طرح نگهداشت و افزایش تولید 27 مخزن

DATA SHEETS FOR CONTROL/REGULATOR VALVES - EXTENSION OF BINAK B/C MANIFOLD

نگهداشت و افزایش تولید میدان نفتی بینک

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D01	JUN.2022	IFA	P.Hajisadeghi	M.Fakharian	M.Mehrshad	
D00	MAR.2022	IFC	P.Hajisadeghi	M.Fakharian	M.Mehrshad	
Rev.	**Date**	**Purpose of Issue / Status**	**Prepared by:**	**Checked by:**	**Approved by:**	**Client Approval**

Class: 2 — **Client Doc. Number: F9Z-707976**

status:

IDC: Inter-Discipline Check

IFC: Issued For Comment

IFA: Issued For Approval

AFD: Approved For Design

AFC: Approved For Construction

AFP: Approved For Purchase

AFQ: Approved For Quotation

IFI: Issued For Information

AB-R: As-Built for CLIENT Review

AB-A: As-Built –Approved

شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
053 - 073 – 9184	BK	W007S	PEDCO	110	IN	DT	0006	D02

REVISION RECORD SHEET

Page	D00	D01	D02	D03	D04	Page	D00	D01	D02	D03	D04
1	X	X	X			65					
2	X	X	X			66					
3	X	X				67					
4	X	X				68					
5	X	X	X			69					
6	X	X	X			70					
7	X	X	X			71					
8	X	X	X			72					
9	X	X	X			73					
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62						126					
63						127					
64						128					

REFERENCE DOCUMENTS :

Specification For Instrumentation	BK-GNRAL-PEDCO-000-IN-SP-0001
Process Basis Of Design	BK-GNRAL-PEDCO-000-PR-DB-0001
P&ID - Extension of Binak B/C Manifold	BK-W007S-PEDCO-110-PR-PI-0001
Piping Material Specification	BK-SSGRL-PEDCO-110-PI-SP-0001
Instrument & Control System Design Criteria	BK-SSGRL-PEDCO-110-IN-DC-0002
Process Flow Diagram - Extension of Binak B/C Manifold	BK-W007S-PEDCO-110-PR-PF-0001
Specification for Control Valve	BK-GNRAL-PEDCO-000-IN-SP-0005
Process Design Criteria	BK-GNRAL-PEDCO-000-PR-DC-0001

شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: 4 از 10
053 - 073 – 9184	BK	W007S	PEDCO	110	IN	DT	0006	D02	

GENERAL NOTES:

1-The electrical equipment shall be suitable for hazardous area Zone 2, gas group IIB, temperature class T4.

2-Flow direction shall be specified on the valve body.

3- All flanges shall be in accordance with ASME B16.5.

4- Each valve shall be furnished with name plate as per "specification for control valves" with No. "BK-GNRAL-PEDCO-000-IN-SP-0005".

5- The following items shall be considered:

Design standard for globe valves: IPS-M-IN-160, BS1873

Design standard for plug valves: IPS-M-IN-160 API 599

Valve bonnet and bottom flanges shall be of bolted construction with fully retained gaskets

Trim and seat shall be easily replaceable. seat should be damped or backed up by a seat retainer

Packing material / Packing construction: Teflon/Chevron type

Material test certificate

Dimensional check

Hydrostatic test

Performance and mechanical operation test

Testy certificate including pressure test, visual, Dimensional and nude

Seal leakage test

Casting examination for valves 6 inches and larger in class 600 and higher as per ANSI B 16.34

Casting quality valves shall NDT (RT tested)

Mill test certificate for all metallic parts

6- Screwed bolt-type limit stops, e.g. on the control valve stem, adjustable over the full length of the stroke shall be applied. the vendor shall set the limit/travel stops at the required minimum or maximum valve opening.

7- Environmental Condition For Field Instrumentation Of BINAK oilfield Shall Be Considered As Per The Following:

Maximum ambient temperature: 50 (°C)
Minimum ambient temperature: -5 (°C)
Maximum steel surface exposed to sun: 85 (°C)
Maximum summer dry bulb: - (°C)
DB/RH for Summer HVAC Design: 41 °C / 61 % (Note */ Note**)
DB FOR Winter HVAC Design: 6 °C Note *

* Refer to " HVAC Design Criteria; N.I.O.C. NO.: F-1-B-422001".
** Refer to “NISOC Meteorological Studies Report".

Relative Humidity:

Maximum Design relative humidity (%): 100Minimum Design relative humidity (%): 0

8- Below content to be considered in process condition for all control valves:

H2S Mol% = W007S ,W035 , W028 , W046S =0.0003 / W018S , W008N = 0.0004

CO2 Mol%= W007S ,W035 , W028 , W046S = 0.0014 / W018S, W008N = 0.0022

CL- Content in formation water is 133504 ppm

MAX. Water CUT: ASMARI =20% , BANGESTAN =60%

9- All Control valves shall be IP 65 and weather proof.

10- Standard ISA75.01 for sizing of Control valves shall be considered by vendor.

11- In accordance to IPS-E-IN-160, Control valve body size normally shall not be less than half of normal line size.

12- 2 Nos. Eye-Bolt and 2 Nos. Jack Bolt for each valve to be supplied by vendor.

13- Quick Change Trim type control valve to be designed by vendor.

14- Main parameters such as Noise level, vibration, actuator sizing, valve construction material, CV factor, Fluid specification, … to be specified as per standard by vendor.

15- The stroking time shall be lower than 5 second for valves up to 4” and 1 second per inch diameter for bigger ones. (VTC)

16- Actuators shall be sized for a minimum air pressure of 3 barg. The normal operating pressure is 4 barg, and the maximum operating pressure is 10 barg. The capacity of the secured instrument air buffer vessel shall be sized for a minimum instrument air supply pressure of 3 barg.

نگهداشت و افزایش تولید میدان نفتی بینک

فعالیت های رو زمینی در بسته‌های کاری تحت‌الارض

ساخت موقعیت چاه، تأسیسات سرچاهی، خطوط جریانی، تسهیلات

برق‌رسانی مربوط به موقعیت W007S و توسعه چندراهه کلاستر بینک

DATA SHEETS FOR CONTROL/REGULATOR VALVES - EXTENSION OF BINAK B/C MANIFOLD

شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: 5 از 10
053 - 073 – 9038	BK	W007S	PEDCO	110	IN	DT	0006	D02	

Control Valve

D02

GENERAL	1	Tag No.			FCV-1701A		
	2	Service			FROM W018S		
	3	Line No.	P&ID No.		CRD-110-171A-FN05-4"-PT	BK-W007S-PEDCO-110-PR-PI-0001 (3 of 6)	
	4	Area Classification			Zone 2, IIB,T4		
	5	Ambient Temperature °C	Min.	Max.	-5	50	
	6	Available Air Supply Pressure barg	Min.	Max.	3	8	
	7	Nace Requirement:			Required		
PIPE & LINE	8	Pipe Class	Pipe Sch.		FN05	SCH. 80	
	9	Pipe Line Insulation |Line Size	Pipe Material		PT / 4"	API 5L GR.B, SMLS, BE, ASME, B36.10M	
PROCESS CONDITIONS	10	Fluid			Crude oil		
	11	State			mixed / 3phase		
	12	Valve Design Pressure(barg)/ Actuator Shut Off Pressure DP			93/93		
	13				Units	Max	Norm.	Min.
	14	Flow Rate(vapor/liquid)			kg/h	195.88/12285.84	178.076/11168.95	59.35/3722.98
	15	Inlet Pressure			bar-g	12.78	12.78	12.78
	16	Pressure Drop			bar	2		
	17	Inlet Temperature(max)			°C	36.15		
		Molecular Weight(MIX)				65.08		
	18	Liquid Specific Gravity (Gl) / Gas Specific Gravity				0.909/0.39		
	19	Compressibility Factor(Z)(vapour)			-	0.9525		
	20	Viscosity (vapour/oil/water)			cP	0.011/8.89/0.69		
	21	Specific Heats Ratio(Cp/Cv) (vapour/liquid)			-	1.27/1.13		
	22	Vapour Pressure			bar-g	52.57		
	23	Critical Pressure (liquid)			bar-g	291.2		
CALCULATED RESULTS	24	Flow Coefficient Cv (max-case)			-	BY VENDOR		
	25	Travel (max-case)			%	BY VENDOR		
	26	Sound Pressure Level			dBA	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)

BODY AND TRIM(Note 6)	27	Body size		2" (VTC)		POSITIONER (Note 5)	50	Type	Electro-Pneumatic Smart
	28	Rated Cv		(NOTE 4)			51	Input Signal	4~20 mA-HART Smart
	29	End conn. & Rating IN/OUT		2" # 600 / 2" # 600 (VTC)			52	Power Supply	24 VDC loop powered
	30	Body/Bonnet Material		ASTM A216 GR. WCB			53	Electrical Connection	ISO M20x 1.5
	31	Body/Bonnet Type		GLOBE / Bolted Flange Bonnet			54	FlowDirection	Flow to Open(VTC)
							55	Lock Last Position	Failure Position/Close
	32	Flow Direction		(NOTE 4)			56	Output Signal	3-15 Psi
	33	Packing Material		P.T.F.E.			57	I.P./Ex.Protec. / Gauge	65 / EExia / Yes
	34	Trim Type		SINGLE SEATED/CAGE			58	MFR/Model / LCD requirement	(NOTE 4) / Yes
	35	Characteristic		EQUAL PERCENTAGE (VTC)		SOLENOID VALVE	59	Type / Qty.	N/A / N/A
	36	Guiding		(NOTE 4)			60	MFR / Model	N/A / N/A
	37	Rated Travel		(NOTE 4)			61	I.P. / Ex.Protec.	N/A / N/A
	38	Plug/Disk Material		SS316			62	MFR / Model	N/A / N/A
	39	Seat Material		SS316		SWITCHES	63	Type / Qty.	N/A / N/A
	40	Cage/Guid Material		SS316			64	Power Supply	N/A
	41	Stem Material		SS316			65	Contacts / Rating	N/A
	42	Trim Material		SS316			66	Switching Position	N/A
	43	MFR	Model	(NOTE 4)	(NOTE 4)		67	I.P. / Ex.Protec.	N/A / N/A
							68	MFR / Model	N/A / N/A
ACTUTOR	44	Size	Eff.Area	(NOTE 4)	(NOTE 4)	AIR SET	69	Set Pressure	Yes (NOTE 4)
	45	Air Failure	Handwheel	FAIL CLOSE	TOP MOUNTED		70	Filter / Gauge	Yes / Yes
	46	Air Action	Orientation	AIR TO OPEN	VERT. UP		71	Pnumatic Conn.	1/4 " NPTF
	47	Actuator Type		spring return and diaphragm type			72	MFR / Model	(NOTE 4) / (NOTE 4)
	48	AIR Press. Min/ Max/ Des. (Barg)		4 (Note3)	7.5 / 8.5	TESTS	73	Hydro. Pressure	API 598
	49	MFR	Model	(NOTE 4)	(NOTE 4)		74	Leakage Class	ANSI IV
							75	Performance Test	Required
						OPTIONS	76	Internal Tubing	Required(with Double Ferrule Compression conn.)
							77	Tube Material	316 S.S L
PURCHASE		Manufacturer		(Note 4)			78	Cable Gland	M20, Nickel plated brass
		Model		(Note 4)			79	Cable Entry	M20 x 1.5

NOTES:

1- All materials shall be in accordance with 'Piping Material Specification' ,"Document No.: BK-SSGRL-PEDCO-110-PI-SP-0001".

2- VTA: Vendor To Advise VTC: Vendor To Confirm

3- Minimmum of instrument air pressure supply is 4 barg but 3 barg as minimmum working pressure, shall be considered for actuator sizing .

4- Shall be stated by vendor at quotaion stage.

5- Bypass line and isolating valve shall be considered for valve positioner by vendor.

6- Trim part material shall be considered as minimum 316SS or any equal hard steel.

Control Valve

D02

GENERAL	1	Tag No.			FCV-1701B	
	2	Service			FROM W046S	
	3	Line No.	P&ID No.		CRD-110-171B-FN05-4"-PT	BK-W007S-PEDCO-110-PR-PI-0001 (3 of 6)
	4	Area Classification			Zone 2, IIB,T4	
	5	Ambient Temperature °C	Min.	Max.	-5	50
	6	Available Air Supply Pressure barg	Min.	Max.	3	8
	7	Nace Requirement:			Required	
PIPE & LINE	8	Pipe Class	Pipe Sch.		FN05	SCH. 80
	9	Pipe Line Insulation |Line Size	Pipe Material		PT / 4"	API 5L GR.B, SMLS, BE, ASME, B36.10M

PROCESS CONDITIONS	10	Fluid			Crude oil	
	11	State			mixed / 3phase	
	12	Valve Design Pressure(barg)/ Actuator Shut Off Pressure DP			93/93	
	13				Units	Max	Norm.	Min.
	14	Flow Rate(vapor/liquid)			kg/h	712.24/18451.85	647.492/16774.41	431.66/11182.94
	15	Inlet Pressure			bar-g	12.78	12.78	12.78
	16	Pressure Drop			bar	2		
	17	Inlet Temperature(max)			ºC	31.37		
		Molecular Weight(MIX)				39.09		
	18	Liquid Specific Gravity (Gl) / Gas Specific Gravity				0.961/0.40		
	19	Compressibility Factor(Z)(vapour)			-	0.94		
	20	Viscosity (vapour/oil/water)			cP	0.011/6.25/0.77		
	21	Specific Heats Ratio(Cp/Cv) (vapour/liquid)			-	1.276/3.66		
	22	Vapour Pressure			bar-g	96.59		
	23	Critical Pressure (liquid)			bar-g	1140		
CALCULATED RESULTS	24	Flow Coefficient Cv (max-case)			-	BY VENDOR		
	25	Travel (max-case)			%	BY VENDOR		
	26	Sound Pressure Level			dBA	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)

BODY AND TRIM(Note 6)	27	Body size		2" (VTC)				
	28	Rated Cv		(NOTE 4)				
	29	End conn. & Rating IN/OUT		2" # 600 / 2" #600 (VTC)				
	30	Body/Bonnet Material		ASTM A216 GR. WCB				
	31	Body/Bonnet Type		GLOBE / Bolted Flange Bonnet				
	32	Flow Direction		(NOTE 4)				
	33	Packing Material		P.T.F.E.				
	34	Trim Type		SINGLE SEATED/CAGE				
	35	Characteristic		EQUAL PERCENTAGE (VTC)				
	36	Guiding		(NOTE 4)				
	37	Rated Travel		(NOTE 4)				
	38	Plug/Disk Material		SS316				
	39	Seat Material		SS316				
	40	Cage/Guid Material		SS316				
	41	Stem Material		SS316				
	42	Trim Material		SS316				
	43	MFR	Model	(NOTE 4)	(NOTE 4)			
ACTUTOR	44	Size	Eff.Area	(NOTE 4)	(NOTE 4)			
	45	Air Failure	Handwheel	FAIL CLOSE	TOP MOUNTED			
	46	Air Action	Orientation	AIR TO OPEN	VERT. UP			
	47	Actuator Type		spring return and diaphragm type				
	48	AIR Press. Min/ Max/ Des. (Barg)		4 (Note3)	7.5	8.5		
	49	MFR	Model	(NOTE 4)	(NOTE 4)			
PURCHASE		Manufacturer		(Note 4)				
		Model		(Note 4)				

POSITIONER (Note 5)	50	Type		Electro-Pneumatic Smart	
	51	Input Signal		4~20 mA-HART Smart	
	52	Power Supply		24 VDC loop powered	
	53	Electrical Connection		ISO M20x 1.5	
	54	FlowDirection		Flow to Open(VTC)	
	55	Lock Last Position		Failure Position/Close	
	56	Output Signal		3-15 Psi	
	57	I.P./Ex.Protec.	Gauge	65 / EExia	Yes
	58	MFR/Model	LCD requirement	(NOTE 4)	Yes
SOLENOID VALVE	59	Type	Qty.	N/A	N/A
	60	MFR	Model	N/A	N/A
	61	I.P.	Ex.Protec.	N/A	N/A
	62	MFR	Model	N/A	N/A
SWITCHES	63	Type	Qty.	N/A	N/A
	64	Power Supply		N/A	
	65	Contacts / Rating		N/A	
	66	Switching Position		N/A	
	67	I.P.	Ex.Protec.	N/A	N/A
	68	MFR	Model	N/A	N/A
AIR SET	69	Set Pressure		Yes (NOTE 4)	
	70	Filter	Gauge	Yes	Yes
	71	Pnumatic Conn.		1/4 " NPTF	
	72	MFR	Model	(NOTE 4)	(NOTE 4)
TESTS	73	Hydro. Pressure		API 598	
	74	Leakage Class		ANSI IV	
	75	Performance Test		Required	
OPTIONS	76	Internal Tubing		Required(with Double Ferrule Compression conn.)	
	77	Tube Material		316 S.S L	
	78	Cable Gland		M20, Nickel plated brass	
	79	Cable Entry		M20 x 1.5	

NOTES:

1- All materials shall be in accordance with 'Piping Material Specification' ,"Document No.: BK-SSGRL-PEDCO-110-PI-SP-0001".

2- VTA: Vendor To Advise VTC: Vendor To Confirm

3- Minimmum of instrument air pressure supply is 4 barg but 3 barg as minimmum working pressure, shall be considered for actuator sizing .

4- Shall be stated by vendor at quotaion stage.

5- Bypass line and isolating valve shall be considered for valve positioner by vendor.

6- Trim part material shall be considered as minimum 316SS or any equal hard steel.

Control Valve

D02

GENERAL	1	Tag No.		FCV-1701C	
	2	Service		FROM W008N	
	3	Line No.	P&ID No.	CRD-110-171C-FN05-4"-PT	BK-W007S-PEDCO-110-PR-PI-0001 (4 of6)
	4	Area Classification		Zone 2, IIB,T4	
	5	Ambient Temperature °C	Min. / Max.	-5	50
	6	Available Air Supply Pressure barg	Min. / Max.	3	8
	7	Nace Requirement:		Required	
PIPE & LINE	8	Pipe Class	Pipe Sch.	FN05	SCH. 80
	9	Pipe Line Insulation |Line Size	Pipe Material	PT / 4"	API 5L GR.B, SMLS, BE, ASME, B36.10M

PROCESS CONDITIONS	10	Fluid		Crude oil		
	11	State		mixed / 3phase		
	12	Valve Design Pressure(barg)/ Actuator Shut Off Pressure DP		93/93		
	13		Units	Max	Norm.	Min.
	14	Flow Rate(vapor/liquid)	kg/h	218.94/12262.78	199.04/11147.99	66.34/3715.99
	15	Inlet Pressure	bar-g	12.78	12.78	12.78
	16	Pressure Drop	bar	2		
	17	Inlet Temperature(max)	°C	46		
		Molecular Weight(MIX)		77.41		
	18	Liquid Specific Gravity (Gl) / Gas Specific Gravity		0.902/0.39		
	19	Compressibility Factor(Z)(vapour)	-	0.95		
	20	Viscosity (vapour/oil/water)	cP	0.011/7.60/0.58		
	21	Specific Heats Ratio(Cp/Cv) (vapour/liquid)	-	1.25/1.17		
	22	Vapour Pressure	bar-g	52.57		
	23	Critical Pressure (liquid)	bar-g	291.2		
CALCULATED RESULTS	24	Flow Coefficient Cv (max-case)	-	BY VENDOR		
	25	Travel (max-case)	%	BY VENDOR		
	26	Sound Pressure Level	dBA	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)

BODY AND TRIM(Note 6)	27	Body size		2" (VTC)			
	28	Rated Cv		(NOTE 4)			
	29	End conn. & Rating IN/OUT		2" # 600 / 2" # 600 (VTC)			
	30	Body/Bonnet Material		ASTM A216 GR. WCB			
	31	Body/Bonnet Type		GLOBE / Bolted Flange Bonnet			
	32	Flow Direction		(NOTE 4)			
	33	Packing Material		P.T.F.E.			
	34	Trim Type		SINGLE SEATED/CAGE			
	35	Characteristic		EQUAL PERCENTAGE (VTC)			
	36	Guiding		(NOTE 4)			
	37	Rated Travel		(NOTE 4)			
	38	Plug/Disk Material		SS316			
	39	Seat Material		SS316			
	40	Cage/Guid Material		SS316			
	41	Stem Material		SS316			
	42	Trim Material		SS316			
	43	MFR	Model	(NOTE 4)	(NOTE 4)		
ACTUTOR	44	Size	Eff.Area	(NOTE 4)	(NOTE 4)		
	45	Air Failure	Handwheel	FAIL CLOSE	TOP MOUNTED		
	46	Air Action	Orientation	AIR TO OPEN	VERT. UP		
	47	Actuator Type		spring return and diaphragm type			
	48	AIR Press.	Min/ Max/ D (Barg)	4 (Note3)	7.5	8.5	
	49	MFR	Model	(NOTE 4)	(NOTE 4)		
PURCHASE		Manufacturer		(Note 4)			
		Model		(Note 4)			

POSITIONER (Note 5)	50	Type		Electro-Pneumatic Smart	
	51	Input Signal		4~20 mA-HART Smart	
	52	Power Supply		24 VDC loop powered	
	53	Electrical Connection		ISO M20x 1.5	
	54	FlowDirection		Flow to Open(VTC)	
	55	Lock Last Position		Failure Position/Close	
	56	Output Signal		3-15 Psi	
	57	I.P./Ex.Protec.	Gauge	65 / EExia	Yes
	58	MFR/Model	LCD requirement	(NOTE 4)	Yes
SOLENOID VALVE	59	Type	Qty.	N/A	N/A
	60	MFR	Model	N/A	N/A
	61	I.P.	Ex.Protec.	N/A	N/A
	62	MFR	Model	N/A	N/A
SWITCHES	63	Type	Qty.	N/A	N/A
	64	Power Supply		N/A	
	65	Contacts / Rating		N/A	
	66	Switching Position		N/A	
	67	I.P.	Ex.Protec.	N/A	N/A
	68	MFR	Model	N/A	N/A
AIR SET	69	Set Pressure		Yes (NOTE 4)	
	70	Filter	Gauge	Yes	Yes
	71	Pnumatic Conn.		1/4 " NPTF	
	72	MFR	Model	(NOTE 4)	(NOTE 4)
TESTS	73	Hydro. Pressure		API 598	
	74	Leakage Class		ANSI IV	
	75	Performance Test		Required	
OPTIONS	76	Internal Tubing		Required(with Double Ferrule Compression conn.)	
	77	Tube Material		316 S.S L	
	78	Cable Gland		M20, Nickel plated brass	
	79	Cable Entry		M20 x 1.5	

NOTES:

1- All materials shall be in accordance with 'Piping Material Specification' ,"Document No.: BK-SSGRL-PEDCO-110-PI-SP-0001".

2- VTA: Vendor To Advise VTC: Vendor To Confirm

3- Minimmum of instrument air pressure supply is 4 barg but 3 barg as minimmum working pressure, shall be considered for actuator sizing .

4- Shall be stated by vendor at quotaion stage.

5- Bypass line and isolating valve shall be considered for valve positioner by vendor.

6- Trim part material shall be considered as minimum 316SS or any equal hard steel.

Control Valve

D02

GENERAL	1	Tag No.			FCV-1701D	
	2	Service			FROM W028	
	3	Line No.	P&ID No.		CRD-110-171D-FN05-4"-PT	BK-W007S-PEDCO-110-PR-PI-0001 (4 of 6)
	4	Area Classification			Zone 2, IIB,T4	
	5	Ambient Temperature °C	Min.	Max.	-5	50
	6	Available Air Supply Pressure barg	Min.	Max.	3	8
	7	Nace Requirement:			Required	
PIPE & LINE	8	Pipe Class	Pipe Sch.		FN05	SCH. 80
	9	Pipe Line Insulation |Line Size	Pipe Material		PT / 4"	API 5L GR.B, SMLS, BE, ASME, B36.10M

PROCESS CONDITIONS	10	Fluid			Crude oil	
	11	State			mixed / 3phase	
	12	Valve Design Pressure(barg)/ Actuator Shut Off Pressure DP			93/93	
	13				Units	Max	Norm.	Min.
	14	Flow Rate(vapor/liquid)			kg/h	1316.60/30623.54	1196.917/27839.59	718.15/16703.75
	15	Inlet Pressure			bar-g	12.78	12.78	12.78
	16	Pressure Drop			bar	2		
	17	Inlet Temperature(max)			°C	44.16		
		Molecular Weight(MIX)				39.09		
	18	Liquid Specific Gravity (Gl) / Gas Specific Gravity				0.953/0.40		
	19	Compressibility Factor(Z)(vapour)			-	0.9505		
	20	Viscosity (vapour/oil/water)			cP	0.012/5.39/0.60		
	21	Specific Heats Ratio(Cp/Cv) (vapour/liquid)			-	1.24/1.12		
	22	Vapour Pressure			bar-g	10.08		
	23	Critical Pressure (liquid)			bar-g	1081		
CALCULATED RESULTS	24	Flow Coefficient Cv (max-case)			-	BY VENDOR		
	25	Travel (max-case)			%	BY VENDOR		
	26	Sound Pressure Level			dBA	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)

BODY AND TRIM(Note 6)	27	Body size		3" (VTC)			
	28	Rated Cv		(NOTE 4)			
	29	End conn. & Rating IN/OUT		3" # 600 / 3"#600 (VTC)			
	30	Body/Bonnet Material		ASTM A216 GR. WCB			
	31	Body/Bonnet Type		GLOBE / Bolted Flange Bonnet			
	32	Flow Direction		(NOTE 4)			
	33	Packing Material		P.T.F.E.			
	34	Trim Type		SINGLE SEATED/CAGE			
	35	Characteristic		EQUAL PERCENTAGE (VTC)			
	36	Guiding		(NOTE 4)			
	37	Rated Travel		(NOTE 4)			
	38	Plug/Disk Material		SS316			
	39	Seat Material		SS316			
	40	Cage/Guid Material		SS316			
	41	Stem Material		SS316			
	42	Trim Material		SS316			
	43	MFR	Model	(NOTE 4)	(NOTE 4)		
ACTUTOR	44	Size	Eff.Area	(NOTE 4)	(NOTE 4)		
	45	Air Failure	Handwheel	FAIL CLOSE	TOP MOUNTED		
	46	Air Action	Orientation	AIR TO OPEN	VERT. UP		
	47	Actuator Type		spring return and diaphragm type			
	48	AIR Press. Min/ Max/ Des. (Barg)		4 (Note3)	7.5	8.5	
	49	MFR	Model	(NOTE 4)	(NOTE 4)		
PURCHASE		Manufacturer		(Note 4)			
		Model		(Note 4)			

POSITIONER (Note 5)	50	Type		Electro-Pneumatic Smart	
	51	Input Signal		4~20 mA-HART Smart	
	52	Power Supply		24 VDC loop powered	
	53	Electrical Connection		ISO M20x 1.5	
	54	FlowDirection		Flow to Open(VTC)	
	55	Lock Last Position		Failure Position/Close	
	56	Output Signal		3-15 Psi	
	57	I.P./Ex.Protec.	Gauge	65 / EExia	Yes
	58	MFR/Model	LCD requirement	(NOTE 4)	Yes
SOLENOID VALVE	59	Type	Qty.	N/A	N/A
	60	MFR	Model	N/A	N/A
	61	I.P.	Ex.Protec.	N/A	N/A
	62	MFR	Model	N/A	N/A
SWITCHES	63	Type	Qty.	N/A	N/A
	64	Power Supply		N/A	
	65	Contacts / Rating		N/A	
	66	Switching Position		N/A	
	67	I.P.	Ex.Protec.	N/A	N/A
	68	MFR	Model	N/A	N/A
AIR SET	69	Set Pressure		Yes (NOTE 4)	
	70	Filter	Gauge	Yes	Yes
	71	Pnumatic Conn.		1/4 " NPTF	
	72	MFR	Model	(NOTE 4)	(NOTE 4)
TESTS	73	Hydro. Pressure		API 598	
	74	Leakage Class		ANSI IV	
	75	Performance Test		Required	
OPTIONS	76	Internal Tubing		Required(with Double Ferrule Compression conn.)	
	77	Tube Material		316 S.S L	
	78	Cable Gland		M20, Nickel plated brass	
	79	Cable Entry		M20 x 1.5	

NOTES:

1- All materials shall be in accordance with 'Piping Material Specification' ,"Document No.: BK-SSGRL-PEDCO-110-PI-SP-0001".

2- VTA: Vendor To Advise VTC: Vendor To Confirm

3- Minimmum of instrument air pressure supply is 4 barg but 3 barg as minimmum working pressure, shall be considered for actuator sizing .

4- Shall be stated by vendor at quotaion stage.

5- Bypass line and isolating valve shall be considered for valve positioner by vendor.

6- Trim part material shall be considered as minimum 316SS or any equal hard steel.

Control Valve

D02

GENERAL	1	Tag No.		FCV-1701E	
	2	Service		FROM W035	
	3	Line No.	P&ID No.	CRD-110-171E-FN05-4"-PT	BK-W007S-PEDCO-110-PR-PI-0001 (5 of 6)
	4	Area Classification		Zone 2, IIB,T4	
	5	Ambient Temperature °C	Min. / Max.	-5	50
	6	Available Air Supply Pressure barg	Min. / Max.	3	8
	7	Nace Requirement:		Required	
PIPE & LINE	8	Pipe Class	Pipe Sch.	FN05	SCH. 80
	9	Pipe Line Insulation |Line Size	Pipe Material	PT / 4"	API 5L GR.B, SMLS, BE, ASME, B36.10M

PROCESS CONDITIONS	10	Fluid		Crude oil		
	11	State		mixed / 3phase		
	12	Valve Design Pressure(barg)/ Actuator Shut Off Pressure DP		93/93		
	13		Units	Max	Norm.	Min.
	14	Flow Rate(vapor/liquid)	kg/h	1278.20/30661.96	1162.004/27874.51	697.2/16724.7
	15	Inlet Pressure	bar-g	12.78	12.78	12.78
	16	Pressure Drop	bar	2		
	17	Inlet Temperature(max)	ºC	40.47		
		Molecular Weight(MIX)		39.09		
	18	Liquid Specific Gravity (Gl) / Gas Specific Gravity		0.955/0.40		
	19	Compressibility Factor(Z)(vapour)	-	0.949		
	20	Viscosity (vapour/oil/water)	cP	0.012/5.60/0.64		
	21	Specific Heats Ratio(Cp/Cv) (vapour/liquid)	-	1.25/1.12		
	22	Vapour Pressure	bar-g	96.51		
	23	Critical Pressure (liquid)	bar-g	1140		
CALCULATED RESULTS	24	Flow Coefficient Cv (max-case)	-	BY VENDOR		
	25	Travel (max-case)	%	BY VENDOR		
	26	Sound Pressure Level	dBA	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)

BODY AND TRIM(Note 6)	27	Body size		3" (VTC)			
	28	Rated Cv		(NOTE 4)			
	29	End conn. & Rating IN/OUT		3" # 600 / 3"#600 (VTC)			
	30	Body/Bonnet Material		ASTM A216 GR. WCB			
	31	Body/Bonnet Type		GLOBE / Bolted Flange Bonnet			
	32	Flow Direction		(NOTE 4)			
	33	Packing Material		P.T.F.E.			
	34	Trim Type		SINGLE SEATED/CAGE			
	35	Characteristic		EQUAL PERCENTAGE (VTC)			
	36	Guiding		(NOTE 4)			
	37	Rated Travel		(NOTE 4)			
	38	Plug/Disk Material		SS316			
	39	Seat Material		SS316			
	40	Cage/Guid Material		SS316			
	41	Stem Material		SS316			
	42	Trim Material		SS316			
	43	MFR	Model	(NOTE 4)	(NOTE 4)		
ACTUTOR	44	Size	Eff.Area	(NOTE 4)	(NOTE 4)		
	45	Air Failure	Handwheel	FAIL CLOSE	TOP MOUNTED		
	46	Air Action	Orientation	AIR TO OPEN	VERT. UP		
	47	Actuator Type		spring return and diaphragm type			
	48	AIR Press. Min/ Max/ Des. (Barg)		4 (Note3)	7.5	8.5	
	49	MFR	Model	(NOTE 4)	(NOTE 4)		

POSITIONER (Note 5)	50	Type		Electro-Pneumatic Smart	
	51	Input Signal		4~20 mA-HART Smart	
	52	Power Supply		24 VDC loop powered	
	53	Electrical Connection		ISO M20x 1.5	
	54	FlowDirection		Flow to Open(VTC)	
	55	Lock Last Position		Failure Position/Close	
	56	Output Signal		3-15 Psi	
	57	I.P./Ex.Protec.	Gauge	65 / EExia	Yes
	58	MFR/Model	LCD requirement	(NOTE 4)	Yes
SOLENOID VALVE	59	Type	Qty.	N/A	N/A
	60	MFR	Model	N/A	N/A
	61	I.P.	Ex.Protec.	N/A	N/A
	62	MFR	Model	N/A	N/A
SWITCHES	63	Type	Qty.	N/A	N/A
	64	Power Supply		N/A	
	65	Contacts / Rating		N/A	
	66	Switching Position		N/A	
	67	I.P.	Ex.Protec.	N/A	N/A
	68	MFR	Model	N/A	N/A
AIR SET	69	Set Pressure		Yes (NOTE 4)	
	70	Filter	Gauge	Yes	Yes
	71	Pnumatic Conn.		1/4 " NPTF	
	72	MFR	Model	(NOTE 4)	(NOTE 4)
TESTS	73	Hydro. Pressure		API 598	
	74	Leakage Class		ANSI IV	
	75	Performance Test		Required	
OPTIONS	76	Internal Tubing		Required(with Double Ferrule Compression conn.)	
	77	Tube Material		316 S.S L	
	78	Cable Gland		M20, Nickel plated brass	
	79	Cable Entry		M20 x 1.5	

PURCHASE	Manufacturer	(Note 4)
	Model	(Note 4)

NOTES:

1- All materials shall be in accordance with 'Piping Material Specification' ,"Document No.: BK-SSGRL-PEDCO-110-PI-SP-0001".

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5- Bypass line and isolating valve shall be considered for valve positioner by vendor.

6- Trim part material shall be considered as minimum 316SS or any equal hard steel.

Control Valve

D02

GENERAL	1	Tag No.			FCV-1701F	
	2	Service			FROM W007S	
	3	Line No.	P&ID No.		CRD-110-171F-FN05-4"-PT	BK-W007S-PEDCO-110-PR-PI-0001 (5 of 6)
	4	Area Classification			Zone 2, IIB,T4	
	5	Ambient Temperature °C	Min.	Max.	-5	50
	6	Available Air Supply Pressure barg	Min.	Max.	3	8
	7	Nace Requirement:			Required	
PIPE & LINE	8	Pipe Class	Pipe Sch.		FN05	SCH. 80
	9	Pipe Line Insulation |Line Size	Pipe Material		PT / 4"	API 5L GR.B, SMLS, BE, ASME, B36.10M

PROCESS CONDITIONS	10	Fluid			Crude oil	
	11	State			mixed / 3phase	
	12	Valve Design Pressure(barg)/ Actuator Shut Off Pressure DP			93/93	
	13				Units	Max	Norm.	Min.
	14	Flow Rate(vapor/liquid)			kg/h	515.64/12260.413	468.769/11145.83	5572.91/5572.91
	15	Inlet Pressure			bar-g	12.78	12.78	12.78
	16	Pressure Drop			bar	2		
	17	Inlet Temperature(max)			ºC	41.52		
		Molecular Weight(MIX)				39.09		
	18	Liquid Specific Gravity (Gl) / Gas Specific Gravity				0.954/0.40		
	19	Compressibility Factor(Z)(vapour)			-	0.9501		
	20	Viscosity (vapour/oil/water)			cP	0.012/5.54/0.63		
	21	Specific Heats Ratio(Cp/Cv) (vapour/liquid)			-	1.25/1.12		
	22	Vapour Pressure			bar-g	96.59		
	23	Critical Pressure (liquid)			bar-g	1140		
CALCULATED RESULTS	24	Flow Coefficient Cv (max-case)			-	BY VENDOR		
	25	Travel (max-case)			%	BY VENDOR		
	26	Sound Pressure Level			dBA	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)	Max. 85 dBA(VTC)

BODY AND TRIM(Note 6)	27	Body size		2" (VTC)				
	28	Rated Cv		(NOTE 4)				
	29	End conn. & Rating IN/OUT		2" # 600 / 2" # 600 (VTC)				
	30	Body/Bonnet Material		ASTM A216 GR. WCB				
	31	Body/Bonnet Type		GLOBE / Bolted Flange Bonnet				
	32	Flow Direction		(NOTE 4)				
	33	Packing Material		P.T.F.E.				
	34	Trim Type		SINGLE SEATED/CAGE				
	35	Characteristic		EQUAL PERCENTAGE (VTC)				
	36	Guiding		(NOTE 4)				
	37	Rated Travel		(NOTE 4)				
	38	Plug/Disk Material		SS316				
	39	Seat Material		SS316				
	40	Cage/Guid Material		SS316				
	41	Stem Material		SS316				
	42	Trim Material		SS316				
	43	MFR	Model	(NOTE 4)	(NOTE 4)			
ACTUATOR	44	Size	Eff.Area	(NOTE 4)	(NOTE 4)			
	45	Air Failure	Handwheel	FAIL CLOSE	TOP MOUNTED			
	46	Air Action	Orientation	AIR TO OPEN	VERT. UP			
	47	Actuator Type		spring return and diaphragm type				
	48	AIR Press. Min/ Max/ Des. (Barg)		4 (Note3)	7.5	8.5		
	49	MFR	Model	(NOTE 4)	(NOTE 4)			

PURCHASE		Manufacturer	(Note 4)		
		Model	(Note 4)		
POSITIONER (Note 5)	50	Type		Electro-Pneumatic Smart	
	51	Input Signal		4~20 mA-HART Smart	
	52	Power Supply		24 VDC loop powered	
	53	Electrical Connection		ISO M20x 1.5	
	54	FlowDirection		Flow to Open(VTC)	
	55	Lock Last Position		Failure Position/Close	
	56	Output Signal		3-15 Psi	
	57	I.P./Ex.Protec.	Gauge	65 / EExia	Yes
	58	MFR/Model	LCD requirement	(NOTE 4)	Yes
SOLENOID VALVE	59	Type	Qty.	N/A	N/A
	60	MFR	Model	N/A	N/A
	61	I.P.	Ex.Protec.	N/A	N/A
	62	MFR	Model	N/A	N/A
SWITCHES	63	Type	Qty.	N/A	N/A
	64	Power Supply		N/A	
	65	Contacts / Rating		N/A	
	66	Switching Position		N/A	
	67	I.P.	Ex.Protec.	N/A	N/A
	68	MFR	Model	N/A	N/A
AIR SET	69	Set Pressure		Yes (NOTE 4)	
	70	Filter	Gauge	Yes	Yes
	71	Pnumatic Conn.		1/4 " NPTF	
	72	MFR	Model	(NOTE 4)	(NOTE 4)
TESTS	73	Hydro. Pressure		API 598	
	74	Leakage Class		ANSI IV	
	75	Performance Test		Required	
OPTIONS	76	Internal Tubing		Required(with Double Ferrule Compression conn.)	
	77	Tube Material		316 S.S L	
	78	Cable Gland		M20, Nickel plated brass	
	79	Cable Entry		M20 x 1.5	

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