

T-MATE DC

8 – 172 kW

**Dry coolers with axial fans.
Outdoor installation**



 AC AXIAL

The picture of the unit is indicative and may vary depending on the model

- OUTDOOR INSTALLATION
- AXIAL FANS WITH AC ELECTRIC MOTOR
- 3 SOUND LEVELS

Technical Bulletin: T_T-MATEDC_0618_GB

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MEHITS CERTIFICATIONS

SYSTEM CERTIFICATIONS



ISO 9001 CERTIFICATION – MEHITS S.p.A.
Quality Management System



ISO 14001 CERTIFICATION – MEHITS S.p.A.
Environmental Management System



BS OHSAS 18001 CERTIFICATION – MEHITS S.p.A.
Occupational Health and Safety Management System

PRODUCT CERTIFICATIONS BY COUNTRY



CE MARKING
MEHITS units are in compliance with the European Directives in force.



CCC – CQC CERTIFICATION
(People's Republic of China)



EAC CERTIFICATION
(Russian Federation, Belarus, Kazakhstan)



GENERAL CHARACTERISTICS

Dry coolers with axial fans and horizontal air flow.

The machines are made for outdoor installation.

The constructive solutions allow high application flexibility.

The series consists in 10 models with capacity from 8 to 172 kW

The series has an independent power supply from the indoor unit.
Among the indoor unit and the dry cooler is necessary only the electrical connection of the fan speed proportional control signal and the alarms.

PRODUCT FEATURES AND BENEFITS

- Suitable for any type of plant
- Independent power supply from the indoor unit;
- Horizontal air flow – from coil to fan.
- Vertical air flow (optional).
- 3 sound levels and quiet operation particularly suitable for applications in urban areas.
- Operating life of the project exceeding 10 years.

MODEL IDENTIFICATION

T-MATE DC-A STD M 14

T-MATE DC	Series
-A	Series with axial fans with AC electric motor
STD	Sound level STD – standard LNO – low noise (Nominal air flow at 85%) ELN - extremely low noise (Nominal air flow at 70%)
M	Power supply M – Single-phase T – Three-phases
14	Size

WORKING LIMITS

TEMPERATURE OF LIQUID TO BE COOLED	
-10°C	Minimum liquid temperature
60°C	Maximum liquid temperature
AMBIENT AIR TEMPERATURE	
-15°C	Minimum ambient air temperature
45°C	Maximum ambient air temperature
HYDRAULIC CIRCUIT	
10 Bar	Maximum operating pressure
POWER SUPPLY	
± 10%	Maximum tolerance of the supply voltage (V)

STORING TEMPERATURE



If the machine is not installed on receipt and is stored for a long time, store it in a protected place, at temperatures ranging between -30°C and 50°C in absence of superficial condensation and direct sun light.

MAIN COMPONENTS



FRAMEWORK

- Base, self-supporting frame and panelling in steel plate with protective surfaces treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and painted with epoxy powders.
- Colour: RAL 9002

FAN SECTION

- Axial fans with sickle-shaped blades, fan guard and optimized for low noise levels.
- AC electric motor with external rotor.
- Continuous variation of the rotation speed. The motor rotation control is obtained according to the 0÷10V proportional signal coming from the internal unit microprocessor control.
- IP54 enclosure class

AIR/WATER HEAT EXCHANGER

- Heat exchanger coil with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops. The combination of two factors, special tubes and fins, allow to optimally combine the following aspects:
 - Maximum capacity relative to the size of the exchanger.
 - Reduction of the air flow required for the heat exchange.
- Frame in galvanized steel.

ELECTRICAL PANEL

In accordance with EN60204-1 norms, suitable for outdoor installation, IP54 enclosure class, complete with:

- Terminals for power supply:
 - 230/1/50 for models "M"
 - 400/3+N/50 for models "T"Independent power supply from the indoor unit.
- Terminals for electrical connections:
 - 0÷10V signal for fans speed control system (connect to indoor machine).
 - alarm signal (connect to indoor machine).
- Fans speed regulator.

OPTIONAL ACCESSORIES

- Support legs for vertical air flow.

TECHNICAL DATA

MODEL		M 14	M 20	M 35	M 45	M 60
STD version						
CAPACITY (1)	kW	8,3	11,7	22,6	26,4	31,8
Air flow	m ³ /h	4500	6400	9100	12000	16000
Fans engaged power	kW	0,25	0,39	0,53	0,78	1,08
HEAT EXCHANGER						
Water flow	m ³ /h	1,5	2,1	4,0	4,7	5,7
Pressure drops	kPa	24	21	26	16	8
LNO version						
CAPACITY (1)	kW	7,3	10,4	19,8	23,3	28,0
Air flow	m ³ /h	3825	5440	7735	10200	13600
Fans engaged power	kW	0,21	0,33	0,45	0,66	0,92
HEAT EXCHANGER						
Water flow	m ³ /h	1,3	1,9	3,5	4,2	5,0
Pressure drops	kPa	19	17	21	13	6
ELN version						
CAPACITY (1)	kW	6,4	9,0	16,9	19,9	23,8
Air flow	m ³ /h	3150	4480	6370	8400	11200
Fans engaged power	kW	0,18	0,27	0,37	0,55	0,76
HEAT EXCHANGER						
Water flow	m ³ /h	1,1	1,6	3,0	3,6	4,3
Pressure drops	kPa	15	13	16	10	5
COMMON DATA						
POWER SUPPLY	V/ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
AXIAL FANS	n.	1	1	1	1	1
Max absorbed current (FLA)	A	0,7	1,8	2,9	3,6	5,7
External static pressure	Pa	0	0	0	0	0
HEAT EXCHANGER						
Water content	l	4,0	5,7	15,7	15,2	17,9
DIMENSIONS						
Length	mm	875	1200	1400	1600	1850
Width	mm	540	540	665	665	665
Height	mm	727	727	1027	1027	1027
NET WEIGHT	kg	56	73	122	156	191
HYDRAULIC CONNECTIONS						
Inlet / Outlet	R	1 1/4"	1 1/4"	1 1/2"	1 1/2"	2"

1. Referred to glycol solution inlet temperature 45°C (20% ethylene glycol); ambient temperature 35°C.

TECHNICAL DATA

MODEL		M 70	M 110	M 140	T 210	T 280
STD version						
CAPACITY (1)	kW	40,2	62,2	86,1	124,0	172,0
Air flow	m ³ /h	18000	27200	36000	54000	72000
Fans engaged power	kW	1,08	1,59	2,12	3,18	4,24
HEAT EXCHANGER						
Water flow	m ³ /h	7,2	11,1	15,4	22,1	30,8
Pressure drops	kPa	12	17	40	17	40
LNO version						
CAPACITY (1)	kW	35,3	54,8	75,9	109,0	152,0
Air flow	m ³ /h	15300	23120	30600	45900	61200
Fans engaged power	kW	0,92	1,35	1,80	2,70	3,60
HEAT EXCHANGER						
Water flow	m ³ /h	6,3	9,8	13,6	19,5	27,1
Pressure drops	kPa	10	14	32	14	32
ELN version						
CAPACITY (1)	kW	30,2	46,9	65,0	93,2	130,0
Air flow	m ³ /h	12600	19040	25200	37800	50400
Fans engaged power	kW	0,76	1,11	1,48	2,23	2,97
HEAT EXCHANGER						
Water flow	m ³ /h	5,4	8,4	11,6	16,7	23,3
Pressure drops	kPa	7	11	25	10	25
COMMON DATA						
POWER SUPPLY	V/ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50
AXIAL FANS	n.	2	3	4	6	8
Max absorbed current (FLA)	A	5,7	8,5	11,4	17,1	22,8
External static pressure	Pa	0	0	0	0	0
HEAT EXCHANGER						
Water content	l	25,1	37,7	72,8	75,3	100,4
DIMENSIONS						
Length	mm	2320	3490	4540	3490	4540
Width	mm	665	665	665	665	665
Height	mm	1140	1150	1150	2250	2250
NET WEIGHT	kg	219	227	359	533	708
HYDRAULIC CONNECTIONS						
Inlet / Outlet	R	2"	2"	2"	2 1/2"	3"

1. Referred to glycol solution inlet temperature 45°C (20% ethylene glycol); ambient temperature 35°C.

ACOUSTIC DATA

The series is available in 3 versions:

Standard units – STD: Standard noise level. No air flow reduction

Low Noise units – LNO: Reduced noise level. Nominal air flow reduction at 85%.

Extremely low noise units – ELN: Extremely reduced noise level. Nominal air flow reduction at 70%.

WARNING

It is pointed out that a reduction of air flow on the condenser coils causes a reduction in the capacity of the condenser and a greater energy engagement of the compressors.

STD VERSION

MODEL		M 14	M 20	M 35	M 45	M 60
Sound power level [Lw] (1)	dB(A)	76,8	79,1	81,8	82,4	84,5
Average sound pressure level [Lpm] (2)						
At 1m	dB(A)	63,0	65,0	67,0	67,4	69,4
At 5 m	dB(A)	51,3	53,5	56,1	56,6	58,7
At 10 m	dB(A)	45,6	47,9	50,5	51,1	53,2
MODEL		M 70	M 110	M 140	T 210	T 280
Sound power level [Lw] (1)	dB(A)	85,0	86,9	88,1	88,8	90,1
Average sound pressure level [Lpm] (2)						
At 1m	dB(A)	69,4	70,5	71,1	71,5	72,2
At 5 m	dB(A)	59,0	60,6	61,6	62,3	63,3
At 10 m	dB(A)	53,6	55,3	56,4	57,1	58,2

LNO VERSION

MODEL		M 14	M 20	M 35	M 45	M 60
Sound power level [Lw] (1)	dB(A)	72,9	75,2	77,9	78,5	80,7
Average sound pressure level [Lpm] (2)						
At 1m	dB(A)	59,1	61,1	63,1	63,6	65,5
At 5 m	dB(A)	47,4	49,7	52,2	52,7	54,8
At 10 m	dB(A)	41,7	44,0	46,6	47,2	49,3
MODEL		M 70	M 110	M 140	T 210	T 280
Sound power level [Lw] (1)	dB(A)	81,1	83,0	84,2	84,9	86,2
Average sound pressure level [Lpm] (2)						
At 1m	dB(A)	65,5	66,6	67,2	67,7	68,3
At 5 m	dB(A)	55,1	56,7	57,7	58,4	59,4
At 10 m	dB(A)	49,7	51,4	52,5	53,2	54,3

ELN VERSION

MODEL		M 14	M 20	M 35	M 45	M 60
Sound power level [Lw] (1)	dB(A)	68,2	70,6	73,3	73,9	76,0
Average sound pressure level [Lpm] (2)						
At 1m	dB(A)	54,5	56,5	58,5	58,9	60,8
At 5 m	dB(A)	42,8	45,0	47,5	48,1	50,2
At 10 m	dB(A)	37,1	39,4	42,0	42,6	44,7
MODEL		M 70	M 110	M 140	T 210	T 280
Sound power level [Lw] (1)	dB(A)	76,5	78,4	79,6	80,3	81,5
Average sound pressure level [Lpm] (2)						
At 1m	dB(A)	60,8	61,9	62,5	63,0	63,7
At 5 m	dB(A)	50,5	52,1	53,1	53,7	54,8
At 10 m	dB(A)	45,1	46,8	47,9	48,5	49,7

1. Sound power level [L_w] according to ISO EN 9614 - 2.
2. Average sound pressure level [L_{p,m}] according to ISO EN 3744

WATER QUALITY

For a correct and optimal functioning of the hydraulic circuits, a water quality must be guaranteed as indicated in the table below. The values shown in the table must be guaranteed during the entire life cycle of the machine.

	Description	Symbol	Range
1	Hydrogen Ions	pH	7.5 ÷ 9
2	Presence of calcium (Ca) and magnesium (Mg)	Hardness	4 ÷ 8.5 °D
3	Chlorine ions	Cl ⁻	< 150 ppm
4	Iron Ions	Fe ³⁺	< 0.5 ppm
5	Manganese Ions	Mn ²⁺	< 0.05 ppm
6	Carbon dioxide	CO ₂	< 10 ppm
7	Hydrogen sulphide	H ₂ S	< 50 ppb
8	Oxygen	O ₂	< 0.1 ppm
9	Chlorine	Cl ₂	< 0.5 ppm
10	Ammonia	NH ₃	< 0.5 ppm
11	Ratio between carbonates and sulphates	HCO ₃ ⁻ /SO ₄ ²⁻	> 1
12	Sulphate ions	SO ₄ ⁻	< 100 ppm
13	Phosphate ions	PO ₄ ³⁻	< 2.0 ppm

where: 1/1.78°D = 1°F with 1°F = 10 gr CaCO₃ / m³

ppm = parts for millions

ppb = part for billion

Explanatory notes:

- ref.1: A greater concentration of hydrogen ions (pH) than 9 implies a high risk of deposits, whereas a lower pH than 7 implies a high risk of corrosion.
- ref.2: The hardness measures the amount of Ca and Mg carbonate dissolved in the water with a temperature lower than 100°C (temporary hardness). A high hardness implies a high risk of deposits.
- ref.3: The concentration of chloride ions with higher values than those indicated causes corrosion.
- ref. 4 - 5 - 8: The presence of iron and manganese ions and oxygen leads to corrosion.
- ref.6 - 7: Carbon dioxide and hydrogen sulphide are impurities that promote corrosion.
- ref.9: Usually in water from the waterworks it is a value of between 0.2 and 0.3 ppm. High values cause corrosion.
- ref.10: The presence of ammonia reinforces the oxidising power of oxygen
- ref.11: Below the value shown in the table, there is a risk of corrosion due to the trigger of galvanic currents between copper and other less noble metals.
- ref.12: The presence of sulphates ions triggers corrosion phenomenon.
- ref.13: The presence of phosphates ions triggers corrosion phenomenon.

It is necessary to carry out periodic checks, with withdrawals at different points of the hydraulic system.

During the first year of operation, checks are recommended every 4 months which can be reduced every 6 months starting from the second year of operation.

WARNING:

It is necessary that, in the presence of dirty and / or aggressive waters, an intermediate heat exchanger is installed upstream of the heat exchangers

FANS SPEED CONTROL

The units are equipped with a fans speed control system by continuous variation of the rotation speed according to the 0=10V proportional signal coming from the internal unit microprocessor control. The units with AC fan are equipped with phase-cut electronic regulator for the rotation speed control.

The units with low noise emission LNO and ELN have the air flow rate reduced respect to the nominal one:

- LNO version: reduction at 85% of the nominal
- ELN version: reduction at 70% of the nominal

In severe operating conditions, such as with high ambient air temperatures, the speed control system bypasses the set of limiting air flow to provide the coil the maximum air flow.

Clearly this logic does increase the noise level of the unit but guarantees the indoor unit operation.

POWER SUPPLY

The power supply is independent from the indoor unit.

The supply line must be equipped with all the protections and controls required by current regulations.

ELECTRICAL CONNECTION WITH THE INDOOR UNIT

The electrical connection with the indoor unit is provided by the installer and must be made with a shielded cable 4 x 0.75mm².

The connections include:

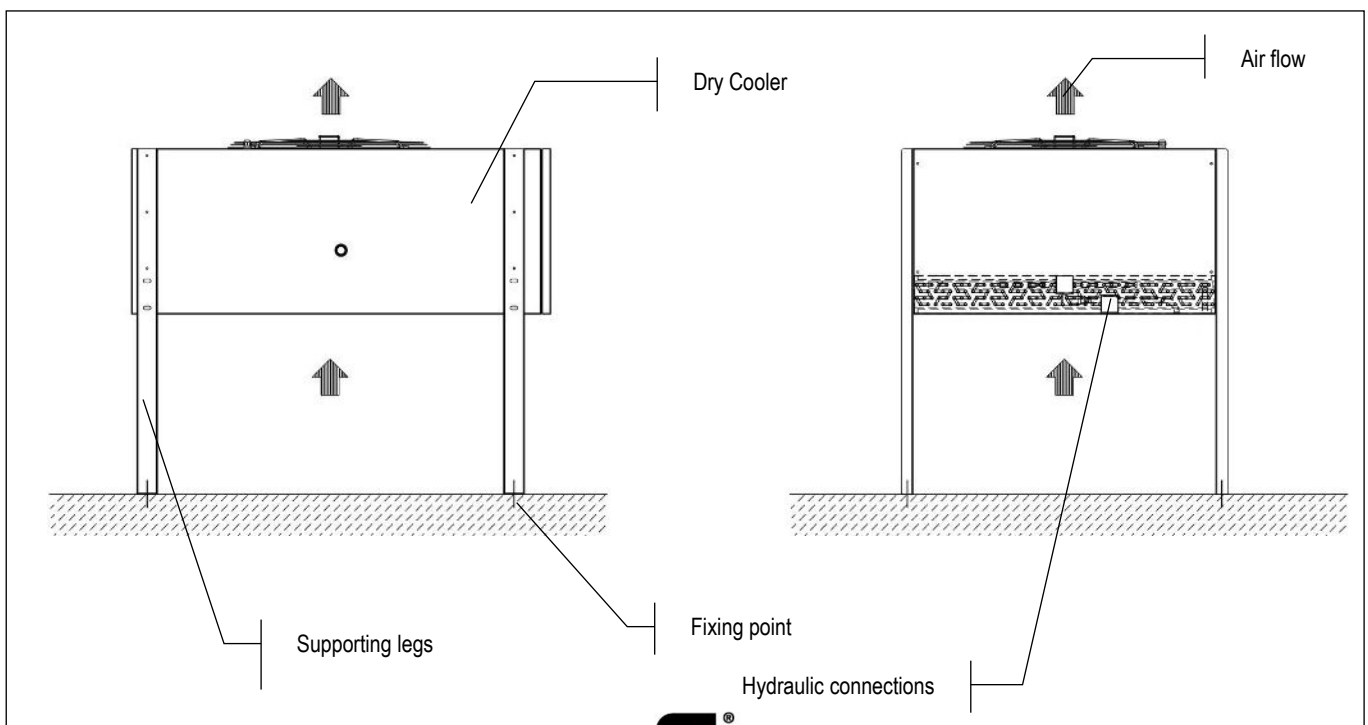
- Fan failure digital alarm to connect to the indoor unit terminals.
- 0-10Vdc proportional signal for fans speed control from the indoor unit controller

OPTIONAL ACCESSORIES: SUPPORTING LEGS FOR VERTICAL AIR FLOW

The units can be supplied with supporting legs for a vertical airflow.

The supporting legs are supplied in mounting kit

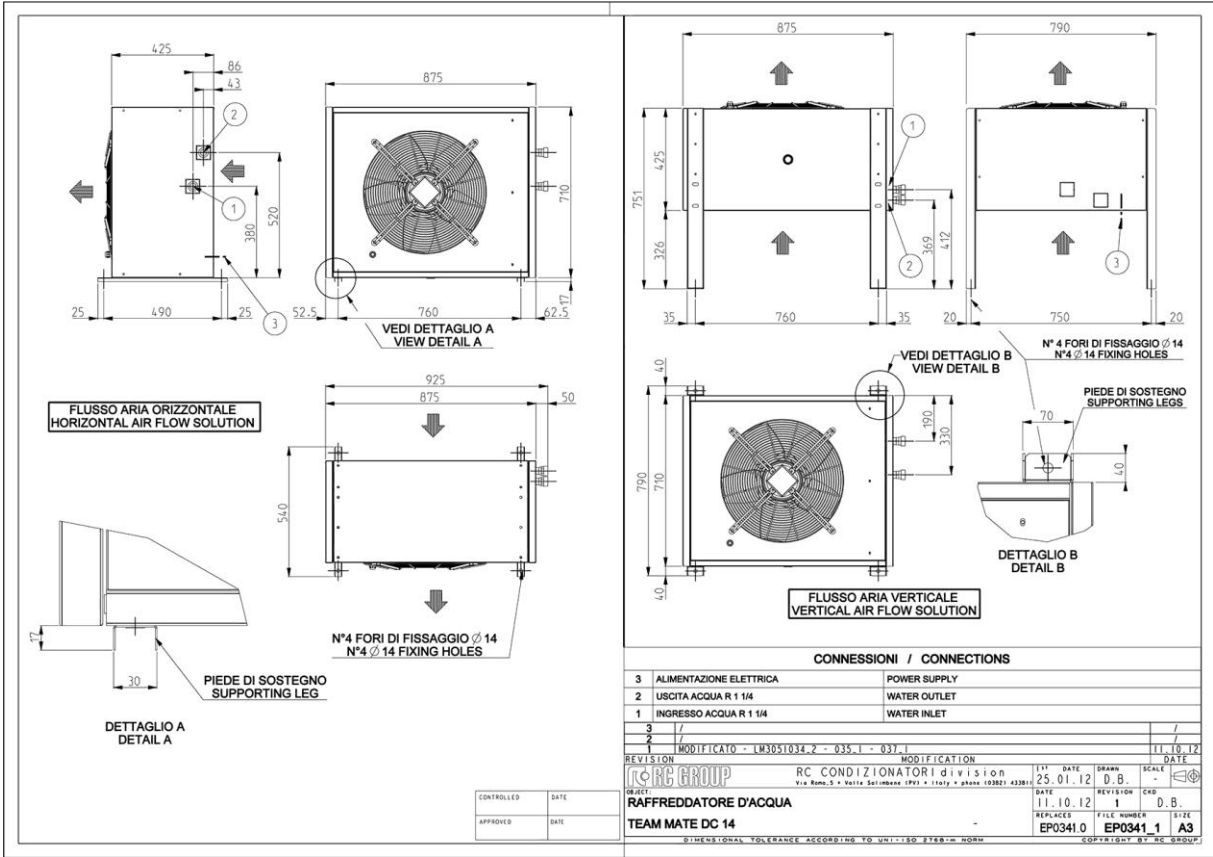
Always fix the unit to the floor



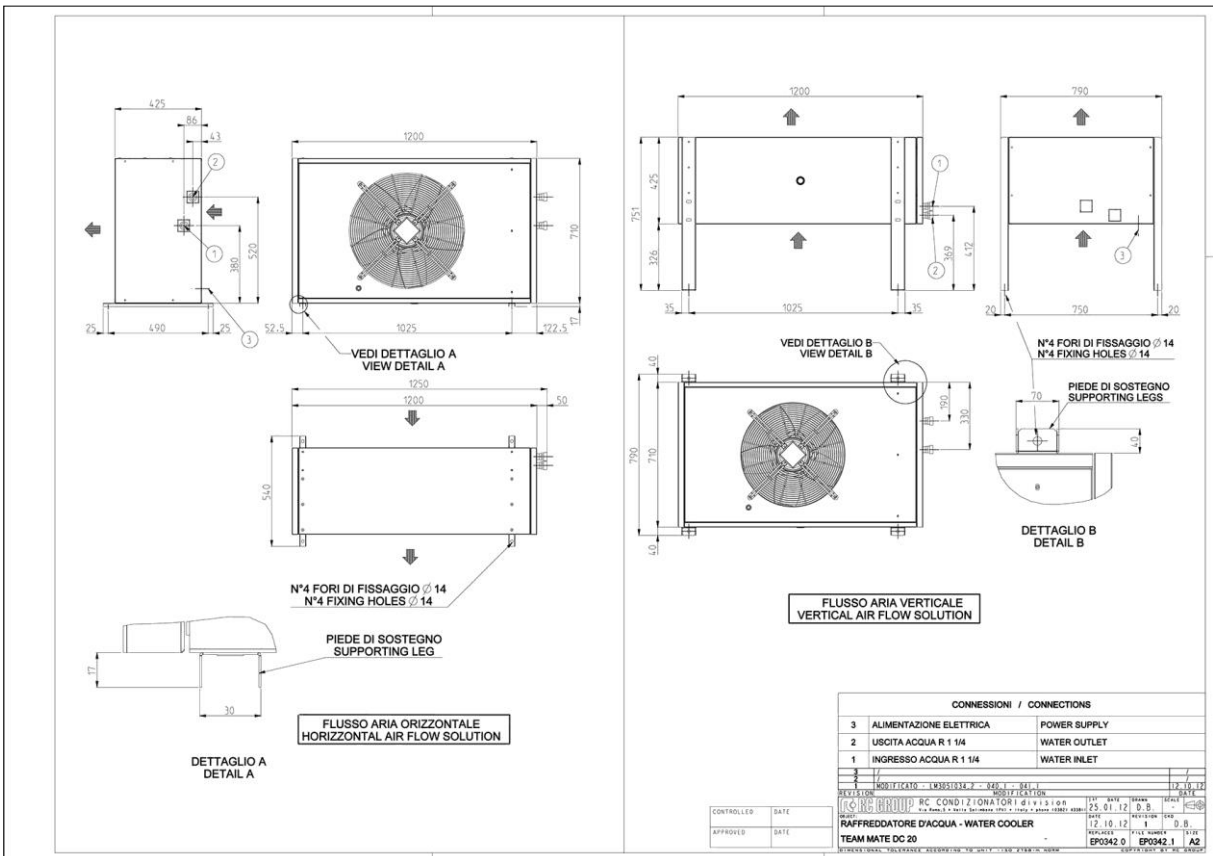
MACHINE DRAWINGS

Dimensions in mm

M 14

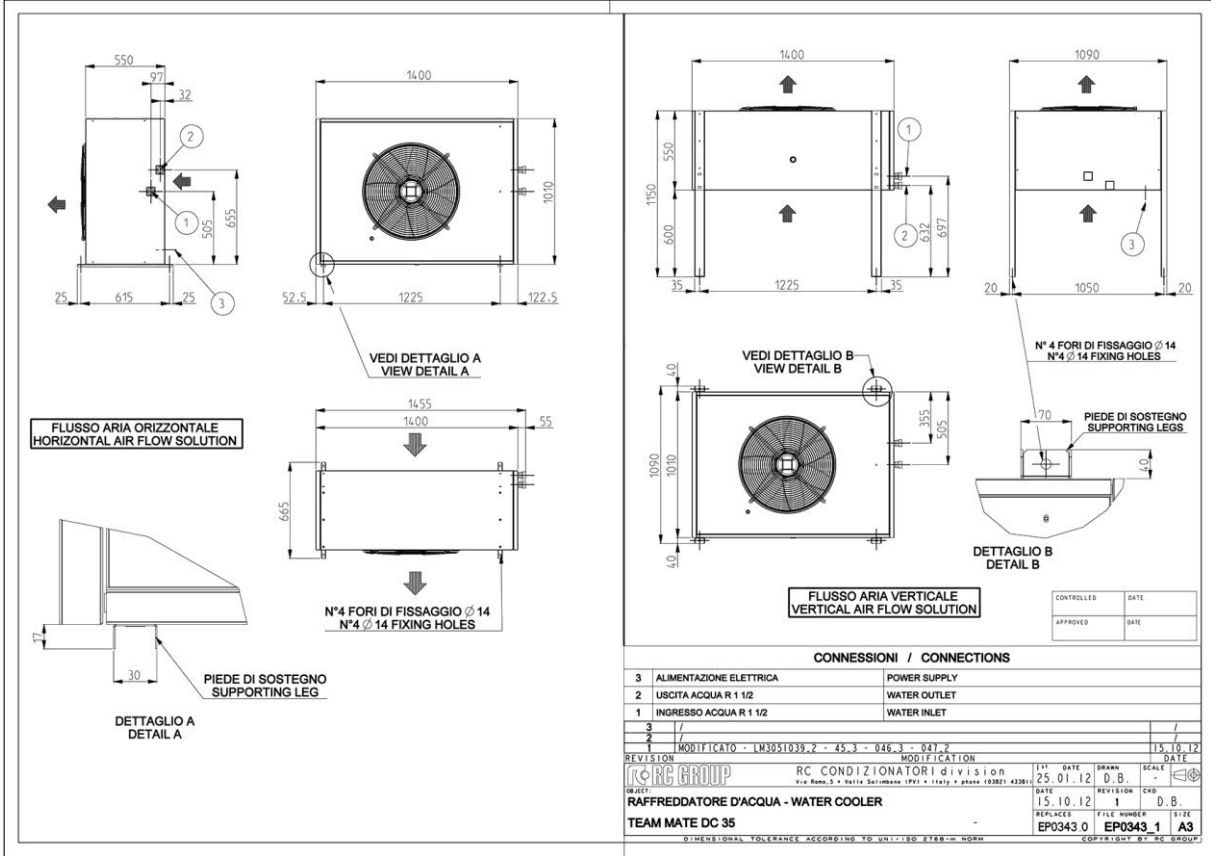


M 20

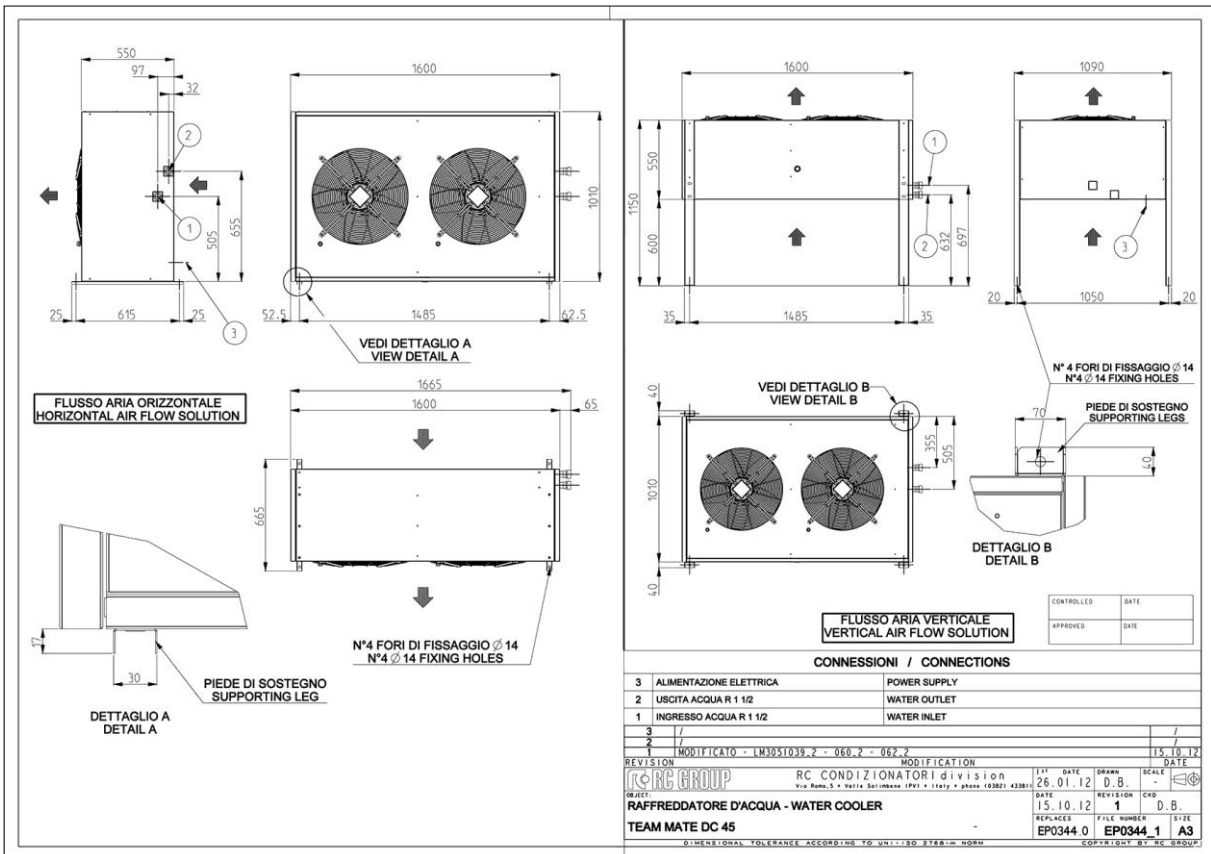


MACHINE DRAWINGS Dimensions in mm

M 35

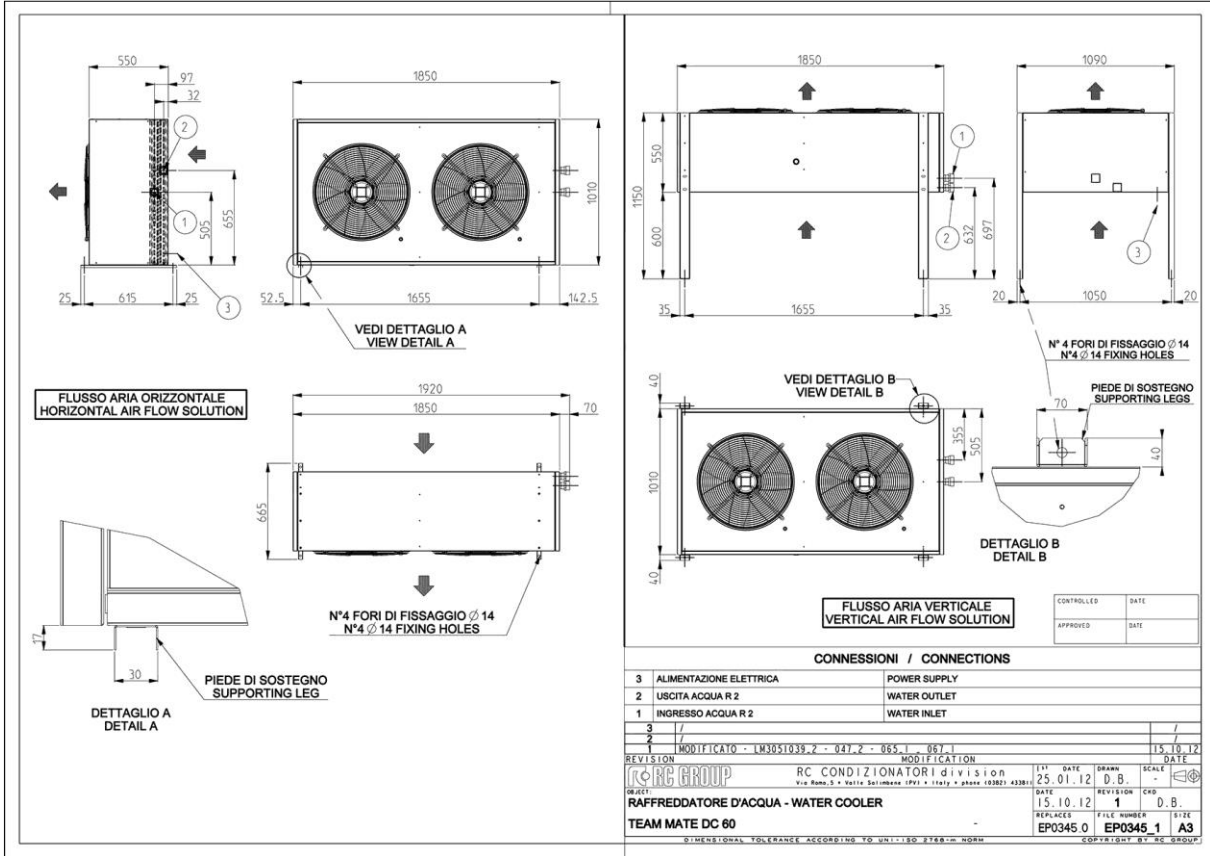


M 45

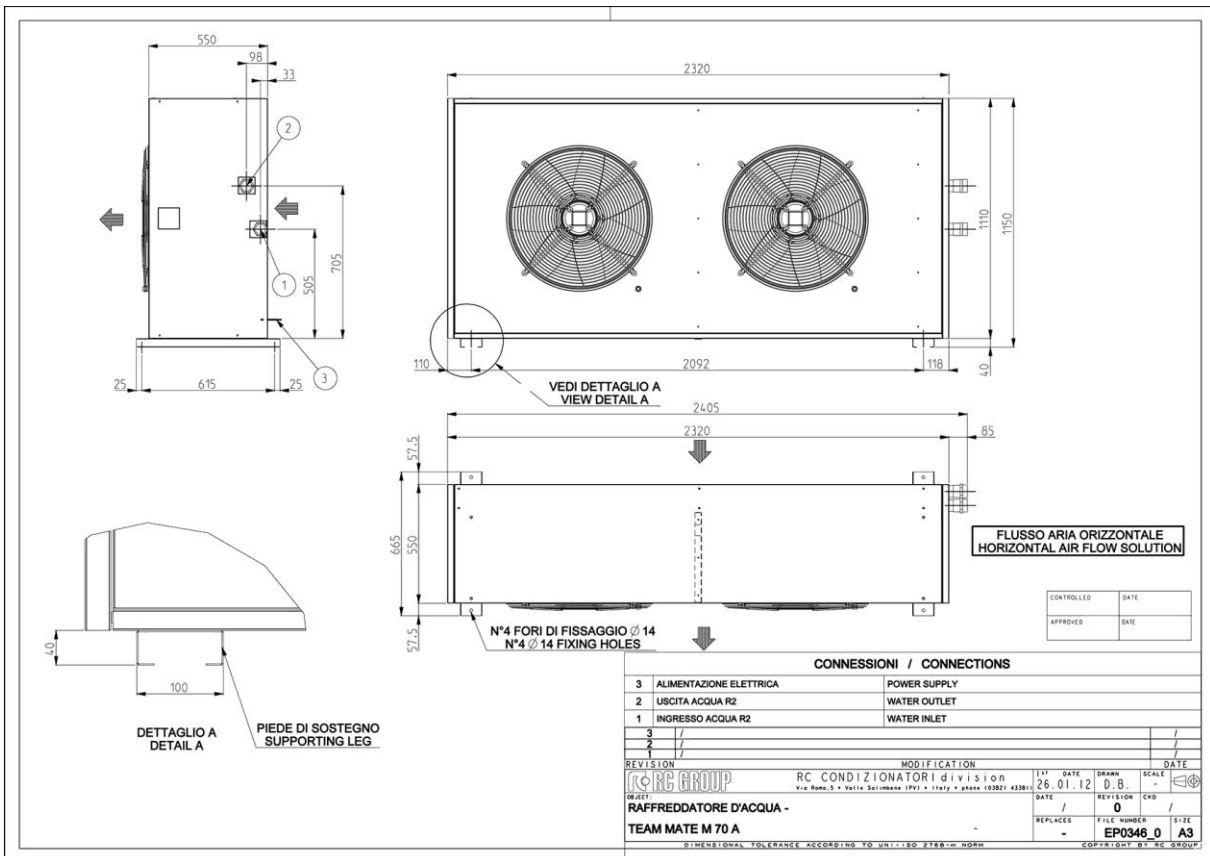


MACHINE DRAWINGS Dimensions in mm

M 60



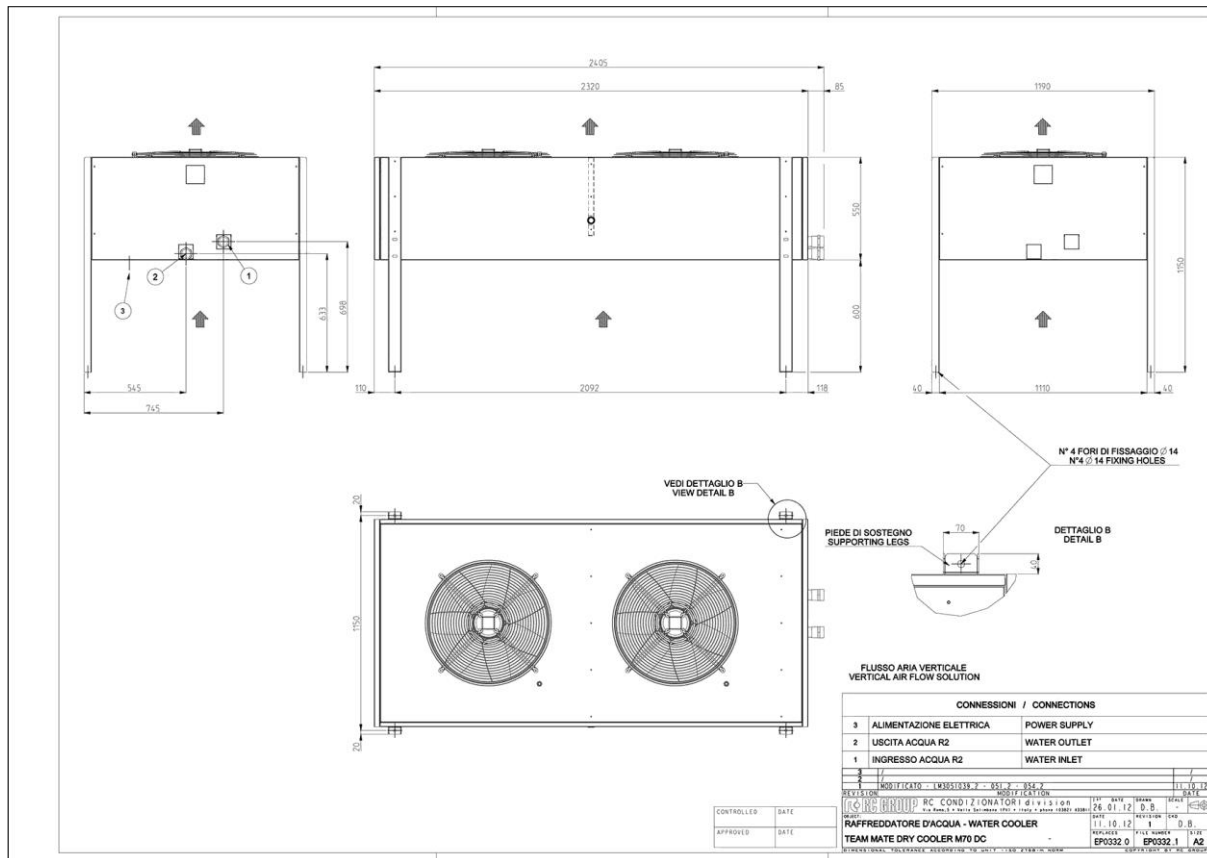
M 70 - HORIZONTAL AIR FLOW



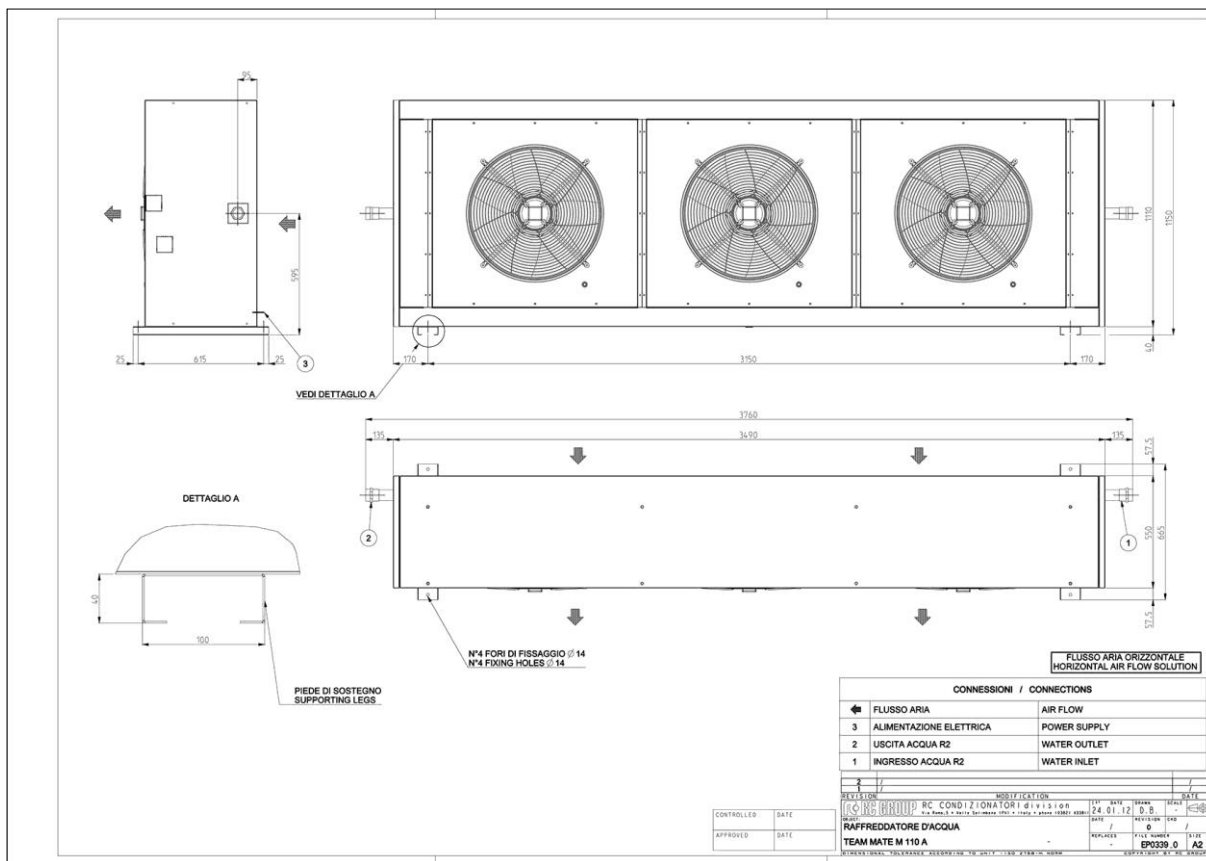
MACHINE DRAWINGS

Dimensions in mm

M 70 – VERTICAL AIR FLOW (OPTIONAL)



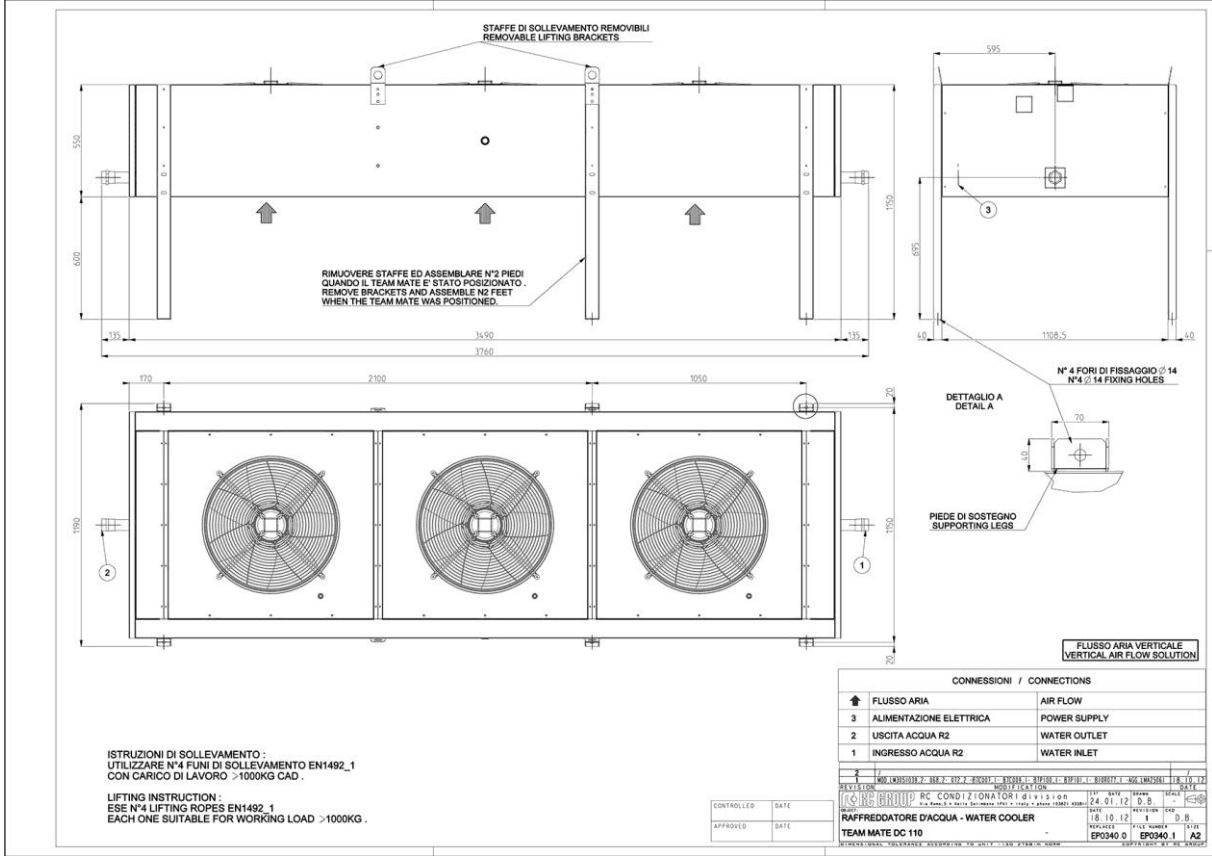
M 110 – HORIZONTAL AIR FLOW



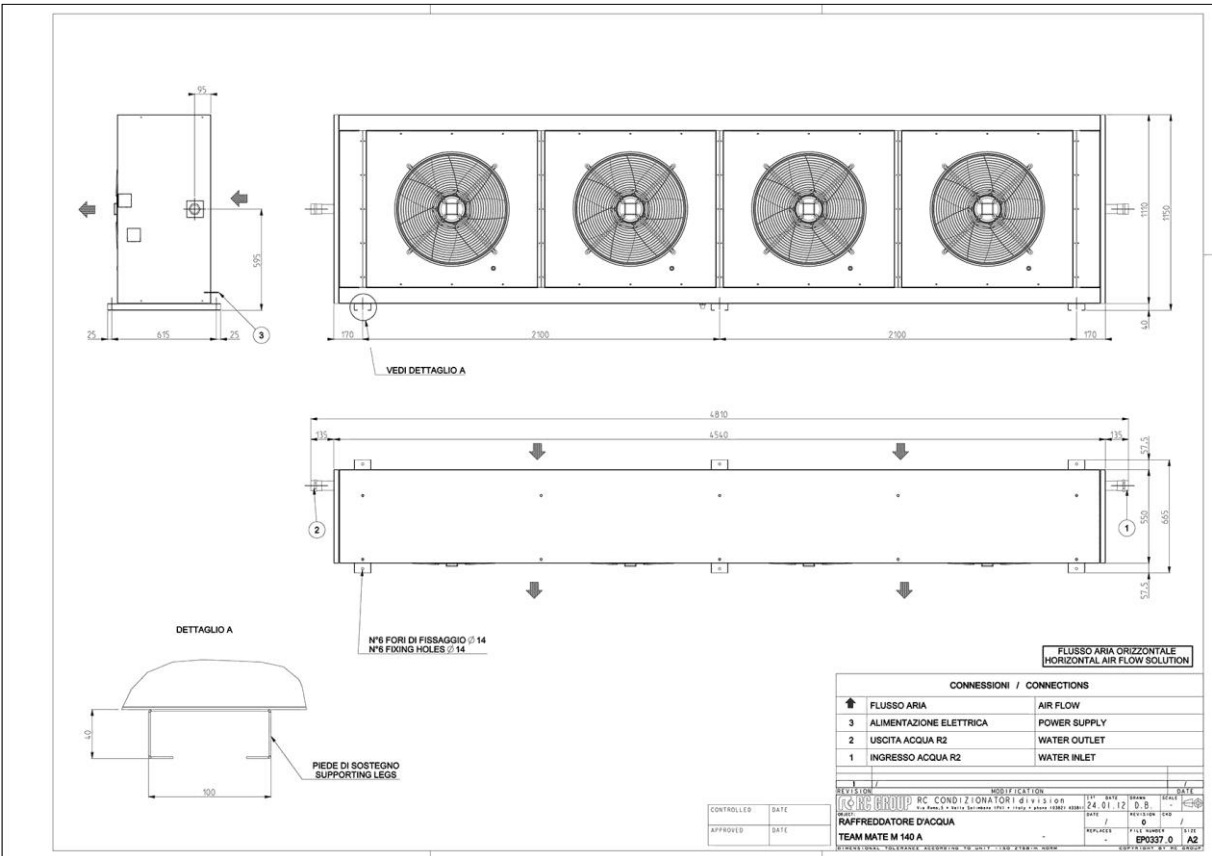
RC 11 COOLING

MACHINE DRAWINGS Dimensions in mm

M 110 – VERTICAL AIR FLOW (OPTIONAL)

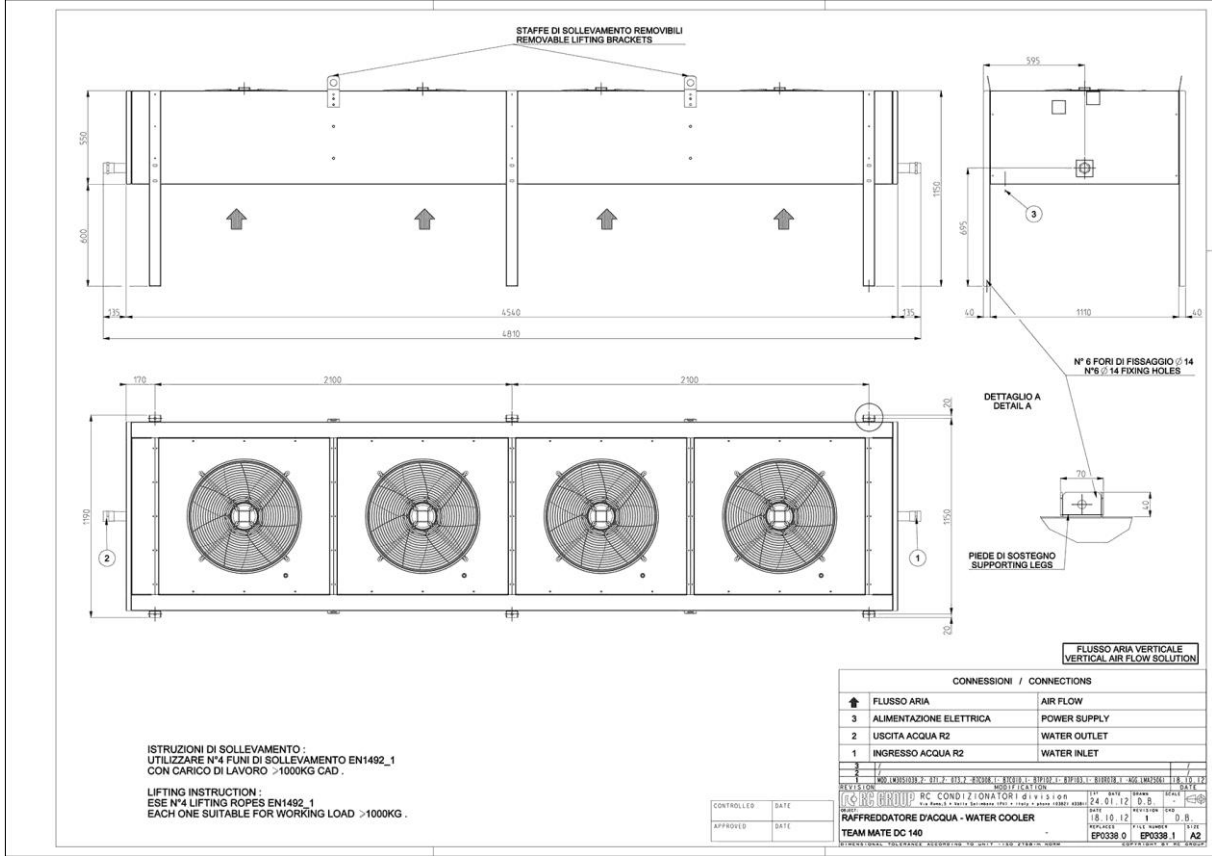


M 140 – HORIZONTAL AIR FLOW

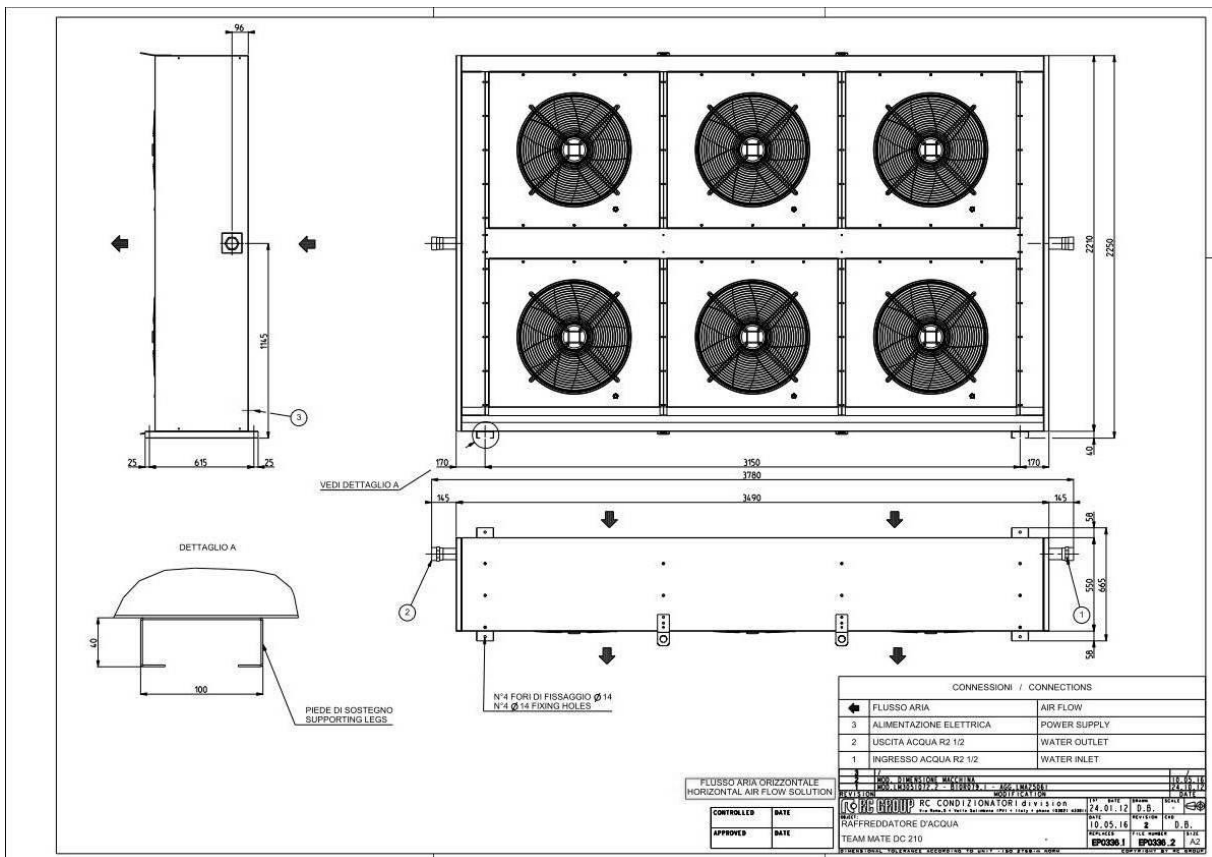


MACHINE DRAWINGS Dimensions in mm

M 140 – VERTICAL AIR FLOW (OPTIONAL)



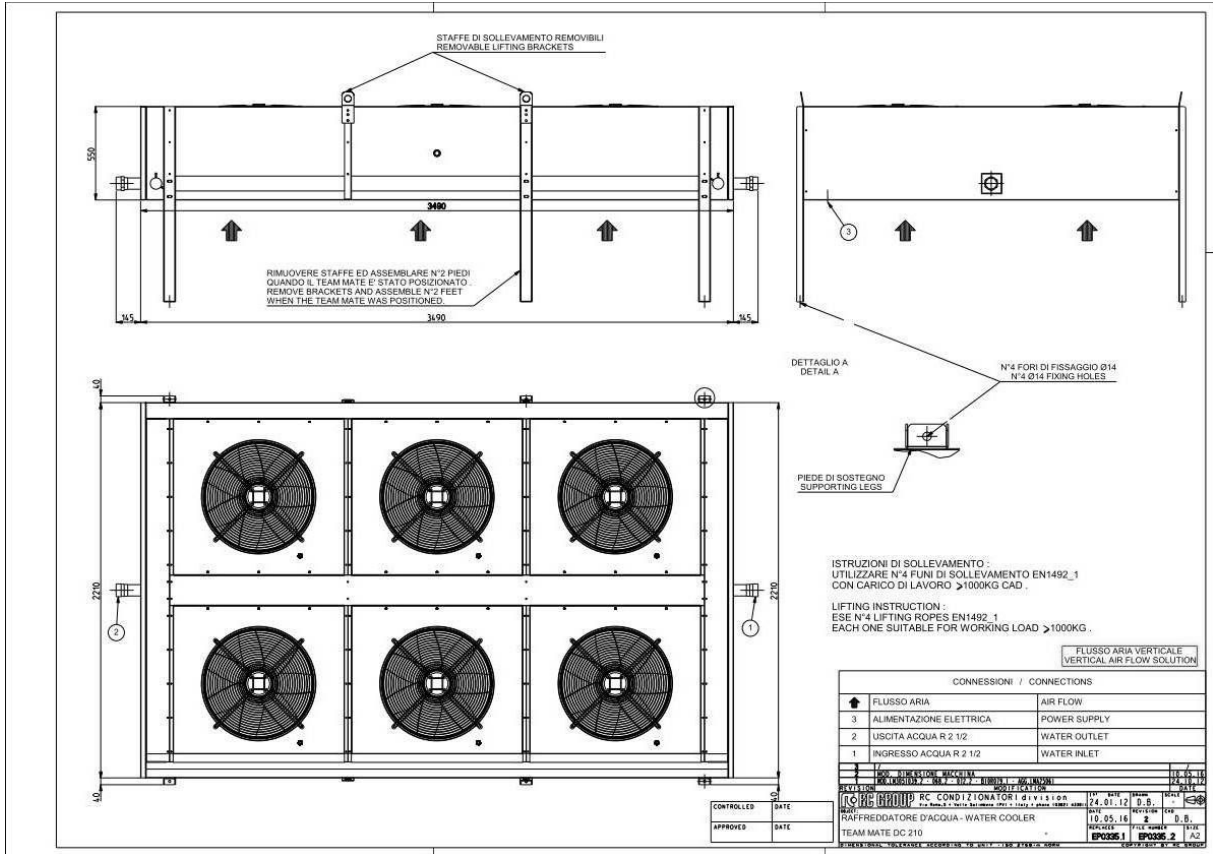
T 210 – HORIZONTAL AIR FLOW



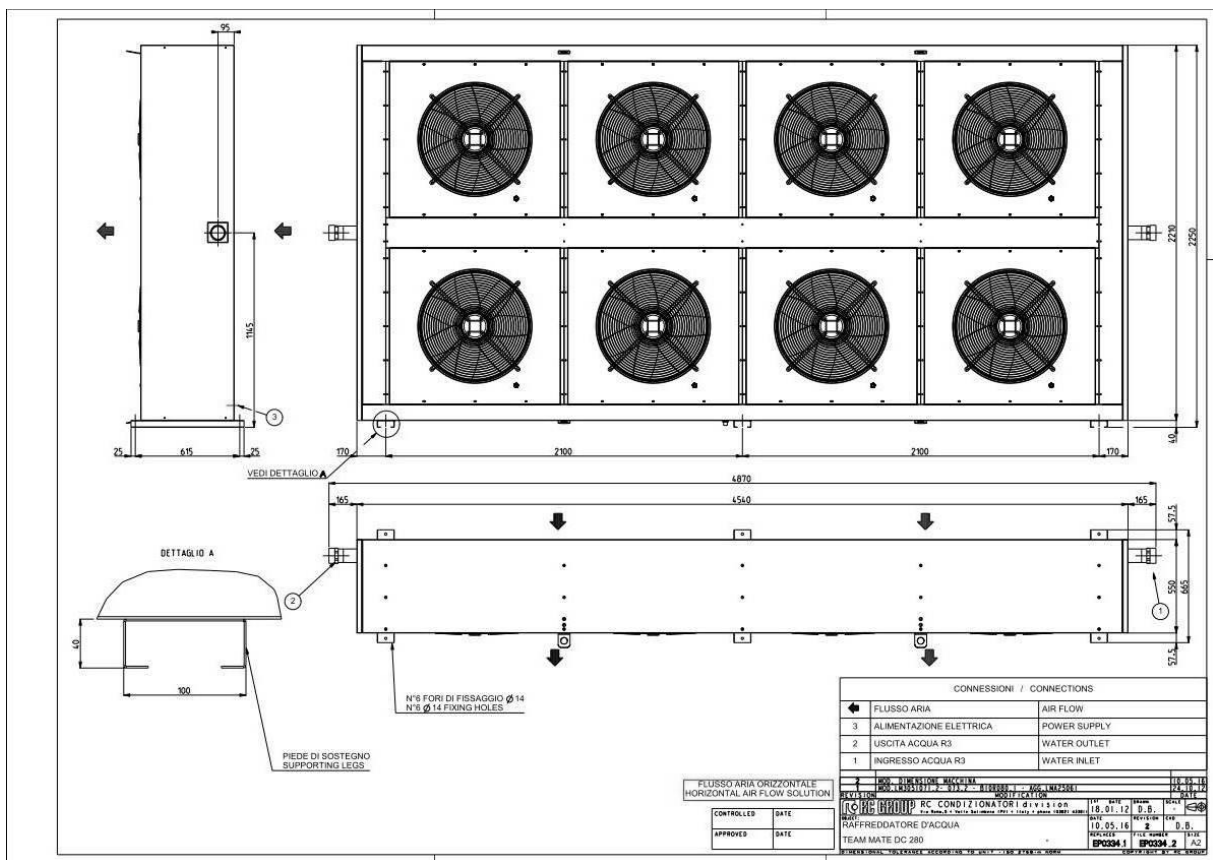
MACHINE DRAWINGS

Dimensions in mm

T 210 – VERTICAL AIR FLOW (OPTIONAL)



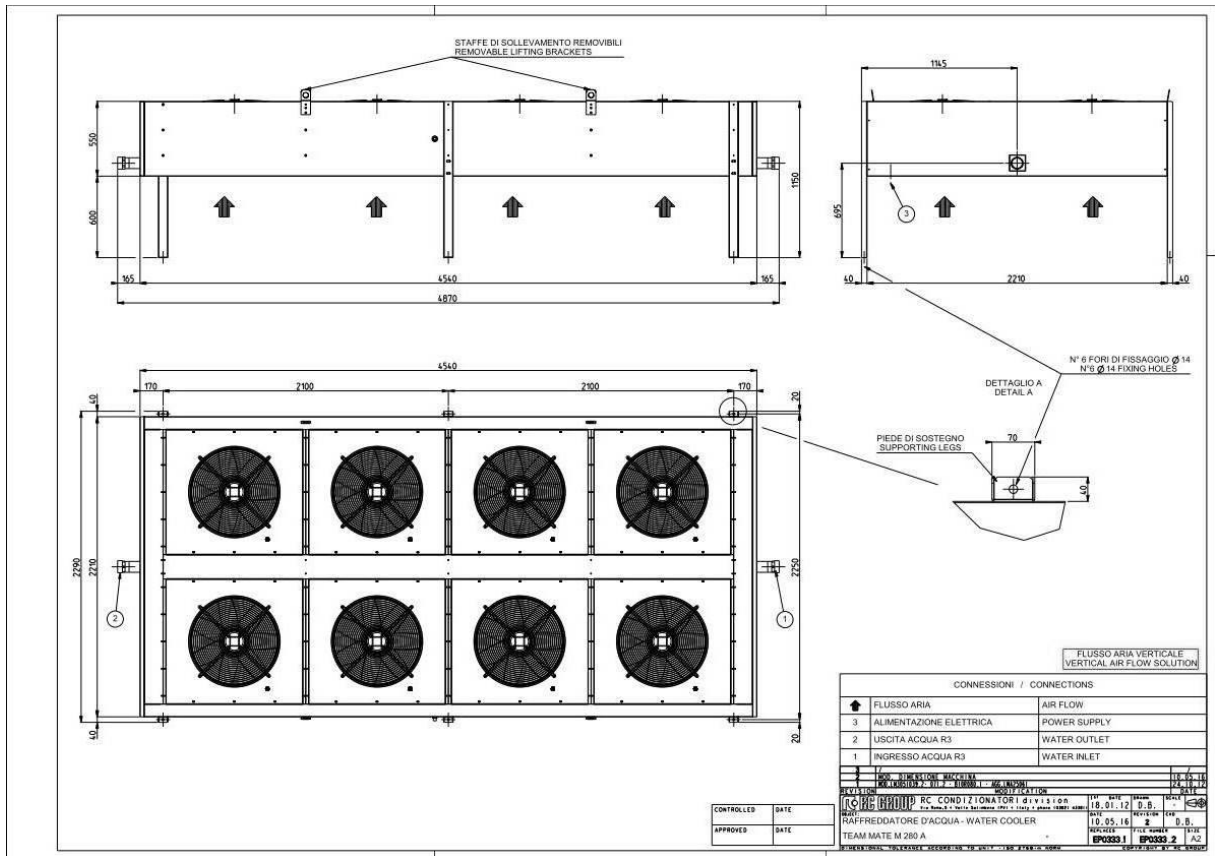
T 280 – HORIZONTAL AIR FLOW



T-MATE DC

MACHINE DRAWINGS Dimensions in mm

T 280 – VERTICAL AIR FLOW (OPTIONAL)





for a greener tomorrow

Eco-Changes è il motto per l'ambiente del gruppo Mitsubishi Electric ed esprime la posizione dell'azienda relativamente alla gestione ambientale. Attraverso le nostre numerose attività di business diamo un contributo alla realizzazione di una società sostenibile.



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