

Air Liquide AGS GmbH

**Item:** Safety valve  
**Plant:** A690 / L110  
**Location:** Kosice  
**Project:** K70101 ASU No. 9 Kosice  
**By:** TV PV

**Page:**  
**Date:** 29.11.2004  
**Rev:** 0  
**Vendor:**  
**Spec-ID:** SP198

**Procurement:** IAZ


ITEM	Unit	
<b>TAG Number</b>		<b>73115</b>
<b>Service</b>		LIN pipe from customer (TOP15)
<b>Fluid name</b>		Nitrogen
<b>Location/ line No</b>		#038
<b>Gauge pressure</b>		
normal operation (1)	bar g	11
outlet	bar g	0
design	bar g	
set pressure gauge	bar g	25
<b>Operating temperature</b>	°C	-153
<b>Design temperature</b>	°C	
<b>Temperature at no flow</b>	°C	ambient
<b>Required capacity</b>	Nm³/h	
<b>Required capacity (2)</b>	kg/h	136
<b>Fluid density</b>	kg/m³	131
<b>Phase</b>		vapour
<b>Sizing basis</b>		thermal expansion
<b>Valve type</b>		
<b>Manufacturer</b>		
<b>Material</b>	body/spring disc/seat	

**Notes:**

- (1) estimated
- (2) Required capacity [kg/h] = Surface [m²] \* Gas flow [kg/m²s] / Insulation factor \* 3600 s/h
- Pipe diameter: 60 mm
- Pipe length: 10 m estimated
- Gas flow: 0,02 kg/m²s (MG Standard 54010, Nitrogen, FL)
- Insulation factor 1
- Resulting required capacity 136 kg/h

4				5			
2				3			
0	29.11.2004	TV		1			
rev	date	name	checked	rev	date	name	checked

File:

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		AD 2000:A2 / TRD 421 for gases		Date:	25.04.2005
		VALVESTAR® - v 6.3.1		Project:	Kosice Tank Farm
				Tag-No:	Z 73115
				Commission-No:	
Project: Kosice Tank Farm					
Contractor: Air Liquide					
1	Valve - General				
2	Article number	4374.3142			
3	Lift characteristic steam/gas	Safety Relief Valve			
4	Lift characteristic liquid	Safety Relief Valve			
5	Bonnet / Lifting Device	Cap H2			
6	Certified coefficient of discharge for steam and gases	$\alpha_{w,DG}$	0,5		
7	Certified coefficient of discharge for liquid	$\alpha_{w,F}$	0,35		
8	Valve - Construction				
9	Minimum discharge area	$A_0$	78,54	mm <sup>2</sup>	
10	Flow diameter	$d_0$	10	mm	
11	Thread Inlet	G 1/2"			
11	Design Inlet	Male			
12	Thread Outlet	G 1/2"			
12	Design Outlet	Female			
13	Valve - Dimensions				
14	Centre to face dimension	a	30	mm	
15	Centre to face dimension	b	33	mm	
16	Length	c	15	mm	
17	Height	H	137	mm	
18	Weight	M	1,2	kg	
19	Medium				
20	Name	Nitrogen			
21	Formula	N <sub>2</sub>			
22	Molecular weight	M	28		
23	Ratio of specific heats	k	1,4		
24	Compressibility factor	Z	1		
25	Service condition				
26	Set pressure	p	25	bar-g	
27	Constant back pressure	$p_{af}$	0	bar-g	
28	Built up - back pressure	$p_{ae}$	0	bar-a	
29	Superimposed back pressure		0	bar-g	
30	Overpressure	dp	10	%	
31	Environmental pressure	$p_u$	1,013	bar-a	
32	Temperature	T	-153	°C	
33	Required massflow	$q_{m,ab}$	136	kg/h	
34	Volume flow to be discharged (working condition)	$q_{vb,ab}$	1,7	m <sup>3</sup> / h	
35	Volume flow to be discharged (standard condition)	$q_{vn,ab}$	108,89	m <sup>3</sup> / h	
36	Sizing				
37	Certified mass flow	$q_{m,zu}$	1461,27	kg/h	
38	Certified volume flow (working condition)	$q_{vb,zu}$	18,28	m <sup>3</sup> / h	
39	Certified volume flow (standard condition)	$q_{vn,zu}$	1170,01	m <sup>3</sup> / h	
40	Maximum mass flow	$q_{m,max}$	1623,63	kg/h	
41	Maximum volume flow (working condition)	$q_{vb,max}$	20,31	m <sup>3</sup> / h	
42	Maximum volume flow (standard condition)	$q_{vn,max}$	1300,01	m <sup>3</sup> / h	
43	Capacity exceed		974,5	%	
44	Required effective discharge area	$A_{0,Req}$	7,31	mm <sup>2</sup>	
45	Required discharge diameter	$d_{0,Req}$	3,051	mm	
46	Noise level in 1m distance from the valve (acc. to VDI 2713)	L	84,6	dB	
47	Reaction force (calculated acc. to W. Gossiau and K. Weyl)	$F_R$	148,848	N	

<b>LESER</b>		Sizing acc. to AD 2000:A2 / TRD 421 for gases  VALVESTAR® - v 6.3.1		Page:	2 of 3	
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				Project:	Kosice Tank Farm	
				Tag-No:	Z 73115	
				Commision-No:		
48	<b>Valve - Partlist</b>					
49	Pos	Denomination	Q	DIN	ASME	
50	1	Inlet body	1	1.4404	316L	
51	2	Outlet body	1	1.4404	316L	
52	7	Disc incl. detachable lifting	1	1.4404	316L	
53	12	Spindle	1	1.4404	316L	
54	16	Spring plate	2	1.4404	316L	
55	18	Adjusting screw	1	1.4404	316L	
56	19	Lock nut	1	1.4404	316L	
57	54	Spring	1	1.4310	Low temperature alloy steel	
58	57	Pin	1	1.4310	Low temperature alloy steel	
59	61	Ball washer	1	1.3541/1.4401	Stainless steel	
	Name:	Hakon Rlbsamen	Hakon Rlbsamen			
	Date:	25.04.2005	25.04.2005			
	Rev.No:	1	2			

**LESER**

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