



TOTALFLOW[®]

Technical Bulletin 104

Proper use of GCMC numbers

Totalflow Technical Bulletin

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Purpose

This bulletin describes the proper use of the Gas Chromatograph Module Coefficients (GCMC) function of the BTU 8000/8100 CV Transmitter.

Description

The GCMC factors are printed on a tag attached to the GC Module. The GCMC factors are specific to each module and result from a proprietary characterization of the hardware during factory testing. Use of the factors allows the analyzer to find peaks with no input from a calibration sample. Proper operation of a unit using GCMCs can only be confirmed by comparing the BTU 8000 results to results obtained by some other method such as taking a spot sample to a lab. The accuracy of the BTU reading obtained by this method is ± 5 to 15%. For more accurate operation, obtain the proper calibration blend.

The operator can choose to “Find Peaks” using GCMC simply by selecting this option in the startup options window. Selection of this mode of operation will force the GC to use GCMC Factors 17-22 to identify key peaks. The GC will then calculate the position of other peaks. This mode of operation can be used with normal calibration or GCMC calibration. The peak deviation window may need to be adjusted wider to pick up ethane. The peak deviation is set in the advanced calibration setup window. By default, peak deviation is set to 0.075. Please contact Totalflow customer service for details on performing this operation.

Factors 17-22 are also used for automatic peak find using calibration gas. If using automatic peak find, set these factors to match the numbers found on the tag on the GC module and enter your calibration gas concentrations in the calibration setup screen.

If the user chooses to calibrate using GCMCs, factors 13-16 are used to modify the default calibration factors (Factors 00-12). To use the GCMC factors for calibration the GC must be cold started or default calibration response factors must be placed in Factors 00-12.

NOTE: Any number that is placed in the Factor 13-16 slot is used even when the GCMC calibration option is not selected. For normal operation with calibration gas, factors 13-16 should be set to exactly 1 (one). Any other number placed in these factors after a successful calibration will cause a “double calibration”. Factors 13-16 will be overwritten to 1s at the time a successful calibration is performed using a calibration standard. Similarly, a GCMC calibration using a cal blend will reset the individual calibration factors to their defaults at the end of the calibration sequence.

The majority of GC installations will have calibration gas available and will use either manual peak find or automatic peak find to identify the components to be analyzed. The use of GCMC numbers should be seen as an emergency measure to get a unit up and running. The results should not be relied on for custody transfer.

Important: If GCMC numbers will not be used, do not modify the default factor numbers as they are used by the other calibration methods.

Conclusion

The user should verify that the GCMC factors are set as shown below if using automatic or manual peak find options and calibration using a calibration standard. Setting the GCMC factors to anything other than the numbers shown below may lead to unsatisfactory analysis results.



Factor Defaults and Descriptions

Factor 00	4.50e-9	C3	Propane (Measured on detector 2)
Factor 01	4.20e-9	IC4	Iso-Butane
Factor 02	4.17e-9	NC4	Normal Butane
Factor 03	3.28e-9	NEOC5	Neo Pentane
Factor 04	3.26e-9	IC5	Iso-Pentane
Factor 05	3.14e-9	NC5	Normal Pentane
Factor 06	1.90e-9	C6+	Normal Hexane and heavier components
Factor 07	1.43e-8	N2	Nitrogen
Factor 08	1.91e-8	C1	Methane
Factor 09	1.30e-8	CO2	Carbon dioxide
Factor 10	7.80e-9	C4+	Butanes and heavier components
Factor 11	7.46e-7	C3'	Propane (measured on detector one)
Factor 12	1.17e-8	C2	Ethane
Factor 13	1	C3 – NC5 Response factor modifier – Primary is C3	
Factor 14	1	C6+ Response factor modifier	
Factor 15	1	N2, C1, CO2 Response factor modifier– Primary is C1	
Factor 16	1	C4+, C3', C2 Response factor modifier– Primary is C3'	
Factor 17	0	Operating Carrier Pressure – sets NC5 Peak Time	
Factor 18	0	C1 Peak Time @ Operating Carrier Pressure	
Factor 19	0	C3' Peak Time @ Operating Carrier Pressure	
Factor 20	0	SV1 Adjust Time	
Factor 21	50	NC5 Peak Time (used by auto peak find as peak time target for NC5)	
Factor 22	0	C3 Peak Time	

These default factors may also be viewed by pressing the HELP button on the GCMC screen on the BTU MMI software.

Factors 0-12 are default individual component response factors. The GC will adjust these numbers during normal calibration operation. So the numbers you see in the above table may not be what you see in your GC after a successful calibration using a calibration standard. The default values shown here for factors 00-12 must be in place for GCMC calibration to work.