

**OIL & GAS DEVELOPMENT COMPANY LIMITED**  
**PROCUREMENT DEPARTMENT, ISLAMABAD**  
**FOREIGN SECTION C**

(To be completed, filled in, signed and stamped by the principal)

**ANNEXURE 'A'**

**Material** CONTROL VALVES FOR QADIRPUR PLANT  
**Tender Enquiry No** PROC-FC/CB/P&P/QP-4403/2019  
**Due Date**  
**Evaluation Criteria** FULL

**SCHEDULE OF REQUIREMENT**

Sr No	Description	Unit	Quantity	Unit Price (FOB)	Total Price (FOB)	Unit Price C & F BY SEA	Total Price C & F BY SEA	Deviated from Tender Spec. If Any
1	Complete control valve with all accessories 20-LCV-106 AND 20-LCV-206 along with two years recommended spares, OR EQUIVALENT, SEE ATTACHED DATA SHEETS	Number	2					
2	Complete control valve with all accessories 20-PCV-102 along with two years recommended spares OR EQUIVALENT, SEE ATTACHED DATA SHEET	Number	1					

Bidder shall provide Two Years recommended spare parts list for all three valves.

Note:

- Unpriced list with technical bid and
- Priced list with commercial bid.

Two Year Recommended spare parts will not be made part of commercial evaluation.

Sr. No	Description of Spare Part / Part Number	QTY	Unit FOB Price USD	Total FOB Price USD	Unit CFR Price USD	Total CFR Price USD

*vetted*

*[Signature]*

**ARSHAD RASHID**  
 Dy. Chief Engr. (Inst.)  
 P&P-SA, Ext: 4-93  
 14/08/19

**TENDER NO. PROC-FC/CB/P&P/QP-4403/2019**  
**CONTROL VALVES FOR QADIRPUR PLANT**

<b>1</b>	Case will be processed on <b>single stage – two envelop</b> bidding procedure as per PPRA rules.
<b>2</b>	For Evaluation, Bidders must confirm/meet the following criteria:
<b>#</b>	<b>Technical Terms</b>
<b>A</b>	Authority Letter from OEM in favor of Principal or L/C beneficiary.
<b>B</b>	Authority Letter from Principal or L/C beneficiary in favor of Local agent.
<b>C</b>	Bidder will provide the calibration certificate, MTC (Material Test Certificate) and Standard warranty / guarantee.
<b>D</b>	All Items should be in standard packing.
<b>E</b>	All items should be brand new and free from defectes.
<b>F</b>	In case of equivalent, bidder will provide the equivalence certificate from OEM.
<b>F</b>	Bidder shall confirm compliance to Data sheets
<b>G</b>	In case of any deviation from Data Sheet bidder will clearly mention the deviation
<b>H</b>	Clean acceptance of OGDCL terms and conditions
<b>I</b>	Bidder shall provide Two Years recommended spare parts list for all three valves. <ul style="list-style-type: none"> <li>• Unpriced list with technical bid and</li> <li>• Priced list with commercial bid.</li> </ul> <p>Two Year Recommended spare parts will not be made part of commercial evaluation.</p>
<b>#</b>	<b>Other Terms</b>
<b>3</b>	<p><b>PAYMENT TERMS</b></p> <p>Payment will be made as per the foreign procurement payment terms available at OGDCL website (tenders tab) effective from February 27, 2018.</p> <p>"Payment to the Contractor/ bidder in foreign currency shall be made by establishing in favor of the Contractor an irrevocable Letter of Credit (hereinafter called the L/C). 70 % Payment (s) under the L/C will be made for the FOB/ CFR / CPT (as the case may be) price of material of each shipment upon submission of the shipping documents. Balance 30% Payment will be released after receipt, inspection and acceptance of material. "</p>

4	<b>BID VALIDITY</b> Bid shall remain valid for a period of <b>180 days</b> from the date of technical bid opening	
5	<b>BID BOND VALIDITY</b> Bid bond for amount of <b>USD 2,500</b> (US Dollars two thousand five hundred only) is required upfront along with technical bid, which shall remain valid for a period of <b>210 days</b> from the date of technical bid opening.	
6	<b>DELIVERY PERIOD</b> Supplier will be required to complete delivery in <b>120 days / four (04) months</b> CFR Karachi by Sea Basis from the date of establishment of LC.	
7	<b>EVALUATION CRITERIA:</b> Full consignment wise on <b>CFR KARACHI BY SEA BASIS.</b>	
8	<b>TERMS AND CONDITIONS:</b> Bidder is advised to carefully read all the terms and conditions of the tender document available at OGDCL website in the master tender document foreign.	
9	<b>SHIPMENT FROM ACU MEMBER COUNTRIES:</b> In case of shipment from ACU member countries, the LC beneficiary should be of that particular country from where the consignment is being shipped. Bidder to confirm/ensure that there are no trade ban/restrictions on LC beneficiary/manufacturer's country by Pakistan / international organization.	
10	<b>COMPLIANCE TO TENDER TERMS/SOR/ATTACHMENT</b> Supplier will be responsible for completeness of the package and full requirement of OGDCL. Compliance is required from bidder/manufacturer to the full OGDCL tender terms/requirement.	
11	<b>10% PERFORMANCE BANK GUARANTEE</b> In case of award successful bidder shall provide 10% Performance Bank Guarantee. Which shall remain valid for full value upto twelve (12) months from the date of completion of shipment/Inspection/acceptance. FORMAT ATTACHED.	
12	Please attach Un-priced Schedule of requirement along with Technical Bid and Priced Schedule of requirement along with Financial Bid. In case of Non-compliance bid shall be rejected.	

**PERFORMANCE BANK GUARANTEE**

Oil & Gas Development Company  
Limited OGDCL House, Jinnah  
Avenue, Blue Area, Islamabad,  
(Pakistan)

Dear Sir,

Ref; our Bank Guarantee No. \_\_\_\_\_ in the sum of \_\_\_\_\_  
Account \_\_\_\_\_ in consideration of you having entered into Contract  
No. \_\_\_\_\_ Dated \_\_\_\_\_ with \_\_\_\_\_ Called  
Contractor and in consideration for value received from CONTRACTOR. We hereby agree and undertake as  
followings:

- 1 To make unconditional payment to you as called upon of (10%) ten percent of the Contract value of the contract price mentioned in the said contract, on your written FIRST and SIMPLE demand without further recourse, question or reference to CONTRACTOR or any other person in the event of default, non-performance or non-fulfillment by CONTRACTOR of his obligations, liabilities, responsibilities under the said contract of which you shall be the sole judge.
- 2 The accept written intimation from you as conclusive and sufficient evidence of the existence of the default or breach as aforesaid on the part of CONTRACTOR and to make payment immediately and forthwith upon receipt of your FIRST and SIMPLE written demand.
- 3 This Performance Bond shall remain valid and in full force and effect upto \_\_\_\_\_ or issue of statement of discharge by your authorized representative or return of original guarantee whichever is earlier.
- 4 DEMURRAGE DUE TO DELAY IN RECEIPT / NEGOTIATION OF ORIGINAL SHIPPING DOCUMENTS.

If clean documents are not negotiated within Negotiation Period allowed in Letter of Credit or documents are with held by Bank on account of any discrepancy:

- If the Demurrage, if any incurred due to late negotiation of the Clean Documents and paid by OGDCL will be realized from the beneficiary of L/C, by encashing this Performance Bond to the extent of demurrage amount. In case demurrage amount exceeds the total value of this Performance Bond the balance amount will be payable by the beneficiary.

- 1 That no grant of time or other indulgence to, amendment in the terms of the Contract by Agreement between the parties, or imposition or Agreement with CONTRACTOR in respect of the performance of his obligations under the said Agreement, with or without notice to us, shall in any manner discharge or otherwise affect this Guarantee and our liabilities and commitments there under.
- 2 This is an independent and direct obligation guarantee and shall be binding on us and our successors interest and shall be Irrevocable.
- 3 This guarantee shall not be affected by any change in the constitution of the Guarantor Bank or the constitution of the Contractor.
- 4 The Guarantor Bank Warrants and represents that it is fully authorized, empowered and competent to issue this guarantee.

(B A N K E R S)

## FORMAT OF CORPORATE & FINANCIAL INFORMATION

(To be filled by Bidder)

### PART - I

#### GENERAL INFORMATION

1. Name (Full Company Name):

- Postal Address :
- Contact Person Name :
- Contact Person Mobile No :
- Company Telephone:
- Facsimile:
- Valid e-mail for correspondence:
- Website Address:

1.1 Has the Company operated under any other name? If yes please give name, date of change and reason for change.

2. Type of Entity/Firm:

- Corporation/Stock Company
- Public Limited
- Private Limited
- Partnership
- Proprietorship

3. Shareholders information/pattern with names and addresses of majority shareholders.

4. Place of Incorporation/Registration:

5. Year of Incorporation/Registration:

(Please provide copies of Incorporation/Registration Certificates and Memorandum & Articles of Association)

6. Company's National Tax No.

7. Company's Core Business Areas and their annual sales revenue/earnings during last five (5) years.

8. Name & Address of Owners/Directors

9. Registration with Pakistan Engineering Council (PEC) as Contractor. Please provide copy of membership certificate issued by PEC.

**PART - II**  
**FINANCIAL STRENGTH**

1. Provide details with regard to the financial standing of the applicant including copies of last three (3) years annual audited profit & loss account and balance sheet. Complete postal address, email address and contact numbers of the audited firm should be provided along with the bid. Also, please fill the financial summary as per below table In USD only;

S. No.	Description	Years		
1	Sales Revenue			
2	Paid Up Capital			
3	Profit Before Tax			
4	Profit After Tax			
5	Current Assets			
6	T. Asset			
7	Owner Equity			
8	Long Term Debt			
9	Current Liability			
10	Total Liabilities			

2. Bank(s) credit worthiness certificates (Latest Period) of applicant organization and available credit ceiling/limits with Account Number/Title.
3. Detail record with regard to litigation/arbitration proceedings or any other dispute related to project undertaken/being undertaken by the Bidder their Sub-Contractors and Suppliers (Specially with OGDCL its Joint Venture Partners or other public and private organizations working in the Oil & Gas sector of Pakistan) during past five (05) years.
4. Any information including brochures, references and other documentary evidence of technical qualification, capability and experience of the Applicant to execute the Project.

The undersigned on behalf of \_\_\_\_\_ hereby declare that the statements made and the information provided official herewith is complete, true and correct in every detail

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Official Seal of the Company

## Sliding Stem Valve Specification

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	Lead Time:
Contact:	Contact: <b>Nazar Muhammad</b>	
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	Rev: A
Item: 1	Quote: 975-NM-190312-0005608 / OGDCL	
Tags: 20-LCV-106	Date Last Modified: 12/03/2019	
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000		
Service Description:		

Service:	Positioner Type:	DVC6200,Auto Calibrate-AC
Size and Type: NPS 2 D	Input Signal:	4 to 20 mA dc
Body Style: Globe	Access:	67CFR Filter/Regulator
Design Temp: 100 deg F	Gauges:	0-60 psig/0-4 bar
Design Press: 950 psig	Action:	Direct
End Connect/In/Out: CL600/RTJ Flg/RTJ Flg	Certification:	FM,Explosion Proof/Intrinsic Safe/Nonincendive
Material: LCC Steel	Controller Type:	
Ports: 1	Action:	
Flow Direction: Up	Measure Element:	
Trim Number: SST/COCR-A	Range:	
Cage Matl:	Output:	
Retainer Matl:	Mounting:	
Bushing Matl:	Airset:	
Seat Ring Matl: S31600 SST/CoCr-A Seat	Mounting:	
VALVE PLUG	Transducer:	
Material: S31600 SST/CoCr-A Seat	Input Signal:	
Guiding: Post	Output Signal:	
Balance: Unbalanced	Action:	
Shutoff Class: ANSI CL IV	Mounting:	
Port Size: 1 1/4 Inch	Airset:	
Characteristic: Micro-Form (Eq Pct)	Certifications:	
Stem Material: S20910 SST	Line In:	
Stem Size: 1/2 Inch	Line Out:	
Bonnet Style: Plain	Insulation:	None
Boss Size: 2 13/16	Service Cond:	
Packing: Double PTFE Press	Process Fluid:	
Access: No	Critical Pressure:	
Bolt, Bonnet:	Shutoff Drop:	900 psi
PackFlg/Bltg: SA-193-B7M Studs/2HM Nuts NACE		
Actuator: Spring & Diaphragm		
Type/Size: 667/45i		
Travel: 3/4 Inch		
Bench Set: 14-30 psi		
Push Down To: PDTTC		
Supply: Air		
To Actuator: 0 to 33 psig		
Fails Valve: Close		
Handwheel: Side Mounted	Max Rated Cv:	34.5

Variable Name	Unit	MAX	NOR	MIN
Mass Flow Rate Gas (w)	lb/h	130.000	111.000	90.000
Volumetric Flow Rate Liquid (Ql)	barrel/d	6500.00	4500.00	2500.00
Inlet Pressure (P1)	psig	950.000	750.000	150.000
Pressure Change (dP)	psi	850.000	650.000	50.000
Inlet Temperature (T1)	deg F	100.0000	100.0000	100.0000
Vapor Pressure (Pv)	psig	290.300	290.300	149.000
Sizing Coefficient (Cv)		9.501	7.604	27.603
% Open		63	58	88

## NOTES:

NACE Compliant.

## Valve/Regulator Sizing Calculation

Customer: OIL AND GAS DEVELOPMENT CO LTD		TECHNOBIZ (Private) Limited			
Contact:		Contact: <b>Nazar Muhammad</b>			
Customer Reference: Control valves LCV-106/206 and PCV-102		Sales Office Reference:		Lead Time:	
Item: 1	Rev:	Qty: 1	Quote: 975-NM-190312-0005608/OGDCL		
Tags: 20-LCV-106		Date Last Modified: 12/03/2019			
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000					
Service Description:					
Sizing Type: Two Phase Gas		Flow is Turbulent	Solving for: Cv	Noise is None	Flow is Mass
Variable Name	Units	MAX	NOR	MIN	
<b>SERVICE &amp; SIZING</b>					
Gas					
Inlet Temperature (T1)	deg F	100.0000	100.0000	100.0000	
Inlet Pressure (P1)	psig	950.000	750.000	150.000	
Pressure Change (dP)	psi	850.000	650.000	50.000	
Pressure drop ratio factor (Xt)		0.517	0.502	0.525	
Pressure Recovery Factor (Fl)		0.850	0.850	0.850	
Atmospheric Pressure	psi	14.69	14.69	14.69	
Mass Flow Rate Gas (w)	lb/h	130.000	111.000	90.000	
Molecular Weight/Specific Gravity	M	19.500	19.500	19.500	
Specific heats ratio (gamma)		1.130	1.130	1.130	
Inlet Compressibility Factor (Z1)		0.983	0.983	0.983	
Volumetric Flow Rate Liquid (Ql)	barrel/d	6500.00	4500.00	2500.00	
Specific Gravity (SG)		0.960	0.960	0.860	
Vapor Pressure (Pv)	psig	290.300	290.300	149.000	
Sizing Coefficient (Cv)		9.501	7.604	27.603	
% Open		63	58	88	
Cv Gas		0.086	0.094	0.359	
Cv Liquid		9.257	7.306	22.887	
dP/P1 Valve		0.881	0.850	0.304	
dP Choked Gas	psi	402.636	309.780	69.748	
dP Choked Liquid	psi	493.780	349.280	8.729	
Two Phase Correction Factor (Fm)		0.017	0.027	0.187	
Gas Volume ratio (Vr)		0.026	0.040	0.220	
Gas sizing pressure drop ratio		0.417	0.405	0.304	
Item Notes:					



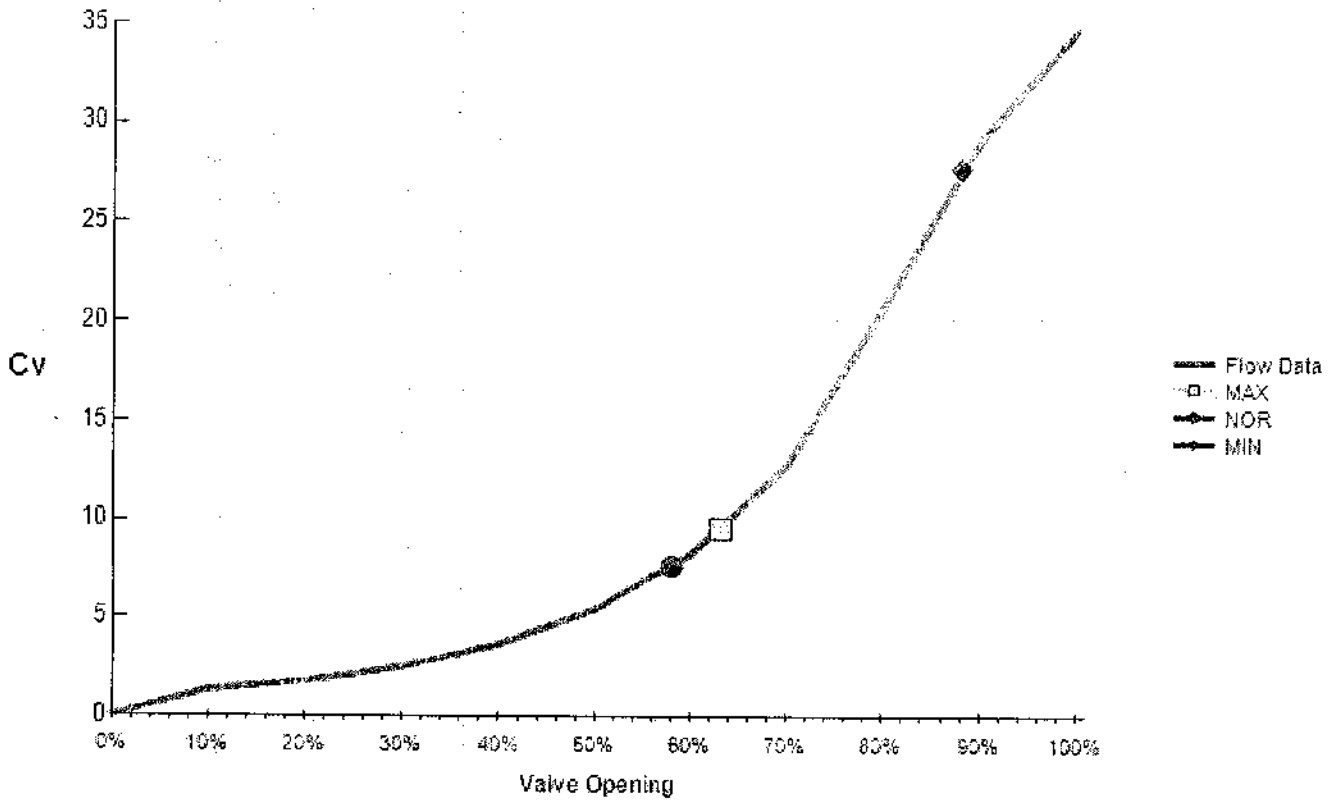
## Actuator Sizing Calculation

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	
Contact:	Contact: <b>Nazar Muhammad</b>	
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	Lead Time:
Item: 1	Rev:	Qty: 1
Tags: 20-LCV-106	Quote: 975-NM-190312-0005608 / OGDCL	Rev: A
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000	Date Last Modified: 12/03/2019	
Service Description:		
Variable Name	Values	Units
Pa	0.00	psig
Pb	33.00	psig
Pas Available	35.00	psig
Valve Body Size	2.0	in
Port Diameter	1.25	in
Unbalanced Area	1.36	in <sup>2</sup>
Valve Travel	0.75	in
Valve Stem Size	.5	in
Valve Friction	75.00	lbf
Additional Friction	0.00	lbf
Seat load force	40.00	lbf/in
P1 Max	900.00	psig
P2 Min	0.00	psig
Unbalance Force @ Open	0.00	lbf
Liquid Negative Gradient	0.5	in
dP Flowing	850	psi
With Side MO	Yes	
Works	Yes	
Actuator Size	45i	
Spring	1E8264	
Product Lower Bench Set	14.00	psig
Product Upper Bench Set	30.00	psig
Spring Rate	2240.00	lbf/in
Spring Windup	0.66	in
Max Spring Load	3150.11	lbf
PS Required	32.72	psig
Actuator thrust down	1470.11	lbf
Actuator thrust up	285.00	lbf
Valve thrust down	1457.88	lbf
Valve thrust up	75.00	lbf
Lower Bench Set	14.00	psig
Upper Bench Set	30.00	psig
Lower Stroking	2.33	psig
Upper Stroking	30.00	psig
Lower Friction Band(+/-)	0.71	psig
Upper Friction Band(+/-)	0.71	psig
Lower Operating	0.12	psig
Upper Operating	30.72	psig
Req. Handwheel thrust	3225.11	lbf
Supply Pressure Used	35.00	psig

# Flow Coefficient Graph

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	Lead Time:
Contact:	Contact: <b>Nazar Muhammad</b>	Rev: A
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	
Item: 1      Rev:	Qty: 1      Quote: 975-NM-190312-0005608 / OGDCL	
Tags: 20-LCV-106	Date Last Modified: 12/03/2019	
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000		
Service Description:		

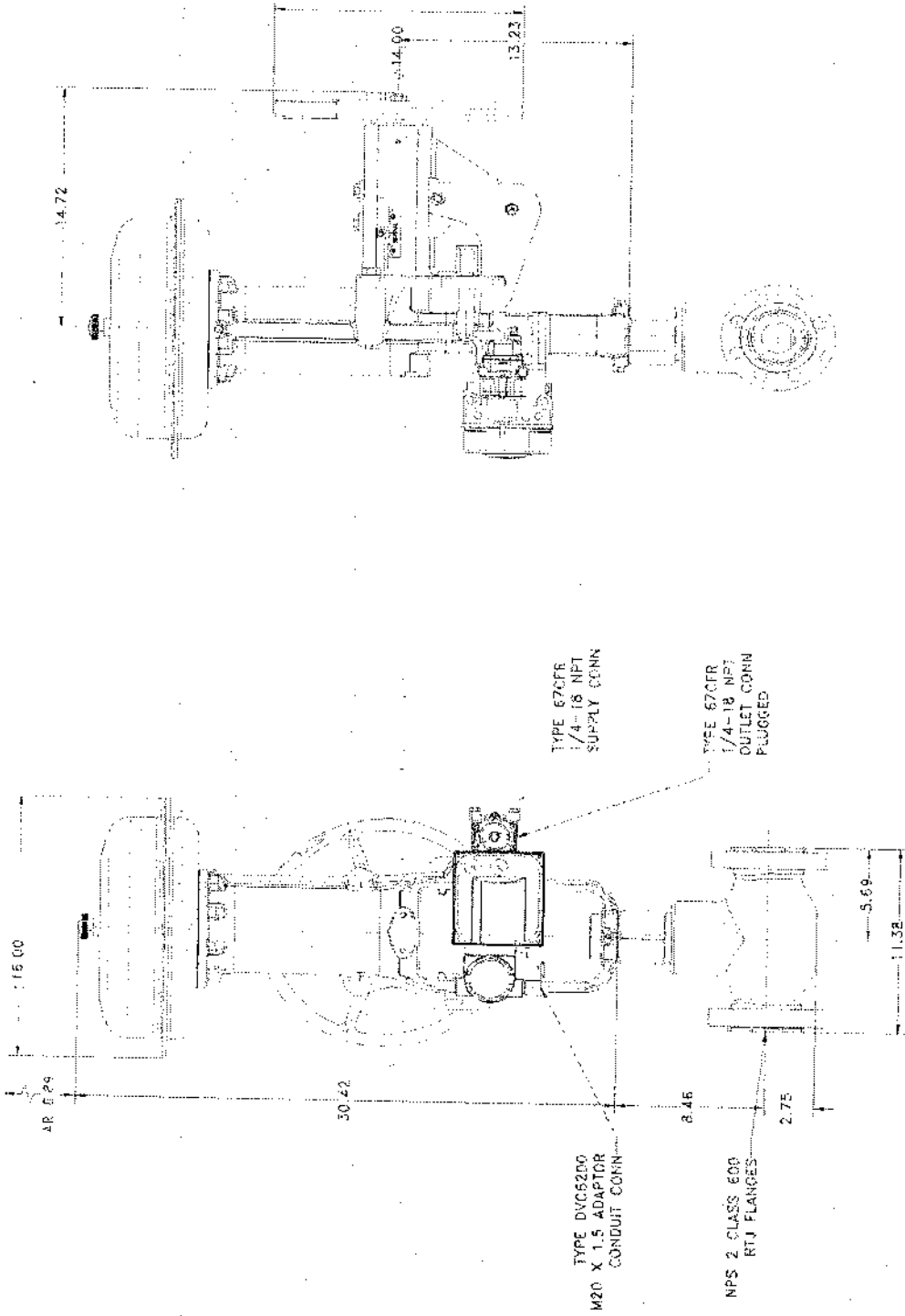
Flow Coefficient vs. Valve Opening



Product: D    Valve Size=NPS 2    Trim Style/Characteristic=Micro-Form (Eq Pct)    Port Diameter=1 1/4 Inch    Travel=3/4 Inch

ORIENTATION MAY VARY

FEATURES - ACTUALLY TYPICAL



DIMENSIONS CERTIFIED CORRECT BY FISHER CONTROLS

CUST: OIL AND GAS DEVELOPMENT CO LTD

CUST REF NO.: CONTROL VALVES ECV-106/206 AND ECV-102567 ACTUATOR SIZE 451

FISHER REF NO.: 975-NM-190312-0005602

TAG NO.: 20-LCV-106

PROJECT NAME:

SCALE: NONE

DATE: 11/19/01

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

EMERSON

GENERAL ARRANGEMENT

SHEET 1 OF 1

FACE TO FACE TOLERANCE IS +/- 0.05 INCH

AR = ACTUATOR REMOVAL CLEARANCE

## Sliding Stem Valve Specification

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	
Contact:	Contact: <b>Nazar Muhammad</b>	
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	Lead Time:
Item: 2	Rev:	Qty: 1
Tags: 20-LCV-206	Quote: 975-NM-190312-0005608 / OGDCL	Rev: A
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000	Date Last Modified: 12/03/2019	
Service Description:		

Service:		Positioner Type:	DVC6200,Auto Calibrate-AC
Size and Type:	NPS 2 D	Input Signal:	4 to 20 mA dc
Body Style:	Globe	Access:	67CFR Filter/Regulator
Design Temp:	100 deg F	Gauges:	0-60 psig/0-4 bar
Design Press:	950 psig	Action:	Direct
End Connect/In/Out:	CL600/RTJ Flg/RTJ Flg	Certification:	FM,Explosion Proof/Intrinsic Safe/Nonincendive
Material:	LCC Steel	Controller Type:	
Ports:	1	Action:	
Flow Direction:	Up	Measure Element:	
Trim Number:	SST/COCR-A	Range:	
Cage Matl:		Output:	
Retainer Matl:		Mounting:	
Bushing Matl:		Airset:	
Seat Ring Matl:	S31600 SST/CoCr-A Seat	Mounting:	
VALVE PLUG		Transducer:	
Material:	S31600 SST/CoCr-A Seat	Input Signal:	
Guiding:	Post	Output Signal:	
Balance:	Unbalanced	Action:	
Shutoff Class:	ANSI CL IV	Mounting:	
Port Size:	1 1/4 Inch	Airset:	
Characteristic:	Micro-Form (Eq Pct)	Certifications:	
Stem Material:	S20910 SST	Line In:	
Stem Size:	1/2 Inch	Line Out:	
Bonnet Style:	Plain	Insulation:	None
Boss Size:	2 13/16	Service Cond:	
Packing:	Double PTFE Press	Process Fluid:	
Access:	No	Critical Pressure:	
Bolt, Bonnet:		Shutoff Drop:	900 psi
PackFlg/Bltg:	SA-193-B7M Studs/2HM Nuts NACE		
Actuator:	Spring & Diaphragm		
Type/Size:	667/45i		
Travel:	3/4 Inch		
Bench Set:	14-30 psi		
Push Down To:	PDTC		
Supply:	Air		
To Actuator:	0 to 33 psig		
Fails Valve:	Close		
Handwheel:	Side Mounted	Max Rated Cv:	34.5

Variable Name	Unit	MAX	NOR	MIN
Mass Flow Rate Gas (w)	lb/h	130.000	111.000	90.000
Volumetric Flow Rate Liquid (Ql)	barrel/d	6500.00	4500.00	2500.00
Inlet Pressure (P1)	psig	950.000	750.000	150.000
Pressure Change (dP)	psi	850.000	650.000	50.000
Inlet Temperature (T1)	deg F	100.0000	100.0000	100.0000
Vapor Pressure (Pv)	psig	290.300	290.300	149.000
Sizing Coefficient (Cv)		9.501	7.604	27.603
% Open		63	58	88

## NOTES:

NACE Compliant.

## Valve/Regulator Sizing Calculation

Customer: OIL AND GAS DEVELOPMENT CO LTD		TECHNOBIZ (Private) Limited			
Contact:		Contact: <b>Nazar Muhammad</b>			
Customer Reference: <b>Control valves LCV-106/206 and PCV-102</b>		Sales Office Reference:		Lead Time:	
Item: <b>2</b>	Rev:	Qty: <b>1</b>	Quote: <b>975-NM-190312-0005608/OGDCL</b>	Rev: <b>A</b>	
Tags: <b>20-LCV-206</b>		Date Last Modified: <b>12/03/2019</b>			
Description: <b>NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000</b>					
Service Description:					
Sizing Type: Two Phase Gas		Flow is Turbulent	Solving for: Cv	Noise is None	Flow is Mass
Variable Name	Units	MAX	NOR	MIN	
<b>SERVICE &amp; SIZING</b>					
Gas					
Inlet Temperature (T1)	deg F	100.0000	100.0000	100.0000	
Inlet Pressure (P1)	psig	950.000	750.000	150.000	
Pressure Change (dP)	psi	850.000	650.000	50.000	
Pressure drop ratio factor (Xt)		0.517	0.502	0.525	
Pressure Recovery Factor (FI)		0.850	0.850	0.850	
Atmospheric Pressure	psi	14.69	14.69	14.69	
Mass Flow Rate Gas (w)					
Molecular Weight/Specific Gravity	M	19.500	19.500	19.500	
Specific heats ratio (gamma)		1.130	1.130	1.130	
Inlet Compressibility Factor (Z1)		0.983	0.983	0.983	
Volumetric Flow Rate Liquid (Ql)					
Specific Gravity (SG)		0.960	0.960	0.860	
Vapor Pressure (Pv)	psig	290.300	290.300	149.000	
Sizing Coefficient (Cv)					
% Open		63	58	88	
Cv Gas		0.086	0.094	0.359	
Cv Liquid		9.257	7.306	22.887	
dP/P1 Valve		0.881	0.850	0.304	
dP Choked Gas	psi	402.636	309.780	69.748	
dP Choked Liquid	psi	493.780	349.280	8.729	
Two Phase Correction Factor (Fm)		0.017	0.027	0.187	
Gas Volume ratio (Vr)		0.026	0.040	0.220	
Gas sizing pressure drop ratio		0.417	0.405	0.304	
Item Notes:					

## Actuator Sizing Calculation

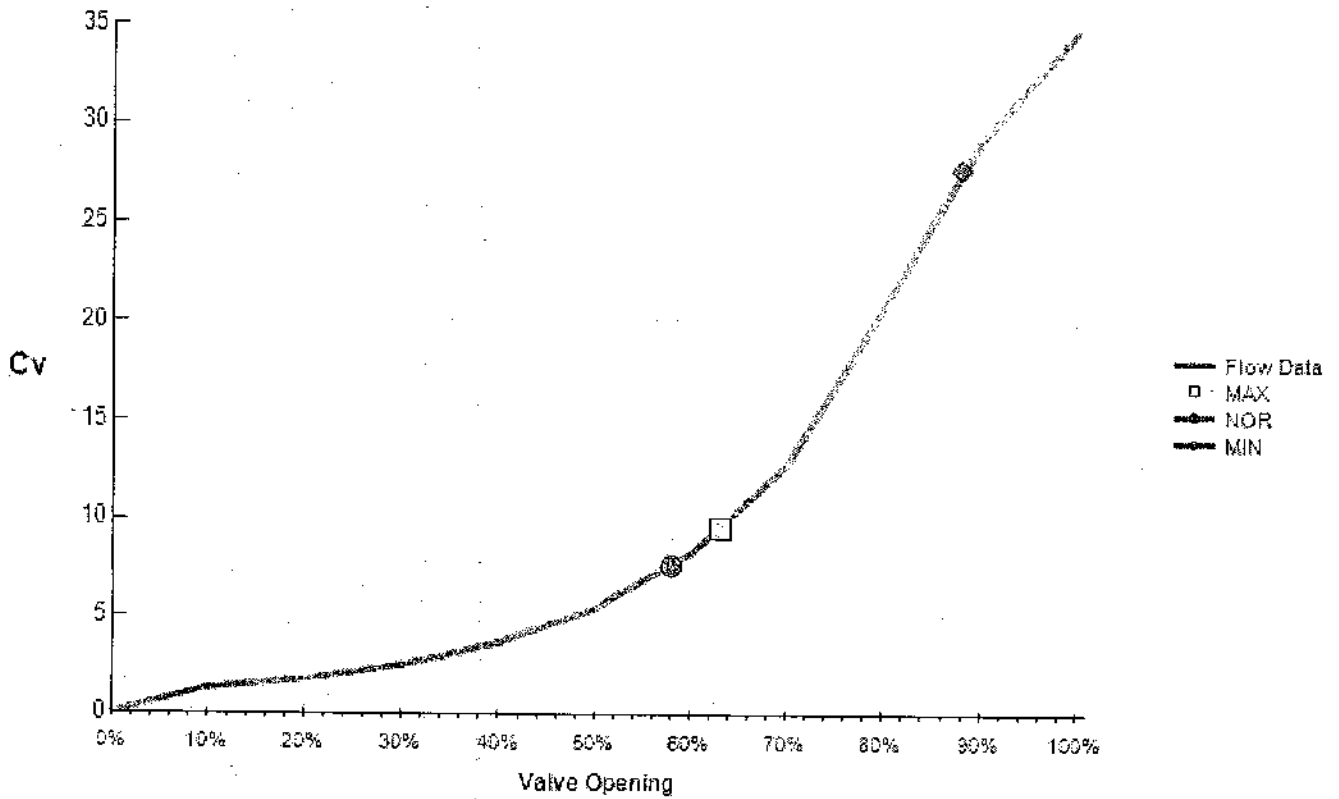
Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	
Contact:	Contact: <b>Nazar Muhammad</b>	
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	Lead Time:
Item: 2	Rev:	Qty: 1
Tags: 20-LCV-206	Quote: 975-NM-190312-0005608 / OGDCL	Rev: A
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000	Date Last Modified: 12/03/2019	
Service Description:		

Variable Name	Values	Units
Pa	0.00	psig
Pb	33.00	psig
Pas Available	35.00	psig
Valve Body Size	2.0	in
Port Diameter	1.25	in
Unbalanced Area	1.36	in <sup>2</sup>
Valve Travel	0.75	in
Valve Stem Size	.5	in
Valve Friction	75.00	lbf
Additional Friction	0.00	lbf
Seat load force	40.00	lbf/in
P1 Max	900.00	psig
P2 Min	0.00	psig
Unbalance Force @ Open	0.00	lbf
Fluid Negative Gradient	0.5	in
dP Flowing	850	psi
With Side MO	Yes	
Works	Yes	
Actuator Size	45i	
Spring	1E8264	
Product Lower Bench Set	14.00	psig
Product Upper Bench Set	30.00	psig
Spring Rate	2240.00	lbf/in
Spring Windup	0.66	in
Max Spring Load	3150.11	lbf
PS Required	32.72	psig
Actuator thrust down	1470.11	lbf
Actuator thrust up	285.00	lbf
Valve thrust down	1457.88	lbf
Valve thrust up	75.00	lbf
Lower Bench Set	14.00	psig
Upper Bench Set	30.00	psig
Lower Stroking	2.33	psig
Upper Stroking	30.00	psig
Lower Friction Band(+/-)	0.71	psig
Upper Friction Band(+/-)	0.71	psig
Lower Operating	0.12	psig
Upper Operating	30.72	psig
Req. Handwheel thrust	3225.11	lbf
Supply Pressure Used	35.00	psig

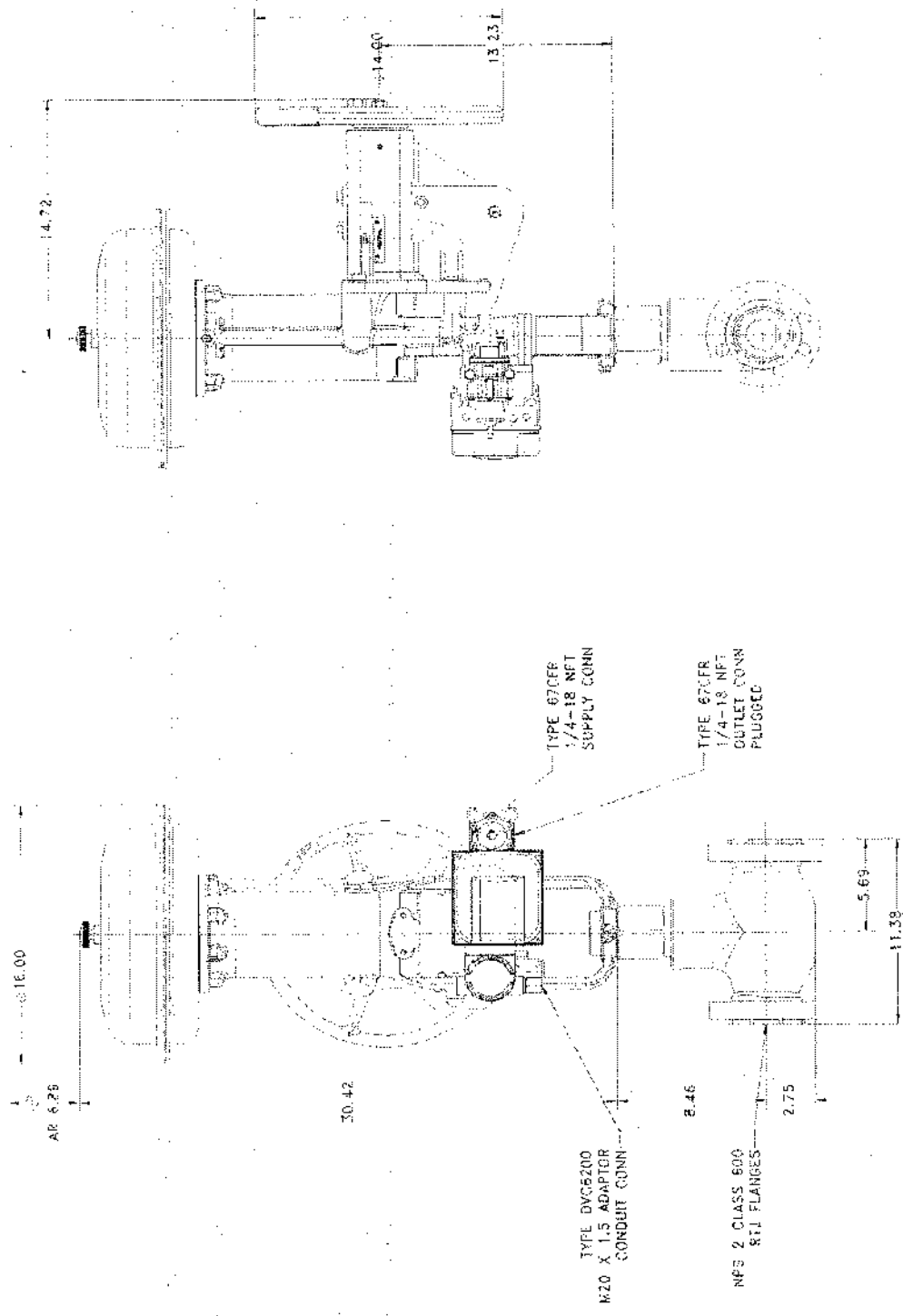
# Flow Coefficient Graph

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	Lead Time:
Contact:	Contact: <b>Nazar Muhammad</b>	Rev: A
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	
Item: 2      Rev:      Qty: 1	Quote: 975-NM-190312-0005608 / OGDCL	
Tags: 20-LCV-206	Date Last Modified: 12/03/2019	
Description: NPS 2 D 667 Size 45i DVC6200 Factory Mtgs DVC6200/DVC2000		
Service Description:		

Flow Coefficient vs. Valve Opening



Product: D    Valve Size=NPS 2    Trim Style/Characteristic=Micro-Form (Eq Pct)    Port Diameter=1 1/4 Inch    Travel=3/4 Inch



DIMENSIONS CERTIFIED CORRECT BY FISHER CONTROLS		SCALE: NONE	
D. VALVE BODY SIZE 2		CUST. ITEM: 0002	
CUST REF NO.: CONTROL VALVES LCV-106/206 AND PCV-102/667 ACTUATOR SIZE 451		SCALE: NONE	
FISHER REF NO.: 975-HM-180312-8005608		SCALE: NONE	
TAG NO.: 20-LCV-206		SCALE: NONE	
PROJECT NAME:		SCALE: NONE	
TOTAL CALCULATED WT +/- 10%		SCALE: NONE	
TOTAL WEIGHT: 251 LB		SCALE: NONE	
UNLESS OTHERWISE SPECIFIED		SCALE: NONE	
UNIT OF MEASURE: INCH		SCALE: NONE	
GENERAL ARRANGEMENT		SCALE: NONE	
EMERSON		SCALE: NONE	
SHEET 1 OF 3		SCALE: NONE	

FACE TO FACE TOLERANCE IS +/- 0.06 INCH  
AR = ACTUATOR REMOVAL CLEARANCE



## Sliding Stem Valve Specification

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	
Contact:	Contact: <b>Nazar Muhammad</b>	
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	Lead Time:
Item: 3	Rev:	Qty: 1
Tags: 20-PCV-102	Quote: 975-NM-190312-0005608 / OGDCL	Rev: A
Description: NPS 12 Large ET 585C Size 80 DVC6200 377 Volume Tanks Factory Mtgs DVC6200/DVC2000		
Service Description:		

Service:		Positioner Type:	DVC6200,Auto Calibrate-AC
Size and Type:	NPS 12 Large ET	Input Signal:	4 to 20 mA dc
Body Style:	Globe	Access:	67DFR Filter/Regulator
Design Temp:	120 deg F	Gauges:	0-160 psig/0-11 bar
Design Press:	200 psig	Action:	Increasing Input Moves Piston Down
End Connect/In/Out:	CL300/RF Flg/RF Flg	Certification:	FM,Explosion Proof/Intrinsic Safe/Nonincendive
Material:	WCC Steel	Controller Type:	
Ports:	1	Action:	
Flow Direction:	Up	Measure Element:	
Trim Number:	47	Range:	
Cage Matl:	17-4 SST DBL H1150	Output:	
Retainer Matl:		Mounting:	
Bushing Matl:		Airset:	
Seat Ring Matl:	316 SST with CoCr-A	Mounting:	
VALVE PLUG		Transducer:	
Material:	CF8M with CoCr-A	Input Signal:	
Guiding:	Cage	Output Signal:	
Balance:	Balanced	Action:	
Shutoff Class:	ANSI CL IV	Mounting:	
Port Size:	11 Inch	Airset:	
Characteristic:	Whisper III	Certifications:	
Stem Material:	S20910 SST	Line In:	12 in, SCH 40
Stem Size:	1 1/4 Inch	Line Out:	12 in, SCH 40
Bonnet Style:	Style 1 Extension	Insulation:	None
Boss Size:	5H	Service Cond:	
Packing:	Double PTFE Press	Process Fluid:	
Access:	No,No	Critical Pressure:	
Bolt, Bonnet:	SA-193-B7 Studs/2H Nuts NCF2	Shutoff Drop:	200 psi
PackFlg/Bltg:	SST Pkg Flg, SST Studs & Nuts		
Actuator:	Piston		
Type/Size:	585C/80		
Travel:	5 1/2 Inch		
Bench Set:			
Push Down To:	PDTC		
Supply:	Air		
To Actuator:	60 psig		
Fails Valve:	Close		
Handwheel:	None	Max Rated Cv:	1049.0

Variable Name	Unit	MIN	OPER	MAX
Volumetric Flow Rate Gas (Qg)	MMscfd	78.00000000	130.00000000	146.00000000
Inlet Pressure (P1)	psig	70.000	150.000	200.000
Pressure Change (dP)	psi	60.000	120.000	150.000
Inlet Temperature (T1)	deg F	120.0000	120.0000	120.0000
M / Gg	M	19.790	19.790	19.790
Specific heats ratio (gamma)		1.290	1.290	1.290
Dynamic Viscosity (Mu)	cP	0.013	0.013	0.013
Sizing Coefficient (Cv)		949.870	844.016	752.209
% Open		86	74	63
Valve LpA(LpAValve1m)	dB(A)	86	88	87

## NOTES:

- 1- NACE Compliant.
- 2- We have used Inlet Pressure as Design Pressure and Shutoff Pressure.
- 3- We have used Inlet Temperature as Design Temperature.

## Valve/Regulator Sizing Calculation

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	
Contact:	Contact: <b>Nazar Muhammad</b>	
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	Lead Time:
Item: 3	Rev:	Qty: 1
Tags: 20-PCV-102	Quote: 975-NM-190312-0005608/OGDCL	Rev: A
Description: NPS 12 Large ET 585C Size 80 DVC6200 377 Volume Tanks Factory Mtgs DVC6200/DVC2000		
Service Description:		

Sizing Type: Gas	Flow is Turbulent	Solving for: Cv	Noise is FisherAerodynamic	Flow is Volumetric
Variable Name	Units	MIN	OPER	MAX
<b>SERVICE &amp; SIZING</b>				
Gas				
Inlet Pressure (P1)	psig	70.000	150.000	200.000
Pressure Change (dP)	psi	60.000	120.000	150.000
Inlet Temperature (T1)	deg F	120.0000	120.0000	120.0000
Volumetric Flow Rate Gas (Qg)	MMscfd	78.00000000	130.00000000	146.00000000
Pressure drop ratio factor (Xt)		0.841	0.778	0.727
Pressure Recovery Factor (Fi)		0.890	0.890	0.890
Valve style modifier (Fd)		0.350	0.350	0.350
Atmospheric Pressure	psi	14.69	14.69	14.69
Dynamic Viscosity (Mu)	cP	0.013	0.013	0.013
Specific heats ratio (gamma)		1.290	1.290	1.290
Molecular Weight/Specific Gravity	M	19.790	19.790	19.790
Inlet Compressibility Factor (Z1)		0.980	0.980	0.980
Pipe Size Up	in	12	12	12
Pipe Schedule Up		40	40	40
Pipe Size Down	in	12	12	12
Pipe Schedule Down		40	40	40
Nominal Valve Diameter (dv)	in	12.000	12.000	12.000
Aerodynamic Distance (Rn)	in	39.37	39.37	39.37
Sizing Coefficient (Cv)		949.870	844.016	752.209
% Open		86	74	63
dP Choked	psi	65.628	118.062	143.816
dP/P1 Valve		0.708	0.729	0.699
Fp		1.00	1.00	1.00
<b>NOISE CALCULATION</b>				
Valve/Trim		Whisper III A3	Whisper III A3	Whisper III A3
Whisper III Trim Level		A3	A3	A3
Valve Lpa (LpAe1m)	dB(A)	86	88	87
Valve Lpa (LpAeRn)	dB(A)	86	88	87
<b>VELOCITY OUTPUTS</b>				
Valve Outlet Area(Ao)	in2	113.000	113.000	113.000
M1 Pipe	Mach	0.161	0.138	0.119
Mo Valve	Mach	0.557	0.513	0.398
M2 Pipe	Mach	0.563	0.518	0.402
V1 Pipe	ft/s	220.391	188.889	162.732
Vo Valve	ft/s	764.106	703.579	545.878
V2 Pipe	ft/s	771.399	710.294	551.088
C1 Pipe	ft/s	1371.054	1371.054	1371.054
Co Valve	ft/s	1371.054	1371.054	1371.054
C2 Pipe	ft/s	1371.054	1371.054	1371.054
Item Notes:				

# Actuator Sizing Calculation

Customer: OIL AND GAS DEVELOPMENT CO LTD      TECHNOBIZ (Private) Limited  
 Contact:      Contact: **Nazar Muhammad**  
 Customer Reference: Control valves LCV-106/206 and PCV-102      Sales Office Reference:      Lead Time:  
 Item: 3      Rev:      Qty: 1      Quote: 975-NM-190312-0005608 / OGDCL      Rev: A  
 Tags: 20-PCV-102      Date Last Modified: 12/03/2019  
 Description: NPS 12 Large ET 585C Size 80 DVC6200 377 Volume Tanks Factory Mtgs DVC6200/DVC2000  
 Service Description:

Variable Name	Values	Units
Pas Available	60	psig
Valve Body Size	12.0	in
Port Diameter	11.00	in
Unbalanced Area	0.49	in <sup>2</sup>
Valve Travel	5.50	in
Valve Stem Size	1.25	in
Valve Friction	180.00	lbf
Additional Friction	0.00	lbf
Seat load force	80.00	lbf/in
P1 Max	200.00	psig
P2 Min	0.00	psig
Unbalance Force @ Open	0.00	lbf
Fluid Negative Gradient	4	in
dP Flowing	150	psi
Type 377 Trip Valve	Yes	
Volume Tank	Yes	
HandWheel	No	
Works	Yes	
Actuator Size	80	
PS Required	60.00	psig
Actuator Thrust	5133.0	lbf
Valve Thrust	3092.0	lbf

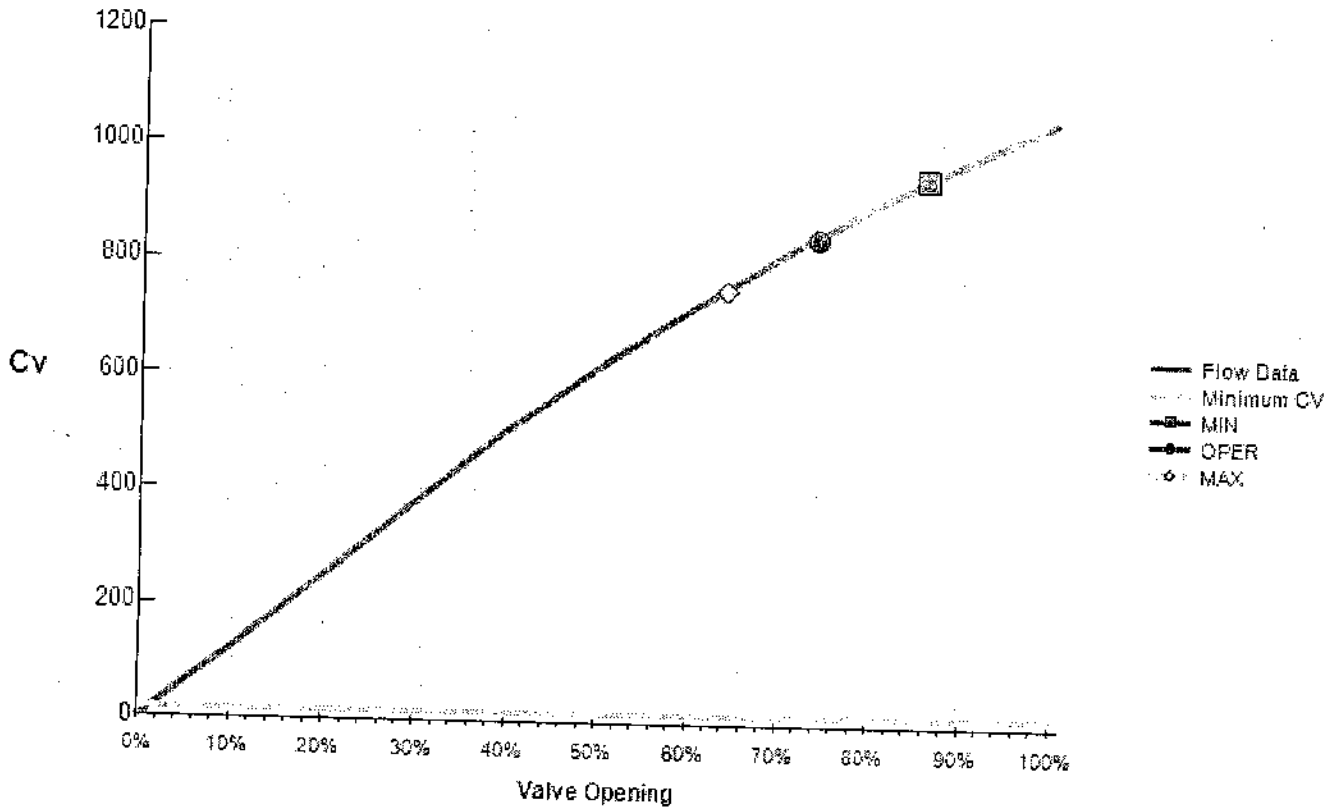
FISHER

# Flow Coefficient Graph

EMERSON

Customer: OIL AND GAS DEVELOPMENT CO LTD	TECHNOBIZ (Private) Limited	Lead Time:
Contact:	Contact: Nazar Muhammad	Rev: A
Customer Reference: Control valves LCV-106/206 and PCV-102	Sales Office Reference:	
Item: 3      Rev:	Qty: 1      Quote: 975-NM-190312-0005608 / OGDCL	
Tags: 20-PCV-102	Date Last Modified: 12/03/2019	
Description: NPS 12 Large ET 585C Size 80 DVC6200 377 Volume Tanks Factory Mtgs DVC6200/DVC2000		
Service Description:		

Flow Coefficient vs. Valve Opening



Caution: Operation Not Recommended below Minimum CV value of 17

Product: Large ET/EWT    Valve Size=NPS 12    Flow=Up    Trim Style/Characteristic=Whisper III    Trim Level=A3    Port  
Diameter=11 Inch    Construction=Short Neck    Travel=5 1/2 Inch





ENAR PETROTECH  
SERVICE (PVT.) LTD.



CONTROL VALVE

DATA SHEET NO	0225-JMA-6000
SHEET NO.	1 OF 1
DATE	4-Feb-19
REV	0
PREPARED BY	WAS
CHECKED BY	NAS
APPROVED BY	NAS

OWNER: OIL & GAS DEVELOPMENT COMPANY LIMITED (OGDCL)  
PROJECT: QADIRPUR FLARE PCV ADEQUACY CHECK (PHASE-II)

1	Tag Number	Note - 6	20-PCV-102		
2	Service		on line of Gas from Slug Catcher to Flare		
3	Line No.		12"-G-BA2-20012		
4	Piping Class		ANSI Class 300		
5	Pipe Size UP / Pipe Size Down		12" / 12"		
6	Pipe Schedule UP / Pipe Schedule Down		40 / 40		
7	R&ID No.		2037-20-P-115		
8	Fluid		Hydro Carbon		
9	State		Gas		
10	Flow Rate (MMSCFD)(min/oper/max)		78	130	146
11	Inlet Press at Flow (psig)		70	150	200
12	Dp at Flow (psi)		60	120	150
13	Temperature (°F)		120	120	120
14	Vapour Pressure (psia)		-		
15	Critical Pressure (psig)		-		
16	Critical Temperature (°F)		-		
17	Shut-off Pressure (psig)		-		
18	Gas Compressibility Factor		0.98		
19	Specific Gravity Mixture at STP		-		
20	Density at Oper. Conditions (lb/ft <sup>3</sup> )		0.540		
21	Specific Gravity Gas at Std. Conditions		-		
22	Viscosity (cP) Gns / Liquid		0.0131	-	-
23	Vapour (Wt%) / Liquid (Wt%)		100%	0%	-
24	Flow type (Choked/Flashing etc.)		-		
25	Sour Service	(Yes / No)	Yes		
26	K=C/P/CV MW		1.29	19.79	-
27	Calculated Cv	Min./Oper./Max.	VTA	VTA	VTA
28	Valve Body Size / Rating	Note-1	(VTA) / 300# RF		
29	Selected Cv		VTA		
30	Valve Type / Port		Globe / Single		
31	Trim / Bearing Material		316 SS compliant		
32	Body Material		A-216 WCB Carbon Steel		
33	END Connection	(Inlet/Outlet)	VTA / Flanged 300 # RF (ASME B 16.5)		
34	Valve Stem Packing		Teflon / VTA		
35	Control Characteristic / Rangeability		Equal Percentage / VTA		
36	Seat Material	Note - 5	316 SS		
37	Plug	Note - 5	316 SS		
38	Shaft	Note - 5	316 SS		
39	Fail (Open / Close)		Close		
40	Leakage Rate (Class to ASME FCI 70-2)		Class IV		
41	Comply to NACE Standard	Note - 9	Yes		
42	Actuator Type		Spring Diaphragm		
43	Actuator Size	Note - 10	VTA		
44	Air Connection Size		1/4" NPT		
45	Actuator Action		Air to Open		
46	Air Supply Pressure		60 PSIG		
47	Failure Action		Close		
48	Available Air Supply	Note - 10	100 PSIG		
49	Valve Duty (On/Off or Throttle)		Throttle		
50	Travel Stop / Handwheel / Solenoid Valve		Not Required		
51	Type / Tag No.		Electropneumatic / 20-PY-102		
52	Enclosure Type		Aluminium / IP 65		
53	Input Signal Range		4-20 mA, 24 VDC with HART		
54	Output Signal		3-15 PSI		
55	Action		Direct		
56	Air Supply Pressure / Air Connection		60 Psig / VTA		
57	Air Regulator / Manufacturer		Yes / 1/2" NPT (F)		
58	Gauges		Yes		
59	Electrical Classification / Protection	Note - 7	Ex'd IIC T4		
60	Cable Connection	Note - 8	M 20 x 1.5		

61	NOTES:
1-	Vendor to check selection/sizing and materials of valve and actuator and may change body size and to return one completed copy to purchaser with quotation.
2-	Vendor shall provide SS Tag attached with SS Screws or SS Wire. Tag shall contain Tag No. & Model No.
3-	Noise level shall not be above 85DB at 1 meter distance. Supplier shall provide noise solution for valve having noise level above 85DB.
4-	Vendor to calculate and verify the body size and valve Cv. The trim may be varied as per sizing condition.
5-	For flashing service hard face trim material shall be used.
6-	Existing Control Valve Tag # 20-PCV-102 shall be replaced with New Control Valve.
7-	Approval for Electrical / Hazardous Area Classification shall be from CBNELEC, ATEX, Factory Mutual (FM), IEC or Canadian Standards Association (CSA).
8-	Vendor shall provide Ex'e metallic plugs for spare electrical connection.
9-	All wetted parts shall conform to NACE MR-0175 / ISO 15156 (latest edition).
10-	Vendor to confirm that Actuator selected shall be operated within available Air Supply pressure range.
	*VTA = Vendor To Advise

	<b>CLIENT</b> <b>PRODUCED WATER ADEQUACY &amp; CAPACITY ENHANCEMENT AT QADIRPUR GAS FIELD</b>		<b>CONSULTANT</b> 	
	<b>DOCUMENT TITLE</b> <b>DATA SHEET OF LEVEL CONTROL VALVE (LCV-5206)</b>			
	<b>DOCUMENT NO.</b> <b>2547-PDS-001</b>		<b>Rev-1</b>	

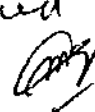
Page No. 1/4

GENERAL	1	Tag Number	CCV-5206			20-LCV-106/206		
	2	Service	Condensate / Water Separator					
	3	Line Size	4"					
	4	Area Classification	Zone 1 Gas Group IIA Temperature class T3 min.					
	5	Ambient Temperature	Min.	Max.	23	°F		120
	6	Allowable Sound Pressure Level	85 @ 1m from the Valve					
	7	Tightness Requirements	ANSI IV (Standard)					
	8	Availability of Supply Press.	Min.	Max.	70	psig		100
	9	Power Failure Position	Close					
10	P&ID Drawing Number	2547-PDS-001						
PIPE LINE	11	Line Size and Schedule	Inlet	Outlet	4	in		4
	12	Pipe Material	A106 Gr. B					
	13	Pipe Insulation	None					
PROCESS CONDITION	14	Process Flow	CONDENSATE / WATER					
	15	Upstream Condition	Three Phase					
	16	Differential Pressure for Actuator Sizing	900					
	17					@ Max. Flow	@ Norm. Flow	@ Min. Flow
	18	Gas Flow	scfm	130	111	80		
	19	Cond. Flow	psig	950	750	150		
	20	Pressure Drop	psig	850	850	50		
	21	Inlet Temperature	°F	100	100	100		
	22	Inlet Density @ 10000 °F 17 Mol Wt	lb/vol	19.5	19.5	19.5		
	23	Inlet Sp. Gravity		0.85-0.95	0.85-0.95	0.85-0.95		
	24	Inlet Compressibility Factor		0.963	0.963	0.963		
	25	Inlet Viscosity	Cp	0.67	0.67	0.67		
	26	Inlet Specific Heat Rate		1.13	1.13	1.13		
	27	Water/Condensate Content	Gal/Day	8500	4500	2500		
	CALCULATED RESULTS	28	Flow Coefficient Cv	VTS				
29		Travel	VTS					
30		Sound Pressure Level	85					
BODY AND TRIM	31	Body Type	Globe					
	32	Body Material	A216 Gr. B					
	33	Body Connection	RTJ BDDP					
	34	Body Flange	ANSI B.16.1					
	35	Body Flange Rating	ANSI B.16.3					
	36	Body Flange Material	A216 Gr. B					
	37	Body Flange Gasket	RTJ					
	38	Body Flange Gasket Material	RTJ					
	39	Body Flange Gasket Rating	RTJ					
	40	Body Flange Gasket Material	RTJ					
	41	Body Flange Gasket Rating	RTJ					
	42	Body Flange Gasket Material	RTJ					
	43	Body Flange Gasket Rating	RTJ					
	44	Body Flange Gasket Material	RTJ					
	ACTUATOR	45	Actuator Type	Solenoid				
46		Actuator Material	316SS					
47		Actuator Flange	ANSI B.16.1					
48		Actuator Flange Rating	ANSI B.16.3					
49		Actuator Flange Material	316SS					
50		Actuator Flange Gasket	RTJ					
51		Actuator Flange Gasket Material	RTJ					
52		Actuator Flange Gasket Rating	RTJ					
53		Actuator Flange Gasket Material	RTJ					
54		Actuator Flange Gasket Rating	RTJ					
POSITIONER	55	Positioner Type	Smart					
	56	Positioner Material	316SS					
	57	Positioner Flange	ANSI B.16.1					
	58	Positioner Flange Rating	ANSI B.16.3					
	59	Positioner Flange Material	316SS					
	60	Positioner Flange Gasket	RTJ					
	61	Positioner Flange Gasket Material	RTJ					
	62	Positioner Flange Gasket Rating	RTJ					
	63	Positioner Flange Gasket Material	RTJ					
	64	Positioner Flange Gasket Rating	RTJ					
SOLENOID VALVE	65	Solenoid Valve Type	Direct Acting					
	66	Solenoid Valve Material	316SS					
	67	Solenoid Valve Flange	ANSI B.16.1					
	68	Solenoid Valve Flange Rating	ANSI B.16.3					
	69	Solenoid Valve Flange Material	316SS					
	70	Solenoid Valve Flange Gasket	RTJ					
	71	Solenoid Valve Flange Gasket Material	RTJ					
	72	Solenoid Valve Flange Gasket Rating	RTJ					
	73	Solenoid Valve Flange Gasket Material	RTJ					
	74	Solenoid Valve Flange Gasket Rating	RTJ					
SWITCHES	75	Switch Type	Limit Switch					
	76	Switch Material	316SS					
	77	Switch Flange	ANSI B.16.1					
	78	Switch Flange Rating	ANSI B.16.3					
	79	Switch Flange Material	316SS					
	80	Switch Flange Gasket	RTJ					
	81	Switch Flange Gasket Material	RTJ					
	82	Switch Flange Gasket Rating	RTJ					
	83	Switch Flange Gasket Material	RTJ					
	84	Switch Flange Gasket Rating	RTJ					
AIR SET	85	Air Set Type	Pressure					
	86	Air Set Material	316SS					
	87	Air Set Flange	ANSI B.16.1					
	88	Air Set Flange Rating	ANSI B.16.3					
	89	Air Set Flange Material	316SS					
	90	Air Set Flange Gasket	RTJ					
	91	Air Set Flange Gasket Material	RTJ					
	92	Air Set Flange Gasket Rating	RTJ					
	93	Air Set Flange Gasket Material	RTJ					
	94	Air Set Flange Gasket Rating	RTJ					
TESTS	95	Hydro Pressure	850					
	96	Leakage	ANSI B.16.104					
	97	Leakage	ANSI B.16.104					
	98	Leakage	ANSI B.16.104					
	99	Leakage	ANSI B.16.104					
	100	Leakage	ANSI B.16.104					
	101	Leakage	ANSI B.16.104					
	102	Leakage	ANSI B.16.104					
	103	Leakage	ANSI B.16.104					
	104	Leakage	ANSI B.16.104					
PURCHASE	105	Manufacturer						
	106	Model						
	107	Part Number						
	108	Price						
	109	Item Number						
	110	Serial Number						
	111	Serial Number						
	112	Serial Number						
	113	Serial Number						
	114	Serial Number						

**NOTES:**

1. Working Material SS316L
2. Noise level shall not be above 85 DB. Supplier shall provide noise solution for having noise level above 85 DB.
3. VTS Vendor to Supply as Vendor to Subject

11/0/2017	1	ISSUED FOR TENDER	RK	NWS	AJ
5/10/2015	0	ISSUED FOR TENDER	AUD	NWS	AJ
Date	Rev	Description	PREP.	CKO	APPR

verified  


**Muhammad Asif**  
 S.E (Process) - 33513  
 OGDC, Qadirpur Gas Field  
 Tele: # 0723-860695



# Sliding Stem Valve Specification

Page No 2/4

Customer: OGDCL  
 Contact: TECHNOBIZ (Private) Limited  
 Customer Reference: RFQ for Level Control Valve LCV- Sales Office Reference: 5206  
 Item: 1 Rev: Qty: 1 Quote: 975-NM-171204-0004185 / Lead Time:  
 Tags: LCV-5206 Date Last Modified: 02/07/2018 Rev: A  
 Description: NPS 2 D 667 Size 45I DVC6200 Factory Mtgs DVC6200/DVC2000  
 Service Description:

Service:		Positioner Type:	DVC6200,Auto Calibrate-AC
Size and Type:	NPS 2 D	Input Signal:	4 to 20 mA dc
Body Style:	Globe	Access:	67CFR Filter/Regulator
Design Temp:	100 deg F	Gauges:	0-60 psig/0-4 bar
Design Press:	950 psig	Action:	Direct
End Connect/In/Out:	CL600/RTJ Flg/RTJ Flg	Certification:	FM,Explosion Proof/Intrinsic Safe/Nonincendive
Material:	LCC Steel	Controller Type:	
Ports:	1	Action:	
Flow Direction:	Up	Measure Element:	
Trim Number:	SST/COCR-A	Range:	
Cage Matl:		Output:	
Retainer Matl:		Mounting:	
Bushing Matl:		Airset:	
Seat Ring Matl:	S31600 SST/CoCr-A Seat	Mounting:	
VALVE PLUG		Transducer:	
Material:	S31600 SST/CoCr-A Seat	Input Signal:	
Guiding:	Post	Output Signal:	
Balance:	Unbalanced	Action:	
Shutoff Class:	ANSI CL IV	Mounting:	
Port Size:	1 1/4 Inch	Airset:	
Characteristic:	Micro-Form (Eq Pct)	Certifications:	
Stem Material:	S20910 SST	Line In:	
Stem Size:	1/2 Inch	Line Out:	
Bonnet Style:	Plain	Insulation:	None
Boss Size:	2 13/16	Service Cond:	
Packing:	Double PTFE Press	Process Fluid:	
Access:	No	Critical Pressure:	
Bolt, Bonnet:		Shutoff Drop:	900 psi
PackFlg/Blg:	SA-193-B7M Studs/2HM Nuts NACE		
Actuator:	Spring & Diaphragm		
Type/Size:	667/45i		
Travel:	3/4 Inch		
Bench Set:	14-30 psi		
Push Down To:	PDTC		
Supply:	Air		
To Actuator:	0 to 33 psig		
Fails Valve:	Close		
Handwheel:	Side Mounted	Max Rated Cv:	34.5

Variable Name	Unit	MAX	NOR	MIN
Mass Flow Rate Gas (w)	lb/h	130.000	111.000	90.000
Volumetric Flow Rate Liquid (Ql)	barrel/d	6500.00	4500.00	2500.00
Inlet Pressure (P1)	psig	950.000	750.000	150.000
Pressure Change (dP)	psi	850.000	650.000	50.000
Inlet Temperature (T1)	deg F	100.0000	100.0000	100.0000
Vapor Pressure (Pv)	psig	290.300	290.300	149.000
Sizing Coefficient (Cv)		9.501	7.604	27.603
% Open		63	58	88

NOTES:  
 Kindly re-check the specs at your end before placing the order.

# Valve/Regulator Sizing Calculation

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Customer:	TECHNOBIZ (Private) Limited		
Contact:	Contact: Nazar Muhammad		
Customer Reference: RFQ for Level Control Valve LCV-5206	Sales Office Reference:	Lead Time:	
Item: 1	Rev:	Qty: 1	Quote: 975-NM-171204-0004185/OGDCL
Tags: LCV-5206	Date Last Modified: 02/07/2018		Rev: A
Description: NPS 2 D 667 Size 45I DVC6200 Factory Mtgs DVC6200/DVC2000			
Service Description:			

Variable Name	Units	MAX	NOR	MIN
<b>SIZING TYPE: Two Phase Gas</b>				
<b>Flow is Turbulent</b>				
<b>Solving for: Cv</b>				
<b>Noise is None</b>				
<b>Flow is Mass</b>				
<b>SERVICE &amp; SIZING</b>				
Gas				
Inlet Temperature (T1)	deg F	100.0000	100.0000	100.0000
Inlet Pressure (P1)	psig	950.000	750.000	150.000
Pressure Change (dP)	psi	850.000	650.000	50.000
Pressure drop ratio factor (Xt)		0.517	0.502	0.525
Pressure Recovery Factor (F1)		0.850	0.850	0.850
Atmospheric Pressure	psi	14.69	14.69	14.69
Mass Flow Rate Gas (w)	lb/h	130.000	111.000	90.000
Molecular Weight/Specific Gravity	M	19.500	19.500	19.500
Specific heats ratio (gamma)		1.130	1.130	1.130
Inlet Compressibility Factor (Z1)		0.983	0.983	0.983
Volumetric Flow Rate Liquid (Ql)	barrel/d	6500.00	4500.00	2500.00
Specific Gravity (SG)		0.960	0.960	0.860
Vapor Pressure (Pv)	psig	290.300	290.300	149.000
Sizing Coefficient (Cv)		9.501	7.604	27.603
% Open		63	58	88
Cv Gas		0.086	0.094	0.359
Cv Liquid		9.257	7.306	22.887
dP/P1 Valve		0.881	0.850	0.304
dP Choked Gas	psi	402.636	309.780	69.748
dP Choked Liquid	psi	493.780	349.280	8.729
Two Phase Correction Factor (Fm)		0.017	0.027	0.187
Gas Volume ratio (Vr)		0.026	0.040	0.220
Gas sizing pressure drop ratio		0.417	0.405	0.304
Item Notes:				

## Actuator Sizing Calculation

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Customer:	TECHNOBIZ (Private) Limited		Lead Time:
Contact:	Contact: Nazar Muhammad		
Customer Reference: RFQ for Level Control Valve LCV-5206	Sales Office Reference:		
Item: 1	Rev:	Qty: 1	Quote: 975-NM-171204-0004185 / OGDCL
Tags: LCV-5206	Date Last Modified: 02/07/2018		Rev: A
Description: NPS 2 D 867 Size 45I DVC6200 Factory Mtgs DVC6200/DVC2000			
Service Description:			
Variable Name	Values	Units	
Pa	0.00	psig	
Pb	33.00	psig	
Valve Body Size	2.0	in	
Port Diameter	1.25	in	
Unbalanced Area	1.36	in <sup>2</sup>	
Valve Travel	0.75	in	
Valve Stem Size	.5	in	
Valve Friction	75.00	lbf	
Additional Friction	0.00	lbf	
Seat load force	40.00	lbf/in	
P1 Max	900.00	psig	
P2 Min	0.00	psig	
Unbalance Force @ Open	0.00	lbf	
Fluid Negative Gradient	0.00	in	
dP Flowing	0.00	psi	
With Side MO	Yes		
Works	Yes		
Actuator Size	45I		
Spring	1E8264		
Product Lower Bench Set	14.00	psig	
Product Upper Bench Set	30.00	psig	
Spring Rate	2240.00	lbf/in	
Spring Windup	0.66	in	
Max Spring Load	3150.11	lbf	
PS Required	33.52	psig	
Actuator thrust down	1470.11	lbf	
Actuator thrust up	369.00	lbf	
Valve thrust down	1457.88	lbf	
Valve thrust up	75.00	lbf	
Lower Bench Set	14.00	psig	
Upper Bench Set	30.00	psig	
Lower Stroking	2.33	psig	
Upper Stroking	30.00	psig	
Lower Friction Band(+/-)	0.71	psig	
Upper Friction Band(+/-)	0.71	psig	
Lower Operating	0.12	psig	
Upper Operating	31.52	psig	
Req. Handwheel thrust	3309.11	lbf	
Supply Pressure Used	33.00	psig	