Base Load Power Hub (BLPH)

TECHNICAL DATASHEET for SDV/BDV and Tight Shut-Off XV Valves

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Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ACCEPTED FOR CONSTRUCTION (AFC)
02	ACCEPTED FOR CONSTRUCTION (AFC) Note: updated operating close and opening time
03	ACCEPTED FOR CONSTRUCTION (AFC) Note: revised according the open points of your CRS

HOLDS LIST

No.	Description

GENERAL REQUIREMENTS / NOTES

1) Valve design code shall be API-6D/ ASME-16.34 as per Valve Data sheets (123A90-DDL-PP-DS-70003 DS -Manual Valves).

2) All valves shall have fire-safe or fire-tested design and capability of meeting the requirements of API 6 FA, BS 6755 part 2 and API 607 as applicable.

3) Where required, tight shutoff (TSO) shall be in accordance with ISO5208 Rate A.

4) For shut down (SDV) and blow down valves (BDV), the actuator sizing shall be calculated according to specified criteria. Actuators shall be sized such that it is able to close/open the valve with the maximum operating pressure acting upstream and atmospheric pressure acting downstream (max. differential pressure) within the specified time, taking into consideration minimum actuation medium supply pressure.

5) This datasheet is to be read in conjunction with following documents:
   a) Material Requisition (123A90-DDL-IN-MR-40037);
   b) Specification for Piping Material Classes (123A90-DDL-PP-SP-70000);
   c) Valve Data sheets (123A90-DDL-PP-DS-70003).

6) The Valves shall be a completely assembled unit including the actuators, limit switches etc.

7) All materials and electronic items shall be suitable for use in marine environment.

8) Ambient Temperature Min: -8.4 °C, Norm: 10.5 °C, Max: +25.0 °C.

9) All Electrical equipment shall be Atex certified Exd IIC (or IIB+H2) T1, with ingression protection IP66.

10) All flanges in ASME B31.3 and ASME B31.12 shall be Raised Face type.

11) Each actuator shall be pneumatic and single acting (with scotch-yoke design for protective application).

12) The valve maximum closing time shall be 1 sec/valve inch and max opening time shall be 3 sec/valve inch for fail close valves. For fail open valves, the maximum closing time shall be 3 sec/valve inch and maximum opening time shall be 1 sec/valve inch speed.

13) SDV and BDV valve actuators will be sized to produce twice of the required valve torque at each of valve unseating, run, and valve reseating torques (in both directions), calculated at the valve body design differential pressure with zero pressure downstream. XV valve actuators shall be as per above safety system actuators, except sizing safety factor can be 1.5 times.

14) Actuator and valve including accessories for SDV/BDV shall be SIL 2 minimum certified and shall Comply with SIL/LOPA Study requirement.

15) Solenoid valves shall be direct-operated (24Vdc, low power), have magnetically actuated plunger, spring return, auto-reset, NAMUR NE 19 mounting, whilst exhaust shall be protected from blockage by ice, insects etc.

16) The solenoid coil and spring shall be selected to provide sufficient operational power to position the valve stem correctly under all process conditions. Coils shall be rated for continuous operation and fitted with surge suppression diode.

17) Limit switches shall be Hermetically-sealed H CLASS insulated proximity switches as per IEC60947-5-2/3/6 and provided with terminal box (minimum two entry, dedicated for each signal). Mechanical indicator (Red for Close position & Green for open position) shall be provided

18) Wherever specified, valve open, valve close and partial stroke limit switches shall be mounted on the valve and operate at less than 5 % of the valve travel from their respective limits.

19) Pneumatic tubing and fittings shall be AISI 316L stainless steel with exception of seawater (intake) systems for which the proper material alloy 2507 (UNS S32750) shall be considered. Fittings (Twin-ferrule compression type) and tubing shall be provided by primary manufacture.

20) Material test certificates MTCs shall be provided by Manufacturer for all valves, tubing & fittings. MTCs shall include EN 10204 3.1 certification for all metallic materials.

21) PED 2014/68/EU Pressure Equipment Directive 2014/68/EU shall apply~~ for all piping materials where Category (HOLD 3) is applicable~~.

22) The instrument air supply is available at the following pressure:
   Normal: 9 barg; Minimum: 4 barg; Maximum: 10 barg, Design: 11 barg.
   Actuator and accessories shall be sizing considering above instrument air pressure.

23) Valve including accessories shall be provided with 316 SS identification tag, permanently attached.

24) Stainless steel material shall be dual certified type (i.e. SS 316 / 316L).

GENERAL REQUIREMENTS / NOTES

25) Complete valve inspection and testing requirements shall comply to Material Requisition (123A90-DDL-IN-MR-40037) document.

26) Vendor is responsible for selection of suitable wetted parts material applicable to the specific service condition.

27) The SS nameplate shall indicate the tag number, manufacture name, model number, serial number, size, rating, certification data, and other items as required.

28) The colour of the actuator shall be Standard Vendor.

29) Information with asterisk (*) shall be confirmed or provided by manufacturer according to the service condition.

30) Valve & Actuator orientation shall be finalized by Purchaser as per plant 3D model requirements, Vendor shall submit GA drawings for purchaser's approval before assembly.

31) The Valve accessories shall be mounted on a suitable plate and shall be provided with mounting accessories.

32) Vendor shall provide provision for applying lubrication to gland packing (as applicable).

33) All valves on HYDROGEN service shall be provided with certified packing for Fugitive Emissions in accordance with ISO 15848-1 Cl B and ISO 15848-2.

34) In accordance with TSS - Manual Valves and Strainers 123A90-DDL-PP-SP-70030.

35) Painting and coating in accordance with Coating and Painting Specification 123A90-DDL-MAT-SP-60006.

36) TBD= To Be Defined.

37) PST functionality to be quoted as option including partial stroke limit switch.

38) In-line (process connections) Gasket and Bolting shall be supplied by Contractor.

39) HART revision 7 protocol is required for all electronic device 4-20mA Smart type.

40) 25-BDV-003 valve shall be quoted as option.

GENERAL	1	Tag Number	Location				25-BDV-005		25
	2	Service					HYDROGEN STORAGE TANK V-25001A DEPRESS.		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80015		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					4"-HY-142-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet			4" / 3.05 mm		4" / 3.05 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum	Max		[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close : 12 sec		Open : 4 sec
	17	Operation (seconds)	Actual				Close : 1,00		Open : 2,00
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BA03C01RFH)		
	21	Body Size	Body Form				4"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316/316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		055-250A/CA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				OPEN		OPEN
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-BDY-005 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-005 - Soldo SQN120E-20X23L7		25-ZSH-005 - Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location				25-BDV-007		25
	2	Service					HYDROGEN STORAGE TANK V-25001B DEPRESS.		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80016		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					4"-HY-167-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet			4" / 3.05 mm		4" / 3.05 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi		[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close : 12 sec		Open : 4 sec
	17	Operation (seconds)	Actual				Close : 1,00		Open : 2,00
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BA03C01RFH)		
	21	Body Size	Body Form				4"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316/316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		055-250A/CA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				OPEN		OPEN
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-BDY-007 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-007- Soldo SQN120E-20X23L7		25-ZSH-005- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			25-BDV-010		25
	2	Service				HYDROGEN STORAGE TANK V-25001C DEPRESS.		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80017		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				4"-HY-171-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		4" / 3.05 mm		4" / 3.05 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close : 12 sec		Open : 4 sec
	17	Operation (seconds)	Actual			Close : 1,00		Open : 2,00
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BA03C01RFH)		
	21	Body Size	Body Form			4"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316/316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		055-250A/CA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			OPEN		OPEN
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-BDY-010 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-010- Soldo SQN120E-20X23L7		25-ZSH-010- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location			25-BDV-013	25
	2	Service				HYDROGEN STORAGE TANK V-25001D DEPRESS.	
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80018	Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				4"-HY-175-03HSS-N	
	5	Line Size and Schedule	Inlet	Outlet		4" / 3.05 mm	4" / 3.05 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L	NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN	
	8	Fluid State	Phase			GAS	GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40	
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29	80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40	
	14						
	15						
	16	Speed of	Design			Close : 12 sec	Open : 4 sec
	17	Operation (seconds)	Actual			Close : 1,00	Open : 2,00
	18						
	19						
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BA03C01RFH)	
	21	Body Size	Body Form			4"	FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L	N.A.
	23	Connections	Rating			FLANGED ASME B16.5	#300
	24	Flange Finish	Gasket Material			RF	VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite	N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M	
	27	Trim Material	Ball	Stem	Seat	A182 F316/316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598	
	29	Fire Safe				API 6FA	
ACTUATOR	30	Manufacturer	Type			Rotork	Spring Return
	31	Model No.	Size			CP/S	055-250A/CA
	32	Actuator Orientation	Actuator Form			Horizontal	Cylinder
	33	Ingress Protection	Certification			IP-66	II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			OPEN	OPEN
	36	Fireproofing				NOT APPLICABLE	
	37	Solenoid Valve				25-BDY-013 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid	
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-013- Soldo SQN120E-20X23L7	25-ZSH-013- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED	
	40	Air Set	Handwheel			4 barg	NOT REQUIRED
	41	Mounting Position				HORIZONTAL	
	42	Partial Stroke Test Facility				NOT REQUIRED	
	43	Control Type				-	
	44	Electrical Connection	Electrical Class			M20	H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-	
	47	Safety Valve	Model			-	-
	48	Check Valve	Mounting			-	-
PURCHASE	49	Manufacturer				FLUITEK	
	50	Model				FB2	
	51	Purchase Order Number				1724000204	

GENERAL	1	Tag Number	Location			25-BDV-016		25
	2	Service				HYDROGEN STORAGE TANK V-25001E DEPRESS.		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80019		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				4"-HY-180-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		4" / 3.05 mm		4" / 3.05 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close : 12 sec		Open : 4 sec
	17	Operation (seconds)	Actual			Close : 1,00		Open : 2,00
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BA03C01RFH)		
	21	Body Size	Body Form			4"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316/316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		055-250A/CA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			OPEN		OPEN
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-BDY-016 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-016- Soldo SQN120E-20X23L7		25-ZSH-016- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location				25-BDV-019		25
	2	Service					HYDROGEN STORAGE TANK V-25001F DEPRESS.		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80020		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					4"-HY-184-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet			4" / 3.05 mm		4" / 3.05 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi		[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close :	12 sec	Open : 4 sec
	17	Operation (seconds)	Actual				Close :	1,00	Open : 2,00
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BA03C01RFH)		
	21	Body Size	Body Form				4"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316/316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		055-250A/CA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				OPEN		OPEN
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-BDY-019 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-019- Soldo SQN120E-20X23L7		25-ZSH-019- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location				25-BDV-022		25
	2	Service					HYDROGEN TO FUEL CELL PACKAGE DEPRESS.		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80014		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-HY-144-03HSS-N		
	5	Line Size and Schedule		Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi		[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close : 3 sec		Open : 1 sec
	17	Operation (seconds)	Actual				Close : 0,47		Open : 0,40
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form				1"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				OPEN		OPEN
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-BDY-022 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-022- Soldo SQN120E-20X23L7		25-ZSH-022- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			25-SDV-001		25
	2	Service				HYDROGEN TO STORAGE TANKS		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80013		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-007-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	-	5	65
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual			Close :	0,48	Open : 0,41
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/AA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-SDY-001 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-001- Soldo SQN120E-20X23L7		25-ZSH-001- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location				25-SDV-023		25
	2	Service					HYDROGEN TO FUEL CELL PACKAGE		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80014		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1-1/2"-HY-148-03HSS-N		
	5	Line Size and Schedule		Inlet		Outlet	1-1/2" / 3.68 mm		1-1/2" / 3.68 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum		Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close :	1.5 sec	Open : 4.5 sec
	17	Operation (seconds)	Actual				Close :	1,00	Open : 2,00
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form				1-1/2"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem		Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-130A/CA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max		Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-SDY-004 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-023- Soldo SQN120E-20X23L7		25-ZSH-023- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			64-SDV-001		64
	2	Service				NITROGEN TO H2 STORAGE VESSELS INLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80027		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-N-128-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				NITROGEN GAS		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	6	-	-
	10	Design Pressure	Full Vacuum		[barg]	10		
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-46		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	10		
	14							
	15							
	16	Speed of	Design			Close : 1 sec		Open : 3 sec
	17	Operation (seconds)	Actual			Close : 0,47		Open : 0,40
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFHS)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-080A/AA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				64-SDY-001 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			64-ZSL-001- Soldo SQN120E-20X23L7		64-ZSH-001- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location			25-XV-004		25
	2	Service				HYDROGEN STORAGE TANK V-25001A INLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80015		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-015-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	-	5	65
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close : 1 sec		Open : 3 sec
	17	Operation (seconds)	Actual			Close : 0,45		Open : 0,41
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-004 -FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-004- Soldo SQN120E-20X23L7		25-ZSH-004- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location			25-XV-006		25
	2	Service				HYDROGEN STORAGE TANK V-25001A OUTLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80015		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-026-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual			Close :	0,46	Open : 0,41
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-006- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-006- Soldo SQN120E-20X23L7		25-ZSH-006- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location				25-XV-008		25	
	2	Service					HYDROGEN STORAGE TANK V-25001B INLET			
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80016		Zone 2, Gas Group IIC (or IIB+H2), Class T1	
PIPELINE	4	Line Number					1"-HY-016-03HSS-N			
	5	Line Size and Schedule	Inlet	Outlet			1" / 3.38 mm		1" / 3.38 mm	
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)	
PROCESS DATA	7	Fluid					HYDROGEN			
	8	Fluid State	Phase				GAS		GAS	
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30	
	10	Design Pressure	Full Vacuum			[barg]	40			
	11	Operating Temperature Norm/Min/Max				[°C]	-	5	65	
	12	Design Temperature	Minimum	Maxi		[°C]	-29		80	
	13	Max. Diff. Pressure for Actuator Size				[bar]	40			
	14									
	15									
	16	Speed of	Design				Close :	1 sec	Open :	3 sec
	17	Operation (seconds)	Actual				Close :	0,41	Open :	0,40
	18									
	19									
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)			
	21	Body Size	Body Form				1"		FULL BORE	
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.	
	23	Connections	Rating				FLANGED ASME B16.5		#300	
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE	
	25	Packing	Lubrication & Isolation				Graphite		N.A.	
	26	Bolting					A193 B8M / A194 Gr. 8M			
	27	Trim Material	Ball	Stem	Seat		A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE	
	28	Leakage Class					(1, 3) TSO			
	29	Fire Safe					API 6FA			
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return	
	31	Model No.	Size				CP/S		035-100A/BA	
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder	
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb	
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg	
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE	
	36	Fireproofing					NOT APPLICABLE			
	37	Solenoid Valve					25-XY-008 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid			
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-008- Soldo SQN120E-20X23L7		25-ZSH-008- Soldo SQN120E-20X23L7	
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED			
	40	Air Set	Handwheel				4 barg		NOT REQUIRED	
	41	Mounting Position					HORIZONTAL			
	42	Partial Stroke Test Facility					NOT REQUIRED			
	43	Control Type					-			
	44	Electrical Connection	Electrical Class				M20		H	
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-		-	-
	46	No of Strokes Per Capacity					-			
	47	Safety Valve	Model				-		-	
	48	Check Valve	Mounting				-		-	
PURCHASE	49	Manufacturer					FLUITEK			
	50	Model					FB2			
	51	Purchase Order Number					1724000204			

GENERAL	1	Tag Number	Location				25-XV-009		25
	2	Service					HYDROGEN STORAGE TANK V-25001B OUTLET		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80016		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-HY-132-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet			1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi		[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close : 1 sec		Open : 3 sec
	17	Operation (seconds)	Actual				Close : 0,49		Open : 0,41
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form				1"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-XY-009- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-009- Soldo SQN120E-20X23L7		25-ZSH-009- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			25-XV-011		25
	2	Service				HYDROGEN STORAGE TANK V-25001C INLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80017		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-017-03HSS-N		
	5	Line Size and Schedule	Inlet		Outlet	1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	-	5	65
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close : 1 sec		Open : 3 sec
	17	Operation (seconds)	Actual			Close : 0,46		Open : 0,49
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-011 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-011- Soldo SQN120E-20X23L7		25-ZSH-011- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location				25-XV-012	25
	2	Service					HYDROGEN STORAGE TANK V-25001C OUTLET	
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80017	Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-HY-133-03HSS-N	
	5	Line Size and Schedule	Inlet	Outlet			1" / 3.38 mm	1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L	NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN	
	8	Fluid State	Phase				GAS	GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40	
	11	Operating Temperature Norm/Min/Max				[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi		[°C]	-29	80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40	
	14							
	15							
	16	Speed of	Design				Close : 1 sec	Open : 3 sec
	17	Operation (seconds)	Actual				Close : 0,39	Open : 0,40
	18							
	19							
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)	
	21	Body Size	Body Form				1"	FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L	N.A.
	23	Connections	Rating				FLANGED ASME B16.5	#300
	24	Flange Finish	Gasket Material				RF	VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite	N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M	
	27	Trim Material	Ball	Stem	Seat		A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598	
	29	Fire Safe					API 6FA	
ACTUATOR	30	Manufacturer	Type				Rotork	Spring Return
	31	Model No.	Size				CP/S	035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal	Cylinder
	33	Ingress Protection	Certification				IP-66	II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE	CLOSE
	36	Fireproofing					NOT APPLICABLE	
	37	Solenoid Valve					25-XY-012- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid	
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-012- Soldo SQN120E-20X23L7	25-ZSH-012- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED	
	40	Air Set	Handwheel				4 barg	NOT REQUIRED
	41	Mounting Position					HORIZONTAL	
	42	Partial Stroke Test Facility					NOT REQUIRED	
	43	Control Type					-	
	44	Electrical Connection	Electrical Class				M20	H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-	
	47	Safety Valve	Model				-	-
	48	Check Valve	Mounting				-	-
PURCHASE	49	Manufacturer					FLUITEK	
	50	Model					FB2	
	51	Purchase Order Number					1724000204	

GENERAL	1	Tag Number	Location				25-XV-014		25
	2	Service					HYDROGEN STORAGE TANK V-25001D INLET		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80018		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-HY-018-03HSS-N		
	5	Line Size and Schedule		Inlet		Outlet	1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max				[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum			[barg]	40		
	11	Operating Temperature Norm/Min/Max				[°C]	-	5	65
	12	Design Temperature	Minimum		Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size				[bar]	40		
	14								
	15								
	16	Speed of	Design				Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual				Close :	0,49	Open : 0,38
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form				1"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem		Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min		Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-XY-014-FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-014- Soldo SQN120E-20X23L7		25-ZSH-014- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			25-XV-015		25
	2	Service				HYDROGEN STORAGE TANK V-25001D OUTLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80018		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-134-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close : 1 sec		Open : 3 sec
	17	Operation (seconds)	Actual			Close : 0,45		Open : 0,42
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-015 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-015- Soldo SQN120E-20X23L7		25-ZSH-015- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location			25-XV-017		25
	2	Service				HYDROGEN STORAGE TANK V-25001E INLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80019		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-019-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	-	5	65
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual			Close :	0,51	Open : 0,38
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-017 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-017- Soldo SQN120E-20X23L7		25-ZSH-017- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location				25-XV-018		25
	2	Service					HYDROGEN STORAGE TANK V-25001E OUTLET		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80019		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-HY-135-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet			1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]		-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]		40		
	11	Operating Temperature Norm/Min/Max			[°C]		AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]		-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]		40		
	14								
	15								
	16	Speed of	Design				Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual				Close :	0,45	Open : 0,40
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form				1"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					25-XY-018 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				25-ZSL-018- Soldo SQN120E-20X23L7		25-ZSH-018- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			25-XV-020		25
	2	Service				HYDROGEN STORAGE TANK V-25001F INLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80020		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-020-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	-	5	65
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual			Close :	0,47	Open : 0,40
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-020- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-020- Soldo SQN120E-20X23L7		25-ZSH-020- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location			25-XV-021		25
	2	Service				HYDROGEN STORAGE TANK V-25001F OUTLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80020		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-HY-136-03HSS-N		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid				HYDROGEN		
	8	Fluid State	Phase			GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30
	10	Design Pressure	Full Vacuum		[barg]	40		
	11	Operating Temperature Norm/Min/Max			[°C]	AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80
	13	Max. Diff. Pressure for Actuator Size			[bar]	40		
	14							
	15							
	16	Speed of	Design			Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual			Close :	0,48	Open : 0,40
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				25-XY-021- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-021- Soldo SQN120E-20X23L7		25-ZSH-021- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL		
	42	Partial Stroke Test Facility				NOT REQUIRED		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location			25-XV-024		25	
	2	Service				HYDROGEN TO STORAGE TANKS DEPRESS.			
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80013		Zone 2, Gas Group IIC (or IIB+H2), Class T1	
PIPELINE	4	Line Number				1"-HY-143-03HSS-N			
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm	
	6	Line Material	Line Insulation			ASTM A312/TP316/316L		NOT INSUL. (PAINTED)	
PROCESS DATA	7	Fluid				HYDROGEN			
	8	Fluid State	Phase			GAS		GAS	
	9	Operating Pressure Norm/Min/Max			[barg]	-	7.5	30	
	10	Design Pressure	Full Vacuum		[barg]	40			
	11	Operating Temperature Norm/Min/Max			[°C]	-	5	65	
	12	Design Temperature	Minimum	Maxi	[°C]	-29		80	
	13	Max. Diff. Pressure for Actuator Size			[bar]	40			
	14								
	15								
	16	Speed of	Design			Close :	1 sec	Open :	3 sec
	17	Operation (seconds)	Actual			Close :	0,47	Open :	0,42
	18								
	19								
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS03C01RFH)			
	21	Body Size	Body Form			1"		FULL BORE	
	22	Body Material	Bonnet Type			ASTM A182 F316/316L		N.A.	
	23	Connections	Rating			FLANGED ASME B16.5		#300	
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE	
	25	Packing	Lubrication & Isolation			Graphite		N.A.	
	26	Bolting				A193 B8M / A194 Gr. 8M			
	27	Trim Material	Ball	Stem	Seat	A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE	
	28	Leakage Class				Table 5 API 598			
	29	Fire Safe				API 6FA			
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return	
	31	Model No.	Size			CP/S		035-100A/BA	
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder	
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb	
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg	
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE	
	36	Fireproofing				NOT APPLICABLE			
	37	Solenoid Valve				25-XY-024- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid			
	38	Limit Switch Closed	Limit Switch Open			25-ZSL-024- Soldo SQN120E-20X23L7		25-ZSH-024- Soldo SQN120E-20X23L7	
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED			
	40	Air Set	Handwheel			4 barg		NOT REQUIRED	
	41	Mounting Position				HORIZONTAL			
	42	Partial Stroke Test Facility				NOT REQUIRED			
	43	Control Type				-			
	44	Electrical Connection	Electrical Class			M20		H	
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-		-	-
	46	No of Strokes Per Capacity				-			
	47	Safety Valve	Model			-		-	
	48	Check Valve	Mounting			-		-	
PURCHASE	49	Manufacturer				FLUITEK			
	50	Model				FB2			
	51	Purchase Order Number				1724000204			

GENERAL	1	Tag Number	Location				50-XV-001		50
	2	Service					SEA WATER P-50001A DISCHARGE		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80021		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1-1/2"-SWS-031-01SD-E		
	5	Line Size and Schedule	Inlet	Outlet			1-1/2" / 3.68 mm		1-1/2" / 3.68 mm
	6	Line Material	Line Insulation				ASTM A790 UNS S32760		ELECTRICALLY HEAT TRACED
PROCESS DATA	7	Fluid					SEA WATER SUPPLY		
	8	Fluid State	Phase				LIQUID		LIQUID
	9	Operating Pressure Norm/Min/Max	[barg]				15	-	-
	10	Design Pressure	Full Vacuum	[barg]			17.7		
	11	Operating Temperature Norm/Min/Max	[°C]				22	-	-
	12	Design Temperature	Minimum	Maxi	[°C]		-29		100
	13	Max. Diff. Pressure for Actuator Size	[bar]				17.7		
	14								
	15								
	16	Speed of	Design				Close : 1.5 sec		Open : 4.5 sec
	17	Operation (seconds)	Actual				Close : 0,38		Open : 0,38
	18								
	19								
VALVE BODY (34)	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS01F01RF)		
	21	Body Size	Body Form				1-1/2"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F53		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#150
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B7 +HDG / A194 Gr. 2H + HDG		
	27	Trim Material	Ball	Stem	Seat		ASTM A182 F53	ASTM A182 F53	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					50-XY-001- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				50-ZSL-001- Soldo SQN120E-20X23L7		50-ZSH-001- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL / VERTICAL		
	42	Partial Stroke Test Facility					-		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location			50-XV-002		50
	2	Service				SEA WATER P-50001A INLET		
	3	P&ID Number	Area Classification			123A90-DDL-PR-PID-80021		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number				1"-SWS-146-01SD-E		
	5	Line Size and Schedule	Inlet	Outlet		1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation			ASTM A790 UNS S32760		ELECTRICALLY HEAT TRACED
PROCESS DATA	7	Fluid				SEA WATER SUPPLY		
	8	Fluid State	Phase			LIQUID		LIQUID
	9	Operating Pressure Norm/Min/Max			[barg]	-	ATM	15
	10	Design Pressure	Full Vacuum		[barg]	17.7		
	11	Operating Temperature Norm/Min/Max			[°C]	-	-	-
	12	Design Temperature	Minimum	Maxi	[°C]	-29		100
	13	Max. Diff. Pressure for Actuator Size			[bar]	17.7		
	14							
	15							
	16	Speed of	Design			Close : 1 sec		Open : 3 sec
	17	Operation (seconds)	Actual			Close : 1,00		Open : 2,00
	18							
	19							
VALVE BODY	20	Body Type				BALL VALVE (FLOATING BALL) - SPLIT BODY (BS01F01RF)		
	21	Body Size	Body Form			1"		FULL BORE
	22	Body Material	Bonnet Type			ASTM A182 F53		N.A.
	23	Connections	Rating			FLANGED ASME B16.5		#150
	24	Flange Finish	Gasket Material			RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation			Graphite		N.A.
	26	Bolting				A193 B7 +HDG / A194 Gr. 2H + HDG		
	27	Trim Material	Ball	Stem	Seat	ASTM A182 F53	ASTM A182 F53	RPTFE
	28	Leakage Class				Table 5 API 598		
	29	Fire Safe				API 6FA		
ACTUATOR	30	Manufacturer	Type			Rotork		Spring Return
	31	Model No.	Size			CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form			Horizontal		Cylinder
	33	Ingress Protection	Certification			IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design	4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure			CLOSE		CLOSE
	36	Fireproofing				NOT APPLICABLE		
	37	Solenoid Valve				50-XY-002 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open			50-ZSL-002- Soldo SQN120E-20X23L7		50-ZSH-002- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)				NOT REQUIRED		
	40	Air Set	Handwheel			4 barg		NOT REQUIRED
	41	Mounting Position				HORIZONTAL / VERTICAL		
	42	Partial Stroke Test Facility				-		
	43	Control Type				-		
	44	Electrical Connection	Electrical Class			M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code			-	-	-
	46	No of Strokes Per Capacity				-		
	47	Safety Valve	Model			-		-
	48	Check Valve	Mounting			-		-
PURCHASE	49	Manufacturer				FLUITEK		
	50	Model				FB2		
	51	Purchase Order Number				1724000204		

GENERAL	1	Tag Number	Location				50-XV-003		50
	2	Service					SEA WATER P-50001B DISCHARGE		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80021		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1-1/2"-SWS-033-01SD-E		
	5	Line Size and Schedule	Inlet	Outlet			1-1/2" / 3.68 mm		1-1/2" / 3.68 mm
	6	Line Material	Line Insulation				ASTM A790 UNS S32760		ELECTRICALLY HEAT TRACED
PROCESS DATA	7	Fluid					SEA WATER SUPPLY		
	8	Fluid State	Phase				LIQUID		LIQUID
	9	Operating Pressure Norm/Min/Max			[barg]		15	-	-
	10	Design Pressure	Full Vacuum		[barg]		17.7		
	11	Operating Temperature Norm/Min/Max			[°C]		22	-	-
	12	Design Temperature	Minimum	Maxi	[°C]		-29		100
	13	Max. Diff. Pressure for Actuator Size			[bar]		17.7		
	14								
	15								
	16	Speed of	Design				Close :	1.5 sec	Open : 4.5 sec
	17	Operation (seconds)	Actual				Close :	0,39	Open : 0,40
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS01F01RF)		
	21	Body Size	Body Form				1-1/2"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F53		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#150
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B7 +HDG / A194 Gr. 2H + HDG		
	27	Trim Material	Ball	Stem	Seat		ASTM A182 F53	ASTM A182 F53	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					50-XY-003 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				50-ZSL-003- Soldo SQN120E-20X23L7		50-ZSH-003- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL / VERTICAL		
	42	Partial Stroke Test Facility					-		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location				50-XV-004		50
	2	Service					SEA WATER P-50001B INLET		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80021		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-SWS-147-01SD-E		
	5	Line Size and Schedule	Inlet	Outlet			1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A790 UNS S32760		ELECTRICALLY HEAT TRACED
PROCESS DATA	7	Fluid					SEA WATER SUPPLY		
	8	Fluid State	Phase				LIQUID		LIQUID
	9	Operating Pressure Norm/Min/Max			[barg]		-	ATM	15
	10	Design Pressure	Full Vacuum		[barg]		17.7		
	11	Operating Temperature Norm/Min/Max			[°C]		-	-	-
	12	Design Temperature	Minimum	Maxi	[°C]		-29		100
	13	Max. Diff. Pressure for Actuator Size			[bar]		17.7		
	14								
	15								
	16	Speed of	Design				Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual				Close :	1,00	Open : 2,00
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS01F01RF)		
	21	Body Size	Body Form				1"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F53		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#150
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B7 +HDG / A194 Gr. 2H + HDG		
	27	Trim Material	Ball	Stem	Seat		ASTM A182 F53	ASTM A182 F53	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					50-XY-004 -FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				50-ZSL-004- Soldo SQN120E-20X23L7		50-ZSH-004- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL / VERTICAL		
	42	Partial Stroke Test Facility					-		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location				80-XV-001		80
	2	Service					HYDROGEN TO FUEL CELL PACKAGE VENTED		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80012		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1"-HY-163-01HSS-N		
	5	Line Size and Schedule	Inlet	Outlet			1" / 3.38 mm		1" / 3.38 mm
	6	Line Material	Line Insulation				ASTM A312/TP316/316L		NOT INSUL. (PAINTED)
PROCESS DATA	7	Fluid					HYDROGEN		
	8	Fluid State	Phase				GAS		GAS
	9	Operating Pressure Norm/Min/Max			[barg]		-	3.5	6.5
	10	Design Pressure	Full Vacuum		[barg]		10		
	11	Operating Temperature Norm/Min/Max			[°C]		AMB	-	-
	12	Design Temperature	Minimum	Maxi	[°C]		-29		100
	13	Max. Diff. Pressure for Actuator Size			[bar]		10		
	14								
	15								
	16	Speed of	Design				Close :	1 sec	Open : 3 sec
	17	Operation (seconds)	Actual				Close :	1,00	Open : 2,00
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS01C01RFH)		
	21	Body Size	Body Form				1"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F316/316L		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#300
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B8M / A194 Gr. 8M		
	27	Trim Material	Ball	Stem	Seat		A182 F316 / 316L	API 6A CRA UNS N07718	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-080A/AA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					80-XY-021 - FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				80-ZSL-021- Soldo SQN120E-20X23L7		80-ZSH-021- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL		
	42	Partial Stroke Test Facility					NOT REQUIRED		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

GENERAL	1	Tag Number	Location				50-XV-005		50
	2	Service					SEA WATER P-50001A DISCHARGE		
	3	P&ID Number	Area Classification				123A90-DDL-PR-PID-80021		Zone 2, Gas Group IIC (or IIB+H2), Class T1
PIPELINE	4	Line Number					1-1/2"-SWS-031-01SD-E		
	5	Line Size and Schedule	Inlet	Outlet			1-1/2" / 3.68 mm		1-1/2" / 3.68 mm
	6	Line Material	Line Insulation				ASTM A790 UNS S32760		ELECTRICALLY HEAT TRACED
PROCESS DATA	7	Fluid					SEA WATER SUPPLY		
	8	Fluid State	Phase				LIQUID		LIQUID
	9	Operating Pressure Norm/Min/Max				[barg]	15	-	-
	10	Design Pressure	Full Vacuum			[barg]	17.7		
	11	Operating Temperature Norm/Min/Max				[°C]	22	-	-
	12	Design Temperature	Minimum	Maxi		[°C]	-29		100
	13	Max. Diff. Pressure for Actuator Size				[bar]	17.7		
	14								
	15								
	16	Speed of	Design				Close :	1.5 sec	Open : 4.5 sec
	17	Operation (seconds)	Actual				Close :	0,26	Open : 0,46
	18								
	19								
VALVE BODY	20	Body Type					BALL VALVE (FLOATING BALL) - SPLIT BODY (BS01F01RF)		
	21	Body Size	Body Form				1-1/2"		FULL BORE
	22	Body Material	Bonnet Type				ASTM A182 F53		N.A.
	23	Connections	Rating				FLANGED ASME B16.5		#150
	24	Flange Finish	Gasket Material				RF		VITON GLT AED+GRAPHITE
	25	Packing	Lubrication & Isolation				Graphite		N.A.
	26	Bolting					A193 B7 +HDG / A194 Gr. 2H + HDG		
	27	Trim Material	Ball	Stem	Seat		ASTM A182 F53	ASTM A182 F53	RPTFE
	28	Leakage Class					Table 5 API 598		
	29	Fire Safe					API 6FA		
ACTUATOR	30	Manufacturer	Type				Rotork		Spring Return
	31	Model No.	Size				CP/S		035-100A/BA
	32	Actuator Orientation	Actuator Form				Horizontal		Cylinder
	33	Ingress Protection	Certification				IP-66		II 2 G Ex h IIC T5 Gb
	34	Air Supply	Min	Max	Design		4 barg	10 barg	11 barg
	35	Action on Air Failure	Action on Power Failure				CLOSE		CLOSE
	36	Fireproofing					NOT APPLICABLE		
	37	Solenoid Valve					50-XY-001- FP06P-S1-04-32-NU-V-77A-24D-57 Bifold solenoid		
	38	Limit Switch Closed	Limit Switch Open				50-ZSL-001- Soldo SQN120E-20X23L7		50-ZSH-001- Soldo SQN120E-20X23L7
	39	Elect. Reset Pushbutton (Actuator mounted)					NOT REQUIRED		
	40	Air Set	Handwheel				4 barg		NOT REQUIRED
	41	Mounting Position					HORIZONTAL / VERTICAL		
	42	Partial Stroke Test Facility					-		
	43	Control Type					-		
	44	Electrical Connection	Electrical Class				M20		H
EMERGENCY A/S VESSEL	45	Capacity	Fabrication Code				-	-	-
	46	No of Strokes Per Capacity					-		
	47	Safety Valve	Model				-		-
	48	Check Valve	Mounting				-		-
PURCHASE	49	Manufacturer					FLUITEK		
	50	Model					FB2		
	51	Purchase Order Number					1724000204		

TAGNAME	TYPOLOGY	P&ID	SIZE	CLASS	RATING	FLANGES	B. MATERIAL	TYPICAL	TSO	AIR FAIL	FULL BORE
25-BDV-022	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80014	1"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-BDV-005	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80015	3"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-BDV-007	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80016	3"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-BDV-010	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80017	3"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-BDV-013	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80018	3"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-BDV-016	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80019	3"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-BDV-019	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80020	3"	03HSS	#300	B31.12	SS	4	-	FO	YES
25-SDV-001	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80013	1"	03HSS	#300	B31.12	SS	2	-	FC	YES
25-SDV-023	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80014	1,5"	03HSS	#300	B31.12	SS	2	-	FC	YES
25-XV-004	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80015	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-006	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80016	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-008	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80016	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-009	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80016	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-011	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80017	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-012	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80017	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-014	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80018	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-015	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80018	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-017	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80019	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-018	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80019	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-020	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80020	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-021	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80020	1"	03HSS	#300	B31.12	SS	1	-	FC	YES
25-XV-024	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80014	1,5"	03HSS	#300	B31.12	SS	1	-	FC	YES
50-XV-001	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80021	1,5"	01SD	#150	B31.3	SD	1	-	FC	YES
50-XV-002	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80021	1"	01SD	#150	B31.3	SD	1	-	FC	YES
50-XV-003	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80021	1,5"	01SD	#150	B31.3	SD	1	-	FC	YES
50-XV-004	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80021	1"	01SD	#150	B31.3	SD	1	-	FC	YES
80-XV-001	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80012	1"	01HSS	#150	B31.12	SS	1	-	FC	YES
64-SDV-001	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80027	1"	01CS	#300	B31.3	CS	2	-	FC	YES
50-XV-005	ON-OFF BALL VALVE	123A90-DDL-PR-PID-80021	1,5"	01SD	#150	B31.3	SD	1	-	FC	YES