

VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

TLV-DUAL SERIES - INSTALLATION GUIDE

Information to consider before installing your autoclave.

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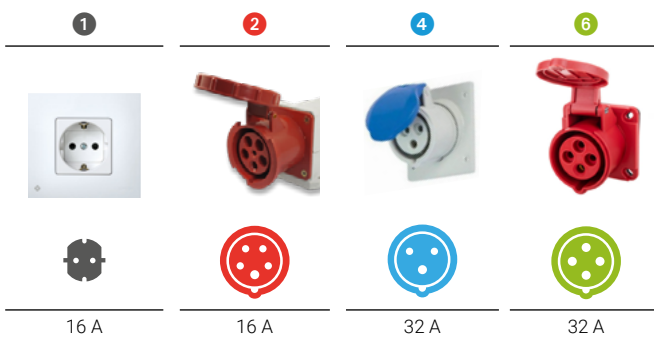


VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

ELECTRICAL CONNECTION STANDARD

The following table shows the plug configuration according to international IEC and SCHUKO standards. For customers requiring other plugs and other electrical configurations, please contact our technical service.

MODELS	FREQUENCY	POWER	AMPERES / PHASE	TENSION	CONNECTION
TLV-50DUAL	50/60 Hz	3600 W	15 A	230 (1P+N+PE) V	16 A 
TLV-50DUAL-115V	50/60 Hz	3600 W	30 A	120 (1P+N+PE) V	32 A 
TLV-75DUAL	50/60 Hz	3600 W	15 A	230 (1P+N+PE) V	16 A 
TLV-75DUAL-115V	50/60 Hz	3600 W	30 A	120 (1P+N+PE) V	32 A 
TLV-110DUAL	50/60 Hz	9000 W	13 A	400 (3P+N+PE) V	16 A 
TLV-110DUAL-220T	50/60 Hz	9000 W	23 A	230 (3P+PE) V	32 A 
TLV-110DUAL-6K-220M	50/60 Hz	6000 W	26 A	230 (1P+N+PE) V	32 A 
TLV-150DUAL	50/60 Hz	9000 W	13 A	400 (3P+N+PE) V	16 A 
TLV-150DUAL-220T	50/60 Hz	9000 W	23 A	230 (3P+PE) V	32 A 
TLV-150DUAL-6K-220M	50/60 Hz	6000 W	26 A	230 (1P+N+PE) V	32 A 



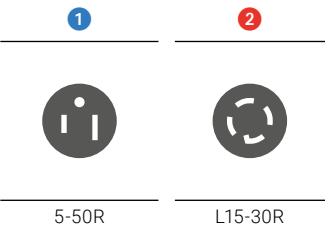
**VERTICAL AUTOCLAVES
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ELECTRICAL CONNECTION NORTH AMERICA

The following table shows the plug configuration according to NEMA standards for the United States of America and other regions. For customers requiring other plugs and other electrical configurations, please contact our technical service.

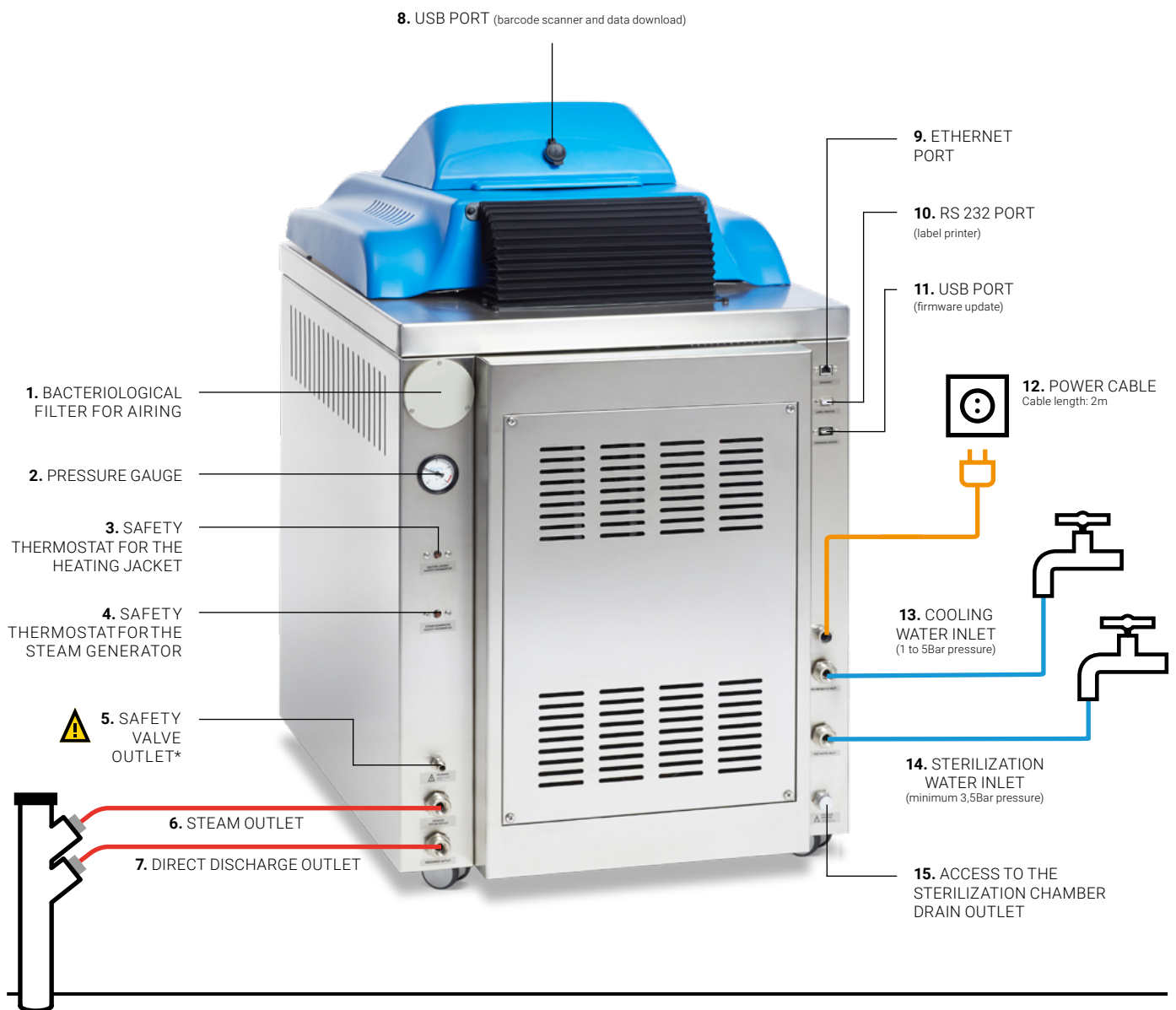
Attention: The following table lists standard electrical configuration versions. The voltage of each model can be modified to suit other configurations if required. Moreover, certain models can be adjusted between single-phase and three-phase. Additionally, the provided NEMA plug can also be customized if needed.

MODELS	FREQUENCY	POWER	AMPERES / PHASE	TENSION	CONNECTION
TLV-50DUAL-115V-US	50/60 Hz	3600 W	30 A	120 (1P+N+PE) V	NEMA 5-50P ①
TLV-75DUAL-115V-US	50/60 Hz	3600 W	30 A	120 (1P+N+PE) V	NEMA 5-50P ①
TLV-110DUAL-220T-US	50/60 Hz	9000 W	23 A	230 (3P+PE) V	NEMA L15-30P ②
TLV-150DUAL-220T-US	50/60 Hz	9000 W	23 A	230 (3P+PE) V	NEMA L15-30P ②



VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

CONNECTIONS GRAPH



ATTENTION!
Outlets 6 and 7 must be driven to the drain separately and must be properly attached to it. See page 6.



*Outlet 5 must be left unobstructed at all times.

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INCLUDED COMPONENTS

In addition to the accessories chosen at the time of purchase of the autoclave (baskets, label printer, ticket printer, barcode scanner, external server, etc.), the following components are included:



1 stainless steel protective rack for the sterilization chamber, with legs to place it on the inner base of the sterilization chamber.

MODELS	DIAMETER
TLV-50DUAL	360 mm
TLV-75DUAL	360 mm
TLV-110DUAL	460 mm
TLV-150DUAL	460 mm



4 reinforced NBR hoses 2m long with 3/4" connection at both ends for threaded connection to the equipment and tap (gaskets included).

For:

- 6.** STEAM OUTLET
- 7.** DIRECT DISCHARGE OUTLET
- 13.** COOLING WATER INLET
- 14.** STERILIZATION WATER INLET

VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

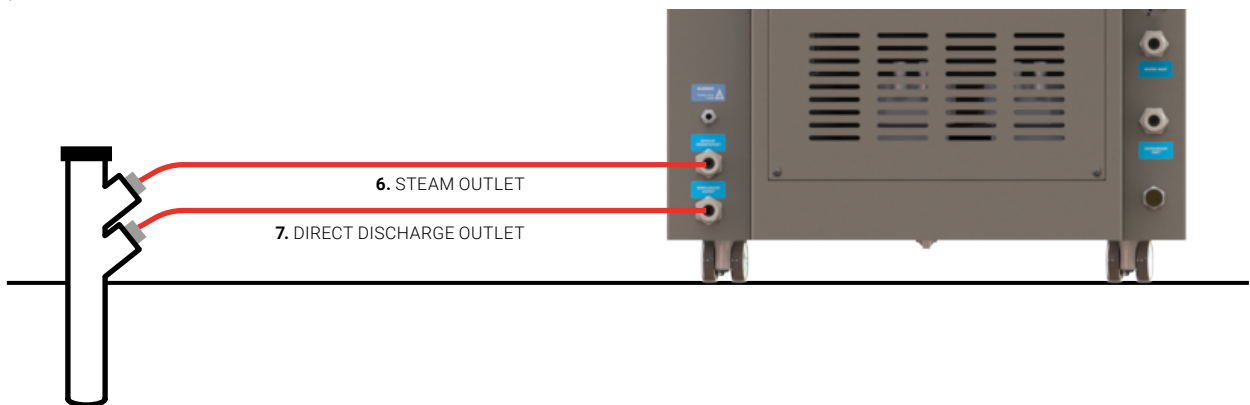
DRAINAGE CONNECTIONS

All models from the TLV-DUAL Series are equipped with two drainage outlets which serve to discharge the purge, regulate internal pressure, and expel the steam and condensates produced during each sterilization cycle. Additionally, they feature an active cooling system, which utilizes a heat exchanger with the main water supply to reduce the temperature of these gas and liquid emissions to a safe level before being discharged into the drain.

There are three options for managing the autoclave discharge, **A**, **B** and **C** using the STEAM OUTLET (6) and the DIRECT DISCHARGE OUTLET (7).

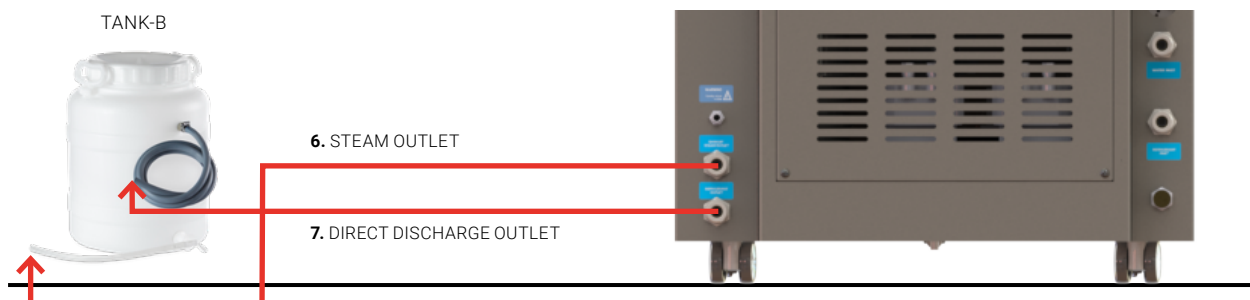
STANDARD

A. Connect both connections, the STEAM OUTLET (6) and the DIRECT DISCHARGE OUTLET (7), independently to a drain using the provided hoses.



OPTIONAL IF A DRAIN IS NOT AVAILABLE AND NO COOLING WATER NETWORK IS ACCESSIBLE

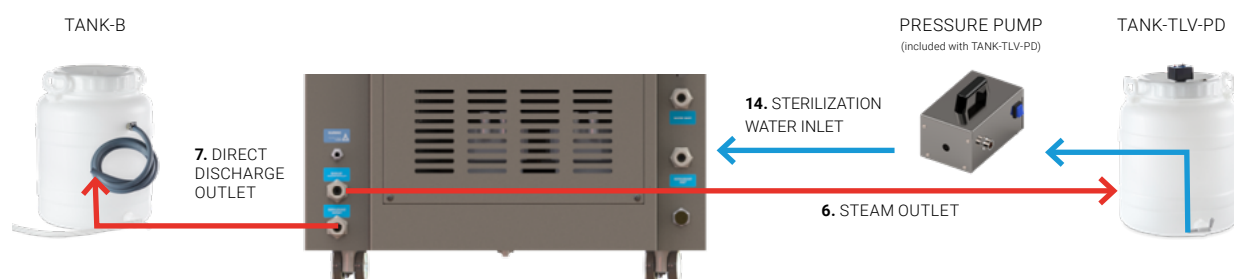
B. If a drain is not available and no cooling water network is accessible, an external tank can be used for equipment drainage. For this purpose, the DIRECT DISCHARGE OUTLET (7) and the STEAM OUTLET (6) connections, must be connected to the external tank TANK-B.



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OPTIONAL IF NEITHER A WATER SUPPLY NETWORK, A COOLING WATER NETWORK, NOR A DRAIN IS AVAILABLE

C. In the absence of an adequate water supply network for the steam generator, a cooling water network, and a drainage system, external tanks can be utilized for the equipment's water supply and drainage. To implement this solution, the DIRECT DISCHARGE OUTLET (7) must be connected to the external tank TANK-B and both the STEAM OUTLET (6) and the STERILIZATION WATER INLET (14) must be connected to the tank TANK-TLV-PD using the hoses and pressure pump supplied with these two accessories.



ATTENTION

Ensuring these connections are robustly fastened is critical for maintaining safety and operational integrity. During routine operation of the autoclave, the hoses are subjected to elevated pressures and temperatures, resulting in significant vibrations. Improperly secured hoses pose a substantial risk of detachment, which could lead to hazardous situations such as burns.

CONSIDER:

Height and position of drain outlets:

MODEL	HS STEAM OUTLET	HD DIRECT DISCHARGE OUTLET
TLV-50DUAL	170 mm	110 mm
TLV-75DUAL	180 mm	110 mm
TLV-110DUAL	190 mm	115 mm
TLV-150DUAL	190 mm	110 mm



VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

WATER SUPPLY FOR COOLING

All models in the TLV-DUAL Series are equipped with two cooling systems. The primary system is a rapid cooling mechanism, utilizing a water coil that encircles the sterilization chamber, designed to expedite the temperature reduction of the load during the cooling phase. The secondary system is a heat exchanger that employs the main water supply to lower the temperature of gas and liquid emissions to safe levels before they are discharged into the drain. To prevent the formation of calcareous residue deposits inside the cooling coils of the primary cooling system the use of decalcified or soft water is recommended.

The COOLING WATER INLET (13) must be connected to a 3/4" GAS tap from a water main with a minimum pressure of 1Bar.

WATER TYPE	MG/L ¹	FH ²	DH ³	EH ⁴
Soft water	≤17	≤1,7	≤0,95	≤1,19
Slightly hard water	≤60	≤6,0	≤3,35	≤4,20
Moderately hard water	≤120	≤12,0	≤6,70	≤8,39
Hard water	≤180	≤18,0	≤10,05	≤12,59
Very hard water	>180	>18,0	>10,05	>12,59

¹ Mg/L: calcium carbonate (CaCO₃) milligrams per liter of water.

² FH: French hardness (10,0mg CaCO₃/L).

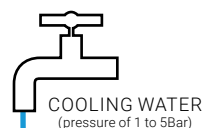
³ DH: German hardness (17,8mg CaCO₃/L).

⁴ EH: English hardness (14,3mg CaCO₃/L).

Fast cooling system
of the sterilization
chamber by means
of a water coil



13. COOLING WATER INLET



COOLING WATER
(pressure of 1 to 5Bar)



ATTENTION

If a water supply network is not available, please contact our technical service.

VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

USE OF WATERSOFT-TLV IN COMBINATION WITH TLV-DUAL SERIES AUTOCLAVES

If you don't have a soft water main available, we recommend using the WATERSOFT-TLV water softener.

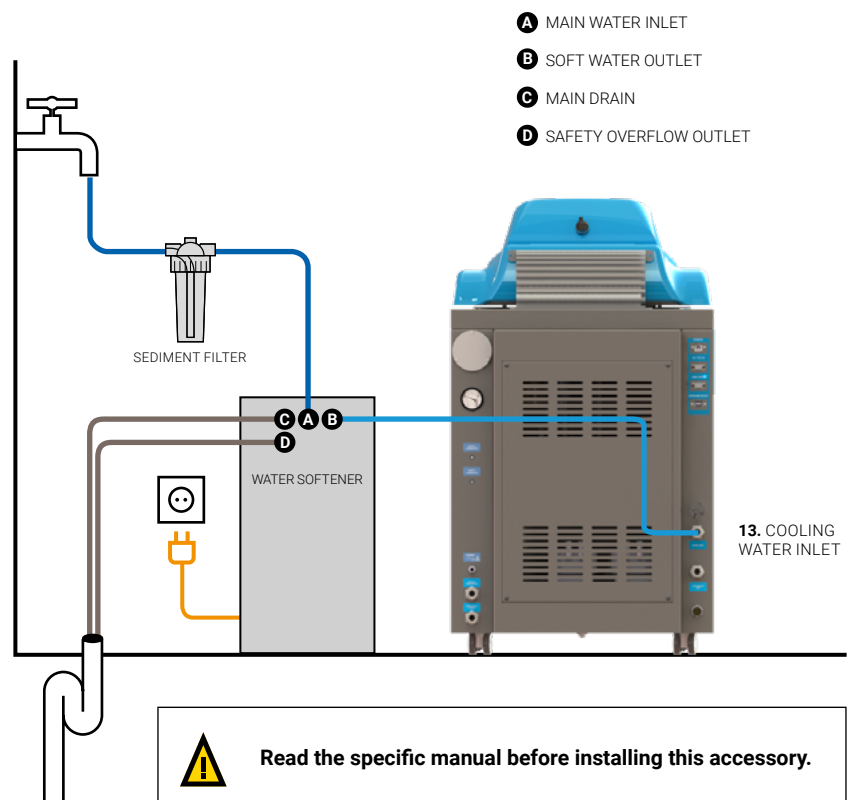
The WATERSOFT-TLV water softener comes with all hoses needed for installation (hoses are 2 meters long), one particle filter equipped with a cartridge and a water hardness measuring kit.

The MAIN WATER INLET (A) must be connected from the water softener to the water main with the provided 2m hose after going through the included sediment filter (water temperature from the main must be between 5 °C and 38 °C).

Soft water must be driven from the SOFT WATER OUTLET (B) to the COOLING WATER INLET (13) of the autoclave using the 2m long included hose.

The pre-installed drainage hoses: MAIN DRAIN (C) and SAFETY OVERFLOW OUTLET (D) must be driven to the drain.

Inlet and drainage hoses must always be visible and in good condition.



VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

WATER SUPPLY FOR STERILIZATION

AUTOMATIC SUPPLY

TLV-DUAL Series autoclaves have automated filling of the steam generator that produces the steam during normal operation of the autoclave. Purified water must be used and supply options **A**, **B** and **C** are available using the STERILIZATION WATER INLET (14).

A. Use a water main (1 to 5Bar pressure) connected to a ECOPUR-TLV water purifier and connect to the automatic sterilization water inlet of the autoclave.



3/4" GAS TAP
NON-PURIFIED MAIN WATER
(pressure from 1 to 5Bar)



ECOPUR-TLV ACCESSORY



B. Use a previously purified water main (1 to 5Bar pressure) connected directly to the autoclave's automatic water supply inlet.



3/4" GAS TAP
PURIFIED MAIN WATER
(pressure from 1 to 5Bar)



C. Use the external tank TANK-TLV-PD with purified water and connect it to the pressure pump supplied with the accessory; connect the pump directly to the automatic water supply inlet of the autoclave. This tank is equipped with a level sensor that emits an acoustic signal when it needs to be refilled.



TANK-TLV-PD ACCESSORY



PRESSURE PUMP
(included with TANK-TLV-PD)



VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

IMPORTANT NOTE:

PURIFIED WATER

The water used to feed the autoclave must be free of contaminants and meet the following hardness and conductivity requirements:

- Hardness: $\leq 0,02\text{mmol/L}$
- Conductivity: between $5\mu\text{S/cm}$ and $15\mu\text{S/cm}$

Multiple systems may be used to obtain water which fulfills these requirements: osmosis, demineralization, decalcification, etc.

*Note: Take into account that distilled water that is too pure (conductivity less than $5\mu\text{S/cm}$) is not recommended as it may cause corrosion on stainless steel in the long term and water level detection problems.

USE OF ECOPUR-TLV IN COMBINATION WITH TLV-DUAL SERIES AUTOCLAVES

If you don't have a purified water main available where you intend to install the autoclave, we recommend using our ECOPUR-TLV water purifier*.

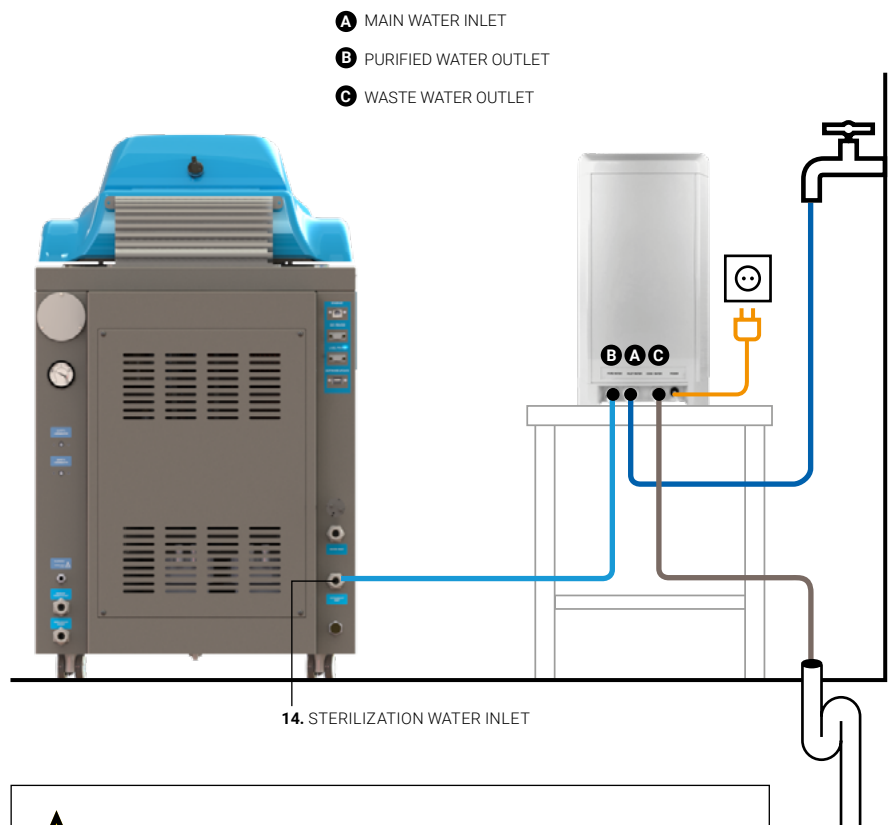
The MAIN WATER INLET (A) must be connected from the purifier to a non-purified water main with the 1,2m hose (water temperature from the main must not exceed 38°C or be less than 5°C).

Water must be driven from the PURIFIED WATER OUTLET (B) to the STERILIZATION WATER INLET (14) of the autoclave using the provided 1,2m hose.

Waste water must be driven from the WASTE WATER OUTLET (C) to a drain with the 1,2m provided hose.

Bear in mind that the inlet and drain hoses in the purifier must always be visible and in perfect working condition.

*It is recommended to use a single purifier for each autoclave. In case you would like to use the same purifier for more than one autoclave contact our technical support.



Read the specific manual before installing this accessory.

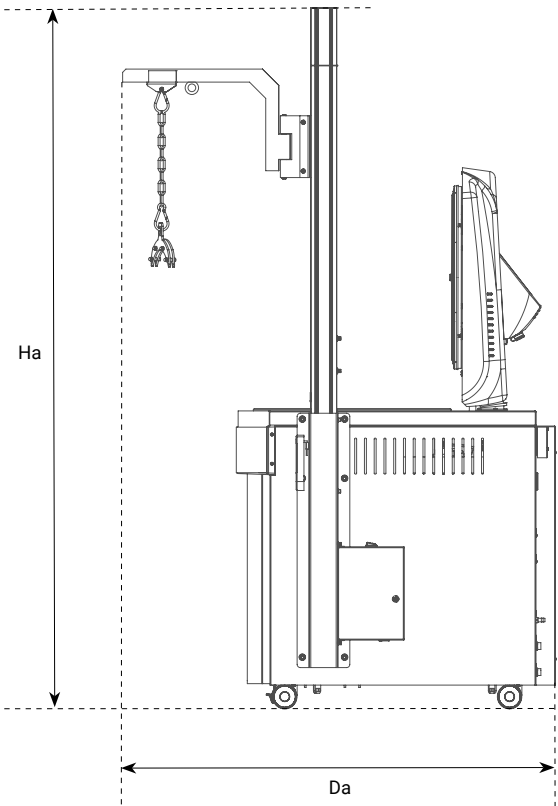
**VERTICAL AUTOCLAVES
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INTEGRATED BASKET LIFT SYSTEM INSTALLATION

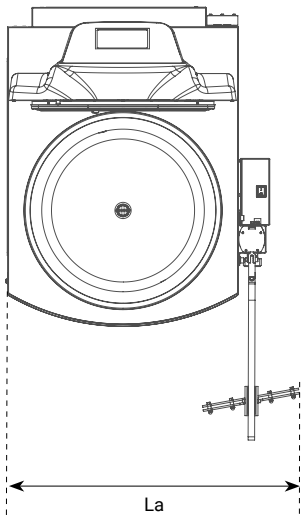
To ensure safe handling of the baskets in larger volume autoclaves, it is recommended to use a basket lifting crane equipped with a rotating mast. For the TLV-DUAL Series autoclaves, the recommended model is the FIX-LIFT crane, which is capable of handling loads up to 30 kg.

CRANE DIMENSIONS L x D x H	MAXIMUM LOAD PER BASKET	AUTOCLAVE MODEL COMPATIBILITY	DIMENSIONS OF THE CRANE + AUTOCLAVE SET La x Da x Ha
83 x 700 x 2112 mm	30 Kg	TLV-75DUAL	707 x 1231 x 2106 mm
		TLV-110DUAL	806 x 1331 x 2155 mm
		TLV-150DUAL	806 x 1331 x 2305 mm

SIDE VIEW



PLAN VIEW



ATTENTION:
The integrated crane can be installed at the factory or retrofitted later. The larger models, 124L and 169L, include a special factory adaptation to allow for later installation of the crane. For the other models, the adaptation must be requested.

VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

INTEGRATED BASKET LIFT SYSTEM DESCRIPTION



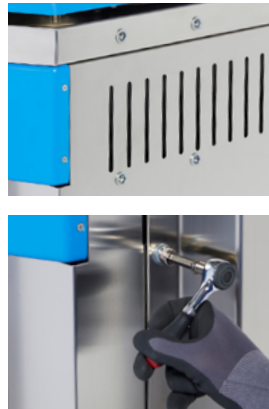
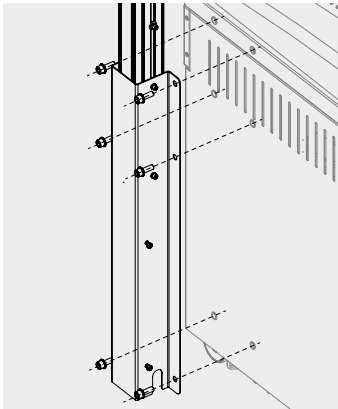
VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

SIMPLIFIED INSTALLATION GUIDE FOR THE INTEGRATED BASKET LIFT SYSTEM



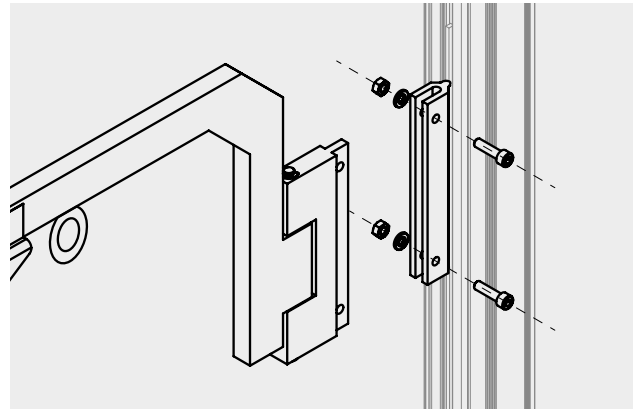
ATTENTION

Refer to the specific manual of the integrated basket lift system before assembling, installing and handling this accessory.



1. Preparation and assembly of the vertical column

Follow the steps indicated in the manual to assemble the vertical column and attach it to the housing. Secure it to the right side of the autoclave chassis using the provided screws and washers, and install the electrical panel box by connecting the cables.



2. Installation of the mast

Install the mobile mast on the vertical column using the provided screws and washers.



3. Placement of other components

Once the structural elements are securely fastened, proceed with the placement of the remaining components: carabiner, chain, and basket holder.



4. Use of the lift system

The accessory is ready for use. To ensure safety and proper maintenance, we recommend following the instructions in the specific lift system manual carefully.

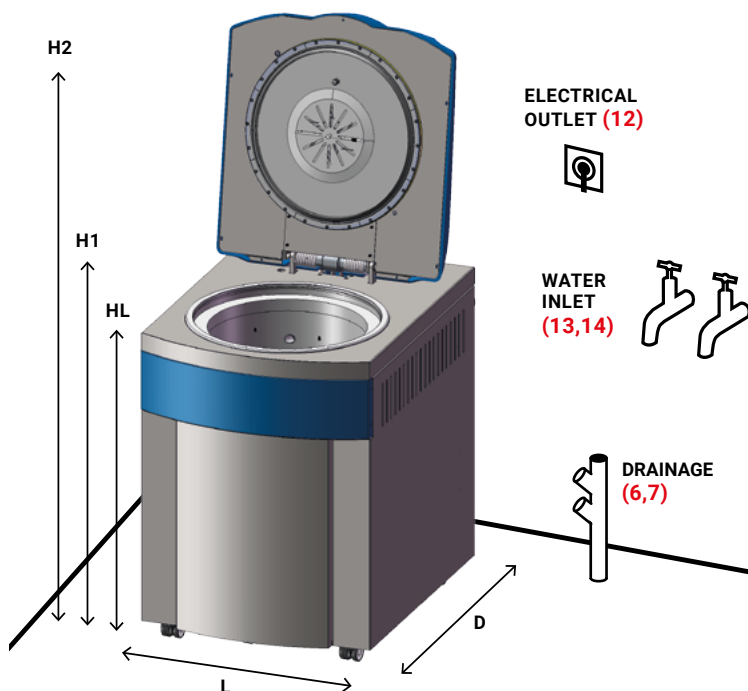
VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES



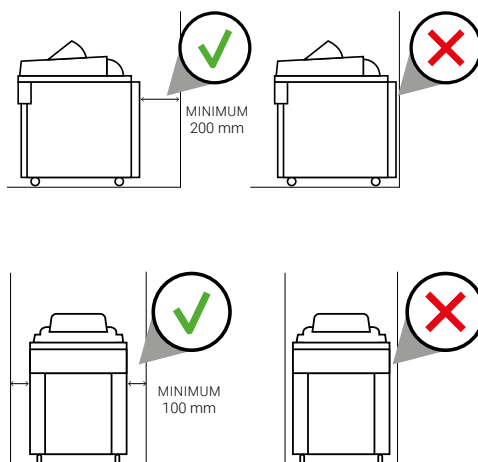
DIMENSIONS TO CONSIDER FOR THE INSTALLATION OF YOUR AUTOCLAVE

For safety reasons, the distance between both sides of the autoclave and the wall or any other object must be 100 mm, and at least 200mm between the autoclave and the rear wall.

MODELS	L LENGTH	D DEPTH	H1 HEIGHT	H2 HEIGHT with maximum door opening	HL LOADING HEIGHT	HS STEAM OUTLET CONNECTION HEIGHT	HD DIRECT DISCHARGE CONNECTION HEIGHT
TLV-50DUAL	610 mm	870 mm	1060 mm	1470 mm	815 mm	170 mm	110 mm
TLV-75DUAL	610 mm	876 mm	1110 mm	1520 mm	865 mm	180 mm	110 mm
TLV-110DUAL	710 mm	980 mm	1160 mm	1665 mm	915 mm	190 mm	115 mm
TLV-150DUAL	710 mm	980 mm	1310 mm	1810 mm	1065 mm	190 mm	110 mm



WARNING:
Respect the
recommended distances.



CONSIDER:
Height and
position of drain
connections.



ENVIRONMENTAL CONDITIONS

This equipment can operate under the following maximum conditions:

- Ambient temperature: 30 °C
- Humidity: 75%
- Altitude: 3.000 meters above sea level.*

*In case of higher altitudes, contact with our technical team.

VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

RECOMMENDED MAINTENANCE

Autoclaves are like cars: they need regular maintenance for them to work properly, to ensure good condition, prevent deterioration of its components, and maximize their useful life. Frequent cleaning and regular maintenance are essential, as autoclaves work at high pressures and temperatures and are therefore subject to a high level of stress.

For clients that perform multiple cycles each day, we recommend carrying out maintenance and cleaning tasks more frequently.

DAILY MAINTENANCE

Clean the gasket using a clean cotton cloth with a mild vinegar solution (or a comparable product) to reduce the formation of lime deposits.

Wipe the external surfaces with a clean cotton cloth moistened with water and a neutral detergent. Ensure all surfaces are thoroughly dried afterwards.



WEEKLY MAINTENANCE

Clean the sterilization chamber with a clean cotton cloth dampened with water and neutral detergent. Dry the chamber thoroughly after cleaning.

Clean all components with a clean cotton cloth and a small amount of water and neutral detergent. Ensure all components are dried completely after cleaning.



ANNUAL MAINTENANCE

Autoclaves from the TLV-DUAL Series are equipped with a bacteriological filter, which should be replaced either upon reaching the recommended interval or when a filter blockage is detected.

Conducting a technical inspection is essential to ensure consistent process safety over time. It is necessary to periodically verify the thermodynamic process parameters (pressure and temperature), ensuring they remain within the accepted limits.



VERTICAL AUTOCLAVES WITH SUPERDRYING AND FAST COOLING SYSTEM TLV-DUAL SERIES

TECHNICAL SUPPORT, ORIGINAL SPARE PARTS AND EXPERIENCED CONSULTING SERVICES

For an optimal operation of the autoclave, always use original spare parts and schedule periodically, with a specialized technician, the relevant maintenance tasks, such as calibration of the temperature and pressure sensors or replacement of the sterilization chamber door gasket.

Additionally, we provide a comprehensive range of services to ensure a satisfactory user experience throughout the entire lifespan of our products. These services include support and training programs, guided start-up and qualification services, preventive and corrective maintenance, periodic calibration, technical support and repairs, as well as consulting on special applications.

Should you encounter any issues, have questions, or require further information regarding maintenance of the TLV-DUAL Series autoclave, please don't hesitate to reach out to our technical support service using the following contact details.



Technical support

<https://www.raypa.com/en/contact/>
+34 937 830 720 (Ext. 2109)

