


// UN GÜLTIG //

 <b>AIR LIQUIDE</b> Air Liquide AGS GmbH	<b>Item:</b>	Safety valve	<b>Page:</b>	38 / 154
	<b>Plant:</b>	A690 / L110	<b>Date:</b>	03.01.2005
	<b>Location:</b>	Kosice	<b>Rev:</b>	0
	<b>Project:</b>	K70101 ASU No. 9 Kosice	<b>Vendor:</b>	
	<b>By</b>	<b>TV PV</b>	<b>Spec-ID:</b>	SP198

Procurement: IA.Z

ITEM	Unit	
<b>TAG Number</b>		<b>Z44052</b>
Service		LAR pump recycle
Fluid name		Argon
Location/ line No		#042
Gauge pressure		
normal operation	bar g	0,5
outlet	bar g	0
design	bar g	
set pressure gauge	bar g	5
Operating temperature	°C	-165      -182
Design temperature	°C	
Temperature at no flow	°C	ambient      ambient
Required capacity	Nm³/h	
Required capacity	kg/h	2036      25463
Fluid density	kg/m³	30      1369
Phase		vapour      liquid
Sizing basis		thermal expansion or recycle from P48001
Valve type		
Manufacturer		
Material	body/spring disc/seat	

**Notes:**

(1) Required capacity [kg/h] = Surface [m²] \* Gas flow [kg/m²s] / Insulation factor \* 3600 s/h

Pipe diameter: 60 mm  
Pipe length: 15 m  
Gas flow: 0,20 kg/m²s (Standard 54010, Argon)  
Insulation factor 1  
Resulting required capacity 2036 kg/h

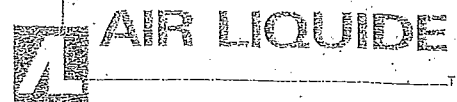
(2) Maximum capacity P48001 at set pressure 310 l/min

4				5			
2				3			
0	03.01.2005	JJ	TV	1			
rev	date	name	checked	rev	date	name	checked

File:

Z44052, Z 44062

Best-Nr. 4500025872



# Konformitätserklärung nach Druckgeräterichtlinie 97/23/EG

*Declaration of conformity in acc. to the pressure equipment directive 97/23/EC*

**Hersteller:** Air Liquide Deutschland GmbH  
**Manufacturer:** Füttingsweg 34  
D-47805 Krefeld

**Bezeichnung des Druckgerätes:**  
*Definition of the pressure equipment:*

Erzeugnis Product	Type	Zertifikat-Nr. der EG-Baumusterprüfung Certificate No of the EC-type-examination
Vollhub-Sicherheits- ventil Safety valve	MG-84 (S;A;P;G;M;K;E)	01 202 111-B-00034

**Festgelegte Kategorie:** IV  
*Defined category:*

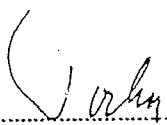
**Angewandte Konformitätsbewertungsverfahren:**  
*Applied conformity assessment procedures:*

Modul module	Bewertungsverfahren assessment procedure
B	EG-Baumusterprüfung EC-type examination
F	EG-Einzelprüfung EC-individual examination

**Angewandte Regelwerke:** AD 2000- Merkblatt A2, VdTÜV- Merkblatt SV 100  
*Applied standards:* AD 2000- Merkblatt A4

Die EG-Prüfung nach Modul F und die jährliche Kontrolle der Fertigung wurde durch die Benannte Stelle, Kennnummer 0035 durchgeführt. Der unterzeichnende Hersteller bestätigt hiermit, dass Konstruktion, Herstellung und Prüfung der hiermit aufgeführten Erzeugnisse den Anforderungen der Druckgeräterichtlinie entspricht.


**The EC-examination acc. to module F and the annual inspection of the production were performed by the notified body, Ident.-No 0035. The signing manufacturer confirms that the design, manufacturing and inspection of the listed products on the back page meet the requirements of the pressure equipment directive.**

  
(Klaus Tocha, CE-Beauftragter Sicherheitsverantwortlicher)

Sitz der Gesellschaft: Krefeld  
Registergericht: Amtsgericht Krefeld, Reg.-Nr. HRB 10252-  
Vorsitzender des Aufsichtsrates: Jürgen Reimnitz  
Geschäftsführung: Markus Sieverding (Vors.), Willi Brinkmann, Arno Sander

"UN65LT16"

<b>LESER</b>		Sizing acc. to AD 2000:A2 / TRD 421 for liquids  VALVESTAR® - v 6.3.1		Page:	1 of 3
				Date:	24.04.2005
				Project:	Kosice ASU
				Tag-No:	Z 44052
				Commission-No:	
Project: Kosice ASU					
Contractor: Air Liquide GmbH					
1	Valve - General				
2	Article number	4414.4644			
3	Lift characteristic steam/gas	Full Lift Safety Valve			
4	Lift characteristic liquid	Safety Relief Valve			
5	Bonnet / Lifting Device	Lifting device H4 (gastight)			
6	Certified coefficient of discharge for steam and gases	$\alpha_{d,BG}$	0,7		
7	Certified coefficient of discharge for liquid	$\alpha_{d,F}$	0,45		
8	Valve - Construction				
9	Minimum discharge area	$A_0$	415,48	mm <sup>2</sup>	
10	Flow diameter	$d_0$	23	mm	
11	Nominal diameter inlet	DN/NPS	25		
12	Pressure rating inlet	PN/PR	PN 40		
13	Contact facing inlet		Form C		
14	Nominal diameter outlet	DN/NPS	40		
15	Pressure rating outlet	PN/PR	PN 16		
16	Contact facing outlet		Form C		
17	Valve - Dimensions				
18	Centre to face dimension	a	100	mm	
19	Centre to face dimension	b	105	mm	
20	Height	H	234	mm	
21	Weight	M	9	kg	
22	Medium				
23	Name	Argon			
24	Formula				
25	Density	$\rho$	1369	kg / m <sup>3</sup>	
26	Service condition				
27	Set pressure	p	5	bar-g	
28	Constant back pressure	$p_{af}$	0	bar-g	
29	Built up - back pressure	$p_{ae}$	0	bar-a	
30	Superimposed back pressure			bar-g	
31	Overpressure	dp	10	%	
32	Environmental pressure	$p_u$	1,013	bar-a	
33	Temperature	T	-182	C	
34	Required massflow	$q_{m,ab}$	25463	kg/h	
35	Sizing				
36	Certified mass flow	$q_{m,zu}$	26120,39	kg/h	
37	Certified volume flow (working condition)	$q_{vb,zu}$	19,08	m <sup>3</sup> / h	
38	Maximum mass flow	$q_{m,max}$	29022,66	kg/h	
39	Maximum volume flow (working condition)	$q_{vb,max}$	21,20	m <sup>3</sup> / h	
40	Capacity exceed		2,6	%	
41	Required effective discharge area	$A_{0,req}$	405,02	mm <sup>2</sup>	
42	Required discharge diameter	$d_{0,Req}$	22,709	mm	
43	Reaction force (calculated acc. to W. Gossiau and K. Weyl)	$F_R$	37,779	N	

		Sizing acc. to AD 2000:A2 / TRD 421 for liquids  VALVESTAR® - v 6.3.1		Page:	2 of 3
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				Project:	Kosice ASU
				Tag-No:	Z 44052
				Commision-No:	
44	Valve - Partlist				
45	Pos	Denomination	Q	DIN	ASME
46	1	Body	1	1.4408	SA-351/CF8M
47	5	Seat	1	1.4404	316L
48	7	Disc	1	1.4404	316L
49	8	Guide	1	1.4404	316L
50	9	Bonnet	1	1.4408	SA-351/CF8M
51	12	Spindle	1	1.4404	316L
52	14	Split ring	2	1.4404	316L
53	16	Spring plate	2	1.4404	316L
54	18	Adjusting screw	1	1.4404	316L
55	19	Lock nut	1	1.4404	316L
56	41	Lever cover H4	1	1.4408	SA-351/CF8M
57	43	Lever H4	1	1.4301	304
58	44	Lifting fork	1	1.4571	316Ti
59	45	Shaft	1	1.4404	316L
60	46	Spindle cap	1	1.4404	316L
61	47	packing gland H4	1	1.4404	316L
62	54	Spring	1	1.4310	Low temperature alloy steel
63	54	Spring	1	1.1200	Carbon steel
64	55	Bolt	4	1.4401	B8M
65	56	Nut	4	1.4401	B8M
66	57	Pin	1	1.4310	Low temperature alloy steel
67	59	Securing ring	1	1.4571	316Ti
68	60	Gasket	1	Reingraphit + 1.4401	Pure graphite/ss
69	61	Ball washer	1	1.3541/1.4401	Stainless steel
70	74	Pin	1	1.4401	B8M
71	75	Spacer	1	1.4571	316Ti
72	81	Washer	1	1.4401	B8M
73	82	Nut	1	A2 / Poly	Stainl. steel/polyamid
74	85	Lead seal	1	Kunststoff	Plastic
75	86	Seal wire	1	1.4541	321
76	86	Seal wire	1	1.4541	321
77	89	grafite ring	1	Reingraphit	Pure graphite
78	91	Securing ring	1	1.4571	316Ti
79	98	sealing plug	1	1.4435	316L
	Name:	My PC	Hakon Røbsamen		
	Date:	24.04.2005	22.04.2005		
	Rev.No:	1	2		

<b>LESER</b>	Sizing acc. to AD 2000:A2 / TRD 421 for liquids  VALVESTAR® - v 6.3.1	Page:	3 of 3
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