

KOG LN

Low Noise Chilled Water Cassettes

Models 9, 12 & 18



Design Features

Introduction

The new **low noise** chilled water cassettes **9 LN to 18 LN** offer a comfortable air conditioning with **improved acoustic performance**.

Their design and their small dimensions allow them to fit harmoniously into the standard ceiling tiles of 600 x 600 mm size.

These new cassettes have been specially designed for an easy and fast installation, as well as for a great ease of maintenance with a complete access to internal components through the return air grille.

The chilled water cassettes are available in **3 sizes** (9 LN, 12 LN & 18 LN) and in **3 versions** (2-pipe, 2-pipe/2-wire and 4-pipe).

Features and benefits

- As a result of new motor staging, the noise level has been reduced by **4 to 6 dBA** at low speed.
- The casing to be fitted into the false ceiling has a low profile (287 mm thick). Its dimensions as well as the incorporation of electrical box and control valves (optional) inside the unit, make its installation compatible with standard false ceiling tiles (600 x 600 mm size).
- The casing is made from galvanized steel sheet with thermal and acoustical insulation, eliminating condensations on the casing and providing low sound levels.
- The grille of RAL 9016 colour combines discharge and return with air filter; discharge manually adjustable on all four sides with possibility of closing one or two faces of discharge, return at the center.
- The coils are composed of copper tubes and aluminium hydrophilic fins ensuring a better condensate drainage and a better protection against corrosion.
- The coils of sizes 9 LN and 12 LN have 2 rows for 2-pipe and 4-pipe systems. Those of size 18 LN have 3 rows for 2-pipe and 4-pipe systems.
- Prepunched holes for connection with fresh air intake and connection with a stub duct to treat air of adjacent room. In this case, it becomes necessary to provide a decompression in the adjacent room to allow air return on the cassette.
- Easy and quick access, by simply removing the front grille, to the internal components such as the coil, the fan-motor assembly, the condensate pump, the optional regulating valve(s) and the electrical box.
- All connections : water, electrical, condensate drain and air vent cock are located at the same side, on the exterior of the unit.
- Sliding electrical box is easily accessible after removing two screws. Electrical box has a junction block provided for quick connection on terminals without screws and a multi-output autotransformer supplied for eventual change of fan speeds (on site).

- Condensate pump supplied as standard, can be easily reached and removed by only one screw; electrical connection by pin type connector. The condensate pump provides a manometric lift up to 600 mm. The pump is, in addition, equipped with a high security level control system : it is concerning a 3-level detection float ("On", "Off" to avoid permanent operation, and "Alarm").
- Control valves (factory-supplied option) mounted inside the casing to limit the works on site and the installation costs.
- Flexible hoses for connection on units with or without control valves.

Filtration

Cleanable synthetic type air filter (55 % arrestance, G1 class) accessible after opening the return grille.

Ventilation

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

Single speed motor connected on 6-output autotransformer which allows to modify eventually the fan speeds on site (3 speeds of ventilation are supplied as standard).

Electrical connection

Fast connection on terminals without screws. Two cable glands are provided on the casing wall allowing to block the supply and control cables.

Supply voltage : 230 V / 1 ph / 50 Hz + earth.

Available accessories and options

Electric heater for use with 2-pipe/2-wire system

It is composed of heating elements located inside the tubes of heat exchanger and is thermally protected against abnormal rises in temperature by two thermostats : automatic reset thermostat and manual reset one.

Supply voltage : 230 V / 1 ph / 50 Hz + earth.

Control valves

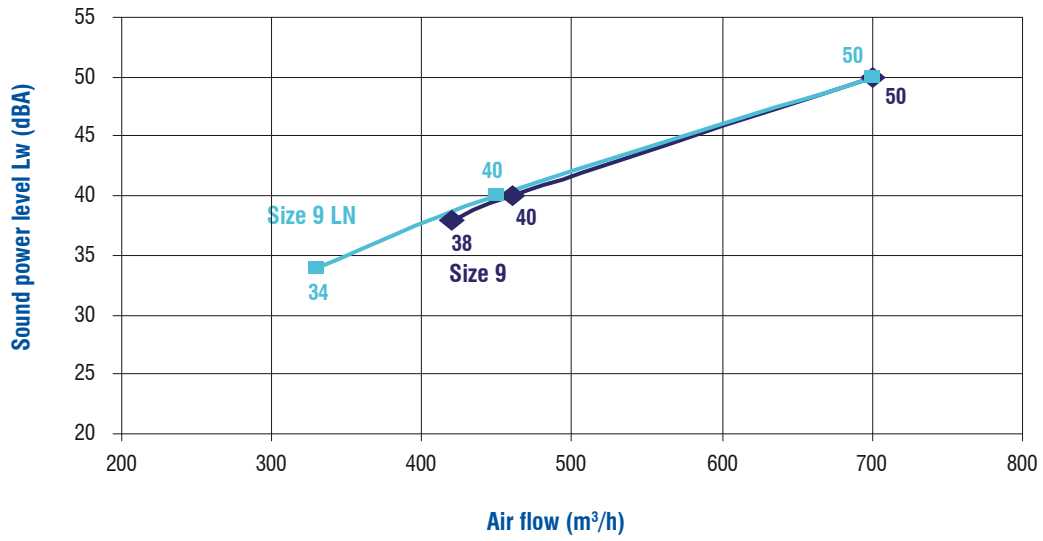
Motorized valves, 2 ways and 3 ways with by-pass, factory-fitted option and incorporated inside the unit for 2-pipe and 4-pipe systems.

Controls

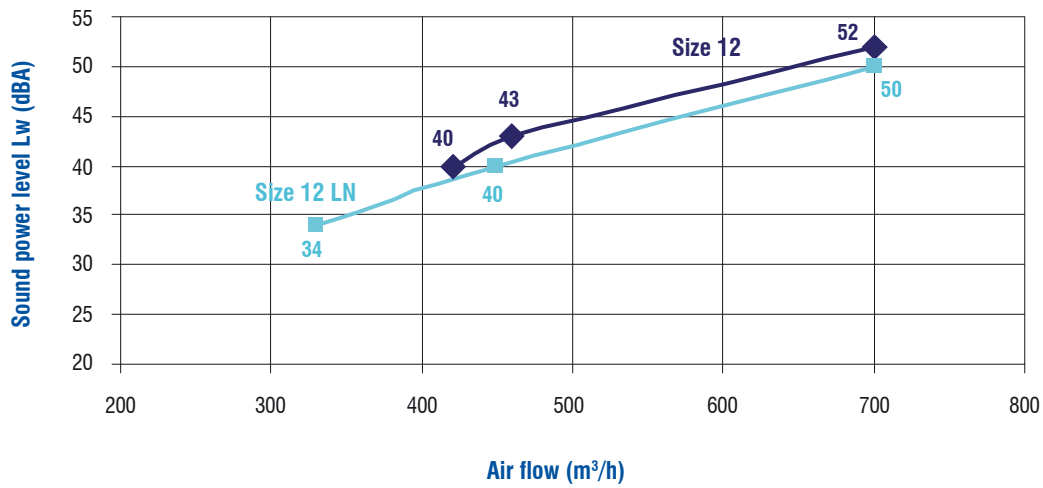
TRM-VP (kit), TRM-FA (kit), TAE 20 (kit), TAE 20 + SEH (kit), Aqu@Simp, Aqu@Net and IR remote control.

Comparison of Acoustic Performance

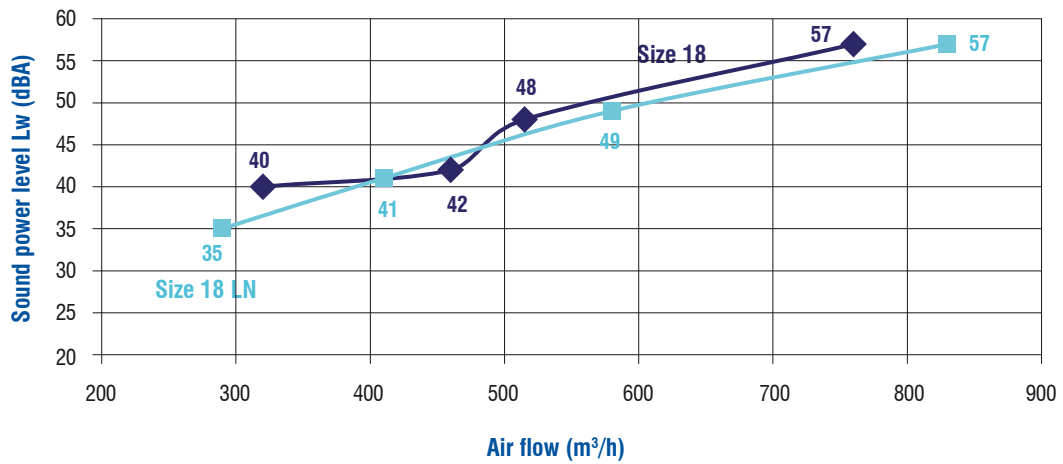
Sizes 9 and 9 LN



Sizes 12 and 12 LN



Sizes 18 and 18 LN



Technical Data

| MODELS | | 9 LN | | 12 LN | | 18 LN | | | | |
|---|-------------------|----------------------|------------|--------|-----------|------------|--------|-----------|------------|----|
| | | 2-pipe | 4-pipe | 2-pipe | 4-pipe | 2-pipe | 4-pipe | | | |
| Nominal cooling capacity (1) | W | 2300 | 2300 | 3500 | 3500 | 4600 | 4600 | | | |
| Nominal heating capacity (2) | W | 3270 | 2460 | 4700 | 3335 | 5700 | 4470 | | | |
| AIR FLOW | | | | | | | | | | |
| Treated air | | | | | | | | | | |
| - High speed | m ³ /h | 720 | 720 | 720 | 720 | 830 | 830 | | | |
| - Medium speed | m ³ /h | 450 | 450 | 450 | 450 | 580 | 580 | | | |
| - Low speed | m ³ /h | 330 | 330 | 330 | 330 | 410 | 410 | | | |
| - Super low speed | m ³ /h | - | - | - | - | 290 | 290 | | | |
| Nominal water flow | m ³ /h | 400 | 210 | 600 | 287 | 790 | 380 | | | |
| Water pressure drop (3) | kPa | 12 | 5 | 22 | 13 | 16 | 28 | | | |
| Nominal power supply | | 230 V / 1 ph / 50 Hz | | | | | | | | |
| Voltage range | V | 207 / 253 | | | | | | | | |
| SOUND POWER LEVELS (MEASURED ACCORDING TO ISO 9614 STANDARD) | | 9 LN | | | 12 LN | | | 18 LN | | |
| | | Lw global | Lp* global | NR | Lw global | Lp* global | NR | Lw global | Lp* global | NR |
| - Super low speed | dBA | - | - | - | - | - | - | 35 | 27 | 23 |
| - Low speed | dBA | 34 | 26 | 20 | 34 | 26 | 20 | 41 | 33 | 28 |
| - Medium speed | dBA | 40 | 32 | 27 | 40 | 32 | 27 | 49 | 41 | 35 |
| - High speed | dBA | 50 | 42 | 37 | 50 | 42 | 37 | 57 | 49 | 43 |
| DIMENSIONS | | | | | | | | | | |
| Casing (L x P x H) | mm | 571 x 571 x 287 | | | | | | | | |
| Grille (L x P x H) | mm | 625 x 625 x 40 | | | | | | | | |
| PACKING | | | | | | | | | | |
| Gross weight | kg | 26 | 27 | 28 | 28 | 29 | 29 | | | |
| Packed volume | m ³ | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | | | |

(1) Nominal conditions : Air : 27 °C/19 °C wet bulb (nominal air flow in high speed). Chilled water : 7 °C/12 °C.

(2) Nominal conditions :

- In 2-pipe configuration : air : 20 °C (nominal air flow in high speed); hot water : entering temperature 50 °C (nominal water flow obtained in cooling mode).
- In 4-pipe configuration : air : 20 °C (nominal air flow in high speed); hot water : 70 °C / 60 °C.

(3) Water pressure drops given for the corresponding nominal water flow on cassettes without control valves.

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

Electrical Data

| Models | | 9 LN - 2-pipe | | 12 LN - 2-pipe | | 18 LN - 2-pipe | |
|--------------------------|-----------------|---------------------|------------|----------------|------------|----------------|------------|
| | | With BE | Without BE | With BE | Without BE | With BE | Without BE |
| Nominal current | A | 6.7 | 0.3 | 8 | 0.3 | 10.8 | 0.4 |
| Fuse rating gG | A | 10 | 1 ** | 10 | 1 ** | 16 | 1 ** |
| Fuse rating ASE/VDE** | A | 16 | 2 | 16 | 2 | 16 | 2 |
| Power supply | | 230 V / 1 Ph / 50Hz | | | | | |
| Cable section* | mm ² | 3G1.5 | 3G1 | 3G2.5 | 3G1 | 3G2.5 | 3G1 |
| Electric heater capacity | W | 1500 | - | 1800 | - | 2400 | - |

| Models | | 9 LN - 4-pipe | | 12 LN - 4-pipe | | 18 LN - 4-pipe | |
|---------------------|-----------------|---------------------|------------|----------------|------------|----------------|------------|
| | | With BE | Without BE | With BE | Without BE | With BE | Without BE |
| Nominal current | A | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 |
| Fuse rating aM** | A | 1 | 1 | 1 | 1 | 1 | 1 |
| Fuse rating ASE/VDE | A | 2 | 2 | 2 | 2 | 2 | 2 |
| Power supply | | 230 V / 1 Ph / 50Hz | | | | | |
| Cable section* | mm ² | 3G1 | 3G1 | 3G1 | 3G1 | 3G1 | 3G1 |

BE : Electric heater.

* Minimum section to be adapted according to local regulations and norms.

** aM or circuit breaker curve C.

Fan motor electrical data

| Models | | 9 LN | | 12 LN | | 18 LN | |
|-----------|-----|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|
| | | Absorbed current (A) | Absorbed power (W) | Absorbed current (A) | Absorbed power (W) | Absorbed current (A) | Absorbed power (W) |
| Fan speed | SLS | - | - | - | - | 0.09 | 21 |
| | LS | 0.08 | 20 | 0.08 | 20 | 0.13 | 30 |
| | MS | 0.12 | 30 | 0.12 | 30 | 0.2 | 46 |
| | HS | 0.21 | 50 | 0.21 | 50 | 0.31 | 71 |

Thermal Performance

2-pipe system

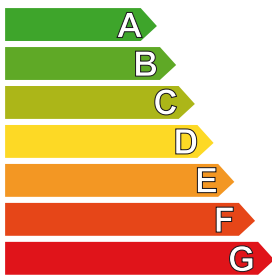
| Models | | 9 LN | | | 12 LN | | | 18 LN | | | | | |
|--------------|-------------------------------|---------------------|-----|------|-----------------|------|------|-----------------|------|------|------|------|------|
| | | Air flow (m³/h) | | | Air flow (m³/h) | | | Air flow (m³/h) | | | | | |
| | | LS | MS | HS | LS | MS | HS | SLS | LS | MS | HS | | |
| Water in/out | Entering air temperature / HR | | 330 | 450 | 720 | 330 | 450 | 720 | 290 | 410 | 580 | 830 | |
| 7°C / 12°C | 27°C / 47% | Total capacity | W | 1600 | 1900 | 2300 | 2400 | 2900 | 3500 | 2300 | 3000 | 3700 | 4600 |
| | | Sensible capacity | W | 1450 | 1760 | 2200 | 2040 | 2550 | 3100 | 1750 | 2300 | 2950 | 3850 |
| | | Water flow Qv | l/h | 280 | 330 | 400 | 420 | 500 | 600 | 400 | 520 | 640 | 790 |
| | | Water pressure drop | kPa | 6 | 9 | 12 | 10 | 17 | 22 | 5 | 8 | 11 | 16 |
| 50°C / Qv | 20°C | Heating capacity | W | 2230 | 2710 | 3270 | 2700 | 3700 | 4700 | 2700 | 3600 | 4600 | 5700 |
| | | Water pressure drop | kPa | 6 | 9 | 12 | 10 | 17 | 22 | 5 | 8 | 11 | 16 |

4-pipe system

| Models | | 9 LN | | | 12 LN | | | 18 LN | | | | | |
|--------------|-------------------------------|---------------------|-----|------|-----------------|------|------|-----------------|------|------|------|------|------|
| | | Air flow (m³/h) | | | Air flow (m³/h) | | | Air flow (m³/h) | | | | | |
| | | LS | MS | HS | LS | MS | HS | SLS | LS | MS | HS | | |
| Water in/out | Entering air temperature / HR | | 330 | 450 | 720 | 330 | 450 | 720 | 290 | 410 | 580 | 830 | |
| 7°C / 12°C | 27°C / 47% | Total capacity | W | 1600 | 1900 | 2300 | 2400 | 2900 | 3500 | 2300 | 3000 | 3700 | 4600 |
| | | Sensible capacity | W | 1450 | 1760 | 2200 | 2040 | 2550 | 3100 | 1750 | 2300 | 2950 | 3850 |
| | | Water flow | l/h | 280 | 330 | 400 | 420 | 500 | 600 | 400 | 520 | 640 | 790 |
| | | Water pressure drop | kPa | 6 | 9 | 12 | 10 | 17 | 22 | 5 | 8 | 11 | 16 |
| 70°C / 60°C | 20°C | Heating capacity | W | 1840 | 2070 | 2460 | 2380 | 2820 | 3335 | 2800 | 3430 | 3950 | 4470 |
| | | Water flow | l/h | 160 | 180 | 210 | 200 | 244 | 287 | 240 | 300 | 340 | 380 |
| | | Water pressure drop | kPa | 3 | 4 | 5 | 7 | 9 | 13 | 11 | 17 | 24 | 28 |

Energy class

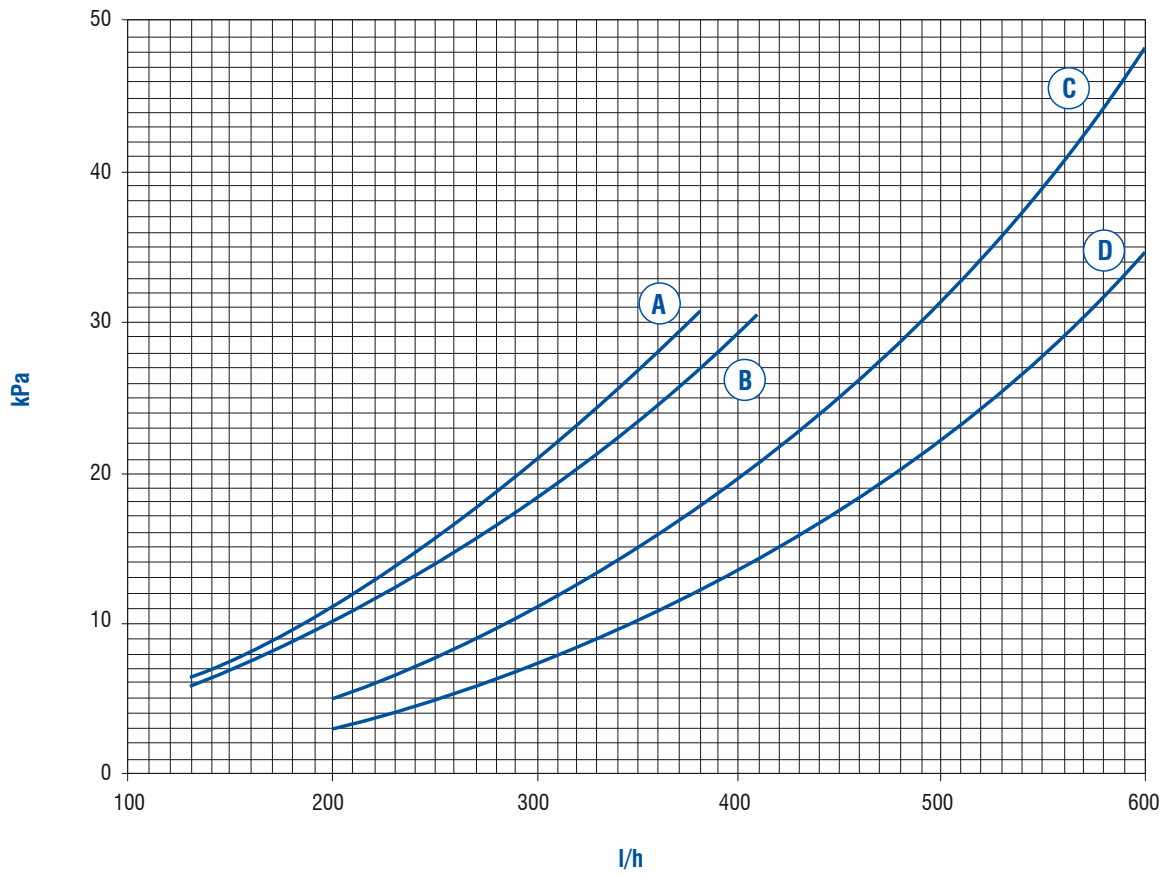
More efficient



| Models | 9 LN | Class | 12 LN | Classe | 18 LN | Class | |
|--------|--------|-------|-------|--------|-------|-------|---|
| FCEER | 2-pipe | 70 | D | 106 | C | 89 | C |
| | 4-pipe | 70 | D | 106 | C | 89 | C |
| FCCOP | 2-pipe | 100 | C | 127 | C | 110 | C |
| | 4-pipe | 80 | D | 106 | C | 100 | C |

Less efficient

Water Pressure Drops - Size 9 LN - 2-rows - 2 circuits



- Curve A** : Pressure drop of heating circuit with control valve (4-pipe system).
- Curve B** : Pressure drop of heating circuit without control valve (4-pipe system).
- Curve C** : Pressure drop of cooling circuit with control valve (2 and 4-pipe systems).
- Curve D** : Pressure drop of cooling circuit without control valve (2 and 4-pipe systems).

| T _{wm} (°C) / % Glycol | K : Glycol factor | | | | |
|---------------------------------|-------------------|-------|-------|------|------|
| | 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 |

T_{wm} : Average temperature of the mixture.

ΔP_{w0} : Pure water pressure drop.

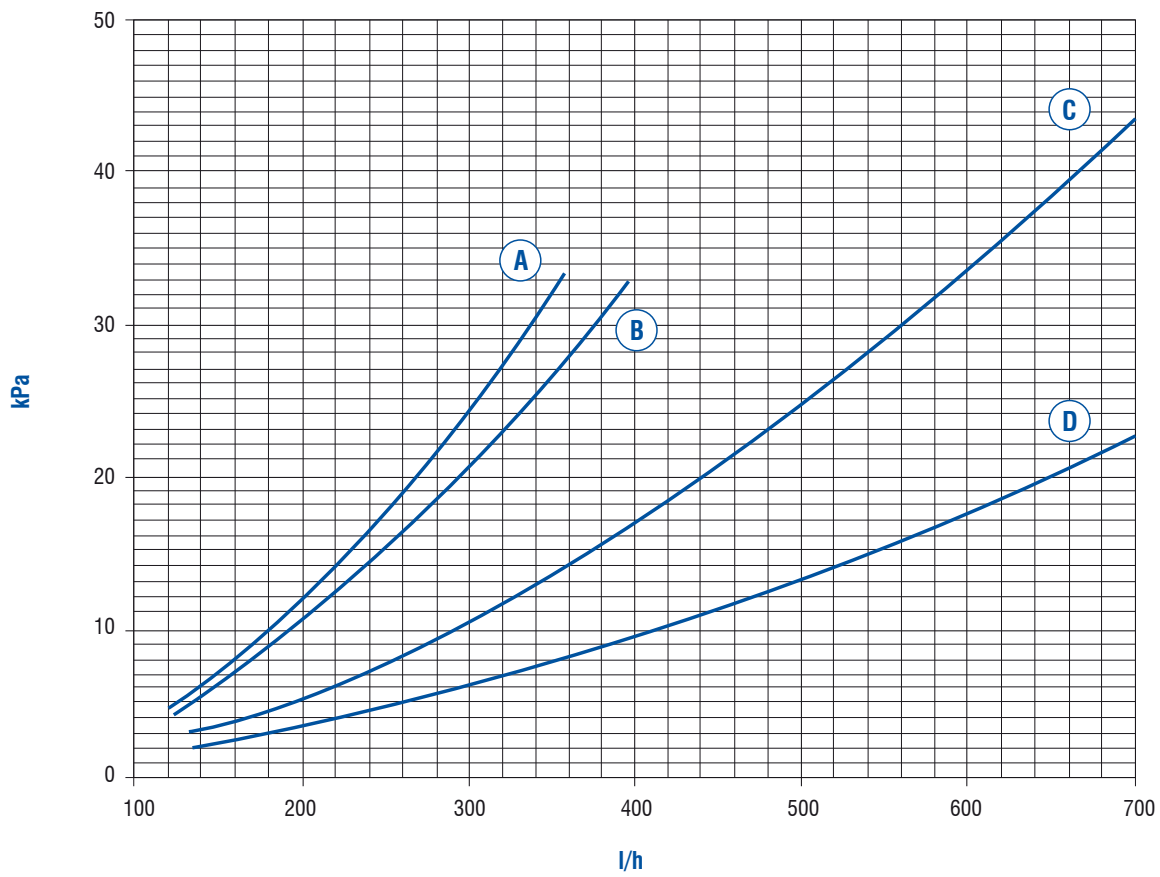
ΔP_w : Brine water pressure drop.

ΔP_w : K x ΔP_{w0}.

| T _{se} (°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 |

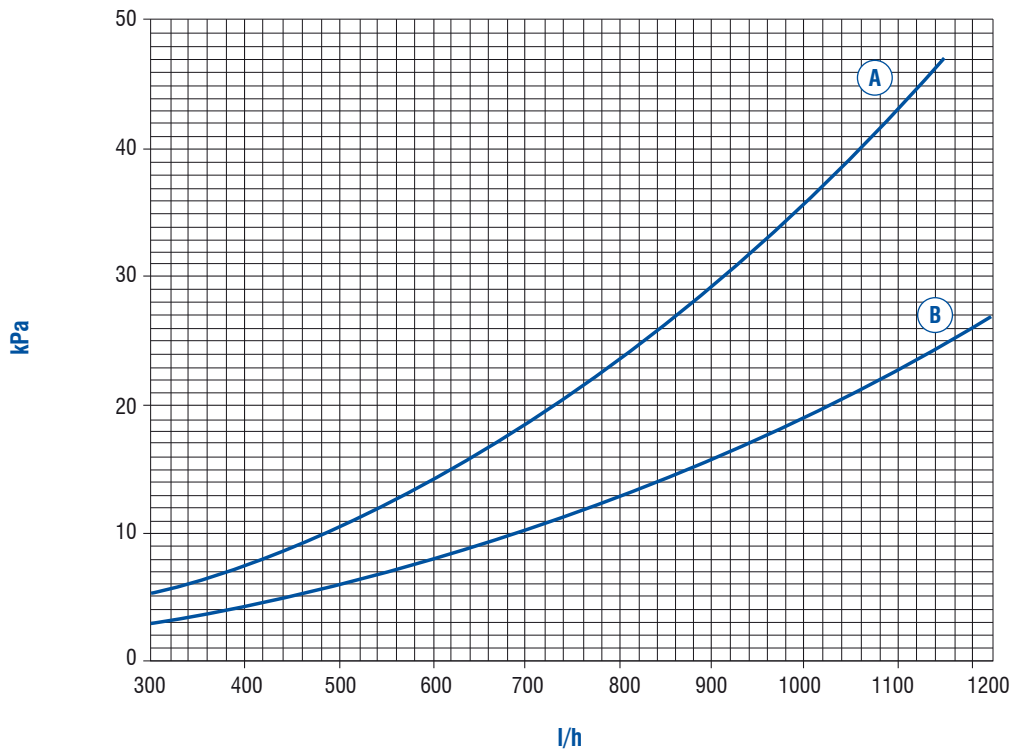
T_{se} : Outdoor dry bulb temperature.

Water Pressure Drops - Size 12 LN - 2-rows - 3 circuits



- Curve A** : Pressure drop of heating circuit with control valve (4-pipe system).
- Curve B** : Pressure drop of heating circuit without control valve (4-pipe system).
- Curve C** : Pressure drop of cooling circuit with control valve (2 and 4-pipe systems).
- Curve D** : Pressure drop of cooling circuit without control valve (2 and 4-pipe systems).

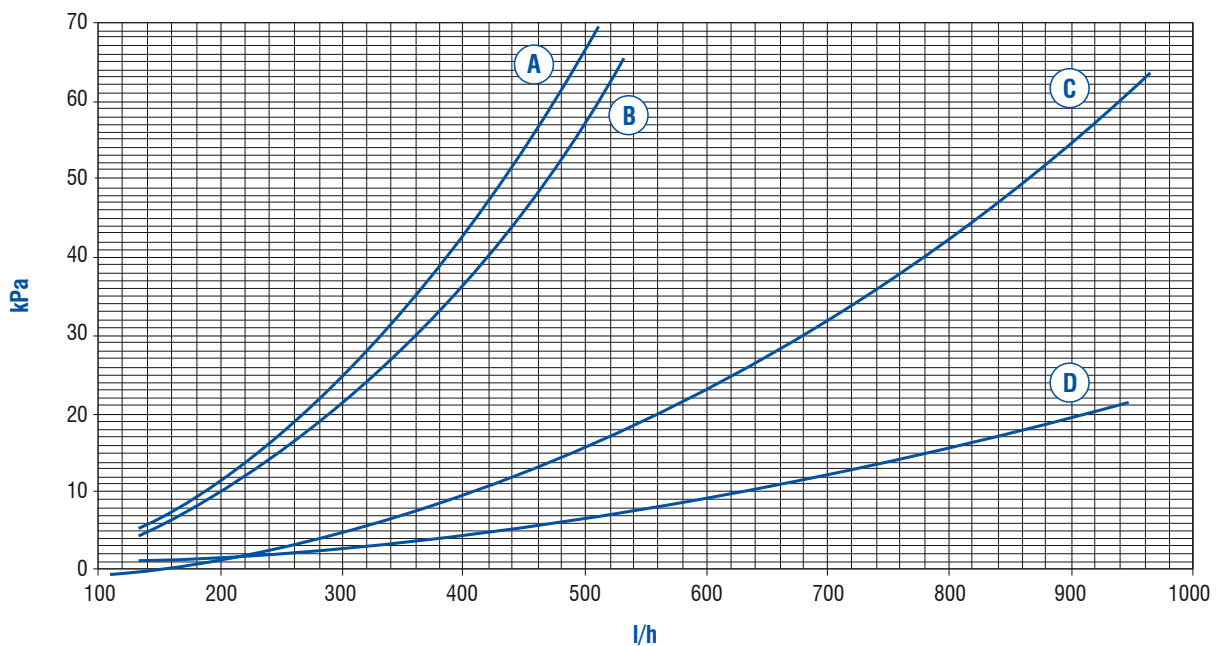
Water Pressure Drops - Size 18 LN - 3-rows - 4 circuits - 2-pipe system



Curve A : Pressure drop of heating/cooling circuit with control valve.

Curve B : Pressure drop of heating/cooling circuit without control valve.

Water Pressure Drops - Size 18 LN - 3-rows - 4 circuits - 4-pipe system



Curve A : Pressure drop of heating circuit with control valve.

Curve C : Pressure drop of cooling circuit with control valve.

Curve B : Pressure drop of heating circuit without control valve.

Curve D : Pressure drop of cooling circuit without control valve.

Operating Limits

Use of chilled water

| Lower limits | | | |
|--------------------|----|-----|----|
| Indoor temperature | °C | Thi | 13 |
| | | Tsi | 17 |
| Water temperature | °C | Twe | 3 |
| Higher limits | | | |
| Indoor temperature | °C | Thi | 22 |
| | | Tsi | 32 |
| Water temperature | °C | Twe | 18 |

Thi : Indoor wet bulb temperature.
Tsi : Indoor dry bulb temperature.

Twe : Entering water temperature.

Use of hot water

| | | | |
|------------------------------------|----|-----|--------------------------|
| Maximum indoor temperature | °C | Thi | 22 |
| | | Tsi | 32 |
| Maximum entering water temperature | °C | Twe | 70 (1) (2) |

Thi : Indoor wet bulb temperature.
Tsi : Indoor dry bulb temperature.

Twe : Entering water temperature for 2 or 4-pipe systems.

(1) : For reversible 2-pipe system with extra electric heater energized, maximum Twe is 35 °C.

(2) : For applications with water temperature higher than 70 °C, consult factory.

Water connections

| Models | | 9 LN | 12 LN | 18 LN |
|----------------------------|-----|---------------|---------------|--|
| Contents | l | 1.3 | 1.3 | 2 |
| Maximum operating pressure | bar | 15 | 15 | 15 |
| Test pressure | bar | 24 | 24 | 24 |
| Couplings (2-pipe system) | Ø | 1/2" gas male | 1/2" gas male | 3/4" gas male |
| | mm | 15-21 male | 15-21 male | 20-27 male |
| Couplings (4-pipe system) | Ø | 1/2" gas male | 1/2" gas male | 1/2" gas male (heating) 3/4" gas male (cooling) |
| | mm | 15 - 21 male | 15 - 21 male | 15 - 21 male (heating) 20 - 27 male (cooling) |

Fresh air intake

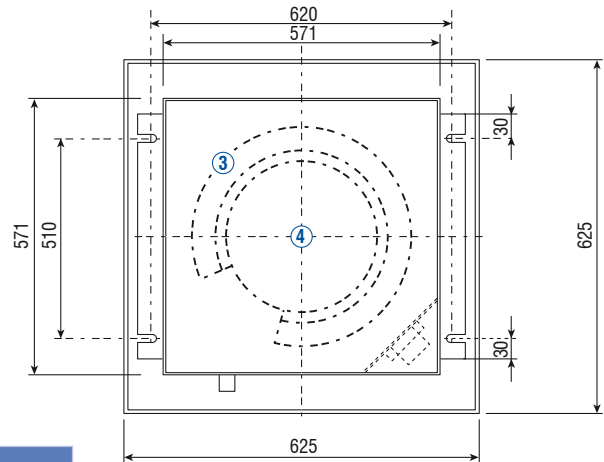
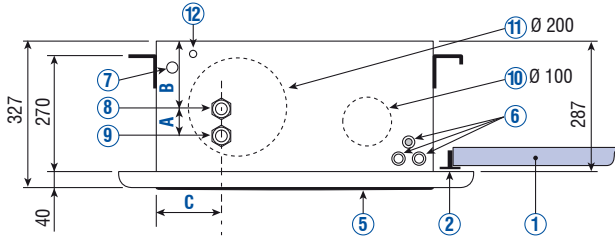
Fresh air flow should not exceed 12 % of nominal air flow (see table below).

An antifreeze thermostat, switching off the external fan at +5 °C, must be used on fresh air intake during winter period.

A filter, fan and insulated air duct are to be provided on site.

| Models | | 9 LN | 12 LN | 18 LN |
|--------------------------------|-------------------|------|-------|-------|
| Nominal air flow in high speed | m ³ /h | 720 | 720 | 830 |
| Maximum fresh air flow | m ³ /h | 85 | 85 | 100 |

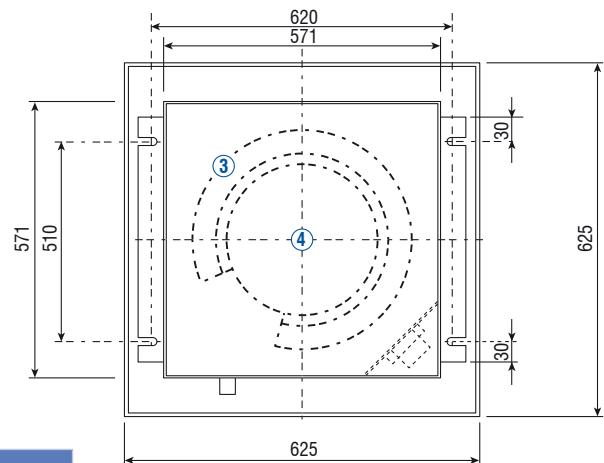
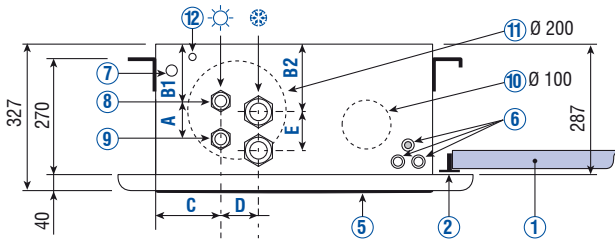
Dimensional Data (mm) - 2-pipe Cassettes



| LEGEND | | | |
|--------|------------------------------|----|---|
| 1 | False ceiling | 7 | Condensate drain (Ø15) |
| 2 | T-shaped rod (false ceiling) | 8 | Water leaving gas male coupling (refer to table "water connections") |
| 3 | Coil | 9 | Water entering gas male coupling (refer to table "water connections") |
| 4 | Fan | 10 | Fresh air intake |
| 5 | Suction grille | 11 | Opening for air diffusion through a duct into the adjacent room (pre-punched) |
| 6 | Electrical connection | 12 | Air vent |

| Sizes | 9 LN 2-pipe | 12 LN 2-pipe | 18 LN 2-pipe |
|-------|-------------|--------------|--------------|
| A | 39 | 39 | 50 |
| B | 119 | 119 | 130 |
| C | 126.5 | 126.5 | 106.5 |

Dimensional Data (mm) - 4-pipe Cassettes



| LEGEND | | | |
|--------|------------------------------|----|---|
| 1 | False ceiling | 7 | Condensate drain (Ø15) |
| 2 | T-shaped rod (false ceiling) | 8 | Water leaving gas male coupling (refer to table "water connections") |
| 3 | Coil | 9 | Water entering gas male coupling (refer to table "water connections") |
| 4 | Fan | 10 | Fresh air intake |
| 5 | Suction grille | 11 | Opening for air diffusion through a duct into the adjacent room (pre-punched) |
| 6 | Electrical connection | 12 | Chilled water air vent |

| Sizes | 9 LN 4-pipe | 12 LN 4-pipe | 18 LN 4-pipe |
|-------|-------------|--------------|--------------|
| A | 39 | 39 | 39 |
| B1 | 119 | 119 | 130 |
| B2 | 119 | 119 | 132 |
| C | 76.5 | 76.5 | 85.5 |
| D | 50 | 50 | 50 |
| E | 39 | 39 | 50 |

■ Computer chilled water cassettes selection by SELECT'IT software

To provide optimal chilled water cassette unit selection, we supplies computer selection capability. The SELECT'IT selection program will select the most economical unit size to meet the specification.

To operate the SELECT'IT software, the user needs a microcomputer using Windows : XP, Vista or Seven.

Contact your nearest representative for a copy of SELECT'IT software or for a unit selection that meets the most exacting specifications.



Ref. : EDM KOG1-A.5GB/10.11 - Supersedes : EDM KOG1-A.4GB/06.09

As part of our ongoing product improvement programme, our products are subject to change without prior notice. Non contractual photos.



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