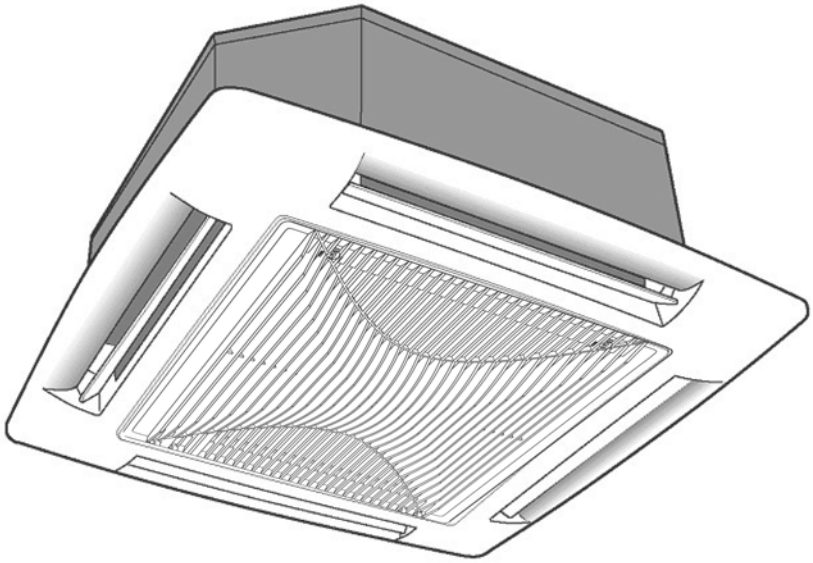
FCS

“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

TABLE OF CONTENTS

THIS MANUAL IS DIVIDED INTO SECTIONS. THEIR NAMES APPEAR IN THE HEADING OF EACH PAGE

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

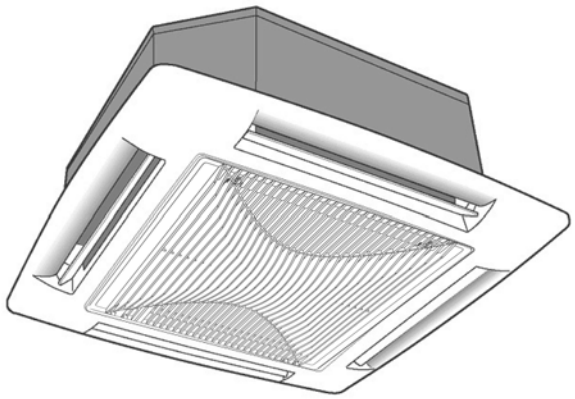
Purpose of the machine

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.

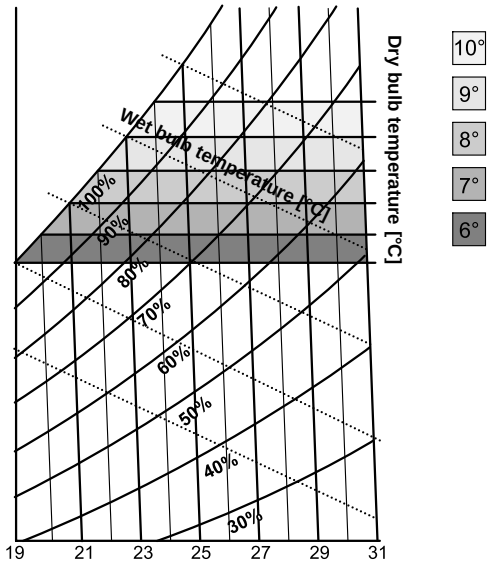
(6) Maximum height for water discharge pump = 200 mm

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



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]
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 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

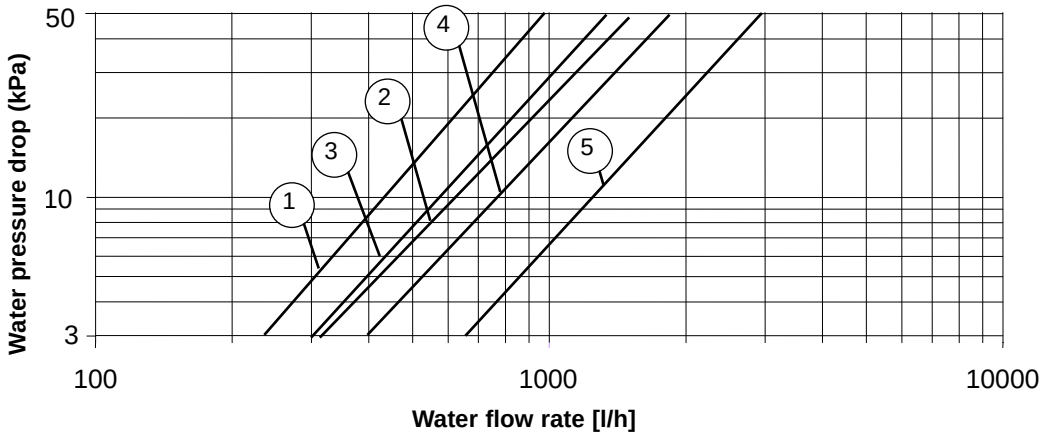
Model	Speed	Correction Factors Total capacity
04-4T	Min	0,65
	Med	0,76
	Max	1,00
10-4T	Min	0,59
	Med	0,76
	Max	1,00
20-4T	Min	0,57
	Med	0,88
	Max	1,00

WATER PRESSURE DROPS

Water Pressure Drop

The following graphs give the water pressure drop valves:

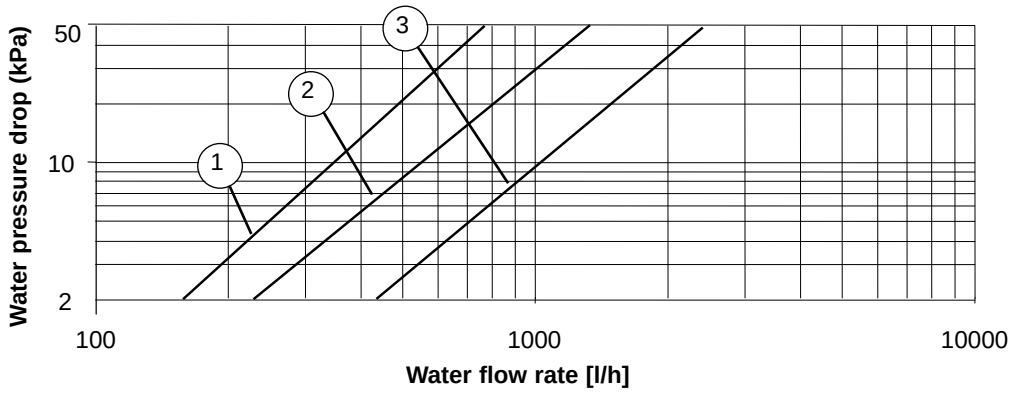
2 Pipes serier water pressure drop



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

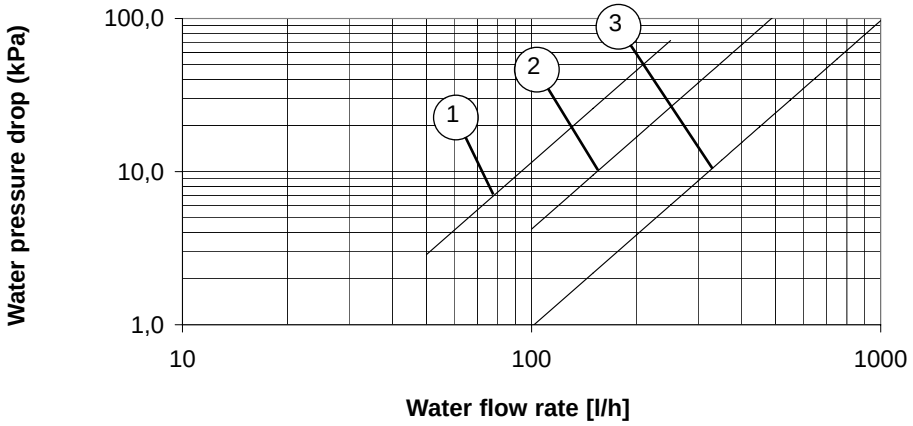
water pressure drop in the previous diagram refer to an average water temperature of 10°C

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

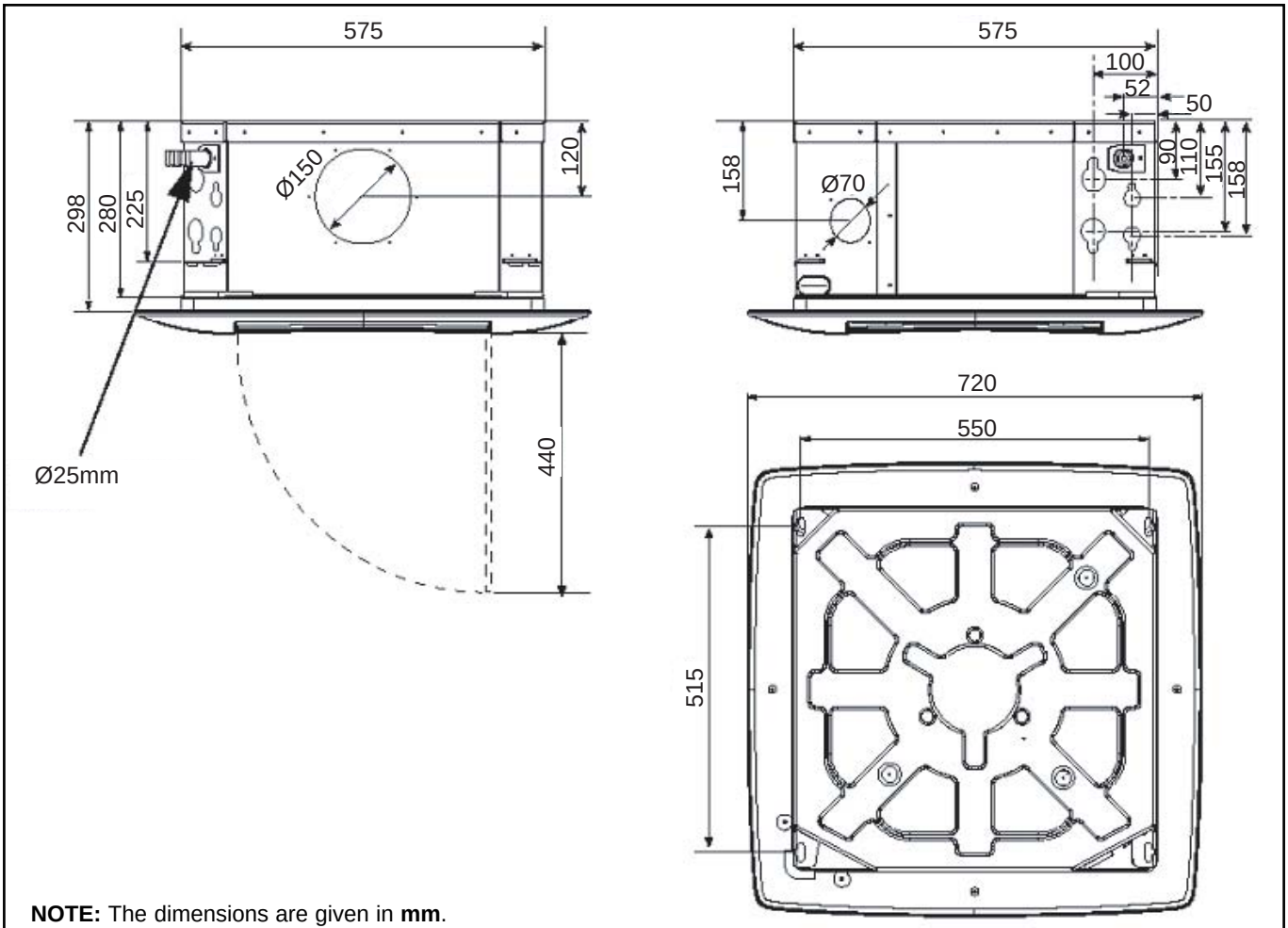
Noise levels

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 100m^3 room with 0.5 sec. reverberation time.

OVERALL DIMENSION

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



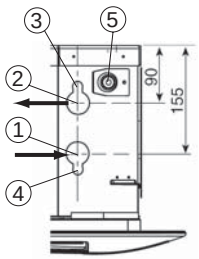
NOTE: The dimensions are given in **mm**.

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

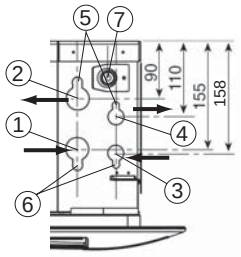
Wet Connections

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)



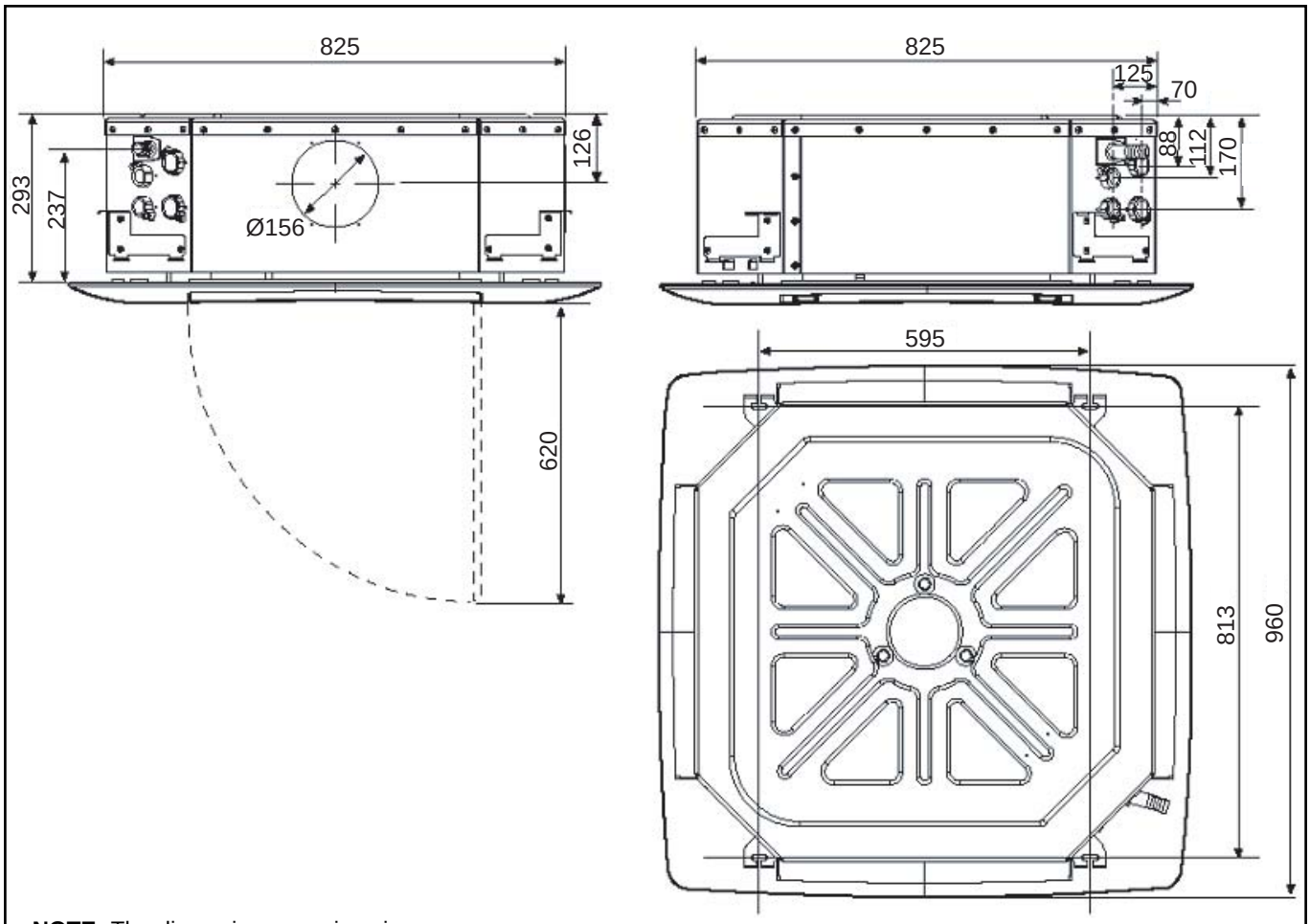
Version with 4 pipes
1-Cool water inlet
2-Cool water outlet
3-Hot water inlet
4-Hot water outlet
5-Air venting valve
6-Draining valve (1")
7-To drain condensation (∅25mm)



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



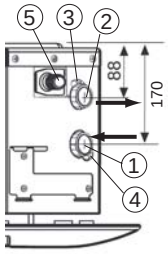
NOTE: The dimensions are given in **mm**.

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

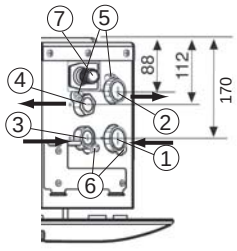
Wet Connections

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)

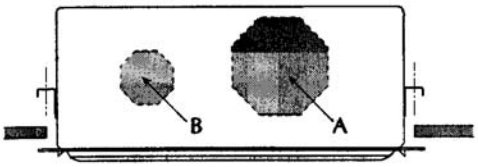


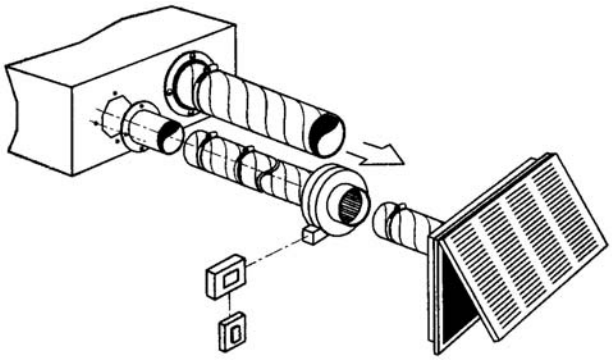
MOD.	Size of main coil connections [Ø]	Size of secondary coil connections [Ø]
12	1”	-
16	1”	-
20	1”	3/4”

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.

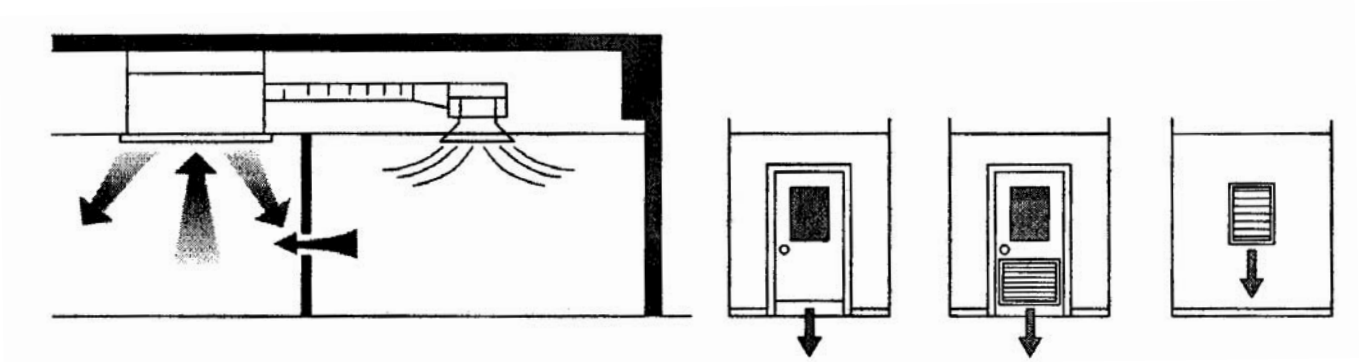
- The outdoor air flow rate must be less than **10%** of the total air flow rate to prevent operating faults or noisy operation.

- 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:

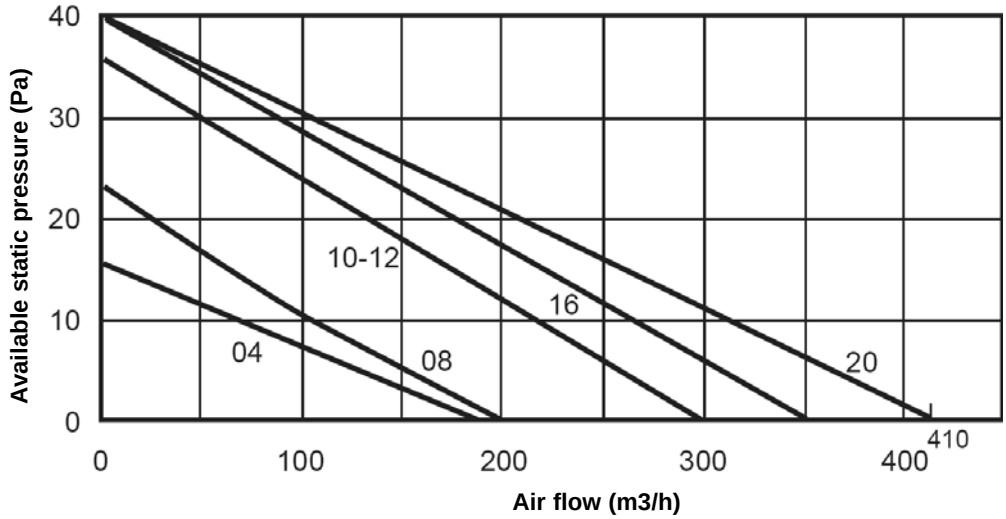
If air is to be blown into an adjacent room, one or more of the fins corresponding to the duct must be shut off.
Apply an air intake port to the partition wall between the conditioned room in which the unit is installed and the addcent room, as shown in the figure.



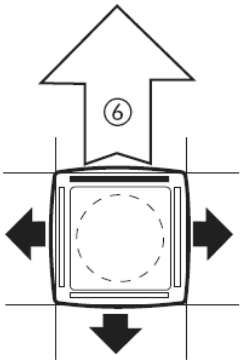
Preliminary Inspections Prior To Starting

- 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**.

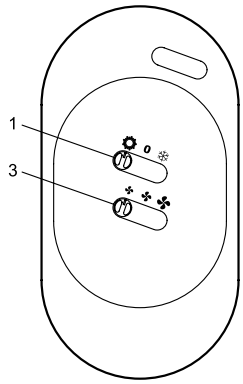
Functions

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	•		

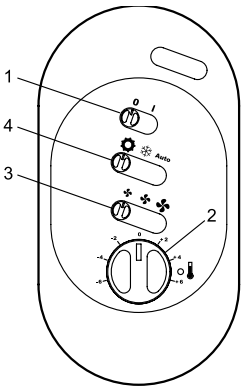
ACCESSORY

Description of commutator (CMR-F)



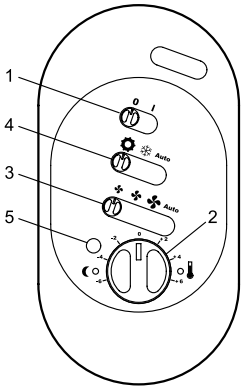
Commutator: remote control (CMR-F)
1- when in position **0**, selector **0** indicates that the control is off. Turn to the **sun** symbol to select the heating mode or to the **snow** symbol to select the cooling mode.
2- selector **2** is used to choose the minimum, medium or maximum fan speeds.

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.

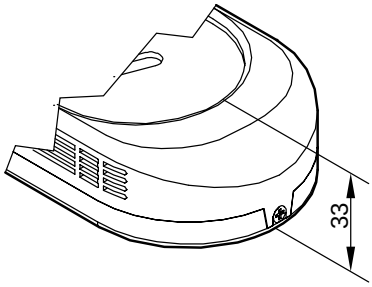
Description of the evolved thermostat (TER-F)

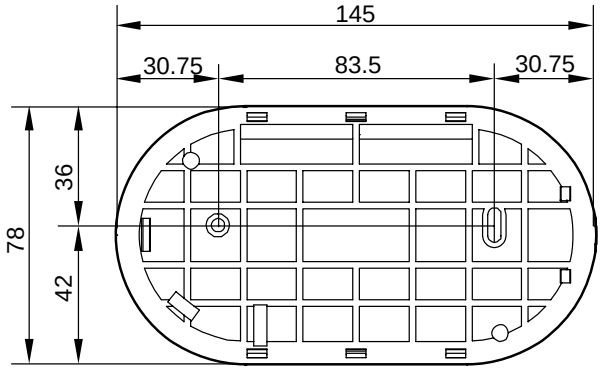


Evolved thermostat: remote control (TER-F)
1- on/off cursor to turn the unit on and off.
2- seasonal selector. Turn to the **sun** symbol to select the heating mode or to the **snow** symbol to activate the cooling mode. Turn to **auto** and the control will select the operating mode on its own, depending 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:

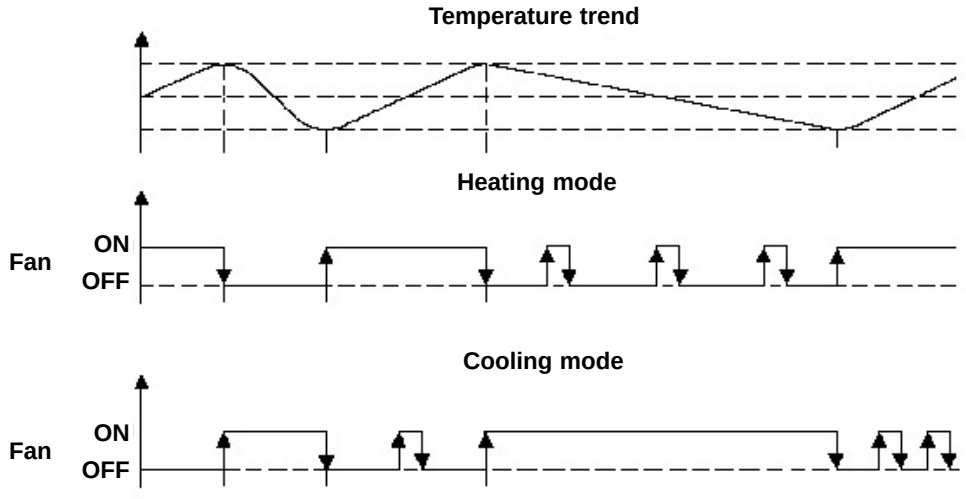
• cooling and heating function for the basic and evolved control with thermostating via the valve/s
• cooling and heating function for the basic and evolved control with thermostating via the fan.

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.

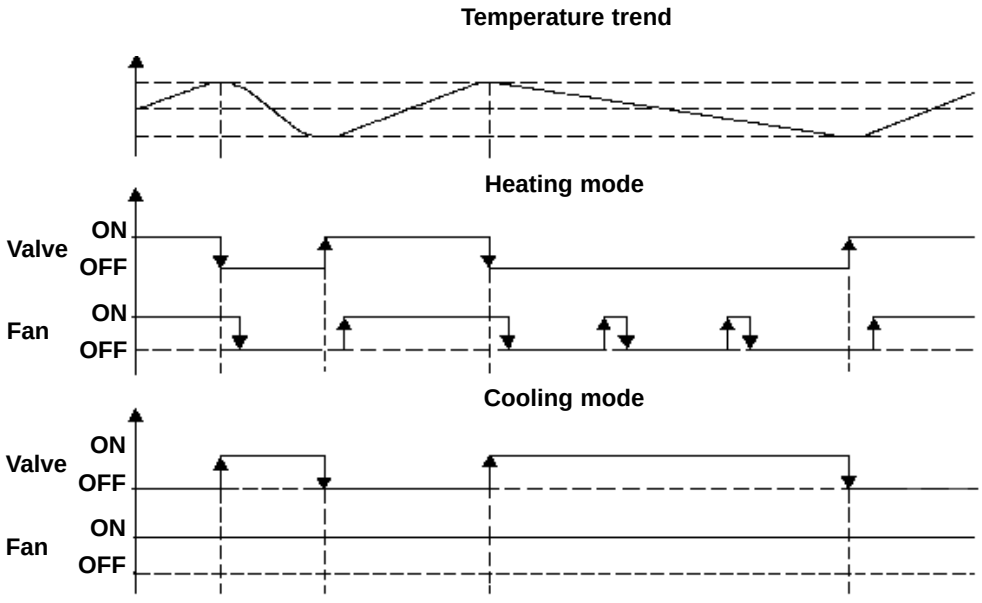


Graph depicting **heating/cooling** thermostating via the fan

VALVE THERMOSTATING

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

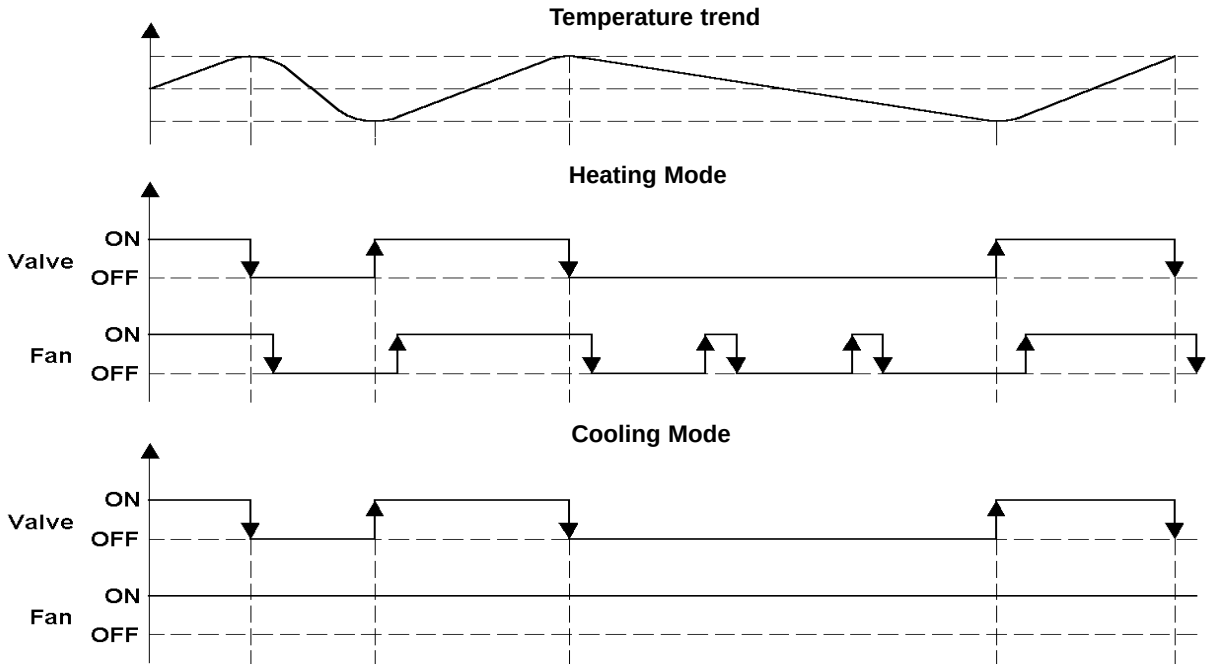
• **Cooling mode:** thermostating opens/closes the valve as required, while the fan is permanently on even when thermostating has been accomplished.
• **Heating mode:** thermostating opens/closes the valve while the fan is controlled with delay times linked to the **HOT START** and **PERIODIC VENTILATION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



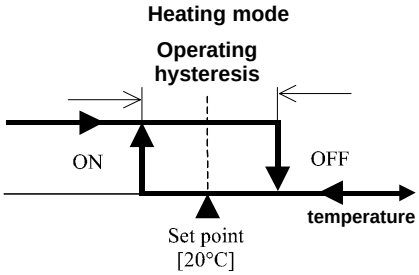
Graph depicting **heating/cooling** thermostating via the valve

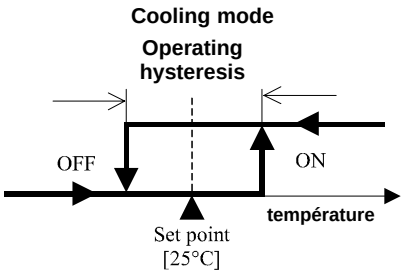
ACCESSORY

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**):

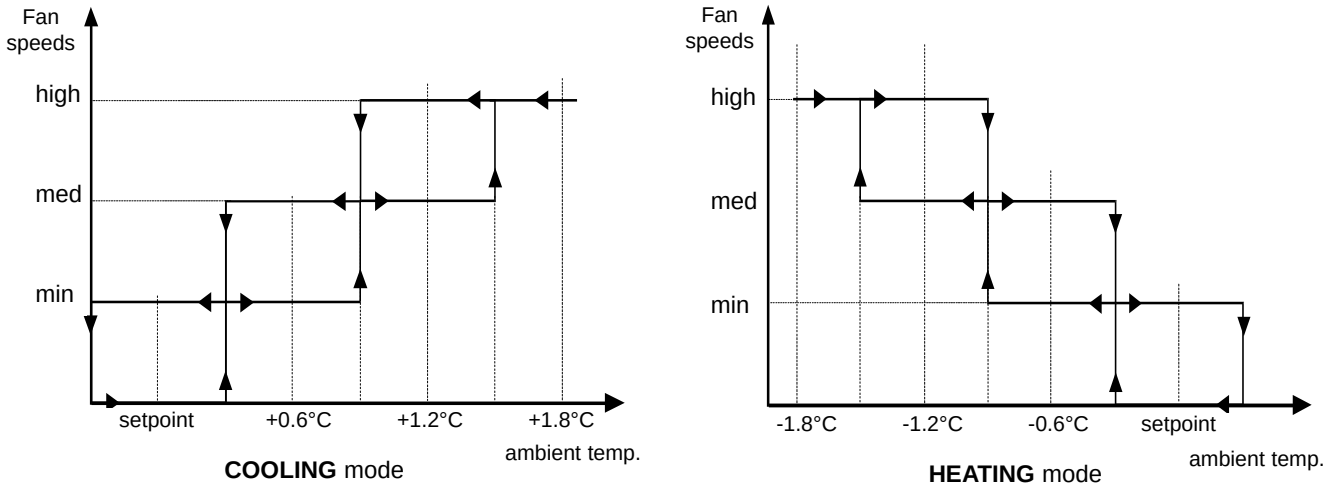
- Fan speed:
If the fans are activated, their speed may be:
• Selected by the user in the manual mode;
• Automatically selected if the fan switch is set to the auto mode (**evolved thermostat only**).

- 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

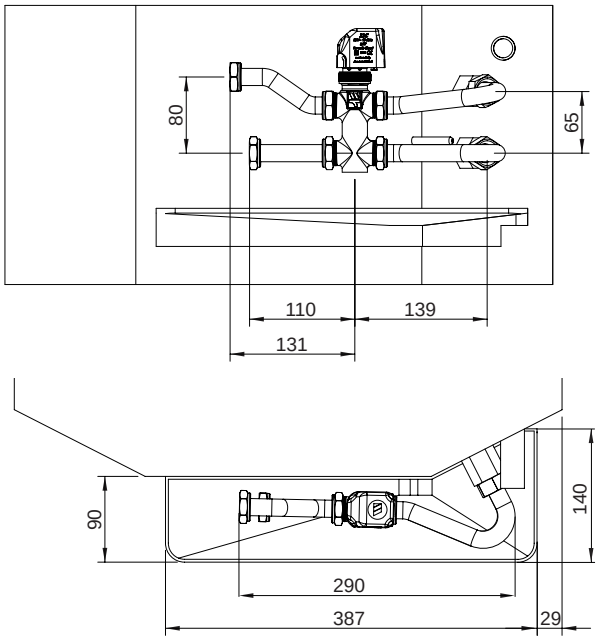
WARNING: The valve is required not just to monitor the ambient temperature but also to shut off the chilled water that flows to the bank if the level of condensation in the tray becomes too high. It is obligatory to use this valve if the appliance is used for cooling purposes.

One of the following two valves can be chosen:

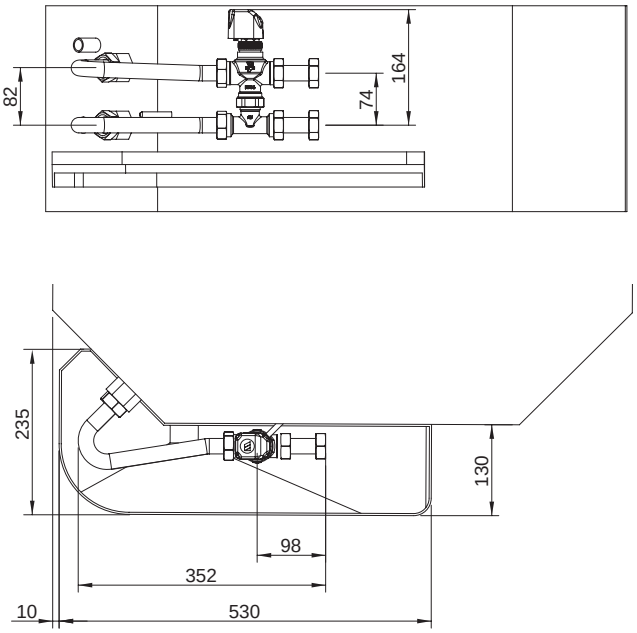
- Driven valves supplied as accessories.
- Driven valves supplied by the installer.

2 Pipes Version

MOD. 04-08-10

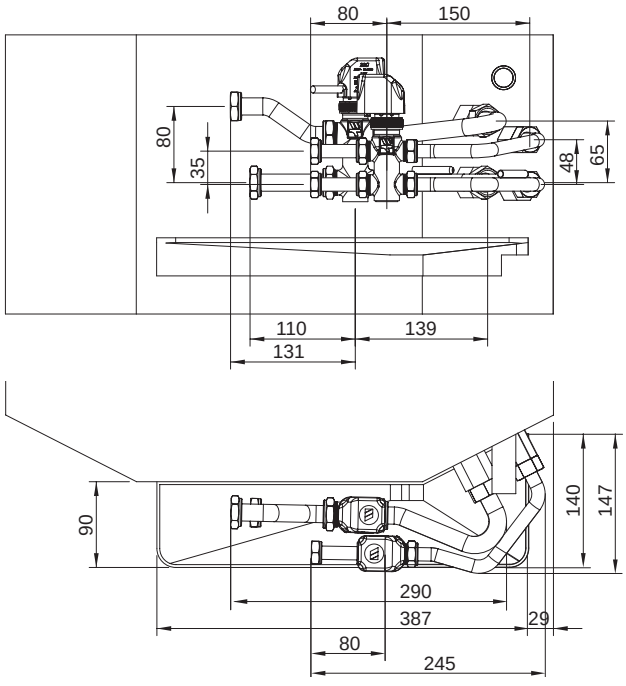


MOD. 12-16-20

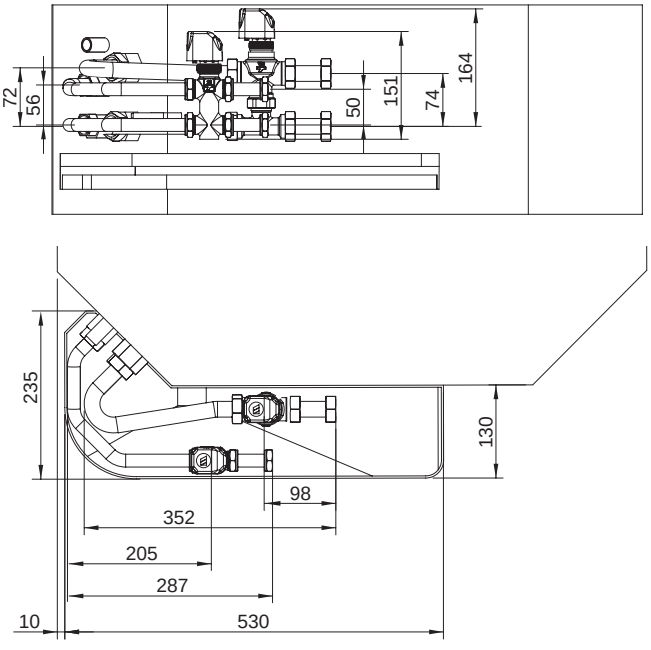


4 Pipes Version

MOD. 04-4T e 10-4T



MOD. 20-4T



ACCESSORY

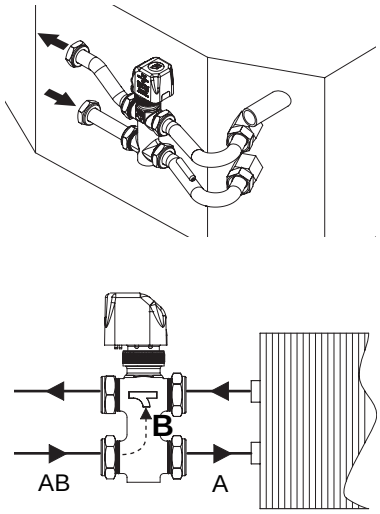
Valve technical data

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

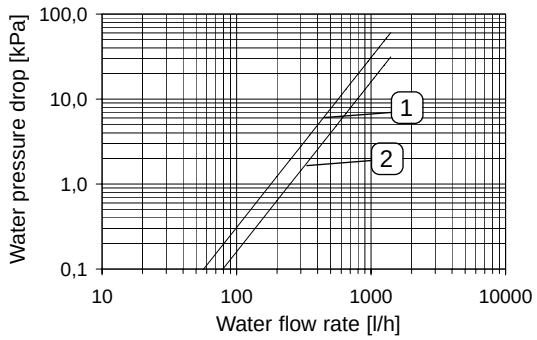
Valve techincal data

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

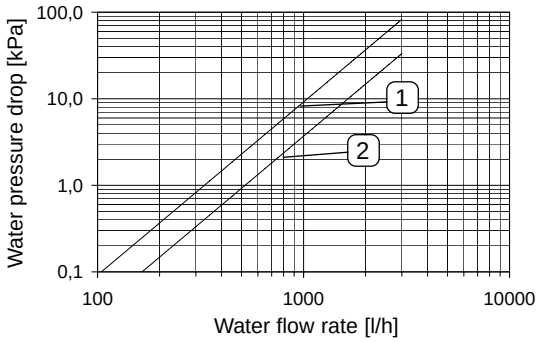


1=By Pass **2=**Power supply

Model / Valves	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

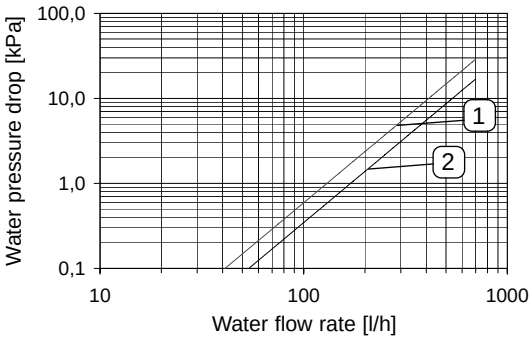


1=By Pass **2=**Power supply

Model / Valve	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

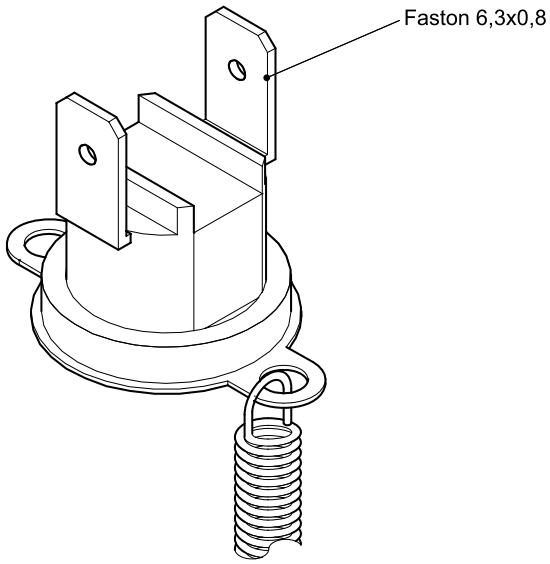
Model / Valve	12	16	20	20-4T
VTV2 (1)	•	•	•	•

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

ACCESSORY

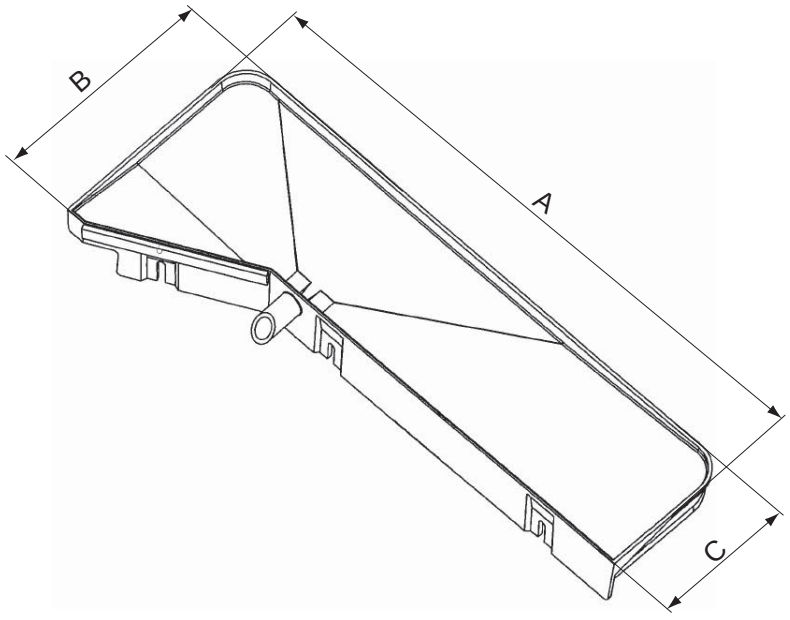
Enabling thermostat (TC-F)

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).

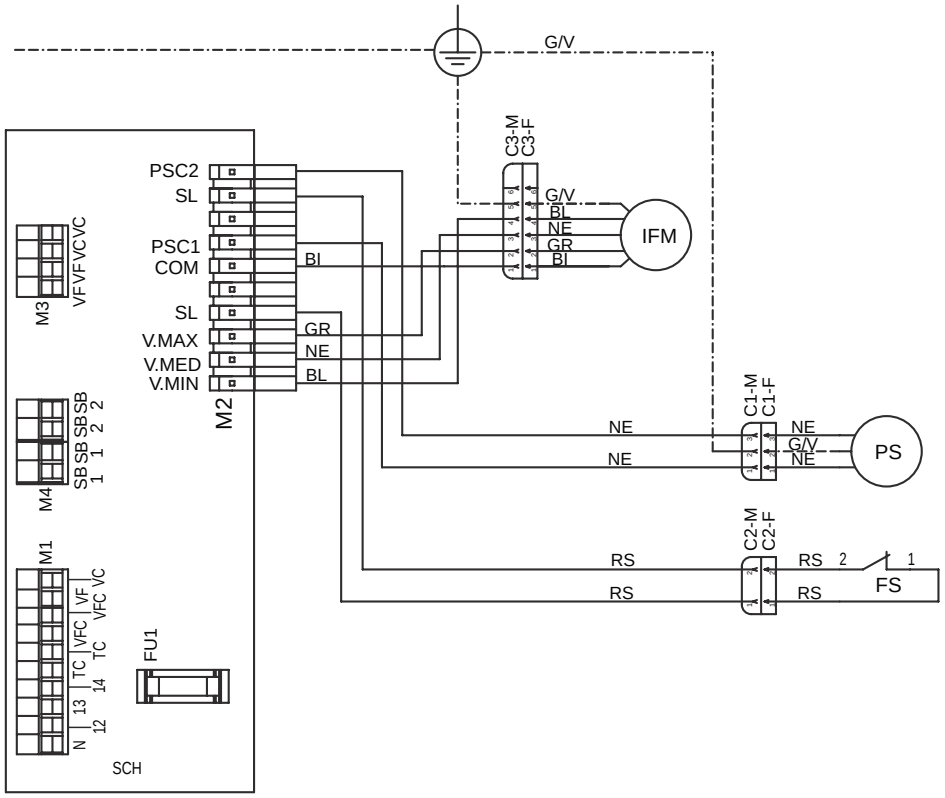


ELECTRICAL CONNECTIONS

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

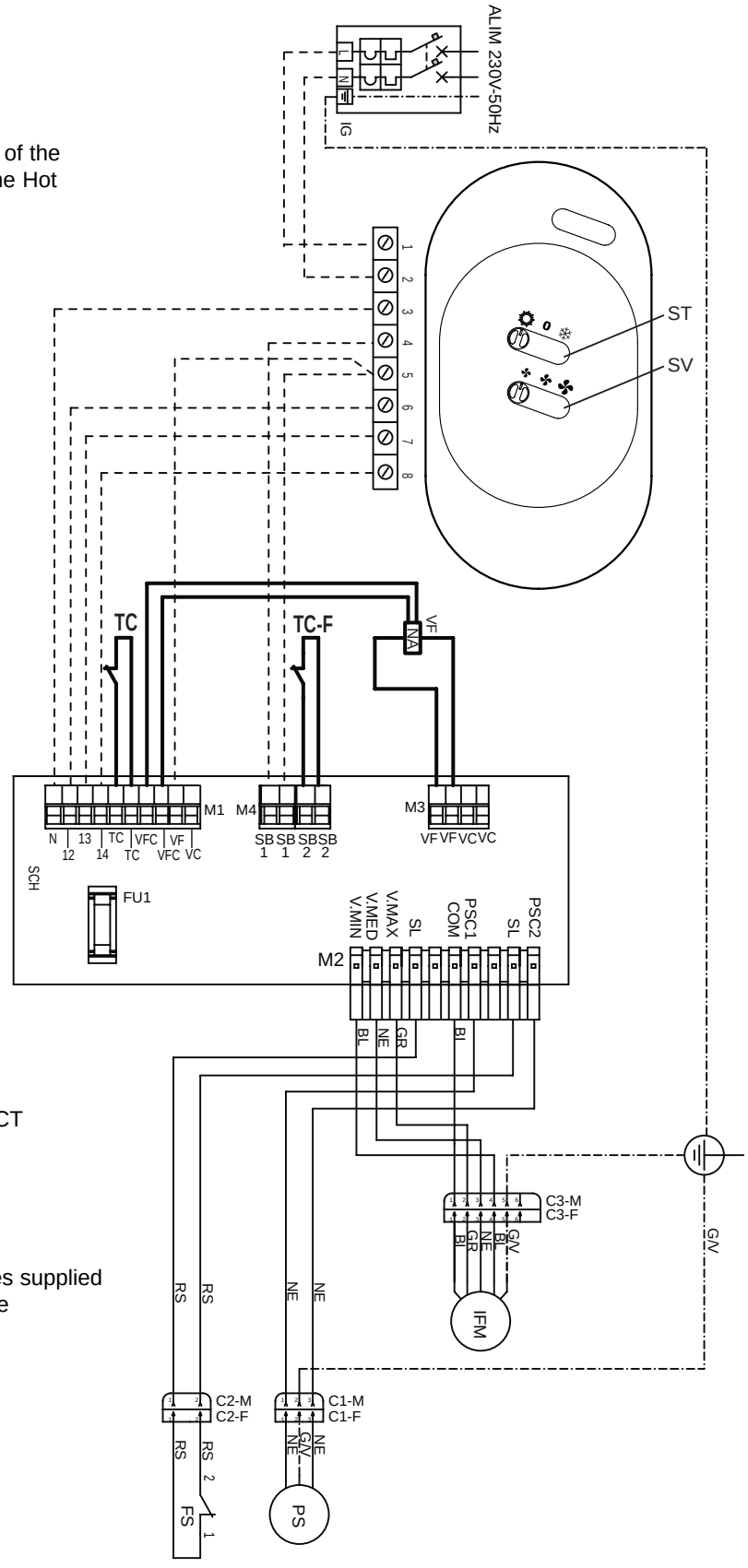
1 - Electrical Connections of the Commutator Control

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

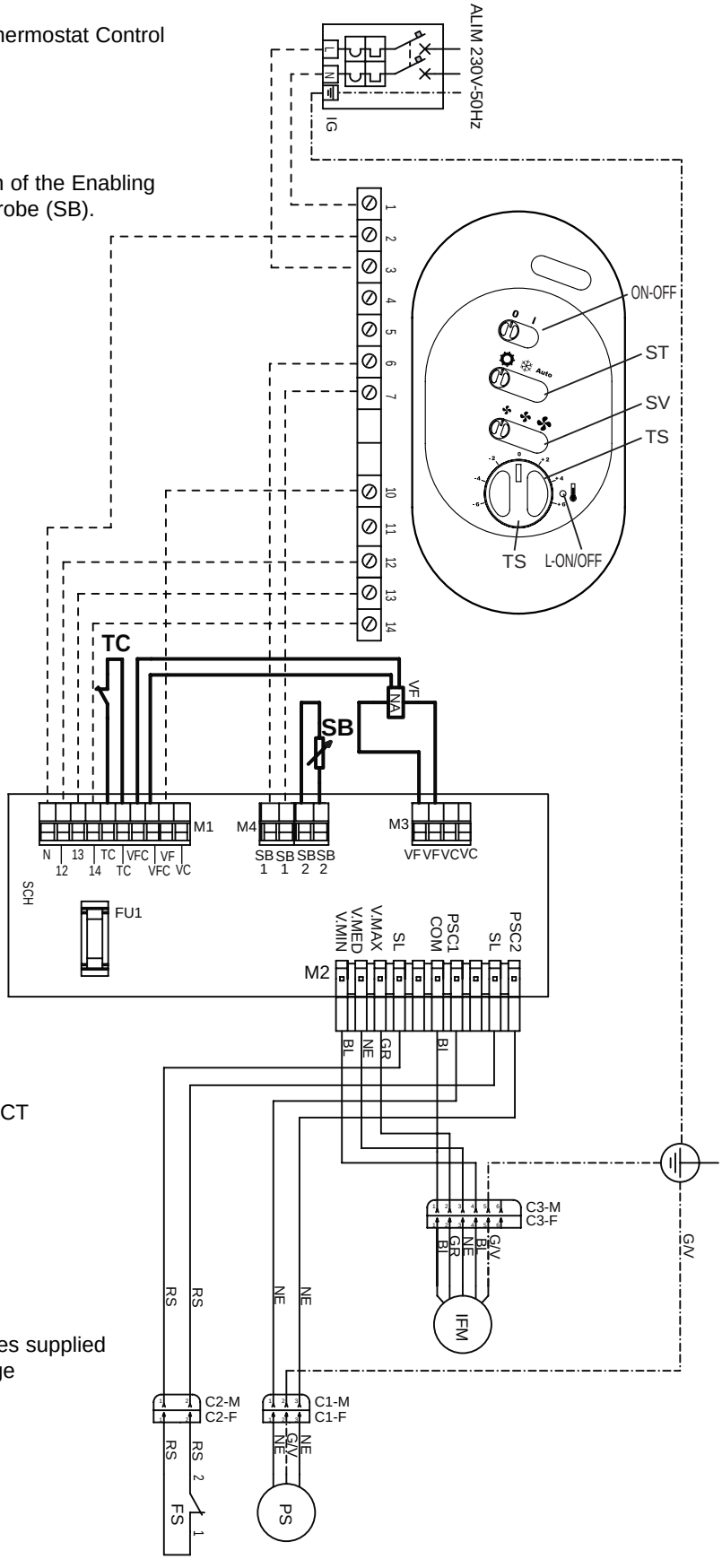
2 - Electrical Connections of the Basic Thermostat Control

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



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connections and cables at installer's charge

ELECTRICAL CONNECTIONS

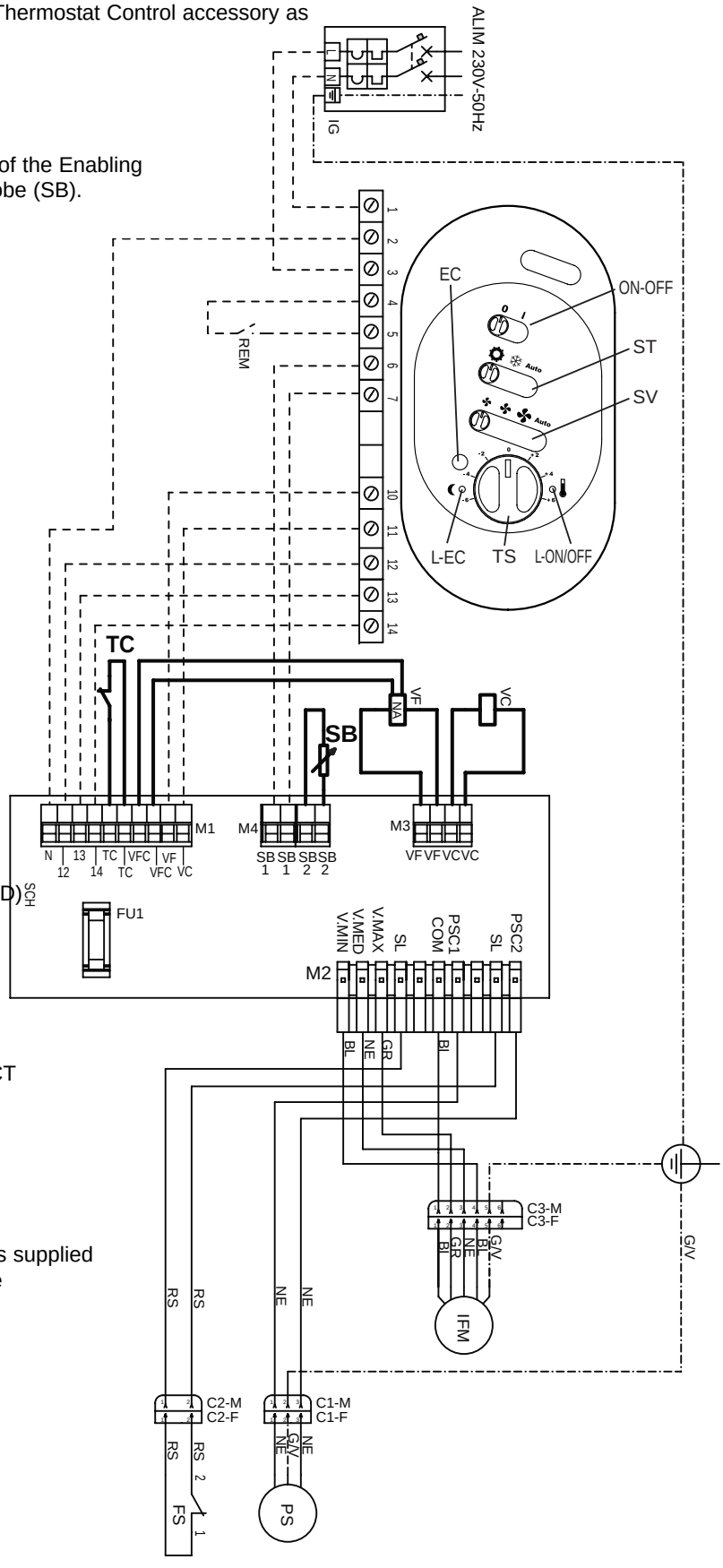
3 - Electrical Connections of the Evolved Thermostat Control

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



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Cod. 3QE20122

FERROLI S.p.A.
Via Ritonda, 78/a - 37047 San Bonifacio
VERONA (Italy)
Tel.045/6139411 (r.a.)
Fax 045/6100233 - 6100933 - Tlx 480172