





# Steam Conditioning Valves



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## **Steam Conditioning Valves**

The use of combination control valves, commonly called "Steam Conditioning Valves" has grown steadily during the past twenty years. The reason is clear when considering the simplification of the overall control system versus that of a conventional one utilizing separate desuperheating and pressure reduction components.



#### **Conventional System**



**Hora System** 

### Hora - Excellence is Our Standard

Hora's background in steam pressure and temperature control began with the introduction of the integrated steam conditioning concept. The current range of Hora Steam Conditioning Valves represents the end product of this experience and marks a significant advance in the design technology of this type of valve.

Hora Steam Conditioning Valves are available in a wide range of design configurations engineered to meet the challenges of current industry application requirements.

The technology of steam conditioning is of major importance in modern power and process industries. As the name itself states, steam is conditioned or more correctly, it's status changed. Steam pressure reduction is taken in one or more stages in an effort to control velocities and noise. The valve plug may be machined and the cage drilled to provide any characteristic desired.

Desuperheating water is introduced through the flanged water connection on the lower valve bonnet. The water travels upward through the orifice tube and is injected into the steam flow through a series of orifices which are progressively uncovered by the lower section of the plug as it rises to pass more steam. The plug travel and the cooling water orifices sizing are predetermined so that desuperheating water and steam flow are in a constant ratio to one another as indicated by the heat balance across the valve. Minor upsets in steam flow or temperature are compensated for by a water control valve in the incoming water line.

#### **Applications**

Typical power plant applications in which precise steam temperature and pressure control can be maintained by steam conditioning valves include:

- 1. Turbine bypass
- 2. Drying rolls, kettles
- 3. Start-up service
- 4. Air preheater coils
- 5. Unit tie lines
- 6. Process reactors
- 7. Fan drives
- Compressor drives 8.
- Plant heating 9
- 10. Fuel oil heating
- 11. Evaporator supply
- 12. Atomizing steam



# Hands-On Service



# **Steam Conditioning Valve - Orifice Tube** (SCV-OT)

The Hora variable orifice cooling injection system employed in SCV-OTs offers proven performance spanning a period of thirty years. This advanced steam conditioning system utilizes water injection in direct proportion to plug lift.

Cooling water is injected into the valve through a tube having multiple orifices. In the closed position, the perforated plug covers these orifices preventing the flow of cooling water. As the plug lifts, holes become uncovered allowing water to mix with the flowing steam. The appropriate number, size and arrangement of the holes determines the injection of the correct volume of water in proportion to the steam volume. This ensures optimal atomization and evaporation over the complete flow range.



# **Steam Conditioning Valve (SCV)**

The Hora SCV with fixed spray nozzle is designed for low cooling capacity applications where the steam load remains fairly constant. The water is injected below the seat area of the pressure reducing valve utilizing a special stainless steel nozzle. As with SCV-OTs rapid evaporation and optimal control are the result of high turbulence and efficient mixing in this area.

The SCV design limits cooling water flow to no greater than 20 percent of steam load. The set point temperature is controlled by regulating the cooling water flow with a separate control valve. This, combined with a fixed open area nozzle limits the rangeability of this design.







# Steam Conditioning Valve - Steam Assist (SCV-SA)

When severe or unusual requirements dictate the need for a different cooling solution, an integrated atomizing system can be implemented in the SCV-SA. This design utilizes the kinetic energy present in the flowing steam to assist efficient droplet dispersal and evaporation.

#### Conditions requiring an integrated atomizing system include:

- Steam cooling close to the saturation temperature
- High water/steam ratio (greater than or equal to high temperature drop)
- High steam flows
- Available cooling water pressure is less than half the steam pressure





#### Data Sheet for steam conditioning system

Date:					
Customer:			Name:		
Address:			_ Telephone:		
Inquiry No. / Order No.:			 Telefax:		
Quantity:	Item No.:		– Tag No.:		
Valve Description:				-	
Lavout Data	Inlet		Outlet		
Design pressure			ounor		PSIG
Design temperature					°F
Pining diameter					in
Piping Material					
Pressure rating					lbs
End connections					RF/BW
Process Data		Minimum	Normal	Maximum	
Main Steam Flow W1		Withingth	lionnar	Maximum	lhs/hr
Main Steam Flow W2					lbs/hr
Inlet Steam Pressure D1					DSIG
Decired outlet Steem Pr					PSIC
Inlet Steam Temperature	53501612				°⊑
Desired Outlet Steam Te	: II amnerature T2				 ○⊑
					1
Conditions of available	e cooling water				
Water Pressure		PW			
Temperature		TW		°F	
Valve type:	🗖 alobe	🗖 angle		🔲 Z-type	
Valve Characteristic:	linear	equal percentage	1	Square	
Leakage Class:					∐ VI
Selection of actuation	system				
Docitions of valve on our	- nly failura		- I onen	□ fixed	
Actuating time	ipiy lanule	control e/etroke			quick closing
n actuator may				dalek opennigs	quick closing :
		-		have a second	
pneumauc	DOL	eleculo		nyaraunc T	
Air pressure	P3I	Ivianutacturer		_ Type Output south t	
Handwneel		i ype		_ [_] Cylinder with I	nydraulic power pack
Positioner pneui	л mA	∨oltage ⊑		V 🗀 Compact unit	.,
Positioner E/P	PSI	Frequency		Hz Voltage	Y
□ Iransmitter		I lorque Switch	Quantity	Frequency	Hz
Airset		Travel Switch	Quantity	Handweel	📙 Handpump
Limit switches	Quanitity	Transmitter		Limit switche	es
└─ Solenoid valve		Positioner		Transmitter	
Ex - protection		Ex - protection		🔲 Ex - protecti	on
tubing 🔲 CU	🔲 SS				
Terms of delivery					
L EN 1349 [	ASME B 16.34				
Documentation / test c	ertificate				
Pressure - Equipme	ant Directive 97723/EC				



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