

Hy-Cone™ - The latest Hydrogen flow meter from GM Flow

GM Flow Measurement Services Ltd are proud to introduce Hy-Cone™, for a wide range of flow rates and fluid types. Hy-Cone was specifically designed for hydrogen gas, but it is equally suited to other gases such as nitrogen, air or natural gas, as well as clean Water, diesel, acids and well scale treatment. By varying the beta ratio, differential pressure and flowing pressure transmitter ranges, Hy-Cone™ can measure from as low as 0.1 g/sec (@ 10 Bar) up to 541 g/sec of Hydrogen (@ 1000 bar). Hy-Cone™ complements our Hy-Orifice™ and Integra-Cone™ flow meters by providing a medium range flow range device for extreme pressure applications.



Hy-Cone comes equipped with flow computer, 1000 bar rated differential pressure, static pressure and temperature elements enabling mass and/or liquid flow rate measurements to be achieved.

Working pressures and flow ranges are determined by the customers application, so contact your designated representative for assistance to select the right flow meter for you application.

- △ NPT or Autoclave Threaded Connections
- △ 10:1 Turndown Ratio
- △ Very Low Pressure Drop
- △ Mono-Block Design - no Welding
- △ Integrated Pressure, Differential Pressure & Temperature Instruments
- △ Corrosion and Erosion Resistant Materials
- △ Simple Operation and Field Inspection/Maintenance
- △ Reliable by Design
- △ Meets or Exceeds Requirements of ISO 5167 part V
- △ Rated to 1000 bar Working Pressure
- △ 316L Stainless Steel as standard

GM Flow Measurement Services Ltd
Hy-Cone™ Selection Table



Instructions for use, (flow rate in g/sec):

- 1) If the flow range is between 0.25 and 541 g/sec, select the 24 mm bore. If smaller, select the 12.7 mm bore.
- 2) For the required working pressure, select the beta range which best covers the required flow range.
- 3) If no single beta covers the required flow range, contact GM Flow for further advice
- 4) GM Flow will run check calculations, for customer to sign off on, prior to final manufacture

24 mm Bore Hy-Cone™ Sizing Data. Flow Rate in g/Sec

Meter Bore	Hydrogen Flowing Pressure									
	1000 Bar (14504 PSIG)		750 Bar (10878 PSIG)		500 Bar (7252 PSIG)		250 Bar (3626 PSIG)		100 Bar (1450 PSIG)	
24 mm	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)
Beta										
0.45	17.8 (2)	178.3 (1)	16.3 (2)	162.7 (1)	10 (4)	99.7 (3)	7.6 (4)	75.5 (3)	3.2 (6)	31.6 (5)
0.50	22.1 (2)	220.8 (1)	20.2 (2)	201.4 (1)	12.4 (4)	123.5 (3)	9.4 (4)	93.5 (3)	3.9 (6)	39.2 (5)
0.55	26.9 (2)	269.2 (1)	24.6 (2)	245.6 (1)	15.1 (4)	150.6 (3)	11.4 (4)	114 (3)	4.8 (6)	47.8 (5)
0.60	32.4 (2)	324.2 (1)	29.6 (2)	295.8 (1)	18.1 (4)	181.3 (3)	13.7 (4)	137.3 (3)	5.8 (6)	57.5 (5)
0.65	38.7 (2)	386.7 (1)	35.3 (2)	352.9 (1)	21.6 (4)	216.3 (3)	16.4 (4)	163.7 (3)	6.9 (6)	68.6 (5)
0.70	45.9 (2)	458.4 (1)	41.8 (2)	418.3 (1)	25.6 (4)	256.4 (3)	19.4 (4)	194.1 (3)	8.1 (6)	81.3 (5)
0.75	54.2 (2)	541.8 (1)	49.5 (2)	494.4 (1)	30.3 (4)	303.1 (3)	23 (4)	229.4 (3)	9.6 (6)	96.2 (5)

Meter Bore	Hydrogen Flowing Pressure									
	75 Bar (1088 PSIG)		50 Bar (725 PSIG)		25 Bar (363 PSIG)		15 Bar (145 PSIG)		10 Bar (72.5 PSIG)	
24 mm	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)
Beta										
0.45	2.3 (8)	23.1 (7)	1.6 (10)	16.1 (9)	0.8 (12)	8.2 (11)	0.5 (14)	5 (13)	0.25 (16)	2.8 (15)
0.50	2.9 (8)	28.6 (7)	2 (10)	20 (9)	1 (12)	10.2 (11)	0.6 (14)	6.2 (13)	0.35 (16)	3.5 (15)
0.55	3.5 (8)	34.9 (7)	2.4 (10)	24.4 (9)	1.2 (12)	12.4 (11)	0.8 (14)	7.6 (13)	0.45 (16)	4.3 (15)
0.60	4.2 (8)	42.1 (7)	2.9 (10)	29.3 (9)	1.5 (12)	14.9 (12)	0.9 (14)	9.1 (13)	0.5 (16)	5.2 (15)
0.65	5 (8)	50.2 (7)	3.5 (10)	35 (9)	1.8 (12)	17.8 (11)	1.1 (14)	10.9 (13)	0.6 (16)	6.2 (15)
0.70	6 (8)	59.5 (7)	4.2 (10)	41.5 (9)	2.1 (12)	21.1 (11)	1.3 (14)	12.9 (13)	0.75 (16)	7.3 (15)
0.75	7 (8)	70.3 (7)	4.9 (10)	49 (9)	2.5 (12)	24.9 (11)	1.5 (14)	15.2 (13)	0.85 (16)	8.6 (15)

Instructions for use, (flow rate in Kg/Hour):

- 1) If the flow range is between 0.9 & 1950 Kg/Hr, select the 24 mm bore. If smaller, select the 12.7 mm bore.
- 2) For the required working pressure, select the beta range which best covers the required flow range.
- 3) If no single beta covers the required flow range, contact GM Flow for further advice
- 4) GM Flow will run check calculations, for customer to sign off on, prior to final manufacture

24 mm Bore Hy-Cone™ Sizing Data. Flow Rate in Kg/Hour

Meter Bore	Hydrogen Flowing Pressure									
	1000 Bar (14504 PSIG)		750 Bar (10878 PSIG)		500 Bar (7252 PSIG)		250 Bar (3626 PSIG)		100 Bar (1450 PSIG)	
24 mm	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)
Beta										
0.45	64.08 (2)	641.88 (1)	58.68 (2)	585.72 (1)	36 (4)	358.92 (3)	27.36 (4)	271.8 (3)	11.52 (6)	113.76 (5)
0.50	79.56 (2)	794.88 (1)	72.72 (2)	725.04 (1)	44.64 (4)	444.6 (3)	33.84 (4)	336.6 (3)	14.04 (6)	141.12 (5)
0.55	96.84 (2)	969.12 (1)	88.56 (2)	884.16 (1)	54.36 (4)	542.16 (3)	41.04 (4)	410.4 (3)	17.28 (6)	172.08 (5)
0.60	116.64 (2)	1167.12 (1)	106.56 (2)	1064.88 (1)	65.16 (4)	652.68 (3)	49.32 (4)	494.28 (3)	20.88 (6)	207 (5)
0.65	139.32 (2)	1392.12 (1)	127.08 (2)	1270.44 (1)	77.76 (4)	778.68 (3)	59.04 (4)	589.32 (3)	24.84 (6)	246.96 (5)
0.70	165.24 (2)	1650.24 (1)	150.48 (2)	1505.88 (1)	92.16 (4)	923.04 (3)	69.84 (4)	698.76 (3)	29.16 (6)	292.68 (5)
0.75	195.12 (2)	1950.48 (1)	178.2 (2)	1779.84 (1)	109.08 (4)	1091.16 (3)	82.8 (4)	825.84 (3)	34.56 (6)	346.32 (5)

Meter Bore	Hydrogen Flowing Pressure									
	75 Bar (1088 PSIG)		50 Bar (725 PSIG)		25 Bar (363 PSIG)		15 Bar (145 PSIG)		10 Bar (72.5 PSIG)	
24 mm	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)
Beta										
0.45	8.28 (8)	83.16 (7)	5.76 (10)	57.96 (9)	2.88 (12)	29.52 (11)	1.8 (14)	18 (13)	0.9 (16)	10.08 (15)
0.50	10.44 (8)	102.96 (7)	7.2 (10)	72 (9)	3.6 (12)	36.72 (11)	2.16 (14)	22.32 (13)	1.26 (16)	12.6 (15)
0.55	12.6 (8)	125.64 (8)	8.64 (10)	87.84 (9)	4.32 (12)	44.64 (11)	2.88 (14)	27.36 (13)	1.62 (16)	15.48 (16)
0.60	15.12 (8)	151.56 (7)	10.44 (10)	105.48 (9)	5.4 (12)	53.64 (12)	3.24 (14)	32.76 (13)	1.8 (16)	18.72 (16)
0.65	18 (8)	180.72 (7)	12.6 (10)	126 (9)	6.48 (12)	64.08 (11)	3.96 (14)	39.24 (13)	2.16 (16)	22.32 (16)
0.70	21.6 (8)	214.2 (7)	15.12 (10)	149.4 (9)	7.56 (12)	75.96 (11)	4.68 (14)	46.44 (13)	2.7 (16)	26.28 (15)
0.75	25.2 (8)	253.08 (7)	17.64 (10)	176.4 (10)	9 (12)	89.64 (11)	5.4 (14)	54.72 (13)	3.06 (16)	30.96 (15)

- (1) @ 500 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 1000 mBar - dependant on fluid velocity
- (2) @ 5 mBar Differential Pressure
- (3) @ 250 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 500 mBar - dependant on fluid velocity
- (4) @ 2.5 mBar Differential Pressure
- (5) @ 100 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 200 mBar - dependant on fluid velocity
- (6) @ 1 mBar Differential Pressure
- (7) @ 70 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 100 mBar - dependant on fluid velocity
- (8) @ 0.7 mBar Differential Pressure
- (9) @ 50 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 70 mBar - dependant on fluid velocity
- (10) @ 0.5 mBar Differential Pressure
- (11) @ 25 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 50 mBar - dependant on fluid velocity
- (12) @ 0.25 mBar Differential Pressure
- (13) @ 15 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 30 mBar - dependant on fluid velocity
- (14) @ 0.15 mBar Differential Pressure
- (15) @ 7 mBar Differential Pressure. Note, it may be possible to increase this maximum flow rate using 10 mBar - dependant on fluid velocity
- (16) @ 0.07 mBar Differential Pressure

GM Flow Measurement Services Ltd

Hy-Cone™ Selection Table



Instructions for use, (flow rate in g/sec):

- 1) If the flow range is between 0.25 and 541 g/sec, select the 24 mm bore. If smaller, select the 12.7 mm bore.
- 2) For the required working pressure, select the beta range which best covers the required flow range.
- 3) If no single beta covers the required flow range, contact GM Flow for further advice
- 4) GM Flow will run check calculations, for customer to sign off on, prior to final manufacture

12.7 mm Bore Hy-Cone™ Sizing Data. Flow Rates in g/Sec

Meter Bore	Hydrogen Flowing Pressure									
	1000 Bar (14504 PSIG)		750 Bar (10878 PSIG)		500 Bar (7252 PSIG)		250 Bar (3626 PSIG)		100 Bar (1450 PSIG)	
Beta	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)
0.45	5 (2)	49.9 (1)	4.6 (2)	45.5 (1)	3.9 (2)	39.5 (1)	2.1 (4)	21.1 (3)	0.9 (6)	8.9 (5)
0.50	6.2 (2)	61.8 (1)	5.6 (2)	56.4 (1)	4.9 (2)	48.9 (1)	2.6 (4)	26.2 (3)	1.1 (6)	11 (5)
0.55	7.5 (2)	75.4 (1)	6.9 (2)	68.8 (1)	6 (2)	59.6 (1)	3.2 (4)	31.9 (3)	1.3 (6)	13.4 (5)
0.60	9.1 (2)	90.8 (1)	8.3 (2)	82.8 (1)	7.2 (2)	71.8 (1)	3.8 (4)	38.4 (3)	1.6 (6)	16.1 (5)
0.65	10.8 (2)	108.3 (1)	9.9 (2)	98.8 (1)	8.6 (2)	85.6 (1)	4.6 (4)	45.9 (3)	1.9 (6)	19.2 (5)
0.70	12.8 (2)	128.4 (1)	11.7 (2)	117.1 (1)	10.2 (2)	101.5 (1)	5.4 (4)	54.3 (3)	2.3 (6)	22.8 (5)
0.75	15.2 (2)	151.7 (1)	13.9 (2)	138.4 (1)	12 (2)	120 (1)	6.4 (4)	64.2 (3)	2.7 (6)	26.9 (5)

Meter Bore	Hydrogen Flowing Pressure									
	75 Bar (1088 PSIG)		50 Bar (725 PSIG)		25 Bar (363 PSIG)		15 Bar (145 PSIG)		10 Bar (72.5 PSIG)	
Beta	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)	Min Rate (g/sec)	Max Rate (g/sec)
0.45	0.6 (8)	6.5 (7)	0.5 (10)	4.5 (9)	0.2 (12)	2.3 (11)	0.1 (14)	1.4 (14)	Too Small	Too Small
0.50	0.8 (8)	8 (7)	0.6 (10)	5.6 (9)	0.3 (12)	2.8 (11)	0.2 (14)	1.7 (13)	0.1 (16)	1 (16)
0.55	1 (8)	9.8 (7)	0.7 (10)	6.8 (9)	0.3 (12)	3.5 (11)	0.2 (14)	2.1 (13)	0.1 (16)	1.2 (15)
0.60	1.2 (8)	11.8 (7)	0.8 (10)	8.2 (9)	0.4 (12)	4.2 (11)	0.3 (14)	2.5 (13)	0.1 (16)	1.4 (15)
0.65	1.4 (8)	14.1 (7)	1 (10)	9.8 (9)	0.5 (12)	5 (11)	0.3 (14)	3 (13)	0.2 (16)	1.7 (15)
0.70	1.7 (8)	16.7 (7)	1.2 (10)	11.6 (9)	0.6 (12)	5.9 (11)	0.4 (14)	3.6 (13)	0.2 (16)	2 (15)
0.75	2 (8)	19.7 (7)	1.4 (10)	13.7 (9)	0.7 (12)	7 (11)	0.4 (14)	4.3 (13)	0.2 (16)	2.4 (15)

Instructions for use, (flow rate in Kg/Hour):

- 1) If the flow range is between 0.9 & 1950 Kg/Hr, select the 24 mm bore. If smaller, select the 12.7 mm bore.
- 2) For the required working pressure, select the beta range which best covers the required flow range.
- 3) If no single beta covers the required flow range, contact GM Flow for further advice

12.7 mm Bore Hy-Cone™ Sizing Data. Flow Rates in Kg/Hour

Meter Bore	Hydrogen Flowing Pressure									
	1000 Bar (14504 PSIG)		750 Bar (10878 PSIG)		500 Bar (7252 PSIG)		250 Bar (3626 PSIG)		100 Bar (1450 PSIG)	
Beta	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)
0.45	18 (2)	179.64 (1)	16.56 (2)	163.8 (1)	14.04 (2)	142.2 (1)	7.56 (4)	75.96 (3)	3.24 (6)	32.04 (5)
0.50	22.32 (2)	222.48 (1)	20.16 (2)	203.04 (1)	17.64 (2)	176.04 (1)	9.36 (4)	94.32 (3)	3.96 (6)	39.6 (5)
0.55	27 (2)	271.44 (1)	24.84 (2)	247.68 (1)	21.6 (2)	214.56 (1)	11.52 (4)	114.84 (3)	4.68 (6)	48.24 (5)
0.60	32.76 (2)	326.88 (1)	29.88 (2)	298.08 (1)	25.92 (2)	258.48 (1)	13.68 (4)	138.24 (3)	5.76 (6)	57.96 (5)
0.65	38.88 (2)	389.88 (1)	35.64 (2)	355.68 (1)	30.96 (2)	308.16 (1)	16.56 (4)	165.24 (3)	6.84 (6)	69.12 (5)
0.70	46.08 (2)	462.24 (1)	42.12 (2)	421.56 (1)	36.72 (2)	365.4 (1)	19.44 (4)	195.48 (3)	8.28 (6)	82.08 (5)
0.75	54.72 (2)	0.1517 (1)	50.04 (2)	498.24 (1)	43.2 (2)	432 (1)	23.04 (4)	231.12 (3)	9.72 (6)	96.84 (5)

Meter Bore	Hydrogen Flowing Pressure									
	75 Bar (1088 PSIG)		50 Bar (725 PSIG)		25 Bar (363 PSIG)		15 Bar (145 PSIG)		10 Bar (72.5 PSIG)	
Beta	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)	Min Rate (Kg/Hr)	Max Rate (Kg/Hr)
0.45	2.16 (8)	23.4 (7)	1.8 (10)	16.2 (9)	0.72 (12)	8.28 (11)	0.36 (14)	5.04 (13)	Too Small	Too Small
0.50	2.88 (8)	28.8 (7)	2.16 (10)	20.16 (9)	1.08 (12)	10.08 (11)	0.72 (14)	6.12 (13)	0.35 (16)	3.6 (16)
0.55	3.6 (8)	35.28 (7)	2.52 (10)	24.48 (9)	1.08 (12)	12.6 (11)	0.72 (14)	7.56 (13)	0.36 (16)	4.32 (15)
0.60	4.32 (8)	42.48 (7)	2.88 (10)	29.52 (9)	1.44 (12)	15.12 (11)	1.08 (14)	7.56 (13)	0.36 (16)	5.04 (15)
0.65	5.04 (8)	50.76 (7)	3.6 (10)	35.28 (9)	1.8 (12)	18 (11)	1.08 (14)	10.8 (13)	0.72 (16)	6.12 (15)
0.70	6.12 (8)	60.12 (7)	4.32 (10)	41.76 (9)	2.16 (12)	21.24 (11)	1.44 (14)	12.96 (13)	0.72 (16)	7.2 (15)
0.75	7.2 (8)	70.92 (7)	5.04 (10)	49.32 (9)	2.52 (12)	25.2 (11)	1.44 (14)	15.48 (13)	0.72 (16)	8.64 (15)

- (1) @ 500 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 1000 mBar - dependant on fluid velocity
- (2) @ 5 mBar Differential Pressure
- (3) @ 250 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 500 mBar - dependant on fluid velocity
- (4) @ 2.5 mBar Differential Pressure
- (5) @ 100 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 200 mBar - dependant on fluid velocity
- (6) @ 1 mBar Differential Pressure
- (7) @ 70 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 100 mBar - dependant on fluid velocity
- (8) @ 0.7 mBar Differential Pressure
- (9) @ 50 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 70 mBar - dependant on fluid velocity
- (10) @ 0.5 mBar Differential Pressure
- (11) @ 25 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 50 mBar - dependant on fluid velocity
- (12) @ 0.25 mBar Differential Pressure
- (13) @ 15 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 30 mBar - dependant on fluid velocity
- (14) @ 0.15 mBar Differential Pressure
- (15) @ 7 mBar Differential Pressure. Note, it maybe possible to increase this maximum flow rate using 10 mBar - dependant on fluid velocity
- (16) @ 0.07 mBar Differential Pressure

Built entirely from 316L SS Hy-Cone™ provides a tough, accurate, corrosion and erosion resistant flow measurement technique, which is easy and safe to operate, even by inexperienced personnel.*

Utilising NPT or Autoclave end connections and offering a range of between 0.45 to 0.75 Beta ratios,

Hy-Cone™ offers a quick, easy and compact installation with flow computer, differential and flowing pressure, and temperature transmitters already attached, ready to measure any flow rate within the ranges below.

Hy-Cone™ includes high and low pressure ports and the required upstream and downstream straight lengths, built into the meter body. Simply plumb it into your line, attach 24 VDC power supply and start to measure instantly.

* Other Materials on Request.

Size	End Connections	Working Pressure	Dimensions
12.7 mm LP	3/4" x 14 TPI NPT Fem	320 Bar	48 mm Dia x 175 mm Long
12.7 mm HP	1" MP Autoclave	1035 Bar	62 mm Dia x 210 mm Long
24 mm LP	1 1/4 In NPT 11.5 TPI	320 Bar	72 mm Dia x 312 mm Long
24 mm HP	1 1/2 In MP Autoclave	1035 Bar	96 mm Dia x 340 mm Long



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