

Metering Valves (HR Series)

Catalog 4170-HR Revised, August 2002



Introduction

Parker HR Series Metering Valves provide the highest degree of precision metering for moderate pressure applications. A choice of seven precision ground, tapered flat, non-rotating and non-rising valve stems enable repeatable metering at flow capacities as low as 0.0004 C_v . With 15 stem turns, this valve offers the ultimate in precision flow control. This series also features shut-off capability not found in most metering valves.

Features

- Bubble tight shut-off
- Special fine pitch thread with 15 turn resolution is isolated from contact with process fluids
- Non-rotating/non-rising valve stem design provides smooth, non-reversing flow characteristics
- Seven optional valve stem tapers
- Special orifice liner assures long life
- Panel or in-line mounting
- Angle or in-line patterns
- Brass or 316 SS forged body construction
- 100% function tested for actuation and shut-off

Specifications

Pressure Rating at all temperatures:

250 psig (17 bar) CWP

Flow Data:

H0 Orifice: 0.000002 in² In-line pattern: $C_v = 0.0004$; $X_\tau = 0.85$ Angle pattern: $C_{v} = 0.0004$; $X_{\tau} = 0.66$ **H1** Orifice: 0.000083 in² In-line pattern: $C_v = 0.0070$; $X_\tau = 0.85$ Angle pattern: $C_{v} = 0.0070; X_{\tau} = 0.66$ **H2** Orifice: 0.000168 in² In-line pattern: $C_v = 0.0140$; $X_\tau = 0.85$ Angle pattern: $C_v = 0.0140$; $X_\tau = 0.66$ **H**3 Orifice: 0.000241 in² In-line pattern: $C_{y} = 0.0200; X_{\tau} = 0.85$ Angle pattern: $C_{v} = 0.0210$; $X_{\tau} = 0.66$ **H4** Orifice: 0.000674 in² In-line pattern: $C_v = 0.0300$; $X_\tau = 0.85$ Angle pattern: $C_v = 0.0320$; $X_\tau = 0.66$ **H5** Orifice: 0.002325 in2 In-line pattern: $C_{v} = 0.0470; X_{\tau} = 0.85$ Angle pattern: $C_v = 0.0490$; $X_\tau = 0.66$ **H6** Orifice: 0.006227 in2 In-line pattern: $C_v = 0.1180$; $X_\tau = 0.85$ Angle pattern: $C_v = 0.1550$; $X_\tau = 0.66$ Turns to open: 15 +/- 1



Model Shown: 2A-H0A-NE-SS-TC

Valve / Seal Temperature Ratings

Buna-N Rubber: -50 °F to 300 °F (-47 °C to 149 °C) Ethylene Propylene Rubber: -50 °F to 300 °F (-47 °C to 149 °C) Neoprene Rubber: -50 °F to 300 °F (-47 °C to 149 °C) Fluorocarbon Rubber*: -25 °F to 400 °F (-32 °C to 204 °C) Highly Fluorinated Fluorocarbon Rubber: -25 °F to 200 °F (-32 °C to 93 °C) *Nete: The Turne Counter Headle (TC) requires the l

***Note**: The Turns Counter Handle (TC) requires the HT option for use at temperatures above 300 °F (149 °C).

Flow tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = x_T$.



Dimensions

Basic	End Connections		Dimensions							
Part	(Inlet) (Outlet)		A	†	B†		С		D	
Number	Port 1	Port 2	Inch	mm	Inch	mm	Inch	mm	Inch	mm
1A-H#A	1/16" Compre	ession A-LOK®	0.92	23.4	0.92	23.4	0.41	10.4	0.73	18.5
1Z-H#A	1/16" Comp	ression CPI™	0.92	23.4	0.92	23.4	0.41	10.4	0.73	18.5
2A-H#L 2A-H#A	1/8" Compre	ssion A-LOK®	1.03 1.03	26.2 26.2	1.03 1.03	26.2 26.2	0.41 0.41	10.4 10.4	0.85 0.73	21.6 18.5
2F-H#L 2F-H#A	1/8" Fen	nale NPT	0.93 0.93	23.6 23.6	0.93 0.93	23.6 23.6	0.41 0.41	10.4 10.4	0.85 0.73	21.6 18.5
2Z-H#L	1/8" Compression CPI™		1.03	26.2	1.03	26.2	0.41	10.4	0.85	21.6
2Z-H#A			1.03	26.2	1.03	26.2	0.41	10.4	0.73	18.5
4A-H#L	1/4" Compression A-LOK®		1.11	28.2	1.11	28.2	0.41	10.4	0.85	21.6
4A-H#A			1.11	28.2	1.11	28.2	0.41	10.4	0.73	18.5
4F-H#L	1/4" Female NPT		0.97	24.6	0.97	24.6	0.41	10.4	0.85	21.6
4F-H#A			0.97	24.6	0.97	24.6	0.41	10.4	0.73	18.5
4M-H#L	1/4" Male NPT		0.93	23.6	0.93	23.6	0.41	10.4	0.85	21.6
4M-H#A			0.93	23.6	0.93	23.6	0.41	10.4	0.73	18.5
4Z-H#L	1/4" Compression CPI™		1.11	28.2	1.11	28.2	0.41	10.4	0.85	21.6
4Z-H#A			1.11	28.2	1.11	28.2	0.41	10.4	0.73	18.5
M3A-H#L	3mm Compression A-LOK®		1.00	25.4	1.00	25.4	0.41	10.4	0.85	21.6
M3A-H#A			1.00	25.4	1.00	25.4	0.41	10.4	0.73	18.5
M3Z-H#L	3mm Compression CPI [™]		1.00	25.4	1.00	25.4	0.41	10.4	0.85	21.6
M3Z-H#A			1.00	25.4	1.00	25.4	0.41	10.4	0.73	18.5
M6A-H#L	6mm Compression A-LOK®		1.15	29.2	1.15	29.2	0.41	10.4	0.85	21.6
M6A-H#A			1.15	29.2	1.15	29.2	0.41	10.4	0.73	18.5
M6Z-H#L M6Z-H#A	6mm Comp	ression CPI [™]	1.15 1.15	29.2 29.2	1.15 1.15	29.2 29.2	0.41 0.41	10.4 10.4	0.85 0.73	21.6 18.5

 \dagger For CPI $^{\!\!\!\!\!\!^{\scriptscriptstyle \infty}}$ and A-LOK $^{\!\!\!\!^{\scriptscriptstyle \otimes}}$, dimensions are measured with nuts in the finger tight position.

K Handle Dimensions

	Dimensions							
Pattern	E		F		G			
	Inch	mm	Inch	mm	Inch	mm		
In-line	2.35	59.7	2.35	59.7	0.78	19.8		
Angle	2.23	56.6	2.23	56.6	0.78	19.8		

TC Handle Dimensions

	Dimensions							
Pattern	E		F		G			
	Inch	mm	Inch	mm	Inch	mm		
In-line	2.88	73.2	2.88	73.2	1.12	28.4		
Angle	2.76	70.1	2.76	70.1	1.12	28.4		

NS Handle Dimensions

	Dimensions							
Pattern	E		F		G			
	Inch	mm	Inch	mm	Inch	mm		
In-line	2.33	59.2	2.33	59.2	0.25	6.4		
Angle	2.21	56.1	2.21	56.1	0.25	6.4		



Model Shown: M6A-H6L-KZ-SS-K



How to Order

The correct part number is easily derived from the following number sequence. The six product characteristics required are coded as shown below. *Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Example:	<u>4Z</u>	<u>*</u> -	<u>H3L</u> -	<u>V</u>	- <u>SS</u> -	<u>TC</u>
	(1)	(2)	(3)	(4)	(5)	(6)
	Inlet	Outlet	Valve/Stem	Seal	Body	Handle
	Port	Port	Series	Material	Material	Туре

1 Inlet Port	2 Outlet Port	3 Valve/Stem Series	4 Seal Material	5 Body Material	6 Handle Type
14	, 1Z	H#A	BN - Buna-N Rubber EPR - Ethylene Propylene Rubber	SS- Stainless Steel	K - Knurled
4A, 4F,	F, 2Z, 4M, 4Z, M3Z,	H#A H#L	NE - Neoprene Rubber V - Fluorocarbon Rubber	B - Brass	TC - Turns Counter NS - No Handle
	, M6Z		KZ - Highly Fluorinated Fluorocarbon Rubber		(Slotted Stem)

Handle Options

Knurled (K)



Knurled ABS molded handle provides ease of actuation

How to Order Options

Turns Counter (TC)



Graduated black-anodized aluminum alloy handle provides a readable count of turns open

Slotted Stem (NS)



Screwdriver slot on top of stem may be used for inaccessible locations or tamper resistance

Oxygen Cleaning – Add the suffix **-C3** to the end of the part number to receive valves cleaned and assembled for oxygen service in accordance with Parker Specification ES8003. Example: 4A-H1A-EPR-SS-K-C3

High Temperature – Add the suffix **-HT** to the end of the part number to receive valves with Turns Counter (TC) handles suitable for service above 300 °F (149 °C). Example: M3A-H4L-KZ-SS-TC**-HT**



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HR Series Metering Valves

Materials of Construction

Item #	Description	Stainless Steel	Brass				
1	Body	ASTM A 182	ASTM B 283				
		Type F316	Alloy C37700				
			(Nickel Plated)				
2	Bonnet	ASTM A 479	ASTM B 16				
		Type 316	Alloy C36000				
			(Nickel Plated)				
3	Bonnet Nut	ASTM B 16	ASTM B 16				
		Alloy C36000	Alloy C36000				
4	Lower Stem	316 Stainless Steel	316 Stainless Steel				
5	Orifice	ASTM A 479	ASTM B 453				
		Type 316	Alloy C34000				
6	Orifice Liner	Mica Filled PTFE	Mica Filled PTFE				
7	Stem Guide	ASTM A 182	ASTM B 16				
		Type F316	Alloy C36000				
8	Upper Stem	ASTM B 150	ASTM B 150				
		Alloy C64200	Alloy C64200				
9	Spring	302 Stainless Steel	302 Stainless Steel				
10	Wave Washer	Steel	Steel				
11	Friction Collar*	Acetal	Acetal				
12	Stem Washer	Nylon	Nylon				
13	Stem Guide Pin	Alloy Steel	Alloy Steel				
14	Orifice Screw	Stainless Steel	Stainless Steel				
15	Panel Nut	ASTM B 16	ASTM B 16				
		(Nickel Plated)	(Nickel Plated)				
16	Handle**	ABS Plastic	ABS Plastic				
17	Handle Set Screw	Alloy Steel	Alloy Steel				
18	Lower Stem O-Ring***	Fluorocarbon Rubber	Fluorocarbon Rubber				
19	Orifice O-Ring***	Fluorocarbon Rubber	Fluorocarbon Rubber				
20	Bonnet O-Ring***	Fluorocarbon Rubber	Fluorocarbon Rubber				
21	Stem Guide O-Ring***	Fluorocarbon Rubber	Fluorocarbon Rubber				
<u>k</u>	Friction Collar is Dalymida with UT antion						

Friction Collar is Polymide with HT option Acrylonitrile-Butadiene-Styrene. Optional handles are available **

Optional materials are available - See How to Order

Lubrication: Perfluorinated polyether



Model Shown: 4A-H4L-NE-SS-K

Parker Instrumentation

C, vs. Turns Open



Water Flow Data



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