VGS800W1N Series PN 16, Rp ½ to Rp2 Male Threaded Bronze Valves

Introduction

The VGS800W1N (VGS8) series electrically operated Bronze valves are primarily designed to regulate the flow of water in response to the demand of a controller, in heating, ventilating, and air conditioning systems. This three-way mixing valve is also easily converted into a two-way valve using the available modkit.

Two models of electric actuator are available as standard: The VA-7700 and the VA7810 self-adjusting actuators. Each model can be ordered either for 3-point or for 0…10 VDC proportional control.

VGS800W1N Valve

Features and Benefits

❑ **Male threaded fittings**	Much easier fitting and replacement
❑ **PN 16**	Covers the common HVAC applications.
❑ **Mixing valve easily converted to two-way valve on-site**	Low storage, reduction of valve types, faster availability
❑ **Full DIN / IEC flow capacity for all valves Rp ½ …Rp 2.**	Cost-efficient, offers maximum flow capacity (k_{vs}) per Rp size.
❑ **Uses PTFE guided stainless steel stem with dual O-ring seal packing.**	Long lasting, proven reliability. No adjustment required.
❑ **Brass plug with soft seal for tight (no leakage) shut-off on both control and bypass ports.**	Provides maximum energy efficiency.
❑ **Electric actuators available either factory mounted, or separately for in-situ installation.**	Provides the optimal selection either for direct installations or for distribution centres.
❑ **Slotted stem for quick-fit coupler system**	Quick and easy mounting of actuator to valve reduces installation costs.

Order No. DS 10.252 E

Application Overview

Valve bodies are made of Bronze and are available in sizes from Rp 1/2 to Rp 2.Male threaded fittings comply with ISO 228. (Blind plug for 2-way model as per ISO 7-1) The valve features a brass plug with soft seal and a stainless steel stem guided by two PTFE bushes and dual seal-ring packing.

The VGS8 valve is available in three-way mixing configuration and can be easily converted to a two-way valve for Push-Down-To-Open operation (closing off inlet 2).

Three-way valves have a combination of equal percentage and linear characteristic. Two-way valves have equal percentage relationship between valve travel and flow at a constant pressure drop. An arrow is embossed on one side of the valve body indicating the direction of flow for correct installation.

Four models of electric actuator are available as standard and can be ordered either as factory fitted actuator / valve combinations or separately for in-situ installation.

Refer to this and the following pages for ordering data and additional details.

Refer to this and following pages for ordering

Ordering codes for Valve Bodies

VGS800W1N

Three-way mixing configurations

VGS8 □□ W1 N

A1	= 15/4	**B1**	= 20/6.3
A2	= 15/2.5	**C1**	= 25/10
A3	= 15/1.6	**D1**	= 32/16
A4	= 15/1	**E1**	= 40/25
A5	= 15/0.63	**F1**	= 50/40

Pipe muffles

Order code	Muffles
121 4935 151	DN15 / Rp ½
121 4935 201	DN20 / Rp ¾
121 4935 251	DN25 / Rp 1
121 4935 321	DN32 / Rp 1 ¼
121 4935 401	DN40 / Rp 1 ½
121 4935 501	DN50 / Rp 2

Modkit 3-way in 2-way

Order code	Modkit for:
121 4930 151	DN15 / Rp ½
121 4930 201	DN20 / Rp ¾
121 4930 251	DN25 / Rp 1
121 4930 321	DN32 / Rp 1 ¼
121 4930 401	DN40 / Rp 1 ½
121 4930 501	DN50 / Rp 2

3 muffles are needed for the mixing valve, 2 muffles and 1 modkit are needed for the 2-way valve.

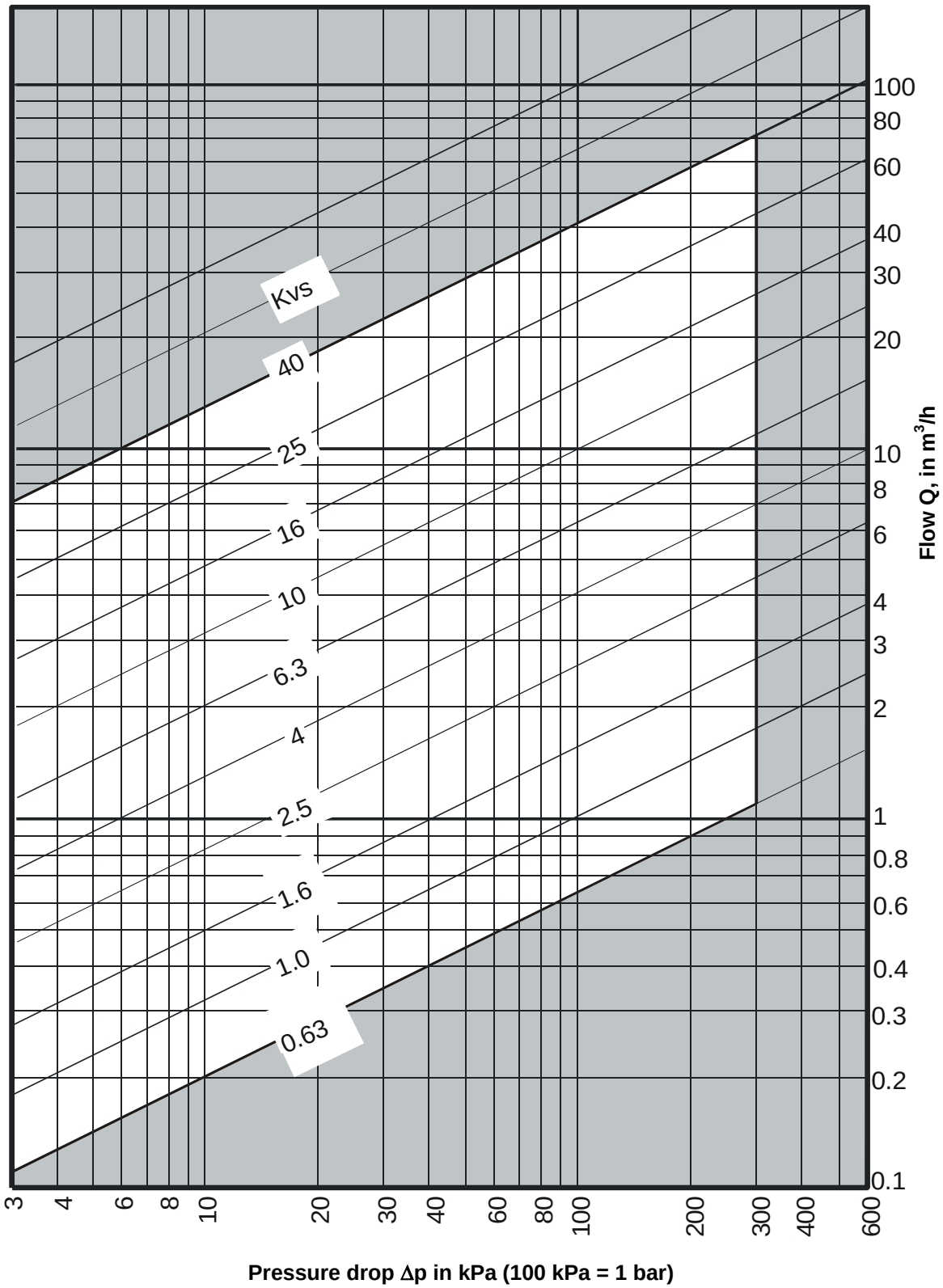
Ordering example:

For a mixing valve, Rp ½, PN 16, valve with $4k_{vs}$ the ordering code is:**VGS8A1W1N**

Valve Selection

The valve size for water applications can be defined using the diagrams below, where the intersection of the pressure drop across the valve and the flow must be within the white area.

k_v selection diagram for Rp ½ …Rp 2 valves:



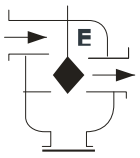
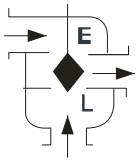
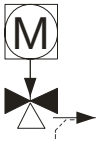
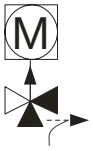
Valve - actuator combinations

The VGS8 series flanged cast iron valves can be combined with the following electric actuator series:

- VA-7700-8200 (Rp ½ …Rp 2 not for Rp 2 mixing valves)
- VA78x0-xxx-12 (Rp ½ …Rp 2)

The flow through the valve is dependent on the position of the plug, as indicated in the tables below.

The function of the actuator / valve combination is dependent on the action of the actuator and the type of valve used.

Valve Type	Electric Actuator
	VA-77xx-820x **VA78x0-xxx-12**
 **VGS800WN1** **2-way PDTO (NC)**	***Actuator stem extends*** 
	Actuator stem retracts 
 **VGS800WN1** **3-way mixing**	***Actuator stem extends*** 
	Actuator stem retracts 

E = Equal percentage control characteristic L = Linear control characteristic	▲ = Flow △ = No flow

Actuator Selection

VA-7700 Electric self adapting actuators:

The VA-77xx Series synchronous motor driven actuator, for valves in heating, ventilation and air conditioning applications, is available for incremental (3-point) control or proportional control with 0-10 V position feedback signal. It provides a stroke capability of 8 mm to a maximum 20 mm.

This compact, non-spring return actuator has a 500 N nominal force and responds to a variety of input signals.

Ordering codes for VA-7700 Electric

Device code	Power supply	Manual override
Floating models (3-point)		
VA-7700-8201	24 V AC	None
VA-7700-8203	230 V AC	None
VA-7740-8201	24 V AC	Mechanical
VA-7740-8203	230 V AC	Mechanical
Proportional models (0…10 V DC / 0 (4)…20 mA)		
VA-7706-8201	24 V AC	Electrical
VA-7746-8201	24 V AC	Electrical and mechanical

Attention: The VA-7700 is not appropriate for **Rp 2 mixing** valves!

VA78x0 Electric Actuators

The VA78x0 non-spring and spring return actuator with 1000N thrust for valves in heating, ventilation and air conditioning applications are available for floating (3-point) control or proportional control.

All models have manual override as standard. Proportional models are **self-calibrating**. The actuator is intended for use with Johnson Controls VGS8 valves.

It provides 1000 N nominal stem force and can be used with DN 15...DN 50 valves in accordance with the max. close-off pressure ratings specified.

Ordering codes for VA7810 Electric Actuators

Non-Spring Return Actuators

Ordering code	Actuator Description
On/Off & Floating Control	
VA7810-ADA-12	AC 230 V
VA7810-ADC-12	AC 230 V, (2) Aux. switches
VA7810-AGA-12	AC 24 V
VA7810-AGC-12	AC 24 V, (2) aux. switches
VA7810-AGH-12	AC 24 V, 2kΩ Feedback pot.
Proportional Control	
VA7810-GGA-12	AC 24 V DC 0(2)…10 V or 0(4)… 20 mA + Floating or On/Off control
VA7810-GGC-12	AC 24 V 2 Aux. switches DC 0(2)…10 V or 0(4)… 20 mA + Floating or On/Off control

Spring Return Actuators

Ordering code	Actuator Description
Spring Return Actuators	
VA7820-GGA-12 (Spring return retracts) **VA7830-GGA-12** (Spring return extends)	**1000N;** AC 24 V Supply DC 0(2)…10 V Feedback Proportional DC 0(2)…10 V or 0(4)… 20 mA control + Floating or On/Off control
VA7820-GGC-12 (Spring return retracts) **VA7830-GGC-12** (Spring return extends)	**1000N;** AC 24 V Supply DC 0(2)…10 V Feedback 2 Aux. switches Proportional DC 0(2)…10 V or 0(4)… 20 mA control + Floating or On/Off control

Ordering procedure

The valves and actuators can be ordered separately or factory mounted. When factory mounted, please add **"+M"** to the order code for the actuator.

For example:

For a mixing valve, Rp 2, K_{vs} 40, plus actuator with electric positioner 0...10 V input, 24 VAC 50/60 Hz supply, order:

Item 1 **VGS8F1W1N** (valve body)
Item 2 **VA7810-GGA-12** (actuator)

Alternatively, to order a factory fitted combination:

Item 1 **VGS8F1W1N** (valve body)
Item 2**VA7810-GGA-12 +M** (actuator)

Close-off pressures

Maximum Close-off Pressures for Electric Valve-actuators (kPa)

Actuator	Stroke	Thrust	Body Size Rp											
	(mm)	(N)	½		¾		1		1 ¼		1 ½		2	
			PN 16											
			⋈	⧓	⋈	⧓	⋈	⧓	⋈	⧓	⋈	⧓	⋈	⧓
VA-7700-820x	13	500	1401	958	982	605	536	280	378	176-	174	54	86	-
VA78x0-xxx-12		1000	1600		1600		1235	1046	908	744	477	369	281	208

Installation and Servicing

When mounting the *VGS8* series valves please follow the instructions below:

- It is recommended that the valves be mounted at angles not greater than 90° from the upright position, in a conveniently accessible location.
- Do not cover the actuator with insulating material.
- Sufficient clearance must be allowed for actuator removal (refer to the dimension drawings on page 7)
- Install the valve as indicated by the arrow(s) on the valve body so that the plug seats against the flow.
- Johnson Controls must approve use of the *VGS8* series valves with fluids other than specified.
- On electrically actuated valve assemblies, all wiring must be in accordance with applicable electrical codes and ordinances.
- Input lines to the actuator must be wired correctly to open or close the valve as is functionally required.

Ordering Code for Replacement packing kits:

Ordering Code	For valves
121 4571 011	Rp ½ …Rp 2

When servicing the VGS8 series valves, make sure that:

- The pneumatic or electrical power to the actuator is isolated.
- You do not touch or attempt to connect or disconnect wires when electrical power is on.

WARNING

Shock Hazard

Disconnect the power supply before wiring connections are made to prevent personal injury.

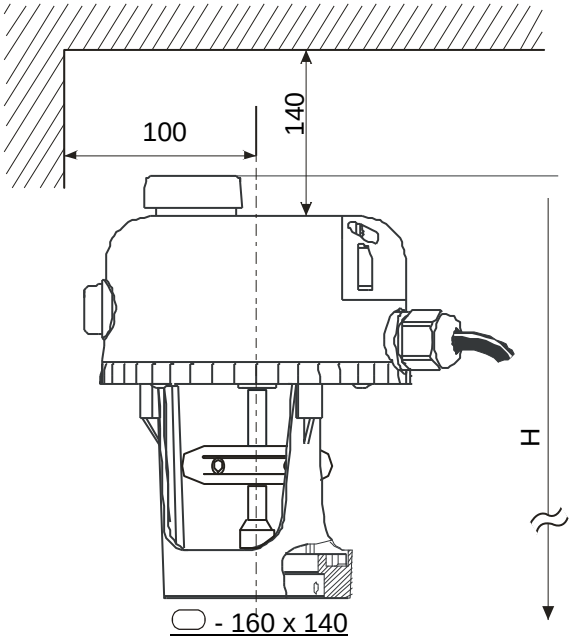
Equipment Damage Hazard

Make and check all wiring connections before applying power to the system. Short circuited or improperly connected wires may result in permanent damage to the unit.

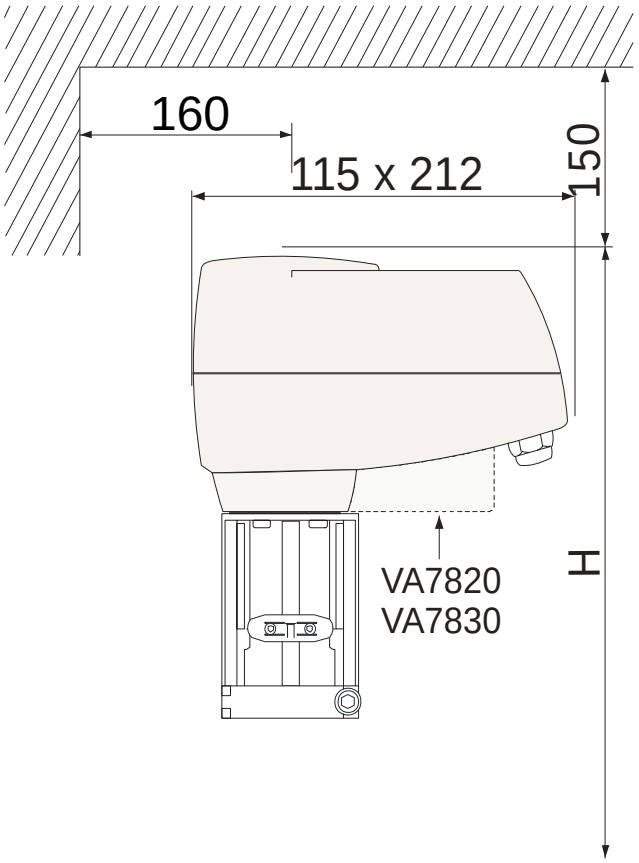
- No air pressure is applied to the piping system when servicing the valve.

Dimensions (in mm): Electric Actuators for VGS800W1N valves, Rp ½ to Rp 2

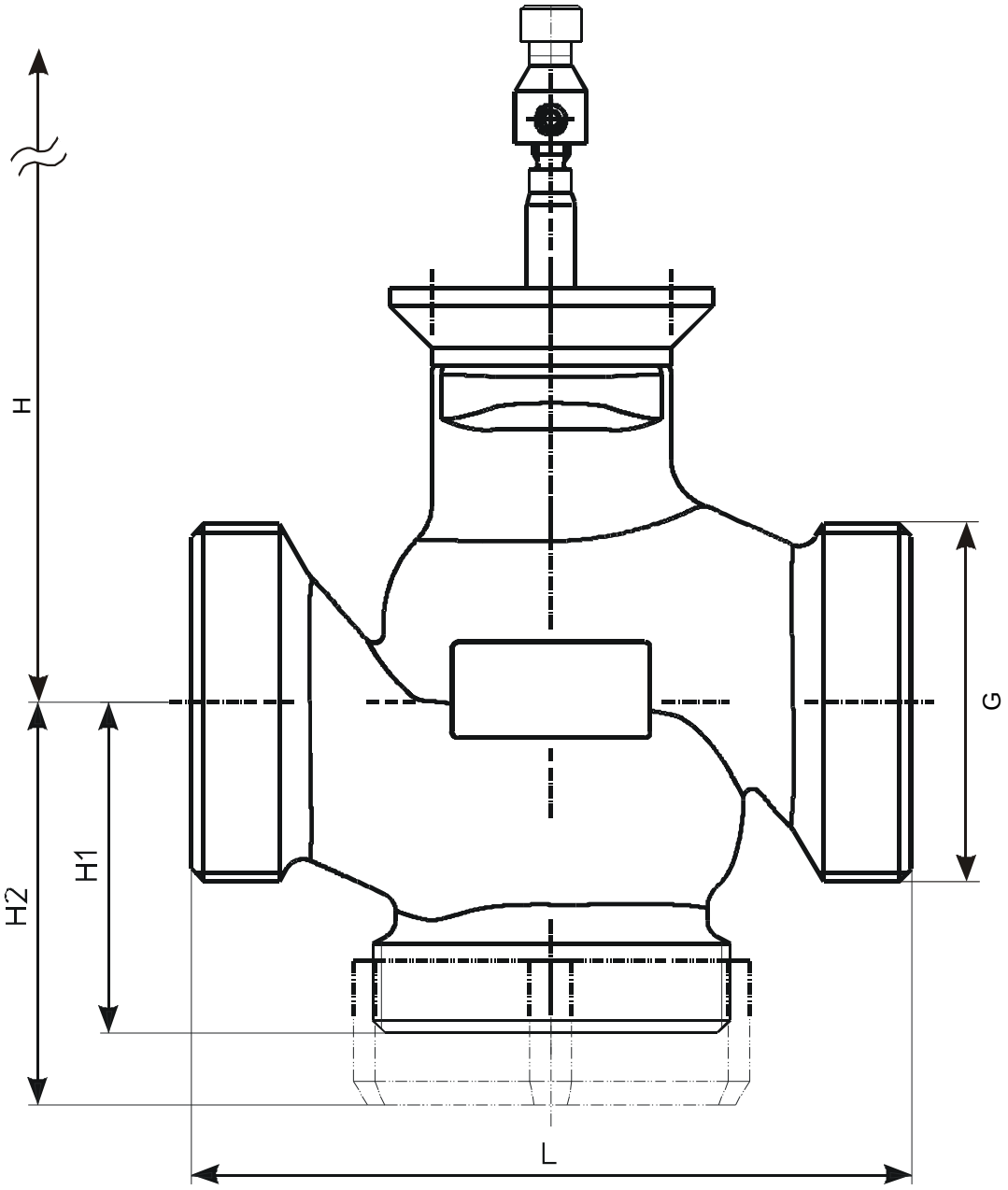
VA-7700-820x



VA78x0-xxx12



VGS800W1N PN 16 Valve



		Rp ½	Rp ¾	Rp 1	Rp 1 ¼	Rp 1 ½	Rp 2
L		80	90	110	120	130	150
H	**VA-7700**	257	257	263	267	276	276
	VA78x0	321	321	327	331	340	340
H1		55	55	55	55	60	65
H2		65	65	66	67	72	77
G		1 1/8	1 ¼	1 ½	2	2 ¼	2 ¾
Valve weight (kg)		1.1	1.2	1.4	2.0	2.5	3.5

Specifications

Product :	**VGS800W1N Series Male Threaded PN 16 valves**						
Models:	3-way mixing Rp ½ …Rp 2 (DN 15…DN 50) 2-way (PDTO) Rp ½ …Rp 2 (After conversion from 3-way)						
Service:	Water, glycol solutions (max 50%) for HVAC applications (proper water treatment is recommended, refer to VDI 2035)						
Valve body data: Rp:	½	¾	1	1 ¼	1 ½	2
k_{vs}:	(*)	6.3	10	16	25	40
3-Way valve weight (kg):	1.1	1.2	1.4	2.0	2.5	3.5
Nominal stroke:	13 mm						
Body pressure rating:	1600 kPa up to 120°C – 1560 kPa up to 130°C as per DIN 4747-1						
Male thread dimensions:	ISO 228-1						
Pipe fitting:	Rp ½ …Rp 2 ISO 7-1						
Fluid temperature limits:	2°C...130 °C						
Material							
Body:	Cast G Cu Sn 5Zn Pb, 2.1096.01, DIN EN 1982						
Stem:	Stainless steel, Material specification 1.4571						
Plug:	Brass, Material specification 2.0401 with soft seal - EPDM						
Seat:	Control port machined into body. Stainless steel, Material specification 1.4571 mixing valve for inlet 2						
Packing:	PTFE guided stainless steel stem with dual O-ring seal packing, no adjustment required						
Face to face dimensions:	In accordance with DIN EN558-1						
Flow characteristics	3-way control port - Equal percentage / Linear (inlet 2)						
Practical rangeability:	k_{vs} / k_{vr} > 30:1						
Leakage rate:	Tight as per DIN EN1349 IV L1 (inlet 1 and 2)						
Operating pressure drop:	Max. 300 kPa						

(*) k_{vs} values for Rp ½ (see also “Ordering codes for valve bodies”)

0.63	1.0	1.6	2.5	4

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. are not liable for damages resulting from misapplication or misuse of its products

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