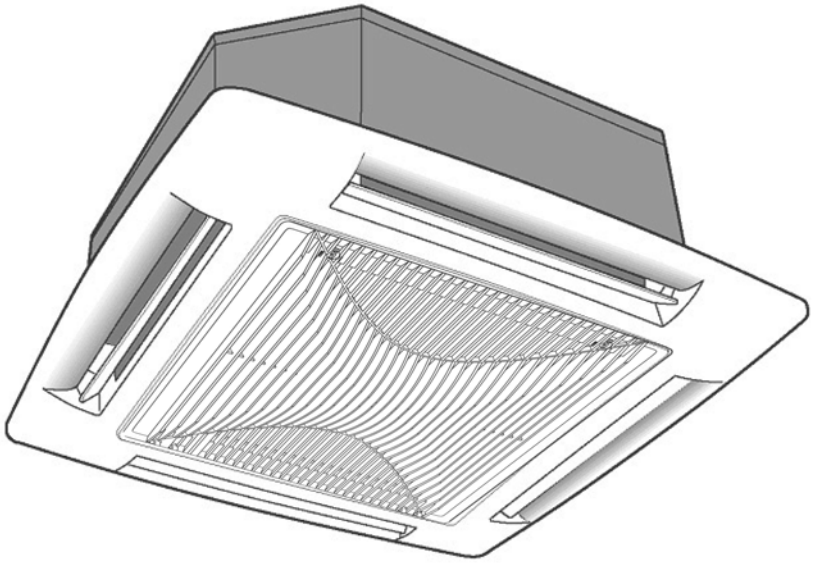
Ferroli

# FCS

## “CASSETTE” FAN COIL



**Mod. 04÷20 - 04-4T÷20-4T**

EUROVENT CERTIFIED PERFORMANCE

**FERROLI** adheres to the **EUROVENT** certification programme.
The products concerned appear in the products guide to www.eurovent-certification.com

GB TECHNICAL MANUAL

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# GENERAL SPECIFICATIONS

The company hereby declares that the machine in question complies with the matters prescribed by the following Directives:

- Machine Directive **98/73 CEE**
- Low voltage Directive **73/23 EEC**
- Electromagnetic compatibility Directive **EMC 89/336 EE**

The manufacturer is associated with the **EUROVENT** certification program.
The products are listed in the certified products guide www.eurovent-certification.com

## Foreword

This is one of the two manuals supplied with the machine in question. Some manuals are dedicated to the end user, others to the installer, thus the information they contain and their purposes are different. The following table lists the subjects discussed in the two manuals:

| SUBJECTS | MANUALS | |
|---|---|---|
| | TECHNICIAN(1) | INSTALLATION AND USE |
| **General information:** | • | • |
| Features | | |
| Description of the machine, versions, accessories | • | |
| Technical specifications | • | |
| Technical data | • | • |
| Dimensional data | • | • |
| Accessory data | • | |
| Wiring diagrams | • | • |
| **Safety measures:** | | • |
| General precautions | | • |
| Improper uses | | • |
| **INSTALLATION:** | | • |
| Transport | | • |
| How to INSTALL the appliance | | • |
| **Setting at work** | | • |
| **Operation** | | • |
| **Routine maintenance** | | • |
| **Assistance and spares** | | • |
| **Troubleshooting** | | • |

**(1):** Not supplied with the machine

Keep the manual in a dry place so that it remains in a good condition for several years (**10 years**), ready to hand for future reference when required.

**Carefully read all the information in this manual. Pay particular attention to the operation instructions marked with the words "DANGER" or "WARNING" since failure to comply with such instructions can cause damage to the machine and/or persons or property.**

Contact your nearest assistance center for any faults not described in this manual.

The manufacturer declines all liability for damage caused by improper use of the machine, or due to the information in this manual having been partially or superficially read.
Besides the matters described in the warranty certificate, failure to comply with the instructions herein or inadequate installation of the machine may oblige the manufacturer to void the warranty provided.

# GENERAL SPECIFICATIONS

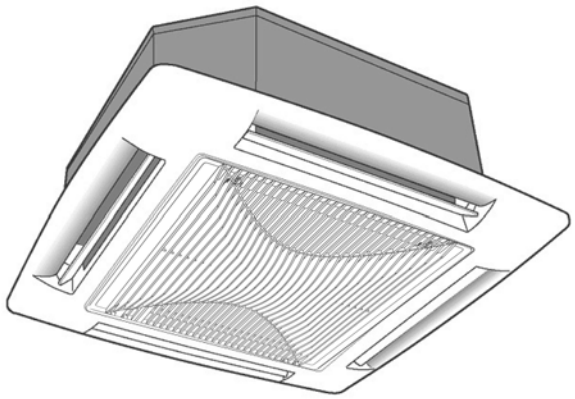
## Purpose of the machine

The cassette convector fan is a terminal appliance that treats the air in a room both in the summer and winter. The appliance must be installed on the ceiling. It is equipped with a very pleasantly designed grille.

## Available version

This new series of cassette type convector fans is available in the version with 2 pipes in 6 sizes and **2.4 to 10 kW** nominal cooling capacity ratings and in the version with 4 pipes **(-4T)** in 3 sizes with **1.9 to 9.8 kW** nominal cooling capacity ratings.

## Description Of The Main Components



| UNIT | VERSION |
|---|---|
| 04 | **2 PIPES** |
| 08 | |
| 10 | |
| 12 | |
| 16 | |
| 20 | |
| 04-4T | **4 PIPES** |
| 10-4T | |
| 20-4T | |

The unit consists of a module or main structure containing a finned exchanger, the ventilating unit formed by a three-speed motor and a centrifugal axial fan, a tray to collect the condensation equipped with a pump to drain this off.
The electric box, where all the electrical connections required are made during the installation phase, is housed in a convenient position within the main structure.
The unit also has a grille made of thermoplastic material and formed by a frame which houses the filter and air flow directing fins plus an intake grille: the air flow directing fins are installed on each side of the grille and can be positioned by hand. The intake grille is fixed in a practical way that allows it to be easily inspected for servicing and filter cleaning operations.

# GENERAL SPECIFICATIONS

## Technical data

| MODEL | | UM | 04 | 08 | 10 | 12 | 16 | 20 | 04-4T | 10-4T | 20-4T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Version | | - | 2 Pipes | | | | | | 4 Pipes | | |
| Cooling capacity (1) | min | W | 1550 | 1900 | 2850 | 3400 | 3170 | 3900 | 1230 | 2500 | 4100 |
| | med | W | 1800 | 2850 | 3500 | 4500 | 5100 | 7100 | 1430 | 3050 | 7300 |
| | max | W | 2400 | 4000 | 4700 | 6300 | 7600 | 10000 | 1900 | 4000 | 9800 |
| Water flow rate (2) | | l\h | 413 | 688 | 808 | 1084 | 1307 | 1720 | 327 | 688 | 1686 |
| Water Pressure Drop (1)(2) | | kPa | 9 | 12 | 20 | 22 | 14 | 24 | 10,8 | 19,7 | 30 |
| Heating capacity (3) | min | W | 2600 | 2410 | 4050 | 4700 | 4300 | 5400 | - | - | - |
| | med | W | 3000 | 4090 | 4800 | 6300 | 7300 | 10000 | - | - | - |
| | max | W | 3800 | 5000 | 6600 | 8700 | 10800 | 13900 | - | - | - |
| Water flow rate (3) | | l\h | 413 | 688 | 808 | 1084 | 1307 | 1720 | - | - | - |
| Heating capacity (4) | min | W | 4850 | 4700 | 7200 | 8200 | 8400 | 9850 | 1240 | 2730 | 5100 |
| | med | W | 5600 | 8000 | 8500 | 10800 | 13200 | 17500 | 1440 | 3500 | 7900 |
| | max | W | 7110 | 9770 | 11760 | 14600 | 18000 | 24500 | 1900 | 4610 | 9000 |
| Water flow rate (4) | | l\h | 611 | 840 | 1011 | 1256 | 1548 | 2107 | 163 | 396 | 774 |
| Power supply | | V-F-Hz | 230-1-50 | | | | | | | | |
| Indoor fan air flow rate | min | $m^3$\h | 360 | 300 | 470 | 550 | 550 | 700 | 360 | 470 | 700 |
| | med | $m^3$\h | 450 | 490 | 600 | 770 | 910 | 1220 | 450 | 600 | 1220 |
| | max | $m^3$\h | 660 | 700 | 850 | 1100 | 1300 | 1750 | 660 | 850 | 1750 |
| Sound power level | | dB(A) | 33 | 32 | 42 | 34 | 40 | 42 | 33 | 42 | 42 |
| | | dB(A) | 38 | 45 | 48 | 40 | 49 | 55 | 38 | 50 | 55 |
| | | dB(A) | 49 | 54 | 57 | 49 | 56 | 63 | 49 | 58 | 63 |
| Sound pressure level (5) | min | dB(A) | 25 | 24 | 34 | 26 | 32 | 34 | 25 | 34 | 34 |
| | med | dB(A) | 30 | 37 | 40 | 32 | 41 | 47 | 30 | 42 | 47 |
| | max | dB(A) | 41 | 46 | 49 | 41 | 48 | 55 | 41 | 50 | 55 |
| Power input | min | W | 35 | 35 | 55 | 33 | 40 | 70 | 35 | 55 | 70 |
| | med | W | 45 | 55 | 75 | 51 | 75 | 140 | 45 | 75 | 140 |
| | max | W | 70 | 85 | 95 | 85 | 120 | 200 | 70 | 95 | 200 |
| N° fans | | n° | 1 | | | | | | | | |
| Unit weight with grille | | kg | 21,5 | 22,5 | 22,5 | 46 | 48 | 51 | 21,5 | 22,5 | 51 |
| Main coil connections | | “ | 3/4 | 3/4 | 3/4 | 1 | 1 | 1 | 3/4 | 3/4 | 1 |
| Secondary coil connections | | “ | - | - | - | - | - | - | 1/2 | 1/2 | 3/4 |
| Condensation draining connections (6) | | mm | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |

**NOTES:**

**(1)** Cooling mode Operation. Data referred to:
- Inlet water temperature: **7°C, water Δt = 5°C** and water flow rate at the maximum fan speed.
- The water flow rate for medium and minimum fan speeds are the same at the maximum fan speed.
- Ambient air temperature.: **27°C D.B. 19°C W.B**

**(2)** Data referred to the maximum fan speed.

**(3)** Heating mode Operation. Data referred to:
- Inlet water temperature: **50°C**, and the same water flow rate as in the cooling mode.

**(4)** Heating mode Operation. Data referred to:
- Inlet water temperature: **70°C, water Δt = 10°C** and water flow rate at the maximum fan speed.
- The water flow rate for medium and minimum fan speeds are the same at the maximum fan speed.
- Ambient air temperature.: **20°C D.B. 19°C W.B**

**(5)** Sound pressure in a 100 $m^3$ room with 0.5 sec. reverberation time.

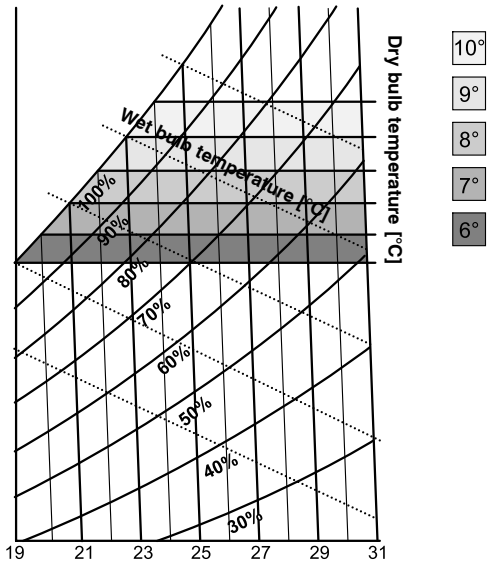
**(6)** Maximum height for water discharge pump = 200 mm

# OPERATION RANGE

## Limits to operation

The main limits to operation for the machine in question are given in the following table:

| MODEL | | U.M. | 04 | 08 | 10 | 12 | 16 | 20 | 04-4T | 10-4T | 20-4T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Temperature limits | **max** | (°C) | 80 | | | | | | | | |
| Pressure limits | **max** | (bar) | 14 | | | | | | | | |
| Water flow rate limits Main coil | **max** | (l/h) | 1000 | 1600 | | 1800 | 3000 | | 1000 | 1400 | 3000 |
| | **min** | (l/h) | 200 | 300 | | 400 | 600 | | 200 | 300 | 600 |
| Water flow rate limits Coil for heating only | **max** | (l/h) | / | / | / | / | / | / | 700 | 1200 | 2000 |
| | **min** | (l/h) | / | / | / | / | / | / | 100 | 200 | 400 |







**Minimum temperature of inlet water**

To prevent condensation from forming on the external structure of the appliance, the minimum temperature of the water must not drop below the limits given in the graph on the left, which depend on the **thermo-hygrometric** conditions of the surrounding air.
The above limits refer to operation at minimum speed.

**If the appliance is used to cool the room, it is obligatory to install an on-off valve for the water, both to control the ambient temperature and to shut off the water supplied to the coil is the condensation level rises to an abnormal degree.**

# HOW TO SELECT THE UNIT

## Selection criteria

**Example of how the unit is selected:**
An example of how the unit is selected has been given for explanatory purposes and to illustrate how the graphs or tables in the documentation are used. The selection will be made supposing that the unit is to be operated at the same conditions, but installed in two different types of system:
**A)** system with two pipes for heating and cooling
**B)** system with four pipes
A unit able to guarantee the following performances must be selected:
Total cooling capacity **3600 [Watt]**
Sensitive cooling capacity **2900 [Watt]**
Operating ambient temperature **27 [°C] D.B and 19 [°C ] W.B**
The value must be obtained at the **medium speed.**
Heating capacity **4500 [Watt]**
Operating ambient temperature **20 [°C] d.b.**
Water flow rate as in operation in the cooling mode for the unit with two pipes.
The value must be obtained at the **medium speed.**

**- Selection A (unit for system with two pipes)**

The efficiency values of the “COOLING AND HEATING EFFICIENCIES” tables refer to the maximum speed of the fan. The correction coefficients in the “DATA CORRECTION FACTORS” tables can be used to determine the efficiencies at the medium and minimum speeds. To use the tables, the parameters of the required values must be calculated again, considering operation at the maximum speed.

**Checking the "Technical Data"** table for all the models, the suitable unit model according the required performances and operating conditions is the model 10, which provides as standard cooling capacity the following ones::
Total cooling capacity required at the maximum speed = **4700 [Watt]**
Total cooling capacity required at the medium speed = **3500 [Watt]**

**Cooling operating conditions**
Operating conditions deqfinition for the required performances.
By the " DATA CORRECTION FACTORS" table and using the right correction values for the selected model, the required performances are:

Total cooling capacity required at the maximum speed **Pft max = 3600/0.74 = 4865 [Watt]**
Sensible cooling effect required at the maximum speed **Pft max = 2900/0.72 = 4028 [Watt]**
Considering that the total efficiency value in the cooling mode mainly depends on the wet bulb temperature of the air, while the sensible cooling effect depends on the dry bulb temperature, the ratio between the two remains more or less fixed and characteristic of each model since these operating temperatures are set beforehand. The choice will therefore tend to consider the total cooling efficiency as priority. The "Cooling capacity" table for the selected model 10 can be used to calculate the required cooling capacity and to obtain the following:
inlet water temperature **5[°C]** and a **Δt of 6.6[°C]**
inlet water temperature **6[°C]** and a **Δt of 5.6[°C]**
inlet water temperature **7[°C]** and a **Δt of 4.6[°C]**
a sensible efficiency of **4000 [Watt] corresponds in both cases**
Supposing that the water enters the fan coil at a temperature of **7[°C]** and with **Δt of 4.6[°C]**, the following water flow rate must be guaranteed:

$$Qw = \frac{Pft_{\max}}{\Delta t \cdot \rho_{w1} \cdot Cp_{w1}} = \frac{4685 \cdot 3600}{4{,}6 \cdot 1 \cdot 4192} = 908\left[l/h\right]$$

where:
**Qw**= Water flow rate [l/h]
**ρw1**= Density of the water at 10 °C [kg/dm³]
**Cpw**1= Specific heat of the water at 10°C [J/kg·K]
The calculations are used to find the conditions in which the unit must be supplied so as to obtain the total efficiency values envisaged at maximum speed. Bearing in mind that the tables are of value and that their parameters can be re-calculated so long as the same water flow rate is maintained, the effective Δt value at the medium speed will be:

$$\Delta tm = \frac{Pft_{med}}{Qw \cdot \rho_{w1} \cdot Cp_{w1}} = \frac{3600 \cdot 3600}{908 \cdot 1 \cdot 4192} = 3{,}4\left[°C\right]$$

Selection of the model and the operating conditions in the cooling mode will therefore be as follows
Model **10**
Total cooling capacity **3600 [Watt]**
Sensible cooling effect **4000·0.72=2880 [Watt]**
Inlet water temperature **7[°C]**
∆t of the water **3.4[°C]**
Water flow rate **908[l/h]**

The loss of head can be calculated from the "WATER PRESSURE DROPS" graph and is **25[KPa]**.
If the loss of head is incompatible with the characteristics of the pump in the circuit, it would be possible to opt for the solution with different inlet temperature and **∆t** values so as to modify the water flow rate delivered to the unit.
If valve kit **VTV-1** is used, the additional loss of head with the unit supplied can be calculated from the "WATER PRESSURE DROP VALVES" graph and is **12 [KPa]**

**Heating operating conditions**
Calculation of the optimal conditions in which the unit must be supplied so as to obtain the required Heating capacity.
Let us suppose that a system with two pipes is used and that it must operate with the same water flow rate calculated for operation in the cooling mode. Here again, the parameters of the required power must be re-calculated, considering that the fan will operate at maximum speed. The correction coefficients in the "DATA CORRECTION FACTORS" table can be used to calculate the required Heating capacity at the maximum speed **Pt max = 4500/0.73 = 6164 [Watt]**
In this case, the required **∆t** can be easily calculated as both the flow rate and efficiency are fixed values.
Supposing that a **908 [l/h]** flow rate is used, the result will be:

$$\Delta t = \frac{Pt_{\max}}{Qw \cdot \rho_{w2} \cdot Cp_{w2}} = \frac{6164 \cdot 3600}{908 \cdot 0.98 \cdot 4180} = 5.97[°C]$$

where:
**Qw=** Water flow rate [l/h]
**ρw2=** Density of the water at 60 °C [kg/dm³]
**Cpw2=** Specific heat of the water at 60°C [J/kg·K]
By interpolating the values in the "HEATING EFFICIENCIES" table for model 10, one calculates that to obtain the required power, the unit must be supplied with water at a temperature of about **47 [°C].**
The effective value of **∆t** at the medium speed will be:

$$\Delta tm = \frac{Pt_{med}}{Qw \cdot \rho_{w2} \cdot Cp_{w2}} = \frac{4500 \cdot 3600}{908 \cdot 0.98 \cdot 4180} = 4.36[°C]$$

Selection of the model and the operating conditions in the cooling mode will therefore be as follows
Model **10**
Heating capacity **4500 [Watt]**
Inlet water temperature **47.0[°C]**
∆t of the water **4.36[°C]**
Water flow rate **908[l/h]**

The "NOISE LEVELS" table can now be used to calculate the value of the noise created by the selected unit, remembering that this is model **10**, operating at the medium speed to which a **48 dB[A]** sound power and sound pressure of **40 dB[A]** measured at the indicated conditions correspond.

**- Selection B** (unit for system with four pipes)

**Checking the "Technical Data" table for all the models,** the suitable unit model according the required performances and operating conditions is the model 10-4T, which provides as standard heating capacity the following ones::
Total cooling capacity required at the maximum speed = **4000 [Watt]**
Total cooling capacity required at the medium speed = **3050 [Watt]**

**Cooling operating conditions**
Operating conditions deqfinition for the required performances.
By the " DATA CORRECTION FACTORS" table and using the right correction values for the selected model, the required performances are:

Total cooling capacity required at the maximum speed **Pft max = 3600/0.76 = 4737 [Watt]**
Sensible cooling effect required at the maximum speed **Pft max = 2900/0.76 = 3815 [Watt]**

# HOW TO SELECT THE UNIT

The "Cooling capacity" table for the selected model 10-4T can be used to calculate the required cooling capacity and to obtain the following:
Total efficiency = **4737 [Watt]** with water in the following conditions.
inlet water temperature **5[°C]** and a **Δt of 5.4 [°C]**
inlet water temperature **6[°C]** and a **Δt of 4.35[°C]**
inlet water temperature **7[°C]** and a **Δt of 3.3 [°C]**
a sensible efficiency of **3700 [Watt] corresponds in both cases**

Supposing that the water enters the fan coil at a temperature of **6[°C]** and with **Δt of 4.35[°C**], the following water flow rate must be guaranteed:

$$Qw = \frac{Pft_{\max}}{\Delta t \cdot \rho_{w1} \cdot Cp_{w1}} = \frac{4737 \cdot 3600}{4{,}35 \cdot 1 \cdot 4192} = 935\left[l/h\right]$$

where:
**Qw=** Water flow rate [l/h]
**ρw1=** Density of the water at 10 °C [kg/dm³]
**Cpw1=** Specific heat of the water at 10°C [J/kg·K]
The calculations are used to find the conditions in which the unit must be supplied so as to obtain the total efficiency values envisaged at the maximum speed. Bearing in mind that the tables are of value and that their parameters can be re-calculated so long as the same water flow rate is maintained, the effective **Δt** value at medium speed will be:

$$\Delta tm = \frac{Pft_{med}}{Qw \cdot \rho_{w1} \cdot Cp_{w1}} = \frac{3500 \cdot 3600}{935 \cdot 1 \cdot 4192} = 3{,}31\left[°C\right]$$

Selection of the model and the operating conditions in the cooling mode will therefore be as follows
Model **10-4T**
Total cooling capacity **3500 [Watt]**
Sensible cooling effect **3900·0.76=2964 [Watt]**
Inlet water temperature **6[°C]**
Δt of the water **3.31[°C]**
Water flow rate **938[l/h]**

A **28** kPa water pressure drop is given in the "water pressure drop" graph, on a level with the determined water flow rate and the curve of the selected model.
If you would use the 3-way valve kit (**VTV1**), the water pressure drop, given in the "valve working pressure drop" would be **15** [KPa].

**Heating operating conditions**
Refer to the 10-4T size in the “HEATING EFFICIENCIES” table for the efficiency values in the heating mode. Remember that the data in the documentation refer to the maximum speed of the fan, thus the parameters of the required efficiency value must be calculated again. The “DATA CORRECTION FACTORS” tables must therefore be used.
Heating capacity required at the maximum speed **Pt max = 4500/0.76 = 5921 [Watt]**

The “HEATING EFFICIENCIES” table shows that with ambient air at a temperature of **20 [°C]**, model **10-4T** is unable to provide this output, even when fed with water at **80 [°C]** and with a minimum **Δt** of about **6 [°C]**. In these conditions, the maximum power delivered by the unit at maximum speed is, in fact, **5774 [Watt]**. In this case, the only thing to do is to operate at the maximum speed. If this is done, the required value **4500 [Watt]** is obtained at an inlet water temperature of **70[°C]** and with a **Δt** of **12[°C].**

$$Qw = \frac{Pt_{\max}}{\Delta t \cdot \rho_{w3} \cdot Cp_{w3}} = \frac{4500 \cdot 3600}{12 \cdot 0.97 \cdot 4196} = 332\left[l/h\right]$$

The required water flow rate of the water is therefore:
**Qw=** Water flow rate [l/h]
**ρw3=** Density of the water at 70 °C [kg/dm³]
**Cpw3=** Specific heat of the water at 70°C [J/kg·K]
This water flow rate is compatible with the limits indicated in the “LIMITS TO OPERATION” section while the exchanger’s loss of head can be found in the “WATER PRESSURE DROPS” graph for model **104-4T** secondary exchanger, and is 40 [Kpa].
If valve kit **VTV-3** is used, the additional loss of head with the unit supplied can be calculated from the “WATER PRESSURE DROP VALVES” graph and is **1 [KPa]**

The “NOISE LEVELS” table can now be used to calculate the value of the noise created by the selected unit, remembering that this is model **10-4T**, operating at the medium speed in the cooling mode and at the maximum speed in the heating mode to which a **50** and **58 dB[A]** sound power and a corresponding sound pressure of **42** and **50 dB[A]** measured at the indicated conditions, respectively correspond.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

**2 Pipes Version**

**Mod. 04 Cooling Capacity**

The tables give the performances in cooling mode at operating conditions differing from the nominal ones. The data given refer to the maximum fan speed. The ones corresponding to the medium and minimum speeds can be calculated by applying the corresponding correction coefficients (see “Data correction factors”).

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 2030 | 2712 | 3432 | 0 | 0 | 1888 | 2287 | 2562 | 2829 | 3088 | 3381 |
| | 4 | 1798 | 2478 | 3191 | 4008 | 0 | 1817 | 2131 | 2437 | 2715 | 2986 | 3244 |
| | 5 | 1555 | 2201 | 2950 | 3729 | 4560 | 1629 | 1966 | 2293 | 2587 | 2868 | 3138 |
| | 6 | 0 | 1916 | 2676 | 3485 | 4328 | 1470 | 1770 | 2118 | 2446 | 2737 | 3018 |
| | 7 | 0 | 1645 | 2358 | 3206 | 4073 | 1366 | 1632 | 1920 | 2264 | 2592 | 2887 |
| 6 | 3 | 1784 | 2408 | 3192 | 0 | 0 | 1825 | 2127 | 2420 | 2693 | 2955 | 3207 |
| | 4 | 1579 | 2039 | 2936 | 3720 | 4560 | 1667 | 1977 | 2290 | 2576 | 2850 | 3111 |
| | 5 | 1363 | 1946 | 2688 | 3320 | 4297 | 1464 | 1814 | 2139 | 2447 | 2731 | 3003 |
| | 6 | 0 | 1664 | 2384 | 3212 | 4059 | 1330 | 1627 | 1957 | 2290 | 2598 | 3154 |
| | 7 | 0 | 0 | 2067 | 2921 | 3798 | 1242 | 1499 | 1781 | 2107 | 2450 | 2747 |
| 7 | 3 | 1559 | 2191 | 2928 | 0 | 0 | 1674 | 1984 | 2284 | 2555 | 2820 | 3077 |
| | 4 | 1377 | 1948 | 2671 | 3436 | 4296 | 1501 | 1827 | 2134 | 2437 | 2715 | 2979 |
| | 5 | 1192 | 1707 | **2400** | 3198 | 4025 | 1318 | 1656 | 1979 | **2300** | 2589 | 2866 |
| | 6 | 0 | 1446 | 2108 | 2928 | 3784 | 1202 | 1485 | 1802 | 2137 | 2456 | 2742 |
| | 7 | 0 | 0 | 1788 | 2605 | 3502 | 1118 | 1366 | 1650 | 1942 | 2287 | 2604 |
| 8 | 3 | 1364 | 1074 | 2636 | 3408 | 0 | 1510 | 1830 | 2127 | 2416 | 2685 | 2944 |
| | 4 | 1220 | 1708 | 2393 | 3164 | 4032 | 1348 | 1678 | 1982 | 2298 | 2574 | 2846 |
| | 5 | 0 | 1487 | 2122 | 2913 | 3753 | 1181 | 1489 | 1832 | 2146 | 2451 | 2730 |
| | 6 | 0 | 0 | 1848 | 2626 | 3488 | 1076 | 1341 | 1645 | 1978 | 2300 | 2602 |
| | 7 | 0 | 0 | 0 | 2303 | 3192 | 993 | 1242 | 1508 | 1794 | 2129 | 2461 |
| 9 | 3 | 1222 | 1676 | 2367 | 3168 | 0 | 1361 | 1679 | 1983 | 2278 | 2548 | 2811 |
| | 4 | 1095 | 1494 | 2112 | 2884 | 3744 | 1186 | 1525 | 1836 | 2144 | 2436 | 2707 |
| | 5 | 0 | 1297 | 1861 | 2614 | 3463 | 1042 | 1329 | 1678 | 1989 | 2302 | 2588 |
| | 6 | 0 | 0 | 1602 | 2323 | 3185 | 953 | 1204 | 1495 | 1827 | 2147 | 2458 |
| | 7 | 0 | 0 | 0 | 2003 | 2867 | 868 | 1118 | 1369 | 1659 | 1806 | 1926 |
| 10 | 3 | 1103 | 1460 | 2079 | 2856 | 0 | 1212 | 1518 | 1831 | 2125 | 2409 | 2675 |
| | 4 | 966 | 1305 | 1845 | 2594 | 3408 | 1028 | 1365 | 1690 | 1994 | 2296 | 2570 |
| | 5 | 0 | 0 | 1616 | 2309 | 3161 | 910 | 1189 | 1524 | 1844 | 2149 | 2447 |
| | 6 | 0 | 0 | 0 | 2026 | 2873 | 838 | 1076 | 1351 | 1670 | 1998 | 2304 |
| | 7 | 0 | 0 | 0 | 1730 | 2539 | 739 | 993 | 1241 | 1525 | 1811 | 2145 |
| 11 | 3 | 980 | 1286 | 1805 | 2545 | 3360 | 1059 | 1368 | 1684 | 1982 | 2272 | 2539 |
| | 4 | 0 | 1169 | 1606 | 2287 | 3116 | 888 | 1209 | 1532 | 1841 | 2144 | 2428 |
| | 5 | 0 | 0 | 1414 | 2021 | 2850 | 787 | 1051 | 1353 | 1693 | 2004 | 2302 |
| | 6 | 0 | 0 | 0 | 1766 | 2541 | 700 | 953 | 1212 | 1513 | 1848 | 2157 |
| | 7 | 0 | 0 | 0 | 0 | 2225 | 610 | 868 | 1117 | 1377 | 1670 | 1998 |
| 12 | 3 | 840 | 1165 | 1563 | 2245 | 3096 | 901 | 1220 | 1523 | 1833 | 2120 | 2400 |
| | 4 | 0 | 1046 | 1396 | 1994 | 2807 | 747 | 1045 | 1380 | 1697 | 1998 | 2292 |
| | 5 | 0 | 0 | 1239 | 1761 | 2520 | 661 | 913 | 1198 | 1546 | 1855 | 2151 |
| | 6 | 0 | 0 | 0 | 1530 | 2215 | 572 | 827 | 1078 | 1360 | 1696 | 2010 |
| | 7 | 0 | 0 | 0 | 0 | 1926 | 473 | 739 | 993 | 1244 | 1534 | 1845 |
| 13 | 3 | 744 | 1008 | 1416 | 1948 | 2784 | 733 | 1069 | 1375 | 1677 | 1980 | 2215 |
| | 4 | 0 | 0 | 1248 | 1730 | 2482 | 620 | 895 | 1227 | 1543 | 1845 | 2140 |
| | 5 | 0 | 0 | 0 | 1525 | 2201 | 534 | 786 | 1058 | 1378 | 1708 | 2006 |
| | 6 | 0 | 0 | 0 | 0 | 1925 | 446 | 572 | 952 | 1222 | 1537 | 1861 |
| | 7 | 0 | 0 | 0 | 0 | 1659 | 322 | 610 | 868 | 1117 | 1388 | 1693 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

## Mod. 08 Cooling Capacity

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 3383 | 4520 | 0 | 0 | 0 | 2709 | 3281 | 3676 | 4060 | 4431 | 4851 |
| | 4 | 2997 | 4129 | 5318 | 0 | 0 | 2607 | 3057 | 3497 | 3895 | 4284 | 4655 |
| | 5 | 2592 | 3669 | 4917 | 6215 | 7600 | 2337 | 2820 | 3290 | 3712 | 4116 | 4502 |
| | 6 | 2241 | 3194 | 4460 | 5808 | 7213 | 2109 | 2540 | 3039 | 3509 | 3927 | 4331 |
| | 7 | 0 | 2742 | 3929 | 5343 | 6789 | 1960 | 2342 | 2755 | 3249 | 3719 | 4142 |
| 6 | 3 | 2973 | 4014 | 0 | 0 | 0 | 2619 | 3052 | 3473 | 3863 | 4239 | 4602 |
| | 4 | 2632 | 3398 | 4893 | 6200 | 0 | 2391 | 2837 | 3286 | 3696 | 4089 | 4463 |
| | 5 | 2272 | 3243 | 4480 | 5534 | 7162 | 2100 | 2603 | 3069 | 3510 | 3918 | 4309 |
| | 6 | 0 | 2773 | 3974 | 5354 | 6766 | 1909 | 2334 | 2807 | 3286 | 3728 | 4525 |
| | 7 | 0 | 0 | 3444 | 4868 | 6330 | 1782 | 2151 | 2556 | 3022 | 3515 | 3941 |
| 7 | 3 | 2598 | 3651 | 4880 | 0 | 0 | 2401 | 2846 | 3277 | 3666 | 4046 | 4415 |
| | 4 | 2294 | 3246 | 4452 | 5727 | 0 | 2154 | 2621 | 3062 | 3497 | 3895 | 4275 |
| | 5 | 1987 | 2845 | **4000** | 5331 | 6708 | 1891 | 2376 | 2840 | **3300** | 3714 | 4113 |
| | 6 | 0 | 2409 | 3514 | 4880 | 6306 | 1725 | 2131 | 2585 | 3066 | 3523 | 3934 |
| | 7 | 0 | 0 | 2980 | 4341 | 5837 | 1605 | 1960 | 2367 | 2786 | 3282 | 3737 |
| 8 | 3 | 2274 | 1790 | 4394 | 0 | 0 | 2166 | 2625 | 3052 | 3467 | 3852 | 4224 |
| | 4 | 2033 | 2846 | 3988 | 5273 | 0 | 1934 | 2408 | 2843 | 3297 | 3693 | 4083 |
| | 5 | 1838 | 2479 | 3536 | 4855 | 6255 | 1694 | 2136 | 2628 | 3079 | 3517 | 3916 |
| | 6 | 0 | 2128 | 3080 | 4376 | 5813 | 1544 | 1924 | 2360 | 2839 | 3300 | 3734 |
| | 7 | 0 | 0 | 2629 | 3838 | 5321 | 1425 | 1782 | 2164 | 2574 | 3055 | 3531 |
| 9 | 3 | 2036 | 2793 | 3945 | 0 | 0 | 1953 | 2409 | 2846 | 3268 | 3656 | 4033 |
| | 4 | 1824 | 2490 | 3520 | 4807 | 6240 | 1702 | 2187 | 2634 | 3076 | 3495 | 3884 |
| | 5 | 0 | 2162 | 3102 | 4356 | 5772 | 1494 | 1908 | 2407 | 2854 | 3303 | 3713 |
| | 6 | 0 | 0 | 2670 | 3872 | 5308 | 1367 | 1728 | 2145 | 2622 | 3081 | 3527 |
| | 7 | 0 | 0 | 0 | 3339 | 4778 | 1245 | 1605 | 1964 | 2380 | 2592 | 2764 |
| 10 | 3 | 1838 | 2434 | 3464 | 4760 | 0 | 1738 | 2178 | 2627 | 3049 | 3457 | 3838 |
| | 4 | 1610 | 2175 | 3075 | 4324 | 5680 | 1475 | 1958 | 2425 | 2861 | 3294 | 3688 |
| | 5 | 0 | 1912 | 2693 | 3848 | 5268 | 1306 | 1706 | 2186 | 2646 | 3083 | 3511 |
| | 6 | 0 | 0 | 2311 | 3377 | 4789 | 1202 | 1544 | 1938 | 2396 | 2867 | 3306 |
| | 7 | 0 | 0 | 0 | 2883 | 4232 | 1061 | 1425 | 1780 | 2188 | 2598 | 3078 |
| 11 | 3 | 1634 | 2143 | 3008 | 4242 | 0 | 1519 | 1963 | 2416 | 2844 | 3259 | 3643 |
| | 4 | 1400 | 1949 | 2676 | 3812 | 5194 | 1274 | 1735 | 2197 | 2641 | 3076 | 3484 |
| | 5 | 0 | 0 | 2357 | 3368 | 4750 | 1129 | 1507 | 1941 | 2428 | 2875 | 3303 |
| | 6 | 0 | 0 | 0 | 2944 | 4235 | 1005 | 1367 | 1739 | 2171 | 2652 | 3094 |
| | 7 | 0 | 0 | 0 | 2492 | 3709 | 875 | 1245 | 1603 | 1975 | 2396 | 2867 |
| 12 | 3 | 1400 | 1942 | 2606 | 3742 | 0 | 1292 | 1750 | 2185 | 2630 | 3042 | 3444 |
| | 4 | 0 | 1743 | 2327 | 3324 | 4679 | 1072 | 1500 | 1980 | 2435 | 2866 | 3288 |
| | 5 | 0 | 0 | 2064 | 2935 | 4199 | 948 | 1309 | 1719 | 2218 | 2661 | 3086 |
| | 6 | 0 | 0 | 0 | 2549 | 3692 | 821 | 1187 | 1546 | 1951 | 2434 | 2884 |
| | 7 | 0 | 0 | 0 | 0 | 3210 | 678 | 1061 | 1425 | 1784 | 2202 | 2647 |
| 13 | 3 | 1240 | 1680 | 2360 | 3246 | 4640 | 1052 | 1533 | 1973 | 2406 | 2841 | 3178 |
| | 4 | 0 | 1520 | 2080 | 2883 | 4136 | 889 | 1283 | 1760 | 2214 | 2648 | 3071 |
| | 5 | 0 | 0 | 1843 | 2542 | 3668 | 766 | 1128 | 1519 | 1977 | 2451 | 2878 |
| | 6 | 0 | 0 | 0 | 2215 | 3208 | 640 | 820 | 1365 | 1754 | 2205 | 2670 |
| | 7 | 0 | 0 | 0 | 0 | 2764 | 463 | 875 | 1245 | 1603 | 1992 | 2429 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

## Mod. 10 Cooling Capacity

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 3975 | 0 | 0 | 0 | 0 | 3202 | 3878 | 4345 | 4798 | 5237 | 5733 |
| | 4 | 3521 | 4852 | 6249 | 0 | 0 | 3081 | 3613 | 4132 | 4603 | 5063 | 5501 |
| | 5 | 3045 | 4311 | 5778 | 7302 | 0 | 2761 | 3333 | 3889 | 4387 | 4864 | 5321 |
| | 6 | 2633 | 3753 | 5240 | 6824 | 8475 | 2492 | 3001 | 3591 | 4147 | 4641 | 5118 |
| | 7 | 0 | 3222 | 4617 | 6279 | 7976 | 2316 | 2767 | 3256 | 3839 | 4395 | 4895 |
| 6 | 3 | 3493 | 4716 | 0 | 0 | 0 | 3095 | 3606 | 4104 | 4566 | 5010 | 5439 |
| | 4 | 3093 | 3993 | 5749 | 0 | 0 | 2826 | 3353 | 3883 | 4368 | 4833 | 5275 |
| | 5 | 2670 | 3811 | 5264 | 6502 | 0 | 2482 | 3077 | 3627 | 4149 | 4630 | 5093 |
| | 6 | 2333 | 3258 | 4669 | 6291 | 7949 | 2256 | 2759 | 3318 | 3884 | 4406 | 5348 |
| | 7 | 0 | 2845 | 4047 | 5720 | 7438 | 2106 | 2542 | 3021 | 3572 | 4154 | 4658 |
| 7 | 3 | 3052 | 4290 | 0 | 0 | 0 | 2838 | 3364 | 3873 | 4333 | 4781 | 5218 |
| | 4 | 2696 | 3815 | 5231 | 0 | 0 | 2546 | 3098 | 3619 | 4133 | 4603 | 5052 |
| | 5 | 2335 | 3343 | **4700** | 6264 | 7882 | 2234 | 2808 | 3356 | **3900** | 4390 | 4861 |
| | 6 | 2105 | 2831 | 4129 | 5733 | 7410 | 2038 | 2518 | 3055 | 3623 | 4164 | 4649 |
| | 7 | 0 | 2527 | 3502 | 5101 | 6858 | 1896 | 2316 | 2797 | 3293 | 3879 | 4416 |
| 8 | 3 | 2672 | 2104 | 0 | 0 | 0 | 2560 | 3103 | 3607 | 4098 | 4552 | 4992 |
| | 4 | 2389 | 3344 | 4686 | 6196 | 0 | 2285 | 2845 | 3360 | 3896 | 4364 | 4826 |
| | 5 | 2159 | 2913 | 4155 | 5704 | 7349 | 2002 | 2524 | 3106 | 3639 | 4156 | 4629 |
| | 6 | 0 | 2500 | 3619 | 5142 | 6830 | 1825 | 2273 | 2789 | 3355 | 3900 | 4413 |
| | 7 | 0 | 0 | 3089 | 4510 | 6252 | 1684 | 2106 | 2557 | 3042 | 3611 | 4174 |
| 9 | 3 | 2392 | 3282 | 4636 | 0 | 0 | 2309 | 2847 | 3363 | 3863 | 4321 | 4766 |
| | 4 | 2143 | 2926 | 4136 | 5648 | 0 | 2011 | 2585 | 3113 | 3636 | 4130 | 4590 |
| | 5 | 1865 | 2540 | 3645 | 5118 | 6782 | 1766 | 2254 | 2845 | 3373 | 3904 | 4389 |
| | 6 | 0 | 2229 | 3138 | 4550 | 6237 | 1615 | 2042 | 2535 | 3099 | 3641 | 4169 |
| | 7 | 0 | 0 | 2716 | 3923 | 5615 | 1471 | 1896 | 2321 | 2813 | 3063 | 3266 |
| 10 | 3 | 2159 | 2860 | 4071 | 0 | 0 | 2054 | 2574 | 3105 | 3603 | 4085 | 4535 |
| | 4 | 1892 | 2556 | 3613 | 5081 | 0 | 1743 | 2314 | 2866 | 3381 | 3893 | 4358 |
| | 5 | 0 | 2247 | 3164 | 4521 | 6190 | 1543 | 2017 | 2584 | 3127 | 3644 | 4150 |
| | 6 | 0 | 0 | 2716 | 3968 | 5627 | 1421 | 1825 | 2290 | 2831 | 3388 | 3907 |
| | 7 | 0 | 0 | 0 | 3387 | 4973 | 1254 | 1684 | 2104 | 2586 | 3071 | 3637 |
| 11 | 3 | 1920 | 2518 | 3535 | 0 | 0 | 1795 | 2320 | 2855 | 3361 | 3852 | 4306 |
| | 4 | 1645 | 2290 | 3144 | 4479 | 6103 | 1505 | 2050 | 2597 | 3122 | 3636 | 4117 |
| | 5 | 0 | 1994 | 2770 | 3957 | 5581 | 1334 | 1782 | 2294 | 2870 | 3398 | 3903 |
| | 6 | 0 | 0 | 2388 | 3459 | 4976 | 1187 | 1615 | 2055 | 2566 | 3134 | 3657 |
| | 7 | 0 | 0 | 0 | 2928 | 4358 | 1034 | 1471 | 1894 | 2335 | 2831 | 3388 |
| 12 | 3 | 1645 | 2282 | 3062 | 4397 | 0 | 1527 | 2069 | 2582 | 3108 | 3596 | 4070 |
| | 4 | 1410 | 2048 | 2734 | 3906 | 5498 | 1267 | 1772 | 2340 | 2878 | 3387 | 3886 |
| | 5 | 0 | 1786 | 2426 | 3448 | 4934 | 1121 | 1547 | 2031 | 2621 | 3145 | 3647 |
| | 6 | 0 | 0 | 2134 | 2996 | 4338 | 971 | 1402 | 1827 | 2306 | 2876 | 3408 |
| | 7 | 0 | 0 | 0 | 2583 | 3771 | 801 | 1254 | 1684 | 2109 | 2602 | 3128 |
| 13 | 3 | 1457 | 1974 | 2773 | 3814 | 0 | 1243 | 1812 | 2332 | 2844 | 3358 | 3756 |
| | 4 | 0 | 1786 | 2444 | 3387 | 4860 | 1051 | 1517 | 2080 | 2616 | 3129 | 3629 |
| | 5 | 0 | 0 | 2165 | 2987 | 4310 | 905 | 1333 | 1795 | 2336 | 2896 | 3401 |
| | 6 | 0 | 0 | 0 | 2603 | 3770 | 757 | 969 | 1614 | 2073 | 2606 | 3156 |
| | 7 | 0 | 0 | 0 | 0 | 3248 | 547 | 1034 | 1471 | 1894 | 2354 | 2871 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

## Mod. 12 Cooling Capacity

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 5328 | 0 | 0 | 0 | 0 | 4269 | 5170 | 5793 | 6397 | 6982 | 7644 |
| | 4 | 4720 | 6504 | 0 | 0 | 0 | 4108 | 4817 | 5510 | 6138 | 6751 | 7335 |
| | 5 | 4082 | 5778 | 7745 | 9788 | 0 | 3682 | 4444 | 5185 | 5849 | 6485 | 7094 |
| | 6 | 3530 | 5030 | 7024 | 9147 | 11360 | 3323 | 4002 | 4789 | 5529 | 6188 | 6824 |
| | 7 | 0 | 4319 | 6189 | 8416 | 10692 | 3088 | 3690 | 4342 | 5119 | 5860 | 6527 |
| 6 | 3 | 4682 | 0 | 0 | 0 | 0 | 4127 | 4809 | 5472 | 6087 | 6680 | 7252 |
| | 4 | 4145 | 5352 | 7707 | 0 | 0 | 3768 | 4471 | 5178 | 5824 | 6444 | 7033 |
| | 5 | 3579 | 5108 | 7056 | 8715 | 0 | 3310 | 4102 | 4836 | 5531 | 6174 | 6790 |
| | 6 | 3127 | 4367 | 6259 | 8432 | 10656 | 3008 | 3678 | 4423 | 5178 | 5874 | 7130 |
| | 7 | 0 | 3813 | 5425 | 7667 | 9970 | 2808 | 3389 | 4027 | 4763 | 5539 | 6210 |
| 7 | 3 | 4092 | 5750 | 0 | 0 | 0 | 3784 | 4485 | 5164 | 5777 | 6375 | 6958 |
| | 4 | 3614 | 5113 | 7012 | 0 | 0 | 3394 | 4130 | 4825 | 5510 | 6137 | 6736 |
| | 5 | 3130 | 4481 | **6300** | 8396 | 0 | 2979 | 3743 | 4475 | **5200** | 5853 | 6481 |
| | 6 | 2821 | 3795 | 5534 | 7685 | 9932 | 2718 | 3358 | 4073 | 4831 | 5552 | 6199 |
| | 7 | 0 | 3387 | 4694 | 6838 | 9193 | 2529 | 3088 | 3729 | 4390 | 5171 | 5888 |
| 8 | 3 | 3581 | 2820 | 0 | 0 | 0 | 3413 | 4137 | 4809 | 5463 | 6070 | 6657 |
| | 4 | 3202 | 4483 | 6281 | 8305 | 0 | 3047 | 3794 | 4480 | 5195 | 5819 | 6435 |
| | 5 | 2895 | 3904 | 5569 | 7646 | 9851 | 2670 | 3365 | 4141 | 4851 | 5542 | 6171 |
| | 6 | 0 | 3352 | 4852 | 6892 | 9156 | 2433 | 3031 | 3719 | 4473 | 5199 | 5884 |
| | 7 | 0 | 0 | 4140 | 6045 | 8380 | 2245 | 2808 | 3410 | 4057 | 4814 | 5565 |
| 9 | 3 | 3207 | 4399 | 6214 | 0 | 0 | 3078 | 3796 | 4484 | 5150 | 5762 | 6354 |
| | 4 | 2873 | 3922 | 5543 | 7571 | 0 | 2681 | 3447 | 4150 | 4848 | 5507 | 6120 |
| | 5 | 2500 | 3405 | 4886 | 6861 | 9091 | 2355 | 3006 | 3793 | 4497 | 5205 | 5851 |
| | 6 | 0 | 2987 | 4206 | 6099 | 8360 | 2153 | 2723 | 3380 | 4132 | 4854 | 5558 |
| | 7 | 0 | 0 | 3641 | 5259 | 7526 | 1961 | 2529 | 3095 | 3750 | 4084 | 4355 |
| 10 | 3 | 2895 | 3834 | 5456 | 0 | 0 | 2739 | 3433 | 4140 | 4804 | 5447 | 6047 |
| | 4 | 2536 | 3426 | 4842 | 6810 | 0 | 2324 | 3085 | 3821 | 4508 | 5190 | 5811 |
| | 5 | 0 | 3012 | 4241 | 6060 | 8297 | 2058 | 2689 | 3445 | 4170 | 4859 | 5533 |
| | 6 | 0 | 0 | 3640 | 5318 | 7542 | 1894 | 2433 | 3054 | 3775 | 4518 | 5209 |
| | 7 | 0 | 0 | 0 | 4540 | 6666 | 1672 | 2245 | 2805 | 3448 | 4095 | 4850 |
| 11 | 3 | 2573 | 3375 | 4738 | 0 | 0 | 2394 | 3093 | 3807 | 4481 | 5136 | 5741 |
| | 4 | 2205 | 3069 | 4215 | 6004 | 8180 | 2007 | 2734 | 3463 | 4162 | 4847 | 5490 |
| | 5 | 0 | 2673 | 3713 | 5304 | 7481 | 1778 | 2375 | 3058 | 3827 | 4530 | 5204 |
| | 6 | 0 | 0 | 3201 | 4636 | 6670 | 1583 | 2153 | 2740 | 3421 | 4178 | 4876 |
| | 7 | 0 | 0 | 0 | 3924 | 5841 | 1378 | 1961 | 2525 | 3113 | 3775 | 4518 |
| 12 | 3 | 2205 | 3059 | 4104 | 5894 | 0 | 2036 | 2758 | 3443 | 4144 | 4794 | 5427 |
| | 4 | 1890 | 2745 | 3665 | 5235 | 7369 | 1690 | 2363 | 3120 | 3838 | 4516 | 5181 |
| | 5 | 0 | 2394 | 3251 | 4622 | 6614 | 1495 | 2063 | 2708 | 3495 | 4193 | 4863 |
| | 6 | 0 | 0 | 2860 | 4015 | 5815 | 1294 | 1870 | 2436 | 3075 | 3835 | 4544 |
| | 7 | 0 | 0 | 0 | 3463 | 5055 | 1068 | 1672 | 2245 | 2812 | 3469 | 4171 |
| 13 | 3 | 1953 | 2646 | 3717 | 5112 | 0 | 1658 | 2416 | 3110 | 3792 | 4477 | 5007 |
| | 4 | 0 | 2394 | 3276 | 4541 | 6514 | 1401 | 2022 | 2773 | 3489 | 4172 | 4839 |
| | 5 | 0 | 0 | 2902 | 4003 | 5777 | 1207 | 1777 | 2393 | 3115 | 3862 | 4535 |
| | 6 | 0 | 0 | 0 | 3489 | 5053 | 1009 | 1292 | 2152 | 2764 | 3474 | 4208 |
| | 7 | 0 | 0 | 0 | 0 | 4354 | 729 | 1378 | 1961 | 2525 | 3139 | 3827 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

## Mod. 16 Cooling Capacity

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 6427 | 8588 | 0 | 0 | 0 | 4195 | 5081 | 5692 | 6286 | 6862 | 7512 |
| | 4 | 5694 | 7846 | 10105 | 12692 | 0 | 4037 | 4733 | 5415 | 6032 | 6634 | 7208 |
| | 5 | 4924 | 6971 | 9343 | 11808 | 14440 | 3618 | 4367 | 5095 | 5748 | 6373 | 6971 |
| | 6 | 4258 | 6068 | 8473 | 11035 | 13704 | 3265 | 3933 | 4706 | 5434 | 6081 | 6706 |
| | 7 | 0 | 5210 | 7466 | 10153 | 12898 | 3035 | 3626 | 4267 | 5030 | 5759 | 6414 |
| 6 | 3 | 5648 | 7626 | 10108 | 0 | 0 | 4055 | 4725 | 5377 | 5982 | 6565 | 7126 |
| | 4 | 5001 | 6456 | 9297 | 11780 | 0 | 3703 | 4393 | 5088 | 5723 | 6332 | 6911 |
| | 5 | 4318 | 6162 | 8512 | 10514 | 13607 | 3252 | 4031 | 4752 | 5436 | 6067 | 6673 |
| | 6 | 0 | 5268 | 7551 | 10172 | 12855 | 2956 | 3615 | 4347 | 5088 | 5772 | 7007 |
| | 7 | 0 | 0 | 6544 | 9249 | 12027 | 2759 | 3330 | 3958 | 4680 | 5443 | 6103 |
| 7 | 3 | 4936 | 6937 | 9272 | 0 | 0 | 3718 | 4407 | 5074 | 5677 | 6265 | 6837 |
| | 4 | 4359 | 6168 | 8459 | 10881 | 13604 | 3336 | 4059 | 4742 | 5415 | 6031 | 6619 |
| | 5 | 3776 | 5406 | **7600** | 10128 | 12745 | 2928 | 3679 | 4397 | **5110** | 5752 | 6369 |
| | 6 | 0 | 4578 | 6676 | 9271 | 11982 | 2671 | 3300 | 4003 | 4747 | 5456 | 6091 |
| | 7 | 0 | 0 | 5663 | 8249 | 11089 | 2485 | 3035 | 3665 | 4314 | 5082 | 5786 |
| 8 | 3 | 4320 | 3402 | 8348 | 0 | 0 | 3354 | 4065 | 4726 | 5369 | 5965 | 6541 |
| | 4 | 3863 | 5408 | 7577 | 10019 | 12768 | 2994 | 3728 | 4403 | 5105 | 5718 | 6323 |
| | 5 | 3492 | 4710 | 6718 | 9224 | 11884 | 2624 | 3307 | 4069 | 4767 | 5446 | 6065 |
| | 6 | 0 | 0 | 5853 | 8314 | 11045 | 2391 | 2979 | 3655 | 4396 | 5109 | 5782 |
| | 7 | 0 | 0 | 4994 | 7292 | 10109 | 2206 | 2759 | 3351 | 3986 | 4731 | 5468 |
| 9 | 3 | 3868 | 5307 | 7496 | 10032 | 0 | 3025 | 3730 | 4406 | 5061 | 5662 | 6245 |
| | 4 | 3466 | 4731 | 6687 | 9134 | 11856 | 2635 | 3387 | 4078 | 4764 | 5412 | 6014 |
| | 5 | 0 | 4107 | 5895 | 8276 | 10967 | 2314 | 2954 | 3728 | 4420 | 5115 | 5750 |
| | 6 | 0 | 0 | 5074 | 7357 | 10085 | 2116 | 2676 | 3321 | 4060 | 4770 | 5462 |
| | 7 | 0 | 0 | 0 | 6344 | 9079 | 1927 | 2485 | 3041 | 3685 | 4013 | 4279 |
| 10 | 3 | 3492 | 4625 | 6582 | 9044 | 0 | 2692 | 3373 | 4068 | 4721 | 5352 | 5942 |
| | 4 | 3060 | 4133 | 5842 | 8216 | 10792 | 2284 | 3032 | 3755 | 4430 | 5100 | 5710 |
| | 5 | 0 | 3634 | 5117 | 7311 | 10009 | 2022 | 2642 | 3385 | 4098 | 4775 | 5437 |
| | 6 | 0 | 0 | 4392 | 6416 | 9099 | 1862 | 2391 | 3001 | 3710 | 4440 | 5119 |
| | 7 | 0 | 0 | 0 | 5477 | 8041 | 1643 | 2206 | 2756 | 3388 | 4024 | 4766 |
| 11 | 3 | 3104 | 4072 | 5716 | 8059 | 0 | 2352 | 3040 | 3741 | 4403 | 5047 | 5642 |
| | 4 | 0 | 3703 | 5085 | 7243 | 9868 | 1972 | 2686 | 3403 | 4090 | 4763 | 5395 |
| | 5 | 0 | 0 | 4479 | 6398 | 9024 | 1748 | 2334 | 3005 | 3760 | 4452 | 5114 |
| | 6 | 0 | 0 | 0 | 5593 | 8047 | 1556 | 2116 | 2693 | 3362 | 4106 | 4792 |
| | 7 | 0 | 0 | 0 | 0 | 7046 | 1354 | 1927 | 2482 | 3059 | 3710 | 4439 |
| 12 | 3 | 2660 | 3690 | 4951 | 7110 | 9804 | 2001 | 2711 | 3383 | 4072 | 4711 | 5333 |
| | 4 | 0 | 3311 | 4422 | 6316 | 8890 | 1660 | 2322 | 3066 | 3771 | 4438 | 5091 |
| | 5 | 0 | 0 | 3922 | 5576 | 7979 | 1469 | 2028 | 2661 | 3434 | 4120 | 4778 |
| | 6 | 0 | 0 | 0 | 4844 | 7015 | 1272 | 1837 | 2394 | 3021 | 3769 | 4465 |
| | 7 | 0 | 0 | 0 | 0 | 6098 | 1050 | 1643 | 2206 | 2763 | 3409 | 4098 |
| 13 | 3 | 2356 | 3192 | 4484 | 6167 | 8816 | 1629 | 2375 | 3056 | 3726 | 4400 | 4921 |
| | 4 | 0 | 2888 | 3952 | 5478 | 7858 | 1377 | 1987 | 2725 | 3428 | 4100 | 4756 |
| | 5 | 0 | 0 | 3501 | 4830 | 6969 | 1186 | 1746 | 2351 | 3061 | 3795 | 4457 |
| | 6 | 0 | 0 | 0 | 4209 | 6096 | 992 | 1270 | 2114 | 2716 | 3414 | 4135 |
| | 7 | 0 | 0 | 0 | 0 | 5252 | 716 | 1354 | 1927 | 2482 | 3084 | 3761 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

**Mod. 20 Cooling Capacity**

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 8457 | 0 | 0 | 0 | 0 | 5870 | 7109 | 7965 | 8796 | 9601 | 10511 |
| | 4 | 7492 | 10324 | 13296 | 0 | 0 | 5649 | 6623 | 7576 | 8440 | 9283 | 10086 |
| | 5 | 6479 | 9172 | 12294 | 15537 | 0 | 5063 | 6111 | 7129 | 8043 | 8917 | 9755 |
| | 6 | 5603 | 7985 | 11149 | 14519 | 18032 | 4569 | 5503 | 6584 | 7603 | 8509 | 9383 |
| | 7 | 5069 | 6856 | 9824 | 13359 | 16971 | 4247 | 5074 | 5970 | 7038 | 8058 | 8974 |
| 6 | 3 | 7431 | 10035 | 0 | 0 | 0 | 5674 | 6612 | 7524 | 8370 | 9185 | 9971 |
| | 4 | 6580 | 8495 | 12233 | 0 | 0 | 5181 | 6147 | 7120 | 8008 | 8860 | 9671 |
| | 5 | 5681 | 8108 | 11200 | 13834 | 0 | 4551 | 5640 | 6649 | 7606 | 8489 | 9337 |
| | 6 | 4963 | 6931 | 9935 | 13384 | 16914 | 4136 | 5058 | 6082 | 7120 | 8077 | 9804 |
| | 7 | 0 | 6052 | 8611 | 12170 | 15825 | 3861 | 4660 | 5538 | 6549 | 7616 | 8539 |
| 7 | 3 | 6495 | 9127 | 0 | 0 | 0 | 5203 | 6167 | 7100 | 7943 | 8766 | 9567 |
| | 4 | 5736 | 8116 | 11131 | 0 | 0 | 4667 | 5679 | 6635 | 7577 | 8439 | 9262 |
| | 5 | 4968 | 7113 | **10000** | 13327 | 16769 | 4096 | 5147 | 6153 | **7150** | 8048 | 8911 |
| | 6 | 4478 | 6024 | 8784 | 12199 | 15765 | 3737 | 4617 | 5600 | 6642 | 7634 | 8523 |
| | 7 | 0 | 5377 | 7451 | 10854 | 14591 | 3477 | 4247 | 5128 | 6037 | 7111 | 8096 |
| 8 | 3 | 5684 | 4476 | 0 | 0 | 0 | 4693 | 5688 | 6612 | 7512 | 8346 | 9153 |
| | 4 | 5083 | 7116 | 9970 | 13182 | 0 | 4190 | 5217 | 6160 | 7143 | 8001 | 8848 |
| | 5 | 4595 | 6197 | 8840 | 12137 | 15636 | 3671 | 4627 | 5694 | 6671 | 7620 | 8486 |
| | 6 | 0 | 5320 | 7701 | 10940 | 14533 | 3345 | 4168 | 5113 | 6150 | 7149 | 8090 |
| | 7 | 0 | 0 | 6572 | 9595 | 13302 | 3087 | 3861 | 4688 | 5578 | 6620 | 7652 |
| 9 | 3 | 5090 | 6983 | 9864 | 0 | 0 | 4232 | 5219 | 6166 | 7082 | 7922 | 8737 |
| | 4 | 4561 | 6225 | 8799 | 12018 | 0 | 3687 | 4739 | 5707 | 6666 | 7572 | 8415 |
| | 5 | 3968 | 5405 | 7756 | 10890 | 14431 | 3238 | 4133 | 5216 | 6184 | 7157 | 8046 |
| | 6 | 0 | 4742 | 6676 | 9680 | 13270 | 2961 | 3744 | 4647 | 5681 | 6675 | 7643 |
| | 7 | 0 | 0 | 5779 | 8347 | 11946 | 2697 | 3477 | 4256 | 5156 | 5615 | 5988 |
| 10 | 3 | 4595 | 6085 | 8661 | 0 | 0 | 3766 | 4720 | 5692 | 6606 | 7489 | 8315 |
| | 4 | 4026 | 5439 | 7686 | 10810 | 0 | 3195 | 4242 | 5254 | 6199 | 7137 | 7990 |
| | 5 | 3500 | 4781 | 6732 | 9619 | 13170 | 2829 | 3697 | 4737 | 5733 | 6681 | 7608 |
| | 6 | 0 | 4274 | 5778 | 8442 | 11972 | 2605 | 3345 | 4199 | 5191 | 6212 | 7163 |
| | 7 | 0 | 0 | 5139 | 7207 | 10581 | 2299 | 3087 | 3857 | 4741 | 5630 | 6668 |
| 11 | 3 | 4084 | 5357 | 7520 | 0 | 0 | 3291 | 4253 | 5235 | 6161 | 7062 | 7894 |
| | 4 | 3500 | 4872 | 6690 | 9530 | 12985 | 2760 | 3759 | 4761 | 5723 | 6665 | 7548 |
| | 5 | 0 | 4243 | 5893 | 8419 | 11874 | 2445 | 3266 | 4205 | 5261 | 6229 | 7156 |
| | 6 | 0 | 0 | 5082 | 7359 | 10588 | 2177 | 2961 | 3768 | 4704 | 5745 | 6705 |
| | 7 | 0 | 0 | 0 | 6229 | 9272 | 1895 | 2697 | 3472 | 4280 | 5191 | 6212 |
| 12 | 3 | 3500 | 4856 | 6514 | 9355 | 0 | 2800 | 3793 | 4734 | 5698 | 6592 | 7462 |
| | 4 | 3000 | 4357 | 5818 | 8310 | 11697 | 2323 | 3249 | 4290 | 5277 | 6210 | 7124 |
| | 5 | 0 | 3800 | 5161 | 7337 | 10498 | 2055 | 2837 | 3724 | 4805 | 5765 | 6686 |
| | 6 | 0 | 0 | 4539 | 6373 | 9230 | 1779 | 2571 | 3350 | 4227 | 5273 | 6248 |
| | 7 | 0 | 0 | 0 | 5496 | 8024 | 1469 | 2299 | 3087 | 3866 | 4770 | 5734 |
| 13 | 3 | 3100 | 4200 | 5900 | 8115 | 0 | 2280 | 3322 | 4276 | 5214 | 6156 | 6885 |
| | 4 | 0 | 3800 | 5200 | 7207 | 10340 | 1926 | 2781 | 3813 | 4797 | 5737 | 6654 |
| | 5 | 0 | 0 | 4607 | 6355 | 9169 | 1659 | 2444 | 3290 | 4283 | 5310 | 6236 |
| | 6 | 0 | 0 | 0 | 5538 | 8021 | 1388 | 1777 | 2959 | 3800 | 4777 | 5785 |
| | 7 | 0 | 0 | 0 | 0 | 6911 | 1002 | 1895 | 2697 | 3472 | 4316 | 5263 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

**4 Pipes Version**

**Mod. 04-4T Cooling Capacity**

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 1607 | 2147 | 2717 | 3382 | 0 | 1379 | 1670 | 1871 | 2067 | 2256 | 2470 |
| | 4 | 1424 | 1961 | 2526 | 3173 | 3819 | 1327 | 1556 | 1780 | 1983 | 2181 | 2370 |
| | 5 | 1231 | 1743 | 2336 | 2952 | 3610 | 1190 | 1436 | 1675 | 1890 | 2095 | 2292 |
| | 6 | 0 | 1517 | 2118 | 2759 | 3426 | 1073 | 1293 | 1547 | 1786 | 1999 | 2205 |
| | 7 | 0 | 0 | 1866 | 2538 | 3225 | 998 | 1192 | 1403 | 1654 | 1893 | 2109 |
| 6 | 3 | 1412 | 1907 | 2527 | 3173 | 0 | 1333 | 1554 | 1768 | 1967 | 2158 | 2343 |
| | 4 | 1250 | 1614 | 2324 | 2945 | 3610 | 1217 | 1444 | 1673 | 1882 | 2082 | 2272 |
| | 5 | 0 | 1541 | 2128 | 2628 | 3402 | 1069 | 1325 | 1562 | 1787 | 1995 | 2194 |
| | 6 | 0 | 0 | 1888 | 2543 | 3214 | 972 | 1188 | 1429 | 1673 | 1898 | 2304 |
| | 7 | 0 | 0 | 1636 | 2312 | 3007 | 907 | 1095 | 1301 | 1539 | 1789 | 2006 |
| 7 | 3 | 1234 | 1734 | 2318 | 2964 | 0 | 1222 | 1449 | 1668 | 1866 | 2060 | 2248 |
| | 4 | 1090 | 1542 | 2115 | 2720 | 3401 | 1097 | 1334 | 1559 | 1780 | 1983 | 2176 |
| | 5 | 0 | 1351 | **1900** | 2532 | 3186 | 962 | 1209 | 1446 | **1680** | 1891 | 2094 |
| | 6 | 0 | 0 | 1669 | 2318 | 2995 | 878 | 1085 | 1316 | 1561 | 1794 | 2003 |
| | 7 | 0 | 0 | 0 | 2062 | 2772 | 817 | 998 | 1205 | 1418 | 1671 | 1902 |
| 8 | 3 | 1080 | 850 | 2087 | 2698 | 3420 | 1103 | 1337 | 1554 | 1765 | 1961 | 2151 |
| | 4 | 966 | 1352 | 1894 | 2505 | 3192 | 984 | 1226 | 1447 | 1678 | 1880 | 2079 |
| | 5 | 0 | 1177 | 1680 | 2306 | 2971 | 863 | 1087 | 1338 | 1567 | 1790 | 1994 |
| | 6 | 0 | 0 | 1463 | 2079 | 2761 | 786 | 979 | 1201 | 1445 | 1680 | 1901 |
| | 7 | 0 | 0 | 0 | 1823 | 2527 | 725 | 907 | 1102 | 1311 | 1555 | 1798 |
| 9 | 3 | 967 | 1327 | 1874 | 2508 | 3192 | 994 | 1226 | 1449 | 1664 | 1861 | 2053 |
| | 4 | 0 | 1183 | 1672 | 2283 | 2964 | 866 | 1114 | 1341 | 1566 | 1779 | 1977 |
| | 5 | 0 | 0 | 1474 | 2069 | 2742 | 761 | 971 | 1225 | 1453 | 1682 | 1890 |
| | 6 | 0 | 0 | 0 | 1839 | 2521 | 696 | 880 | 1092 | 1335 | 1568 | 1796 |
| | 7 | 0 | 0 | 0 | 0 | 2270 | 634 | 817 | 1000 | 1212 | 1319 | 1407 |
| 10 | 3 | 873 | 1156 | 1646 | 2261 | 2888 | 885 | 1109 | 1337 | 1552 | 1760 | 1954 |
| | 4 | 0 | 1033 | 1460 | 2054 | 2698 | 751 | 997 | 1235 | 1457 | 1677 | 1877 |
| | 5 | 0 | 0 | 1279 | 1828 | 2502 | 665 | 869 | 1113 | 1347 | 1570 | 1788 |
| | 6 | 0 | 0 | 0 | 1604 | 2275 | 612 | 786 | 987 | 1220 | 1460 | 1683 |
| | 7 | 0 | 0 | 0 | 0 | 2010 | 540 | 725 | 906 | 1114 | 1323 | 1567 |
| 11 | 3 | 776 | 1018 | 1429 | 2015 | 2660 | 773 | 999 | 1230 | 1448 | 1659 | 1855 |
| | 4 | 0 | 0 | 1271 | 1811 | 2467 | 648 | 883 | 1119 | 1345 | 1566 | 1774 |
| | 5 | 0 | 0 | 0 | 1600 | 2256 | 575 | 767 | 988 | 1236 | 1464 | 1681 |
| | 6 | 0 | 0 | 0 | 1398 | 2012 | 511 | 696 | 885 | 1105 | 1350 | 1575 |
| | 7 | 0 | 0 | 0 | 0 | 1762 | 445 | 634 | 816 | 1006 | 1220 | 1460 |
| 12 | 3 | 0 | 923 | 1238 | 1777 | 2451 | 658 | 891 | 1112 | 1339 | 1549 | 1753 |
| | 4 | 0 | 0 | 1105 | 1579 | 2223 | 546 | 763 | 1008 | 1240 | 1459 | 1674 |
| | 5 | 0 | 0 | 0 | 1394 | 1995 | 483 | 667 | 875 | 1129 | 1355 | 1571 |
| | 6 | 0 | 0 | 0 | 0 | 1754 | 418 | 604 | 787 | 993 | 1239 | 1468 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 345 | 540 | 725 | 908 | 1121 | 1347 |
| 13 | 3 | 0 | 798 | 1121 | 1542 | 2204 | 536 | 781 | 1005 | 1225 | 1446 | 1618 |
| | 4 | 0 | 0 | 988 | 1369 | 1965 | 453 | 653 | 896 | 1127 | 1348 | 1563 |
| | 5 | 0 | 0 | 0 | 1207 | 1742 | 390 | 574 | 773 | 1006 | 1248 | 1465 |
| | 6 | 0 | 0 | 0 | 0 | 1524 | 326 | 418 | 695 | 893 | 1123 | 1359 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 236 | 445 | 634 | 816 | 1014 | 1237 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

**Mod. 10-4T Cooling Capacity**

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 3383 | 4520 | 0 | 0 | 0 | 2791 | 3381 | 3788 | 4183 | 4565 | 4998 |
| | 4 | 2997 | 4129 | 5318 | 0 | 0 | 2686 | 3149 | 3603 | 4013 | 4414 | 4796 |
| | 5 | 2592 | 3669 | 4917 | 6215 | 7600 | 2407 | 2906 | 3390 | 3825 | 4240 | 4639 |
| | 6 | 2241 | 3194 | 4460 | 5808 | 7213 | 2173 | 2617 | 3131 | 3615 | 4046 | 4462 |
| | 7 | 0 | 2742 | 3929 | 5343 | 6789 | 2019 | 2413 | 2839 | 3347 | 3832 | 4267 |
| 6 | 3 | 2973 | 4014 | 0 | 0 | 0 | 2698 | 3144 | 3578 | 3980 | 4368 | 4741 |
| | 4 | 2632 | 3398 | 4893 | 6200 | 0 | 2464 | 2923 | 3385 | 3808 | 4213 | 4599 |
| | 5 | 2272 | 3243 | 4480 | 5534 | 7162 | 2164 | 2682 | 3162 | 3617 | 4037 | 4440 |
| | 6 | 0 | 2773 | 3974 | 5354 | 6766 | 1967 | 2405 | 2892 | 3386 | 3841 | 4662 |
| | 7 | 0 | 0 | 3444 | 4868 | 6330 | 1836 | 2216 | 2633 | 3114 | 3621 | 4061 |
| 7 | 3 | 2598 | 3651 | 4880 | 0 | 0 | 2474 | 2932 | 3376 | 3777 | 4168 | 4549 |
| | 4 | 2294 | 3246 | 4452 | 5727 | 0 | 2219 | 2701 | 3155 | 3603 | 4013 | 4404 |
| | 5 | 1987 | 2845 | **4000** | 5331 | 6708 | 1948 | 2448 | 2926 | **3400** | 3827 | 4237 |
| | 6 | 0 | 2409 | 3514 | 4880 | 6306 | 1777 | 2196 | 2663 | 3159 | 3630 | 4053 |
| | 7 | 0 | 0 | 2980 | 4341 | 5837 | 1653 | 2019 | 2438 | 2871 | 3381 | 3850 |
| 8 | 3 | 2274 | 1790 | 4394 | 0 | 0 | 2231 | 2705 | 3144 | 3572 | 3969 | 4352 |
| | 4 | 2033 | 2846 | 3988 | 5273 | 0 | 1992 | 2481 | 2929 | 3397 | 3805 | 4207 |
| | 5 | 1838 | 2479 | 3536 | 4855 | 6255 | 1746 | 2200 | 2708 | 3172 | 3624 | 4035 |
| | 6 | 0 | 2128 | 3080 | 4376 | 5813 | 1591 | 1982 | 2432 | 2925 | 3400 | 3847 |
| | 7 | 0 | 0 | 2629 | 3838 | 5321 | 1468 | 1836 | 2229 | 2652 | 3148 | 3638 |
| 9 | 3 | 2036 | 2793 | 3945 | 0 | 0 | 2013 | 2482 | 2932 | 3368 | 3767 | 4155 |
| | 4 | 1824 | 2490 | 3520 | 4807 | 6240 | 1753 | 2254 | 2714 | 3170 | 3601 | 4002 |
| | 5 | 0 | 2162 | 3102 | 4356 | 5772 | 1540 | 1965 | 2480 | 2941 | 3403 | 3826 |
| | 6 | 0 | 0 | 2670 | 3872 | 5308 | 1408 | 1780 | 2210 | 2701 | 3174 | 3634 |
| | 7 | 0 | 0 | 0 | 3339 | 4778 | 1282 | 1653 | 2024 | 2452 | 2670 | 2847 |
| 10 | 3 | 1838 | 2434 | 3464 | 4760 | 0 | 1791 | 2244 | 2707 | 3141 | 3561 | 3954 |
| | 4 | 1610 | 2175 | 3075 | 4324 | 5680 | 1519 | 2017 | 2499 | 2948 | 3394 | 3799 |
| | 5 | 0 | 1912 | 2693 | 3848 | 5268 | 1345 | 1758 | 2253 | 2726 | 3177 | 3618 |
| | 6 | 0 | 0 | 2311 | 3377 | 4789 | 1239 | 1591 | 1997 | 2468 | 2954 | 3406 |
| | 7 | 0 | 0 | 0 | 2883 | 4232 | 1093 | 1468 | 1834 | 2254 | 2677 | 3171 |
| 11 | 3 | 1634 | 2143 | 3008 | 4242 | 0 | 1565 | 2022 | 2489 | 2930 | 3358 | 3754 |
| | 4 | 1400 | 1949 | 2676 | 3812 | 5194 | 1312 | 1787 | 2264 | 2722 | 3169 | 3589 |
| | 5 | 0 | 0 | 2357 | 3368 | 4750 | 1163 | 1553 | 2000 | 2502 | 2962 | 3403 |
| | 6 | 0 | 0 | 0 | 2944 | 4235 | 1035 | 1408 | 1792 | 2237 | 2732 | 3188 |
| | 7 | 0 | 0 | 0 | 2492 | 3709 | 901 | 1282 | 1651 | 2035 | 2468 | 2954 |
| 12 | 3 | 1400 | 1942 | 2606 | 3742 | 0 | 1331 | 1804 | 2251 | 2710 | 3135 | 3548 |
| | 4 | 0 | 1743 | 2327 | 3324 | 4679 | 1105 | 1545 | 2040 | 2509 | 2953 | 3387 |
| | 5 | 0 | 0 | 2064 | 2935 | 4199 | 977 | 1349 | 1771 | 2285 | 2742 | 3179 |
| | 6 | 0 | 0 | 0 | 2549 | 3692 | 846 | 1223 | 1593 | 2010 | 2508 | 2971 |
| | 7 | 0 | 0 | 0 | 0 | 3210 | 699 | 1093 | 1468 | 1838 | 2268 | 2727 |
| 13 | 3 | 1240 | 1680 | 2360 | 3246 | 4640 | 1084 | 1580 | 2033 | 2479 | 2927 | 3274 |
| | 4 | 0 | 1520 | 2080 | 2883 | 4136 | 916 | 1322 | 1813 | 2281 | 2728 | 3164 |
| | 5 | 0 | 0 | 1843 | 2542 | 3668 | 789 | 1162 | 1565 | 2037 | 2525 | 2965 |
| | 6 | 0 | 0 | 0 | 2215 | 3208 | 660 | 845 | 1407 | 1807 | 2272 | 2751 |
| | 7 | 0 | 0 | 0 | 0 | 2764 | 477 | 901 | 1282 | 1651 | 2052 | 2503 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IR UNIT FOR COOLING MODE ONLY

## Mod. 20-4T Cooling Capacity

| | | TOTAL Cooling Capacity | | | | | SENSIBLE Cooling Capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | W.B. Inlet air temp. | | | | | D.B. Inlet air temp. | | | | | |
| Inlet temp. | DT | 15 | 17 | 19 | 21 | 23 | 21 | 23 | 25 | 27 | 29 | 31 |
| 5 | 3 | 8288 | 0 | 0 | 0 | 0 | 5952 | 7209 | 8076 | 8919 | 9735 | 10658 |
| | 4 | 7343 | 10117 | 13030 | 0 | 0 | 5728 | 6716 | 7682 | 8558 | 9413 | 10227 |
| | 5 | 6350 | 8989 | 12048 | 15226 | 0 | 5133 | 6196 | 7229 | 8155 | 9042 | 9891 |
| | 6 | 5491 | 7825 | 10926 | 14229 | 17671 | 4633 | 5579 | 6676 | 7709 | 8628 | 9514 |
| | 7 | 4967 | 6719 | 9627 | 13092 | 16632 | 4306 | 5145 | 6053 | 7137 | 8171 | 9100 |
| 6 | 3 | 7283 | 9834 | 0 | 0 | 0 | 5753 | 6704 | 7629 | 8487 | 9314 | 10110 |
| | 4 | 6448 | 8325 | 11988 | 0 | 0 | 5254 | 6233 | 7219 | 8120 | 8984 | 9806 |
| | 5 | 5567 | 7946 | 10976 | 13557 | 0 | 4614 | 5719 | 6742 | 7712 | 8608 | 9467 |
| | 6 | 4864 | 6793 | 9736 | 13117 | 16576 | 4194 | 5129 | 6167 | 7219 | 8190 | 9941 |
| | 7 | 0 | 5931 | 8439 | 11927 | 15508 | 3915 | 4725 | 5615 | 6640 | 7722 | 8659 |
| 7 | 3 | 6365 | 8945 | 0 | 0 | 0 | 5276 | 6253 | 7200 | 8054 | 8888 | 9701 |
| | 4 | 5621 | 7954 | 10908 | 0 | 0 | 4732 | 5759 | 6728 | 7683 | 8557 | 9392 |
| | 5 | 4869 | 6970 | **9800** | 13060 | 16434 | 4154 | 5219 | 6239 | **7250** | 8161 | 9036 |
| | 6 | 4389 | 5903 | 8608 | 11955 | 15450 | 3789 | 4682 | 5679 | 6735 | 7740 | 8642 |
| | 7 | 0 | 5269 | 7302 | 10636 | 14299 | 3525 | 4306 | 5200 | 6121 | 7210 | 8209 |
| 8 | 3 | 5571 | 4386 | 0 | 0 | 0 | 4758 | 5768 | 6705 | 7617 | 8463 | 9281 |
| | 4 | 4981 | 6973 | 9771 | 12919 | 0 | 4248 | 5290 | 6246 | 7243 | 8113 | 8971 |
| | 5 | 4503 | 6073 | 8663 | 11894 | 15324 | 3722 | 4692 | 5774 | 6764 | 7727 | 8604 |
| | 6 | 0 | 5214 | 7547 | 10721 | 14242 | 3392 | 4226 | 5185 | 6236 | 7249 | 8203 |
| | 7 | 0 | 0 | 6440 | 9403 | 13035 | 3130 | 3915 | 4754 | 5656 | 6712 | 7759 |
| 9 | 3 | 4988 | 6844 | 9666 | 0 | 0 | 4292 | 5292 | 6252 | 7181 | 8033 | 8860 |
| | 4 | 4469 | 6100 | 8623 | 11778 | 0 | 3738 | 4806 | 5786 | 6759 | 7678 | 8533 |
| | 5 | 3889 | 5296 | 7601 | 10672 | 14142 | 3283 | 4191 | 5289 | 6270 | 7257 | 8158 |
| | 6 | 0 | 4647 | 6542 | 9487 | 13005 | 3002 | 3797 | 4712 | 5760 | 6768 | 7749 |
| | 7 | 0 | 0 | 5664 | 8180 | 11707 | 2735 | 3525 | 4315 | 5228 | 5694 | 6071 |
| 10 | 3 | 4503 | 5964 | 8488 | 0 | 0 | 3819 | 4786 | 5772 | 6699 | 7594 | 8431 |
| | 4 | 3945 | 5330 | 7533 | 10594 | 13916 | 3240 | 4302 | 5328 | 6286 | 7236 | 8101 |
| | 5 | 0 | 4686 | 6598 | 9427 | 12907 | 2869 | 3749 | 4803 | 5814 | 6774 | 7714 |
| | 6 | 0 | 4188 | 5663 | 8273 | 11732 | 2641 | 3392 | 4258 | 5263 | 6299 | 7263 |
| | 7 | 0 | 0 | 5036 | 7062 | 10369 | 2331 | 3130 | 3910 | 4807 | 5709 | 6762 |
| 11 | 3 | 4003 | 5250 | 7370 | 10392 | 0 | 3337 | 4312 | 5308 | 6248 | 7161 | 8004 |
| | 4 | 3430 | 4774 | 6556 | 9340 | 12725 | 2798 | 3811 | 4828 | 5803 | 6758 | 7654 |
| | 5 | 0 | 4158 | 5775 | 8251 | 11636 | 2480 | 3312 | 4264 | 5335 | 6316 | 7256 |
| | 6 | 0 | 0 | 4980 | 7212 | 10376 | 2207 | 3002 | 3821 | 4770 | 5826 | 6798 |
| | 7 | 0 | 0 | 0 | 6105 | 9086 | 1922 | 2735 | 3521 | 4340 | 5263 | 6299 |
| 12 | 3 | 3430 | 4759 | 6384 | 9168 | 0 | 2839 | 3846 | 4800 | 5778 | 6684 | 7566 |
| | 4 | 2940 | 4270 | 5702 | 8144 | 11463 | 2356 | 3295 | 4350 | 5350 | 6297 | 7223 |
| | 5 | 0 | 3724 | 5058 | 7190 | 10288 | 2084 | 2877 | 3776 | 4872 | 5846 | 6780 |
| | 6 | 0 | 0 | 4449 | 6246 | 9045 | 1804 | 2607 | 3397 | 4287 | 5347 | 6336 |
| | 7 | 0 | 0 | 0 | 5386 | 7863 | 1490 | 2331 | 3130 | 3920 | 4837 | 5815 |
| 13 | 3 | 3038 | 4116 | 5782 | 7953 | 0 | 2312 | 3369 | 4336 | 5286 | 6242 | 6981 |
| | 4 | 0 | 3724 | 5096 | 7063 | 10133 | 1953 | 2820 | 3867 | 4864 | 5817 | 6747 |
| | 5 | 0 | 0 | 4515 | 6228 | 8986 | 1683 | 2478 | 3336 | 4343 | 5384 | 6323 |
| | 6 | 0 | 0 | 0 | 5427 | 7860 | 1407 | 1802 | 3000 | 3853 | 4844 | 5866 |
| | 7 | 0 | 0 | 0 | 0 | 6773 | 1016 | 1922 | 2735 | 3521 | 4376 | 5336 |

**WB** = Wet Bulb.
**DB** = Dry Buld.
**DT** = Temperature difference between inlet-outlet.
**NOTE**: Sensible efficiency values exceeding the total efficiency value should be interpreted as an absence of dehumidification. Only the sensible efficiency values should be considered.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# GENERAL SPECIFICATIONS - IP HEAT PUMP UNIT

**2 Pipes Version**

**Mod. 04 Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 5976 | 5147 | 4332 | 3525 | 2705 | 1872 |
| | 8 | 5823 | 4989 | 4162 | 3326 | 2481 | 0 |
| | 10 | 5651 | 4805 | 3951 | 3091 | 0 | 0 |
| | 12 | 5445 | 4580 | 3710 | 2812 | 0 | 0 |
| | 14 | 5219 | 4337 | 3425 | 0 | 0 | 0 |
| 50 | 6 | 6768 | 5931 | 5116 | 4310 | 3506 | 2705 |
| | 8 | 6615 | 5787 | 4962 | 4148 | 3326 | 2490 |
| | 10 | 6462 | 5624 | 4787 | 3951 | 3110 | 0 |
| | 12 | 6291 | 5435 | 4584 | 3728 | 2844 | 0 |
| | 14 | 6093 | 5219 | 4363 | 3462 | 0 | 0 |
| 55 | 6 | 0 | 6714 | 5895 | 5084 | 4283 | 3493 |
| | 8 | 7398 | 6570 | 5751 | 4936 | 4135 | 3326 |
| | 10 | 7254 | 6417 | 5597 | 4778 | 3951 | 3116 |
| | 12 | 7092 | 6255 | 5426 | 4580 | 3735 | 2875 |
| | 14 | 6930 | 6075 | 5219 | 4364 | 3493 | 0 |
| 60 | 6 | 0 | 0 | 6660 | 5855 | 5058 | 4265 |
| | 8 | 8182 | 7344 | 6525 | 5715 | 4914 | 4121 |
| | 10 | 8038 | 7200 | 6381 | 5562 | 4760 | 3945 |
| | 12 | 7894 | 7048 | 6227 | 5408 | 4580 | 3748 |
| | 14 | 7731 | 6894 | 6056 | 5219 | 4373 | 3512 |
| 65 | 6 | 0 | 0 | 0 | 6615 | 5818 | 5031 |
| | 8 | 8946 | 8118 | 7291 | 6480 | 5679 | 4887 |
| | 10 | 8815 | 7974 | 7155 | 6345 | 5535 | 4743 |
| | 12 | 8668 | 7840 | 7011 | 6192 | 5386 | 4571 |
| | 14 | 8524 | 7686 | 6858 | 6039 | 5210 | 4378 |
| 70 | 6 | 0 | 0 | 0 | 0 | 6579 | 5787 |
| | 8 | 0 | 8886 | 8056 | 7245 | 6443 | 5651 |
| | 10 | 9585 | 8744 | 7921 | **7110** | 6309 | 5517 |
| | 12 | 9453 | 8614 | 7785 | 6966 | 6165 | 5363 |
| | 14 | 9311 | 8470 | 7641 | 6822 | 6011 | 5202 |
| 75 | 6 | 0 | 0 | 0 | 0 | 0 | 6552 |
| | 8 | 0 | 0 | 8815 | 8001 | 7209 | 6417 |
| | 10 | 10355 | 9514 | 8686 | 7875 | 7074 | 6282 |
| | 12 | 10223 | 9382 | 8551 | 7740 | 6930 | 6138 |
| | 14 | 10082 | 9240 | 8416 | 7596 | 6786 | 5994 |
| 80 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 8764 | 7956 | 7182 |
| | 10 | 11115 | 10274 | 9450 | 8632 | 7840 | 7048 |
| | 12 | 10983 | 10142 | 9311 | 8505 | 7696 | 6912 |
| | 14 | 10851 | 10010 | 9180 | 8361 | 7569 | 6768 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**Mod. 08 Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 8211 | 7072 | 5953 | 4843 | 3716 | 2572 |
| | 8 | 8002 | 6856 | 5718 | 4570 | 3409 | 0 |
| | 10 | 7765 | 6603 | 5429 | 4247 | 0 | 0 |
| | 12 | 7482 | 6294 | 5098 | 0 | 0 | 0 |
| | 14 | 7171 | 5960 | 0 | 0 | 0 | 0 |
| 50 | 6 | 9300 | 8149 | 7030 | 5923 | 4817 | 3716 |
| | 8 | 9090 | 7951 | 6819 | 5700 | 4570 | 3422 |
| | 10 | 8879 | 7728 | 6578 | 5429 | 4273 | 0 |
| | 12 | 8644 | 7468 | 6299 | 5123 | 0 | 0 |
| | 14 | 8372 | 7171 | 5996 | 0 | 0 | 0 |
| 55 | 6 | 10364 | 9226 | 8101 | 6987 | 5885 | 4800 |
| | 8 | 10166 | 9028 | 7903 | 6782 | 5681 | 4570 |
| | 10 | 9968 | 8817 | 7691 | 6566 | 5429 | 4281 |
| | 12 | 9745 | 8595 | 7457 | 6294 | 5132 | 0 |
| | 14 | 9523 | 8347 | 7171 | 5997 | 0 | 0 |
| 60 | 6 | 0 | 10290 | 9151 | 8045 | 6950 | 5861 |
| | 8 | 11243 | 10092 | 8966 | 7852 | 6752 | 5663 |
| | 10 | 11045 | 9894 | 8768 | 7643 | 6541 | 5421 |
| | 12 | 10847 | 9684 | 8557 | 7431 | 6294 | 5150 |
| | 14 | 10624 | 9473 | 8322 | 7171 | 6009 | 0 |
| 65 | 6 | 0 | 0 | 10203 | 9090 | 7995 | 6913 |
| | 8 | 12293 | 11156 | 10018 | 8904 | 7804 | 6715 |
| | 10 | 12113 | 10958 | 9832 | 8718 | 7606 | 6517 |
| | 12 | 11911 | 10773 | 9634 | 8508 | 7401 | 6281 |
| | 14 | 11713 | 10562 | 9424 | 8298 | 7160 | 6015 |
| 70 | 6 | 0 | 0 | 0 | 10141 | 9040 | 7951 |
| | 8 | 13352 | 12210 | 11070 | 9956 | 8854 | 7765 |
| | 10 | 13171 | 12015 | 10884 | **9770** | 8669 | 7581 |
| | 12 | 12990 | 11837 | 10698 | 9572 | 8471 | 7369 |
| | 14 | 12795 | 11639 | 10500 | 9374 | 8260 | 7148 |
| 75 | 6 | 0 | 0 | 0 | 0 | 10067 | 9003 |
| | 8 | 14410 | 13254 | 12113 | 10995 | 9906 | 8817 |
| | 10 | 14229 | 13073 | 11936 | 10822 | 9721 | 8632 |
| | 12 | 14047 | 12892 | 11750 | 10636 | 9523 | 8434 |
| | 14 | 13853 | 12697 | 11565 | 10438 | 9325 | 8236 |
| 80 | 6 | 0 | 0 | 0 | 0 | 11131 | 10030 |
| | 8 | 0 | 14285 | 13171 | 12043 | 10933 | 9869 |
| | 10 | 15273 | 14117 | 12985 | 11862 | 10773 | 9684 |
| | 12 | 15092 | 13936 | 12795 | 11688 | 10575 | 9498 |
| | 14 | 14910 | 13756 | 12614 | 11490 | 10401 | 9300 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**Mod. 10 Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 9884 | 8513 | 7166 | 5830 | 4473 | 3096 |
| | 8 | 9631 | 8252 | 6883 | 5501 | 4103 | 0 |
| | 10 | 9347 | 7947 | 6535 | 5112 | 3638 | 0 |
| | 12 | 9005 | 7576 | 6137 | 4651 | 0 | 0 |
| | 14 | 8632 | 7174 | 5665 | 0 | 0 | 0 |
| 50 | 6 | 0 | 9809 | 8462 | 7129 | 5798 | 4473 |
| | 8 | 10942 | 9571 | 8208 | 6861 | 5501 | 4119 |
| | 10 | 10688 | 9303 | 7917 | 6535 | 5144 | 3690 |
| | 12 | 10405 | 8990 | 7582 | 6167 | 4704 | 0 |
| | 14 | 10078 | 8632 | 7217 | 5727 | 0 | 0 |
| 55 | 6 | 0 | 11106 | 9750 | 8410 | 7083 | 5778 |
| | 8 | 12237 | 10867 | 9512 | 8164 | 6839 | 5501 |
| | 10 | 11998 | 10613 | 9258 | 7903 | 6535 | 5153 |
| | 12 | 11730 | 10346 | 8975 | 7576 | 6178 | 4755 |
| | 14 | 11463 | 10048 | 8632 | 7218 | 5778 | 0 |
| 60 | 6 | 0 | 0 | 11015 | 9684 | 8365 | 7055 |
| | 8 | 13533 | 12148 | 10793 | 9452 | 8127 | 6816 |
| | 10 | 13295 | 11909 | 10554 | 9199 | 7873 | 6526 |
| | 12 | 13056 | 11657 | 10300 | 8945 | 7576 | 6199 |
| | 14 | 12788 | 11403 | 10017 | 8632 | 7233 | 5809 |
| 65 | 6 | 0 | 0 | 0 | 10942 | 9623 | 8321 |
| | 8 | 14797 | 13428 | 12059 | 10718 | 9393 | 8083 |
| | 10 | 14580 | 13190 | 11835 | 10494 | 9155 | 7844 |
| | 12 | 14337 | 12967 | 11596 | 10241 | 8909 | 7560 |
| | 14 | 14098 | 12713 | 11344 | 9989 | 8618 | 7241 |
| 70 | 6 | 0 | 0 | 0 | 0 | 10882 | 9571 |
| | 8 | 0 | 14697 | 13325 | 11984 | 10658 | 9347 |
| | 10 | 15854 | 14462 | 13101 | **11760** | 10435 | 9125 |
| | 12 | 15636 | 14248 | 12877 | 11522 | 10197 | 8870 |
| | 14 | 15401 | 14009 | 12638 | 11283 | 9943 | 8604 |
| 75 | 6 | 0 | 0 | 0 | 0 | 0 | 10837 |
| | 8 | 0 | 0 | 14580 | 13234 | 11924 | 10613 |
| | 10 | 17128 | 15736 | 14367 | 13026 | 11701 | 10391 |
| | 12 | 16908 | 15518 | 14143 | 12802 | 11463 | 10152 |
| | 14 | 16675 | 15283 | 13920 | 12564 | 11225 | 9914 |
| 80 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 14495 | 13160 | 11879 |
| | 10 | 18384 | 16993 | 15630 | 14278 | 12967 | 11657 |
| | 12 | 18167 | 16775 | 15401 | 14068 | 12729 | 11433 |
| | 14 | 17947 | 16557 | 15183 | 13830 | 12519 | 11194 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

## Mod. 12 Heating Capacity

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 12271 | 10569 | 8896 | 7238 | 5554 | 3844 |
| | 8 | 11957 | 10245 | 8545 | 6830 | 5094 | 0 |
| | 10 | 11604 | 9867 | 8114 | 6346 | 0 | 0 |
| | 12 | 11180 | 9405 | 7619 | 5775 | 0 | 0 |
| | 14 | 10717 | 8906 | 7033 | 0 | 0 | 0 |
| 50 | 6 | 0 | 12178 | 10506 | 8851 | 7198 | 5554 |
| | 8 | 13584 | 11882 | 10190 | 8518 | 6830 | 5114 |
| | 10 | 13269 | 11549 | 9829 | 8114 | 6386 | 0 |
| | 12 | 12918 | 11161 | 9413 | 7656 | 5840 | 0 |
| | 14 | 12511 | 10717 | 8960 | 7110 | 0 | 0 |
| 55 | 6 | 0 | 0 | 12105 | 10441 | 8794 | 7173 |
| | 8 | 15192 | 13492 | 11809 | 10135 | 8490 | 6830 |
| | 10 | 14896 | 13176 | 11494 | 9812 | 8114 | 6398 |
| | 12 | 14563 | 12845 | 11143 | 9405 | 7670 | 5903 |
| | 14 | 14231 | 12474 | 10717 | 8962 | 7173 | 0 |
| 60 | 6 | 0 | 0 | 0 | 12022 | 10385 | 8758 |
| | 8 | 0 | 15081 | 13399 | 11734 | 10090 | 8463 |
| | 10 | 16505 | 14785 | 13103 | 11421 | 9774 | 8102 |
| | 12 | 16209 | 14472 | 12788 | 11105 | 9405 | 7695 |
| | 14 | 15876 | 14156 | 12437 | 10717 | 8979 | 7212 |
| 65 | 6 | 0 | 0 | 0 | 0 | 11947 | 10330 |
| | 8 | 0 | 16671 | 14971 | 13306 | 11661 | 10034 |
| | 10 | 18101 | 16375 | 14693 | 13028 | 11366 | 9739 |
| | 12 | 17799 | 16099 | 14397 | 12715 | 11060 | 9386 |
| | 14 | 17503 | 15783 | 14083 | 12401 | 10699 | 8989 |
| 70 | 6 | 0 | 0 | 0 | 0 | 0 | 11882 |
| | 8 | 0 | 0 | 16543 | 14878 | 13231 | 11604 |
| | 10 | 19682 | 17955 | 16265 | **14600** | 12955 | 11328 |
| | 12 | 19412 | 17688 | 15986 | 14304 | 12659 | 11013 |
| | 14 | 19120 | 17393 | 15691 | 14008 | 12344 | 10681 |
| 75 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 16430 | 14803 | 13176 |
| | 10 | 0 | 19536 | 17836 | 16172 | 14527 | 12900 |
| | 12 | 20992 | 19266 | 17558 | 15894 | 14231 | 12604 |
| | 14 | 20702 | 18974 | 17282 | 15598 | 13935 | 12308 |
| 80 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 16337 | 14748 |
| | 10 | 0 | 0 | 19404 | 17726 | 16099 | 14472 |
| | 12 | 22554 | 20826 | 19120 | 17466 | 15803 | 14194 |
| | 14 | 22282 | 20556 | 18850 | 17170 | 15543 | 13898 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**Mod. 16 Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 15128 | 13030 | 10968 | 8923 | 6847 | 4739 |
| | 8 | 14742 | 12631 | 10535 | 8420 | 6280 | 0 |
| | 10 | 14307 | 12165 | 10003 | 7824 | 0 | 0 |
| | 12 | 13784 | 11596 | 9393 | 0 | 0 | 0 |
| | 14 | 13212 | 10980 | 0 | 0 | 0 | 0 |
| 50 | 6 | 17134 | 15014 | 12952 | 10912 | 8875 | 6847 |
| | 8 | 16748 | 14649 | 12563 | 10501 | 8420 | 6305 |
| | 10 | 16359 | 14239 | 12118 | 10003 | 7873 | 0 |
| | 12 | 15926 | 13760 | 11605 | 9439 | 0 | 0 |
| | 14 | 15425 | 13212 | 11046 | 0 | 0 | 0 |
| 55 | 6 | 19094 | 16998 | 14924 | 12872 | 10842 | 8843 |
| | 8 | 18729 | 16634 | 14560 | 12495 | 10467 | 8420 |
| | 10 | 18365 | 16244 | 14170 | 12096 | 10003 | 7888 |
| | 12 | 17954 | 15836 | 13738 | 11596 | 9456 | 0 |
| | 14 | 17545 | 15379 | 13212 | 11048 | 0 | 0 |
| 60 | 6 | 0 | 18958 | 16860 | 14822 | 12804 | 10798 |
| | 8 | 20713 | 18593 | 16519 | 14467 | 12439 | 10433 |
| | 10 | 20349 | 18229 | 16155 | 14081 | 12050 | 9988 |
| | 12 | 19984 | 17842 | 15766 | 13691 | 11596 | 9488 |
| | 14 | 19573 | 17453 | 15333 | 13212 | 11070 | 0 |
| 65 | 6 | 0 | 20896 | 18798 | 16748 | 14730 | 12736 |
| | 8 | 22649 | 20553 | 18457 | 16405 | 14377 | 12371 |
| | 10 | 22316 | 20188 | 18114 | 16062 | 14012 | 12006 |
| | 12 | 21944 | 19848 | 17750 | 15676 | 13636 | 11571 |
| | 14 | 21579 | 19459 | 17363 | 15289 | 13191 | 11083 |
| 70 | 6 | 0 | 0 | 20713 | 18683 | 16655 | 14649 |
| | 8 | 24599 | 22496 | 20395 | 18343 | 16313 | 14307 |
| | 10 | 24266 | 22136 | 20052 | **18000** | 15972 | 13966 |
| | 12 | 23933 | 21808 | 19709 | 17635 | 15607 | 13577 |
| | 14 | 23573 | 21443 | 19345 | 17271 | 15218 | 13169 |
| 75 | 6 | 0 | 0 | 0 | 20577 | 18547 | 16587 |
| | 8 | 26549 | 24419 | 22316 | 20256 | 18250 | 16244 |
| | 10 | 26216 | 24086 | 21990 | 19938 | 17910 | 15904 |
| | 12 | 25880 | 23753 | 21647 | 19595 | 17545 | 15539 |
| | 14 | 25523 | 23393 | 21307 | 19230 | 17181 | 15175 |
| 80 | 6 | 0 | 0 | 0 | 0 | 20507 | 18479 |
| | 8 | 0 | 26318 | 24266 | 22187 | 20142 | 18182 |
| | 10 | 28139 | 26009 | 23923 | 21854 | 19848 | 17842 |
| | 12 | 27806 | 25676 | 23573 | 21533 | 19483 | 17499 |
| | 14 | 27470 | 25343 | 23240 | 21168 | 19162 | 17134 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**Mod. 20 Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 20592 | 17735 | 14929 | 12146 | 9319 | 6450 |
| | 8 | 20065 | 17193 | 14340 | 11461 | 8548 | 0 |
| | 10 | 19473 | 16557 | 13615 | 10650 | 7579 | 0 |
| | 12 | 18761 | 15783 | 12784 | 9690 | 0 | 0 |
| | 14 | 17984 | 14946 | 11802 | 0 | 0 | 0 |
| 50 | 6 | 0 | 20436 | 17630 | 14853 | 12080 | 9319 |
| | 8 | 22796 | 19940 | 17100 | 14294 | 11461 | 8581 |
| | 10 | 22266 | 19380 | 16494 | 13615 | 10716 | 7688 |
| | 12 | 21677 | 18728 | 15796 | 12847 | 9799 | 0 |
| | 14 | 20995 | 17984 | 15035 | 11931 | 0 | 0 |
| 55 | 6 | 0 | 0 | 20314 | 17520 | 14757 | 12037 |
| | 8 | 25493 | 22640 | 19817 | 17007 | 14247 | 11461 |
| | 10 | 24996 | 22111 | 19288 | 16465 | 13615 | 10736 |
| | 12 | 24437 | 21555 | 18699 | 15783 | 12871 | 9905 |
| | 14 | 23881 | 20932 | 17984 | 15038 | 12037 | 0 |
| 60 | 6 | 0 | 0 | 0 | 20175 | 17428 | 14697 |
| | 8 | 0 | 25308 | 22485 | 19691 | 16931 | 14201 |
| | 10 | 27697 | 24811 | 21988 | 19165 | 16402 | 13595 |
| | 12 | 27201 | 24285 | 21459 | 18636 | 15783 | 12914 |
| | 14 | 26641 | 23755 | 20870 | 17984 | 15068 | 12103 |
| 65 | 6 | 0 | 0 | 0 | 0 | 20049 | 17335 |
| | 8 | 0 | 0 | 25122 | 22329 | 19569 | 16839 |
| | 10 | 30374 | 27479 | 24656 | 21862 | 19072 | 16342 |
| | 12 | 29868 | 27015 | 24159 | 21336 | 18560 | 15750 |
| | 14 | 29372 | 26486 | 23633 | 20810 | 17954 | 15085 |
| 70 | 6 | 0 | 0 | 0 | 0 | 0 | 19940 |
| | 8 | 0 | 0 | 27760 | 24967 | 22203 | 19473 |
| | 10 | 33029 | 30129 | 27293 | **24500** | 21740 | 19010 |
| | 12 | 32575 | 29683 | 26827 | 24004 | 21243 | 18480 |
| | 14 | 32085 | 29186 | 26330 | 23507 | 20714 | 17924 |
| 75 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 27571 | 24841 | 22111 |
| | 10 | 0 | 32784 | 29931 | 27138 | 24378 | 21647 |
| | 12 | 35226 | 32330 | 29464 | 26671 | 23881 | 21151 |
| | 14 | 34739 | 31840 | 29001 | 26175 | 23385 | 20654 |
| 80 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 27416 | 24748 |
| | 10 | 0 | 0 | 32562 | 29746 | 27015 | 24285 |
| | 12 | 37847 | 34948 | 32085 | 29309 | 26519 | 23818 |
| | 14 | 37390 | 34495 | 31632 | 28812 | 26082 | 23322 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**4 Pipes Version**

**Mod. 04-4-T Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 1597 | 1375 | 1158 | 942 | 723 | 0 |
| | 8 | 1556 | 1333 | 1112 | 0 | 0 | 0 |
| | 10 | 1510 | 1284 | 0 | 0 | 0 | 0 |
| | 12 | 1455 | 0 | 0 | 0 | 0 | 0 |
| | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 6 | 1809 | 1585 | 1367 | 1152 | 937 | 723 |
| | 8 | 1768 | 1546 | 1326 | 1108 | 0 | 0 |
| | 10 | 1727 | 1503 | 1279 | 0 | 0 | 0 |
| | 12 | 1681 | 1452 | 0 | 0 | 0 | 0 |
| | 14 | 1628 | 0 | 0 | 0 | 0 | 0 |
| 55 | 6 | 2015 | 1794 | 1575 | 1359 | 1144 | 933 |
| | 8 | 1977 | 1756 | 1537 | 1319 | 1105 | 0 |
| | 10 | 1938 | 1715 | 1496 | 1277 | 0 | 0 |
| | 12 | 1895 | 1672 | 1450 | 0 | 0 | 0 |
| | 14 | 1852 | 0 | 0 | 0 | 0 | 0 |
| 60 | 6 | 2222 | 2001 | 1780 | 1565 | 1352 | 1140 |
| | 8 | 2186 | 1963 | 1744 | 1527 | 1313 | 1101 |
| | 10 | 2148 | 1924 | 1705 | 1486 | 1272 | 0 |
| | 12 | 2109 | 1883 | 1664 | 1445 | 0 | 0 |
| | 14 | 2066 | 1842 | 0 | 0 | 0 | 0 |
| 65 | 6 | 2429 | 2206 | 1984 | 1768 | 1555 | 1344 |
| | 8 | 2391 | 2169 | 1948 | 1732 | 1518 | 1306 |
| | 10 | 2356 | 2131 | 1912 | 1695 | 1479 | 1267 |
| | 12 | 2316 | 2095 | 1874 | 1655 | 1439 | 0 |
| | 14 | 2278 | 2054 | 1833 | 0 | 0 | 0 |
| 70 | 6 | 2632 | 2407 | 2186 | 1972 | 1758 | 1546 |
| | 8 | 2597 | 2375 | 2153 | 1936 | 1722 | 1510 |
| | 10 | 2561 | 2337 | 2117 | **1900** | 1686 | 1474 |
| | 12 | 2526 | 2302 | 2080 | 1862 | 1647 | 1433 |
| | 14 | 2488 | 2263 | 2042 | 1823 | 0 | 0 |
| 75 | 6 | 2835 | 2613 | 2391 | 2172 | 1958 | 1751 |
| | 8 | 2802 | 2578 | 2356 | 2138 | 1926 | 1715 |
| | 10 | 2767 | 2542 | 2321 | 2105 | 1891 | 1679 |
| | 12 | 2732 | 2507 | 2285 | 2068 | 1852 | 1640 |
| | 14 | 2694 | 2469 | 2249 | 2030 | 1814 | 0 |
| 80 | 6 | 3036 | 2813 | 2591 | 2380 | 2165 | 1951 |
| | 8 | 3003 | 2778 | 2561 | 2342 | 2126 | 1919 |
| | 10 | 2970 | 2745 | 2525 | 2307 | 2095 | 1883 |
| | 12 | 2935 | 2710 | 2488 | 2273 | 2057 | 1847 |
| | 14 | 2900 | 2675 | 2453 | 2234 | 2023 | 1809 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**Mod. 10-4-T Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 3875 | 3337 | 2809 | 2285 | 1754 | 0 |
| | 8 | 3776 | 3235 | 2698 | 2156 | 0 | 0 |
| | 10 | 3664 | 3115 | 2562 | 0 | 0 | 0 |
| | 12 | 3530 | 2970 | 0 | 0 | 0 | 0 |
| | 14 | 3384 | 0 | 0 | 0 | 0 | 0 |
| 50 | 6 | 4388 | 3845 | 3317 | 2795 | 2273 | 1754 |
| | 8 | 4289 | 3752 | 3218 | 2690 | 2156 | 0 |
| | 10 | 4190 | 3647 | 3104 | 2562 | 0 | 0 |
| | 12 | 4079 | 3524 | 2972 | 0 | 0 | 0 |
| | 14 | 3951 | 3384 | 0 | 0 | 0 | 0 |
| 55 | 6 | 4890 | 4353 | 3822 | 3297 | 2777 | 2265 |
| | 8 | 4797 | 4260 | 3729 | 3200 | 2681 | 2156 |
| | 10 | 4703 | 4160 | 3629 | 3098 | 2562 | 0 |
| | 12 | 4598 | 4056 | 3518 | 2970 | 0 | 0 |
| | 14 | 4494 | 3939 | 3384 | 0 | 0 | 0 |
| 60 | 6 | 5392 | 4855 | 4318 | 3796 | 3279 | 2766 |
| | 8 | 5305 | 4762 | 4231 | 3705 | 3186 | 2672 |
| | 10 | 5212 | 4669 | 4137 | 3606 | 3086 | 2558 |
| | 12 | 5118 | 4570 | 4038 | 3507 | 2970 | 0 |
| | 14 | 5013 | 4470 | 3927 | 3384 | 0 | 0 |
| 65 | 6 | 5893 | 5352 | 4814 | 4289 | 3772 | 3262 |
| | 8 | 5801 | 5264 | 4727 | 4201 | 3682 | 3168 |
| | 10 | 5715 | 5170 | 4639 | 4114 | 3589 | 3075 |
| | 12 | 5620 | 5083 | 4546 | 4015 | 3492 | 2964 |
| | 14 | 5527 | 4984 | 4447 | 3916 | 3378 | 0 |
| 70 | 6 | 6385 | 5840 | 5305 | 4785 | 4266 | 3752 |
| | 8 | 6300 | 5761 | 5223 | 4698 | 4178 | 3664 |
| | 10 | 6215 | 5669 | 5136 | **4610** | 4091 | 3577 |
| | 12 | 6129 | 5585 | 5048 | 4517 | 3997 | 3477 |
| | 14 | 6037 | 5492 | 4954 | 4423 | 3898 | 3373 |
| 75 | 6 | 6878 | 6339 | 5801 | 5270 | 4750 | 4248 |
| | 8 | 6799 | 6254 | 5715 | 5188 | 4674 | 4160 |
| | 10 | 6714 | 6169 | 5632 | 5106 | 4587 | 4073 |
| | 12 | 6628 | 6083 | 5544 | 5019 | 4494 | 3980 |
| | 14 | 6537 | 5991 | 5457 | 4925 | 4400 | 3886 |
| 80 | 6 | 7367 | 6826 | 6287 | 5774 | 5252 | 4733 |
| | 8 | 7285 | 6740 | 6215 | 5682 | 5159 | 4657 |
| | 10 | 7207 | 6661 | 6127 | 5597 | 5083 | 4570 |
| | 12 | 7121 | 6576 | 6037 | 5515 | 4990 | 4482 |
| | 14 | 7035 | 6491 | 5952 | 5421 | 4908 | 4388 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

**Mod. 20-4-T Heating Capacity**

| Water | | Inlet air temp. | | | | | |
|---|---|---|---|---|---|---|---|
| Inlet temp. | DT | 5 | 10 | 15 | 20 | 25 | 30 |
| 45 | 6 | 7564 | 6515 | 5484 | 4462 | 3423 | 0 |
| | 8 | 7371 | 6316 | 5268 | 4210 | 0 | 0 |
| | 10 | 7153 | 6082 | 5001 | 0 | 0 | 0 |
| | 12 | 6892 | 5798 | 0 | 0 | 0 | 0 |
| | 14 | 6606 | 0 | 0 | 0 | 0 | 0 |
| 50 | 6 | 8567 | 7507 | 6476 | 5456 | 4437 | 3423 |
| | 8 | 8374 | 7325 | 6282 | 5251 | 4210 | 0 |
| | 10 | 8179 | 7119 | 6059 | 5001 | 0 | 0 |
| | 12 | 7963 | 6880 | 5803 | 0 | 0 | 0 |
| | 14 | 7713 | 6606 | 0 | 0 | 0 | 0 |
| 55 | 6 | 9547 | 8499 | 7462 | 6436 | 5421 | 4422 |
| | 8 | 9365 | 8317 | 7280 | 6248 | 5234 | 4210 |
| | 10 | 9182 | 8122 | 7085 | 6048 | 5001 | 0 |
| | 12 | 8977 | 7918 | 6869 | 5798 | 0 | 0 |
| | 14 | 8773 | 7689 | 6606 | 0 | 0 | 0 |
| 60 | 6 | 10527 | 9479 | 8430 | 7411 | 6402 | 5399 |
| | 8 | 10357 | 9297 | 8260 | 7234 | 6220 | 5217 |
| | 10 | 10174 | 9114 | 8077 | 7040 | 6025 | 4994 |
| | 12 | 9992 | 8921 | 7883 | 6846 | 5798 | 0 |
| | 14 | 9787 | 8726 | 7666 | 6606 | 0 | 0 |
| 65 | 6 | 11504 | 10448 | 9399 | 8374 | 7365 | 6368 |
| | 8 | 11324 | 10277 | 9229 | 8202 | 7189 | 6186 |
| | 10 | 11158 | 10094 | 9057 | 8031 | 7006 | 6003 |
| | 12 | 10972 | 9924 | 8875 | 7838 | 6818 | 5786 |
| | 14 | 10790 | 9729 | 8681 | 7644 | 6595 | 0 |
| 70 | 6 | 12466 | 11402 | 10357 | 9342 | 8328 | 7325 |
| | 8 | 12299 | 11248 | 10197 | 9171 | 8156 | 7153 |
| | 10 | 12133 | 11068 | 10026 | **9000** | 7986 | 6983 |
| | 12 | 11966 | 10904 | 9855 | 8818 | 7804 | 6789 |
| | 14 | 11786 | 10721 | 9672 | 8635 | 7609 | 6584 |
| 75 | 6 | 13428 | 12376 | 11324 | 10289 | 9274 | 8294 |
| | 8 | 13274 | 12210 | 11158 | 10128 | 9125 | 8122 |
| | 10 | 13108 | 12043 | 10995 | 9969 | 8955 | 7952 |
| | 12 | 12940 | 11876 | 10824 | 9798 | 8773 | 7770 |
| | 14 | 12761 | 11696 | 10653 | 9615 | 8590 | 7587 |
| 80 | 6 | 0 | 13326 | 12274 | 11273 | 10253 | 9239 |
| | 8 | 14223 | 13159 | 12133 | 11093 | 10071 | 9091 |
| | 10 | 14070 | 13005 | 11962 | 10927 | 9924 | 8921 |
| | 12 | 13903 | 12838 | 11786 | 10766 | 9742 | 8750 |
| | 14 | 13735 | 12671 | 11620 | 10584 | 9581 | 8567 |

**DT** = Temperature difference between inlet-outlet.
**NOTE**: Values that are not given refer to operating conditions beyond the operating limits.

# DATA CORRECTION FACTORS

## Data correction factors

With reference to the Cooling and Heating Capacity tables, if the unit works at the same inlet water temperature and with the same water flow rate as the one for maximum speed, the efficiencies achieved at speeds differing from maximum are calculated according to the following correction coefficients.

**2 Pipes Unit Cooling Capacity**

| Model | Speed | Correction Factors | |
|---|---|---|---|
| | | Total capacity | Sensible Capacity |
| 04 | Min | 0,65 | 0,65 |
| | Med | 0,75 | 0,74 |
| | Max | 1,00 | 1,00 |
| 08 | Min | 0,48 | 0,45 |
| | Med | 0,71 | 0,70 |
| | Max | 1,00 | 1,00 |
| 10 | Min | 0,61 | 0,59 |
| | Med | 0,74 | 0,72 |
| | Max | 1,00 | 1,00 |
| 12 | Min | 0,54 | 0,52 |
| | Med | 0,71 | 0,69 |
| | Max | 1,00 | 1,00 |
| 16 | Min | 0,42 | 0,34 |
| | Med | 0,67 | 0,63 |
| | Max | 1,00 | 1,00 |
| 20 | Min | 0,39 | 0,35 |
| | Med | 0,71 | 0,67 |
| | Max | 1,00 | 1,00 |

**4 Pipes Unit Cooling Capacity**

| Model | Speed | Correction Factors | |
|---|---|---|---|
| | | Total capacity | Sensible Capacity |
| 04-4T | Min | 0,65 | 0,72 |
| | Med | 0,75 | 0,78 |
| | Max | 1,00 | 1,00 |
| 10-4T | Min | 0,63 | 0,59 |
| | Med | 0,76 | 0,76 |
| | Max | 1,00 | 1,00 |
| 20-4T | Min | 0,42 | 0,38 |
| | Med | 0,74 | 0,75 |
| | Max | 1,00 | 1,00 |

# DATA CORRECTION FACTORS

**2 Pipes Unit Heating Capacity**

| Model | Speed | Correction Factors Total capacity |
|---|---|---|
| 04 | Min | 0,68 |
| | Med | 0,79 |
| | Max | 1,00 |
| 08 | Min | 0,48 |
| | Med | 0,82 |
| | Max | 1,00 |
| 10 | Min | 0,61 |
| | Med | 0,73 |
| | Max | 1,00 |
| 12 | Min | 0,54 |
| | Med | 0,72 |
| | Max | 1,00 |
| 16 | Min | 0,40 |
| | Med | 0,68 |
| | Max | 1,00 |
| 20 | Min | 0,39 |
| | Med | 0,72 |
| | Max | 1,00 |

**4 Pipes Unit Heating Capacity**

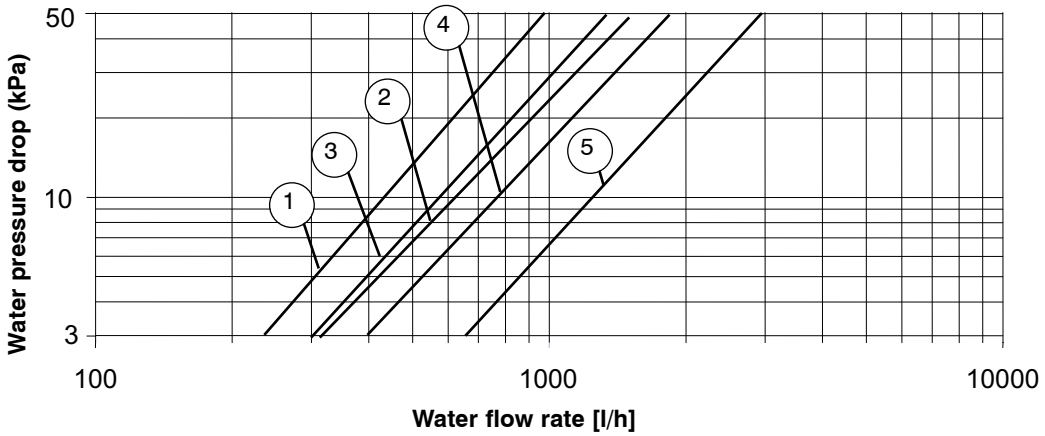
| Model | Speed | Correction Factors Total capacity |
|---|---|---|
| 04-4T | Min | 0,65 |
| | Med | 0,76 |
| | Max | 1,00 |
| 10-4T | Min | 0,59 |
| | Med | 0,76 |
| | Max | 1,00 |
| 20-4T | Min | 0,57 |
| | Med | 0,88 |
| | Max | 1,00 |

# WATER PRESSURE DROPS

## Water Pressure Drop

The following graphs give the water pressure drop valves:

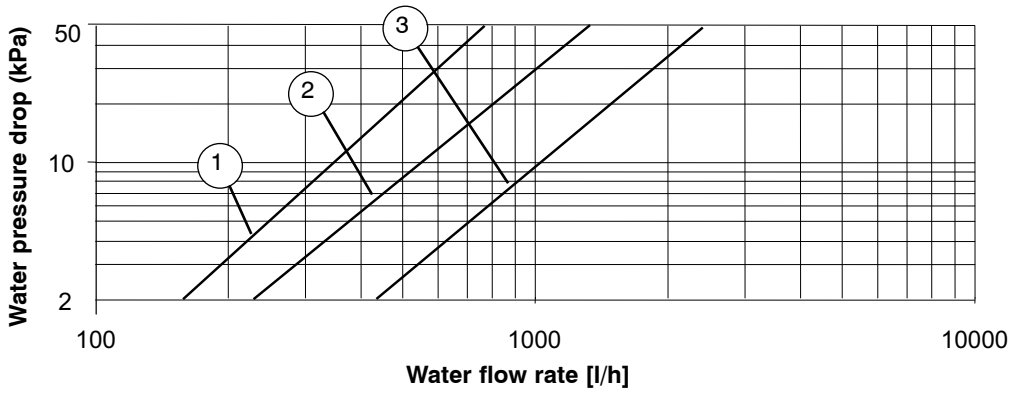
**2 Pipes serier water pressure drop**




| Unit size | Graph reference |
|---|---|
| 04 | 1 |
| 08 | 2 |
| 10 | 3 |
| 12 | 4 |
| 16 | 5 |
| 20 | |

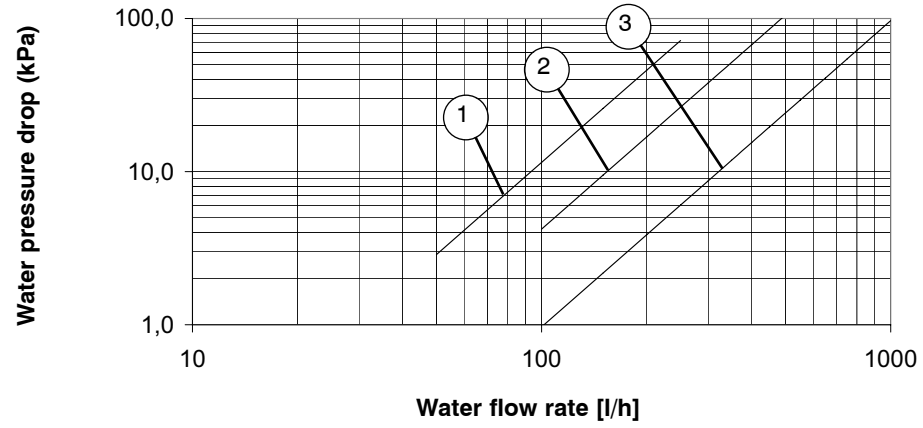
water pressure drop in the previous diagram refer to an average water temperature of 10°C

**4 Pipes serier water pressure drop**
**Main Exchanger**
**(Cooling Mode)**




| Unit size | Graph reference |
|---|---|
| 04-4T | 1 |
| 10-4T | 2 |
| 20-4T | 3 |

**4 Pipes serier water pressure drop**
**Secondary Exchanger**
**(Heating Mode)**




| Unit size | Graph reference |
|---|---|
| 04-4T | 1 |
| 10-4T | 2 |
| 20-4T | 3 |

# NOISE LEVELS

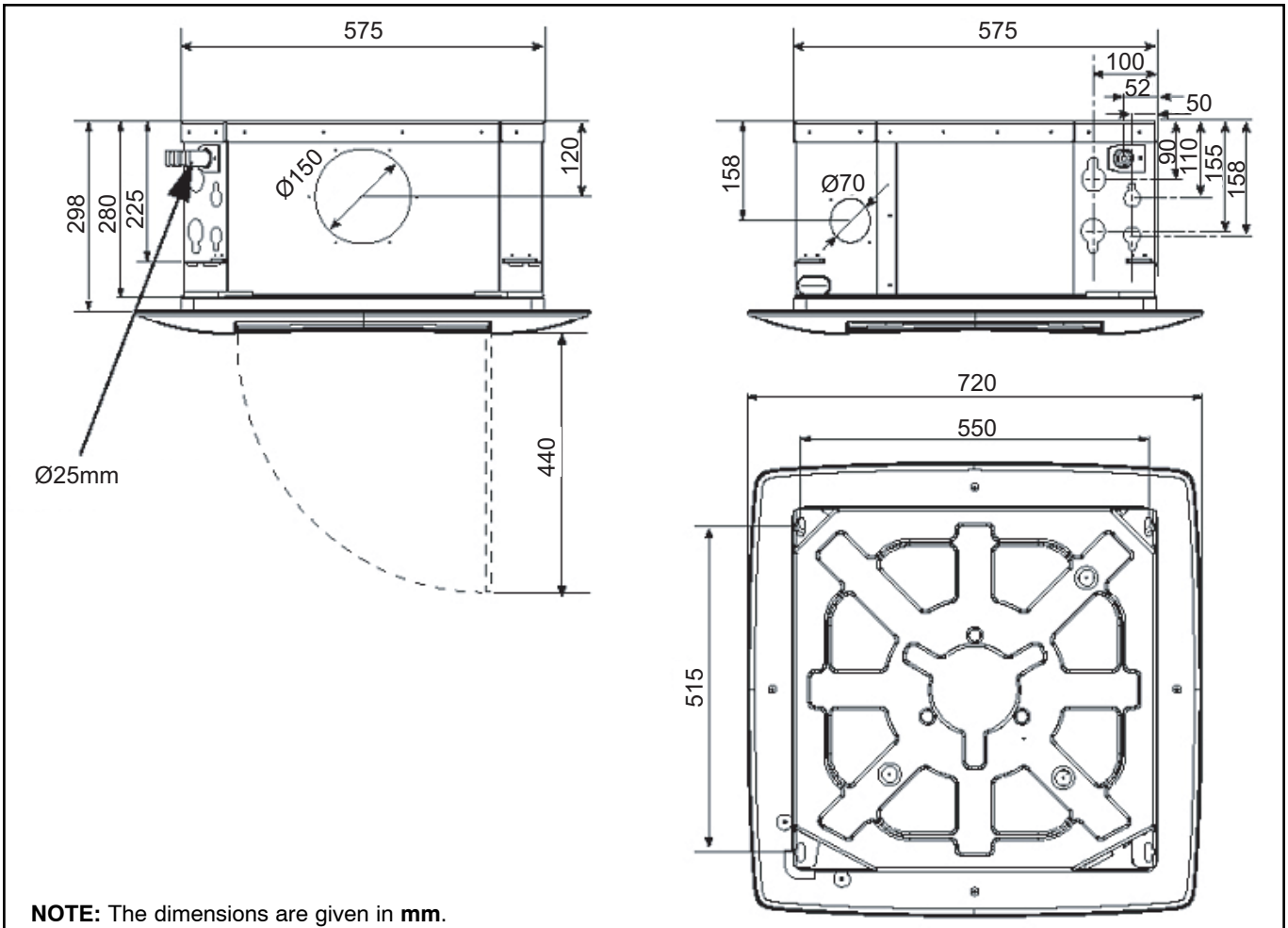
## Noise levels

| Model | Speed | Sound power Level | | | | | | | | Pressure level |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Central band frequency [Hz] | | | | | | | Total | |
| | | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | [dB(A)] | [dB(A)] |
| 04 | Max | 51 | 50 | 49 | 43 | 37 | 25 | -- | **49** | 41 |
| | Med | 41 | 41 | 38 | 30 | 26 | -- | -- | **38** | 30 |
| | Min | 37 | 37 | 33 | 24 | 22 | -- | -- | **33** | 25 |
| 08 | Max | 53 | 55 | 54 | 47 | 41 | 34 | 23 | **54** | 46 |
| | Med | 43 | 47 | 45 | 39 | 31 | 26 | -- | **45** | 37 |
| | Min | 34 | 35 | 33 | 23 | -- | -- | -- | **32** | 24 |
| 10 | Max | 57 | 57 | 56 | 51 | 46 | 38 | 28 | **57** | 49 |
| | Med | 48 | 49 | 48 | 42 | 36 | 29 | 22 | **48** | 40 |
| | Min | 42 | 44 | 42 | 35 | 29 | 24 | -- | **42** | 34 |
| 12 | Max | 52 | 51 | 48 | 44 | 33 | 24 | -- | **49** | 41 |
| | Med | 45 | 43 | 39 | 35 | 25 | -- | -- | **40** | 32 |
| | Min | 39 | 35 | 31 | 31 | 22 | -- | -- | **34** | 26 |
| 16 | Max | 57 | 56 | 56 | 51 | 42 | 32 | 28 | **56** | 48 |
| | Med | 50 | 50 | 49 | 44 | 35 | 25 | 20 | **49** | 41 |
| | Min | 44 | 44 | 40 | 34 | 20 | -- | -- | **40** | 32 |
| 20 | Max | 62 | 62 | 61 | 59 | 52 | 44 | 33 | **63** | 55 |
| | Med | 56 | 55 | 55 | 50 | 41 | 31 | 27 | **55** | 47 |
| | Min | 48 | 44 | 42 | 35 | 23 | -- | -- | **42** | 34 |
| 04-4T | Max | 51 | 50 | 49 | 43 | 37 | 25 | -- | **49** | 41 |
| | Med | 41 | 41 | 38 | 30 | 26 | -- | -- | **38** | 30 |
| | Min | 37 | 37 | 33 | 24 | 22 | -- | -- | **33** | 25 |
| 10-4T | Max | 59 | 59 | 56 | 54 | 47 | 38 | 28 | **58** | 50 |
| | Med | 51 | 50 | 50 | 44 | 38 | 30 | 23 | **50** | 42 |
| | Min | 42 | 44 | 42 | 35 | 29 | 24 | -- | **42** | 34 |
| 20-4T | Max | 62 | 62 | 61 | 59 | 52 | 44 | 33 | **63** | 55 |
| | Med | 56 | 55 | 55 | 50 | 41 | 31 | 27 | **55** | 47 |
| | Min | 48 | 44 | 42 | 35 | 23 | -- | -- | **42** | 34 |

Acoustic pressure in a 100$m^3$ room with 0.5 sec. reverberation time.

# OVERALL DIMENSION

## Dimensions For Installing Models 04 - 08 - 10 And 04-4T and 10-4T



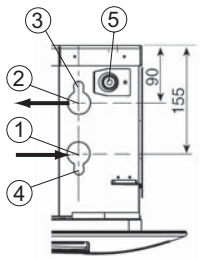

**NOTE:** The dimensions are given in **mm**.

| MODEL | 04 | 04-4T | 08 | 10 | 10-4T | UM |
|---|---|---|---|---|---|---|
| UNIT WEIGHT | 19 | | 20 | 20 | | kg |
| GRILLE WEIGHT | 2.5 | | 2.5 | 2.5 | | kg |

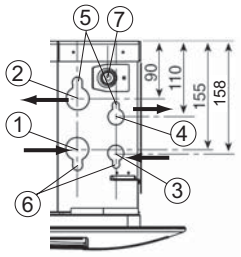
## Wet Connections

The wet connections are fixed to the structure of the unit so as to prevent breakages when the pipes are connected. However, it is advisable to hold the union firm with a wrench. The upper coil connection has an air venting valve while the lower one is fitted with a draining valve, which can be operated with a 10 mm wrench or a screwdriver.
**Note that the coil can only be partially drained. Blow air into the coil to drain it fully.**

**Version with 2 pipes**
1-Water inlet
2-Water outlet
3-Air venting valve
4-Draining valve (1")
5-To drain condensation (∅25mm)



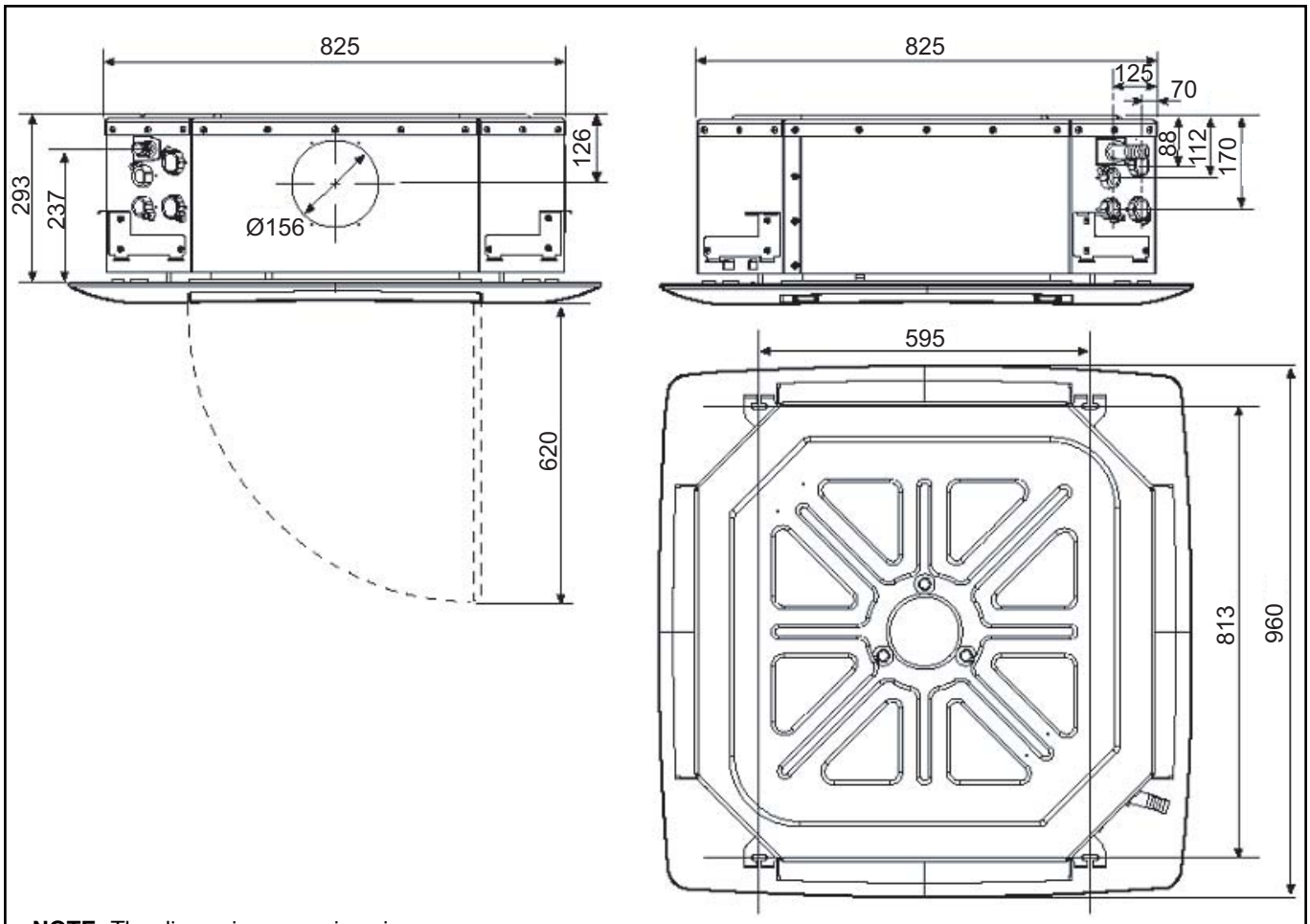

**Version with 4 pipes**
1-Cool water inlet
2-Cool water outlet
3-Hot water inlet
4-Hot water outlet
5-Air venting valve
6-Draining valve (1")
7-To drain condensation (∅25mm)




| MOD. | Size of main coil connections [Ø] | Size of secondary coil connections [Ø] |
|---|---|---|
| 04 | 3/4” | 1/2” |
| 08 | 3/4” | - |
| 10 | 3/4” | 1/2” |

# OVERALL DIMENSION

## Dimensions For Installing Models 12 - 16 - 20 and 20-4T



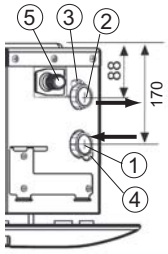

**NOTE:** The dimensions are given in **mm**.

| MODEL | 12 | 16 | 20 | 20-4T | UM |
|---|---|---|---|---|---|
| UNIT WEIGHT | 41 | 43 | 46 | | kg |
| GRILLE WEIGHT | 5 | 5 | 5 | | kg |

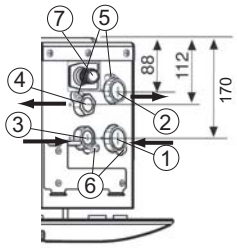
## Wet Connections

The wet connections are fixed to the structure of the unit so as to prevent breakages when the pipes are connected. However, it is advisable to hold the union firm with a wrench. The upper coil connection has an air venting valve while the lower one is fitted with a draining valve, which can be operated with a 10 mm wrench or a screwdriver.
**Note that the coil can only be partially drained. Blow air into the coil to drain it fully.**

**Version with 2 pipes**
1-Water inlet
2-Water outlet
3-Air venting valve
4-Draining valve (1")
5-To drain condensation (∅25mm)




**Version with 4 pipes**
1-Cool water inlet
2-Cool water outlet
3-Hot water inlet
4-Hot water outlet
5-Air venting valve
6-Draining valve (1")
7-To drain condensation (∅25mm)

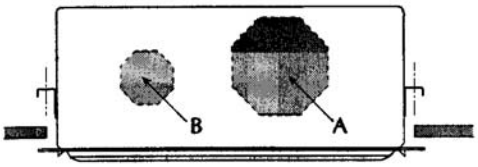


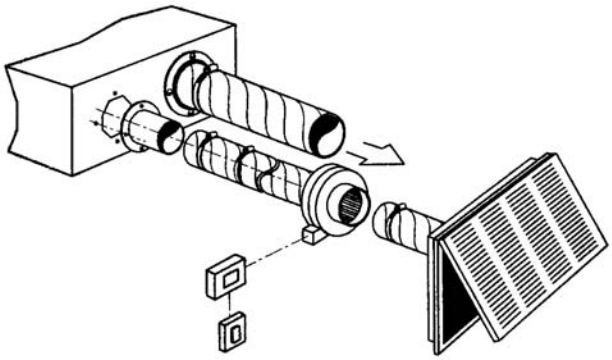

| MOD. | Size of main coil connections [Ø] | Size of secondary coil connections [Ø] |
|---|---|---|
| 12 | 1” | - |
| 16 | 1” | - |
| 20 | 1” | 3/4” |

# INSTALLATION OPTIONS

## Installation Options

The side openings allow a separate outdoor air change intake duct (**B**) and a delivery duct to convey treated air towards an adjacent room (**A**) to be made.



**Outdoor air change:**

- Remove the outer condensation-proof insulation delimited by the die-cut and take out the micro-jointed sheet metal panels using a punch. Take care to prevent the heat exchanger bank at the rear from being damaged. Trim the inner condensation-proof insulation along the perimeter of the opening.

- Use locally purchased material able to withstand a continuous temperature of **80 °C**. The ducts can be the flexible type in polyester (with a spiral steel core) or in corrugated aluminium covered on the outside with condensation-proof material (**12 - 25 mm thick fiber-glass**).

- After installation, the non-insulated surfaces of the pipes must be covered with condensation-proof material (e.g. **6 mm** thick neoprene foam).

**Failure to comply with these instructions could lead to dripping through condensation. The Manufacturer is not liable for damage of this type.**

- An appropriately sized fan must be installed to overcome the drop in pressure caused by the air change intake port, duct, filter, etc.

- The additional fan cannot be controlled by the set of controls available as accessories (CMR-F, TAR-F, TER-F).
It must be activated in parallel with operation of the main fan, regardless of the fan selected.

- For winter operation with outdoor air changes, it is advisable to install an antifreeze thermostat with a **2 °C** setting and bulb on the water outlet pipe, that activates and deactivates the supplementary fan.

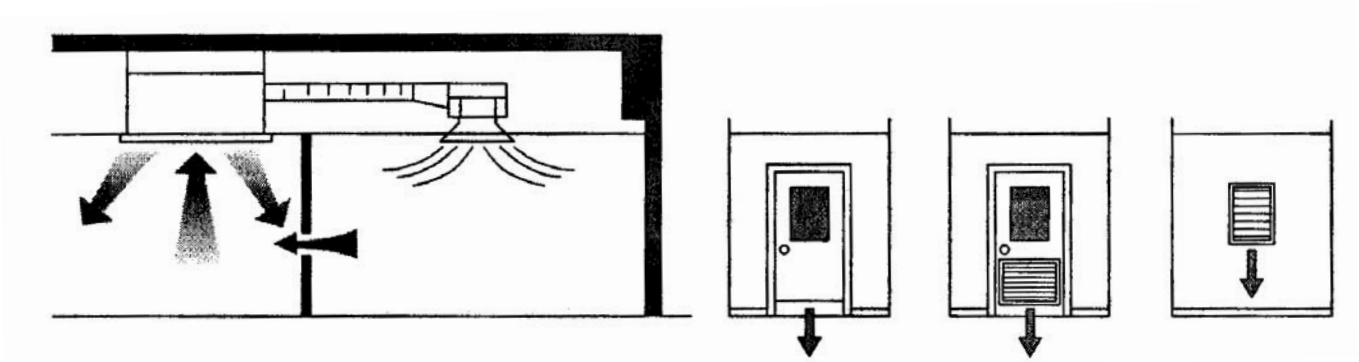
- The outdoor air flow rate must be less than **10%** of the total air flow rate to prevent operating faults or noisy operation.

- Install an intake grille with filter holder accessible for inspection outdoors to prevent dust and leaves from being sucked in and irreparably clogging the thermal exchange bank of the interior unit. Filter installation also does away with the need to install a channel air lock for idle periods.

# INSTALLATION OPTIONS

**Air delivery into an adjacent room:**

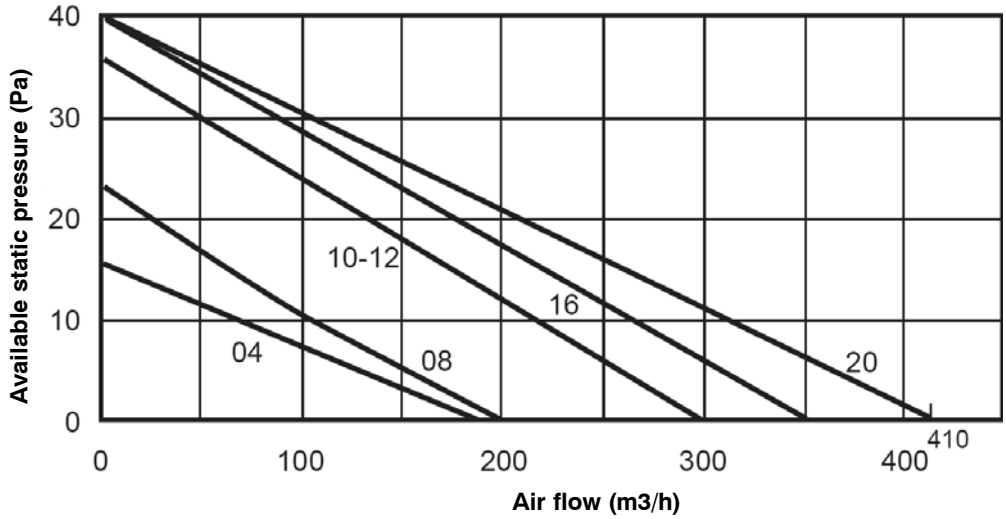
If air is to be blown into an adjacent room, one or more of the fins corresponding to the duct must be shut off.
Apply an air intake port to the partition wall between the conditioned room in which the unit is installed and the addcent room, as shown in the figure.



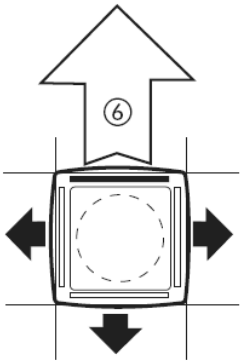
**Preliminary Inspections Prior To Starting**

- The unit must not be started until the pipes have been cleaned and bled until all the air has been eliminated from the system.
- Make sure that the condensation drain pipes slope correctly.
- Make sure that the filter is clean and well seated in its housing.
- Check the voltage and current values and compare them with the values on the data plate of the appliance. Check the electrical connections.
- Make sure that the delivery fins are not shut.

Diagram of conditioned air supply to anadjacent room: one louvre closed




In case of two louvres closed, the fresh air flow towards theadjacent room is 50% higher compared with only one louvreclosed (with equal static external pressure)




⑥ Supply air duct to adjacent room

# ACCESSORY

## Accessory Combinations

| VERSION | | UNIT WITH 2 PIPES | | | | | | UNIT WITH 4 PIPES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ACCESSORY | | 04 | 08 | 10 | 12 | 16 | 20 | 04-4T | 10-4T | 20-4T |
| CONTROL | CMR-F | • | • | • | • | • | • | | | |
| | TAR-F | • | • | • | • | • | • | | | |
| | TER-F | | | | | | | • | • | • |
| 3-WAY VALVE | VTV 1 | • | • | • | | | | • | • | |
| | VTV 2 | | | | • | • | • | | | • |
| | VTV 3 (1) | | | | | | | • | • | |
| | VTV 4 (2) | | | | | | | | | • |
| TRAY | BCN 1 | • | • | • | | | | • | • | |
| | BCN 2 | | | | • | • | • | | | • |
| ENABLING THERMO-STAT | TC-F (NB) | • | • | • | • | • | • | | | |

**(1):** 3-way valve for the Secondary Coil in the version with 4 pipes.
**(NOTE):** Can only be used in conjunction with the Remote Control (CMR-F).

## Control panel

A set of panels is available for **remote wall installation** formed by three different types of control, **commutator**, **basic thermostat** and **evolved thermostat**.

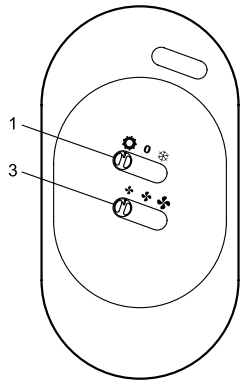
## Functions

The various functions available are listed below so that the control can be selected more quickly. These functions are described in the following pages.

| Functions | Commutator | Basic Thermostat | Evolved Thermostat |
|---|---|---|---|
| **General control of the unit** | | | |
| General ON-OFF | • | • | • |
| **Temperature control** | | | |
| Temperature thermostating | | • | • |
| Set-point modification with the economy key | | | • |
| **Ventilation control** | | | |
| Speed selection in the manual mode | | • | • |
| Speed selection in the automatic mode | | | • |
| **Control of SUM/WIN seasonal operation** | | | |
| Manual selection of SUM/WIN funct. via command | | • | • |
| Automatic SUM/WIN selection via command | | • | • |
| Remote controlled SUM/WIN selection | | | • |
| **Control of Valves/Resistors accessories** | | | |
| Main coil valve | | • | • |
| Resistors/supplementary coil valve | | | • |
| **Functions that can be configured during installation phase** | | | |
| ON/OFF-Continuous fan thermostating control | | • | • |
| Probe reading correction | | • | • |
| Configuration of unit-system with 2 pipes | | | • |
| Configuration of unit-system with 4 pipes | | | • |
| Configuration of unit-system with 2 pipes+Resistor | | | • |
| Resistor control | | | • |
| Dead zone set-up | | | • |
| **Integration with accessories (if any)** | | | |
| Bimetallic minimum temperature probe | • | | |

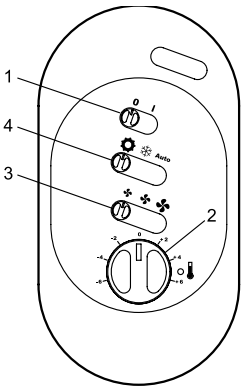
# ACCESSORY

## Description of commutator (CMR-F)



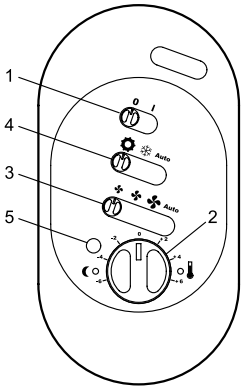

**Commutator: remote control (CMR-F)**
**1-** when in position **0**, selector **0** indicates that the control is off. Turn to the **sun** symbol to select the heating mode or to the **snow** symbol to select the cooling mode.
**2-** selector **2** is used to choose the minimum, medium or maximum fan speeds.

## Description of basic thermostat (TAR-F)




**Basic thermostat: remote control (TAR-F)**
**1- on**/**off** cursor to turn the unit on and off.
**2- seasonal selector**. Turn to the **sun** symbol to select the heating mode or to the **snow** symbol to activate the cooling mode. Turn to **auto** and the control will select the operating mode on its own, depending on the ambient temperature.
**3-** selector **3** is used to choose the minimum, medium or maximum fan speeds.
**4-** use knob **4** to set the required temperature. The temperature setting that corresponds to position **0** is **20°C in the heating mode** and **25°C in the cooling mode**.
**5-** the **red led** is on when the thermostat function of the control is operating.

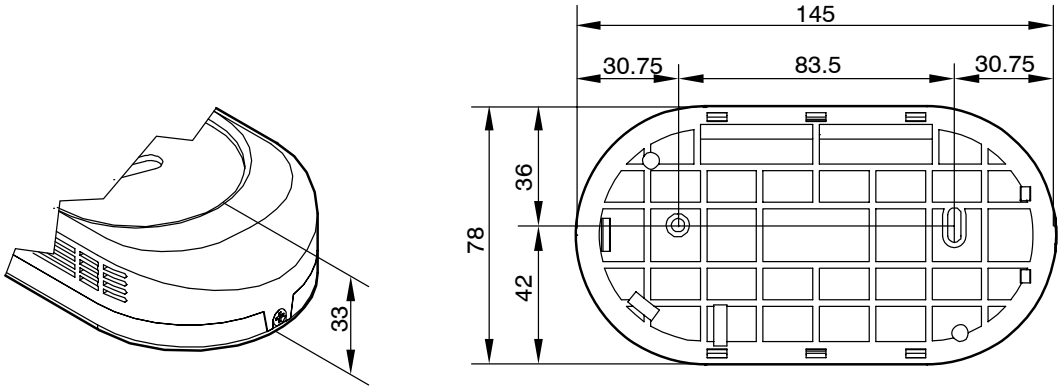
## Description of the evolved thermostat (TER-F)




**Evolved thermostat: remote control (TER-F)**
**1- on**/**off** cursor to turn the unit on and off.
**2- seasonal selector**. Turn to the **sun** symbol to select the heating mode or to the **snow** symbol to activate the cooling mode. Turn to **auto** and the control will select the operating mode on its own, depending on the ambient temperature.
**3-** selector **3** is used to choose the minimum, medium, maximum or automatic fan speeds. In the automatic mode, the control selects the adequate speed on its own.
**4-** use knob **4** to set the required temperature. The temperature setting that corresponds to position **0** is **20°C in the heating mode** and **25°C in the cooling mode**.
**5-** the **red led** is on when the control is thermostating.
**6-** the **economy** key allows the winter and summer set-points to be varied. When the key is pressed, the **green led (7)** comes on and ventilation is forced to the minimum speed. The previously selected set-point is changed to -3°C in the heating mode and +3°C in the cooling mode, thus obtaining **17°C in the heating mode** and **28°C in the cooling mode in relation to position 0**.

# ACCESSORY

## Overall dimensions of the control panel




## Technical specifications

| ELECTRICAL SPECIFICATIONS | WALL-MOUNTED VERSION |
|---|---|
| **Power supply voltage rating** | 230V ± 10% |
| **Power supply frequency** | 50Hz |
| **Maximum power input** | - |
| **Protection degree** | Less than IP40 |
| **Operating ambient temperature** | 0 ÷ 50°C |
| **Non-condensing environmental humidity** | 10 ÷ 90% |
| **Storage temperature** | -20 ÷ 85°C |
| **Non-condensing storage humidity** | 10 ÷ 90% |
| **Max. current on valve output and/or resistor relay control terminals** | 0.5A |
| **Max. current on fan output terminals** | 1A |
| **PROBES** | |
| **Air probe NTC 10k-25°C - precision: err<1°C between +5°Ce 50°C** | Installed on board |
| **Water probe NTC 10k-25°C - precision: err<1°C between +5°Ce 50°C** | To be installed in contact with the inlet pipe to the water coil - length 1800mm |

# ACCESSORY

## Installation options

When the unit is installed, the **basic** and **evolved** commands can be configured according to the following options:

• **Machine type configuration:**
This operation, which is carried out using dip-switches, allows the type of application of the control to be selected.

| TYPE OF APPLICATION | Basic thermostat | Evolved thermostat |
|---|---|---|
| Machine with 4 pipes | | ● |
| Machine with 2 pipes | ● | ● |
| Thermostating via valve | ● | ● |
| Thermostating via fan | ● | ● |
| Dead zone 1 (2°C) | ● | ● |
| Dead zone 2 (5°C) | ● | ● |
| Remote activation of summer/winter function | | ● |

• **Air probe compensation**
Available in both the basic and evolved model, this operation allows the air probe reading to be calibrated by means of 4 jumpers in order to correct any errors. The function is activated in the **HEATING** and **COOLING** modes.

• **Summer/winter remote control**
Available in the **evolved thermostat** version only, where there is a digital input in the terminal board to handle the **SUMMER/WINTER** remote control. The digital input is the clean type and is therefore handled by means of a contact that can only operate in the two statuses **OPEN= summer**, **CLOSED= winter**.

**Warning:** take the utmost care when wiring the **summer/winter** remote control since the terminals are live even though the digital input is clean (it does not require voltage to activate the function.

**The configuration mode details are described in the instructions enclosed with the control.**

## Operating modes

There are 2 types of operation:

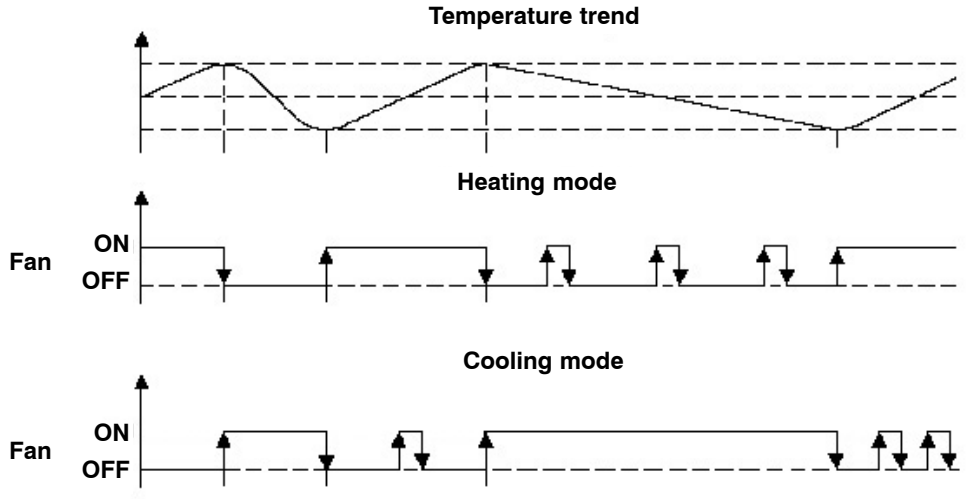
• cooling and heating function for the basic and evolved control with thermostating via the valve/s
• cooling and heating function for the basic and evolved control with thermostating via the fan.

**The installation instructions of the control describe how to select the operating modes.**

# ACCESSORY

## FAN THERMOSTATING

In this case, the valve is not used (hot or cold water flows freely into the coil) and thermoregulation occurs by turning the fan on or off. This regulation is associated with both the **heating** and **cooling** modes. To prevent the ambient probe from making reading errors, the **PERIODIC VENTILATION** function is activated in both the cooling and heating modes.

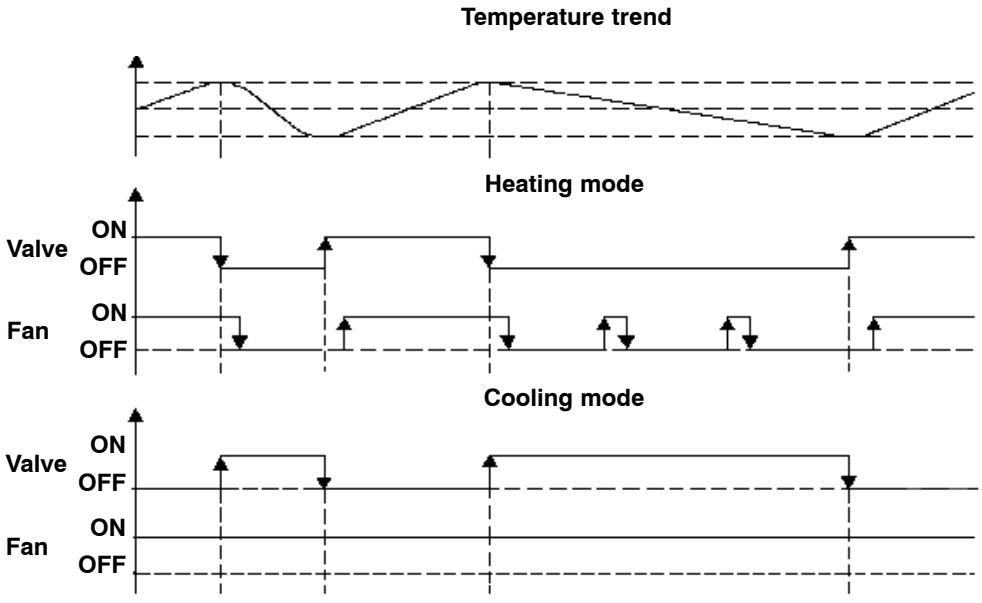



Graph depicting **heating**/**cooling** thermostating via the fan

## VALVE THERMOSTATING

In this case, fan control differs depending on whether the unit operates in the **heating** or **cooling**mode, as described below:

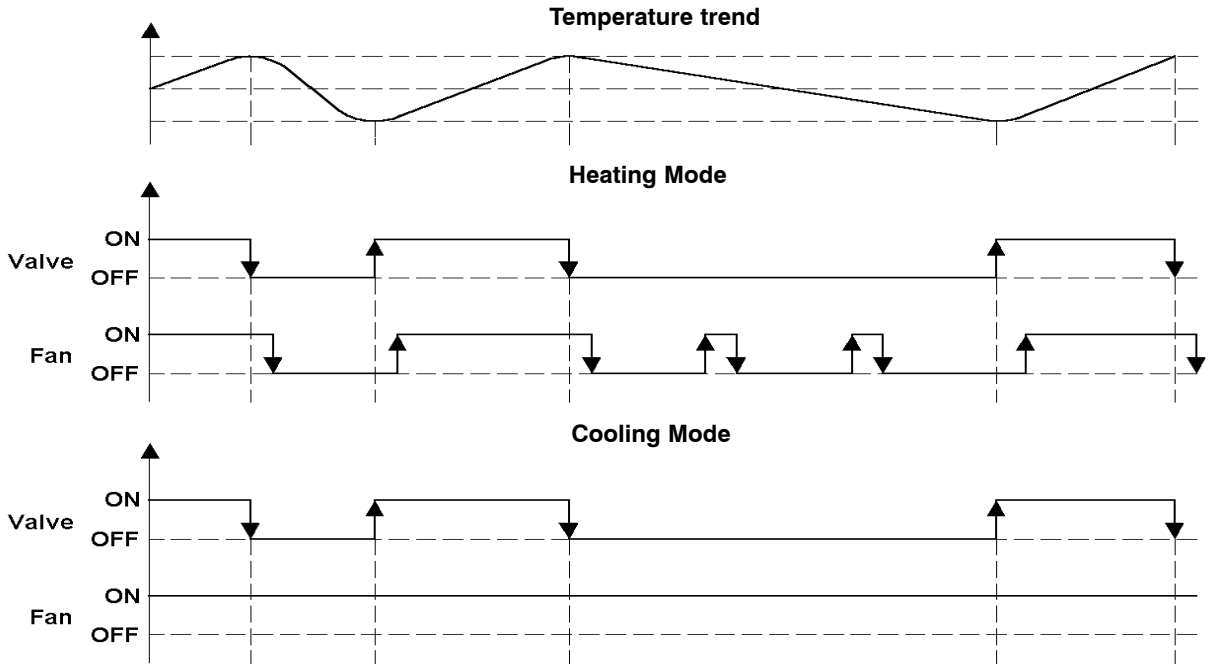
• **Cooling mode:** thermostating opens/closes the valve as required, while the fan is permanently on even when thermostating has been accomplished.
• **Heating mode:** thermostating opens/closes the valve while the fan is controlled with delay times linked to the **HOT START** and **PERIODIC VENTILATION functions.**



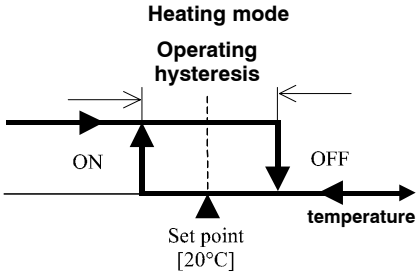

Graph depicting **heating**/**cooling** thermostating via the valve

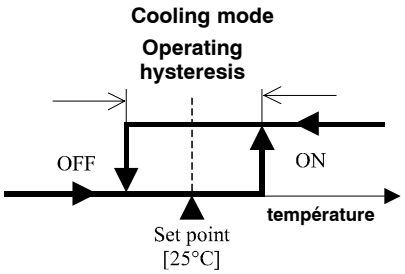
# ACCESSORY

Valve management includes an **ON**/**OFF** control with valve shut signal when the set-point has been reached according to the hysteresis cycles of the **heating**/**cooling** graphs. The valves required are the normally closed type with electrothermal actuators and opening/closing times of approx. **3 minutes**.
The fan is controlled with the time settings described in the **VENTILATION CONTROL** section in order to keep the ambient temperature constantly monitored.




**THERMOSTATING MODE HYSTERESIS:**
The hysteresis value is **1°C** for controls on the machine and **0.6°C** for wall-mounted controls.



# ACCESSORY

## Ventilation control

Fan control with the **basic** and **evolved** thermostats depends on the selected operating mode (**cooling**, **heating**):

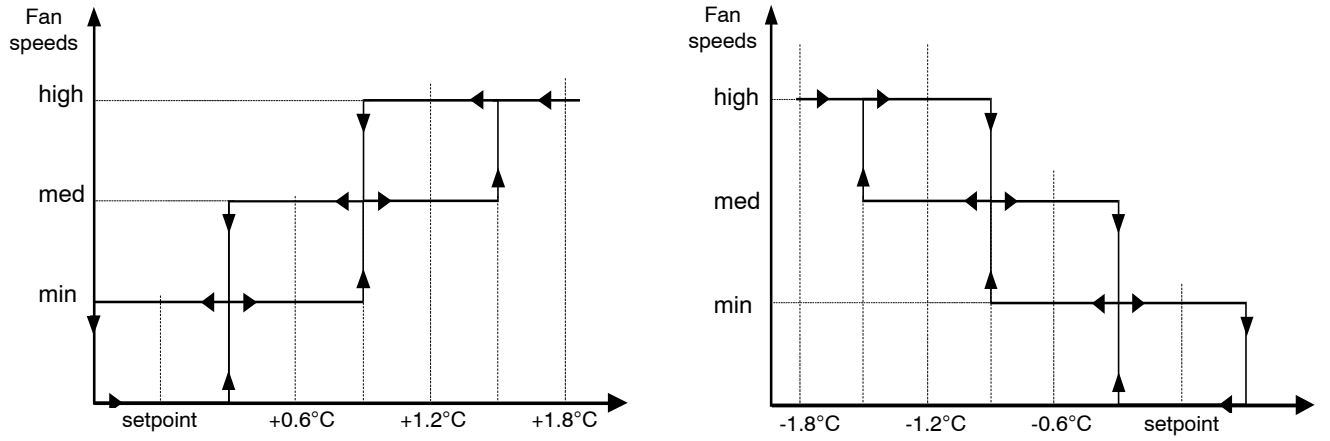
**- Fan speed:**
If the fans are activated, their speed may be:
• Selected by the user in the manual mode;
• Automatically selected if the fan switch is set to the auto mode (**evolved thermostat only**).

**- Ventilation thermostating:**
In this case, the fan will go on and off as described on page 31.

**- Valve thermostating:**
If valve thermostating is enabled, the fan will be automatically set for continuous operation in the **cooling** mode (fans permanently on), while in the **heating**mode, the fan is timed as the probe installed prior to the valve is no longer able to control the cold inlet air :
• Fan **ON** 180 seconds after the valve opening command;
• Fan **OFF** 180 seconds after the valve closing command;
The **hot start** function is always activated (in the heating mode) for water temperatures of below **34°C**

**Automatic ventilation:**
The automatic fan speed starts by being forced to the minimum speed for 60 sec., after which is is regulated according to the difference between the ambient temperature and the value set by means of the **setpoint**.
This difference depends on the hysteresis set in the regulator, which is:
• **0.6°C** for wall-mounted control units;

The figure below gives the difference values for control units.




Graph showing automatic fan control for thermostats (0.6°C hystersis)

**Note:** the set-point shown on the x-axis of the graphs refers to the value set by the user via the potentiometer.

# ACCESSORY

## Valve Installation

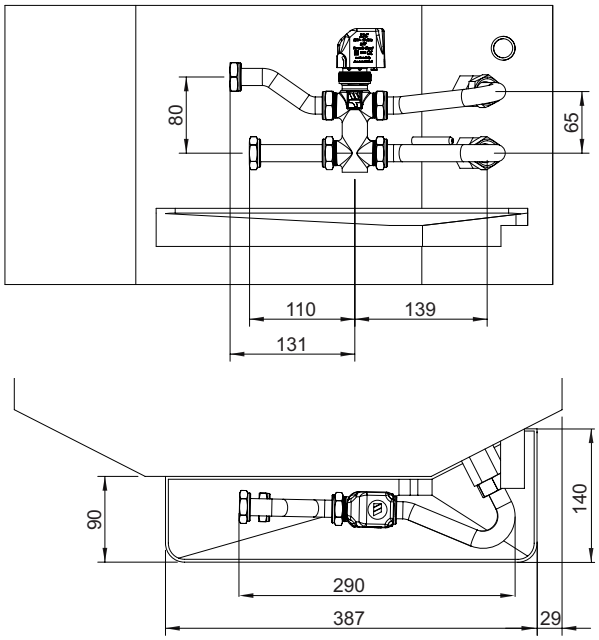
**WARNING: The valve is required not just to monitor the ambient temperature but also to shut off the chilled water that flows to the bank if the level of condensation in the tray becomes too high. It is obligatory to use this valve if the appliance is used for cooling purposes.**

One of the following two valves can be chosen:

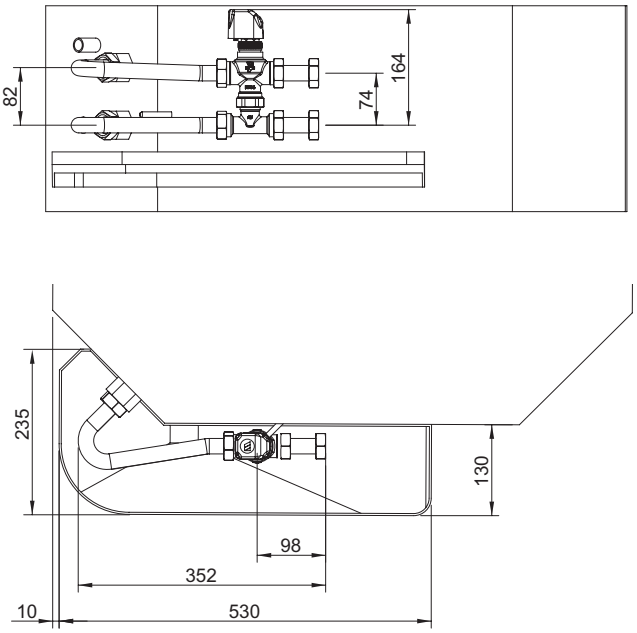
- Driven valves supplied as accessories.
- Driven valves supplied by the installer.

### 2 Pipes Version

**MOD. 04-08-10**

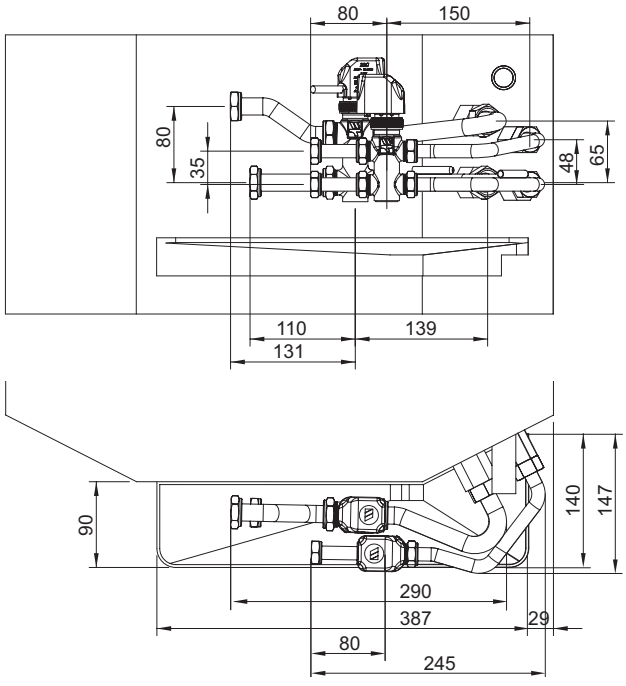



**MOD. 12-16-20**

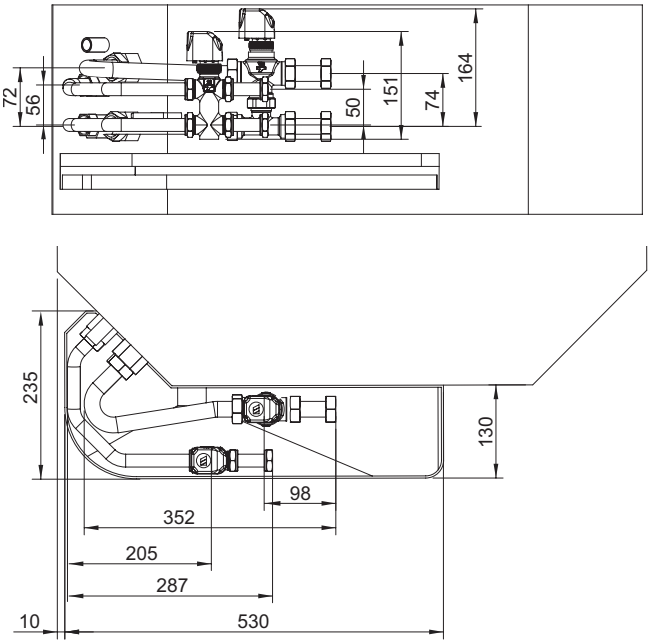



### 4 Pipes Version

**MOD. 04-4T e 10-4T**




**MOD. 20-4T**



# ACCESSORY

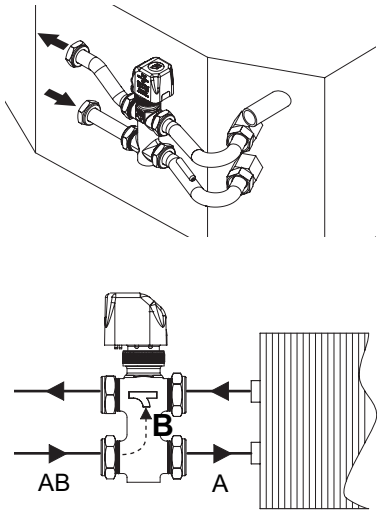
## Valve technical data

**Control Element technical feature**

| MODEL | VTV 1 | VTV 2 | VTV 3 | VTV 4 | UM |
|---|---|---|---|---|---|
| Power supply | 230-1-50 | | | | V-F-Hz |
| Working power input | 2.5 | | | | W |
| Opening time | 90 | | | | sec |
| Closing time | 90 | | | | sec |
| Ambient temperature | 0÷40 | | | | °C |
| Protection degree | 44 | | | | IP |

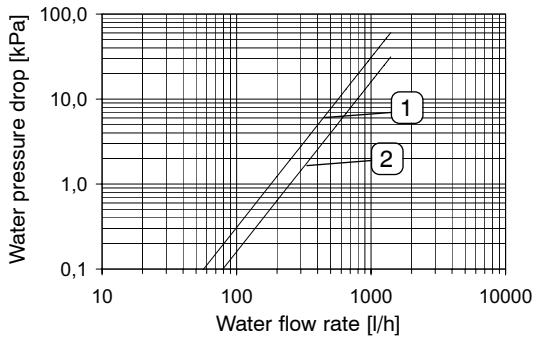
**Valve techincal data**

| | | | | | |
|---|---|---|---|---|---|
| Wet connection | 3/4" G | 1" G | 1/2" G | 3/4" G | " |
| Water temperature | 4 ÷ 110 | | | | °C |
| Maximum static pressure | 1600 | | | | kPa |
| **Flow switching** | | | | | |
| with valve supplied | AB - A | | | | - |
| with valve not supplied | AB - B | | | | - |
| Kvs when supplied | 2.5 | 5.2 | 1.7 | 2.5 | - |
| Kvs in by-pass mode | 1.8 | 3.3 | 1.2 | 1.8 | - |




## Valves working pressure drop

### VTV1 - VTV4 Valves Water Pressure Drop

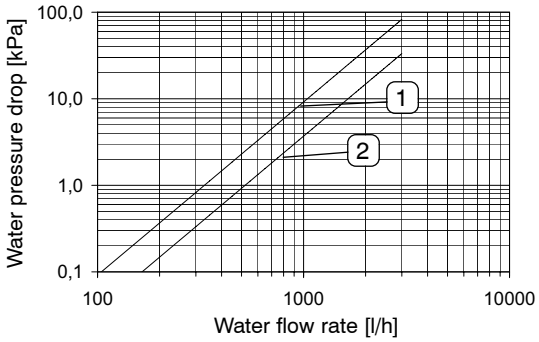



**1**=By Pass **2**=Power supply

| Valves \ Model | 04 | 08 | 10 | 04-4T | 10-4T | 20-4T |
|---|---|---|---|---|---|---|
| VTV1 (1) | • | • | • | • | • | |
| VTV4 (2) | | | | | | • |

**(1):** For the 4 pipes series, 3-way valve for the main coil.
**(2):** 3-Way valve for the secondary coil of 4 pipes units.

### VTV3 Valve Water Pressure Drop

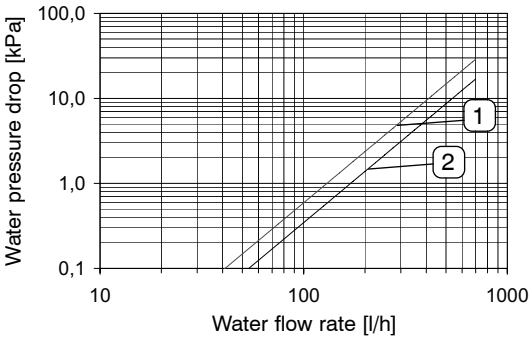



**1**=By Pass **2**=Power supply

| Valve \ Model | 04-4T | 10-4T |
|---|---|---|
| VTV3 (1) | • | • |

**(1):** 3-Way valve for the secondary coil of 4 pipes units

### VTV2 Valve Water Pressure Drop




**1**=By Pass **2**=Power supply

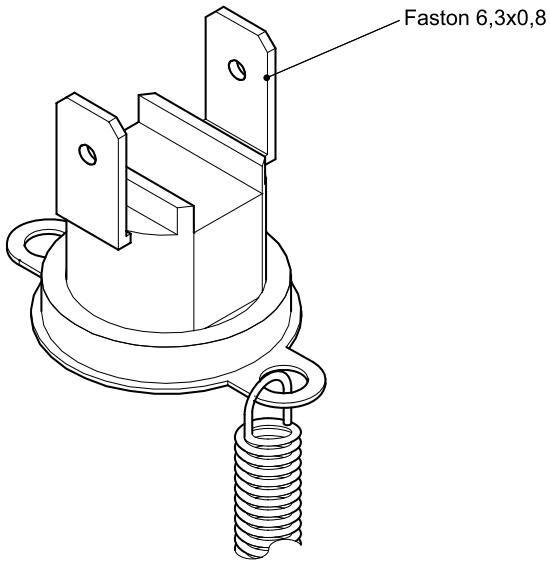
| Valve \ Model | 12 | 16 | 20 | 20-4T |
|---|---|---|---|---|
| VTV2 (1) | • | • | • | • |

**(1):** For the 4 pipes series, 3-way valve for the main coil.

# ACCESSORY

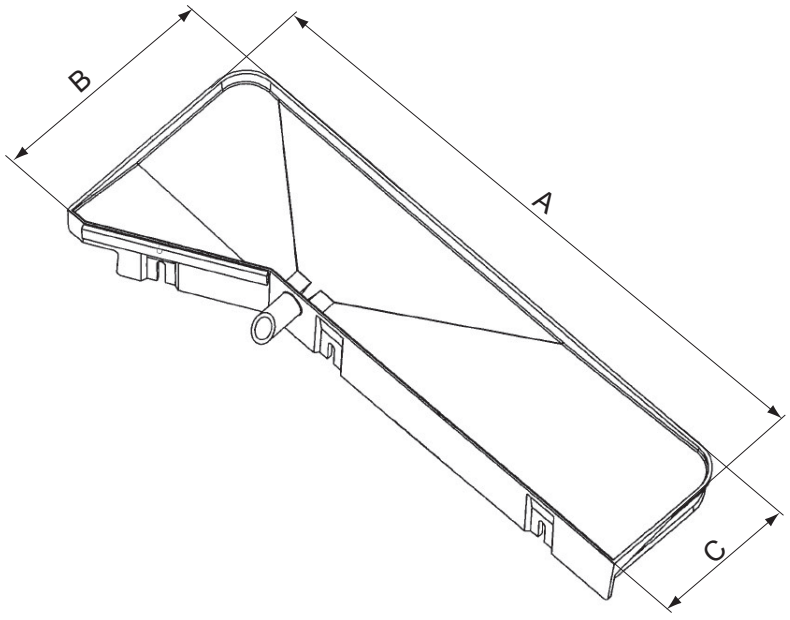
## Enabling thermostat (TC-F)

This accessory can be used with the commutator control to inhibit fan operation in the heating mode if the temperature of the coil fails to reach an acceptable operating value.




## Overall dimensions of the tray (BCN)

Made of plastic material, this collects the condensation that forms on non-insulated wet connections and the valve kit (if installed) during operation in the summer season, and conveys it outside (obligatory accessory for applications in the cooling mode).

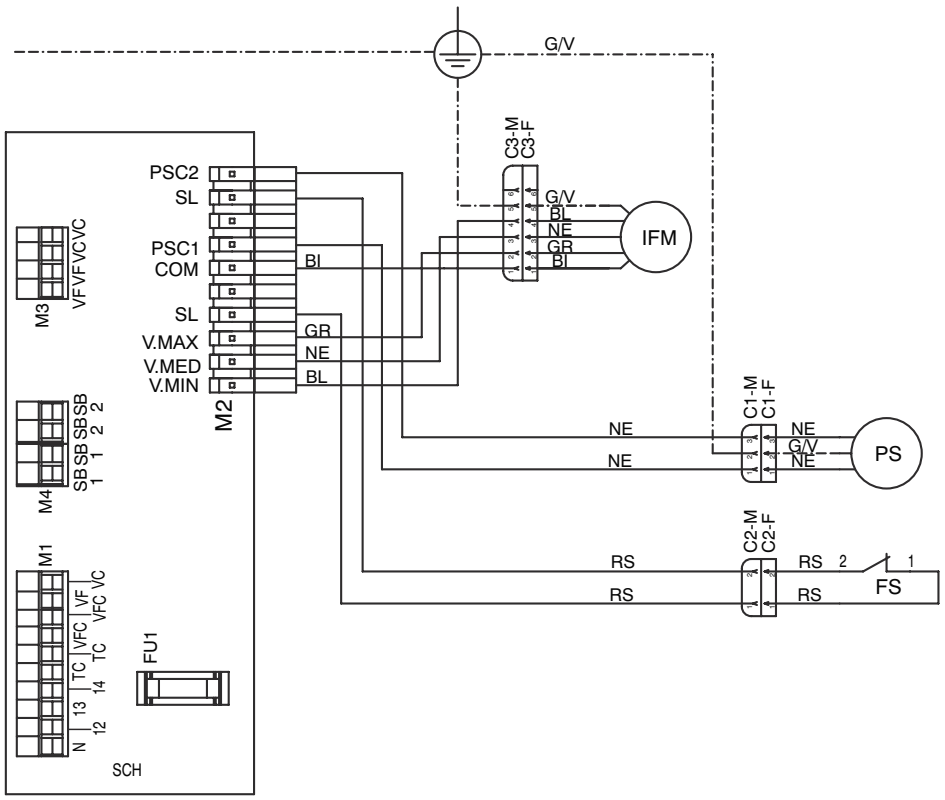


# ELECTRICAL CONNECTIONS

## Key To Wiring Diagrams

| | |
|---|---|
| **BL** | BLUE WIRE |
| **GR** | GREY WIRE |
| **NE** | BLACK WIRE |
| **BI** | WHITE WIRE |
| **RS** | RED WIRE |
| **G/V** | YELLOW/GREEN WIRE |
| **VF** | COOLING MODE VALVE |
| **VFC** | PS ENABLING BY VF |
| **VC** | HEATING MODE VALVE |
| **SB** | COIL PROBE |
| **TC** | PS ACTIVATION THERMOSTAT (SUPPLIED) |
| **PS** | CONDENSATION DRAINING PUMP |
| **IFM** | UNIT FAN MOTOR |
| **FS** | SAFETY FLOAT MICRO |
| **SCH** | CONNECTION BOARD |
| **FU1** | FAN MOTOR FUSE |
| **M1/2/3/4** | TERMINAL BOARDS |
| **NA** | NORMALLY OPEN COLD VALVE CONTACT |
| **C1/2/3-M/F** | MALE/FEMALE CONNECTORS |

The connections that are already in the machine are indicated below.




## Installation Notes

All the units are equipped with an enabling thermostat to activate the condensation draining pump (TC) which is part of the standard outfit of the unit, is installed on the water inlet pipe of the coil used for cooling and allows the pump to stop when the temperature of the water flowing into the coil exceeds 25°C, thus preventing condensation from forming.
Thermostat **TC** is always installed, regardless of the type of control selected. The relative electrical connections must be made as shown on the wiring diagrams supplied.

If the "Commutator" control is installed and for applications used in the heating mode, fan operation may be made to depend on a minimum water temperature being reached (42°C), this to prevent unpleasantly cold air from being blown into the room.
The Enabling Thermostat accessory (**TC-F**), which should be installed on the water inlet pipe, allows the coil inlet temperature to be monitored and can be installed regardless of whether the three-way valve is installed. The electrical connections must be made in compliance with the previous wiring diagrams.

If the "Basic Thermostat" or the "Evolved Thermostat" control are installed, the coil probe (**SB**) supplied with the controls must be positioned correctly as this allows fan operation to be made to depend on a minimum water temperature being reached (35°C), this to prevent unpleasantly cold air from being blown into the room.
If the three-way valve is not installed, the Coil probe must be positioned in the water inlet pipe. If the three-way valve is installed, it should be positioned in the valve holder on the valve itself.
If the unit is the version with 4 pipes, the enabling thermostat (**TC**) must be installed in the water inlet pipe of the main coil while the coil probe (**SB**) should be installed in the pipe of the additional coil.

For further details, consult the "Notes about Pump activation" and "Notes about valve activation" further on.

# ELECTRICAL CONNECTIONS

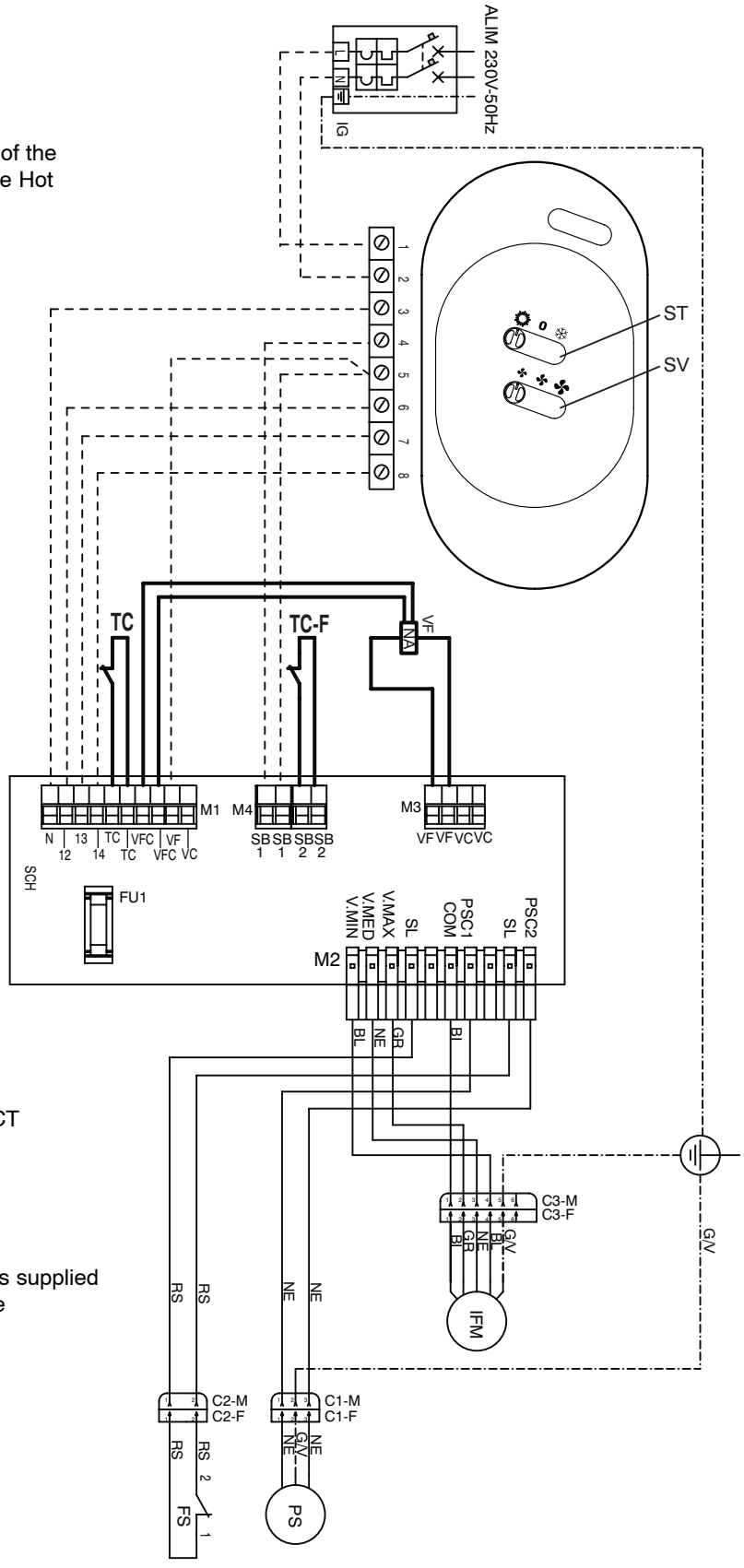
## 1 - Electrical Connections of the Commutator Control

Make the electric connections of the unit with Commutator Control accessory as shown in the following wiring diagrams.

**NOTE:**
Consult the relative "Installation Notes" for the position of the Enabling Thermostat Components (TC) and those of the Hot Ventilation Enabling Thermostat (TC-F).

**KEY TO WIRING DIAGRAMS**

| | |
|---|---|
| **BL** | BLUE WIRE |
| **GR** | GREY WIRE |
| **NE** | BLACK WIRE |
| **BI** | WHITE WIRE |
| **RS** | RED WIRE |
| **G/V** | YELLOW/GREEN WIRE |
| **IG** | MAIN SWITCH |
| **SV** | FAN SPEED SELECTOR |
| **ST** | SWITCH SELECTOR HEAT/COOL FUNCTION |
| **VF** | COOLING MODE VALVE |
| **VFC** | PS ENABLING BY VF |
| **VC** | HEATING MODE VALVE |
| **SB** | COIL PROBE |
| **TC** | PS ACTIVATION THERMOSTAT (SUPPLIED) |
| **PS** | CONDENSATION DRAINING PUMP |
| **IFM** | UNIT FAN MOTOR |
| **FS** | SAFETY FLOAT MICRO |
| **SCH** | CONNECTION BOARD |
| **FU1** | FAN MOTOR FUSE |
| **TC-F** | ENABLING THERMOSTAT VENTILATION IN HEATING MODE (ACCESSORY) |
| **M1/2/3/4** | TERMINAL BOARDS |
| **NA** | NORMALLY OPEN COLD VALVE CONTACT |
| **C1/2/3-M/F** | MALE/FEMALE CONNECTORS |




connections to be made by installer - cables supplied

connections and cables at installer's charge

# ELECTRICAL CONNECTIONS

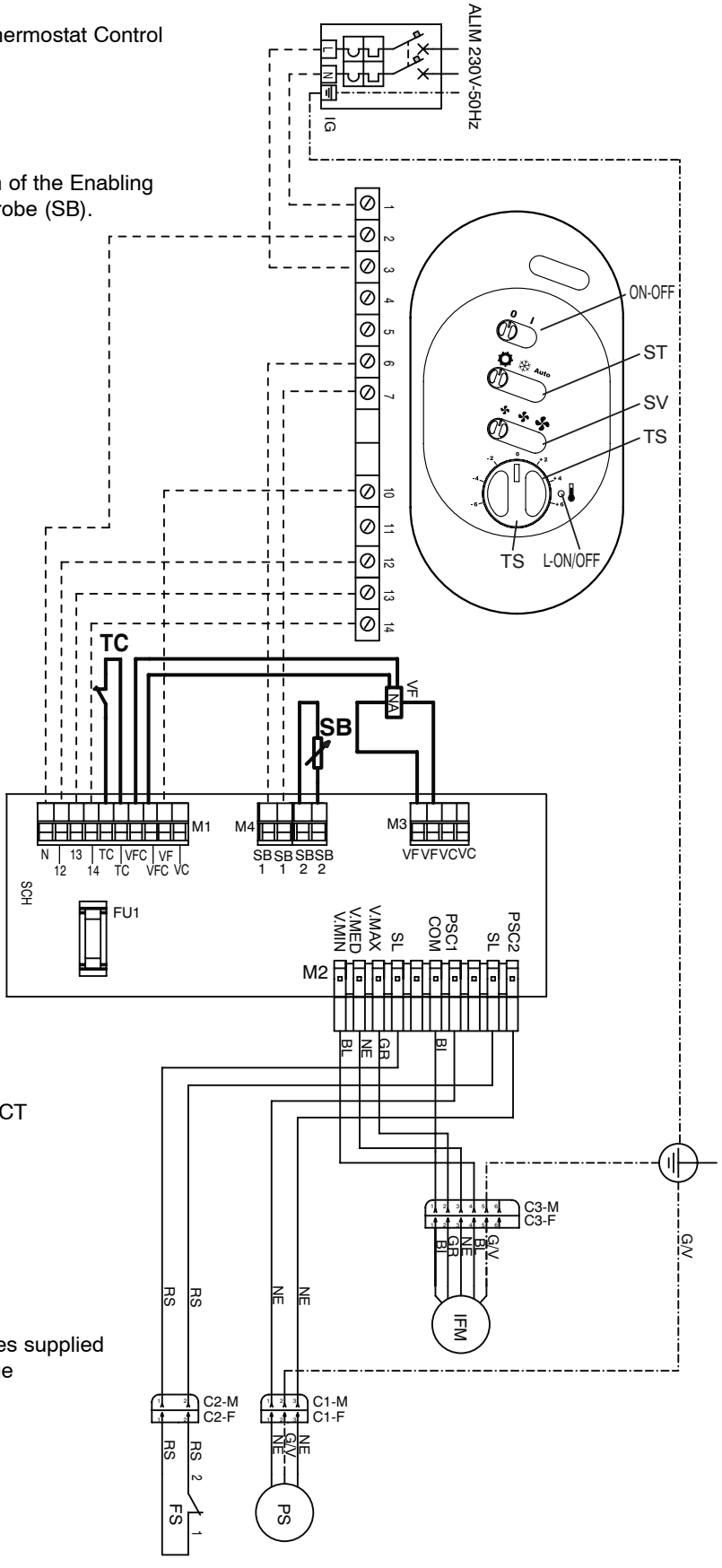
## 2 - Electrical Connections of the Basic Thermostat Control

Make the electric connections of the unit with Basic Thermostat Control accessory as shown in the following wiring diagrams.

**NOTE**:
Consult the relative "Installation Notes" for the position of the Enabling Thermostat Components (TC) and those of the Coil Probe (SB).

**KEY TO WIRING DIAGRAMS**

| | |
|---|---|
| **BL** | BLUE WIRE |
| **GR** | GREY WIRE |
| **NE** | BLACK WIRE |
| **BI** | WHITE WIRE |
| **RS** | RED WIRE |
| **G/V** | YELLOW/GREEN WIRE |
| **IG** | MAIN SWITCH |
| **ON/OFF** | ON/OFF SELECTOR |
| **SV** | FAN SPEED SELECTOR |
| **ST** | SWITCH SELECTOR HEAT/COOL FUNCTION |
| **TS** | SET POINT VARIATOR |
| **VF** | COOLING MODE VALVE |
| **VFC** | PS ENABLING BY VF |
| **VC** | HEATING MODE VALVE |
| **SB** | COIL PROBE |
| **TC** | PS ACTIVATION THERMOSTAT (SUPPLIED) |
| **PS** | CONDENSATION DRAINING PUMP |
| **IFM** | UNIT FAN MOTOR |
| **FS** | SAFETY FLOAT MICRO |
| **SCH** | CONNECTION BOARD |
| **FU1** | FAN MOTOR FUSE |
| **M1/2/3/4** | TERMINAL BOARDS |
| **NA** | NORMALLY OPEN COLD VALVE CONTACT |
| **C1/2/3-M/F** | MALE/FEMALE CONNECTORS |




connections to be made by installer - cables supplied

connections and cables at installer's charge

# ELECTRICAL CONNECTIONS

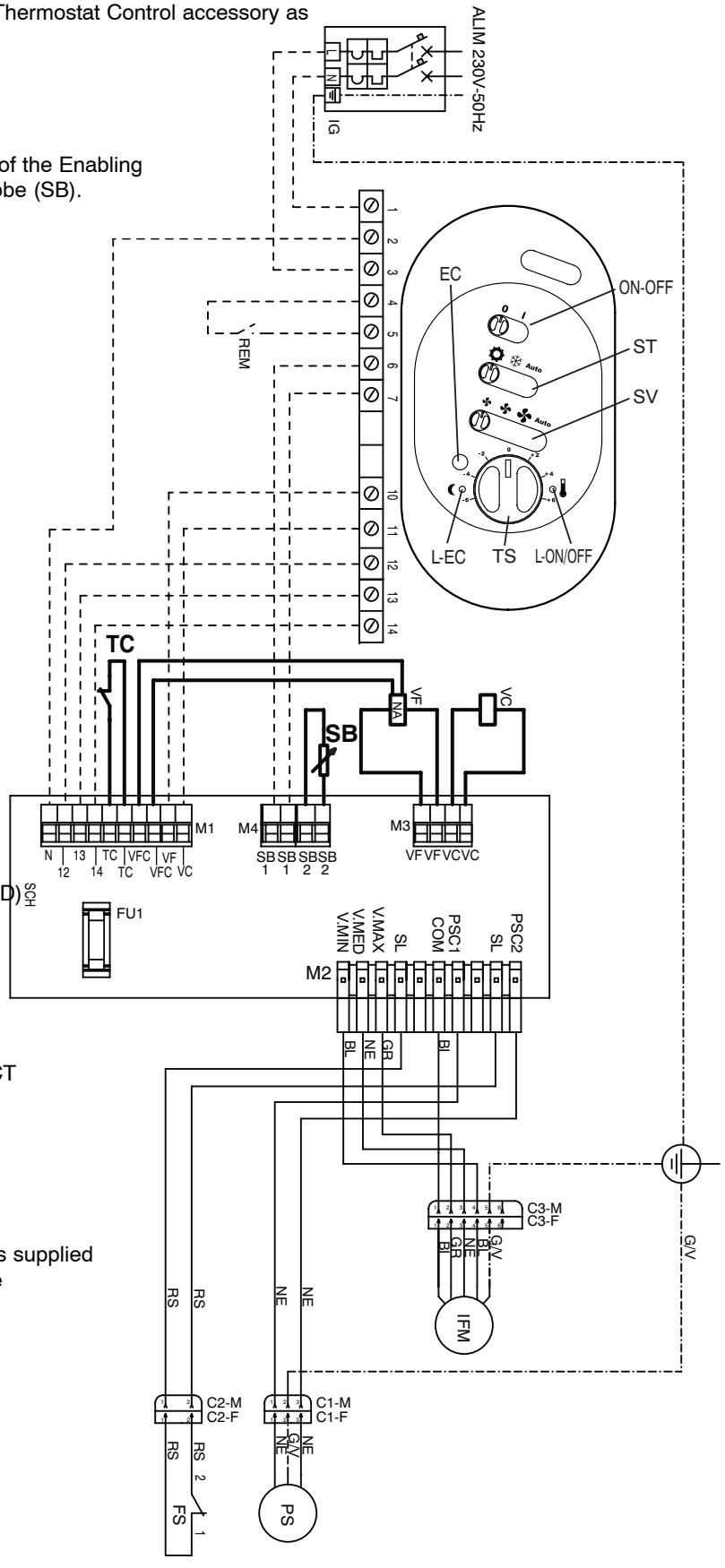
## 3 - Electrical Connections of the Evolved Thermostat Control

Make the electric connections of the unit with Evolved Thermostat Control accessory as shown in the following wiring diagrams.

**NOTE:**
Consult the relative "Installation Notes" for the position of the Enabling Thermostat Components (TC) and those of the Coil Probe (SB).

**KEY TO WIRING DIAGRAMS**

| | |
|---|---|
| **BL** | BLUE WIRE |
| **GR** | GREY WIRE |
| **NE** | BLACK WIRE |
| **BI** | WHITE WIRE |
| **RS** | RED WIRE |
| **G/V** | YELLOW/GREEN WIRE |
| **IG** | MAIN SWITCH |
| **ON/OFF** | ON/OFF SELECTOR |
| **SV** | FAN SPEED SELECTOR |
| **ST** | SWITCH SELECTOR HEAT/COOL FUNCTION |
| **TS** | SET POINT VARIATOR |
| **EC** | ECONOMY KEY |
| **L-EC** | ECONOMY LED |
| **L-ON/OFF** | ON/OFF LED |
| **VF** | COOLING MODE VALVE |
| **VFC** | PS ENABLING BY VF |
| **VC** | HEATING MODE VALVE |
| **SB** | COIL PROBE |
| **REM** | REMOTE FUNCTION CHANGE |
| **TC** | PS ACTIVATION THERMOSTAT (SUPPLIED) |
| **PS** | CONDENSATION DRAINING PUMP |
| **IFM** | UNIT FAN MOTOR |
| **FS** | SAFETY FLOAT MICRO |
| **SCH** | CONNECTION BOARD |
| **FU1** | FAN MOTOR FUSE |
| **M1/2/3/4** | TERMINAL BOARDS |
| **NA** | NORMALLY OPEN COLD VALVE CONTACT |
| **C1/2/3-M/F** | MALE/FEMALE CONNECTORS |




connections to be made by installer - cables supplied

connections and cables at installer's charge

The manufacturer declines all responsibility for any inaccuracies in this manual due to printing or typing errors.

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