

Filter Fan Unit SILENT

Type SILENT EC



Product Description

Filter Fan Units (FFUs) from Exyte Technology are designed to provide clean air to individual workstations or entire cleanrooms. Due to the symmetric construction of the noise absorbing internal flow fixtures, the filter downstream air velocity becomes very consistent and the sound power level is very low.

The FFU SILENT is in particular suitable for applications in uni-directional (laminar) airflow cleanroom areas with advanced requirements regarding downstream air velocity uniformity and noise level.

Depending on the configuration of the filter coverage and of filter classes, cleanroom classes ISO 1.0 to ISO 8.0 according DIN EN ISO 14644-1 can be reached.

This brochure provides information about the device design FFU SILENT EC with EC-motor and advanced control and monitoring possibility

Design and Function

The unit consists essentially of the housing 1, the HEPA filter cell 2 and the compact fan unit 3 with impeller and motor 4 with inlet nozzle 5. The integrated baffle plate 1a optimizes the uniformity of airflow towards the filter. The sound absorber 9 reduces the fan noise level.

The following additional accessories are available:

- prefilter 11 for coarse particle filtration
- AMC-filter 12 for filtration of gaseous contaminants
- Cooling coil/heating coil 13
- Aerosol inlet connector, Aerosol measurement connector
- air diffuser (perforated plate diffuser, swirl outlet) 10

The FFUs generate an uni-directional air-flow. If necessary filter cell classes H13 to U17 can be used.

With implementation of the air diffuser 10 a turbulent airflow inside the cleanroom is created.

The FFU fans have sufficient reserve capacity to overcome any additional pressure loss due to e.g. raised floor, return air ducts, prefilter or cooling/heating coils.

The FFU SILENT EC is driven by an electronically commutated external rotor motor.

Technical Data

Grid size 1)	mm	1200	× 600	1200	×900	1200	<1200
Housing lenght bearing rails filter installation frame	mm mm		1132 1132 1100 1100			1132 1100	
Housing width bearing rails filter installation frame	mm mm	532 500		832 800		1132 1100	
Housing height	mm			440			
Housing material standard		Aluminium untreated					
Weight standard without filter	kg	24		39		45	
EC-Motor (IP20)							
Voltage/Phase Frequency Nominal current Nominal power Rotation speed max. Operation temp. min./max.	V/ph Hz A W 1/min °C	200-277/1 50/60 1,8-1,3 370 300-1304 0/+40					
Air velocity	m/s	0,30	0,45	0,30	0,45	0,30	0,45
Air volume flow	m³/h	778	1166	1166	1750	1555	2330
Differential pressure	Pa	80	120	80	120	80	120
Power consumption 2)	W	46	89	68	142	83	195
Sound power lever pressure side ²⁾	dB(A)	41	47	42	49	44	52
Sound pressure level in the cleanroom ²⁾ - 25 % - 50 % - 100 % External differential press. max. ³⁾	dB(A) dB(A) dB(A)	43 46 50 400	49 52 55 375	42 45 48 355	49 52 56 295	44 47 50 350	52 55 58 235

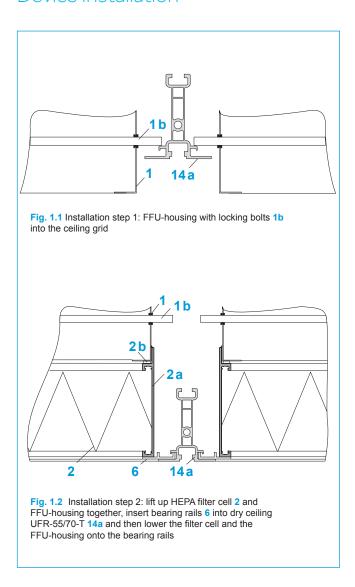
- 1) Special size upon request
- 2) with H14 filter cell without external differential pressure
- 3) without installed HEPA/ULPA filter
- 4) measured with transformer

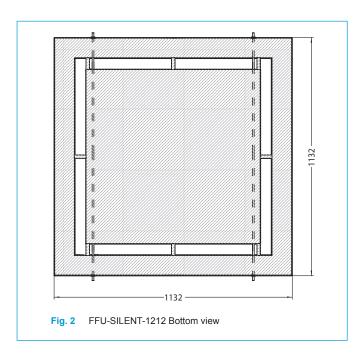
Sond power level measurement according to ISO 3741, tolerances according to DIN 24166.

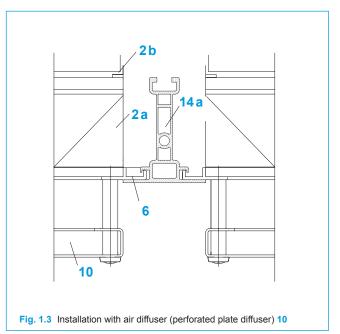
Dimensions

2 4 9 1 1b 2 4 9 1 1b 5 5 7 5 a Fig.1 FFU-SILENT-1212, with locking bolts 1b for the cleanroom side installation into Exyte Technology ceiling grid UFR 55/70-T with bearing rails

Device Installation

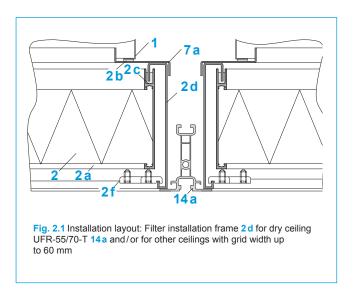


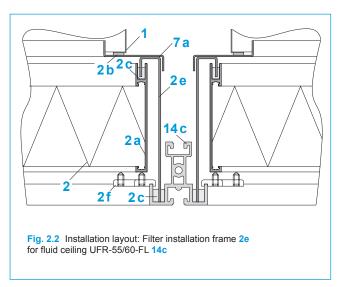


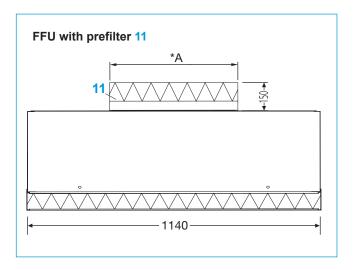


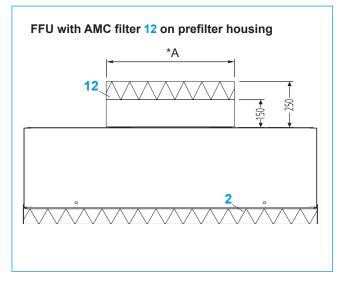
Device Installation

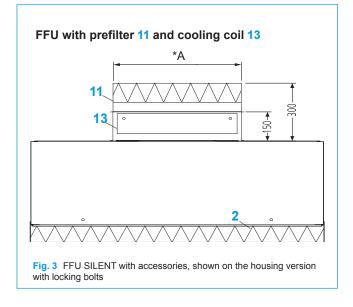
The installation into the Exyte Technology ceiling grid system \rightarrow Ultraflex Grid Ceiling is very simple. The installation can take place from the cleanroom, using the ceiling grid system UFR-55/70-T **14a** with bearing rails **6** (Fig. 1.2). FFU and filter cell are installable independently from each other from the cleanroom side. Depending on the requirements on air tightness of the ceiling grid system, grid profiles without a gasket **14a** or grid profiles with fluid seal are available **14c** (Fig. 2.2). The sealing between the housing and the filter cell frame is done with a dry sealant **2b** (Fig. 1.2, 2.1 and 2.2).











*A) FFU 1206 Prefilter 500 x 500 mm FFU 1209 Prefilter and Cooling coil 750 x 750 mm

Control

FFU SILENT EC

Based on LON (Local Operating Network) the FFUs are merged to a network system through a special bus-system → Control System DC. This enables a simple and individual speed adjustment and monitoring of each unit, even in complex systems with several thousand units.

Power Supply

A plug & play cable system is provided for the power supply. Each unit is connected through the existing terminal box 8, minimizing installation efforts.



Fig. 4 FFU SILENT

Legend

- 1 FFU housing
- 1a Baffle plate
- 1b Locking bolts
- 2 HEPA filter
- 2a Filter frame
- 2b Dry seal
- 2c Fluid seal
- 2d Filter installation frame UFR-55/70-T
- 2e Filter installation frame UFR-55/60-FL
- 2f Filter tension part
- 3 Impeller
- 4 Motor

- 5 Inlet nozzle
- 5a Air grill
- 6 Bearing rail
- 7a Intermediate profile
- 8 Terminal box
- 9 Sound absorber
- 10 Air diffuser
- 11 Prefilter
- 12 AMC filter
- 13 Cooling coil
- 14a Ceiling grid UFR-55/70-T
- 14c Ceiling grid UFR-55/60-FL

Key Features

- FFU suitable for highest cleanroom classes and advanced requirements regarding downstream air-flow uniformity and noise level, in particular suited for applications in unidirectional (laminar) airflow cleanroom areas.
- FFU sizes fit in ceiling grid size
 - 1200 mm × 1200 mm
 - 1200 mm × 900 mm
 - 1200 mm × 600 mm
- Low power consumption, very low sound pressure level
- Easy operation, low maintenance effort
- Applicable for individual workstations or entire cleanroom facilities
- Aluminum housing (standard), optionally steel powdercoated (disinfectant proof, color similar RAL 9010), different designs on request
- Filter cell classes H13 to U17 (standard H14)
- Installed radial fan:
 Motor with internally wired thermal contacts
- FFU SILENT EC with electronically commutating external rotor motor, volume flow adjustable through
 → Control System DC
- Minimized power supply installation effort due to plug & play cable system
- Easy device installation from below (cleanroom side) with bearing rails or segmented adapter frame from Exyte Technology, optionally installation from top (plenum side)
- Optional components: Prefilter, AMC filter, cooling coil/ heating coil and air diffuser on the cleanroom side, Test Aerosol Device
- Flexible installation when production conditions will change

Type Designation

Filter Fan Unit GA Type COoling/-heating coil Air diffuser CA Type COoling/-heating coil Air diffuser CA Type CA Type

Type

S SILENT

Motor

EC/LR EC-Motor with LON RS485-interface
EC/LF EC-Motor with LON FTT10A-interface

Size (ceiling grid)

1212 1 200 mm × 1 200 mm 1209 1 200 mm × 900 mm 1206 1 200 mm × 600 mm

Housing Design

T Installation into dry ceiling with bearing rails Installation into fluid ceiling with filter installation

frame

Installation into other ceiling systems (special de-

So sign)

Material/Surface

AU Aluminium untreated (standard)

AE Aluminium anodized

PB Steel powder coated (disinfectant proof, color

similar to RAL 9010)

ES Stainless steel (1.4301)

RAL___ Special color, for powder-coating

HEPA/ ULPA Filter

O Without

H14 Standard filter class

Optional

Filter classes H13, U15, U16, U17

Prefilter

Without

Optional

G4 Filter class G4
Special filter class

AMC Filter

O Without
A With AMC filter

Cooling/heating coil

Without

Optional

LK With cooling coil
LE With heating coil

Air diffuser

O Without

Optional

With air diffuser

Submittal Text FFU SII FNT FC

- ___ pcs. of FFU SILENT EC for highest cleanliness classes, consisting of:
- Housing with sound absorber, non-flammable according to class A2 according to DIN 4102
- High performance radial fan with backwards curved blades.
 The impeller is directly connected with the driveshaft of the external EC motor. The motor is maintenance free. Fan impeller and motor are statically and dynamically balanced.

Technische Daten

Component size 1200 mm × 1200 mm

Operating voltage 200–277 V/1 ph, 50/60 Hz

Speed min./max. 300-1304 1/min

Component size 1 200 mm × 900 mm

Operating voltage 200 – 277 V/1 ph, 50/60 Hz

Speed min./max......300-1304 1/min

Component size 1200 mm × 600 mm

Operating voltage 200-277 V/1 ph, 50/60 Hz

Speed min./max. 300-1304 1/min

Op	perational Data
Po۱	velocity
	PA Filter Class H14 Class Filter height mm
Ho	using Material Aluminium untreated (standard) Aluminium anodized Steel with disinfecant proof powder coating similar to RAL 9010 Stainless steel (1.4301) Special color (RAL) for powder-coating
	iling profile grid-ceiling UFR-55/70-T UFR-55/60-FL Other ceiling profile
Op	otional
	Prefilter according to DIN EN 779 for coarse particle separation, incl. frame made of aluminium, untreated Filter class G4 ————
	AMC filter for the separation of gaseous and air pollutant substances, Adapter frame standard made of aluminium (the AMC filter must be specified).
	Heating coil
	Cooling coil made of copper tubes, aluminium fins and an aluminium frame Cooling coil for FFU 1212 1209 1206 Air-flow

	Installation frame for installation and removal of filter and FFU from the cleanroom side (fluid ceiling systems only), made of — Steel frame 1,5 mm, powder coated — 4 bearing elbows — Filter tension part, size: ☐ 1200×1200 ☐ 1200×900 ☐ 1200×600
	Air diffuser, cleanroom side, includes mounting hardware design: ☐ Aluminium perforated plate, anodized ☐ Steel perforated plate, powder-coated, RAL ☐ Swirl outlet
	Test Aerosol Device ☐ Test Aerosol Dispenser ☐ Aerosol measuring point
Ma Typ	nufacturer Exyte Technology GmbH FFU-S-EC

^{*} Housing in Aluminium

¹⁾ When installed into fluid ceiling systems



Local Support Wherever You Need Us



Exyte Technology GmbH

Rosine-Starz-Str. 2-4 71272 Renningen Germany Phone +49 711 8804-8000 Email info@exyte-technology.net

Exyte Technology Shanghai Co., Ltd.

No. 139 Beimin Road, Chedun, Songjiang 201611 Shanghai, China Phone + 86 21 37838360 Email info@exyte-technology.net