

Rotation Air Shower RSE All Types Air Shower / Air Locks

Technical Concept



Product Description

Air showers prevent the transfer of dust particles into cleanrooms through entering personnel. Exyte Technology offers Rotation Air Showers (RSE) for all cleanroom classes.

Before entering the cleanroom, each person goes through an air shower, preventing the transfer of dust particles.

The modular design of the Rotation Air Shower is a unique feature.

Unit Construction

The main components are the air shower module **1** and the drive module **2** (Fig. 1).

The air shower module consists of four diagonally arranged supply air ducts **4**, each with 13 nozzles (standard) **4a**, two wall panels **5**, each with one prefilter **5a** and one recirculation air duct **5b**, the swirl outlet **6**, lighting **7** and the two safety glass doors **8**.

The drive module includes the radial fan **2a** with motor **2b**, the two HEPA filter cells **2c** and a control cabinet **2d** with plug & play cable system.

Due to the modular design the shower cabinets can be configured with opposite doors for a straight passage (180°) or arranged together with a 90° entrance. The doors can be fitted with a right or left doorstop. The pictures 2.1 and 2.2 illustrate the two door configurations. The door configuration can be modified at any time.

The standard material for the air shower module and the drive module housing is powder-coated steel. The glass doors are without frame.

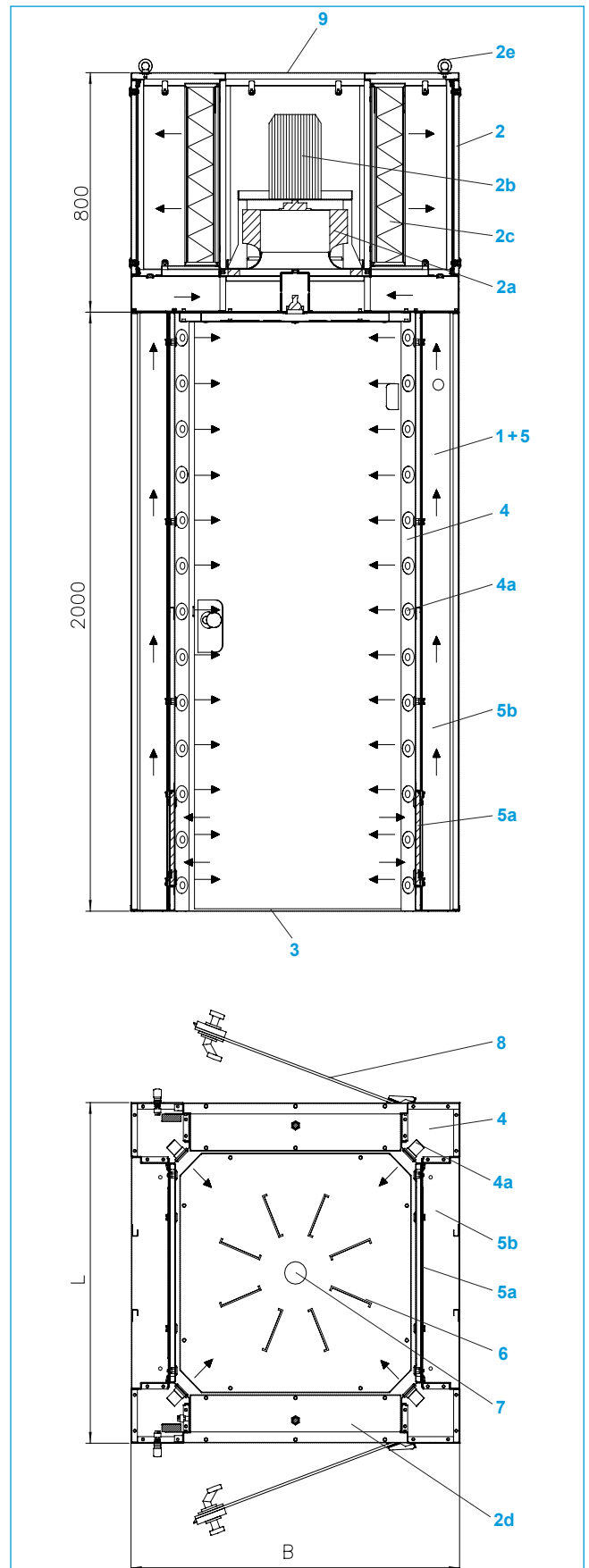
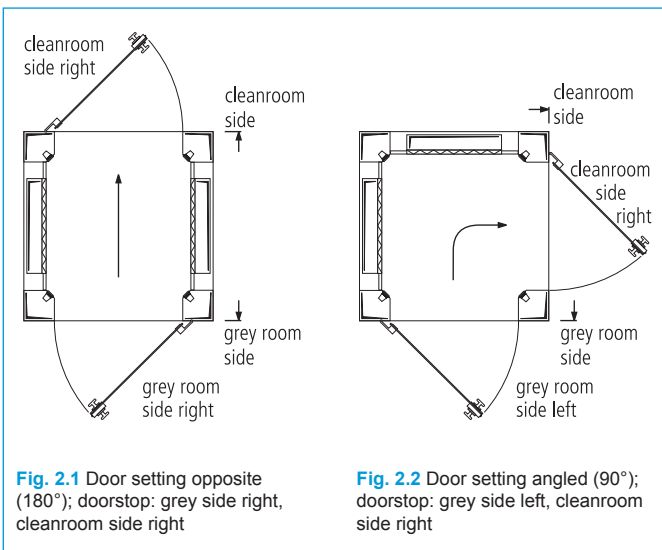


Fig. 1 Rotation Air Shower, unit construction and dimensions

Operation

Once personnel enter the air shower the fan is turned on and high-speed, pulsed, clean supply air is blown out of the nozzles. The air-flows over the cleanroom garment surfaces and removes dust particles and aerosols. The rotational air stream transports the contaminants into the filter system. The recirculation air passes through the prefilter **5a**, the air ducts **5b** and the HEPA filters **2c** and flows back into the air shower cabine as described above.

The cleaning effect of the air shower depends on the duration (time personnel remain in the air shower). The optimal operating time is 12 to 15 seconds (factory pre-set).

Automatic Operation

The switch and control cabinet provides the following functions:

- Automatic fan activation after entry
- Adjustable run time
- Fan stops automatically before entering the cleanroom
- Automatic shower door interlocking system with optical status display (signal lights)

Technical Data

Type	Unit	Size 1	Size 2
Height			
– Air shower module	mm	2000	
– Drive module	mm	800	
Width B	mm	1 135	1 250
Length L	mm	1 135	1 250
Overall height	mm	2800	
Door (all-glass)			
– Entrance width	mm	735	850
– Entrance height	mm	1970	1970
Weight			
– Air shower module	kg	500	
– Drive module	kg	350	
Air-flow volume	m ³ /h	3200	
Max. nozzle air velocity (4 x 13 pcs.)	m/s	30	
HEPA filter class (DIN EN 1822-1)		H14 (standard)	
Prefilter class (DIN EN 779)		G4	
Radial fan			
– Motor capacity	kW	2.4	
– Motor speed	1/min	2850	
– Nominal current	A	4.0	
– Voltage	V	380/400	
– Frequency	Hz	50/60	



Fig. 3 Rotation Air Shower with opposing doors

Optional Designs

- Ionization for reducing electrostatic particle adherence
- Mechanical, self-closing doors
- ULPA filter U15, U16
- Doors with door leaf frame and border, aluminium anodized E6/EV1 with single glazing ESG (alternatively powder-coated frame and border); with drop-sealing in the door panel
- Supply air duct with 4 x 7 pieces blow nozzle \varnothing 40 mm
- Frequency converter to manually update / modify the fan performance
- Display on grey room side for setting the exposure time and the fan speed
- Differential pressure indicator for pre- and main filter

Legend

1 Air shower module	3 Floor	6 Swirl outlet
2 Drive module	4 Supply air duct	7 Lighting
2a Radial fan	4a Nozzle	8 Tempered safety glass doors
2b Motor	5 Wall panel	9 Power supply
2c HEPA filter	5a Prefilter	
2d Control cabinet	5b Recirculation air duct	
2e Ring bolts		

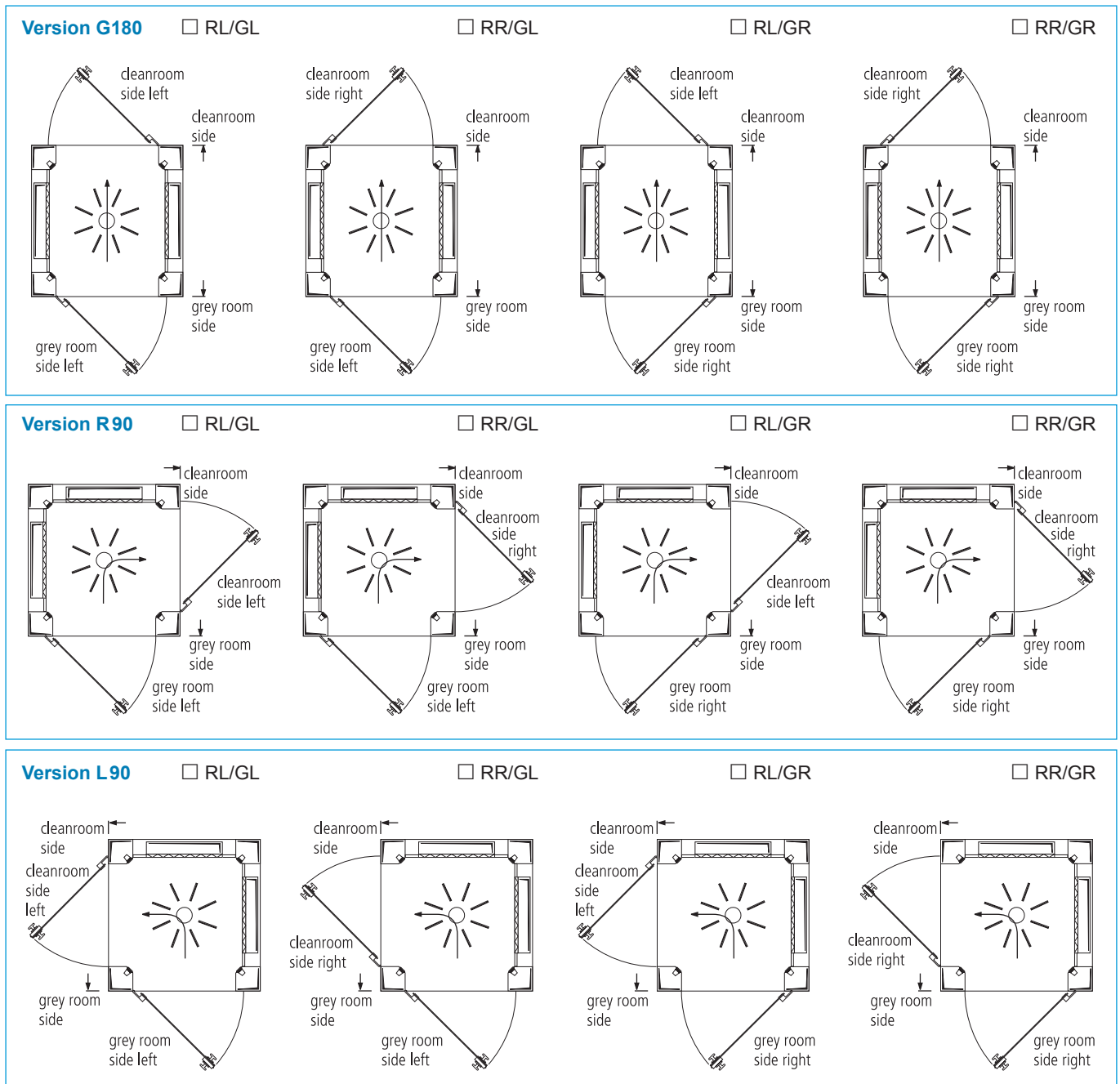


Fig. 4 Rotation Air Shower with doors at 180° and 90° angle

Key Features

- High cleaning effect
- Adjustable cleaning operation time
- Drive module provided with plug & play cable system
- Modular design allows many different door and doorstop positions
- Applicable for 1200 mm × 1200 mm floor and ceiling grid
- Low size ratio; easily integrated into existing cleanrooms

Air Shower Operation

Passage from the Grey Room to the Cleanroom

1. Air shower operational (basic position)
 - Fan is turned off, air shower unoccupied
 - All signal lights are green
 - Illumination is off
 2. Entering the air shower
 - Person opens the door on the grey room side
 - Illumination is turned on
 - Cleanroom side indicator light changes to red
 - Cleanroom side door is locked
 - Person enters the air shower
 - Grey room side door is not locked
 - Grey room side indicator light changes to green
 - Fan starts
 3. Stay in the air shower
 - Fan motor runs for 15 seconds and turns off
 - Fan stops 3 seconds after the motor is powered off
 - Grey room side indicator light is red
 - Grey room side door is locked
 - Cleanroom side indicator light turns green
 - Cleanroom side door is unlocked
 4. Leaving the air shower
 - Person opens the cleanroom side door
 - Person leaves and closes the cleanroom side door
 - Cleanroom side door remains unlocked
 - Grey room side door is unlocked
 - Illumination is turned off
- Air shower is operational again (basic position)

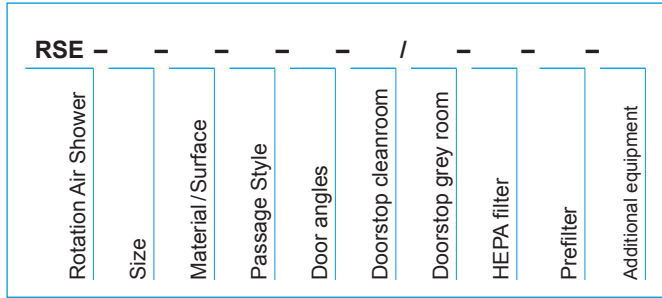
Passage from the Cleanroom to the Grey Room

1. Air shower operational (basic position)
 - Fan is turned off, air shower unoccupied
 - All signal lights are green
 - Illumination is off
2. Entering the air shower
 - Person opens the gray-room-side door
 - Illumination is turned on
 - Grey room side door is locked
 - Grey room side indicator light changes to red
 - Person enters and closes the cleanroom side door
 - Cleanroom side door is locked
 - Cleanroom side indicator light turns red
 - Grey room side door is unlocked
3. Stay in the air shower
 - Fan is turned off
4. Leaving the air shower
 - Person opens the grey room side door
 - Cleanroom side door is locked
 - Person leaves the shower and closes the grey room side door
 - Fan runs for 5 seconds and turns off
 - Illumination is turned off
 - Both indicator lights changes to green
 - Air shower is operational (basic position)

Emergency Stop

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

Type Designation



Size	
11	1 135 × 1 135 × 2 800 [mm]
Optional	
12	1 250 × 1 250 × 2 800 [mm]
Material/Surface	
PB	powder-coated steel in RAL 9010 (white)
Optional	
ES	stainless steel 1.4304, grinded
PB _____	powder-coated steel special color RAL _____
Passage Style	
G180	180° straight
L90	90° to left
R90	90° to right
Doorstop Cleanroom	
RL	cleanroom left
RR	cleanroom right
Doorstop Grey Room	
GL	grey room left
GR	grey room right
Ionization	
0	without
I	with ionization
HEPA Filter	
H14	standard filter class
Optional	
_____	optional filter class U15, U16
Prefilter	
G4	standard filter class
Optional	
_____	special type
Additional equipment	
Z	(special description)

Submittal Text

Active personnel air lock for an effective cleaning of individual people before entering the cleanroom.

In the Rotation Air Shower four vertical supply air ducts with nozzles are arranged diagonal. The nozzles and the ceiling diffuser (swirl outlet) produce a rotational airflow. The shower shearing forces of the rotating airflow ensure a very thorough cleaning of the personnel in the vortex core.

The air-flow is provided by a heavy-duty radial fan in the drive module above the air shower module. The air is blown into the air shower chamber through the 4 corner ducts with 13 nozzles each and through the ceiling diffuser after being drawn through 2 HEPA filters in the return plenum.

The contaminated air-flows back into the drive unit through the two return air ducts integrated in the side walls. There are prefilters in the air inlet openings near the floor.

The two tempered safety glass doors are locked during the cleaning cycle.

The door locks have an adjustable time setting to control the duration of stay inside the air shower. Red and green lights inside the air lock as well as at the entrance indicate when the doors can be opened.

The rotation air shower is a compact modular unit consisting of the following components:

- 4 corner ducts with nozzle rows
- 2 side walls with integrated air inlets and prefilters
- 1 drive unit with fan and 2 HEPA filters
- 2 safety glass doors
- 1 light fixture
- 1 control cabinet integrated in the drive unit wired according to VDE guidelines

The drive module, side walls and corner ducts come standard powder-coated.

Technical Data

(Standard Design)

Overall height2800 mm
Module width1135 mm
Module Length1135 mm
Entrance width735 mm
Entrance height1970 mm
Air-flow volume3200 m³/h
Max. nozzle outlet speed30 m/s
Voltage380/400 V
Frequency50/60 Hz
Motor capacity2.4 kW
Nominal current4.0 A
Motor speed2850 1/min
SPS controlling, integrated according to VDE guidelines

PrefilterG4
HEPA-FilterH14

Passage Style

- G180
- R90
- L90

Doorstop Cleanroom Side

- DIN left
- DIN right

Doorstop Grey Room Side

- DIN left
- DIN right

Options

- optional size
Module Width1250 mm
Module Length1250 mm
Entrance width850 mm
- Ionization
Located behind the 4 nozzle rows
incl. control unit and electrical installation
- Door top lock
 - Silver
 - White

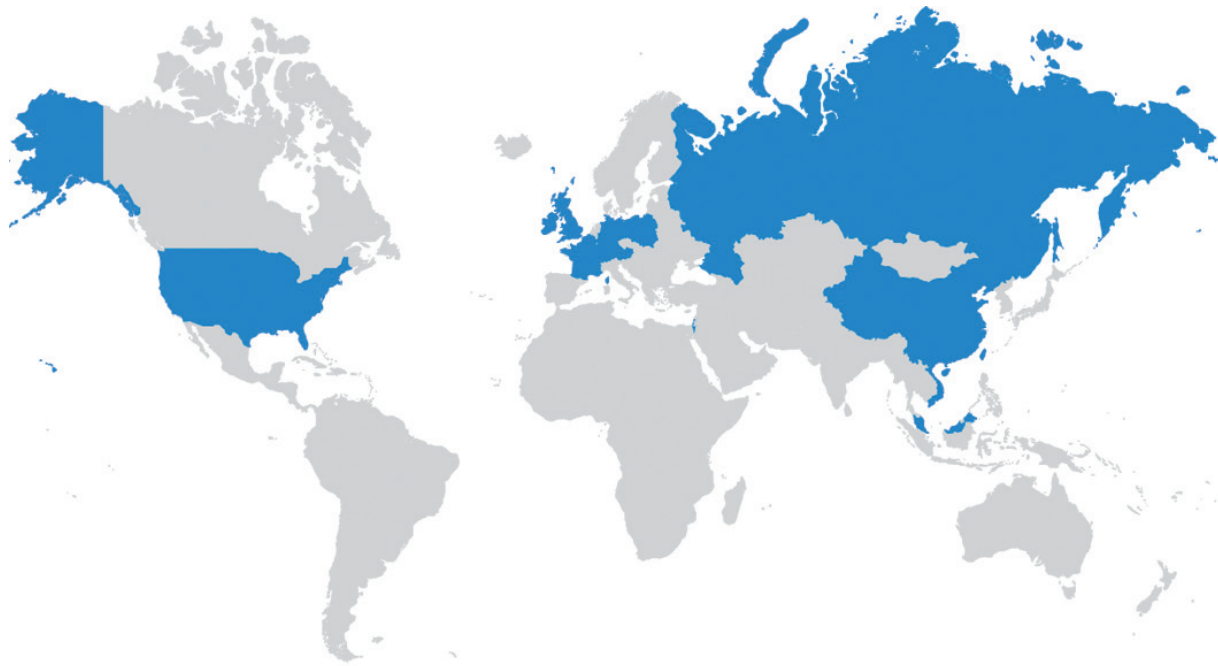
- Doors with door-leaf-frame and border and single glazing ESG
 - Frame and border aluminum anodized E6/EV 1
 - Frame and border aluminum, powder-coated acc. to RAL
 - Frame and border stainless steel
 - Drop-sealing in door-leaf
- Frequency converter for the manual fan-speed setting
- Display* on the grey-room side for rinse-cycle setting
- Display* on the grey-room side for rinse-cycle setting and nozzle-air-flow-speed
- Display* on the grey-room side for rinse-cycle setting, nozzle air-flow speed and filter monitoring
- Differential pressure indicator
 - Main-filter (HEPA Filter)
 - Prefilter
- Supply-air with blow-nozzles ø 40 mm (4 x 7 pieces)
- Partition
 - Up to the ceiling
steel sheet, RAL coated
Partition height _____ mm
Partition width _____ mm
 - Sidewards to the wall
steel sheet, RAL coated
Partition height _____ mm
Partition width _____ mm

Manufacturer Exyte Technology GmbH

Type RSE-_____-_____-_____- / _____-_____-_____-
_____-_____-

*Display in combination with frequency converter

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