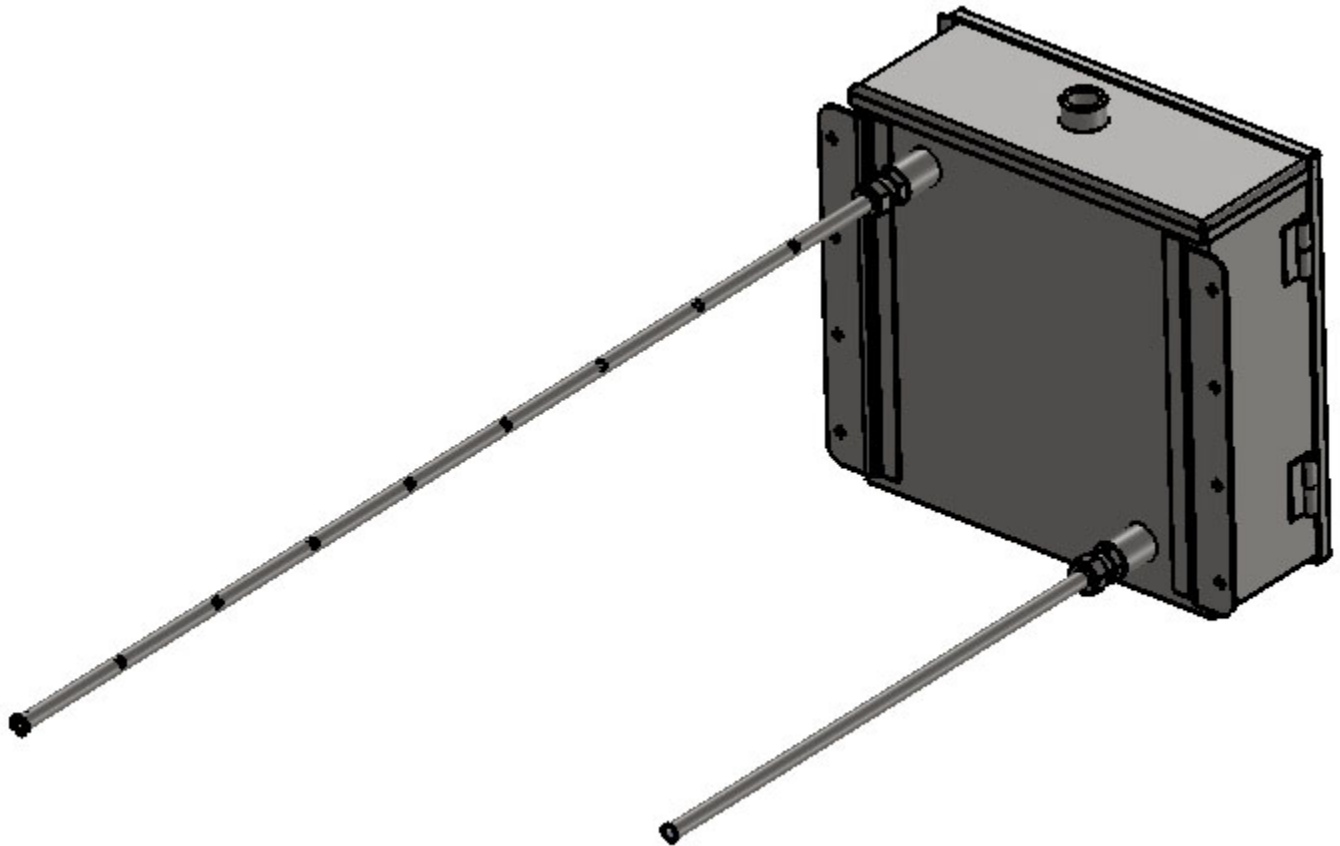


Net Safety™ Universal Duct Mount UDM-001 and UDM-002



Important Instructions

Net Safety designs, manufactures, and tests products to function within specific conditions. Because these products are sophisticated technical instruments, it is important that the owner and operation personnel must strictly adhere both to the information printed on the product nameplate and to all instructions provided in this manual prior to installation, operation, and maintenance.

WARNING

Installing, operating, or maintaining a Net Safety Product improperly could lead to serious injury or death from explosion or exposure to dangerous substances. Comply with all information on the product, in this manual, and in any local and national codes that apply to the product. Do not allow untrained personnel to work with this product. Use Net Safety parts and work procedures specified in this manual.

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Section 1: Introduction

1.1 Models covered

The UDM-001 and UDM-002 universal duct mount assemblies are available in Stainless Steel (SS).

Models available are:

- **UDM-001** -Universal duct mount with 1 m inlet sampling pipe
- **UDM-002** - Universal duct mount with 1.5 m inlet sampling pipe

1.2 Service support

Technical support for this product can be provided by contacting your local Emerson™ Process Management/Net Safety representative or by contacting the Net Safety Technical Support department at +1 866 347 3427 or Safety.CSC@Emerson.com.

1.3 Return of material

To expedite the repair and return of this product, proper communication between the customer and the factory is important. Before returning a product for repair, call +1866 347 3427 or e-mail Safety.CSC@Emerson.com for a Material Return Authorization (MRA) number.

On the return of the equipment, include the following information:

1. MRA number provided to you by Net Safety
2. Company name and contact information
3. Purchase order, from your company, authorizing repairs or request for quote
4. Ship all equipment, prepaid to:
Emerson Process Management
6021 Innovation Blvd.
Shakopee, MN 55379
T +1 866 347 3427
F +1 952 949 7001
Safety.CSC@Emerson.com
5. Mark all packages with as **Return for Repair** and include MRA number

Pack items to protect them from damage and use anti-static bags or aluminum-backed cardboard as protection from electrostatic damage.

All equipment must be shipped prepaid. Collect shipments will not be accepted.

1.4 Product recycling/disposal

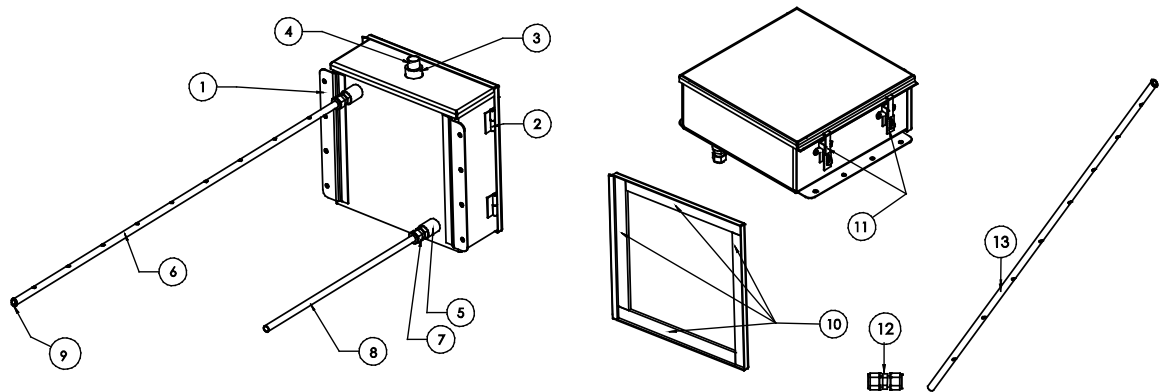
Recycling of equipment and packaging should be taken into consideration and disposed of in accordance with local and national legislations/regulations.

Section 2: Installation

2.1 Unpacking and inspection

Carefully remove all of the components from the packaging and verify them against the enclosed packing list. Inspect all components for any obvious damage such as broken or loose parts. If you find any components missing or damaged, notify your local Net Safety representative or the factory immediately. Figure 2-1 outlines some components of the UDM assembly. Items numbered 12 and 13 are supplied in custom orders. See Figure 2-3 and Section 3 for more on the use of custom parts.

Figure 2-1 Product Components

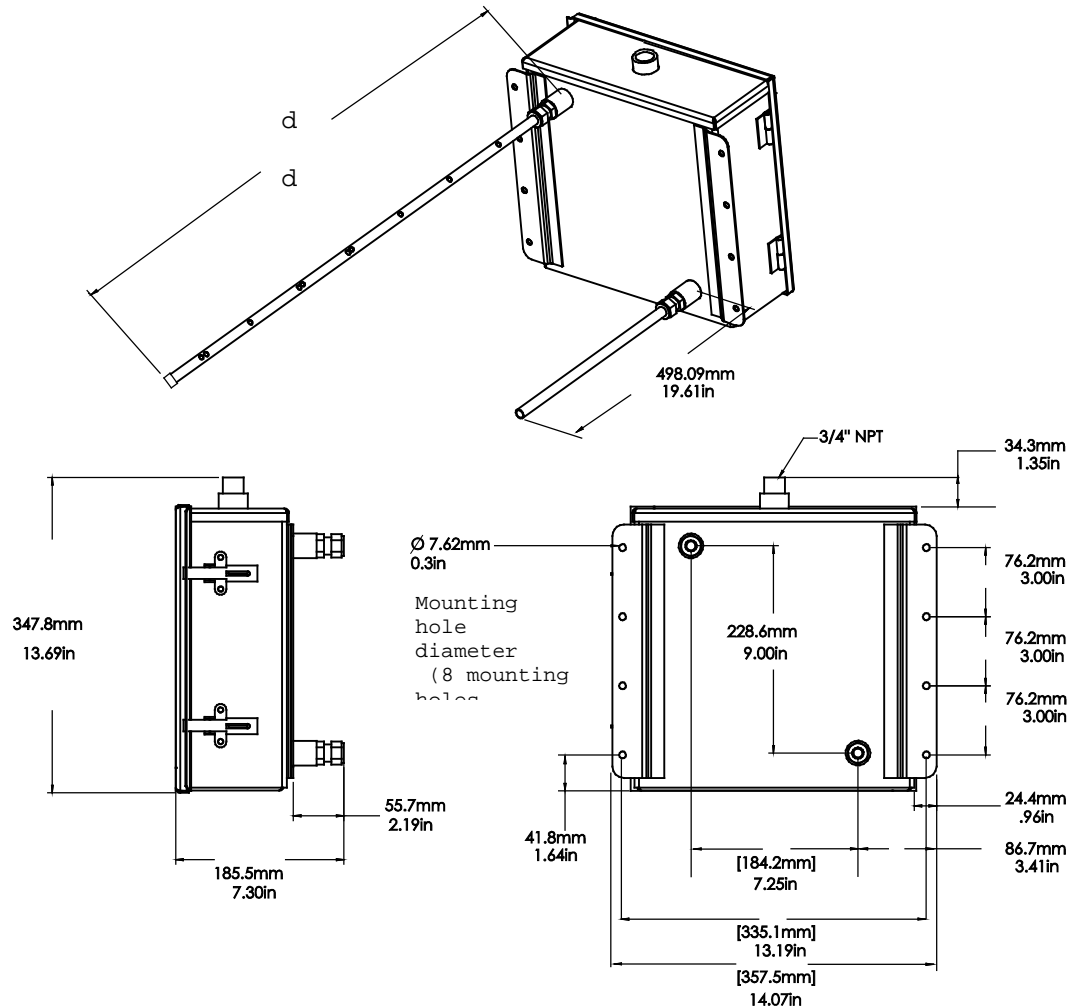


Item number	Part number	Description	Quantity
1	MFG-0262	UDM mounting bracket, 316SS	2
2	HDW-0174	UDM bullet hinge, SS	2
3	HDW-0175	UDM coupling, 3/4-in., 316SS	1
4	HDW-0177	UDM close nipple, 3/4-in. NPT, 316SS	1
5	HDW-0178	UDM coupling, 1/2-in. NPT, 316SS	2
6	MFG-0264 (for UDM-001) MFG-0267 (for UDM-002)	Inlet pipe 1 m lg x 1/2-in. OD x .035-in. wall, 316SS Inlet pipe 1.5 m lg x 1/2-in. OD x .035-in. wall, 316SS	1
7	HDW-0126	UDM, 1/2-in. OD tube 1/2-in. NPT male fit, 316SS	2
8	MFG-0265	Outlet pipe 0.5 m lg x 1/2-in. OD x .035-in. wall, 316SS	1
9	HDW-0071	Pipe plug, 1/8-in. NPT size	1
10	GSK-0044	GSK, Neoprene, 11.35-in. x 1.0-in. x 0.25-in. Thk (Gasket placement inside door)	4
11	HDW-0179	Small pad lockable draw latch, SS	2

12	HDW-0228	Tube fitting union or compression fitting (available for custom order)	1
13	MFG-0264 or MFG-0267	Extension inlet pipe(custom ordered)	1

2.2 Dimensions

Figure 2-2 UDM with Standard Pipe Lengths



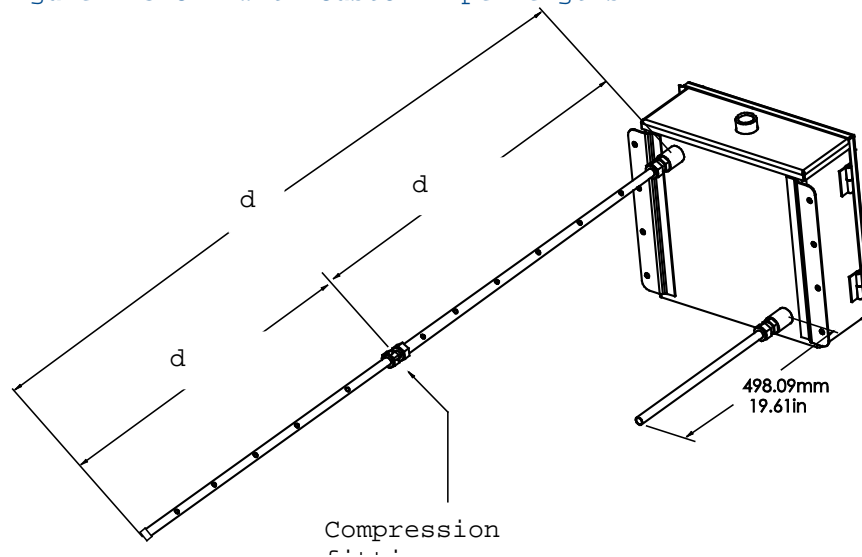
Drawing shows the insertion distance, 'd' (d_{standard}) for standard pipe lengths.

d is the distance from the end of the pipe to the flat surface of the duct mount enclosure (chamber).

d = 956.13 mm (37.63-in.) for UDM-001

d = 1464.13 mm (57.64-in.) for UDM-002

Figure 2-3 UDM with Custom Pipe Lengths



For custom (extended lengths) the insertion distance d ($d_{\text{standard}} + d_{\text{extension}}$) will be determined by the user. Extension pipes can be made available if duct widths are in excess of 1.5 meters. Extension pipes may be modified as desired. See [Section 3](#) for more information.

NOTICE

Support fixtures for the inlet pipes are not supplied by Net Safety and should be sourced by the end-user.

2.3 Mounting

Prior to mounting the UDM-001 or UDM-002 duct mount assembly carefully plan the location of the equipment. Ensure that the duct mount assembly with detection equipment is mounted on a flat surface with minimal to no vibration. The UDM duct mount chamber comes with eight mounting holes each of which is 7.62 mm (0.3-in.) in diameter. Prior to mounting and installing the equipment, see [Section 3](#) and seek advice from experts knowledgeable in duct installation and HVAC systems.

2.3.1 Field installation

⚠ WARNING

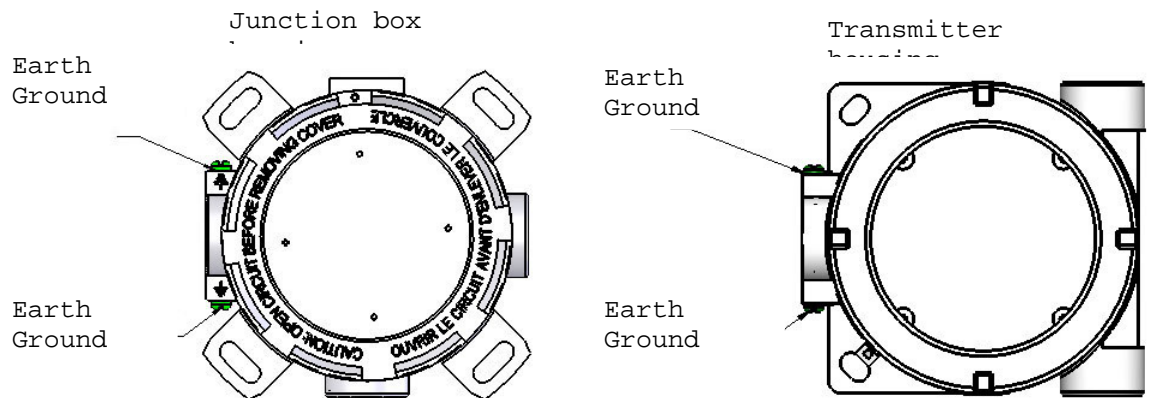
Never install the UDM-001 or UDM-002 duct mount assembly at the bottom (underside) of a duct.

Follow all local installation guidelines when installing equipment as failure to do so could result in death or serious injury. Ensure that only qualified personnel perform the installation.

2.3.2 General requirements

In many cases, the duct system will be located at a level where it is not easily accessible. In these cases, it is convenient to have the sensor separated from the transmitter using a certified Net Safety junction box fitted to the top of the UDM chamber. This provides proper termination for the sensor wires. In other cases, the duct system may be located at accessible locations where the transmitter enclosure (housing) can be fitted to the top of the UDM chamber with the sensor inside. In order to ensure proper operation of the detection equipment, an external earth ground is recommended. Net Safety recommends that the external ground be connected to the grounding point on the junction box or transmitter enclosure. Refer to [Figure 2-4](#) for grounding connection location on enclosures.

Figure 2-4 External Grounding Point



2.4 Installation procedure

NOTICE

The instructions contained in this document allow the user to set up and mount the UDM-001 or UDM-002 assembly with the sensor of choice for the particular application. In order to ensure proper and safe mounting, take the necessary safety precautions when lifting and holding heavy equipment and follow the instructions given to ensure that all screws, nuts and bolts are tightly fitted.

Prior to using the duct mount equipment, review the following list to ensure that all local installation requirements are satisfied.

- Locate the desired spot on the duct surface to mount the UDM-001 or UDM-002. Refer to [Section 2.3](#) .
- Fit the sampling (inlet) and exhaust (outlet) pipes to the ½-in. couplings located at the back of the UDM chamber. See [Figure 2-1](#) for inlet and outlet pipe location.
- Adjust the inlet pipe so that the perforations along the pipe will be facing the air stream flow.
- Drill ½-in. concentric holes to accommodate the pipes and the two ½-in. couplings located at the back of the duct mount chamber. Refer to [Figure 2-1](#) when locating couplings.
- Carefully hold the UDM assembly and align the sampling and exhaust pipes of the UDM with the holes drilled. Holes should be concentric to the pipes.
- Use a center punch to mark the locations on the duct for the eight 7.62 mm (0.3-in.) holes. See [Figure 2-2](#) for the eight mounting holes on the UDM chamber.
- Using appropriate self-tapping screws, or by welding, fit the UDM assembly to the duct.
- Consult qualified personnel on the use of appropriate sealing equipment (gaskets, etc) and methods in order to ensure adequate sealing between pipes and holes in the duct.
- Fit the supplied ¾-in. NPT close nipple fitting to the outside of the UDM chamber.
- Open the front cover of the UDM chamber and then fit and tighten the sensor to the ¾-in. fitting inside of the chamber.
- Fit and tighten the junction box enclosure (on the outside of the chamber) to the ¾-in. NPT close nipple fitting.

Note

If the transmitter enclosure is being connected to the close nipple fitting, it should be accessible.

- Terminate the sensor wires to the junction box or transmitter electronic board. Refer to the specific manuals for wiring designations.
- Connect appropriate cabling (cable adapters, cable and cable glands) between the transmitter and the junction box, if the transmitter is remotely located, and ensure that wires are terminated as designated by the user manuals.
- Verify wiring at all termination points and junction points (transmitter, junction box, and power supply) and ensure that all shielding and grounding practices are being followed.
- Check system operational voltage and conditions and ensure that they are within the applicable specifications of the transmitter and sensor.
- Ensure that the transmitter housing cover and sensor housing halves are tightly secured.
- Place external systems in bypass and conduct testing with target gas for gas applications or use particulate matter tester if the application involves particulate detection with the APM.
- Take external systems out of bypass after tests are completed.

Section 3: Operation

The UDM-001 and UDM-002 are designed to accommodate mounting of Net Safety sensors to ducts. With a box enclosure (chamber) and inlet (sampling) and outlet (exhaust) pipes (tubes), monitoring of air/gas, particulate matter or dust can be done.

The difference between the UDM-001 and UDM-002 duct mount assembly is in the length of the inlet pipe. The approximate standard length of the inlet pipe for the UDM-001 is 1.0 meter (3.3 feet) and the length of the inlet pipe for the UDM-002 is approximately 1.5 meters (4.92 feet). The approximate length of the outlet pipe for each duct mount assembly is 0.5 meter (1.64 feet).

Since duct widths can be greater than 1.5 meters (4.92 feet), and a representative sample is required, Net Safety has made provisions for these cases by use of the extended sampling pipe options.

The length of the sampling inlet pipe can be increased by fitting extension (custom) piping to the end of the standard inlet pipe. Extension pipes are available in 1.0 meter (3.3 feet) or 1.5 meters (4.92 feet) lengths. Refer to [Figure 2-2](#) and [Figure 2-3](#).

The extension pipe can also be cut (modified) to the desired length and this may be done on site. When fitting an extension pipe to a standard inlet pipe, first remove the plastic plug at the end of the standard inlet pipe, then use a tube fitting union or compression fitting (available for custom order) to secure both pipes together. When the overall length of the piping exceeds 1.8 meters (5.90 feet), users should provide additional support at the compression fitting and at the end of the piping. The plug should then be fitted to the end of the extended pipe.

The UDM-001 or UDM-002 Duct Mounts are mounted with the Millennium II Series Sensors, Millennium Premium ST series toxic and SC series combustible sensors, Air Particle Monitor (APM), SIR sensors, and Gas Shield sensors. Not all sensors are available in all markets. Contact Net Safety for sensors available in your specific market.

Prior to operating the detection system with ducting, place external alarm in bypass and confirm that the air mixture or particulate flows through the sampling pipe, into the chamber and back into the duct line. Adjust the air speeds as required and ensure that there is no loss of flow due to any loose joints or broken seals. Configure the detector alarm points to meet specific requirements.

WARNING

Always ensure that the plastic plug is properly fitted to the end of the inlet (sampling) pipe prior to operating the system.

3.1 Operation notes for APM sensors

Although the Net Safety Air Particle Monitor has been proven to detect particulate matter travelling at speeds of up to 20 meters per second (65.62 feet per second) the detector is virtually unaffected by the velocity of particulate and air that it is exposed to. Based on the application and the speed of the particulate matter, the user can perform a "zero" and adjust the sensitivity settings to suit the application.

Net Safety recommends the APM be used with the UDM-001 or UDM-002 sample draw system to acquire a cross-sectional sample of air and particulate moving through ducts. The sample is drawn through perforations along the inlet pipe into a chamber where the APM is mounted. Particulate matter from the outlet pipe is then returned to the duct. See [Figure 3-1](#).

3.2 Operation notes for gas sensors

When using a gas sensor with the UDM-001 or UDM-002 duct mount assembly in gas detection applications, calibration tubing and cup will be required to aid in calibration.

For detection accuracy purposes the air speeds reaching the gas sensor should not be greater than 5.5 meters per second (18.2 feet per second).

NOTICE

UDM-001 or UDM-002 duct mount equipment does not come with gas calibration equipment (calibration cup, calibration tubing, calibration gas and regulator). These items will have to be ordered separately. Refer to [Section 4.3](#). Also see specific manuals when performing calibrations. Note that access to sensors is gained by opening the cover of the UDM-001 or the UDM-002.

3.3 Factors to consider for operation

Prior to operating duct monitoring equipment and detectors, the following list outlines some factors to consider for operation

- Operating temperature
- Changes or fluctuation in temperature
- Air-gas mixture or particulate speeds
- Gas or particulate make-up and characteristic
- Location of fans, bends, dampers, flanges, connections, etc
- The type of air flow in the duct system (turbulent, stratified, etc)

Duct air speeds should be determined since speeds may not be uniform within the duct. If an anemometer is being used to measure speeds, it should always be in an upright position.

In some cases, it may be good to have a visual of the air flow pattern and accumulation by injecting aerosol or smoke into the duct. Breaks in

connection points, junction points and seals may be easily identified using this method.

Air speed calculation can also be done based on the distance the aerosol travels over a specific time (speed = distance divided by time). Air speed testing and confirmation may be required at different points (distances) along the duct and then an average speed determined.

Air speeds and pressure may be affected by location of sharp bends, junction points, connections, other duct work, and fans. Improper sealing of duct work and connections could cause a decrease in air speeds as well as pressure.

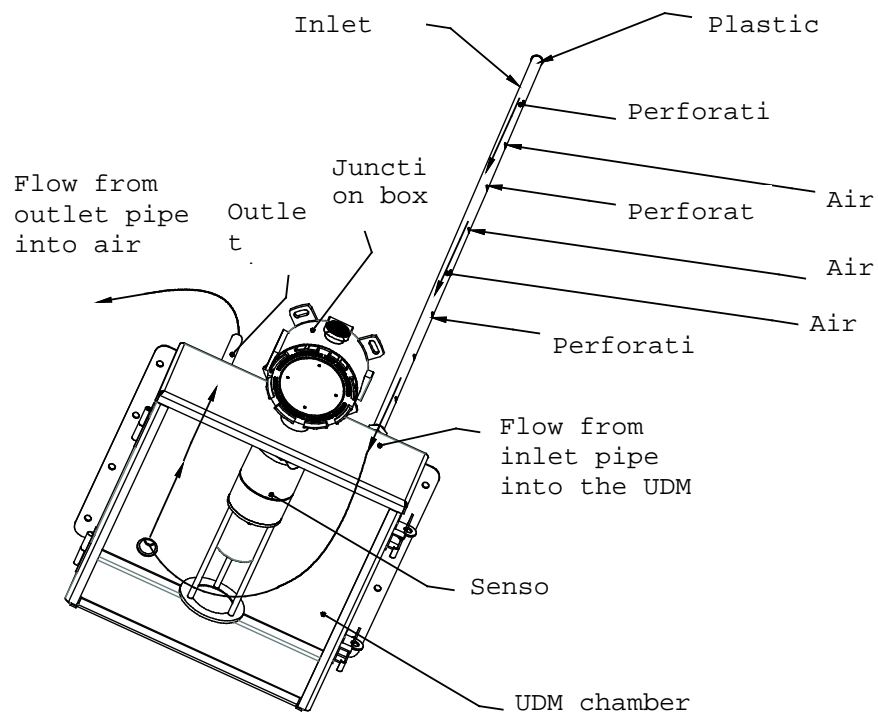
Different gases will have different make-up, as a result, gases that are considered heavy may become light when temperatures are increased, causing the bulk of the gas to be towards the top inner surface of the duct. On the other hand, gases that are normally light may become heavy when temperatures fall, resulting in accumulation at the bottom levels inside the duct. This will determine where gases will accumulate within the flow.

Traditionally it has been understood that duct particulate detectors should be at a distance of about five duct widths downstream from duct openings, sharp bends, branch connections, or deflection plates. Turbulent flow allows the air/gas mixture or particulate to properly mix, and hence a representative sample of the gas concentration or particulate build-up may be taken in these instances. This type of flow makes the decision on positioning the sampling pipes a little easier. Studies done on stratified particulate flow in ducts, have concluded that detectors midway of a straight run of a duct provide good response.

3.4 Principles of operation

Air-gas mixture or particulate moving through the duct comes in contact with the perforations on the sampling (inlet) pipe and enters the duct mount chamber. The air then circulates throughout the chamber and comes into contact with the sensor and returns to the duct through the exhaust (outlet) pipe.

Figure 3-1 Air-Gas Mixture Flow



Note: APM sensor is shown inside chamber.

Figure 3-2 Positioning the UDM Assembly

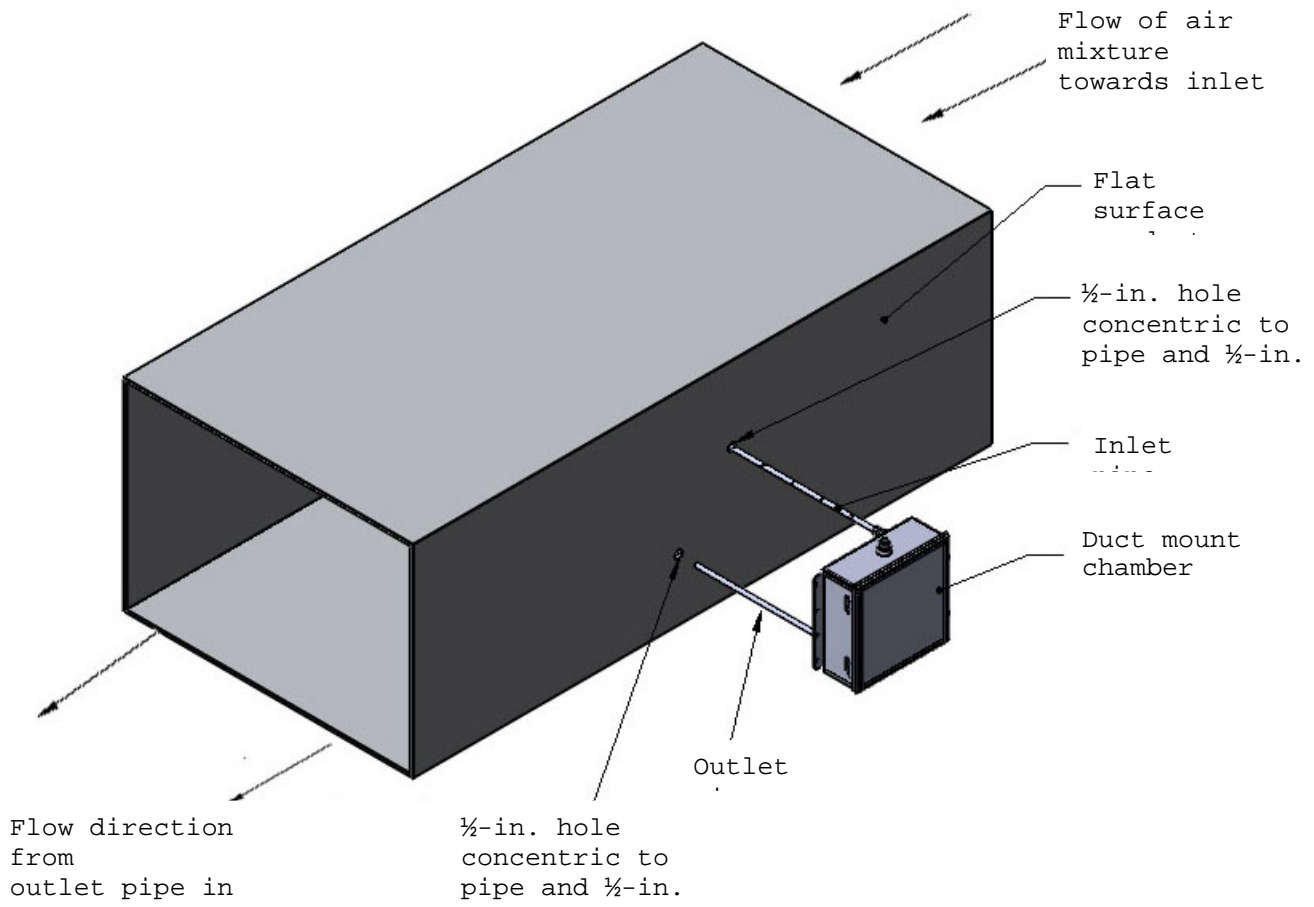
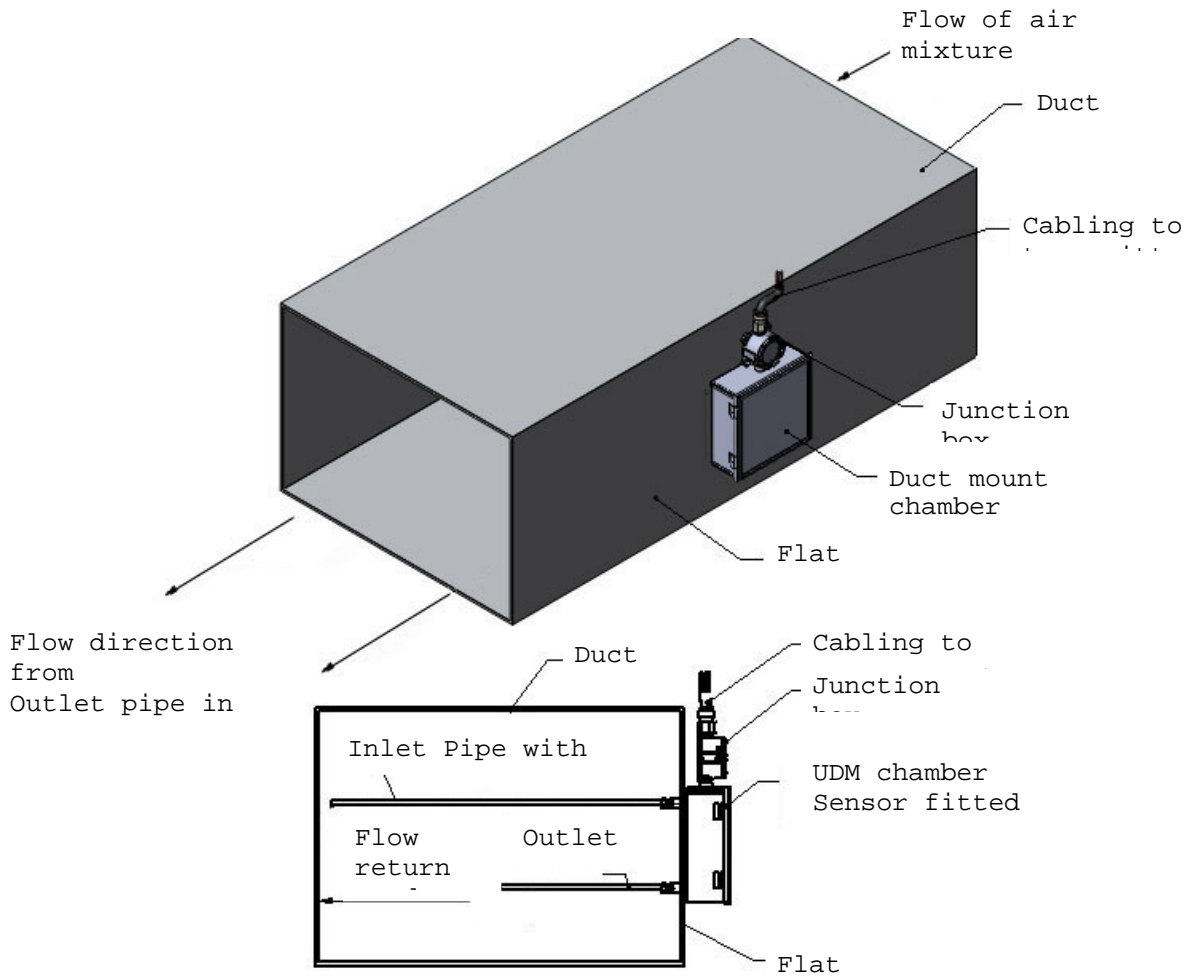


Figure 3-3 UDM Assembly Installed to Duct



Section 4: Maintenance

4.1 Troubleshooting and cleaning

The UDM-001 and UDM-002 duct mount kit assemblies do not require repairs. Other equipment such as sensors and detectors are not designed to be repaired in the field. If a problem should develop with detection equipment, carefully check for faulty wiring. If it is determined that the problem is caused by an electronic defect, the device must be returned to the factory for repair (refer to Section 1.2 and Section 1.3 for instructions).

Inspection and cleaning should be built into maintenance routines to ensure the proper function of equipment. If possible, the duct mount assembly may be dismantled for cleaning or clean instrument air may be blown through the pipes and chamber in order to remove debris that may have accumulated over time. The frequencies of cleaning and maintenance will depend on the application and local the requirements.

4.2 Storage

Duct mount equipment should be properly stored when not in use. Sensor and its electronic components/parts should be stored in locations free from dust and moisture. The storage temperature of detection equipment should be well within the limits of the certified temperatures of the equipment.

4.3 Spare parts and accessories

Description	Part number
Calibration, hardware kit, 0.5 lpm regulator, calibration cup	CAL-KIT-1
¼-in. NPT close nipple	HDW-0177
Outlet pipe	MFG-0265
UDM-001 inlet pipe	MFG-0264
UDM-002 inlet pipe	MFG-0267
UDM 1m extension kit	UDM-EX1
UDM 1.5 m extension kit	UDM-EX2
Neoprene gasket for UDM-001/UDM-002 door	GSK-0044
Pipe plug (plastic plug)	HDW-0071
Tube fitting union (compression fitting) for custom length extension	HDW-0228
1 m long extension inlet pipe for custom length	MFG-0264

1.5 m long extension inlet pipe for custom length

MFG-0267

Section 5: Specifications

5.1 Environmental

5.1.1 Metallurgy

Stainless Steel (SS316)

5.1.2 Weight

UDM-001: 16.27 lb (7.37 kg)

UDM-002: 16.69 lb (7.57 kg)

5.2 Warranty

12 months after commissioning or 18 months after shipment, whichever comes first

Section 6: Ordering information

Model	Description
UDM-	Universal duct mount
-001	Universal duct mount 1 m inlet sampling pipe
-002	Universal duct mount 1.5 m inlet sampling pipe

Notes:

EmersonProcess.com/FlameGasDetection

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