

Filter Fan Unit SILENT Type SILENT EC

Technical Concept



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.

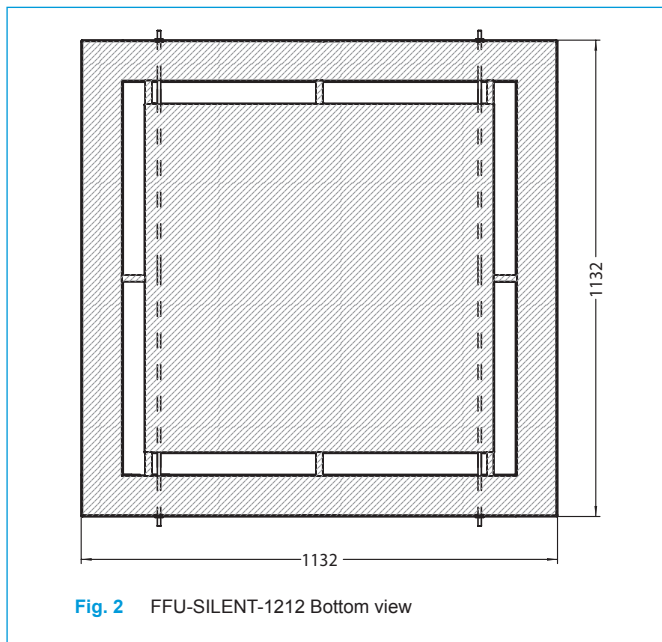
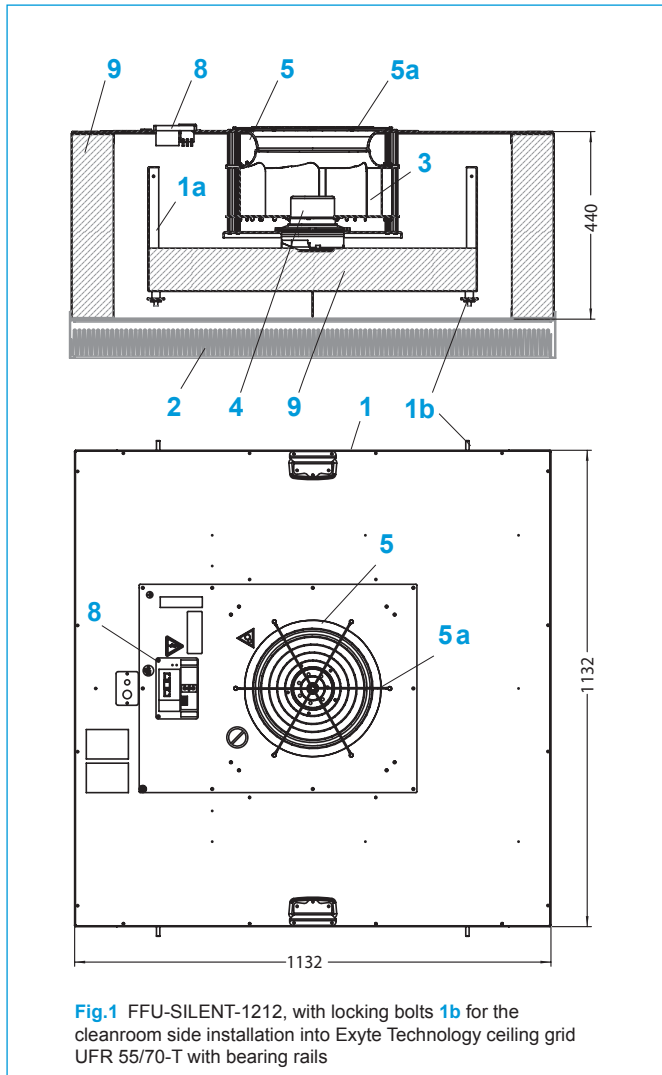
Technical Data

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

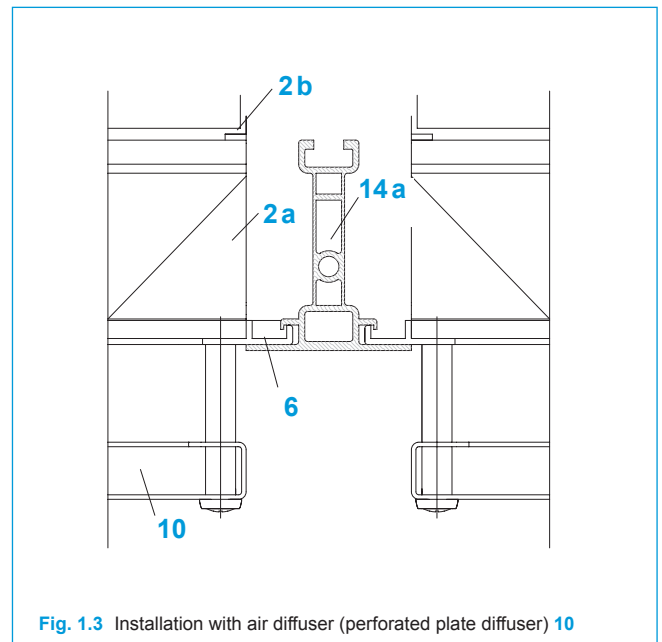
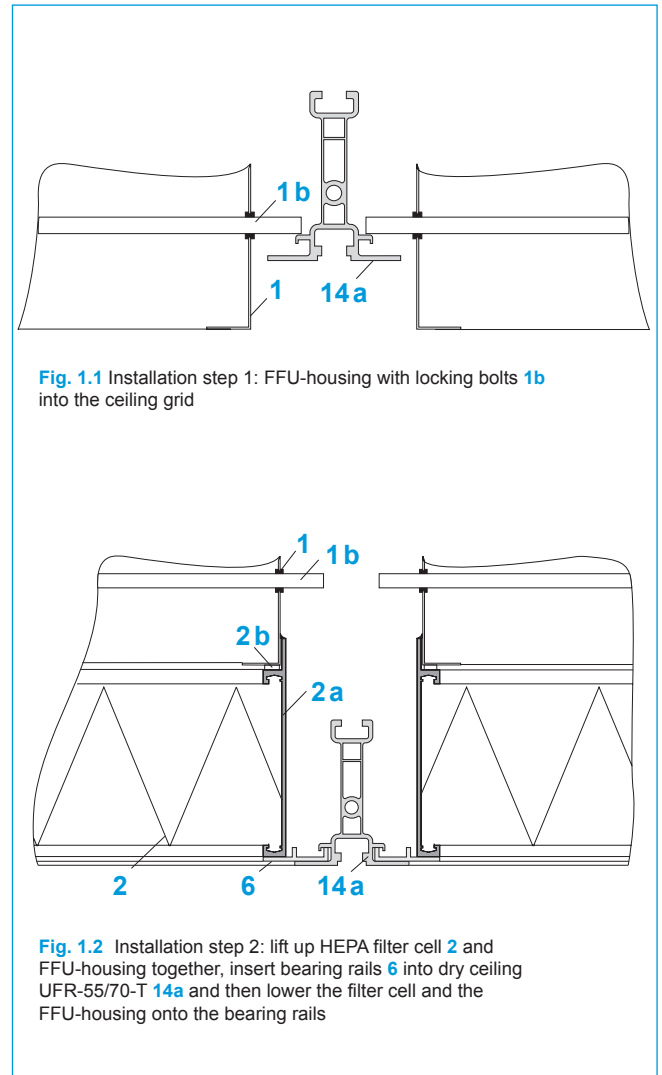
- 1) Special size upon request
- 2) with H14 filter cell without external differential pressure
- 3) without installed HEPA/ULPA filter
- 4) measured with transformer

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

Dimensions



Device Installation



Device Installation

The installation into the Exyte Technology ceiling grid system → 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).

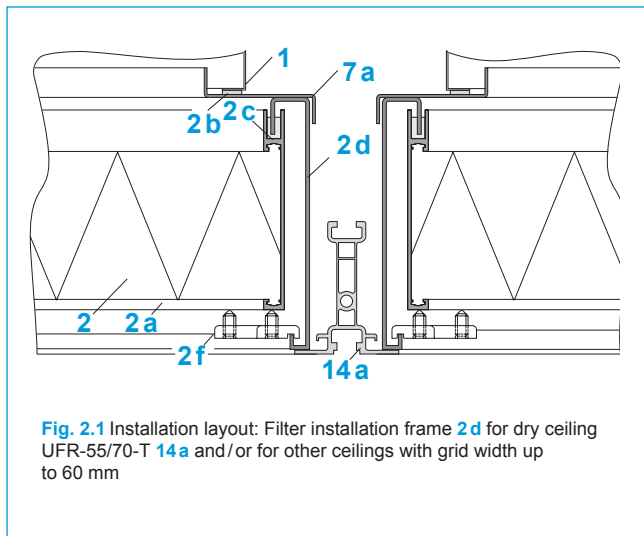


Fig. 2.1 Installation layout: Filter installation frame **2d** for dry ceiling UFR-55/70-T **14a** and/or for other ceilings with grid width up to 60 mm

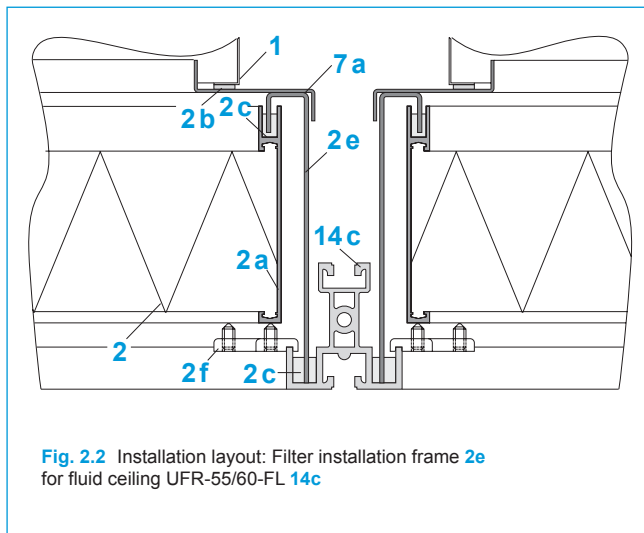


Fig. 2.2 Installation layout: Filter installation frame **2e** for fluid ceiling UFR-55/60-FL **14c**

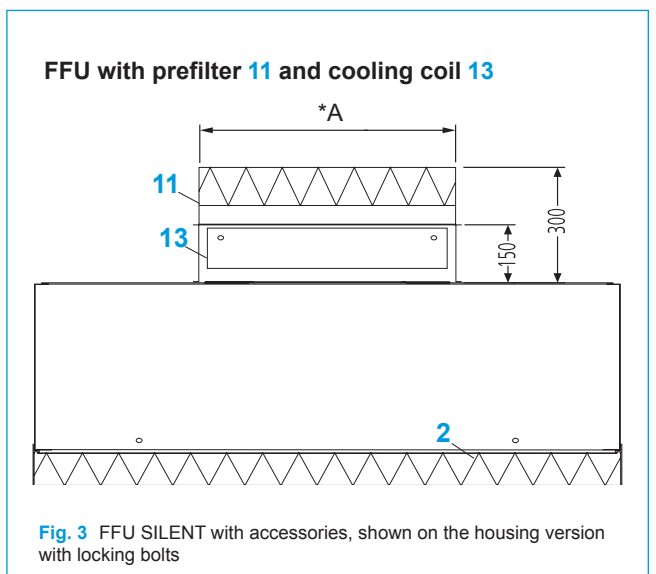
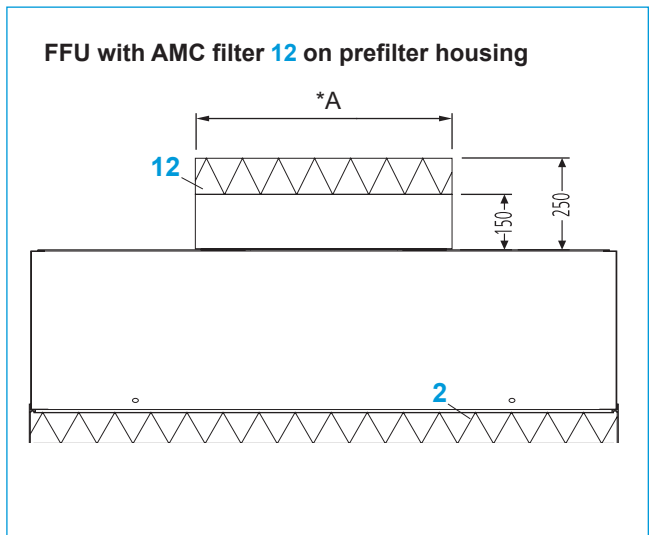
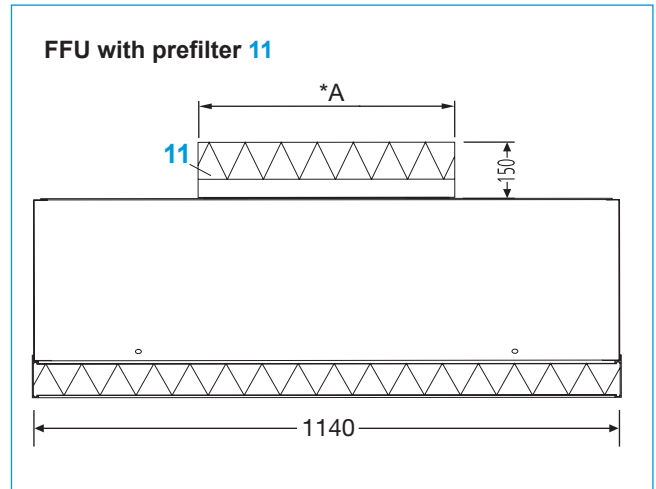


Fig. 3 FFU SILENT with accessories, shown on the housing version with locking bolts

*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

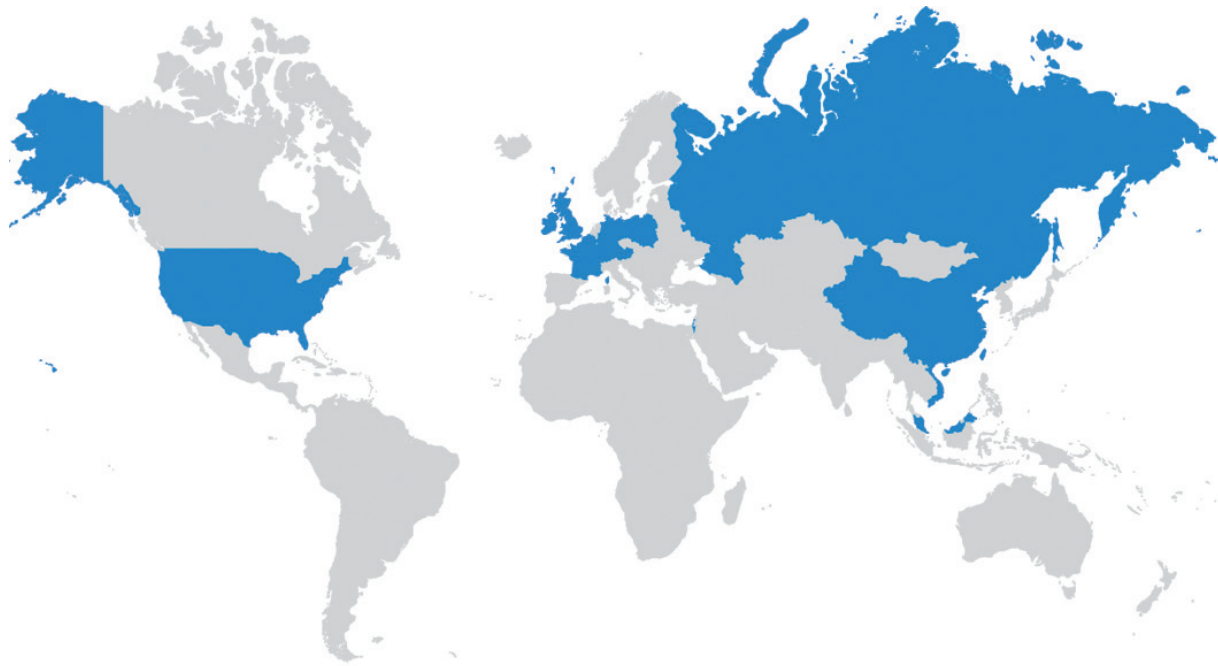
Key Features

- FFU suitable for highest cleanroom classes and advanced requirements regarding downstream air-flow uniformity and noise level, in particular suited for applications in uni-directional (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 powder-coated (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

Legend

- | | |
|---|-------------------------------|
| 1 FFU housing | 5 Inlet nozzle |
| 1a Baffle plate | 5a Air grill |
| 1b Locking bolts | 6 Bearing rail |
| 2 HEPA filter | 7a Intermediate profile |
| 2a Filter frame | 8 Terminal box |
| 2b Dry seal | 9 Sound absorber |
| 2c Fluid seal | 10 Air diffuser |
| 2d Filter installation frame UFR-55/70-T | 11 Prefilter |
| 2e Filter installation frame UFR-55/60-FL | 12 AMC filter |
| 2f Filter tension part | 13 Cooling coil |
| 3 Impeller | 14a Ceiling grid UFR-55/70-T |
| 4 Motor | 14c Ceiling grid UFR-55/60-FL |

Local Support Wherever You Need Us



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