

Submittal Text

_____pcs. Plenum Integrated Filter Fan (PIFF-COMPACT)

The PIFF-COMPACT is a ceiling installed, compact recirculation air unit that accomplishes the following:

- Mixing make-up and recirculation air in the unit's plenum
- HEPA filtration of the supply air
- Blowing the supply air into the room through the air grill
- Developping turbulent mixed air-flow
- Intake the return air through the air grill
- Discharging exhaust air rate
- Cooling the recirculated air

Housing

The housing is made of 1.5 mm aluminum sheet, fastened with rivets and sealed. The surface is untreated and cleaned.

The servicing level is recessed to protect it from damage. The fan power supply and bus cable connections (only EC) as well as grounding are on the left. The cooling water connections are on the right. All connections are labeled.

Function

Normally the unit runs in recirculation mode. Through the make-up air connection up to 500 m³/h of make-up air can be supplied and through an additional connector exhaust air can be discharged. In a 100 percent recirculation air mode the make-up and exhaust air connections will be closed by a cap.

Components

- Filter Fan Unit (FFU) with the dimensions 992 × 692 × 289 [mm]
- HEPA filter, class H14, efficiency 99.995 %
- Cooling coil, capacity approx. 2.6 kW (see technical data)
- Water connection ¾" female thread
- Connection for particle counter and/or differential pressure measurements at the HEPA filter
- Ceiling installation frame for Exyte Technology ceiling systems

Technical Data

Ceiling grid size1200 mm × 1200 mm
Outer dimensions1100 mm × 1100 mm
Height PIFF-COMPACT590 mm
Height installation frame60 mm
Total Weight incl. filter70 kg

Fan Operating Parameters . . .EC

Air-flow volume1500 m³/h . .
Filter pressure loss126 Pa
Power220 W
Voltage/Phase200-277/1
Nominal current1,8-1,3 A
Sound power level68 dB(A)

- ☐ HEPA filter H14
Dimensions1000 × 700 × 109 [mm]
Pressure loss126 Pa (at v=1500 m³/h)
Efficiency99.995 % in MPPS
- ☐ Optional Filter class _____

Cooling Coil

Power2.6 kW
Air-flow volume1500 m³/h
Pressure loss air42 Pa
Air inlet temperature23 °C
Air outlet temperature18 °C
Water amount400 l/h
Pressure drop water12.7 kPa
Water supply temperature14 °C
Water return temperature20 °C

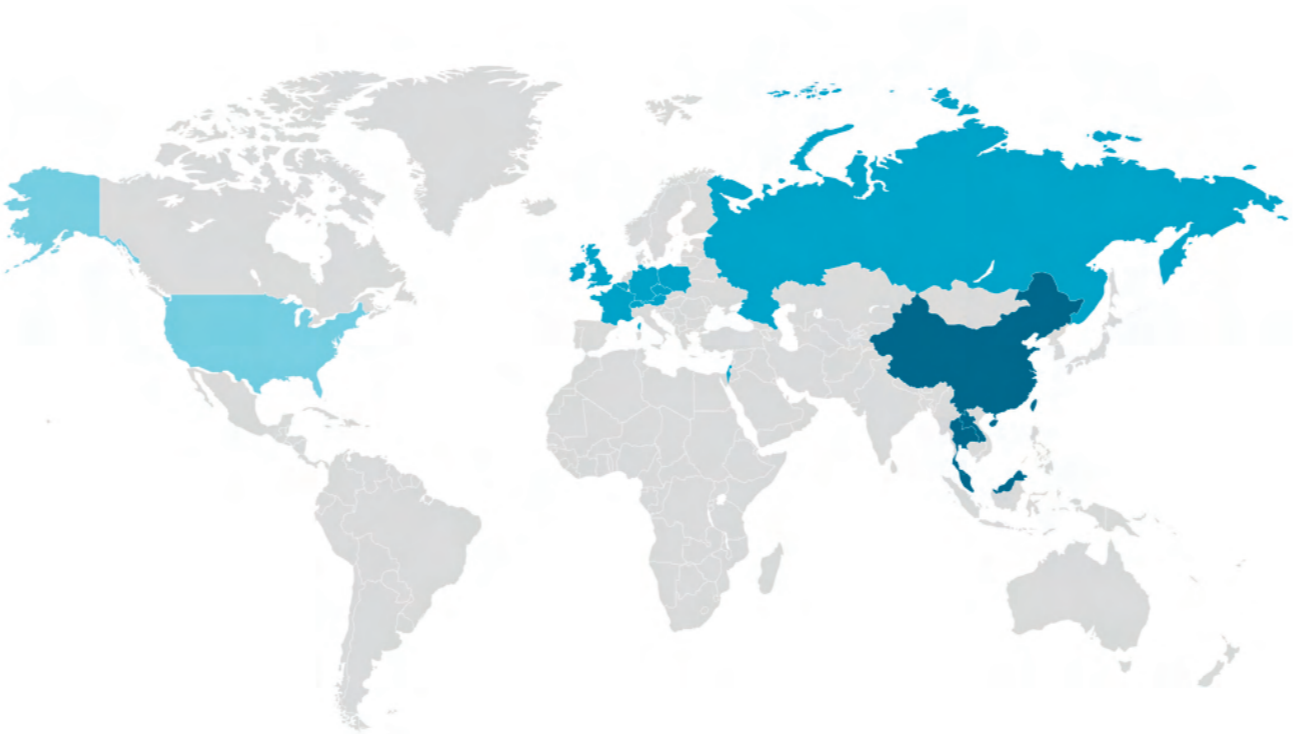
Optional

- ☐ Ceiling installation adaptor for other ceiling systems
- ☐ Prefilter G4 according to DIN EN 779

Manufacturer **Exyte TechnologyGmbH**
Type PIFF-COMPACT-__-__-__



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Plenum Integrated Filter Fan
PIFF COMPACT-EC

Technical Concept



Product Description

The Plenum Integrated Filter Fan (PIFF-COMPACT) is a fan filter unit with integrated return air and cooling coil. It is used to supply turbulent mixed air-flow while reducing the concentration of particles and the temperature inside of clean environments e.g. pharmaceutical laboratories and clean rooms. Depending on the coverage of the clean room ceiling, the classes 5.0 to 8.0 according to DIN EN ISO 14644-1 as well as B, C and D according to EC Guide "GMP" can be achieved.

The PIFF-COMPACT is installed into the existing ceiling grid by an installation frame.

Compared to standard air supply systems with centralized air handing unit, the supply & return air ducts on top of the clean room ceiling can be eliminated, which results in considerable savings of installation space and in a reduction of design expenditures.

The unit is working in recirculation mode by default; if needed, supply with make up air can be engaged up to 500 m³/h to keep up the over-pressurization of the clean room as well as to maintain the supply with fresh air.

Through the exhaust air connection used air can be removed. For an operation with 100% return air supply both supply and exhaust connections can be closed with a cap.

The product is protected by patent.

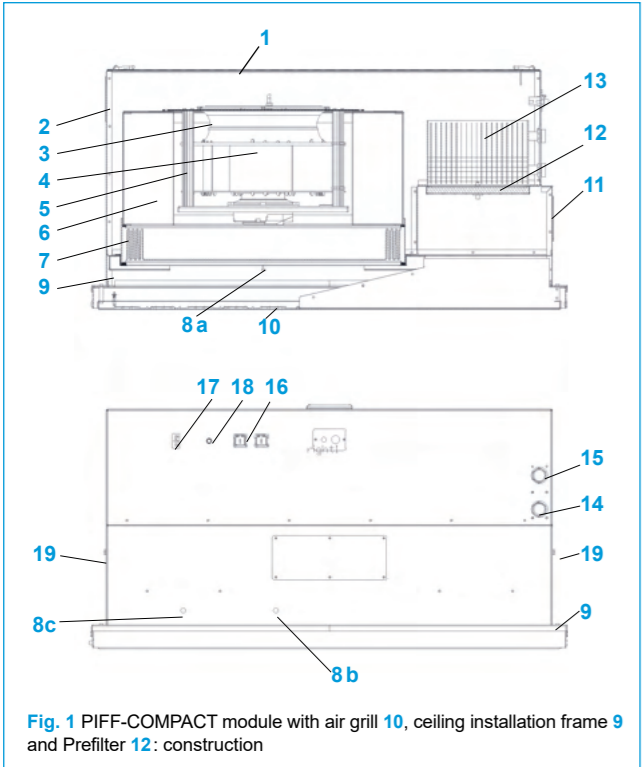


Fig. 1 PIFF-COMPACT module with air grill 10, ceiling installation frame 9 and Prefilter 12: construction

Design and Function

The PIFF-COMPACT consists of an outer housing 1 with make-up air connection 2 and exhaust air connection 11 together with the internal components HEPA filter cell 7 with fan motor unit 5 in a common internal housing 6 and a cooling coil 13. As an option, a prefilter 12 can be installed.

The supply with fresh air and the collection of exhaust or return air is implemented by a specially designed air grill 10 which is located on top of the ceiling installation frame 9 of the PIFF-COMPACT.

The power 17 and network 16 connectors as well as the cooling water connections (return 14, supply 15) are located at the side of the unit. The control valve for the cooling coil is to be provided for a single or a group of PIFF-COMPACT (by others).

The fan 5 draws air from the room via the return air intake in the outlet grill and channels the air through an optional pre-filter 12 to the cooling coil 13. The chilled air-flows through the HEPA filter 7 and is blown with high turbulence into the cleanroom via the outlet air grill. This design prevents a short-cut between supply air and return air. The distribution elements of the outlet air grill are arranged in a special design to ensure a homogenous air distribution to all sides.

Legend

- | | | | |
|----|---------------------------------------|----|-------------------------|
| 1 | Housing | 12 | closed with a cap |
| 2 | Make-up air connection | 13 | Prefilter (option) |
| 3 | DN 160 (optional), Standard: | 14 | Cooling coil |
| 4 | closed with a cap | 15 | Cooling return ¾" |
| 5 | Inlet nozzle | 16 | Cooling water supply ¾" |
| 6 | Motor | 17 | RJ45 network connectors |
| 7 | Fan motor unit | 18 | (EC version) |
| 8 | Internal housing | 19 | Power supply |
| 9 | HEPA filter | 20 | Ground connection |
| 10 | Particle measuring point | 21 | Transport lock |
| 11 | Differential pressure measuring point | | |
| 12 | Ceiling installation frame | | |
| 13 | Intermediate profile | | |
| 14 | Air grill | | |
| 15 | Exhaust air connection | | |
| 16 | DN 160 (optional), Standard: | | |

Technical Data

Grid size	mm	1 200 × 1 200
Housing L × W × H	mm	1 100 × 1 100 × 590
Air grill cassette L × W × H	mm	1 145 × 1 145 × 60
Ceiling installation frame L × W × H	mm	1 166 × 1 166 × 60
Height Total	mm	590
Weight Total	kg	70
Motor IP20		EC-Motor
Voltage / Phase	V	
Frequency	Hz	
Nominal current	A	200-277 / 1
Air-flow volume	m³/h	50/60
Power 1)	W	1,8-1,3
Sound power level 1)	B(A)	1500
		280
		68
Sound pressure level 1)		
– 25%	dB(A)	68
– 10%	dB(A)	65
HEPA Filter		
Filter class DIN EN 1822-1		H14
Dimensions L × W × H	mm	1 000 × 700 × 109
Separation efficiency in MPPS	%	99,995
Pressure drop	Pa	126
Cooling Coil		
Cooling capacity	kW	2,6
Media volume flow	m³/h	0,4
Water temperature		
– In	°C	14
– Out	°C	20
Pressure loss water-side max.	kPa	12,7
Air temperature		
– In	°C	23
– Out	°C	18
Pressure loss air-side at 1500 m³/h	Pa	42

1) with H14 filter cell

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



Fig. 2 PIFF-COMPACT module without air grill and installation frame, incl. make-up/exhaust air connection (optional)

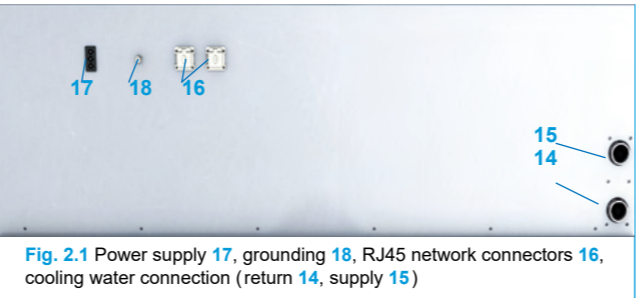


Fig. 2.1 Power supply 17, grounding 18, RJ45 network connectors 16, cooling water connection (return 14, supply 15)

System Installation

The installation of a PIFF-COMPACT into the Exyte Technology ceiling systems is very simple. Fig. 3 shows a sample installation situation into the → Ultraflex ceiling grid UFR 55/70 T/P 20 (an UFR 55/70 T/E can be used the same way). Fig. 4 shows the installation into the → Ultraflex cassette ceiling 21. Installation is executed from the clean room side using a ceiling installation frame 9 and an intermediate profile 9a. Installation in other ceiling systems available on the market is possible as well (for installation instructions please send an enquiry).

Access to the top side of the PIFF-COMPACT is only necessary to connect the BUS-Systems (EC only), the power supply and the chilled water connection.

Maintenance is executed from the clean room side. Therefore the air grill is removed by loosening the fixing screws. Next, the fan-motor-unit is lowered with an installation lift and there is free access to the HEPA filter. Alternatively the maintenance can be executed from the plenum side by unfastening the PIFF-COMPACT cover panel.

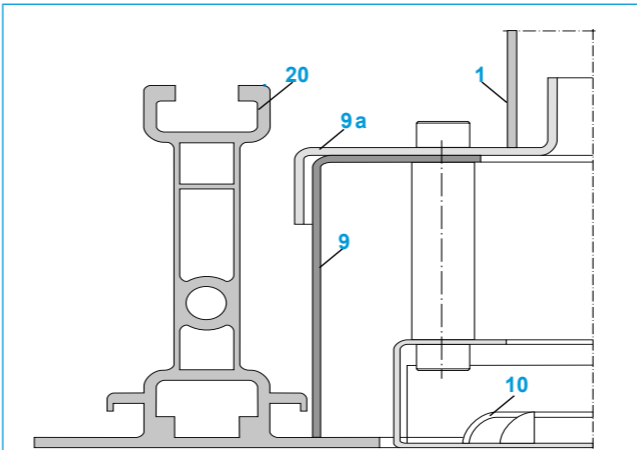


Fig. 3 Installation situation with ceiling installation frame 9 and intermediate profile 9a in ceiling grid profile UFR 55/70 T/P

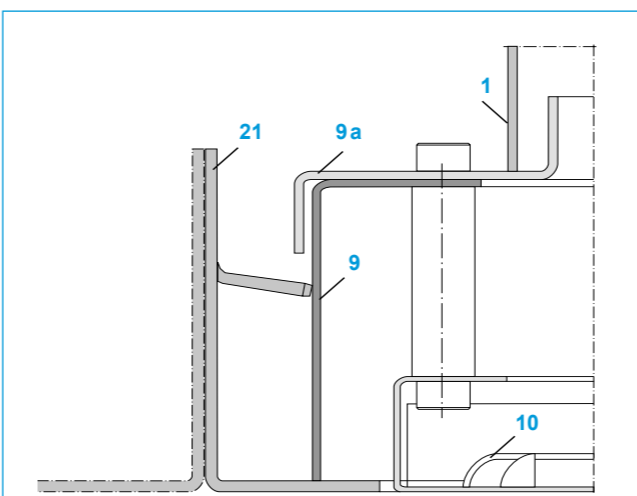


Fig. 4 Installation Situation with ceiling installation frame 9 and intermediate profile 9a in ceiling grid profile UKD Cassette Ceiling Grid

Key Features

- Complete, plug & play unit
- Provided with supply air and return air as well as make-up air and exhaust air connections
- Integrated air cooling coil (without valve or thermostat, water connection 3/4" female thread)
- No additional plenum necessary
- Connections for particle and/or differential pressure measurements at the HEPA filter
- Easy installation with ceiling installation frames and intermediate profiles for an optimal unit integration into the cleanroom ceiling system
- Flexible in that way that the unit can be easily relocated
- Filter change from above or below
- Easily operated and maintained
- Housing made of 1.5 mm aluminum, untreated

Type Designation

PIFF-COMPACT –	
Plenum Integrated Filter Fan	Motor type
HEPA filter	Prefilter
Motor type: EC/LR EC/LF	
EC-Motor with LON RS485-interface EC-Motor with LON FTT10A-interface	
HEPA Filter H14 Optional	
standard filter class special type	
Prefilter O Optional G4	
without filter class G4 special type	

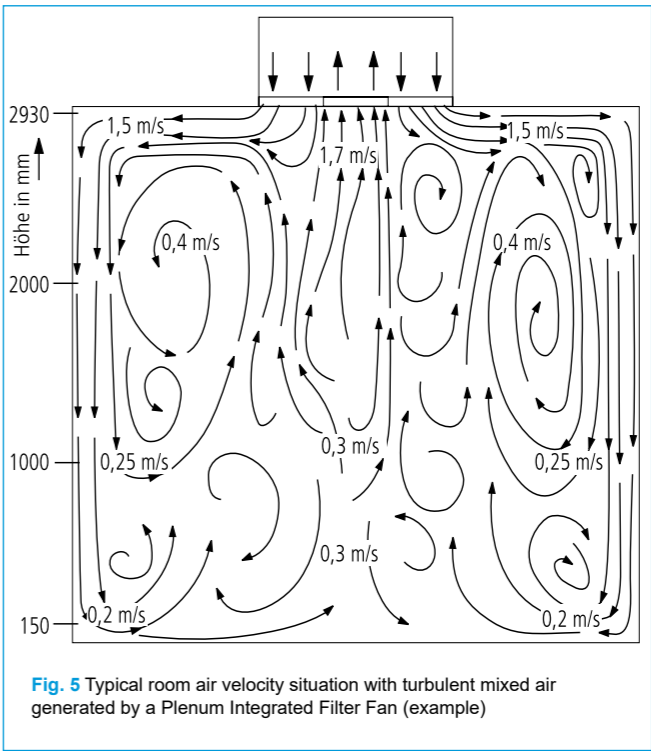


Fig. 5 Typical room air velocity situation with turbulent mixed air generated by a Plenum Integrated Filter Fan (example)

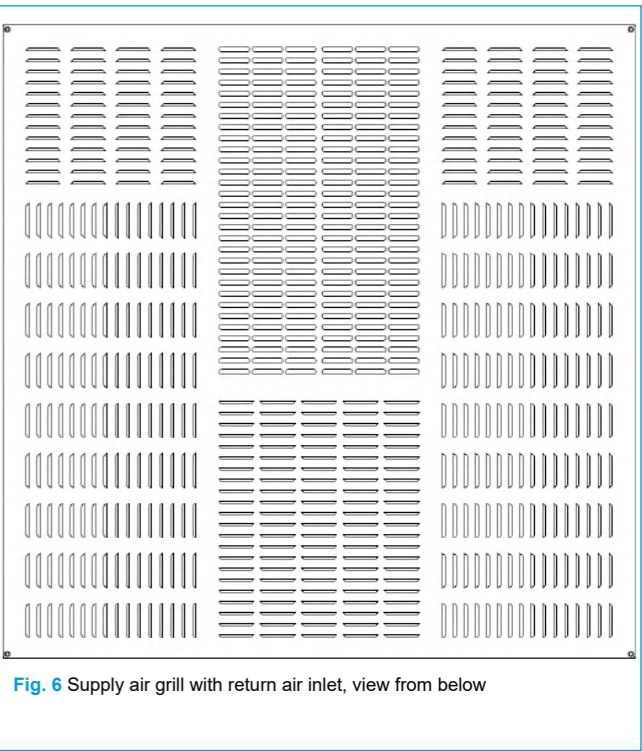


Fig. 6 Supply air grill with return air inlet, view from below