

INTERTEC FKS 8-HVAC-1/S/HI

ALL IN ONE: Heating, Ventilation, Air Conditioning

Customizable 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 maintained in shelters designed for safe operation with good ventilation and overpressure protection.

This 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 possible.

Through direct integration of the HVAC's into the shelters, double walls can be eliminated (see drawing).

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

In hot climate zones or during long periods of extreme weather issues arise in keeping the interior climate of the analyzer shelters as stable as possible for good performance.

Large temperature fluctuations can be overcome between day and night, especially in spring and autumn, through this HVAC system. It can significantly reduce heat loss, as well as stabilize the room temperature in hazardous areas of shelters in Zone 1 and 2 applications.

These includes further options, such as air drying and operation of the equipment with overpressure in accordance with 60079-13 Equipment protection by pressurized rooms (IEC 60079-13:2010) as well as fresh air from the ex-free space, which is filtered and according to the room size of the equipment with a defined air exchange rate (eg. six-fold or twelve-fold) can be fixed.

This Type of Certified Ex-climate-system investment adds improved value and stable operating conditions for the expensive and critical analytical equipment.

An amortization for such an investment is high system availability of process analyzers by greater value.

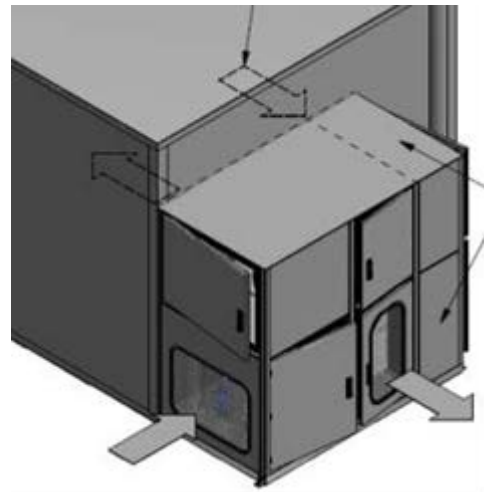
2. Application

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 Exp Control Box	SLEX-FKS8- HVAC-0/S ...
Ingress Protection internal circuit	IP54
Ingress Protection outside	IP54
Nominal Voltage	400 VAC \pm 10%, 50 Hz, 3 ph + PE (Standard) 460 VAC \pm 10%, 60 Hz, , 3 ph + PE (Option)
Starting Current	eg. 80 A
Rated current	Heating operation 11A, cooling operation 19A
Refrigerant	R134A
Thermal output	5 kW (Option)
Room thermostat	+5 °C ... +32 °C
Noise Level outside	eg. 75 dB(A) in 1 meter distance, level I
Condensation Discharge	Expiry external, with overpressure areas applied by U-tube
Housing Material	Antistatic glassfibre reinforced polyester GRP (RAL 7032) in sandwich construction (insulated) mounted on a stainless steel frame, complete with crane lifting devices
Weight	eg. 750 kg
Dimensions (H x W x D)	ca. 2000 x 2000 x 1100 mm
Note to lineup	At least 1m free space in front of the ventilation grilles

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 (Option: high temperature) -40°C ... -20°C (Option: 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 is to tempering with internal air
Ventilation rate (without stack, without ventilation duct)	Total: 1650 m³/h Air Inside 750 m³/h, Fresh air 900 m³/h Air Inside 370 m³/h, Fresh air 1280 m³/h

5. Further options

Hot gas bypass heating system	For ambient temperature until -20°C
Offshore	Special coating
External thermostat	Execution Ex i
Noise Level outside	eg. 71 dB(A) in 1 meter distance

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 fully hermetically sealed compressor in explosion proof housing, an air cooled condenser and a liquid receiver.

All functional elements of the refrigeration system are piped to an overpressure fixed cycle, in which the FCKW free refrigerant R134a circulates.

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

The hot gas bypass heating is only available up 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.

6.1 Operation

The system operates on the compression method.

The pressure of the liquid refrigerant is reduced during the cooling by expansion and evaporation (=> change in physical appearance) 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 are delivered to the ambient air.

This process is repeated continuously.

