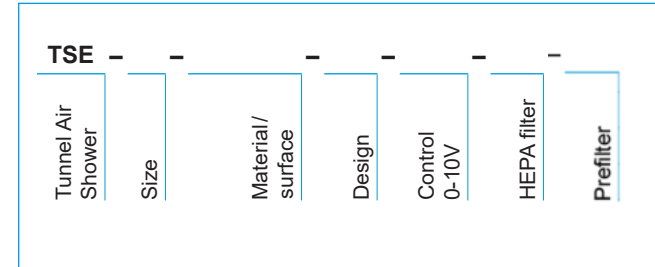


Type Designation



Size	
1	1740 × 571 × 2114 [mm]
Optional	
2	1740 × 450 × 2114 [mm]
Material / Surface	
PB9010	powder-coated steel in RAL 9010 (standard color)
Optional	
PB _____	powder-coated steel in RAL _____ (special color)
Design	
St	standard design
Optional	
LK	with air cooler
IO	with ionization
KI	with air cooler and ionization
HEPA filter	
H14	standard filter class
Optional	
_____	optional filter classes U15, U16
Prefilter	
G4	standard filter class
Optional	
_____	special design

Submittal Text

_____ pcs.

Tunnel Air Shower made of at least 2 single modules (module pair) set opposite one another creating a tunnel.

To increase the number of persons per cleaning cycle, the tunnel can be extended with more module pairs.

Single module

The self-supporting housing is made of steel sheets with rounded edges. A module consists of a pressure chamber with vertical blow nozzles and a suction chamber with fan.

The air is drawn out of the tunnel through an inlet grid, roughly cleaned by a prefilter, and transported by a one-way sucking fan to two large HEPA filters for fine cleaning. The air-flows through the HEPA filters into the pressure chamber and through the nozzles into the shower tunnel.

The length and width of the modules is adapted to a filter ceiling grid and raised floor grid of 600 mm. For an exact positioning of the module a height levelling is integrated in the module floor.

Number of module pairs _____ pcs.

Technical Data Standard Module

Module height 2114 mm
 Module width 571 mm
 Optional module width . . . 450 mm
 Module length 1740 mm

Prefilter

Filter class G3 (DIN EN 779)
 Dimensions 500/500 mm
 Optional filter class _____

HEPA Filter

Filter class H14 (DIN EN 1822-1)
 Dimensions 1139 × 539 × 110 [mm]
 Optional filter class _____

Number of nozzles 2 × 13

Heavy-duty Radial Fan

Nominal voltage / phase 230 V / 1 ph
 Frequency 50/60 Hz
 Motor capacity 750 W
 Nominal current 3,3 A
 Speed max. 1310 1/min
 Speed controller (transformer)

Operational Data

Air velocity 30 m/s
 Air-flow rate 1300 m³/h
 Current consumption 3,3 A
 Power consumption 750 W
 Sound pressure level 64 dB(A)

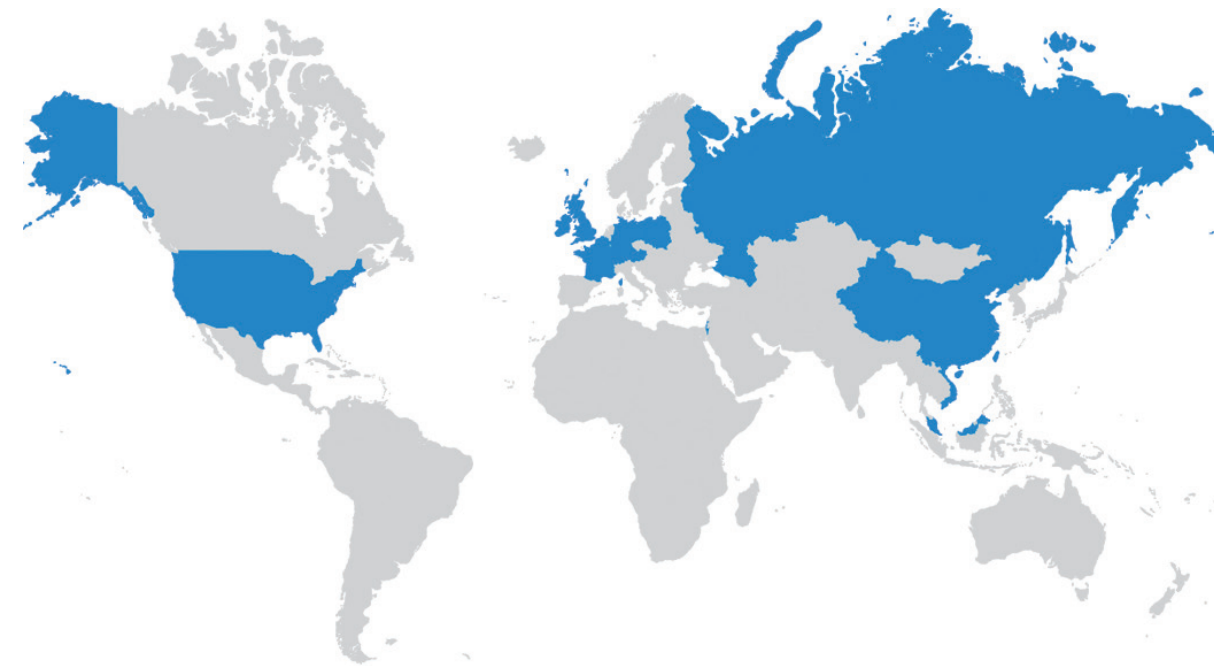
Optional

- Control cabinet with tunnel control
- Cooler; 3 kW without control
- Ionization
 2 emitter rails,
 each with 6 emitters per module behind the nozzle rows
 incl. control unit and internal electric cabling
- Wall and ceiling elements, doors, partitions¹⁾

Manufacturer Exyte Technology GmbH
Type TSE-_____-_____-_____-_____

1) separate description required

Local Support Wherever You Need Us



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Tunnel Air Shower All Types Air Shower / Air Locks

Technical Concept



Product Description

Personnel air showers minimize the transfer of dust particles on cleanroom clothing into cleanrooms. Exyte Technology offers Rotation Air Showers for rooms with low frequency and Tunnel Air Showers for the entering of several persons at the same time. To achieve an optimal personnel flow the modular designed Tunnel Air Showers can be put together to air showers of different sizes.

The Tunnel Air Shower offers a high cleaning effect and is designed for all cleanroom classes.

Unit Construction

The Tunnel Air Shower consists of single modules (pics. 1 and 2) that can be set in pairs opposite each other, and – depending on the required size – set in rows. They can be easily integrated into existing cleanroom systems. The length and width of a module is adapted to the filter ceiling or raised floor grid of 600 mm. Each module has a pressure chamber 1 and a suction chamber 2.

The main components of the pressure chamber are the housing 1a with two vertical nozzle rows 1b and a HEPA filter cell 1c.

The suction chamber with housing 2a includes an inlet grid 2b, a prefilter 2c and a radial fan 2d.

After opening the spagnolets 3 and removing the housing walls, the pressure and suction chambers are easily accessible from the inside.

For each Tunnel Air Shower additional safety glass doors 4 are needed on the grey room and cleanroom side for installation in the cleanroom wall.

On request the modules are equipped with an air cooler to compensate for the fan heat. The installation of an air cooler is especially recommended when the module is set up outside the cleanroom.

The modules are made of powder-coated steel or stainless steel.

Key Features

- For high frequentation
- Individual modules in plug-and-play design for various cleanroom-lock combinations
- High cleaning effect
- Individual setting of the cleaning duration
- Applicable for floor and ceiling grid 600 mm × 600 mm
- Easy integration into cleanroom-wall systems
- Low space requirement and easily retrofitted
- Module-material is optional steel metal sheet (powder-coated) or stainless steel

Automatic Operation

The Tunnel Air Shower has a control system with the following functions:

- Automatic start of the fans when personnel is entering the chamber
- Setting of the cleaning time
- Automatic shut down of the fans before personnel is entering the cleanroom
- Automatic locking and unlocking of the air shower doors with an optical indication through light signals

Technical Data Standard Module

Type	Unit	TSE-1
Module height	mm	2114
Module width ¹⁾	mm	571
Module length	mm	1740
HEPA filter cell (DIN EN 1822-1)		H14 (standard)
Prefilter (DIN EN 779)		G4
Air-flow rate	m ³ /h	1300
Nozzle air velocity	m/s	≥30
Number of nozzles	pcs	2 × 13
Weight without cooler approx.	kg	247
Heavy-duty radial fan		
– Motor capacity	W	750
– Motor speed max.	1/min	1310
– Nominal voltage	V	230
– Nominal current	A	3.3
– Frequency	Hz	50/60

1) optional also with 450 mm module width

Ventilation Function

After the personnel enter the air shower tunnel, the air shower starts off and clean supply air is blown through the nozzles at high speed and impulse. The air-flow covers the complete surface of the cleanroom clothing, removes dust particles and aerosols, and transports them to the filter system. During this process the recirculation air-flows through the inlet grid 2b and the prefilter 2c into the suction chamber and is transported through the HEPA filter cell 1c to the pressure chamber by the radial fan 2d. Afterwards the air-flows back (as described above) through the nozzles into the air shower tunnel.

The staggered arrangement of the nozzle rows increases the cleaning effect. The optimal cleaning time (length of duration of the personnel in the air shower) is 15 seconds.

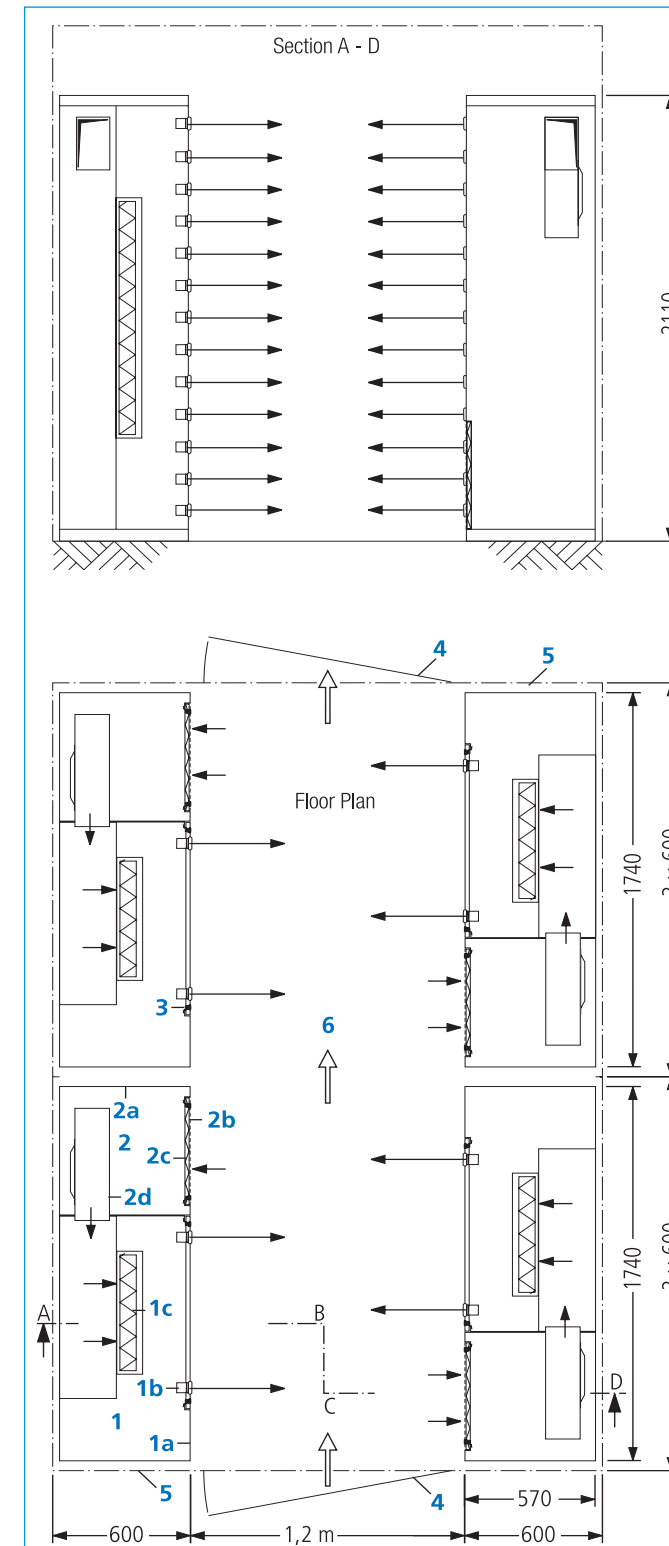


Fig. 1 Tunnel Air Shower with two module pairs

Legend

1 Pressure chamber	2c Prefilter
1a Housing	2d Radial fan with motor
1b Nozzles	3 Spagnolet
1c HEPA filter cell	4 Safety glass door
2 Suction chamber	5 Floor and ceiling grid or cleanroom wall
2a Housing	6 Air shower tunnel
2b Inlet grid	



Fig. 2 Single module with inlet grid, prefilter and two vertical nozzle rows

Optional Designs

- Air-cooler for the compensation of the fan heat
- Ionization device to reduce electrostatical particle adhesive force
- Wall and ceiling elements, doors, partition
- Filter cells U15 or U16

Tunnel Air Shower Operation

This function applies, if the the tunnel air shower is equipped with entrance and exit doors.

Passage from the Grey Room to the Cleanroom

1. Tunnel air shower operational (basic position)
 - All signal lights are green
 - Fan is running with reduced speed
 - Illumination is on
2. Entering the tunnel air shower
 - Person opens door grey room side
 - Signal light cleanroom side changes to red
 - Door cleanroom side is locked
 - Person enters the shower
 - Door grey room side is not looked
 - Signal light grey room side is green
 - Fan increases speed
3. In the tunnel air shower
 - Fan runs for 15 sec with increased speed
 - Signal light cleanroom side changes to green
 - Door cleanroom side is unlocked
4. Leaving the tunnel air shower
 - Door grey room side is locked
 - Signal light grey room side is red
 - Signal light cleanroom side is green
 - Person opens the cleanroom side door
 - Person leaves the shower
 - Close door cleanroom side
 - Door cleanroom side remains unlocked
 - Door grey room side is unlocked
 - Tunnel air shower is operational (basic position)



Abb. 3 Tunnelschleuse, Innenansicht

Passage from the Cleanroom to the Grey Room

1. Tunnel air shower operational (basic position)
 - All signal lights are green
 - Fan is running with reduced speed
 - Illumination is on
2. Entering the tunnel air shower
 - Person opens door cleanroom side
 - Door grey room side is locked
 - Signal lights grey room side changes to red
 - Person enters the shower and closes door to cleanroom side
 - Door cleanroom side is locked
 - Signal light cleanroom side changes to red
 - Door grey room side is unlocked
3. In the tunnel air shower
 - Fan is off
4. Leaving the tunnel air shower
 - Person opens the grey room side door
 - Door cleanroom side is locked
 - Signal light grey room side is green
 - Signal light cleanroom side changes to red
 - Person leaves the shower and locks the grey room side door
 - Fan is running with reduced speed
 - Both signal lights turn green
 - Tunnel air shower is operational (basic position)

Optional Stand-by-Operation

- Fan and Illumination turn off after 5 minutes

Emergency-Off-Switch

If the emergency switch is pressed, all doors can be opened. The fan keeps on running. An acoustic signal will sound continuously until the switch is reset.

Time Calculation for the Optimal Personnel

Number of Modules		2	4	6
Persons per cycle		2	4	6
Opening of the grey room door, entering the air shower, closing the door	s	2.5	3	4
Recommended cleaning time	s	10		
Opening of the cleanroom door, leaving the air shower, closing the door	s	2.5	3	4
Buffer time	s	2		
Total time	s	17	18	20
Personnel flow rate (persons/min)		7	13	18