

3-Way Control Ball Valve with a modulating Actuator

Flange dimensions: DN15 – DN50: EN1092-1

Typical Applications

For engines, turbines, gearboxes and heat exchangers:

- Charge air cooling
- Secondary cooling systems
- Fuel and lube oil preheating
- Co-generation
- Engine jacket water

For refineries, chemical plants and oil reproduction:

- Waste heat boilers
- Product coolers
- Product heaters
- Product condensers

Key benefits

- Ease of integration - valve size matches pipe size, resulting in reduced installation time and installation costs
- Flexible design - ports can be configured to suit installation
- Low pressure drop compared to other valve types
- Small physical size
- Hand wheel allows manual adjustment of valve (optional on pneumatic valve)
- Easy installation and maintenance
- Low internal leakage over closed port: Class II (0,5%) ANSI/FCI 70-2 and IEC 60534-4



Overview

The 3-way control valves consist of a heavy-duty ball valve and either a quarter turn electric or pneumatic actuator. The valves provide a high degree of accuracy and repeatability for accurate temperature control and are equally accurate in mixing or diverting service over a wide flow range. The heavy-duty rotor design provides tight temperature control without high maintenance requirements. The system is available in three standard control configurations: electric; pneumatic; and electro-pneumatic, offering flexibility for most requirements.

Some actuator options are designed and reinforced for vibration service and are qualified to Lloyd's Marine Requirements for shipboard service. Certain valve and actuator combinations can be directly mounted to reciprocating machinery such as diesel engines, without vibration isolation. Standard valves are suitable for a variety of fluids such as water, water/glycol, sea water, lubricating and hydraulic oils. Optional body materials are available for services involving synthetic or fire-resistant oils, deionized water and ammonia or freon in oil.

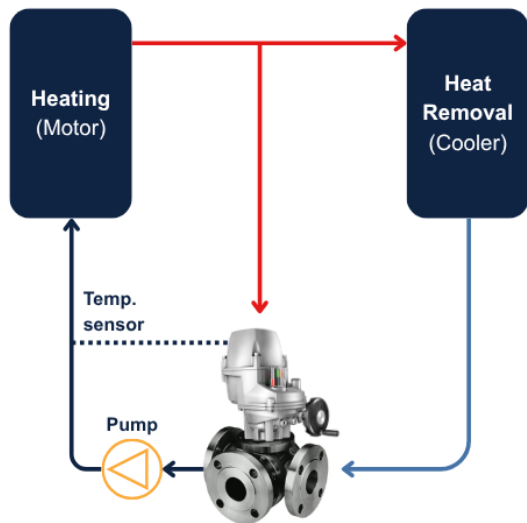
3-Way Control Ball Valve with a modulating Actuator

Flange dimensions: DN15 – DN50: EN1092-1

Valve Applications

Mixing Applications

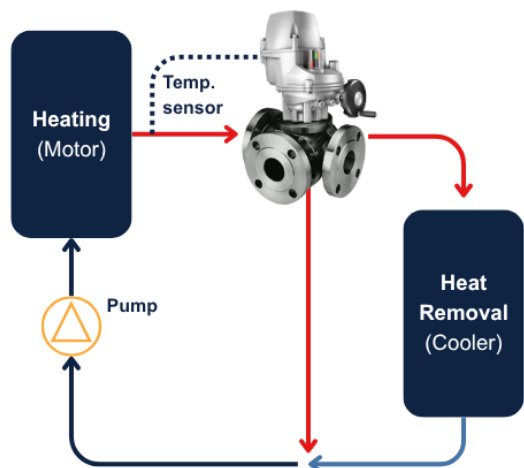
Lubricating oil temperature control is normally configured in a mixing application controlling the return temperature to the heat load. The temperature is normally measured as close as possible to the pump return.



Diverting Applications

Jacket water cooling in diverting applications regulates the outlet coolant water temperature from a diesel or gas engine. The valve either sends water to a cooler or bypass loop, accurately maintaining the temperature.

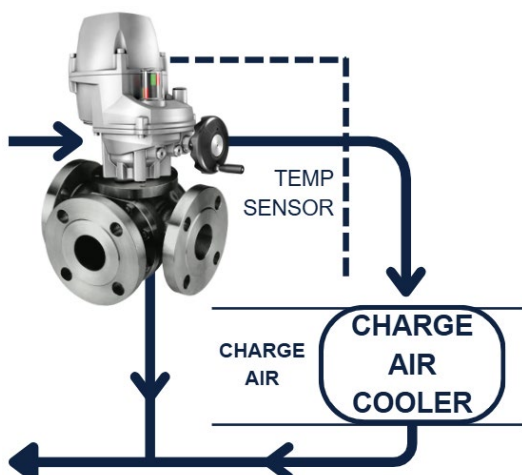
The temperature is normally measured at the outlet from the heat source.



Charge Air Applications

The intercooler is used to cool high temperature turbo charger air.

In this application the valve regulates the flow of cooling water through an intercooler, increasing efficiency, enhancing performance and helping to meet today's environmental requirements.



3-Way Control Ball Valve with a modulating Actuator

Flange dimensions: DN15 – DN50: EN1092-1

System Types (Electric)



For the electrically operated valves, a number of actuator options are available, which use an electric motor that rotates in either direction in response to the control signals received. The motor drives a gearbox connected to the rotor shaft and turns the valve rotor clockwise or counterclockwise, normally 0 - 90 degrees. At the end of travel, limit switches are incorporated to isolate the electrical supply to the motor when the valve rotor has reached either end of the rotation. A feedback hall sensor is available on some actuators, providing position indication to the control system.



Temperature probe
8060

PID Controller
8072E / 8071D



A typical electric valve system incorporates an electrically actuated three-way control valve with an electronic controller and temperature probe. AMOT's 8071D PID Controller can be either panel or wall mounted. The system is completed with a temperature sensor type 8060.

The electric valve system is simple to install with standard multicore cable and provides more accurate measurement and control than typical pneumatically operated systems.



3-way valve
AUMA Profox Actuator

3-Way Control Ball Valve with a modulating Actuator

Flange dimensions: DN15 – DN50: EN1092-1



Valve Body: Assembly features

Lightweight & compact design

Configurable ports = flexibility on installation

Low pressure drop = savings on either valve or pump size

High accuracy = better temperature control

Valve Specification Overview

Flow to	2-500 m³/h	
Sizes	DN15 – DN150	
Body Materials		
	Steel	
	Stainless Steel	
	Stainless Steel w/nano polymer	
Temp. Range	Min: -40°C	Max: +150°C
Max Internal Valve Pressure	25 bar	
Seal Material	RPTFE	
Seal Compatibility		
	Water	
	Ethylene/Propylene Glycol	
	Oils - Synthetic Based	
	Oils - Petroleum Based	
Applicable Standards		
Design Standard	DIN3357	
Face to Face Dimenstion	Factory standard	
Test Standard	END12266	
END Flange Dimensions	EN1092-1	
Internal Leakage	Class II (0,5 %) ANSI/FCI 70-2 / IEC 60534-4	
Property Specification		
Nominal Pressure Class	PN16 / PN25	
Air Seal Test	6 bar	
Hydraulic Seal Test	25 bar	
Pressure Equipment Compliance	Pressure Accessory - Sound Engineering Practices (SEP)	

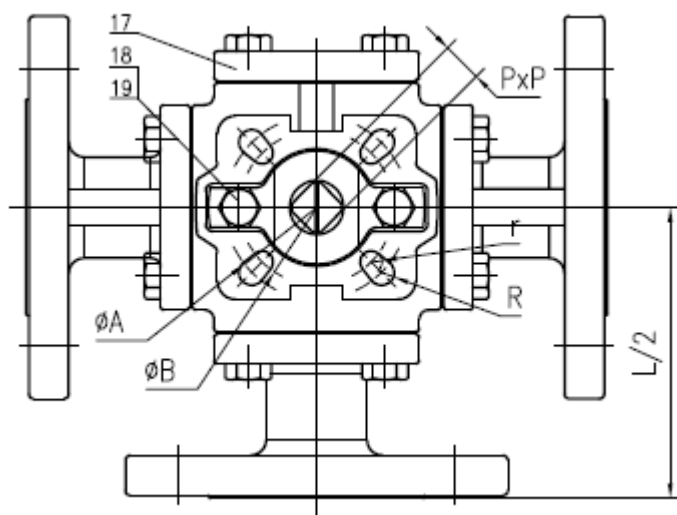
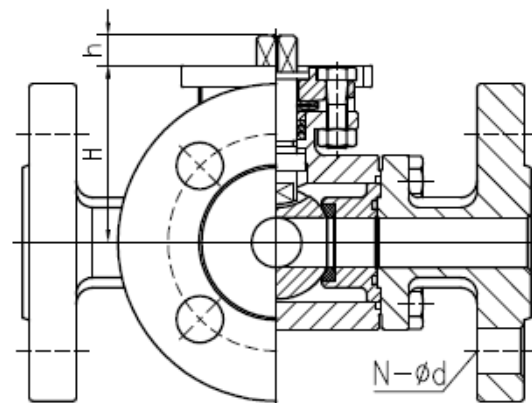
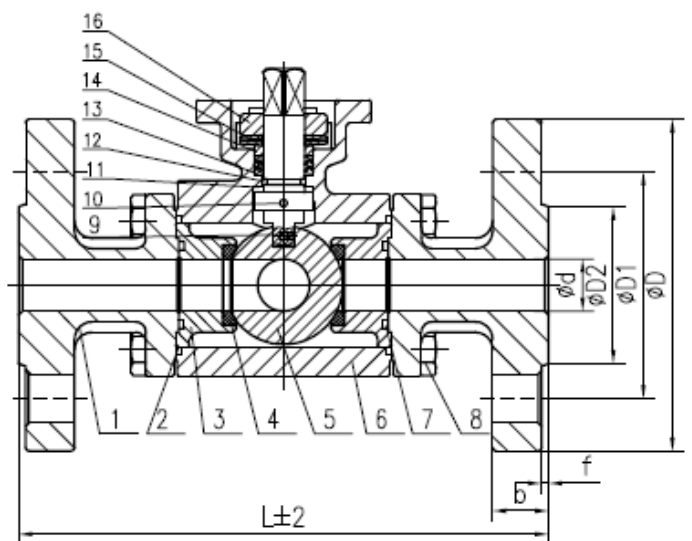
Comment: In its design as a temperature control valve, the valve is defined as a Pressure Accessory under the terms of the EU Pressure Equipment Directive (PED) and the GB Pressure Equipment (Safety) Regulation (PE(S)R). When used within the temperature and pressure limitations given in this table, the valve range is designed for use in applications using non-hazardous liquids defined as Group 2 in the Directive/Regulation (such as water, water/glycol and lubricating oil). In these applications, the valves fall into the Sound Engineering Practice (SEP) category. Contact Ing Westad AS to discuss solutions if the application and/or specifications are outside of the above limitations, or if it is to use hazardous liquids (Group 1) or contain non-hazardous Group 2) or hazardous (Group 1) gases.

3-Way Control Ball Valve with a modulating Actuator

Flange dimensions: DN15 – DN50: EN1092-1

Valve Body: Materials

No.	Part Name	Material
1.	Bonnet	ASTM A351 CF3M
2.	Gasket	PTFE
3.	Seat liner ring	ASTM A351 CF3M
4.	Seat	RTFE
5.	Ball	SS316L
6.	Body	ASTM A351 CF3M
7.	Gasket	PTFE
8.	Bolt	ASTM A193 B8M
9.	Stem	SS316L
10.	Anti-static spring	SS316L
11.	Thrust gasket	PTFE
12.	O-ring	VITON
13.	Packing	PTFE
14.	Gland	SS316L
15.	Disc spring	SS316
16.	Gland flange	SS316L
17.	Rear cover	ASTM A351 CF3M
18.	Bolt	ASTM A193 B8M
19.	Nut	ASTM A193 B8M



3-Way Control Ball Valve with a modulating Actuator

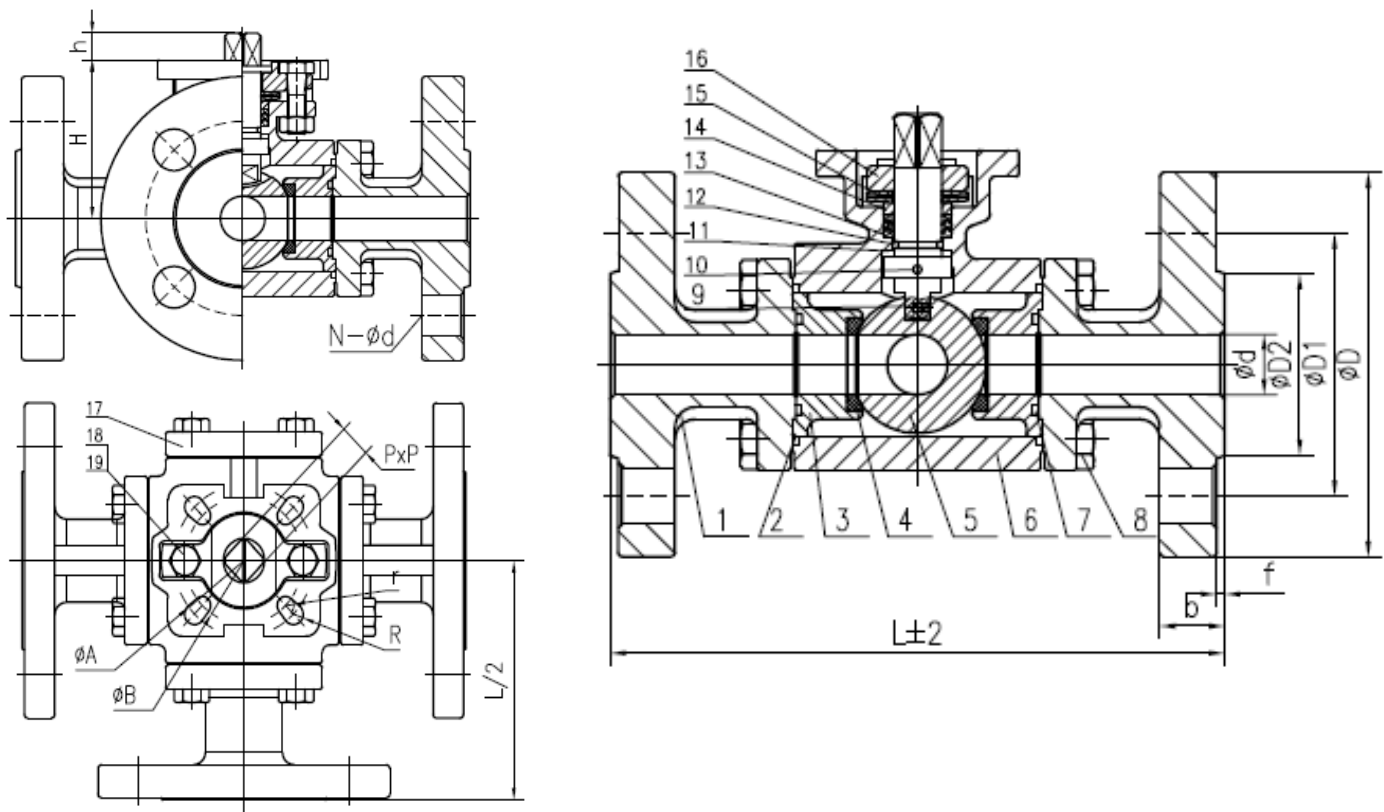
Flange dimensions: DN15 – DN50: EN1092-1

Valve Body: Flowrate

Flow Rate			Recommended flow rate in m³/h		
Size	Inches	Kv	Min	Ideal	Max
DN15	½"	13	2	6	7
DN20	¾"	22	3	10	12
DN25	1"	37	4	16	20
DN32	1¼"	58	8	26	32
DN40	1½"	75	10	33	41
DN50	2"	100	14	44	55

Valve Body: Dimensions

Size	L	D	D1	D2	b	f	N-ø d	H	h2	r	R3
DN15	152	95	65	45	16	2	4-ø14	55	9	3	3,5
DN20	167	105	75	58	18	2	4-ø14	60	11	3	3,5
DN25	190	115	85	68	18	2	4-ø14	67	11	3	3,5
DN32	208	140	100	78	18	2	4-ø18	80	14	3,5	4,5
DN40	230	150	110	88	18	3	4-ø18	96	17	5	6
DN50	254	165	125	102	18	3	4-ø18	101	17	5	6

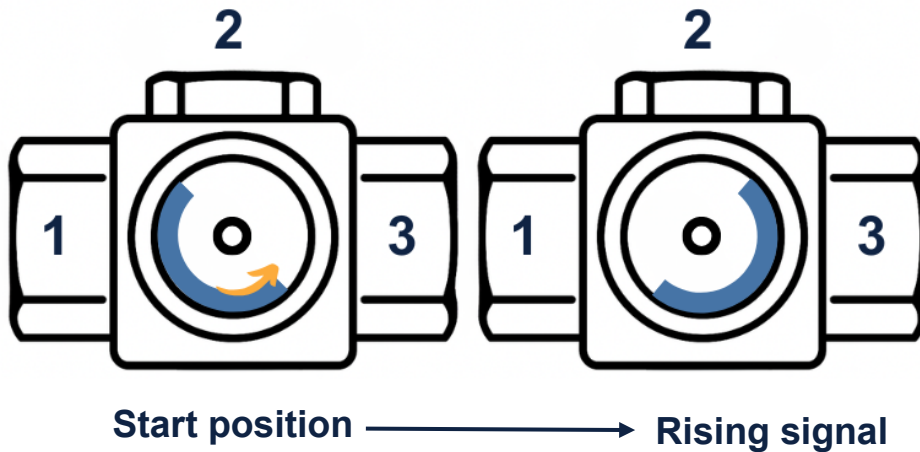


3-Way Control Ball Valve with a modulating Actuator

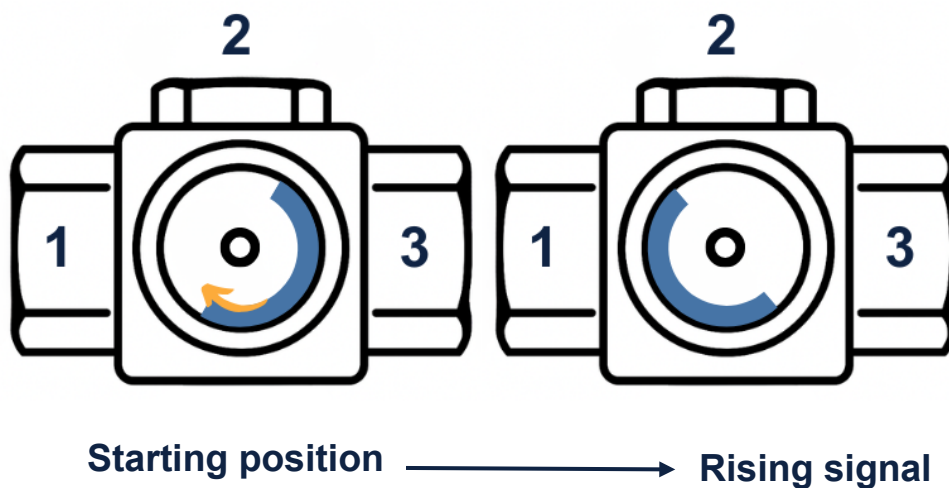
Flange dimensions: DN15 – DN50: EN1092-1

Modes of Operation

Mode 13



Mode 31



3-Way Control Ball Valve with a modulating Actuator

Flange dimensions: DN15 – DN50: EN1092-1



Valve model code designation

Valve model code designation	Code	Code Description
Valve Size	15	DN15 = 1/2"
	20	DN20 = 3/4"
	25	DN25 = 1"
	32	DN32 = 1 1/4"
	40	DN40 = 1 1/2"
	50	DN50 = 2"
	80	DN80 = 3"
	100	DN100 = 4"
	125	DN125 = 5"
	150	DN150 = 6"
Valve Model	W2	2-way control valve
	W3	3-way control valve
Valve Flow Type	L	Low flow
	S	Standard flow
	H	High flow
Valve Body / Seal Material	S	216 Steel
	R	316 Stainless Steel
	N	316 Stainless Steel treated with Nano polymer
Valve Flange Connection	B	PN10 RF (Raised flanges)
	C	PN16 RF (Raised flanges)
	D	PN25 RF (Raised flanges)
	U	Female Parallel Threads (BSPP/G) EN ISO 228 1
Ball-Rotor Type	S	Class I «no test»
	H	Class II (0,5 %) ANSI/FCI 70 2 and IEC 60534 4.
	K	Class IV (0,01 %) ANSI/FCI 70 2 and IEC 60534 4.
Mode of Operation	OC	OPEN-CLOSE only 2-way
	13	Mode 13: Start position Port 1 closed @signal 4mA.
	31	Mode 31: Start position Port 3 closed @signal 4mA.
	CL	Configuration L
	CT	Configuration T
	MM	360 degrees rotation - multi mode
Valve Actuation Type	E / F / G	AMOT Electric Actuator (E: EB, F: EA, G: EC)
	A	AUMA Electric Actuator
	H	HKC Electric Actuator
	V	Valpes EL actuator
	P	Pneumatic
Actuator Power Supply	1	12 VDC
	2	24 VDC
	A	110 VAC 1 phase
	B	230 VAC 1 phase
	C	400 VAC 3 phase
	M	Pneumatic with manual override
Actuator Control Signal Input	0	OPEN-CLOSE only 2-way
	A	Switched live supply
	B	4-20mA: signal increases as temp rises
	K	0-10V: signal increases as temp rises
	P	Pneu with pos 4-20mA signal increases as temp rises
	B	BUS - Specify which kind
Actuator Feedback Signal	A	End pos signal, no feedback or pot meter
	B	4-20mA
	K	0-10V
	P	Pneu 4-20mA
	T	BUS - Specify which kind