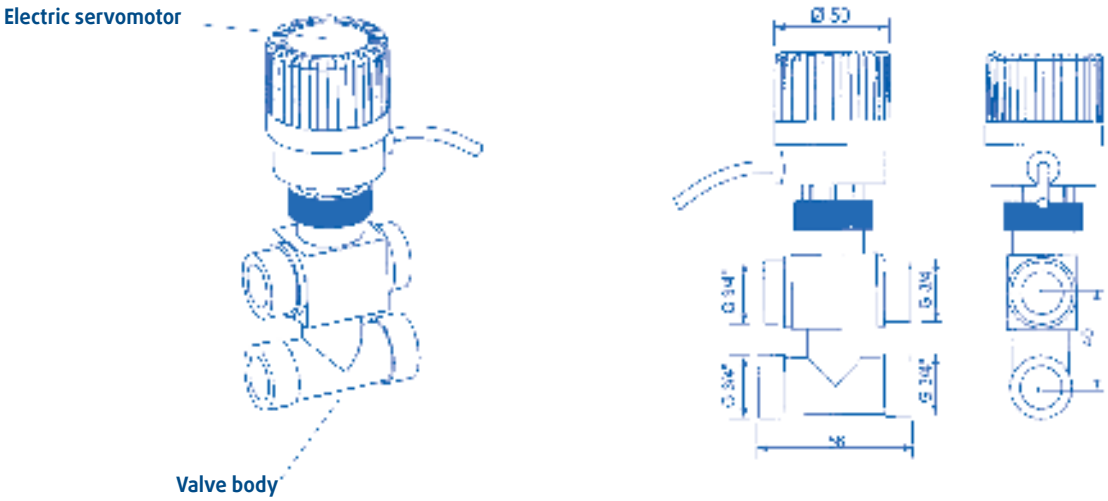
description			
1	False ceiling	8	Hot water outlet connection (G1/2")
2	T-shaped rod (false ceiling)	8a	Hot water inlet connection (G1/2")
3	Heat exchanger	9	Chilled water outlet connection (G1")
4	Fan	9a	Chilled water inlet connection (G1")
5	Suction grille	10	Port to distribute air through a duct into a neighbouring room (pre-punched)
6	Electric box (removable)	11	Port to suction fresh air (pre-punched)
7	Draining of condensates (Ø1/2")		

3-Way Valve with By-pass

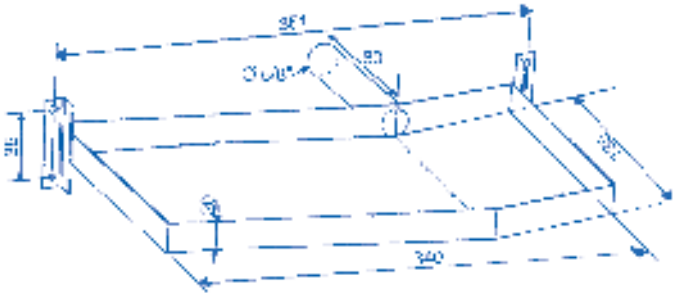
The kit three-way valve with by-pass allows to control "all or nothing" of a cassette when operating chilled water mode or hot water mode.

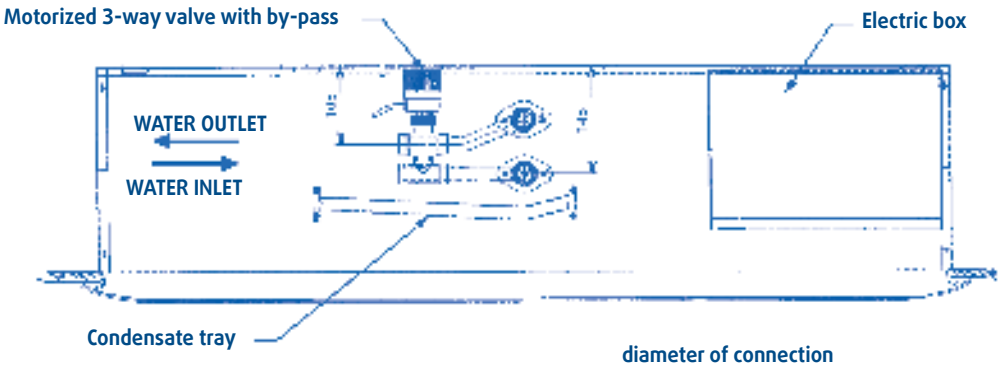
This kit includes a three-way valve with by-pass controlled by an electric servomotor.

Motorized 3-way valve with by-pass



Condensate tray for 3-way valve





diameter of connection

Models	30 LN	45 LN
Water inlet	G 3/4" Male 20-27	
Water outlet	G 3/4" Male 20-27	

Notes

Distributor:

AVU Klimaatbeheer
Uw technische groothandel

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7071 PC Ulft

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systemair

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