Hitewell ST Control Valve

Hitewell ST is a compact, state-of-the-art control valve and actuator system, to control a wide range of process liquids, gases, and vapors.

The ST is rugged, reliable, and easy to select. It requires no actuator sizing -- the actuator selection is automatic once the valve body construction is selected.

The optimized results in reduced complexity and parts count. As a result, the cost of maintenance is reduced.

The ST meets the requirements of both EN and ANSI standards. It is available with a complete accessory package, including the NT3000 Series integrated digital valve positioner.

Figure 1. ST Control Valve, Actuator, and NT3000 Series Digital Valve Controller

Features

■ Easy to size and select

■ No actuator sizing required--selection is Automatic

■ Engineered for easy maintenance

■Maximum part commonality across sizes

■Replaceable trim

■ Low lifetime costs

■Robust, low-profile

■Compact field-reversible multi-spring pneumatic actuator

■Available with integrated, easy-to-calibrate NT3000 Series Digital Valve Controller

■ Valve body sizes DN 25 to DN 200 (1 inch through 8-inch)

■Pressure Classes PN 10-100, Class 150 ， 300 and 600

■ High capacity

■ Valve body flow passage optimized for flow Stability

■Full range of materials, including alloys

■Shutoff capabilities: Class IV, V, and VI

■Rangeability of 50:1 (equal percentage)

■Optional metal bellows seal

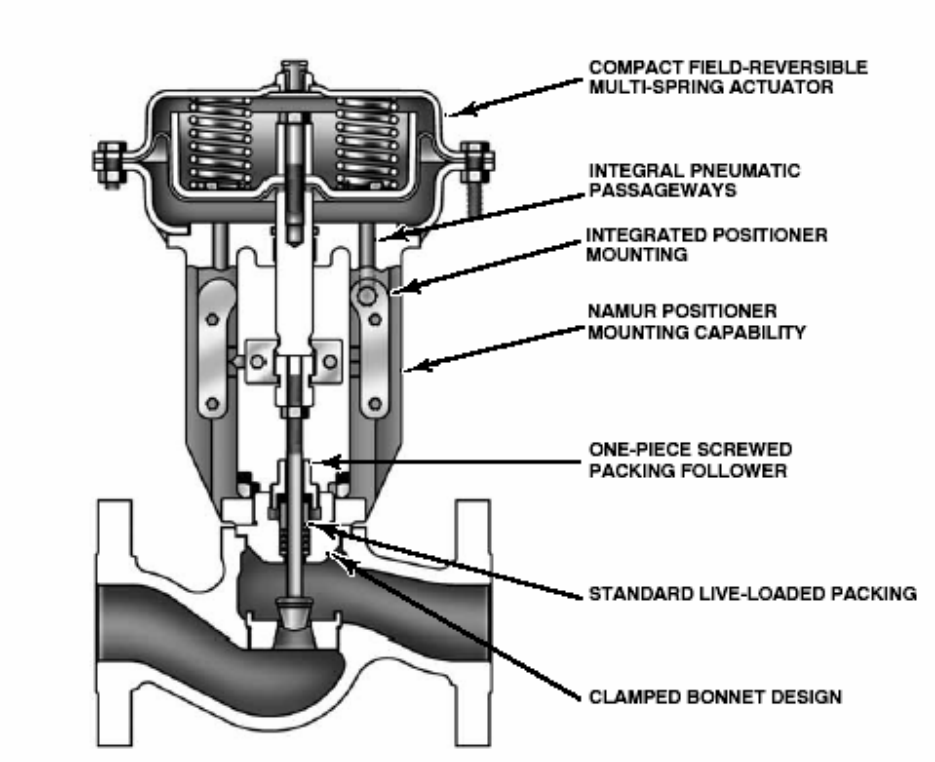

Figure 2. Design ST Control Valve Assembly with Stem-Guided Contoured Plug (Size DN 25/1-Inch)

Optimized valve and actuator system. Product simplicity and ease of selection form the foundation of the ST. Mounted with a digital or analog positioner, the ST provides high performance control across a wide range of process applications.

Compact actuator . The multi-spring ST actuator is compact and field-reversible. (No extra parts are required to reverse the fail-action). The ST has been optimized to eliminate complicated actuator sizing procedures - once the valve body and port size are selected, the actuator size is fixed.

Modular . The architecture has been optimized to maximize the use of common parts across sizes. The actuator stem and stem connector are used across all ST sizes. Only one set of springs is used in each of the three actuator sizes.
The plug/stem assemblies and packing sets are common across several sizes, as well.

Lower lifetime costs. Reduced product complexity, low parts count, and part commonality all contribute to reduced inventory and maintenance costs.

Stable flow control. The flow cavity of the ST valve body has been engineered to provide stable flow and reduce process variability.

Live-loaded packing. The ST comes with live-loaded PTFE V-ring packing as standard. The live-loaded helps to seal your process to conserve valuable process fluid, while reducing emissions to the environment. The long-life and high reliability of the live-loaded system also reduces maintenance costs and process downtime. For applications exceeding 232_C (450_F), live-loaded ULF (Ultra Low Friction) graphite packing and extension bonnets are available.

Easy maintenance. The simple screwed seat-ring and one-piece plug and stem provide easy maintenance. simplicity and parts commonality contribute to reduced spares inventory.

The integrated NT3000 digital valve controller allows easy instrument removal, without a requirement for tubing disconnection or replacement (air-to-open construction).

Longer life. Alloy valve constructions and hardened trim materials are available in the ST to increase valve body, bonnet, and trim life.

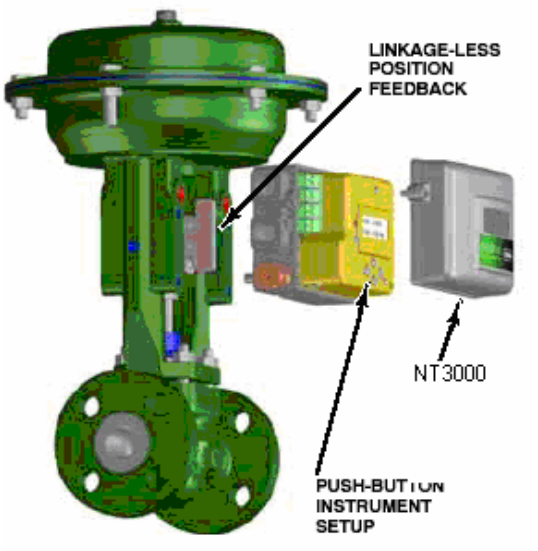

Figure 3. ST and NT3000 Series Digital Valve Positioner

Digital valve controller. The ST is available with the NT3000 Series digital valve controller. The NT3000 is easy to use, compact, and ed for easy mounting. It converts a 4-20 mA input signal into a pneumatic output signal, which feeds the control valve actuator. Instrument setup is performed with a push button and liquid crystal display (LCD) interface. This interface is protected from the environment within a sealed enclosure.

Intrinsic safety and non-incendive construction is available to CSA, FM, ATEX, and IEC standards. An optional module provides integrated limit switches and a position transmitter.

Integrated mounting. The NT3000 digital valve controller integrally mounts to the ST actuator, eliminating the need for mounting brackets. The NT3000 transmits a pneumatic signal to the actuator casing via an air passage in the yoke leg, causing the valve to stroke. This eliminates the need for positioner-to-actuator tubing in the air-to-open (spring-to-close) configuration.

The NT3000 mounting interface is identical on both sides of the actuator yoke. This symmetrical allows the NT3000 to be easily moved from one side of the valve to the other without the need to rotate the actuator.

Linkage-less feedback. The NT3000 digital valve controller offers as standard a non-contacting valve position feedback system. This is a true linkage-less , which uses no levers and no touching parts between the valve stem and the positioner.

Additional Accessory selection. The ST is available with a variety of digital or analog positioners besides the NT3000 Series, as well as solenoid and limit switches. The actuator is also compatible with the IEC 60534-6-1 (NAMUR) positioner mounting standard.

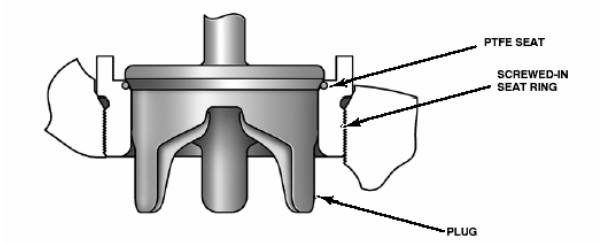

Figure 4. ST Control Valve with Typical Soft Seat Trim Construction (Port Sizes of 36mm - 90mm)

Integrated Air Supply. When mounted with the NT3000 Series digital valve controller, the ST uses an integrated actuator air supply system. In the air-to-open construction, air is supplied to the lower actuator casing via a port on the actuator yoke face -- no tubing is required. In the air-to-close configuration, air is supplied to the upper casing via tubing.

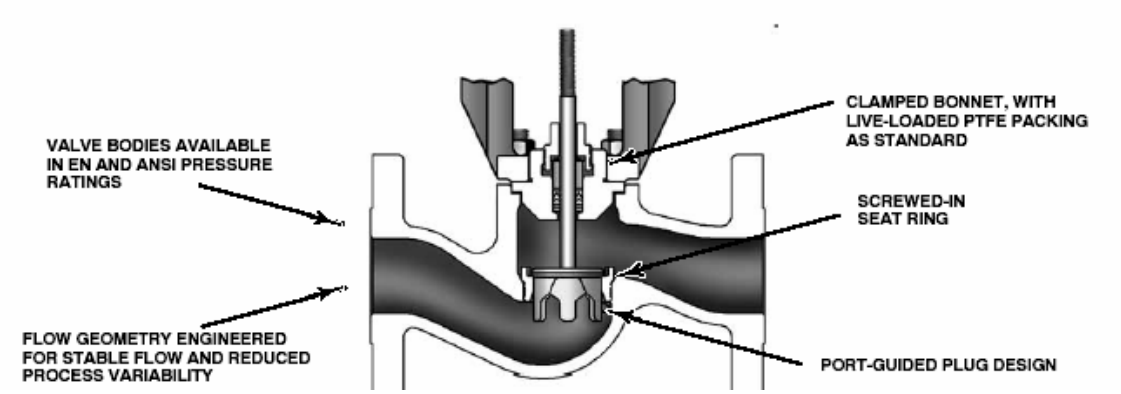

Figure 5. STControl Valve with Port-Guided Plug (Port Sizes of 36mm - 90mm)

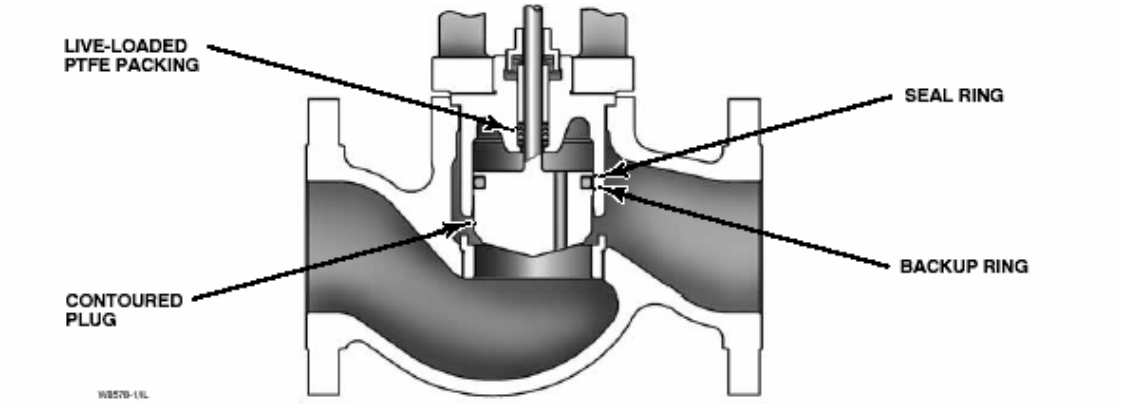

Figure6. ST Control Valve with Balanced Trim (Port Sizes of 70mm and 90mm Only)

The ST Control Valve

The ST is a single port, flow-up globe style valve that offers stem-guided, port-guided, and balanced trim with a screwed-in seat ring (see table 1 for a description of trim style availability). Each valve size offers an unbalanced plug , which eliminates dead spaces where fluid polymerization might occur. Sizes DN80 and 100 (3- and 4-inch) also offer balanced trim to reduce actuator thrust requirements.

The ST incorporates a clamped bonnet and an easy-to-adjust screwed packing follower (see figure 2). The plug and stem are a rugged, one-piece welded assembly.

The standard construction incorporates metal-to-metal seating, with a PTFE soft seat option for Class VI shutoff (see figure 5). Class V shutoff is available with metal trim. Hardened trim with satellite overlay is available for erosive service, as well.

PTFE V-ring stem packing is standard with the ST. The live-loaded system provides excellent stem sealing and extended service life. Live-loaded graphite ULF packing and extension bonnets are available for high temperature applications.

Both linear and equal percentage flow

characteristics are available in full port and restricted trim. Micro-Flow_ is available for applications requiring low flow control capability.

Standard valve body materials are carbon steel and stainless steel, with alloy materials available for highly corrosive applications.

ST Control Valve Specifications and Materials of Construction

See tables 1 and 2.

Table 1. ST Valve Specifications

Specifications	**EN**	**ANSI**
Valve Body Size	DN 15, 20, 25, 40, 50, 80, 100	0.5, 0.75, 1, 1.5, 2, 3, 4-inch
Pressure Rating	PN 10 / 16 / 25 / 40 per EN 1092-1	Class 150 / 300 per ASME B16.34
End Connections	Flanged raised face per EN 1092-1	Flanged raised face per ASME B16.5
Valve Body/Bonnet Materials	1.0619 steel	ASME SA216 WCC steel
	1.4409 stainless steel	ASME SA351 CF3M stainless steel
	Hastelloy C (CW2M)	Hastelloy C (CW2M)
Face-to-Face Dimensions	Consistent with EN 558-1	Consistent with EN 558-2 (same as ISA S75.03)
Shutoff per IEC 60534 4 and ANSI/FCI 70-2	Metal seat - Class IV (standard)	
	Metal seat - Class V (optional)	
	PTFE seat - Class VI (optional)	
Flow Direction	Flow-up only	
Flow Control Characteristics	Equal Percentage and Linear	
Trim Style	**Port Diameters**	**Trim Style Description**
	4.8 mm	Micro-Flow trim (unbalanced)
	9.5, 14, 22 mm	Stem-Guided with Contoured Plug (unbalanced)
	36, 46 mm	Port-Guided Plug (unbalanced)
	70, 90 mm	Balanced Trim with Contoured plug (standard) or Unbalanced Port-Guided Plug (optional)

Table 2. Materials (Other Valve Components)

Component	**Material**
Packing Follower	Nitronic 60 screwed follower
Body/Bonnet Bolting and Nuts	SA193-B7 studs / SA194-2H nuts with NCF2 coating for carbon steel and stainless steel constructions
	Nitronic 50 (XM19) for alloy (standard) and stainless steel assemblies (optional)
Packing	Live-loaded PTFE V-ring (standard) with Inconel 718 Belleville springs
	Live-loaded Graphite ULF (optional) with Inconel 718 Belleville springs
Bonnet Gasket	Graphite laminate (Graphoil)
	PTFE encapsulated Hastelloy C (optional) Applicable from –46 to 232_C (–50 to 450_F) (May be preferable when the standard graphoil gasket material is not compatible with the process fluid)
NACE MR0103 Construction	Stainless steel, or heat-treated carbon steel valve bodies and bonnets
	Nitronic 50 body/bonnet bolting
	Standard live-loaded PTFE packing
	316L/CoCr-A plug, Nitronic 50 stem, and 316L/CoCr-A seat ring

Balanced Trim (Sizes DN 80 and 100 / 3- and4 I h) Back-up Rings	Carbon-Filled PTFE Seal Ring	
	Nitrile (Standard) –46 to 82_C (–50 to 180_F)	
	Ethylene Propylene [EPDM] (Optional): –46 to 232_C (–50 to 450_F) in steam and hot water; –46 to 121_C (–50 to 250_F) in air (EPDM is not recommended for use in hydrocarbons) 4-Inch)	
	Back Viton [Fluoroelastomer] (Optional): –18 to 204_C (0 to 400_F) (Applicable in a wide variety of solvents, chemicals, and hydrocarbons. Avoid use with steam, ammonia, or hot water over 82_C [180_F])	

Table 3. Trim Materials for Port Diameters

Valve Body Construction	Trim Type	Stem	Plug	Seat
Carbon steel (1.0619 / WCC)	Metal to metal	316L strain hardened	Ultimet_ (R31233)	SA351 CF3M
	Hard–faced	316L strain hardened	Ultimet (R31233)	SA351 CF3M / CoCr–A seat)
	Metal to metal	Hastelloy C (N06022)	Ultimet (R31233)	Hastelloy C (CW2M)
Stainless steel (1 4409 / CF3M)	Metal to metal	316L strain hardened	Ultimet (R31233)	SA351 CF3M
	Hard–faced	316L strain hardened	Ultimet (R31233)	SA351 CF3M / CoCr–A seat
	Metal to metal	Hastelloy C (N06022)	Ultimet (R31233)	Hastelloy C (CW2M)
Hastelloy C (CW2M)	Metal to metal	Hastelloy C (N06022)	Ultimet (R31233)	Hastelloy C (CW2M)

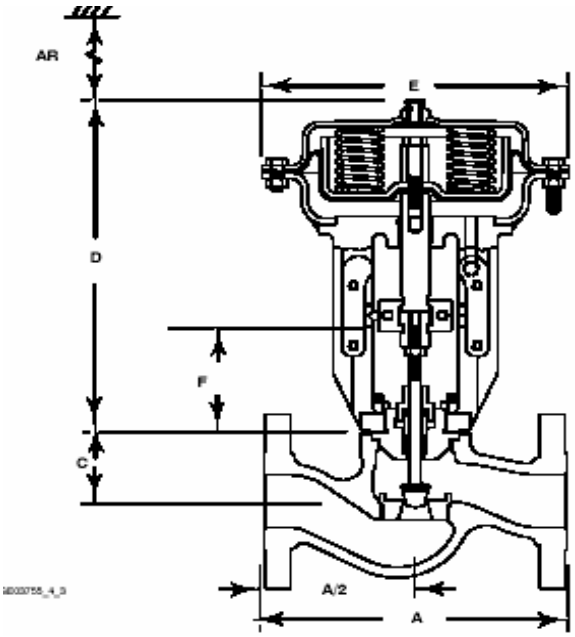

Figure 7. ST Dimensions (also see table 4)

Table 4. ST Dimensions and Weights

VALVE SIZE	PORT DIA	ACTUATOR SIZE	A			C		D		E	F (AR) Removal Height		TOTAL WEIGHT
			PN10 - PN40	ANSI Class 150	ANSI Class 300	Std Bonnet	Extension or Bellows Bonnet	Actuator Height (Standard Bonnet)	Actuator Height (Extension or Bellows Bonnet)	Casing Dia		With Standard Bonnet	With Extension or Bellows Bonnet
	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg
DN 15/ 0.5 Inch	4.8 9.5	225 225	130 130	184 184	190 190	66 66	304 304	313 313	313 313	270 270	115 115	21 21	25 25
DN 20/ 0.75 Inch	4.8 9.5 14	225 225 225	150 150 150	184 184 184	194 194 194	66 66 66	304 304 304	313 313 313	313 313 313	270 270 270	115 115 115	22 22 22	26 26 26
DN 25/ 1-Inch	4.8 9.5 14 22	225 225 225 225	160 160 160 160	184 184 184 184	197 197 197 197	58 58 58 58	296 296 296 296	313 313 313 313	313 313 313 313	270 270 270 270	115 115 115 115	22 22 22 22	26 26 26 26
DN 40/ 1.5 Inch	14 22 36	225 225 750	200 200 200	222 222 222	235 235 235	62 62 62	300 300 300	313 313 342	313 313 342	270 270 430	115 115 115	25 25 52	29 29 56
DN 50/ 2-Inch	22 36 46	225 750 750	230 230 230	254 254 254	267 267 267	68 68 68	306 306 306	313 342 342	313 342 342	270 430 430	115 115 115	29 56 56	33 60 60
DN 80/ 3-Inch	36 46 70 70	750 750 750 1200	310 310 310 310	298 298 298 298	318 318 318 318	105 105 105 105	373 373 373 373	375 375 375 458	375 375 375 458	430 430 430 566	125 125 125 125	79 79 81 131	88 88 NA 140
DN 100/ 4-Inch	46 70 90 90 90	750 1200 750 750 1200	350 350 350 350 350	352 352 352 352 352	368 368 368 368 368	121 121 121 121 121	393 393 393(4) 393(4) 393	379 462 379 379 462	375 458 375 375 458	430 566 430 430 566	130 130 130 130 130	98 150 105 105 150	109 161 NA NA 161

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