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WEKA SAP fabrication reference no.: **C-... Rev. -, ... (tba in case of order)**
WEKA offer no.: **C-13733, Rev. -, 13.04.2011**
Customer: **NIKHEF - National Institute for Subatomic Physics**
Science Park 105, NL-1098 XG Amsterdam, The Netherlands
Purchase order no.: **-**
Project: **E-Mail dated 06.04.2011 - LN2-Control Valve**

1	WEKA item no.:	**000010**
2	Customer item no.:	
3	Description:	- i-p cryogenic control valve for G/LN2 consisting of:
4		cryogenic valve, pneum. diaphragm actuator, i-p positioner SAMSON 3730-0
5		- top load type cryogenic valve with inherent convection stop
6		- q-ring spindle seal
7		- angle pattern body with standard butt weld ends
8		- cryogenic length & weld-in flange for vacuum isolation
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25	customer's valve Tag no. / valve identification no:	
26	Component:	
27	Component, circuit, function, application, line:	
28	WEKA Drawing no.:	
29	Delivery :	
30	WEKA SAP fabrication reference no.:	
31	Number(s) of valve(s) each item:	**1**
32	Fluid, service and design conditions:	L/GN2@77...323K
33		p(service)<=10bar / p(design)=16bar
34	Type:	**PM-TEQV**
35	DN/PN:	**DN4/PN16**
36	Function:	C-Po
37	Cryogenic length h (mm):	600
38	Thermal contact, cat.-no. 930435, h1 (mm):	-
39	Dia. of vacuum weld in flange, dia. (mm):	dia. 60
40	Material code for body, seat seal and sealing:	316L/AlBz/Ms-PTFE-NBR
41	Shut-off pressure (bar):	<=10bar
42	Type of manual drive, dia. of hand wheel (mm):	-
43		
44	Supply air pressure (SAC) or Supply air filter-pressure control (SAFC):	-
45	Type and dia. (mm) of pneumatic diaphragm actuator:	PA15A6 - dia. 160
46		standard execution, air piping Ms-Al/PE
47	Supply air pressure min/max (barg):	min 3.0barg/max 6.0barg
48	Supply air pressure control valve (SAC) or	-
49	Supply air filter-pressure control valve (SAFC):	
50	I-p positioner:	Samson 3730-0
51		sidewise on actuators leg
52		
53		
54		
55		
56	Signal:	4...20mA = 0...100% travel
57		2-wire, power supply by signal
58	3/2-way solenoid valve MV	-
59	including plug, LED and protection diode:	
60	ES or IS to indicate valve end-position(s) O and/or C, mounted:	-
61		
62	kv(requested), (kv=Cv*0.86 or Cv=1.16*Kv):	
63	kv(calc):	see kv-calculation enclosed
64	kv(max, executed):	0.06 lin
65	kv(max. possible) by changing of flow plug, Cv=kv*0.86:	0.6 eq-% or lin
66	Type and part no. of flow plug:	4/10-1.2 / part no. ...
67	Dia. of valve orifice bore - valve travel (mm):	dia. 4.0 - travel 10.0
68	Butt weld ends D*s of inlet & outlet (mm):	dia. 13.0*1.5
69	Heat load by conductivity of solids with indicate h / h1 (W):	to 77K: <0.75W
70	Directive 97/23/EC, PED conformity assessment:	- Fluid Group 2, DN<=32 or PS*DN<=1000
71		- Cat.: Art 3.3! / Marking: PED Art.3.3
72	WEKA Catalogue no. and delivery standard no.	- Standard valves to cat.-no. WEKA_19911004/19930219
73	for execution, tests and documentation:	- Standard delivery to spec.-no. WEKA_20041222 - modified
74	Notes:	
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84		
85	Key:	PM-TEQV DN4/PN16 C-Po 600/- dia. 60
86	**Price in EUR each valve:**	
87	Cryogenic control valve as described:	4'353.00
88	-:	0.00
89	-:	0.00
90	-:	0.00
91	-:	0.00
92	-:	0.00
93	-:	0.00
94	-:	0.00
95	-:	0.00
96	-:	0.00
97	-:	0.00
98	-:	0.00
99	-:	0.00
100	-:	0.00
101	-:	0.00
102	**EUR gross each valve:**	4'353.00
103	Discount for Quantity:	0.00%
104	EUR each valve considering discount for quantity:	4'353.00
105	EUR gross each item:	4'353.00
106	EUR each valve net i.e. less discounts quantity & order value:	3'830.64
107	**EUR net each item:**	**3'830.64**

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WEKA SAP fabrication reference no.:
WEKA offer no.:
Customer:

Purchase order no.:
Project:

1	WEKA item no.:	**000020**
2	Customer item no.:	
3	Description:	
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25	customer's valve Tag no. / valve identification no:	
26	Component:	
27	Component, circuit, function, application, line:	
28	WEKA Drawing no.:	
29	Delivery :	
30	WEKA SAP fabrication reference no.:	
31	Number(s) of valve(s) each item:	
32	Fluid, service and design conditions:	
33		
34	Type:	
35	DN/PN:	
36	Function:	
37	Cryogenic length h (mm):	
38	Thermal contact, cat.-no. 930435, h1 (mm):	
39	Dia. of vacuum weld in flange, dia. (mm):	
40	Material code for body, seat seal and sealing:	
41	Shut-off pressure (bar):	
42	Type of manual drive, dia. of hand wheel (mm):	
43		
44	Supply air pressure (SAC) or Supply air filter-pressure control (SAFC):	
45	Type and dia. (mm) of pneumatic diaphragm actuator:	
46		
47	Supply air pressure min/max (barg):	
48	Supply air pressure control valve (SAC) or	
49	Supply air filter-pressure control valve (SAFC):	
50	I-p positioner:	
51		
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55		
56	Signal:	
57		
58	3/2-way solenoid valve MV	
59	including plug, LED and protection diode:	
60	ES or IS to indicate valve end-position(s) O and/or C, mounted:	
61		
62	kv(requested), (kv=Cv*0.86 or Cv=1.16*Kv):	
63	kv(calc):	
64	kv(max, executed):	
65	kv(max. possible) by changing of flow plug, Cv=kv*0.86:	
66	Type and part no. of flow plug:	
67	Dia. of valve orifice bore - valve travel (mm):	
68	Butt weld ends D*s of inlet & outlet (mm):	
69	Heat load by conductivity of solids with indicate h / h1 (W):	
70	Directive 97/23/EC, PED conformity assessment:	
71		
72	WEKA Catalogue no. and delivery standard no.	
73	for execution, tests and documentation:	
74	Notes:	
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84		
85	Key:	/
86	**Price in EUR each valve:**	
87	Cryogenic control valve as described:	0.00
88	-:	0.00
89	-:	0.00
90	-:	0.00
91	-:	0.00
92	-:	0.00
93	-:	0.00
94	-:	0.00
95	-:	0.00
96	-:	0.00
97	-:	0.00
98	-:	0.00
99	-:	0.00
100	-:	0.00
101	-:	0.00
102	**EUR gross each valve:**	0.00
103	Discount for Quantity:	0.00%
104	EUR each valve considering discount for quantity:	0.00
105	EUR gross each item:	0.00
106	EUR each valve net i.e. less discounts quantity & order value:	0.00
107	**EUR net each item:**	**0.00**

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Customer: **NIKHEF - National Institute for Subatomic Physics**
Science Park 105, NL-1098 XG Amsterdam, The Netherlands
Purchase order no.: **-**
Project: **E-Mail dated 06.04.2011 - LN2-Control Valve**

1	WEKA item no.:	**000030 - Summary**	
2	Customer item no.:		
3	Description:	**a) Summary of Number:**	
4		Numbers of valves total:	**1**
5–24			
25	customer's valve Tag no. / valve identification no:		
26	Component:		
27	Component, circuit, function, application, line:		
28	WEKA Drawing no.:		
29	Delivery :		
30	WEKA SAP fabrication reference no.:		
31	Number(s) of valve(s) each item:		
32	Fluid, service and design conditions:		
33			
34	Type:		
35	DN/PN:		
36	Function:		
37	Cryogenic length h (mm):		
38	Thermal contact, cat.-no. 930435, h1 (mm):		
39	Dia. of vacuum weld in flange, dia. (mm):		
40	Material code for body, seat seal and sealing:		
41	Shut-off pressure (bar):		
42	Type of manual drive, dia. of hand wheel (mm):		
43			
44	Supply air pressure (SAC) or Supply air filter-pressure control (SAFC):		
45	Type and dia. (mm) of pneumatic diaphragm actuator:		
46			
47	Supply air pressure min/max (barg):		
48	Supply air pressure control valve (SAC) or		
49	Supply air filter-pressure control valve (SAFC):		
50	I-p positioner:		
51–55			
56	Signal:		
57			
58	3/2-way solenoid valve MV		
59	including plug, LED and protection diode:		
60	ES or IS to indicate valve end-position(s) O and/or C, mounted:		
61			
62	kv(requested), (kv=Cv*0.86 or Cv=1.16*Kv):		
63	kv(calc):		
64	kv(max. executed):		
65	kv(max. possible) by changing of flow plug, Cv=kv*0.86:		
66	Type and part no. of flow plug:		
67	Dia. of valve orifice bore - valve travel (mm):		
68	Butt weld ends D*s of inlet & outlet (mm):		
69	Heat load by conductivity of solids with indicate h / h1 (W):		
70	Directive 97/23/EC, PED conformity assessment:		
71			
72	WEKA Catalogue no. and delivery standard no.		
73	for execution, tests and documentation:	Packing charges of about 0.8...1.2% of net purchase order value, depending on total value net.	
74	Notes:		
75		Charges for delivery FCA CH-8344 Bäretswil, of about EUR 50.00...80.00 each delivery.	
76			
77		Delivery DDP, named place in NL min EUR 150.00 or	
78		of about 3.2...3.7% of net purchase value. To be confirmed with WEKA!	
79		Payment conditions:	
80		100% payment 30 days net after delivery, all payment by bank transfer	
81		Delivery time:	
82		Of about 6 weeks after technical and commercial clear and confirmed purchase order,	
83		subject to previous sale and depending on execution, numbers of valves will be purchased.	
84		Earlier part delivery to be agreed in case of purchasing.	
85	Key:		
86	**Price in EUR each valve:**	**b) Price summary:**	
87	Cryogenic control valve as described:	- Price as indicated bellow, EUR total net, EXW:	3'830.64
88	-:	- Costs for packing, EUR total net:	35.00
89	-:	- Costs for delivery FCA, EUR total net:	0.00
90	-:	- Costs for delivery DDP named place in NL EUR total net:	137.00
91	-:	- Costs for special payment, EUR total net:	0.00
92	-:	**- EUR total net, DDP NIKHEF, NL-1098 XG Amsterdam, The Netherlands:**	**4'002.64**
93	-:		
94–101	-:		
102	**EUR gross each valve:**	**Discount on gross project value to expect in case of uncut purchasing:**	**12.0%**
103	Discount for Quantity:		
104	EUR each valve considering discount for quantity:		
105	EUR gross each item:	**EUR gross total project value:**	**4'353.00**
106	EUR each valve net i.e. less discounts quantity & order value:		
107	**EUR net each item:**	**= EUR total net, unpacked, EXW Switzerland:**	**3'830.64**

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Purchase order no.: **-**
Project: **E-Mail dated 06.04.2011 - LN2-Control Valve**

1	WEKA item no.:	**000240 - Technical information**
2	Customer item no.:	
3	Description:	**Valve design:**
4		**a) Technical characteristics:**
5		- Cryogenic valve with extended body/spindle, bellows sealed with back-up sealing and
6		test connection, size M4
7		- Bellows spindle assembly dismountable from the top
8		- Angle pattern body with weld-in flange for vacuum isolation on the top
9		- All valves are usable either as control valves as shut-off or digital valves
10		- Rangeability of control valves i.e. kv @ travel just >0% : kv @ travel=100% as standard ca. 1:100,
11		however this value is also depending on valve, higher values are possible on request
12		- Shape of flow control characteristic adjustable for linear or equal-% or specials or digital/shut-off
13		- Eq-% characteristics are linear modified to achieve kv=0 @ travel just >0%
14		- Standard flow plugs are assumed for an eq-% characteristic ca. 1:100 also modified to 0
15		**b) Actuation**
16		- Actuated with pneumatic diaphragm actuator either "normally closed" (i.e. powerless or w/o
17		air-supply pressure valve in closed position or "normally open" (i.e. powerless or w/o
18		air-supply pressure valve in open position
19		- Actuator are able to modify into normally open or normally closed function at site
20		- Control valves with added on digital electropneumatic positioner type as described
21		As standard positioner is mounted sidewise on actuators leg.
22		Several option for positioner as indicated in the catalogue are possible
23		Execution "external potentiometer" or external electronics" on request.
24		- Shut-off or digital valves will be guided by powering the added on 3/2-way solenoid pilot valve
25	customer's valve Tag no. / valve identification no:	**c) Materials:**
26	Component:	ca) Cryogenic valve:
27	Component, circuit, function, application, line:	- body, spindle, bellows: ss 316L i.e. EN 1.4404, 1.4432 or 1.4435
28	WEKA Drawing no.:	- upper part, upper part for manual valves, union nut: brass
29	Delivery:	- flow plug, guiding tacks: Al-Bz¨- seat seal: PTFE
30	WEKA SAP fabrication reference no.:	- o-ring seals, back up sealing: NBR
31	Number(s) of valve(s) each item:	cb) pneumatic diaphragm actuator:
32	Fluid, service and design conditions:	- legs, coupling, screws, springs, spring disc: c-steel galvanic corrosion protected
33		- casings: c-steel Epoxy coated, in blue
34	Type:	- diaphragm: PA netting, NBR matrix
35	DN/PN:	cd) i-p positioner: SIPART PS2 or ARCApro or SAMSON 3730, several types available:
36	Function:	- casing: Al, Epoxy coated
37	Cryogenic length h (mm):	**d) Assembling, testing, cleanliness:**
38	Thermal contact, cat.-no. 930435, h1 (mm):	- According standard delivery for WEKA Cryogenic Valves no. 20041222
39	Dia. of vacuum weld in flange, dia. (mm):	- Cleanliness according to ISO23208-2005 for cryogenic and O2-service, assembled
40	Material code for body, seat seal and sealing:	and tested in dust free clean room according to DIN25410, category 2
41	Shut-off pressure (bar):	**e) Abbreviations:**
42	Type of manual drive, dia. of hand wheel (mm):	- PM-TEV = pneumatic cryogenic valve, bellows sealed, angle pattern, diaphragm actuator
43		- HIs-TEV = manual cryogenic valve, bellows sealed, angle pattern, integral manual drive
44	Supply air pressure (SAC) or Supply air filter-pressure control (SAFC):	
45	Type and dia. (mm) of pneumatic diaphragm actuator:	- HIe-TEV = manual cryogenic valve, bellows sealed, angle pattern, integral manual drive, possible
46		to mount ES (micro-switches) or IS (inductive sensors) in O and/or C position(s)
47	Supply air pressure min/max (barg):	- HL-TEV = manual cryogenic valve, bellows sealed, angle pattern, possible to add ES or IS
48	Supply air pressure control valve (SAC) or	- PM-TEQV = pneumatic cryogenic valve, q-ring sealed , angle pattern, diaphragm actuator
49	Supply air filter-pressure control valve (SAFC):	- HIs-TEQV = manual cryogenic valve, q-ring sealed, angle pattern, integral manual drive
50	I-p positioner:	- HIe-TEQV = manual cryogenic valve, q-ring sealed, angle pattern, integral manual drive, possible
51		to mount ES (micro-switches) or IS (inductive sensors) in O and/or C position(s)
52		- HL-TEQV = manual cryogenic valve, q-ring sealed, angle pattern, possible to add ES or IS
53		- DN = Nominal size of valve / PN = nominal pressure of valve
54		- C-Po = control valve, normally closed i.e. powerless or w/o air supply valve in closed position
55		- C-Ps = control valve, normally open i.e. powerless or w/o air supply valve in open position
56	Signal:	- D-Po = digital valve, normally closed i.e. powerless or w/o air supply valve in closed position
57		- D-Ps = digital valve, normally open i.e. powerless or w/o air supply valve in open position
58	3/2-way solenoid valve MV	- D-man = digital valve, manual drive
59	including plug, LED and protection diode:	- digital valve = shut-off valve
60	ES or IS to indicate valve end-position(s) O and/or C, mounted:	- SAC = air supply pressure regulator, including gauge
61		- SAFC = air supply filter pressure regulator, including gauge
62	kv(requested), (kv=Cv*0.86 or Cv=1.16*Kv):	**f) Climatic classes, rated values:**
63	kv(calc):	a) Cryogenic valve: -200°C to 80°C
64	kv(max, executed):	Allowed temperature in service: - 30°C to 80°C
65	kv(max. possible) by changing of flow plug, Cv=kv*0.86:	Allowed ambient temperature in service: - 30°C to 80°C
66	Type and part no. of flow plug:	- for reference only: FPM q- & o-ring seals: - 15°C to 200°C
67	Dia. of valve orifice bore - valve travel (mm):	- for reference only: NBR q- & o-ring seals: - 30°C to 100°C
68	Butt weld ends D*s of inlet & outlet (mm):	(NBR is not recommended for fluids with high content of O2 gas!)
69	Heat load by conductivity of solids with indicate h / h1 (W):	- for reference only: EPDM o-ring seals: - 40°C to 160°C
70	Directive 97/23/EC, PED conformity assessment:	- for reference only: MVQ o-ring seals: - 60°C to 200°C
71		b) Diaphragm actuators type MA:
72	WEKA Catalogue no. and delivery standard no.	Allowed ambient temperature in service: - 30°C to 80°C
73	for execution, tests and documentation:	c) Positioner:
74	Notes:	Allowed ambient temperature in service: - 30°C to 80°C
75		Allowed ambient temperature for storage: - 40°C to 80°C
76		
77		
78		Remarks:
79		*1) Following calculation schema is to apply to calculate for air pressure consumption:
80		- Constant air consumption of positioner: 40Nl/h
81		- Air consumption of actuator: Actuators volume for on travel for MA16A 0.2Nl * min needed
82		air supply to fully open the valve 3.0bar i.e. 4barg * number of cycles per hour * security factor
83		for air supply leaks etc. 5
84		- Example: Assumed for 100 full openings in one hour,
85	Key:	(0.2Nl*4.0bar*100 cycles/h + 40Nl/h)*5 = 400Nl/h = min air supply in Nl/h for planning
86	**Price in EUR each valve:**	
87	Cryogenic control valve as described:	
88	-:	
89	-:	
90	-:	
91	-:	
92	-:	
93	-:	
94	-:	
95	-:	
96	-:	
97	-:	
98	-:	
99	-:	
100	-:	
101	-:	
102	**EUR gross each valve:**	
103	Discount for Quantity:	
104	EUR each valve considering discount for quantity:	
105	EUR gross each item:	
106	EUR each valve net i.e. less discounts quantity & order value:	
107	**EUR net each item:**	