

Analysis chamber for ducts



Analysis chamber for ventilation and air conditioning ducts. Venturi tube operating principle, sampling mode, single tube with double duct for air intake and discharge.

The analysis chamber is equipped with TFBASE01 connection base, for TFDA-S2 optical smoke detector.

Protection rating IP54. ABS casing. Grey colour. Dimensions (L x H x D) 165 x 279 x 83mm.

The device must be equipped with: TFDA-S2 detector and sampling tube of appropriate length. Approved EN 54-27.

MODEL		EN 54-27	ANALYSIS CHAMBER FOR DUCT	AIR SAMPLING	ABS BOX
Name	Item no.				
TFDA-DUCT	TF3TFDADUCT				

OBLIGATIONS AND WARNINGS

The TFDA-DUCT duct smoke detector housing must accommodate an addressed Tecnofire TFDA-S2 detector inside. During the design and installation phases, it is necessary to observe and apply current regulations. In particular, refer to the EN 54-27 standard: "Fire detection and fire alarm systems - Duct smoke detectors."

DETECTION TECHNIQUE

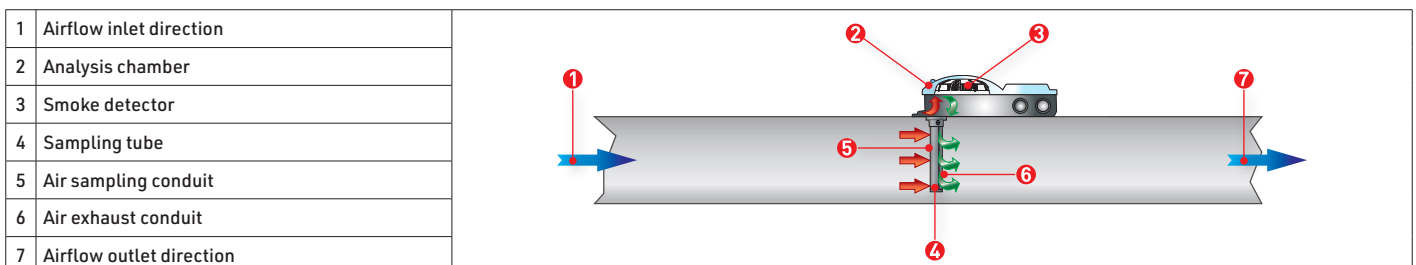
The TFDA-DUCT analysis chamber allows monitoring the airflow conveyed by a ventilation duct. The TFDA-DUCT consists of a sealed housing with an analysis chamber onto which a double-conduit sampling tube is connected. The analysis chamber operates according to the Venturi effect principle: using the first conduit, it takes air samples from the flow circulating in the duct and conveys them inside the analysis chamber, which houses the TFDA-S2 smoke detector. The analyzed air is then released through the second conduit. The sampling tube can be inserted into the ventilation duct in either a horizontal or vertical position.

MAINTENANCE

The deterioration of detection capability, caused by the accumulation of impurities inside the detector's sensing chamber, is automatically reported by the control panel, which indicates the need for maintenance. Maintenance frequency depends on the environmental conditions in which the detector operates. Maintenance must be carried out by specialized personnel, equipped with the knowledge and tools required to restore normal operating conditions.

CLEANING THE DETECTOR AND THE CHAMBER

Remove the sensor from its base, unclip the cover, and open the detector's sensing chamber by lifting the reflection labyrinth and the insect screen. Carefully clean all parts, removing any dust deposits. Pay the same attention to cleaning the components that make up the TFDA-DUCT analysis chamber. Reassemble the detector and the analysis chamber, then perform a functional test.





REGULATORY REFERENCES

When installing the analysis chamber, it is important to carefully consider and evaluate all possible causes of disturbance that may alter the normal airflow, such as:

- Inlet and outlet branches of fans
- Inlet and outlet branches of air handling units
- Duct bends (elbows)
- Air vents/diffusers
- Duct branches
- Interconnections with other ducts
- Duct sections with dimensional changes
- Radiators or heating/cooling coils
- Dampers or similar components

These disturbances can modify the composition of the air/smoke mixture, with dangerous consequences in terms of missed or delayed detection of smoke particles.

To achieve precise detection free from interference, the analysis chamber must be installed at an appropriate distance from these sources.

To avoid negative effects caused by air turbulence, detectors must be installed in straight duct sections at an adequate distance from interference sources.

For detectors installed upstream of the interference source, the minimum distance must be three times the equivalent diameter of the duct; for detectors installed downstream, the minimum distance must be five times the equivalent diameter.

For all detectors that are not directly visible, such as those monitoring ducts, a remote optical indicator must be connected to the smoke detector and installed in a visible position so the alarm source can be immediately identified.

INSTALLATION RULES

The TFDA-DUCT analysis chamber must be installed with the sampling tube oriented against the direction of the airflow. In rectangular ducts, to achieve maximum air sample capture capacity, install the analysis chamber on the shorter side of the duct.

The aluminum sampling tube can be shortened to fit the duct diameter or height.

For outdoor installations or environments subject to significant temperature fluctuations, always use the TFCOVER-DUCT accessory to prevent condensation.

It is always good practice to indicate the location of the analysis chamber with a sign.

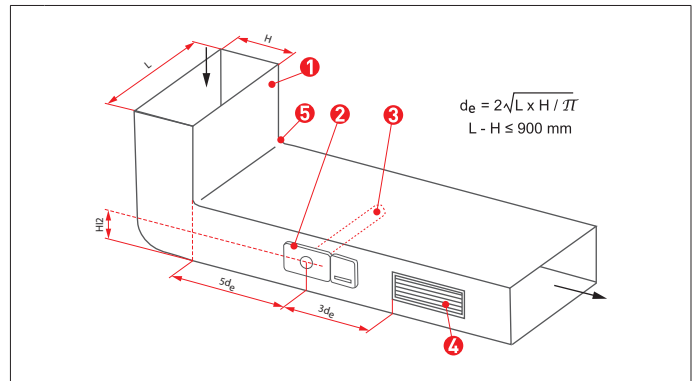
FIELDS OF APPLICATION

Duct analysis chambers are used to monitor the airflow conveyed by ventilation and air handling systems. In the event of a fire, these systems represent a serious problem as their nature and widespread distribution throughout the building can rapidly convey and distribute smoke, exponentially favoring the propagation and ignition of new fire cells. The primary objective of fire prevention measures for centralized air conditioning and ventilation systems is the early detection of smoke particles captured and conveyed by the air handling systems.

Smoke detection must rapidly trigger countermeasures to combat the danger of propagation, typically by blocking airflow and closing duct compartment dampers.

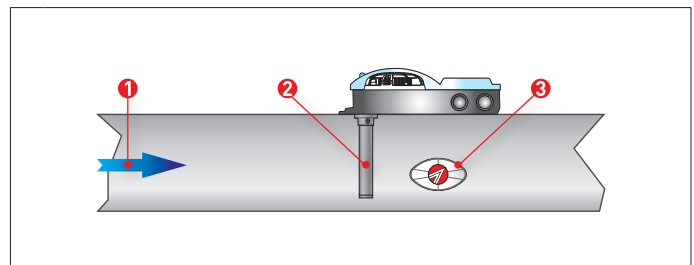
PLEASE NOTE

The configurations and installation measurements provided in this document comply with the Italian standard UNI 9795. For installations in countries other than Italy, it is mandatory to consult and apply the specific local regulations in force.



3de = distance equal to 3 times the equivalent diameter
5de = distance equal to 5 times the equivalent diameter

1	Air duct
2	TFDA-DUCT analysis chamber
3	Double-conduit sampling tube
4	Air vent / Diffuser (downstream disturbance source)
5	Duct bend / Elbow (upstream disturbance source)
Source: UNI 9795 standard	

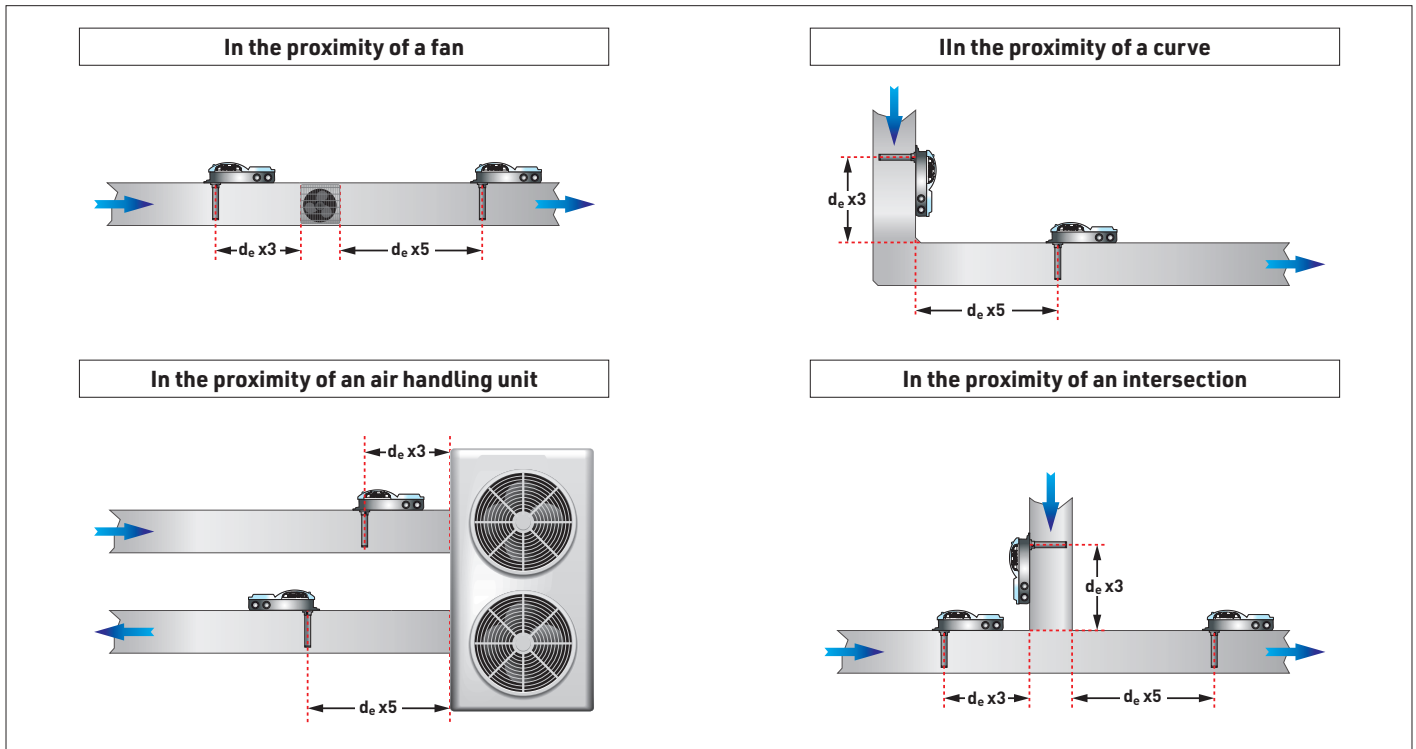


1	Airflow direction
2	Sampling tube orientation relative to the airflow
3	Remote optical indicator

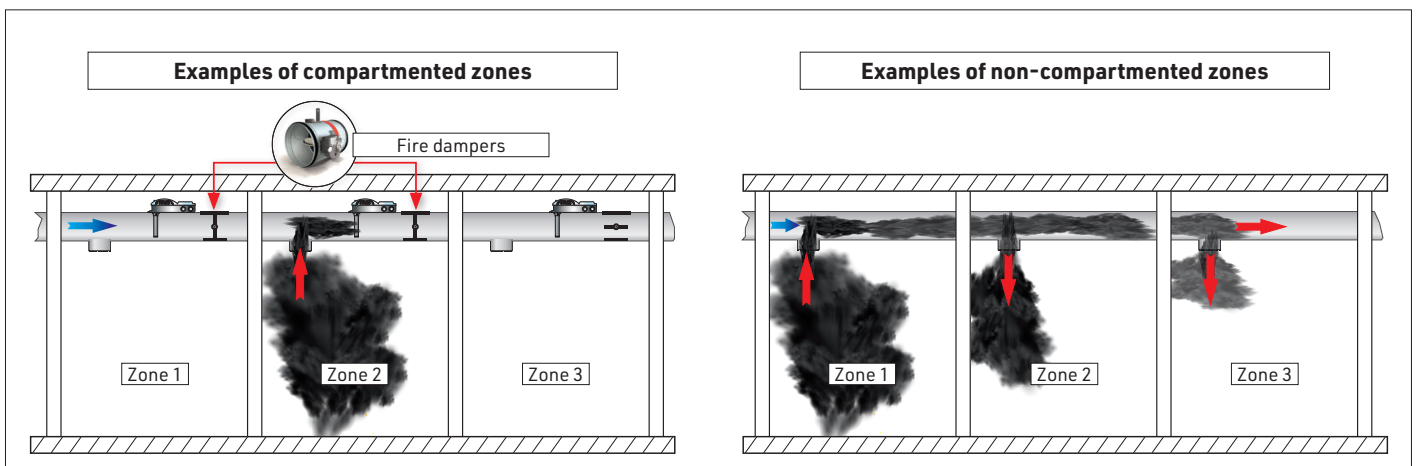
APPLICATION DRAWINGS

Below are some examples of analysis chamber positioning near interference sources: bends, intersections, and fans. In particular, minimum distances are indicated for positions both upstream and downstream relative to the airflow direction.

Calculation of the d_e value (equivalent diameter expressed in mm): for circular section ducts, d_e is equal to the duct diameter; for rectangular section ducts, the d_e value is calculated using the formula: $d_e = 2\sqrt{L \times H / \pi}$.



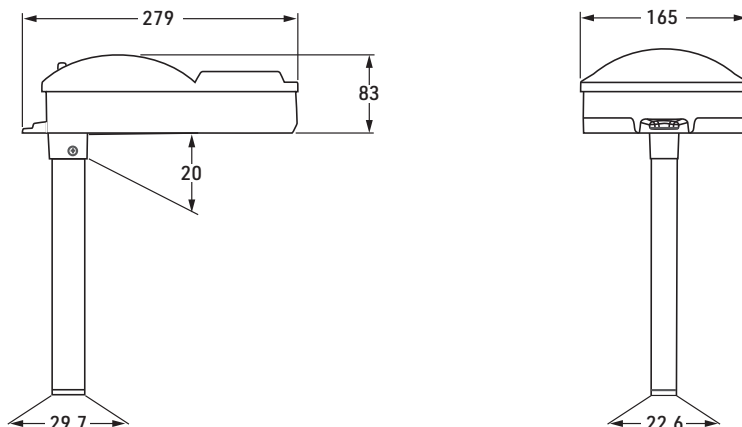
Quantity and position of sampling tubes based on air duct dimensions			
	$L \leq 900\text{mm}$	$H \leq 900\text{mm}$	1 sampling tube at the centerline of one of the sides
	$L > 900\text{mm}$ $L \leq 1800\text{mm}$	$H \leq 900\text{mm}$	2 sampling tubes on one of the horizontal sides, uniformly distributed, or 1 sampling tube at the centerline of each side
	$L > 900\text{mm}$ $L \leq 1800\text{mm}$	$H > 900\text{mm}$ $H \leq 1800\text{mm}$	4 sampling tubes positioned in pairs on opposite sides, uniformly distributed





TFDA-DUCT



Analysis chamber for ducts

DIMENSIONS



Accessories

	TFTUBO-DUCT 60
	TFDA-DUCT accessory. Sampling tube with dual duct for air intake and discharge, length 60cm.
	Item no. TF3TFTUBODUCT60
	TFDA-S2
	Configurable optical smoke detector, can be used with analogue addressed or conventional control panels. Optical smoke detection technology Tyndall effect. Universal base mounting TFBASE01. Dimensions with base (D x H) 100 x 52mm.
	Item no. TF3TFDAS2

	TFTUBO-DUCT 150
	TFDA-DUCT accessory. Sampling tube with dual duct for air intake and discharge, length 150cm.
	Item no. TF3TFTUBODUCT15
	TFCOVER-DUCT
	TFDA-DUCT accessory. Protective cover for TFDA-DUCT, in polycarbonate with internal insulation in polyethylene foam. Dimensions (L x H x D) 292 x 460 x 122mm.
	Item no. TF3TFCOVERDUCT

TFDA-DUCT - Technical and functional specifications

General information	Analysis chamber for ducts	TFDA-DUCT
	Housing for base and smoke detector	TFDA-S2
Detection characteristics	Airflow speed	From 0.5 m/s to 20 m/s
	Internal equivalent diameter of the duct	TFTUBO-DUCT 60 Max. 60 cm TFTUBO-DUCT 150 Max. 140cm
Sampling tube	Single tube with double conduit	Venturi Effect
	Sampling tube material	Aluminium

Physical specifications	Test hole	For detector testing
	Operating temperature	-10°C...+55°C
	Relative humidity (non-condensing)	10%...93%
	Protection class	IP54 (EN 60529)
	Casing	ABS V0
	Dimensions (L x H x D)	165 x 83 x 279mm
	Weight	880g
Conformity	Standards	EN 54-27:2015
	System Compatibility	EN 54-13:2020

N.B. Declarations of conformity and performance are available on www.tecnofire.com



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The product features can be subject to change without notice.