



Option 17 — Configured for Shifting Gases

Option 17 has dual-purpose functionality that is configured per user specifications. The two functionalities are mutually exclusive, and the specified functionality cannot be changed.

Important:

This section contains information for configuring the flow meter for a shifting gas composition. Information for selecting from the available list of multiple gas calibration curves is available with “Option 17— Configured for Multiple Gases.”

An optional feature available with Kurz flow meters is the ability to adjust for shifting gas (also referred to as “binary gas”) compositions or to select a different predefined gas calibration.

- A shifting gas composition is a gas mix with only the percentages of the gases within the mix changing based on the key gas within the mix.
- Multiple gas calibrations support up to five unique gases or gas mixes.

Important:

Two different sets of parameters appear depending on Option 17 being configured for the shifting gas feature or the multiple gas feature.

Make sure you are referring to the correct set of feature parameters for Option 17.

Shifting Gas Composition

Shifting gas compositions are common in biogas applications where the amount of methane, hydrogen, and carbon dioxide can shift based on seasonal changes, biomass content, and rate of decomposition.

The gas composition can be changed two ways:

- Manually by entering a percent concentration of the key gas.
- Automatically adjusting the percent concentration of the key gas through the 4-20mA external input signal read by the flow meter.

The factory setting for the shifting gas composition feature is configured so that the percent concentration of the key gas is entered manually, and it is set to 50% concentration of the key gas. Make sure to properly wire the flow meter electronics before changing the source of the gas adjustment to an external source. Refer to the *Kurz Hardware Reference Guide*, Appendix A for detailed wiring diagrams of the TB6-5/TB6-6 input connections for the 4-20mA input signal.



Changing the Shifting Gas Composition Manually

Changing the percentage of the shifting gas composition using Manual mode:

1. Press **P**.
2. Enter the Advanced Access password, and then press **E**.
3. Press **2** to invoke the Quick Jump option.
4. Press **17** for the Shifting Gas Composition menu, and then press **E**.

The prompt for selecting the source of the shifting gas composition appears.

```
% CONC SOURCE  
>MANUAL    ^v
```

5. Use the arrow keys to select **MANUAL**, and then press **E**.

The prompt for the key gas percentage concentration appears.

```
CONC CH4  
>50.0%
```

The example uses CH4 as the key gas.

6. Enter the percentage concentration of the key gas, and then press **E**.
7. The molecular weight of the new gas composition appears.

```
GAS MOL WT  
>29.9225
```

8. If necessary, use the number keys to change the molecular weight to the desired gas composition. Press **E**.

```
MOLWT=29.922  
LB/CF=0.076419
```

The molecular weight and calculated density of the gas composition appear.

9. Press **E** to return to the main menu.



Changing the Shifting Gas Composition Automatically Through the External Input

Before setting up Option 17 for the external input, you must define **Option 20** to use **VM Reference** as the external input.

To access the External Input Setup option in Program mode:

1. Press **P**.
2. Enter the Advanced Access password, and then press **E**.
3. Press **2** to invoke the Quick Jump option.
4. Press **20** for the External Input Usage menu, and then press **E**.

```
EXT INPUT USAGE  
>VM REEFERENCE ^v
```

5. Select **VM REFERENCE**, and then press **E**.

The prompt for linearizing the scale unit of the 4-20mA signal appears.

```
SCALE UNIT  
>%
```

10. Enter the scale unit as a percentage by pressing **1** until **%** appears, and then press **E**.

```
SCALE UNIT  
>0%
```

The prompt for the percent value equivalent to the 4mA signal appears.

11. Enter **0%**, and then press **E**.

The prompt for the percent value equivalent to the 20mA signal appears.

```
SCALE UNIT  
>100%
```

12. Enter **100%**, and then press **E**.



Changing the percentage of the shifting gas composition using Automatic mode from an external input:

1. Press **P**.
2. Enter the Advanced Access password, and then press **E**.
3. Press **2** to invoke the Quick Jump option.
4. Press **17** for the Shifting Gas Composition menu, and then press **E**.

The prompt for selecting the source of the shifting gas composition appears.

The options for entering the gas composition are manual through the keypad or external input through the analog input signal.

```
% CONC SOURCE
>EXT INPUT    ^v
```

5. Use the arrow keys to select **EXT INPUT**, and then press **E**.

The prompt to select the source of the change for the gas concentration appears.

```
CONC CH4
>50.3557%
```

The key gas concentration percentage that is read from the 4-20mA input appears.
The example uses CH₄ as the key gas.
This value is read-only and cannot be changed.

6. Press **P**.

```
MOLWT=29.922
LB/CF=0.076419
```

The molecular weight and calculated density of the gas composition appears.

7. Press **E** to return to the main menu.



Viewing the External Analog Input for Shifting Gases

To view the External Analog Input in Display mode:

1. Press **D**.
2. Press **2** to invoke the Quick Jump option.
3. Press **41** for the input current and the equivalent key gas percentage concentration.

```
IN=12.057 mA
AT 50.35%
```

The input current equivalent key gas percentage concentration appears.

4. Press **H** to exit.

The main Display mode (DSP) prompt appears.

Troubleshooting Shifting Gas Composition

The flow meter will not provide an accurate measurement of the flow when the 4-20mA signal reading is out of range ($\leq 3.6\text{mA}$ or $\geq 21.0\text{mA}$).

- The key gas percentage is 0% when the signal is $\leq 3.6\text{mA}$.
- The key gas percentage is 100% when the signal is $\geq 21.0\text{mA}$.

The flow meter engages the NE-43 alarm level on the 4-20mA output when the 4-20mA input signal that provides the gas composition percentage is out of range. The flow meter also activates an alarm output connected to the digital output (DO1) connected to TB6-3/TB6-4, and the following information appears in the display:

```
EXT ANALOG INPUT
OUT OF RANGE
```
