

Technical Manual – TC

Series TMC

Commercial condensers TKSmart

Manuale tecnico – TC

Serie TMC

Condensatori commerciali TKSmart

Technisches Handbuch – TC

Serie TMC

Gewerbe-Verflüssiger TKSmart

Manual técnico – TC

Serie TMC

Condensadores comerciales TKSmart

Manuel Technique – TC

Serie TMC

Condenseurs Commerciaux TKSmart

Podręcznik techniczny - TC

Seria TMC

Skraplacze serii TKSmart

MT TC R MC GEN 04 2017

THE ORIGINAL VERSION OF THESE
INSTRUCTIONS IS IN ITALIAN

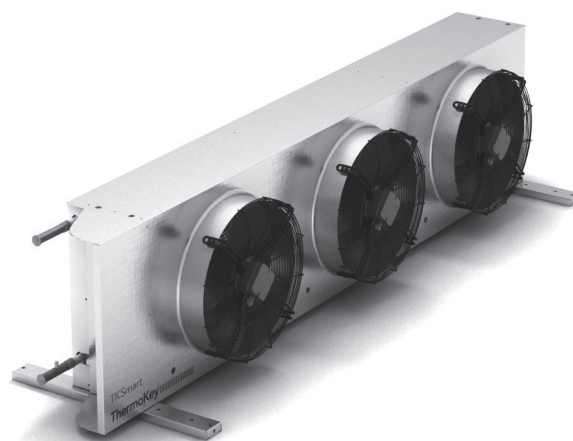
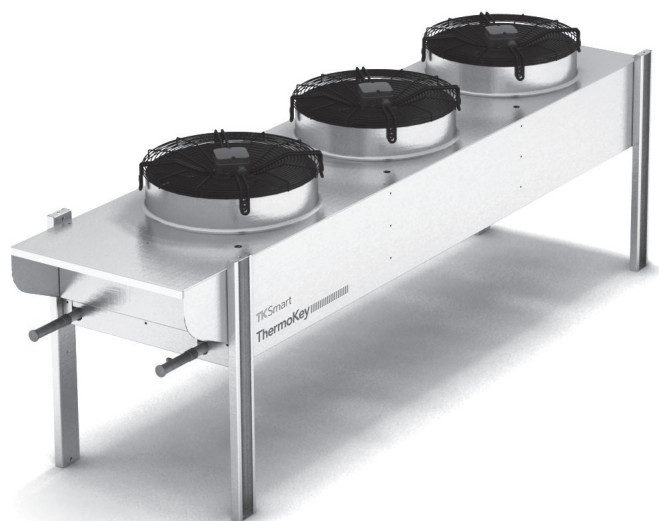
LANGUAGES SUMMARY

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ThermoKey®
Heat Exchange Solutions

Technical Manual TC

Series TMC
Commercial condensers TKSmart



MT TC R MC EN 04 2017

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PLEASE READ CAREFULLY AND FULLY UNDERSTAND ALL INFORMATION CONTAINED IN THESE INSTRUCTIONS PRIOR TO THE DESIGN AND IN ANY CASE BEFORE ANY HANDLING, UNPACKING, ASSEMBLING, POSITIONING AND COMMISSIONING OF THE UNIT. THE MANUFACTURER ACCEPTS NO RESPONSIBILITY FOR DAMAGES TO PERSONS OR PROPERTIES RESULTING FROM FAILURE TO FOLLOW THE INSTRUCTIONS CONTAINED HEREIN.



*The original version of this manual is in **Italian**, and it is available on the website:*

www.thermokey.com.

*The **English** translation is a true copy of the original document and it is available on the website:*

www.thermokey.com.

Translations in other languages may contain errors; if in doubt, always refer back to the original version in Italian or its translation into English.



ThermoKey S.p.A. Quality Management System is certified in conformity with ISO 9001, ThermoKey S.p.A. Environmental Management System is certified in conformity with ISO 14001 and Safe Management System is certified in conformity with OHSAS 18001.



SUMMARY

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TC 1. Directives references

The product described in this manual is compliant with:

MACHINERY DIRECTIVE 2006/42/EC

LOW VOLTAGE DIRECTIVE 2006/95/EC

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2004/108/EC

PED DIRECTIVE 97/23/EC (2014/68/UE STARTING FROM 19/07/2016)

ERP DIRECTIVE 2009/125/EC

TC 2. Hazards

Danger of electrocution. The product is equipped with electric fans with an operating nominal voltage of 400V AC three-phase or single phase 230V. The power supply lines must be fitted with protection systems against electric shock and equipment protection devices as required by law.



Risk of cutting. The heat exchanger, integral part of the product, is made of metal fins with unprotected sharp edges. The casing is made of metal sheet components that in some points may present unprotected sharp edges.



Danger of moving parts. The product is equipped with electric fans fitted with a protection grid as provided by law. For some products it could be possible to deliberately access moving parts (motor fan blades) from unprotected areas. Before any access, please make sure that moving parts do not constitute a hazard to operators.



Danger of squashing limbs or persons. During handling, transportation and installation, operation and maintenance, pay maximum attention to the indicated weight of each product to prevent tipping over or dangerous falls towards the operators.



TC 3. Warnings

TC 3.1

Contents of the Technical Manual of the Product:

GENERAL INSTRUCTIONS FOR SAFE USE (I.G.)

INSTRUCTIONS FOR HANDLING AND UNPACKING (I.M.)

INSTRUCTIONS AND TECHNICAL DATA (T.C.)

SPECIFIC INSTRUCTIONS FOR USE AND MAINTENANCE (I.S.)

TC 3.2

This manual is section TC called INSTRUCTIONS AND TECHNICAL DATA of the Technical Manual of the Product. For any information not covered in this manual, please refer to the other sections (I-II-IV) and, if in doubt, contact the Manufacturer.

TC 3.3

This manual is an integral part of the TMC model and as such it must be kept throughout the operational life of the product.

TC 3.4

Any additional technical documentation regarding non-standard products is attached to this manual, becoming an integral part of it and it is identified with a specific code indicated on the shipping documents.

TC 3.5

The product described in this manual is considered a **partly completed machine**, therefore not usable as supplied but is a component for air conditioning and refrigeration systems and must be installed and commissioned only by qualified operators (see chapter on installation and commissioning).

TC 3.6

Each product is supplied with EC Declaration of Incorporation

TC 3.7

Additional product documentation, consisting of catalogues, guides and technical bulletins, is provided directly by ThermoKey and is available on the website www.thermokey.com.

CATALOGUES – <http://www.thermokey.com/Cataloghi.aspx>

MANUALS – <http://www.thermokey.com/Manuali.aspx>

TC 4. Intended use

TC 4.1

The model must be used exclusively for the purpose indicated below, otherwise its use is considered improper and exempts the manufacturer from any responsibility.

TC 4.2

TKSmart series microchannel condensers are used as condensers in HVAC&R applications. The product is not provided with a dedicated subcooling circuit. The thermodynamic performances are defined in accordance with EN 327.

TC 4.3

The standard model is equipped with electrical fans **not** suitable to withstand additional static pressures.

TC 4.4

If in doubt regarding the intended use of the product, please contact the Manufacturer.

TC 5. Inspection, handling and transport

TC 5.1

Upon receipt of the product, check the integrity of the packaging and of the product; immediately notify any damage to the carrier. The packaging is manufactured in accordance with the model, the appropriate means of transport and the correct handling.

TC 5.2

During transport and handling of the packed product, avoid any excessive and improper stress on the package.

TC 5.3

During transport and handling of the packed product, use appropriate protection to avoid any injury caused by packaging parts such as nails, boards or cardboards and parts of the product such as fins or casing parts (see DPI Technical Manual Section I chapter IG 6).

TC 5.4

Unpack the product as close as possible to its installation site (see also installation and commissioning). In general the product must not be transported or handled without its original packaging.

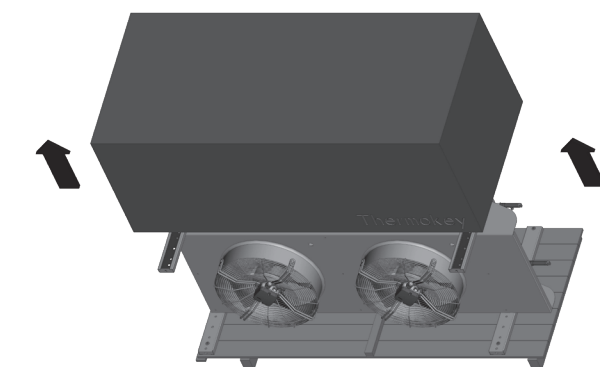
TC 5.5

During handling of the unpacked unit for installation, use protection to prevent injuries caused by sharp edges such as fins or casing parts (see DPI Technical Manual Section I chapter IG 6).

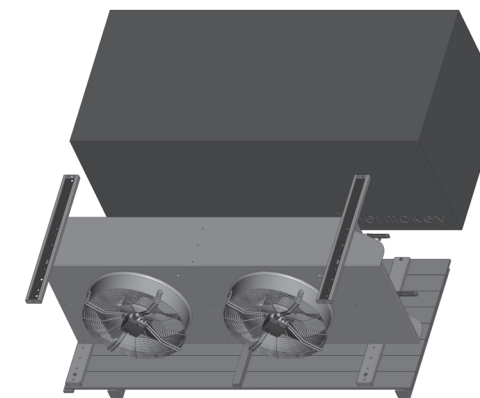
Please find below the unpacking procedure:



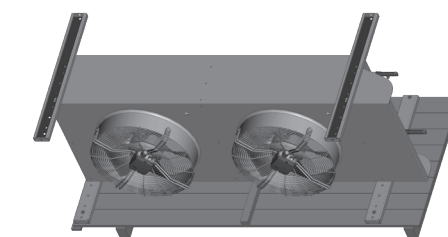
① TKSmart as shipped



② Remove the carton box



③ Remove the 4 screws



④ Please read the documentation attached for more information

TC 6. Installation and commissioning

TC 6.1

The installation and commissioning of the product must be performed by qualified and experienced personnel.

TC 6.2

Check that the support structures and anchoring devices comply with the weight and shape of the product (see chapter Dimensions and Technical Data).

TC 6.3

Fix the unit to all points provided (see chapter Dimensions) with adequate anchors and in accordance with the total weight (net weight of the product, weight of the refrigerant, weight of the heat exchanger, weight of any ice accumulation).

TC 6.4

The product is not designed to support additional loads.

TC 6.5

Check that the electrical supply complies with the specifications as indicated on the technical data label.

TC 6.6

Before connecting the product, verify the presence of shut-off and sectioning devices on the power supply line, protection against electric shock, protection of equipment and anything else required by law.

TC 6.7

If speed controllers are used for the electric fan, verify their compatibility. Non-compliant devices may generate noise and may damage the motors; the Manufacturer does not guarantee the rated performance for models equipped with speed controllers.

TC 6.8

Check that the operating condition limits (humidity, temperatures and pressure) meet the specific requirements of the product selection.

TC 6.9

Access to the installed unit, for any type of intervention, must be reserved to experienced personnel qualified to run the system, according to current regulations.

TC 7. General maintenance and control

TC 7.1

Before performing any maintenance work, make sure that the power supply line of the product has been sectioned: the electrical parts may be connected to automatic controls. All maintenance work should be performed by qualified and experienced personnel.

TC 7.2

The product mainly consists of a finned heat exchanger with microchannel technology, structural frame in aluminium metal sheets and electric fans.

TC 7.3

Periodically check the fixing points of the model, electrical connections and connections to the refrigerant line.

TC 7.4

Provide for periodic cleaning of the casing and the heat exchanger using suitable detergents or possibly water and soap with a neutral pH. Do not use harsh detergents, solvents, acidic or basic solutions containing mainly copper, chlorine or ammonia. Avoid the use of abrasives in general. If the use of sanitising products is required, check their compatibility with the materials. If in doubt, contact the Manufacturer, requiring the specification "how to use microchannel cores".

TC 7.5

Inspection and maintenance intervals depend on the type of plant, therefore are to be defined by experienced and qualified personnel.

TC 7.6

For any operation on the product not described in this manual, please contact the Manufacturer.

TC 7.7

Avoid carrying out on/off settings both on the air and the refrigerant side, if the air temperature is lower than -10 °C in order to avoid thermal shocks.

TC 7.8

The electric fans are equipped with a load-bearing protective grille to allow any replacement operations to be done completely from the outside.

TC 8. Wiring diagrams of fans

TC 8.1

The frame of each model is equipped with a ground terminal (PE) with an identification tag. **It is mandatory to connect the ground terminal of the unit to the plant or to the external conductor of the earthing system.**

TC 8.2

In models with wired electrical fans it is mandatory to connect **the protection conductors of the electrical fans to the plant or to the external conductor of the earthing system.**

TC 8.3

It is mandatory to use protection systems against electric shock and protection of the equipment on the power lines of the electrical fans. The fan assemblies are equipped with thermal contacts, normally closed, inserted in the motor windings. Connect the thermal contacts to protect the motor from overheating.

Warning: over-temperature may not directly arise from an over-current. **Please be aware that the temperature switch closes again itself when the temperature decreases without a manual reset.**

TC 8.4

Strictly follow the wiring diagrams in order to avoid damage to the motors (a, b, c.....)

TC 8.5

For models fitted with non-standard electrical fans, please refer to the wiring diagrams and consumption indicated in the supplementary sheets and on the rating plate.

TC 8.6

Before using speed regulation systems for the electrical fans, check their compatibility, non-compatible controllers may generate noise and may damage the fans; the Manufacturer does not take any responsibility regarding the performance of the products equipped with control systems unless they are defined in the offer.

Electrical values of standard fans:

Diameter: 400 (M)	Diameter: 500 (D/Y)	Diameter: 500 (M)	Diameter: 630 (D/Y)
Nominal voltage: 230 V	Nominal voltage: 400 V	Nominal voltage: 230 V	Nominal voltage: 400 V
Frequency: 50 H	Frequency: 50 H	Frequency: 50 H	Frequency: 50 H
Rpm: 1430 rpm	Rpm: 1340/1060 rpm	Rpm: 1300 rpm	Rpm: 1340/1070 rpm
Power: 160 W	Power: 710/480 W	Power: 680 W	Power: 1900/1350 W
Current: 0,73 A	Current: 1,4/0,8 A	Current: 3,0 A	Current: 3,2/2,2 A

For other versions of fans, please contact ThermoKey.

TC 9. Dimensions — Technical Data

1X400 LL – 2X400 LL – 3X400 LL

Model	Weight	Volume	Connection	Size horizontal air flow	Size vertical air flow
TMCH1140HLLM	35 kg	1,6 dm ³	IN 1 x 22 mm	W 780 mm	
			OUT 1 x 22 mm	H 644 mm L 1067 mm	
TMCH1240HLLM	65 kg	2,4 dm ³	IN 1 x 22 mm	W 780 mm	
			OUT 1 x 22 mm	H 644 mm L 1817 mm	
TMCH1340HLLM	95 kg	3,2 dm ³	IN 1 x 28 mm	W 780 mm	
			OUT 1 x 28 mm	H 644 mm L 2567 mm	
					Scale 1:20

1X500 LL – 2X500 LL – 3X500 LL

Model	Weight	Volume	Connection	Size horizontal air flow	Size vertical air flow
TMCH1150HLLD TMCH1150HLLY TMCH1150HLLM	38,5 kg	1,6 dm ³	IN 1 x 22 mm	W 780 mm	
			OUT 1 x 22 mm	H 644 mm L 1067 mm	
TMCH1250HLLD TMCH1250HLLY TMCH1250HLLM	72 kg	2,4 dm ³	IN 1 x 22 mm	W 780 mm	
			OUT 1 x 22 mm	H 644 mm L 1817 mm	
TMCH1350HLLD TMCH1350HLLY TMCH1350HLLM	105,5 kg	3,2 dm ³	IN 1 x 28 mm	W 780 mm	
			OUT 1 x 28 mm	H 644 mm L 2567 mm	
					Scale 1:20

1X500 UU – 2X500 UU

Model	Weight	Volume	Connection	Size horizontal air flow	Size vertical air flow
TMCH1150HUUD TMCH1150HUUY TMCH1150HUUM	56 kg	2,8 dm ³	IN 1 x 22 mm	W 875 mm	
			OUT 1 x 22 mm	H 943 mm L 1347 mm	
TMCH1250HUUD TMCH1250HUUY TMCH1250HUUM	96 kg	4,4 dm ³	IN 1 x 28 mm	W 875 mm	
			OUT 1 x 28 mm	H 943 mm L 2347 mm	
					Scale 1:20

1X630 UU – 2X630 UU

Model	Weight	Volume	Connection	Size horizontal air flow	Size vertical air flow
TMCH1163HUUD TMCH1163HUUY	63 kg	2,8 dm ³	IN 1 x 28 mm	W 875 mm	
			OUT 1 x 28 mm	H 943 mm L 1347 mm	
TMCH1263HUUD TMCH1263HUUY	110 kg	4,4 dm ³	IN 1 x 28 mm	W 875 mm	
			OUT 1 x 28 mm	H 943 mm L 2347 mm	
					Scale 1:20

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