Gas Fraction Handler (GFH) is a Promass software feature that improves measurement stability and repeatability as well as provides valuable process diagnostic information in the event of two phase flow conditions (e.g. gas entrainment).

The function continuously tests for the presence of disturbances in single-phase flow, i.e. for gas bubbles in liquids or for droplets in gas. The diagnostic Index Inhomogeneous Medium indicates the severity of the second phase. In the presence of the second phase, flow and density will become increasingly unstable. The GFH function improves measurement stability with respect to the severity of the disturbances, with no effect under the condition of a single-phase flow.

The following parameters and settings comprise the Gas Fraction Handler (GFH) function for Promass.

- Gas Frac Handler – GFH (off, moderate, powerful)

  By default, this parameter is set to off. When a second phase is detected, large fluctuations of flow and density will occur. GFH stabilizes the output value and enables a better readability for operators and an easier interpretation by process control system. The level of smoothing is adjusted according to the severity of disturbances introduced by the second phase. The influence of the disturbances can be configured with this switch in two steps: powerful is used for applications with very significant levels of second phase. Moderate should be used for applications with low level or intermittent levels of second phase. When set to off GFH is not active.

  GFH is cumulative to any fixed damping constants applied to flow and density set elsewhere in the instrument parameterization.

Gas Frac Handler	
Navigation	Expert → Sensor → Measurement mode → Gas Frac Handler (6377)
Description	Activates the Gas Fraction Handler function for two phase media.
Selection	▪ Off ▪ Moderate ▪ Powerful
Factory setting	Off

- Index.inh.medium – Index Inhomogeneous Medium

  This diagnostic Index Inhomogeneous Medium describes the relative inhomogeneity of the process fluid. For applications with entrained gas this diagnostic describes the relative amount of entrained gas in the flowing fluid. When there is no entrained gas in a liquid the value is 0 or nearly 0 and for very high levels of gas volume fractions (associated with severe slug flow, for example) the value exceeds 100. The diagnostic generally increases with increasing gas volume but the scaling is not linear with gas volume fraction percentage. Please note the homogeneity of the fluid properties is also related to flow speed and increasing flow speed generally results in a more homogeneous fluid and thus a lower Index Inhomogeneous Medium. The index will not saturate with excessive second phase. The Index Inhomogeneous Medium can be used to better understand process conditions and the level of gas entrainment on a relative basis, but Index values cannot be interpreted on an absolute basis.

Please note the diagnostic can also be used to similarly describe the relative level of solids in a liquid application or the relative level of liquid phase in a wet gas application.

Index inh.medium	
Navigation	Expert → Application → Medium index → Index inh.medium (6368)
Description	Shows the degree of inhomogeneity of the medium.
User interface	Signed floating-point number
Factory setting	2

- Cut off inh.gas –Cut Off Inhomogeneous Gas

  This parameter is used for wet gas applications. If the Index Inhomogeneous Medium falls below this value, the Index Inhomogeneous Medium is reported as zero.

Cut off inh. gas	
Navigation	Expert → Application → Medium index → Cut off inh. gas (6375)
Description	Enter cut off value for wet gas applications. Below this value the Index inhomogeneous medium is set to 0.
User entry	Positive floating-point number
Factory setting	0.25

- Cut off liquid – Cut Off Inhomogeneous Liquid

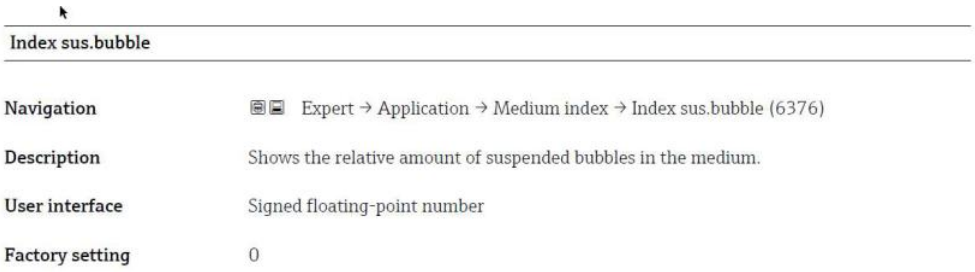
  This parameter is used for entrained gas in liquid applications or for solids in liquid applications. If the Index Inhomogeneous Medium falls below this value, the Index Inhomogeneous Medium is reported as zero.

Cut off liquid	
Navigation	Expert → Application → Medium index → Cut off liquid (6374)
Description	Enter cut off value for liquid applications. Below this value the Index inhomogeneous medium is set to 0.
User entry	Positive floating-point number
Factory setting	0.05

The following additional parameters and settings comprise the Gas Fraction Handler (GFH) function for Promass Q. Promass Q, due to its use of two operating frequencies (Multi-frequency Technology) is also able to provide additional diagnostic information about gas entrainment that is suspended in the process fluid, typically in the form of microbubbles or small bubbles suspended in viscous fluids.

- Index sus.bubble – Index Suspended Bubbles

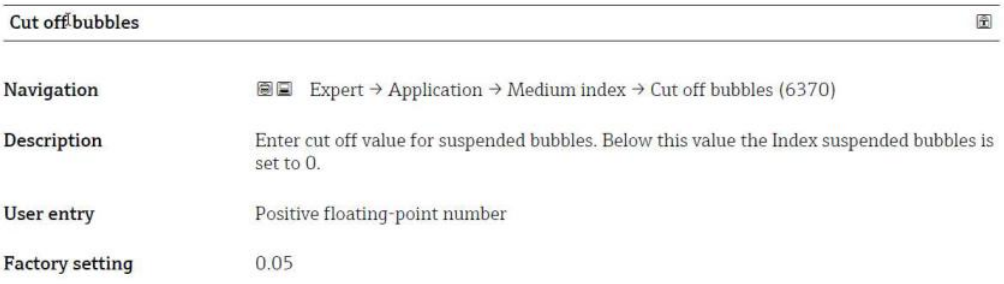
  This diagnostic value index describes the relative amount of microbubbles or small suspended bubbles in a process fluid. When there is no entrained gas in the form of suspended bubbles in a liquid the value is 0 or nearly 0 and for very high levels of suspended gas volumes the value exceeds 10. The diagnostic generally increases with increasing gas volumes, but the scaling is not linear with gas volume fraction percentage. The index will not saturate with excessive second phase. The Index Suspended Bubbles can be used to better understand process conditions and the level of gas entrainment on a relative basis, but Index values cannot be interpreted on an absolute basis.



Index sus.bubble	
Navigation	Expert → Application → Medium index → Index sus.bubble (6376)
Description	Shows the relative amount of suspended bubbles in the medium.
User interface	Signed floating-point number
Factory setting	0

- Cut off bubbles - Cut Off Suspended Bubbles

  This parameter is used for suspended entrained gas in liquid applications. If the Index Suspended Bubbles falls below this value, the Index Suspended Bubbles is reported as zero.



Cut off bubbles	
Navigation	Expert → Application → Medium index → Cut off bubbles (6370)
Description	Enter cut off value for suspended bubbles. Below this value the Index suspended bubbles is set to 0.
User entry	Positive floating-point number
Factory setting	0.05