Version

2

LDARtools

SpanBox5™ Series Setup Requirements

Rev. Date: July 18, 2021

Purpose

To provide requirements to the customer before an on-site installation.

About the SpanBox

The SpanBox is a relay/solenoid box controlled by a provided tablet in kiosk mode. It replaces using gas bags filled from compressed air/methane that are used to calibrate instruments.

Instead of having to fumble with bags, stop watches, clipboards and forms; you attach the phx21(s) and or phx42(s) to a SpanBox5, press *Start* and reply to the prompts.

This increases productivity and decreases the risk of compliance findings in violation of the Clean Air Act.

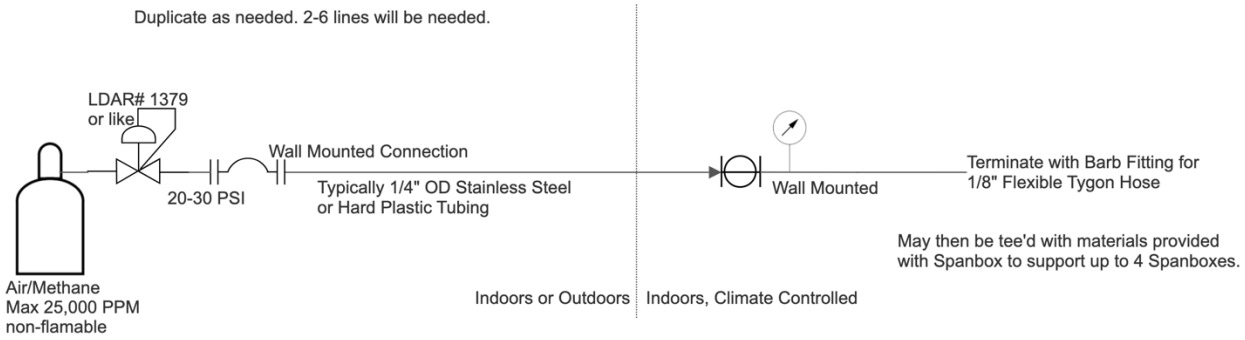
Available Models

Model	**Number of Analyzers**	**Max. Number of Calibration Gasses***
SpanBox5	6	6
SpanBox510	1	5
SpanBox530	3	5

*The number of calibration gasses needed are determined by the regulations that apply to your facility. LDARtools **CANNOT** make that determination.

Plumbing

Recommended Large Bottle Setup:



Disposable Bottle with C-10 Setup:

If LDAR# 5199 is purchased for each calibration gas, all supplies needed will arrive with the SpanBox. These small bottles are generally stored and used indoors.

Electrical

phx42:

Each phx42 will each need a conventional outlet. These are convention AC/DC Wall-Warts.

Example:

SpanBox:

Each Spanbox will require 2 power outlets, one utilizing a USB-C cable with a power adapter for the tablet, and one utilizing a standard AC adapter for the base.

Each site will require one additional outlet for the Wi-Fi hot spot somewhere in the room.

Example for the base unit AC adapter:

Wi-Fi

While a cellular hotspot is provided at no charge, local Wi-Fi tends to be more reliable. Please have Wi-Fi credentials available if possible.

Safety

Below is Hazard Information for Methane.

The Mixtures that are used for calibrations can include the following:

- Clean Air (Zero)
- 2.5 ppm Methane with the balance Air
- 5 ppm Methane with the balance Air
- 10 ppm Methane with the balance Air
- 100 ppm Methane with the balance Air
- 500 ppm Methane with the balance Air
- 1000 ppm Methane with the balance Air
- 2000 ppm Methane with the balance Air
- 5000 ppm Methane with the balance Air
- 1% Methane with the balance Air
- 1.5% Methane with the balance Air
- 2% Methane with the balance Air
- 2.5% Methane with the balance Air

While other mixtures may be used, calibration gas will never exceed 2.5% Methane with the balance being air. Oxygen should never be below 20%.

All mixtures used are non-flammable.

Methane

A. BACKGROUND INFORMATION

I.I.A.1 PHYSICAL AND CHEMICAL PROPERTIES

Structural formula:	CH_4
Molecular weight:	16.04
CAS number:	74–82–8
Boiling point:	−161.49°C
Freezing point:	−182.48°C
Vapor pressure:	40 mm Hg (−86.3°C)
Flash point:	−187.78°C
Flammability limits:	5.3–14%
Physical state:	A colorless, odorless, flammable gas and the major component of natural gas. It forms explosive mixtures with air and is moderately soluble in water.

B. SUMMARY OF TOXICITY INFORMATION

Little information is available on the toxicity of methane. It appears that toxic effects of methane, considered biologically inert, are related to the oxygen deprivation that occurs when the simple alkane is present in air at a high concentration. Hunter (1978) stated that miners evacuate coal pits when the methane concentration in air reaches 2.5% by volume; it is not clear whether evacuation is prompted by the threat of a health hazard or by the danger of explosion.

Kamens and Stern (1973) referred to a literature survey that indicated that methane is biologically inert and that exposure to methane at 10,000 ppm had no toxic effect; conditions of exposure and identification of the test animal were not given, but a U.S. Department of Health, Education and Welfare report was cited (1970).

C. EXPLOSION HAZARD OF METHANE

Methane forms explosive mixtures with air and the loudest explosions occur when one volume of methane is mixed with 10 volumes of air (or 2 volumes of oxygen) (Windholz et al., 1976). Air containing less than 5.5% methane no longer explodes.

D. INHALATION EXPOSURE LIMITS

ACGIH (1982) lists methane in its category of simple asphyxiants. This is described as being gases and vapors, which when present in high concentrations in air, act as simple asphyxiants without other significant physiologic effects. TLVs are not recommended because the limiting factor is the available oxygen.

E. COMMITTEE RECOMMENDATIONS

I.I.E.1 EXPOSURE LIMITS

In 1966, the Committee on Toxicology set an EEL and a CEL for methane:

24-h EEL:	5,000 ppm
90-d CEL:	5,000 ppm

No rationale accompanied these limits.

It is obvious that an exposure limit that presents an explosion hazard cannot be recommended, even if it is well below a concentration that would produce toxicity; thus, exposure limits should not exceed 5% by volume in air.

Animals exposed to methane at 10,000 ppm showed no toxic effects; an uncertainty factor of 2 is suggested to derive an EEL—5,000 ppm. There is no evidence that duration of exposure is important in methane toxicity. Therefore, no change in the previously recommended exposure limits seems necessary.

Material taken from the Emergency and Continuous Exposure Limits for Selected Airborne Contaminants, Volume 1 (2000)