

TTR RANGE

INDUSTRIAL CLIMATE CONTROL SOLUTIONS

## DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS INTRODUCTION

The robust high-performance TTR dehumidifiers ensure efficient and permanent dehumidification, even at low dew points.

The TTR range is developed and manufactured in Germany using nothing but high-quality components supplied by leading component manufacturers.

Thanks to the internal heat recycling process as well as the high level of resilience and performance of their special adsorption rotors, the desiccant dehumidifiers of the TTR series deliver great dehumidification performance with a low energy consumption.



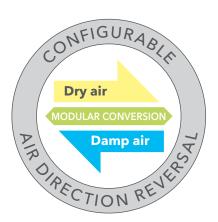
#### **Key features**

- Professional quality "Made in Germany"
- Configurable air direction reversal for all models
- Equipped with manifold functions and extensive features as standard
- High economic efficiency due to modular assembly design
- Can be configured individually for any application due to a wide range of equipment options



#### DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS

# HIGH-PERFORMANCE DEHUMIDIFIERS WITH A MAINTENANCE-FRIENDLY DESIGN

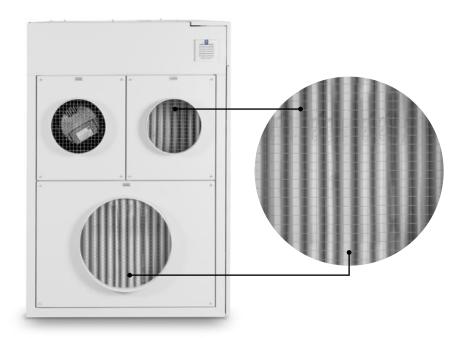




The configurable air direction reversal is a practical detail for stationary industrial applications, in particular those with pipe connections, because it makes it possible to integrate new or additional devices flexibly into existing process sequences. With the operator side always facing the user, the air flow direction can easily be adjusted to individual procedures by utilising the modular conversion capabilities. So blowing out dry air to the right and discharging humid air to the left – or the other way round – is possible thanks to the air direction reversal.

Based on the latest generation of efficient components from leading manufacturers, The TTR industrial desiccant dehumidifiers offer numerous extension options and have been designed with ease of service in mind.





All TTR units come equipped ex works with separate G4 air filters in Z-line design, both for process and regeneration air. A corresponding filter monitoring unit with warning light is also fitted as standard.



# DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS CUSTOMISED SPECIAL SOLUTIONS



## TTR industrial desiccant dehumidifiers with hygienic design

On request, we configure special industrial desiccant dehumidifiers using a maximum of bacteriostatic materials for the pharmaceutical or food industry that both have very high hygienic requirements.

The entire process air conveying section is made exclusively of stainless steel and with its heat regeneration of over 120 °C, a non-corrosive sorption rotor ensures an environment hostile to germs for maximum hygiene.



#### Museums and archives

For exhibition or storage areas in museums, libraries or archives, room climate and air quality are the most important factors for preserving valuable exhibits or archives.



#### Shipbuilding and shipyards

Typical tasks in shipyards require high dehumidification performance at low temperatures. With integrated heat recovery and electronic energy management as standard, the Dantherm TTRs constitute an energy-efficient solution.



#### Agriculture and livestock farming

Animal stables are characterised by high levels of humidity caused by the excretions and vapours of the animals, cleaning and watering. Both stationary and mobile adsorption dehumidifiers are ideal for removal of the humid air.



#### **Electronics and semiconductors**

Moisture is the biggest threat in the production and storage of electronic components and semiconductors: high humidity causes corrosion and condensation moisture on surfaces leads to poorly adhering coatings of microchips or sensors. Keeping a constantly low air humidity is key.



#### Pulp, paper and printing industry

Damage to pulp, finished paper products, printing plants and warehouses is mainly caused by excessive humidity. In addition to deteriorating the quality of the paper produced, excessive humidity also attacks the expensive machinery.



#### **Plastics industry**

In the production of plastic parts, excessive humidity and condensation causes material changes, clumping of granulate, corrosion of injection moulds and water impressions on surfaces. With the right air dehumidification solution in place, these issues can be avoided.





## TTR industrial desiccant dehumidifiers for PWIS-free dry air

On request and for use in the automotive industry, especially in paint shops, we can deliver PWIS-free special models of our TTR desiccant dehumidifiers equipped with a special rotor made entirely of silicone-free components.

As is the case for all TTR units, this model's desiccant wheel is also washable and non-corrosive, it does not discharge any desiccant and resists air saturated with moisture.



#### **Data centres**

Optimal air conditioning is the basis for smooth continuous operation in data centres. Temperatures must be kept relatively low to avoid overheating.



#### Water supply and disposal

In the water treatment industry, our dehumidification solutions not only prevent condensation, corrosion or mould growth and protect electronic equipment, they also ensure that hygiene requirements are met and help reduce operating and maintenance costs.



#### Military and defence

When storing helicopters, vehicles, uniforms and ammunition for the military, it is important to maintain humidity levels to prevent mould, electronic failure, chemical reactions and corrosion.



#### Water damage restoration

In rooms that remain damp and cold for most of the year, or water damage in low temperatures, using adsorption dehumidifiers is the fastest and most efficient way to treat air. Regardless of temperature, they effectively remove moisture to prevent condensation problems.



#### **Restaurants and canteen kitchens**

Preparing food in industrial kitchens releases a lot of water into the ambient air. The following thorough cleaning of the worktops and equipment does the same. The resulting high relative humidity can be countered effectively using adsorption dehumidifiers.



#### Indoor ice rinks

In ice skating rinks, condensation inevitably forms due to the temperature difference between the air and the icy surface, especially if humid outside air constantly flows in through the cooling system. Desiccant dehumidifiers will distribute dry air over the ice to ensure great ice quality and avoid fog.



## DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS CUSTOMISED SPECIAL SOLUTIONS

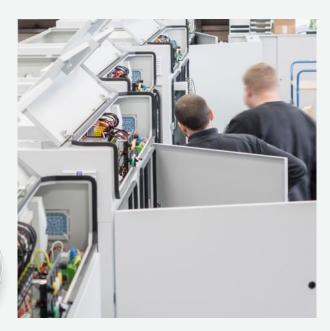
#### Need special desiccant dehumidifier models?

On request, we can manufacture desiccant dehumidifiers in special versions that are tailored to your needs, for example:

- TTR industrial desiccant dehumidifiers with hygienic design
- TTR industrial desiccant dehumidifiers for PWIS-free dry air
- TTR industrial desiccant dehumidifiers with extremely low dew point

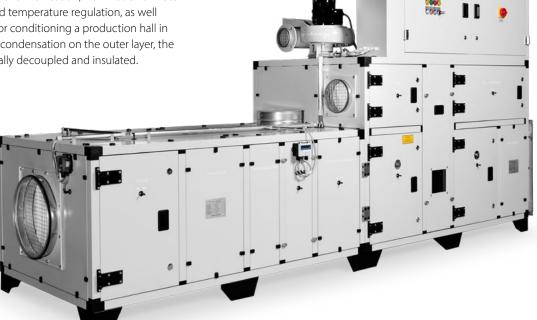
Benefit from getting special models that are tailored to your needs planned, designed and manufactured in close cooperation with our specialists.





#### Special model XTR 2300

Complete facility with air-cooled chilled water unit, combined condensation and desiccant dehumidification, Flowmatic flow rate control of dry air, moisture and temperature regulation, as well as post-tempering of dry air for conditioning a production hall in the food industry. To prevent condensation on the outer layer, the housing has also been thermally decoupled and insulated.





#### DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS

### STANDARD AND OPTIONAL FEATURES

As standard, all TTR units are equipped with numerous functions and features guaranteeing reliable operation, easy handling and a long lifetime requiring minimal maintenance.

Additional equipment options enable you to adapt the units to your specific requirements.

Specifications	TTR 800	TTR 1400	TTR 2000	TTR 2800	TTR 3700	TTR 5200	TTR 6600	TTR 8200	TTR 10000	TTR 12000	TTR 13500
Stainless steel housing	-	-	-	-	-						
Steel housing, galvanised and painted	-	-	-	-	-	•	•	•	•	-	
Wide-range voltage	•		•	•	•	•	•	•	•	•	
Rotor rotation control (rotor and drive)					•		•		•		
Overtemperature protection system with restart lock (regeneration air)	•	•	-	•	-	-	-	•	•	-	-
Operating temperature management (regeneration air)	-	-	-	-	-	-	-	-	•	-	-
Filter monitoring (per air current and collective warning light)	-	•	•	•	•	•	•	•	•	-	•
Duoventic control <sup>1</sup>	-	•	•	•	-	•	•	•	•	-	
PLC control module Millenium						•	•	-	•	-	
Flowmatic volumetric flow control						•	•	•	•	•	
Configurable air direction reversal					•		•		•		
Terminal external On/Off		•			•	•	•		•	•	
Terminal hygrostat					•		•		•		
Potential-free contacts (operation, fault, filter)	•	•	-	•	-	•	-	•	•	•	

Duoventic allows the independent adjustment of each fan's performance via a potentiometer without the need for customer-provided throttle units;

 $\blacksquare$  standard equipment;  $\;\Box$  optional equipment









#### **Caption**

- 1. Lockable swivel castors at the front and trestle rollers at the rear
- Stackable
- 3. Available with a stackable transport frame
- 4. Hygrostat control



## DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS SPECIFICATIONS

Technical data		TTR 800	TTR 1400	TTR 2000	TTR 2800	TTR 3700			
Article number		1 110 003 150	1 110 003 160	1 110 003 171	1 110 003 175	1 110 003 177			
	Dehumidification performance <sup>1</sup> [kg/h]	3.6	7.4	10.8	15.7	20.5			
	Air volume free-blowing [m³/h]	950	1,750	2,350	3,150	4,300			
Dry air	Air volume nominal [m³/h]	750	1,450	2,000	2,800	3,700			
	Compression [Pa]	300	300	300	300	400			
Danasantianasia	Air volume [m³/h]	130	270	380	570	740			
Regeneration air	Compression [Pa]	300	300	250	300	200			
Principle of operatio	n (see page 9)	TTRTrisorp Dual							
Operation range [°C/	/% RH]	-20 °C to +40 °C / 0 to 100 % RH (other operating ranges upon request)							
Heating [kW]		4.1	9.0	12.5	18.9	24.5			
	Power input [kW]	4.9	9.8	15	21.6	28.8			
Flectrical values	Voltage [V, Hz]	3 x 380 480, 50/60 + PE							
Electrical values	Current consumption (@ 3 x 400 V) [A]	7.5	15.0	23.0	31.7	42.8			
	Electrical connection [A]	16	16	32	32	63			
Length [mm]		734	734	1,348	1,348	1,348			
Width [mm]		649	649	769	769	769			
Height [mm]		942	942	1,323	1,323	1,323			
Weight [kg]		85	100	230	250	270			
Connections dry air input/output ø [mm]		250 / 250	250 / 250	315 / 315	315 / 315	315 / 315			
Connections regeneration air input/output ø [mm]  ¹Nominal data at 20°C/60 % RH		160 / 160	160 / 160	200 / 200	200 / 200	200 / 200			

TTR 12000 TTR 13500 **Technical data TTR 5200** TTR 6600 **TTR 8200** TTR 10000 Article number 1 110 003 182 1 110 003 187 1 110 003 190 1 110 003 192 1 110 003 195 1 110 003 197 Dehumidification performance<sup>1</sup> [kg/h] 29.1 37.2 46.2 55.1 66.5 74.6 10,500 14,700 Air volume free-blowing [m³/h] 5,800 7,200 9,000 12,500 Dry air Air volume nominal [m³/h] 6,600 8,200 9,800 11,800 13,300 5.200 Compression [Pa] 400 400 300 300 400 400 Air volume [m³/h] 1,050 1,330 1,660 1,970 2,380 2,670 Regeneration air Compression [Pa] 300 300 300 300 300 200 Principle of operation (see page 9) TTR Trisorp Dual Operation range [°C/% RH] -20 °C to +40 °C / 0 to 100 % RH (other operating ranges upon request) Heating [kW] 36.0 45.0 57.0 66.0 81.0 90.0 Power input [kW] 40.0 50.5 64.5 74.0 89.0 103.0 Voltage [V, Hz] 3 x 380 ... 480, 50/60 + PE Electrical values Current consumption (@ 3 x 400 V) [A] 60.0 73.5 93.5 108.0 129.0 150.0 Electrical connection [A] 100 125 160 160 250 63 Length [mm] 1,919 1,919 2,032 2,032 2,032 1,919 Width [mm] 1,100 1,100 1,100 1,460 1,460 1,460 Height [mm] 1,680 1,680 1,802 1,802 1,802 1,680 Weight [kg] 680 720 750 900 1,000 1,100 500/500 Rectangular duct connection (optional 2 x 500 <sup>2</sup>) Connections dry air input/output ø [mm] 500/500 500/500 Connections regeneration air input/output ø [mm] 300/300 300/300 300/300 400 / 400 400 / 400 400 / 400



¹ Nominal data at 20 °C / 60 % RH

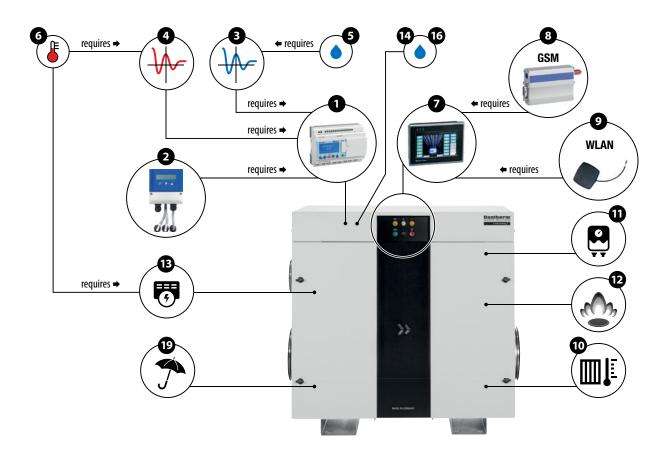
 $<sup>^2</sup>$  2 x ø 500 mm with accessory hose adapter, see equipment options on page 7

# DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS EQUIPMENT OPTIONS

Illustration	Accessory	Description	Products	Code		
	G4 Z-line filter	Process air	TTR 800 TTR 1400 TTR 2000 TTR 2800 TTR 3700 TTR 5200 TTR 6600 TTR 8200 TTR 10000 TTR 12000 TTR 13500	2 x Art. no. 7.160.000.404 2 x Art. no. 7.160.000.404 1 x Art. no. 7.160.000.428 1 x Art. no. 7.160.000.428 1 x Art. no. 7.160.000.428 2 x Art. no. 7.160.000.448 2 x Art. no. 7.160.000.448 2 x Art. no. 7.160.000.448 2 x Art. no. 7.160.000.495 2 x Art. no. 7.160.000.495 2 x Art. no. 7.160.000.495 2 x Art. no. 7.160.000.495		
		Regeneration air	TTR 800 TTR 1400 TTR 2000 TTR 2800 TTR 3700 TTR 5200 TTR 6600 TTR 8200 TTR 10000 TTR 12000 TTR 13500	1 x Art. no. 7.160.000.404 1 x Art. no. 7.160.000.448 1 x Art. no. 7.160.000.448 1 x Art. no. 7.160.000.475 1 x Art. no. 7.160.000.475 1 x Art. no. 7.160.000.475 1 x Art. no. 7.160.000.475		
	F7 pleated filter cartridge	Process air	TTR 800 TTR 1400 TTR 2000 TTR 2800 TTR 3700 TTR 5200 TTR 6600 TTR 8200 TTR 10000 TTR 12000 TTR 13500	2 x Art. no. 7.160.000.409 2 x Art. no. 7.160.000.409 1 x Art. no. 7.160.000.429 1 x Art. no. 7.160.000.429 1 x Art. no. 7.160.000.429 2 x Art. no. 7.160.000.449 2 x Art. no. 7.160.000.449 2 x Art. no. 7.160.000.449 2 x Art. no. 7.160.000.496 2 x Art. no. 7.160.000.496 2 x Art. no. 7.160.000.496		
	cartriage	Regeneration air	TTR 800 TTR 1400 TTR 2000 TTR 2800 TTR 3700 TTR 5200 TTR 6600 TTR 8200 TTR 10000 TTR 12000 TTR 13500	1 x Art. no. 7.160.000.409 1 x Art. no. 7.160.000.449 1 x Art. no. 7.160.000.449 1 x Art. no. 7.160.000.449 1 x Art. no. 7.160.000.476 1 x Art. no. 7.160.000.476 1 x Art. no. 7.160.000.476		
	Tronect SP-T Tronect TF-L	Dry air inlet / outlet Ø 250 mm Humid air inlet / outlet Ø 160 mm	TTR 800 / TTR 1400	6.100.001.202 Ø 255 mm 6.100.001.125 Ø 160 mm		
		Dry air inlet / outlet Ø 315 mm Humid air inlet / outlet Ø 200 mm	TTR 2000 / TTR 2800 / TTR 3700	6.100.001.210 Ø 356 mm 6.100.001.200 Ø 203 mm		
		Dry air inlet / outlet Ø 500 mm Humid air inlet / outlet Ø 300 mm	TTR 5200 / TTR 6600 / TTR 8200	6.100.001.216 Ø 525 mm 6.100.001.295 Ø 305 mm		
		Dry air inlet / outlet Ø 2 X 500 mm Humid air inlet / outlet Ø 400 mm	TTR 10000 / TTR 12000 / TTR 13500	6.100.001.216 Ø 525 mm 6.100.001.212 Ø 425 mm		



# DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS ADDITIONAL EQUIPMENT OPTIONS



Addit	ional equipment options (Article number)	TTR 800	TTR 1400	TTR 2000	TTR 2800	TTR 3700
1	PLC control module Millenium	6.100.010.401	6.100.010.401	6.100.010.401	6.100.010.401	6.100.010.401
2	Flowmatic S (requires 1)	6.100.010.405	6.100.010.405	6.100.010.405	6.100.010.405	6.100.010.405
3	Humidity control (requires 1)	6.100.010.415	6.100.010.415	6.100.010.415	6.100.010.415	6.100.010.415
4	Temperature control (requires 1)	6.100.010.416	6.100.010.416	6.100.010.416	6.100.010.416	6.100.010.416
5	Dew point sensor, -80 °C +20 °C (requires 3)	6.100.010.455	6.100.010.455	6.100.010.455	6.100.010.455	6.100.010.455
6	Pt100 temperature sensor (requires 1+4 and/or 10 or 13)	6.100.010.460	6.100.010.460	6.100.010.461	6.100.010.461	6.100.010.461
7	Touchscreen for device operation (requires 1)	on request				
8	GSM remote connection (requires 7)	on request				
9	WLAN remote connection (requires 7)	on request				
10	Integrated heat exchanger module stainless steel	-	-	6.100.010.437	6.100.010.437	6.100.010.437
11	Steam heater for regeneration air	-	-	6.100.010.440	6.100.010.440	6.100.010.440
12	Gas heater for regeneration air	-	-	6.100.010.445	6.100.010.445	6.100.010.445
13	Electric reheater for dry air	6.100.010.450	6.100.010.450	6.100.010.451	6.100.010.451	6.100.010.451
14	External hygrostat HG 120	6.100.002.040	6.100.002.040	6.100.002.040	6.100.002.040	6.100.002.040
15	4-pin connector coupling for HG 120	6.100.002.039	6.100.002.039	6.100.002.039	6.100.002.039	6.100.002.039
16	External thermohygrostat HG 125, electronic	6.100.002.042	6.100.002.042	6.100.002.042	6.100.002.042	6.100.002.042
17	7-pin connector coupling for HG 125	6.100.002.046	6.100.002.046	6.100.002.046	6.100.002.046	6.100.002.046
18	Wheels (4 swivel castors with brake)	6.100.010.510	6.100.010.510	6.100.010.511	6.100.010.511	6.100.010.511
19	Weather protection equipment	6.100.010.520	6.100.010.520	6.100.010.521	6.100.010.521	6.100.010.521
20	Protective and transport frame, stackable, without castors	-	-	-	-	-
21	Castors for transport frame	-	-	-	-	-
22	Transport frame, stackable, with castors	6.100.010.480	6.100.010.480	6.100.010.485	6.100.010.485	6.100.010.485
23	Filterbox (external) for HEPA air filtration	7.240.000.015	7.240.000.015	7.240.000.015	7.240.000.015	7.240.000.015
24	Hose adapter (2 x ø 500 mm)	-	-	-	-	-

standard equipment; optional equipment; further equipment available upon request, e.g. frost-protected version for outdoor installation, cold room insulation and much more

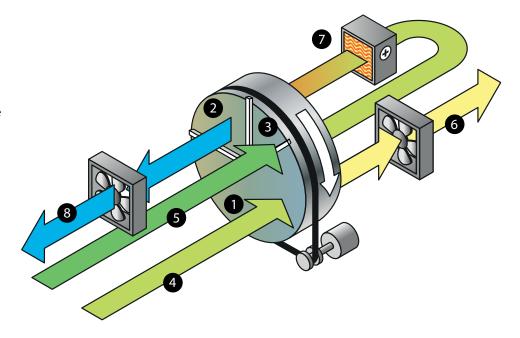


### DANTHERM TTR INDUSTRIAL DESICCANT DEHUMIDIFIERS

## ADDITIONAL EQUIPMENT OPTIONS

## Operation principles of the TTR desiccant dehumidifiers

Separate air flows of process and regeneration air implemented by one fan each. With purging sector for the heat recycling process for incoming regeneration air.



#### TTR-Trisorp-Dual 400 V Key for operation principles

- 1. Dehumidification sector
- 2. Regeneration sector
- 3. Purging sector for heat recovery

- 4. Process air
- 5. Regeneration air
- 6. Dry air
- 7. Heating
- 8. Damp air

Addi	tional equipment options (Article number)	TTR 5200	TTR 6600	TTR 8200	TTR 10000	TTR 12000	TTR 13500
1	PLC control module Millenium	•	•	•	•	•	•
2	Flowmatic S (requires 1)	-	-	-	-	-	-
3	Humidity control (requires 1)	6.100.010.415	6.100.010.415	6.100.010.415	6.100.010.415	6.100.010.415	6.100.010.415
4	Temperature control (requires 1)	6.100.010.416	6.100.010.416	6.100.010.416	6.100.010.416	6.100.010.416	6.100.010.416
5	Dew point sensor, -80 °C +20 °C (requires 3)	6.100.010.455	6.100.010.455	6.100.010.455	6.100.010.455	6.100.010.455	6.100.010.455
6	Pt100 temperature sensor (requires 1+4 and/or 10 or 13)	6.100.010.462	6.100.010.462	6.100.010.462	6.100.010.463	6.100.010.463	6.100.010.463
7	Touchscreen for device operation (requires 1)	on request					
8	GSM remote connection (requires 7)	on request					
9	WLAN remote connection (requires 7)	on request					
10	Integrated heat exchanger module stainless steel	6.100.010.438	6.100.010.438	6.100.010.438	6.100.010.439	6.100.010.439	6.100.010.439
11	Steam heater for regeneration air	6.100.010.441	6.100.010.441	6.100.010.441	6.100.010.442	6.100.010.442	6.100.010.442
12	Gas heater for regeneration air	6.100.010.445	6.100.010.445	6.100.010.445	6.100.010.445	6.100.010.445	6.100.010.445
13	Electric reheater for dry air	6.100.010.452	6.100.010.452	6.100.010.452	6.100.010.453	6.100.010.453	6.100.010.453
14	External hygrostat HG 120	6.100.002.040	6.100.002.040	6.100.002.040	6.100.002.040	6.100.002.040	6.100.002.040
15	4-pin connector coupling for HG 120	6.100.002.039	6.100.002.039	6.100.002.039	6.100.002.039	6.100.002.039	6.100.002.039
16	External thermohygrostat HG 125, electronic	6.100.002.042	6.100.002.042	6.100.002.042	6.100.002.042	6.100.002.042	6.100.002.042
17	7-pin connector coupling for HG 125	6.100.002.046	6.100.002.046	6.100.002.046	6.100.002.046	6.100.002.046	6.100.002.046
18	Wheels (4 swivel castors with brake)	6.100.010.512	6.100.010.512	6.100.010.512	6.100.010.513	6.100.010.513	6.100.010.513
19	Weather protection equipment	6.100.010.522	6.100.010.522	6.100.010.522	6.100.010.523	6.100.010.523	6.100.010.523
20	Protective and transport frame, stackable, without castors	6.100.010.490	6.100.010.490	6.100.010.490	6.100.010.495	6.100.010.495	6.100.010.495
21	Castors for transport frame	6.100.010.501	6.100.010.501	6.100.010.501	6.100.010.502	6.100.010.502	6.100.010.502
22	Transport frame, stackable, with castors	-	-	-	-	-	-
23	Filterbox (external) for HEPA air filtration	7.240.000.015	7.240.000.015	7.240.000.015	7.240.000.015	7.240.000.015	7.240.000.015
24	Hose adapter (2 x ø 500 mm)	-	-	-	6.100.010.524	6.100.010.524	6.100.010.524

🔳 standard equipment; 🗖 optional equipment; further equipment available upon request, e.g. frost-protected version for outdoor installation, cold room insulation and much more





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May 2023

