

WHEN YOU NEED TO BE SURE



# **CyFlex® Air Mass Flow Computation**

**Version 6**

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## Version History

Version	Date	Revision Description
1	1/25/2016	Initial publication
2	8/23/2018	Format with SGS brand
3	4/7/2020	Retrofit to new template
4	6/5/2020	Added Inputs and Outputs to <i>Section 1 Overview on page 1</i> Revised <i>Section 3 Specification File on page 3</i>
5	12/8/2021	Revised <i>Section 2 Starting the Application on page 2</i> to remove inline help content for <code>gasfl</code> and add a hypertext linked cross-reference to its <code>cyflex.com</code> usage.
6	6/13/2022	Updated hypertext linked cross-reference to <code>gasfl</code> <code>cyflex.com</code> usage in <i>Section 2 Starting the Application on page 2</i>

## Document Conventions

This document uses the following typographic and syntax conventions.

- Commands, command options, file names or any user-entered input appear in Courier type. Variables appear in Courier italic type.  
Example: Select the `cmdapp-relVersion-buildVersion.zip` file....
- User interface elements, such as field names, button names, menus, menu commands, and items in clickable dropdown lists, appear in Arial bold type.  
Example: **Type**: Click **Select Type** to display drop-down menu options.
- Cross-references are designated in Arial italics.  
Example: Refer to *Figure 1*...
- Click intra-document cross-references and page references to display the stated destination.

Example: Refer to *Section 1 Overview on page 1*.

The clickable cross-references in the preceding example are *1*, *Overview*, and on page 1.

## CyFlex Documentation

CyFlex documentation is available at <https://cyflex.com/>. View **Help & Docs** topics or use the **Search** facility to find topics of interest.

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## 1 Overview

Use `gasfl` to compute air mass flow on a continuous basis.

The `gasfl` task is normally started in the CyFlex `go` script.

### 1.1 Inputs

The overall purpose of the `gasfl` application is to calculate wet and dry mass air flow when using an air flow meter that outputs volumetric flow rate, as is often the case with ultrasonic air flow meters. In order to perform the calculations, the application requires the following inputs:

- Barometric pressure
- Vapor pressure
- Inlet pressure (gauge) to the air flow meter
- Inlet air temperature to the flow meter
- Volumetric flow rate from the air flow meter
- Gas composition of the fluid flowing through the meter

### 1.2 Outputs

The `gasfl` application outputs wet and dry mass air flow and updates your composition variable by adding the `.WA` water molar fraction to the specified composition variable. If no value is specified in the `spec` file, the `inlet_airC` composition variable will be updated.

**ⓘ Important:**

Do not use the `add_water` application in conjunction with `gasfl` with the same specified gas composition variable or both applications will try to add the water molar fraction to the same composition variable.

## 2 Starting the Application

Enter `gasfl` to start the application.

Refer to [cyflex.com](https://cyflex.com) [gasfl](#) usage help for command syntax.

### 3 Specification File

The following is a gasfl example spec file:

```
#Gas Mass Flow Specification File

# Total of all meters will be placed in following variables if specified
# gasfl will not create these variables, they must already exist.
# If you do not specify variables for the gasfl application to write to,
# it will write over the value specified in perf labels for mass air flow
# (entry number 9) and dry mass air flow (entry number 26).
#total mass flow - wet                total_mass_flow-dry
-                                     -

# gas_composition variable - air is default if the filename is "-"
# if no variable is specified here, inlet_airC will be used as the
# gas composition variable
-

#barometer                water_vapor_partial_pressure - (value or label)
barometer                 vap_pa

#list of meters which comprise the total mass flow ( up to 4 meters )
# inlet_pres, inlet_temp, and volume_flow_rate are inputs to the application
# inlet_pres should be gauge pressure, not absolute
# wet_mass_flow and dry_mass_flow are outputs of the application.
#inlet_pres  inlet_temp  volume_flow_rate  wet_mass_flow  dry_mass_flow
air_mtrL_p   air_mtrL_t   air_mtrL_vf       air_mtrL_mf    air_mtrL_mfd
air_mtrR_p   air_mtrR_t   air_mtrR_vf       air_mtrR_mf    air_mtrR_mfd
```