cooling & heating

OPERATING MANUAL

TITLE CoolMaster K2 Series

REVISION C

DTE.eu

cooling & heating

OPERATING MANUAL *(Translation of the original instructions)* **EN**

INDEX

Disclaimer

The manufacturer reserves the right to change parts at any time to change, without prior or immediate notice to the customer. The contents of this manual may also be changed without prior warning. This is an original manual, and is valid for the machine in its standard version. For information on adjustments, maintenance and repair insofar as this guide does not provide it, please contact the technical department of your supplier. This manual was drawn up with the greatest possible care, however the manufacturer cannot accept any liability for any errors in this book or any consequences thereof. Finally, this manual is a personal and confidential communication to the user. No part of this publication may be reproduced, copied, altered or transmitted in any form or in any manner whatsoever without written permission from Dutch Thermal Engineering B.V.

1 Safety instructions and warnings

Always observe the following safety instructions and warnings!

WARNING!
Warning of possible damage to the device, environment or user

WARNING!
Warning of electricity and / or current threat

WARNING!
Warning of possible entrapment hazard

This user's manual was written for types similar to DTE ***CoolMaster K and N*** type machines. Therefore certain topics may not apply to your machine. For the same reason, the images may differ slightly from how your machine actually looks. The machine drawing is sent separately as an attachment with the correct dimensions and connections.
For more information about the different types of ***CoolMaster*** machines, see chapter §1.1.

Compliance with the technical manual is a prerequisite for fault-free operation and the honouring of any warranty claims. Therefore please read the technical manual carefully before you start working with your device! The manual must therefore be kept near the machine. The ***CoolMaster*** is under pressure with a refrigerant, more information about this can be found in appendix §9.10.

1.1 Correct applications

<u>ATTENTION!</u> In no way the machine can be stacked or overturned. This during transport and storing as well during repairs and commissioning. Even when the machine is not used it should be perpendicular at all times.

<u>ATTENTION</u>! Not following these instruction can cause big damage to the machine.

The ***CoolMaster K and N*** may only be kept inside a cool, well-ventilated, frost-free building!

The ***CoolMaster K*** is only suitable for tap water of drinking quality.

The ***CoolMaster N*** is only suitable for tap water of drinking quality, mixing with appropriate antifreeze (glycol) in suitable mixing ratio.

Please consult the relevant P&ID for information on the minimum and maximum environmental temperature, the right water-glycol ratio and the recommended type of glycol.

1.2 Incorrect applications

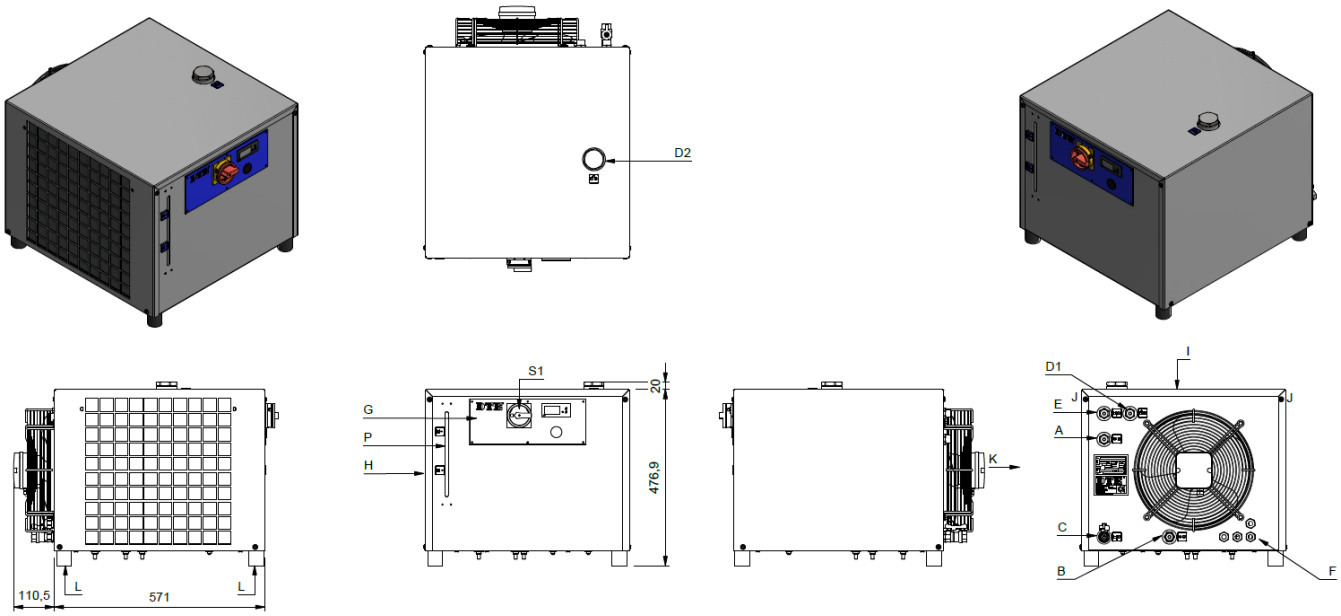
<u>CAUTION!</u> Application is prohibited:

- **In explosive atmospheres.**
- **In environments with hazardous oils, acids, gases, fumes, substances, radiation, etc.**
- **Corrosive environment.**

2 General description

The ***CoolMaster*** is a complete plug and play water cooler with integrated water cooler tank, pump, condenser and controls. Is built for perfect cooling in closed industrial process water systems.

CoolMaster sample drawing*:



Overview of the most common connections on the machine:

NOTE! POSITION THE COVER (I) BEFORE SWITCHING ON THE MACHINE!

A	=		Cooling water inlet, see P&ID
B	=		Cooling water outlet, see P&ID
C	=		Drainage water tank, see P&ID
D1	=		Filling water connection, see P&ID (not present on machines, specified as ***CoolMaster N***)
D2	=		Manual filling device, see P&ID
D2	=		Manual filling device, see P&ID (only present on machines, specified as ***CoolMaster N***)
E	=		Overflow water tank, see P&ID
F	=		Bushing coupling electrical supply cable
G	=		Control panel
H	=		Incoming condenser air
I	=		Removable cover
J	=		Fixing bolts cover
K	=		Air grille outgoing condenser air
L	=		Rubber legs
P / S	=		Sight glass
			Maximum water/glycol level
			Minimum water/glycol level
S1	=		Main switch

***The machine drawing is sent separately as an attachment with the correct dimensions and connections!**

2.1 Identification

The identification plate is located on the left next to the fan. (Figure 2.1)

A = Machine number/ serial number
B = Machine type
C = Voltage
D = Maximum Current
E = Number of phases
F = Frequency in Hz.
G = Refrigerant type
H = Refrigerant mass
I = Maximum ambient temperature
J = CO2 equivalent
K = GWP-values
L = Thermostat Temperature range
M = Maximum pressure
N = Compressor lubrication
O = Compressor oil volume
P = Built
Q = Weight
R = Cooling capacity

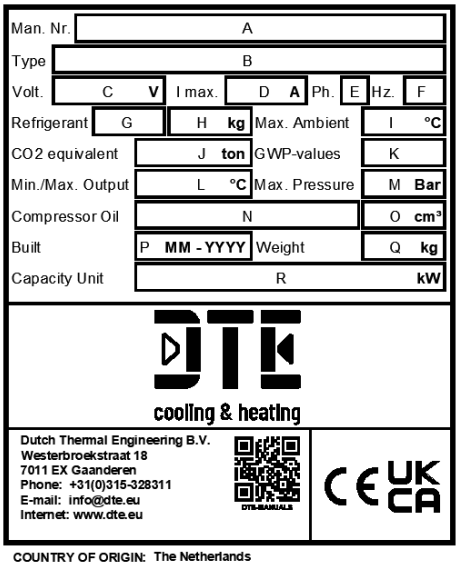


Figure 2.1

3 Transport and storage

These actions are general and have to been carried out, of course, if applicable for the application <u>by qualified personal!</u>

3.1 Draining water from CoolMaster K

For packaging, transport and storage, first follow the following steps;

Step 1: Switch the main switch (S1) on the control panel (G) off.

Step 2: Close the filling connection (D1) (not present on machines, specified as ***CoolMaster N***)

Step 3: Drain the water tank of the cooling system by opening the drainage valve.

Step 4: Dry clean all connections and water tank with a wet vacuum cleaner.

3.2 Draining water/glycol mixture from CoolMaster N

For packaging, transport and storage, first follow the following steps;

Step 1: Switch the main switch (S1) on the control panel (G) off.

Step 2: Drain the water tank of the cooling system by opening the drainage valve.

<u>CAUTION!</u> For machines filled with a mixture of water and glycol (machines specified as *CoolMaster N),* the excess mix from connection (E) may not be discharged into public sewers for environmental reasons. Instead, it should be collected in suitable containers and disposed of in accordance with applicable waste management regulations.

Step 3: Dry clean all connections and water tank with a wet vacuum cleaner.

3.3 Packing, transport and storage instructions

<u>ATTENTION!</u> Before transport the machine has to be protected with the also delivered cardboard box or has to be wrapped with bubble wrap. The machine has to be <u>transported and stored</u> perpendicular at all time on its fundament on the provided pallet!

The machine has to be <u>placed</u> perpendicular on its fundament at all time.

<u>ATTENTION!</u> In no way the machine can be stacked or overturned. This during transport and storing as well during repairs and commissioning. Even when the machine is not used it should be perpendicular at all times.

<u>ATTENTION</u>! Not following these instruction can cause big damage to the machine.

Use at all time the right equipment such as a pallet truck and a forklift truck.

4 Commissioning

These actions are general and have to been carried out, of course, if applicable for the application <u>by qualified personal!</u>

<u>CAUTION!</u> The Declaration of Incorporation of Partly Completed Machinery (if applicable) may not be put into service until a declaration of conformity to the provisions of the Machinery Directive 2006/42/EC is available for the finished machine in which it will be installed.

4.1 Installation CoolMaster K and N

Place the ***CoolMaster*** at a level position and at least **1 meter** from a wall. For a good functioning of the ***CoolMaster*** we recommend keeping the distance between the ***CoolMaster*** and the user to a minimum. The cooling water pipes between the ***CoolMaster*** and the user should not be longer than 20 meters.

4.2 Connecting cooling water pipes*

<u>ATTENTION!</u> Before making any connections to the *CoolMaster*, clean the external pipes. Dirt must be prevented from entering the *CoolMaster.* It may cause serious damage to the system and the *CoolMaster*.

<u>ATTENTION!</u> The diameter of the pipes/hoses must at least match with the connections on the *CoolMaster*. The hoses must be reinforced with braided fibre to prevent kinking the hose.

See for the connections chapter 2 on the ***CoolMaster K and N***. For diameters see the corresponding P&ID.

The tubes must be suitable for use in the same conditions as those for which the ***CoolMaster*** is suitable (pressure and temperature). Consult the P&ID for this information.

Connect the following pipes:
- A and B: cooling water pipes between ***CoolMaster*** and the User.
- D1: If you wish to fill automatically.
  (does not apply to machinery specified as ***CoolMaster N***)

Step 1:
1. Install the ball valve (BVS-1) on the cooling water inlet (A)
2. Install cooling water pipe between ***CoolMaster*** (BVS-1) and user, (see Figure 4.1).

The ball valve (BVS-1) must be kept closed, unless otherwise indicated!

Step 2*:*
1. Install the ball valve (BVS-2) on the cooling water outlet (B).
2. Install the ball valve (BVS-3) on the T-piece (central section).
3. Install the cooling water pipe between ***CoolMaster*** (on the T-piece) and the user, (see Figure 4.2).

The ball valves (BVS-2 and BVS-3) must be kept closed, unless otherwise indicated!

Step 3:
1. Connect the cooling water pipes between ***CoolMaster*** and user. (BVS-1 and BVS-3), see appendix §9.1.
2. Connect D1 to a water tap if you wish to fill automatically.
   <u>(does not apply to machinery specified as ***CoolMaster N***)</u>

Figure 4.1

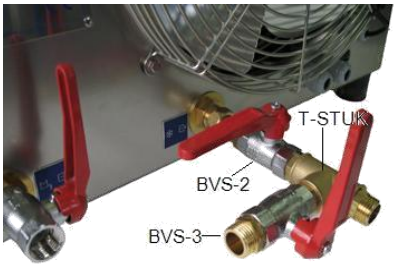


Figure 4.2

<u>*Ball valves are not supplied as standard!</u>

4.3 Connecting drainage/overflow pipe (C) and (E)

<u>CAUTION!</u> For machines filled with a mixture of water and glycol (machines specified as *CoolMaster N),* the excess mix from connection (E) may not be discharged into public sewers for environmental reasons. Instead, it should be collected in suitable containers and disposed of in accordance with applicable waste management regulations.

Connect the drainage/overflow pipe (C) and (E). To enable good outflow of superfluous water, the overflow pipe must be able to flow out into the open sewer without any foreseeable obstructions. The length of the overflow pipe should be kept to a minimum. The pipe should also flows downwards, from the perspective of the ***CoolMaster*** (C) and (E).

4.4 Connecting power supply

<u>ATTENTION!</u> Work may only be carried out on the electrical installation of the *CoolMaster* by an authorised, professionally competent person.

<u>ATTENTION!</u> The *CoolMaster* must only be connected to a <u>clockwise rotary field.</u>

Switch off the main switch (S1) on the control panel (G).
Connect your electrical power supply cable to the appropriate terminals in the control box via the cable entry (F). Refer to the electro-technical diagram for the connection of the cable cores. Consult the diagram number as stated on the technical P&ID corresponding to the serial number of the ***CoolMaster*.**

Consult the type plate for the correct voltage.

<u>ATTENTION!</u> Ensure the voltage as stated on the type plate is also the voltage on each phase wire.

Of no less importance is the mains frequency (50 or 60 Hz) corresponding to the frequency on the type plate. The maximum voltage deviation is +6% and –10% from the voltage indicated on the type plate.

4.5 Connecting external contacts

Also connect the electrical cables for the external contact(s).
See for supplied electrical diagram.

4.6 Water quality

<u>CAUTION!</u> The *CoolMaster* is not suitable for use with demineralized water or water containing high levels of minerals or iron.

<u>CAUTION!</u> The *CoolMaster N* is only suitable for tap water of drinking water quality mixed with the correct ratio of a suitable anti-freeze (glycol).

The filling water which is used must be of good quality. It must at least be of drinking water quality and the water must not contain high levels of lime and/or iron, as it may cause serious damage.

You must check the water regularly.

The minimum filling pressure must be 2,5 bar.

See appendix §9.2 for extra information.
See appendix §9.3 for directive water quality.

4.7 Filling of (external) pipes and systems *CoolMaster K*

Step 1:

1. All the connections must be made in accordance with §4.2.
2. Turn the air vent(s) in your system to “open”. *(The venting must take place at the highest point(s) in pipe(s))*

CAUTION! Do not use automatic air vents!

CAUTION! Filling procedure for machines designated *CoolMaster K,* (see chapter § 4.9).

3. Connecting the filling water (min. 2.5 Bar) to BVS-3.
4. Turn the valve (BVS-3) to “open”, (see Figure 4.3).

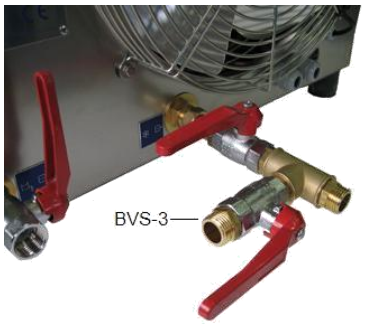


Figure 4.3

Step 2:

Excess air will be released from the pipe(s) though the air release valve(s).

If the water spills from the air release valve(s), the external pipes/systems are filled with water.

1. Turn the ball valve (BVS-3) to “closed”, (see Figure 4.4).
2. Turn the air release valve(s) in your system to the "closed" position.
3. Turn the water fill line to “closed”.
4. Remove the fill water line which is mounted on BVS-3.

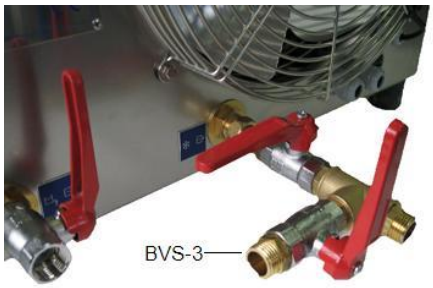


Figure 4.4

Step 3:

1. Turn the ball valve (BVS-1) to “open”, (see Figure 4.5).
2. Turn the ball valve (BVS-2) to “open”, (see Figure 4.6).

When these steps have been completed correctly, the entire system will be filled with water.

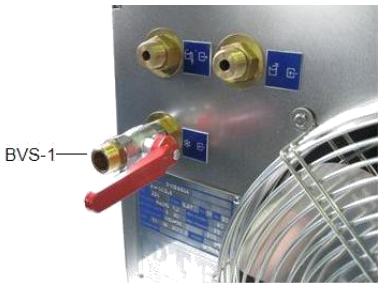


Figure 4.5

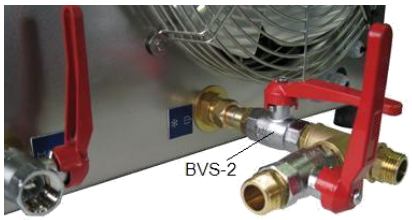


Figure 4.6

4.8 Filling of (external) pipes and systems *CoolMaster N*

Step 1:

1. The connections must be made in accordance with §4.2.

The ball valve (BVS-1) must be kept closed, unless otherwise indicated! (See Figure 4.7)

<u>CAUTION!</u> Filling procedure for machines designated *CoolMaster N,* (see chapter §4.10).

Filling set for mixture of water and glycol
(The fillingset is not supplied as standard)

Figure 4.7

Step 2:

See Figure 4.8 and Figure 4.9. for a complete image from the filling set. The mixture of water and glycol will be provided in the supplied tank.
The ratio of the mixture is indicated in the relevant P&ID.

1. Install the cooling water pipe between ***CoolMaster*** (on the T-piece) and the user.

The ball valve (BVS-2 and BVS-3) must be kept closed, unless otherwise indicated! (See Figure 4.10)

Figure 4.8

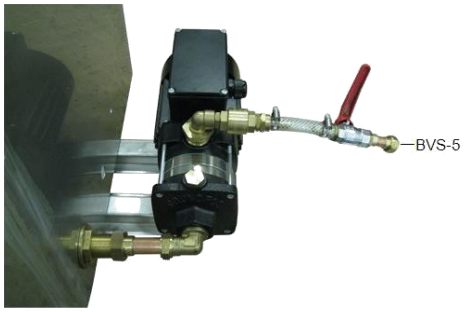


Figure 4.9

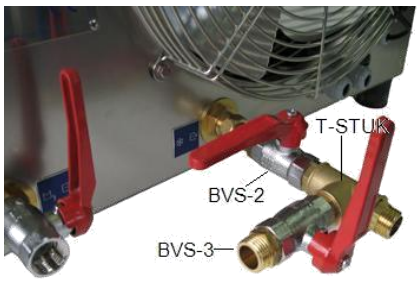


Figure 4.10

2. Install the link (BVS-5) onto the ball valve (BVS-3) (Minimum pressure 2.5 bar), (see Figure 4.11).

Step 3:

1. Turn the air release valve(s) to “open”. *(It is essential that the air release(s) takes place at the highest point(s) in the pipe(s))*

<u>CAUTION!</u> Do not use automatic air release valves!

2. Turn the ball valve (BVS-5) to “open”, (see Figure 4.12).
3. Turn the ball valve (BVS-3) to “open”, (see Figure 4.13 and Figure 4.14).

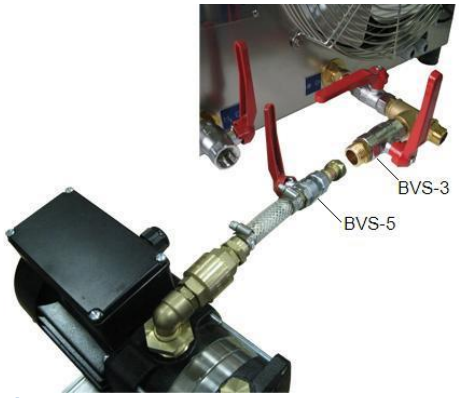


Figure 4.11

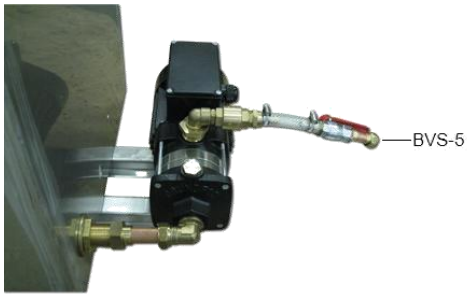


Figure 4.12

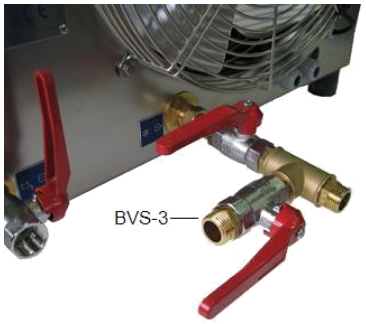


Figure 4.13

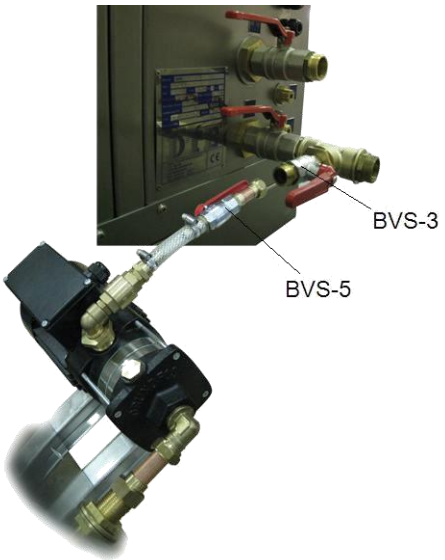


Figure 4.14

Step 4:
Excess air will be released from the pipe(s) though the air release valve(s).

If the water and glycol mixture spills from the air release valve(s), the external pipes/systems are filled with the water and glycol mix.

1. Turn the ball valve (BVS-3) to “closed”, (see Figure 4.15).
2. Turn the air release valve(s) in your system to the "closed" position.
3. Turn the ball valve (BVS-5) to “closed”.
4. Remove the ball valve (BVS-5), (see Figure 4.16).

Step 5:
1. Turn the ball valve (BVS-1) to “open”, (see Figure 4.17).
2. Turn the ball valve (BVS-2) to “open”, (see Figure 4.18).

When these steps have been completed correctly, the entire system will be filled with the water and glycol mixture.

Figure 4.15

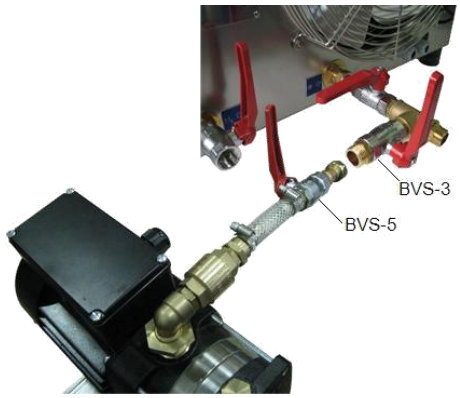


Figure 4.16

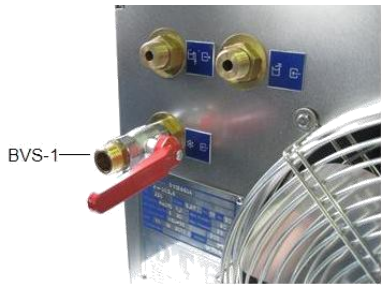


Figure 4.17

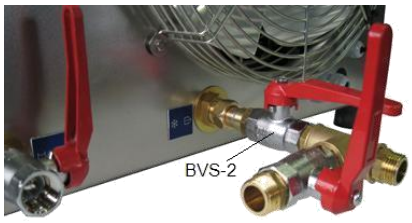


Figure 4.18

4.9 Filling of the system *CoolMaster K*

<u>CAUTION!</u> To add any chemicals or other substances, please consult the supplier.

Fill the ***CoolMaster*** with water (fill automatically or manually):

1. Auto fill (D1) (a power supply is required; a minimum filling pressure of 2.5 bar is required), (see Figure 4.19).
2. Manual fill (D2), (see Figure 4.20).

External systems must be filled via an external filling point. See chapter §4.7 for instructions.

Figure 4.19

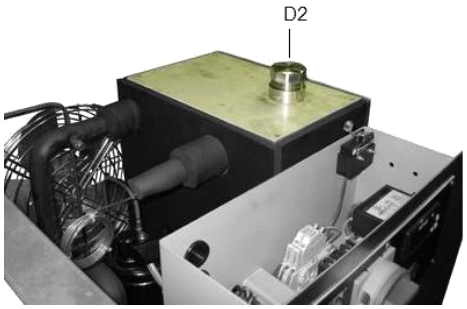


Figure 4.20

4.10 Filling of the system *CoolMaster N*

CAUTION! To add any chemicals or other substances, please consult the supplier.

CAUTION! To prevent the heat exchange and/or other parts from freezing, the mixing ratio of the water and glycol mix must be checked weekly by taking a sample from the tank. If the mixing ratio is not correct, this may affect the warranty.

Fill the ***CoolMaster*** with the mix of water and glycol (using manual fill D2), (see Figure 4.21).

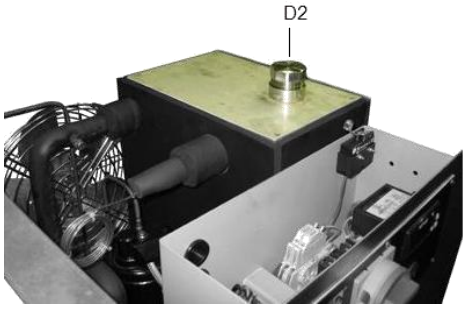


Figure 4.21

CAUTION! This mixture must be prepared beforehand. Filling with water first and adding the glycol afterwards or vice versa is prohibited. For the mixing ratio for this machine see the appropriate P&ID.

External systems must be filled via an external filling point. See chapter §4.8 for instructions.

4.11 Deaerating

<u>CAUTION!</u> DO NOT START THE WATER PUMP BEFORE IT IS FILLED WITH LIQUID AND DEAERATED!

This machine is fitted with a bypass and will therefore the water pump automatically be deaerated.

Step 1: To ensure the whole system is vented, make sure the removable cap (I) of the machine is on it and tank cap is turned off.

Step 2: Turn on the installation and let the water pump run for 10 minutes to get the system deaerated.

Step 3: Now that the whole system is air-free, the removable cap (I) can be put back on the system and screw the tank cap back on the water tank. The system can now be put into operation.

4.12 Setting thermostat (if applicable)

<u>CAUTION!</u> COVER(I) MUST BE PLACED, BEFORE STARTING UP THE MACHINE!

<u>CAUTION!</u> It is important that the values in the P&ID are adhered to, otherwise damage to the compressor may occur! When temperatures set incorrectly the guarantee claim may expire!

<u>CAUTION!</u> This machine is equipped with a bypass, which is erected between water supply and water return pipe inside the *CoolMaster*. The minimum flow is already factory defined and may not be hanged!

Switch on the main switch (S1) on the control panel (G).
Switch on the external start/stop.

Set the thermostat to the correct value, which is on the front of the control panel (G).
See enclosed P&ID for the settings.

The ***CoolMaster*** is now ready for use.

4.13 Commissioning after long standstill

CAUTION! The Declaration of Incorporation of Partly Completed Machinery (if applicable) may not be put into service until a declaration of conformity to the provisions of the Machinery Directive 2006/42/EC is available for the finished machine in which it will be installed.

CAUTION! Machinery specified as ***CoolMaster K and N***, first follow the steps from chapters §4.1 till 4.12.

CAUTION! BEFORE OPENING THE MACHINE, ALWAYS ENSURE POWER SUPPLY IS COMPLETELY DISCONNECTED!

Check the machine for any defects including damages before starting the machine.

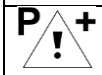
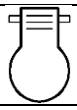
Clean the condenser fins with compressed air and/or vacuum cleaner/brush if necessary. **(ATTENTION: the fins can be sharp! Use the correct PPE) Always brush in the direction of the fins! (See Figure 4.22)**

Figure 4.22

Check the visual checks of the minimum inspection-interval schedule, see chapter §7.1.

For locked water pump after a long period of stand still, see appendix §9.4.

5 Alarm signals (if applicable)

	Fault →	Possible cause →	Check and solution
	**1. HP Alarm**	1.1. High pressure in the system 1.2. Installation Removable cover	1.1. Check the condenser for dirt and and clean with compressed air if necessary 1.2. Contact your supplier
	**2. Level Alarm**	2.1. Water level is too low	2.1. Check the water level on the gauge glass, refill if necessary 2.2. Check whether the machine refills automatically (if connected) 2.3. Check water inlet 2.4. Check valves 2.5. Check for leaks
	**3. Compressor Alarm**	3.1. Thermal alarm or short-circuit compressor(s)	3.1. Check for short-circuit 3.2. Check for overload of compressor(s)
	**4. Condenser Alarm**	4.1. Thermal alarm or short-circuit fan(s)	4.1. Check for short-circuit 4.2. Check for overload of fan(s)
	**5. Water pump Alarm**	5.1. Thermal alarm or short-circuit water pump(s)	5.1. Check for short-circuit 5.2. Check for overload of pump(s)
	**6. Filling**	6.1. Filling system	6.1. Check liquid level 6.2. Refill manually if necessary 6.3. In the event of malfunctions please contact the supplier

6 Fault analysis

Have all checks and repairs performed by a certified technician!		
Fault →	**Possible cause →**	**Check and solution**
1. Unit does not start	1.1. Faulty wiring 1.2. Components down to earth 1.3. Faulty main switch 1.4. Controls incorrectly set	1.1. Check wiring and connections 1.2. Check and replace 1.3. Check and replace 1.4. Check, see electric diagram
2. Fan(s) run but compressor will not start	2.1. Faulty wiring 2.2. Faulty relay, or security 2.3. Faulty compressor 2.4. When the high pressure the pressostat switched on (Only with type K-001.0 and K-001.7)	2.1. Check wiring and connections 2.2. Check components 2.3. Check and replace 2.4. Waiting 10 minutes
3. Compressor starts but no air is delivered over the condenser	3.1. Fan loose on shaft 3.2. Faulty fan motor 3.3. Faulty wiring 3.4. Blocked air flow	3.1. Tighten fixing screw 3.2. Check and replace 3.3. Check wiring and connections 3.4. Clean the condenser
4. Compressor switches off	4.1. Electricity supply 4.2. Faulty thermostat 4.3. Faulty relay, or security 4.4. Internal security activated 4.5. Blocked condenser 4.6. Removable cover not correctly placed on machine	4.1. Check electricity supply 4.2. Check and replace 4.3. Check and replace 4.4. Water and/or ambient temperature too high. Check cleanliness of condenser and clean it 4.5. Clean condenser 4.6. Place removable cover
5. Unit does not cool	5.1. Shortage of refrigerant 5.2. Faulty compressor 5.3. Faulty thermostat 5.4. Faulty pump	5.1. Refill 5.2. Check and replace 5.3. Check and replace 5.3. Check and replace
6. Water pump gives no water	6.1. Water pump not de-aerated 6.2. Impeller of water pump is stuck 6.3. Faulty relay, or security	6.1. De-aerate water pump 6.2. See appendix §9.4 6.3. Check components
7. Shortage of refrigerant	7.1. Leak in the refrigerant system	7.1. Check the refrigerant system for leakage and repair

7 Maintenance and cleaning

WARNING!

All proceedings must be performed:

- By expert qualified personnel
- With a user manual under easy reach
- Separated from the electrical network and guards against arming!

Weekly checks, User maintenance may be performed by the user of the machine.

All maintenance proceedings (with an interval >weekly) serve must always be performed by qualified personnel!

A technical person with managerial position is responsible for determination of the maintenance interval. NEN3140 prescribes that this person must be the Installation manager.

The determination of these interval serves with reference to:

- **User manual**
- **Authority (competent bodies, policy, regulation etc.)**
- **Conditions of parts (exposure and/or corrosion)**
- **Results of previous inspections**



DTE recommends a minimum inspection interval as given in chapter (§7.1

If a problem and/or advise is needed from our technical staff, please always mention:

- Serial number
- Ambient temperature
- What is shown at the display of the thermostat
- What is the setpoint of the thermostat
- Which alarm signals are given

By mention these points, a quick solution of the problem can be given.

All maintenance jobs should be executed when the ***CoolMaster*** is complete tensionless.

NOTE: The minimal distance of service area should be 1 meter.

Dutch Thermal Engineering B.V.
Westerbroekstraat 18
7011 EX Gaanderen
Tel.: +31(0)315-328311
E-mail: service@dte.eu
Website: https://dte.eu/

7.1 Minimum Inspection-interval scheme

All inspections should be performed by an authorized technician!

CAUTION! BEFORE OPENING THE MACHINE, ALWAYS ENSURE POWER SUPPLY IS COMPLETELY DISCONNECTED!

	Inspection interval			
Inspection points	**Weekly**	**monthly**	**Every 6 months**	**Every 12 months**
Mechanical				
Visual check on damage outside of the unit	X			
Visual check fans motor(s) and fan blade(s) on damage and prevalence	X			
Visual (and auditive) check on defects	X			
Visual check mixing ratio water/glycol (only ***CoolMaster N***)	X			
Visual check water level of the water tank at the sight glass (P) or (S)	X			
Visual the by-pass flow of the water pump **inside** the water tank (if applicable)	X			
Visual check water quality		X		
Visual check for water leaks		X		
Cleaning condenser by using with compressed air or vacuum cleaner **(ATTENTION! the fins can be sharp! Use the correct PPE) Always brush in the direction of the fins!**		X		
Cleaning the compressor with damp cloth.				X
Visual check quality of the insulation material				X
Electrical				
Visual check power consumption			X	
Visual check all wiring for damage			X	
Visual check electrical components and contactors			X	
Visual check all potential equalisation and earthings				X

The maintenance and leak-tightness checks should be carried out, according to the local legislation.

For the Dutch guidelines, the maintenance and leak-tightness checks should be carried out according to the table below.

Only certified companies employing qualified technicians are allowed to carry out refrigeration work or inspections of refrigeration installations.

CO2-equivalent	Number of inspections each year	NOTE:
5 – 50 ton CO2-equivalent:	1 x	for installations with a leak detection system, the frequency can be halved
50 – 500 ton CO2-equivalent:	2 x	
> 500 ton CO2-equivalent * :	4 x	

** automatic leak detection mandatory*

CO2 equivalent content is stated on the nameplate and corresponding P&ID.

7.2 Cleaning of the machine

<u>CAUTION!</u> ONLY APPLIES TO THE EXTERIOR CASING!

Step 1: Before cleaning the machine, make sure you completely disconnect the power supply.

Step 2: To clean the machine use a soft brush, with lukewarm water with a non-aggressive cleaner.

Step 3: Then rub the machine dry with a soft, dry cloth. Unless explicitly stated otherwise the machine must <u>not</u> be cleaned with a high-pressure cleaner and/or other powerful water jets!

Step 4: For additional cleaning instructions, see appendix §9.2 Water Treatment.

8 Removal

The ***CoolMaster*** consists primarily of stainless steel, copper, brass and aluminium. The ***CoolMaster*** is also compressed with a refrigerant which is specified in the “P&ID” and the relevant safety data sheet.

Removal of the ***CoolMaster*** must be carried out in accordance with local or national legislation. Contact your government for instructions.

9 Appendix

9.1 Connection diagram filling the system

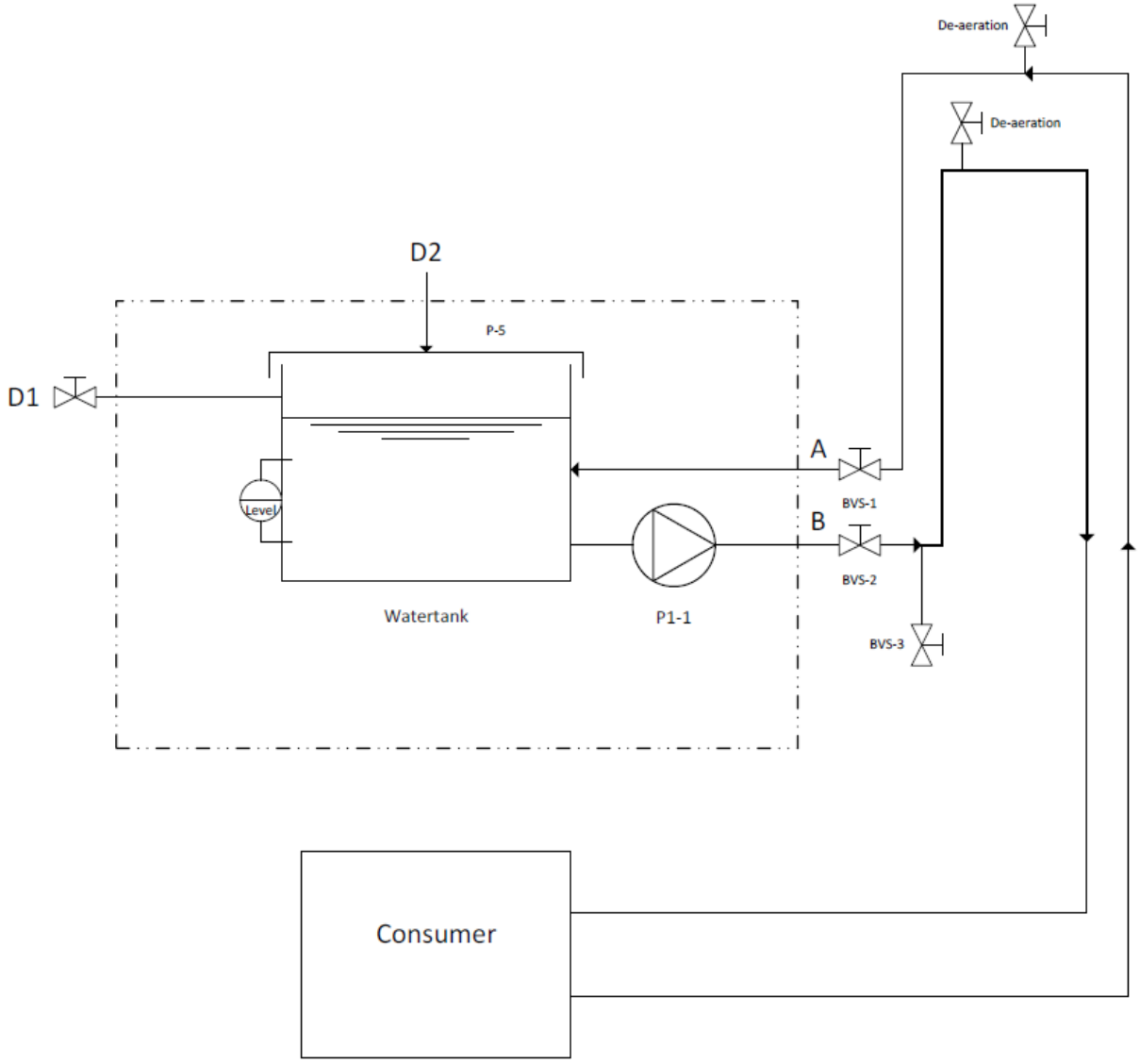


Figure 9.1

9.2 Water treatment

INTRODUCTION

Semi-closed and closed cooling systems are used in many processes.
An efficient and effective cooling system is needed for a process to function without problems.
Generally such cooling systems contain between 0.5 and 5.0 m³ water,
which is normally topped up with tap water. The tap water available is often, technically speaking, of poor quality:

- contains limescale and/or
- is corrosive

The system may contain many different materials with which the cooling water comes into contact. Such as:

- steel/cast iron
- copper/brass
- aluminium
- synthetics/sealants

PROBLEM DEFINITION

Corrosion problems can occur in cooling systems, which have different causes.
The presence of different materials can result in galvanic corrosion, which is where the least precious metal is dissolved. The action of oxygen on iron and steel causes oxygen corrosion and the formation of iron oxide or silt. Natural silt accumulation can lead to “under deposit corrosion”. High flow-speeds can lead to erosion corrosion. The quality of the cooling water plays a significant role in this.

GENERAL MEASURES

Contamination	Measure
Mechanical contamination caused by iron oxides or silt	Install filters, depending on contamination
High hardness	Soften water via ion exchange
Minor contamination caused by presence of oxides and hardness	Use water treatment in the form of hardness stabilisation and corrosion inhibitors
Biological contamination caused by presence of algae and slime bacteria	Use water treatment in the form of biocides

WATER QUALITY

The water quality should be kept within the values below for closed or semi-close systems.

WATER TREATMENT

Specific water treatment should be used if one or more values cannot be maintained or achieved.

Water treatment products can be used for a wide variety of applications in this case. DTE has a water treatment in the form of PollutionMaster. This product can optionally be supplied. If the temperature of the water exceeds approx. 40°C, (partial) water softening must in general be applied.

A complete water treatment proposal can be drawn up after the water quality has been assessed on site.

CLEANING

If the cooling system is already very contaminated, we recommend cleaning the system with a suitable cleaning product. The cleaning solution can be pumped around using the system pump or an cleaning pump.
For the best cleaning result, at least some flow should be established across all components. The cleaning progress can be monitored through visual inspection and using pH test strips.

Systems with considerable biological contamination should be rinsed thoroughly first. A bio-dispergator can also be used for this purpose.

The cleaning method and costs will be assessed and determined per situation.

Note: You can contact DTE anytime.

9.3 Guideline for water quality in DTE installations

Water quality for use in all DTE installations is prescribed in this general guideline. Water quality used in DTE installations should meet this standard at all times.

Standard values for water quality:

- Acidity: PH 7 < PH 9,5
- Chloride: < 50mg / L
- Conductivity: 150 µS < 350µS
- Bicarbonate (HCO_3): 80mg/L < 100mg/L
- Hardness: 2dH° < 8dH°

This directive is a general directive which also applies to systems in which water with a percentage of glycol is used.

In cases where a water-glycol mixture is to be applied, the quality of water must first be analysed to be ensured the water quality is within the norm values. Subsequently, a water-glycol mixture may be prepared that must be tested on mixing ratio before use.

In the system the absorption of oxygen must prevented to keep the hydrogen carbonate (HCO3) level within the acceptable range. In case of doubt, this should be tested with a sufficient frequency.

9.4 Manual for locked water pump after a long period of stand still

<u>CAUTION!</u> BEFORE OPENING MACHINE, ALWAYS ENSURE POWER SUPPLY IS COMPLETELY DISCONNECTED!

DTE uses reputable components in its products, whereby DTE will reduce the risk of faults in its machines.
This also applies to the water pumps. These pumps are made with a stainless steel fan, a high quality pump house and a “Mechanical seal” to seal the axis. The mechanical seal is a high quality axis seal made from polished hard metal, and all contact surfaces are polished. This will guarantee a good sealing even under the toughest operating circumstances. The mechanical seal will lubricate itself by means of a thin liquid layer of the pumped fluid.

When the machine has not been used for a long period there is a chance that the water pump will not run.

<u>Cause:</u>

The cause of this fault may be cohesion between the polished contact surfaces of the mechanical seals. The seals "stick together".

<u>Solution:</u>

- This problem is easily solved by rotating the pump axis by hand.
- In the Grundfos CM pump, it can be done by first removing the roster by unscrewing the two screws.
- You can now rotate the engine fan by hand, (see Figure 9.2 and Figure 9.3).
- The sticking together has now been broken and the machine can be started.

<u>CAUTION!</u> MAKE SURE TO REPLACE THE ROSTER, OTHERWISE THE PUMP ENGINE WILL NOT BE COOLED PROPERLY!

Figure 9.2

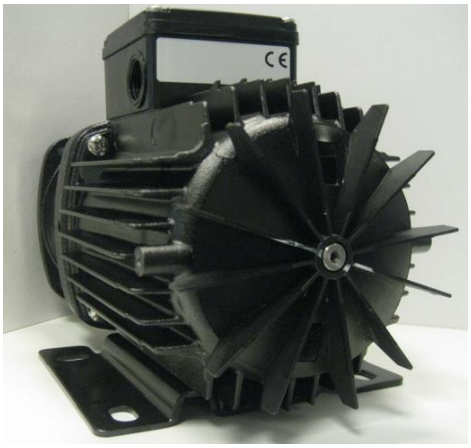


Figure 9.3

Checking the direction of rotation

- For the Grundfos CM pump:

The description below applies to three-phase motors only. The motor fan cover has an installation indicator, (see Figure 9.4). Based on the motor cooling air, it indicates the direction of rotation of the motor. Before you start the motor for the first time or if the position of the installation indicator has been changed, check that the installation indicator is working properly for instance by moving the indicator field with a finger. To determine whether the direction of rotation is correct or wrong, compare the indication with the table below.

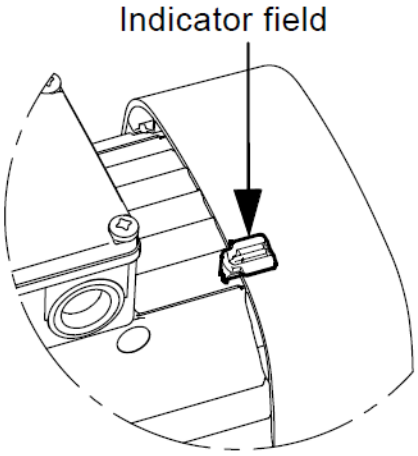


Figure 9.4

Indicator field	Direction of rotation
Black	Correct
White/reflecting	Wrong*

* To reverse the direction of rotation, switch off the power supply and interchange any two of the incoming supply wires.

You can place the indicator in various positions on the motor, but do not place it between the cooling fins close to the screws that hold the fan cover. The correct direction of rotation is also shown by arrows on the motor fan cover.

9.5 User manual thermostat (if applicable)*

KLT12ID:

SETPOINT CHANGE

- Push "**SET**" once (set point will be displayed flashing).
- Change the set point by pressing "**UP**" and "**DOWN**".
- Confirm the changed set point with "**SET**".

DISPLAY MESSAGE:

In normal operation the probe temperature selected by P5 will be displayed. But the following messages may also appear:

- ''Err'' - Memory reading error
- ''Erp'' - Probe error, not viewed in display
- ''Eri'' - Internal parameter error. In this case, enter the above DTE-configuration
- ''ALH'' - High temperature alarm
- ''ALL'' - Low temperature alarm (temperature is 5 degrees lower then ''SET")
- ''ALE'' - External alarm
- ''AEL'' - High and external alarm
- ''000'' - Probe open
- ''---'' - Probe short-circuited
- ''DON'' - Defrosting activated
- ''DOF'' - Defrosting de-activated, or cannot be done
- ''CON'' - Continuous cold cycle
- ''COF'' - Continuous cold cycle de-activated, or cannot be done
- ''-d-'' - Thermostat on defrosting
- ''OFF'' - Thermostat switched OFF, can be switched on by pressing the ''UP'' and ''DOWN''-button simultaneously for at least 8 seconds

MAINTENANCE

- Cleaning
  Clean the surface of the controller with a soft, damp cloth. NEVER use abrasive detergents, alcohol or solvents
- Repairs/Programming
  All repairs and the programming of the thermostat must be carried out by authorised professional.

***When deviating from the standard, the user manual of the thermostat will be sent as an appendix!**

9.6 Instructions of Partly Completed Machinery (if applicable)

CAUTION! ONLY APPLICABLE TO THE OUTSIDE OF THE CASING!

CAUTION! When there is an Partly Completed Machinery, the machine must be equipped with an external thermal protection and main switch with the correct range to ensure safety!

CAUTION! The Declaration of Incorporation of Partly Completed Machinery may not be put into service until a declaration of conformity to the provisions of the Machinery Directive 2006/42/EC is available for the finished machine in which it will be installed.

9.7 EU-Declaration of conformity*

EU declaration:

Manufacturer: D.T.E. B.V.
Address: Westerbroekstraat 18
7011 EX GAANDEREN / HOLLAND

CE

Hereby certifies that:

The ***CoolMaster*** meets the requirements of the Machinery Directive (Directive 2006/42/EC, as amended), and the national legislation implementing this Directive;

Meets the provisions of the following other EU directives.

- 2014/35/EU Low Voltage Directive
- 2014/30/EU EMC directive
- 2014/68/EU Pressure Equipment Directive (PED)

And furthermore certifies that

The following (parts of) harmonised standards are applied:

- NEN-EN-IEC 60204-1:2018
- NEN-EN-ISO 12100:2010
- NEN-EN 378-2:2016
- NEN-EN-ISO 13857:2019

The following (parts of) national technical standards and specifications are used:

- Regulation EU 517/2014

Signed in Gaanderen on 01-01-2024

……
M. Bril

Manager director

***This is an example, the original declaration will delivered with the machine!**

UKCA declaration:

Manufacturer: D.T.E. B.V.
Address: Westerbroekstraat 18
7011 EX GAANDEREN / HOLLAND

Hereby certifies that:

The ***CoolMaster*** meets the requirements of the Machinery Directive (Directive Supply of Machinery (Safety) Regulations 2008, as amended), and the national legislation implementing this Directive;

Meets the provisions of the following other UKCA directives:

- Electrical Equipment (Safety) Regulations 2016
- Electromagnetic Compatibility Regulations 2016
- Pressure Equipment (Safety) Regulations 2016

And certify that:

The following (parts of) harmonized standards are applied:

- NEN-EN-IEC 60204-1:2018
- NEN-EN-ISO 12100:2010
- NEN-EN 378-2:2016
- NEN-EN-ISO 13857:2019

The following (parts of) national technical standards and specifications are used:

- Regulation EU 517/2014

Made in Gaanderen on 01-01-2024

…….
M. Bril

Managing director

***This is an example, the original declaration will delivered with the machine!**

9.8 Guarantee

One or more components in this ***CoolMaster*** are sealed.
Breaking these seals or adjusting components which are not sealed, may void your guarantee.
Always contact your supplier. When claiming one or more components under the guarantee, these components must be returned to the supplier uncleaned and in their original state.

Otherwise, the guarantee conditions on this machine apply as described in the general conditions of delivery and payment. These were deposited at the Chamber of Commerce in Arnhem on 05-06-1989, a copy of which is available upon request.

9.9 Comments

9.10 Technical information*

- Machine drawing
- P&ID
- Spare parts list
- Electrical diagram
- User manual thermostat
- Safety data sheet refrigerant
- Safety data sheet monoethylene glycol (MEG)
- Other

***Technical information is sent as an attachment to the technical operating instructions!**