In order to verify the flow computer configuration will generate volume numbers similar to the V-Cone Application Sizing worksheet, it is a good practice to simulate flowing conditions. This can be achieved in 4 steps:

- Enter V-Cone Parameters
- Simulate flow conditions
- Provide density values
- Verify flow rates

Note: This procedure covers parameters for matching the V-Cone sizing only and does not cover full configuration of the flow computer. Refer to the operator's manual for complete configuration instructions.
**Remember to remove ALL override values used while matching the V-Cone sizing prior to returning the flow computer to normal operation.

1) Entering V-Cone Parameters

The following parameters must be configured in the flow computer:

Meter Equation Type: V-Cone
- Meter ID **(1)**
- Cone OD **(2)**
- Isentropic Exponent **(3)**
- Flow Coefficient **(4)**
- Pipe Thermal Coefficient **(5)**
- Cone Thermal Coefficient **(6)**
- Y Factor: Set it to one (1) unless using wafer cone

Meter Settings
- Base Temperature in °F **(7)**
- Base Pressure in PSIA **(8)**
- Atmospheric Pressure in PSIA **(9)**

2) Simulating Flow Conditions

Use the override feature of the Dynacom software to enter the following:
- Flow Temperature in °F **(10)**
- Flow Static Pressure in PSIG **(11)**
- Flow Differential Pressure in Inches of Water **(12)**

3) Providing Density Values

Finally, we provide the fluid's flowing and base density. The flowing density is given by the sizing sheet and the base density (if not provided) can be calculated using the compressibility values given on the sizing sheet. The equation for base density is:

$$\rho_b = k \times \frac{G \times P_b}{Z_b(T_b + N)}$$

k = 2.698825 for Imperial (US) units or 3.493407 for metric units
N = 459.67 for Imperial (US) units or 273.15 for metric units

From the sample sizing sheet, we obtain:

$$\rho_b = 2.698825 \times \frac{1.180 \times 14.696}{0.9947 \times (60 + 459.67)}$$

The result of the equation is 0.0459426, which is then entered into the Base Density Override feature. The flowing density value of 0.08122 **(13)** is entered into the Flowing Density Override feature.

4) Verifying Flow Rates

Now we can change the differential pressure and verify different flow rates. For example:

- Maximum differential pressure (52.992" H_2O) **(14)**
- Medium Range (18.144" H_2O) **(15)**
- Minimum differential pressure (0.49157" H_2O) **(16)**

The flow computer will generate 25701.10 SCFD, 15420.95 SCFD and 2570.13 SCFD respectively, which are well within 0.1% of the sizing sheet rates and therefore demonstrate the correctness of the V-Cone parameters entered into the flow computer.

V-Cone® Preliminary Application Sizing

Serial #	
Tag	
P.O. Ref.	
Model	

Fluid	Mixed Gas , CARBON DIOXIDE
Fluid State	GAS
End User	
Market	
Application	

Mark/App Code

Description	2" V-Cone
Note	

C_d	0.8533	**(4)**
P_f	600 psiG	**(11)**
T_f	215 °F	**(10)**
ρ	3.256 lb/ft3	**(13)**
μ	1.850e-02 cP	
G	1.180	
Z	0.8911	
Y	0.99648	
k	1.256	**(3)**
C_p	9.731	
Mw	34.16	⇐
P_b		**(8)**
T_b		**(7)**
Z_b	0.9947	
P_{atm}	14.696 psi	**(9)**
P_c	1070.8 psi	
T_c	87.908 °F	
F_a	1.002	
aPE	D 6.7e-06 d 6.7e-06	
P_v	**(5)** —— **(6)**	
P_{loss}	2.961 psi	

⇐ Entered value.

q	max. Flowrate	1200000 SCFD
Re	max. Reynolds	7.972e+05
V	max. Velocity	18.83 fps
ΔP	max. Dp	111.25 inWC **(12)**
ΔP	min. Dp	1.1048 inWC
D	Meter I.D.	1.9390 in **(1)**
d	Cone O.D.	1.7316 in **(2)**
β	Beta Ratio	0.4500
	Turn Down	10

McCrometer Eng. _____

	Re	Cd	Velocity fps	Gas. Exp. Y	ΔP inWC	Flowrate SCFD
1	7.972e+05	0.8533	18.83	0.9965	111.25 **(14)**	1.2000e+06
2	7.174e+05	0.8533	16.95	0.9972	89.995	1.0800e+06
3	6.377e+05	0.8533	15.07	0.9978	71.021	9.6000e+05
4	5.580e+05	0.8533	13.18	0.9983	54.318	8.4000e+05
5	4.783e+05	0.8533	11.30	0.9987	39.870 **(15)**	7.2000e+05
6	3.986e+05	0.8533	9.417	0.9991	27.667	6.0000e+05
7	3.189e+05	0.8533	7.533	0.9994	17.695	4.8000e+05
8	2.391e+05	0.8533	5.650	0.9997	9.9488	3.6000e+05
9	1.594e+05	0.8533	3.767	0.9999	4.4201	2.4000e+05
10	7.972e+04	0.8533	1.883	1.0000	1.1048 **(16)**	1.2000e+05

Table based on one flow condition (P, T ,Z , k ...)   V40 Version 2.0
Standard Gas Expansion Equation - Rev. Aug. 2001

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Record Start Date	
Print Date	