HBE ENGINEERING Inc.
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INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

HBE MULTIPLE STAGE ORIFICE

MODEL: MSO SERIES

MULTIPLE STAGE ORIFICE

FUNCTION

The HBE Multiple Stage Orifice Model MSO is provided for high pressure reduction applications which require accurate flow volume with quiet operation without flashing or cavitation.

INSTALLATION

The directional arrows stamped on the orifice body must match the flow direction. A straight run of pipe of at least 10 piping diameters should exit the orifice.

OPERATION

The orifice operates similarly to many high pressure drop control valves except it operates in a fixed open position. The fluid is directed into a vortex flow across multiple stages which progressively reduces the pressure. The multiple stages results in the fluid not falling below vapor pressure. The outlet of the orifice is a multi hole flow straightener, which directs the fluid as a laminar spray, preventing damage to downstream piping.

OPERATION CHECK

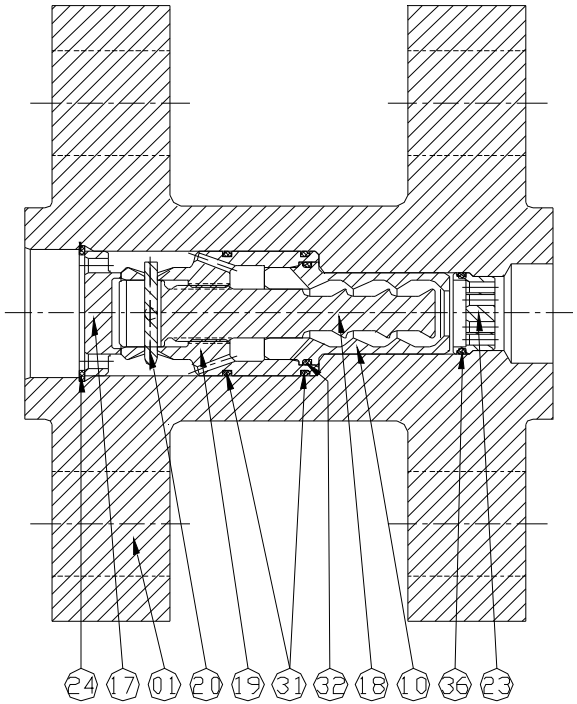
The MSO is a fixed flow device. If flow rate increases or decreases from normal set flow rate, the MSO should be inspected for debris trapped or worn internals.

INSPECTION AND MAINTENANCE

The MSO can be dissembled by:

1. Remove snap ring (part 24)
2. Using a press or mallet, press on flow straightener (part 23) from the flow outlet end of the MSO to remove internals from housing
3. Clean all parts
4. Inspect for wear and replace any metal components if necessary
5. Replace all O-rings
6. Reassemble internal assembly
7. Insert internal assembly back into housing and lock with snap ring

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



Pos.	Qty.	Description	Material
01	1	Body	A105 Carbon Steel
10	1	Vortex Housing	416 Stainless Steel
17	1	Orifice Bushing	416 Stainless Steel
18	1	Vortex Insert	431 Stainless Steel
19	1	Linkage	416 Stainless Steel
20	1	Pin	316 Stainless Steel
23	1	Flow Straightener	431 Stainless Steel
24	1	Snap Ring	316 Stainless Steel
31	2	O-Ring	Aflas
32	1	O-Ring	Aflas
36	1	O-Ring	Aflas

NOTES:

TOLERANCE UNLESS NOTED

X	±0.040
X.X	±0.020
X.XX	±0.010
X.XXX	±0.005
∠	±1/2°
√	125RMS

SERIES MSO

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DATE	SCALE	DWG. NO.
03/04/97	NONE	
DWN. JAP	CHK. JAP	SYMBOL NO.
MATERIAL SEE ABOVE		