



		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No: 900-DAS-A4-IN-0009			
		Owner Job No:		Sheet No: 1 of 41			
General Data	1	Tag No.		FV-0201			
	2	P&ID No.	Piping Size	Piping Class	002	1 1/2"	4CC2
	3	Fluid	State		WATER GLYCOL		LIQUID
	4	Pressure rating		Piping material		150# CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification		Area		ZONE 1 000	
Flow Rate	7	Max.Continuous	Unit		6000		Kg/h
	8	Min.Continuous	Unit		600		Kg/h
	9	Max.In Transients	Unit		7200		Kg/h
	10	Allow. with closed va	Unit		0		Kg/h
Press	11	Norm . Op. upstr. Press	Unit		3		barg
	12	Dp. At max. flowrate	Unit		0.5		bar
	13	Max. Dp with closed va	Unit		10		bar
Temperature	14	Norm . upstr. Temp		Unit		2 °C	
	15	Max . upstr. Temp		Unit		-10 + 100 °C	
Sp. Gr.	16	Gases vapours		Unit		kg/m	
	17	Liquids		Unit		1084 kg/m	
	18	Mol.weight		Unit		26.83 Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		4.85			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required		1.17	2.6	9.6
Body	22	Body type		Body material		Globe CS	
	23	Size Body		Port		1 1/2" Single	
	24	Design Pressure		Min. Bar a	Max. Bar a	Barg	
	25	Design Temperature		Min. °C	Max. °C	°C	
	26	Valve end con. & rating		Flange 150#			
	27	Packing mat.		Lubricator		PTFE VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	SEAT Leakage Class ANSI		IV			
	Trim	31	Plug type		Plug material		Contoured SS - 316
32		Seat Material		Cage/Guide Material		SS - 316 NA	
33		Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Reverse			
	35	Fail Position		CLOSE			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting		Modulating		Single
Positioner	38	Type		Electro Pneumatic			
	39	Input signal		Out put signal		4-20 mA+HART VTA	
	40	Air supply		Action dir.		3.5 barg Direct	
	41	Protection		Certificate		IP 65 EExia-IIB T6	
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage		Consumption		NA NA	
	45	Protection		Certificate		NA NA	
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland		Size/Qty		NA	
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA
Notes:							
No.	Rev	Date	Issued For	Prepared	Checked	Approved	
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No: 900-DAS-A4-IN-0009			
		Owner Job No:		Sheet No: 2 of 41			
General Data	1	Tag No.		FV-0301 (1)			
	2	P&ID No.	Piping Size	Piping Class	003	6"	4CC2 (P)
	3	Fluid		State		WATER LIQUID	
	4	Pressure rating		Piping material		150# CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification		Area		ZONE 1 000	
Flow Rate	7	Max.Continuous		Unit		83500 Kg/h	
	8	Min.Continuous		Unit		8350 Kg/h	
	9	Max.In Transients		Unit		100200 Kg/h	
	10	Allow. with closed va		Unit		0 Kg/h	
Press	11	Norm . Op. upstr. Press		Unit		4 barg	
	12	Dp. At max. flowrate		Unit		1 bar	
	13	Max. Dp with closed va		Unit		10 bar	
Temperature	14	Norm . upstr. Temp		Unit		35 °C	
	15	Max . upstr. Temp		Unit		100 °C	
Sp. Gr.	16	Gases vapours		Unit		Kg/m3	
	17	Liquids		Unit		1000 Kg/m3	
	18	Mol.weight		Unit		18 Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		1			
	20	Solid in suspension					
Cv	21	Min/Norm/Max		Required		30.62 41.12 98	
	22	Body type		Body material		Globe CS	
Body	23	Size Body		Port		6" Single	
	24	Design Pressure		Min. Bar a Max. Bar a			
	25	Design Temperature		Min. °C Max. °C			
	26	Valve end con. & rating		Flange 150#			
	27	Packing mat.		Lubricator		PTFE VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	SEAT Leakage Class ANSI		IV			
Trim	31	Plug type		Plug material		Contoured SS - 316	
	32	Seat Material		Cage/Guide Material		SS - 316 NA	
	33	Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Direct			
	35	Fail Position		OPEN			
	36	Spring range		VTA			
	37	On-Off/Modulating		Single/Double Acting		Modulating Single	
Positioner	38	Type		Electro Pneumatic			
	39	Input signal		Out put signal		4-20 mA+HART VTA	
	40	Air supply		Action dir.		3.5 barg Direct	
	41	Protection		Certificate		IP 65 EExia-IIB T6	
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage		Consumption		NA NA	
	45	Protection		Certificate		NA NA	
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland		Size/Qty		NA	
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA
Notes: (1) Shall be check according suplier data pump							
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PROJECT: PP-PE PILOT PLANT



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 4 of 163

General Data	1	Tag No.		FV-1201			
	2	P&ID No.	Piping Size	Piping Class	012	1/2"	1FS4
	3	Fluid		State		ALKYL (1)	LIQUID
	4	Pressure rating		Piping material		600#	SS
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification		Area		ZONE 1	100
Flow Rate	7	Max.Continuous	Unit		0.50	Kg/h	
	8	Min.Continuous	Unit		0.05	Kg/h	
	9	Max.In Transients	Unit		0.60	Kg/h	
	10	Allow. with closed va	Unit		0	Kg/h	
Press	11	Norm . Op. upstr. Press	Unit		55	barg	
	12	Dp. At max. flowrate	Unit		5	bar	
	13	Max. Dp with closed va	Unit		65	bar	
Temperature	14	Norm . upstr. Temp	Unit		30	°C	
	15	Max . upstr. Temp	Unit		100	°C	
Sp. Gr.	16	Gases vapours	Unit			kg/m	
	17	Liquids	Unit		661	kg/m	
	18	Mol.weight	Unit		86	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.28			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required		0.00011	0.00051	0.025
	22	Body type	Body material		Globe	SS-304	
Body	23	Size Body	Port		1/2"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating	Seat leakage class		Flange 600#	ANSI IV	
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	Trim	30	Plug type	Plug material		Contoured	SS - 316
31		Seat Material	Cage/Guide Material		SS - 316	NA	
32		Characteristics		Equal Percentage			
Actuator	33	Type / Direction of action		Diaphragm/Reverse			
	34	Fail Position		CLOSE			
	35	Spring range		VTA			
	36	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	37	Type		Electro Pneumatic			
	38	Input signal	Out put signal		4-20 mA+HART	VTA	
	39	Air supply	Action dir.		3.5 barg	Direct	
	40	Protection	Certificate		IP 65	EExia-IIB T3	
Solenoid Valve	41	Type		NA			
	42	Tag No.		NA			
	43	Supply Voltage	Consumption		NA	NA	
	44	Protection	Certificate		NA	NA	
Accessories	45	Pressure gauge and filter		YES			
	46	Manual Control Wheel		NA			
	47	Cable Gland	Size/Qty		NA		
	48	Electrical Conection		M20* 1.5 mm ISO			
	49	Tubing & Conection		SS Tube 1/4"			
	50	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Alkyl solution at 100g/l is assumed as for hexane condition

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PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 4 of 41

General Data	1	Tag No.		FV-1202			
	2	P&ID No.	Piping Size	Piping Class	012	1/2"	1FS4
	3	Fluid	State		ALKYL (1)		LIQUID
	4	Pressure rating	Piping material		600#		SS
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		100
Flow Rate	7	Max.Continuous	Unit	3.30		Kg/h	
	8	Min.Continuous	Unit	0.33		Kg/h	
	9	Max.In Transients	Unit	3.96		Kg/h	
	10	Allow. with closed va	Unit	0		Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	55		barg	
	12	Dp. At max. flowrate	Unit	5		bar	
	13	Max. Dp with closed va	Unit	65		bar	
Temperature	14	Norm . upstr. Temp	Unit	30		°C	
	15	Max . upstr. Temp	Unit	100		°C	
Sp. Gr.	16	Gases vapours	Unit			kg/m	
	17	Liquids	Unit	661		kg/m	
	18	Mol.weight	Unit	86		Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)	0.28				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00038	0.0027	0.0757	
Body	22	Body type	Body material		Globe		SS-304
	23	Size Body	Port		1/2"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating	Flange 600#				
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	30	SEAT Leakage Class ANSI	V				
	Trim	31	Plug type	Plug material		Contoured	
32		Seat Material	Cage/Guide Material		SS - 316		NA
33		Characteristics	Equal Percentage				
Actuator	34	Type / Direction of action	Diaphragm/Reverse				
	35	Fail Position	CLOSE				
	36	Spring range	VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating		Single	
Positioner	38	Type	Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EExia-IIB T6
Solenoid Valve	42	Type	NA				
	43	Tag No.	NA				
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter	YES				
	47	Manual Control Wheel	NA				
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Tubing & Conection	SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Alkyl solution at 100g/l is assumed as for hexane condition

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PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 5 of 41

General Data	1	Tag No.		FV-1301			
	2	P&ID No.	Piping Size	Piping Class	013	1/2"	1FS4
	3	Fluid	State		DONOR (1)		LIQUID
	4	Pressure rating	Piping material		600#		SS
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		100
Flow Rate	7	Max.Continuous	Unit		0.5		Kg/h
	8	Min.Continuous	Unit		0.05		Kg/h
	9	Max.In Transients	Unit		0.6		Kg/h
	10	Allow. with closed va	Unit		0		Kg/h
Press	11	Norm . Op. upstr. Press	Unit		55		barg
	12	Dp. At max. flowrate	Unit		5		bar
	13	Max. Dp with closed va	Unit		65		bar
Temperature	14	Norm . upstr. Temp	Unit		30		°C
	15	Max . upstr. Temp	Unit		100		°C
Sp. Gr.	16	Gases vapours	Unit				kg/m
	17	Liquids	Unit		661		kg/m
	18	Mol.weight	Unit		86		Kg/Kmol
Visc.	19	Op. visc. (when>5mpa's)		0.28			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required		0.0001	0.0005	0.025
Body	22	Body type	Body material		Globe		SS-304
	23	Size Body	Port		1/2"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating			Flange 600#		
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction			FTO		
	29	Bonnet type			Standard		
	30	SEAT Leakage Class ANSI			IV		
	Trim	31	Plug type	Plug material		Contoured	
32		Seat Material	Cage/Guide Material		SS - 316		NA
33		Characteristics			Equal Percentage		
Actuator	34	Type / Direction of action			Diaphragm/Reverse		
	35	Fail Position			CLOSE		
	36	Spring range			VTA		
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type			Electro Pneumatic		
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EExia-IIB T6
Solenoid Valve	42	Type			NA		
	43	Tag No.			NA		
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter			YES		
	47	Manual Control Wheel			NA		
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection			M20* 1.5 mm ISO		
	50	Tubing & Conection			SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Donor solution at 30g/1 is assumed as for hexane condition

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PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 6 of 41

General Data	1	Tag No.		FV-1302			
	2	P&ID No.	Piping Size	Piping Class	013	1/2"	1FS4
	3	Fluid	State		DONOR (1)		LIQUID
	4	Pressure rating	Piping material		600#		SS
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		100
Flow Rate	7	Max.Continuous	Unit	2.0		Kg/h	
	8	Min.Continuous	Unit	0.2		Kg/h	
	9	Max.In Transients	Unit	2.4		Kg/h	
	10	Allow. with closed va	Unit	0		Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	55		barg	
	12	Dp. At max. flowrate	Unit	5		bar	
	13	Max. Dp with closed va	Unit	65		bar	
Temperature	14	Norm . upstr. Temp	Unit	30		°C	
	15	Max . upstr. Temp	Unit	100		°C	
Sp. Gr.	16	Gases vapours	Unit			kg/m	
	17	Liquids	Unit	661		kg/m	
	18	Mol.weight	Unit	86		Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)	0.28				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.0003	0.0017	0.057	
Body	22	Body type	Body material		Globe		SS-304
	23	Size Body	Port		1/2"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating	Flange 600#				
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	30	SEAT Leakage Class ANSI	IV				
	Trim	31	Plug type	Plug material		Contoured	
32		Seat Material	Cage/Guide Material		SS - 316		NA
33		Characteristics	Equal Percentage				
Actuator	34	Type / Direction of action	Diaphragm/Reverse				
	35	Fail Position	CLOSE				
	36	Spring range	VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating		Single	
Positioner	38	Type	Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EExia-IIB T6
Solenoid Valve	42	Type	NA				
	43	Tag No.	NA				
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter	YES				
	47	Manual Control Wheel	NA				
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Tubing & Conection	SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Donor solution at 30g/1 is assumed as for hexane condition

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شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 7 of 41

General Data	1	Tag No.		FV-1401			
	2	P&ID No.	Piping Size	Piping Class	014	1/2"	1FS4
	3	Fluid	State		ATMER (1)	LIQUID	
	4	Pressure rating	Piping material		600#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		
Flow Rate	7	Max.Continuous	Unit	1.0	Kg/h		
	8	Min.Continuous	Unit	0.1	Kg/h		
	9	Max.In Transients	Unit	1.2	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	55	barg		
	12	Dp. At max. flowrate	Unit	25	bar		
	13	Max. Dp with closed va	Unit	55	bar		
Temperature	14	Norm . upstr. Temp	Unit	30	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit		Kg/m ³		
	17	Liquids	Unit	661	Kg/m ³		
	18	Mol.weight	Unit	86	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.28			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00006	0.00039	0.0419	
Body	22	Body type	Body material	Globe	SS-304		
	23	Size Body	Port	1/2"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating	Flange 600#				
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	30	SEAT Leakage Class ANSI	IV				
	Trim	31	Plug type	Plug material	Contoured	SS - 316	
32		Seat Material	Cage/Guide Material	SS - 316	NA		
33		Characteristics	Equal Percentage				
Actuator	34	Type / Direction of action	Diaphragm/Reverse				
	35	Fail Position	CLOSE				
	36	Spring range	VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	38	Type	Electro Pneumatic				
	39	Input signal	Out put signal	4-20 mA+HART	VTA		
	40	Air supply	Action dir.	3.5 barg	Direct		
	41	Protection	Certificate	IP 65	EEExia-IIB T6		
Solenoid Valve	42	Type	NA				
	43	Tag No.	NA				
	44	Supply Voltage	Consumption	NA	NA		
	45	Protection	Certificate	NA	NA		
Accessories	46	Pressure gauge and filter	YES				
	47	Manual Control Wheel	NA				
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Tubing & Conection	SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Atmer solution at 100g/l is assumed as for hexane condition

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1	0	12/21/2021	IFA	K.A	M.N	AA.SH

PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 8 of 41

General Data	1	Tag No.		FV-1402			
	2	P&ID No.	Piping Size	Piping Class	014	1/2"	1FS4
	3	Fluid	State		ATMER (1)		LIQUID
	4	Pressure rating	Piping material		600#		SS
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		100
Flow Rate	7	Max.Continuous	Unit	2.6		Kg/h	
	8	Min.Continuous	Unit	0.26		Kg/h	
	9	Max.In Transients	Unit	3.12		Kg/h	
	10	Allow. with closed va	Unit	0		Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	55		barg	
	12	Dp. At max. flowrate	Unit	25		bar	
	13	Max. Dp with closed va	Unit	55		bar	
Temperature	14	Norm . upstr. Temp	Unit	30		°C	
	15	Max . upstr. Temp	Unit	100		°C	
Sp. Gr.	16	Gases vapours	Unit			Kg/m ³	
	17	Liquids	Unit	661		Kg/m ³	
	18	Mol.weight	Unit	86		Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)	0.28				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00012	0.00092	0.073	
Body	22	Body type	Body material		Globe		SS-304
	23	Size Body	Port		1/2"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating	Flange 600#				
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	30	SEAT Leakage Class ANSI	IV				
	Trim	31	Plug type	Plug material		Contoured	
32		Seat Material	Cage/Guide Material		SS - 316		NA
33		Characteristics	Equal Percentage				
Actuator	34	Type / Direction of action	Diaphragm/Reverse				
	35	Fail Position	CLOSE				
	36	Spring range	VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating		Single	
Positioner	38	Type	Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EExia-IIB T6
Solenoid Valve	42	Type	NA				
	43	Tag No.	NA				
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter	YES				
	47	Manual Control Wheel	NA				
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Tubing & Conection	SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Atmer solution at 100g/1 is assumed as for hexane condition

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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 35 of 41

General Data	1	Tag No.		FV-3201			
	2	P&ID No.	Piping Size	Piping Class	032	1 1/2"	1FS4
	3	Fluid	State		PROPYLENE	LIQUID	
	4	Pressure rating	Piping material		600#	SS	
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit		1750	Kg/h	
	8	Min.Continuous	Unit		175	Kg/h	
	9	Max.In Transients	Unit		2100	Kg/h	
	10	Allow. with closed va	Unit		0	Kg/h	
Press	11	Norm . Op. upstr. Press	Unit		55	barg	
	12	Dp. At max. flowrate	Unit		30	bar	
	13	Max. Dp with closed va	Unit		65	bar	
Temperature	14	Norm . upstr. Temp	Unit		25	°C	
	15	Max . upstr. Temp	Unit		100	°C	
Sp. Gr.	16	Gases vapours	Unit			kg/m	
	17	Liquids	Unit		523.5	kg/m	
	18	Mol.weight	Unit		42	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.09			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required		0.1358	0.5079	0.7113
Body	22	Body type	Body material		Globe	SS-304	
	23	Size Body	Port		1 1/2"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating			Flange 600#		
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction			FTO		
	29	Bonnet type			Standard		
	30	SEAT Leakage Class ANSI			V		
	Trim	31	Plug type	Plug material		Contoured	SS - 316
32		Seat Material	Cage/Guide Material		SS - 316	NA	
33		Characteristics			Equal Percentage		
Actuator	34	Type / Direction of action		Diaphragm/Direct			
	35	Fail Position		OPEN			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal		4-20 mA+HART	VTA	
	40	Air supply	Action dir.		3.5 barg	Direct	
	41	Protection	Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption		NA	NA	
	45	Protection	Certificate		NA	NA	
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes:

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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
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General Data	1	Tag No.		FV-3601			
	2	P&ID No.	Piping Size	Piping Class	036	1"	1DS4
	3	Fluid	State		PROPYLENE	LIQUID	
	4	Pressure rating	Piping material		300#	SS	
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	500	Kg/h		
	8	Min.Continuous	Unit	50	Kg/h		
	9	Max.In Transients	Unit	600	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	21	barg		
	12	Dp. At max. flowrate	Unit	2	bar		
	13	Max. Dp with closed va	Unit	3	bar		
Temperature	14	Norm . upstr. Temp	Unit	40	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit		kg/m		
	17	Liquids	Unit	470	kg/m		
	18	Mol.weight	Unit	42	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.04			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.2405	0.3866	1.947	
Body	22	Body type	Body material	Globe	SS-304		
	23	Size Body	Port	1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating			Flange 300#		
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction			FTO		
	29	Bonnet type			Standard		
	30	SEAT Leakage Class ANSI			V		
	Trim	31	Plug type	Plug material	Contoured	SS - 316	
32		Seat Material	Cage/Guide Material	SS - 316	NA		
33		Characteristics			Equal Percentage		
Actuator	34	Type / Direction of action			Diaphragm/Reverse		
	35	Fail Position			CLOSE		
	36	Spring range			VTA		
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	38	Type			Electro Pneumatic		
	39	Input signal	Out put signal	4-20 mA+HART	VTA		
	40	Air supply	Action dir.	3.5 barg	Direct		
	41	Protection	Certificate	IP 65	EExia-IIB T6		
Solenoid Valve	42	Type			NA		
	43	Tag No.			NA		
	44	Supply Voltage	Consumption	NA	NA		
	45	Protection	Certificate	NA	NA		
Accessories	46	Pressure gauge and filter			YES		
	47	Manual Control Wheel			NA		
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection			M20* 1.5 mm ISO		
	50	Tubing & Conection			SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA	NA	NA

Notes:

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General Data	1	Tag No.		FV-3602			
	2	P&ID No.	Piping Size	Piping Class	036	1 1/2" 2DC4	
	3	Fluid		State	STEAM	GAS	
	4	Pressure rating		Piping material	300#	CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara 86%	
	6	Area Classification		Area	ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	100	Kg/h		
	8	Min.Continuous	Unit	10	Kg/h		
	9	Max.In Transients	Unit	120	Kg/h		
	10	Allow. with closed valve	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	5.5	barg		
	12	Dp. At max. flowrate	Unit	2	bar		
	13	Max. Dp with closed valve	Unit	6.5	bar		
Temperature	14	Norm . upstr. Temp	Unit	162	°C		
	15	Max . upstr. Temp	Unit	180	°C		
Sp. Gr.	16	Gases vapours	Unit	3.3	kg/m3		
	17	Liquids	Unit		kg/m3		
	18	Mol.weight	Unit	18	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.014			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	VTA	VTA		
	22	Body type	Body material	Globe	CS		
Body	23	Size Body	Port	1 1/2"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg		
	25	Design Temperature	Min. °C	Max. °C	°C		
	26	Valve end con. & rating	Seat leakage class	Flange 300#	ANSI IV		
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	Trim	30	Plug type	Plug material	Contoured	SS - 316	
		31	Seat Material	Cage/Guide Material	SS - 316	NA	
32		Characteristics		Equal Percentage			
Actuator	33	Type / Direction of action		Diaphragm/Reverse			
	34	Fail Position		CLOSE			
	35	Spring range		VTA			
	36	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	37	Type		Electro Pneumatic			
	38	Input signal	Out put signal	4-20 mA+HART	VTA		
	39	Air supply	Action dir.	3.5 barg	Direct		
	40	Protection	Certificate	IP 65	EExib-IIB T3		
Solenoid Valve	41	Type		NA			
	42	Tag No.		NA			
	43	Supply Voltage	Consumption	NA	NA		
	44	Protection	Certificate	NA	NA		
Accessories	45	Pressure gauge and filter		YES			
	46	Manual Control Wheel		NA			
	47	Cable Gland	Size/Qty	NA			
	48	Electrical Conection		M20* 1.5 mm ISO			
	49	Tubing & Conection		SS Tube 1/4"			
	50	Switch	Protection	Certificate	NA	NA NA	

Notes:

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TITLE: Control Valve Data Sheet

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General Data	1	Tag No.		FV-3603			
	2	P&ID No.	Piping Size	Piping Class	036	1/2"	1DS4
	3	Fluid		State		HCM (1)	GAS
	4	Pressure rating		Piping material		300#	SS
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification		Area		ZONE 1	300
Flow Rate	7	Max.Continuous	Unit	70		Kg/h	
	8	Min.Continuous	Unit	7		Kg/h	
	9	Max.In Transients	Unit	84		Kg/h	
	10	Allow. with closed valve	Unit	0		Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	18		barg	
	12	Dp. At max. flowrate	Unit	17		bar	
	13	Max. Dp with closed valve	Unit	28		bar	
Temperature	14	Norm . upstr. Temp	Unit	23		°C	
	15	Max . upstr. Temp	Unit	100		°C	
Sp. Gr.	16	Gases vapours	Unit	26		kg/m3	
	17	Liquids	Unit			kg/m3	
	18	Mol.weight	Unit	29.2		Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.01			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	VTA		VTA	
	22	Body type	Body material	Globe		SS-304	
Body	23	Size Body	Port	1/2"		Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating	Seat leakage class		Flange 300#	ANSI IV	
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	Trim	30	Plug type	Plug material		Contoured	SS - 316
		31	Seat Material	Cage/Guide Material		SS - 316	NA
32		Characteristics		Equal Percentage			
Actuator	33	Type / Direction of action		Diaphragm/Reverse			
	34	Fail Position		CLOSE			
	35	Spring range		VTA			
	36	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	37	Type		Electro Pneumatic			
	38	Input signal	Out put signal		4-20 mA+HART	VTA	
	39	Air supply	Action dir.		3.5 barg	Direct	
	40	Protection	Certificate		IP 65	EExib-IIB T3	
Solenoid Valve	41	Type		NA			
	42	Tag No.		NA			
	43	Supply Voltage	Consumption		NA	NA	
	44	Protection	Certificate		NA	NA	
Accessories	45	Pressure gauge and filter		YES			
	46	Manual Control Wheel		NA			
	47	Cable Gland	Size/Qty		NA		
	48	Electrical Conection		M20* 1.5 mm ISO			
	49	Tubing & Conection		SS Tube 1/4"			
	50	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) HCM SHOULD BE CHANGE AS FOR COMPOSITION

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General Data	1	Tag No.		FV-6101				
	2	P&ID No.	Piping Size	Piping Class	061	1"	1CS2	
	3	Fluid		State		NITROGEN	GAS	
	4	Pressure rating		Piping material		300#	SS	
	5	Amb. Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification		Area		ZONE 1	600	
Flow Rate	7	Max.Continuous		Unit		40	Kg/h	
	8	Min.Continuous		Unit		4	Kg/h	
	9	Max.In Transients		Unit		48	Kg/h	
	10	Allow. with closed va		Unit		0	Kg/h	
Press	11	Norm . Op. upstr. Press		Unit		5.5	barg	
	12	Dp. At max. flowrate		Unit		4	bar	
	13	Max. Dp with closed va		Unit		7	bar	
Temperature	14	Norm . upstr. Temp		Unit		AMB	°C	
	15	Max . upstr. Temp		Unit		100	°C	
Sp. Gr.	16	Gases vapours		Unit		6.8	kg/m	
	17	Liquids		Unit			kg/m	
	18	Mol.weight		Unit		28	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.18				
	20	Solid in suspension						
Cv	21	Min/Norm/Max		Required		0.063	0.385	0.4193
	22	Body type		Body material		Globe	SS-304	
Body	23	Size Body		Port		1"	Single	
	24	Design Pressure		Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature		Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 300#				
	27	Packing mat.		Lubricator		PTFE	VTA	
	28	Flow direction		FTO				
	29	Bonnet type		Standard				
	30	SEAT Leakage Class ANSI		IV				
	Trim	31	Plug type		Plug material		Contoured	SS - 316
		32	Seat Material		Cage/Guide Material		SS - 316	NA
33		Characteristics		Equal Percentage				
Actuator	34	Type / Direction of action		Diaphragm/Reverse				
	35	Fail Position		CLOSE				
	36	Spring range		VTA				
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single		
Positioner	38	Type		Electro Pneumatic				
	39	Input signal		Out put signal		4-20 mA+HART	VTA	
	40	Air supply		Action dir.		3.5 barg	Direct	
	41	Protection		Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type		NA				
	43	Tag No.		NA				
	44	Supply Voltage		Consumption		NA	NA	
	45	Protection		Certificate		NA	NA	
Accessories	46	Pressure gauge and filter		YES				
	47	Manual Control Wheel		NA				
	48	Cable Gland		Size/Qty		NA		
	49	Electrical Conection		M20* 1.5 mm ISO				
	50	Tubing & Conection		SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA	

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General Data	1	Tag No.		FV-6102				
	2	P&ID No.	Piping Size	Piping Class	061	1"	3CC6	
	3	Fluid		State		STEAM	GAS	
	4	Pressure rating		Piping material		150#	CS	
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification		Area		ZONE 1	600	
Flow Rate	7	Max.Continuous		Unit		50	Kg/h	
	8	Min.Continuous		Unit		5	Kg/h	
	9	Max.In Transients		Unit		60	Kg/h	
	10	Allow. with closed va		Unit		0	Kg/h	
Press	11	Norm . Op. upstr. Press		Unit		5.5	barg	
	12	Dp. At max. flowrate		Unit		4	bar	
	13	Max. Dp with closed va		Unit		6.5	bar	
Temperature	14	Norm . upstr. Temp		Unit		163	°C	
	15	Max . upstr. Temp		Unit		180	°C	
Sp. Gr.	16	Gases vapours		Unit		3.36	kg/m	
	17	Liquids		Unit			kg/m	
	18	Mol.weight		Unit		18	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.014				
	20	Solid in suspension						
Cv	21	Min/Norm/Max		Required		0.095	0.731	0.784
Body	22	Body type		Body material		Globe	CS	
	23	Size Body		Port		1"	Single	
	24	Design Pressure		Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature		Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 150#				
	27	Packing mat.		Lubricator		PTFE	VTA	
	28	Flow direction		FTO				
	29	Bonnet type		Standard				
	30	SEAT Leakage Class ANSI		IV				
	Trim	31	Plug type		Plug material		Contoured	SS - 316
32		Seat Material		Cage/Guide Material		SS - 316	NA	
33		Characteristics		Equal Percentage				
Actuator	34	Type / Direction of action		Diaphragm/Reverse				
	35	Fail Position		CLOSE				
	36	Spring range		VTA				
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single		
Positioner	38	Type		Electro Pneumatic				
	39	Input signal		Out put signal		4-20 mA+HART	VTA	
	40	Air supply		Action dir.		3.5 barg	Direct	
	41	Protection		Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type		NA				
	43	Tag No.		NA				
	44	Supply Voltage		Consumption		NA	NA	
	45	Protection		Certificate		NA	NA	
Accessories	46	Pressure gauge and filter		YES				
	47	Manual Control Wheel		NA				
	48	Cable Gland		Size/Qty		NA		
	49	Electrical Conection		M20* 1.5 mm ISO				
	50	Tubing & Conection		SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA	

Notes:

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TITLE: Control Valve Data Sheet




شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی


Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 41 of 41


General Data	1	Tag No.		FV-6201			
	2	P&ID No.	Piping Size	Piping Class	062	4"	1CS2
	3	Fluid	State		NITROGEN		GAS
	4	Pressure rating	Piping material		150#		SS
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		600
Flow Rate	7	Max.Continuous	Unit		335		Kg/h
	8	Min.Continuous	Unit		33.5		Kg/h
	9	Max.In Transients	Unit		402		Kg/h
	10	Allow. with closed va	Unit		0		Kg/h
Press	11	Norm . Op. upstr. Press	Unit		0.6		barg
	12	Dp. At max. flowrate	Unit		0.4		bar
	13	Max. Dp with closed va	Unit		0.8		bar
Temperature	14	Norm . upstr. Temp	Unit		60		°C
	15	Max . upstr. Temp	Unit		120		°C
Sp. Gr.	16	Gases vapours	Unit		1.6		kg/m
	17	Liquids	Unit				kg/m
	18	Mol.weight	Unit		28		Kg/Kmol
Visc.	19	Op. visc. (when>5mpa's)		0.019			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required		2.4	17.86	18.81
Body	22	Body type	Body material		Globe		SS-304
	23	Size Body	Port		4"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating			Flange 150#		
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction			FTO		
	29	Bonnet type			Standard		
	30	SEAT Leakage Class ANSI			IV		
	Trim	31	Plug type	Plug material		Contoured	
32		Seat Material	Cage/Guide Material		SS - 316		NA
33		Characteristics			Equal Percentage		
Actuator	34	Type / Direction of action			Diaphragm/Direct		
	35	Fail Position			OPEN		
	36	Spring range			VTA		
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type			Electro Pneumatic		
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EExia-IIB T6
Solenoid Valve	42	Type			NA		
	43	Tag No.			NA		
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter			YES		
	47	Manual Control Wheel			NA		
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection			M20* 1.5 mm ISO		
	50	Tubing & Conection			SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA	NA	NA


Notes:


1	0	12/21/2021	IFA	K.A	M.N	AA.SH
No.	Rev	Date	Issued For	Prepared	Checked	Approved


		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2101			
	2	Service		Propylene to Propane			
	3	P&ID No.	Piping Size	021	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.03	0.3	0.36	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00005	0.00022	0.00023	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2102			
	2	Service		HCM TO R 211			
	3	P&ID No.	Piping Size	021	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	Propane	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.5	15	18	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	23.82	23.82	23.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	514	512.4	510.9	
	13	Vapor pressure	bar	7.92	8.36	8.81	
	14	Critical pressure	bar	42.57	42.57	42.57	
	15	Viscosity	cP	0.1083	0.1065	0.1046	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1801	0.1971	0.2139	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.51	1.5	
	21	CV coefficient	Required	0.00052	0.00429	0.0048	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2103			
	2	Service		PROPYLEN TO PICK-UP			
	3	P&ID No.	Piping Size	021	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLEN	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2.5	25	30	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00119	0.00849	0.00931	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42	MANUFACTURER		VTA				
43	MODEL no.		VTA				
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2201			
	2	Service		HCM TO R 221			
	3	P&ID No.	Piping Size	021	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	Propane	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2	20	24	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	23.82	23.82	23.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	514	512.4	510.9	
	13	Vapor pressure	bar	7.92	8.36	8.81	
	14	Critical pressure	bar	42.57	42.57	42.57	
	15	Viscosity	cP	0.1083	0.1065	0.1046	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1801	0.1971	0.2139	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.51	1.5	
	21	CV coefficient	Required	0.00068	0.00527	0.00639	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2202			
	2	Service		PROPYLEN TO PICK-UP			
	3	P&ID No.	Piping Size	022	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLEN	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	3.5	35	42	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.0016	0.01152	0.01265	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42	MANUFACTURER		VTA				
43	MODEL no.		VTA				
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	12/21/2021	IFA	K.A	M.N	AA.SH		
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2501			
	2	Service		HYD TO R 251			
	3	P&ID No.	Piping Size	025	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HYDROGEN	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.002	0.02	0.024	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	4.682	4.918	5.062	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	8.46 e -3	8.73 e -3	8.99 e -3	
	16	Molar mass	g/mol	2.016	2.016	2.016	
	17	Real gas factor (Z)		1.021	1.023	1.024	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.429	1.428	1.427	
	21	CV coefficient	Required	0.00001	0.00008	0.00009	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	FV-2502				
	2	Service	ETH TO R 251				
	3	P&ID No.	Piping Size	025	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	ETHYLENE	GAS		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7		titel	case 1	case 2	case 3	
	8	Flow	Kg/h	0.7	7	8.4	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	60.56	64.25	67.69	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.4291	0.5074	0.5522	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.22	1.22	1.22	
	21	CV coefficient	Required	0.00058	0.0058	0.00679	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
Owner Job No:		Sheet No: of					
Process data	1	Tag No.	FV-2503				
	2	Service	Propylene to R-251				
	3	P&ID No.	Piping Size	025	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.5	15	18	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00077	0.00535	0.00586	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2504			
	2	Service		Propylene to R-251			
	3	P&ID No.	Piping Size	025	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	5	50	60	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00219	0.01596	0.01753	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2505			
	2	Service		Propylene to R-251			
	3	P&ID No.	Piping Size	025	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2.5	25	30	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00119	0.00849	0.00931	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2506			
	2	Service		PROPANE TO R 261			
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	3	30	36	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00077	0.00674	0.00776	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet





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Process data	1	Tag No.	FV-2601				
	2	Service	HYD TO R 261				
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HYDROGEN	GAS		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.005	0.05	0.06	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	4.682	4.918	5.062	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	8.46 e -3	8.73 e -3	8.99 e -3	
	16	Molar mass	g/mol	2.016	2.016	2.016	
	17	Real gas factor (Z)		1.021	1.023	1.024	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.429	1.428	1.427	
	21	CV coefficient	Required	0.00002	0.00019	0.00022	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	FV-2602				
	2	Service	ETH TO R 261				
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	ETHYLENE	GAS		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7		titel	case 1	case 2	case 3	
	8	Flow	Kg/h	1.25	12.5	15	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	60.56	64.25	67.69	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.4291	0.5074	0.5522	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.22	1.22	1.22	
	21	CV coefficient	Required	0.00103	0.01039	0.01213	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
Owner Job No:		Sheet No:		of			
Process data	1	Tag No.	FV-2603				
	2	Service	Propylene to R-261				
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	6	60	72	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00257	0.01886	0.02073	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2604			
	2	Service		BUTENE TO R 261			
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	BUTENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.07	0.7	0.84	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	577.2	566.8	556.3	
	13	Vapor pressure	bar	2.19	2.99	4.01	
	14	Critical pressure	bar	36.48	36.48	36.48	
	15	Viscosity	cP	0.1956	0.1774	0.1613	
	16	Molar mass	g/mol	58.12	58.12	58.12	
	17	Real gas factor (Z)		0.2174	0.2348	0.2521	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387	
	21	CV coefficient	Required	0.00009	0.00036	0.00041	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2605			
	2	Service		PROPANE TO R 261			
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	6	60	72	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00173	0.01616	0.01863	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2606			
	2	Service		PROPANE TO P 261			
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	4	40	48	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00119	0.01078	0.01242	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT			 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی		
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-2607			
	2	Service		PROPANE TO R 261			
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2	20	24	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00063	0.00539	0.00621	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet





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Process data	1	Tag No.	FV-2608				
	2	Service	PROPANE PICK-UP R 261				
	3	P&ID No.	Piping Size	026	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	7	70	84	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00201	0.01886	0.02174	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4101			
	2	Service		HYD TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HYDROGEN	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.025	0.25	0.3	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	16.82	20.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	4.682	4.918	5.062	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	8.46 e -3	8.73 e -3	8.99 e -3	
	16	Molar mass	g/mol	2.016	2.016	2.016	
	17	Real gas factor (Z)		1.021	1.023	1.024	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.429	1.428	1.427	
	21	CV coefficient	Required	0.0001	0.00095	0.0011	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4102			
	2	Service		HYD TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HYDROGEN		GAS	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.25	2.5	3	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	16.82	20.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	4.682	4.918	5.062	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	8.46 e -3	8.73 e -3	8.99 e -3	
	16	Molar mass	g/mol	2.016	2.016	2.016	
	17	Real gas factor (Z)		1.021	1.023	1.024	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.429	1.428	1.427	
	21	CV coefficient	Required	0.00102	0.00952	0.01096	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4103			
	2	Service		ETH TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	ETHYLENE	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2.5	25	30	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	60.56	64.25	67.69	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.4291	0.5074	0.5522	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.22	1.22	1.22	
	21	CV coefficient	Required	0.00207	0.02078	0.02427	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4104			
	2	Service		ETH TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#		SS	
	5	Fluid	State	ETHYLENE		GAS	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	8.5	85	102	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	60.56	64.25	67.69	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.4291	0.5074	0.5522	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.22	1.22	1.22	
	21	CV coefficient	Required	0.00703	0.07066	0.0825	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4105			
	2	Service		Propylene to R-411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2.5	25	30	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	16.82	20.82	24.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.00109	0.00836	0.00972	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42	MANUFACTURER		VTA				
43	MODEL no.		VTA				
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4106			
	2	Service		Propylene to R-411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPYLENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	8.5	85	102	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	16.82	20.82	24.82	
	11	Inlet temperature	-C	18	20	22	
	12	Density	kg/m3	529.3	527.6	527.1	
	13	Vapor pressure	bar	9.63	10.15	10.68	
	14	Critical pressure	bar	46.3	46.3	46.3	
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	42.08	42.08	42.08	
	17	Real gas factor (Z)		0.1669	0.1827	0.1983	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.6	1.59	1.577	
	21	CV coefficient	Required	0.0032	0.02557	0.02982	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43	MODEL no.		VTA				
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4107			
	2	Service		BUTENE TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	BUTENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.1	1	1.2	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	577.2	566.8	556.3	
	13	Vapor pressure	bar	2.19	2.99	4.01	
	14	Critical pressure	bar	36.48	36.48	36.48	
	15	Viscosity	cP	0.1956	0.1774	0.1613	
	16	Molar mass	g/mol	58.12	58.12	58.12	
	17	Real gas factor (Z)		0.2174	0.2348	0.2521	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387	
	21	CV coefficient	Required	0.00011	0.00046	0.00055	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43	MODEL no.		VTA				
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4108			
	2	Service		BUTENE TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	BUTENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1	10	12	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	577.2	566.8	556.3	
	13	Vapor pressure	bar	2.19	2.99	4.01	
	14	Critical pressure	bar	36.48	36.48	36.48	
	15	Viscosity	cP	0.1956	0.1774	0.1613	
	16	Molar mass	g/mol	58.12	58.12	58.12	
	17	Real gas factor (Z)		0.2174	0.2348	0.2521	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387	
	21	CV coefficient	Required	0.0005	0.00346	0.00416	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet				
		Contractor Job No:		Doc. No:		
		Owner Job No:		Quantity: 2		
Process data	1	Tag No.		FV-4109		
	2	Service		BUTENE TO R 411		
	3	P&ID No.	Piping Size	041	1/2"	
	4	Pressure rating	Piping material	600#	SS	
	5	Fluid	State	BUTENE	LIQ.	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara
	7	titel		case 1	case 2	case 3
	8	Flow	Kg/h	4	40	48
	9	Inlet pressure	bar(a)	50.82	55.82	60.82
	10	Outlet pressure	bar(a)	21.82	21.82	21.82
	11	Inlet temperature	-C	10	20	30
	12	Density	kg/m3	577.2	566.8	556.3
	13	Vapor pressure	bar	2.19	2.99	4.01
	14	Critical pressure	bar	36.48	36.48	36.48
	15	Viscosity	cP	0.1956	0.1774	0.1613
	16	Molar mass	g/mol	58.12	58.12	58.12
	17	Real gas factor (Z)		0.2174	0.2348	0.2521
	18	Solid in suspension	(YES / NO)	NO	NO	NO
	19	velocity	m/s	1-3	1-3	1-3
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387
	21	CV coefficient	Required	0.00165	0.01212	0.01459
VALVE	22	CV coefficient for Valve (Selected)		VTA		
	23	Valve type	Body material	Globe	forged steel-SS-316	
	24	Nominal size	Pressure ratings	VTA	ANSI 150#	
	25	Packing	Sealing	PTFE	metal	
	26	Design temperature		100		
	27	Characteristics		equal percentage		
	28	Leakage rate		V		
	29	Fail position		Close		
	30	Plug & seat & stem material		SS-316		
	31	Bonnet type	Bonnet material	Standard	SS-316	
	32	MANUFACTURER		VTA		
	33	MODEL no.		VTA		
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator	
35		Actuator Size (cm2)		VTA		
36		Hand Wheel		NA		
37		Air supply pressure		3.5 bar(g)		
38		Actuator Action		Air to Open		
39		Actuator stem & Actuator body materials		VTA		
40		Diaphragm materials		VTA		
41		Single/Double Acting		Single		
42		MANUFACTURER		VTA		
43		MODEL no.		VTA		
Positioner	44	Positioner Type		Electro Pneumatic with HART communication		
	45	Input signal & Out put signal		4-20 mA+HART		
	46	Air supply		3.5 barg		
	47	Ingress Protection		IP 65		
	48	Enclosure Protection		EE xia , IIC , T6		
	49	Electrical Conection		M20* 1.5 mm ISO		
	50	Single/Double Acting		VTA		
	51	calibration		self calibration		
	52	materials houssing		VTA		
	53	Display, Operation		LCD, push button on display electronics-Indicating		
	54	MANUFACTURER		VTA		
	55	MODEL no.		VTA		
Accessories	56	Pressure gauge and filter and Regulator		YES		
	57	Certificates		pressure test, inspection certificate-Works		
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4110			
	2	Service		HEXENE to R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HEXENE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	3.5	35	42	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	681.6	678.2	669.7	
	13	Vapor pressure	bar	0.1348	0.2115	0.3206	
	14	Critical pressure	bar	31.71	31.71	31.71	
	15	Viscosity	cP	0.2871	0.2603	0.2359	
	16	Molar mass	g/mol	84	84	84	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	----	----	----	
	21	CV coefficient	Required	0.00003	0.00027	0.0003	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42	MANUFACTURER		VTA				
43	MODEL no.		VTA				
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4111			
	2	Service		PROPANE TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	5	50	60	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00146	0.01452	0.01553	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4112			
	2	Service		PROPANE TO CF 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	3.5	35	42	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00105	0.01016	0.01087	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		FV-4113			
	2	Service		PROPANE TO R 411			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2	20	24	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00063	0.00581	0.00621	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	FV-4201				
	2	Service	HYD TO R 421				
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HYDROGEN	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7		titel	case 1	case 2	case 3	
	8	Flow	Kg/h	0.04	0.4	0.48	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	4.682	4.918	5.062	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	8.46 e -3	8.73 e -3	8.99 e -3	
	16	Molar mass	g/mol	2.016	2.016	2.016	
	17	Real gas factor (Z)		1.021	1.023	1.024	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.429	1.428	1.427	
	21	CV coefficient	Required	0.00017	0.00154	0.00175	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		PROJECT: PP-PE PILOT PLANT			 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی		
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4202			
	2	Service		HYD TO R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HYDROGEN	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.17	1.7	2.04	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	4.682	4.918	5.062	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	8.46 e -3	8.73 e -3	8.99 e -3	
	16	Molar mass	g/mol	2.016	2.016	2.016	
	17	Real gas factor (Z)		1.021	1.023	1.024	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.429	1.428	1.427	
	21	CV coefficient	Required	0.00071	0.0065	0.00745	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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Rev	Date	Issued For	Prepared	Checked	Approved		

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4203			
	2	Service		ETH TO R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	ETHYLENE	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	5	50	60	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	60.56	64.25	67.69	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.4291	0.5074	0.5522	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.22	1.22	1.22	
	21	CV coefficient	Required	0.00414	0.04156	0.04853	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT					
		TITLE: Control Valve Data Sheet			شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی		
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4204			
	2	Service		ETH TO R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	ETHYLENE	GAS		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	25	250	300	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	60.56	64.25	67.69	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.4291	0.5074	0.5522	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.22	1.22	1.22	
	21	CV coefficient	Required	0.0207	0.207	0.243	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4207			
	2	Service		BUTENE TO R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	BUTENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.4	4	4.8	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	577.2	566.8	556.3	
	13	Vapor pressure	bar	2.19	2.99	4.01	
	14	Critical pressure	bar	36.48	36.48	36.48	
	15	Viscosity	cP	0.1956	0.1774	0.1613	
	16	Molar mass	g/mol	58.12	58.12	58.12	
	17	Real gas factor (Z)		0.2174	0.2348	0.2521	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387	
	21	CV coefficient	Required	0.00027	0.00153	0.00184	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet





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Process data	1	Tag No.	FV-4208				
	2	Service	BUTENE TO R 421				
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	BUTENE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.7	17	20.4	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	577.2	566.8	556.3	
	13	Vapor pressure	bar	2.19	2.99	4.01	
	14	Critical pressure	bar	36.48	36.48	36.48	
	15	Viscosity	cP	0.1956	0.1774	0.1613	
	16	Molar mass	g/mol	58.12	58.12	58.12	
	17	Real gas factor (Z)		0.2174	0.2348	0.2521	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387	
	21	CV coefficient	Required	0.00078	0.00557	0.0067	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4209			
	2	Service		BUTENE TO R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	BUTENE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	6	60	72	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	577.2	566.8	556.3	
	13	Vapor pressure	bar	2.19	2.99	4.01	
	14	Critical pressure	bar	36.48	36.48	36.48	
	15	Viscosity	cP	0.1956	0.1774	0.1613	
	16	Molar mass	g/mol	58.12	58.12	58.12	
	17	Real gas factor (Z)		0.2174	0.2348	0.2521	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.402	1.395	1.387	
	21	CV coefficient	Required	0.00236	0.01756	0.02116	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4210			
	2	Service		HEXENE to R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HEXENE		LIQ.	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	6	60	72	
	9	Inlet pressure	bar(a)	50.82	55.82	60.82	
	10	Outlet pressure	bar(a)	21.82	21.82	21.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	681.6	678.2	669.7	
	13	Vapor pressure	bar	0.1348	0.2115	0.3206	
	14	Critical pressure	bar	31.71	31.71	31.71	
	15	Viscosity	cP	0.2871	0.2603	0.2359	
	16	Molar mass	g/mol	84	84	84	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	----	----	----	
	21	CV coefficient	Required	0.00005	0.00046	0.00052	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	12/21/2021	IFA	K.A	M.N	AA.SH		
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4211			
	2	Service		PROPANE TO R 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	8.5	85	102	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00244	0.02468	0.0264	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4212			
	2	Service		PROPANE TO CF 421			
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	3.5	35	42	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00105	0.01016	0.01087	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		equal percentage			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	12/21/2021	IFA	K.A	M.N	AA.SH		
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	FV-4213				
	2	Service	PROPANE TO R 421				
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	PROPANE	LIQ.		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2	20	24	
	9	Inlet pressure	bar(a)	55.82	60.82	64.82	
	10	Outlet pressure	bar(a)	24.82	24.82	24.82	
	11	Inlet temperature	-C	10	20	30	
	12	Density	kg/m3	527	513.5	500.9	
	13	Vapor pressure	bar	6.35	8.36	10.8	
	14	Critical pressure	bar	42.4	42.4	42.4	
	15	Viscosity	cP	0.1236	0.1124	0.1016	
	16	Molar mass	g/mol	44.1	44.1	44.1	
	17	Real gas factor (Z)		0.1989	0.2143	0.2264	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.52	1.503	1.478	
	21	CV coefficient	Required	0.00063	0.00539	0.00621	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	100				
	27	Characteristics	equal percentage				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4402			
	2	Service		LPS to Reboiler E-352			
	3	P&ID No.	Piping Size	0044	1½"		
	4	Pressure rating	Piping material	300#	CS		
	5	Fluid	State	Steam	Vapor		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	Titel		case 1	case 2	case 3	
	8	Flow	Kg/h	6	60	72	
	9	Inlet pressure	bar	2	2	2	
	10	Outlet pressure	bar	1.9	1.9	1.9	
	11	Inlet temperature	-C	120	120	120	
	12	Density	kg/m3				
	13	Vapor pressure	bar				
	14	Critical pressure	bar				
	15	Viscosity	cP	0.014	0.014	0.014	
	16	Molar mass	g/mol	18.015	18.015	18.015	
	17	Real gas factor (Z)			0.1827		
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s				
	20	Isentropic exponent	gamma (Cp/Cv)				
	21	CV coefficient	Required	0.09	0.85	1.02	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	CS		
	24	Nominal size	Pressure ratings	Falnge - 1½"	ANSI 300#		
	25	Packing	Sealing	PTFE	Metal		
	26	Design temperature		-60 +230			
	27	Characteristics		Equal Percentage			
	28	Leakage rate		ANSI IV			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIB , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		Single			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	Tubing Conection		SS Tube 1/4 "			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	08/01/2021	IFA	M.AGHAMOHAMMADI	A.A.SHOKRI	N.NOUHJAH		
Rev	Date	Issued For	Prepared	Checked	Approved		

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		FV-4403			
	2	Service		1-Butene to R-411 R-421			
	3	P&ID No.	Piping Size	0044	1/2"		
	4	Pressure rating	Piping material	300#	SS (SA312-304L)		
	5	Fluid	State	1-Butene	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2	20	24	
	9	Inlet pressure	bar	31	31	31	
	10	Outlet pressure	bar	30	30	30	
	11	Inlet temperature	-C	110	110	110	
	12	Density	kg/m3	462	462	462	
	13	Vapor pressure	bar				
	14	Critical pressure	bar				
	15	Viscosity	cP	0.0755	0.0737	0.072	
	16	Molar mass	g/mol	56.11	56.11	56.11	
	17	Real gas factor (Z)					
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s				
	20	Isentropic exponent	gamma (Cp/Cv)				
	21	CV coefficient	Required	0.0015	0.007	0.055	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	SS-304		
	24	Nominal size	Pressure ratings	1/2 "	ANSI 300#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		-60 +230			
	27	Characteristics		equal precentage			
	28	Leakage rate		ANSI IV			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIB , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		Single			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	Tubing Conection		SS Tube 1/4 "			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	08/01/2021	IFA	M.AGHAMOHAMMADI	A.A.SHOKRI	N.NOUHJAH		
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PROJECT: PP-PE PILOT PLANT



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 1 of 5

General Data	1	Tag No.	LV-0301			
	2	P&ID No.	Piping Size	Piping Class	003 1" 1CS2	
	3	Fluid	State	WATER LIQUID		
	4	Pressure rating	Piping material	150# SS		
	5	Amb. Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C 0.82 Bara 86%	
	6	Area Classification	Area	ZONE 1 000		
Flow Rate	7	Max.Continuous	Unit	500 Kg/h		
	8	Min.Continuous	Unit	50 Kg/h		
	9	Max.In Transients	Unit	600 Kg/h		
	10	Allow. with closed va	Unit	0 Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	4.5 barg		
	12	Dp. At max. flowrate	Unit	2 bar		
	13	Max. Dp with closed va	Unit	10 bar		
Temperature	14	Norm . upstr. Temp	Unit	30 °C		
	15	Max . upstr. Temp	Unit	-10 +100 °C		
Sp. Gr.	16	Gases vapours	Unit	Kg/m3		
	17	Liquids	Unit	1000 Kg/m3		
	18	Mol.weight	Unit	18 Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)	1			
	20	Solid in suspension				
Cv	21	Min/Norm/Max	Required	0.057 0.23 0.41		
Body	22	Body type	Body material	Globe SS-304		
	23	Size Body	Port	1" Single		
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg	
	25	Design Temperature	Min. °C	Max. °C	°C	
	26	Valve end con. & rating	Flange 150#			
	27	Packing mat.	Lubricator	PTFE VTA		
	28	Flow direction	FTO			
	29	Bonnet type	Standard			
	30	Seat Leakage Class ANSI	IV			
	Trim	31	Plug type	Plug material	Contoured SS -316	
32		Seat Material	Cage/Guide Material	SS -316 NA		
33		Characteristics	Equal Percentage			
Actuator	34	Type / Direction of action	Diaphragm/Reverse			
	35	Fail Position	CLOSE			
	36	Spring range	VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single	
Positioner	38	Type	Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART VTA		
	40	Air supply	Action dir.	3.5 barg Direct		
	41	Protection	Certificate	IP 65 EExia-IIB T6		
Solenoid Valve	42	Type	NA			
	43	Tag No.	NA			
	44	Supply Voltage	Consumption	NA NA		
	45	Protection	Certificate	NA NA		
Accessories	46	Pressure gauge and filter	YES			
	47	Manual Control Wheel	NA			
	48	Cable Gland	Size/Qty	NA		
	49	Electrical Conection	M20* 1.5 mm ISO			
	50	Tubing & Conection	SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA NA NA	

Notes:

No.	Rev	Date	Issued For	Prepared	Checked	Approved
1	0	12/21/2021	IFA	K.A	M.N	AA.SH

PROJECT: PP-PE PILOT PLANT



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009

Owner Job No: _____ Sheet No: 3 of 5

General Data	1	Tag No.		LV-3201				
	2	P&ID No.	Piping Size	Piping Class	032	1"	1DS4	
	3	Fluid		State		PROPYLENE	LIQUID	
	4	Pressure rating		Piping material		300#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification		Area		ZONE 1	300	
Flow Rate	7	Max.Continuous		Unit		840	Kg/h	
	8	Min.Continuous		Unit		84	Kg/h	
	9	Max.In Transients		Unit		1008	Kg/h	
	10	Allow. with closed va		Unit		0	Kg/h	
Press	11	Norm . Op. upstr. Press		Unit		23	barg	
	12	Dp. At max. flowrate		Unit		1	bar	
	13	Max. Dp with closed va		Unit		25	bar	
Temperature	14	Norm . upstr. Temp		Unit		AMB (1)	°C	
	15	Max . upstr. Temp		Unit		100	°C	
Sp. Gr.	16	Gases vapours		Unit			Kg/m3	
	17	Liquids		Unit		520	Kg/m3	
	18	Mol.weight		Unit		42	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)				0.1		
	20	Solid in suspension						
Cv	21	Min/Norm/Max		Required		0.1638	1.38	0.665
	22	Body type		Body material		Globe	SS-304	
Body	23	Size Body		Port		1"	Single	
	24	Design Pressure		Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature		Min. °C	Max. °C		°C	
	26	Valve end con. & rating				Flange 300#		
	27	Packing mat.		Lubricator		PTFE	VTA	
	28	Flow direction				FTO		
	29	Bonnet type				Standard		
	30	Seat Leakage Class ANSI				V		
Trim	31	Plug type		Plug material		Contoured	SS -316	
	32	Seat Material		Cage/Guide Material		SS -316	NA	
	33	Characteristics				Equal Percentage		
Actuator	34	Type / Direction of action				Diaphragm/Reverse		
	35	Fail Position				CLOSE		
	36	Spring range				VTA		
	37	On-Off/Modulating		Single/Double Acting		Modulating	Single	
Positioner	38	Type				Electro Pneumatic		
	39	Input signal		Out put signal		4-20 mA+HART	VTA	
	40	Air supply		Action dir.		3.5 barg	Direct	
	41	Protection		Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type				NA		
	43	Tag No.				NA		
	44	Supply Voltage		Consumption		NA	NA	
	45	Protection		Certificate		NA	NA	
Accessories	46	Pressure gauge and filter				YES		
	47	Manual Control Wheel				NA		
	48	Cable Gland		Size/Qty		NA		
	49	Electrical Conection				M20* 1.5 mm ISO		
	50	Tubing & Conection				SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA	NA	NA	

Notes: (1) Ambient temperature it is sppone -20 ÷ +50 °c

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PROJECT: PP-PE PILOT PLANT



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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009

Owner Job No: _____ Sheet No: 5 of 5

General Data	1	Tag No.		LV-6103			
	2	P&ID No.	Piping Size	Piping Class	061	1"	4CC2
	3	Fluid	State		WATER		LIQUID
	4	Pressure rating	Piping material		150#		CS
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		600
Flow Rate	7	Max.Continuous	Unit		3500		Kg/h
	8	Min.Continuous	Unit		350		Kg/h
	9	Max.In Transients	Unit		4200		Kg/h
	10	Allow. with closed va	Unit		0		Kg/h
Press	11	Norm . Op. upstr. Press	Unit		3		barg
	12	Dp. At max. flowrate	Unit		2.5		bar
	13	Max. Dp with closed va	Unit		9		bar
Temperature	14	Norm . upstr. Temp	Unit		30		°C
	15	Max . upstr. Temp	Unit		150		°C
Sp. Gr.	16	Gases vapours	Unit				Kg/m3
	17	Liquids	Unit		1000		Kg/m3
	18	Mol.weight	Unit		18		Kg/Kmol
Visc.	19	Op. visc. (when>5mpa's)			0.7		
	20	Solid in suspension			YES		
Cv	21	Min/Norm/Max	Required		0.3281	2.56	2.35
	22	Body type	Body material		VEEBALL		SS-304
Body	23	Size Body	Port		1"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating			Flange 150#		
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction			FTO		
	29	Bonnet type			Standard		
	30	Seat Leakage Class ANSI			IV		
Trim	31	Plug type	Plug material		Contoured		SS -316
	32	Seat Material	Cage/Guide Material		SS -316		NA
	33	Characteristics			Equal Percentage		
Actuator	34	Type / Direction of action			Diaphragm/Reverse		
	35	Fail Position			CLOSE		
	36	Spring range			VTA		
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type			Electro Pneumatic		
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EExia-IIB T6
Solenoid Valve	42	Type			NA		
	43	Tag No.			NA		
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter			YES		
	47	Manual Control Wheel			NA		
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection			M20* 1.5 mm ISO		
	50	Tubing & Conection			SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: Body type = V Ball

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 1 of 20

General Data	1	Tag No.		PV-1201			
	2	P&ID No.	Piping Size	Piping Class	012	1/2"	1FS4
	3	Fluid		State	ALKYL (1)	LIQUID	
	4	Pressure rating		Piping material	600#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification		Area	ZONE 1	100	
Flow Rate	7	Max.Continuous	Unit	4	Kg/h		
	8	Min.Continuous	Unit	0.4	Kg/h		
	9	Max.In Transients	Unit	4.8	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	55	barg		
	12	Dp. At max. flowrate	Unit	54.9	bar		
	13	Max. Dp with closed va	Unit	65	bar		
Temperature	14	Norm . upstr. Temp	Unit	30	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit		Kg/m3		
	17	Liquids	Unit	661	Kg/m3		
	18	Mol.weight	Unit	86	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.28			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00015	0.00097	0.0845	
	22	Body type	Body material	Globe	SS-304		
Body	23	Size Body	Port	1/2"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg		
	25	Design Temperature	Min. °C	Max. °C	°C		
	26	Valve end con. & rating		Flange 600#			
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	Seat Leakage Class ANSI		V			
	Trim	31	Plug type	Plug material	Contoured	SS - 316	
		32	Seat Material	Cage/Guide Material	SS - 316	NA	
33		Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Direct			
	35	Fail Position		OPEN			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART	VTA		
	40	Air supply	Action dir.	3.5 barg	Direct		
	41	Protection	Certificate	IP 65	EExia-IIB T6		
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption	NA	NA		
	45	Protection	Certificate	NA	NA		
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Alkyl solution at 100g/l is assumed as for hexane condition

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TITLE: Control Valve Data Sheet



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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 2 of 20

General Data	1	Tag No.		PV-1301			
	2	P&ID No.	Piping Size	Piping Class	013	1/2"	1FS4
	3	Fluid	State		DONOR (1)		LIQUID
	4	Pressure rating	Piping material		600#		SS
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1		100
Flow Rate	7	Max.Continuous	Unit	4		Kg/h	
	8	Min.Continuous	Unit	0.4		Kg/h	
	9	Max.In Transients	Unit	4.8		Kg/h	
	10	Allow. with closed va	Unit	0		Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	55		barg	
	12	Dp. At max. flowrate	Unit	54		bar	
	13	Max. Dp with closed va	Unit	65		bar	
Temperature	14	Norm . upstr. Temp	Unit	30		°C	
	15	Max . upstr. Temp	Unit	100		°C	
Sp. Gr.	16	Gases vapours	Unit			Kg/m3	
	17	Liquids	Unit	661		Kg/m3	
	18	Mol.weight	Unit	86		Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)	0.28				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00015	0.00097	0.0845	
Body	22	Body type	Body material		Globe		SS-304
	23	Size Body	Port		1/2"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a			Barg
	25	Design Temperature	Min. °C	Max. °C			°C
	26	Valve end con. & rating	Flange 600#				
	27	Packing mat.	Lubricator		PTFE		VTA
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	30	Seat Leakage Class ANSI	IV				
Trim	31	Plug type	Plug material		Contoured		SS - 316
	32	Seat Material	Cage/Guide Material		SS - 316		NA
	33	Characteristics	Equal Percentage				
Actuator	34	Type / Direction of action	Diaphragm/Direct				
	35	Fail Position	OPEN				
	36	Spring range	VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating		Single	
Positioner	38	Type	Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART		VTA
	40	Air supply	Action dir.		3.5 barg		Direct
	41	Protection	Certificate		IP 65		EEExia-IIB T6
Solenoid Valve	42	Type	NA				
	43	Tag No.	NA				
	44	Supply Voltage	Consumption		NA		NA
	45	Protection	Certificate		NA		NA
Accessories	46	Pressure gauge and filter	YES				
	47	Manual Control Wheel	NA				
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Tubing & Conection	SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Donor solution at 30g/l is assumed as for hexane condition

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 3 of 20

General Data	1	Tag No.		PV-1401			
	2	P&ID No.	Piping Size	Piping Class	014	1/2"	1FS4
	3	Fluid	State		ATMER (1)	LIQUID	
	4	Pressure rating	Piping material		600#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	100	
Flow Rate	7	Max.Continuous	Unit	4	Kg/h		
	8	Min.Continuous	Unit	0.4	Kg/h		
	9	Max.In Transients	Unit	4.8	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	55	barg		
	12	Dp. At max. flowrate	Unit	54	bar		
	13	Max. Dp with closed va	Unit	65	bar		
Temperature	14	Norm . upstr. Temp	Unit	30	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit		Kg/m3		
	17	Liquids	Unit	661	Kg/m3		
	18	Mol.weight	Unit	86	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.28			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00015	0.00096	0.0845	
Body	22	Body type	Body material		Globe	SS-304	
	23	Size Body	Port		1/2"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 600#			
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	Seat Leakage Class ANSI		IV			
Trim	31	Plug type	Plug material		Contoured	SS - 316	
	32	Seat Material	Cage/Guide Material		SS - 316	NA	
	33	Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Direct			
	35	Fail Position		OPEN			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal		4-20 mA+HART	VTA	
	40	Air supply	Action dir.		3.5 barg	Direct	
	41	Protection	Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption		NA	NA	
	45	Protection	Certificate		NA	NA	
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Atmer solution at 100g/l is assumed as for hexane condition

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 7 of 20

General Data	1	Tag No.		PV-3201			
	2	P&ID No.	Piping Size	Piping Class	032	1"	1DS4
	3	Fluid		State	PROPYLENE	LIQUID	
	4	Pressure rating		Piping material	300#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification		Area	ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	50	Kg/h		
	8	Min.Continuous	Unit	5	Kg/h		
	9	Max.In Transients	Unit	60	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	18	barg		
	12	Dp. At max. flowrate	Unit	0.1	bar		
	13	Max. Dp with closed va	Unit	0.1	bar		
Temperature	14	Norm . upstr. Temp	Unit	30	°C		
	15	Max . upstr. Temp	Unit	-45 +120	°C		
Sp. Gr.	16	Gases vapours	Unit		Kg/m3		
	17	Liquids	Unit	485	Kg/m3		
	18	Mol.weight	Unit	42	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.09			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.051	0.3664	0.04371	
Body	22	Body type	Body material	Globe	SS-304		
	23	Size Body	Port	1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 300#			
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	Seat Leakage Class ANSI		V			
Trim	31	Plug type	Plug material	Contoured	SS - 316		
	32	Seat Material	Cage/Guide Material	SS - 316	NA		
	33	Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Reverse			
	35	Fail Position		CLOSE			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART	VTA		
	40	Air supply	Action dir.	3.5 barg	Direct		
	41	Protection	Certificate	IP 65	EExia-IIB T6		
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption	NA	NA		
	45	Protection	Certificate	NA	NA		
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes:

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TITLE: Control Valve Data Sheet



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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 107 of 163

General Data	1	Tag No.	PV-3202				
	2	P&ID No.	Piping Size	Piping Class	032	1" 1DS4	
	3	Fluid	State		PROPYLENE	GAS	
	4	Pressure rating	Piping material		300#	SS	
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara 86%	
	6	Area Classification	Area		ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	75	Kg/h		
	8	Min.Continuous	Unit	7.5	Kg/h		
	9	Max.In Transients	Unit	90	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	18	barg		
	12	Dp. At max. flowrate	Unit	16	bar		
	13	Max. Dp with closed va	Unit	25	bar		
Temperature	14	Norm . upstr. Temp	Unit	35	°C		
	15	Max . upstr. Temp	Unit	-45 +120	°C		
Sp. Gr.	16	Gases vapours	Unit	44.2	Kg/m3		
	17	Liquids	Unit		Kg/m3		
	18	Mol.weight	Unit	42	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)	0.01				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00029	0.00233	0.00803	
	22	Body type	Body material	Globe	SS-304		
Body	23	Size Body	Port	1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg		
	25	Design Temperature	Min. °C	Max. °C	°C		
	26	Valve end con. & rating	Seat leakage class		Flange 300#	ANSI IV	
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	Trim	30	Plug type	Plug material	Contoured	SS - 316	
		31	Seat Material	Cage/Guide Material	SS - 316	NA	
32		Characteristics	Equal Percentage				
Actuator	33	Type / Direction of action	Diaphragm/DIRECT				
	34	Fail Position	OPEN				
	35	Spring range	VTA				
	36	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	37	Type	Electro Pneumatic				
	38	Input signal	Out put signal	4-20 mA+HART	VTA		
	39	Air supply	Action dir.	3.5 barg	Direct		
	40	Protection	Certificate	IP 65	EExia-IIB T3		
Solenoid Valve	41	Type	NA				
	42	Tag No.	NA				
	43	Supply Voltage	Consumption	NA	NA		
	44	Protection	Certificate	NA	NA		
Accessories	45	Pressure gauge and filter	YES				
	46	Manual Control Wheel	NA				
	47	Cable Gland	Size/Qty	NA			
	48	Electrical Conection	M20* 1.5 mm ISO				
	49	Tubing & Conection	SS Tube 1/4"				
	50	Switch	Protection	Certificate	NA	NA	NA

Notes:

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

General Data	1	Tag No.	PV-3404A (1)		
	2	P&ID No.	Piping Size	Piping Class	1" 1CL1
	3	Fluid	State		N2 (2) Vapours
	4	Pressure rating	Piping material		150# L.T.C.S
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C 0.82 Bara 86%
	6	Area Classification	Area		ZONE 1 100
Flow Rate	7	Max.Continuous	Unit	30	Kg/h
	8	Min.Continuous	Unit	5	Kg/h
	9	Max.In Transients	Unit	40	Kg/h
	10	Allow. with closed va	Unit	0	Kg/h
Press	11	Norm . Op. upstr. Press	Unit	0.3	barg
	12	Dp. At max. flowrate	Unit	0.1	bar
	13	Max. Dp with closed va	Unit	0.2	bar
Temperature	14	Norm . upstr. Temp	Unit	-15	°C
	15	Max . upstr. Temp	Unit	AMB	°C
Sp. Gr.	16	Gases vapours	Unit	1.3	Kg/m3
	17	Liquids	Unit		Kg/m3
	18	Mol.weight	Unit		Kg/Kmol
Visc.	19	Op. visc. (when>5mpa's)	0.28		
	20	Solid in suspension			
Cv	21	Min/Norm/Max	Required	0.508 3.05	4.068
Body	22	Body type	Body material		Globe SS-304
	23	Size Body	Port		1" Single
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg
	25	Design Temperature	Min. °C	Max. °C	°C
	26	Valve end con. & rating	Flange 150#		
	27	Packing mat.	Lubricator		PTFE VTA
	28	Flow direction	FTO		
	29	Bonnet type	Standard		
	30	Seat Leakage Class ANSI	V		
	Trim	31	Plug type	Plug material	
32		Seat Material	Cage/Guide Material		SS - 316 NA
33		Characteristics	Equal Percentage		
Actuator	34	Type / Direction of action	Diaphragm/Direct		
	35	Fail Position	OPEN		
	36	Spring range	VTA		
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single
Positioner	38	Type	Electro Pneumatic		
	39	Input signal	Out put signal		4-20 mA+HART VTA
	40	Air supply	Action dir.		3.5 barg Direct
	41	Protection	Certificate		IP 65 EExia-IIB T6
Solenoid Valve	42	Type	NA		
	43	Tag No.	NA		
	44	Supply Voltage	Consumption		NA NA
	45	Protection	Certificate		NA NA
Accessories	46	Pressure gauge and filter	YES		
	47	Manual Control Wheel	NA		
	48	Cable Gland	Size/Qty		NA
	49	Electrical Conection	M20* 1.5 mm ISO		
	50	Tubing & Conection	SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA NA NA

Notes: (1) PV 3404A/B work in split range
(2) nitrogen plus hexane vapour; max content: 0,02 kg/ kg N2

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شرکت پژوهش و فناوری پتروشیمی

TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

General Data	1	Tag No.		PV-3404B (1)		
	2	P&ID No.	Piping Size	Piping Class	1"	1CL1
	3	Fluid	State		N2	Gas
	4	Pressure rating	Piping material		150#	L.T.C.S
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara 86%
	6	Area Classification	Area		ZONE 1	100
Flow Rate	7	Max.Continuous	Unit	30	Kg/h	
	8	Min.Continuous	Unit	5	Kg/h	
	9	Max.In Transients	Unit	40	Kg/h	
	10	Allow. with closed va	Unit	0	Kg/h	
Press	11	Norm. Op. upstr. Press	Unit	4	barg	
	12	Dp. At max. flowrate	Unit	1	bar	
	13	Max. Dp with closed va	Unit	3.9	bar	
Temperature	14	Norm. upstr. Temp	Unit	AMB	°C	
	15	Max. upstr. Temp	Unit	AMB	°C	
Sp. Gr.	16	Gases vapours	Unit	1.25	Kg/m3	
	17	Liquids	Unit		Kg/m3	
	18	Mol.weight	Unit	28	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)				
	20	Solid in suspension				
Cv	21	Min/Norm/Max	Required	0.089	0.534	0.712
Body	22	Body type	Body material		Globe	SS-304
	23	Size Body	Port		1"	Single
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg
	25	Design Temperature	Min. °C	Max. °C		°C
	26	Valve end con. & rating		Flange 150#		
	27	Packing mat.	Lubricator		PTFE	VTA
	28	Flow direction		FTO		
	29	Bonnet type		Standard		
	30	Seat Leakage Class ANSI		V		
	Trim	31	Plug type	Plug material		Contoured
32		Seat Material	Cage/Guide Material		SS - 316	NA
33		Characteristics		Equal Percentage		
Actuator	34	Type / Direction of action		Diaphragm/Direct		
	35	Fail Position		OPEN		
	36	Spring range		VTA		
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single
Positioner	38	Type		Electro Pneumatic		
	39	Input signal	Out put signal		4-20 mA+HART	VTA
	40	Air supply	Action dir.		3.5 barg	Direct
	41	Protection	Certificate		IP 65	EEExia-IIB T6
Solenoid Valve	42	Type		NA		
	43	Tag No.		NA		
	44	Supply Voltage	Consumption		NA	NA
	45	Protection	Certificate		NA	NA
Accessories	46	Pressure gauge and filter		YES		
	47	Manual Control Wheel		NA		
	48	Cable Gland	Size/Qty		NA	
	49	Electrical Conection		M20* 1.5 mm ISO		
	50	Tubing & Conection		SS Tube 1/4"		
	51	Switch	Protection	Certificate	NA	NA

Notes: (1) PV 3404A/B work in split range

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شرکت ملی صنایع پتروشیمی
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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 11 of 20

General Data	1	Tag No.		PV-3501				
	2	P&ID No.	Piping Size	Piping Class	035	1"	1DS4	
	3	Fluid	State		MONOMERS (1)	GAS		
	4	Pressure rating	Piping material		300#	SS		
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification	Area		ZONE 1	300		
Flow Rate	7	Max.Continuous	Unit	500	Kg/h			
	8	Min.Continuous	Unit	50	Kg/h			
	9	Max.In Transients	Unit	600	Kg/h			
	10	Allow. with closed va	Unit	0	Kg/h			
Press	11	Norm . Op. upstr. Press	Unit	18	barg			
	12	Dp. At max. flowrate	Unit	17	bar			
	13	Max. Dp with closed va	Unit	28	bar			
Temperature	14	Norm . upstr. Temp	Unit	50 - 80	°C			
	15	Max . upstr. Temp	Unit	100	°C			
Sp. Gr.	16	Gases vapours	Unit	35.6	Kg/m3			
	17	Liquids	Unit		Kg/m3			
	18	Mol.weight	Unit	42	Kg/Kmol			
Visc.	19	Op. visc. (when>5mpa's)		0.1				
	20	Solid in suspension						
Cv	21	Min/Norm/Max	Required	0.1899	1.453	1.063		
Body	22	Body type	Body material		Globe	SS-304		
	23	Size Body	Port		1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg		
	25	Design Temperature	Min. °C	Max. °C		°C		
	26	Valve end con. & rating		Flange 300#				
	27	Packing mat.	Lubricator		PTFE	VTA		
	28	Flow direction		FTO				
	29	Bonnet type		Standard				
	30	Seat Leakage Class ANSI		V				
Trim	31	Plug type	Plug material		Contoured	SS - 316		
	32	Seat Material	Cage/Guide Material		SS - 316	NA		
	33	Characteristics		Equal Percentage				
Actuator	34	Type / Direction of action		Diaphragm/DIRECT				
	35	Fail Position		OPEN				
	36	Spring range		VTA				
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single		
Positioner	38	Type		Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART	VTA		
	40	Air supply	Action dir.		3.5 barg	Direct		
	41	Protection	Certificate		IP 65	EExia-IIB T6		
Solenoid Valve	42	Type		NA				
	43	Tag No.		NA				
	44	Supply Voltage	Consumption		NA	NA		
	45	Protection	Certificate		NA	NA		
Accessories	46	Pressure gauge and filter		YES				
	47	Manual Control Wheel		NA				
	48	Cable Gland	Size/Qty		NA			
	49	Electrical Conection		M20* 1.5 mm ISO				
	50	Tubing & Conection		SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA	

Notes: (1) It is assumed Propylene to define instrument

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 12 of 20

General Data	1	Tag No.	PV-3505				
	2	P&ID No.	Piping Size	Piping Class	035	1/2"	1FS4
	3	Fluid	State		PROPYLENE	LIQUID	
	4	Pressure rating	Piping material		600#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	85	Kg/h		
	8	Min.Continuous	Unit	8.5	Kg/h		
	9	Max.In Transients	Unit	102	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	55	barg		
	12	Dp. At max. flowrate	Unit	32	bar		
	13	Max. Dp with closed va	Unit	65	bar		
Temperature	14	Norm . upstr. Temp	Unit	AMB (1)	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit		Kg/m3		
	17	Liquids	Unit	523.5	Kg/m3		
	18	Mol.weight	Unit	42	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)	0.069				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.00326	0.02688	0.04111	
Body	22	Body type	Body material		Globe	SS-304	
	23	Size Body	Port		1/2"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating	Flange 600#				
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	30	Seat Leakage Class ANSI	V				
Trim	31	Plug type	Plug material		Contoured	SS - 316	
	32	Seat Material	Cage/Guide Material		SS - 316	NA	
	33	Characteristics	Equal Percentage				
Actuator	34	Type / Direction of action	Diaphragm/Reverse				
	35	Fail Position	CLOSE				
	36	Spring range	VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	38	Type	Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART	VTA	
	40	Air supply	Action dir.		3.5 barg	Direct	
	41	Protection	Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type	NA				
	43	Tag No.	NA				
	44	Supply Voltage	Consumption		NA	NA	
	45	Protection	Certificate		NA	NA	
Accessories	46	Pressure gauge and filter	YES				
	47	Manual Control Wheel	NA				
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Tubing & Conection	SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA

Notes: (1) Ambient temperature it is suppose -20 ÷ +50°C

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 13 of 20

General Data	1	Tag No.		PV-3506				
	2	P&ID No.	Piping Size	Piping Class	035	1/2"	3CC6	
	3	Fluid	State		STEAM	GAS		
	4	Pressure rating	Piping material		150#	CS		
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification	Area		ZONE 1	300		
Flow Rate	7	Max.Continuous	Unit	80	Kg/h			
	8	Min.Continuous	Unit	8	Kg/h			
	9	Max.In Transients	Unit	96	Kg/h			
	10	Allow. with closed va	Unit	0	Kg/h			
Press	11	Norm . Op. upstr. Press	Unit	5.5	barg			
	12	Dp. At max. flowrate	Unit	4	bar			
	13	Max. Dp with closed va	Unit	6.5	bar			
Temperature	14	Norm . upstr. Temp	Unit	155	°C			
	15	Max . upstr. Temp	Unit	180	°C			
Sp. Gr.	16	Gases vapours	Unit	3.3	Kg/m3			
	17	Liquids	Unit		Kg/m3			
	18	Mol.weight	Unit	18	Kg/Kmol			
Visc.	19	Op. visc. (when>5mpa's)		0.014				
	20	Solid in suspension						
Cv	21	Min/Norm/Max	Required	0.1522	1.182	1.265		
	22	Body type	Body material	Globe	CS			
Body	23	Size Body	Port	1/2"	Single			
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg			
	25	Design Temperature	Min. °C	Max. °C	°C			
	26	Valve end con. & rating		Flange 150#				
	27	Packing mat.	Lubricator	PTFE	VTA			
	28	Flow direction		FTO				
	29	Bonnet type		Standard				
	30	Seat Leakage Class ANSI		IV				
	Trim	31	Plug type	Plug material	Contoured	SS - 316		
		32	Seat Material	Cage/Guide Material	SS - 316	NA		
33		Characteristics		Equal Percentage				
Actuator	34	Type / Direction of action		Diaphragm/Reverse				
	35	Fail Position		CLOSE				
	36	Spring range		VTA				
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single			
Positioner	38	Type		Electro Pneumatic				
	39	Input signal	Out put signal	4-20 mA+HART	VTA			
	40	Air supply	Action dir.	3.5 barg	Direct			
	41	Protection	Certificate	IP 65	EExia-IIB T6			
Solenoid Valve	42	Type		NA				
	43	Tag No.		NA				
	44	Supply Voltage	Consumption	NA	NA			
	45	Protection	Certificate	NA	NA			
Accessories	46	Pressure gauge and filter		YES				
	47	Manual Control Wheel		NA				
	48	Cable Gland	Size/Qty	NA				
	49	Electrical Conection		M20* 1.5 mm ISO				
	50	Tubing & Conection		SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA	

Notes:

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 119 of 163

General Data	1	Tag No.		PV-3507			
	2	P&ID No.	Piping Size	Piping Class	035	1/2"	3CC6
	3	Fluid	State		STEAM	GAS	
	4	Pressure rating	Piping material		150#	CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	70	Kg/h		
	8	Min.Continuous	Unit	7	Kg/h		
	9	Max.In Transients	Unit	84	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	5.5	barg		
	12	Dp. At max. flowrate	Unit	4	bar		
	13	Max. Dp with closed va	Unit	6.5	bar		
Temperature	14	Norm . upstr. Temp	Unit	155	°C		
	15	Max . upstr. Temp	Unit	180	°C		
Sp. Gr.	16	Gases vapours	Unit	3.3	Kg/m3		
	17	Liquids	Unit		Kg/m3		
	18	Mol.weight	Unit	18	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.014			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.1332	1.034	1.107	
	22	Body type	Body material	Globe	CS		
Body	23	Size Body	Port	1/2"	Single		
	24	Design Pressure	Min. Bar a Max. Bar a		Barg		
	25	Design Temperature	Min. °C Max. °C		°C		
	26	Valve end con. & rating	Seat leakage class	Flange 150#	ANSI IV		
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	Trim	30	Plug type	Plug material	Contoured	SS - 316	
		31	Seat Material	Cage/Guide Material	SS - 316	NA	
32		Characteristics	Equal Percentage				
Actuator	33	Type / Direction of action	Diaphragm/Reverse				
	34	Fail Position	CLOSE				
	35	Spring range	VTA				
	36	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	37	Type	Electro Pneumatic				
	38	Input signal	Out put signal	4-20 mA+HART	VTA		
	39	Air supply	Action dir.	3.5 barg	Direct		
	40	Protection	Certificate	IP 65	EExia-IIB T3		
Solenoid Valve	41	Type	NA				
	42	Tag No.	NA				
	43	Supply Voltage	Consumption	NA	NA		
	44	Protection	Certificate	NA	NA		
Accessories	45	Pressure gauge and filter	YES				
	46	Manual Control Wheel	NA				
	47	Cable Gland	Size/Qty	NA			
	48	Electrical Conection	M20* 1.5 mm ISO				
	49	Tubing & Conection	SS Tube 1/4"				
	50	Switch	Protection	Certificate	NA	NA	NA

Notes:

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 14 of 20

General Data	1	Tag No.		PV-3508			
	2	P&ID No.	Piping Size	Piping Class	035	1/2"	3CC6
	3	Fluid	State		STEAM	GAS	
	4	Pressure rating	Piping material		150#	CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	300	
Flow Rate	7	Max.Continuous	Unit	10	Kg/h		
	8	Min.Continuous	Unit	1	Kg/h		
	9	Max.In Transients	Unit	12	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	5.5	barg		
	12	Dp. At max. flowrate	Unit	4	bar		
	13	Max. Dp with closed va	Unit	6.5	bar		
Temperature	14	Norm . upstr. Temp	Unit	155	°C		
	15	Max . upstr. Temp	Unit	180	°C		
Sp. Gr.	16	Gases vapours	Unit	3.3	Kg/m3		
	17	Liquids	Unit		Kg/m3		
	18	Mol.weight	Unit	18	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.014			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.019	0.1478	0.1582	
Body	22	Body type	Body material		Globe	CS	
	23	Size Body	Port		1/2"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 150#			
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	Seat Leakage Class ANSI		IV			
Trim	31	Plug type	Plug material		Contoured	SS - 316	
	32	Seat Material	Cage/Guide Material		SS - 316	NA	
	33	Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Reverse			
	35	Fail Position		CLOSE			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal		4-20 mA+HART	VTA	
	40	Air supply	Action dir.		3.5 barg	Direct	
	41	Protection	Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption		NA	NA	
	45	Protection	Certificate		NA	NA	
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes:

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 15 of 20

General Data	1	Tag No.	PV-3601			
	2	P&ID No.	Piping Size	Piping Class	037	1" 1DS4
	3	Fluid	State		PROPYLENE	LIQUID
	4	Pressure rating	Piping material		300#	SS
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara 86%
	6	Area Classification	Area		ZONE 1	300
Flow Rate	7	Max.Continuous	Unit	680	Kg/h	
	8	Min.Continuous	Unit	68	Kg/h	
	9	Max.In Transients	Unit	816	Kg/h	
	10	Allow. with closed va	Unit	0	Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	21	barg	
	12	Dp. At max. flowrate	Unit	1	bar	
	13	Max. Dp with closed va	Unit	31	bar	
Temperature	14	Norm . upstr. Temp	Unit	40	°C	
	15	Max . upstr. Temp	Unit	100	°C	
Sp. Gr.	16	Gases vapours	Unit		Kg/m3	
	17	Liquids	Unit	474 (1)	Kg/m3	
	18	Mol.weight	Unit	42 (1)	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)	0.014			
	20	Solid in suspension				
Cv	21	Min/Norm/Max	Required	0.1346	1.184	0.5326
Body	22	Body type	Body material		Globe	SS-304
	23	Size Body	Port		1"	Single
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg
	25	Design Temperature	Min. °C	Max. °C		°C
	26	Valve end con. & rating	Flange 300#			
	27	Packing mat.	Lubricator		PTFE	VTA
	28	Flow direction	FTO			
	29	Bonnet type	Standard			
	30	Seat Leakage Class ANSI	V			
Trim	31	Plug type	Plug material		Contoured	SS - 316
	32	Seat Material	Cage/Guide Material		SS - 316	NA
	33	Characteristics	Equal Percentage			
Actuator	34	Type / Direction of action	Diaphragm/DIRECT			
	35	Fail Position	OPEN			
	36	Spring range	VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single	
Positioner	38	Type	Electro Pneumatic			
	39	Input signal	Out put signal		4-20 mA+HART	VTA
	40	Air supply	Action dir.		3.5 barg	Direct
	41	Protection	Certificate		IP 65	EEExia-IIB T6
Solenoid Valve	42	Type	NA			
	43	Tag No.	NA			
	44	Supply Voltage	Consumption		NA	NA
	45	Protection	Certificate		NA	NA
Accessories	46	Pressure gauge and filter	YES			
	47	Manual Control Wheel	NA			
	48	Cable Gland	Size/Qty	NA		
	49	Electrical Conection	M20* 1.5 mm ISO			
	50	Tubing & Conection	SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA

Notes: HCM should be change as for composition

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PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 130 of 163

General Data	1	Tag No.		PV-5301 A				
	2	P&ID No.	Piping Size	Piping Class	053	1"	1CL1	
	3	Fluid		State		Nitrogen	GAS	
	4	Pressure rating		Piping material		150#	L.T.C.S	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification		Area		ZONE 1	500	
Flow Rate	7	Max.Continuous	Unit		100	Kg/h		
	8	Min.Continuous	Unit		10	Kg/h		
	9	Max.In Transients	Unit		120	Kg/h		
	10	Allow. with closed valve	Unit		0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit		0.6	barg		
	12	Dp. At max. flowrate	Unit		0.5	bar		
	13	Max. Dp with closed valve	Unit		1	bar		
Temperature	14	Norm . upstr. Temp	Unit		50	°C		
	15	Max . upstr. Temp	Unit		100	°C		
Sp. Gr.	16	Gases vapours	Unit		1.6	Kg/m3		
	17	Liquids	Unit			Kg/m3		
	18	Mol.weight	Unit		28	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.018				
	20	Solid in suspension						
Cv	21	Min/Norm/Max	Required		0.5863	5.149	4.599	
	22	Body type		Body material		Globe	SS-304	
Body	23	Size Body		Port		1"	Single	
	24	Design Pressure		Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature		Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Seat leakage class		Flange 150#	ANSI IV	
	27	Packing mat.		Lubricator		PTFE	VTA	
	28	Flow direction		FTO				
	29	Bonnet type		Standard				
	Trim	30	Plug type		Plug material		Contoured	SS - 316
		31	Seat Material		Cage/Guide Material		SS - 316	NA
32		Characteristics		Equal Percentage				
Actuator	33	Type / Direction of action		Diaphragm/DIRECT				
	34	Fail Position		OPEN				
	35	Spring range		VTA				
	36	On-Off/Modulating	Single/Double Acting		Modulating		Single	
Positioner	37	Type		Electro Pneumatic				
	38	Input signal		Out put signal		4-20 mA+HART	VTA	
	39	Air supply		Action dir.		3.5 barg	Direct	
	40	Protection		Certificate		IP 65	EExib-IIB T3	
Solenoid Valve	41	Type		NA				
	42	Tag No.		NA				
	43	Supply Voltage		Consumption		NA	NA	
	44	Protection		Certificate		NA	NA	
Accessories	45	Pressure gauge and filter		YES				
	46	Manual Control Wheel		NA				
	47	Cable Gland		Size/Qty		NA		
	48	Electrical Conection		M20* 1.5 mm ISO				
	49	Tubing & Conection		SS Tube 1/4"				
	50	Switch	Protection	Certificate	NA	NA	NA	

Notes:

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TITLE: Control Valve Data Sheet



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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 131 of 163

General Data	1	Tag No.	PV-5301 B				
	2	P&ID No.	Piping Size	Piping Class	053	1" 1CS1	
	3	Fluid	State	LOW PRESSRE NITROGEN	GAS		
	4	Pressure rating	Piping material	150#	SS		
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara 86%	
	6	Area Classification	Area	ZONE 1	500		
Flow Rate	7	Max.Continuous	Unit	50	Kg/h		
	8	Min.Continuous	Unit	5	Kg/h		
	9	Max.In Transients	Unit	60	Kg/h		
	10	Allow. with closed valve	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	3	barg		
	12	Dp. At max. flowrate	Unit	2.5	bar		
	13	Max. Dp with closed valve	Unit	6	bar		
Temperature	14	Norm . upstr. Temp	Unit	AMB	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit	6.8	Kg/m3		
	17	Liquids	Unit		Kg/m3		
	18	Mol.weight	Unit	28	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)	0.018				
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.06054	0.5196	0.5242	
	22	Body type	Body material	Globe	SS-304		
Body	23	Size Body	Port	1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg		
	25	Design Temperature	Min. °C	Max. °C	°C		
	26	Valve end con. & rating	Seat leakage class	Flange 150#	ANSI IV		
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction	FTO				
	29	Bonnet type	Standard				
	Trim	30	Plug type	Plug material	Contoured	SS - 316	
		31	Seat Material	Cage/Guide Material	SS - 316	NA	
32		Characteristics	Equal Percentage				
Actuator	33	Type / Direction of action	Diaphragm/Reverse				
	34	Fail Position	CLOSE				
	35	Spring range	VTA				
Positioner	36	On-Off/Modulating	Single/Double Acting	Modulating	Single		
	37	Type	Electro Pneumatic				
	38	Input signal	Out put signal	4-20 mA+HART	VTA		
	39	Air supply	Action dir.	3.5 barg	Direct		
Solenoid Valve	40	Protection	Certificate	IP 65	EExib-IIB T3		
	41	Type	NA				
	42	Tag No.	NA				
	43	Supply Voltage	Consumption	NA	NA		
Accessories	44	Protection	Certificate	NA	NA		
	45	Pressure gauge and filter	YES				
	46	Manual Control Wheel	NA				
	47	Cable Gland	Size/Qty	NA			
	48	Electrical Conection	M20* 1.5 mm ISO				
	49	Tubing & Conection	SS Tube 1/4"				
	50	Switch	Protection	Certificate	NA	NA	NA

Notes:

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TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 18 of 20

General Data	1	Tag No.	PV-6101			
	2	P&ID No.	Piping Size	Piping Class	061	3" 1CS1
	3	Fluid	State	NITROGEN PROCESS (1)		GAS
	4	Pressure rating	Piping material	150#		SS
	5	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara 86%
	6	Area Classification	Area	ZONE 1		600
Flow Rate	7	Max.Continuous	Unit	150	Kg/h	
	8	Min.Continuous	Unit	15	Kg/h	
	9	Max.In Transients	Unit	180	Kg/h	
	10	Allow. with closed va	Unit	0	Kg/h	
Press	11	Norm. Op. upstr. Press	Unit	0.4	barg	
	12	Dp. At max. flowrate	Unit	0.2	bar	
	13	Max. Dp with closed va	Unit	6	bar	
Temperature	14	Norm. upstr. Temp	Unit	35	°C	
	15	Max. upstr. Temp	Unit	100	°C	
Sp. Gr.	16	Gases vapours	Unit	2	Kg/m3	
	17	Liquids	Unit		Kg/m3	
	18	Mol.weight	Unit	37	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.018		
	20	Solid in suspension				
Cv	21	Min/Norm/Max	Required	2.237	11.43	1.71
Body	22	Body type	Body material	Globe		SS-304
	23	Size Body	Port	2 1/2"		Single
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg	
	25	Design Temperature	Min. °C	Max. °C	°C	
	26	Valve end con. & rating	Flange 150#			
	27	Packing mat.	Lubricator	PTFE		VTA
	28	Flow direction	FTO			
	29	Bonnet type	Standard			
	30	Seat Leakage Class ANSI	V			
Trim	31	Plug type	Plug material	Contoured		SS - 316
	32	Seat Material	Cage/Guide Material	SS - 316		NA
	33	Characteristics	Equal Percentage			
Actuator	34	Type / Direction of action	Diaphragm/DIRECT			
	35	Fail Position	OPEN			
	36	Spring range	VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating		Single
Positioner	38	Type	Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART		VTA
	40	Air supply	Action dir.	3.5 barg		Direct
	41	Protection	Certificate	IP 65		EEExia-IIB T6
Solenoid Valve	42	Type	NA			
	43	Tag No.	NA			
	44	Supply Voltage	Consumption	NA		NA
	45	Protection	Certificate	NA		NA
Accessories	46	Pressure gauge and filter	YES			
	47	Manual Control Wheel	NA			
	48	Cable Gland	Size/Qty	NA		
	49	Electrical Conection	M20* 1.5 mm ISO			
	50	Tubing & Conection	SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA

Notes: (1) Is assumed nitrogen and monomers

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TITLE: Control Valve Data Sheet



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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 19 of 20

General Data	1	Tag No.		PV-6102			
	2	P&ID No.	Piping Size	Piping Class	061	1"	3CC6
	3	Fluid	State		STEAM	GAS	
	4	Pressure rating	Piping material		150#	CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	600	
Flow Rate	7	Max.Continuous	Unit	125	Kg/h		
	8	Min.Continuous	Unit	12.5	Kg/h		
	9	Max.In Transients	Unit	150	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	5.5	barg		
	12	Dp. At max. flowrate	Unit	4.5	bar		
	13	Max. Dp with closed va	Unit	6.5	bar		
Temperature	14	Norm . upstr. Temp	Unit	162	°C		
	15	Max . upstr. Temp	Unit	180	°C		
Sp. Gr.	16	Gases vapours	Unit	3.3	Kg/m3		
	17	Liquids	Unit		Kg/m3		
	18	Mol.weight	Unit	18	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.014			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.2181	1.845	1.953	
	22	Body type	Body material	Globe	CS		
Body	23	Size Body	Port	1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg		
	25	Design Temperature	Min. °C	Max. °C	°C		
	26	Valve end con. & rating		Flange 150#			
	27	Packing mat.	Lubricator	PTFE	VTA		
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	Seat Leakage Class ANSI		IV			
	Trim	31	Plug type	Plug material	Contoured	SS - 316	
		32	Seat Material	Cage/Guide Material	SS - 316	NA	
33		Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/Reverse			
	35	Fail Position		CLOSE			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single		
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART	VTA		
	40	Air supply	Action dir.	3.5 barg	Direct		
	41	Protection	Certificate	IP 65	EExia-IIB T6		
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption	NA	NA		
	45	Protection	Certificate	NA	NA		
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty	NA			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes:

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TITLE: Control Valve Data Sheet



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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009

Owner Job No: _____ Sheet No: 132 of 163

General Data	1	Tag No.		PV-6201 A				
	2	P&ID No.	Piping Size	Piping Class	062	1"	1CS2	
	3	Fluid	State		NITROGEN	GAS		
	4	Pressure rating	Piping material		150#	SS		
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification	Area		ZONE 1	600		
Flow Rate	7	Max.Continuous	Unit		50	Kg/h		
	8	Min.Continuous	Unit		5	Kg/h		
	9	Max.In Transients	Unit		60	Kg/h		
	10	Allow. with closed va	Unit		0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit		5	barg		
	12	Dp. At max. flowrate	Unit		4.5	bar		
	13	Max. Dp with closed va	Unit		7	bar		
Temperature	14	Norm . upstr. Temp	Unit		AMB (1)	°C		
	15	Max . upstr. Temp	Unit		100	°C		
Sp. Gr.	16	Gases vapours	Unit		6.8	Kg/m3		
	17	Liquids	Unit			Kg/m3		
	18	Mol.weight	Unit		28	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.018				
	20	Solid in suspension						
Cv	21	Min/Norm/Max	Required		0.06054	0.5196	0.5242	
	22	Body type	Body material		Globe	SS-304		
Body	23	Size Body	Port		1"	Single		
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg		
	25	Design Temperature	Min. °C	Max. °C		°C		
	26	Valve end con. & rating	Seat leakage class		Flange 150#	ANSI IV		
	27	Packing mat.	Lubricator		PTFE	VTA		
	28	Flow direction	FTO					
	29	Bonnet type	Standard					
	Trim	30	Plug type	Plug material		Contoured	SS - 316	
		31	Seat Material	Cage/Guide Material		SS - 316	NA	
32		Characteristics	Equal Percentage					
Actuator	33	Type / Direction of action	Diaphragm/Reverse					
	34	Fail Position	CLOSE					
	35	Spring range	VTA					
	36	On-Off/Modulating	Single/Double Acting		Modulating	Single		
Positioner	37	Type	Electro Pneumatic					
	38	Input signal	Out put signal		4-20 mA+HART	VTA		
	39	Air supply	Action dir.		3.5 barg	Direct		
	40	Protection	Certificate		IP 65	EExia-IIB T3		
Solenoid Valve	41	Type	NA					
	42	Tag No.	NA					
	43	Supply Voltage	Consumption		NA	NA		
	44	Protection	Certificate		NA	NA		
Accessories	45	Pressure gauge and filter	YES					
	46	Manual Control Wheel	NA					
	47	Cable Gland	Size/Qty		NA			
	48	Electrical Conection	M20* 1.5 mm ISO					
	49	Tubing & Conection	SS Tube 1/4"					
	50	Switch	Protection	Certificate	NA	NA	NA	

Notes: (1) Ambient temperature it is suppose -20 / +50°C

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Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 20 of 20

General Data	1	Tag No.		PV-6201 B			
	2	P&ID No.	Piping Size	Piping Class	062	1"	1CS2
	3	Fluid	State		NITROGEN	GAS	
	4	Pressure rating	Piping material		150#	SS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	6	Area Classification	Area		ZONE 1	600	
Flow Rate	7	Max.Continuous	Unit	100	Kg/h		
	8	Min.Continuous	Unit	10	Kg/h		
	9	Max.In Transients	Unit	120	Kg/h		
	10	Allow. with closed va	Unit	0	Kg/h		
Press	11	Norm . Op. upstr. Press	Unit	0.6	barg		
	12	Dp. At max. flowrate	Unit	0.5	bar		
	13	Max. Dp with closed va	Unit	1	bar		
Temperature	14	Norm . upstr. Temp	Unit	50	°C		
	15	Max . upstr. Temp	Unit	100	°C		
Sp. Gr.	16	Gases vapours	Unit	1.6	Kg/m3		
	17	Liquids	Unit		Kg/m3		
	18	Mol.weight	Unit	28	Kg/Kmol		
Visc.	19	Op. visc. (when>5mpa's)		0.019			
	20	Solid in suspension					
Cv	21	Min/Norm/Max	Required	0.5863	5.149	4.599	
Body	22	Body type	Body material		Globe	SS-304	
	23	Size Body	Port		1"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature	Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 150#			
	27	Packing mat.	Lubricator		PTFE	VTA	
	28	Flow direction		FTO			
	29	Bonnet type		Standard			
	30	Seat Leakage Class ANSI		IV			
Trim	31	Plug type	Plug material		Contoured	SS - 316	
	32	Seat Material	Cage/Guide Material		SS - 316	NA	
	33	Characteristics		Equal Percentage			
Actuator	34	Type / Direction of action		Diaphragm/DIRECT			
	35	Fail Position		OPEN			
	36	Spring range		VTA			
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single	
Positioner	38	Type		Electro Pneumatic			
	39	Input signal	Out put signal		4-20 mA+HART	VTA	
	40	Air supply	Action dir.		3.5 barg	Direct	
	41	Protection	Certificate		IP 65	EExia-IIB T6	
Solenoid Valve	42	Type		NA			
	43	Tag No.		NA			
	44	Supply Voltage	Consumption		NA	NA	
	45	Protection	Certificate		NA	NA	
Accessories	46	Pressure gauge and filter		YES			
	47	Manual Control Wheel		NA			
	48	Cable Gland	Size/Qty		NA		
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Tubing & Conection		SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA	NA	NA

Notes:

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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	PV-3401				
	2	Service	TK 341 VENT				
	3	P&ID No.	Piping Size	034	1"		
	4	Pressure rating	Piping material	150#	SS		
	5	Fluid	State	NITROGEN	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7		titel	case 1	case 2	case 3	
	8	Flow	Kg/h	0.2	2	2.4	
	9	Inlet pressure	bar(a)	1.32	1.82	2.32	
	10	Outlet pressure	bar(a)	1.02	1.02	1.02	
	11	Inlet temperature	-C	30	30	30	
	12	Density	kg/m3	0.556	1.112	1.67	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	0.0185	0.0185	0.0186	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		0.999	0.999	0.999	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.41	1.41	1.41	
	21	CV coefficient	Required	0.012	0.072	0.064	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Open				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

Process data	1	Tag No.	PV-3402				
	2	Service	P 341 RECYCLE				
	3	P&ID No.	Piping Size	034	1"		
	4	Pressure rating	Piping material	600#	SS		
	5	Fluid	State	HEXENE	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	25	250	300	
	9	Inlet pressure	bar(a)	50.82	55.82	65.82	
	10	Outlet pressure	bar(a)	1.32	1.32	1.32	
	11	Inlet temperature	-C	30	30	30	
	12	Density	kg/m3	668.6	669.1	670.3	
	13	Vapor pressure	bar	0.3206	0.3206	0.3206	
	14	Critical pressure	bar	31.71	31.71	31.71	
	15	Viscosity	cP	0.2356	0.2358	0.236	
	16	Molar mass	g/mol	84	84	84	
	17	Real gas factor (Z)		0.2538	0.2786	0.3279	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.314	1.312	1.309	
	21	CV coefficient	Required	0.00017	0.00162	0.00178	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		Linear			
	28	Leakage rate		V			
	29	Fail position		Open			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Quantity: 2

Process data	1	Tag No.	PV-4101				
	2	Service	R 411 PRESS. CONTROL				
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	300#	SS		
	5	Fluid	State	Hydrocarbon mix	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	42	420	504	
	9	Inlet pressure	bar(a)	20.82	25.82	30.82	
	10	Outlet pressure	bar(a)	1.02	1.02	1.02	
	11	Inlet temperature	-C	75	75	75	
	12	Density	kg/m3	40.28	55.45	76.87	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	0.011	0.0116	0.0125	
	16	Molar mass	g/mol	42.62	42.62	42.62	
	17	Real gas factor (Z)		0.7611	0.6856	0.5904	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.302	1.443	1.804	
	21	CV coefficient	Required	0.098	0.7121	0.5942	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 300#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		+100			
	27	Characteristics		Linear			
	28	Leakage rate		V			
	29	Fail position		Open			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
Note1: Composition to define instrument (H2=1,68% C2-=7% C3+=89,79% c4-=1,53%)							
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		PV-4102			
	2	Service		R 411 PRESS. CONTROL			
	3	P&ID No.	Piping Size	041	1"		
	4	Pressure rating	Piping material	300#	SS		
	5	Fluid	State	Hydrocarbon mix (Note1)		GAS	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	85	850	1020	
	9	Inlet pressure	bar(a)	20.82	25.82	30.82	
	10	Outlet pressure	bar(a)	1.02	1.02	1.02	
	11	Inlet temperature	-C	75	75	75	
	12	Density	kg/m3	40.28	55.45	76.87	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	0.011	0.0116	0.0125	
	16	Molar mass	g/mol	42.62	42.62	42.62	
	17	Real gas factor (Z)		0.7611	0.6856	0.5904	
	18	Solid in suspension	(YES / NO)	YES	YES	YES	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.302	1.443	1.804	
	21	CV coefficient	Required	0.198	1.44	1.2	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	V-BALL	forged steel-SS-316		
	24	Nominal size	Pressure ratings	1"	ANSI 300#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		+100			
	27	Characteristics		Linear			
	28	Leakage rate		V			
	29	Fail position		Open			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to close			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
Note1: Composition to define instrument (H2=1,68% C2-=7% C3+=89,79% c4-=1,53%)							
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

Process data	1	Tag No.	PV-4201				
	2	Service	R 421 PRESS. CONTROL				
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	300#	SS		
	5	Fluid	State	Hydrocarbon mix	GAS		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	42	420	504	
	9	Inlet pressure	bar(a)	20.82	25.82	30.82	
	10	Outlet pressure	bar(a)	1.02	1.02	1.02	
	11	Inlet temperature	-C	75	75	75	
	12	Density	kg/m3	33.91	44.82	57.59	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	0.0115	0.0119	0.0124	
	16	Molar mass	g/mol	38.55	38.55	38.55	
	17	Real gas factor (Z)		0.8177	0.7673	0.7128	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.257	1.324	1.423	
	21	CV coefficient	Required	0.1087	0.827	0.7729	
VALVE	22	CV coefficient for Valve (Selected)					
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 300#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	+100				
	27	Characteristics	Linear				
	28	Leakage rate	V				
	29	Fail position	Open				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
Note1: Composition to define instrument (H2=7,75% C2-=25% C3+=58,47% c4-=8,78%)							
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

Process data	1	Tag No.	PV-4202				
	2	Service	R 421 PRESS. CONTROL				
	3	P&ID No.	Piping Size	041	1"		
	4	Pressure rating	Piping material	300#	SS		
	5	Fluid	State	Hydrocarbon mix (Note1)	GAS		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	85	850	1020	
	9	Inlet pressure	bar(a)	20.82	25.82	30.82	
	10	Outlet pressure	bar(a)	1.02	1.02	1.02	
	11	Inlet temperature	-C	75	75	75	
	12	Density	kg/m3	33.91	44.82	57.59	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	0.0115	0.0119	0.0124	
	16	Molar mass	g/mol	38.55	38.55	38.55	
	17	Real gas factor (Z)		0.8177	0.7673	0.7128	
	18	Solid in suspension	(YES / NO)	YES	YES	YES	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.257	1.324	1.423	
	21	CV coefficient	Required	0.22	1.67	1.56	
VALVE	22	CV coefficient for Valve (Selected)					
	23	Valve type	Body material	V-BALL	forged steel-SS-316		
	24	Nominal size	Pressure ratings	1"	ANSI 300#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	+100				
	27	Characteristics	Linear				
	28	Leakage rate	V				
	29	Fail position	Open				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
Note1: Composition to define instrument (H2=7,75% C2-=25% C3+=58,47% c4-=8,78%)							
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		PV-4401			
	2	Service		HCM to T-351			
	3	P&ID No.	Piping Size	0044	1"		
	4	Pressure rating	Piping material	300#	SS (SA312-304L)		
	5	Fluid	State	HCM (Note 1)		GAS	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	40	400	480	
	9	Inlet pressure	bar	31	31	31	
	10	Outlet pressure	bar	30	30	30	
	11	Inlet temperature	-C	50	50	50	
	12	Density	kg/m3	42	42	42	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	0.0115	0.0119	0.0124	
	16	Molar mass	g/mol	38.55	38.55	38.55	
	17	Real gas factor (Z)		0.8177	0.7673	0.7128	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.4	1.4	1.4	
	21	CV coefficient	Required	0.24	2.4	2.9	
VALVE	22	CV coefficient for Valve (Selected)					
	23	Valve type	Body material	V-BALL	SS-304		
	24	Nominal size	Pressure ratings	1"	ANSI 300#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		-60 +230			
	27	Characteristics		Linear			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air To Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	Tubing Conection		SS Tube 1/4 "			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
Note1: Composition to define instrument (Ethylene = 12 wt % and Propane = 88 wt %)							
0	08/01/2021	IFA	M.AGHAMOHAMMADI	A.A.SHOKRI	N.NOUHJAH		
Rev	Date	Issued For	Prepared	Checked	Approved		

PROJECT: PP-PE PILOT PLANT



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 7 of 9

General Data	1	Tag No.	TV-6201			
	2	P&ID No.	Piping Size	Piping Class	062 1" 3CC6	
	3	Fluid	Piping Size	Sta Piping Class	STEAM GAS	
	4	Pressure rating	Piping material 150# CS			
	5	Amb. Temp	Amb Press	Amb. Rel. Humidity Max	(-28)°C / 44°C 0.82 Bara 86%	
	6	Area Classification	Area ZONE 1 600			
Flow Rate	7	Max. Continuous	Unit	30	Kg/h	
	8	Min. Continuous	Unit	3	Kg/h	
	9	Max. In Transients	Unit	36	Kg/h	
	10	Allow. with closed va	Unit	0	Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	5.5	barg	
	12	Dp. At max. flowrate	Unit	4	bar	
	13	Max. Dp with closed va	Unit	6.5	bar	
Temperature	14	Norm . upstr. Temp	Unit	162	°C	
	15	Max . upstr. Temp	Unit	180	°C	
SP. GR.	16	Gases vapours	Unit	3.3	Kg/m3	
	17	Liquids	Unit		Kg/m3	
	18	Mol. weight	Unit	18	Kg/Kmol	
Visc.	19	Op. visc. (when > 5mpa's)	0.014			
	20	Solid in suspension				
Cv	21	Min/Norm/Max	Required	0.05279 0.4433 0.4745		
	22	Body type	Body material	Globe	CS	
Body	23	Size Body	Port	1"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg	
	25	Design Temperature	Min. °C	Max. °C	°C	
	26	Valve end con. & rating	Flange 150#			
	27	Packing mat.	Lubricator	PTFE	VTA	
	28	Flow direction	FTO			
	29	Bonnet type	Standard			
	30	SEAT Leakage Class ANSI	IV			
	Trim	31	Plug type	Plug material	Contoured	SS - 316
		32	Seat Material	Cage/Guide Material	SS - 316	NA
33		Characteristics	Equal Percentage			
Actuator	34	Type / Direction of action	Diaphragm/Reverse			
	35	Fail Position	CLOSE			
	36	Spring range	VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single	
Positioner	38	Type	Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART	VTA	
	40	Air supply	Action dir.	3.5 barg	Direct	
	41	Protection	Certificate	IP 65	EExia-IIb-T6	
Solenoid Valve	42	Type	NA			
	43	Tag No.	NA			
	44	Supply Voltage	Consumption	NA	NA	
	45	Protection	Certificate	NA	NA	
	Accessories	46	Pressure gauge and filter	YES		
47		Manual Control Wheel	NA			
48		Cable Gland	Size/Qty	NA		
49		Electrical Conection	M20 1.5mm ISO			
50		Tubing & Conection	SS Tube 1/4"			
51		Switch	Protection	Certificate	NA NA NA	

Notes:

1	0	12/21/2021	IFA	K.A	M.N	AA.SH
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PROJECT: PP-PE PILOT PLANT



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE: Control Valve Data Sheet

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 8 of 9

General Data	1	Tag No.	TV-7101			
	2	P&ID No.	Piping Size	Piping Class	071 1/2" 3CC6	
	3	Fluid	Piping Size	Sta Piping Class	STEAM GAS	
	4	Pressure rating	Piping material 150# CS			
	5	Amb. Temp	Amb Press	Amb. Rel. Humidity Max	(-28)°C / 44°C 0.82 Bara 86%	
	6	Area Classification	Area ZONE 1 700			
Flow Rate	7	Max. Continuous	Unit	42	Kg/h	
	8	Min. Continuous	Unit	4.2	Kg/h	
	9	Max. In Transients	Unit	50.4	Kg/h	
	10	Allow. with closed va	Unit	0	Kg/h	
Press	11	Norm . Op. upstr. Press	Unit	5	barg	
	12	Dp. At max. flowrate	Unit	2.5	bar	
	13	Max. Dp with closed va	Unit	6	bar	
Temperature	14	Norm . upstr. Temp	Unit	162	°C	
	15	Max . upstr. Temp	Unit	180	°C	
SP. GR.	16	Gases vapours	Unit	3.4	Kg/m3	
	17	Liquids	Unit		Kg/m3	
	18	Mol. weight	Unit	18	Kg/Kmol	
Visc.	19	Op. visc. (when > 5mpa's)	0.014			
	20	Solid in suspension				
Cv	21	Min/Norm/Max	Required	0.09342	0.7125 0.7204	
	22	Body type	Body material	Globe	CS	
Body	23	Size Body	Port	1/2"	Single	
	24	Design Pressure	Min. Bar a	Max. Bar a	Barg	
	25	Design Temperature	Min. °C	Max. °C	°C	
	26	Valve end con. & rating	Flange 150#			
	27	Packing mat.	Lubricator	PTFE	VTA	
	28	Flow direction	FTO			
	29	Bonnet type	Standard			
	30	SEAT Leakage Class ANSI	IV			
	Trim	31	Plug type	Plug material	Contoured	SS - 316
		32	Seat Material	Cage/Guide Material	SS - 316	NA
33		Characteristics	Equal Percentage			
Actuator	34	Type / Direction of action	Diaphragm/Reverse			
	35	Fail Position	CLOSE			
	36	Spring range	VTA			
	37	On-Off/Modulating	Single/Double Acting	Modulating	Single	
Positioner	38	Type	Electro Pneumatic			
	39	Input signal	Out put signal	4-20 mA+HART	VTA	
	40	Air supply	Action dir.	3.5 barg	Direct	
	41	Protection	Certificate	IP 65	EExia-IIb-T6	
Solenoid Valve	42	Type	NA			
	43	Tag No.	NA			
	44	Supply Voltage	Consumption	NA	NA	
	45	Protection	Certificate	NA	NA	
Accessories	46	Pressure gauge and filter	YES			
	47	Manual Control Wheel	NA			
	48	Cable Gland	Size/Qty	NA		
	49	Electrical Conection	M20 1.5mm ISO			
	50	Tubing & Conection	SS Tube 1/4"			
	51	Switch	Protection	Certificate	NA NA NA	

Notes:

1	0	12/21/2021	IFA	K.A	M.N	AA.SH
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PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



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شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: 900-DAS-A4-IN-0009
Owner Job No: _____ Sheet No: 9 of 9

General Data	1	Tag No.		TV-7102				
	2	P&ID No.	Piping Size	Piping Class	071	1/2"	3CC6	
	3	Fluid	Piping Size	Sta	Piping Class	STEAM	GAS	
	4	Pressure rating		Piping material		150#	CS	
	5	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%	
	6	Area Classification		Area		ZONE 1	700	
Flow Rate	7	Max.Continuous		Unit		40	Kg/h	
	8	Min.Continuous		Unit		4	Kg/h	
	9	Max.In Transients		Unit		48	Kg/h	
	10	Allow. with closed va		Unit		0	Kg/h	
Press	11	Norm . Op. upstr. Press		Unit		5	barg	
	12	Dp. At max. flowrate		Unit		2.5	bar	
	13	Max. Dp with closed va		Unit		6	bar	
Temperature	14	Norm . upstr. Temp		Unit		162	°C	
	15	Max . upstr. Temp		Unit		180	°C	
SP. GR.	16	Gases vapours		Unit		3.4	Kg/m3	
	17	Liquids		Unit			Kg/m3	
	18	Mol.weight		Unit		18	Kg/Kmol	
Visc.	19	Op. visc. (when>5mpa's)		0.014				
	20	Solid in suspension						
Cv	21	Min/Norm/Max		Required		0.08898	0.6786	0.6861
	22	Body type		Body material		Globe	CS	
Body	23	Size Body		Port		1/2"	Single	
	24	Design Pressure		Min. Bar a	Max. Bar a		Barg	
	25	Design Temperature		Min. °C	Max. °C		°C	
	26	Valve end con. & rating		Flange 150#				
	27	Packing mat.		Lubricator		PTFE	VTA	
	28	Flow direction		FTO				
	29	Bonnet type		Standard				
	30	SEAT Leakage Class ANSI		IV				
	Trim	31	Plug type		Plug material		Contoured	SS - 316
		32	Seat Material		Cage/Guide Material		SS - 316	NA
33		Characteristics		Equal Percentage				
Actuator	34	Type / Direction of action		Diaphragm/Reverse				
	35	Fail Position		CLOSE				
	36	Spring range		VTA				
	37	On-Off/Modulating	Single/Double Acting		Modulating	Single		
Positioner	38	Type		Electro Pneumatic				
	39	Input signal	Out put signal		4-20 mA+HART	VTA		
	40	Air supply	Action dir.		3.5 barg	Direct		
	41	Protection	Certificate		IP 65	EExia-IIb-T6		
Solenoid Valve	42	Type		NA				
	43	Tag No.		NA				
	44	Supply Voltage	Consumption		NA	NA		
	45	Protection	Certificate		NA	NA		
Accessories	46	Pressure gauge and filter		YES				
	47	Manual Control Wheel		NA				
	48	Cable Gland	Size/Qty		NA			
	49	Electrical Conection		M20 1.5mm ISO				
	50	Tubing & Conection		SS Tube 1/4"				
	51	Switch	Protection	Certificate	NA	NA	NA	

Notes:

1	0	12/21/2021	IFA	K.A	M.N	AA.SH
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PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet





شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

Process data	1	Tag No.	TV-2101				
	2	Service	TEMP. R 211				
	3	P&ID No.	Piping Size	002	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.5	15	18	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.024	0.22	0.25	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
		TITLE: Control Valve Data Sheet				
		Contractor Job No:		Doc. No:		
		Owner Job No:		Sheet No: of		
Process data	1	Tag No.		TV-2201		
	2	Service		TEMP. R 221		
	3	P&ID No.	Piping Size	002	1/2"	
	4	Pressure rating	Piping material	150#	CS	
	5	Fluid	State	STEAM	VAPOUR	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara
	7	titel		case 1	case 2	case 3
	8	Flow	Kg/h	2.5	25	30
	9	Inlet pressure	bar(a)	5.82	6.32	6.82
	10	Outlet pressure	bar(a)	1.82	1.82	1.82
	11	Inlet temperature	-C	158	161	164
	12	Density	kg/m3	3.1	3.34	3.58
	13	Vapor pressure	bar	----	----	----
	14	Critical pressure	bar	----	----	----
	15	Viscosity	cP	----	----	----
	16	Molar mass	g/mol	28	28	28
	17	Real gas factor (Z)		----	----	----
	18	Solid in suspension	(YES / NO)	NO	NO	NO
	19	velocity	m/s	10-30	10-30	10-30
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391
	21	CV coefficient	Required	0.04	0.37	0.413
VALVE	22	CV coefficient for Valve (Selected)		VTA		
	23	Valve type	Body material	Globe	forged steel-SS-316	
	24	Nominal size	Pressure ratings	VTA	ANSI 150#	
	25	Packing	Sealing	PTFE	metal	
	26	Design temperature		-45 +100		
	27	Characteristics		Quick opening		
	28	Leakage rate		V		
	29	Fail position		Close		
	30	Plug & seat & stem material		SS-316		
	31	Bonnet type	Bonnet material	Standard	SS-316	
	32	MANUFACTURER		VTA		
	33	MODEL no.		VTA		
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator	
35		Actuator Size (cm2)		VTA		
36		Hand Wheel		NA		
37		Air supply pressure		3.5 bar(g)		
38		Actuator Action		Air to Open		
39		Actuator stem & Actuator body materials		VTA		
40		Diaphragm materials		VTA		
41		Single/Double Acting		Single		
42		MANUFACTURER		VTA		
43		MODEL no.		VTA		
Positioner	44	Positioner Type		Electro Pneumatic with HART communication		
	45	Input signal & Out put signal		4-20 mA+HART		
	46	Air supply		3.5 barg		
	47	Ingress Protection		IP 65		
	48	Enclosure Protection		EE xia , IIC , T6		
	49	Electrical Conection		M20* 1.5 mm ISO		
	50	Single/Double Acting		VTA		
	51	calibration		self calibration		
	52	materials houssing		VTA		
	53	Display, Operation		LCD, push button on display electronics-Indicating		
	54	MANUFACTURER		VTA		
	55	MODEL no.		VTA		
Accessories	56	Pressure gauge and filter and Regulator		YES		
	57	Certificates		pressure test, inspection certificate-Works		
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	TV-2501A				
	2	Service	R251 TEMPERATURE				
	3	P&ID No.	Piping Size	002	1"		
	4	Pressure rating	Piping material	150#	C.S.		
	5	Fluid	State	WATER GLYCOL	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	150	1500	1800	
	9	Inlet pressure	bar(a)	3.32	3.82	4.32	
	10	Outlet pressure	bar(a)	2.82	2.82	2.82	
	11	Inlet temperature	-C	2	2	2	
	12	Density	kg/m3	1107	1107	1107	
	13	Vapor pressure	bar	0.003	0.003	0.003	
	14	Critical pressure	bar	221.1	221.1	221.1	
	15	Viscosity	cP	9.811	9.811	9.812	
	16	Molar mass	g/mol	35.64	35.64	35.64	
	17	Real gas factor (Z)		0.0047	0.0054	0.0061	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.087	1.087	1.087	
	21	CV coefficient	Required	0.01	0.057	0.054	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Open				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.	TV-2501B				
	2	Service	R251 TEMPERATURE				
	3	P&ID No.	Piping Size	002	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM		VAPOUR	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.5	15	18	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)	-----				
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.024	0.22	0.248	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

PROJECT: PP-PE PILOT PLANT

TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

Process data	1	Tag No.	TV-2601A				
	2	Service	R261 TEMPERATURE				
	3	P&ID No.	Piping Size	002	1"		
	4	Pressure rating	Piping material	150#	C.S.		
	5	Fluid	State	WATER GLYCOL	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	150	1500	1800	
	9	Inlet pressure	bar(a)	3.32	3.82	4.32	
	10	Outlet pressure	bar(a)	2.82	2.82	2.82	
	11	Inlet temperature	-C	2	2	2	
	12	Density	kg/m3	1107	1107	1107	
	13	Vapor pressure	bar	0.003	0.003	0.003	
	14	Critical pressure	bar	221.1	221.1	221.1	
	15	Viscosity	cP	9.811	9.811	9.812	
	16	Molar mass	g/mol	35.64	35.64	35.64	
	17	Real gas factor (Z)		0.0047	0.0054	0.0061	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.087	1.087	1.087	
	21	CV coefficient	Required	0.01	0.057	0.054	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Open				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to close				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet





شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی


Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____


Process data	1	Tag No.	TV-2601B				
	2	Service	R261 TEMPERATURE				
	3	P&ID No.	Piping Size	002	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	2.5	25	30	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.041	0.372	0.413	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		TV-4101A			
	2	Service		TEMP. R 411			
	3	P&ID No.	Piping Size	041	1 1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	WATER	LIQ.		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	170	1700	2040	
	9	Inlet pressure	bar(a)	3.32	3.82	4.32	
	10	Outlet pressure	bar(a)	2.82	2.82	2.82	
	11	Inlet temperature	-C	20	30	35	
	12	Density	kg/m3	998.2	998.2	994.1	
	13	Vapor pressure	bar	0.023	0.042	0.056	
	14	Critical pressure	bar	221.1	221.1	221.1	
	15	Viscosity	cP	1.05	0.7938	0.6838	
	16	Molar mass	g/mol	18.02	18.02	18.02	
	17	Real gas factor (Z)		-----	-----	-----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.007	1.007	1.007	
	21	CV coefficient	Required	0.34	1.97	1.93	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		Linear			
	28	Leakage rate		V			
	29	Fail position		Open			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to close			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		TV-4101B			
	2	Service		TEMP. R 411			
	3	P&ID No.	Piping Size	002	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	4	40	48	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.065	0.595	0.661	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		-45 +100			
	27	Characteristics		Quick opening			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		TV-4106			
	2	Service		TEMP. GAS TO CF 411 (seal)			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.75	7.5	9	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.012	0.111	0.124	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		-45 +100			
	27	Characteristics		Quick opening			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Quantity: 2			
Process data	1	Tag No.		TV-4107			
	2	Service		R 411 MONOMER INLET			
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.25	12.5	15	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.02	0.19	0.21	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		-45 +100			
	27	Characteristics		Quick opening			
	28	Leakage rate		V			
	29	Fail position		Close			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to Open			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
55	MODEL no.		VTA				
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		TV-4201A			
	2	Service		TEMP. R 421			
	3	P&ID No.	Piping Size	042	2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	WATER		LIQ.	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	420	4200	5040	
	9	Inlet pressure	bar(a)	3.32	3.82	4.32	
	10	Outlet pressure	bar(a)	2.82	2.82	2.82	
	11	Inlet temperature	-C	20	30	35	
	12	Density	kg/m3	998.2	998.2	994.1	
	13	Vapor pressure	bar	0.023	0.042	0.056	
	14	Critical pressure	bar	221.1	221.1	221.1	
	15	Viscosity	cP	1.05	0.7938	0.6838	
	16	Molar mass	g/mol	18.02	18.02	18.02	
	17	Real gas factor (Z)		-----	-----	-----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.007	1.007	1.007	
	21	CV coefficient	Required	0.76	4.87	4.78	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		100			
	27	Characteristics		Linear			
	28	Leakage rate		V			
	29	Fail position		Open			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to close			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	12/21/2021	IFA	K.A	M.N	AA.SH		
Rev	Date	Issued For	Prepared	Checked	Approved		

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
		TITLE: Control Valve Data Sheet				
		Contractor Job No:		Doc. No:		
		Owner Job No:		Sheet No: of		
Process data	1	Tag No.		TV-4201B		
	2	Service		TEMP. R 421		
	3	P&ID No.	Piping Size	002	3/4"	
	4	Pressure rating	Piping material	150#	CS	
	5	Fluid	State	STEAM	VAPOUR	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara
	7	titel		case 1	case 2	case 3
	8	Flow	Kg/h	8.5	85	102
	9	Inlet pressure	bar(a)	5.82	6.32	6.82
	10	Outlet pressure	bar(a)	1.82	1.82	1.82
	11	Inlet temperature	-C	158	161	164
	12	Density	kg/m3	3.1	3.34	3.58
	13	Vapor pressure	bar	----	----	----
	14	Critical pressure	bar	----	----	----
	15	Viscosity	cP	----	----	----
	16	Molar mass	g/mol	28	28	28
	17	Real gas factor (Z)		----	----	----
	18	Solid in suspension	(YES / NO)	NO	NO	NO
	19	velocity	m/s	10-30	10-30	10-30
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391
	21	CV coefficient	Required	0.138	1.265	1.4
VALVE	22	CV coefficient for Valve (Selected)		VTA		
	23	Valve type	Body material	Globe	forged steel-SS-316	
	24	Nominal size	Pressure ratings	VTA	ANSI 150#	
	25	Packing	Sealing	PTFE	metal	
	26	Design temperature		-45 +100		
	27	Characteristics		Quick opening		
	28	Leakage rate		V		
	29	Fail position		Close		
	30	Plug & seat & stem material		SS-316		
	31	Bonnet type	Bonnet material	Standard	SS-316	
	32	MANUFACTURER		VTA		
	33	MODEL no.		VTA		
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator	
35		Actuator Size (cm2)		VTA		
36		Hand Wheel		NA		
37		Air supply pressure		3.5 bar(g)		
38		Actuator Action		Air to Open		
39		Actuator stem & Actuator body materials		VTA		
40		Diaphragm materials		VTA		
41		Single/Double Acting		Single		
42		MANUFACTURER		VTA		
43		MODEL no.		VTA		
Positioner	44	Positioner Type		Electro Pneumatic with HART communication		
	45	Input signal & Out put signal		4-20 mA+HART		
	46	Air supply		3.5 barg		
	47	Ingress Protection		IP 65		
	48	Enclosure Protection		EE xia , IIC , T6		
	49	Electrical Conection		M20* 1.5 mm ISO		
	50	Single/Double Acting		VTA		
	51	calibration		self calibration		
	52	materials houssing		VTA		
	53	Display, Operation		LCD, push button on display electronics-Indicating		
	54	MANUFACTURER		VTA		
55	MODEL no.		VTA			
Accessories	56	Pressure gauge and filter and Regulator		YES		
	57	Certificates		pressure test, inspection certificate-Works		
0	12/21/2021	IFA	K.A	M.N	AA.SH	
Rev	Date	Issued For	Prepared	Checked	Approved	

		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
Owner Job No:		Sheet No: of					
Process data	1	Tag No.	TV-4206				
	2	Service	TEMP. GAS TO CF 421 (seal)				
	3	P&ID No.	Piping Size	042	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	0.75	7.5	9	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.012	0.111	0.124	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
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PROJECT: PP-PE PILOT PLANT


TITLE: Control Valve Data Sheet



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

Contractor Job No: _____ Doc. No: _____
Owner Job No: _____ Sheet No: _____ of _____

Process data	1	Tag No.	TV-4207				
	2	Service	R 421 MONOMER INLET				
	3	P&ID No.	Piping Size	041	1/2"		
	4	Pressure rating	Piping material	150#	CS		
	5	Fluid	State	STEAM	VAPOUR		
	6	Amb.Temp	Amb.Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	1.5	15	18	
	9	Inlet pressure	bar(a)	5.82	6.32	6.82	
	10	Outlet pressure	bar(a)	1.82	1.82	1.82	
	11	Inlet temperature	-C	158	161	164	
	12	Density	kg/m3	3.1	3.34	3.58	
	13	Vapor pressure	bar	----	----	----	
	14	Critical pressure	bar	----	----	----	
	15	Viscosity	cP	----	----	----	
	16	Molar mass	g/mol	28	28	28	
	17	Real gas factor (Z)		----	----	----	
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	10-30	10-30	10-30	
	20	Isentropic exponent	gamma (Cp/Cv)	1.384	1.387	1.391	
	21	CV coefficient	Required	0.024	0.22	0.25	
VALVE	22	CV coefficient for Valve (Selected)	VTA				
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature	-45 +100				
	27	Characteristics	Quick opening				
	28	Leakage rate	V				
	29	Fail position	Close				
	30	Plug & seat & stem material	SS-316				
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER	VTA				
	33	MODEL no.	VTA				
	Pneumatic Actuator	34	Actuator Type	Spring Diaphragm Actuator			
35		Actuator Size (cm2)	VTA				
36		Hand Wheel	NA				
37		Air supply pressure	3.5 bar(g)				
38		Actuator Action	Air to Open				
39		Actuator stem & Actuator body materials	VTA				
40		Diaphragm materials	VTA				
41		Single/Double Acting	Single				
42		MANUFACTURER	VTA				
43		MODEL no.	VTA				
Positioner	44	Positioner Type	Electro Pneumatic with HART communication				
	45	Input signal & Out put signal	4-20 mA+HART				
	46	Air supply	3.5 barg				
	47	Ingress Protection	IP 65				
	48	Enclosure Protection	EE xia , IIC , T6				
	49	Electrical Conection	M20* 1.5 mm ISO				
	50	Single/Double Acting	VTA				
	51	calibration	self calibration				
	52	materials houssing	VTA				
	53	Display, Operation	LCD, push button on display electronics-Indicating				
	54	MANUFACTURER	VTA				
	55	MODEL no.	VTA				
Accessories	56	Pressure gauge and filter and Regulator	YES				
	57	Certificates	pressure test, inspection certificate-Works				
0	12/21/2021	IFA	K.A	M.N	AA.SH		
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		PROJECT: PP-PE PILOT PLANT				 شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
		TITLE: Control Valve Data Sheet					
		Contractor Job No:		Doc. No:			
		Owner Job No:		Sheet No: of			
Process data	1	Tag No.		TV-4405			
	2	Service		CW to E-351			
	3	P&ID No.	Piping Size	0044	1 1/2"		
	4	Pressure rating	Piping material	300#	C.S.		
	5	Fluid	State	WATER		LIQ.	
	6	Amb.Temp	Amb Press	Amb.Rel.Humidity Max	(-28)°C / 44°C	0.82 Bara	86%
	7	titel		case 1	case 2	case 3	
	8	Flow	Kg/h	420	4200	5040	
	9	Inlet pressure	bar	4	4	4	
	10	Outlet pressure	bar	2.82	2.82	2.82	
	11	Inlet temperature	-C	30	30	30	
	12	Density	kg/m3	995.7	995.7	995.7	
	13	Vapor pressure	bar	0.04	0.04	0.04	
	14	Critical pressure	bar	221.1	221.1	221.1	
	15	Viscosity	cP	1	1	1	
	16	Molar mass	g/mol	18.015	18.015	18.015	
	17	Real gas factor (Z)					
	18	Solid in suspension	(YES / NO)	NO	NO	NO	
	19	velocity	m/s	1-3	1-3	1-3	
	20	Isentropic exponent	gamma (Cp/Cv)	1.007	1.007	1.007	
	21	CV coefficient	Required	0.49	4.87	5.84	
VALVE	22	CV coefficient for Valve (Selected)		VTA			
	23	Valve type	Body material	Globe	forged steel-SS-316		
	24	Nominal size	Pressure ratings	VTA	ANSI 150#		
	25	Packing	Sealing	PTFE	metal		
	26	Design temperature		-60 +230			
	27	Characteristics		Quick opening			
	28	Leakage rate		V			
	29	Fail position		Open			
	30	Plug & seat & stem material		SS-316			
	31	Bonnet type	Bonnet material	Standard	SS-316		
	32	MANUFACTURER		VTA			
	33	MODEL no.		VTA			
	Pneumatic Actuator	34	Actuator Type		Spring Diaphragm Actuator		
35		Actuator Size (cm2)		VTA			
36		Hand Wheel		NA			
37		Air supply pressure		3.5 bar(g)			
38		Actuator Action		Air to close			
39		Actuator stem & Actuator body materials		VTA			
40		Diaphragm materials		VTA			
41		Single/Double Acting		Single			
42		MANUFACTURER		VTA			
43		MODEL no.		VTA			
Positioner	44	Positioner Type		Electro Pneumatic with HART communication			
	45	Input signal & Out put signal		4-20 mA+HART			
	46	Air supply		3.5 barg			
	47	Ingress Protection		IP 65			
	48	Enclosure Protection		EE xia , IIC , T6			
	49	Electrical Conection		M20* 1.5 mm ISO			
	50	Single/Double Acting		VTA			
	51	calibration		self calibration			
	52	materials houssing		VTA			
	53	Display, Operation		LCD, push button on display electronics-Indicating			
	54	MANUFACTURER		VTA			
	55	Tube Cinection		SS tube 1/4 "			
Accessories	56	Pressure gauge and filter and Regulator		YES			
	57	Certificates		pressure test, inspection certificate-Works			
0	08/01/2021	IFA	M.AGHAMOHAMMADI	A.A.SHOKRI	N.NOUHJAH		
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ITP FOR CONTROL VALVE



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ABBREVIATION ON TYPE OF INSPECTION

H: Hold Point, inspection notification required. During hold point inspection, the witness will be performed.
 The Vendor shall not proceed with the work until presence of the inspector or written consent of the inspector.
 W: Inspection activities performed by the Vendor and witnessed by the inspector. Inspection notification required.
 If the Inspector is not present, the Vendor may perform the inspection/tests as scheduled unless otherwise requested.
 S: Witness, but spot check basis, inspection notification required. Initial operation will be witnessed and subsequent operation will be witnessed at discretion of the inspector considering the results of previous inspection unless otherwise inspection % specified.
 R: Review of inspection records and/or specified document
 M: Vendor's inspection and tests X: Required

- 1. Inspection/Tests by the OWNER
- 2. Inspection/Tests by Purchaser and/or Purchaser's Representative
- 3. Inspection/Tests to be Performed by Vendor as a Minimum
- 4. Certificate/Data to be Provided by Vendor

No.	1.	2.	3.	4.	Inspection/Test Items	Procedure & Standards	Remarks
					(Pneumatic type control valve.)		
01	R	W	M		Visual inspection	Approved procedure and drawings	
02	R	S	M	X	Dimensional inspection	Approved procedure and drawings	
03	R	W	M	X	Material identifications against material certificates	Approved procedure and drawings	
04	W	H	M	X	Checking of characteristics including the following items as minimum: 1)Body, seat, stem, packing, accessories and actuator 2)Check of material certificates for body, trim, seat, plug, disc or ball, bolting, gasket/packing	Approved procedure and drawings	
05	R	R	M	X	Non-destructive examination, when specified	Approved procedure and drawings	
06	R	W	M	X	Pressure test of body(Note: Witness for body class 300 and larger)	Approved procedure and drawings	
07	R	W	M	X	Pneumatic test, when specified	Approved procedure and drawings	
08	R	W	M	X	Seat leakage test	Approved procedure and drawings	
09	R	W	M	X	Calibration test	Approved procedure and drawings	
10	H	H	M	X	Performance/functional test	Approved procedure and drawings	
11	R	W	M	X	Stroke test	Approved procedure and drawings	
12	R	W	M	X	Air failure test	Approved procedure and drawings	
13	R	W	M	X	Linearity and accuracy check	Approved procedure and drawings	
14	R	W	M	X	Response and stabilization time	Approved procedure and drawings	
15	R	W	M	X	Check the interoperability test certificate for hart protocol	Approved procedure and drawings	
16	R	S	M	X	Insulation resistance test	Approved procedure and drawings	
17	R	S	M	X	High voltage test	Approved procedure and drawings	
18	H	H	M		Preparation for shipment	Approved procedure and drawings	
19	R	R	M	X	Documentation review prior to release	Approved procedure and drawings	
					(Self-acting control valve)		
20	R	W	M	X	Visual inspection including connection check	Approved procedure and drawings	
21	R	S	M		Dimensional inspection	Approved procedure and drawings	
22	R	R	M	X	Check of material certificat for body and trim	Approved procedure and drawings	
23	R	R	M	X	Non-destructive examination, when specified	Approved procedure and drawings	
24	R	S	M	X	Pressure and tightness test	Approved procedure and drawings	
25	W	H	M	X	Performance test including open/close check	Approved procedure and drawings	
26	H	H	M		Preparation for shipment	Approved procedure and drawings	
27	R	R	M	X	Documentation review prior to release	Approved procedure and drawings	

Note: Percent of witness for type "S" shall be depend on the quantity as follows: 3 to 20→3(all if total 2 and less), 20 to 40→5, 50 to 100→10, 100 to 200→15, 200 to 300→20, 300 to 500→25.
 For another type, percent of witness inspection shall be 100%.



PP-PE Pilot Plant

Document No. : ۰۰۰-SPC-A۴-IN-۰۰۰۹

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Title: INSTRUMENTATION GENERAL SPECIFICATION

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A	X																			
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۱	Sep. ۱۳, ۲۰۲۱	K.Asgari/ V.Vasfi		M.Nazeri Nasab		M.Rajabian		AA.Shokri		M.Asadi		IFA								
Rev	Date	Prepared By		Checked By		Approved By		Approved By		Approved By		Status								
		Discipline		Discipline		Discipline		Discipline		Discipline		Discipline								
		PEM		PEM		PEM		PEM		PEM		PEM								
		PM		PM		PM		PM		PM		PM								

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۱. SCOPE

This specification covers the minimum general requirements for the instrumentation and control system design for PP-PE Pilot Plant in NPC-RT plant, Arak, Iran.

For instrumentation systems and components, as far as mechanical and electrical characteristics and performances are concerned, the present general specification will be used, and specific detailed specifications will be issued for each system and/or component. In case of discrepancy, information contained in the particular instrument specification and data sheet will take precedence over the general specification. The instrument design specification will be updated to include all the requirements of the project during detail engineering and is subject to the client's approval.

Any deviation from the present specification at any stage of the project will be clearly stated to the Contractor/Client by the Vendor or the Bidder. If any variation or addition is required in individual cases, they will be shown on material data-sheets. Any deviation from data-sheets or specifications, must be approved in writing by Contractor/Client, otherwise the equipment will be rejected at factory inspection.

۲. TECHNICAL REQUIREMENTS

- ۲.۱. Instruments and control equipment will be specified on standard data sheet formats and by written detailed specification and description.
- ۲.۲. Design methods and materials will be mainly in accordance with NPCS standards while the latest editions of the following standards as well as contractual codes and requirements are applicable:

- ISA Instrumentation Standards:

- ISA S ۰-۱ : Identification and Symbolization ۱۹۹۲
- ISA S ۰-۲ : Graphic symbols for logic diagrams ۱۹۹۲
- ISA S ۰-۳ : Graphic symbols for distributed control/shared display instrumentation, logic and computer systems
- ISA S ۱۸-۱ : Alarm and sequences
- ISA S ۷۰-۱ : Control valve sizing, equations
- ISA S ۷۰-۳ : Face to Face dimensions of globe type control valves
- ISA S ۷۰-۱۹ : Hydraulic testing of control valves ۱۹۹۱
- ISA S ۶۱,۱ : Procedures for executive function for process input output and bit manipulation
- ISA S ۶۱,۲ : Procedure for file access and the control of file contention.
- ISA RP ۶۰,۸ : Electrical guide for control centers

- ANSI Standards:

- ANSI-B ۱۶-۰ : Steel pipe flanges, flanged valve fitting edition + B۱۶-۰ a (۱۹۹۲)
- ANSI-B ۱۶-۱۰ : Face to face and end to end dimensions of valves
- ANSI-B ۳۱,۳ : Process Piping
- ANSI-B ۱-۲۰,۱ : Pipe threads
- ANSI/FC ۷۰,۲ : Control valve seat leakage
- ANSI/MC ۹۶-۱ : Temperature measurement thermocouples
- ANSI-B ۱۶,۳۷ : Hydro static Testing



• ASME & ASTM Standards:

- ASME, Div 1, : Hydraulic test for safety relief valve, Sect. VIII
ASTM : Material specifications

• ISO Standards:

- ISO 5167 : Flow measurement with orifices, nozzles and venturi tubes

• BS Standards

- BS 1042 : Methods for measurement of fluid flow in pipes (where not covered by ISO 5167)
BS 6739 : Instrumentation in process control systems installation design and practice (1986)
BS 5308 : Instrumentation cables

• IEC Standards:

- IEC 701 : Industrial platinum resistance - thermometer sensors (1983 + AMD 1 1986)
IEC 947 : Low voltage switchgear and control gear (1990)
IEC 61131 : Programmable controllers Programming languages.(for DCS/PLC)
IEC 61108 : DCS/PLC
IEC 529 : Mechanical Protection degree for enclosures
IEC 60548 : Industrial Thermocouples- thermometer sensors (for T/C)
IEC 60751 : Industrial Thermocouples- thermometer sensors (for RTD)
IEC 337-1 : Switches Contact Rating

• API Standards

- API-RP 501 : Process measurement Instrumentation
API-RP 504 : Process Instrumentation and control
API-RP 500 : Process Analyzers
API-RP 526 : Dimensions of Flanged type Pressure Safety valves
API-RP 526 : Valves Leakage Limits
API-RP 500 : Hazardous Area classification

• Other Standards

- NACE- MR-0102 : In Sour Corrosive Services
AWS D1.1 : American Welding Society for steel structures and Instrument welding.
CENELEC-50114 to 50120 : Protection of Electrical apparatus in explosive area
NAMUR : Proximity switch mounting and solenoid valve connection.
IPS -G-IN-16 : Engineering & material standard for control valves
IPS-C-IN-16 : Construction & installation standard for control valves

Plant control and process monitoring as well as all operational interlocks and sequences shall be performed by DCS.



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- 2.3. When it is commercially available all field instruments shall have a protection of at least IP-60 or better according to IEC 609. In case of non-availability of IP-60 or better, other commercially available IP ratings will be reviewed and approved case by case by the client. Transmitter enclosures shall be rated IP-60 as minimum.
- 2.4. All instruments will be tested and calibrated by the Manufacturer before delivery and a calibration sheet will be supplied with each instrument.
- 2.5. In order to achieve a fail safe design all Alarm, safety and interlock contacts will be closed and solenoid valves and relays shall be energized during normal plant operation.
- 2.6. The actions of valves will be designed in such a way as to keep the plant under safe conditions in case of main electric power or instrument air failure.
- 2.7. Instrumentation system shall be basically electronic type. Final control elements and local loops will be pneumatic. Minimization of pneumatic instruments to be considered. Control valves shall have electro-pneumatic positioner. Electronic transmitters shall be Smart type.
- 2.8. Electronic signals shall be 4-20 mA as standard. Isolated outputs to be considered where required. All transmitters shall be Smart type with HART protocol. Communicator shall be supplied by manufacturer.
- Pneumatic signals shall be 0.2-1 Bar.
Solenoid valves will be 24 VDC powered.
Cable Entry size shall be generally M^xX¹,0 mm ISO.
- 2.9. Electronic instruments and circuit boards will be tropicalized against moisture, fungus growth and insect attack and will have a high degree of environmental protection for such a duty as well as protection against corrosive, saline etc. atmospheres.
- 2.10. Electronic instruments construction material of wetted parts shall be in accordance with piping class requirements. Wetted parts shall be, as minimum, AISI 316. Where AISI 316 is not suitable for the application other compatible materials with process fluid at service conditions of pressure and temperature shall be selected as Hastelloy C, Titanium, Monel, etc.
- 2.11. Electronic instruments installed in classified area shall be selected in accordance with CENELEC or IEC code requirements. Electronic instruments in hazardous area shall be basically Intrinsically safe. Where Intrinsic safe instruments are not available Explosion proof or purged instruments shall be selected. Certification shall be provided by a recognized laboratory.

3. BASIC DESIGN VALUES

- 3.1. All field equipment will be suitable for operation in a corrosive, dusty, saline etc. Atmosphere.

3.2. SITE CONDITION:

- Minimum temp. : - °C
- Maximum temp. : +44°C
- Maximum humidity : 86% in January



- 3.3. Critical instruments systems and control systems will be supplied by 110V 50 Hz single phase from UPS and 24 VDC.



The UPS (un-interruptible power supply) located in the control building, or in the electrical substation (UPS room) will deliver:

- Frequency : 50 Hz \pm 0.5 Hz
- Voltage : 110 VAC \pm 1.0%

The UPS is limited to feeding the DCS, analyzers and other specific instruments when required. Instruments such as transmitters, transducers, converters, switches... will be powered by 24 VDC. Power supply will normally be supplied from the DCS or other systems otherwise 24 VDC power supply will be used for solenoid valves.

No voltages other than 24 VDC, and 110 VAC will be used for systems supply except if clearly specified by the Contractor.

3.4. Instrument air supply shall have the following characteristics as minimum:


- Normal Pressure : 1 Barg
- Minimum Pressure : 0.5 Barg
- Design Pressure : 1.5 Barg
- Temperature : Ambient
- Dew Point : -4.0 °C
- Dust,Oil,Water free

4. MEASUREMENT UNITS

- Density : kg/m³ (kilograms per cubic meter)
- Level : m,cm,mm
- Viscosity : % of range (for indication)
- Liquid : cSt
- Gas : cp
- Other units:
 - Rotation : rpm (revolutions per minute)
 - Power : kW or kVA
 - Voltage : V (volt)
 - Electrical current : A (ampere)
 - Pressure : barg
 - Flow : m³/hr
 - Mass flow : kg/s , kg/hr
 - Temperature : °C
 - Time : Sec,Minute
 - Distance : Meter



0. INSTRUMENT GENERAL REQUIREMENTS

- 0.1. For transmission and control, electronic loops will use a standard 4-20 mA signal. This is based on smart transmission of signal with HART protocol. The electrical instrument signal will increase in level in increase of the process variable.
For temperature instruments, refer to chapter 12 (TEMPERATURE INSTRUMENTS).
- 0.2. Instrument will in general be of the electronic type.
- 0.3. Transmitters may be provided with integral or separate local digital indicator per process requirements.
- 0.4. Millimeters and receiver gauges will be visible and readable at the associated control valve assembly or at the location indicated on the detailed engineering P&ID.
- 0.5. Process control valves with pneumatic actuators will be actuated via I/P positioners (integral with the control valve).
- 0.6. Limit switches shall be proximity type (NAMUR type) 
- 0.7. The component parts of instruments will be of material suitable for the process. Movements or wetted parts for instruments will be stainless steel or better when specified. Materials exposed to the process fluid will be in accordance with the fluid conditions (pressure, temperature, and corrosion). This will be reviewed case by case during detail engineering and is subject to the Client's approval.
- 0.8. All components, particularly if containing electric contacts, will be vibration resistant. All components will be constructed of material which is resistant to corrosion by the process fluid with which they are in contact internally and to the ambient air environment to which they are externally exposed (corrosive, dusty, saline etc. atmospheres).
- 0.9. Instrument cables (analog (4-20 mA), digital signal, RTD and thermocouple cables) will be run separate from power supply cables from the field junction boxes to the control room.
- 0.10. Cables carrying intrinsically safe shall be routed separately with non-IS signal carrying cables.
- 0.11. Instrument air manifolds shall be used for distributing the instrument air to the consumer. Min 20% spare tapping shall be considered in each manifold.
- 0.12. Control actions shall be done as much as possible in the DCS system but Local controllers if any will be specified with one or more of the following actions; the control action will be easily reversible.
- Proportional
 - Integral or reset
 - Derivative or rate.
- Generally, temperature controllers will be three term controllers; flow pressure and level will be two term controllers. Integral and derivative actions will have an off position where possible.
- 0.13. Each pneumatic user shall be provided with a 1/2" block valve. the material of block valve shall be 316 SS. An air filter regulator with pressure gauge shall be considered for each user. For control valves the pressure gauge will be installed on the positioner.



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- 0.14. All indicator dials will be white with black graduations. Electronic indicators will be as per supplier standard.
- 0.15. All field instruments will be provided with a suitable stainless-steel nameplate bearing whenever applicable, the following information:
 - tag number
 - Manufacturer's name, model and serial number
 - Maximum allowable pressure / temperature for the parts concerned
 - Scale factors
 - Materials of the fluid wetted parts
 - Power voltage and frequency or instrument air pressure
 - Calibrated rangeAll indoor instruments will be provided with at least one nameplate for operating and maintenance purposes.
- 0.16. Final drawing and certificates will be issued in the English language.

1. CONTROL ROOM

- 1.1. The main apparatus installed in control room is the cabinets of Distributed Control System (DCS) package PLCs and operator stations.
- 1.2. Cable cross wiring marshalling cabinets, DCS process interface and controller cabinets, DCS historical modules and network modules, marshalling cabinets, electrical distribution panel will be installed in an auxiliary room adjacent to the PCR (process control room).
The DCS operator stations / engineering stations and associated printers will be located in the PCR (process control room).
The UPS cabinets and the UPS batteries will be located in the UPS room and battery room respectively which is in the scope of Electrical.
- 1.3. All instrument cable entries into the control room and auxiliary room from the outside will be via PVC conduit, which will be sealed in order to prevent the ingress of gas or vapors.
- 1.4. No process fluids will be piped into the control room or the auxiliary room.
- 1.5. The process control room and the auxiliary room will be air conditioned, and classified as a general-purpose (unclassified) electrical area. They will also have a false floor for routing of cables and a false ceiling for proper lighting and air conditioning ducting.

2. LOCAL PANELS

All functions for process control of the plant will be done through the Distributed Control System. However, local panels may be provided for main EQUIPMENT, which will be normally controlled by programmable logic controllers (PLC) located in the auxiliary room. The local panels (installed near the EQUIPMENT) will include push buttons, lamps and indicators necessary for local operations, start-up and maintenance (e.g. heater...) and will be the Vendor's standard design.



1. ALARMS AND SHUTDOWNS

- 1.1. Alarms and shutdown systems will be generally designed to be fail-safe.
- 1.2. The control systems will be designed in order to protect against tripping from random or spurious signals on deviation from normal operating conditions i.e. to prevent noisy shutdown.

2. CONNECTIONS

- 2.1. Instrument connections and tapping points on vessels or pipes are defined on table #1.
- 2.2. Plant pneumatic signal lines will be 1/2" OD stainless steel tubing and fittings.
- 2.3. All cable runs between the control room and the plant will be made with multi core/pair cables and connected to the field junction boxes.
Cable specifications from the auxiliary room to the field are:
Electronic signals: multi-pair, each pair twisted and screened, overall screened, armored PVC insulated.
On-off signals : multi core, overall screened, armored PVC insulated
- 2.4. The single pair cable specifications are the following:
Electronic signals single pair, twisted, screened, armored, PVC insulated
On-off signals Two Core, armored, PVC insulated, overall sheath
Cable runs in the main control room as well as in the auxiliary room and the plant, will be tagged at each end for identification purposes. For the cable runs in the plant, cable markers will be provided at specific distances to indicate the route of the cable.
- 2.5. Multi-strand copper wires for single pair or triple conductor cables will be used in the auxiliary room, and for cables between field junction boxes and instruments. For other connections, solid copper conductors are preferred.
- 2.6. A maximum voltage drops of 1% at normal loading conditions will be taken into account in the sizing of cables.
- 2.7. 2% spare cores are required in multi core cables and for spare cable inlets to the junction boxes. All spare conductors will be connected to terminals.
- 2.8. Minimum 2% spare space is required in junction boxes.
- 2.9. Screwed terminals will normally be used. Test/disconnect terminals will be used for the connection of field cables in the marshalling cabinets.
- 2.10. Accuracy rating for instruments.

The rated accuracy of individual instruments will be as listed below.

These tolerances will apply to the full-scale reading of the particular instrument, referring to repeatability a deviation of characteristic curve, at constant ambient temperature and a steady power supply (for instruments accuracy values marked with (*) referred to the measured value).



Primary devices:

Standard orifice plates and Venturi tubes ($> 0.5\%$ of measuring range)	71,0 %
Resistance thermometers Pt 100 DIN	70,6 %
Thermocouples	70,70 %

Field indicators:

Pressure gauges	71,6 %
Pressure gauges (flanged connections)	72,0 %
Liquid expansion thermometers	71,0 %
Bimetal thermometers	72,0 %

Flow meters ($> 1\%$ of measuring range)

Magnetic flow meters	71,0 %
Turbine flow meters	70,0 %
Positive displacement meters	70,0 %
Rotameters	71,6 %
Rotameters with PTFE lining	72,0 %
Rotameters (for purge systems)	74,0 %
Coriolis flow meters for gas streams	(*)70,0 %
Coriolis flow meters for liquid streams	(*)70,2 %
Vortex flow meters for gas or vapour streams	(*)71,0 %
Vortex flow meters for liquid streams	(*)71,0 %
Thermal mass flow meters	(*)72,0 %

(*) accuracy rating referred to the measured value

Transmitters

Temperature transmitters for resistance Thermometers/thermocouples	70,6 %
Pressure transmitters	70,2 %
Differential pressure transmitters	70,2 %
Level transmitters (displacer type)	71,0 %
Level transmitters (radar type)	710 mm 70,3 %

I/P transducers	70,6 %
A/D or D/A converters	70,2 %

Control room instruments

Line recorders	70,0 %
Dotted line recorders	70,0 %
Pneumatic indicators	70,0 %
Electric indicator	70,0 %
Factors influencing the measuring accuracy:	



1. FLOW INSTRUMENTS

1.1. ORIFICE PLATES

In general, flow measurement will be made by means of square-edged concentric orifice plates mounted between flanges with flange taps, in accordance with ISO 5167 recommendations and relevant codes and standards.

Eccentric orifices may be used in horizontal lines to avoid accumulation of liquid when vent or drain holes (maximum 3 mm diameter) are not specified or with fluids containing solids. Quarter circle or conical entrance orifice plated may be selected when a square-edge type is not appropriate.

Orifice plates shall be in AISI 316 as minimum for general service. Other materials shall be used when AISI 316 is not suitable for the service conditions; The material to be used will be specified on Piping material specification and/or instrument data sheet.

Orifice plate beta ratios shall be between 0.2 to 0.7.

Orifice meter runs shall be used for line size lower than 2".

Integral Orifice assemblies shall be used for to measure flow rates which can't be measured accurately with the minimum size of meter runs.

Orifices will be sized for the following standard instrument DP range:

- 12, 5, 25, 50, 72, 5, 125, 250, 500, 1000, 1250 mbar.

In order to achieve a minimum pressure loss in the system, the maximum allowable beta value (d/D) will be selected for each orifice.

Straight run pipe requirements shall be in accordance with ISO 5167 or vendor requirements. Straightening vane can be used to reduce upstream pipe lengths.

1.2. VENTURI AND FLOW NOZZLE

Venturi tubes may be selected for non-viscous fluids when relatively high accuracy is required with a low-pressure drop in the system and or short minimum straight run piping requirements.

1.3. PITOT TUBES

Pitot tubes or modified pitot tubes (Annubars) may be selected for large flows of clean fluid to achieve minimum pressure loss in the system where the pressure drop through an orifice is uneconomical or flow measurement accuracy is not critical.

1.4. MAGNETIC FLOW METERS

Magnetic flow meters may be used for dirty liquids having conductivity higher than 50 µS/cm.

1.5. VORETX FLOW METERS

Vortex and other non differential flow transmitters shall be used only in special applications as shown on P&IDs.

1.6. MASS FLOW METERS

Generally, Coriolis or thermal Mass flow meters shall be used for mass flow measurement. Installation of flow meters shall be in a manner as to ensure that the entire assembly is fitted with the respective process fluid.



10.7 DIFFERENTIAL PRESSURE TRANSMITTERS

Flow measurement signals (e.g. for indication/recording / totalizing / trending etc.) will generally be connected to the DCS:

Transmitter measuring principles used with orifice plates, venturi tubes, pitot tubes, etc. will be in accordance with the selected manufacturer's standards e.g. diffused silicon strain gauge, capacitance etc....

The transmitters will be of the "smart" type (HART Protocol) with accuracy better than 0.2%. The sensing element material will be AISI 316 minimum.

Electronic transmitters will be furnished with test terminals and by-pass diode to facilitate field testing without disconnection or connection of a field mounted signal indicator (MV-Meter) either integral with or remote from the transmitter. Transmitters shall be reverse polarity protected.

10.8 FLOW SWITCHES

Direct-acting flow switches will not generally be used for process fluids. Switch actions will normally be made via normal measuring means with the switch function on the transmitter output or as threshold contact type on local flow indicator.

The switch function will be adjustable. Switches will have changed-over volt-free snap-acting contacts.

Further detailed data and information will be provided when specifying the instruments

10.9 LOCAL FLOW MEASUREMENT:

For local measurement, variable flow meters or differential head type elements with DP pressure indicator will be used.

10.10 P/T COMPENSATION:

Whenever high fluctuation of pressure or temperature of the process fluids are expected, P/T compensation shall be considered.

11 LEVEL INSTRUMENTS

11.1 DISPLACEMENT TYPE

External displacer-type (torque tube type) transmitters will generally be used for level ranges lower than or equal to 1219 mm (48"). Adequate valves will be provided for maintenance purposes.

The following standard ranges will be used:

- 306, 813, 1219, 1524, 1829, 2134: mm
- 12, 32, 48, 60, 72, 84: inch

Displacement type level instrument shall not be used with viscous, turbulent, solidifying, corrosive conditions or liquids that boils at ambient temperature.



Internal displacer type (displacer hanging in vessel) will only be used where conditions dictate that the level shall be measured internally and where turbulence will not detach the displacer. and they shall be avoided practically on vessels that can't be isolated without shutting down a part of the plant.

Extensions will be considered for services above 200°C (fins).

Connections will be in general side-bottom mounted. The housing will be rotatable. Left-hand type or right-hand mounting position of housing will be in accordance with the installation requirements. Drain valves shall be considered for external level transmitters.

11.2 DIFFERENTIAL PRESSURE TYPE

In general, differential pressure transmitters will be used to measure liquid level where the range of level to be measured is greater than 2000 mm and where this type of instrument is preferred to a displacer type like steam drum level.

Transmitter measuring principles will be in accordance with the selected manufacturer's standards, and preferably same as those differential pressure transmitters used for flow measurement.

External differential pressure instruments shall be installed lower than the lowest vessel connection and higher than the highest vessel connection depending on the process fluid or selected purge method.

The transmitters will be of the "smart" type with accuracy better than 0.2%. The sensing element material will be AISI 316 minimum.

Electronic transmitters will be furnished with test terminals and by-pass diode to facilitate field testing without disconnection or connection of a field mounted signal indicator (MV-Meter) either integral with or remote from the transmitter. Transmitters will be reverse polarity protected. D/p transmitters will have zero elevation or suppression as required.

11.3 DIAPHRAGM SEAL AND CAPILLARIES

For measurement of viscous fluids, fluids containing solids, highly corrosive fluids or where temperature changes may influence the fluid conditions, the use of diaphragm seals and capillaries may be considered. Capillaries for remote seal applications will be kept as short as possible and will not exceed 6 m. When remote seal systems are specified, the fill liquid shall be selected to agree with the process requirements, and shall not affect a change in the instrument calibration when subjected to a calibration at ambient conditions versus normal process condition.

11.4 LIQUID LEVEL SWITCHES

Depending on the process requirements, level switches shall be of the float type, tuning fork, or capacitive sensor type. Switches without mechanical contacts are preferred. For process connection refer to the Table #1 on the attachment.

11.5 SPECIAL LEVEL MEASUREMENTS:

Capacitive level transmitters may be used as an alternative for fluids of high viscosity and for bulk materials.

Ultrasonic or radar methods will be used for tank gauging if physical condition of the process fluid allows this.

Radioactive level measurements will be used in the polymerization reactors only, as in this case it is the only possible method of measurement.



Load cell assemblies normally will be used for silo measurement. In that case the silo shall be installed stress free.

11.6 LOCAL LEVEL INDICATORS:

Local level indicators with all metric construction and magnetic coupling of follower magnet is generally preferred. For process connection refer to Table #1.

The instruments will have vents and drains according to manufacturers standard. In justified exceptional cases and as explicit shown on the PID, permanently attached valves and fluid discharge lines will be used and installed in accordance with the piping specification.

Local tank level gauges with a large measuring range will consist of level transmitters with local indicators.

11.7 REMARKS

- There will be no local recording
- Installing two or more devices on the same connections will be avoided.

12 PRESSURE INSTRUMENTS

12.1 GENERAL

Pressure-measuring elements will be minimum AISI 316 stainless steel or comply with piping material if more resistive material required.

Pressure Instruments will have over-range protection to minimize the effect of over pressure in order to avoid a shift in calibration. Instruments, which can be exposed to vacuum, will have under range protection. Over-range protection will cover the Design pressure of line.

Pulsation dampeners or glycerin-filled systems will be supplied for all pressure instruments and gauges in vibrating or pulsating services.

Differential-pressure instruments will generally be capable of withstanding the full static pressure without loss of calibration.

For the measurement of absolute pressure, differential pressure transmitters will be used with an absolute vacuum reference chamber.

12.2 PRESSURE GAUGES

Bourdon-tube type pressure gauges will generally be used. The material of the Bourdon-tube will be SS 316 minimum or better, depending on process requirements.

Pressure gauges shall have stainless steel housings with a blowout disc and zero adjustment. It must be possible to fill the gauge with glycerin.

The movement will be of corrosion and wear-resistant material, e.g. stainless steel/nylon-coated, independent of case.

Gauges for direct mounting will have a 1/2" NPT male bottom connection and a 4" (100 mm) dial.

Bourdon tube type pressure gages shall be used for ranges from 1 Barg to 100 Barg

Diaphragm type pressure gages shall be used for measuring ranges bellow 1 Barg.



Over range protection of pressure gauges shall be 1.3 of full scale.



For slurry, viscous, highly corrosive or fluids with suspended solids the pressure gages shall have diaphragm seal with 1/2" flange connection.

Pressure gauges will preferably be direct-mounted to the process. Receiver gauges may be local field-mounted or panel-mounted (local panel).

12.3 PRESSURE SWITCHES

Pressure switches will be of the Bourdon tube or pressure gauges with adjustable contacts (proximity type), diaphragm or bellows type with a 316 SS element as a minimum requirement. Switches will be adjustable over the full scale. Pressure switches for direct mounting will have a 1/2" NPT female connection. Diaphragm seals with capillary shall be provided where required. Whenever no suitable pressure switch can be found due to material or, over-range protection requirements etc., a 4 - 20 mA electronic transmitter will be used instead. Pressure switches for pneumatic signals will preferably have bellows measuring elements. Connections will be 1/4" NPT female. Pressure switches will have a minimum standard over-range protection of 120% of range and be capable of withstanding the full static design pressure of the system without loss of calibration. Switches will be snap acting hermetically sealed switches with contact rating in accordance with IEC 947-5-1 and relevant codes and standards. The switches type shall be SPDT type.

12.4 TRANSMITTERS

Transmitter measuring principles will be in accordance with the selected manufacturer's standards e.g. diffused silicon strain gauge, capacitance etc.

The transmitter will be of the "smart" (HART protocol) type with accuracy better than 0.2%.

The sensing element material will be AISI 316 minimum.

Electronic transmitters will be furnished with test terminals and by-pass diode to facilitate field-testing without disconnection or connection of a field mounted signal indicator (MV-Meter) either integral with or remote from the transmitter. Transmitters will be reverse polarity protected.

Electronic transmitters will have a provision for checking zero and span on the output terminals while the transmitter is in service.

The manufacturer of each type of transmitter shall supply suitable communicator.

12.5 DIAPHRAGM SEALS AND CAPILLARIES

For measurement of viscous fluids, fluids containing solids, highly corrosive fluids or where temperature changes may influence the fluid conditions the use of remote diaphragm seals and capillaries may be considered. Capillaries for remote seal applications will be kept as short as possible and will not exceed 1 m in length.

Seals and capillaries will be considered to be an integral part of the instrument.



13 TEMPERATURE INSTRUMENTS

13.1 THERMOWELLS

Standard length thermowells will be used. Thermowell will be solid machined and drilled from bar stock. They will be selected in accordance with the piping class.

Thermowells shall be flanged type, for connection size refer to Table #1.

13.2 THERMOCOUPLE ELEMENTS (T/C'S)

Thermocouples will be in accordance with IEC-60584; non-grounded hot junction type will be used for temperature measurement. RTD detectors will be used in preference to thermocouples for temperature ranges of -200 to 600°C . The following types of thermocouples may be used depending on the temperature range to be measured.

- Type K (chromel - alumel) -270 to 1372°C (Nickel-chrome/nickel-aluminum)
- Type R (platinum 13% rhodium-platinum) -50 to 1768°C
- Standard length thermocouples will be used. Thermocouple inserts will match the standard Thermowell diameter and length. Lagging extensions will be supplied as required. Connection heads to be metal type.
- Stainless steel sheathed mineral-insulated spring-loaded 2-wire type elements will be used. Special protection tube/sheathing and/or insulation will be used for temperatures above 400°C , saline environment and when hydrogen diffusion may be expected.
- For services where thermowells must be considered to be an obstacle in the process (clogging/turbulence), skin-type thermocouples may be considered. Skin-type thermocouples will be used to measure heater coil, reactor wall temperatures, as per process. Skin-type thermocouples will preferably be welded to the surface and as a minimum be spring-loaded or clamped. Open-air skin-thermocouple installations will be insulated. Skin-type thermocouples will not generally be used for shutdown purposes.

13.3 RESISTANCE-TYPE ELEMENTS (RTD'S)

Platinum-type resistance elements, with characteristics in accordance with IEC 60751 (resistance 100 ohms at 0°C), will be used in preference to thermocouples for ranges between of -200 to 600°C

- Standard length elements will be used. RTD inserts will match the standard Thermowell diameter and length. Lagging extensions will be supplied as required. Connection heads to be metal type.
- Stainless steel sheathed mineral-insulated spring-loaded 3-wire type elements will be used.

13.4 THERMISTOR AND SEMICONDUCTOR SYSTEMS

These systems will not be used, except for motor windings when specified.

13.5 BIMETALLIC SYSTEMS

Dial thermometers for local use will be of the bimetallic type with adjustable gland and dial. Dial thermometers will fit the standard Thermowell diameter and lengths.



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Thermometers will be heavy duty, industrial type. Nominal dial size will be ۱۰۰ mm (۴"). Case to be stainless steel with back shafts and zero adjustment.

The movement will be of corrosion and wear-resistant material, e.g. stainless steel/nylon-coated, independent of the housing.

Bimetallic-operated switches may only be used in non-critical services such as for tank heater. Bimetallic switches are not permitted for process alarm and shutdown functions.

۱۳,۶ TRANSMITTERS

- Head mounted mV/I (T/C) or ohm/I (RTD) converters will be used as much as possible. The required degree of accessibility will be strictly adhered to.
- In cases head mounting is not possible or when indicator is required, where, the converter will be installed locally, close to the measuring element or in the place where local reading is required.
- Cold junction compensation will be provided for mV/I (T/C) converters.

Transmitters will be of the "smart" type with accuracy better than ۰,۲%.

Electronic transmitters will be furnished with test terminals and by-pass diode to facilitate field-testing without disconnection or connection of a field mounted signal indicator (MV-Meter) either integral with or remote from the transmitter. Transmitters will be reverse polarity protected. Electronic transmitters will have a provision for checking zero and span on the output terminals while the transmitter is in service.

۱۳,۷ SPECIAL APPLICATIONS

Temperature-measurement on rotating equipment:

- A temperature rise in the bearings of rotating machinery, is an indication of approaching problems.
- In thrust bearing, a temperature rise indicates inadequate cooling of bearings or excessive wear.
- Sensors, extension wire, terminal heads, cables,
- boxes, etc., must be capable of withstanding considerable mechanical stress, weather exposure, fire-protection sprinklers, equipment washing etc.

۱۳,۸ REMARKS

Local temperature control (thermo-valve) is not recommended. Local recording will not be done.

Further detailed data and application for each type of instrument will be provided when specifying the temperature instruments.



14. CONTROL VALVES

14.1. GENERAL REQUIREMENT

Supplier quotation shall include a detailed specification sheet for each control valve, which shall provide all the details regarding type, construction materials, noise, etc... and any other valve accessories.

This specification is general. If exceptions, variation or additions are required in individual cases they will be shown on specification/data sheets for control valves.

Any proposed deviation from control valve specification /data sheets or this general specification, must be approved in writing by client / contractor.

14.2. CONTROL VALVES SELECTION

14.2.1. Required valves capacities

Required valve capacities shall be referred to in terms of CV coefficients and selected CV value.

14.2.2. Valve sizing

A calculation note / sheet for the sizing of each control valve shall be supplied.

Calculation of the control valves shall be based on ISA S 70.1 "Control valve sizing equations".

The control valve capacities in term if CV shown on the purchaser's data sheets has been arrived at using the formula given in the standard ISA-S-70.1, "Control Valve Sizing Equations". In case of Vendor sizing formula differs from this. Purchaser should be provided with the same.

In general, control valves shall be sized so that the valve opening is as following:

At maximum flow-about 90% open

At normal flow about 70% open

At minimum flow about 20% open

Rangeability of valves shall be 30:1 unless otherwise specified.

Butterfly valves shall be sized assuming a 60° opening at max. flow in general.

Non preferred valve body sizes are 1/4", 3/4", 1/2", 3/2", 4/2", 6", 8" and 9".

Vendor shall furnish calculation sheets or computer print out for sizing.

14.2.3. By pass & Block Valve

Block & Bypass valves are mostly manifolded in piping system to allow manual manipulation of flow through systems when control valves are not in service. Bypass valves in sizes of 2 inches or less most be globe valves.

They should have a capacity at least equal to the calculated Cv of control valve.

Block and Bypass valves should be avoided in the following cases:

- On hydrogen service
- Around 3-way valves
- Around self-acting steam pressure reducing valves
- Around control valves forming part of a protection system



14.2.4. Valve type

Globe body type control valves shall generally be chosen for standard use (due to bench test requirement).

Butterfly control valves shall be considered where:

- When available pressure drop is low
- For large line sizes
- Where allowed in piping specification

Shut off valves shall be generally selected as Ball type except for high temperature services.

Valves using special technology shall be submitted to the Client / Contractor for approval. (Clearly noted on P&ID)

For small size or special cases (low noise, etc...) other types shall also be considered

14.3. GENERAL VALVE CONSTRUCTION REQUIREMENTS

14.3.1. Flange Finish Facing

Minimum body and connection rating shall be 300 lbs Raised Face (RF). Flange facing shall be chosen in accordance with classes of the piping specification. Contact finish facing shall be as follows:

Spiral serrated finish (conventional symbols: RFD)

Roughness: Ra 6.3 μm to 12.5 μm (250 μin to 500 μin AARH)

Smooth finish (conventional symbols: RFC)

Roughness: Ra 3.2 μm to 6.3 μm (125 μin to 250 μin AARH)

For RTJ flanges, ring joints will be supplied by others

14.3.2. Accessories

Limit switches if any shall be proximity type with NAMUR standard.

All control valves shall be normally fitted with an electropneumatic positioners.

All accessories specified on data sheets shall be supplied, installed, connected and wired to the valve by the valve supplier.

All tubing shall be in 316 Stainless steel.

Compression fittings shall be in SS 316 Stainless steel double ferrule design.

Pneumatic connections shall be 1/4" NPT female minimum, or bigger if stated by supplier for flow considerations.

Electrical connections shall be:

- M20 x 1.0 ISO for positioner
- M20 x 1.0 ISO solenoid valve

All positioners shall have pneumatic gauges, graduated in bar, two (2) in case of electropneumatic positioners, three (3) in case of pneumatic positioners if any. Dial size shall be as per Vendor standard.

Solenoid valves shall be provided where specified on data sheets and shall be NAMUR type.

Valve trim shall be stainless steel with Viton or similar resilient seat to provide tight shutoff.

Solenoid valves shall be normally energized. Coils shall be suitable for permanent energizing.

Low power coils shall be proposed (maximum acceptable is 10 W). Electrical power for solenoid valves coils will be 24 VDC.

Solenoid valves shall be suitable for instrument air Service.



When specified, solenoid valves shall be provided with manual reset facilities. The manual reset facilities shall prevent automatic reset but allow local manual reset of individual valves on restoration of electrical power (i.e. reset of electrical logic), and local shutdown.

15. PRESSURE RELIEF VALVES

Pressure relief valves shall be full-bore type.

Relief valves shall be designed in accordance to the requirements of API-RP-597.

Lifting lever shall be provided for steam and air services.

Conventional valves shall be used for constant back pressure applications while pressure balanced valves with stainless steel bellows shall be used for varying back pressure application where the back pressure exceeds 10% of the set pressure of the valve.

Connection of Pressure relief valves shall be flanged type while the connections of thermal relief valves shall be screwed type.

Steel bodies with stainless steel trim shall be used for all pressure relieving devices unless piping specification requires alloy construction.

Rupture Disc may be used in lieu of or in combination with safety and relief valves.

Combination of rupture disc and pressure safety valve shall be used for slurry or highly corrosive services.

Rupture discs shall be provided with bursting alarm device. Combination of rupture disc and relief valves shall include a pressure switch installed between disc and valve to alarm a leakage or burst.

16. ANALYZERS

Process analyzers requiring sampling will be supplied pre-assembled with their own sampling and conditioning systems in open ladder type racks. Analyzer racks will be installed in analyzer houses.

Where possible analyzers will be of the on-line type.

When necessary analyzers will be provided with a fast loop system

Sample purge gas and analyzer vent gas will be properly vented to a safe area.

When applicable analyzer transmitters shall be of the "smart" type with accuracy better than 0.2% and have a 4-20 mA output to DCS.

All materials used shall be suitable for the sample stream and the surrounding atmosphere; AISI 304 / 316 shall be selected as minimum.

Whenever practical sample shall be returned to the process. Other methods of disposal shall ensure safety and pollution restrictions.

Field mounted analyzers shall be used for simple analyzers such as Conductivity, PH, density, etc.

Analyzers shall be in general installed in analyzer house that shall be weather proof, with air conditioning.

Sample Pressure reducers, conditioners, fast loops, and calibration gas cylinders shall be installed outside analyzer house.



Further detailed data and application for each type of analyzer will be provided when specifying the analyzers.

INSTRUMENT ON VESSEL	VESSEL CONNECTION	FIRST BLOCK VALVE	INSTRUMENT CONNECTION
External level instrument	2" flanged	2" flanged	2" flanged
Internal displacer level	4" flanged	-	-
External ball float level switch	4" flanged	-	4" flanged
Internal ball float level switch	4" flanged	-	4" flanged
Level guage on vessel	1" flanged	1" flanged	1" flanged
Level guage on standpipe	1" flanged	1" flanged	1" flanged
Magnetic level instrument	1" flanged	1" flanged	1" flanged
Dp cell on vessel (without diaphragm)	1" flanged	1" flanged	1/2" NPT
Dp cell on vessel (with diaphragm)	3" flanged	3" flanged	3" diaph.seal
Dp cell on standpipe(without diaphragm)	1" flanged	1" flanged	1/2" NPT
Dp cell on standpipe (with diaphragm)	3" flanged	3" flanged	3" diaph.seal
Dip tube level instrument	4" flanged	1" flanged	1/2" NPT
Pressure guage&transmitter(general case)	1" flanged	1" flanged	1/2" NPT
Pressure transmitter with diaphragm	2" flanged	2" flanged	2" flanged
Pressure gauge with diaphragm	2" flanged	2" flanged	2" flanged
Thermowell (general case)	1 1/2" flanged	-	-
D/P pressure transmitter /gauge(vessel)	1" flanged	1" flanged	1/2" NPT
Radar type level instrument	3" flanged	-	-

Table #1

PIPING	PIPE CONNECTION	FIRST BLOCK PIPE	INSTRUMENT CONNECTION
Orifice (Dp) flow-meter	1/2"	1/2"	1/2" NPT
Pitot tube	Acc.mfr.std	Acc.mfr.std	1/2" NPT
Pressure transmitter	1/2"	1/2"	1/2" NPT
Pressure gauge	1/2"	1/2"	1/2" NPT
Pressure transmitter with diaphragm	2" flanged	2" flanged	2" flanged
Pressure guage with diaphragm	2" flanged	2" flanged	2" flanged
Thermowell (flanged connection)	1 1/2" flanged	-	TE : 1/2" NPT
Thermowell (Threaded connection)	1" NPT	-	
Analyzer connection	1" flanged	Special valve	Acc.mfr.std
D/P pressure transmitter/guage	1/2"	1/2"	1/2"

Table #2

PAGE	REV.	۰	۱	۲	۳	۴	۵	PAGE	REV.	۰	۱	۲	۳	۴	۵	PAGE	REV.	۰	۱	۲	۳	۴	۵
A	X																						
۱	X																						
۲	X																						
۳	X																						
۴	X																						
۵	X																						
۶	X																						
۷	X																						
۸	X																						
۹	X																						
۱۰	X																						
۱۱	X																						
۱۲	X																						
۱۳	X																						
۱۴	X																						
۱۵	X																						
۱۶	X																						

۵						
۴						
۳						
۲						
۱						
۰	۲۰-۱۰-۲۰	M.Asgari	M.Nazeri Nasab	AA.SH	M.Asadi	N.Nouhjah
Rev	Date	Prepared By	Checked By	Approved By	Approved By	Approved By
		Discipline		PEM	PM	Status

Document Revisions



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۱. Purpose

The purpose of this procedure is to give instructions for preparation of Vendor's data book (mechanical catalogue) applicable to the contract.

۲. Difinition

VENDOR Companies Awarded by Owner for Procurement Services, Inspection Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as defined in the purchase order.

OWNER: Petrochemical Research & Technology Company

۳. Content

The Vendor's Data Book shall contain comprehensive detailed information covering design and engineering, inspection and testing, installation, operation and maintenance manual of the equipment and accessories included in, and supplied for the plant.

In addition, VENDOR shall submit the drawings and documents according to the "LIST OF DOCUMENTS REQUIRED FROM VENDOR" given in the requisition / purchase order.

For a sample of the contents of VENDOR's data book refer to Attachment No. ۱.

۴. **Instructions Concerning Vendor's Data Books Presentation**



۴.۱ **Language / Units**

All documents and drawings for design and fabrication shall be written in English as well as all Maintenance and Operating Instructions.

All units and dimensions shall be in the metric system except for the following:

- Size of pipe and valve (Inch)
- Flange rating (Pound)

If necessary, other units and dimensions shall be used with OWNER approval.

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۴,۲ Size Of Documents

- All drawings shall be prepared on ISO standard size sheets, i.e.

A ^۰	:	۸۴۰ x ۱۱۸۸	mm
A ^۱	:	۵۹۴ x ۸۴۰	mm
A ^۲	:	۴۲۰ x ۵۹۴	mm
A ^۳	:	۲۹۷ x ۴۲۰	mm
A ^۴	:	۲۱۰ x ۲۹۷	mm

- Size A^۰ should be used only with OWNER approval. Larger sizes are not allowed.
- In general all drawings shall be reduced to ۲۹۷ mm x random length size for convenience in handling.
- All documents other than drawings shall be prepared on standard A^۳ or A^۴ size sheets suitable for insertion in an A^۴ hard-core binder.
- All reduced drawings, data, etc. shall be legible.

۴,۳ Class Of Documents



All drawings / data submitted must be of good quality that will allow production of legible copies.

- Documents submitted to OWNER for comments:
These documents give all data necessary to understand operation and to appraise the construction method, assembly, disassembly, fastening and connections of equipment. They clearly indicate the scope of supply and specify all details necessary for installation.
- Final documents:
These documents are certified, “As built” documents finally reviewed without comment by OWNER.
OWNER comments on VENDOR documentation shall in no way relieve the VENDOR of his responsibility especially concerning the design of the equipment or facilities.

۴,۴ Books Form

All the documentation shall be inserted in A^۴ (۲۹۷ mm x ۲۱۰ mm) white color binder (Punch holes shall be two).

Other types, such as folders or boxes with loose sheets, are not acceptable. The thickness of each volume shall under no circumstance exceed that of a normal file (۷ cm). The paper level inside each file shall be at least ۹ mm below the opening point of the binder.

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Drawings and documents with sizes larger than A_۳ will be folded in plastic jackets inserted in the file, with opening upward.

۴,۵ Identification

Each Vendor's data book shall be identified on its back and on the cover by a standard label, the format of which is given in Attachment No.۲.

۴,۶ Internal Presentation

All drawings and documents shall be written in English.
Cardboard division sheets shall separate different groups of documents, sheets and directions. At least rigid index sheets with numbering shall separate the different chapters.


The wording and presentation of the reports will be controlled with utmost care.



Consequently, any loose presentation, which may give the OWNER impression of careless work, will be rejected. This applies in particular to:

- All manuscripts or type texts with handwritten comments (except for technical documents on OWNER or Vendor's standard forms).
- All texts in any language other than English, unless they are transmitted together with a translation in compliance with the above requirement.
- All copies that might be questionable: writing too light, dark background areas, dark edge due to poor centering, titled copy, perforation marks, etc.

۴,۷ Vendor Document Numbering

In addition to the Vendor's document number, VENDOR shall add OWNER's document number.
The block shown here below will be placed on each "first page" of specification, data sheet and each drawing in addition to the Vendor's label.

 NPC-RT PP-PE Pilot Plant	National Petrochemical Company / Petrochemical Research & Technology Company PP-PE Pilot Plant			
	Owner Project No.	Rev.	Date	Signature
	Owner Doc/Dwg. No.			
	Sh. Of			

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All other pages of the specifications and data sheets shall have the following block.

Project No.	Owner Project No.	Rev. Sh. Of
OWNER DOC. No.		

۰. **Number Of Vendor's Data Books Per Purchase Order**

If the purchase order includes several separate requisitions or covers several items, which are to be shipped with different vessels, the VENDOR shall supply as many separate Vendor's data books, as there are separate requisitions and/or shipments.

If the requisition covers a large number of items, a common part and specific chapters by item may be planned in agreement with OWNER.

VENDOR shall prepare:

- ۳ Copies of the complete VENDOR Data Book.
- Copy of electronic file in CD
- ۳ Reproducible copy of final drawings / documents

۱. **Delivery Time**

Documents submitted for review are forwarded in compliance with the dates specified on the Attachment # ۳ of requisition.

Final documents shall be forwarded ۱۰ days after receipt of documents commented by OWNER.



Delivery dates are mandatory and a payment installment may be conditioned by the receipt of documents and/or drawings (refer to the order provisions).

۲. **Transmittal Of Documentation**

All drawings and documents shall be transmitted with a transmittal note to the address indicated in the Purchase contract. Purchase order number should be clearly indicated.

Any drawing, which is unreadable, will be returned without fail to the VENDOR who shall in no case use this as an excuse for delivery delay.

Any revision made on documentation should be highlighted with a cloud mark.

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٨. Documents For Engineering

This paragraph is to clarify OWNER requirements concerning the presentation of some essential engineering documents and drawings submitted for approval. The items indicated below refer to the items listed in the “LIST OF DOCUMENTS REQUIRED FROM THE VENDOR” shown in the attachment # ٢ of requisition.

٨, ١ **Vendor Drawing And Documentation List**

The VENDOR’S shall provide an exhaustive list of the documentation to be delivered. It should be sent together with the first issue of documents.

٨, ٢ **Plate Arrangement Drawing And Material List**

This drawing shall be in proper scale.



The plate arrangement drawing or sketch shall indicated as a minimum:

- A general outline of the equipment (shells, heads, supports, skirt, lugs, saddles, stiffeners, etc.) ;
- For columns, shell / cone / skirt development including all internal & external attachments;
- Position of circumferential and longitudinal weld seams in accordance with plates sizes;
- Head shape (and plate arrangement in case of composed head);
- Shape of reduction cone (straight flange, knuckle radius, etc.) ;
- Plate thickness after plate forming;
- Material specification;
- Material list

Approval of this document enables order of main materials to be finalized.

The material list for nozzles shall be presented in schedule form. It shall be established from the nozzles list shown on the engineering arrangement drawing or process data sheet, and shall include:

- Identification (or item), quantity and diameter of nozzles;
- Type, rating, facing and material of flanges;
- Schedule or thickness of nozzle necks;
- Diameter, thickness and material of reinforcements;
- Material, thickness, rating of blind flanges (if any);
- Diameter, quantity, length, thread type, material of stud bolts and nuts;
- Definition, rating, materials of gaskets

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This document is prepared from information known when equipment is ordered. Its approval will allow the above accessories to be supplied.

Any modifications of one of the items listed above will involve revision of the documents and be followed by new approval.

After approval, the material list shall be transferred on the VENDOR general arrangement drawing.

Note: these documents do not apply to storage tanks.

۸,۳ **Item: General Arrangement Drawing**



The VENDOR can start fabrication only after receiving OWNER approval of this document as a minimum.

This drawing shall be in proper scale.

This drawing shall give the following technical information:

- Main dimensions, overall length, minimum thickness of major components;
- Design code, design pressure and temperature, hydrostatic test pressure, non-destructive tests, heat treatment, etc.;
- Corresponding material specification;
- Location and orientation of weld seams (shells, heads, skirt, etc.);
- Shape of heads or, type/ angle of roof for storage tanks;
- Location, orientation of nozzle gussets and other external welded Attachments;
- Location & orientation of internals (trays supports, coils, demisters, baffles, etc.);
- List of nozzles and connections in accordance with material list (dia., type, rating, schedule, etc.);
- Gaskets and bolting (type, material, etc.);
- All information of scope of supply;
- All information on anchoring system;
- Fabricated weight;
- Empty weight;
- Hydro test weight;
- Operating weight;
- Net weight of removable parts;
- Type of paint and its surface preparation;
- North direction;
- List of detail drawings;
- Insulation / fire proofing support detail;

Note: OWNER guide drawings shall not be used as construction drawings.

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۸, ۴ **Detail Drawings**

These drawings shall include references to general arrangement drawing and show:

- Detail of all accessories, internal and external attachment (gussets, etc.): With weld geometry and specification in accordance with approved welding procedure;
- Weight and dimension of removable internals;
- Part list of the various elements;
- Weld geometry and specification in accordance with approved welding procedure;
- All information required on manufacturer name plate;
- Insulation / Fire proofing support detail;
- All construction details not covered above;

All this information may be shown on general arrangement drawing, at Vendor's choice.

۸, ۵ **Calculation Notes**

Calculation notes shall be in accordance with general arrangement drawing. VENDOR shall establish calculation notes for each equipment. They shall in all cases be included in "manufacturer file".

These documents shall be clearly marked with identification numbers as other VENDOR documents.

They shall include full reference to information sources (codes, formulas, etc.) used for design.

These documents shall be transmitted for review / approval to OWNER. These documents shall be approved prior to general arrangement drawing approval. OWNER approval shall in no case relieve the VENDOR from his responsibilities.



۸, ۶ **Spare Parts List**

SPARE PARTS LIST AND INTERCHANGEABILITY RECORD (SPIR form) to be filled out by VENDOR according to its filling procedure.

۹. **Description Of Inspection And/Or Acceptance Documents**

This paragraph clarifies OWNER requirements for documents relating to inspection and acceptance of equipment.

The items indicated below refer to the items listed in the "LIST OF DOCUMENTS REQUIRED FROM THE VENDOR" included in the requisition.

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۹.۱ **Material Certificates**

All pressurized parts shall be considered as main components requiring certificates type ۳

.۱. B including:

- Shell, heads, cones
- Skirt, saddles, support brackets
- Tubes, flanges, forging, internal piping, nozzle necks
- Bolting for nozzle and shell flanges
- Welding material

۹.۲ **Welders Qualification**

This document shall contain all the information concerning:

- Welders (name, number, mark)
- Welding procedure
- Base material (specification, thickness, etc.)
- Welding material (specification, diameter, etc.)
- Electrode type
- Destructive tests results (bending, tensile, impact tests)

All information required on the QW ۴۸۴ forms given by ASME section IX shall be considered as a minimum.

۹.۳ **Hydraulic Test Report**

This document shall contain the following information:

- Type and volume of equipment
- Contained gas analysis
- Description of equipment (length, width or diameter, nature of base material, thickness)
- Construction number and date
- Hydrostatic test pressure in letters
- Date of inspection (before test) and inspector's name
- Hydrostatic test data
- Signatures of inspectors

۱۰. **Issuance Schedule**

Final Vendor's data books should normally be shipped to the OWNER as per agreed delivery schedule specified in PO of the relevant equipment.

Such final Vendor's data books shall be an integral part of the Vendor's services set forth in the purchase order and the following precautions must be taken in order to meet the above shipping requirements:



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At the latest ۶ months before the scheduled delivery date, the VENDOR shall transmit the Vendor's data book model to OWNER for comments and approval.

The model shall be in conformity with the final internal and external presentation and shall contain all documents required for the final report.

A non- completed form will replace the final acceptance documents, which do not exist at that stage.

Note: Recommendation for handling, transport and storage shall be shipped in box together with the equipment.



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ATTACHMENT # ۱

VENDOR DATA BOOK'S CONTENT (SAMPLE)

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PART ۱ : General Descripton Of The Equipment

- ۱,۱. OWNER's requisition
- ۱,۲. General description including OWNER's specifications and data sheets and drawings

PART ۲ : Recommendations For Storage, Handling And Lifting

- ۲,۱. Special precautions for handling prior erection (۱)
- ۲,۲. Recommendations for storage prior and during erection

PART ۳: Erection

- ۳,۱. List of components to be erected/installed on site
- ۳,۲. Detailed schedule of the erection including hypothesis taken into account
- ۳,۳. Procedures for erection and installation of the equipment
- ۳,۴. Schedule of connection points detailing locations and dimensions
- ۳,۵. Electrical terminal wiring diagrams
- ۳,۶. Details of site assembly, and filed welds
- ۳,۷. List of special tools for site erection and assembly
- ۳,۸. Procedures for site assembly, leveling and welding
- ۳,۹. Welding specifications for field welds
- ۳,۱۰. List of checks and tests to be performed on site
- ۳,۱۱. Site testing and acceptance procedures
- ۳,۱۲. Procedures for preparation of the equipment for commissioning (including the calibration of instruments)
- ۳,۱۳. List of works to be implemented on site instead of Vendor's shop (When required)
- ۳,۱۴. Weight (empty, full of water)

PART ۴ : Start-Up Running Instructions

- ۴,۱. General
- ۴,۲. Principle
- ۴,۳. Operation
- ۴,۴. Description of the apparatus
- ۴,۵. Commissioning
- ۴,۶. Running instructions



PART ۰ : Maintenance Instructions

- ۰, ۱. Maintenance
- ۰, ۲. Safety instructions
- ۰, ۳. General maintenance
- ۰, ۴. Lubricant table and equivalence
- ۰, ۵. Trouble shooting check lists and diagrams
- ۰, ۶. Maintenance Schedule

PART ۱: Spare Parts (۲), (۶)

- ۱, ۱. Spare parts for erection, precommissioning, commissioning and start-up
- ۱, ۲. Spare parts for ۲ years operation
- ۱, ۳. Sectional drawings

PART ۲: Manufacturer's Documents / Drawings (۳)

- ۲, ۱. List of drawings (۴)
- ۲, ۲. Manufacturer's data report
- ۲, ۳. Drawings (۵)
- ۲, ۴. Calculation notes
- ۲, ۵. Curves and technical data (including P.W.H.T. if applicable)
- ۲, ۶. MANUFACTURER name plate photography

PART ۳: Quality Assurance And Manufacturing Documents

- ۳, ۱. Material test certificates
- ۳, ۲. Welding Inspection controls and test reports
- ۳, ۳. Welding procedure specification
- ۳, ۴. Welding procedure qualification reports
- ۳, ۵. Welder qualification reports
- ۳, ۶. Weld identification
- ۳, ۷. Plate identification sketch with heat numbers
- ۳, ۸. Certificate of shop inspection (before hydrostatic test)
- ۳, ۹. X-Ray identification
- ۳, ۱۰. Radiographic procedure qualification
- ۳, ۱۱. Radiographic reports along with radiographs
- ۳, ۱۲. Batch test certificates from manufactures for electrodes
- ۳, ۱۳. Hydrostatic and other test results and reports (such as visual control and N.D.T., etc.).
- ۳, ۱۴. Precommissioning / commissioning check Lists & procedures
- ۳, ۱۵. All other requirements as specified in the respective specifications



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Remarks

- (۱) Including a copy of transportation drawing
- (۲) No spare parts price must be incorporated in this book
- (۳) Only issues approved by as "FINAL"
- (۴) Only the drawings included in this part √.
- (۵) Drawings larger than A^۳ format must be folded and inserted in individual plastic skirts.
- (۶) Sufficient information to be prepared for spare parts Such as: materials of construction sizes / three proposed Vendor's, etc.



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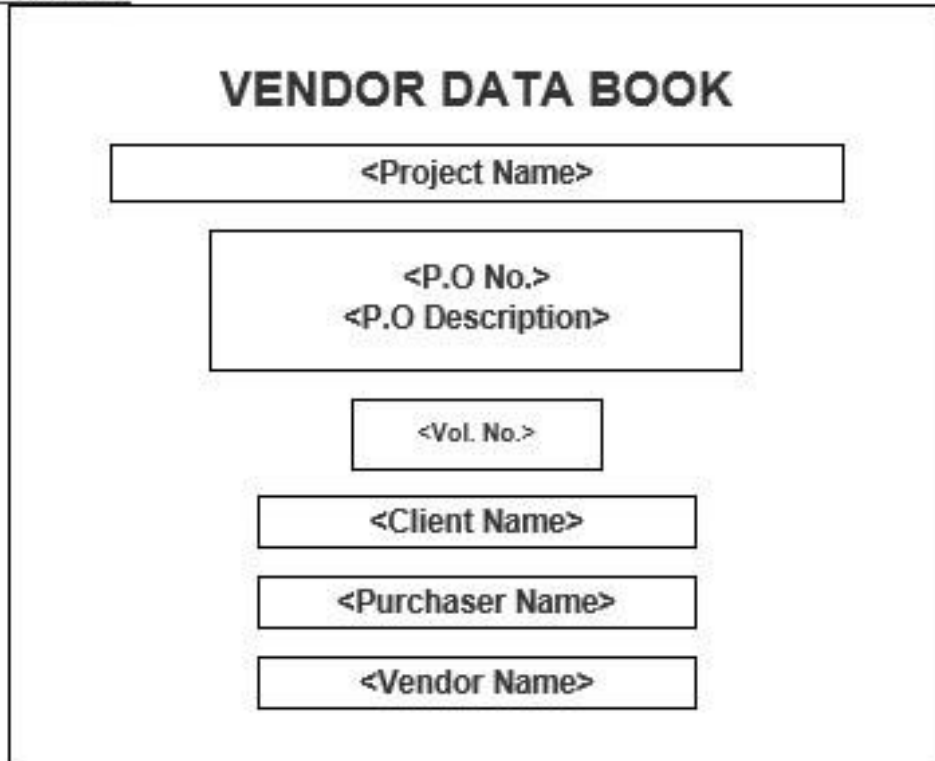
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ATTACHMENT # ۲
VENDOR'S DATA BOOK
COVER

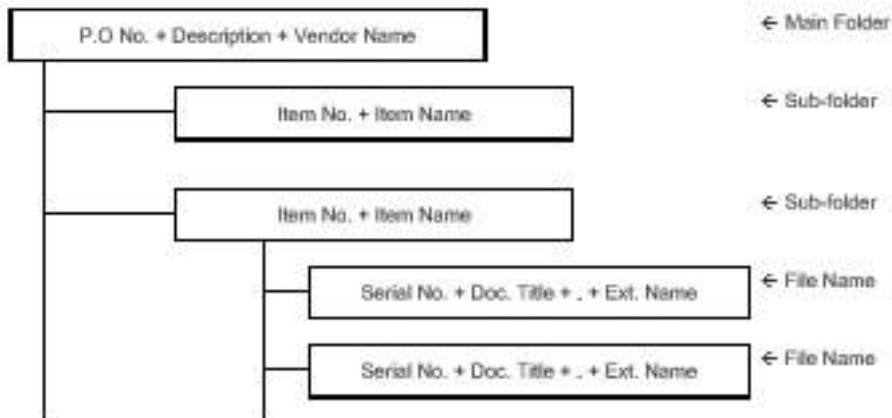


Attachment #6 Instruction for making Data CD

● CD Title CASE



● Construction of the Data Folder



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National Petrochemical Company
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PP-PE Pilot Plant



شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

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CONTENTS

۱. **Scope**
۲. **Purpose**
۳. **Definitions**
۴. **Packing for Equipment and Materials**
۵. **Packing and Marking for Electrical Panels And Instruments**



۱. **Scope**

- ۱,۱ This procedure gives the information for Packing and Marking and it is to be applied to vendors for the preparation, protection and packaging of materials, equipment, requiring export shipments for the PP-PE Pilot Plant Project to be built in Petrochemical Research & Technology Company, Arak/Iran.

The following instructions are intended as minimum requirements, and adherence to these instructions in no way, absolves or relieves Vendors of any responsibility or obligation outlined in the Purchase Order.

۲. **Purpose**

This document defines the criteria required by the Project in relation to the packing and marking of both Project's Equipment and materials including Electrical Panels and Instruments.

۳. **Definitions**

OWNER	Petrochemical Research & Technology Company
PROJECT	PP-PE Pilot Plant
GOODS	All kind of materials and equipment to be incorporated in the Project.
VENDOR	Companies Awarded by Owner for Procurement Services, Inspection Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as defined in the purchase order.

۴. **Packing For Equipment And Materials**

- ۴,۱ Equipment and material shall be exported packed in compliance with General Purchase Conditions and the best established practice for overseas construction jobs in accordance with the following directives. In the event of any divergence between this specification and the established practice, this specification shall govern.
- ۴,۱,۱. **"Seaworthy and tropical proof " according to international standard.**
- ۴,۱,۲ Packing and conservation of goods shall be sufficient to protect them from damage during transit from point of manufacture to the delivery at job site under conditions



which may involve multiple handling, extended storage, exposure to moisture and the possibility of pilferage. The contents must withstand one year transit conditions without suffering damage and Vendors shall give recommendations for a further two(۲) years storage under SITE conditions.

Required storage facilities and procedure shall be advised by manufacturer/seller in advance.

- ۴,۱,۳ The packing of the equipment and materials shall be carried out in order to comply with transport conditions.
- ۴,۱,۴ Individual packages shall be kept as small in bulk as possible.
- ۴,۱,۵ Individual packages exceeding a gross weight of ۳۰۰۰ kgs shall be avoided, if possible.
- ۴,۱,۶ Kind and dimension of packages shall be chosen to suit overseas transport in containers and to fully utilize the size of containers.
- ۴,۱,۷ The following inside dimension of containers are to be observed :
 - ۴۰-foot-containers : ۱۱۹۰x۲۲۰x۲۰۵ cms.
 - ۲۰-foot-containers : ۵۹۵x۲۲۰x۲۰۵ cms.

۴,۲ Modes of Packing

In accordance with the nature of the contents, the following modes of packing shall be considered:

- a) wooden cases
- b) wooden crates
- c) skid-construction (for vessels etc.)
- d) non-returnable steel drums (export variety)
- e) non-returnable cable reels
- f) bales
- g) ۲۰ ft - ۴۰ ft non-refundable containers

۴,۳ General Rules for Packing

- ۴,۳,۱ Cases and crates shall be made from new, sound and seasoned lumber. Sheathing shall be of min ۲۴ mm thickness.
If so required for static reasons, thicker sheathing shall be used, in accordance with size and weight of the package. Timber crates and boxes shall be strong enough to withstand without any damage , transport on ship board at sea and numerous handling between the works and the port of origin and between the port of destination and the site.



- ۴,۳,۲ Cases and crates with gross weight up to ۱,۰۰۰ kgs shall be provided with bottom cleats of min. ۴۰ mm thickness to ensure clearance for handling by forklift. Cases and crates exceeding gross weight of ۱,۰۰۰ kgs shall be provided with skid runners, number and size according to weight of package.
- ۴,۳,۳ The contents of cases shall be protected by waterproof and strong plastic foil which shall be sealed by welding. An adequate quantity of moisture absorbent (silica gel) shall be added to protect the contents for sufficiently long time from corrosion.
- ۴,۳,۴ Felt , cellophane paper, polyester cuttings , crepe cellulose and some equally efficient materials may be used for padding or cushioning. Wood shavings and other paper shall not be used for padding or cushioning.
- ۴,۳,۵ Materials shall be protected against corrosion during transit as necessary. All bright and machined parts shall be coated with a recognized rust preventative suited to the particular application concerned. All internal parts of machinery shall be treated with lubricant containing rust and oxidation inhibitors to protect equipment from any damage possible. Such lubricants shall be compatible with those which will subsequently be used in service and shall be identified by appropriate tagging.
- ۴,۳,۶ When required, materials shall be painted or coated in accordance with the particulars contained in the purchase order and/or specifications.
- ۴,۳,۷ All flanges, machined working surfaces and threaded parts of all equipment shall be suitably protected . All flanged connections of vessels shall be protected by metal plates correctly gasketed by wooden plugs or plastic caps suitably secured in position.
- ۴,۳,۸ Units or parts belonging to main equipment but separately packed shall be clearly marked for easy identification with the main equipment to which they relate.
- ۴,۳,۹ Packages containing "FRAGILE" articles shall be appropriately packed and in addition to the words "FRAGILE-HANDLE WITH CARE" being stenciled on two opposite sides, internationally recognized symbols shall also be used "This Side Up".
- ۴,۳,۱۰ Pipe, structural steel sections and plates shall be strapped in bundles of convenient size and weight for handling. Rolled and shaped plates shall be provided with suitable bracing to eliminate distortion during transit, and shall be bundled in uniform lengths. The weight of each bundle shall be within the breaking strain of the steel wrapping. Each bundle shall be marked with a metal tag ,hard stamped, secured under steel wrapping. A ۲۰۰۰ kg limitation shall be imposed for lifts in this category. Where practicable long lengths shall be limited to ۱۲,۲ meters to avoid long length carriers. All small steel sections, handrail stanchions, gusset plates etc. shall be boxed.
- ۴,۳,۱۱ Black steel pipes with an outside diameter of up to ۱۶۸,۳ mm shall be bundled by strapping cleats above and below the load, with boards between each pipe layer and secured by bolts.



Black steel pipes exceeding the above outside diameter shall be treated as an individual package and marked accordingly.

All black steel pipes shall be protected by means of TECTYL spray. The pipe ends shall be closed with plastic caps.

If, in case of pipes with large diameters, the pipe ends cannot be closed with plastic caps, the interior of the pipes shall also be protected and sprayed with TECTYL.

۴,۳,۱۲ Bitumen coated pipes shall be prepared, packed and handled according to established practice.

۴,۳,۱۳ Stainless steel pipes shall be packed in wooden cases.
Protection with TECTYL is not necessary.

۴,۳,۱۴ All valves and fittings (pipe elbows, flanges, etc.) shall be suitably protected and their method of shipment shall be:

- a) All valves and fittings shall be suitably packed and shipped in metal strapped or wood re-enforced waterproof wooden cases with metal corner protection .
- b) All treaded fittings shall be greased and provided with plastic caps.
- c) Control valves shall be packed in wooden cases having adequately designed interior support with interior water proof protection .

۴,۳,۱۵ Apparatus and vessels shall, where possible, be packed on skid constructions and secured with adjustable steel straps. All unprotected surfaces shall be sprayed with TECTYL. Manholes and other major openings shall be protected with either plastic caps or wooden lids, which shall be firmly secured. Smaller openings shall be closed with plastic plugs.

۴,۳,۱۶ All vessel internals and items not installed by the vendor at works including accessories such as small parts, bolts, nuts, gaskets etc. shall be packed in wooden cases separately for each vessel or apparatus and marked with the same item number as the vessel/apparatus in order to protect all parts from loss or damage in transit. Internals, bolts and gaskets for service/ testing operations shall be supplied with the vessels/items by the vendor and all internals, boxed separately and marked according to marking procedures. Each item shall be supplied correctly and identified for field installation by others.

NOTE: It is imperative that all these items be clearly listed on the packing list.

۴,۳,۱۷ Fire bricks, special tiles and insulation refractories shall be boxed after sealing in a polyethylene liner. These boxes shall be skid mounted. Instructions regarding storage prior to installation shall be stenciled on each box with particular reference to adverse weather/temperature/humidity conditions.

۴,۳,۱۸ All electrical motors whether coupled or uncoupled, generators and electrical equipment shall have all openings sealed with protective tape, shall be packed in suitable weather proof skid mounted boxes, and protected from moisture ingress by desiccant as described above.



Items with brushes shall be brushed and rust removed before shipment.

All electrical equipment shall be suitably protected to withstand ١ year transit conditions and Vendors shall give recommendations for a further , ٢ years storage under site conditions

Batteries shall be shipped dry with electrolyte packed separately and shall include charging instructions.

٤,٣,١٩ All electronic and pneumatic instruments to be packed in accordance with given instructions and must be suitably protected to withstand ١ year transit conditions and Vendors are to give recommendations for a further ٢ years storage under site conditions.

٤,٣,٢٠ Pipeline / vessel insulation shall be packed in double water-proof wooden plywood cases and secured to pallets.
Drums of insulation mastic will also be shipped on pallets.

٤,٣,٢١ Spare parts for two years operation, which shall be individually tagged, must be covered with a suitable preservative and wrapped with greaseproof paper and be packed in separate cases from the base item. The cases are to bear the markings as specified and in addition the words "SPARE PARTS FOR TWO YEARS OPERATION".

٤,٣,٢٢ Commissioning spares shall be individually tagged and marked "COMMISSIONING SPARES" and shall be packed and shipped with the base item.

٤,٣,٢٣ All vessels/heat exchangers or items of such kind shall be dried, thoroughly cleaned inside and be free of all dirt and loose materials.



٤,٣,٢٤ Should any materials be scheduled to be freighted as deck cargo, additional packing instructions may be required; the Vendor will advise, for vessels and columns, which shipment cradles will be used throughout the transportation. Cradles to be secured to vessels and columns, by strapping.

٤,٣,٢٥ Paper bags suitably boxed, or water tight Steel Drums will be used for shipping cement, special aggregate, etc. Paperbags must not be less substantial than ٦٠ lbs outer wall, ٤٠ lbs inner wall and one moisture craft inner wall.

٤,٣,٢٦ Unless otherwise specified, all export cases, boxes, bundles and containers are to be securely metal strapped with a minimum of two unannealed steel straps in each of two right angled and opposite directions, or where applicable wood re-enforced.

NOTE: Should consignments arrive at the shipment point of origin visually damaged, the shipping agent will advise and await instruction before onward shippings.

٤,٣,٢٧ All bulk items, lighting, fittings, cable glands, switches etc. are to be packed in batches sufficient for a specific volume of work.

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۴,۳,۲۸ Cases and crates shall, according to their weight and size , be provided with two or more steel straps made of unannealed steel, applied with a stretching tool and secured with crimped steel seals.

۴,۳,۲۹ Fittings (valves, pipe elbows, flanges, etc.) must be packed in wooden cases and must be protected.

۴,۳,۳۰ Accessories for apparatus and vessels (small parts, bolts, nuts, washers, gaskets, etc.) are to be packed in wooden cases, separately for each apparatus or vessel. These cases must be marked with the same item No. as the apparatus/vessel to which it belongs (see also Item ۰ - packing lists).

All commissioning spare parts to be packed separately, being the packing marked with the relevant main item.

۴.۴ **Marking of Packages**

۴,۴,۱ All packages shall be clearly stencilled on two opposite sides with black, indelible and seawater proof paint, as follows:

Wherever possible , the stencilled characters shall be ۱ cms high.

In case the surfaces of a package are too small to permit stenciling, sheet metal tags shall be embossed with the above marking and shall be securely fastened on two opposite ends of the package.

۴,۴,۲ If necessary, packages shall be additionally marked with cautionary symbols on two opposite ends.

۴,۴,۳ Packages which may be stored in the open but under a tarpaulin, shall be marked with a red "double roof" symbol.

۴,۴,۴ Packages which are to be stored in closed and dry places shall be marked with a red "double roof" symbol.

۴,۴,۵ The system of package-numbering shall be indicated to the OWNER in due course of time.

۴,۴,۶ The gross weight shall be determined by the party who is responsible for the packing of the items/materials.

۴,۴,۷ **Example for marking of packages is shown in attach ۱.**

۴,۵ **Packing list**

The packing lists shall be prepared on standard forms :

The necessary number of forms will be made available to OWNER , who shall advise about the quantity required.

The packing list forms shall be filled in ENGLISH language.



OWNER shall supply VENDOR with a specimen packing list showing how it is to be filled in.

At the same time OWNER shall be informed of the package numbers required for marking the packages. one column of the packing list shall be filled in with OWNER "ITEM NO. " These item numbers shall be taken from the order form. Special attention shall be paid to the order form that the item number is correctly attributed to the goods to which it belongs . If any question should arise in this respect VENDOR shall contact the OWNERS Representative.

Special care shall be taken that all accessory parts loose or detachable, belonging to the main item under dispatch, shall also be individually listed in the packing list. In the event these accessory parts are not listed in the packing list , they shall be considered by OWNER as not delivered.

Two copies of the packing list in a water-proof plastic envelope shall securely be mailed under a galvanized steel sheet on the outer surface of the package The final packing list in ۶-folds shall be available in OWNERS office ۱۰ (TEN) working days prior to dispatch of the goods from the manufacturer's premises.

۴,۶ **Liability and Guarantee**

The party responsible for the packing shall be fully liable for and guarantee proper, sufficient and adequate packing, completeness of the contents, protection of the contents for a storage time of ۱۲ month starting from the date when the equipment is loaded on the ship, and the correct preparation of the packing list.

All cost whatever resulting from inadequate or insufficient packing shall be fully charged to the responsible party.

۵. **Packing And Marking For Electrical Panels And Instruments**

۵,۱ **Scope**

This section covers the method for packaging of electric and instrument panels for export delivery, which are to be provided with full protection against physical damage and atmospheric attack during transit and possible long periods under adverse storage conditions which may extend to two years.

۵,۲ **General**

This specification is for the package Vendor's guidance only.

Vendor shall remain fully responsible for selecting suitable materials for proper packaging and shall comply with the latest issues of the following European or British Standards: Where standards conflict with this specification, specification shall govern .

- Packing Code
- Silica gel for use as desiccant for packages
- Method of determining the permeability of materials used for packaging.



The Vendor shall provide written instructions for the removal of protective coatings and devices.

۰,۳ **Method**

۰,۳,۱ **The instrument or panel which shall be thoroughly clean, dry and free from rust** shall be totally enclosed in a polythene shroud after sharp projections on the instrument or panel have been padded . Silica gel or other approved desiccant shall be strapped inside the shroud, but shall not come into contact with the paint work. After the desiccant is strapped into position, the open ends of the shroud shall be heat sealed , only leaving an opening large enough for the insertion of an air extracting pipe. After extraction of the air from the shroud, the opening shall be completely sealed.

۰,۳,۲ **Packing Case Materials**

- All wood shall be thoroughly seasoned and thoroughly sound without knots, knot holes, shakes and checks .
- Wood which can cause metallic such as oak , western red cedar and sweet chestnut shall not be used .
- The case shall be of sill base type. All sheathing shall be tongued and grooved.

۰,۳,۳ **Packing Case Lining**

The packing case shall be lined with completely multilayer waterproof. The lining shall have as few joints as possible. If joints are necessary, the pieces shall be overlapped so that any rain water which may penetrate the case is shed automatically when the case is upright. Overlaps shall be ۷۰ mm minimum Joints shall be made with Bostik 'C'".

۰,۳,۴ **Securing Instruments or Panels Inside Packing Case.**

- a)The instrument or panel shall be completely secured by wooden battens faced with suitable rubber or other shock absorbing materials.
- b)Wood, wool and other hydroscopic shall not be used.
- c)Hay and straw shall not be used.



۰,۳,۵ **Sealing of Packing Case**

After nailing, joints in the case shall be sealed with Bostik Sealing Compound and the outside bound with steel strapping .

۰,۴ **Marking of Packing Cases**

۰,۴,۱ Cases which are for Carriage by sea shall be marked "*HOLD STORAGE*".

۰,۴,۲ All cases shall be marked to indicate the correct way up and bear the marking described here in above.

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ATTACHMENT No.۱

MARKING OF PACKAGES

PROJECT :

PROJECT No. :

L/C No. :

OWNER :

ORDERED BY :

ORDER No. :

FINAL DESTINATION : Pouyesh Site, Arak / Iran

STORAGE CODE :

DIMENSION : L x W x H

GROSS WEIGHT :

NET WEIGHT :



PACKAGE No. : _____ OF _____ .

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These instructions outline the requirements for providing original manufacturer's pre-commissioning, commissioning and two years operation spare parts for a PP-PE Pilot Plant to be built in Petrochemical Research & Technology Company, Arak/Iran.

CONTENTS

- ۱) General information
- ۲) Definitions
- ۳) Spare parts required
- ۴) Required information
- ۵) Identification
- ۶) Packing and protection
- ۷) Special storage items

Attachments:

۱. **Erection, precommissioning, commissioning and start-up phase spare parts**
۲. Two years operation spare parts
۳. Guidelines for the compilation of Spare Parts Interchangeability Record (SPIR)
۴. SPIR form

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۱) **General Information**

These instruction outline the requirements for providing original manufacture's pre-commissioning, commissioning and two years operation spare parts for PP-PE Pilot Plant to be built in Petrochemical Research & Technology Company, Arak/Iran.

The Vendor is obliged to provide with an original equipment manufacturer spare parts data package, containing full and complete spare parts information and prices for each item of equipment supplied.

The Vendor shall recommend those spare parts that are deemed necessary on the basis of Vendor's recommendations and experience.

۲) **Definitions**

۲,۱ "Erection, Precommissioning, Commissioning and start-up spare parts" are those material, equipment or components necessary during the erection, precommissioning, commissioning and start-up activities of the Plant.

۲,۲ "Operating Spare Parts" are spare parts material, equipment or components necessary for the continuous operation of the plant after commissioning completion for a period of two years.

۲,۳ GOODS: All kind of materials and equipment to be incorporated in the Project.

۲,۴ VENDOR: Companies Awarded by Owner for Procurement Services, Inspection Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as defined in the purchase order.

۲,۵ OWNER: Petrochemical Research & Technology Company.

۳) **Spare Parts Required**



۳,۱ **Capital spare parts**

Capital spare parts are defined in documentation prepared by technical department.

۳,۲ **Erection, precommissioning, commissioning and start-up Spare Parts**

Vendor is requested to submit a Spare Parts proposal together with base quotation. Such spare parts shall be packed in separate boxes and shipped together with the main equipment/material purchased in order to be available at the site together with the base order supply.

Minimum required quantities are shown in attachment ۱.

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۳,۳ Two years operation spare parts

Vendor is requested to submit a Operation Spare Parts quotation based on his experience together with base quotation

The necessary and sufficient two years spare parts include those parts that are normally required to maintain the plant in a satisfactory working condition for a period of two years of continuous operation after plant start-up.

These Operation Spare Parts shall be packed in separate boxes.

Guidelines for selection of two years spare parts are shown in attachment ۲.

۴) **Required Information**

۴,۱ All information and drawings must be in English language.

۴,۲ Data sheets, engineering drawings, manufacturer's catalogs and operating and maintenance manuals required to identify the function of and fully describe all parts associated with the equipment

۴,۳ The interchangeability of spare parts must be completely assured between all units contained on the parent equipment purchase order.

۴,۴ The Vendor shall guarantee the spare parts in accordance with the requirements requested for the parent equipment.

۴,۵ The offer must be valid for supply either for total or partial quantities.

۴,۶ All Spare Parts list shall be filled-in using the attached "Spare Parts Card" according also to the instructions attached herein.

Photocopied or hand-written documents are not acceptable.

Twelve (۱۲) months price validity is required

۵) **Identification**

All spare parts shall be individually identified by one of the following methods:

۵,۱ A stainless steel label imprinted with lettering approximately ۶ mm (۱/۴) high and secured to the part with S.S. wire.

۵,۲ Inscribing with an electric spark erosion pencil

۵,۳ On large items inscribing with non-fading, moisture resistant marking ink, figures/ letters to be at least ۲۰ mm (۱) high. Ink shall be Pannier ۱۰۰۱ Yellow Industrial or equal.



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- ٥,٤ Items such as Ball Bearings which in actual storage will remain in their packing may be identified with an adhesive label firmly attached to the outside of the carton.
- ٥,٥ Alternative methods which are standard industrial practice may be used provided SP's approval has been obtained in writing in advance. Stamping directly into spare parts will not be allowed.
- ٥,٦ The following shall appear on each spare or spare part label:
Manufacturer's real part number.
Short description (one word will suffice if space is limited).
Tag number of equipment (if applicale).

٦) **Packing And Protection**

- ٦,١ Packing protection and marking of the packing container shall be as described in Project Packing and Marking Procedure ٠٠٠-PCR-PRC-٠٠٠٢. Spare parts shall be packed separately from main equipment and the packing containers shall clearly be marked "erection, pre-commissioning, commissioning, and start-up spare parts" or "two years operating spare parts" as applicale. The following additional comments apply :
- ٦,٢ Packing cases and other shipping containers must be capable of giving adequate protection to contents for a period of one year after despatch from Vendor work-shop (i.e. cases may after receipt at the Plant Site be stored outside before being unpacked).
- ٦,٣ Two years operating spares are to be protected and packed in such a manner as to ensure a minimum shelf life of four years in an un-air-conditioned warehouse sited in extremely dusty heavy industrial and coastal area with salt pollution location where the maximum shade temperature may exceed $-١٤ + ٤٥$ C. and where relative humidity reaches ٩٠%.
- ٦,٤ Consumables items such as bolts and nuts shall be adequately oiled to prevent corrosion.
- ٦,٥ Other unpackaged items shall be protected by a rust preservative oil, hard drying type. if the nature of the item permits the removal of the deposited tar oil skin by means of petroleum based solvents or the use of hot dip strippable coating.
- ٦,٦ Any protection for stainless steel parts shall not contain chlorides or harmful metal salts such as Zinc, Lead, Copper. etc. Also marking paint or ink shall not contain similar harmful components.
- ٦,٧ Electronic and instrument parts shall be packed in sealed clear plastic bags along with a bagged amount of dessicant.

٧) **Special Storage Items**



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- ۷,۱ Vendor must advise of any spares which cannot be stored under the conditions stated in para. ۶,۲ and which require special storage conditions
- ۷,۲ Special Storage Items are to be clearly labelled with storage instructions such as:
STORE IN A COOL DRY PLACE AT C
STORE IN DARK PLACE
KEEP HUMIDITY BELOW %
etc.
- ۷,۳ Owner must be notified of all such items without delay before order placement since a restricted shelf life may require an amendment to order quantity and an appropriate re-ordering procedure.

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ATTACHMENT ١

ERECTION, PRECOMMISSIONING, COMMISSIONING AND START UP SPARE PARTS

١) FURNACES

Gaskets for coil:	٥٠٪
-Burner Tiles	١٠٠٪
-Burner Tips	٥٪
-Fire eyes	١٠٪
-Gas valves seat	١٠٠٪
-Solenoid valves	٢٥٪

٢) EXCHANGERS, REACTORS & DRUMS/TANKS

Gaskets for Girth Flange, M/H& H/H	١٠٠٪
Stud Bolts and Nuts for the Above	٥٪(Min. ٢ Sets)
<u>Field-Installed Trays:</u>	
-Bolts and Nuts	١٥٪ (Min. ٢ Sets)
-Washers (Metal and Asb.)	٢٠٪ (Min. ٢ Sets)
-Tray Clamps	١٠٪ (Min. ٢ Sets)
-Asb. Rope and Tape	٢٥٪ (Min. ٢ Sets)
<u>Field-Installed Internals, Piping and Other Bolted Internals:</u>	
Stud Bolts (Alloy and C.S.)	١٠٪ (Min. ٢ Sets)
Washers and Nuts	١٠٪ (Min. ٢ Sets)
<u>Packing:</u>	
-Inert Balls	١٥٪
-Raschig Rings / Slotted Rings	١٥٪
-Gaskets Sets And O-Rings	١٠٠٪
-Fan for Air Cooler	

٣) STEEL STRUCTURE AND PLATFORM

Bridge Crane:

-Bolts & Washers	١٥٪
------------------	-----



-Gashels	۱۰٪
-Contactors	۵٪
-Tension Springs	۱۰٪
-Fuse Elements	۱۰٪
-Gaskets	۱۰٪
-Oil Seals	۲۵٪
-Relays	۵٪
-Collectors	۱ set Each Size
-Contact Shoes	۱ set Each Size
-Limit Switches	۱ set Each Size
-Welding Rod	۱۰٪

۴) MACHINERY / PACKAGES

Please see the relevant engineering specifications of each equipment for commissioning spares.

Electrical Equipment: See item ۹

Instrumentation:

- Control panel	See item ۱۰
- Board instruments	See item ۱۰
- Field Transmitters	See item ۱۰
- Field instruments	See item ۱۰
- Others	۰٪

۵) H.V.A.C.

Bolts, Nuts, Gaslets for Field installation of Pipe/Duct	۵٪
Rotating Equipment	See item ۵
Heat Exchangers	۰٪
Filter Element	۱ Set Each Size/Material
Electrical	See Item ۹

Instrumentation:

-Control panel	See Item ۱۰
-Board Instruments	See Item ۱۰
-Field Transmitters	See Item ۱۰



-Field Instruments	See Item ۱۰		
-Others	۰٪		
۶) <u>SPECIAL EQUIPMENT</u>			
Heat Exchanger	See Item ۲		
Rotating Equipment	See Item ۰		
Filter Element	۱ Set Each Size/Mat'1		
Piping	۰٪		
Electrical	See Item ۹		
<u>Instrumentation:</u>			
-Control panel	See Item ۱۰		
-Board Instruments	See Item ۱۰		
-Field Transmitters	See Item ۱۰		
-Field Instruments	See Item ۱۰		
-Others	۰٪		
۷) <u>PIPING</u>			
Gaskets, all sizes	۲۰٪		
Stud Bolts less than ۱"	۱۰٪		
Stud Bolts ۱" to ۱ ۱/۸"	۱۰٪		
Stud Bolts ۲" and over	۰٪		
Welding Rods	۱۰٪		
Coating and Wrapping	۱۰٪		
	Carbon Steel	Alloy/SS	Cast Iron
Pipe ۲" and below	۱۰٪	۴٪	۰٪
۳" to ۶"	۱۰٪	۲٪	۰٪
۸" and over	۰٪	۱٪	۰٪
(* Valves ۲" and below			
screwed and welded	۱۰٪	۰٪	۰٪
(* flanged	۲٪	۲٪	۰٪



(*) Valves ۳" to ۱۰"	۲٪	۲٪	۰٪
(*) Valves over ۱۰"	۰٪	۰٪	۰٪
(*) Flanges up to ۱۲"	۰٪	۳٪	۰٪
(*) ۱۴" and over	۲٪	۲٪	۰٪
(*) Fittings welded up to ۲"	۱۰٪	۶٪	۰٪
(*) ۲ 1/2" to ۱۰"	۰٪	۳٪	۰٪
(*) ۱۲" and over	۳٪	۲٪	۰٪
(*) Fittings Screwed up to ۲"			
(*) ۳" and over	۰٪	۳٪	۰٪
(*) Flanged all sizes	۰٪	۳٪	۰٪
(*) Hub and Spigot ۳" to ۱۲"	۰٪	۰٪	۰٪
(*) ۱۴" and over	۰٪	۰٪	۳٪

Note: as indicated with (*), where the percent gives the quantity consisting of a whole number plus a decimal less than ۰,۵, the decimal portion will be dropped; where the decimal portion is ۰,۵ and more, the next higher whole number quantity will be selected.

۸) ELECTRICAL EQUIPMENT

Switchgear, Motor Control Centers MV/LV:

-Fuse elements ۰۰٪

-Bulb for Signal Lamps ۰۰٪

Local Control Panels & control stations:

-Fuse elements ۰۰٪

-Bulb for Signal Lamps ۰۰٪

Electirc Motors:

-Grease Nipples where applicable ۱۰٪+power terminal (in J.B.) ۲٪

Lighting Fixtures ۳٪

Flag Relay ۲٪

Time Relay ۲٪

Terminal Block ۲٪

Auxiliary Relays ۱٪

Moving Contacts ۱۵٪



Fixed Contacts	۱۵٪
Coils for Contactors	۱۰٪
Boucholz Relay	one of each type and size
Thermometer	
<u>Local Control Station:</u>	۵٪
-Ammeter	
-Push button	۵٪
-Selector Switch	۵٪
<u>UPS:</u>	
-Fuse	*
-MCB (miniature circuit breaker)	*
-SCR	*
-DIOD	*
-Transistor	*
-Control cards	*
-Signaling lamps	*
-Batteries	*
<u>Battery Charger:</u>	
-Fuse	*
-MCB(miniature circuit breaker)	*
-SCR	*
-DIOD	*
-Transistor	*
-Control cards	*
-Signaling lamps	*
-Batteries	*
Fire Alarm System	*
Telephone System	*
Paging System	*
Radio System	*
Emergency Diesel Generator	*
Sockets (۴۰۰V, ۲۳۰V, ۲۴V)	۵٪



Plugs(۴۰۰V, ۲۳۰V, ۲۴V)	۵٪
Portable ۱۱۰V AC, ۵۰Hz, with transformer	۵٪ each type
Socket and plug (ex-type)	
Hand lamp ۲۴V AC, ۵۰Hz(ex-type)	۱۰ no.

All special tools, equipment and spare parts required for commissioning and start-up shall be provided.

These are the spare parts that VENDORS shall recommend based on experience.

۹) INSTRUMENTATION

For control Panel:

- Bulbs For Signal Lamps	۵۰٪
- Fuse Elements	۵۰٪

Boards instruments:

- Fuse elements	۵۰٪
- Chart paper for recorders	۳ boxes each type
- Ink for Recorder	۷ sets each type
- Pens for Recorders	۵۰٪

Field transmitters:

- Gasket	۱۵٪
----------	-----

Field instruments:

- Air pressure regulators	۵٪
- Temperature Indicators	۱۰٪ each range
- Pressure gauges	۱۰٪ each range
Solenoid Valves	۲٪ each type(min ۱ set)
Solonoid coils	۳ coil each type
Valve positioners	۲٪ each type(min ۱ set)
Cable – Single Pair	۲۰٪
Cable – Multi Pair	۱۵٪
Cable Glands	۲۰٪
Junction Boxes – Large	۱ min.
Pipe and Tube	۱۰٪



Fittings all type	۱۵% each size
Valves	۲۰%
Manifold Valves	۱۰% each size
Cable Tray	۲۰%

DCS:

- Bulbs for signal lamps	۵۰%
- Fuse elements	۵۰%
- Printer paper, Chart paper	۴ boxes each type
- Printer Ribbon	۱۰ sets each type
- Blank Floppy disks/magnetic tape cartridge	۱۰ pieces

Gas Chromatograph:

-Filter elements	۱۰%
-Calibration gas cylinders	۱ cylinder (۱۰۰ liter) each type
-Standard gas cylinders	۱ cylinder (۱۰۰ liter) each type
-Other gas cylinders	۱ cylinder (۱۰۰ liter) each type

Other Analyzers:

-Filter Elements	۱۰%
-Calibration Gas Cylinders	۱ cylinder (۱۰۰ liter) each type
-Standard gas cylinders	۱ cylinder (۱۰۰ liter) each type
-Other gas cylinders	۱ cylinder (۱۰۰ liter) each type

۱۰) PAINT AND INSULATION

Paint	۱۰%
Insulation material	۱۰%
Insulation Band & Seal	۱۰%
Insulating Cement	۱۰%
Insulation Sheet Metal	۱۵%
Insulation Wire	۱۰%

۱۱) UTILITY EQUIPMENT

Heat Exchanger, Vessel, Tank and Tower	See item ۲
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Rotating Equipment	See item °
Filter Elements	۱ Set Each Size/Mat'l
Piping	•٪
Electrical	See item ۹
<u>Insturmentation :</u>	
-Control panel	See item ۱۰
-Board Instruments	See item ۱۰
-Field Instruments	See item ۱۰
-Others	•٪



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ATTACHMENT ۲

GUIDELINES FOR SELECTION OF ۲ YEARS OPERATION SPARE PARTS

Spare parts for equipment are shown in the following tables:

Table ۱ – Spare parts for machinery/packages.

Table ۲ – Spare parts for electrical equipment

Table ۳ – Spare parts for instruments

Table ۴ – Spare parts for pressure vessels and heat exchangers

Table ۵ – Spare parts for piping.



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TABLE ۱
SPARE PARTS FOR MACHINERY / PACKAGES

Note ۱: Please see the relevant engineering specifications of each equipment for recommended ۳-years spares.

Note ۲: Please see tables ۳ and ۴ of attachment-۳ for the electrical and instrument spare parts requirements of machinery / packages for ۳ -years.



TABLE ۲
MINIMUM SPARE PART FOR ELECTRICAL EQUIPMENT

Item:	Quantities
۱) Switchgears:	
MV Fuses	۱۵٪
Protecting and Flag Relay	۲٪
Time Relay	۲٪
Lamps	۱۰٪
Space Heaters	۱۰٪
L.V. Fuses	۲٪
Auxiliary Relays	۱٪
Moving Contacts	۱۵٪
Fixed Contacts	۱۵٪
Circuit Breakers(MCCB,MCB)	۱۰٪
Contactors	۱۵٪
Metering	۱۵٪
CT	۲۰٪
PT	۲۰٪
۲)Power Motors Control Center:	
L.V. Fuses	۱۵٪
Time Delayed Relays	۸٪
Lamps	۱۰٪
Space Heaters	۱۰٪
Terminal Blocks	۷٪
Auxiliary relays	To be determined later in conjunction with the equipment vendor
Contactors	
Thermal	
overload Relays	
Isolators for each trip	
Current Setting	۱۱٪



	Motor Circuit Brakers					
	Complete Unit for Each	۱۵%(min ۱)				
	Type & Size(incoming & bus tie)					
	Moving Contacts	۲۰٪				
	Fixed Contacts	۲۰٪				
	Metering	۱۵٪				
	CT	۲۰٪				
	PT	۲۰٪				
	Circuit Breaker	one per each type				
۳) Transformers :	Bucholz Relays	one each type & size				
	Thermometer	۱۰٪				
	Bushing HV/LV	۵۰٪				
	Measuring and cintrol devices	۲۰٪				
	CT of natural resistor	۱۰٪ (of each type)				
۴) Power Material:	a) Local Control Stations	۵٪				
	b) Sockets ۴۰۰V AC	۱۰٪				
	c) Plugs ۴۰۰V AC	۱۰٪				
۵) Lighting Materials:	a) Switches	۱۰٪				
	b) Fuses	۳۰٪				
	c) Sockets(۲۳۰ V, ۲۴V)	۱۰٪				
	d) Plugs(۲۳۰ V, ۲۴V)	۱۰٪				
	e) Lighting Fixtures	۱۰٪				
	f) Ballast Lamps	۵٪				
	g) Lamps	۲۰٪				
	h) Portable ۱۱۰V AC, ۵۰Hz with transformer (ex-type)socket and plug	۱۰٪				
	i) hand amp ۲۴V AC, ۵۰Hz (ex-type)					
۶) Motors:						
No of Machines	۱	۲	۳	۴	۵	more
set of Bearing	۱	۱	۱	۲	۲	۴۰٪
Fan, terminal, blocks, space heater (MV)per type						۵٪



۷) UPS:

Fuses	۳۰٪
MCB(miniator circuit breaker)	۱۵٪
SCR	۳۰٪
Signaling lamps and protection device	۱۵٪
DIOD	۱۰٪
Transistor	۳۰٪
Control cards	one per each type
Batteries	۵٪
Isolator switch (make before break)	one per each type

۸) Battery charger:

Fuse	۳۰٪
MCB	۱۵٪
SCR	۳۰٪
DIOD	۱۰٪
Signaling lamp	۱۵٪
Control cards	one per each type
Batteries	۵٪

۹) Telephoned system

*

۱۰) Paging system

*

۱۱) Radio system

*

۱۲) Fire alarm system

*

۱۳) Neutral grounding system

*

۱۴) Bus duct

*

These are the spare parts required for two years operation. Vendor shall recommend the spares based on their experience.

(*The Quantities indicated are only preliminary estimation, so the firm quantities will be specified later in conjunction with recommendations of equipment vendors.

The quantities which shall be ordered by VENDOR shall be approved By OWNER.



TABLE ۳
SPARE PARTS FOR INSTRUMENTS

<u>Item</u>	<u>Quantities</u>
Flow Instruments	To be determined
Level Instruments	in conjunction with the equipment Vendor
Temperature Instruments	(based on Vendor's experience on similar type of plant)
Pressure Instruments	
Analyzers	
Control Valves : Valve Bodies	None unless service is corrosive or erosive. For corrosive or erosive services, shall be determined in conjunction with the equipment Vendor.
Valve Plugs	۱ of each size/min. ۱۵% or ۱
Seat Rings	۱ of each size/min. ۲۵% or ۱
Actuators	۱۰% (min ۱ per type / size)
Valve Stems	۱ of each diameter. These vary in length depending on valve size. Purchase the longest of each dia. These can be cut to the correct size.



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Stem packings	۳ boxes of each size used/min. ۲۰٪
Grease	۳ boxes of each type used/min. ۲۰٪
Diaphragms	۱ of each size used min. ۲۰٪
Blank Orifice Plates	
Dial Thermometers	
Manual Loading Stations	
Instrument Air Filters (Regulation sets)	
Pressure Gauges	
Pressure Switches	
Plug-in Assemblies for Elect. Instr.	
Plug-in Assemblies for Pneum. Instr.	۱۰٪
Seal, Condensate and Vent Pots	(for all)
Solenoid Valves	
Thermocouples	
Thermowells	
Signal Lights	
Pneumatic relay and/or boosh(if any)	
Valve Positioners	۱۰٪
I/P Convertes	(for all)



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DCS/ESD/PLC (for each system the following items):

- I/O cards % for each type (min 1 for each type)
- Main cards one set
- Power supply (AC, if any) one set
- Power supply (DC, if any) one set
- Barriers cards % for each type (min 1 for each type)

On-line gaschromatographs:

- Main mother board one set
- Column one per type



TABLE ۴
SPARE PARTS FOR
PRESSURE VESSELS & HEAT EXCHANGERS

<u>ITEM</u>	<u>QUANTITIES</u>
۱) Heat Exchangers-Shell and Tube (U Type included)	
- Tubes	Straight tubes sufficient to retube the largest bundle of each tube size and material.
- Bolts and nuts	(Special or Alloy) of each exchanger minimum one set.
- Gaskets	۲۰۰٪
۲) Pressure Vessels	
- Gaskets	۲۰۰٪
- Bolts and nuts	۱۰٪ (Special, Alloy or size ۲" diam or greater), minimum one set.
۳) Air Cooled Exchangers	
- Plugs	Steel ۱٪; Non-ferrous ۲٪ (min. one number)
- Plug Gaskets	۵٪ (min. one number)
-Cover plate gaskets	۱۰٪
-Tube support boxes	۱۰٪ (min. one number)
۴) Number of Air-fin Coolers Using Part.	۱ ۲ ۳ ۴ ۵ ۶ ۷ or more
(i) V-Belts-Sheaves (Driven & Driver)	• • • • • ۱
- Set of Belts	۱ ۲ ۳ ۴ ۵ ۶ ۱۰۰٪
(ii) Fan Shaft Bearing (Upper & Lower)	۱ ۱ ۱ ۲ ۲ ۳ ۵۰٪ of No of Air Fins
(iii) Speed Reducers (Gear Box) Shaft	



and pinion

- Bearing Set ۱ ۱ ۱ ۲ ۲ ۳ ۵۰% of No
of Air Fins

- O-Rings, Seals, Lock-washers, Locknuts

(iv) Couplings – Complete Coupling,

-Flanges, Gaskets, Seals ۱ ۱ ۱ ۱ ۱ ۱ ۱

(v) Fan Assemblies ۱ ۲ ۳ ۴ ۵ ۶ ۱۰۰% of No
of Air Fins

-Automatic Pitch Control

-Hub Assembly Parts Guide Bushing,

-Pitch Blocks, O-Rings, Clam Gaskets

(vi) Bolt Assemblies, Fork, Pins ۱ ۲ ۳ ۴ ۵ ۶ ۱۰۰% of No
of Air Fins

(vii) Flexible Hose, Rotary Union ۱ ۱ ۱ ۱ ۱ ۱ ۲

(viii) Automatic or Manual Adjustments:

- Blade Retention Clamps, Pitch, ۱ ۱ ۱ ۲ ۲ ۲ ۳۰% of No
of Air Fins

Change Forks, Puch Rod, Stub,(with pilot tubes),Bearing

Retainer Rings

(ix) Spring Housing Gasket, Diaphragm, ۱ ۱ ۱ ۱ ۲ ۲ ۲۰% of No
Blade Retainer Ring, Thrust of Air Fins

cover Gasket

(x) Hub Assembly with Blades ۱ (b)

(*) NOTES

(a) Quantities shown are for each size and type of part

(b) Twenty units or more

(c) The parts listed are the principal parts only. Other parts shall be considered for recommendation in quantities consistent with the above table.



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o) Plate type Exchangers

Plat gasket	۱۰۰٪
Flow Plate	۱۰٪
Nozzle Gasket	۲۰۰٪
Glue (۱ Kg. Pot)	۱
Special spanner tool	۱ for each size/type



TABLE °
SPARE PARTS FOR PIPING

<u>Item</u>	<u>Quantities</u>
Valves up to ½"	۵٪ for each size, type and material complete units
Valves from ¾" to ۱"	۲٪ (minimum ۲ pieces) for each size , type and material
Valves above ۱" to ۱.۵"	۱ piece for each size, type and material complete units
Valves above ۱.۵"	۱ only if installed valves quantity is more than ۳۰
Valves up to ۱.۵"	
Gland packing and bonnet gasket	۱۰٪
Valves from ۱.۵" to ۲"	۲ for each type , size and material set of changeable inner parts
Valves above ۲"	۱ for each type, size and material
Set interchangeable inner parts: bonnet gasket and stem packing	
Piping gaskets and bolts set for each size and type	۱۰٪

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ATTACHMENT ۳

**GUIDELINES FOR THE COMPILATION OF SPARE PARTS
INTERCHANGEABILITY RECORD (SPIR)**

The manufacturer/supplier shall complete the following parts of th SPIR form as per listed sequence and in the English language:

- Line ۱: PLANT registration/item number or tag number of equipment/instruments, etc. as stated on requisitions and/or Purchase Orders.
- Line ۲: Mode, type or other identification of equipment/instruments, etc. ordered.
- Line ۳: Serial number of each equipment/instruments, etc. ordered.
- Line ۴: Purchase Order number reference of equipment/instruments, etc.
- Line ۵a: Unit of measure, i.e. No., set, pair, kg,roll, etc.
- Line ۵: Number of identical equipment, etc. of particular model or type being supplied against Purchase Order number mentioned under line ۴.
- Line ۶: Parts description of all component parts considered by supplier as being required for maintenance of equipment, etc. listed in lines ۱, ۲ and ۳. However, all items specified in the appropriate equipment list shall be shown separately.
- Col. ۹: Drawing number/part number as per supplier's parts list or drawing.
- Col. ۱۰: Part identification number shoeing interchangeability within equipment manufacturer's organization.
- Note: Identical parts, regardless of whether they have the same part number or drawing number, should be shown only once (see also line ۵).
- Col. ۱۱: Material specification of parts listed in column ۶.
- Line ۷: Enter in appropriate sqare the nuber of parts (listed in column) fitted in each applicable unit. For groups of identical units, denote quantity per unit below quantity shown in line ۵.
- Col. ۷: Total number of identical parts listed in colimn ۶ for all equipment, etc. For identical units multiply quantity in line ۷ by number in same column in line ۵ and enter overall total of each line in column ۷.





- Col. ۱۲: Total spare parts recommended for ۳ years operation and commissioning period.
- Col. ۱۸: Unit price (up to two decimals) for recommended spare parts of column ۱۲.
- Col. ۲۰: Original identification number for all items of third party manufacture (bought-out items) such as : ball/-roller bearings, mechanical seals, couplings, bearing lock nuts, bearing lock washers, V-belts, bolts/nuts, gaskets, O-rings, and the like. These items should be fully identified by manufacturers' numbers, types, sizes, etc.
- V – for: Vital equipment, a breakdown of which would mean an immediate and serious interruption of vital operations in field or plant and with which no risk in the ordering and stocking of spare parts can be justified.
- E – for: Essential equipment, engaged in primary operations, but with which a calculated risk can be taken in ordering and stocking of spare parts.
- A – for: Auxiliary, general purpose and stand-by equipment, for secondary operations, the temporary lack of spare parts would not have a serious effect.
- Under this heading also comes the equipment of which there is a large number of units in used, thus ensuring a sufficient degree of protection in case of failure of one or more units.

The Owner MESC project team should complete the following part of the SPIR form

- Col. ۱۶: For allocation of the final MESC number.
- Col. ۱۷: For the classification of spare parts, i.e.:
- C – for: Parts wearing out or deteriorating during normal operations, thus shown a fairly regular consumption.
- Q - for: Parts not normal stocked, but ordered on request only.
- I - for: Insurance items.
- O - for: Temporary code number.

THE VENDOR SHALL COMPLETE THE FOLLOWING PART OF THE SPIR FORM:

- Col. ۱۳: VENDOR'S recommended spare parts for ۳ years operation.

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- Col. ١٤: VENDOR'S recommended spare parts for the precommissioning, commissioning and start-up period.
- Col. ٢٢: This column has to be filled out for the respective parts purchase order-item reference. This number should be tagged to the respective material for easy identification upon receipt at site.
- Col. ١٩: Total price (up to ٢ decimals) of the spare parts for ٢ years operation and the commissioning period based upon the quantities approved by the OWNER'S Project Engineer (see column ١٥)

NOTE: Columns ١٥, ١٧ and ٢١ should be left blank, these are for OWNER'S use.
THE OWNER'S PROJECT ENGINEER SHOULD COMPLETE THE FOLLOWING PART OF SPIR FORM:

- Col. ١٥: Final quantity to be ordered and Approved by the OWNER'S Project Engineer.
- Col. ٢١: This column has to be used to indicate the equipment class, i.e.

IMPORTANT NOTE:

The necessary provisions shall be made to fix the prices of spare parts for all equipment and materials for future purchasing of the spare parts by OWNER more than which shall be purchased by VENDOR for two years operations of the PLANT all EQUIPMENT AND MATERIALS for future purchasing of the spare

ATTACHMENT ٤

SPIR Form:



1	EQUIPMENT REQ. OR TAG NO.	2	MANUFACTURER'S MODEL OR TYPE	3	MANUFACTURER'S SERIAL NO.	4	NO. OF UNITS	5	NO. OF PARTS PER UNIT		6	MISC NO. OF EOPT OR ORDER REF. NO.		SPRFORM
7	PROJECT A Project	8	PLANT/LOCATION Plant A Com/B	9	MANUFACTURER'S SERIAL NO.	10	TOTAL NO. OF IDENTICAL PARTS INSTALLED		11	SERIAL NUMBER		12	Notes (Any INFORMATION NOT COVERED IN OTHER COLUMNS)	
13	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	14	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	15	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		16	DESCRIPTION OF PARTS	17	MATERIAL SPECIFICATION	18	MANUFACTURER'S MATERIAL SPECIFICATION	19	NAME OF THE SUPPLIER OR BRAND XXX
20	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	21	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	22	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		23	DESCRIPTION OF PARTS	24	MATERIAL SPECIFICATION	25	MANUFACTURER'S MATERIAL SPECIFICATION	26	NAME OF THE SUPPLIER OR BRAND XXX
27	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	28	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	29	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		30	DESCRIPTION OF PARTS	31	MATERIAL SPECIFICATION	32	MANUFACTURER'S MATERIAL SPECIFICATION	33	NAME OF THE SUPPLIER OR BRAND XXX
34	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	35	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	36	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		37	DESCRIPTION OF PARTS	38	MATERIAL SPECIFICATION	39	MANUFACTURER'S MATERIAL SPECIFICATION	40	NAME OF THE SUPPLIER OR BRAND XXX
41	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	42	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	43	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		44	DESCRIPTION OF PARTS	45	MATERIAL SPECIFICATION	46	MANUFACTURER'S MATERIAL SPECIFICATION	47	NAME OF THE SUPPLIER OR BRAND XXX
48	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	49	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	50	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		51	DESCRIPTION OF PARTS	52	MATERIAL SPECIFICATION	53	MANUFACTURER'S MATERIAL SPECIFICATION	54	NAME OF THE SUPPLIER OR BRAND XXX
55	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	56	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	57	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		58	DESCRIPTION OF PARTS	59	MATERIAL SPECIFICATION	60	MANUFACTURER'S MATERIAL SPECIFICATION	61	NAME OF THE SUPPLIER OR BRAND XXX
62	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	63	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	64	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		65	DESCRIPTION OF PARTS	66	MATERIAL SPECIFICATION	67	MANUFACTURER'S MATERIAL SPECIFICATION	68	NAME OF THE SUPPLIER OR BRAND XXX
69	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	70	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	71	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		72	DESCRIPTION OF PARTS	73	MATERIAL SPECIFICATION	74	MANUFACTURER'S MATERIAL SPECIFICATION	75	NAME OF THE SUPPLIER OR BRAND XXX
76	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	77	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	78	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		79	DESCRIPTION OF PARTS	80	MATERIAL SPECIFICATION	81	MANUFACTURER'S MATERIAL SPECIFICATION	82	NAME OF THE SUPPLIER OR BRAND XXX
83	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	84	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	85	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		86	DESCRIPTION OF PARTS	87	MATERIAL SPECIFICATION	88	MANUFACTURER'S MATERIAL SPECIFICATION	89	NAME OF THE SUPPLIER OR BRAND XXX
90	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	91	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	92	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		93	DESCRIPTION OF PARTS	94	MATERIAL SPECIFICATION	95	MANUFACTURER'S MATERIAL SPECIFICATION	96	NAME OF THE SUPPLIER OR BRAND XXX
97	SPARE PARTS LIST AND INTERCHANGEABILITY RECORD	98	MANUFACTURER'S/SUPPLIER'S SPARE PARTS DATA	99	EQUIPMENT IDENTIFICATION OF THE COLUMN ON SHEET 2 (EQUIPMENT TAG NO.)		100	DESCRIPTION OF PARTS	101	MATERIAL SPECIFICATION	102	MANUFACTURER'S MATERIAL SPECIFICATION	103	NAME OF THE SUPPLIER OR BRAND XXX

Quantity for 1 unit of P.M.V.B. Qty of parts for 1 unit of P-XXX/XXX to be shown.

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