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MBM SERIES SAFETY VALVES

FAMILY 05 – GROUPS 67, 68

The MBM model safety valves are of direct spring loaded type and are qualified in according with the 97/23/CE directive (PED directive - Pressure Equipment Directive) with classification in IV category. The conformity evaluation procedure, used according to annex II, consists of B+D modules. The evaluation procedure has been carried out by the notified body no. 1115 (Consorzio PASCAL SRL), via Scarsellini 13, 20161 Milano. "CE type" examination certificate no. PA001-97/23/CE-B Rev.03 del 23/10/2012. Quality System Certificate N.2-97/23/CE-D Rev.04 del 26/02/2014.

The qualification has been obtained with a very high coefficient of discharge ($K = 0.96$): this allows a considerable discharge capacity also with models of small dimensions.

Valves are designed in the version with or without lifting device (reset).

They can be used for: air, saturated steam, overheated water, nitrogen and gases belonging to group 2 (97/23/CE directive)

They are produced with flanged or threaded connections



MBM models Valves

Technical data

General notice: valve designed for air, saturated steam, overheated water, nitrogen, of group 2 (97/23/CE directive), compatible with AISI 316 and Carbon-loaded Teflon

ND: 15 ÷ 50

Range of calibration: varies from 0.5 to 15 bar (gauge pressure), at atmospheric back pressure

Connections: External GAS inlet threaded: 1/2" - 2", Internal GAS outlet threaded: 3/4" - 2"1/2.
Inlet flanged: NP 16 ND 15 - 50, outlet flanged: NP 16 ND 20 - 65

Max. all. press. (relative): 25 bar

Min. all. press. (relative): 0 bar

Max. all. temperature: 210 °C

Min. all. temperature: -10 °C

Flow direction: unidirectional 2-way globe valve, with angle pattern body.

Calculation Formulas for Capacity (Vapour and Gas)

Foreword: the following formulas provide the capacity values of safety valves under critical stage conditions

The critical stage condition is obtained when $p_2 \leq p_c$ being : p_2 = back pressure in absolute bar declared by the user ; p_c = critical pressure in absolute bar ; p_1 = calculation pressure in absolute bar (calibration pressure).

$$p_c = p_1 \left(\frac{2}{k+1} \right)^{\frac{k}{k-1}}$$

where k = exponent of the equation for the isentropic expansion.

Steam

$$Q(\text{Kg/h}) = 0.9 \cdot K \cdot 113.8 \cdot C \cdot \sqrt{\frac{P_1}{V_1}} \cdot A$$

(ISPESL and UNI EN ISO 4126-1)

Gases and Vapours

$$P(\text{Kg/h}) = \frac{0.9 \cdot K \cdot 394.9 \cdot C \cdot P_1 \cdot A}{\sqrt{\frac{Z_1 \cdot T}{M}}}$$

(ISPESL and UNI EN ISO 4126-1)

Calculation Formulas for Capacity (Overheated Water from ND 25)

Foreword : the following formula provides the capacity values of safety valves under critical stage conditions. The critical stage condition is obtained when pressure beyond the valve (back pressure P_2) does not exceed 58% of calibration pressure.

Considerer that the discharge coefficient K_v as a function of the ratio between the absolute back pressure and the discharge absolute pressure (Back pressure ratio).

Overheated Water

$$P(\text{Kcal/h}) = 0.9 \cdot K \cdot 113.8 \cdot C \cdot \sqrt{\frac{P_1}{V_1}} \cdot A \cdot r \quad (\text{UNI EN ISO 4126-1})$$

where P is the nominal thermal power of the generator.

Legend

K = coefficient of discharge.

C = coefficient of expansion (which can be taken from the exponent of the equation for the isentropic expansion).

P_1 = calculation pressure (absolute bar) [Kg/cm²].

P_2 = back pressure [Kg/cm²].

Z_1 = compression factor (take the approximate value $Z_1=1$ if the effective value is unknown).

T = absolute temperature [°K].

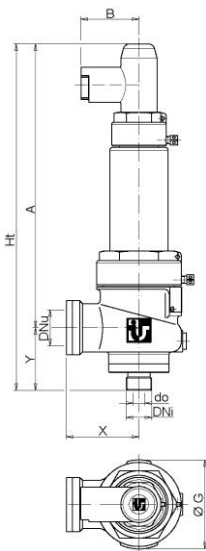
A = valve inlet area [cm²].

V_1 = specific volume [m³/Kg].

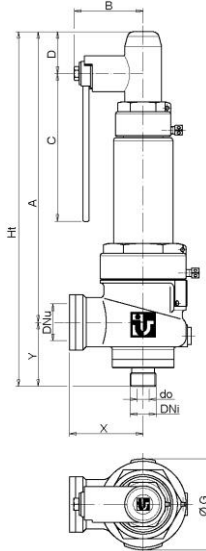
r = water vaporisation heat at pressure P_1 [Kcal/Kg].

y = specific weight at the calculation temperature [Kg/dm³].

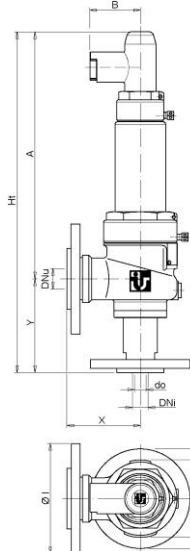
M = molecular mass [Kg/Kmol].



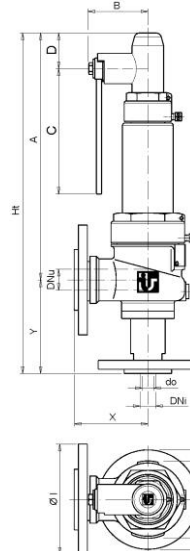
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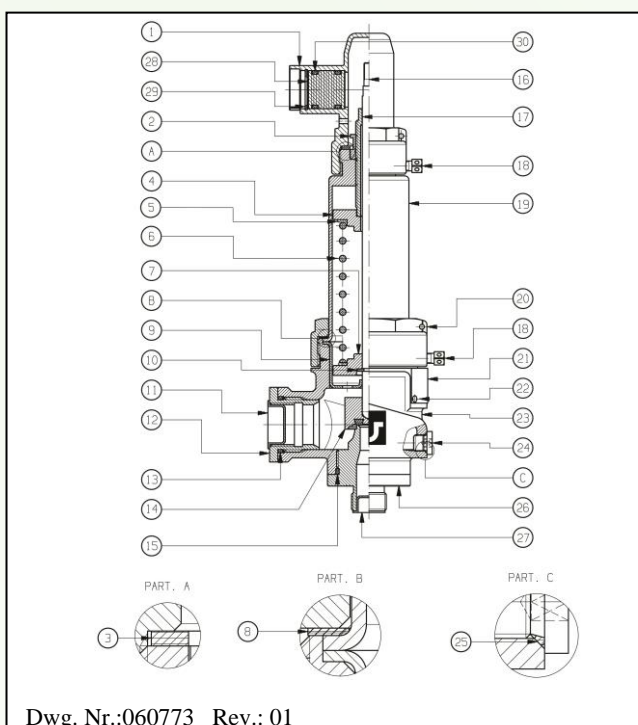
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Dimension table MBM valves

MBM Model	15/20	15/25	20/25	25/32	25/40	32/40	40/50	40/65	50/65
DNi	1/2"	1/2"	3/4"	1"	1"	1" 1/4	1" 1/2	1" 1/2	2"
DNu	3/4"	1"	1"	1" 1/4	1" 1/2	1" 1/2	2"	2" 1/2	2" 1/2
do (Output diameter)	10.5	10.5	13.5	17	17	21.5	26.5	26.5	34
A	Short cylinder	236	236	243.5	243.5	243.5	267	267	267
	Long cylinder	276	276	276	283.5	283.5	307	307	307
B without resetting device / B with resetting device	48 / 56	48 / 56	48 / 56	48 / 56	48 / 56	48 / 56	48 / 56	48 / 56	48 / 56
C	120	120	120	120	120	120	120	120	120
D	34	34	34	34	34	34	34	34	34
Ø G	74	74	74	84	84	84	114	114	114
Ø I	105	115	115	140	150	150	165	185	185
Ø L	95	95	105	115	115	140	150	150	165
Ht threaded	Short cylinder	288	288	288	303.5	303.5	303.5	352	352
	Long cylinder	328	328	328	343.5	343.5	343.5	392	392
Ht flanged	Short cylinder	326	326	326	353.5	353.5	353.5	397	397
	Long cylinder	366	366	366	393.5	393.5	393.5	437	437
X threaded / X flanged	60 / 70	55 / 70	55 / 70	68 / 80	60 / 90	60 / 90	88 / 100	80 / 100	80 / 100
Y threaded / Y flanged	52 / 90	52 / 90	52 / 90	60 / 110	60 / 110	60 / 110	85 / 130	85 / 130	85 / 130
Area [mm²]	86.6	86.6	143	227	227	363	551.5	551.5	908
H [lift]	5.6	5.6	6.6	7.2	7.2	9	10.2	10.2	13.8

Details table

P.N°	Q.ty	DESCRIPTION	MATERIAL
1	1	MBM V. cover	CF8M/1.4408
2	1	Stop nut	S31600/1.4401
3	1	Gasket	PTFE
4	1	Up. spring hold. plate	S30400/1.4301
5	2	Anti friction washer	PTFE
6	1	Spring	S31600/1.4401
7	1	Low spring hold. plate	S30400/1.4301
8	1	Gasket	PTFE
9	1	Stem guide	CF8M/1.4408
10	1	Spring lock washer	S31600/1.4401
11	1	Cylindrical cap	L.D. POLYTHENE
12	1	Reducing valve union	S31600/1.4401
13	1	O-Ring gasket	FPM
14	1	Obturator	S31600/1.4401+PTFE-CARB
15	1	O-Ring gasket	FPM
16	1	Obturator stem	S31600/1.4401
17	1	Pre-load screw	S31600/1.4401
18	2	Lock screw	S30400/1.4301
19	1	Spring holder piston	CF8M/1.4408
20	1	Cylinder ring nut	AISI 316
21	1	Rating plate	ALUMINIUM
22	2	Self-tapping rivets	ALUMINIUM
23	1	Valve body	CF8M/1.4408
24	1	Male cap	S31600/1.4401
25	1	O-Ring gasket	FPM
26	1	Valve seat	S31600/1.4401
27	1	Cylindrical cap	L.D. POLYTHENE
28	1	Closing cover gasket	PTFE
29	1	Snap ring	AISI 304
30	2	O-Ring gasket	GACO



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