

# INTERTEC FKS 8-HVAC-...

**ALL IN ONE: Heating, Ventilation, Air Conditioning**

**Custom Applications**

## 1. Description

In refinery, petrochemical and chemical plants walk-in analyzer shelters containing measuring and analytical equipment can be located in hazardous areas.

This equipment is housed in shelters designed for safe operation with good ventilation and overpressure protection.

The HVAC system functions as **Heating, Ventilation, Air Conditioning** and supplies continuous fresh non-hazardous air for purging.

With an energy-efficient HVAC system, operating efficiency is increased and the performance of the analyzers is enhanced.

To enhance the design the HVAC housings are made of the same materials and colors as the INTERTEC shelters.

Antistatic design according to DIN EN IEC 60079-0 is also available.

Through direct integration of the HVAC's into the shelter walls additional supports are eliminated (see drawing).

INTERTEC shelters provide protection against all extreme weather conditions as well as fire resistance and internal explosion.

In hot climate zones or during long periods of extreme weather keeping the interior climate of the analyzer shelters stable is critical for good performance.

Large temperature fluctuations can be overcome through this HVAC system, as well as stabilizing the room temperature in hazardous areas of shelters in Zone 1 and 2 applications.

Additional options, such as air drying, overpressure protection in accordance with 60079-13 equipment with pressurized rooms (IEC 60079-13:2010) and filtered fresh air exchanges, e.g. 6 or 12 times an hour as per shelter size or specifications.

This type of certified Ex-climate-system investment adds value and stable operating conditions for your expensive and critical analytical equipment.

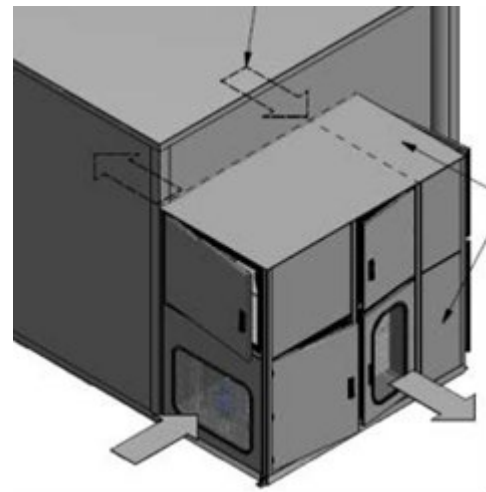
## 2. Application

Due to sensitive measurement equipment, constant temperature is required inside the shelters both for heating and cooling requirements.

Fresh air supply as well as humidity control can be supplied.

INTERTEC provides these technologies in one explosion-proof design.

HVAC (Heating/Ventilation/Air Conditioning) is a floor-mounted system with the following dimensions: approximately 2 x 2 x 1.1 m.



It is suitable for outdoor use and operation at ambient temperatures ranging from -20 °C to +55 °C air temperature.

The Ex-approval allows for operation in a Zone 1 environment.

The high quality energy efficient design optimizes not only energy consumption but can be used in chemically aggressive environments.

INTERTEC can provide the entire shelter completely outfitted with the HVAC system.

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### 3. Technical Data

Model # without heating Ex d Control Box	SLEX-FKS8- HVAC-0/S ...
Ingress Protection internal circuit	IP54
Ingress Protection outside	IP54
Nominal Voltage	400 V AC $\pm$ 10%, 50 Hz, 3 phase + PE (standard) 460 V AC $\pm$ 10%, 60 Hz, 3 phase + PE (optional)
Starting Current	ca. 80 A
Rated current	Heating operation 11 A, cooling operation 19 A
Preliminary fuse	35 A
Nominal cooling capacity <sup>1</sup>	$Q_0 = \text{ca. } 8000 \text{ W } (T_{in}/T_{amb} = 35^\circ\text{C}/35^\circ\text{C})$
Cooling range	+20 °C ... +55 °C; $\pm 2$ °C
Refrigerant	R134a
Heating capacity <sup>2</sup> (optional)	5 kW
Room thermostat	+5 °C ... +32 °C
Noise Level - outside	ca. 75 dB(A) in 1 meter distance, level I
Condensation Discharge	External discharge with overpressure rooms available with U-tube
Housing Material	Antistatic glassfibre reinforced polyester GRP (similar to RAL 7032) in sandwich construction (insulated) mounted on a stainless steel frame, complete with crane lifting devices
Weight	ca. 750 kg
Dimensions (H x W x D)	ca. 2000 x 2000 x 1100 mm
Note on installation	Keep at least 1 m clear space in front of the ventilation grilles

<sup>1</sup> further cooling capacities ( $T_{in}/T_{amb} = 35^\circ\text{C}/35^\circ\text{C}$ ): 12 kW / 16 kW / 20 kW / 24 kW

<sup>2</sup> further heating capacities on request

### 4. Explosion Protection

ATEX Examination Certificate	TÜV 06 ATEX 2958
ATEX Marking (Gas)	II 2G IIB bzw. IIC T3 Bzw. T4 Gb
GOST-R-Certificate	On request
Ambient Temperature	-20°C ... +40°C (standard) +40°C ... +55°C (optional: high temperature) -40°C ... -20°C (optional: low temperature, without refrigerated tank, without hot gas bypass heating system)
Ambient Temperature Ex d Control Unit	-20 °C ... +40 °C At ambient temperatures -40°C ... +55°C, the control unit will be tempered with internal air
Ventilation rate (without stack, without ventilation duct)	Total: 1650 m <sup>3</sup> /h Air inside 750 m <sup>3</sup> /h, fresh air 900 m <sup>3</sup> /h Air inside 370 m <sup>3</sup> /h, fresh air 1280 m <sup>3</sup> /h

### 5. Further options

Hot gas bypass heating system	For ambient temperature to -20°C
Offshore	Special coatings available
External thermostat	Design in Ex i
Reduced Noise Level - outside	ca. 71 dB(A) in 1 meter distance
Further cooling capacities	12 kW / 16 kW / 20 kW / 24 kW ( $T_{in}/T_{amb} = 35^\circ\text{C}/35^\circ\text{C}$ )

Classification review for the minimum ignition energy of gases and vapors is the ex-climate system of the explosion subgroup IIC classified in the temperature class T4 or T3.

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## 6. Functional Elements

The chassis is divided into several chambers.

The explosion proof refrigeration unit consists of a powerful hermetically sealed compressor in an explosion proof housing, an air cooled condenser and a liquid receiver.

All functional elements of the refrigeration system are piped to an overpressure closed loop cycle, in which the CFC-free refrigerant R134a circulates.

Optionally an electric Ex heater, a temperature controlled condensate vapor heat exchanger or an installed hot gas bypass heating system can be integrated into the internal loop which can be controlled as needed to heat the room air.

The hot gas bypass heating is only available to an ambient temperature of -20 °C.

A pressure switch controls the differential pressure of the air, the quantity of fresh air supply and the degree of contamination of the filter mat.

A capillary thermostat with remote sensor (-5 °C/+50 °C) with adjustable set point is supplied to control room temperature inside the shelter.

Ex e junction boxes are supplied for termination between the electrical

connections of the refrigeration system and the explosion proof control.

All non-explosion proof switches and control devices, which are required for the automatic function sequence of the system, will be installed in an explosion-proof control box.

## 7. Operation

The system operates on the principle of compression. The pressure of the liquid refrigerant is reduced during the cooling by expansion and evaporation

(→ change of physical state) in the evaporator.

The vaporization is required for the heat of vaporization and is removed from the analyzer equipment room.

By increasing the pressure (compression) from low to high gas pressure in the compressor with subsequent condensation in the condenser, the refrigerant vapor is liquefied again.

The transported heat and the resultant loss of heat from the compressor discharged to the ambient air.

This cycle runs continuously as required by temperature settings.

