

Introduction

The Valtek Sizing & Selection Manual is a comprehensive, easy-to-follow reference guide for determining the proper control valve for a particular application. The material follows the sequential order of the typical Valtek quote sheet (as shown in Figures 1-1 through 1-3).

This introduction discusses general information about control valve sizing. It also outlines the basic control valve parameters which must be known for correct sizing.

THE CONTROL VALVE

A control valve is a final control element used in instrumentation systems to regulate the flow, pressure or temperature of liquids and gases in process systems.

A control valve is different from other valves in that it has a power positioning actuator for moving the closure mechanism in response to an external signal. The actuator's energy source is usually provided from an independent source.

The following reference table outlines the line of Valtek control valves, along with their applications, advantages and limitations:

TABLE 1-I: Globe Valves

Valve	Application	Advantages	Limitations
Mark One	Cryogenic to high temperature; vacuum to high-pressure	Higher ΔP than rotary; tight shutoff	Lower C_v than rotary valve
Mark Two	High-pressure	Fabricated, no casting delay	Size limitations
Mark Eight	High flow rates	High C_v ; self-draining in some applications	Angled top-works; maintenance
Three-way	Combining/diverting service	3-way capability	Limited to 3-way service
Angle	Erosive service; slurries	Streamlined; self-draining	Piping

TABLE 1-II: Rotary Valves

Valve	Application	Advantages	Limitations
Valdisk	High flow with low ΔP	High C_v ; low cost; lightweight	Low F_L ; low ΔP
ShearStream	High flow; slurries; pulp stock	High C_v ; high rangeability	Low F_L ; low ΔP

TABLE 1-III: Severe Service

Valve	Application	Advantages	Limitations
CavControl	Minor cavitation control	Minimizes cavitation damage; low cost alternative	Limited to minor cavitation
ChannelStream	Anti-cavitation	Eliminates cavitation damage	Relative cost
MegaStream	Gaseous noise control	Wide range of attenuation	Relative cost
Tiger-Tooth	Anti-cavitation and gaseous noise control	Eliminates cavitation damage; wide range of attenuation	Relative cost

TABLE 1-IV: Special Service

Valve	Application	Advantages	Limitations
Mark Four	Check valve	Non-slamming	Limited application
Mark Six	Cryogenics; cold box	Top-entry; no flanges in cold box	Limited application
Guardian	Critical services	Zero leakage; metal bellows stem seal	Limited application

SELECTING THE RIGHT CONTROL VALVE

Control valves are available in a variety of styles and configurations, depending on the flow conditions, pressure and temperature requirements, material requirements, end connections, leakage classifications, cost, and customer preference. In general, the Valtek control valve selected will be one of four types: 1) globe, 2) rotary, 3) severe service or 4) special service.

Mark One globe-style control valves feature a standard cast carbon steel or stainless steel globe body, top-entry trim with a characterized plug contour, high thrust double-acting piston actuator, four-way positioner, and fail-safe return spring. In addition to the carbon and stainless steel construction, Mark One bodies can be furnished in various grades of chrome-moly, alloy 20, Hastelloy "B" and "C", Monel, Inconel, titanium, bronze, nickel, and other castable materials.

The Mark One is available in sizes ranging from 1/2 through 42-inch, and in ANSI Pressure Classes from 150 through 4500. Body styles include standard globe, globe with expanded outlets (Mark One-X), angle and three-way configurations. A variety of end connections is also available, including raised face, RTJ (ring-type joint), socketweld, buttweld, NPT (National Pipe Threads) and Grayloc. This versatility makes the globe design the most widely used of all control valve types.

Mark Two control valves are similar to Mark One globe-style valves except that the body is fabricated from barstock. It is typically available in sizes from 1/2 through 2-inch and Classes from 150 through 2500. Special designs are also available for body sizes up to 6-inch with special applications to 15,000 psi.

Valdisk is a high-performance eccentric disk control valve with quarter-turn action. It utilizes an elastomeric or metal seat for tight shutoff. Valdisk features a flangeless wafer body that fits between raised-face line flanges.

One Valdisk body serves ANSI Classes 150 through 600 in sizes 2 through 8-inch, and Classes 150 through 300 in sizes 10 through 12-inch. The disc pressure class on Valdisk valves 12-inch and smaller is one pressure class less than the maximum body rating. For example, an ANSI Class 600, 8-inch Valdisk has a maximum shaft pressure drop of 720 psi. Sizes 14 through 30-inch use a Class 150 body as a standard. Valtek also has the capability to design and manufacture special high-pressure bodies and discs.

Valdisk is available in the same body materials as the Mark One. It also uses a piston actuator with a rotary transfer case in place of the linear yoke. Many parts are interchangeable between Valdisk and Mark One.

ShearStream is a high-performance ball valve designed to overcome the problems of harsh, particle entrained processes. Its high 300 to 1 rangeability, or turn down ratio, also makes ShearStream an ideal control valve for use in high temperature water and steam applications. It is available in sizes 1-inch through 12-inch and ANSI Pressure Classes 150, 300 and 600. Class IV and VI shutoff are achieved with Valtek's unique Flex-Loc™ metal seal and soft seal design, respectively.

ShearStream's V-notch ball design reduces clogging and improves shearing action, making it an ideal control valve for particle entrained processes. The one-piece body design overcomes many long standing challenges faced by traditional ball valves: piping forces that unevenly load the seat, low rangeability due to limited orifice characterization, and unsatisfactory shutoff capabilities. Available body materials include 316 stainless steel and carbon steel. Ball materials available include 317 stainless steel with either hard chrome or Stellite facing.

MegaStream, ChannelStream and Tiger-Tooth control valves use special trim enclosed in the standard Mark One body to eliminate problems associated with high pressure drops. MegaStream minimizes the aerodynamic noise associated with gas services. ChannelStream eliminates cavitation and vibration in liquid services. Tiger-Tooth is used in liquid services to eliminate cavitation and in gaseous applications when the required noise attenuation exceeds 20 dB. All three valves use the same materials of construction as the Mark One.

These special trims act to eliminate noise and damaging cavitation which would otherwise severely limit service life of the valve, cause premature mechanical failure of the component parts or prevent personnel from working near the valve.

Valtek also offers special service control valves which are designed for a specific application where standard control valves are not particularly suited or easily adapted.

Tek-Check check valves are often used with reciprocating and centrifugal pumps to provide directional flow control. The body and seat ring are both interchangeable with the Mark One. Tek-Check materials of construction are the same as the Mark One.

Mark Six cryogenic valves are specially designed for use in cryogenic air separation columns where all equipment is sealed and insulated in the cold box. Access to the trim is through the valve bonnet. Bodies are available in bronze and various grades of stainless steel.

Mark Eight Y-pattern valves offer a greater capacity per valve size than do standard globe valves, while at the same time retaining the advantages of the globe valve configuration. Materials of construction are identical to the Mark One.

SELECTION CRITERIA

To properly select the type of control valve best suited for a particular application, sizing calculations must be determined with accurate process conditions. Based on the estimated body size, consideration should then be given to the following selection criteria:

Flow Conditions

In general, applications for relatively low operating pressures and nominal operating temperatures may use any one of the “general service” control valves. Where pressure drops are small and flow rates are substantial, the Valdisk control valve, with its large capacity per size, may be chosen. The Mark One body style, on the other hand, should be chosen for those applications where operating pressures and pressure differentials are higher. Large pressure drops often require the use of Tiger-Tooth, MegaStream, CavControl or ChannelStream trim to reduce noise and damage to the valve and associated piping.

Pressure and Temperature Requirements

Regardless of the body style, selection of a control valve must be in accordance with established material properties. ANSI Standard B16.34 lists the allowable temperature and pressure combinations for a variety of body materials. Standard pressure classes include ANSI Classes 150, 300, 600, 900, 1500, 2500 and 4500. (Valtek also has the capability to work with higher ratings and special class valves.) For a given body material, each class denotes the maximum working pressure for a given operating temperature. Due to loss of material strength, the allowable working pressure decreases as the operating temperature rises. Lower temperature limits are also specified due to loss of ductility in some materials. Although a pressure class is usually indicated for an application, proper attention to selection of the pressure class is crucial to the safe operation of the control valve.

Standard Valdisk may be specified in services up to ANSI Class 600, 2 thru 8-inch, with reduced pressure classes in larger size valves. However, Valtek specializes in high-pressure, high temperature applications. For applications where the working pressures and temperatures are extremely high, special Mark One and Mark Two valves can be selected. These valves can be designed with pressure and temperature ratings that exceed the parameters of ANSI Standard B16.34.

Material Requirements

Proper material selection is essential for reasonable valve life. Process fluid corrosion, high velocity erosion, entrained particles, cavitation or other problems can combine to destroy or consume improperly specified

materials. Where carbon steel or stainless steel materials are unsuitable for a corrosive process, special alloys should be selected based on material compatibility with the process fluid. Where erosion exists, harder or more durable materials can be specified to prolong the valve life.

Since the control valve user is most familiar with the chemical composition and corrosive properties of the process fluid, the ultimate responsibility for material selection rests with the user.

Special materials of construction are available in all product lines. Alloy costs can be cut, however, by using Valdisk in applications where exotic alloys are required and where process conditions permit. Because of their size and weight, rotary valves tend to be less costly than comparable globe-style valves.

The Mark One minimizes costs with separable bonnet and end flanges. These flanges can be supplied in less expensive materials since they do not come in contact with the flowing medium. Carbon steel and stainless steel valves can be specified with carbon steel flanges. Exotic alloy valves such as Alloy 20, Hastelloy, Inconel and others are typically specified with 316 stainless steel flanges for significant cost savings. Using separable flanges – instead of integral flanges – can also result in significant cost savings.

End Connections

Most control valve specifications request raised face flange connections suitable for bolting to the process piping. In power piping and nuclear applications, butt-weld ends suitable for welding to the process piping are typical. For limited applications, screwed end connections (NPT) and socket-weld ends are specified for globe valves in sizes 2-inch and smaller. Some high-pressure applications may require the use of RTJ (ring-type joint) flanges or patented Grayloc hub ends. Flangeless, wafer-style connections are specified in applications where rotary valves are suitable for the process conditions. These connections are usually raised face.

The Mark One can be built with any one of the standard end connections, except the flangeless wafer style. The Mark One also uses face-to-face dimensions per ANSI Standard B16.10 for valve sizes 1/2 through 4-inch and ANSI Classes 150 through 600 (allowing the use of the same Class 600 face-to-face dimension for all three Pressure Classes with a given body size).

With separable flanges, the standard ANSI face-to-face dimension allows the use of a single body casting for ANSI Class 150, 300 and 600 for a given body size. This greatly reduces inventory costs and increases critical spare parts availability. For all valve sizes – except 6-inch and larger valves, Class 900 – the ISA face-to-face dimension per ANSI/ISA Standard 75.03 is available, and is standard with all valves 6-inch and larger.

Leakage Connections

Control valve seat leakage can be an important factor in the selection of a control valve. Seat leakage is typically rated by leakage class per ANSI Standard B16.104. Most standard Valtek control valves shutoff tighter than Class IV, which corresponds to a leakage rate of 0.01% of the rated valve capacity. Class V or Class VI leakage can be obtained with proper actuator sizing or a soft seat selection.

With globe or rotary valves, a “bubble-tight” Class VI leakage can be specified using an elastomeric insert configuration (commonly referred to as a “soft seat”). However, there are some soft seat limitations to remember, such as temperature and pressure.

Pressure-balanced valves typically meet Class II and Class III leakage when used with a metal seat and metal or resilient seals. Pressure-balanced trim can achieve Class IV or Class V leakage when used with a soft seat and exceptionally tight resilient seals.

Cost Considerations

The selection of a control valve type is generally based on the least expensive alternative which will meet the process control requirements. Rotary valves are very economical in applications where capacity requirements are high, and where process pressures and pressure drops are low. Globe valves are usually selected where flows are small and pressure drops are high, or where process fluids may be corrosive or erosive. Severe service control valves, which are typically modifications of a standard globe valve, should be considered for those applications where noise and cavitation must be controlled or eliminated.

Customer Preference

The accumulated experience of control valve users in a particular industry or process plant application may have a strong influence on control valve selection. Pulp and paper plants may use rotary valves almost exclusively due to the problems inherent in processing paper stock. Globe valves are generally selected in most standard applications due to their versatility. High performance rotary valves have gained in popularity as actuator capabilities and linkages have been improved to allow the valves to function as true control valves. Purchase price, performance, cost of maintenance and valve life also influence user preference.



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Globe Valve Quotation

Page

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Date _____ **Project** _____

By _____

SIZE / C_v		TRIM NO.		FILTER/REG.	<input type="checkbox"/> AIR FILTER	<input type="checkbox"/> AIRSET	
MODEL	<input type="checkbox"/> MARK ONE	<input type="checkbox"/> MARK TWO	<input type="checkbox"/>	LIMIT SWITCH	<input type="checkbox"/> EXAR-SPDT	<input type="checkbox"/> EXHAR 3-SPDT	<input type="checkbox"/> EXDAR-DPDT
BODY MATERIAL	<input type="checkbox"/> STEEL	<input type="checkbox"/> 316 S.S.	<input type="checkbox"/>	MODEL NO.	<input type="checkbox"/> OPAR-SPDT	<input type="checkbox"/> OPDAR-DPDT	<input type="checkbox"/>
	<input type="checkbox"/> CR. MO. _____			POSITION PAC	<input type="checkbox"/> _____		
BODY FORM	<input type="checkbox"/> GLOBE	<input type="checkbox"/> ANGLE	<input type="checkbox"/> 3-WAY	<input type="checkbox"/>	TO INDICATE	<input type="checkbox"/> FULL OPEN	<input type="checkbox"/> FULL CLOSE
ANSI CLASS	<input type="checkbox"/> 150	<input type="checkbox"/> 300	<input type="checkbox"/> 600		SOLENOID	<input type="checkbox"/> AC	<input type="checkbox"/> DC VOLTAGE _____
	<input type="checkbox"/> 1500 (900)	<input type="checkbox"/> 2500				<input type="checkbox"/> 3-WAY	<input type="checkbox"/> 4-WAY
END CONNECTION	<input type="checkbox"/> SEP. FLG. (RF)	<input type="checkbox"/> NPT	<input type="checkbox"/> SOCKETWELD			MODEL _____	
	<input type="checkbox"/> INT. FLG. (RF)	<input type="checkbox"/> BUTTWELD SCH. _____		DE-ENERGIZED	<input type="checkbox"/> OPENS VALVE <input type="checkbox"/> CLOSSES VALVE		
	<input type="checkbox"/> RTJ	<input type="checkbox"/>		TRANSDUCER	<input type="checkbox"/> VALTEK <input type="checkbox"/>		
FACE FINISH	<input type="checkbox"/> 125/250 RA	<input type="checkbox"/> 250/500RA	<input type="checkbox"/>	INPUT	<input type="checkbox"/> 4 - 20 mA	<input type="checkbox"/> 10 - 50 mA	<input type="checkbox"/>
SEP. FLANGE	<input type="checkbox"/> STEEL	<input type="checkbox"/> 316 S.S.	<input type="checkbox"/>	MOUNTING	<input type="checkbox"/> MTD.	<input type="checkbox"/> UNMTD.	<input type="checkbox"/> PIPE MTD.
FACE-TO-FACE	<input type="checkbox"/> ANSI B16.10	<input type="checkbox"/> ISA S4.01.1	<input type="checkbox"/> VALTEK STD.	LOCK-UP	<input type="checkbox"/> FAIL-IN-PLACE LOCK-UP		
GASKETS	<input type="checkbox"/> TEFLON	<input type="checkbox"/> SPIR. GRAFOIL	<input type="checkbox"/>	AIR SPRING	<input type="checkbox"/> FAIL-CLOSED <input type="checkbox"/> FAIL-OPEN		
TRIM CHARA.	<input type="checkbox"/> EQ. PERCENT	<input type="checkbox"/> LINEAR	<input type="checkbox"/> QUICK OPEN	FLOW BOOSTER	<input type="checkbox"/> VALTEK	<input type="checkbox"/>	QTY/PORT _____
TRIM MAT'L.	<input type="checkbox"/> 316 S.S.	S / R _____		FLUID		#/HR.	GPM
	<input type="checkbox"/> SEAT S. STELL.	S / RET _____		CRIT. PRESS. / TEMP.	/		
	<input type="checkbox"/> FB & FC. STELL.	PLUG _____		SP.GR. OR MW			SCFH
SPECIAL TRIM	<input type="checkbox"/> CAV CONT.	<input type="checkbox"/> MEGASTREAM	<input type="checkbox"/> CHANNELSTREAM	TEMP. (F)			
	NUMBER OF STAGES _____			VAPOR PRESS.			
PRESS. BAL.	<input type="checkbox"/> SEAL _____	<input type="checkbox"/> SLEEVE MAT'L. _____		INLET (PSIA)			
SOFT SEAT	<input type="checkbox"/> TEFLON	<input type="checkbox"/> KEL-F	<input type="checkbox"/>	OUTLET (PSIA)			
BONN. MAT'L.	<input type="checkbox"/> SAME AS BODY <input type="checkbox"/>			FLOW RATE			
BONNET FORM	<input type="checkbox"/> STANDARD	<input type="checkbox"/> EXTENDED LENGTH _____		REQ'D. C_v			
	<input type="checkbox"/> CRYOGENIC	<input type="checkbox"/>		SPL			
	<input type="checkbox"/> MBS _____	<input type="checkbox"/> MBS MAT'L _____		EXIT VELOCITY			
BONNET FLG.	<input type="checkbox"/> STEEL	<input type="checkbox"/> 316 S.S.		PIPE SIZE	IN	OUT	PIPE SCH. IN OUT
PACKING BOX SPECIALS	<input type="checkbox"/> LUBRICATOR	<input type="checkbox"/> ISO. VALVE		MAX. ΔP / AIR SUPPLY			
	<input type="checkbox"/> TWIN SEAL	<input type="checkbox"/> VACUUM SEAL	<input type="checkbox"/> PURGE	ADTL. FEATURES			
PACKING	<input type="checkbox"/> TEFLON	<input type="checkbox"/> GAIP	<input type="checkbox"/> AFPI				
	<input type="checkbox"/> GRAFOIL	<input type="checkbox"/>					
GUIDES: UPPER	<input type="checkbox"/> GRAFOIL	<input type="checkbox"/> STELLITE	<input type="checkbox"/> G.L. TEF.				
LOWER	<input type="checkbox"/> GRAFOIL	<input type="checkbox"/> STELLITE	<input type="checkbox"/> G.L. TEF.				
AIR TO:	<input type="checkbox"/> OPEN		<input type="checkbox"/> CLOSE				
FLOW:	<input type="checkbox"/> OVER		<input type="checkbox"/> UNDER				
FAIL POSITION	<input type="checkbox"/> OPEN		<input type="checkbox"/> CLOSE				
FUNCTION	<input type="checkbox"/> THROTTLING		<input type="checkbox"/> ON-OFF				
SIZE	<input type="checkbox"/> 25	<input type="checkbox"/> 50	<input type="checkbox"/> 100	<input type="checkbox"/> 200	<input type="checkbox"/> MANUAL	<input type="checkbox"/>	
AUX. H.W.	<input type="checkbox"/> SIDE MTD.		<input type="checkbox"/> PUSH ONLY	<input type="checkbox"/> LIMITORQUE	<input type="checkbox"/>		
SPRING TYPE	<input type="checkbox"/> STANDARD		<input type="checkbox"/> HD	<input type="checkbox"/> NONE	<input type="checkbox"/>		
POSITIONER	<input type="checkbox"/> BETA P/P		<input type="checkbox"/> BETA I/P	<input type="checkbox"/>			
SIGNAL	<input type="checkbox"/> 3-15	<input type="checkbox"/> 3-9	<input type="checkbox"/> 9 -15	<input type="checkbox"/> 4-20 mA			
TUBING	<input type="checkbox"/> 1/4"		<input type="checkbox"/> 3/8"	<input type="checkbox"/>	PRICE EACH		
	<input type="checkbox"/> PVC COATED COPPER		<input type="checkbox"/> S.S.	<input type="checkbox"/>	QTY.		
FITTINGS	<input type="checkbox"/> STD		<input type="checkbox"/> SWAGELOK		TOTAL PRICE		



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Valdisk Quotation

PAGE

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By _____

SIZE / Cv		TRANSDUCER	<input type="checkbox"/> VALTEK <input type="checkbox"/>	
MODEL	<input type="checkbox"/> VALDISK <input type="checkbox"/>	INPUT	<input type="checkbox"/> 4-20 mA <input type="checkbox"/> 10-50 mA	
BODY MATERIAL	<input type="checkbox"/> STEEL <input type="checkbox"/> 316 S.S. <input type="checkbox"/>	MOUNTING	<input type="checkbox"/> MTD. <input type="checkbox"/> UNMTD. <input type="checkbox"/> PIPE MTD.	
ANSI CLASS		LOCK-UP	<input type="checkbox"/> FAIL IN PLACE LOCK-UP	
BODY:	<input type="checkbox"/> 150 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/>	AIR	<input type="checkbox"/> FAIL CLOSE <input type="checkbox"/> FAIL OPEN <input type="checkbox"/>	
DISK:	<input type="checkbox"/> 150 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/>	SPRING	<input type="checkbox"/> VOL. TANK SZ. _____ GAL. TRIP PRESS _____ PSI	
FACE TO FACE	<input type="checkbox"/> MSS SP-67 <input type="checkbox"/>	FLOW BOOSTER	<input type="checkbox"/> VALTEK <input type="checkbox"/>	
FACE FINISH	<input type="checkbox"/> 125/250 RA <input type="checkbox"/> 250/500 RA <input type="checkbox"/>	TUBING	<input type="checkbox"/> 1/4" <input type="checkbox"/> 3/8" <input type="checkbox"/>	
DISK MATERIAL	<input type="checkbox"/> 316 S.S. <input type="checkbox"/> STEEL W/CHROME PLATE <input type="checkbox"/> 316 W/CHROME PLATE <input type="checkbox"/>	MATERIAL	<input type="checkbox"/> PVC COATED COPPER <input type="checkbox"/> S.S. <input type="checkbox"/>	
SHAFT MATERIAL	<input type="checkbox"/> 17-4 PH <input type="checkbox"/> NITRONIC 50 <input type="checkbox"/>	FITTINGS	<input type="checkbox"/> STANDARD <input type="checkbox"/> SWAGELOK <input type="checkbox"/>	
PIN MATERIAL	<input type="checkbox"/> 17-4 PH <input type="checkbox"/> NITRONIC 50 <input type="checkbox"/>	ADDITIONAL FEATURES		
SEAT STYLE	<input type="checkbox"/> SOFT <input type="checkbox"/> METAL <input type="checkbox"/> DUAL SEAT			
SEAT MATERIAL	<input type="checkbox"/> TEFLON <input type="checkbox"/> 316 S.S. <input type="checkbox"/>			
SEAT GASKET	<input type="checkbox"/> TEFLON <input type="checkbox"/> SPIRAL GRAFOIL <input type="checkbox"/>			
END SEAL	<input type="checkbox"/> STD <input type="checkbox"/> FLANGED			
SEAL MATERIAL	<input type="checkbox"/> TEFLON <input type="checkbox"/> GRAFOIL <input type="checkbox"/>			
BEARINGS	<input type="checkbox"/> PEEK <input type="checkbox"/> BRNZ <input type="checkbox"/> NITRON <input type="checkbox"/> STELL <input type="checkbox"/> FBRGL/TFE			
BONNET	<input type="checkbox"/> STANDARD <input type="checkbox"/> EXTENDED			
FORM	<input type="checkbox"/> CRYOGENIC LENGTH _____			
PACKING	<input type="checkbox"/> TEFLON <input type="checkbox"/> GAIP <input type="checkbox"/> AFPI <input type="checkbox"/> GRAFOIL <input type="checkbox"/>			
PACKING BOX	<input type="checkbox"/> LUBRICATOR <input type="checkbox"/> ISO. VALVE <input type="checkbox"/> PURGE			
SPECIALS	<input type="checkbox"/> TWIN SEAL <input type="checkbox"/> VACUUM SEAL <input type="checkbox"/>			
AIR TO	<input type="checkbox"/> OPEN <input type="checkbox"/> CLOSE			
SHAFT	<input type="checkbox"/> DOWNSTREAM <input type="checkbox"/> UPSTREAM	FLUID	#/HR.	GPM
FAIL POSITION	<input type="checkbox"/> NOT REQ'D. <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSE	CRIT. PRESS/TEMP		
FUNCTION	<input type="checkbox"/> THROTTLING <input type="checkbox"/> ON-OFF	SP. GR. OR MW		
ACTUATOR TYPE	<input type="checkbox"/> CYLINDER <input type="checkbox"/> MAN. GEARED <input type="checkbox"/>	TEMP (°F)		
SIZE	<input type="checkbox"/> 25 <input type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> 200 <input type="checkbox"/>	VAPOR PRESS.		
HANDWHEEL	<input type="checkbox"/> DECLUTCHABLE SIDE-MOUNTED <input type="checkbox"/>	INLET (PSIA)		
SPRING	<input type="checkbox"/> STANDARD <input type="checkbox"/> HD <input type="checkbox"/> NONE <input type="checkbox"/>	OUTLET (PSIA)		
POSITIONER	<input type="checkbox"/> BETA P/P <input type="checkbox"/> BETA I/P <input type="checkbox"/>	FLOW RATE		
SIGNAL	<input type="checkbox"/> 3-15 <input type="checkbox"/> 3-9 <input type="checkbox"/> 9-15 <input type="checkbox"/> 4-20 mA <input type="checkbox"/>	REQ'D Cv		
CAM	<input type="checkbox"/> = % <input type="checkbox"/> LINEAR	SPL		
FILTER/REG.	<input type="checkbox"/> AIR FILTER <input type="checkbox"/> AIRSET <input type="checkbox"/> BRACKET MTD.	EXIT VELOCITY		
LIMIT SWITCH	<input type="checkbox"/> LSX-SPDT <input type="checkbox"/> LSX-DPDT	PIPE SIZE IN/OUT	PIPE SCH. IN/OUT	
MODEL NO.	<input type="checkbox"/> LS-SPDT <input type="checkbox"/> LS-DPDT <input type="checkbox"/>	MAX ΔP/AIR SPL		
POSITION PAC	<input type="checkbox"/>	TAG NO.		
TO INDICATE	<input type="checkbox"/> FULL OPEN <input type="checkbox"/> FULL CLOSE	ITEM NO.		
SOLENOID	<input type="checkbox"/> AC <input type="checkbox"/> DC VOLTAGE _____ <input type="checkbox"/> 3-WAY <input type="checkbox"/> 4-WAY MODEL _____	PRICE EACH		
DE-ENERGIZED	<input type="checkbox"/> OPENS VALVE <input type="checkbox"/> CLOSSES VALVE	QUANTITY		
		TOTAL PRICE		

Figure 1-2: Valdisk Quotation Sheet

ShearStream Quotation

Quotation To _____

Date _____ **Project** _____

By _____

SIZE / Cv		TRANSUCER	<input type="checkbox"/> VALTEK	<input type="checkbox"/>
MODEL	<input type="checkbox"/> SHEARSTREAM <input type="checkbox"/>	INPUT	<input type="checkbox"/> 4-20 mA	<input type="checkbox"/> 10-50 mA
BODY MATERIAL	<input type="checkbox"/> STEEL <input type="checkbox"/> 316 S.S. <input type="checkbox"/>	MOUNTING	<input type="checkbox"/> MTD.	<input type="checkbox"/> UNMTD. <input type="checkbox"/> PIPE MTD.
ANSI CLASS		LOCK-UP	<input type="checkbox"/> FAIL IN PLACE LOCK-UP	
BODY:	<input type="checkbox"/> 150 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/>	AIR	<input type="checkbox"/> FAIL CLOSED	<input type="checkbox"/> FAIL OPEN <input type="checkbox"/>
BALL:	<input type="checkbox"/> 150 <input type="checkbox"/> 300 <input type="checkbox"/>	SPRING	<input type="checkbox"/> VOL.TANK SZ. _____ GAL. TRIP PRESS _____ PSI	
END CONNECTION	<input type="checkbox"/> FLANGELESS <input type="checkbox"/> SEP. FLG. <input type="checkbox"/> INT. FLG. <input type="checkbox"/>	FLOW BOOSTER	<input type="checkbox"/> VALTEK	<input type="checkbox"/>
FACE FINISH	<input type="checkbox"/> 125/250 RA <input type="checkbox"/> 250/500 RA <input type="checkbox"/>	TUBING MATERIAL	<input type="checkbox"/> 1/4" <input type="checkbox"/> 3/8" <input type="checkbox"/>	<input type="checkbox"/> PVC COATED COPPER <input type="checkbox"/> S.S. <input type="checkbox"/>
SEP. FLANGE	<input type="checkbox"/> STEEL <input type="checkbox"/> S.S.	FITTINGS	<input type="checkbox"/> STANDARD	<input type="checkbox"/> SWAGELOK <input type="checkbox"/>
FACE TO FACE	<input type="checkbox"/> ISA-S75.04 <input type="checkbox"/>	ADDITIONAL FEATURES		
BALL MATERIAL	<input type="checkbox"/> 317 S.S. W/HARD CHROME PLATE <input type="checkbox"/>			
SHAFT MATERIAL	<input type="checkbox"/> 17-4 PH <input type="checkbox"/> NITRONIC 50 <input type="checkbox"/>			
SEAL STYLE	<input type="checkbox"/> METAL <input type="checkbox"/> SOFT <input type="checkbox"/> FLOW RING <input type="checkbox"/>			
SEAL MATERIAL	<input type="checkbox"/> 316 S.S. <input type="checkbox"/> GTFE <input type="checkbox"/> PEEK <input type="checkbox"/>			
POST TYPE	<input type="checkbox"/> STD <input type="checkbox"/> FLANGED			
POST MATERIAL	<input type="checkbox"/> 17-4 PH <input type="checkbox"/> NITRONIC 50 <input type="checkbox"/>			
END SEAL	<input type="checkbox"/> VITON <input type="checkbox"/> GRAFOIL <input type="checkbox"/>			
O-RINGS	<input type="checkbox"/> VITON <input type="checkbox"/> NONE <input type="checkbox"/>			
BEARINGS	<input type="checkbox"/> PEEK <input type="checkbox"/> BRNZ <input type="checkbox"/> NITRON <input type="checkbox"/> STELL <input type="checkbox"/> FBRGL/TFE			
BONNET FORM	<input type="checkbox"/> STANDARD <input type="checkbox"/> EXTENDED			
PACKING	<input type="checkbox"/> TEFLON <input type="checkbox"/> GAIP <input type="checkbox"/> AFPI <input type="checkbox"/> GRAFOIL <input type="checkbox"/>			
PACKING BOX SPECIALS	<input type="checkbox"/> LUBRICATOR <input type="checkbox"/> ISO. VALVE <input type="checkbox"/> PURGE <input type="checkbox"/> TWIN SEAL <input type="checkbox"/> VACUUM SEAL <input type="checkbox"/>			
AIR TO	<input type="checkbox"/> OPEN <input type="checkbox"/> CLOSE			
SHAFT	<input type="checkbox"/> DOWNSTREAM <input type="checkbox"/> UPSTREAM	FLUID		#/HR. GPM SCFH.
FAIL POSITION	<input type="checkbox"/> NOT REQ'D. <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	CRIT.PRESS/TEMP	/	
FUNCTION	<input type="checkbox"/> THROTTLING <input type="checkbox"/> ON-OFF	SP.GR. OR MW	/	
ACTUATOR TYPE	<input type="checkbox"/> CYLINDER <input type="checkbox"/> MAN. GEARED <input type="checkbox"/>	TEMP (°F)		
SIZE	<input type="checkbox"/> 25 <input type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> 200 <input type="checkbox"/>	VAPOR PRESS.		
HANDWHEEL	<input type="checkbox"/> DECLUTHTABLE SIDE-MOUNTED <input type="checkbox"/>	INLET (PSIA)		
SPRING	<input type="checkbox"/> STANDARD <input type="checkbox"/> HD <input type="checkbox"/> NONE <input type="checkbox"/>	OUTLET (PSIA)		
POSITIONER	<input type="checkbox"/> BETA P/P <input type="checkbox"/> BETA I/P <input type="checkbox"/>	FLOW RATE		
SIGNAL	<input type="checkbox"/> 3-15 <input type="checkbox"/> 3-9 <input type="checkbox"/> 9-15 <input type="checkbox"/> 4-20 mA <input type="checkbox"/>	REQ'D Cv		
CAM	<input type="checkbox"/> = % <input type="checkbox"/> LINEAR	SPL		
FILTER/REG.	<input type="checkbox"/> AIR FILTER <input type="checkbox"/> AIRSET <input type="checkbox"/> BRACKET MTD.	EXIT VELOCITY		
LIMIT SWITCH	<input type="checkbox"/> LSX-SPDT <input type="checkbox"/> LSX-DPDT	PIPE SIZE IN/OUT	/	PIPE SCH. IN/OUT /
MODEL NO.	<input type="checkbox"/> LS-SPDT <input type="checkbox"/> LS-DPDT <input type="checkbox"/>	MAX ΔP/AIR SPLY	/	
POSITION PAC	<input type="checkbox"/> _____	TAG NO.		
TO INDICATE	<input type="checkbox"/> FULL OPEN <input type="checkbox"/> FULL CLOSED			
SOLENOID	<input type="checkbox"/> AC <input type="checkbox"/> DC VOLTAGE _____ <input type="checkbox"/> 3-WAY <input type="checkbox"/> 4-WAY	ITEM NO.		
	MODEL _____	PRICE EACH		
DE-ENERGIZED	<input type="checkbox"/> OPENS VALVE <input type="checkbox"/> CLOSSES VALVE	QUANTITY		
		TOTAL PRICE		