ICMA RUBINETTERIE srl

TECHNICAL BROCHURE

ANGLE SAFETY VALVE
WITH CONVEYED EXHAUST
ARTICLE 254

GENERAL DESCRIPTION

- *Angle safety valve F/F made of bronze/brass with conveyed exhaust, settable from 0 to 12 bars, with following characteristics:*

ITEM CODE	ND	Obturator material	NP
254	From 3/8" to 3"	brass/bronze	12
256		Teflon PTFE	

Connections	Threads ISO 228/1	
Permitted fluids	Non-dangerous gases, vapours and liquids	
Operating temperatures	Metal obturator	0°C to 200°C
	Teflon obturator	0°C to 180°C

REFERENCE STANDARDS

UNI ISO 228/1: 1993	*Pipe threads for non-sealing fit - Designation, dimensions and tolerances.*
UNI EN 1333: 1997	*Pipeline components - Definition and NP selection .*
UNI EN 12164: 1999	*Copper and copper alloys - Turning bars.*
UNI EN 12165: 1999	*Copper and copper alloys - Machined and raw products for pressing*
UNI EN 12420: 2000	*Copper and copper alloys - Forged and pressed products.*
UNI EN 1982: 2000	*Copper and copper alloys - Ingots and castings*
UNI 10197: 1993	*Setting tables for safety valves - General requirements*
UNI 9335: 1991	*Safety valves for pressure instruments – General information, requirements and tests.*
PrEN 12516-3	*Valves- shell design strength*
ISPESL E, R COLLECTION	*Safety valves for pressure instruments - General information, requirements and tests.*

DESIGN

As far as the wall thickness of the parts under pressure, article 254 has been designed according to the BS 5154 standard,

OUTFLOW AREA

SIZE	Ø SEAT [mm]	AREA [cm^2]
⅜	*10,20*	*0,82*
½	*13,00*	*1,33*
¾	*19,00*	*2,83*
1	*25,70*	*5.18*
1 ¼	*31,00*	*7,54*
1 ½	*38,00*	*11,34*
2	*48,00*	*18,09*
2 ½	*68,00*	*36,30*
3	*77,50*	*47,15*

SPRING SIZES

SIZE	MATERIAL	FREE LENGTH	TURNS	OUTSIDE Ø	INSIDE Ø	WIRE Ø	FINISH
3/8	C 72	46.5	13	10.2	6.2	2	galvanized
½		43.5	11.5	13	8	2.5	
¾	AISI 302	57.0	11	16.5	10.5	3	none
	C72			16.6	10	3.3	galvanized
1		58	10	18.2	11.2	3.5	
				19.3	11.3	4	
1 ¼		73	9.75	25	15	5	
1 ½		83.5	10	28	16	6	
				30	17	6.5	
2				28	16	6	
				30	17	6.5	
2 ½		90	8	38.5	22.5	8	
3							

WATER FLOW RATE
(UNI 9335 Item 7.5)

$$Q = 1.610 \times K \times A \times \sqrt{(p \times P_1)}$$

Where:

		M.U	Value
Q	Exhaust flow rate	m^3/h	See chart
ρ	Volume mass	Kg/ m^3	1000
P_1	Exhaust pressure = P + 1 bar (Max. overpressure: Ps = ± 20%)	bar	See chart
A	Area of gross orifice	mm^2	See chart
K	Coefficient of outflow (standard valves as per ISPESL collection)	Coeff.	0.05

		Outflow area [A] according to ND								
		3/8	***1/2***	***3/4***	***1***	***1 1/4***	***1 1/2***	***2***	***2 1/2***	***3***
		81,7	*132,7*	*283,4*	*518,5*	*754,4*	*1133,5*	*1808,6*	*3629,8*	*4714,9*
P	***P1***									
1	*2*	*0,3*	*0,5*	*1,0*	*1,9*	*2,7*	*4,1*	*6,5*	*13,1*	*17,0*
2	*3*	*0,4*	*0,6*	*1,2*	*2,3*	*3,3*	*5,0*	*8,0*	*16,0*	*20,8*
3	*4*	*0,4*	*0,7*	*1,4*	*2,6*	*3,8*	*5,8*	*9,2*	*18,5*	*24,0*
4	*5*	*0,5*	*0,8*	*1,6*	*3,0*	*4,3*	*6,5*	*10,3*	*20,7*	*26,8*
5	*6*	*0,5*	*0,8*	*1,8*	*3,2*	*4,7*	*7,1*	*11,3*	*22,6*	*29,4*
6	*7*	*0,6*	*0,9*	*1,9*	*3,5*	*5,1*	*7,6*	*12,2*	*24,4*	*31,8*
7	*8*	*0,6*	*1,0*	*2,0*	*3,7*	*5,4*	*8,2*	*13,0*	*26,1*	*33,9*
8	*9*	*0,6*	*1,0*	*2,2*	*4,0*	*5,8*	*8,7*	*13,8*	*27,7*	*36,0*
9	*10*	*0,7*	*1,1*	*2,3*	*4,2*	*6,1*	*9,1*	*14,6*	*29,2*	*38,0*
10	*11*	*0,7*	*1,1*	*2,4*	*4,4*	*6,4*	*9,6*	*15,3*	*30,6*	*39,8*
11	*12*	*0,7*	*1,2*	*2,5*	*4,6*	*6,7*	*10,0*	*15,9*	*32,0*	*41,6*
12	*13*	*0,7*	*1,2*	*2,6*	*4,8*	*6,9*	*10,4*	*16,6*	*33,3*	*43,3*

Warning! To calculate the flow rates of other fluids, enter the specific volume mass. See the technical literature.

STEAM FLOW RATE
(E COLLECTION)

$$Q = (A) \times (0.9) \times (K) \times (113.8) \times (C) \times \sqrt{(P_1 / V_1)}$$

Where:

		M.U	Value
Q	Exhaust flow rate	Kg/h	See chart
A	Area of gross orifice	cm^2	See chart
K	Coefficient of outflow (standard valves as per ISPESL collection)	Coeff.	0.05
C	Coefficient of expansion (as per ISPESL collection)	Coeff	0.607
P	Pressure of valve setting/use	bar	See chart
P_1	Exhaust pressure = P + 1 bar (Max. overpressure: Ps = ± 20%)	bar	See chart
V_1	Specific steam volume at P1 pressure (diagram of Mollier)	m^3/Kg	See chart

						Outflow area [A] according to ND								
						3/8	***1/2***	***3/4***	***1***	***1 1/4***	***1 1/2***	***2***	***2 1/2***	***3***
P	***P1***	***C***	***K***	***t [°C***	***V1***	***0,82***	***1,33***	***2,83***	***5,18***	***7,54***	***11,34***	***18,09***	***36,30***	***47,15***
1	*2*	*0,607*	*0,05*	*119,6*	*0,9030*	*3,8*	*6,2*	*13,1*	*24,0*	*34,9*	*52,5*	*83,7*	*167,9*	*218,1*
2	*3*	*0,607*	*0,05*	*132,9*	*0,6180*	*5,6*	*9,1*	*19,4*	*35,5*	*51,6*	*77,7*	*123,9*	*248,6*	*322,9*
3	*4*	*0,607*	*0,05*	*142,9*	*0,4718*	*7,4*	*12,0*	*25,6*	*46,9*	*68,2*	*102,6*	*163,7*	*328,5*	*426,8*
4	*5*	*0,607*	*0,05*	*151,1*	*0,3825*	*9,2*	*14,9*	*31,8*	*58,2*	*84,7*	*127,4*	*203,3*	*408,0*	*529,9*
5	*6*	*0,607*	*0,05*	*158,1*	*0,3222*	*11,0*	*17,8*	*38,0*	*69,5*	*101,1*	*152,1*	*242,7*	*486,9*	*632,5*
6	*7*	*0,607*	*0,05*	*164,2*	*0,2785*	*12,8*	*20,7*	*44,1*	*80,7*	*117,5*	*176,7*	*281,9*	*565,7*	*734,8*
7	*8*	*0,607*	*0,05*	*169,6*	*0,2454*	*14,6*	*23,6*	*50,2*	*91,9*	*133,8*	*201,3*	*321,1*	*644,3*	*836,8*
8	*9*	*0,607*	*0,05*	*174,5*	*0,2195*	*16,3*	*26,5*	*56,3*	*103,1*	*150,1*	*225,7*	*360,1*	*722,5*	*938,5*
9	*10*	*0,607*	*0,05*	*179,0*	*0,1985*	*18,1*	*29,3*	*62,4*	*114,3*	*166,4*	*250,2*	*399,1*	*800,9*	*1040,3*
10	*11*	*0,607*	*0,05*	*183,2*	*0,1813*	*19,9*	*32,2*	*68,5*	*125,4*	*182,6*	*274,6*	*438,0*	*878,9*	*1141,6*
11	*12*	*0,607*	*0,05*	*187,1*	*0,1668*	*21,6*	*35,1*	*74,6*	*136,6*	*198,8*	*299,0*	*477,0*	*957,1*	*1243,1*
12	*13*	*0,607*	*0,05*	*190,7*	*0,1545*	*23,4*	*37,9*	*80,7*	*147,7*	*215,0*	*323,3*	*515,8*	*1035,0*	*1344,4*

GAS AND VAPOURS FLOW RATE
(E COLLECTION)

$$Q = \frac{(0.9) \times (K) \times 394.4 \times (C) \times (P_1) \times (A)}{\sqrt{\frac{(Z_1 \times T_1)}{PM}}}$$

Where:

		M.U.	Value
Q	Exhaust flow rate	Kg/h	See chart
A	Area of the orifice	cm^2	See chart
K	Coefficient of outflow	Coeff.	0.05
C	Coefficient of expansion	Coeff	variable
P	Setting pressure	bar	See chart
P_1	Exhaust pressure = setting pressure + 1 bar	bar	See chart
Z_1	Compressibility factor (if unknown take 1)	m^3/Kg	variable
T_1	Absolute exhaust temperature	°K	variable
PM	Molecular weight	Kg/Kmol	variable

Example

Fluid	air
C	0,685
PM	28,970
Temperature	20 °C = 293 °K

						Outflow area [A] according to ND								
						3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
P	P1	C	K	T [°K	PM	0,82	1,33	2,83	5,18	7,54	11,34	18,09	36,30	47,15
1	2	0,607	0,05	293,0	28,970	6,3	10,2	21,6	39,6	57,6	86,7	138,3	277,5	360,5
2	3	0,607	0,05	293,0	28,970	9,4	15,3	32,5	59,4	86,5	130,1	207,5	416,3	540,7
3	4	0,607	0,05	293,0	28,970	12,5	20,3	43,3	79,2	115,3	173,4	276,6	555,1	721,0
4	5	0,607	0,05	293,0	28,970	15,7	25,4	54,1	99,0	144,1	216,8	345,8	693,8	901,2
5	6	0,607	0,05	293,0	28,970	18,8	30,5	64,9	118,8	172,9	260,1	414,9	832,6	1081,5
6	7	0,607	0,05	293,0	28,970	21,9	35,6	75,7	138,6	201,8	303,5	484,1	971,4	1261,7
7	8	0,607	0,05	293,0	28,970	25,1	40,7	86,5	158,4	230,6	346,8	553,2	1110,1	1442,0
8	9	0,607	0,05	293,0	28,970	28,2	45,8	97,4	178,2	259,4	390,2	622,4	1248,9	1622,2
9	10	0,607	0,05	293,0	28,970	31,3	50,8	108,2	198,0	288,2	433,5	691,5	1387,7	1802,4
10	11	0,607	0,05	293,0	28,970	34,5	55,9	119,0	217,8	317,1	476,9	760,7	1526,4	1982,7
11	12	0,607	0,05	293,0	28,970	37,6	61,0	129,8	237,6	345,9	520,2	829,9	1665,2	2162,9
12	13	0,607	0,05	293,0	28,970	40,8	66,1	140,6	257,4	374,7	563,6	899,0	1804,0	2343,2

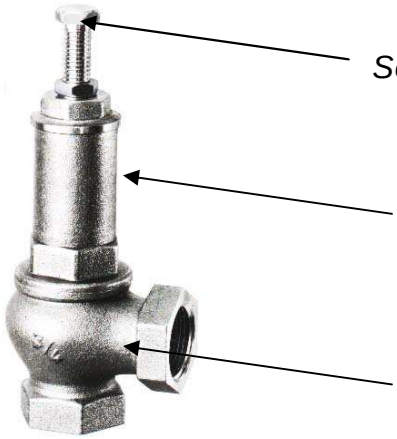
LIST/STANDARDS/CERTIFICATES OF MATERIALS

COMPONENT	MATERIAL
Plug	1/2/3
Spring thruster	1/3
Spring	C72/AISI302
Rubber/teflon obturator thruster	1
Metal obturator thruster	1
Interrupted screw	2/3
Obturator	1/2
Gasket support	1/2/3
Rubber gasket	SBR
Teflon gasket	PTFE
Washer	1
Gasket stop guide	1/2
Body	3
Stop nut	1
Adjusting screw	1

STANDARD	ALLOY	TITLE OF STANDARD	CODE
UNI EN 12164: 1999	CW614 CW617	Copper and copper alloys – Turning bars.	1
UNI EN 12420: 2000	CW614 CW617	Copper and copper alloys - Forged and pressed products	2
UNI EN 1982: 2000	CC491K(bronze) CC754S(brass)	Copper and copper alloys - Ingots and castings	3

NAME	Required certificate	SUPPLIER
Main parts under pressure	EN 10204 3.1.B	QS - ISO 9001certified
Secondary parts under pressure	EN 10204 2.2	Not certified ISO 9001
Spring	EN 10204 2.2	Not certified ISO 9001
Gaskets	EN 10204 2.2	QS Not certified ISO 9001

Documental product traceability is not available.



Use

The article 254 is a **non primary safety device** with conveyed exhaust.

THE MANUFACTURER DECLINES ANY RESPONSIBILITY IF THE VALVE IS DISASSEMBLED, MODIFIED OR TAMPERED

Please note the following conditions of use:

Fluids	*Non-dangerous gases, vapours and liquids*
Maximum working pressure	*12 bar*

Operating temperatures	*Metal obturator*	*0℃ to 200°C*
	Teflon obturator	*0℃ to 180°C*