

# Qualiterme

## TECHNICAL INSTRUCTIONS MANUAL FOR INSTALLATION AND PREVENTIVE MAINTENANCE

TSM LINE



TS LINE



**COOLING TOWER**



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# Presentation

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Congratulations! You have just purchased a product produced with ISO 9001 quality control, we believe you have made an excellent investment, Qualiterme continually seeks to produce equipment with the highest efficiency, profitability and cutting-edge technology to satisfy the demands of its customers, generating profit and greater productive results for your company.



"Reservamo-nos o direito de realizar alterações, visando melhorias às máquinas, sem prévio aviso."

With more than 25 years in the market, the company Qualiterme has an area of approximately 17,127.50 m<sup>2</sup>, located in the São José neighborhood in Novo Hamburgo, our company is focused and committed to developing products and services that surpass us every day and satisfy the needs of our customers!

Qualiterme is a company that operates in the area of manufacturing equipment for industrial refrigeration, developing high quality equipment, using cutting-edge technology. We offer your client equipment suited to each area of activity within the industrial sector, such as the dairy, brewery, plastic, hospital and other sectors. We have a strong sales and after-sales team, technical assistance, quality control, product development engineering. Qualiterme is focused on meeting the needs of its customers with productivity and productive savings.

## Receiving your Equipment

You have just received a product with Qualiterme quality and reliability. Carefully observe the items below so that your equipment is in perfect condition as requested:

- » The equipment is in accordance with your purchase order;
- » The equipment was not dropped or tampered with during transport;
- » The painting and structure of the equipment are in perfect condition;
- » Check that the serial number of the equipment is exactly what appears on the invoice;

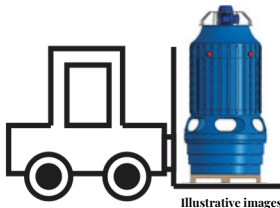
NOTE: If you find any non-compliance with the equipment, contact Qualiterme's commercial sector.

## Transportation/Handling of Equipment

Under no circumstances may the equipment be knocked over, resulting in breakage of the casing material, displacement of the internal lining, displacement of the automatic water distributor resulting in side leaks, stoppage of the automatic water supply distributor, etc. TS and TSM towers must be moved using:

- Forklift; - pallet rack; - Winch or crane - Overhead crane.

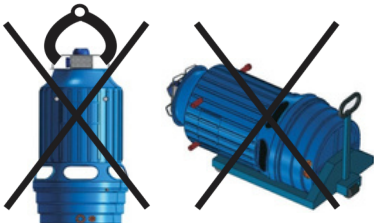
### RIGHT WAY!



**RIGHT WAY!**  
LIFT FORKS  
OVERCOMING THE  
EQUIPMENT

Illustrative images

### WRONG WAY!



**WRONG WAY!**  
LIFTING FORKS NEED TO  
OVERCOME ALL EQUIPMENT  
TO AVOID DAMAGE TO THE  
COMPONENTS.

Illustrative images

# Transportation/Handling of TSM Tower Equipment

It is recommended to always transport the towers upright (vertically) with the help of a pallet truck, forklift or winch (used in TSM towers with more than 3 modules), using a wooden platform at the bottom of the machine, as not using the platform can cause cracks at the bottom of the reservoir.

**Always remember that the reservoir must be empty.**

## **RIGHT WAY!**



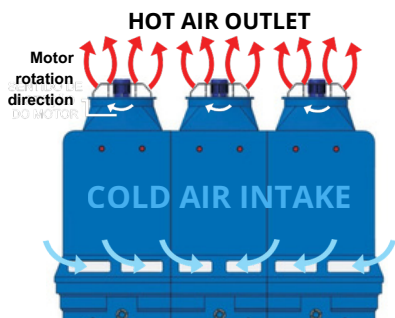
## **INCORRECT WAY!**



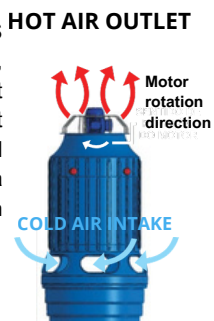
Forklift forks are not in the middle of the truck Forklift forks placed in air intake

## **Installation location**

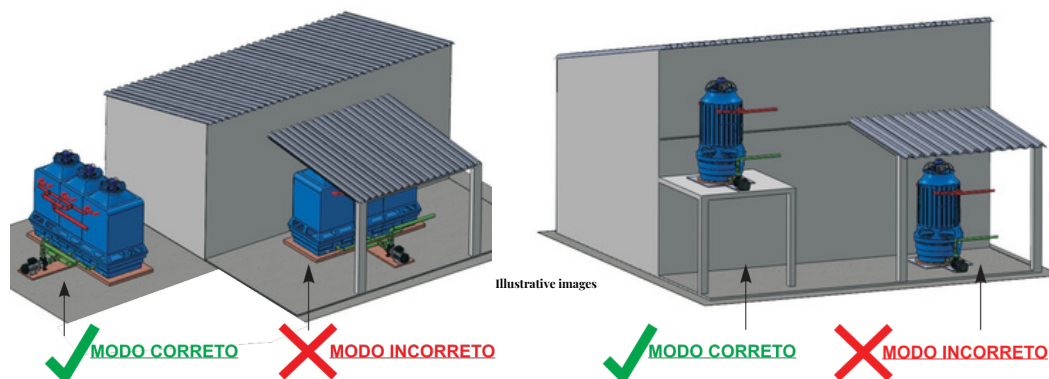
This must be observed very carefully, as it is a water x air heat exchange. environment, for this to happen with maximum effectiveness, we must observe the entire surrounding area, and observe that the entrances must be completely free for cold air to enter.



The air inlet of the COOLING TOWERS (TS/TSM) will always be in the lower part, the air outlet will always be in the highest part so that there is an exchange of heat from hot or warm water descending and cold air rising, bringing This results in a reduction in the temperature of the water in countercurrent with the air.



You must also pay close attention to the air outlet, as when passing through the warm water it will come out slightly heated, therefore this outlet must be free and unrestricted, never close to the ceiling, thus avoiding the recirculation of hot air which will reduce the team's capacity . See the figures below for some examples of right and wrong:



### **ATTENTION!!!**

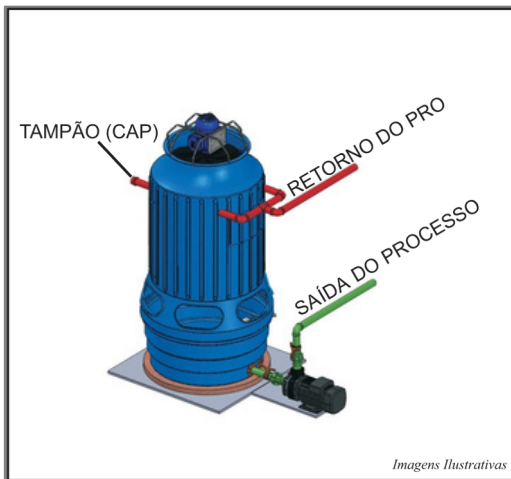
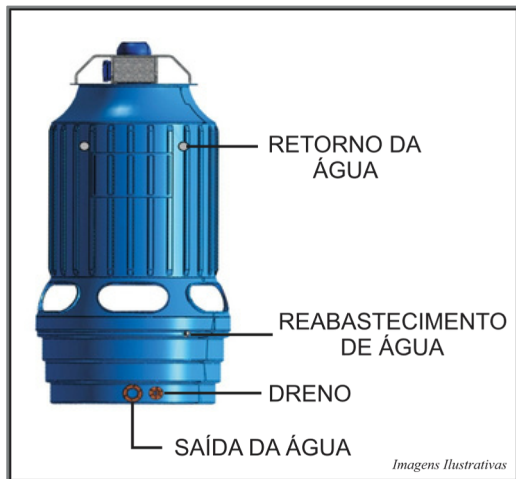
In the figure above, in the incorrect installation design, the hot air reaches the roof and returns even hotter to the tower, causing the water to become increasingly hotter over time. of the process, bringing with it the inefficiency of the refrigeration system

## **Cooling Tower Connections**

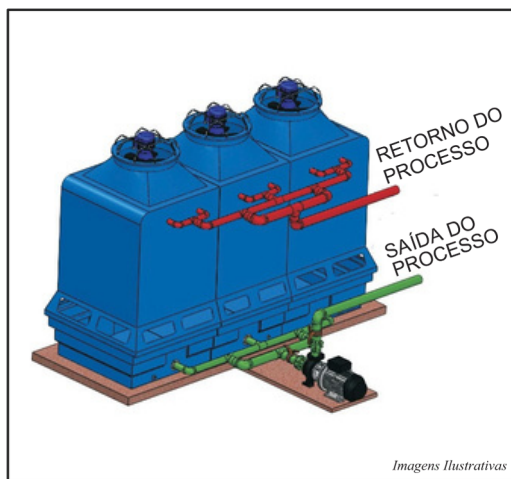
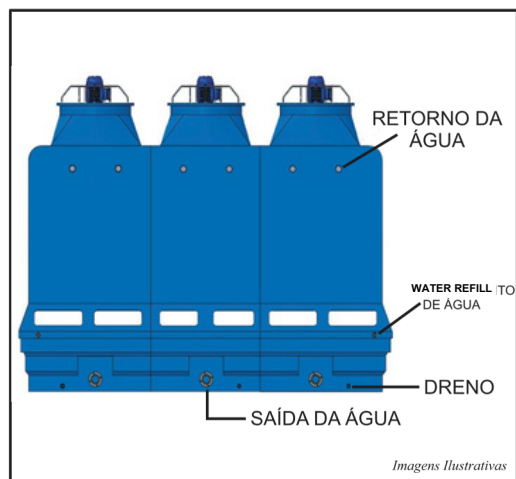
The return and outputs are duly indicated by self-adhesive labels always on the top of each connection. The TS models have 4 options for process water return, and the TSM models have 4 options on each return module, interconnected internally all to an automatic rotary distributor, thus enabling the choice of the best angle for the pipe return connection. Please note that in the event of a higher process return flow, all returns may be interconnected or as necessary. Once the best positioning of the return has been chosen, simply place a cap on the others. The outlet (water return to the system) is located at the bottom of the tower, in its water reservoir. In the TS model there is only one water outlet, and the TSM model has one outlet in each module.

The output must never be reduced, always following the gauge required by the manufacturer of the pump to be installed. Observe the following examples:

## TORRE TS



## TORRE TSM



## Reservoir Supply

The water supply must be carried out after the hydraulic installation is completed, as follows:

» Connect a water network to the floating tap located in the reservoir, this point must always be supplied with water when the tower is in operation, as the heat exchange causes the water to evaporate, causing the reservoir to empty over time .

of time due to water loss through evaporation.



### **ATTENTION!!!**

Only turn on the pump and fan motor after the reservoir has completely filled, as the pump running without water will suffer from a leak in the mechanical seal. The automatic distributor shaft may suffer premature wear due to lack of lubrication.

## Connection to the electrical network

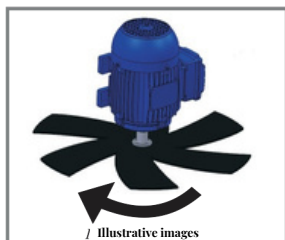


This item must be observed carefully as the TS and TSM towers have extremely fragile 220/380V bivolt motors, simply connecting the wrong cable for a few seconds will burn the motor coil, so it is recommended before starting to check carefully which mains specification (rated voltage) the engine is on. On the motor identification plate there is a printed connection diagram of the motor. It is also recommended to use a contactor switch to connect the motor and an overload relay to protect the motor. even, as the lack of these elements can cause the motor coil to burn out due to lack of phase or overload.



### **ATTENTION!!!**

Connection to the electrical network must only be carried out by a qualified technician with knowledge of electricity, specifically following all NR standards. Note: Care must be taken in the selection and installation of cable glands, which must suitably adapt to the type and diameter of the cable used. It is essential to observe the IP degree of protection of the cable glands, and the equipment installation environment must also be observed. Its use is of due importance as it prevents cables from being twisted or pulled and these devices also have a sealing ring that prevents water or dust from entering.



/ Illustrative images

### **Attention!!!**

Observe the direction of rotation of the engine (CLOCKWISE).

The power to be installed is indicated on the engine identification plate, and it is up to a specialized technician to identify the engine power of each model and thus size the elements described below. See some examples:

- » Wire gauge;
- » Overload relay regulation scale;
- » Contactor power capacity;
- » Nominal voltage of the electrical network and motor;
- » Observe whether they are compatible with each other;

## **Component description**

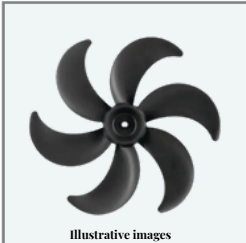
### **Electric motor**



Illustrative images

Used to rotate the cooling tower propellers, this component is one of the best known on the Brazilian market, therefore, in the event of a defect, it must be removed from the tower and taken to the nearest technical assistance center indicated by the part manufacturer.

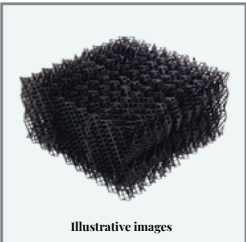
### **Propeller or fan**



Illustrative images

Attached to the motor by an aluminum bushing, to dismantle it simply release the two locks, one to prevent it from rotating on the shaft, the other to prevent it from coming loose, both with screws. This article is provided exclusively by Qualiterme. In the event of a breakdown, contact Qualiterme technical support.

### **Beehive Combs (filling)**



Illustrative images

They are parts injected in PP and assembled exclusively by Qualiterme, with the purpose of dividing the drops of water that come out of the rotating distributor so that no water falls into the reservoir without at least passing through one of the honeycombs. In case of damage, loss or crusting of parts, simply contact Qualiterme to request replacement parts.

### **Drop retainer**



Illustrative images

These components are parts injected in PP and assembled exclusively by Qualiterme. Mounted at the top, just above the water distributor, its function is to retain water that can rise in very hot climates or even through an unbalanced water flow, thus avoiding greater water losses in the cooling tower.



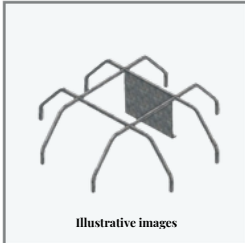
### **Hydraulic Piping**

Hydraulic tube: made of rigid PVC easily found in the construction market.



### **Level Buoy**

This item is easily found in the Brazilian market as it is a versatile piece in different segments. Also called a water tank buoy.



### **Rim (Engine Support)**

Specially built by Qualiterme in treated and hot-dip galvanized carbon steel so that it has greater durability even when exposed to extreme weather conditions. Its purpose is to fix the cooling tower motor that rotates the propeller.



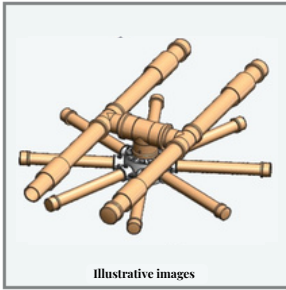
### **Flange ABS**

The ABS Flange is a product developed through the plastic injection process, guaranteeing quality and durability. The ABS flange was designed to join the pipes and assembly with the crosshead, allowing the rotation of the distribution set.



### **ABS Crosshead and Flange Set**

The assembly between the crosshead and ABS flange items allows their functionality in water distribution to be uniform. The union of items through their precise fitting consists of a balanced rotation between flow, pressure and water conduction speed.



### **Automatic water dispenser**

Built by Qualiterme, composed of several assembled components, its purpose is to distribute water inside the cooling tower above the filling honeycombs, mounted in the center of the tower through a PVC T fixed by stainless steel screws, and placed 8 PVC pipes at the crosshead outlets. The water distributor assembly is made of injected ABS plastic, and the water distribution pipes are made of PCV.

## **Cleaning and maintenance**

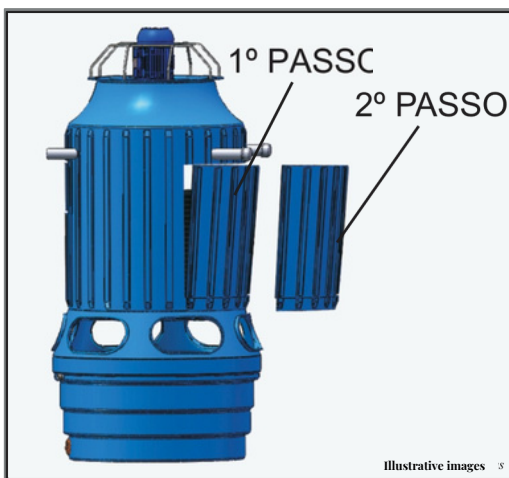
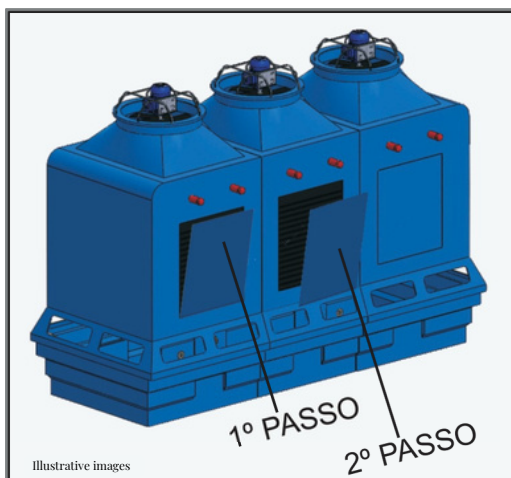
Cooling towers must be inspected periodically to ensure good performance and reliability of the equipment. Below are the guidelines for maintaining your equipment, which can be changed according to installation needs, always taking operational safety into account:

### **Maintenance access cover:**

Located behind the equipment, removing the cover gives access to the main components of the tower (distributor kit, honeycombs and retainer).

First step: To remove it, simply remove the screws, and then pull the upper part outward first.

Second step: After lifting the upper part and removing it, at the bottom the lids have a flap, which provides a seal in the lid fitting, preventing leaks.



### **ATTENTION!!!**



It is not recommended to leave the cooling tower without the maintenance access cover while it is in operation, as it is a fiberglass material and hardened with resin, the turning may affect the structure of the tower, especially if exposed to strong sunlight. warm.

### **Tower Cleaning**

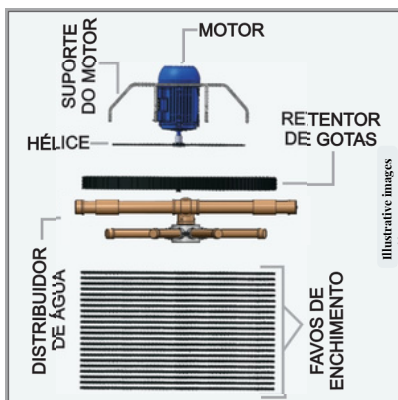


This should only be done with the tower turned off to avoid the risk of electric shock through water. After switching off, all water must always be drained from the drain side.

### **ATTENTION!!!**



This drain is in this position because the reservoir has a slight slope at the bottom to facilitate cleaning of the towers. This item can be observed in the cooling tower connections.



## Cleaning the Beehive Combs and the Drop Retainer

The filling honeycombs and drip retainer can be washed with cold or hot water, being careful not to hit them, as after a while of use the material can become a little brittle. To remove them, simply remove the maintenance access cover and carry out cleaning or repair, and then close the maintenance access cover.

## Cleaning the Automatic Water Dispenser

It is recommended to always keep the tower's water treatment up to date, as excess dirt in the distributor can cause premature wear of this part, as one part is fixed and the other is mobile. In the event of a malfunction, remove the maintenance cap and check that the automatic water dispenser is not blocked by accumulation of dirt or other damage.



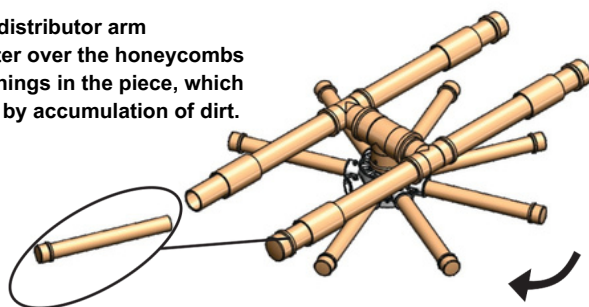
### **ATTENTION!!!**

The distributor does not have a single direction of rotation, just turn it to distribute the water evenly throughout the filling honeycombs.

### **CLOCKWISE AND COUNTERCLOCKWISE ROTATION SETS**

#### **Water distributor arm**

It distributes water over the honeycombs through the openings in the piece, which may be blocked by accumulation of dirt.



## Assessments (Optional)

To ensure good performance and a longer useful life of your equipment, Qualiterme recommends carrying out periodic inspections of it, with these optional items being the responsibility of the equipment owner. Qualiterme recommends that reviews be carried out according to the following table:

| <b>REVIEW PLAN</b>                                                         |                                             |
|----------------------------------------------------------------------------|---------------------------------------------|
| <b>Equipment:</b> _____                                                    | <b>Serial number:</b> _____                 |
| <b>Client:</b> _____                                                       | <b>Date of delivery:</b> ____/____/____     |
| <b>1st Review</b><br>Whichever comes first: 720 hours of work or 4 months. |                                             |
| Service order number: _____                                                | Seal or Signature of the person responsible |
| Review by: _____                                                           |                                             |
| Review Closing: _____                                                      |                                             |
| <b>2nd Review</b><br>Whichever comes first: 1440 work hours or 8 months.   |                                             |
| Service order number: _____                                                | Seal or Signature of the person responsible |
| Review by: _____                                                           |                                             |
| Review Closing: _____                                                      |                                             |
| <b>3rd Review</b><br>Whichever comes first: 2,160 work hours or 12 months. |                                             |
| Service order number: _____                                                | Seal or Signature of the person responsible |
| Review by: _____                                                           |                                             |
| Review Closing: _____                                                      |                                             |
| <b>4th Review</b><br>Whichever comes first: 2,880 work hours or 16 months. |                                             |
| Service order number: _____                                                | Seal or Signature of the person responsible |
| Review by: _____                                                           |                                             |
| Review Closing: _____                                                      |                                             |
| <b>5th Review</b><br>Whichever comes first: 3,600 work hours or 20 months. |                                             |
| Service order number: _____                                                | Seal or Signature of the person responsible |
| Review by: _____                                                           |                                             |
| Review Closing: _____                                                      |                                             |
| <b>6th Review</b><br>Whichever comes first: 4,320 work hours or 24 months. |                                             |
| Service order number: _____                                                | Seal or Signature of the person responsible |
| Review by: _____                                                           |                                             |
| Review Closing: _____                                                      |                                             |

# WARRANTY CERTIFICATE – QUALITERME

When you purchase Qualiterme products, you are choosing a company that has been developing technology applied to refrigeration systems for over 25 years, consolidating tradition, reliability and durability across all our lines.

To ensure the longest lifespan of your equipment, it's essential that you follow the manufacturer's instructions carefully. Failure to follow these guidelines will void your warranty.

## WARRANTY CONDITIONS

The equipment has a 12-month warranty, 3 of which are legal and another 9 months granted by Qualiterme, counting from the date of billing and issuance of the Invoice.

The warranty exclusively covers manufacturing defects in parts and components, subject to analysis and verification by authorized Qualiterme technicians.

Excluded are: built-in accessories, items subject to natural wear and tear and faults resulting from misuse.

Qualiterme is not responsible, under any circumstances, for losses and damages resulting from equipment downtime, even in the event of a manufacturing defect.

## LOSS OF WARRANTY

- The warranty will be automatically void in the following cases:
- Repairs, adjustments or alterations made by a professional not authorized by Qualiterme Technical Assistance.
- Replacement or modification of components without prior authorization from the Qualiterme Technical Department.
- Manipulation, removal or alteration of the equipment identification plate.
- Operation outside the technical specifications provided, or installation in an unsuitable location.
- Damage caused by corrosive environments or liquids without proper treatment.
- Changes in the hydraulic system.
- Damage resulting from inadequate transportation, falls, accidents or force majeure (lightning, sudden power surges, floods, storms, etc.).

## WARRANTY SERVICE

All obligations arising from this certificate will be fulfilled by Qualiterme at its factory in Novo Hamburgo – RS.

The following are not included in this warranty:

Travel, accommodation or food expenses for technicians.

Transportation costs, freight of parts, packaging, insurance or any tax charges.

Qualiterme's responsibility is limited to the supply of parts and labor for repairs, exclusively at its factory.

# Qualiterme

Equipamentos de Refrigeração

Site: [www.qualiterme.com.br](http://www.qualiterme.com.br)

Fone: 51 3066.2030 / 51 3587.5152

Telefone: Assistência: 51 98119.3000

Email: [atendimento@qualiterme.com.br](mailto:atendimento@qualiterme.com.br)

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