

# Mark 93JR Series

## Sanitary Steam Traps

The Mark 93JR is an ultra compact, balanced port, thermostatic steam trap designed specifically for use in validated clean steam systems for the **low to medium condensate flows** associated with process skid clean condensate drainage. The sanitary design follows ASME BPE guidelines including a 20Ra  $\mu\text{in}$  **internal finish, self-draining design, and all relevant materials, marking and documentation.**

The MK93JR has been specifically designed to provide low to medium flow rates at low subcooling levels. In lab testing, the MK93JR consistently exhibited excellent flow rates at subcooling levels of less than 3°F or less (<1,7°C). Note: Low subcooling operation ensures that condensate is less likely to back up and wet (cool) the upstream validated temperature sensor.

### How They Work

During start-up, the bellows element is contracted and fully open to discharge all non-condensable gas and condensate. The heat of entering steam causes the element to expand, closing the valve. As condensate accumulates in the body, the element cools, causing the bellows/stem tip to retract allowing condensate to drain.

### Features

- Fill fluid meets FDA/ICH Q3C/FDA Class 3 criteria designation
- Compact design, small lay-in length - ideal for compact installations like process skids
- The only compact sanitary trap with a Tri-clamp body to facilitate quick bellows assembly change out
- Low subcooling operation reduces probability of temperature validation faults and resultant SIP delays
- All 316L stainless steel housing and internals
- Polished components – body interior is mechanically polished to ASME BPE SF1, 20  $\mu\text{in}$  (0,5 Ra  $\mu\text{m}$ ) mechanical polish. External body is mechanically polished to 40 Ra  $\mu\text{in}$  (1 Ra  $\mu\text{m}$ ).
- Sanitary clamp ends standard, other ends (tube weld, threaded, ISO/DIN) available upon request
- Self draining when installed vertically (outlet side down)



- FDA and USP Class VI TFE-VIT gasket standard
- Option for electropolished body
- Standard Steriflow Valve warranty applies

### Applications

- Typical application is for SIP clean condensate drainage on validated bioprocess skid systems. In this environment, the compact size makes it ideal for:
  - Fermenters, Bioreactors, Separation, Filtration and Purification skids and formulation and filling equipment
  - May also be used for clean steam distribution line drainage

## SPECIFICATIONS

Sizes: 1/4" (DN8), 1/2" (DN15), 3/4" (DN20), 1" (DN25)

### End Connections

- Standard – Sanitary clamp ends (Tri-Clover™)
- Optional – Tube weld ends, DIN/ISO, threaded

### Material

- Body Inlet/Outlet: 316L Stainless Steel
- Thermal Element: 316L Stainless Steel
- Gaskets (Standard): PTFE/Viton - 350°F (177°C)  
Optional: PTFE/EPDM - 300°F (149°C), Tuf-Steel - 350°F (177°C), Silverback - 350°F (177°C), TFE - 350°F (177°C) All gaskets are FDA and USP Class VI compliant
- Tri-Clamp: 304 SST

### Maximum Operating Conditions

- Maximum Operating Pressure (PMO): 100 psig (6,9 bar)
- Maximum Allowable Temperature (TMA): 350°F (177°C)

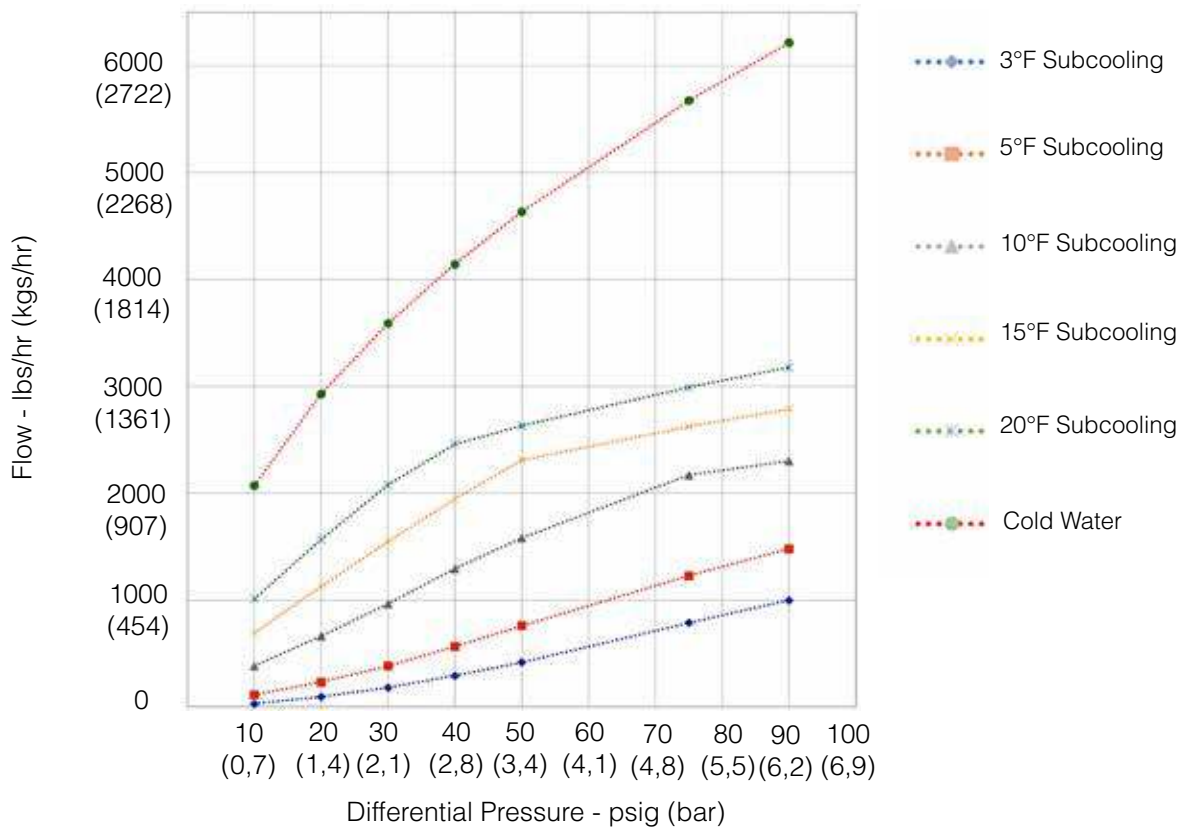
### Design Pressure/Temperature Rating:

- Maximum Allowable Pressure (PMA): 145 psig (10,0 bar)
- Maximum Allowable Temperature (TMA): 350°F (177°C)

Maximum Recommended Differential Pressure: 10 - 100 psig (0,7 -6,9 bar)

Cold water Cv: 1.31

MARK 93J CAPACITY VS. DIFFERENTIAL PRESSURE - LBS/HR (KGS/HR)



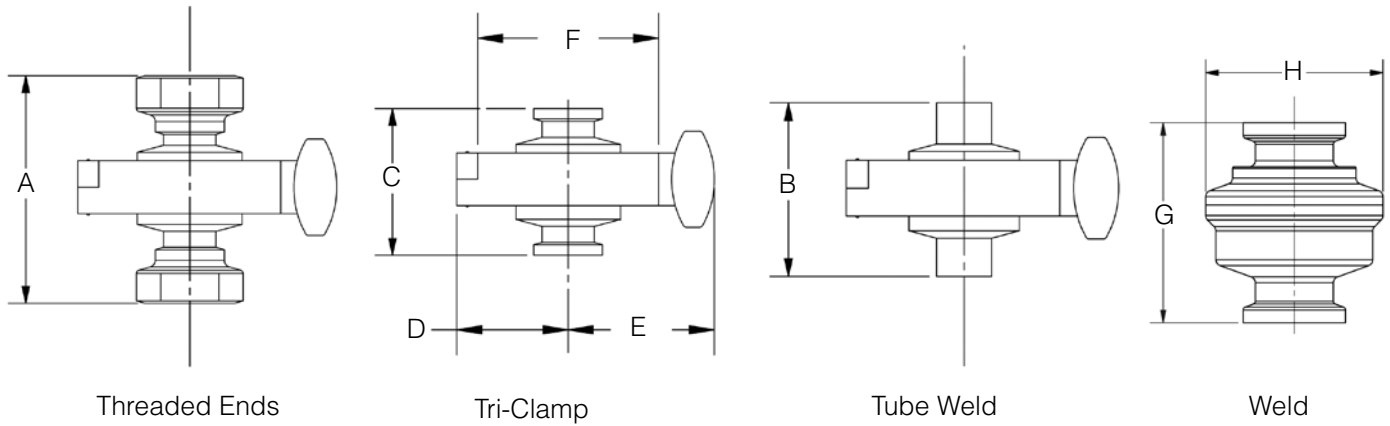
Capacity @ DP and degrees subcooling:

Diff. Pres. Psi	Diff. Pres. Bar	Sub-cool °F	Flow lb/hr	Flow Kgs/Hr
10	0,7	3	29.61	13,43
20	1,3	3	92.90	42,14
30	2,0	3	180.12	81,70
40	2,7	3	292.84	132.83
50	3,4	3	416.25	188.81
75	5,2	3	786.60	356.80
90	6,2	3	998.63	452.98
10	0,7	5	111.56	50.60
20	1,3	5	232.94	105.66
30	2,0	5	382.02	173.28
40	2,7	5	565.52	256.52
50	3,4	5	759.44	344.48
75	5,2	5	1227.38	556.73
90	6,2	5	1479.52	671.10
10	0,7	10	382.91	173.69
20	1,3	10	663.82	301.10
30	2,0	10	965.39	437.90
40	2,7	10	1294.54	587.19
50	3,4	10	1581.42	717.32
75	5,2	10	2169.50	984.07
90	6,2	10	2301.67	1044.02

Capacity @ DP and degrees subcooling:

Diff. Pres. Psi	Diff. Pres. Bar	Subcool °F	Flow lb/hr	Flow Kgs/Hr
10	0,7	15	693.90	314.75
20	1,3	15	1126.93	511.17
30	2,0	15	1547.00	701.71
40	2,7	15	1945.60	882.51
50	3,4	15	2309.30	1047.48
75	5,2	15	2623.53	1190.01
90	6,2	15	2784.90	1263.21
10	0,7	20	1012.62	459.32
20	1,3	20	1566.84	710.71
30	2,0	20	2078.00	942.56
40	2,7	20	2459.61	1115.66
50	3,4	20	2629.82	1192.87
75	5,2	20	2991.11	1356.74
90	6,2	20	3176.75	1440.95
10	0,7	Cold Water	2071.83	939.77
20	1,3	Cold Water	2930.01	1329.03
30	2,0	Cold Water	3588.52	1627.73
40	2,7	Cold Water	4143.66	1879.53
50	3,4	Cold Water	4632.76	2101.38
75	5,2	Cold Water	5673.94	2573.66
90	6,2	Cold Water	6215.50	2819.30

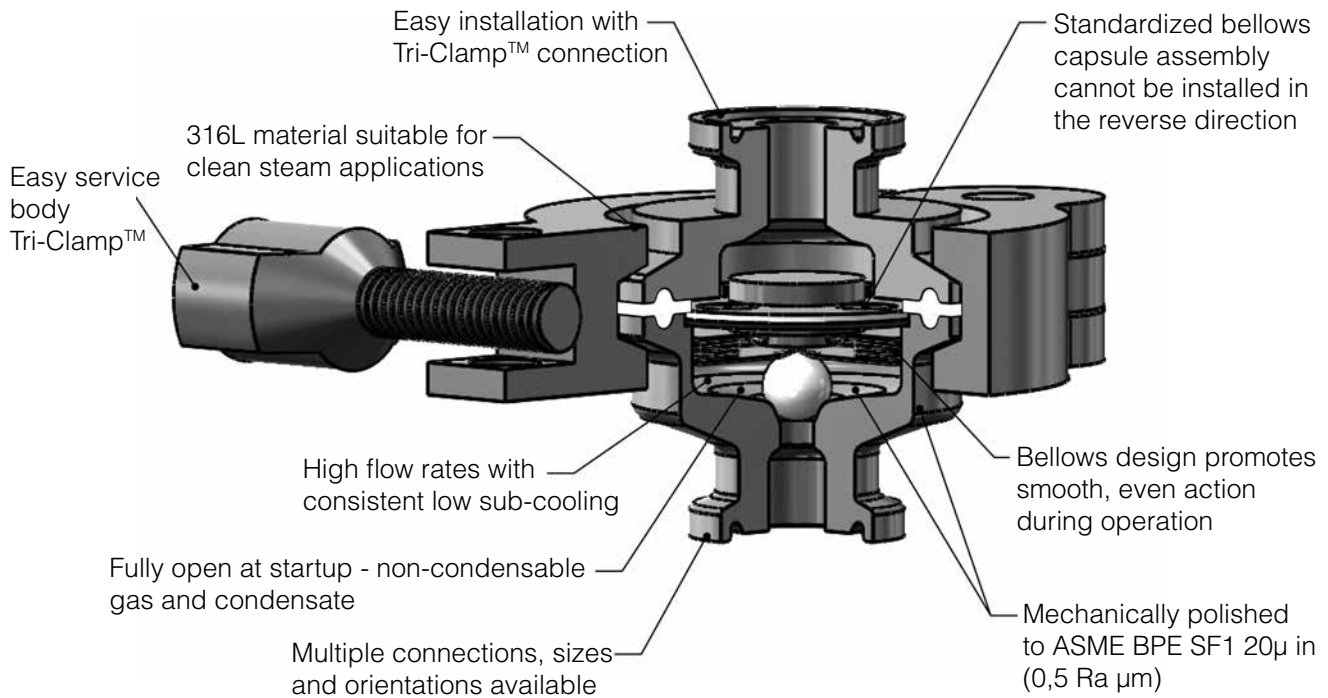
**DIMENSIONS**



Valve Size	Threaded, Tri-Clamp & Tube Weld Dimensions, inches (mm)					
	A	B	C	D	E	F
1/4"	2.28 (58,0)	4.17 (106)	N/A	1.6 (40,6)	2.1 (53,3)	2.6 (66,0)
1/2"	2.91 (74,0)	4.17 (106)	1.93 (49,0)	1.6 (40,6)	2.1 (53,3)	2.6 (66,0)
3/4"	3.19 (81,0)	4.17 (106)	1.93 (49,0)	1.6 (40,6)	2.1 (53,3)	2.6 (66,0)
1"	3.74 (95,0)	4.17 (106)	2.1 (53,3)	1.6 (40,6)	2.1 (53,3)	2.6 (66,0)

Size	Weld Dimensions, inches (mm)	
	G	H
1/2"	1.923 (48,8)	Ø1.705 (43,3)
3/4"	1.923 (48,8)	Ø1.705 (43,3)

**FEATURES & BENEFITS**



## ORDERING SCHEMATIC

Model	Body	—	Size	—	End Connections	—	Special Options
93	JR	—	075	—	C	—	

1	Model/Body Joint
93JR	Tri-Clamp Body, Standard
93JRW	Welded Body

2	Size	
025	1/4"	DN8
050	1/2"	DN15
075	3/4"	DN20
100	1"	DN25
DN10*	12mm OD/1mm wall thickness	DIN 11850 (Series 1)
DN15*	18mm OD/1mm wall thickness	DIN 11850 (Series 1)
S13*	13.5mm OD/ 1.6mm wall thickness	ISO 1127 (Series 1)
S17*	17.2mm OD/1.6mm wall thickness	ISO 1127 (Series 1)
S21*	21.3mm OD/1.6mm wall thickness	ISO 1127 (Series 1)

\* Specify end connection code "X"

3	End Connections
	Inlet/Outlet
C	Tri-Clamp
N	NPT Threaded
B	BSPT Threaded
T	Tube Weld
X*	Tube Butt Weld

\* Use for size options D12, D18, S13, S17, S21

4	Options
G	Tuf-Steel, TFE/SST Body Gasket, FDA USP Class VI
S	Silverback Gasket TFE/SST Body Gasket, USP Class VI
L	Electropolish
TF	PTFE, USP Class VI @ 250°F (121°C)

Note: If no gasket is specified above, a TFE/ Viton FDA/ USP Class VI gasket will be provided.

Note: you can combine up to 2 options in alphabetical order.

For example: 93JR-075-N-L

= MK93JR with a 3/4" Tri-Clamp body, Electropolished Body and Standard Teflon / Viton Gasket

Note: No gasket option required for 93JRW (welded body).

Steriflow Valve reserves the right to make revisions to its products, specifications, literature, and related information without notice. Please visit our website at [www.steriflowvalve.com](http://www.steriflowvalve.com) for the latest information on our products.