Data Processing Sheet

Instrument:	HydroC CO2	Date of calibration:	28.04.2021 (post 15.5°C)
Serial number:	CO2FT-0918-001	Date of delivery:	
Customer:	Svalbard	PO:	RMA30908

Note! *For more information about the HydroC calibration, please check your individual sensor Calibration Sheet.*

Note! *For data processing, apply the application note Data Processing for CONTROS HydroC CO_2.*

Sensor Specific Values

T_0	273.15 K
p_0	1013.25 mbar
F	61470
T_{sensor}	47.9°C
$f(T_{\text{sensor}})$	9848.97 (only for T_{sensor} as given above)
$S'_{\text{2beam,Z}}$	14505.88 (found during calibration)
Polynomial degree	3 (with forced zero crossing)
Regression error:	0.3< ppm (estimate error found during calibration)
Runtime:	39620877 s

Calibration coefficients

k_1	5.736126e-02
k_2	2.472803e-06
k_3	3.173362e-10

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Calibration Data

S_{raw}	S_{ref}	T_{gas}	p_{NDIR}	S_{proc}	$x_{CO_2,reference}$ *
[]	[]	[°C]	[mbar]	[]	[ppm]
21186.04	15125.39	40.83	1016.70	3010.80	233.31
19685.02	15145.10	40.54	1013.73	7223.30	761.13
20083.24	15144.95	40.17	1012.92	6125.35	592.87
20499.29	15141.60	39.99	1013.38	4966.32	441.42

Equations

Equation for $x_{CO_2,wet}$

$$x_{CO_2,wet} = \left(k_3 S_{proc}^3 + k_2 S_{proc}^2 + k_1 S_{proc}\right) \frac{p_0 T_{gas}}{T_0 p_{NDIR}}$$

Equation for p_{CO_2}

$$p_{CO_2} = x_{CO_2,wet} \frac{p_{in}}{1013.25}$$

Calibration Curve

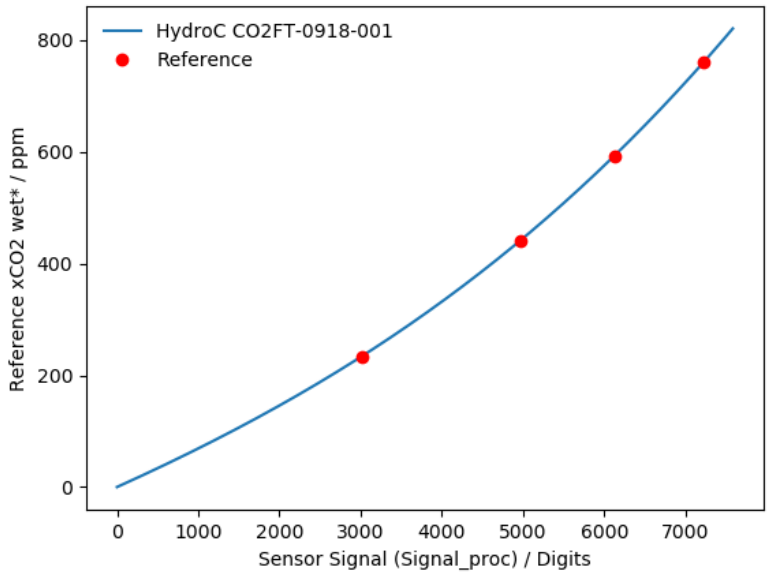

Figure 1: Calibration curve of the processed sensor signal (S_{proc}) against the x_{CO_2} of the Contros CO_2 reference system.

*Converted from the x_{CO_2} value in the reference system to the conditions in the gas stream of the sensor.