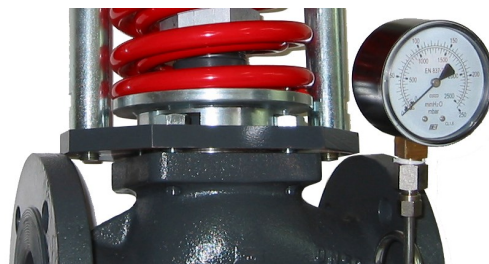


**Selection of the proper valve involves a thorough knowledge of the process for which it will be used.**

Valves design progress puts at the piping engineer's elbow a **great variety of valve types**. How to choose the right one to provide dependable and efficient performance in each particular need?



**It has to be carefully studied** the valve service requirements taking into account **the industrial process, the type of fluids, the working pressure, the volume of flow, the temperature, corrosive elements, etc.** Once it is this perfectly known it is time to match them with the different valve's service characteristics. **Valve cost, installation cost and cost of maintenance have not to be missed in the equation.**

## Deciding which type of valve

When designing a system, a process-control engineer must first decide whether a control valve or a variable-speed pump should be used to throttle the flow. Then, depending on the type of conveyed fluid as well as its mechanical function, is decided the type of valve. The next table (see next page) can be used as a valve selection guide.

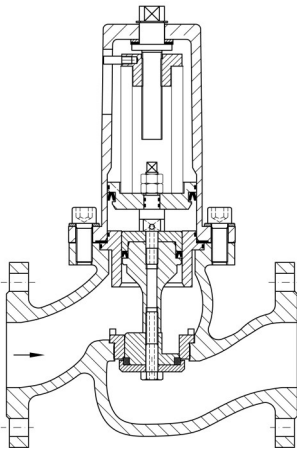
## Choosing the valve characteristics

Once the valve type is selected, the next task is to choose the valve characteristics, and size the valve.

The more important elements to consider: liquid level, pressure, flow, and temperature.

**Level**—If the valve pressure drop is constant, the inherent valve characteristic should be linear. For varying pressure drops, use equal-percentage if the drop at maximum flow is less than 20% of the drop at minimum flow (helps minimize the variation in valve gain). In case the drop at minimum flow is greater than twice the drop at minimum flow, use a quick-opening to negate the effects of large pressure drop at high flows.

VALVE $\Delta P$	CHARACTERISTIC
Constant	linear
$\Delta P_{Qmax} < 0,20 \Delta P_{Qmin}$	equal-percentage
$\Delta P_{Qmax} > 0,20 \Delta P_{Qmin}$	quick-opening



**Deciding which type of valve**

Conveyed Fluid	Nature of Fluid	Valve Function	Type of Disc											
			Gate	Plug gate	Plug	Rotary valve	Diaphragm	Butterfly	Globe	Needle	Squeeze	Pinch	Spiral sock	
Liquid	Neutral (Water, Oil, etc)	On/Off	*	*	*	*	*	*						
		Control valve		*			*	*	*	*				
	Corrosive (Acid, alkaline etc.)	On/Off	*	*	*	*	*	*						
		Control valve		*			*	*	*					
	Hygienic (Food, beverages, drugs etc)	On/Off					*	*						
		Control valve					*	*			*	*		
	Slurry	On/Off			*	*	*	*			*	*		
Control valve		*				*	*			*	*			
Fibrous Suspensions	On/Off, Control valve	*				*				*	*			
Gas	Neutral (Air, Steam etc)	On/Off	*		*	*	*		*					
		Control valve, modulating	*				*	*	*	*				
	Corrosive (Acid vapors, chlorine etc.)	On/Off			*	*	*	*						
		Control valve					*	*	*	*				
	Vacuum	On/Off	*			*		*	*					
Solids	Abrasive Powder (Silica, etc)	On/Off, Control valve									*	*	*	
	Lubricating powder (graphite, talcum, etc)	On/Off, Control valve	*								*	*	*	



**Pressure:** It depends on a time variable: it can be a “slow” or “fast” process. An Equal-percentage is used if variation between the pressure drop at maximum flow and at minimum flow is less than 20%. For fast processes under any pressure drop, an equal-percentage is also recommended.

PROCESS	VALVE $\Delta P$	CHARACTERISTIC
Fast	any	equal-percentage
Slow	Constant or: $\Delta PQ_{max} > 0,20 \Delta PQ_{min}$	linear
	$\Delta PQ_{max} < 0,20 \Delta PQ_{min}$	equal-percentage

**Flow:** The flow is controlled by the set point. Take also into account that transmitters are not always linear. They can be proportional to flow or to the square of the flow rate. The selection of the valve characteristic will depend on what type of signal is sent to the controller. It will also differ if valve is used in series or a bypass.

SIGNAL	VALVE LOCATION	CHARACTERISTIC IF SET POINT VARIES	CHARACTERISTIC IF LOAD VARIES
Proportional to Q (flow)	series	linear	equal-percentage
	bypass	linear	equal-percentage
Proportional to Q <sup>2</sup> (flow squared)	series	linear	equal-percentage
	bypass	equal-percentage	equal-percentage

**Temperature:** When temperature control loops occurs, time constants are large and frequency of the system changes as the load varies. Very common in chemical plants and refineries. The best inherent characteristic for a valve is equal-percentage.

**The secret to good valve performance is selecting the right valve for the service required.**



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Valfonta helps customers with the problems of valve selection every day. Do not hesitate in contacting us.  
 See Our Catalogue in this [link](#).

