TECHNICAL DATA SHEET

IN COMPLIANCE WITH THE DIRECTIVE PED 2014/68/UE

FREE-EXHAUST STRAIGHT LIMITING PRESSURE VALVE ARTICLE 1

Rev.	Date	Revision reason	Checked by RAQ	Approved by DG
5	18/07/16	Upgrade to the new Directive 2014/68 / EU		
4	13/11/13	Adjourment description and table		
3	15/10/10	Adjourment norm		
2	28/05/07	Material, spring, pressure set changes		
1	27/07/06	Material and standards change		
0	04/11/02	First issue		

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GENERAL DESCRIPTION OF THE EQUIPMENT

- Brass male free-exhaust straight limiting valve, adjustable from 0 to 16 bar, with the following characteristics:

ARTICLE CODE	ND	Pressure-containing member material	NP
1	from 1/4" to 2"	Brass	16
1G		SBR rubber	
1T		PTFE	

Connections	Threads UNI EN ISO 228-1	
Admitted fluids	Non-dangerous gases (group 2), steam	
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
¼"	16	7	ARTICOLO 4, COMMA 3	No marking
3/8"				
½"				
¾"				
1"				
1 ¼"				
1 ½"				
2"				

REFERENCE RULES

UNI EN ISO 228-1:2003	Piping threads for non-seal fit on the thread - Designation, dimensions and tolerances.
UNI EN 1333: 1997	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 1 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 FOR CALCULATION OF EXHAUST CAPACITIES

MEASURE	Ø SEAT [mm] PRESSURE-CONTAINING MEMBER	AREA [cm²] PRESSURE-CONTAINING MEMBER	AREA [cm²] EXHAUST HOLES	AREA [cm²] MINIMUM CHOICE
1/4	7,00	0,38	1.18	**0.53**
⅜	10,20	0,82	1.18	**0.82**
½	13,00	1,33	1.18	**1.18**
¾	19,00	2,83	2.33	**2.33**
1	25,70	5.18	2.90	**2.90**
1 ¼	31,00	7,54	4.78	**4.78**
1 ½	38,00	11,34	4.78	**4.78**
2	48,00	18,09	5.71	**5.71**

To calculate exhaust capacities, take the area with the minimum section located between the area where the pressure-containing member is active and the area of the spouts placed on the auger and on the plug.

SPRING SIZING

MEASURE	MATERIAL	FREE LENGTH	TURNS	Ø OUTSIDE	Ø INSIDE	Ø WIRE	FINISH
1/4	C72	44	12	10.2	6.2	2	galvanizing
3/8							
½							
3/4		57	11	16.5	10.5	3	
				16.6	10	3.3	
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	

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.

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	Discharge pressure = P + 1 bar (Max. overpressure: Ps = ± 20%)	bar	See table
V_1	Specific steam volume at P1 pressure (Mollier diagram)	m^3/Kg	See table

						DISCHARGE AREA [A] AS A FUNCTION OF THE SIZE							
						1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
P	P_1	C	K	t [°C]	V_1	0,38	0,82	1,18	2,33	2,90	4,78	4,78	5,71
1	2	0,607	0,05	119,6	0,903	1,8	3,8	5,5	10,8	13,4	22,1	22,1	26,4
2	3	0,607	0,05	132,9	0,618	2,6	5,6	8,1	16,0	19,9	32,7	32,7	39,1
3	4	0,607	0,05	142,9	0,4718	3,4	7,4	10,7	21,1	26,2	43,3	43,3	51,7
4	5	0,607	0,05	151,1	0,3825	4,3	9,2	13,3	26,2	32,6	53,7	53,7	64,2
5	6	0,607	0,05	158,1	0,3222	5,1	11,0	15,8	31,3	38,9	64,1	64,1	76,6
6	7	0,607	0,05	164,2	0,2785	5,9	12,8	18,4	36,3	45,2	74,5	74,5	89,0
7	8	0,607	0,05	169,6	0,2454	6,7	14,6	20,9	41,4	51,5	84,8	84,8	101,3
8	9	0,607	0,05	174,5	0,2195	7,6	16,3	23,5	46,4	57,7	95,1	95,1	113,7
9	10	0,607	0,05	179	0,1985	8,4	18,1	26,0	51,4	64,0	105,5	105,5	126,0
10	11	0,607	0,05	183,2	0,1813	9,2	19,9	28,6	56,4	70,2	115,7	115,7	138,3
11	12	0,607	0,05	187,1	0,1668	10,0	21,6	31,1	61,4	76,5	126,0	126,0	150,5
12	13	0,607	0,05	190,7	0,1545	10,8	23,4	33,6	66,4	82,7	136,3	136,3	162,8
13	14	0,607	0,05	195	0,1407	11,8	25,4	36,6	72,2	89,9	148,2	148,2	177,1
14	15	0,607	0,05	198,2	0,1317	12,6	27,2	39,1	77,3	96,2	158,6	158,6	189,4
15	16	0,607	0,05	201,4	0,1237	13,4	29,0	41,7	82,4	102,5	169,0	169,0	201,9
16	17	0,607	0,05	204,3	0,1166	14,3	30,8	44,3	87,5	108,8	179,4	179,4	214,3

AIR, GAS AND NON-DANGEROUS 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	Orifice area	cm^2	See table
K	Discharge coefficient	Coeff.	0.05
C	Expansion coefficient	Coeff	See table
P	Calibration pressure	bar	See table
P_1	Discharge pressure = calibration pressure + 1 bar	bar	See table
Z_1	Compressibility factor	m^3/Kg	1
T_1	Absolute discharge temperature (Kelvin degrees = °C + 273)	K	See use
MW	Molecular weight	Kg/Kmol	See table

Capacities obtained with the following values:

Fluid	air
C	0.685
MW	28,970
Temperature	20 °C = 293 °K

						DISCHARGE AREA [A] AS A FUNCTION OF THE SIZE							
						1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
P	P_1	C	K	T [°K]	PM	0,38	0,82	1,18	2,33	2,90	4,78	4,78	5,71
1	2	0,685	0,05	293,0	28,97	2,9	6,3	9,0	17,8	22,2	36,5	36,5	43,7
2	3	0,685	0,05	293,0	28,97	4,4	9,4	13,5	26,7	33,3	54,8	54,8	65,5
3	4	0,685	0,05	293,0	28,97	5,8	12,5	18,0	35,6	44,3	73,1	73,1	87,3
4	5	0,685	0,05	293,0	28,97	7,3	15,7	22,6	44,5	55,4	91,4	91,4	109,1
5	6	0,685	0,05	293,0	28,97	8,7	18,8	27,1	53,4	66,5	109,6	109,6	131,0
6	7	0,685	0,05	293,0	28,97	10,2	21,9	31,6	62,3	77,6	127,9	127,9	152,8
7	8	0,685	0,05	293,0	28,97	11,6	25,1	36,1	71,3	88,7	146,2	146,2	174,6
8	9	0,685	0,05	293,0	28,97	13,1	28,2	40,6	80,2	99,8	164,5	164,5	196,5
9	10	0,685	0,05	293,0	28,97	14,5	31,3	45,1	89,1	110,9	182,7	182,7	218,3
10	11	0,685	0,05	293,0	28,97	16,0	34,5	49,6	98,0	121,9	201,0	201,0	240,1
11	12	0,685	0,05	293,0	28,97	17,4	37,6	54,1	106,9	133,0	219,3	219,3	261,9
12	13	0,685	0,05	293,0	28,97	18,9	40,8	58,6	115,8	144,1	237,5	237,5	283,8
13	14	0,685	0,05	293,0	28,97	20,3	43,9	63,2	124,7	155,2	255,8	255,8	305,6
14	15	0,685	0,05	293,0	28,97	21,8	47,0	67,7	133,6	166,3	274,1	274,1	327,4
15	16	0,685	0,05	293,0	28,97	23,2	50,2	72,2	142,5	177,4	292,4	292,4	349,3
16	17	0,685	0,05	293,0	28,97	24,7	53,3	76,7	151,4	188,5	310,6	310,6	371,1

LIST / RULES / CERTIFICATES OF THE USED MATERIALS

COMPONENT	MATERIAL
Plug	1
Spring	C72
Pressure-containing member pusher	1
Pressure-containing member pressing rod/pressure-containing member	1
Auger	1/3
Gasket bearing	1/2
Gasket	Rubber SBR PTFE
Gasket fastening guide	1/2
Body	1/2
Locking jam nut	1
Pressure-containing member	1/2

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

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.

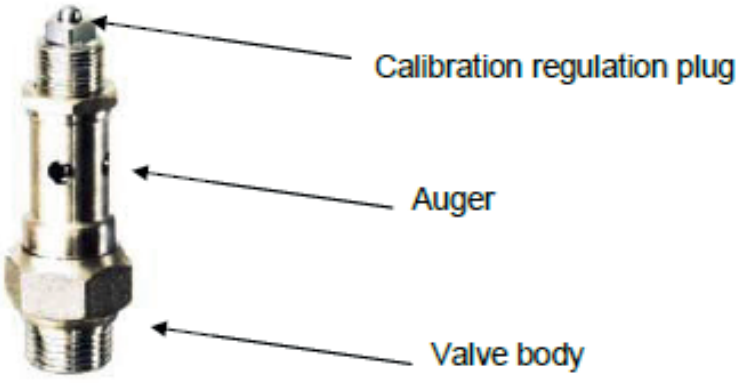
type	code	document title
Process	PRO 7.2-01	Sales procedure
Process	PRO 7.4-01	Material supplying
Process	PRO 7.5-01	Turnery
Process	PRO 7.5-02	Assembly

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. 1



Application

The article 1 is a **FREE-EXHAUST STRAIGHT 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 (group 2) and steam
Max working pressure	16 bar

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

Installation

- For a proper installation, the valve has to be installed vertically, otherwise its operation is compromised.
- 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.

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

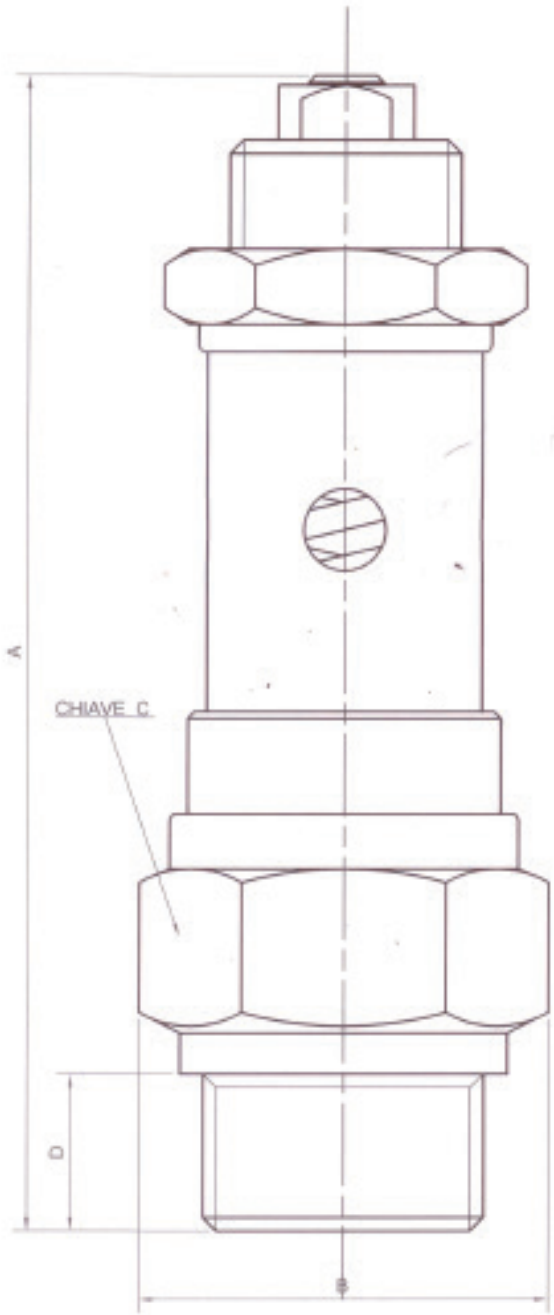
- At least annually verify that:

1. The valve has not been tampered
2. The valve does not present structural defects
3. The valve is still installed correctly
4. The exhaust holes are free and therefore suitable for download

WARNING !!!

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

THE COMPANY RESERVES THE RIGHT TO MAKE ANY TYPE OF MODIFICATION TO ITS PRODUCTS, IF 'DO NOT ALTER THEIR FUNCTIONS', WITHOUT PRIOR TO NOTIFY THE CUSTOMERS.



DN		1/4	3/8	1/2	3/4	1"	1"1/4	1"1/2	2"
Quote(mm)	A	85	85	85	115	110	150	150	172
	B	30	30	30	44	53	68	75	89
	C	26	26	26	40	49	63	69	82
	D	11.5	11.5	11.5	15.5	18	23	24.5	25.5
Peso indicativo (gr.)		140	160	165	380	560	1100	1370	2030

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