TECHNICAL DATA SHEET

IN COMPLIANCE WITH THE DIRECTIVE PED 2014/68/UE

CONVEYED-EXHAUST SQUARE LIMITING PRESSURE VALVE ARTICLE 2

Rev.	Date	Revision reason	Checked by RAQ	Approved by DG
6	18/07/16	Upgrade to the new Directive 2014/68 / EU + maintenance		
5	13/11/13	Adjourment description and table		
4	15/01/13	Adjourment PS 2”1/2 - 3”		
3	15/10/10	Adjourment norm		
2	28/05/07	Material, spring, pressure set changes		
1	04/07/06	Material and standards change		
0	04/11/02	First issue		

GENERAL DESCRIPTION OF THE EQUIPMENT

- Bronze/brass F/F conveyed-exhaust limiting pressure valves, adjustable from 0 to 10/16 bar, with the following characteristics:

ARTICLE CODE	ND	Pressure-containing member material	NP From 3/8 to 2”	NP From 2”1/2 to 3”
2	from 3/8” to 3”	brass	16	10
2G		SBR rubber		
2T		PTFE		

Connections	Threads UNI EN ISO 228-1	
Admitted fluids	Non-dangerous gases, vapours and liquids (group 2)	
Working temperatures	Metal pressure-containing member	From – 10 to + 200° C
	PTFE pressure-containing member	From – 10 to + 180° C
	Rubber pressure-containing member	From – 10 to + 70° C

- PED classification

DN	PS	TABLE	CLASSIFICATION	MARKING
3/8”	16	7	ARTICOLO 4, COMMA 3	Size Fluid direction
1/2”				
3/4”				
1”				
1”1/4				
1”1/2				
2”				
2”1/2	10			
3”				

REFERENCE RULES

UNI EN ISO 228-1:2003	Piping threads for non-seal fit on the thread – Designation. Dimensions and tolerances.
UNI EN 1333: 2007	Components of piping networks – NP definition and selection.
UNI EN 12164: 2001	Copper and copper alloys – Turnery bars.
UNI EN 12165: 1999	Copper and copper alloys – Products for machined and raw product pressing.
UNI EN 12420: 2000	Copper and copper alloys – Forged and pressed products.
UNI EN 1982: 2008	Copper and copper alloys – Ingots and castings.
UNI 10197: 1993	Calibration benches for safety valves – General requirements
UNI EN ISO 4126-1:2006	Safety valves for pressure instruments – Generality, requirements and tests.
UNI EN 12516-3:2003	Valve-shell design strength

DESIGN

The article 2 has been realized using the standard BS 5154 with regard to the wall thickness of the parts under pressure.
Moreover the realized check of the valve walls has been confirmed by tests in compliance with EN 12516-3.

OUTFLOW AREA

MEASURE	Ø SEAT [mm]	AREA [cm^2]
3/8	10,20	0,82
1/2	13,00	1,33
3/4	19,00	2,83
1”	25,70	5.18
1”1/4	31,00	7,54
1”1/2	38,00	11,34
2”	48,00	18,09
2”1/2	64,00	32,15
3”	78,00	47,75

SPRING SIZING

MEASURE	MATERIAL	FREE LENGTH	TURNS	Ø OUTSIDE	Ø INSIDE	Ø WIRE	FINISH
3/8	C 72	43.5	11.5	12,5	7.5	2.5	galvanizing
1/2							
3/4	AISI 302	57.0	11	16.5	10.5	3	none
	C72			16.6	10	3.3	galvanizing
1”		58	10	18.2	11.2	3.5	
				19.3	11.3	4	
1”1/4		73	9.75	25	15	5	
1”1/2		83.5	10	28	16	6	
				30	17	6.5	
2”				28	16	6	
				30	17	6.5	
2”1/2		90	8	38.5	22.5	8	
3”							

It exist, as is shown in the table, for some measures, double type of spring, normal version for relief valves from 0 to about 10 bar, “hard” version (or reinforced spring) for applications with relief valve from about 10 to 16 bar:
THEN YOU HAVE TO PROVIDE, AT SUPPLY, WHEN IT’S POSSIBLE, THE MAXIMUM VALUE OF VALVE RELIEF, TO IDENTIFY CLEARLY THE TYPE OF SPRING TO USE.
If it’s not specified, the value is supplied with the normal version of spring.

WATER CAPACITY

(UNI 9335 paragraph 7.5)

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

Where:

		MU	Value
Q	Capacity to be exhausted	m^3/h	See table
ρ	Volume mass	Kg/m^3	1000
P_1	Exhaust pressure = P + 1 bar (Max. overpressure: Ps = ± 20%)	bar	See table
A	Area of the gross orifice	cm^2	See table
K	Discharge coefficient	Coeff.	0.05

		DISCHARGE AREA [A] AS A FUNCTION OF THE SIZE								
		3/8	1/2	3/4	1”	1”1/4	1”1/2	2”	2”1/2	3”
		0,82	1,33	2,83	5,18	7,54	11,34	18,09	32.15	47,15
P	P_1									
1	2	0,3	0,5	1,0	1,9	2,7	4,1	6,5	11,6	17,0
2	3	0,4	0,6	1,2	2,3	3,3	5,0	8,0	14,2	20,8
3	4	0,4	0,7	1,4	2,6	3,8	5,8	9,2	16,4	24,0
4	5	0,5	0,8	1,6	3,0	4,3	6,5	10,3	18,3	26,8
5	6	0,5	0,8	1,8	3,2	4,7	7,1	11,3	20,0	29,4
6	7	0,6	0,9	1,9	3,5	5,1	7,6	12,2	21,7	31,8
7	8	0,6	1,0	2,0	3,7	5,4	8,2	13,0	23,2	33,9
8	9	0,6	1,0	2,2	4,0	5,8	8,7	13,8	24,6	36,0
9	10	0,7	1,1	2,3	4,2	6,1	9,1	14,6	25,9	38,0
10	11	0,7	1,1	2,4	4,4	6,4	9,6	15,3	27,1	39,8
11	12	0,7	1,2	2,5	4,6	6,7	10,0	15,9		
12	13	0,7	1,2	2,6	4,8	6,9	10,4	16,6		
13	14	0,8	1,3	2,7	4,9	7,2	10,8	17,2		
14	15	0,8	1,3	2,8	5,1	7,4	11,2	17,8		
15	16	0,8	1,4	2,9	5,3	7,7	11,5	18,4		
16	17	0,9	1,4	3,0	5,4	7,9	11,9	19,0		

Attention, to calculate the capacity of other fluids, please enter the specific volume mass to be traced on technical literature.

STEAM CAPACITY
(E DATA COLLECTION)

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

Where:

		MU	Value
Q	Capacity to be exhausted	Kg/h	See table
A	Area of the gross orifice	cm^2	See table
K	Discharge coefficient	Coeff.	0.05
C	Expansion coefficient (as per ISPESL data collection)	Coeff	0.607
P	Calibration pressure/valve use	bar	See table
P_1	Exhaust pressure = P + 1 bar (Max. overpressure: Ps = ± 20%)	bar	See table
V_1	Specific vapour volume at P1 pressure (Mollier diagram)	m^3/Kg	See table

						DISCHARGE AREA [A] AS A FUNCTION OF THE SIZE								
						3/8	1/2	3/4	1”	1”1/4	1”1/2	2”	2”1/2	3”
P	P_1	C	K	t [°C]	V_1	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	0,903	3,8	6,2	13,1	24,0	34,9	52,5	83,7	148,7	218,1
2	3	0,607	0,05	132,9	0,618	5,6	9,1	19,4	35,5	51,6	77,7	123,9	220,2	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	291,0	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	361,3	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	431,3	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	501,0	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	570,6	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	639,9	938,5
9	10	0,607	0,05	179	0,1985	18,1	29,3	62,4	114,3	166,4	250,2	399,1	709,3	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	778,4	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		
12	13	0,607	0,05	190,7	0,1545	23,4	37,9	80,7	147,7	215,0	323,3	515,8		
13	14	0,607	0,05	195	0,1407	25,4	41,2	87,7	160,6	233,8	351,6	560,9		
14	15	0,607	0,05	198,2	0,1317	27,2	44,1	93,9	171,8	250,1	376,2	600,1		
15	16	0,607	0,05	201,4	0,1237	29,0	47,0	100,0	183,1	266,6	400,9	639,5		
16	17	0,607	0,05	204,3	0,1166	30,8	49,9	106,2	194,4	283,0	425,6	679,0		

GAS AND VAPOUR CAPACITY (E DATA COLLECTION)

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

Where:

		MU	Value
Q	Capacity to be exhausted	Kg/h	See table
A	Area of the orifice	cm^2	See table
K	Discharge coefficient	Coeff.	0.05
C	Expansion coefficient	Coeff.	Variable
P	Calibration pressure	bar	See table
P_1	Exhaust pressure = calibration pressure + 1 bar	bar	See table
Z_1	Compressibility factor (if unknown, use 1)	m^3/Kg	Variable
T_1	Absolute exhaust temperature	°K	Variable
MW	Molecolar weight	Kg/Kmol	Variable

Example

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

						DISCHARGE AREA [A] AS A FUNCTION OF THE SIZE								
						3/8	1/2	3/4	1"	1"1/4	1"1/2	2"	2"1/2	3"
P	P_1	C	K	T [°K]	MW	0,82	1,33	2,83	5,18	7,54	11,34	18,09	36,30	47,15
1	2	0,685	0,05	293,0	28,97	6,3	10,2	21,6	39,6	57,6	86,7	138,3	245,8	360,5
2	3	0,685	0,05	293,0	28,97	9,4	15,3	32,5	59,4	86,5	130,1	207,5	368,7	540,7
3	4	0,685	0,05	293,0	28,97	12,5	20,3	43,3	79,2	115,3	173,4	276,6	491,6	721,0
4	5	0,685	0,05	293,0	28,97	15,7	25,4	54,1	99,0	144,1	216,8	345,8	614,5	901,2
5	6	0,685	0,05	293,0	28,97	18,8	30,5	64,9	118,8	172,9	260,1	414,9	737,4	1081,5
6	7	0,685	0,05	293,0	28,97	21,9	35,6	75,7	138,6	201,8	303,5	484,1	860,3	1261,7
7	8	0,685	0,05	293,0	28,97	25,1	40,7	86,5	158,4	230,6	346,8	553,2	983,2	1442,0
8	9	0,685	0,05	293,0	28,97	28,2	45,8	97,4	178,2	259,4	390,2	622,4	1106,1	1622,2
9	10	0,685	0,05	293,0	28,97	31,3	50,8	108,2	198,0	288,2	433,5	691,5	1229,0	1802,4
10	11	0,685	0,05	293,0	28,97	34,5	55,9	119,0	217,8	317,1	476,9	760,7	1351,9	1982,7
11	12	0,685	0,05	293,0	28,97	37,6	61,0	129,8	237,6	345,9	520,2	829,9		
12	13	0,685	0,05	293,0	28,97	40,8	66,1	140,6	257,4	374,7	563,6	899,0		
13	14	0,685	0,05	293,0	28,97	43,9	71,2	151,5	277,2	403,5	606,9	968,2		
14	15	0,685	0,05	293,0	28,97	47,0	76,3	162,3	297,0	432,4	650,3	1037,3		
15	16	0,685	0,05	293,0	28,97	50,2	81,3	173,1	316,8	461,2	693,6	1106,5		
16	17	0,685	0,05	293,0	28,97	53,3	86,4	183,9	336,6	490,0	737,0	1175,6		

LIST / RULES / CERTIFICATES OF USED MATERIALS

COMPONENT	MATERIAL	
	da DN 3/8” a DN 2”	da DN 2 1/2” a DN 3”
Plug	2	1
Spring pusher	1	1
Spring	C72/AISI302	C72
Rubber-PTFE pressure-containing member pusher	1	1
Metal pressure-containing member pusher	1	1
Auger	2/3	3
Pressure-containing member	1/2	3
Gasket bearing	1/2	3
Gasket	Rubber SBR	Rubber SBR
	PTFE	PTFE
Washer	1	-
Gasket fastening guide	1/2	3
Body	3	3
Locking jam nut	1/5	1/5
Adjusting screw	1/5	1/5

STANDARD	ALLOY	STANDARD TITLE	CODE
UNI EN 12164: 1999	CW614 CW617	Copper and copper alloys – Turnery bars.	1
UNI EN 12420: 2000	CW614 CW617	Copper and copper alloys – Pressed and forged products	2
UNI EN 1982: 2008	CC754S (brass)	Copper and copper alloys – Ingots and castings	3
UNI EN 1982: 2008	CC491K (bronze)	Copper and copper alloys – Ingots and castings	4
	Nickel plated carbon steel		5

DENOMINATION	Required certificate	SUPPLIER
Parts under pressure	EN 10204 2.2	Any requisite
Spring	EN 10204 3.1	

There is no documentary possibility of tracing the product.

MARKING

PED 2014/68/UE direction.

TEST / TRIAL / CALIBRATION MODALITY

1. Install on the trial bench the valve to be calibrated with free spouts exposed to the atmosphere.
2. Install the manometer with class 0.6.
3. Increase slowly the pressure at the source of the valve until you cause the start of the opening that can be visually detected or heard.
4. The requested value of the opening pressure is obtained by means of following adjustments, acting on the calibration regulation plug.
5. Once you have obtained the desired value, repeat twice the calibration control to check the reproducibility.
6. Tighten the locking jam nut to avoid variations in the calibration pressure.

PRODUCTION PROCEDURES

The following documents, belonging to the equipment documentation of the concern "Rubinetteria Mora", describe the different operative activities performed for the production of pressure devices.

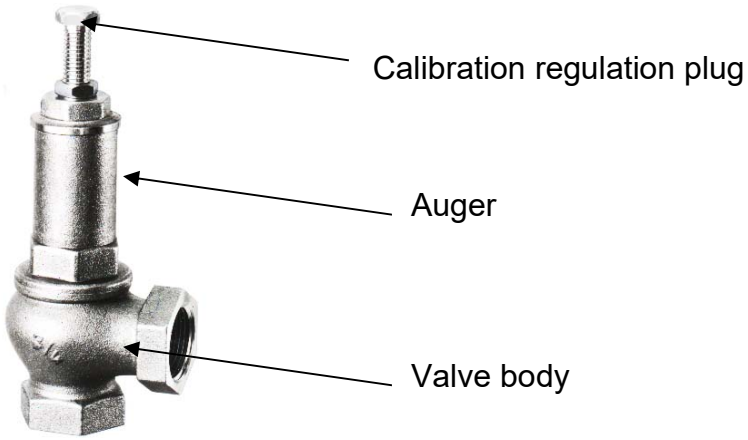
type	code	document title
Process	PRO 7.2-01	Sales procedure
Process	PRO 7.4-01	Material supplying
Process	PRO 7.5-01	Turnery
Process	PRO 7.5-02	Assembly

type	code	document title
Instruction	IST 7.4-01	Incoming material controls
Instruction	IST 7.5-01	Production controls
Instruction	IST 7.5-02	Final controls
Instruction	IST 7.5-03/B	Test controls

type	code	document title
Plan	Annex IST 7.4-01	Control plan in acceptance
Plan	Annex IST 7.5-01	Control plan in production

INSTALLATION, START-UP, APPLICATION AND MAINTENANCE INSTRUCTIONS

ART. 2



Application

The article 2 is a **CONVEYED-EXHAUST SQUARE LIMITING PRESSURE VALVE.**

IF THE VALVE IS DISASSEMBLED, MODIFIED OR TAMPERED WITH, THE CONCERN DECLINES ALL RESPONSIBILITY.

The use conditions are the following:

Fluids	Non-dangerous gases, vapours and liquids	
Max working pressure	From 3/8 to 2”	16 bar
	From 2”1/2 to 3”	10 bar

Max working temperatures	Metal pressure-containing member	200° C
	PTFE pressure-containing member	180° C
	Rubber pressure containing member	70° C

- For a proper installation, the valve has to be installed vertically, otherwise its operation is compromised; however we strongly recommend to convey the valve outlet to an exhaust unit
- For thread sealing use a material compatible with the used fluid.
- Screw the valve on the threaded pipes, positioning the key exclusively on the special hexagonal parts until the valve is blocked on the pipe.
- Do not exert any strength on the auger.

- The exhaust piping has to be properly supported not to stress the valve structure; then use heavy clamps to support the pipes.
- If you use a pipe, it is necessary to place it in a slightly inclined position.
- The exhausted fluid has to be properly conveyed and deviated downwarts to prevent its return to the valve and not to alter the calibration pressure.

WARNING !!!

PAY MUCH ATTENTION WHEN YOU INSTALL THE VALVE, AS THE DISCHARGE OCCURS DIRECTLY WITH NO PROTECTION. THE VALVE HAS TO BE POSITIONED IN SUCH A WAY NOT TO BE HARMFUL TO PEOPLE SAFETY / PHYSICAL INTEGRITY, IN CASE OF OPENING OF THE SAME VALVE.

Maintenance

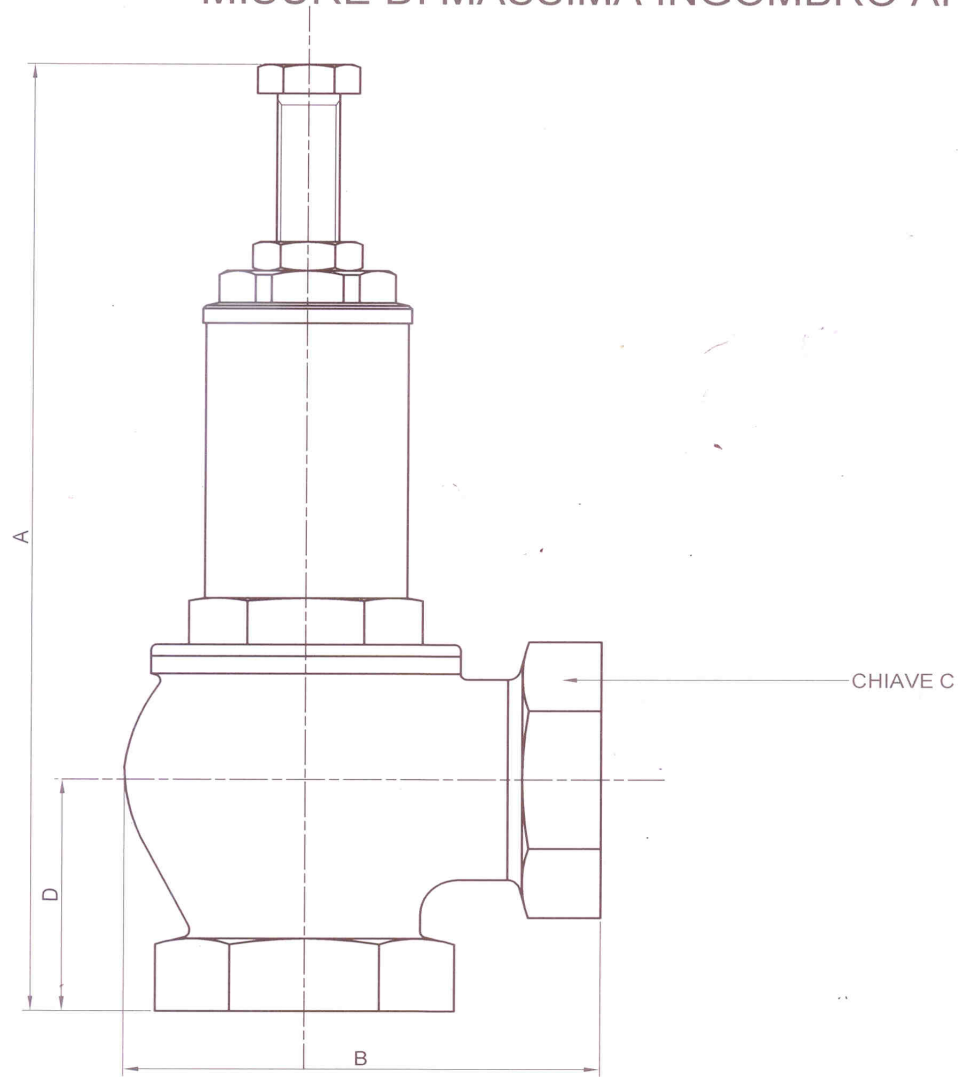
- At least annually verify that:

1. The valve has not been tampered
2. The valve does not present structural defects
3. The valve is still installed correctly
4. The drain hose is free and therefore capable of download

WARNING !!!

Do not remove the limiting pressure valve and not modify or tamper.

MISURE DI MASSIMA INGOMBRO ART.2



DN		3/8	1/2	3/4	1"	1"1/4	1"1/2	2"	2"1/2	3"
Quote(mm)	A	115	130	158	163	192	215	247	280	293
	B	46	56	64	76	90	100	124	135	145
	C	24	28	35	41	49	56	71	88	100
	D	24.5	30	32	40	44	47	60	69	77
Peso indicativo (gr.)		300	350	600	900	1400	1830	2900	4500	5200

REV.	DESCRIZIONE MODIFICHE:	MATERIALE:		TOLLERANZE NON INDICATE		DISEGNATO:	
1		STATO:		LINEARI :		APPROVATO:	
2		PESO GREZZO GR.:		ANGOLARI :		DATA :	
3		PESO FINITO GR.:		RUGOSITA':		SCALA :	
DENOMINAZIONE:			CODICE ART.:			DISEGNO N°:	
						REVISIONE N°:	