

series

VFK



Active Chilled Beams

VFK 600 Model

Two-Way Air Supply

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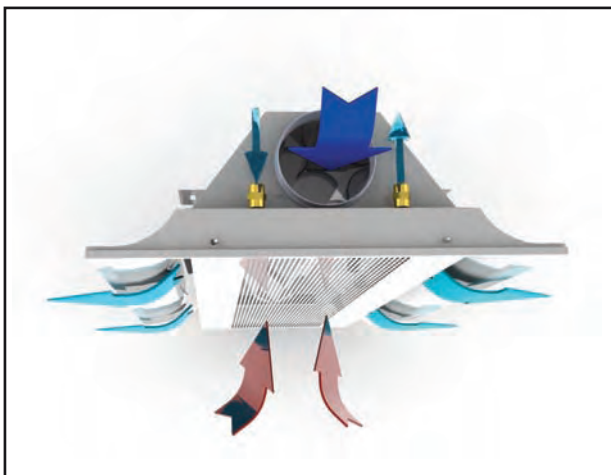
General Features



VFK 600 Active Chilled Beam, lateral primary air connection



VFK 600 Active Chilled Beam, interior



Detailed view of operating principle

Description

The VFK ceiling-mounted induction terminal units (also known as active chilled beams) for two-way air diffusion are used in air-water systems to provide a high level of comfort in interior environments with high internal thermal loads in cooling operation. The units include the following components:

- Primary air plenum, with one or two round duct connections for primary air supply and a distribution of small nozzles with different special designs.
- Hot or chilled water (two-tube installation) or hot and chilled water (four-tube installation) coil.
- Linear slot diffusers, for supply and diffusion of the primary air and induced air mixture of the room.
- Hinged perforated front rack, used for access for unit cleaning. Available in different perforation designs.
- Nozzle control mechanism, to configure different air discharge patterns in the nozzles.
- Integrated air deflectors in the linear slot diffusers, for the purpose of combining different air jet orientations.

As it exits the nozzles, the primary air entrains an air volume of the room (which we will call secondary) that flows through the coil, cooling and/or heating, as applicable, and is mixed with the primary air inside the beam before it is supplied to the room through the diffusers.

As in all air-water air conditioning systems, choosing an active chilled beam has the advantage of using water as a vehicle to carry the cooling or heating power to the rooms, which saves on energy and space compared to all-air A/C systems. In addition, the temperature of each room or independent area can be controlled by adding a 2- or 3-way valve to the terminal unit controlled by the respective ambient control.

Materials

The outer and inner housings, nozzle plate and induction grille are of galvanised steel sheet construction and have a standard powder-paint finish of RAL 9010. Other RAL colours are available upon request. The unit is manufactured of copper pipes and aluminium fins.

General Features



Air flow tests in R&D-Innovation laboratory



VFK 600 Chilled Beam Installation

Applications

The induction air diffusion terminal units are suitable for HVAC of various kinds of premises, such as:

- Office buildings
- Hospitals
- Hotels
- Bank offices
- Etc.

Eurovent certification

We participate in the Eurovent Chilled Beam Certification Programme. The VFK 600 model has Certification No. 11.01.509 and may be viewed on the Eurovent website.

Advantages

The VFK 600 ceiling-mounted induction units are terminal units for central air conditioning installations that provide solutions to meet the needs of the following:

- Ventilation achieved with primary air
- Cooling, based on the primary air itself and the water circulation coil
- Heating, based on a water circulation unit
- Control. Possibility of individual or combined unit control by room or area, using control and regulation valves in the unit to adjust the water volume and ambient thermostats
- Air diffusion based on two linear slot diffusers that ensure proper air diffusion.

In addition to the functional advantages described, the VFK 600 units have the following main advantages over conventional HVAC systems (fan coils, VRV, all air, etc.):

- High energy efficiency and low life-cycle or operating costs; this advantage is mainly due to the absence of a fan in the terminal unit
- Lowest maintenance costs; the unit contains no filter or condensate pan to replace or clean and only cleaning of the unit surface is needed (recommended every 2 years)
- Low noise level
- No air draughts in occupied area
- Extremely hygienic systems, since no filters and condensate pans are used
- Space-saving: smaller air ductwork and equipment units
- Easy to mount
- Adaptation to all types of false ceilings and sections

Dimensions. Configurations

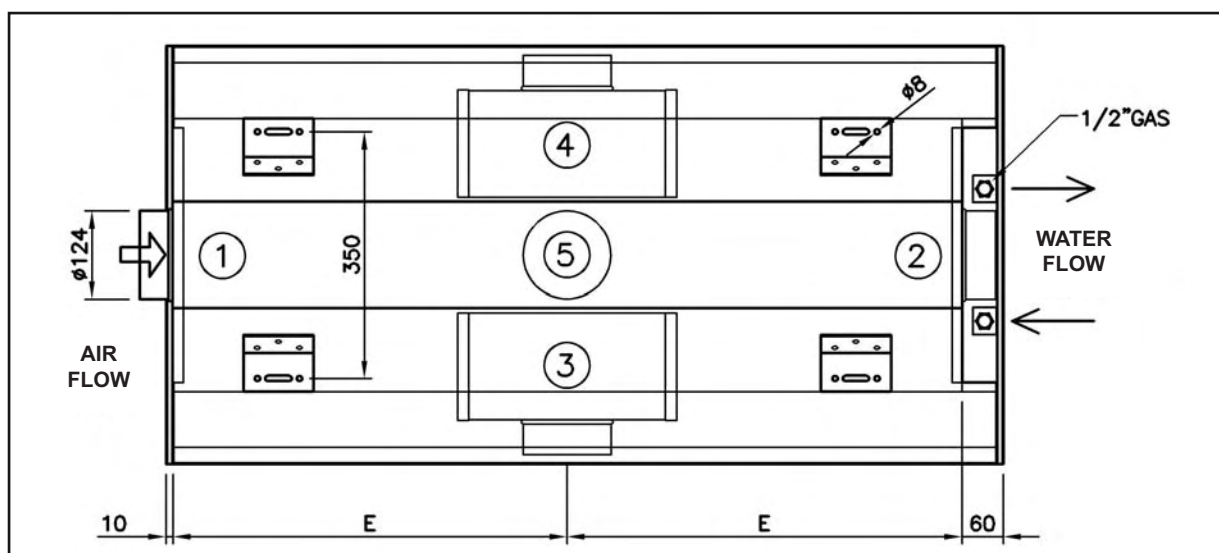
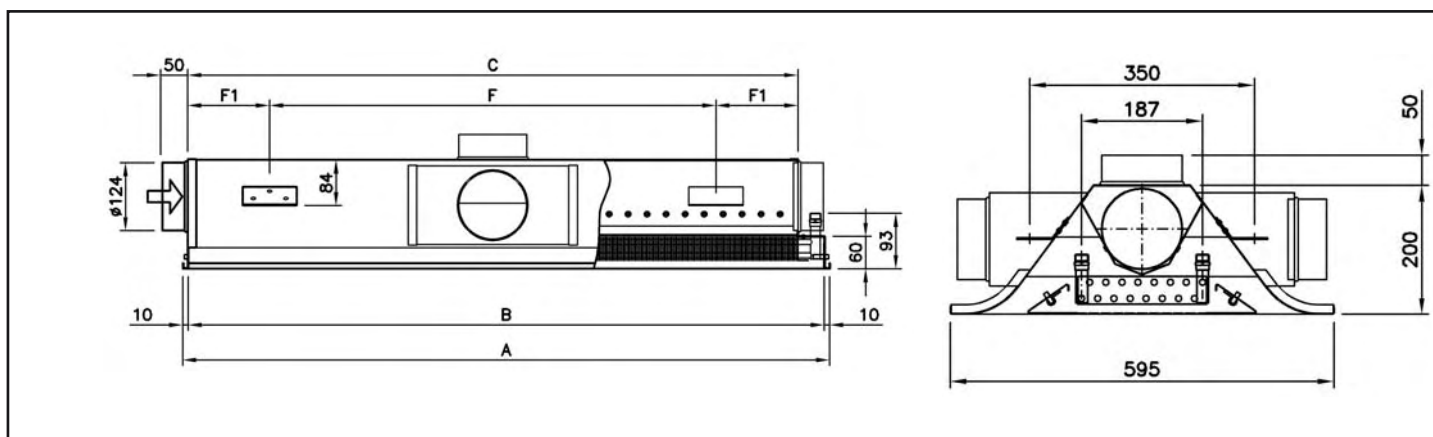
VFK 600 Model

Sizes 600 to 1800 - 2-tube system (for 4-tube system connections, refer to page 6)

Five types of configurations are available, defined according to the position of the primary air connection with regard to the water connections (with the water connection viewed from the front), namely:

1. Front face primary air connection, on opposite side to water connections, (-F) type
2. Rear face primary air connection, on same side as water connections, (-FT) type
3. Lateral primary air connection on left side, (-LI) type
4. Lateral primary air connection on right side, (-LD) type
5. Primary air connection at top, (-S) type

The 600 to 1800 sizes are manufactured with **one** primary air connection inlet.



| Size | A | B | C | E | F | F1 |
|------|------|------|------|-----|------|-----|
| 600 | 592 | 572 | 522 | 261 | 392 | 65 |
| 900 | 892 | 872 | 822 | 411 | 522 | 150 |
| 1200 | 1192 | 1172 | 1122 | 561 | 822 | |
| 1500 | 1492 | 1472 | 1422 | 711 | 1122 | |
| 1800 | 1792 | 1772 | 1722 | 861 | 1422 | |

| Size | Front inlet | Lateral inlet |
|------|-------------|---------------|
| | Weight (kg) | Weight (kg) |
| 600 | 10 | 11 |
| 900 | 13 | 14 |
| 1200 | 20 | 21 |
| 1500 | 23 | 24 |
| 1800 | 26 | 27 |

The beam width measurement (595) listed corresponds to the ceiling-mounted design using a T-section with a width of 25 mm. For installations in other types of ceilings, see page 7.

Dimensions. Configurations

VFK 600 Model

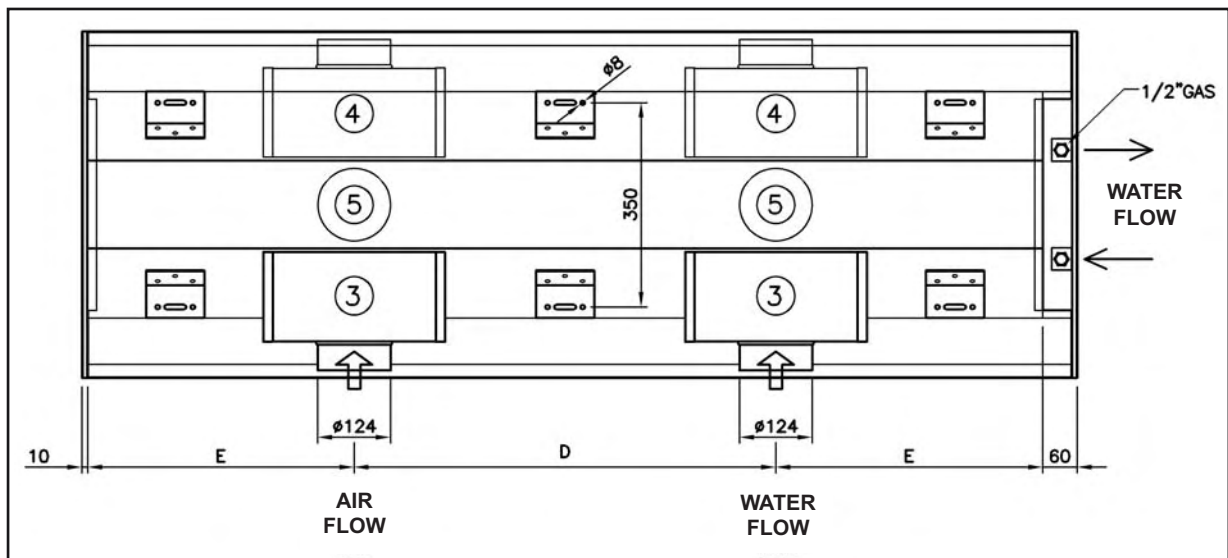
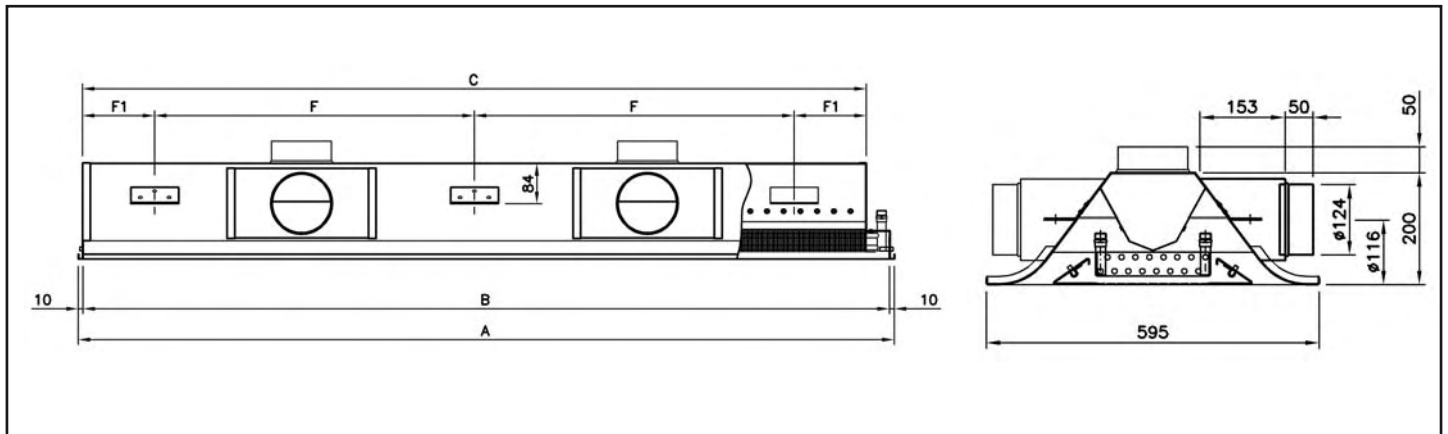
Sizes 2100 to 3000 - 2-tube system (for 4-tube system connections, refer to page 6)

Three types of configurations are available, defined according to the location of the primary air connection with regard to the water connections (with the water connection viewed from the front), namely:

3. Lateral primary air connections on left, (-LI) type
4. Lateral primary air connections on right, (-LD) type
5. Primary air connections at top, (-S) type

Sizes 2100 to 3000 are manufactured with **two** LI or LD or S primary air connection inlets.

Front air connection available for flow rates 50 L/s. For technical information, please contact our Sales Department.



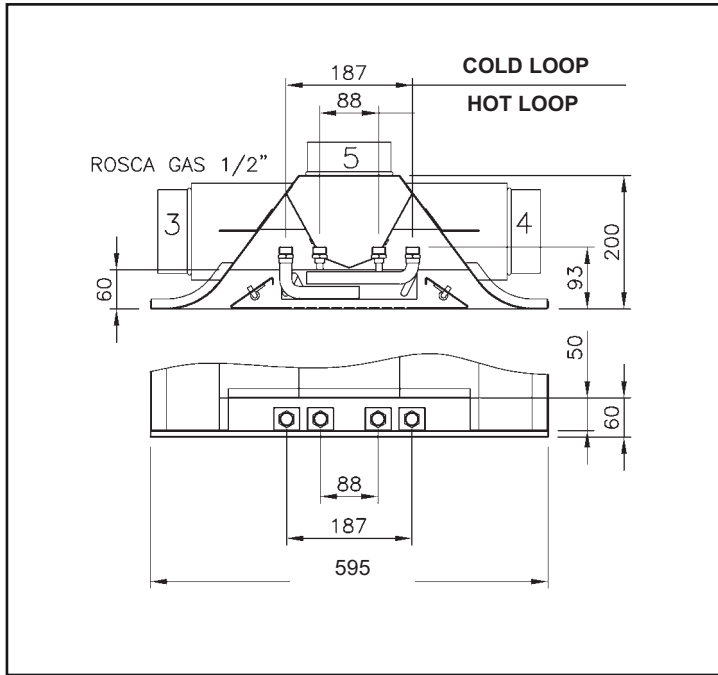
| Size | A | B | C | D | E | F | F1 |
|------|------|------|------|------|-----|------|-----|
| 2100 | 2092 | 2072 | 2022 | 1011 | 506 | 861 | 150 |
| 2400 | 2392 | 2372 | 2322 | 1161 | 581 | 1011 | |
| 2700 | 2692 | 2672 | 2622 | 1311 | 656 | 1161 | |
| 3000 | 2992 | 2972 | 2922 | 1461 | 731 | 1311 | |

| Size | Front inlet | Lateral inlet |
|------|-------------|---------------|
| | Weight (kg) | Weight (kg) |
| 2100 | 34 | 35 |
| 2400 | 41 | 41 |
| 2700 | 45 | 46 |
| 3000 | 48 | 49 |

The beam width measurement (595) listed corresponds to the ceiling-based design using a T-section with a width of 25 mm. For installations in other types of ceilings, see page 7.

Dimensions. Configurations

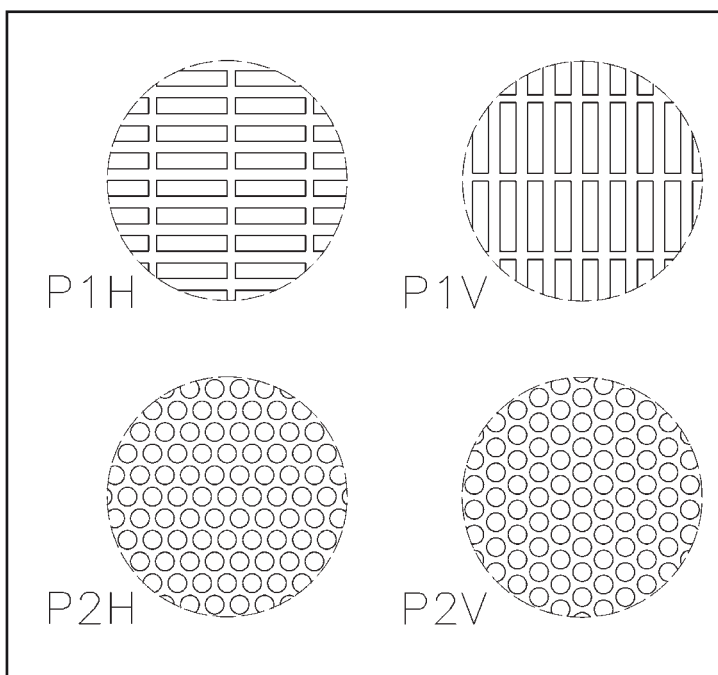
4-TUBE SYSTEM. VFK 600 MODEL



Same identification criterion for primary air connections as in a 2-tube system, except that this system does not include the rear face configuration (-FT), i.e., on the same side as the water connections

PERFORATED INDUCTION RACK DESIGNS

The following front induction rack designs are available for standard projects, when the order is placed:



- *P1H* Rectangular perforations along the length of the beam

- *P1V* Rectangular perforations along the width of the beam

- *P2H* Round perforations distributed continuously along the width of the beam

- *P2V* Round perforations distributed continuously along the length of the beam.

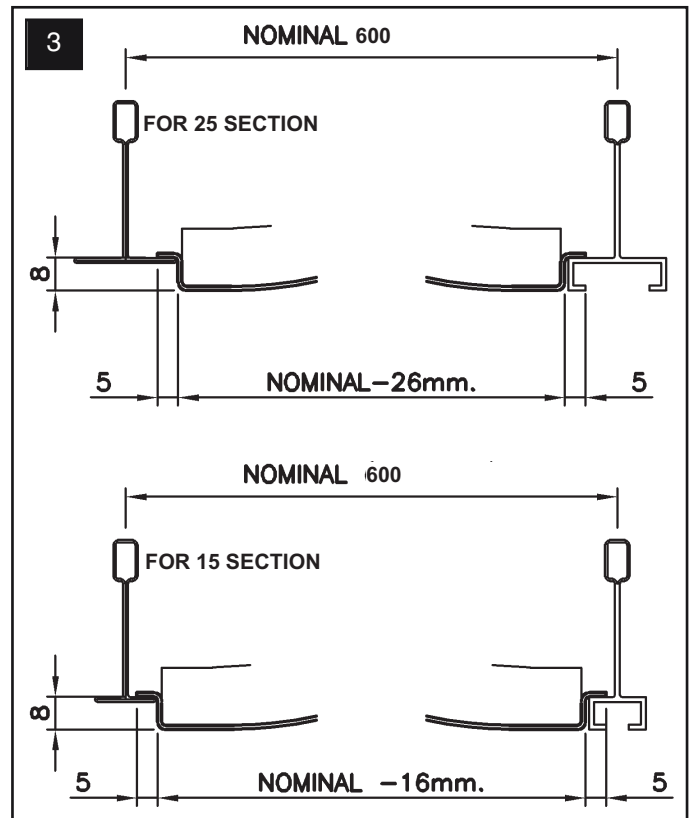
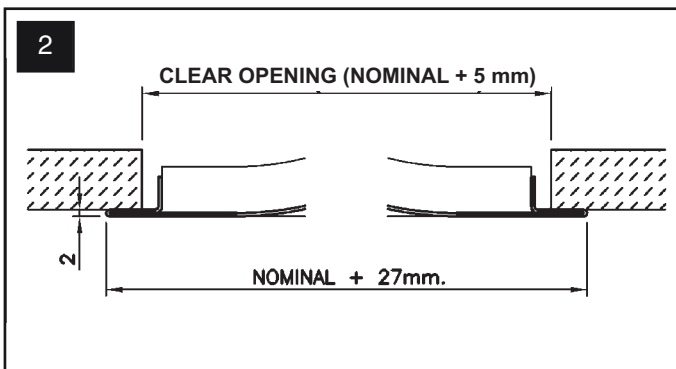
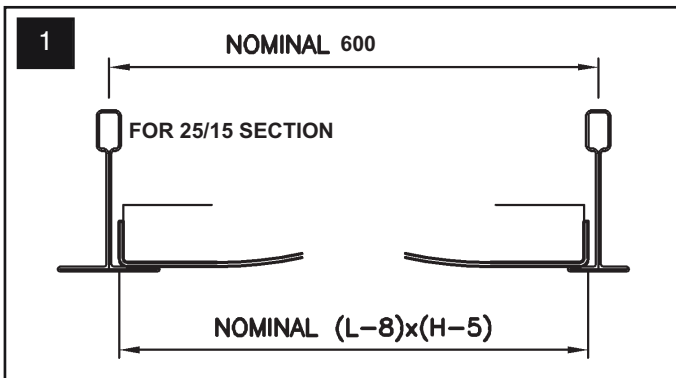
By special order, the unit can be manufactured with other perforation designs.

Installation

- Chilled beam designs for different types of ceilings

All VFK beam sizes are made to be installed in different kinds of false ceilings. The most common are listed below:

- Ceiling with T-support section with a width of 25 and 15 mm (1)
- Continuous or plaster ceiling (2)
- Ceiling for offset rack, with beam hanging (3)

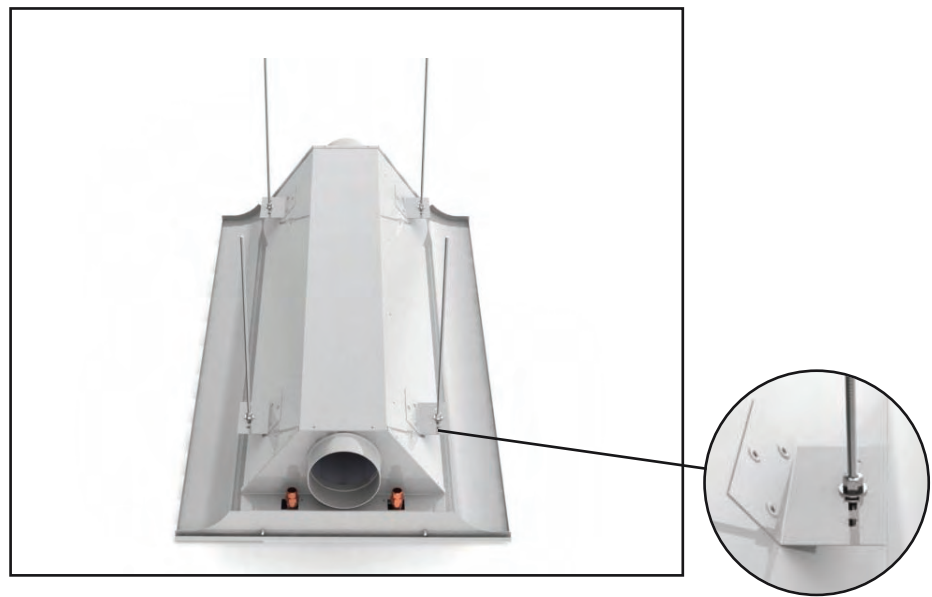


Installation

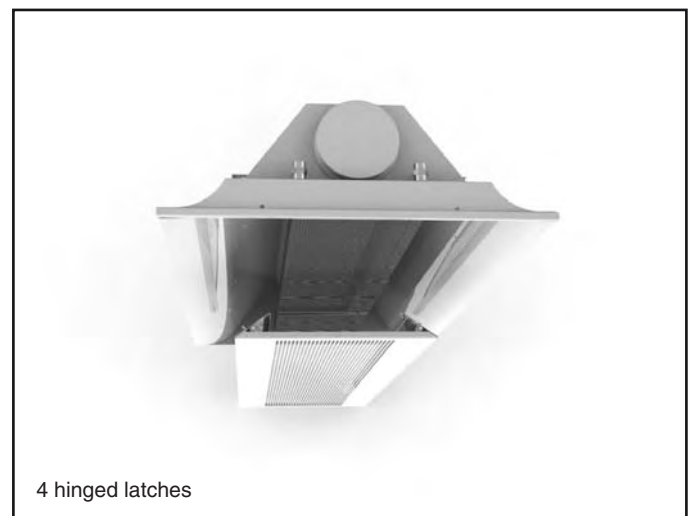
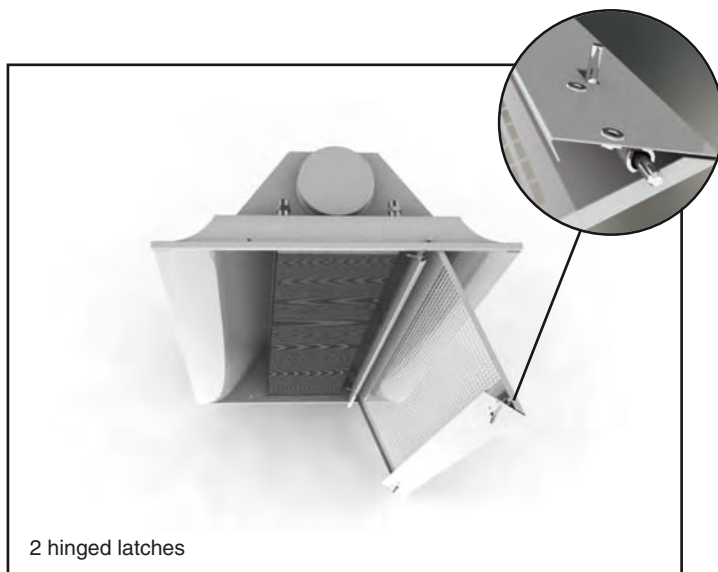
- Fastening

The VFK 600 units include a series of hanging brackets on the two upper longitudinal sides of the beams, as shown in the following photographs. There are two brackets per side in sizes 600 to 1800 and three in sizes 2100 to 3000.

These brackets have a slot hole to hold a $\varnothing 6$ mm threaded rod, which is first attached to the room top slab to hang the unit.



Access rack

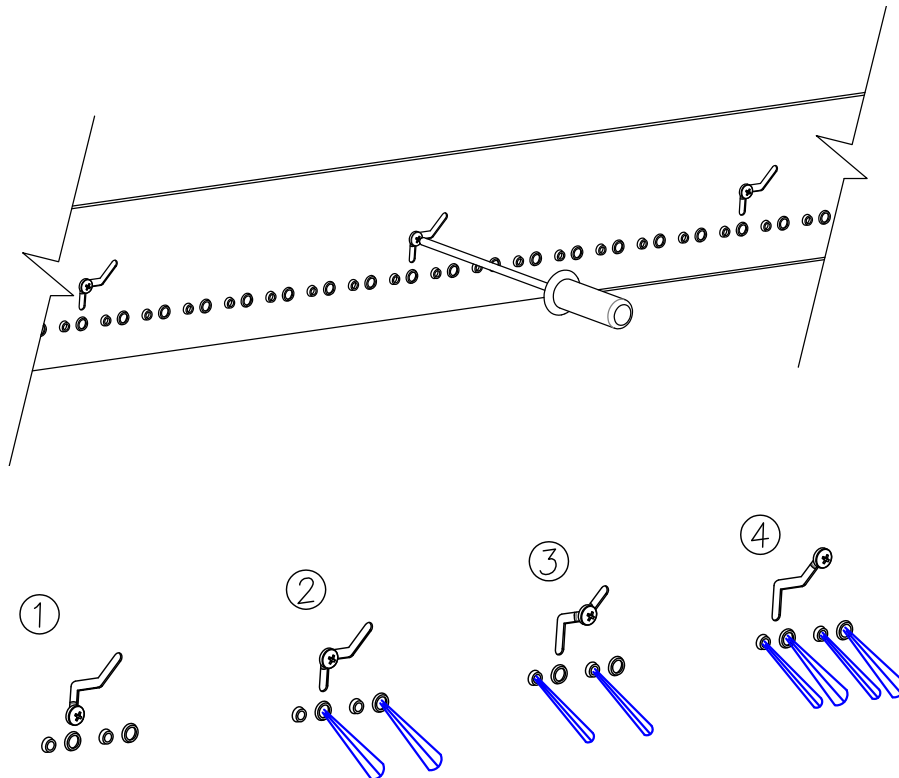


The induction grille or front perforated rack can swing 90° by operating small latches on the side of the rack or by complete removal using the locks. This provides access to the interior of the chilled beam to clean the inner surfaces of the unit and to adjust the nozzles.

Nozzle Control Mechanism

As an optional accessory, the unit can include a nozzle regulation mechanism (-SR). In this case, the chilled beams would be fitted with the two nozzle types or sizes, in which different air discharge configurations can be combined, making the installation highly flexible and able to adapt to various changes, situations or applications. The system allows the following nozzle configurations or types:

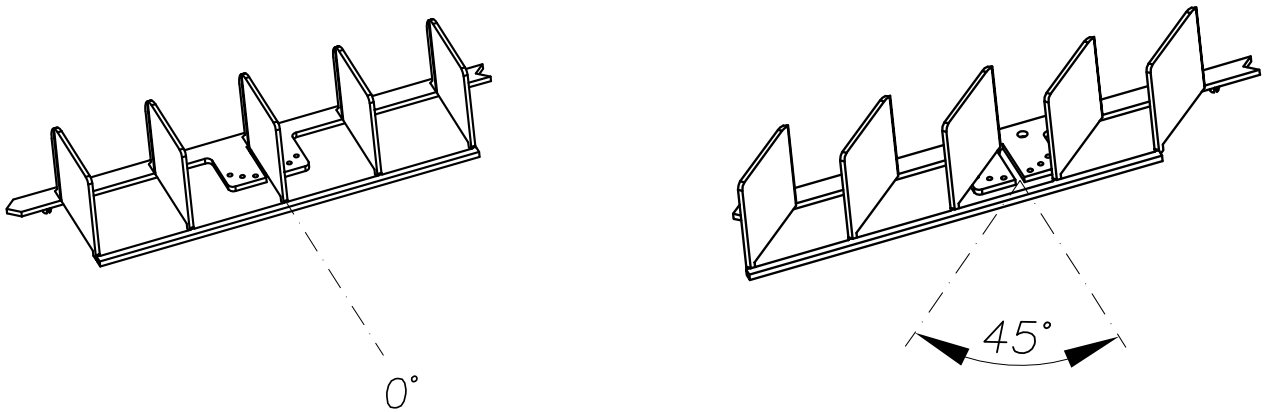
- **Position 1:** Closure of all nozzles prevents the air from flowing out in one or two directions of the chilled beam
- **Position 2:** M-type large nozzle opening, to move medium air volumes, obtaining an intermediate induction factor
- **Position 3:** P-type small nozzle opening, to move small air volumes, but also obtaining a higher induction factor
- **Position 4:** G type-location, opening of both nozzle types to move large air volumes



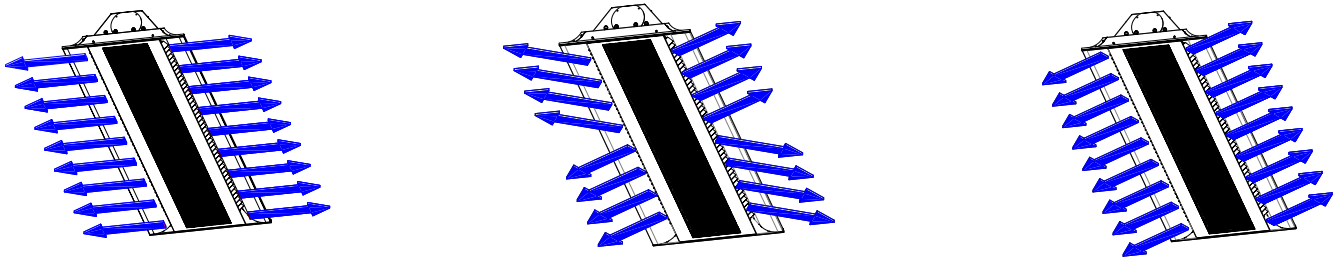
To access the operating mechanism of the regulation mechanism, the front rack should first be swung back and a Phillips screwdriver used to loosen all the screws in the strip, and then slide along the slot to the position at the desired point.

Air Deflectors

As an optional accessory, the VFK 600 chilled beams can be fitted with air deflector slats (-DF) manufactured of M1 plastic, longitudinally built into the diffusers. By modifying the position, the air jet can be aimed in different directions, making it a highly flexible unit to adapt to different situations in the installation. This makes it possible to handle obstacles, to broaden the width of the air jet and to slow the velocity of the jet over a specific throw, in short, to ensure an environment free of air currents. Several applications are shown below in the following figures:



Air deflector design. This allows the air jet to be oriented in 1 of 4 deflection angles (0-15-30-45°).



Examples of diffusion in different directions



Laboratory test. V-shaped air jet orientation



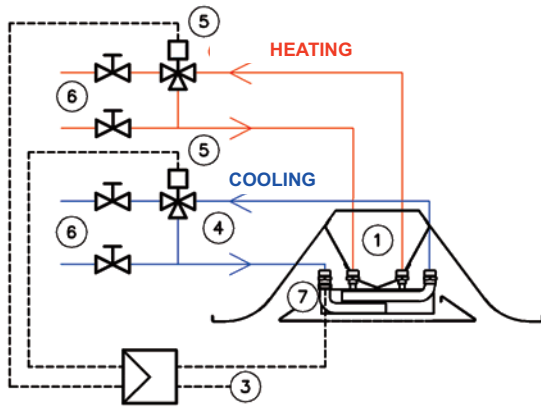
Laboratory test. 45° deviation of the air jet

Volume Regulation and Control Components

- Water

According to the system used, type of control, electrical installation, etc., the usual control and regulation components per chilled beam or groups of units of the water system are the following:

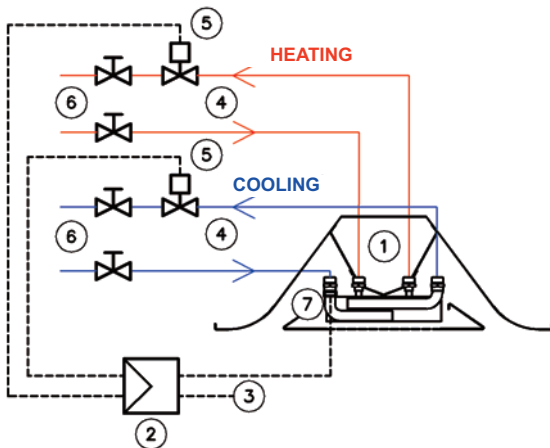
Constant water flow rate system



Basic diagram of 4-tube installation for constant water flow rate

1. Active chilled beam
2. Ambient compact controller or regulator (on-site installation) Can be individual or integrated in a centralised regulation system.
3. Ambient temperature sensor (usually integrated with the controller)
4. 3-way valve
5. Electrical servo drive of the 3-way valve (on-off, 3 points, 0-10 VDC proportional, electro-thermal operation). 24 V or 230 V power based on the type of actuator.
6. Cut-off valve. Depending on the water grid, a balancing or other type of valve will be necessary.
7. Dew point detector (condensation protection sensor)

Variable water flow rate system



Basic diagram of 4-tube installation for variable water flow rate

1. Active chilled beam
2. Ambient compact controller or regulator (on-site installation). Can be individual or integrated in a centralised regulation system.
3. Ambient temperature sensor (usually integrated with the controller)
4. 2-way valve (possibility of thermostatic valves; do not include actuator or electric power)
5. Electrical servo drive of the 2-way valve (on-off, 3 points, 0-10 VDC proportional, electro-thermal operation). 24 V or 230 V power based on the type of actuator.
6. Cut-off valve. Depending on the water grid, a balancing or other type of valve will be necessary.
7. Dew point detector (condensation protection sensor).

Volume Regulation and Control Components



Mechanical constant air flow self-regulator, KCR model



Manual volume control damper, CRR-M model

- Air Control

Usually, the constant flow system is used most often to distribute primary air to the induction terminal units. To ensure that the installation is correctly balanced, an extremely important aspect for proper operation of the active chilled beam, Mech-Elec KRC or RVC mechanical self-regulators are used because they ensure self-balancing of the installation. CRR-M manual volume control dampers can be selected but require manual balancing of the installation using a damper.

Ductwork pressure dampers (RVV) can be used to ensure the specific inlet pressure in each beam.

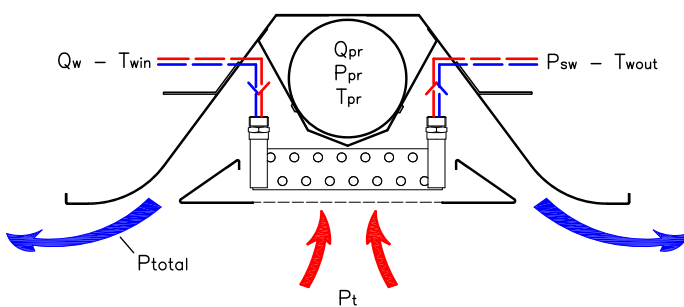
If a variable air flow system based on occupancy, for example, is designed, then the minimum design flow rate per unit should correspond to a minimum inlet pressure of approximately 40 Pa to the beam.

Technical Data

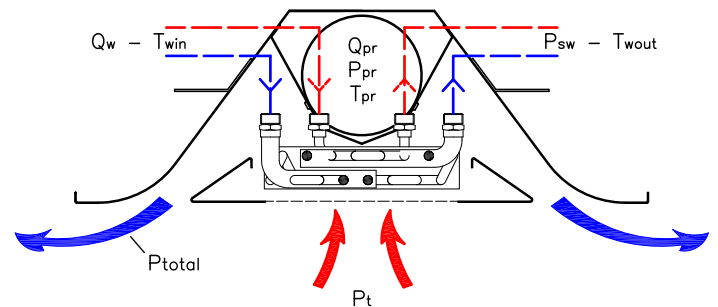
Symbols

The symbols used in the selection tables on page 14 to 25 for the VFK 600 chilled beam are the following:

| | |
|-------------------|---|
| Q_{pr} | Primary air flow |
| L_w -dB(A) | Sound power level, in dB(A) |
| ΔP_{pr} | Primary air pressure drop, in Pa |
| T_{pr} | Primary air temperature, in °C |
| T_R | Room air temperature, in °C |
| ΔT_{pr} | Temperature difference between room air and primary air ($T_R - T_{pr}$) |
| Q_w | Water flow rate, in L/h |
| ΔP_w | Water pressure drop in the coil, in kPa |
| T_{win} | Water inlet temperature in the coil, in °C |
| ΔT_w | Water temperature difference in the coil |
| ΔT_{swin} | Temperature difference between room and unit water inlet |
| P_{pr} | Power supplied by primary air, in W |
| P_{sw} | Power supplied by the coil, in W |
| P_T | Total power $P_{pr} + P_{sw}$, in W |
| X | Throw of the air jet, in m, for a maximum velocity of 0.25 m/s in the occupied area, installation height of 3 m and $\Delta T = 0^\circ\text{C}$ (supply - ambient) |



2-tube system



4-tube system

Technical Data. Selection Tables

COOLING - 2-TUBE SYSTEM - P-TYPE NOZZLE

Reference water flow (Q_W) of 250 L/h

For other water flow rates, correct the unit power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 2-TUBE COOLING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for unit | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - P NOZZLE - 2-TUBE SYSTEM - COOLING | | | | | | | | | | | | | | | | | |
|--|----------|------|----------------|-------------------------|----------|---------------------|-----|-----|-----|-----|-----------------------|------|------|------|------|------|-----------------------|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_W (kPa) |
| | l/s | m³/h | | | | 6 | 7 | 8 | 9 | 10 | 6 | 7 | 8 | 9 | 10 | 12 | |
| | | | | | | | | | | | | | | | | | |
| 600 | 4,4 | 16 | <20 | 64 | 0,9 | 32 | 37 | 42 | 48 | 53 | 152 | 172 | 202 | 227 | 256 | 309 | 2,0 |
| | 5,3 | 19 | 20 | 90 | 1,0 | 38 | 44 | 50 | 57 | 63 | 173 | 196 | 231 | 259 | 292 | 351 | |
| | 6,7 | 24 | 24 | 144 | 1,3 | 48 | 56 | 64 | 72 | 80 | 205 | 234 | 275 | 308 | 346 | 416 | |
| | 8,9 | 32 | 30 | 256 | 1,7 | 64 | 74 | 85 | 96 | 106 | 250 | 287 | 336 | 374 | 419 | 502 | |
| | 11,7 | 42 | 35 | 442 | 2,2 | 84 | 98 | 112 | 126 | 140 | 294 | 341 | 394 | 438 | 489 | 585 | |
| 900 | 6,4 | 23 | <20 | 58 | 0,0 | 46 | 53 | 61 | 69 | 76 | 206 | 237 | 269 | 306 | 339 | 406 | 4,3 |
| | 7,8 | 28 | 20 | 87 | 1,2 | 56 | 65 | 74 | 84 | 93 | 239 | 274 | 313 | 353 | 393 | 471 | |
| | 10,0 | 36 | 24 | 144 | 1,6 | 72 | 84 | 96 | 108 | 120 | 287 | 331 | 379 | 425 | 474 | 568 | |
| | 13,1 | 47 | 29 | 246 | 2,0 | 94 | 109 | 125 | 141 | 156 | 345 | 402 | 460 | 514 | 573 | 688 | |
| | 17,2 | 62 | 34 | 428 | 2,7 | 124 | 144 | 165 | 186 | 206 | 408 | 481 | 548 | 615 | 683 | 820 | |
| 1200 | 8,6 | 31 | <20 | 60 | 1,2 | 62 | 72 | 82 | 93 | 103 | 255 | 296 | 341 | 382 | 428 | 515 | 5,8 |
| | 10,6 | 38 | 20 | 90 | 1,4 | 76 | 88 | 101 | 114 | 126 | 297 | 347 | 398 | 445 | 498 | 598 | |
| | 13,6 | 49 | 25 | 150 | 1,8 | 98 | 114 | 130 | 147 | 163 | 358 | 418 | 478 | 535 | 598 | 716 | |
| | 18,1 | 65 | 30 | 264 | 2,4 | 130 | 151 | 173 | 195 | 216 | 434 | 507 | 577 | 649 | 723 | 865 | |
| | 22,8 | 82 | 34 | 421 | 3,1 | 164 | 191 | 218 | 246 | 273 | 501 | 586 | 666 | 750 | 834 | 999 | |
| 1500 | 11,7 | 42 | <20 | 61 | 1,4 | 84 | 98 | 112 | 126 | 140 | 333 | 385 | 442 | 495 | 553 | 663 | 7,2 |
| | 13,1 | 47 | 20 | 76 | 1,6 | 94 | 109 | 125 | 141 | 156 | 362 | 418 | 480 | 538 | 600 | 720 | |
| | 16,7 | 60 | 24 | 125 | 2,0 | 120 | 140 | 160 | 180 | 200 | 429 | 498 | 571 | 639 | 713 | 855 | |
| | 21,7 | 78 | 29 | 211 | 2,6 | 156 | 182 | 208 | 234 | 260 | 511 | 594 | 679 | 761 | 848 | 1016 | |
| | 28,6 | 103 | 34 | 369 | 3,5 | 206 | 240 | 274 | 309 | 343 | 604 | 704 | 803 | 902 | 1001 | 1199 | |
| 1800 | 13,3 | 48 | <20 | 55 | 1,5 | 96 | 112 | 128 | 144 | 160 | 379 | 439 | 505 | 566 | 635 | 763 | 8,6 |
| | 15,8 | 57 | 20 | 78 | 1,8 | 114 | 133 | 152 | 171 | 190 | 430 | 498 | 573 | 640 | 719 | 863 | |
| | 20,0 | 72 | 24 | 125 | 2,2 | 144 | 168 | 192 | 216 | 240 | 505 | 586 | 673 | 752 | 843 | 1011 | |
| | 26,4 | 95 | 29 | 218 | 2,9 | 190 | 221 | 253 | 285 | 316 | 602 | 700 | 803 | 898 | 1000 | 1200 | |
| | 33,9 | 122 | 34 | 360 | 3,7 | 244 | 284 | 325 | 366 | 406 | 694 | 808 | 926 | 1039 | 1148 | 1380 | |
| 2100 | 14,4 | 52 | <20 | 41 | 1,5 | 104 | 121 | 138 | 156 | 173 | 411 | 479 | 555 | 624 | 691 | 835 | 10,1 |
| | 16,9 | 61 | 20 | 57 | 1,7 | 122 | 142 | 162 | 183 | 203 | 463 | 540 | 622 | 702 | 775 | 934 | |
| | 21,7 | 78 | 25 | 93 | 2,2 | 156 | 182 | 208 | 234 | 260 | 551 | 640 | 736 | 831 | 917 | 1101 | |
| | 27,5 | 99 | 30 | 151 | 2,8 | 198 | 231 | 264 | 297 | 330 | 641 | 745 | 855 | 962 | 1064 | 1276 | |
| | 35,0 | 126 | 35 | 244 | 3,6 | 252 | 294 | 336 | 378 | 420 | 734 | 852 | 980 | 1097 | 1219 | 1460 | |
| 2400 | 16,7 | 60 | <20 | 42 | 1,6 | 120 | 140 | 160 | 180 | 200 | 469 | 550 | 629 | 705 | 782 | 938 | 11,3 |
| | 21,7 | 78 | 20 | 71 | 2,1 | 156 | 182 | 208 | 234 | 260 | 564 | 659 | 755 | 846 | 938 | 1127 | |
| | 26,9 | 97 | 24 | 111 | 2,6 | 194 | 226 | 258 | 291 | 323 | 650 | 758 | 869 | 974 | 1080 | 1297 | |
| | 34,2 | 123 | 29 | 178 | 3,3 | 246 | 287 | 328 | 369 | 410 | 748 | 872 | 999 | 1118 | 1243 | 1491 | |
| | 43,9 | 158 | 34 | 294 | 4,2 | 316 | 368 | 421 | 474 | 526 | 855 | 997 | 1140 | 1273 | 1419 | 1701 | |
| 2700 | 18,9 | 68 | <20 | 51 | 1,7 | 136 | 158 | 181 | 204 | 226 | 523 | 611 | 703 | 787 | 877 | 1056 | 12,7 |
| | 23,6 | 85 | <20 | 80 | 2,1 | 170 | 198 | 226 | 255 | 283 | 609 | 712 | 817 | 917 | 1019 | 1225 | |
| | 27,2 | 98 | 20 | 106 | 2,5 | 196 | 228 | 261 | 294 | 326 | 668 | 781 | 894 | 1005 | 1116 | 1340 | |
| | 33,9 | 122 | 24 | 164 | 3,1 | 244 | 284 | 325 | 366 | 406 | 763 | 891 | 1017 | 1144 | 1272 | 1525 | |
| | 43,1 | 155 | 29 | 266 | 3,9 | 310 | 361 | 413 | 465 | 516 | 869 | 1014 | 1156 | 1298 | 1447 | 1733 | |
| 3000 | 20,6 | 74 | <20 | 49 | 1,8 | 148 | 172 | 197 | 222 | 246 | 571 | 662 | 758 | 849 | 947 | 1133 | 14,2 |
| | 26,9 | 97 | <20 | 84 | 2,3 | 194 | 226 | 258 | 291 | 323 | 682 | 791 | 908 | 1017 | 1133 | 1356 | |
| | 33,3 | 120 | 20 | 129 | 2,9 | 240 | 280 | 320 | 360 | 400 | 777 | 901 | 1035 | 1160 | 1291 | 1546 | |
| | 41,4 | 149 | 24 | 199 | 3,5 | 298 | 347 | 397 | 447 | 496 | 876 | 1015 | 1167 | 1309 | 1457 | 1747 | |
| | 52,5 | 189 | 29 | 320 | 4,5 | 378 | 441 | 504 | 567 | 630 | 987 | 1141 | 1312 | 1475 | 1640 | 1967 | |

Technical Data. Selection Tables

COOLING - 2-TUBE SYSTEM - M-TYPE NOZZLE

Reference water flow (Q_W) of 250 L/h

For other water flow rates, correct the unit power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 2-TUBE COOLING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - M NOZZLE - 2-TUBE SYSTEM - COOLING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|----------------|-------------------------|----------|---------------------|-----|-----|-----|-----|-----------------------|------|------|------|------|------|-----------------------|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_W (kPa) |
| | | | | | | 6 | 7 | 8 | 9 | 10 | 6 | 7 | 8 | 9 | 10 | 12 | |
| | l/s | m ³ /h | | | | P_{pr} (W) | | | | | P_{SW} (W) | | | | | | |
| 600 | 7,8 | 28 | <20 | 64 | 1,2 | 56 | 65 | 74 | 84 | 93 | 147 | 166 | 195 | 219 | 247 | 299 | 2,0 |
| | 9,3 | 33 | 20 | 91 | 1,4 | 67 | 78 | 89 | 100 | 111 | 168 | 191 | 224 | 252 | 284 | 342 | |
| | 11,1 | 40 | 24 | 130 | 1,7 | 80 | 93 | 106 | 120 | 133 | 192 | 218 | 257 | 288 | 324 | 389 | |
| | 13,6 | 49 | 30 | 196 | 2,1 | 98 | 114 | 130 | 147 | 163 | 222 | 253 | 298 | 332 | 373 | 448 | |
| | 16,1 | 58 | 34 | 274 | 2,5 | 116 | 135 | 154 | 174 | 193 | 248 | 286 | 334 | 372 | 417 | 500 | |
| 900 | 11,7 | 42 | <20 | 55 | 1,5 | 84 | 98 | 112 | 126 | 140 | 222 | 255 | 290 | 328 | 364 | 437 | 4,3 |
| | 13,9 | 50 | 20 | 78 | 1,7 | 100 | 116 | 133 | 150 | 166 | 252 | 290 | 332 | 373 | 415 | 498 | |
| | 16,7 | 60 | 25 | 112 | 2,1 | 120 | 140 | 160 | 180 | 200 | 288 | 332 | 381 | 427 | 476 | 571 | |
| | 20,0 | 72 | 30 | 162 | 2,5 | 144 | 168 | 192 | 216 | 240 | 327 | 380 | 436 | 487 | 543 | 652 | |
| | 23,9 | 86 | 35 | 231 | 2,0 | 172 | 200 | 229 | 258 | 286 | 367 | 430 | 492 | 550 | 613 | 736 | |
| 1200 | 15,3 | 55 | <20 | 53 | 1,7 | 110 | 128 | 146 | 165 | 183 | 281 | 327 | 376 | 421 | 472 | 566 | 5,8 |
| | 18,3 | 66 | 20 | 76 | 1,0 | 132 | 154 | 176 | 198 | 220 | 322 | 376 | 431 | 482 | 539 | 646 | |
| | 21,9 | 79 | 25 | 110 | 2,4 | 158 | 184 | 210 | 237 | 263 | 367 | 428 | 489 | 548 | 612 | 733 | |
| | 26,4 | 95 | 30 | 159 | 2,9 | 190 | 221 | 253 | 285 | 316 | 416 | 486 | 554 | 622 | 693 | 830 | |
| | 31,7 | 114 | 35 | 229 | 3,4 | 228 | 266 | 304 | 342 | 380 | 468 | 547 | 622 | 700 | 779 | 932 | |
| 1500 | 18,9 | 68 | <20 | 52 | 1,8 | 136 | 158 | 181 | 204 | 226 | 347 | 402 | 461 | 516 | 576 | 692 | 7,2 |
| | 22,8 | 82 | 20 | 75 | 2,2 | 164 | 191 | 218 | 246 | 273 | 397 | 460 | 527 | 591 | 659 | 791 | |
| | 27,2 | 98 | 25 | 108 | 2,6 | 196 | 228 | 261 | 294 | 326 | 449 | 521 | 597 | 669 | 746 | 894 | |
| | 32,5 | 117 | 29 | 154 | 3,2 | 234 | 273 | 312 | 351 | 390 | 505 | 587 | 671 | 752 | 838 | 1003 | |
| | 39,2 | 141 | 35 | 224 | 3,8 | 282 | 329 | 376 | 423 | 470 | 566 | 659 | 752 | 845 | 939 | 1125 | |
| 1800 | 22,5 | 81 | <20 | 51 | 1,0 | 162 | 189 | 216 | 243 | 270 | 407 | 472 | 543 | 608 | 682 | 819 | 8,6 |
| | 27,2 | 98 | 20 | 75 | 2,4 | 196 | 228 | 261 | 294 | 326 | 467 | 541 | 622 | 695 | 780 | 935 | |
| | 32,2 | 116 | 24 | 105 | 2,9 | 232 | 270 | 309 | 348 | 386 | 523 | 607 | 697 | 778 | 872 | 1045 | |
| | 38,6 | 139 | 29 | 151 | 3,4 | 278 | 324 | 370 | 417 | 463 | 586 | 681 | 781 | 874 | 975 | 1169 | |
| | 46,7 | 168 | 35 | 221 | 4,1 | 336 | 392 | 448 | 504 | 560 | 655 | 762 | 874 | 979 | 1086 | 1303 | |
| 2100 | 25,0 | 90 | <20 | 48 | 2,0 | 180 | 210 | 240 | 270 | 300 | 451 | 526 | 607 | 684 | 756 | 911 | 10,1 |
| | 28,6 | 103 | 20 | 63 | 2,3 | 206 | 240 | 274 | 309 | 343 | 498 | 579 | 667 | 753 | 831 | 1000 | |
| | 35,0 | 126 | 25 | 95 | 2,9 | 252 | 294 | 336 | 378 | 420 | 571 | 664 | 763 | 860 | 950 | 1140 | |
| | 42,8 | 154 | 30 | 142 | 3,5 | 308 | 359 | 410 | 462 | 513 | 647 | 752 | 864 | 971 | 1075 | 1288 | |
| | 52,2 | 188 | 35 | 211 | 4,3 | 376 | 438 | 501 | 564 | 626 | 724 | 841 | 967 | 1083 | 1203 | 1441 | |
| 2400 | 27,8 | 100 | <20 | 45 | 2,1 | 200 | 233 | 266 | 300 | 333 | 499 | 584 | 669 | 750 | 831 | 997 | 11,3 |
| | 32,8 | 118 | 20 | 63 | 2,5 | 236 | 275 | 314 | 354 | 393 | 560 | 654 | 749 | 840 | 932 | 1118 | |
| | 39,7 | 143 | 25 | 93 | 3,0 | 286 | 333 | 381 | 429 | 476 | 635 | 741 | 849 | 952 | 1056 | 1268 | |
| | 48,6 | 175 | 30 | 140 | 3,7 | 350 | 408 | 466 | 525 | 583 | 718 | 837 | 959 | 1074 | 1193 | 1432 | |
| | 59,4 | 214 | 35 | 210 | 4,6 | 428 | 499 | 570 | 642 | 713 | 803 | 936 | 1071 | 1197 | 1333 | 1599 | |
| 2700 | 31,7 | 114 | <20 | 47 | 2,3 | 228 | 266 | 304 | 342 | 380 | 557 | 651 | 749 | 839 | 934 | 1124 | 12,7 |
| | 36,4 | 131 | 20 | 62 | 2,6 | 262 | 305 | 349 | 393 | 436 | 612 | 715 | 821 | 922 | 1024 | 1231 | |
| | 44,4 | 160 | 25 | 92 | 3,2 | 320 | 373 | 426 | 480 | 533 | 696 | 813 | 930 | 1046 | 1162 | 1395 | |
| | 54,4 | 196 | 30 | 139 | 3,9 | 392 | 457 | 522 | 588 | 653 | 784 | 916 | 1046 | 1176 | 1307 | 1567 | |
| | 66,7 | 240 | 34 | 208 | 4,8 | 480 | 560 | 640 | 720 | 800 | 874 | 1021 | 1163 | 1306 | 1456 | 1743 | |
| 3000 | 34,4 | 124 | <20 | 45 | 2,4 | 248 | 289 | 330 | 372 | 413 | 607 | 704 | 807 | 904 | 1007 | 1205 | 14,2 |
| | 40,6 | 146 | 20 | 62 | 2,8 | 292 | 340 | 389 | 438 | 486 | 675 | 783 | 899 | 1007 | 1121 | 1342 | |
| | 49,4 | 178 | 25 | 93 | 3,4 | 356 | 415 | 474 | 534 | 593 | 763 | 885 | 1016 | 1139 | 1268 | 1518 | |
| | 60,3 | 217 | 29 | 138 | 4,1 | 434 | 506 | 578 | 651 | 723 | 854 | 989 | 1137 | 1275 | 1419 | 1701 | |
| | 73,6 | 265 | 34 | 206 | 5,0 | 530 | 618 | 706 | 795 | 883 | 946 | 1095 | 1259 | 1415 | 1573 | 1887 | |

Technical Data. Selection Tables

COOLING - 2-TUBE SYSTEM - G-TYPE NOZZLE

Reference water flow (Q_W) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 2-TUBE COOLING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - G NOZZLE - 2-TUBE SYSTEM - COOLING | | | | | | | | | | | | | | | | | |
|--|----------|------|----------------|-------------------------|----------|---------------------|------|------|------|------|-----------------------|------|------|------|------|------|-----------------------|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_W (kPa) |
| | l/s | m³/h | | | | 6 | 7 | 8 | 9 | 10 | 6 | 7 | 8 | 9 | 10 | 12 | |
| | | | | | | | | | | | | | | | | | |
| 600 | 12,5 | 45 | <20 | 63 | 1,2 | 90 | 105 | 120 | 135 | 150 | 200 | 228 | 268 | 300 | 338 | 406 | 2,0 |
| | 16,9 | 61 | 20 | 117 | 1,7 | 122 | 142 | 162 | 183 | 203 | 247 | 284 | 332 | 370 | 415 | 497 | |
| | 20,0 | 72 | 24 | 163 | 1,0 | 144 | 168 | 192 | 216 | 240 | 274 | 317 | 368 | 409 | 458 | 548 | |
| | 24,4 | 88 | 29 | 244 | 2,4 | 176 | 205 | 234 | 264 | 293 | 306 | 355 | 410 | 455 | 507 | 607 | |
| | 30,0 | 108 | 35 | 367 | 2,0 | 216 | 252 | 288 | 324 | 360 | 334 | 386 | 444 | 494 | 546 | 658 | |
| 900 | 16,7 | 60 | <20 | 50 | 1,4 | 120 | 140 | 160 | 180 | 200 | 251 | 289 | 330 | 372 | 413 | 496 | 4,3 |
| | 19,2 | 69 | 20 | 66 | 1,6 | 138 | 161 | 184 | 207 | 230 | 278 | 320 | 367 | 412 | 459 | 551 | |
| | 22,8 | 82 | 24 | 94 | 1,9 | 164 | 191 | 218 | 246 | 273 | 315 | 364 | 418 | 467 | 521 | 625 | |
| | 27,2 | 98 | 29 | 134 | 2,2 | 196 | 228 | 261 | 294 | 326 | 354 | 413 | 473 | 529 | 590 | 708 | |
| | 33,3 | 120 | 34 | 201 | 2,7 | 240 | 280 | 320 | 360 | 400 | 400 | 472 | 538 | 603 | 670 | 805 | |
| 1200 | 20,8 | 75 | 20 | 44 | 1,5 | 150 | 175 | 200 | 225 | 250 | 299 | 348 | 399 | 447 | 500 | 600 | 5,8 |
| | 25,0 | 90 | 25 | 63 | 1,8 | 180 | 210 | 240 | 270 | 300 | 341 | 399 | 456 | 511 | 571 | 684 | |
| | 30,6 | 110 | 30 | 95 | 2,2 | 220 | 256 | 293 | 330 | 366 | 393 | 459 | 524 | 588 | 656 | 785 | |
| | 36,1 | 130 | 34 | 133 | 2,5 | 260 | 303 | 346 | 390 | 433 | 439 | 514 | 584 | 657 | 732 | 876 | |
| | 44,4 | 160 | 40 | 201 | 3,1 | 320 | 373 | 426 | 480 | 533 | 499 | 584 | 663 | 747 | 831 | 995 | |
| 1500 | 26,4 | 95 | 24 | 40 | 1,7 | 190 | 221 | 253 | 285 | 316 | 374 | 433 | 497 | 557 | 621 | 746 | 7,2 |
| | 31,9 | 115 | 29 | 59 | 2,0 | 230 | 268 | 306 | 345 | 383 | 428 | 496 | 569 | 637 | 711 | 852 | |
| | 38,9 | 140 | 35 | 88 | 2,5 | 280 | 326 | 373 | 420 | 466 | 488 | 567 | 649 | 728 | 811 | 971 | |
| | 47,2 | 170 | 40 | 130 | 2,0 | 340 | 396 | 453 | 510 | 566 | 552 | 642 | 733 | 823 | 915 | 1096 | |
| | 56,9 | 205 | 45 | 189 | 3,6 | 410 | 478 | 546 | 615 | 683 | 615 | 717 | 818 | 919 | 1020 | 1221 | |
| 1800 | 27,8 | 100 | 24 | 31 | 1,6 | 200 | 233 | 266 | 300 | 333 | 390 | 452 | 521 | 583 | 654 | 786 | 8,6 |
| | 33,9 | 122 | 29 | 46 | 1,0 | 244 | 284 | 325 | 366 | 406 | 451 | 523 | 601 | 671 | 754 | 904 | |
| | 40,6 | 146 | 34 | 66 | 2,3 | 292 | 340 | 389 | 438 | 486 | 510 | 591 | 679 | 759 | 850 | 1020 | |
| | 49,7 | 179 | 40 | 100 | 2,9 | 358 | 417 | 477 | 537 | 596 | 581 | 674 | 774 | 866 | 966 | 1158 | |
| | 60,8 | 219 | 45 | 150 | 3,5 | 438 | 511 | 584 | 657 | 730 | 654 | 761 | 872 | 977 | 1084 | 1301 | |
| 2100 | 38,9 | 140 | 25 | 37 | 2,1 | 280 | 326 | 373 | 420 | 466 | 512 | 595 | 685 | 773 | 853 | 1026 | 10,1 |
| | 47,2 | 170 | 30 | 54 | 2,5 | 340 | 396 | 453 | 510 | 566 | 583 | 677 | 778 | 877 | 969 | 1163 | |
| | 56,9 | 205 | 35 | 79 | 3,0 | 410 | 478 | 546 | 615 | 683 | 654 | 760 | 873 | 981 | 1086 | 1302 | |
| | 69,4 | 250 | 40 | 118 | 3,7 | 500 | 583 | 666 | 750 | 833 | 731 | 849 | 975 | 1093 | 1214 | 1454 | |
| | 83,3 | 300 | 44 | 170 | 4,4 | 600 | 700 | 800 | 900 | 1000 | 803 | 931 | 1072 | 1199 | 1335 | 1600 | |
| 2400 | 45,8 | 165 | 25 | 39 | 2,3 | 330 | 385 | 440 | 495 | 550 | 585 | 683 | 783 | 878 | 974 | 1170 | 11,3 |
| | 56,1 | 202 | 30 | 59 | 2,8 | 404 | 471 | 538 | 606 | 673 | 666 | 777 | 890 | 998 | 1108 | 1330 | |
| | 66,7 | 240 | 34 | 83 | 3,3 | 480 | 560 | 640 | 720 | 800 | 738 | 860 | 985 | 1103 | 1226 | 1471 | |
| | 81,9 | 295 | 39 | 126 | 4,1 | 590 | 688 | 786 | 885 | 983 | 825 | 962 | 1101 | 1230 | 1370 | 1643 | |
| | 101,4 | 365 | 45 | 193 | 5,1 | 730 | 851 | 973 | 1095 | 1216 | 918 | 1071 | 1224 | 1365 | 1524 | 1826 | |
| 2700 | 51,9 | 187 | 25 | 40 | 2,4 | 374 | 436 | 498 | 561 | 623 | 648 | 758 | 868 | 976 | 1083 | 1302 | 12,7 |
| | 62,5 | 225 | 30 | 58 | 2,9 | 450 | 525 | 600 | 675 | 750 | 727 | 850 | 971 | 1092 | 1213 | 1456 | |
| | 76,4 | 275 | 35 | 86 | 3,6 | 550 | 641 | 733 | 825 | 916 | 815 | 952 | 1086 | 1221 | 1359 | 1628 | |
| | 93,1 | 335 | 40 | 128 | 4,4 | 670 | 781 | 893 | 1005 | 1116 | 903 | 1055 | 1201 | 1348 | 1505 | 1801 | |
| | 114,4 | 412 | 45 | 195 | 5,4 | 824 | 961 | 1098 | 1236 | 1373 | 995 | 1166 | 1327 | 1487 | 1665 | 1993 | |
| 3000 | 58,3 | 210 | 24 | 41 | 2,6 | 420 | 490 | 560 | 630 | 700 | 717 | 832 | 955 | 1069 | 1191 | 1426 | 14,2 |
| | 72,2 | 260 | 30 | 62 | 3,2 | 520 | 606 | 693 | 780 | 866 | 814 | 943 | 1083 | 1215 | 1352 | 1620 | |
| | 87,5 | 315 | 35 | 92 | 3,9 | 630 | 735 | 840 | 945 | 1050 | 902 | 1045 | 1201 | 1348 | 1500 | 1798 | |
| | 104,2 | 375 | 39 | 130 | 4,6 | 750 | 875 | 1000 | 1125 | 1250 | 983 | 1137 | 1308 | 1470 | 1634 | 1960 | |
| | 127,8 | 460 | 44 | 196 | 5,7 | 920 | 1073 | 1226 | 1380 | 1533 | 1082 | 1248 | 1437 | 1615 | 1796 | 2151 | |

Technical Data. Selection Tables

COOLING - 4-TUBE SYSTEM - P-TYPE NOZZLE

Reference water flow (Q_W) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 4-TUBE COOLING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - P NOZZLE - 4-TUBE SYSTEM - COOLING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|----------------|-------------------------|----------|---------------------|-----|-----|-----|-----|-----------------------|------|------|------|------|------|-----------------------|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_W (kPa) |
| | l/s | m ³ /h | | | | 6 | 7 | 8 | 9 | 10 | 6 | 7 | 8 | 9 | 10 | 12 | |
| | | | | | | | | | | | | | | | | | |
| 600 | 4,4 | 16 | <20 | 64 | 0,9 | 32 | 37 | 42 | 48 | 53 | 142 | 163 | 184 | 209 | 232 | 277 | 2,2 |
| | 5,3 | 19 | 20 | 90 | 1,0 | 38 | 44 | 50 | 57 | 63 | 162 | 186 | 210 | 238 | 264 | 313 | |
| | 6,7 | 24 | 24 | 144 | 1,3 | 48 | 56 | 64 | 72 | 80 | 192 | 221 | 251 | 282 | 313 | 370 | |
| | 8,9 | 32 | 30 | 256 | 1,7 | 64 | 74 | 85 | 96 | 106 | 233 | 270 | 308 | 346 | 381 | 453 | |
| | 11,7 | 42 | 35 | 442 | 2,2 | 84 | 98 | 112 | 126 | 140 | 271 | 315 | 364 | 407 | 448 | 536 | |
| 900 | 6,4 | 23 | <20 | 58 | 0,0 | 46 | 53 | 61 | 69 | 76 | 180 | 217 | 253 | 288 | 327 | 400 | 3,5 |
| | 7,8 | 28 | 20 | 87 | 1,2 | 56 | 65 | 74 | 84 | 93 | 215 | 256 | 294 | 332 | 371 | 448 | |
| | 10,0 | 36 | 24 | 144 | 1,6 | 72 | 84 | 96 | 108 | 120 | 263 | 311 | 353 | 395 | 437 | 524 | |
| | 13,1 | 47 | 29 | 246 | 2,0 | 94 | 109 | 125 | 141 | 156 | 319 | 372 | 420 | 472 | 521 | 622 | |
| | 17,2 | 62 | 34 | 428 | 2,7 | 124 | 144 | 165 | 186 | 206 | 379 | 438 | 495 | 560 | 620 | 741 | |
| 1200 | 8,6 | 31 | <20 | 60 | 1,2 | 62 | 72 | 82 | 93 | 103 | 236 | 279 | 310 | 349 | 383 | 446 | 4,6 |
| | 10,6 | 38 | 20 | 90 | 1,4 | 76 | 88 | 101 | 114 | 126 | 273 | 322 | 361 | 405 | 450 | 532 | |
| | 13,6 | 49 | 25 | 150 | 1,8 | 98 | 114 | 130 | 147 | 163 | 326 | 384 | 435 | 487 | 543 | 649 | |
| | 18,1 | 65 | 30 | 264 | 2,4 | 130 | 151 | 173 | 195 | 216 | 393 | 461 | 528 | 589 | 654 | 787 | |
| | 22,8 | 82 | 34 | 421 | 3,1 | 164 | 191 | 218 | 246 | 273 | 453 | 530 | 611 | 681 | 749 | 903 | |
| 1500 | 11,7 | 42 | <20 | 61 | 1,4 | 84 | 98 | 112 | 126 | 140 | 302 | 354 | 400 | 455 | 512 | 621 | 5,8 |
| | 13,1 | 47 | 20 | 76 | 1,6 | 94 | 109 | 125 | 141 | 156 | 330 | 385 | 435 | 492 | 552 | 665 | |
| | 16,7 | 60 | 24 | 125 | 2,0 | 120 | 140 | 160 | 180 | 200 | 394 | 459 | 519 | 581 | 647 | 775 | |
| | 21,7 | 78 | 29 | 211 | 2,6 | 156 | 182 | 208 | 234 | 260 | 467 | 543 | 616 | 688 | 763 | 912 | |
| | 28,6 | 103 | 34 | 369 | 3,5 | 206 | 240 | 274 | 309 | 343 | 546 | 635 | 723 | 811 | 899 | 1077 | |
| 1800 | 13,3 | 48 | <20 | 55 | 1,5 | 96 | 112 | 128 | 144 | 160 | 336 | 395 | 449 | 507 | 574 | 699 | 6,9 |
| | 15,8 | 57 | 20 | 78 | 1,8 | 114 | 133 | 152 | 171 | 190 | 388 | 455 | 513 | 580 | 650 | 781 | |
| | 20,0 | 72 | 24 | 125 | 2,2 | 144 | 168 | 192 | 216 | 240 | 462 | 541 | 609 | 688 | 763 | 910 | |
| | 26,4 | 95 | 29 | 218 | 2,9 | 190 | 221 | 253 | 285 | 316 | 552 | 646 | 731 | 825 | 910 | 1086 | |
| | 33,9 | 122 | 34 | 360 | 3,7 | 244 | 284 | 325 | 366 | 406 | 631 | 739 | 845 | 953 | 1049 | 1260 | |
| 2100 | 14,4 | 52 | <20 | 41 | 1,5 | 104 | 121 | 138 | 156 | 173 | 381 | 446 | 518 | 580 | 637 | 761 | 8,1 |
| | 16,9 | 61 | 20 | 57 | 1,7 | 122 | 142 | 162 | 183 | 203 | 426 | 499 | 573 | 644 | 710 | 850 | |
| | 21,7 | 78 | 25 | 93 | 2,2 | 156 | 182 | 208 | 234 | 260 | 504 | 588 | 669 | 754 | 835 | 1000 | |
| | 27,5 | 99 | 30 | 151 | 2,8 | 198 | 231 | 264 | 297 | 330 | 584 | 682 | 774 | 871 | 968 | 1160 | |
| | 35,0 | 126 | 35 | 244 | 3,6 | 252 | 294 | 336 | 378 | 420 | 669 | 781 | 889 | 998 | 1110 | 1330 | |
| 2400 | 16,7 | 60 | <20 | 42 | 1,6 | 120 | 140 | 160 | 180 | 200 | 448 | 521 | 577 | 659 | 722 | 856 | 9,0 |
| | 21,7 | 78 | 20 | 71 | 2,1 | 156 | 182 | 208 | 234 | 260 | 523 | 611 | 687 | 777 | 854 | 1019 | |
| | 26,9 | 97 | 24 | 111 | 2,6 | 194 | 226 | 258 | 291 | 323 | 594 | 694 | 787 | 886 | 977 | 1170 | |
| | 34,2 | 123 | 29 | 178 | 3,3 | 246 | 287 | 328 | 369 | 410 | 681 | 794 | 904 | 1016 | 1123 | 1347 | |
| | 43,9 | 158 | 34 | 294 | 4,2 | 316 | 368 | 421 | 474 | 526 | 780 | 905 | 1030 | 1159 | 1285 | 1541 | |
| 2700 | 18,9 | 68 | <20 | 51 | 1,7 | 136 | 158 | 181 | 204 | 226 | 488 | 572 | 645 | 733 | 808 | 967 | 10,4 |
| | 23,6 | 85 | <20 | 80 | 2,1 | 170 | 198 | 226 | 255 | 283 | 558 | 654 | 741 | 838 | 927 | 1112 | |
| | 27,2 | 98 | 20 | 106 | 2,5 | 196 | 228 | 261 | 294 | 326 | 607 | 711 | 809 | 912 | 1011 | 1213 | |
| | 33,9 | 122 | 24 | 164 | 3,1 | 244 | 284 | 325 | 366 | 406 | 691 | 807 | 921 | 1036 | 1149 | 1380 | |
| | 43,1 | 155 | 29 | 266 | 3,9 | 310 | 361 | 413 | 465 | 516 | 790 | 919 | 1051 | 1181 | 1310 | 1572 | |
| 3000 | 20,6 | 74 | <20 | 49 | 1,8 | 148 | 172 | 197 | 222 | 246 | 521 | 622 | 694 | 796 | 884 | 1065 | 11,3 |
| | 26,9 | 97 | <20 | 84 | 2,3 | 194 | 226 | 258 | 291 | 323 | 618 | 727 | 822 | 932 | 1030 | 1237 | |
| | 33,3 | 120 | 20 | 129 | 2,9 | 240 | 280 | 320 | 360 | 400 | 702 | 821 | 934 | 1053 | 1162 | 1392 | |
| | 41,4 | 149 | 24 | 199 | 3,5 | 298 | 347 | 397 | 447 | 496 | 792 | 923 | 1056 | 1187 | 1308 | 1567 | |
| | 52,5 | 189 | 29 | 320 | 4,5 | 378 | 441 | 504 | 567 | 630 | 892 | 1041 | 1193 | 1340 | 1478 | 1774 | |

Technical Data. Selection Tables

COOLING - 4-TUBE SYSTEM - M-TYPE NOZZLE

Reference water flow (Q_W) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 4-TUBE COOLING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - M NOZZLE - 4-TUBE SYSTEM - COOLING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|---------------|----------------------|-------|---------------------|-----|-----|-----|-----|-----------------------|-----|------|------|------|--------------------|------|
| Length | Q_{pr} | | L_W - dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | ΔP_w (kPa) | |
| | l/s | m ³ /h | | | | 6 | 7 | 8 | 9 | 10 | 6 | 7 | 8 | 9 | 10 | | 12 |
| | | | | | | | | | | | | | | | | | |
| 600 | 7,8 | 28 | <20 | 64 | 1,2 | 56 | 65 | 74 | 84 | 93 | 137 | 157 | 178 | 202 | 225 | 268 | 2,2 |
| | 9,3 | 33 | 20 | 91 | 1,4 | 67 | 78 | 89 | 100 | 111 | 157 | 181 | 204 | 231 | 257 | 305 | |
| | 11,1 | 40 | 24 | 130 | 1,7 | 80 | 93 | 106 | 120 | 133 | 180 | 207 | 234 | 264 | 292 | 346 | |
| | 13,6 | 49 | 30 | 196 | 2,1 | 98 | 114 | 130 | 147 | 163 | 207 | 239 | 272 | 306 | 338 | 400 | |
| | 16,1 | 58 | 34 | 274 | 2,5 | 116 | 135 | 154 | 174 | 193 | 231 | 268 | 306 | 344 | 379 | 450 | |
| 900 | 11,7 | 42 | <20 | 55 | 1,5 | 84 | 98 | 112 | 126 | 140 | 196 | 236 | 273 | 309 | 348 | 423 | 3,5 |
| | 13,9 | 50 | 20 | 78 | 1,7 | 100 | 116 | 133 | 150 | 166 | 229 | 272 | 311 | 350 | 389 | 469 | |
| | 16,7 | 60 | 25 | 112 | 2,1 | 120 | 140 | 160 | 180 | 200 | 265 | 312 | 354 | 397 | 439 | 525 | |
| | 20,0 | 72 | 30 | 162 | 2,5 | 144 | 168 | 192 | 216 | 240 | 302 | 354 | 400 | 449 | 495 | 591 | |
| | 23,9 | 86 | 35 | 231 | 2,0 | 172 | 200 | 229 | 258 | 286 | 340 | 395 | 446 | 502 | 555 | 663 | |
| 1200 | 15,3 | 55 | <20 | 53 | 1,7 | 110 | 128 | 146 | 165 | 183 | 259 | 306 | 342 | 384 | 425 | 500 | 4,6 |
| | 18,3 | 66 | 20 | 76 | 1,0 | 132 | 154 | 176 | 198 | 220 | 294 | 348 | 391 | 439 | 489 | 580 | |
| | 21,9 | 79 | 25 | 110 | 2,4 | 158 | 184 | 210 | 237 | 263 | 333 | 393 | 446 | 498 | 556 | 665 | |
| | 26,4 | 95 | 30 | 159 | 2,9 | 190 | 221 | 253 | 285 | 316 | 377 | 443 | 506 | 565 | 628 | 755 | |
| | 31,7 | 114 | 35 | 229 | 3,4 | 228 | 266 | 304 | 342 | 380 | 423 | 496 | 570 | 635 | 702 | 846 | |
| 1500 | 18,9 | 68 | <20 | 52 | 1,8 | 136 | 158 | 181 | 204 | 226 | 316 | 370 | 418 | 473 | 532 | 643 | 5,8 |
| | 22,8 | 82 | 20 | 75 | 2,2 | 164 | 191 | 218 | 246 | 273 | 364 | 424 | 479 | 539 | 602 | 722 | |
| | 27,2 | 98 | 25 | 108 | 2,6 | 196 | 228 | 261 | 294 | 326 | 412 | 479 | 543 | 607 | 675 | 807 | |
| | 32,5 | 117 | 29 | 154 | 3,2 | 234 | 273 | 312 | 351 | 390 | 462 | 536 | 608 | 680 | 754 | 901 | |
| | 39,2 | 141 | 35 | 224 | 3,8 | 282 | 329 | 376 | 423 | 470 | 515 | 598 | 680 | 761 | 844 | 1009 | |
| 1800 | 22,5 | 81 | <20 | 51 | 1,0 | 162 | 189 | 216 | 243 | 270 | 366 | 428 | 485 | 548 | 617 | 745 | 6,9 |
| | 27,2 | 98 | 20 | 75 | 2,4 | 196 | 228 | 261 | 294 | 326 | 425 | 497 | 560 | 633 | 705 | 844 | |
| | 32,2 | 116 | 24 | 105 | 2,9 | 232 | 270 | 309 | 348 | 386 | 479 | 561 | 631 | 713 | 790 | 942 | |
| | 38,6 | 139 | 29 | 151 | 3,4 | 278 | 324 | 370 | 417 | 463 | 538 | 629 | 711 | 803 | 886 | 1057 | |
| | 46,7 | 168 | 35 | 221 | 4,1 | 336 | 392 | 448 | 504 | 560 | 599 | 700 | 797 | 899 | 990 | 1186 | |
| 2100 | 25,0 | 90 | <20 | 48 | 2,0 | 180 | 210 | 240 | 270 | 300 | 416 | 487 | 560 | 629 | 693 | 829 | 8,1 |
| | 28,6 | 103 | 20 | 63 | 2,3 | 206 | 240 | 274 | 309 | 343 | 457 | 534 | 610 | 687 | 759 | 908 | |
| | 35,0 | 126 | 25 | 95 | 2,9 | 252 | 294 | 336 | 378 | 420 | 522 | 609 | 692 | 780 | 864 | 1036 | |
| | 42,8 | 154 | 30 | 142 | 3,5 | 308 | 359 | 410 | 462 | 513 | 590 | 689 | 781 | 880 | 977 | 1172 | |
| | 52,2 | 188 | 35 | 211 | 4,3 | 376 | 438 | 501 | 564 | 626 | 661 | 771 | 877 | 985 | 1095 | 1313 | |
| 2400 | 27,8 | 100 | <20 | 45 | 2,1 | 200 | 233 | 266 | 300 | 333 | 471 | 549 | 612 | 696 | 763 | 907 | 9,0 |
| | 32,8 | 118 | 20 | 63 | 2,5 | 236 | 275 | 314 | 354 | 393 | 520 | 607 | 682 | 771 | 848 | 1012 | |
| | 39,7 | 143 | 25 | 93 | 3,0 | 286 | 333 | 381 | 429 | 476 | 582 | 680 | 770 | 867 | 956 | 1144 | |
| | 48,6 | 175 | 30 | 140 | 3,7 | 350 | 408 | 466 | 525 | 583 | 654 | 763 | 868 | 976 | 1078 | 1292 | |
| | 59,4 | 214 | 35 | 210 | 4,6 | 428 | 499 | 570 | 642 | 713 | 731 | 850 | 969 | 1089 | 1206 | 1446 | |
| 2700 | 31,7 | 114 | <20 | 47 | 2,3 | 228 | 266 | 304 | 342 | 380 | 516 | 604 | 683 | 775 | 855 | 1025 | 10,4 |
| | 36,4 | 131 | 20 | 62 | 2,6 | 262 | 305 | 349 | 393 | 436 | 560 | 657 | 745 | 842 | 932 | 1118 | |
| | 44,4 | 160 | 25 | 92 | 3,2 | 320 | 373 | 426 | 480 | 533 | 631 | 739 | 841 | 948 | 1051 | 1262 | |
| | 54,4 | 196 | 30 | 139 | 3,9 | 392 | 457 | 522 | 588 | 653 | 711 | 830 | 947 | 1065 | 1181 | 1419 | |
| | 66,7 | 240 | 34 | 208 | 4,8 | 480 | 560 | 640 | 720 | 800 | 795 | 925 | 1058 | 1189 | 1319 | 1582 | |
| 3000 | 34,4 | 124 | <20 | 45 | 2,4 | 248 | 289 | 330 | 372 | 413 | 552 | 656 | 735 | 839 | 930 | 1120 | 11,3 |
| | 40,6 | 146 | 20 | 62 | 2,8 | 292 | 340 | 389 | 438 | 486 | 612 | 721 | 814 | 923 | 1021 | 1226 | |
| | 49,4 | 178 | 25 | 93 | 3,4 | 356 | 415 | 474 | 534 | 593 | 690 | 807 | 917 | 1035 | 1142 | 1369 | |
| | 60,3 | 217 | 29 | 138 | 4,1 | 434 | 506 | 578 | 651 | 723 | 772 | 900 | 1028 | 1156 | 1274 | 1527 | |
| | 73,6 | 265 | 34 | 206 | 5,0 | 530 | 618 | 706 | 795 | 883 | 856 | 998 | 1143 | 1284 | 1415 | 1697 | |

Technical Data. Selection Tables

COOLING - 4-TUBE SYSTEM - G-TYPE NOZZLE

Reference water flow (Q_W) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 4-TUBE COOLING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - G NOZZLE - 4-TUBE SYSTEM - COOLING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|---------------|----------------------|-------|---------------------|------|------|------|------|-----------------------|------|------|------|------|------|--------------------|
| Length | Q_{pr} | | L_W - dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_W (kPa) |
| | l/s | m ³ /h | | | | 6 | 7 | 8 | 9 | 10 | 6 | 7 | 8 | 9 | 10 | 12 | |
| | | | | | | | | | | | | | | | | | |
| 600 | 12,5 | 45 | <20 | 63 | 1,9 | 90 | 105 | 120 | 135 | 150 | 188 | 216 | 245 | 276 | 305 | 361 | 2,2 |
| | 16,9 | 61 | 20 | 117 | 2,6 | 122 | 142 | 162 | 183 | 203 | 230 | 267 | 304 | 342 | 377 | 448 | |
| | 20,0 | 72 | 24 | 163 | 3,1 | 144 | 168 | 192 | 216 | 240 | 254 | 295 | 339 | 380 | 418 | 499 | |
| | 24,4 | 88 | 29 | 244 | 3,7 | 176 | 205 | 234 | 264 | 293 | 280 | 327 | 378 | 424 | 464 | 558 | |
| | 30,0 | 108 | 35 | 367 | 4,6 | 216 | 252 | 288 | 324 | 360 | 301 | 351 | 405 | 456 | 496 | 602 | |
| 900 | 16,7 | 60 | <20 | 50 | 2,1 | 120 | 140 | 160 | 180 | 200 | 228 | 271 | 310 | 348 | 388 | 467 | 3,5 |
| | 19,2 | 69 | 20 | 66 | 2,4 | 138 | 161 | 184 | 207 | 230 | 255 | 301 | 343 | 384 | 425 | 510 | |
| | 22,8 | 82 | 24 | 94 | 2,9 | 164 | 191 | 218 | 246 | 273 | 290 | 340 | 385 | 432 | 476 | 569 | |
| | 27,2 | 98 | 29 | 134 | 3,4 | 196 | 228 | 261 | 294 | 326 | 328 | 382 | 431 | 485 | 535 | 639 | |
| | 33,3 | 120 | 34 | 201 | 4,2 | 240 | 280 | 320 | 360 | 400 | 371 | 430 | 486 | 549 | 608 | 727 | |
| 1200 | 20,8 | 75 | 20 | 44 | 2,3 | 150 | 175 | 200 | 225 | 250 | 274 | 324 | 363 | 407 | 452 | 534 | 4,6 |
| | 25,0 | 90 | 25 | 63 | 2,7 | 180 | 210 | 240 | 270 | 300 | 311 | 367 | 415 | 464 | 518 | 617 | |
| | 30,6 | 110 | 30 | 95 | 3,3 | 220 | 256 | 293 | 330 | 366 | 356 | 420 | 478 | 534 | 595 | 714 | |
| | 36,1 | 130 | 34 | 133 | 3,9 | 260 | 303 | 346 | 390 | 433 | 397 | 466 | 535 | 596 | 661 | 796 | |
| | 44,4 | 160 | 40 | 201 | 4,8 | 320 | 373 | 426 | 480 | 533 | 452 | 528 | 608 | 678 | 746 | 900 | |
| 1500 | 26,4 | 95 | 24 | 40 | 2,6 | 190 | 221 | 253 | 285 | 316 | 342 | 399 | 451 | 509 | 570 | 685 | 5,8 |
| | 31,9 | 115 | 29 | 59 | 3,1 | 230 | 268 | 306 | 345 | 383 | 393 | 457 | 517 | 579 | 645 | 772 | |
| | 38,9 | 140 | 35 | 88 | 3,8 | 280 | 326 | 373 | 420 | 466 | 447 | 520 | 589 | 659 | 731 | 873 | |
| | 47,2 | 170 | 40 | 130 | 4,6 | 340 | 396 | 453 | 510 | 566 | 502 | 584 | 663 | 742 | 822 | 983 | |
| | 56,9 | 205 | 45 | 189 | 5,5 | 410 | 478 | 546 | 615 | 683 | 556 | 646 | 736 | 826 | 916 | 1098 | |
| 1800 | 27,8 | 100 | 24 | 31 | 2,5 | 200 | 233 | 266 | 300 | 333 | 348 | 408 | 464 | 524 | 592 | 718 | 6,9 |
| | 33,9 | 122 | 29 | 46 | 2,0 | 244 | 284 | 325 | 366 | 406 | 409 | 479 | 540 | 610 | 681 | 817 | |
| | 40,6 | 146 | 34 | 66 | 3,6 | 292 | 340 | 389 | 438 | 486 | 467 | 546 | 615 | 694 | 770 | 918 | |
| | 49,7 | 179 | 40 | 100 | 4,4 | 358 | 417 | 477 | 537 | 596 | 533 | 624 | 704 | 795 | 878 | 1047 | |
| | 60,8 | 219 | 45 | 150 | 5,4 | 438 | 511 | 584 | 657 | 730 | 598 | 699 | 796 | 898 | 989 | 1184 | |
| 2100 | 38,9 | 140 | 25 | 37 | 3,2 | 280 | 326 | 373 | 420 | 466 | 469 | 548 | 625 | 704 | 778 | 932 | 8,1 |
| | 47,2 | 170 | 30 | 54 | 3,9 | 340 | 396 | 453 | 510 | 566 | 532 | 622 | 705 | 795 | 881 | 1057 | |
| | 56,9 | 205 | 35 | 79 | 4,7 | 410 | 478 | 546 | 615 | 683 | 596 | 696 | 790 | 889 | 988 | 1184 | |
| | 69,4 | 250 | 40 | 118 | 5,7 | 500 | 583 | 666 | 750 | 833 | 667 | 778 | 885 | 994 | 1105 | 1325 | |
| | 83,3 | 300 | 44 | 170 | 6,8 | 600 | 700 | 800 | 900 | 1000 | 732 | 854 | 976 | 1093 | 1216 | 1457 | |
| 2400 | 45,8 | 165 | 25 | 39 | 3,5 | 330 | 385 | 440 | 495 | 550 | 541 | 632 | 712 | 804 | 885 | 1056 | 9,0 |
| | 56,1 | 202 | 30 | 59 | 4,3 | 404 | 471 | 538 | 606 | 673 | 609 | 711 | 807 | 908 | 1001 | 1199 | |
| | 66,7 | 240 | 34 | 83 | 5,1 | 480 | 560 | 640 | 720 | 800 | 672 | 783 | 892 | 1002 | 1108 | 1328 | |
| | 81,9 | 295 | 39 | 126 | 6,3 | 590 | 688 | 786 | 885 | 983 | 752 | 874 | 995 | 1119 | 1240 | 1487 | |
| | 101,4 | 365 | 45 | 193 | 7,8 | 730 | 851 | 973 | 1095 | 1216 | 839 | 972 | 1104 | 1243 | 1380 | 1653 | |
| 2700 | 51,9 | 187 | 25 | 40 | 3,8 | 374 | 436 | 498 | 561 | 623 | 591 | 692 | 786 | 887 | 983 | 1179 | 10,4 |
| | 62,5 | 225 | 30 | 58 | 4,5 | 450 | 525 | 600 | 675 | 750 | 659 | 771 | 879 | 989 | 1097 | 1317 | |
| | 76,4 | 275 | 35 | 86 | 5,5 | 550 | 641 | 733 | 825 | 916 | 740 | 862 | 985 | 1108 | 1229 | 1475 | |
| | 93,1 | 335 | 40 | 128 | 6,7 | 670 | 781 | 893 | 1005 | 1116 | 823 | 956 | 1094 | 1230 | 1364 | 1635 | |
| | 114,4 | 412 | 45 | 195 | 8,3 | 824 | 961 | 1098 | 1236 | 1373 | 911 | 1056 | 1208 | 1360 | 1508 | 1806 | |
| 3000 | 58,3 | 210 | 24 | 41 | 3,0 | 420 | 490 | 560 | 630 | 700 | 649 | 761 | 862 | 975 | 1078 | 1293 | 11,3 |
| | 72,2 | 260 | 30 | 62 | 4,0 | 520 | 606 | 693 | 780 | 866 | 735 | 858 | 978 | 1101 | 1214 | 1455 | |
| | 87,5 | 315 | 35 | 92 | 5,0 | 630 | 735 | 840 | 945 | 1050 | 815 | 951 | 1088 | 1222 | 1347 | 1615 | |
| | 104,2 | 375 | 39 | 130 | 7,1 | 750 | 875 | 1000 | 1125 | 1250 | 889 | 1037 | 1188 | 1335 | 1472 | 1767 | |
| | 127,8 | 460 | 44 | 196 | 8,8 | 920 | 1073 | 1226 | 1380 | 1533 | 974 | 1139 | 1303 | 1467 | 1620 | 1948 | |

Technical Data. Selection Tables

HEATING - 2-TUBE SYSTEM - P-TYPE NOZZLE

Reference water flow (Q_w) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 2-TUBE HEATING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_w (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - P NOZZLE - 2-TUBE SYSTEM - HEATING | | | | | | | | | | | | | | | | | |
|--|----------|------|----------------|-------------------------|----------|---------------------|-----|-----|-----|-----|-----------------------|------|------|------|------|------|-----------------------|
| Length | Q_{pr} | | L_w dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_w (kPa) |
| | l/s | m³/h | | | | 6 | 7 | 8 | 9 | 10 | %\$ | %) | 8\$ | 8) | 30 | 35 | |
| | | | | | | | | | | | | | | | | | |
| 600 | 4,4 | 16 | <20 | 64 | 0,6 | 32 | 37 | 42 | 48 | 53 | 242 | 366 | 490 | 616 | 740 | 864 | 2,0 |
| | 5,3 | 19 | 20 | 90 | 0,7 | 38 | 44 | 50 | 57 | 63 | 277 | 418 | 559 | 703 | 845 | 987 | |
| | 6,7 | 24 | 24 | 144 | 0,9 | 48 | 56 | 64 | 72 | 80 | 332 | 501 | 669 | 841 | 1010 | 1182 | |
| | 8,9 | 32 | 30 | 256 | 1,2 | 64 | 74 | 85 | 96 | 106 | 411 | 620 | 829 | 1041 | 1249 | 1463 | |
| | 11,7 | 42 | 35 | 442 | 1,6 | 84 | 98 | 112 | 126 | 140 | 492 | 742 | 994 | 1247 | 1497 | 1753 | |
| 900 | 6,4 | 23 | <20 | 58 | 0,7 | 46 | 53 | 61 | 69 | 76 | 316 | 477 | 639 | 801 | 963 | 1125 | 4,3 |
| | 7,8 | 28 | 20 | 87 | 0,9 | 56 | 65 | 74 | 84 | 93 | 369 | 557 | 745 | 935 | 1124 | 1314 | |
| | 10,0 | 36 | 24 | 144 | 1,1 | 72 | 84 | 96 | 108 | 120 | 447 | 674 | 902 | 1132 | 1360 | 1591 | |
| | 13,1 | 47 | 29 | 246 | 1,4 | 94 | 109 | 125 | 141 | 156 | 542 | 816 | 1092 | 1370 | 1648 | 1928 | |
| | 17,2 | 62 | 34 | 428 | 1,9 | 124 | 144 | 165 | 186 | 206 | 653 | 980 | 1312 | 1647 | 1981 | 2318 | |
| 1200 | 8,6 | 31 | <20 | 60 | 0,8 | 62 | 72 | 82 | 93 | 103 | 425 | 638 | 852 | 1067 | 1283 | 1503 | 5,8 |
| | 10,6 | 38 | 20 | 90 | 1,0 | 76 | 88 | 101 | 114 | 126 | 496 | 746 | 996 | 1248 | 1500 | 1758 | |
| | 13,6 | 49 | 25 | 150 | 1,3 | 98 | 114 | 130 | 147 | 163 | 600 | 900 | 1203 | 1507 | 1812 | 2121 | |
| | 18,1 | 65 | 30 | 264 | 1,7 | 130 | 151 | 173 | 195 | 216 | 730 | 1094 | 1463 | 1833 | 2205 | 2578 | |
| | 22,8 | 82 | 34 | 421 | 2,2 | 164 | 191 | 218 | 246 | 273 | 843 | 1266 | 1694 | 2124 | 2555 | 2987 | |
| 1500 | 11,7 | 42 | <20 | 61 | 0,0 | 84 | 98 | 112 | 126 | 140 | 561 | 842 | 1124 | 1406 | 1690 | 1976 | 7,2 |
| | 13,1 | 47 | 20 | 76 | 1,1 | 94 | 109 | 125 | 141 | 156 | 610 | 915 | 1223 | 1530 | 1839 | 2150 | |
| | 16,7 | 60 | 24 | 125 | 1,4 | 120 | 140 | 160 | 180 | 200 | 728 | 1091 | 1458 | 1827 | 2195 | 2566 | |
| | 21,7 | 78 | 29 | 211 | 1,8 | 156 | 182 | 208 | 234 | 260 | 868 | 1301 | 1739 | 2179 | 2618 | 3061 | |
| | 28,6 | 103 | 34 | 369 | 2,4 | 206 | 240 | 274 | 309 | 343 | 1025 | 1540 | 2057 | 2577 | 3098 | 3622 | |
| 1800 | 13,3 | 48 | <20 | 55 | 1,0 | 96 | 112 | 128 | 144 | 160 | 640 | 960 | 1284 | 1608 | 1933 | 2257 | 8,6 |
| | 15,8 | 57 | 20 | 78 | 1,2 | 114 | 133 | 152 | 171 | 190 | 727 | 1091 | 1458 | 1826 | 2194 | 2563 | |
| | 20,0 | 72 | 24 | 125 | 1,5 | 144 | 168 | 192 | 216 | 240 | 855 | 1285 | 1718 | 2151 | 2585 | 3019 | |
| | 26,4 | 95 | 29 | 218 | 2,0 | 190 | 221 | 253 | 285 | 316 | 1022 | 1535 | 2052 | 2569 | 3088 | 3608 | |
| | 33,9 | 122 | 34 | 360 | 2,6 | 244 | 284 | 325 | 366 | 406 | 1179 | 1771 | 2367 | 2963 | 3562 | 4164 | |
| 2100 | 14,4 | 52 | <20 | 41 | 1,0 | 104 | 121 | 138 | 156 | 173 | 701 | 1052 | 1403 | 1755 | 2108 | 2464 | 10,1 |
| | 16,9 | 61 | 20 | 57 | 1,2 | 122 | 142 | 162 | 183 | 203 | 786 | 1180 | 1575 | 1972 | 2369 | 2769 | |
| | 21,7 | 78 | 25 | 93 | 1,6 | 156 | 182 | 208 | 234 | 260 | 931 | 1398 | 1867 | 2338 | 2811 | 3284 | |
| | 27,5 | 99 | 30 | 151 | 1,0 | 198 | 231 | 264 | 297 | 330 | 1084 | 1627 | 2173 | 2723 | 3274 | 3826 | |
| | 35,0 | 126 | 35 | 244 | 2,5 | 252 | 294 | 336 | 378 | 420 | 1246 | 1869 | 2497 | 3129 | 3761 | 4396 | |
| 2400 | 16,7 | 60 | <20 | 42 | 1,1 | 120 | 140 | 160 | 180 | 200 | 796 | 1193 | 1591 | 1993 | 2395 | 2801 | 11,3 |
| | 21,7 | 78 | 20 | 71 | 1,5 | 156 | 182 | 208 | 234 | 260 | 953 | 1433 | 1913 | 2396 | 2880 | 3364 | |
| | 26,9 | 97 | 24 | 111 | 1,8 | 194 | 226 | 258 | 291 | 323 | 1098 | 1653 | 2208 | 2764 | 3324 | 3879 | |
| | 34,2 | 123 | 29 | 178 | 2,3 | 246 | 287 | 328 | 369 | 410 | 1265 | 1906 | 2546 | 3186 | 3833 | 4470 | |
| | 43,9 | 158 | 34 | 294 | 2,9 | 316 | 368 | 421 | 474 | 526 | 1446 | 2178 | 2909 | 3640 | 4381 | 5108 | |
| 2700 | 18,9 | 68 | <20 | 51 | 1,2 | 136 | 158 | 181 | 204 | 226 | 886 | 1332 | 1781 | 2229 | 2677 | 3128 | 12,7 |
| | 23,6 | 85 | <20 | 80 | 1,5 | 170 | 198 | 226 | 255 | 283 | 1029 | 1548 | 2070 | 2591 | 3113 | 3637 | |
| | 27,2 | 98 | 20 | 106 | 1,7 | 196 | 228 | 261 | 294 | 326 | 1128 | 1697 | 2268 | 2840 | 3412 | 3987 | |
| | 33,9 | 122 | 24 | 164 | 2,1 | 244 | 284 | 325 | 366 | 406 | 1289 | 1938 | 2590 | 3243 | 3897 | 4554 | |
| | 43,1 | 155 | 29 | 266 | 2,7 | 310 | 361 | 413 | 465 | 516 | 1472 | 2212 | 2953 | 3697 | 4441 | 5193 | |
| 3000 | 20,6 | 74 | <20 | 49 | 1,2 | 148 | 172 | 197 | 222 | 246 | 959 | 1439 | 1920 | 2402 | 2889 | 3377 | 14,2 |
| | 26,9 | 97 | <20 | 84 | 1,6 | 194 | 226 | 258 | 291 | 323 | 1144 | 1717 | 2293 | 2872 | 3453 | 4034 | |
| | 33,3 | 120 | 20 | 129 | 1,0 | 240 | 280 | 320 | 360 | 400 | 1304 | 1958 | 2616 | 3276 | 3938 | 4600 | |
| | 41,4 | 149 | 24 | 199 | 2,5 | 298 | 347 | 397 | 447 | 496 | 1476 | 2214 | 2958 | 3706 | 4455 | 5203 | |
| | 52,5 | 189 | 29 | 320 | 3,1 | 378 | 441 | 504 | 567 | 630 | 1666 | 2498 | 3337 | 4181 | 5026 | 5869 | |

Technical Data. Selection Tables

HEATING - 2-TUBE SYSTEM - M-TYPE NOZZLE

Reference water flow (Q_w) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 2-TUBE HEATING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_w (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - M NOZZLE - 2-TUBE SYSTEM - HEATING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|----------------|-------------------------|----------|---------------------|-----|--------------|-----|-----|-----------------------|------|------|------|------|-----------------------|------|
| Length | Q_{pr} | | L_w dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | ΔP_w (kPa) | |
| | | | | | | 6 | 7 | 8 | 9 | 10 | 10 | 15 | 20 | 25 | 30 | | 35 |
| | l/s | m ³ /h | P_{pr} (W) | | | | | P_{sw} (W) | | | | | | | | | |
| 600 | 7,8 | 28 | <20 | 64 | 0,8 | 56 | 65 | 74 | 84 | 93 | 289 | 436 | 583 | 734 | 881 | 1030 | 2,0 |
| | 9,3 | 33 | 20 | 91 | 0,0 | 67 | 78 | 89 | 100 | 111 | 332 | 501 | 669 | 842 | 1011 | 1182 | |
| | 11,1 | 40 | 24 | 130 | 1,2 | 80 | 93 | 106 | 120 | 133 | 380 | 572 | 765 | 961 | 1154 | 1350 | |
| | 13,6 | 49 | 30 | 196 | 1,5 | 98 | 114 | 130 | 147 | 163 | 439 | 661 | 885 | 1111 | 1333 | 1561 | |
| | 16,1 | 58 | 34 | 274 | 1,7 | 116 | 135 | 154 | 174 | 193 | 489 | 737 | 988 | 1239 | 1488 | 1742 | |
| 900 | 11,7 | 42 | <20 | 55 | 1,0 | 84 | 98 | 112 | 126 | 140 | 404 | 610 | 816 | 1024 | 1230 | 1439 | 4,3 |
| | 13,9 | 50 | 20 | 78 | 1,2 | 100 | 116 | 133 | 150 | 166 | 461 | 694 | 929 | 1166 | 1402 | 1640 | |
| | 16,7 | 60 | 25 | 112 | 1,5 | 120 | 140 | 160 | 180 | 200 | 526 | 792 | 1059 | 1329 | 1598 | 1870 | |
| | 20,0 | 72 | 30 | 162 | 1,8 | 144 | 168 | 192 | 216 | 240 | 596 | 896 | 1200 | 1506 | 1811 | 2119 | |
| | 23,9 | 86 | 35 | 231 | 2,1 | 172 | 200 | 229 | 258 | 286 | 670 | 1005 | 1345 | 1688 | 2031 | 2377 | |
| 1200 | 15,3 | 55 | <20 | 53 | 1,2 | 110 | 128 | 146 | 165 | 183 | 518 | 778 | 1039 | 1302 | 1565 | 1834 | 5,8 |
| | 18,3 | 66 | 20 | 76 | 1,4 | 132 | 154 | 176 | 198 | 220 | 593 | 890 | 1189 | 1490 | 1791 | 2097 | |
| | 21,9 | 79 | 25 | 110 | 1,7 | 158 | 184 | 210 | 237 | 263 | 673 | 1010 | 1351 | 1692 | 2035 | 2380 | |
| | 26,4 | 95 | 30 | 159 | 2,0 | 190 | 221 | 253 | 285 | 316 | 762 | 1142 | 1528 | 1914 | 2302 | 2691 | |
| | 31,7 | 114 | 35 | 229 | 2,4 | 228 | 266 | 304 | 342 | 380 | 851 | 1278 | 1710 | 2144 | 2580 | 3015 | |
| 1500 | 18,9 | 68 | <20 | 52 | 1,3 | 136 | 158 | 181 | 204 | 226 | 636 | 953 | 1274 | 1595 | 1917 | 2241 | 7,2 |
| | 22,8 | 82 | 20 | 75 | 1,5 | 164 | 191 | 218 | 246 | 273 | 728 | 1090 | 1457 | 1825 | 2193 | 2563 | |
| | 27,2 | 98 | 25 | 108 | 1,8 | 196 | 228 | 261 | 294 | 326 | 821 | 1231 | 1645 | 2061 | 2477 | 2895 | |
| | 32,5 | 117 | 29 | 154 | 2,2 | 234 | 273 | 312 | 351 | 390 | 919 | 1379 | 1843 | 2308 | 2774 | 3243 | |
| | 39,2 | 141 | 35 | 224 | 2,7 | 282 | 329 | 376 | 423 | 470 | 1025 | 1540 | 2058 | 2577 | 3098 | 3623 | |
| 1800 | 22,5 | 81 | <20 | 51 | 1,4 | 162 | 189 | 216 | 243 | 270 | 746 | 1121 | 1498 | 1876 | 2255 | 2633 | 8,6 |
| | 27,2 | 98 | 20 | 75 | 1,7 | 196 | 228 | 261 | 294 | 326 | 852 | 1280 | 1711 | 2143 | 2575 | 3008 | |
| | 32,2 | 116 | 24 | 105 | 1,0 | 232 | 270 | 309 | 348 | 386 | 952 | 1431 | 1912 | 2394 | 2877 | 3361 | |
| | 38,6 | 139 | 29 | 151 | 2,4 | 278 | 324 | 370 | 417 | 463 | 1063 | 1598 | 2135 | 2673 | 3213 | 3755 | |
| | 46,7 | 168 | 35 | 221 | 2,9 | 336 | 392 | 448 | 504 | 560 | 1183 | 1777 | 2375 | 2973 | 3574 | 4178 | |
| 2100 | 25,0 | 90 | <20 | 48 | 1,4 | 180 | 210 | 240 | 270 | 300 | 828 | 1245 | 1661 | 2080 | 2500 | 2921 | 10,1 |
| | 28,6 | 103 | 20 | 63 | 1,6 | 206 | 240 | 274 | 309 | 343 | 909 | 1365 | 1823 | 2283 | 2744 | 3207 | |
| | 35,0 | 126 | 25 | 95 | 2,0 | 252 | 294 | 336 | 378 | 420 | 1036 | 1556 | 2078 | 2604 | 3130 | 3658 | |
| | 42,8 | 154 | 30 | 142 | 2,5 | 308 | 359 | 410 | 462 | 513 | 1169 | 1755 | 2344 | 2937 | 3531 | 4127 | |
| | 52,2 | 188 | 35 | 211 | 2,0 | 376 | 438 | 501 | 564 | 626 | 1305 | 1958 | 2615 | 3276 | 3938 | 4604 | |
| 2400 | 27,8 | 100 | <20 | 45 | 1,5 | 200 | 233 | 266 | 300 | 333 | 912 | 1371 | 1829 | 2291 | 2754 | 3218 | 11,3 |
| | 32,8 | 118 | 20 | 63 | 1,8 | 236 | 275 | 314 | 354 | 393 | 1019 | 1532 | 2046 | 2562 | 3081 | 3597 | |
| | 39,7 | 143 | 25 | 93 | 2,1 | 286 | 333 | 381 | 429 | 476 | 1150 | 1731 | 2312 | 2894 | 3482 | 4062 | |
| | 48,6 | 175 | 30 | 140 | 2,6 | 350 | 408 | 466 | 525 | 583 | 1293 | 1948 | 2602 | 3257 | 3918 | 4569 | |
| | 59,4 | 214 | 35 | 210 | 3,2 | 428 | 499 | 570 | 642 | 713 | 1438 | 2166 | 2895 | 3622 | 4358 | 5081 | |
| 2700 | 31,7 | 114 | <20 | 47 | 1,6 | 228 | 266 | 304 | 342 | 380 | 1016 | 1528 | 2042 | 2557 | 3072 | 3589 | 12,7 |
| | 36,4 | 131 | 20 | 62 | 1,8 | 262 | 305 | 349 | 393 | 436 | 1112 | 1672 | 2235 | 2798 | 3362 | 3928 | |
| | 44,4 | 160 | 25 | 92 | 2,2 | 320 | 373 | 426 | 480 | 533 | 1257 | 1890 | 2526 | 3164 | 3801 | 4442 | |
| | 54,4 | 196 | 30 | 139 | 2,8 | 392 | 457 | 522 | 588 | 653 | 1411 | 2121 | 2833 | 3546 | 4261 | 4982 | |
| | 66,7 | 240 | 34 | 208 | 3,4 | 480 | 560 | 640 | 720 | 800 | 1566 | 2354 | 3141 | 3932 | 4723 | 5525 | |
| 3000 | 34,4 | 124 | <20 | 45 | 1,7 | 248 | 289 | 330 | 372 | 413 | 1095 | 1644 | 2195 | 2748 | 3304 | 3861 | 14,2 |
| | 40,6 | 146 | 20 | 62 | 1,9 | 292 | 340 | 389 | 438 | 486 | 1214 | 1823 | 2435 | 3050 | 3666 | 4283 | |
| | 49,4 | 178 | 25 | 93 | 2,4 | 356 | 415 | 474 | 534 | 593 | 1368 | 2053 | 2742 | 3435 | 4129 | 4823 | |
| | 60,3 | 217 | 29 | 138 | 2,9 | 434 | 506 | 578 | 651 | 723 | 1526 | 2289 | 3058 | 3831 | 4605 | 5378 | |
| | 73,6 | 265 | 34 | 206 | 3,5 | 530 | 618 | 706 | 795 | 883 | 1685 | 2527 | 3375 | 4229 | 5083 | 5937 | |

Technical Data. Selection Tables

HEATING - 2-TUBE SYSTEM - G-TYPE NOZZLE

Reference water flow (Q_w) of 250 L/h

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 2-TUBE HEATING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_w (l/h) | Sound power correction factor for coil | | | | | | | | |
| 80 | 0,59 | 0,60 | 0,59 | 0,58 | 0,57 | 0,56 | 0,54 | 0,52 | 0,51 |
| 100 | 0,74 | 0,70 | 0,69 | 0,69 | 0,66 | 0,66 | 0,64 | 0,62 | 0,60 |
| 120 | 0,83 | 0,81 | 0,80 | 0,78 | 0,76 | 0,75 | 0,74 | 0,72 | 0,71 |
| 150 | 0,89 | 0,87 | 0,86 | 0,85 | 0,84 | 0,83 | 0,82 | 0,80 | 0,79 |
| 180 | 0,94 | 0,93 | 0,91 | 0,92 | 0,91 | 0,90 | 0,90 | 0,89 | 0,88 |
| 210 | 0,98 | 0,96 | 0,95 | 0,96 | 0,96 | 0,94 | 0,95 | 0,94 | 0,94 |
| 250 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 290 | 1,02 | 1,02 | 1,03 | 1,03 | 1,03 | 1,04 | 1,04 | 1,03 | 1,04 |
| 340 | 1,04 | 1,05 | 1,06 | 1,06 | 1,07 | 1,07 | 1,08 | 1,08 | 1,07 |

| VFK 600 - G NOZZLE - 2-TUBE SYSTEM - HEATING | | | | | | | | | | | | | | | | | |
|--|----------|------|----------------|-------------------------|----------|---------------------|------|------|------|------|-----------------------|------|------|------|------|-----------------------|------|
| Length | Q_{pr} | | L_w dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | ΔP_w (kPa) | |
| | l/s | m³/h | | | | 6 | 7 | 8 | 9 | 10 | 5% | 7% | 8% | 25 | 30 | | 35 |
| | | | | | | P_{pr} (W) | | | | | P_{sw} (W) | | | | | | |
| 600 | 12,5 | 45 | <20 | 63 | 0,0 | 90 | 105 | 120 | 135 | 150 | 340 | 512 | 685 | 861 | 1034 | 1210 | 2,0 |
| | 16,9 | 61 | 20 | 117 | 1,4 | 122 | 142 | 162 | 183 | 203 | 425 | 641 | 857 | 1076 | 1292 | 1512 | |
| | 20,0 | 72 | 24 | 163 | 1,6 | 144 | 168 | 192 | 216 | 240 | 474 | 715 | 958 | 1202 | 1443 | 1690 | |
| | 24,4 | 88 | 29 | 244 | 1,0 | 176 | 205 | 234 | 264 | 293 | 531 | 802 | 1075 | 1350 | 1623 | 1899 | |
| | 30,0 | 108 | 35 | 367 | 2,4 | 216 | 252 | 288 | 324 | 360 | 573 | 868 | 1163 | 1465 | 1770 | 2065 | |
| 900 | 16,7 | 60 | <20 | 50 | 1,1 | 120 | 140 | 160 | 180 | 200 | 423 | 638 | 854 | 1072 | 1288 | 1506 | 4,3 |
| | 19,2 | 69 | 20 | 66 | 1,2 | 138 | 161 | 184 | 207 | 230 | 470 | 708 | 947 | 1189 | 1429 | 1671 | |
| | 22,8 | 82 | 24 | 94 | 1,5 | 164 | 191 | 218 | 246 | 273 | 532 | 801 | 1071 | 1345 | 1616 | 1891 | |
| | 27,2 | 98 | 29 | 134 | 1,8 | 196 | 228 | 261 | 294 | 326 | 601 | 904 | 1209 | 1518 | 1825 | 2136 | |
| | 33,3 | 120 | 34 | 201 | 2,2 | 240 | 280 | 320 | 360 | 400 | 685 | 1028 | 1376 | 1727 | 2078 | 2433 | |
| 1200 | 20,8 | 75 | 20 | 44 | 1,2 | 150 | 175 | 200 | 225 | 250 | 506 | 760 | 1015 | 1271 | 1529 | 1791 | 5,8 |
| | 25,0 | 90 | 25 | 63 | 1,4 | 180 | 210 | 240 | 270 | 300 | 579 | 870 | 1162 | 1456 | 1751 | 2050 | |
| | 30,6 | 110 | 30 | 95 | 1,7 | 220 | 256 | 293 | 330 | 366 | 669 | 1003 | 1341 | 1680 | 2020 | 2362 | |
| | 36,1 | 130 | 34 | 133 | 2,0 | 260 | 303 | 346 | 390 | 433 | 748 | 1122 | 1500 | 1879 | 2261 | 2642 | |
| | 44,4 | 160 | 40 | 201 | 2,5 | 320 | 373 | 426 | 480 | 533 | 850 | 1276 | 1707 | 2140 | 2576 | 3010 | |
| 1500 | 26,4 | 95 | 24 | 40 | 1,3 | 190 | 221 | 253 | 285 | 316 | 633 | 948 | 1267 | 1586 | 1906 | 2229 | 7,2 |
| | 31,9 | 115 | 29 | 59 | 1,6 | 230 | 268 | 306 | 345 | 383 | 726 | 1087 | 1454 | 1820 | 2188 | 2557 | |
| | 38,9 | 140 | 35 | 88 | 1,0 | 280 | 326 | 373 | 420 | 466 | 829 | 1243 | 1662 | 2081 | 2501 | 2923 | |
| | 47,2 | 170 | 40 | 130 | 2,4 | 340 | 396 | 453 | 510 | 566 | 937 | 1406 | 1879 | 2353 | 2829 | 3307 | |
| | 56,9 | 205 | 45 | 189 | 2,9 | 410 | 478 | 546 | 615 | 683 | 1044 | 1569 | 2096 | 2625 | 3156 | 3690 | |
| 1800 | 27,8 | 100 | 24 | 31 | 1,3 | 200 | 233 | 266 | 300 | 333 | 660 | 990 | 1324 | 1658 | 1993 | 2327 | 8,6 |
| | 33,9 | 122 | 29 | 46 | 1,6 | 244 | 284 | 325 | 366 | 406 | 763 | 1145 | 1531 | 1917 | 2304 | 2691 | |
| | 40,6 | 146 | 34 | 66 | 1,9 | 292 | 340 | 389 | 438 | 486 | 863 | 1297 | 1734 | 2171 | 2609 | 3048 | |
| | 49,7 | 179 | 40 | 100 | 2,3 | 358 | 417 | 477 | 537 | 596 | 985 | 1480 | 1978 | 2477 | 2977 | 3478 | |
| | 60,8 | 219 | 45 | 150 | 2,8 | 438 | 511 | 584 | 657 | 730 | 1111 | 1669 | 2230 | 2791 | 3355 | 3922 | |
| 2100 | 38,9 | 140 | 25 | 37 | 1,7 | 280 | 326 | 373 | 420 | 466 | 865 | 1300 | 1735 | 2172 | 2611 | 3051 | 10,1 |
| | 47,2 | 170 | 30 | 54 | 2,0 | 340 | 396 | 453 | 510 | 566 | 985 | 1479 | 1975 | 2474 | 2974 | 3476 | |
| | 56,9 | 205 | 35 | 79 | 2,4 | 410 | 478 | 546 | 615 | 683 | 1107 | 1662 | 2219 | 2781 | 3343 | 3907 | |
| | 69,4 | 250 | 40 | 118 | 2,0 | 500 | 583 | 666 | 750 | 833 | 1240 | 1861 | 2486 | 3115 | 3745 | 4377 | |
| | 83,3 | 300 | 44 | 170 | 3,6 | 600 | 700 | 800 | 900 | 1000 | 1365 | 2048 | 2736 | 3427 | 4119 | 4816 | |
| 2400 | 45,8 | 165 | 25 | 39 | 1,8 | 330 | 385 | 440 | 495 | 550 | 990 | 1488 | 1987 | 2488 | 2992 | 3493 | 11,3 |
| | 56,1 | 202 | 30 | 59 | 2,2 | 404 | 471 | 538 | 606 | 673 | 1126 | 1695 | 2264 | 2834 | 3409 | 3978 | |
| | 66,7 | 240 | 34 | 83 | 2,7 | 480 | 560 | 640 | 720 | 800 | 1247 | 1879 | 2510 | 3142 | 3780 | 4408 | |
| | 81,9 | 295 | 39 | 126 | 3,3 | 590 | 688 | 786 | 885 | 983 | 1396 | 2103 | 2810 | 3515 | 4230 | 4932 | |
| | 101,4 | 365 | 45 | 193 | 4,0 | 730 | 851 | 973 | 1095 | 1216 | 1551 | 2335 | 3119 | 3904 | 4699 | 5480 | |
| 2700 | 51,9 | 187 | 25 | 40 | 1,0 | 374 | 436 | 498 | 561 | 623 | 1095 | 1647 | 2202 | 2757 | 3312 | 3869 | 12,7 |
| | 62,5 | 225 | 30 | 58 | 2,4 | 450 | 525 | 600 | 675 | 750 | 1229 | 1847 | 2469 | 3092 | 3715 | 4341 | |
| | 76,4 | 275 | 35 | 86 | 2,9 | 550 | 641 | 733 | 825 | 916 | 1380 | 2074 | 2771 | 3469 | 4168 | 4872 | |
| | 93,1 | 335 | 40 | 128 | 3,5 | 670 | 781 | 893 | 1005 | 1116 | 1531 | 2301 | 3071 | 3844 | 4618 | 5401 | |
| | 114,4 | 412 | 45 | 195 | 4,3 | 824 | 961 | 1098 | 1236 | 1373 | 1690 | 2540 | 3387 | 4239 | 5092 | 5957 | |
| 3000 | 58,3 | 210 | 24 | 41 | 2,1 | 420 | 490 | 560 | 630 | 700 | 1202 | 1805 | 2411 | 3019 | 3630 | 4241 | 14,2 |
| | 72,2 | 260 | 30 | 62 | 2,6 | 520 | 606 | 693 | 780 | 866 | 1367 | 2052 | 2741 | 3434 | 4128 | 4821 | |
| | 87,5 | 315 | 35 | 92 | 3,1 | 630 | 735 | 840 | 945 | 1050 | 1520 | 2281 | 3047 | 3817 | 4588 | 5359 | |
| | 104,2 | 375 | 39 | 130 | 3,7 | 750 | 875 | 1000 | 1125 | 1250 | 1660 | 2489 | 3324 | 4165 | 5007 | 5847 | |
| | 127,8 | 460 | 44 | 196 | 4,6 | 920 | 1073 | 1226 | 1380 | 1533 | 1820 | 2729 | 3644 | 4567 | 5490 | 6410 | |

Technical Data. Selection Tables

HEATING - 4-TUBE SYSTEM - P-TYPE NOZZLE

Reference water flow (Q_W) of 50 L/h for sizes 600 to 1800.

Reference water flow (Q_W) of 110 L/h for sizes 2100 to 3000.

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 4-TUBE HEATING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for unit | | | | | | | | |
| 30 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,41 | 0,42 | 0,39 | 0,37 |
| 50 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,64 | 0,66 | 0,63 | 0,61 |
| 70 | 1,12 | 1,16 | 1,17 | 1,20 | 1,23 | 0,82 | 0,82 | 0,81 | 0,78 |
| 90 | 1,19 | 1,25 | 1,30 | 1,36 | 1,38 | 0,93 | 0,94 | 0,93 | 0,91 |
| 110 | 1,25 | 1,32 | 1,38 | 1,45 | 1,48 | 1,00 | 1,00 | 1,00 | 1,00 |
| 130 | 1,29 | 1,37 | 1,45 | 1,51 | 1,56 | 1,07 | 1,08 | 1,06 | 1,07 |
| 150 | 1,33 | 1,42 | 1,50 | 1,57 | 1,65 | 1,14 | 1,14 | 1,13 | 1,14 |
| 180 | 1,36 | 1,46 | 1,55 | 1,64 | 1,72 | 1,18 | 1,19 | 1,21 | 1,21 |
| 210 | 1,39 | 1,51 | 1,60 | 1,69 | 1,78 | 1,23 | 1,25 | 1,27 | 1,27 |
| 250 | 1,42 | 1,56 | 1,64 | 1,74 | 1,83 | 1,27 | 1,28 | 1,32 | 1,33 |

| VFK 600 - P NOZZLE - 4-TUBE SYSTEM - HEATING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|----------------|-------------------------|----------|---------------------|-----|-----|-----|-----|-----------------------|------|------|------|------|------|-----------------------|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | | ΔP_W (kPa) |
| | l/s | m ³ /h | | | | 6 | 7 | 8 | 9 | 10 | 10 | 15 | 20 | 25 | 30 | 35 | |
| | | | | | | P_{pr} (W) | | | | | P_{sw} (W) | | | | | | |
| 600 | 4,4 | 16 | <20 | 64 | 0,6 | 32 | 37 | 42 | 48 | 53 | 110 | 168 | 230 | 290 | 350 | 412 | 0,2 |
| | 5,3 | 19 | 20 | 90 | 0,7 | 38 | 44 | 50 | 57 | 63 | 121 | 185 | 253 | 318 | 383 | 452 | |
| | 6,7 | 24 | 24 | 144 | 0,9 | 48 | 56 | 64 | 72 | 80 | 138 | 210 | 286 | 361 | 434 | 512 | |
| | 8,9 | 32 | 30 | 256 | 1,2 | 64 | 74 | 85 | 96 | 106 | 161 | 243 | 330 | 417 | 503 | 591 | |
| | 11,7 | 42 | 35 | 442 | 1,6 | 84 | 98 | 112 | 126 | 140 | 181 | 272 | 369 | 469 | 568 | 666 | |
| 900 | 6,4 | 23 | <20 | 58 | 0,7 | 46 | 53 | 61 | 69 | 76 | 147 | 227 | 301 | 378 | 456 | 534 | 0,3 |
| | 7,8 | 28 | 20 | 87 | 0,9 | 56 | 65 | 74 | 84 | 93 | 165 | 254 | 335 | 419 | 503 | 591 | |
| | 10,0 | 36 | 24 | 144 | 1,1 | 72 | 84 | 96 | 108 | 120 | 189 | 289 | 380 | 475 | 570 | 670 | |
| | 13,1 | 47 | 29 | 246 | 1,4 | 94 | 109 | 125 | 141 | 156 | 214 | 325 | 428 | 538 | 646 | 760 | |
| | 17,2 | 62 | 34 | 428 | 1,9 | 124 | 144 | 165 | 186 | 206 | 237 | 358 | 475 | 602 | 725 | 853 | |
| 1200 | 8,6 | 31 | <20 | 60 | 0,8 | 62 | 72 | 82 | 93 | 103 | 184 | 281 | 381 | 482 | 579 | 675 | 0,3 |
| | 10,6 | 38 | 20 | 90 | 1,0 | 76 | 88 | 101 | 114 | 126 | 203 | 310 | 421 | 533 | 638 | 744 | |
| | 13,6 | 49 | 25 | 150 | 1,3 | 98 | 114 | 130 | 147 | 163 | 230 | 349 | 474 | 600 | 717 | 838 | |
| | 18,1 | 65 | 30 | 264 | 1,7 | 130 | 151 | 173 | 195 | 216 | 261 | 394 | 534 | 675 | 807 | 947 | |
| | 22,8 | 82 | 34 | 421 | 2,2 | 164 | 191 | 218 | 246 | 273 | 287 | 429 | 581 | 732 | 878 | 1033 | |
| 1500 | 11,7 | 42 | <20 | 61 | 0,0 | 84 | 98 | 112 | 126 | 140 | 228 | 343 | 468 | 592 | 710 | 832 | 0,4 |
| | 13,1 | 47 | 20 | 76 | 1,1 | 94 | 109 | 125 | 141 | 156 | 239 | 361 | 493 | 623 | 748 | 877 | |
| | 16,7 | 60 | 24 | 125 | 1,4 | 120 | 140 | 160 | 180 | 200 | 266 | 402 | 548 | 694 | 833 | 977 | |
| | 21,7 | 78 | 29 | 211 | 1,8 | 156 | 182 | 208 | 234 | 260 | 296 | 445 | 606 | 767 | 921 | 1082 | |
| | 28,6 | 103 | 34 | 369 | 2,4 | 206 | 240 | 274 | 309 | 343 | 325 | 488 | 660 | 832 | 1000 | 1175 | |
| 1800 | 13,3 | 48 | <20 | 55 | 1,0 | 96 | 112 | 128 | 144 | 160 | 258 | 386 | 518 | 653 | 784 | 917 | 0,5 |
| | 15,8 | 57 | 20 | 78 | 1,2 | 114 | 133 | 152 | 171 | 190 | 277 | 415 | 558 | 704 | 844 | 988 | |
| | 20,0 | 72 | 24 | 125 | 1,5 | 144 | 168 | 192 | 216 | 240 | 304 | 455 | 613 | 773 | 926 | 1085 | |
| | 26,4 | 95 | 29 | 218 | 2,0 | 190 | 221 | 253 | 285 | 316 | 333 | 500 | 672 | 848 | 1014 | 1192 | |
| | 33,9 | 122 | 34 | 360 | 2,6 | 244 | 284 | 325 | 366 | 406 | 355 | 534 | 715 | 901 | 1078 | 1271 | |
| 2100 | 14,4 | 52 | <20 | 41 | 1,0 | 104 | 121 | 138 | 156 | 173 | 363 | 544 | 726 | 906 | 1088 | 1270 | 3,8 |
| | 16,9 | 61 | 20 | 57 | 1,2 | 122 | 142 | 162 | 183 | 203 | 394 | 592 | 789 | 986 | 1184 | 1385 | |
| | 21,7 | 78 | 25 | 93 | 1,6 | 156 | 182 | 208 | 234 | 260 | 447 | 675 | 898 | 1122 | 1349 | 1581 | |
| | 27,5 | 99 | 30 | 151 | 1,0 | 198 | 231 | 264 | 297 | 330 | 504 | 762 | 1013 | 1267 | 1524 | 1788 | |
| | 35,0 | 126 | 35 | 244 | 2,5 | 252 | 294 | 336 | 378 | 420 | 566 | 854 | 1135 | 1420 | 1708 | 2005 | |
| 2400 | 16,7 | 60 | <20 | 42 | 1,1 | 120 | 140 | 160 | 180 | 200 | 407 | 608 | 809 | 1011 | 1216 | 1419 | 4,3 |
| | 21,7 | 78 | 20 | 71 | 1,5 | 156 | 182 | 208 | 234 | 260 | 464 | 699 | 934 | 1167 | 1399 | 1634 | |
| | 26,9 | 97 | 24 | 111 | 1,8 | 194 | 226 | 258 | 291 | 323 | 517 | 782 | 1045 | 1306 | 1566 | 1830 | |
| | 34,2 | 123 | 29 | 178 | 2,3 | 246 | 287 | 328 | 369 | 410 | 577 | 874 | 1169 | 1462 | 1755 | 2051 | |
| | 43,9 | 158 | 34 | 294 | 2,9 | 316 | 368 | 421 | 474 | 526 | 642 | 968 | 1294 | 1620 | 1949 | 2279 | |
| 2700 | 18,9 | 68 | <20 | 51 | 1,2 | 136 | 158 | 181 | 204 | 226 | 444 | 669 | 891 | 1113 | 1337 | 1561 | 4,8 |
| | 23,6 | 85 | <20 | 80 | 1,5 | 170 | 198 | 226 | 255 | 283 | 494 | 750 | 998 | 1245 | 1498 | 1756 | |
| | 27,2 | 98 | 20 | 106 | 1,7 | 196 | 228 | 261 | 294 | 326 | 529 | 804 | 1070 | 1336 | 1608 | 1887 | |
| | 33,9 | 122 | 24 | 164 | 2,1 | 244 | 284 | 325 | 366 | 406 | 587 | 892 | 1186 | 1481 | 1784 | 2095 | |
| | 43,1 | 155 | 29 | 266 | 2,7 | 310 | 361 | 413 | 465 | 516 | 653 | 988 | 1314 | 1640 | 1975 | 2318 | |
| 3000 | 20,6 | 74 | <20 | 49 | 1,2 | 148 | 172 | 197 | 222 | 246 | 476 | 715 | 956 | 1194 | 1433 | 1673 | 5,4 |
| | 26,9 | 97 | <20 | 84 | 1,6 | 194 | 226 | 258 | 291 | 323 | 544 | 819 | 1093 | 1367 | 1642 | 1919 | |
| | 33,3 | 120 | 20 | 129 | 1,0 | 240 | 280 | 320 | 360 | 400 | 601 | 904 | 1207 | 1511 | 1816 | 2124 | |
| | 41,4 | 149 | 24 | 199 | 2,5 | 298 | 347 | 397 | 447 | 496 | 659 | 990 | 1322 | 1657 | 1992 | 2332 | |
| | 52,5 | 189 | 29 | 320 | 3,1 | 378 | 441 | 504 | 567 | 630 | 721 | 1078 | 1441 | 1808 | 2171 | 2544 | |

Technical Data. Selection Tables

HEATING - 4-TUBE SYSTEM - M-TYPE NOZZLE

Reference water flow (Q_W) of 50 L/h for sizes 600 to 1800.

Reference water flow (Q_W) of 110 L/h for sizes 2100 to 3000.

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 4-TUBE HEATING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 30 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,41 | 0,42 | 0,39 | 0,37 |
| 50 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,64 | 0,66 | 0,63 | 0,61 |
| 70 | 1,12 | 1,16 | 1,17 | 1,20 | 1,23 | 0,82 | 0,82 | 0,81 | 0,78 |
| 90 | 1,19 | 1,25 | 1,30 | 1,36 | 1,38 | 0,93 | 0,94 | 0,93 | 0,91 |
| 110 | 1,25 | 1,32 | 1,38 | 1,45 | 1,48 | 1,00 | 1,00 | 1,00 | 1,00 |
| 130 | 1,29 | 1,37 | 1,45 | 1,51 | 1,56 | 1,07 | 1,08 | 1,06 | 1,07 |
| 150 | 1,33 | 1,42 | 1,50 | 1,57 | 1,65 | 1,14 | 1,14 | 1,13 | 1,14 |
| 180 | 1,36 | 1,46 | 1,55 | 1,64 | 1,72 | 1,18 | 1,19 | 1,21 | 1,21 |
| 210 | 1,39 | 1,51 | 1,60 | 1,69 | 1,78 | 1,23 | 1,25 | 1,27 | 1,27 |
| 250 | 1,42 | 1,56 | 1,64 | 1,74 | 1,83 | 1,27 | 1,28 | 1,32 | 1,33 |

| VFK 600 - M NOZZLE - 4-TUBE SYSTEM - HEATING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|----------------|-------------------------|----------|---------------------|-----|-----|-----|-----|-----------------------|------|------|------|------|-----------------------|-----|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | ΔP_W (kPa) | |
| | l/s | m ³ /h | | | | 6 | 7 | 8 | 9 | 10 | 10 | 15 | 20 | 25 | 30 | | 35 |
| | | | | | | P_{pr} (W) | | | | | P_{SW} (W) | | | | | | |
| 600 | 7,8 | 28 | <20 | 64 | 0,8 | 56 | 65 | 74 | 84 | 93 | 125 | 191 | 260 | 328 | 395 | 465 | 0,2 |
| | 9,3 | 33 | 20 | 91 | 0,0 | 67 | 78 | 89 | 100 | 111 | 138 | 210 | 286 | 361 | 434 | 512 | |
| | 11,1 | 40 | 24 | 130 | 1,2 | 80 | 93 | 106 | 120 | 133 | 152 | 230 | 313 | 395 | 476 | 560 | |
| | 13,6 | 49 | 30 | 196 | 1,5 | 98 | 114 | 130 | 147 | 163 | 168 | 253 | 344 | 435 | 526 | 617 | |
| | 16,1 | 58 | 34 | 274 | 1,7 | 116 | 135 | 154 | 174 | 193 | 181 | 271 | 368 | 468 | 566 | 663 | |
| 900 | 11,7 | 42 | <20 | 55 | 1,0 | 84 | 98 | 112 | 126 | 140 | 176 | 270 | 356 | 445 | 534 | 627 | 0,3 |
| | 13,9 | 50 | 20 | 78 | 1,2 | 100 | 116 | 133 | 150 | 166 | 193 | 295 | 387 | 485 | 581 | 684 | |
| | 16,7 | 60 | 25 | 112 | 1,5 | 120 | 140 | 160 | 180 | 200 | 210 | 320 | 421 | 528 | 633 | 745 | |
| | 20,0 | 72 | 30 | 162 | 1,8 | 144 | 168 | 192 | 216 | 240 | 226 | 342 | 452 | 571 | 686 | 807 | |
| | 23,9 | 86 | 35 | 231 | 2,1 | 172 | 200 | 229 | 258 | 286 | 240 | 362 | 482 | 611 | 736 | 866 | |
| 1200 | 15,3 | 55 | <20 | 53 | 1,2 | 110 | 128 | 146 | 165 | 183 | 209 | 319 | 432 | 547 | 655 | 764 | 0,3 |
| | 18,3 | 66 | 20 | 76 | 1,4 | 132 | 154 | 176 | 198 | 220 | 228 | 347 | 471 | 596 | 712 | 832 | |
| | 21,9 | 79 | 25 | 110 | 1,7 | 158 | 184 | 210 | 237 | 263 | 248 | 375 | 509 | 644 | 770 | 902 | |
| | 26,4 | 95 | 30 | 159 | 2,0 | 190 | 221 | 253 | 285 | 316 | 268 | 404 | 548 | 692 | 828 | 972 | |
| | 31,7 | 114 | 35 | 229 | 2,4 | 228 | 266 | 304 | 342 | 380 | 288 | 431 | 584 | 736 | 882 | 1039 | |
| 1500 | 18,9 | 68 | <20 | 52 | 1,3 | 136 | 158 | 181 | 204 | 226 | 245 | 370 | 505 | 639 | 767 | 900 | 0,4 |
| | 22,8 | 82 | 20 | 75 | 1,5 | 164 | 191 | 218 | 246 | 273 | 266 | 401 | 548 | 694 | 832 | 977 | |
| | 27,2 | 98 | 25 | 108 | 1,8 | 196 | 228 | 261 | 294 | 326 | 286 | 431 | 588 | 744 | 893 | 1049 | |
| | 32,5 | 117 | 29 | 154 | 2,2 | 234 | 273 | 312 | 351 | 390 | 306 | 460 | 625 | 790 | 949 | 1115 | |
| | 39,2 | 141 | 35 | 224 | 2,7 | 282 | 329 | 376 | 423 | 470 | 325 | 488 | 660 | 832 | 1000 | 1175 | |
| 1800 | 22,5 | 81 | <20 | 51 | 1,4 | 162 | 189 | 216 | 243 | 270 | 282 | 421 | 567 | 715 | 857 | 1003 | 0,5 |
| | 27,2 | 98 | 20 | 75 | 1,7 | 196 | 228 | 261 | 294 | 326 | 303 | 454 | 611 | 771 | 924 | 1082 | |
| | 32,2 | 116 | 24 | 105 | 1,0 | 232 | 270 | 309 | 348 | 386 | 322 | 482 | 649 | 819 | 980 | 1149 | |
| | 38,6 | 139 | 29 | 151 | 2,4 | 278 | 324 | 370 | 417 | 463 | 340 | 510 | 685 | 864 | 1033 | 1215 | |
| | 46,7 | 168 | 35 | 221 | 2,9 | 336 | 392 | 448 | 504 | 560 | 356 | 535 | 716 | 902 | 1080 | 1272 | |
| 2100 | 25,0 | 90 | <20 | 48 | 1,4 | 180 | 210 | 240 | 270 | 300 | 410 | 617 | 821 | 1026 | 1233 | 1443 | 3,8 |
| | 28,6 | 103 | 20 | 63 | 1,6 | 206 | 240 | 274 | 309 | 343 | 439 | 662 | 881 | 1102 | 1324 | 1551 | |
| | 35,0 | 126 | 25 | 95 | 2,0 | 252 | 294 | 336 | 378 | 420 | 487 | 735 | 977 | 1222 | 1469 | 1724 | |
| | 42,8 | 154 | 30 | 142 | 2,5 | 308 | 359 | 410 | 462 | 513 | 537 | 811 | 1078 | 1348 | 1621 | 1903 | |
| | 52,2 | 188 | 35 | 211 | 2,0 | 376 | 438 | 501 | 564 | 626 | 588 | 887 | 1179 | 1476 | 1775 | 2083 | |
| 2400 | 27,8 | 100 | <20 | 45 | 1,5 | 200 | 233 | 266 | 300 | 333 | 450 | 676 | 902 | 1126 | 1352 | 1579 | 4,3 |
| | 32,8 | 118 | 20 | 63 | 1,8 | 236 | 275 | 314 | 354 | 393 | 488 | 737 | 984 | 1230 | 1475 | 1723 | |
| | 39,7 | 143 | 25 | 93 | 2,1 | 286 | 333 | 381 | 429 | 476 | 536 | 810 | 1084 | 1355 | 1625 | 1899 | |
| | 48,6 | 175 | 30 | 140 | 2,6 | 350 | 408 | 466 | 525 | 583 | 587 | 889 | 1189 | 1487 | 1786 | 2088 | |
| | 59,4 | 214 | 35 | 210 | 3,2 | 428 | 499 | 570 | 642 | 713 | 639 | 964 | 1289 | 1614 | 1942 | 2270 | |
| 2700 | 31,7 | 114 | <20 | 47 | 1,6 | 228 | 266 | 304 | 342 | 380 | 490 | 742 | 988 | 1233 | 1483 | 1737 | 4,8 |
| | 36,4 | 131 | 20 | 62 | 1,8 | 262 | 305 | 349 | 393 | 436 | 524 | 795 | 1058 | 1321 | 1590 | 1865 | |
| | 44,4 | 160 | 25 | 92 | 2,2 | 320 | 373 | 426 | 480 | 533 | 576 | 875 | 1164 | 1453 | 1749 | 2054 | |
| | 54,4 | 196 | 30 | 139 | 2,8 | 392 | 457 | 522 | 588 | 653 | 631 | 957 | 1272 | 1588 | 1912 | 2246 | |
| | 66,7 | 240 | 34 | 208 | 3,4 | 480 | 560 | 640 | 720 | 800 | 687 | 1036 | 1377 | 1719 | 2069 | 2427 | |
| 3000 | 34,4 | 124 | <20 | 45 | 1,7 | 248 | 289 | 330 | 372 | 413 | 526 | 792 | 1057 | 1322 | 1588 | 1855 | 5,4 |
| | 40,6 | 146 | 20 | 62 | 1,9 | 292 | 340 | 389 | 438 | 486 | 569 | 857 | 1144 | 1431 | 1719 | 2010 | |
| | 49,4 | 178 | 25 | 93 | 2,4 | 356 | 415 | 474 | 534 | 593 | 623 | 937 | 1250 | 1566 | 1882 | 2203 | |
| | 60,3 | 217 | 29 | 138 | 2,9 | 434 | 506 | 578 | 651 | 723 | 676 | 1014 | 1355 | 1698 | 2041 | 2390 | |
| | 73,6 | 265 | 34 | 206 | 3,5 | 530 | 618 | 706 | 795 | 883 | 727 | 1086 | 1452 | 1822 | 2189 | 2565 | |

Technical Data. Selection Tables

HEATING - 4-TUBE SYSTEM - G-TYPE NOZZLE

Reference water flow (Q_W) of 50 L/h for sizes 600 to 1800.

Reference water flow (Q_W) of 110 L/h for sizes 2100 to 3000.

For other water flow rates, correct the coil power (P_{SW}) of the table by the factors listed in the attached table.

| VFK 600 - 4-TUBE HEATING SYSTEM | | | | | | | | | |
|---------------------------------|--|------|------|------|------|------|------|------|------|
| SIZE | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Q_W (l/h) | Sound power correction factor for the coil | | | | | | | | |
| 30 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,41 | 0,42 | 0,39 | 0,37 |
| 50 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,64 | 0,66 | 0,63 | 0,61 |
| 70 | 1,12 | 1,16 | 1,17 | 1,20 | 1,23 | 0,82 | 0,82 | 0,81 | 0,78 |
| 90 | 1,19 | 1,25 | 1,30 | 1,36 | 1,38 | 0,93 | 0,94 | 0,93 | 0,91 |
| 110 | 1,25 | 1,32 | 1,38 | 1,45 | 1,48 | 1,00 | 1,00 | 1,00 | 1,00 |
| 130 | 1,29 | 1,37 | 1,45 | 1,51 | 1,56 | 1,07 | 1,08 | 1,06 | 1,07 |
| 150 | 1,33 | 1,42 | 1,50 | 1,57 | 1,65 | 1,14 | 1,14 | 1,13 | 1,14 |
| 180 | 1,36 | 1,46 | 1,55 | 1,64 | 1,72 | 1,18 | 1,19 | 1,21 | 1,21 |
| 210 | 1,39 | 1,51 | 1,60 | 1,69 | 1,78 | 1,23 | 1,25 | 1,27 | 1,27 |
| 250 | 1,42 | 1,56 | 1,64 | 1,74 | 1,83 | 1,27 | 1,28 | 1,32 | 1,33 |

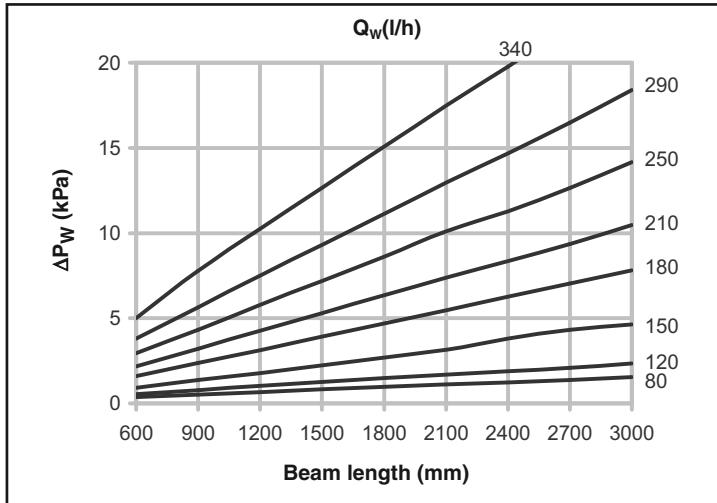
| VFK 600 - G NOZZLE - 4-TUBE SYSTEM - HEATING | | | | | | | | | | | | | | | | | |
|--|----------|-------------------|----------------|-------------------------|----------|---------------------|------|------|------|------|-----------------------|------|------|------|------|-----------------------|-----|
| Length | Q_{pr} | | L_W dB(A) | ΔP_{pr} (Pa) | X (m) | ΔT_{pr} (K) | | | | | ΔT_{SWIN} (K) | | | | | ΔP_W (kPa) | |
| | l/s | m ³ /h | | | | 6 | 7 | 8 | 9 | 10 | 10 | 15 | 20 | 25 | 30 | | 35 |
| | | | | | | P_{pr} (W) | | | | | P_{SW} (W) | | | | | | |
| 600 | 12,5 | 45 | <20 | 63 | 0,0 | 90 | 105 | 120 | 135 | 150 | 140 | 214 | 291 | 367 | 441 | 520 | 0,2 |
| | 16,9 | 61 | 20 | 117 | 1,4 | 122 | 142 | 162 | 183 | 203 | 164 | 248 | 337 | 426 | 515 | 605 | |
| | 20,0 | 72 | 24 | 163 | 1,6 | 144 | 168 | 192 | 216 | 240 | 177 | 266 | 361 | 459 | 555 | 651 | |
| | 24,4 | 88 | 29 | 244 | 1,0 | 176 | 205 | 234 | 264 | 293 | 190 | 284 | 386 | 493 | 598 | 701 | |
| 900 | 30,0 | 108 | 35 | 367 | 2,4 | 216 | 252 | 288 | 324 | 360 | 198 | 293 | 402 | 518 | 630 | 742 | 0,3 |
| | 16,7 | 60 | <20 | 50 | 1,1 | 120 | 140 | 160 | 180 | 200 | 182 | 279 | 367 | 458 | 550 | 646 | |
| | 19,2 | 69 | 20 | 66 | 1,2 | 138 | 161 | 184 | 207 | 230 | 196 | 299 | 392 | 491 | 589 | 692 | |
| | 22,8 | 82 | 24 | 94 | 1,5 | 164 | 191 | 218 | 246 | 273 | 212 | 322 | 423 | 532 | 638 | 750 | |
| 1200 | 27,2 | 98 | 29 | 134 | 1,8 | 196 | 228 | 261 | 294 | 326 | 227 | 344 | 455 | 573 | 689 | 811 | 0,3 |
| | 33,3 | 120 | 34 | 201 | 2,2 | 240 | 280 | 320 | 360 | 400 | 242 | 366 | 488 | 619 | 746 | 878 | |
| | 20,8 | 75 | 20 | 44 | 1,2 | 150 | 175 | 200 | 225 | 250 | 206 | 314 | 426 | 539 | 645 | 753 | |
| | 25,0 | 90 | 25 | 63 | 1,4 | 180 | 210 | 240 | 270 | 300 | 225 | 342 | 464 | 587 | 702 | 820 | |
| 1500 | 30,6 | 110 | 30 | 95 | 1,7 | 220 | 256 | 293 | 330 | 366 | 247 | 374 | 507 | 641 | 766 | 897 | 0,4 |
| | 36,1 | 130 | 34 | 133 | 2,0 | 260 | 303 | 346 | 390 | 433 | 265 | 400 | 542 | 684 | 819 | 961 | |
| | 44,4 | 160 | 40 | 201 | 2,5 | 320 | 373 | 426 | 480 | 533 | 288 | 431 | 583 | 735 | 881 | 1038 | |
| | 26,4 | 95 | 24 | 40 | 1,3 | 190 | 221 | 253 | 285 | 316 | 244 | 369 | 504 | 637 | 765 | 897 | |
| 1800 | 31,9 | 115 | 29 | 59 | 1,6 | 230 | 268 | 306 | 345 | 383 | 265 | 401 | 547 | 693 | 831 | 975 | 0,5 |
| | 38,9 | 140 | 35 | 88 | 1,0 | 280 | 326 | 373 | 420 | 466 | 288 | 434 | 591 | 748 | 898 | 1055 | |
| | 47,2 | 170 | 40 | 130 | 2,4 | 340 | 396 | 453 | 510 | 566 | 309 | 465 | 632 | 798 | 958 | 1126 | |
| | 56,9 | 205 | 45 | 189 | 2,9 | 410 | 478 | 546 | 615 | 683 | 328 | 492 | 665 | 839 | 1008 | 1185 | |
| 2100 | 27,8 | 100 | 24 | 31 | 1,3 | 200 | 233 | 266 | 300 | 333 | 263 | 393 | 528 | 665 | 798 | 934 | 3,8 |
| | 33,9 | 122 | 29 | 46 | 1,6 | 244 | 284 | 325 | 366 | 406 | 285 | 427 | 574 | 724 | 868 | 1016 | |
| | 40,6 | 146 | 34 | 66 | 1,9 | 292 | 340 | 389 | 438 | 486 | 305 | 457 | 616 | 777 | 930 | 1090 | |
| | 49,7 | 179 | 40 | 100 | 2,3 | 358 | 417 | 477 | 537 | 596 | 327 | 491 | 660 | 833 | 997 | 1170 | |
| 2400 | 60,8 | 219 | 45 | 150 | 2,8 | 438 | 511 | 584 | 657 | 730 | 346 | 520 | 698 | 880 | 1053 | 1239 | 4,3 |
| | 38,9 | 140 | 25 | 37 | 1,7 | 280 | 326 | 373 | 420 | 466 | 423 | 637 | 849 | 1060 | 1274 | 1492 | |
| | 47,2 | 170 | 30 | 54 | 2,0 | 340 | 396 | 453 | 510 | 566 | 467 | 706 | 938 | 1173 | 1411 | 1654 | |
| | 56,9 | 205 | 35 | 79 | 2,4 | 410 | 478 | 546 | 615 | 683 | 513 | 775 | 1030 | 1289 | 1550 | 1819 | |
| 2700 | 69,4 | 250 | 40 | 118 | 2,0 | 500 | 583 | 666 | 750 | 833 | 564 | 851 | 1131 | 1415 | 1702 | 1998 | 4,8 |
| | 83,3 | 300 | 44 | 170 | 3,6 | 600 | 700 | 800 | 900 | 1000 | 611 | 919 | 1223 | 1531 | 1842 | 2160 | |
| | 45,8 | 165 | 25 | 39 | 1,8 | 330 | 385 | 440 | 495 | 550 | 478 | 720 | 962 | 1202 | 1441 | 1684 | |
| | 56,1 | 202 | 30 | 59 | 2,2 | 404 | 471 | 538 | 606 | 673 | 527 | 797 | 1066 | 1333 | 1598 | 1868 | |
| 3000 | 66,7 | 240 | 34 | 83 | 2,7 | 480 | 560 | 640 | 720 | 800 | 571 | 864 | 1156 | 1446 | 1735 | 2028 | 5,4 |
| | 81,9 | 295 | 39 | 126 | 3,3 | 590 | 688 | 786 | 885 | 983 | 624 | 943 | 1261 | 1578 | 1897 | 2218 | |
| | 101,4 | 365 | 45 | 193 | 4,0 | 730 | 851 | 973 | 1095 | 1216 | 677 | 1018 | 1361 | 1705 | 2053 | 2401 | |
| | 51,9 | 187 | 25 | 40 | 1,0 | 374 | 436 | 498 | 561 | 623 | 518 | 786 | 1046 | 1306 | 1571 | 1843 | |
| 3000 | 62,5 | 225 | 30 | 58 | 2,4 | 450 | 525 | 600 | 675 | 750 | 565 | 859 | 1143 | 1427 | 1718 | 2018 | 5,4 |
| | 76,4 | 275 | 35 | 86 | 2,9 | 550 | 641 | 733 | 825 | 916 | 620 | 941 | 1250 | 1561 | 1880 | 2208 | |
| | 93,1 | 335 | 40 | 128 | 3,5 | 670 | 781 | 893 | 1005 | 1116 | 675 | 1019 | 1354 | 1690 | 2034 | 2387 | |
| | 114,4 | 412 | 45 | 195 | 4,3 | 824 | 961 | 1098 | 1236 | 1373 | 730 | 1096 | 1455 | 1816 | 2184 | 2558 | |
| 3000 | 58,3 | 210 | 24 | 41 | 2,1 | 420 | 490 | 560 | 630 | 700 | 565 | 850 | 1135 | 1420 | 1706 | 1995 | 5,4 |
| | 72,2 | 260 | 30 | 62 | 2,6 | 520 | 606 | 693 | 780 | 866 | 622 | 936 | 1250 | 1565 | 1881 | 2202 | |
| | 87,5 | 315 | 35 | 92 | 3,1 | 630 | 735 | 840 | 945 | 1050 | 674 | 1011 | 1351 | 1694 | 2035 | 2384 | |
| | 104,2 | 375 | 39 | 130 | 3,7 | 750 | 875 | 1000 | 1125 | 1250 | 719 | 1075 | 1437 | 1803 | 2166 | 2538 | |
| 127,8 | 460 | 44 | 196 | 4,6 | 920 | 1073 | 1226 | 1380 | 1533 | 767 | 1145 | 1529 | 1918 | 2303 | 2698 | | |

Technical Data

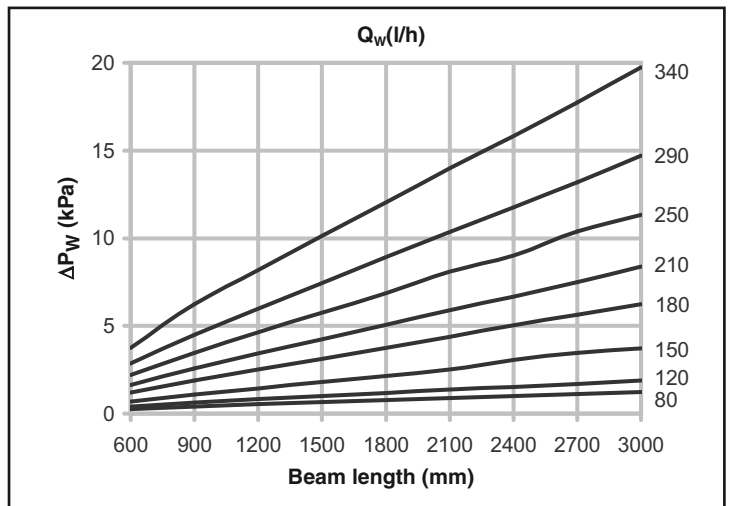
Pressure drop in water

The charts to obtain the pressure drop in the coil for different water flow rates in the various systems are shown below:

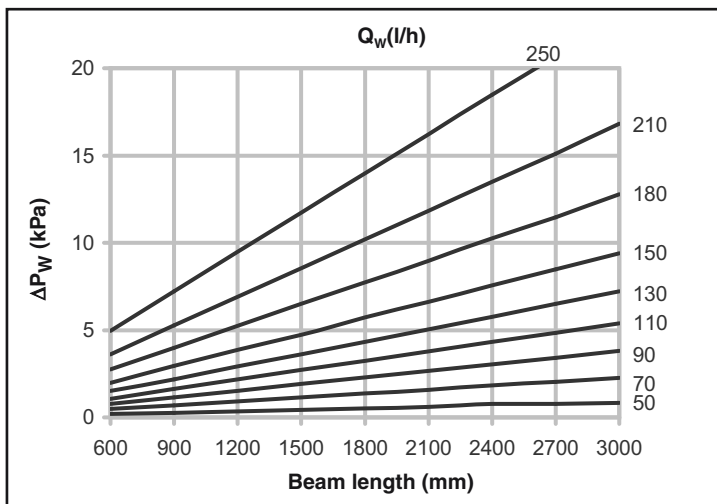
2-tube system. Cooling - Heating



4-tube system. Cooling



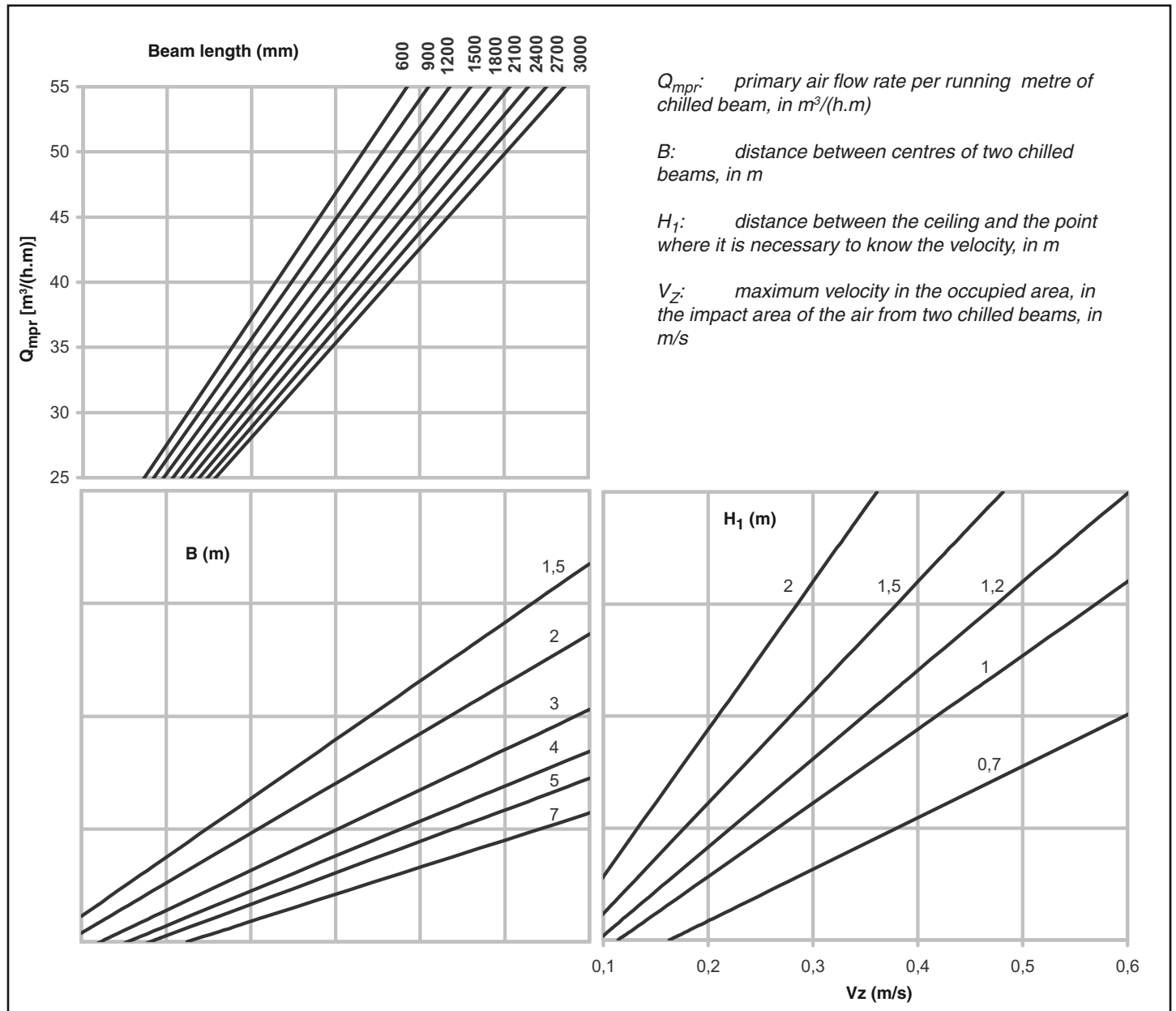
4-tube system. Heating



Technical Data

Velocity in occupied area. Air jet facing air jet

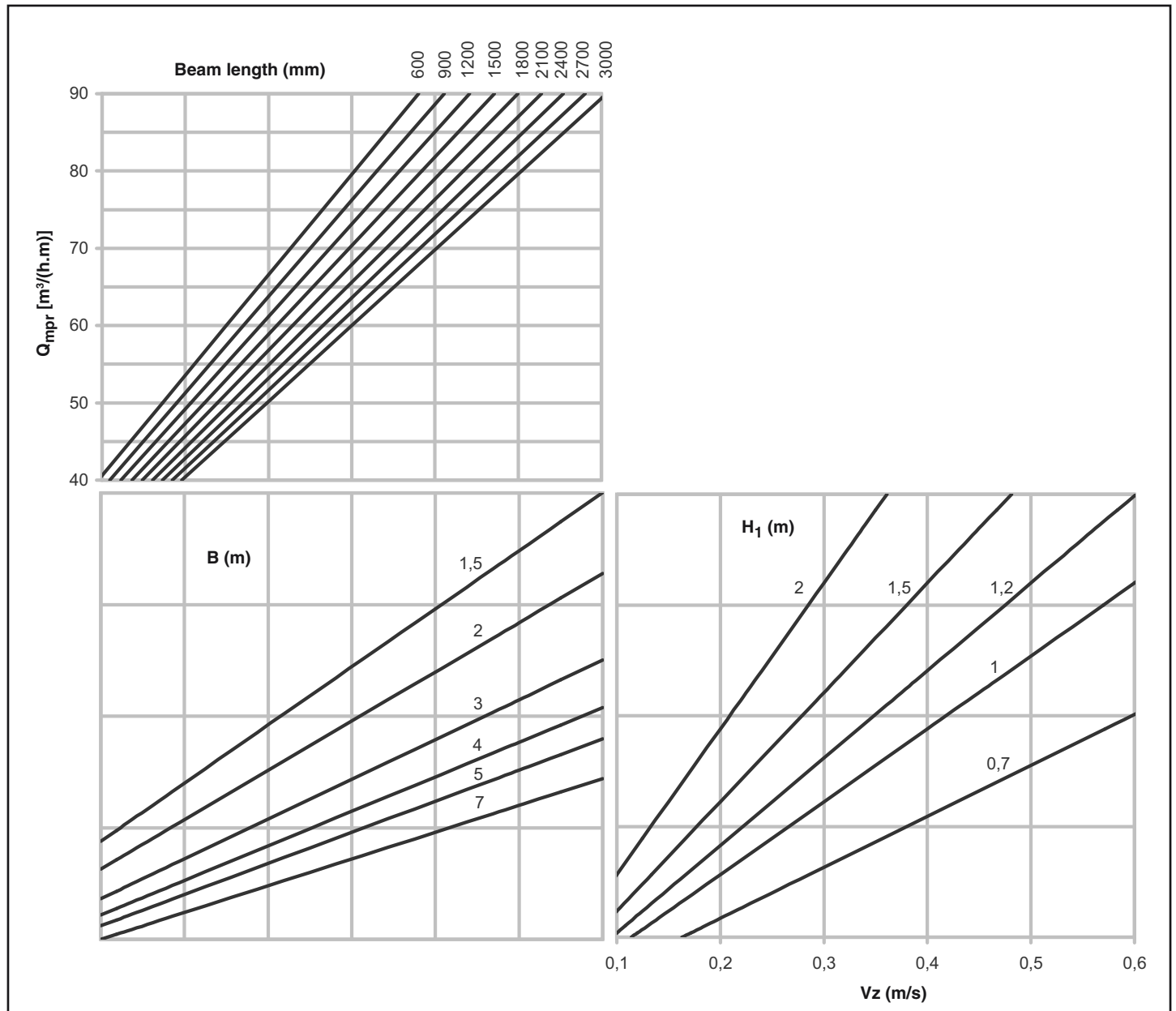
P-TYPE NOZZLE



Technical Data

Velocity in occupied area. Air jet facing air jet

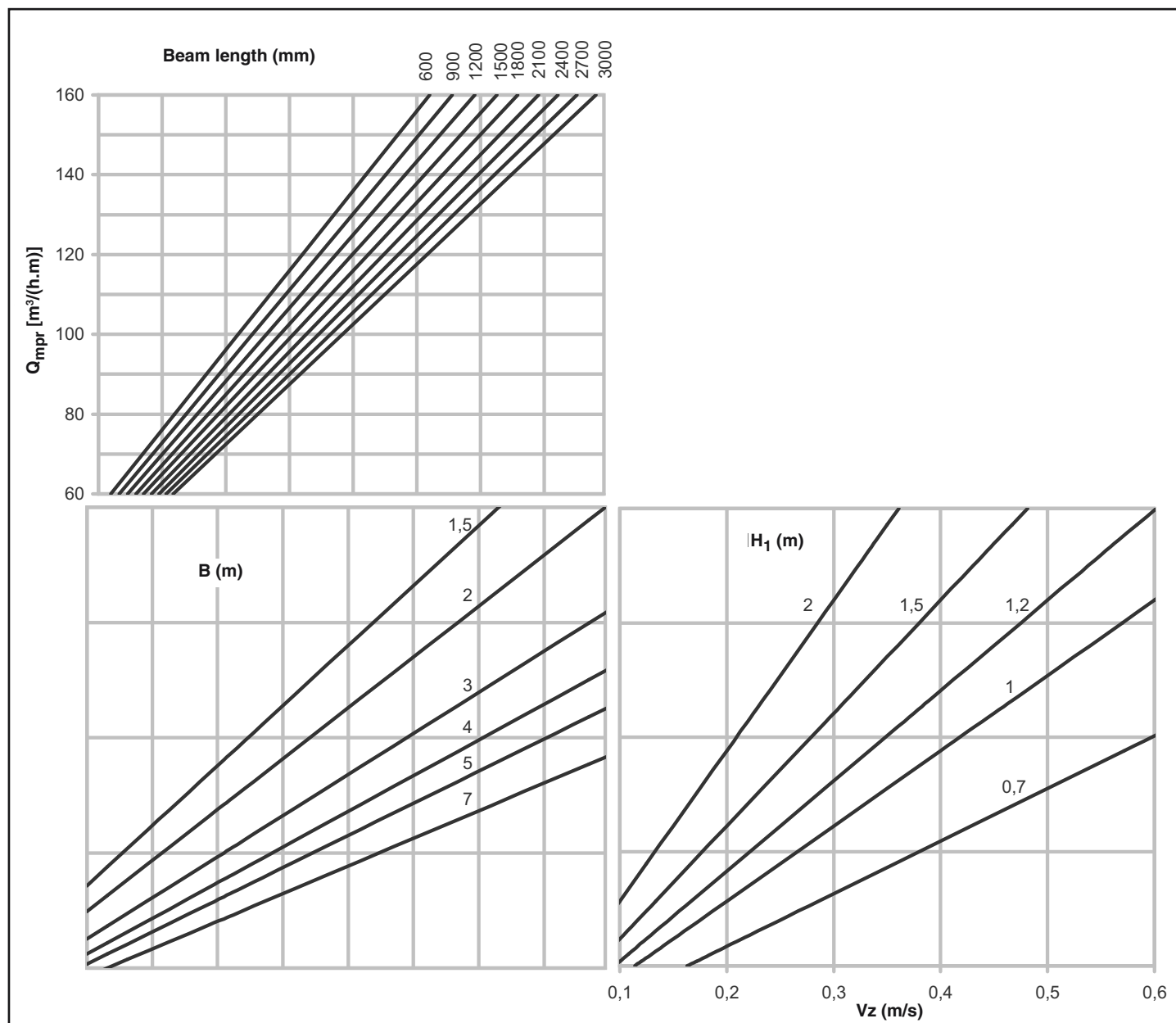
M-TYPE NOZZLE



Technical Data

Velocity in occupied area. Air jet facing air jet

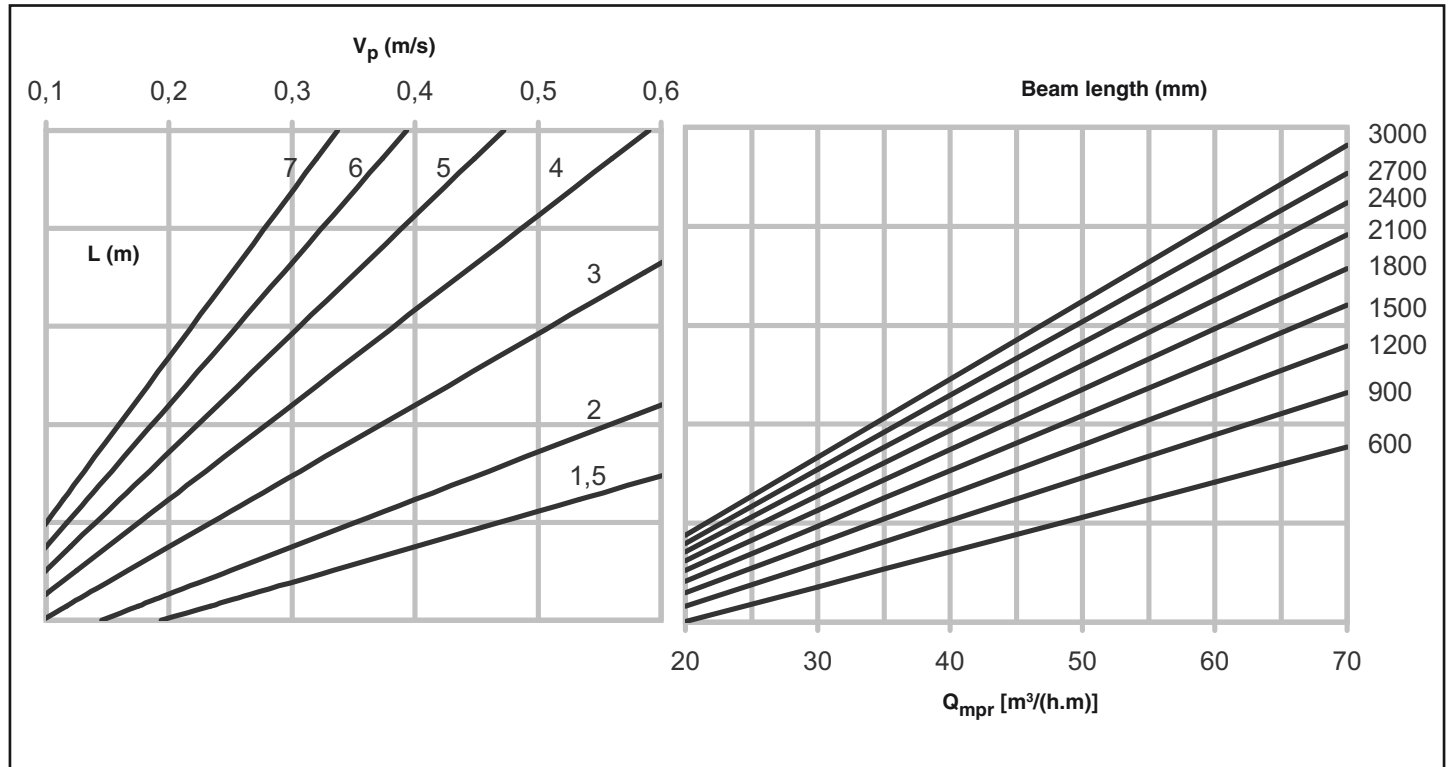
G-TYPE NOZZLE



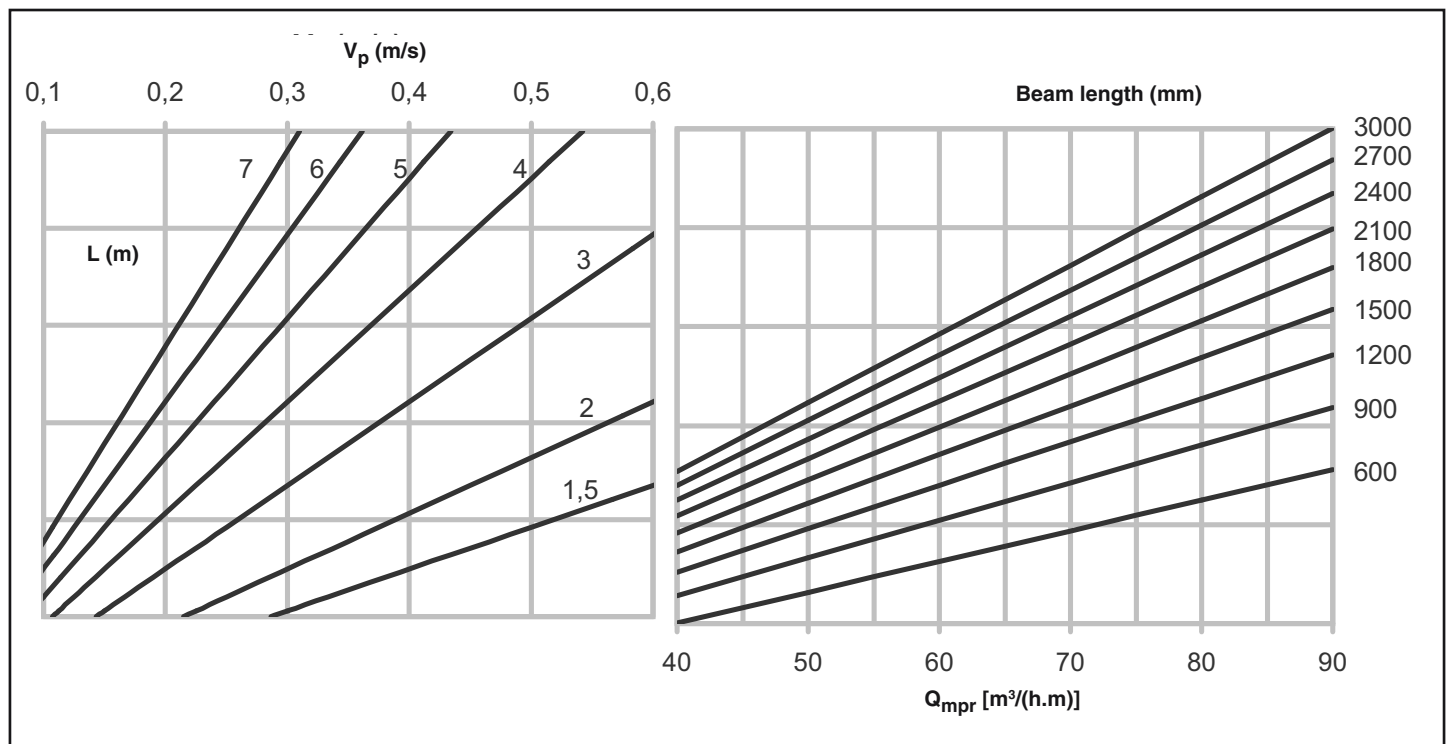
Technical data

Velocity in occupied area. Air jet facing air jet

P-TYPE NOZZLE



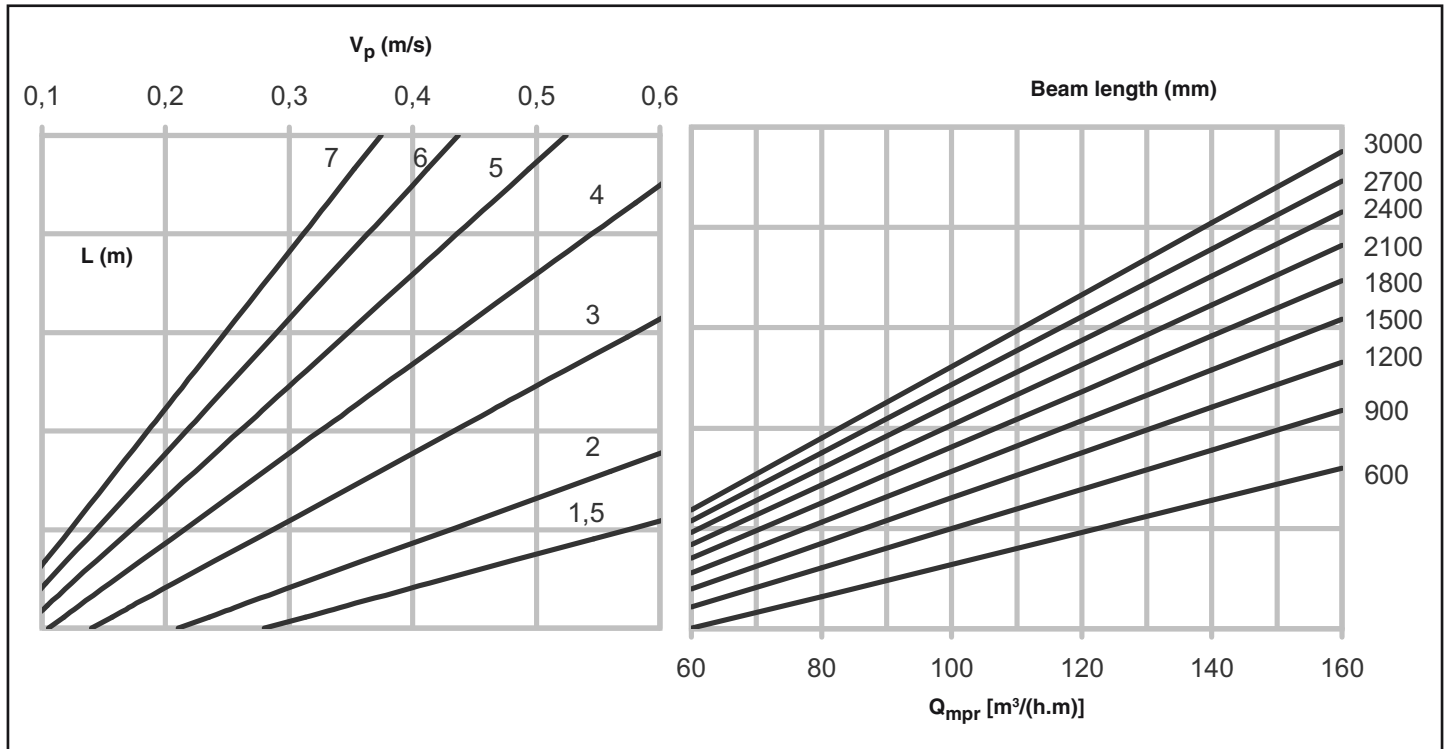
M-TYPE NOZZLE



Technical Data

Velocity in occupied area. Air jet facing air jet

G-TYPE NOZZLE



Symbols

The symbols used in the selection charts on page 27 to 31 for the VFK 600 chilled beam are the following:

Q_{mpr} Primary air flow per running metre of chilled beam, in $m^3/h.m$

B Distance between chilled beam centres, in m

H_1 Distance between the ceiling and the point where it is necessary to know the velocity, in m

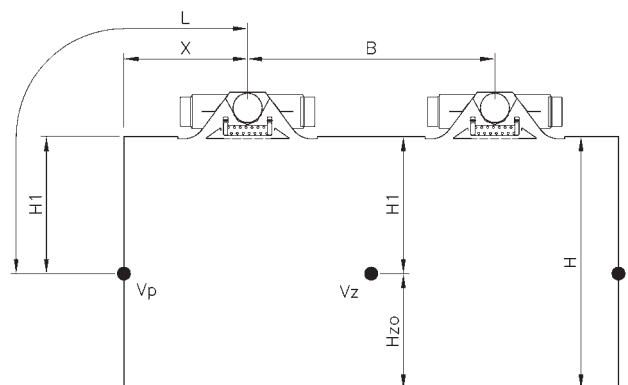
V_z Maximum velocity in the occupied area, caused by cooling of two air jets together, in m/s

H_{z0} Height of occupied area, in m

X Horizontal distance between chilled beam axis and wall, in m

L = $X + H_1$

V_p Velocity in the wall area at distance L from the axis of the chilled beam, in m/s.



Technical Data. Selection in a Sample Project

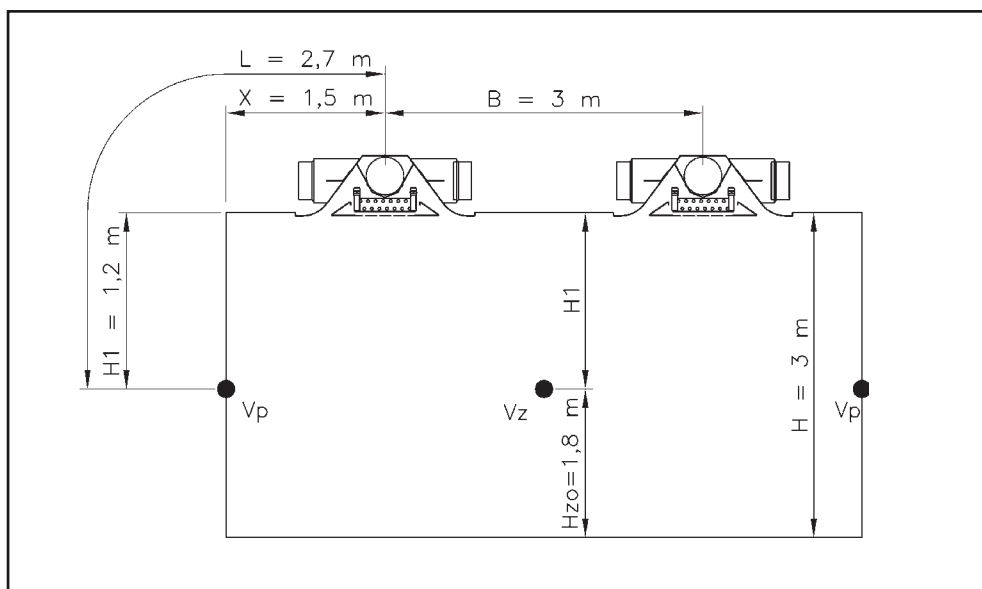
Air conditioning is to be provided using a 2-tube air-water active chilled beam system, a unique office facade module of 6x6x3 m (LxWxH). The thermal loads were calculated, giving a power of 85 W/m² to be handled.

Design conditions (cooling):

- Total sensitive thermal load in refrigeration operation in the facility to be handled, 3060 W
- Ventilation air flow supply, 45 m³/h per person, according to RITE Regulation, IDA 2
- Maximum occupancy: 8
- Primary air temperature, 15°C
- Internal room temperature of 24°C with a relative humidity of 50%, dew point 12.9°C
- Water inlet temperature for beam, 15°C
- Maximum water flow per beam, 150 L/h
- Architectural conditions, ceiling modulation of 1200x600 mm
- Maximum admissible noise level, 35 dB(A)
- Maximum pressure drop in air of 150 Pa in the chilled beam

Solution:

An initial analysis of the selection table on page 15, i.e., if the preliminary calculations are done by assuming the various previously indicated design conditions, the selection can be started with 4 chilled beam units, VFK 600-1200-M-2 model, distributed (2x2) symmetrically in the room, as shown in the following drawings:



Technical Data. Selection in a Sample Project

Calculation of the technical data for the unit and primary air

Based on design conditions, the following are obtained as input data from the selection table on page 15:

- Previously selected chilled beam length: 1200 mm
- Primary air flow per beams, 90 m³/h.
- Temperature difference between room and primary air, $\Delta T_{pr} = 9$ °C.
- Temperature difference between room and water inlet, $\Delta T_{SWIN} = 9$ °C.

Using these input values and interpolating between the two primary air flow values listed in the table, the following results are obtained:

- Power supplied by ventilation air, **$P_{pr} = 270$ W**, obtained from the expression, $P_{pr} (W) = Q_{pr} (l/s) * 1,232 * \Delta T_{pr}$
- Power supplied per beam coil for a water flow rate of 250 L/h, $P_{sw} = 600$ W (data obtained directly from Table 1, after interpolation)
- Corrected coil power for a water flow rate of 150 L/h, **$P_{sw} = 516$ W**. Referring to the table of correction factors for water flow rate on page 17, the value of 600 W listed above must be multiplied by a factor of 0.86
- Total power supplied per beam, **$P_t = 786$ W**, obtained from the expression $P_t = P_{pr} + P_{sw}$
- Pressure drop in water for a flow rate of 150 L/h, **$\Delta P_w = 1,8$ kPa**. (data obtained from the chart on page 26)
- Water temperature difference in coil, **$\Delta T_w = 3$ °C**, obtained from the expression $P_{sw} (W) * 0,86 = Q_w (l/h) * \Delta T_w$
- Sound power level per beam, **$L_w = 29$ dB(A)** (data obtained directly from the table, after interpolation)
- Primary air pressure loss, **$\Delta P_{pr} = 114$ Pa** (data obtained directly from table, after interpolation)

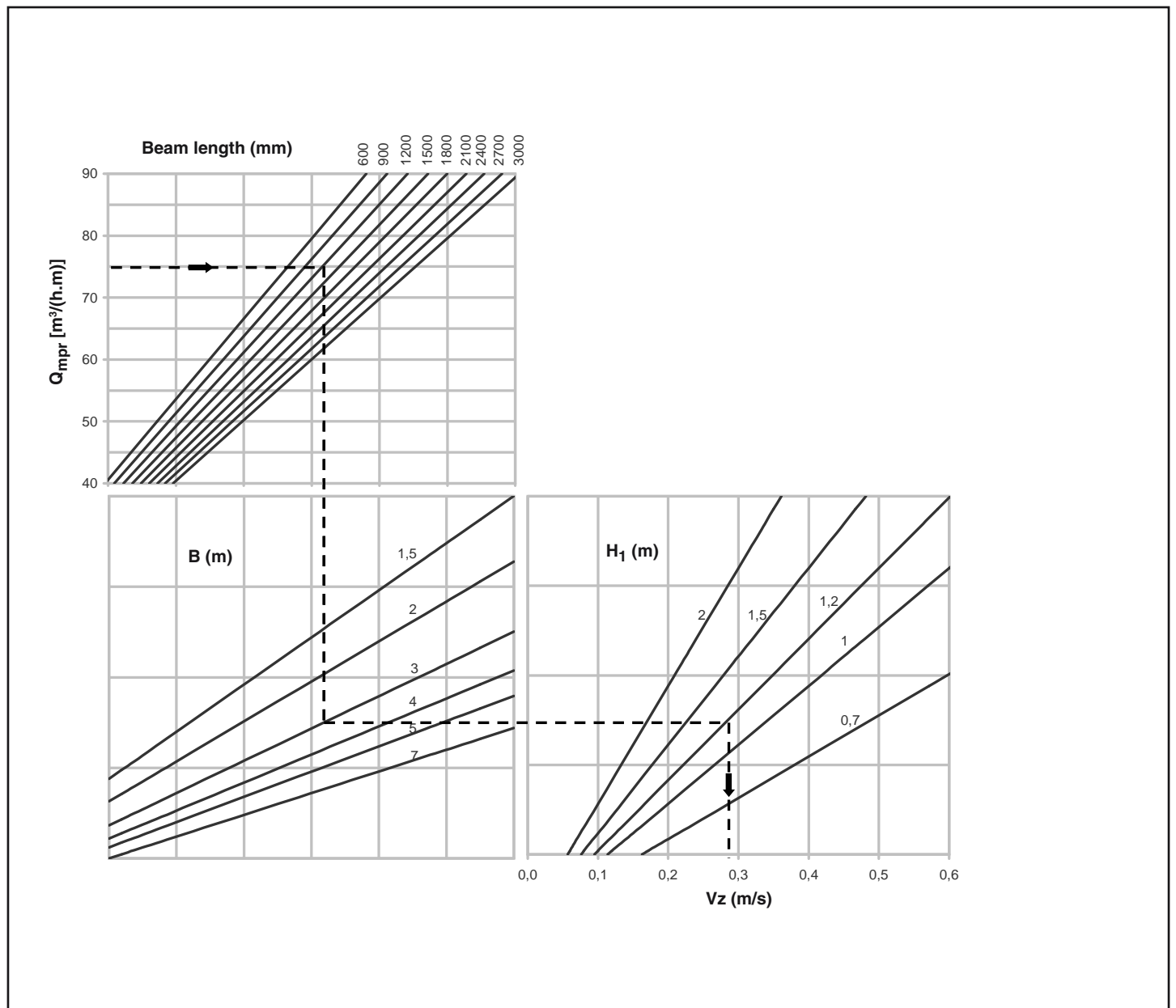
The total power supplied by the 4 chilled beam active installed in the room is $P_t = 3144$ W, which is higher than the maximum demand (3060 W), in other words, the selection by coil power is considered to be correct.

Technical Data. Selection in a Sample Project

Air flow calculations. Maximum velocity in occupied area (V_z) and air jet velocity at perimeter (V_p)

To obtain the maximum velocity in the occupied area (V_z) for the design conditions, refer to the chart on page 28 with the following parameters:

- Flow per linear metre, $Q_{mpr} = 90/1,2 = 75 \text{ m}^3/\text{h}\cdot\text{m}$
- Distance between beam centres, $B = 3 \text{ m}$
- Height from ceiling to occupied area, $H_1 = 3 - 1,8 = 1,2 \text{ m}$



Value obtained from $V_z = 0,28 \text{ m/s}$

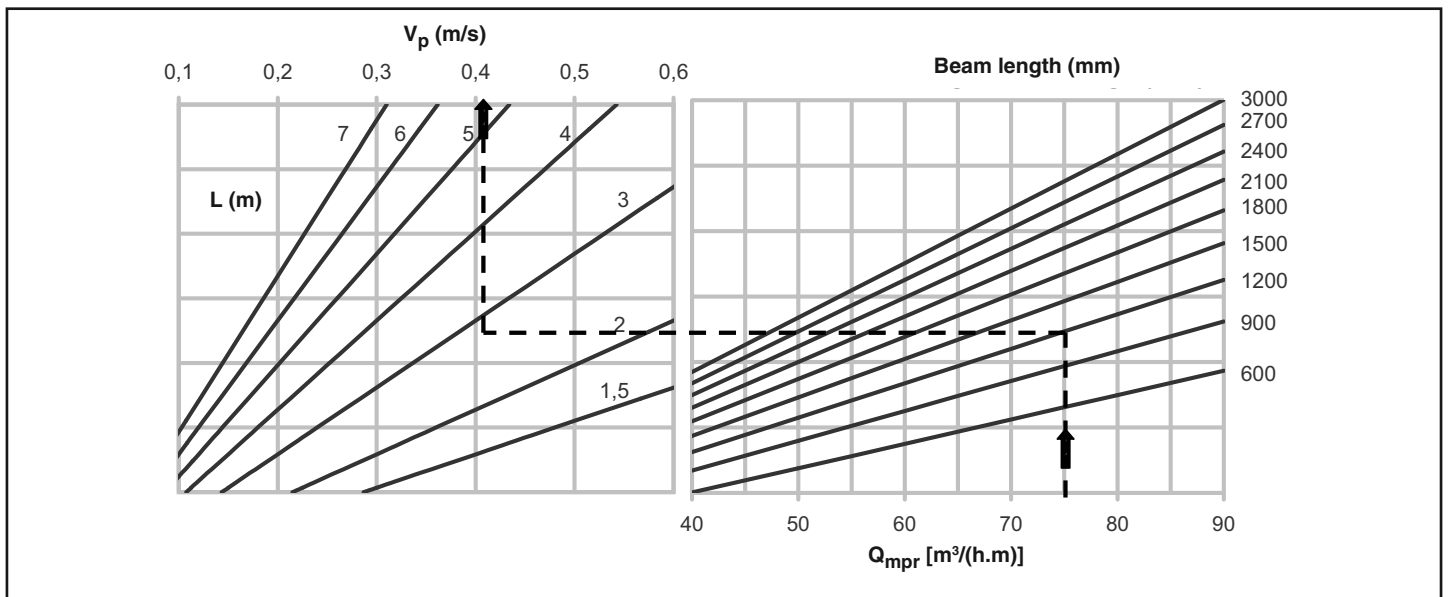
Technical Data. Selection in a Sample Project

To obtain the terminal velocity of the air jet at the perimeter (V_p) at a specific height from the floor, based on the design conditions, refer to the chart on page 30 (M-type nozzle) with the following parameters:

Flow per linear metre, $Q_{mpr} = 90/1,2 = 75 \text{ m}^3/\text{h}\cdot\text{m}$

Distance $L = X + H_1 = 2,7 \text{ m}$, wherein X is the distance between the centre of the beams and the wall

Height from ceiling to occupied area, $H_1 = 3 - 1,8 = 1,2 \text{ m}$



Value obtained from $V_p = 0,41 \text{ m/s}$

Product Codes

Coding example of an order. All of the different models, sizes, accessories, etc., existing in the KOOLAIR VFK active chilled beam series are listed.

- Coding example

(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k)
VFK 600 – 1200 – M – 2 – LD – P1V – E – SR – DF – RAL 9010 – others

(a): Model

VFK 600

(b): Length

VFK 600 : 600 – 900 – 1200 – 1500 – 1800 – 2100 – 2400 – 2700 – 3000 (mm)

(c): Nozzle configuration

- P
- M
- G

(d): Coil Type of system.

- 2 *2-tube system coil*
- 4 *4-tube system coil*

(e): Air/water connection configuration

- F *Front face primary air connection on opposite side to water connections*
- FT *Rear face primary air connection, on same side as water connections (available in 2 tubes)*
- LI *Primary air connection on left*
- LD *Primary air connection on right*
- S *Primary air connection at top*

(f): Perforated induction rack design

- P1H *PRectangular perforations along the length of the beam*
- P1V *Rectangular perforations along the width of the beam*
- P2H *Round perforations distributed continuously along the width of the beam*
- P2V *Round perforations distributed continuously along the length of the beam*

(g): Type of ceiling

- *Design of standard ceiling unit with T support section*
- E *Unit design for continuous or plaster ceiling*
- FL *Ceiling unit design for offset tray*

(h): Nozzle regulation system

- *No nozzle adjustment*
- MR *Nozzle adjustment*

Product Codes

(i): Air deflectors

- No deflector slats
- DF Deflector slats

(j): Finish

- RAL 9010 Standard finish in RAL 9010 glossy white
- RAL... ... Finish in RAL paint upon request.

(k): Other accessories or components

By special request on the order, other components can be requested, e.g.:

- **Electric resistor** For 2-tube systems (chilled water), included inside the unit. Specify the power in watts (W) provided by it.
- **Control valve** Control and/or balancing valves can be included in the water connections by special order. Specify the model and type, as well as the respective servo drive if applicable.
- **Condensation detector** The unit can be fitted with a condensation detector attached to the surface of the chilled water inlet pipe by special order.
- **Air flow adjustment** Mech-Elec has several different air regulation accessories that can be supplied along with the active chilled beam order. Refer to page 12.

Technical specifications

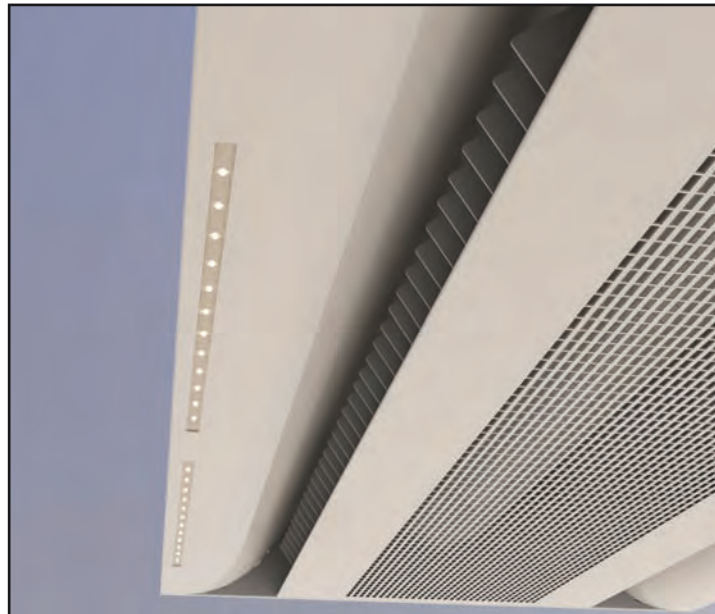
Induction active chilled beam, **VFK 600** model, of length **L** mm, base **B** mm and height 200 mm, for installation in modular or continuous false ceilings. Two linear slot diffusers are included on the sides, with M1 plastic air deflectors for horizontal air supply with a Coanda effect in mixed (primary and secondary) air. Hinged front rack for unit cleaning, with different perforation designs for ambient air induction. The interior of the unit includes a plenum box with nozzles (**P/M/G** type) to both sides for primary air supply, with a nozzle control mechanism. Inner horizontal coil of (**2/4 tubes**) for cooling and/or heating, copper pipes with gas thread connections (outer diameter, 12 mm) and aluminium fin bundle. Equipped with (one/two) primary air connection(s) (**front/side/top**) of diameter Ø124 mm. Front rack, enclosures, sections manufactured entirely of galvanised steel sheet. The unit is fitted with supports for hanging from top slab. Standard finish of glossy paint (RAL9010). Other **RAL** colours upon request.

Multi-Service Active Chilled Beams, VFK 600-MF Series

According to the requirements of each installation, Mech-Elec can design multi-function active chilled beams specifically adapted to each project. This new chilled beam development provides various services as well as lighting of different kinds (LED, linear, halogen, etc.), public-address system, smoke detectors, sprinklers, etc., apart from cooling and heating with the inherent advantages of the system.

Because the product is very specific, it should be customized to the project needs at the beginning.

An example of a VFK 600-MF active chilled beam with a row of LEDs flush-mounted in the beam housing is shown below:



VFK-MF 600 chilled beams with row of LED lights