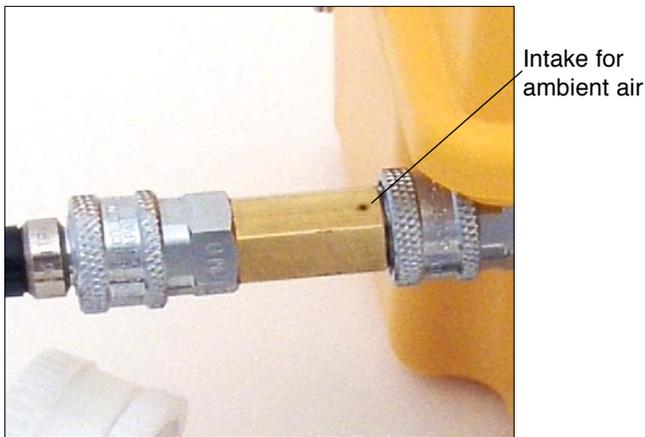


WHAT IS A DILUTION FITTING?

Description

A typical dilution fitting is a plumbing device that is attached to a gas detection instrument sample inlet port, and then the sample hose is attached to the dilution fitting. When used, the sample flow going into the instrument passes through the dilution fitting. The dilution fitting has 2 small holes; one is in the sample gas stream path, and the second is through the side of the fitting and causes the instrument to take in ambient air. Essentially, the dilution fitting creates a calibrated "leak" into the incoming sample, and dilutes the sample with fresh air. If the dilution fitting is calibrated to be 1 to 1, then when used it will dilute the sample gas stream with an equal amount of ambient air.



50/50 dilution fitting,
Part # 80-0405RK



When is a dilution fitting needed?

There are at least two situations where a dilution fitting is needed. The first common usage is when a catalytic LEL sensor is used to test a space that is inerted (contains no oxygen). Since a catalytic sensor requires oxygen in order to operate, a 1 to 1 dilution fitting blends enough fresh air with the sample to provide enough oxygen for the sensor to properly detect flammable gases if they are present. The second common reason for using a dilution fitting is to extend the range of the gas monitor.

Interpretation

When a dilution fitting is used, it reduces the reading of the gas monitor. If the gas monitor is calibrated to read correctly without the dilution fitting used, then when the fitting is used the gas monitor will read lower than what is actually in the gas sample. For example, if a 1 to 1 dilution fitting is used, since it dilutes the sample by 50%, this means that the reading will be half of what is actually present in the test space. In order to understand what is the correct reading, it is necessary for the operator to multiply the meter reading by 2. If a dilution fitting is 2 parts dilution to 1 part sample, then it knocks the reading down to 1/3 of the actual value, and in this case it is necessary to multiply the meter reading by 3 to get the actual concentration. So, a reading of 50% LEL is actually 150% LEL.

Cautions

A dilution fitting ratio can be affected by changes in pressure of the incoming gas sample. The fitting is calibrated to provide the correct dilution if the sample is drawn from atmospheric pressure. If the pressure is different, it can change the ratio. For example, if the sample is drawn from a strong vacuum, the fitting may have a difficult time pumping enough gas through the sample hole, and therefore it would draw a larger proportion of the sample through the dilution hole. In this case, you would be getting more dilution of the sample, and so the readings would be lower than expected. If the sample is drawn from a pressurized vessel, it may force too much gas through the sample hole and the pump will not be able to draw the correct amount from the dilution hole. In this case the reading may be higher than expected. In the case where it is testing an inerted space with a catalytic sensor, if insufficient dilution occurs then the LEL reading may be low or near zero because the catalytic sensor is not responding properly due to a lack of oxygen.



APPLICATION BRIEF

Gas Detection For Life

November 8, 2005

Dilution Fittings Increase H2S Range

This special instrument has an internal dilution fitting. It is built inside the instrument to extend the range of the H2S sensor, and the user cannot remove or adjust it. The dilution ratio used is about 7 to 1, but it is not necessary for the operator to do any multiplying because the instrument is designed and calibrated to read correctly with the internal dilution present.

The range of this H2S EAGLE is 0 to 1,000 ppm. It is very important when calibrating this instrument to use a sample bag. Fill the sample bag, and then draw from the bag with the instrument. If a demand flow regulator is used, or if a fixed flow regulator is connected directly to the EAGLE, then the internal dilution will not work properly and the H2S calibration will not be correct.

EAGLE Configuration	H2S Range
Standard	0 - 100 ppm
Internal Dilution Fitting	0 - 1,000 ppm

Ordering Information

	Part Number	Description
Dilution Fittings	80-0405RK	Dilution fitting 50 / 50, for EAGLE only (for use with hose & probe)
	80-0406RK	Dilution fitting 3 to 1 for EAGLE only (for use with hose & probe)
EAGLE's with Internal Dilution	72-5101RK-11T	EAGLE for LEL & PPM, with teflon-lined hose, and internal dilution
	72-5201RK-11	EAGLE for LEL & PPM / O2, with internal dilution for LEL
	72-5501RK-11	EAGLE for LEL & PPM / O2 / CO / H2S / SO2 (with internal LEL dilution)
Transformer Testing EAGLE with Dilution Fitting	72-5101RK-TR1	EAGLE for Hydrogen (H2), 0 - 5% volume, for transformer gas testing, with bag & dilution fitting
	72-5201RK-TR1	EAGLE for H2 (0-5%)/ O2, for transformer gas testing, with sample bag & dilution fitting
Tank Testing EAGLE with Dilution Fitting	72-5101RK-TT	EAGLE for LEL, tank testing version, with float probe & dilution fitting
	72-5201RK-TT	EAGLE for LEL & PPM / O2, tank testing version, includes float probe assembly and dilution fitting
	72-5301RK-TT	EAGLE for LEL & PPM / O2 / H2S, tank testing version, includes float probe assembly and dilution fitting
	72-5401RK-TT	EAGLE for LEL & PPM / O2 / H2S / CO, Tank Tester version (with float probe & dilution fitting)