HVAC Valves and Actuators Catalogue

Issue: September 2008

Make the most of your energy

Schneider Electric

TAC – the Single Source for all your Valve and Actuator Needs

This catalogue presents the comprehensive HVAC Valve and Actuator portfolio from TAC's Field Device Product Division. By dealing with one trusted supplier, TAC's customers save time and cost, fully confident of the quality, performance, compatibility, and value for money of the items they buy.

For further details of the products featured please refer to the relevant data sheets on the TAC extranet, ExchangeOnline at http://extranet.tac.com/ (registration requirement applies) or contact your local TAC sales office.

GLOBAL LEADER IN BUILDING IT

TAC is a leading provider of building automation solutions based on Open Integrated Systems for Building IT. TAC's mission is to provide added value through building environment services for indoor climate, security and use of energy, delivered with advanced technology to end users and property owners throughout the world.

With over 80 years of experience in the HVAC, building automation and security arenas, TAC employs more than 8,000 people worldwide, with partners and branches in 80 countries. TAC's parent company, Schneider Electric, is the global specialist in energy management with 120,000 employees worldwide and operations in 102 countries.

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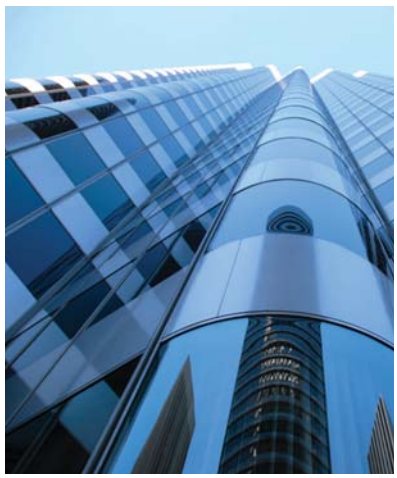

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Ball Valves Available Late Q3

VBS

The new VBS ball valves from TAC utilise a low friction packing design around the ball which enables a low torque and compact motor to be used in the actuator. A 'pop top' connection between the valve and actuator provides a fast and easy installation.

VBS ball valves incorporate a flow characterizing insert to providing an equal percentage flow characteristic with high rangeability. Suitable for control of hot or chilled water applications.

Actuators are available in both spring return and non-spring return versions for floating and proportional control.

SPECIFICATIONS

Valve bodies

Design –	2-way ball valve
Pressure Class	PN40
End Connections	Rp to EN10226 (BSP Female)
Flow Characteristic	EQ, Equal Percentage
Rangeability (Kv/Kv min)	> 100
Seat Leakage	0.01% of Kvs
D Pm (Max Pressure Drop)	4.15 bar (415 kPa)
Close-Off Pressure	9 bar
Media Temperature	-7 to +121 °C
Glycol Concentration	Max 60 %

Materials:

Body	Forged brass.
Stem	303 Stainless steel.
Ball	304 Stainless steel.
Seat	PTFE
Characterisation Insert	Glass filled Ultem 22008™
Stem Seal	Double Viton O-ring

Actuator

Supply Voltage	24V AC 50/60 Hz +25/-15%
Control Signal (Proportional Models)	0-10V, 0-5V, 5-10V, 4-20mA Reverse or Direct Acting
Enclosure	IP50
Electrical Connections	Terminal block
Conduit Entry	22mm
Max Conduit depth	10mm
Manual Override	All models
Open Close Time	159 sec (60 Hz)/135 sec (50Hz)
Ambient Temperature Limits	
Shipping & Storage	-40 to +71 °C
Operating	0 to 60 °C
Humidity	5 to 95% (non-condensing).

Approvals

CE to EMC Direct (89/336/EEC)
CE to Low Voltage Directive (72/23/EEC)
UL to UL873 (File # E9429)
CUL to C22.2 No. 24
C-Tick
PED to SEP (art. 3 para. 3)

VBS Valve Bodies – Stainless Steel trim			
DN	**Part Number**	**Connection**	**kvs**
15	VBS2R01	R_P 1/2	0.6
	VBS2R02		1.0
	VBS2R03		1.8
	VBS2R04		3.0
	VBS2R05		4.0
	VBS2R06		6.7
20	VBS2R15	R_P 3/4	4.0
	VBS2R16		6.7
	VBS2R17		8.7[a]

a. Full port.

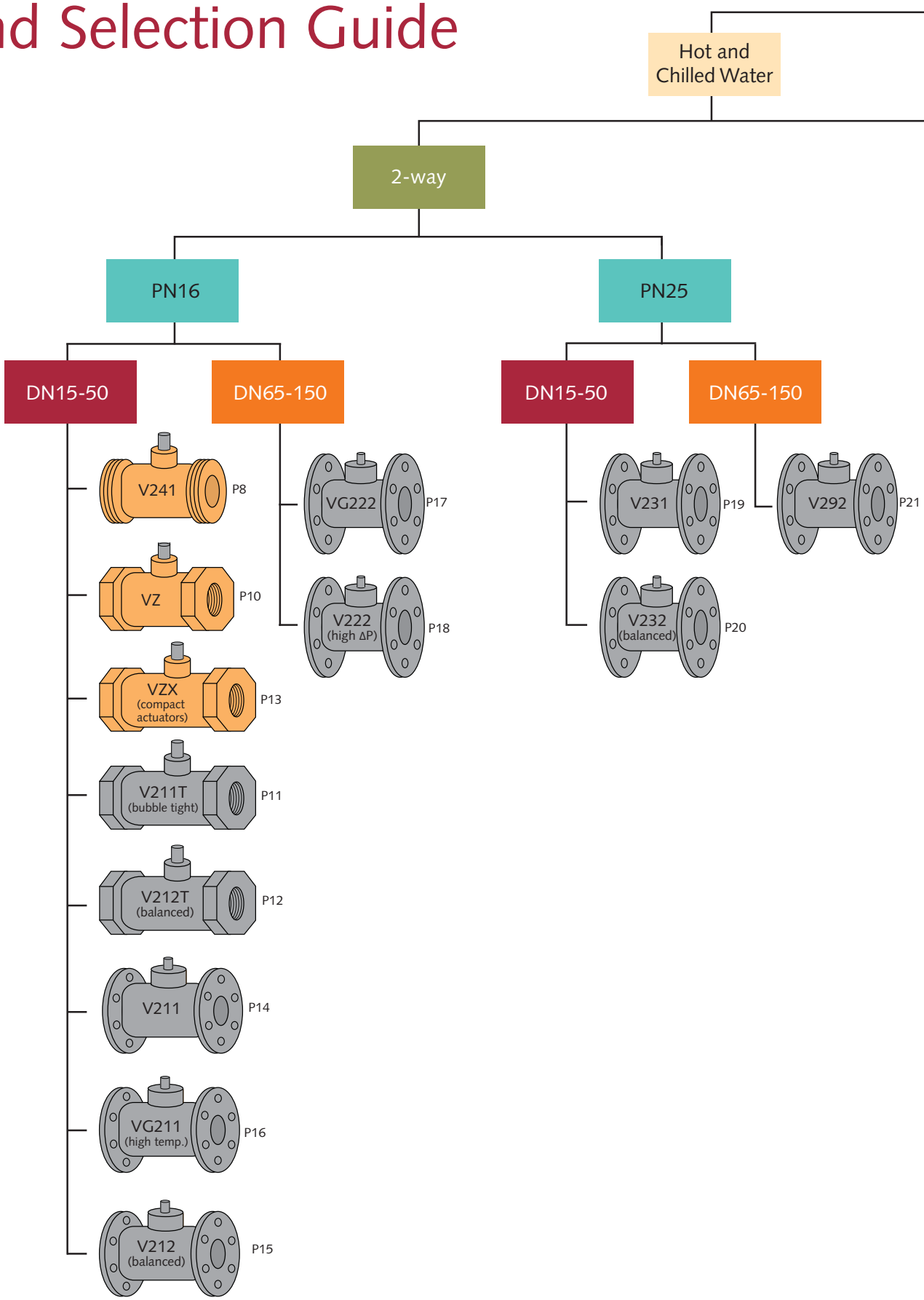
Three Point Floating Actuators (Increase/Decrease)						
Part Number	**Control Signal**	**Spring Return Action (Valve Normal Position)**	**VA @ 24 Vac 50/60 Hz**	**Electrical Connection**	**Stroke Time, sec. 50/60 Hz**	**Time-out Delay, sec. 50/60 Hz**
M131A00	Floating[b]	None	1.7/1.9	Terminal block[c]	159/135	N/A
M112A00	Floating	Normally open	2.7/2.8[d]	Terminal block[c]	159/135	217/181
M122A00		Normally closed		Terminal block[c]		

b. No time-out feature. Controller must provide time-out after 3 minutes on time.
c. All terminal block units accept a 1/2 in. (12.7 mm) conduit connector fitting (22.2 mm diameter cut out).
d. Size transformer for 10 VA per actuator.

Proportional Actuators						
Part Number	**Control Signal**	**Spring Return Action (Valve Normal Position)**	**VA @ 24 Vac 50/60 Hz**	**Electrical Connection**	**Stroke Time, sec. 50/60 Hz**	**Time-out Delay, sec. 50/60 Hz**
M133A00	Proportional 0-5 Vdc, 0-10 Vdc, 5-10 Vdc, 4-20 mAdc	None	2.0/2.4	Terminal block[c]	159/135	200/166
M113A00		Normally open	2.0/2.2[d]	Terminal block[c]		200/166
M123A00		Normally closed		Terminal block[c]		

c. All terminal block units accept a 1/2 in. (12.7 mm) conduit connector fitting (22.2 mm diameter cut out).
d. Size transformer for 10 VA per actuator.

Globe Valve Overview and Selection Guide



Globe Valves

Steam

3-way

2-way

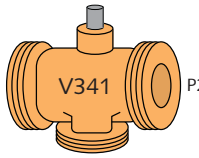
PN16

200C°(PN16)

DN15-50

DN65-150

DN15-100



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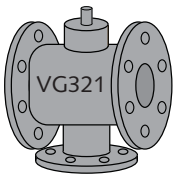

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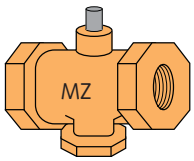

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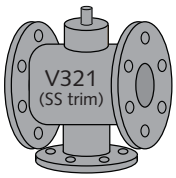

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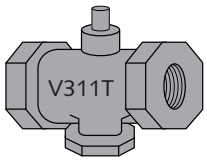

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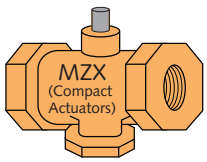

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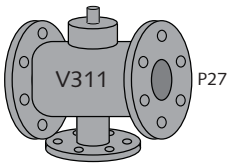

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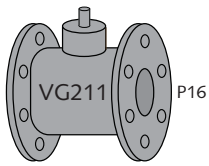
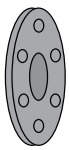


P16

Key

Bronze

Nodular/
Cast Iron


Flange connection


Internal threaded connection


External threaded connection

Globe valves

TAC Venta globe valves offer high rangeability, are self cleaning, offer low leakage and have a robust packing box.

V241

The V241 is a high quality general purpose valve. Polished stainless seats provide high differential pressure capability and low leakage.

Suitable for a wide range of applications such as heating, cooling, air handling and domestic hot water systems. The valve can handle hot and cold water with phosphate, hydrazine and antifreeze additives.

If the valve is used for media at temperatures below 0 °C (32 °F), it should be equipped with a heater in order to prevent ice formation on the valve stem.

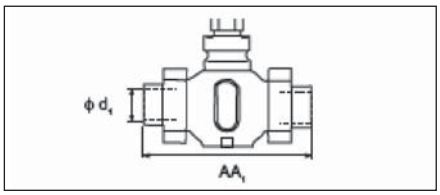
Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	See table
Leakage	up to 0.02% of Kv
ΔPm	600 kPa, water
Max. temperature of medium	150°C
Min. temperature of medium	-20°C
Max. glycol/concentration	50%

Connection	External pipe thread according to ISO 228/1
Materials	
Body	Bronze Rg5
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Standard packing box	Venta

					Max Close-off Pressure kPa					
V241					**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Connection**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
					300N	400N	800N	1500N	1500N	700N
721-4106-000	15	G1B	0.25	>50	1000	1000	1600	1600	1600	1600
721-4110-000	15	G1B	0.40	>50	1000	1000	1600	1600	1600	1600
721-4114-000	15	G1B	0.63	>50	1000	1000	1600	1600	1600	1600
721-4118-000	15	G1B	1.0	>50	1000	1000	1600	1600	1600	1600
721-4122-000	15	G1B	1.6	>50	800	800	1600	1600	1600	1400
721-4126-000	15	G1B	2.5	>50	800	800	1600	1600	1600	1400
721-4130-000	15	G1B	4.0	>50	800	800	1600	1600	1600	1400
721-4134-000	20	G1¼B	6.3	>100	650	650	1500	1600	1600	1100
721-4138-000	25	G1½B	10	>100	400	500	1150	1600	1600	850
721-4142-000	32	G2B	16	>100	300	350	850	1350	1350	650
721-4146-000	40	G2¼B	25	>100	150	250	600	950	950	450
721-4150-000	50	G2¾B	38	>100	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

Internal Thread Connection



Materials

Union nut: malleable iron casting, galv.

Union end: malleable iron casting, galv.

Packing, standard: Klingersil C4400

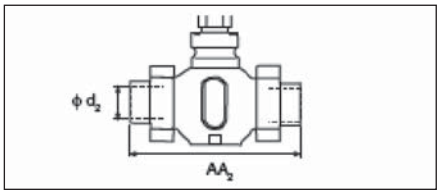
or

Packing, spec: Kingersil Top Chem 1,5mm

Valve		Φ d_1	AA_1	Part no. for connection, one pkg/port	
DN	End Conn.	Int. thread (ISO 7/1)	mm	w/Packing, std	w/Packing, spec.*
15	G1B	R_p ½"	146	911-2100-015	911-2103-015
20	G1¼B	R_p ¾"	146	911-2100-020	911-2103-020
25	G1½B	R_p 1"	159	911-2100-025	911-2103-025
32	G2B	R_p 1¼"	169	911-2100-032	911-2103-032
40	G2¼B	R_p 1½"	197	911-2100-040	911-2103-040
50	G2¾B	R_p 2"	222	911-2100-050	911-2103-050

* The accessory intended for the primary circuit of district heating connections.

Soldering Type Connection



Materials

Union nut: malleable iron casting, galv.

Union end: Bronze, SS 5204

Packing, standard: Klingersil C4400

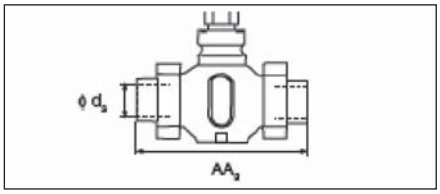
or

Packing, spec: Kingersil Top Chem 1,5mm

Valve		Φ d_2	AA_2	Part no. for connection, one pkg/port	
DN	End Conn.	mm	mm	w/Packing, std	w/Packing, spec.*
15	G1B	15	136	911-2101-015	911-2104-015
20	G1¼B	22	146	911-2101-020	911-2104-020
25	G1½B	28	155	911-2101-025	911-2104-025
32	G2B	35	163	911-2101-032	911-2104-032
40	G2¼B	42	200	911-2101-040	911-2104-040
50	G2¾B	54	232	911-2101-050	911-2104-050

* The accessory combination intended for the primary circuit of district heating connections.

Welded Type Connection



Materials

Union nut: malleable iron casting, galv.

Union end: malleable iron casting, galv.

Packing, standard: Klingersil C4400

or

Packing, spec: Kingersil Top Chem 1,5mm

Valve		Φ d_3	AA_3	Part no. for connection, one pkg/port	
DN	End Conn.	mm	mm	w/Packing, std	w/Packing, spec.*
15	G1B	21.8	182	911-2102-015	911-2105-015 (1)
20	G1¼B	26.9	182	911-2102-020	911-2105-020 (1)
25	G1½B	33.7	187	911-2102-025	911-2105-025 (1)
32	G2B	42.4	197	911-2102-032	911-2105-032 (1)
40	G2¼B	48.3	232	911-2102-040	911-2105-040
50	G2¾B	60.3	262	911-2102-050	911-2105-050

(1) Material Union nut: brass SS 5252

* The accessory Combination intended for the primary circuit of district heating connections.
2 sets of connections required for 2 way valves

VZ

The VZ valve is a general purpose valve with the ½" and ¾" sizes having a soft seat for tight shut off.

Suitable for a wide range of applications such as heating, cooling, air handling and domestic hot water systems.

They may be used with steam with a maximum gauge pressure of 140Kpa.

Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal Percentage
Stroke ½" and ¾" valves	9.5mm
Stroke 1" to 2" valves	15.9mm
Rangeability Kvs/Kv min	>50
Leakage ½" and ¾" valves	tight sealing
Leakage 1" to 2" valves	<0.1%
Max. temperature of medium	120°C
Min. temperature of medium	2°C

Max. glycol concentration	25%
Connections	Screwed BSP to BS21 (Rp)
Materials	
Body	Bronze: Leaded Gunmetal BS1400 LG2
Stem	Stainless steel BS970 Grade 303 S42
Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ110
Sealing	Gland O Ring
Seat	Integral with body
Standard packing box	PTFE Chevron

				Max Close-off Pressure kPa	
VZ				**Non Spring return actuator**	**Spring return actuator**
Part number	**Size (inches)**	**Kvs**	**Rangeability**	**M800 (1)**	**M700 (2)**
				800N	700N
VZ1401	½"	0.2	50	1600	1600
VZ1402	½"	0.5	50	1600	1600
VZ1403	½"	1	50	1600	1600
VZ1404	½"	2.1	50	1600	1600
VZ1451	¾"	4.2	50	1600	1600
VZ2501	1"	8.3	50	1262	1262
VZ2551	1¼"	12.5	50	755	755
VZ2601	1½"	21	50	533	533
VZ2651	2"	33	50	312	312

(1) Use Linkage Kit L2SV
(2) Use Linkage Kit L7SV
Replacement Packing box: 0626-9-203

V211T

The V211T is an internally threaded valve with a soft seat for tight shut off.

Suitable for a wide range of applications such as heating cooling and air handling systems with hot or chilled water.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	>50
Leakage	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120°C
Min. temperature of medium	-20°C
Max. glycol concentration	50%
Connections	Internal pipe thread R_p

Materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Standard packing box	Venta

					Max Close-off Pressure kPa					
V211T					**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Connection**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
					300N	400N	800N	1500N	1500N	700N
721-1716-000	15	R_p ½	1.6	>50	800	800	1600	1600	1600	1400
721-1720-000	15	R_p ½	2.5	>50	800	800	1600	1600	1600	1400
721-1724-000	15	R_p ½	4.0	>50	800	800	1600	1600	1600	1400
721-1728-000	20	R_p ¾	6.3	>50	650	650	1500	1600	1600	1100
721-1732-000	25	R_p 1	10	>50	400	500	1150	1600	1600	850
721-1736-000	32	R_p 1¼	16	>50	300	350	850	1350	1350	650
721-1740-000	40	R_p 1½	25	>50	150	250	600	950	950	450
721-1744-000	50	R_p 2	38	>50	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

V212T

The V212T is an internally threaded balanced valve requiring only minimal actuator force, coupled with a soft seat and good rangeability the V212T provides very energy efficient control of hydronic applications.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Suitable for a wide range of applications such as heating cooling and air handling systems with hot or chilled water.

Design	2-way pressure balanced plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	>50
Leakage	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120°C
Min. temperature of medium	-20°C
Max. glycol/concentration	-20°C
Connections	Internal pipe thread R_p

Materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Standard packing box	Venta

					Max Close-off Pressure kPa					
V212T					**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Connection**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
					300N	400N	800N	1500N	1500N	700N
721-1832-000	25	R_p 1	10	>50		800	1600	1600	1600	1600
721-1836-000	32	R_p 1¼	16	>50		750	1600	1600	1600	1600
721-1840-000	40	R_p 1½	25	>50		700	1600	1600	1600	1600
721-1844-000	50	R_p 2	38	>50		600	1600	1600	1600	1600

Replacement packing box: 1-001-0800-0

VZX

The VZX valve utilises a compact actuator for installations with limited space.

Suitable for a wide range of applications such as heating cooling and air handling systems with hot or chilled water.

Design	2-way plug valve
Pressure class	PN 16
Flow characteristic	Equal Percentage
Stroke	12.7mm
Rangeability Kvs/Kv min	>50
Leakage	<0.1%
Max. temperature of medium	120°C
Min. temperature of medium	2°C
Max. glycol concentration	25%
Connection	Screwed BSP to BS21 (Rp)

Materials	
Body	Bronze: Leaded Gunmetal BS1400 LG2
Stem	Stainless steel BS970 Grade 303 S42
Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ110
Sealing	Gland O Ring
Seat	Integral with body
Standard packing box	PTFE Chevron

Note: only suitable for operation by AVUX, AVUM and AVUE actuators.

				Max Close-off Pressure kPa			
VZX				**Non Spring Return Actuators**			
Part number	**Size (inches)**	**Kvs**	**Rangeability**	**AVUE5304 (1)**	**AVUE5354 (2)**	**AVUX5202**	**AVUM5601**
				220N	220N	220N	220N
VZX4404	½"	2.1	50	1180	1180	1180	1180
VZX4451	¾"	4.2	50	720	720	720	720
VZX4501	1"	8.3	50	340	340	340	340
VZX4551	1¼"	12.5	50	200	200	200	200
VZX4601	1½"	21	50	120	120	120	120
VZX4651	2"	33	50	60	60	60	60

(1) direct acting
(2) reverse acting
Replacement Packing Box: 0626-9-204

V211

The V211 is a flanged valve with a soft seat for tight shut off

Suitable for a wide range of applications such as heating cooling and air handling systems with hot or chilled water.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	>50
Leakage	Tight sealing
ΔPma	400 kPa, water
Max. temperature of medium	120°C
Min. temperature of medium	-20°C
Max. glycol/concentration	50%
Connections	Flange according to ISO 7005-2

Materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Standard packing box	Venta

				Max Close-off Pressure kPa					
V211				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
				300N	400N	800N	1500N	1500N	700N
721-1116-000	15	1.6	>50	800	800	1600	1600	1600	1400
721-1120-000	15	2.5	>50	800	800	1600	1600	1600	1400
721-1124-000	15	4.0	>50	800	800	1600	1600	1600	1400
721-1128-000	20	6.3	>50	650	650	1500	1600	1600	1100
721-1132-000	25	10	>50	400	500	1150	1600	1600	850
721-1136-000	32	16	>50	300	350	850	1350	1350	650
721-1140-000	40	25	>50	150	250	600	950	950	450
721-1144-000	50	38	>50	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

V212

The V212T is a flanged balanced valve requiring only minimal actuator force, coupled with a soft seat and good rangeability the V212 provides very energy efficient control of hydronic applications

Suitable for a wide range of applications such as heating cooling and air handling systems with hot or chilled water.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	2-way pressure balanced plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	>50
Leakage	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120°C
Min. temperature of medium	-20°C
Max.glycol/concentration	50%
Connections	Flange according to ISO 7005-2

Materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Standard packing box	Venta

				Max Close-off Pressure kPa					
V212				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
				300N	400N	800N	1500N	1500N	700N
721-1232-000	25	10	>50		800	1600	1600	1600	1600
721-1236-000	32	16	>50		750	1600	1600	1600	1600
721-1240-000	40	25	>50		700	1600	1600	1600	1600
721-1244-000	50	38	>50		600	1600	1600	1600	1600

Replacement packing box: 1-001-0800-0

VG211

The VG211 is a flanged high temperature valve for media temperatures up to 200°C

Suitable for a wide range of applications such as heating cooling and air handling systems with hot or chilled water and steam.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a stem heater in order to prevent ice formation on the valve stem.

Design	2-way plug valve, stem up open
Pressure class	PN 16
Flow characteristic	Equal Percentage

Rangeability Kvs/Kv min	
DN15-20	>50
DN25-100	>35

Leakage	0,02% of Kvs
ΔPm	600 kPa
Max. temperature of medium	200°C
Min. temperature of medium	-10°C

Max. glycol/concentration	50%
Connections	Flange according to ISO 7005-2

Materials	
Body	Cast iron
Stem	Stainless steel
Plug	Stainless steel
Seat	Stainless steel
Packing box	Spring Loaded PTFE V-Ring

				Max Close-off Pressure kPa						
VG211				**Non Spring Return Actuators**						**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M3000**	**M700**
				300N	400N	800N	1500N	1500N	-	700N
721-1149-000	15	0.6	>50	1600	1600	1600	1600	1600	-	1600
721-1151-000	15	1.0	>50	1600	1600	1600	1600	1600	-	1600
721-1153-000	15	1.6	>50	1600	1600	1600	1600	1600	-	1600
721-1155-000	15	2.5	>50	1300	1300	1600	1600	1600	-	1600
721-1157-000	15	4.0	>50	1300	1300	1600	1600	1600	-	1600
721-1159-000	20	6.3	>50	750	750	1600	1600	1600	-	1500
721-1161-000	25	10	>35	450	450	1300	1600	1600	-	900
721-1163-000	32	16	>35	450	450	1300	1600	1600	-	900
721-1165-000	40	24	>35	250	250	800	1350	1350	-	550
721-1167-000	50	38	>35	150	150	500	900	900	-	350
721-1169-000	65	63	>35	-	-	210	350	350	720	150
721-1171-000	80	110	>35	-	-	150	250	250	550	100
721-1173-000	100	140	>35	-	-	90	150	150	350	60

Replacement packing box: 1-001-0811-0

VG222

The VG222 is a large flanged balanced valve suitable for large hydronic flows in heating and air conditioning circuits. The balanced plug enables a low actuating force to control the valve.

Suitable for a wide range of applications using hot water or de-aerated cooling water

With cooling media at temperatures below 0°C, a heater must be fitted to protect against stem seizure due to freezing.

Design	2-way pressure balanced plug valve, stem up closed
Pressure class	PN 16
Flow characteristics	Equal Percentage
Rangeability Kvs/Kv min	>50

Stroke	
DN 65	25 mm
DN 80 – DN 150	45 mm
Leakage	<0.03% of Kv
ΔPm	200 kPa, water

Max. temperature of medium	150°C
Min. temperature of medium	-10°C
Connection	Flange according ISO 7005-2

Materials	
Body	Grey cast iron
Stem	stainless steel
Plug	Brass
Seat	Grey cast iron
Packing box	Viton OR

				Max Close-off Pressure kPa				
VG222				**Non Spring Return Actuators**				**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500**	**MV15B**	**M3000**	**M700**
				800N	1500N	1500N	3000N	700N
721-2052-000	65	63	>50	1600	1600	1600	1600	1300
721-2056-000	80	100	>50	1450	1600	1600	1600	1000
721-2060-000	100	130	>50	1000	1600	1600	1600	700
721-2064-000	125	200	>50	750	1600	1600	1600	470
721-2068-000	150	300	>50	550	1450	1450	1600	300

Replacement packing box: 1-001-0810-0

V222

The V222 is a large flanged balanced valve, suitable for control of large flows in heating and air conditioning systems. The balanced plug enables a low actuating force to control the valve. A stainless steel seat allows a large pressure drop across the valve

Suitable for a wide range of applications using hot water or de-aerated cooling water

A stem heater is not available for the this valve

Design	2-way pressure balanced plug valve, stem up open
Pressure class	PN 16
Flow characteristics	Equal Percentage

Max. temperature of medium	150°C
Min. temperature of medium	-10°C
Connection	Flange according ISO 7005-2
Max. glycol/concentration	50%

Stroke	
DN 65 – DN 100	30 mm
DN 125 – DN 150	50 mm
Rangeability Kvs/Kv min	50
Leakage	<0.05% of Kv
ΔPm	800 kPa, water

Materials	
Body	Cast iron GG25
Stem	Stainless steel SS 1.4021
Plug	Stainless steel SS 1.4021
Seat	Stainless steel SS 1.4021
Packing box	Spring-loaded PTFE-V-ring

				Max Close-off Pressure kPa					
V222				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500**	**MV15B**	**M22**	**M50**	**M700**
				800N	1500N	1500N	2200N	5000N	700N
721-2254-000	65	63	>50	1500	1600	1600	---	---	1200
721-2258-000	80	100	>50	1500	1600	1600	---	---	1200
721-2262-000	100	160	>50	1100	1600	1600	---	---	800
721-2266-000	125	250	>50	---	---	---	1600	1600	---
721-2270-000	150	400	>50	---	---	---	1400	1600	---

Replacement packing box DN65-100: 1-001-0820-0
DN125-150: 1-001-0821-0

V231

The V231 is a flanged PN25 valve with a very high rangeability

The valve is suitable for primary district heating circuits as well as hot and chilled water applications where high pressure or high rangeability is required.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	2-way plug valve, stem up closed
Pressure class	PN 25
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	See table
Leakage	Up to 0.02% of Kv
ΔPm	Max. 800 kPa, water
Max. temperature, water	150°C
Max. temperature, saturated steam	120°C

Min. temperature of medium	-20°C
Max. Glycol concentration	50%
Flanges drilling	According to SS 335 and ISO 2084
Materials	
Body	Nodular iron SS 0727 (GGG40.3)
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Standard packing box	Venta

				Max Close-off Pressure kPa					
V231				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
				300N	400N	800N	1500N	1500N	700N
721-3106-000	15	0.25	>50	1000	1000	1600	1600	1600	1600
721-3110-000	15	0.40	>50	1000	1000	1600	1600	1600	1600
721-3114-000	15	0.63	>50	1000	1000	1600	1600	1600	1600
721-3118-000	15	1.0	>50	1000	1000	1600	1600	1600	1600
721-3122-000	15	1.6	>50	800	800	1600	1600	1600	1400
721-3126-000	15	2.5	>50	800	800	1600	1600	1600	1400
721-3130-000	15	4.0	>50	800	800	1600	1600	1600	1400
721-3134-000	20	6.3	>200	650	650	1500	1600	1600	1100
721-3138-000	25	10	>200	400	500	1150	1600	1600	850
721-3142-000	32	16	>200	300	350	850	1350	1350	650
721-3146-000	40	25	>200	150	250	600	950	950	450
721-3150-000	50	38	>200	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

V232

The V232 is a pressure balanced flanged PN25 valve with high rangeability. The balanced plug enables a low actuating force to control the valve.

The valve is suitable for primary district heating circuits as well as hot and chilled water applications where high pressure or high rangeability is required.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	2-way, pressure balanced plug valve, stem up closed
Pressure class	PN 25
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability Kvs/Kv min	See table
Leakage	Up to 0.02% of Kv
ΔPm	Max. 800 kPa, water
Max. temperature of medium	150°C
Min. temperature of medium	-20°C
Flange drilling	According to SS 335 and ISO 2084

Materials	
Body	Nodular iron SS 0727 (GGG40.3)
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Standard packing box	Venta

				Max Close-off Pressure kPa					
V232				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
				300N	400N	800N	1500N	1500N	700N
721-3238-000	25	10	>200		800	1600	1600	1600	1600
721-3242-000	32	16	>200		750	1600	1600	1600	1600
721-3246-000	40	25	>200		700	1600	1600	1600	1600
721-3250-000	50	38	>200		600	1600	1600	1600	1600

Replacement packing box: 1-001-0800-0

V292

The V292 is a large pressure balanced flanged valve to PN25. The balanced plug enables a low actuating force to control the valve.

The valve is suitable for primary district heating circuits as well as high pressure hot and chilled water applications

Design	2-way pressure balanced plug valve stem up open
Pressure class	PN 25
Flow characteristics	Equal Percentage

Stroke	
DN 65 – DN 100	30 mm
DN 125 – DN 150	50 mm

Rangeability Kvs/Kv min	> 50
Leakage	<0.05% of Kv
ΔPm	1600 kPa, water

Max. temperature of medium	150°C
Min. temperature of medium	-10°C
Max. Glycol concentration	50%
Connection	Flange according ISO 7005-2

Materials	
Body	Nodular iron GGG40.3
Stem	Stainless steel SS 1.4021
Plug	Stainless steel SS 1.4021
Seat	Stainless steel SS 1.4021
Packing box	Spring-loaded PTFE-V-ring

				Max Close-off Pressure kPa					
V292				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500**	**MV15B**	**M22**	**M50**	**M700**
				800N	1500N	1500N	2200N	5000N	700N
721-9254-000	65	63	>50	1500	2500	2500	---	---	1200
721-9258-000	80	100	>50	1500	2500	2500	---	---	1200
721-9262-000	100	160	>50	1100	1600	1600	---	---	800
721-9266-000	125	250	>50	---	---	---	1800	2500	---
721-9270-000	150	400	>50	---	---	---	1400	2500	---

Replacement packing box DN65-100: 1-001-0820-0
DN125-150: 1-001-0821-0

V341

The V341 is a high quality general purpose valve. Polished stainless seats provide high differential pressure capability and low leakage.

The valve is suitable for a wide range of applications such as heating, cooling, air handling and domestic hot water systems. The valve can handle hot and cold water with phosphate, hydrazine and antifreeze additives.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	3-way plug valve Stem up closed, A port (B-AB open)
Pressure class	PN 16
Flow characteristics A-AB	Equal percentage modified
Flow characteristics B-AB	Complementary
Stroke	20 mm
Rangeability Kvs/Kv min	See table
Leakage A-AB	up to 0.02% of Kv
Leakage B-AB	up to 0.05% of Kv
ΔPm	600 kPa, water

Max. temperature of medium	150°C
Min. temperature of medium	-20°C
Connection	External pipe thread according to ISO 228/1

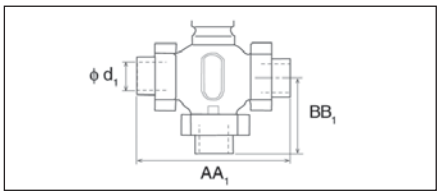
Materials

Body	Bronze Rg5
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Standard packing box	Venta

					Max Close-off Pressure kPa					
V341					**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Connection**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
					300N	400N	800N	1500N	1500N	700N
731-4121-000	15	G1B	1.6	>50	800	800	1600	1600	1600	1400
731-4125-000	15	G1B	2.5	>50	800	800	1600	1600	1600	1400
731-4129-000	15	G1B	4.0	>50	800	800	1600	1600	1600	1400
731-4133-000	20	G1¼B	6.3	>100	650	650	1500	1600	1600	1100
731-4137-000	25	G1½B	10	>100	400	500	1150	1600	1600	850
731-4141-000	32	G2B	16	>100	300	350	850	1350	1350	650
731-4145-000	40	G2¼B	25	>100	150	250	600	950	950	450
731-4149-000	50	G2¾B	38	>100	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

Internal Thread Connection



Materials

Union nut: malleable iron casting, galv.

Union end: malleable iron casting, galv.

Packing, standard: Klingersil C4400

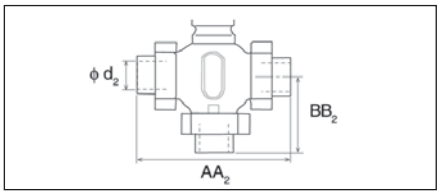
or

Packing, spec: Kingersil Top Chem 1,5mm

Valve		Φ d_1	AA_1	Part no. for connection, one pkg/port	
DN	End Conn.	Int. thread (ISO 7/1)	mm	w/Packing, std	w/Packing, spec.*
15	G1B	R_p ½"	146	911-2100-015	911-2103-015
20	G1¼B	R_p ¾"	146	911-2100-020	911-2103-020
25	G1½B	R_p 1"	159	911-2100-025	911-2103-025
32	G2B	R_p 1¼"	169	911-2100-032	911-2103-032
40	G2¼B	R_p 1½"	197	911-2100-040	911-2103-040
50	G2¾B	R_p 2"	222	911-2100-050	911-2103-050

* The accessory intended for the primary circuit of district heating connections.
3 sets of connections required for 3 way valves

Soldering Type Connection



Materials

Union nut: malleable iron casting, galv.

Union end: Bronze, SS 5204

Packing, standard: Klingersil C4400

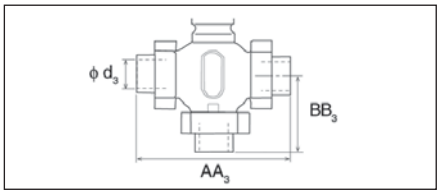
or

Packing, spec: Kingersil Top Chem 1,5mm

Valve		Φ d_2	AA_2	Part no. for connection, one pkg/port	
DN	End Conn.	mm	mm	w/Packing, std	w/Packing, spec.*
15	G1B	15	136	911-2101-015	911-2104-015
20	G1¼B	22	146	911-2101-020	911-2104-020
25	G1½B	28	155	911-2101-025	911-2104-025
32	G2B	35	163	911-2101-032	911-2104-032
40	G2¼B	42	200	911-2101-040	911-2104-040
50	G2¾B	54	232	911-2101-050	911-2104-050

* The accessory combination intended for the primary circuit of district heating connections.
3 sets of connections required for 3 way valves

Welded Type Connection



Materials

Union nut: malleable iron casting, galv.

Union end: malleable iron casting, galv.

Packing, standard: Klingersil C4400

or

Packing, spec: Kingersil Top Chem 1,5mm

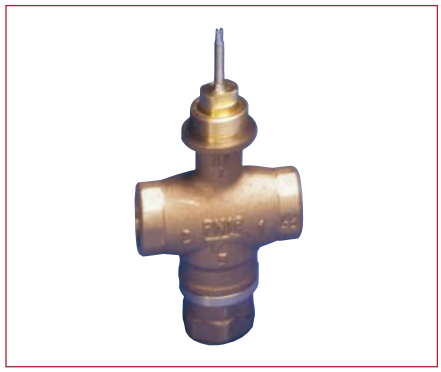
Valve		Φ d_3	AA_3	Part no. for connection, one pkg/port	
DN	End Conn.	mm	mm	w/Packing, std	w/Packing, spec.*
15	G1B	21.8	182	911-2102-015	911-2105-015 (1)
20	G1¼B	26.9	182	911-2102-020	911-2105-020 (1)
25	G1½B	33.7	187	911-2102-025	911-2105-025 (1)
32	G2B	42.4	197	911-2102-032	911-2105-032 (1)
40	G2¼B	48.3	232	911-2102-040	911-2105-040
50	G2¾B	60.3	262	911-2102-050	911-2105-050

(1) Material Union nut: brass SS 5252.
3 sets of connections required for 3 way valves

MZ

Satchwell MZ valves are suitable for a wide range of applications, such as heating, cooling, air handling and domestic hot water systems. These valves have a linear moving spindle and a modified parabolic characterised plug operating against the upper seat, which controls flow quantity to suit the load. The lower part of the plug has a linear characteristic operating against the lower seat, and controlling the bypass quantity.

MZ valves can also be used with a medium of max. 25% glycol solution.



Design	3-way plug valve, stem up closed, A-AB (B-AB open)
Pressure class	PN 16
Flow characteristic Port 2	Modified Parabolic
Flow characteristic Port 3	Linear
Stroke ½" and ¾" Valves	9.5mm
Stroke 1" to 2" Valves	15.9mm
Rangeability Kvs/Kv min	50
Leakage (Ports 2-1)	0.1% max.
Leakage (Ports 3-1)	0.5% max.
Max. temperature of medium	120°C
Min. temperature of medium	2°C
Connections	Screwed BSP to BS21

Materials	
Body	Bronze: Leaded Gunmetal BS1400 LG2
Stem	Stainless steel BS970 Grade 303 S42
Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ 110
Sealing	Gland O Ring
Seat Top	Integral with body
Seat Bottom (½" & ¾" valves)	Copper Alloy BS2874 CZ 132
Seat Bottom (1" to 2" valves)	Leaded Gunmetal BS1400 LG2
Standard packing box	PTFE Chevron

				Max Close-off Pressure kPa	
MZ				**Non Spring return actuator**	**Spring return actuator**
Part number	**Size (inches)**	**Kvs**	**Rangeability**	**M800 (1)**	**M700 (2)**
				800N	700N
MZ3402	½"	2.6	50	1600	1600
MZ3452	¾"	4.2	50	1600	1600
MZ3501	1"	8.3	50	1262	1262
MZ3551	1¼"	12.5	50	755	755
MZ3601	1½"	21	50	533	533
MZ3651	2"	33	50	312	312

(1) Use Linkage Kit L2SV
(2) Use Linkage Kit L7SV
Replacement Packing box: 0626-9-203

V311T

The V211T is an internally threaded valve with a soft seat for tight shut off.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	3-way plug valve stem up closed, A port (B-AB open)
Pressure class	PN 16
Flow characteristic A-AB	Equal percentage modified
Flow characteristic B-AB	Complementary
Stroke	20 mm
Rangeability Kvs/Kv min	>50
Leakage A-AB and B-AB	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120°C
Min. temperature of medium	-20°C
Max. Glycol concentration	50%
Connection	Internal pipe thread R_p

Materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Standard packing box	Venta

					Max Close-off Pressure kPa					
V311T					**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Connection**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
					300N	400N	800N	1500N	1500N	700N
731-1717-000	15	R_p ½	1.6	>50	800	800	1600	1600	1600	1400
731-1721-000	15	R_p ½	2.5	>50	800	800	1600	1600	1600	1400
731-1725-000	15	R_p ½	4.0	>50	800	800	1600	1600	1600	1400
731-1729-000	20	R_p ¾	6.3	>50	650	650	1500	1600	1600	1100
731-1733-000	25	R_p 1	10	>50	400	500	1150	1600	1600	850
731-1737-000	32	R_p 1¼	16	>50	300	350	850	1350	1350	650
731-1741-000	40	R_p 1½	25	>50	150	250	600	950	950	450
731-1745-000	50	R_p 2	38	>50	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

MZX

The MZX is a 3 way valve utilising a compact actuator for installations with limited space.

The valves are suitable for a wide range of mixing applications such as heating, cooling, air handling and domestic hot water systems.

Design	3-way plug valve
Pressure class	PN 16
Flow characteristic Port 2	Modified Parabolic
Flow characteristic Port 3	Linear
Stroke	12.7mm
Rangeability Kvs/Kv min	50
Leakage (Ports 2-1)	0.1% max.
Leakage (Ports 3-1)	0.5% max.
Max. temperature of medium	120°C
Min. temperature of medium	2°C
Max. Glycol concentration	25%
Connections	Screwed BSP to BS21

Materials	
Body	Bronze: Leaded Gunmetal BS1400 LG2
Stem	Stainless steel BS970 Grade 303 S42
Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ 110
Sealing	Gland O Ring
Seat Top	Integral with body
Seat Bottom (½" & ¾" valves)	Copper Alloy BS2874 CZ 132
Seat Bottom (1" to 2" valves)	Leaded Gunmetal BS1400 LG2
Standard packing box	PTFE Chevron

Note: suitable for operation by AVUX, AVUM and AVUE actuators only.

				Max Close-off Pressure kPa			
MZX				**Non Spring Return Actuators**			
Part number	**Size (inches)**	**Kvs**	**Rangeability**	**AVUE5304 (1)**	**AVUE5354 (2)**	**AVUX5202**	**AVUM5601**
				220N	220N	220N	220N
MZX4402	½"	2.6	50	1180	1180	1180	1180
MZX4452	¾"	4.2	50	720	720	720	720
MZX4501	1"	8.3	50	340	340	340	340
MZX4551	1¼"	12.5	50	200	200	200	200
MZX4601	1½"	21	50	120	120	120	120
MZX4651	2"	33	50	60	60	60	60

1) direct acting
(2) reverse acting
Replacement Packing Box: 0626-9-204

V311

The V311 is a flanged valve with a soft seat for tight shut off

The valve is suitable for a wide range of mixing applications with hot or chilled water in heating cooling and air handling systems.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a stem heater in order to prevent ice formation on the valve stem.

Design	3-way plug valve stem up closed (A port/B-AB open)
Pressure class	PN 16
Flow characteristic A-AB	Equal percentage modified
Flow characteristic B-AB	Complementary
Stroke	20 mm
Rangeability Kvs/Kv min	>50
Leakage A-AB and B-AB	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120°C
Min. temperature of medium	-20°C
Max. Glycol concentration	25%
Connection	Flange according to ISO 7005-2

Materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Standard packing box	Venta

				Max Close-off Pressure kPa					
V311				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M400**	**M800**	**M1500**	**MV15B**	**M700**
				300N	400N	800N	1500N	1500N	700N
731-1117-000	15	1.6	>50	800	800	1600	1600	1600	1400
731-1121-000	15	2.5	>50	800	800	1600	1600	1600	1400
731-1125-000	15	4.0	>50	800	800	1600	1600	1600	1400
731-1129-000	20	6.3	>50	650	650	1500	1600	1600	1100
731-1133-000	25	10	>50	400	500	1150	1600	1600	850
731-1137-000	32	16	>50	300	350	850	1350	1350	650
731-1141-000	40	25	>50	150	250	600	950	950	450
731-1145-000	50	38	>50	50	150	400	650	650	300

Replacement packing box: 1-001-0800-0

VG321

The VG321 is a large flanged general purpose valve

The valve is suitable for a wide range of mixing applications with hot or chilled water in heating cooling and air handling systems.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a stem heater in order to prevent ice formation on the valve stem.

Design	3-way plug mixing valve stem up closed (A port/B-AB open)
Pressure class	PN 16
Connection	Flange according ISO 7005-2
Rangeability Kvs/Kv min	> 50
Flow characteristics A – AB	Equal Percentage
Flow characteristics B – AB	Linear
Stroke DN65	25 mm
DN80-150	45mm
Leakage A – AB DN65 – DN150	< 0.03% of Kv
Leakage B – AB DN65 – DN150	< 2% of Kv
ΔPm	200 kPa, water

Max. temperature of medium	150°C
Min. temperature of medium	-10°C
Max. Glycol concentration	50%

Materials

Body	Grey Cast iron
Stem	Stainless steel
Plug	Brass
Seat	Grey Cast iron
Packing box	Viton OR

				Max Close-off Pressure kPa				
VG321				**Non Spring Return Actuators**				**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500**	**MV15B**	**M3000**	**M700**
				800N	1500N	1500N	3000N	700N
731-2053-000	65	63	>50	240	400	400	850	220
731-2057-000	80	100	>50	160	240	240	570	140
731-2061-000	100	130	>50	100	150	150	370	80
731-2065-000	125	200	>50	60	90	90	230	50
731-2069-000	150	300	>50	40	50	50	160	35

Replacement packing box: 1-001-0810-0

V321

The V321 is a large flanged valve with a stainless steel seat for high pressure drops

The valve is suitable for a wide range of mixing applications with hot or chilled water in heating cooling and air handling systems.

If the valve is used for media at temperatures below 0 °C , it should be equipped with a heater in order to prevent ice formation on the valve stem.

Design	3-way plug mixing valve stem up closed (A port/B-AB open)
Pressure class	PN 16
Connection	Flange according ISO 7005-2

DN 65 – DN100

Flow characteristics A – AB	Equal Percentage
Flow characteristics B – AB	Complementary
Stroke	30 mm
Rangeability Kvs/Kv min	>30
Leakage A – AB DN65 – DN100	<0.05% of Kv
Leakage B – AB DN65 – DN100	<0.05% of Kv
ΔPm	400 kPa, water
Max. temperature of medium	130°C
Min. temperature of medium	-10°C
Max. Glycol concentration	50%

Materials

Body	Cast iron GG25
Stem	Stainless steel SS 1.4571
Plug	Stainless steel SS 1.4021
Seat	Stainless Steel SS 1.4021
Packing box	EPDM

DN 125 – DN150

Flow characteristics A – AB	Linear
Flow characteristics B – AB	Linear
Stroke	50 mm
Rangeability Kv/Kv min	>30
Leakage A – AB DN125 – DN150	<0.05% of Kv
Leakage B – AB DN125 – DN150	<0.05% of Kv
ΔPm	400 kPa, water
Max. temperature of medium	200 °C
Min. temperature of medium	-10 °C
Max. Glycol concentration	50%

Materials

Body	Nodular iron GGG40.3
Stem	Stainless steel SS 1.4021
Plug	Stainless steel SS 1.4021
Seat	Stainless steel SS 1.4021
Packing box	Spring-loaded PTFE-V-ring

				Max Close-off Pressure kPa					
V321				**Non Spring Return Actuators**					**Spring Return**
Part number	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500**	**MV15B**	**M22**	**M50**	**M700**
				800N	1500N	1500N	2200N	5000N	700N
731-2153-010	65	63	>30	140	290	290	---	---	80
731-2157-010	80	100	>30	80	180	180	---	---	40
731-2161-010	100	160	>30	40	110	110	---	---	---
731-2165-010	125	220	>30	---	---	---	90	340	---
731-2169-010	150	320	>30	---	---	---	60	240	---

Replacement packing box: DN65-100: 1-001-0822-0
DN-150: 1-001-0823-0

Tight sealing versions available, contact TAC for details

Globe valve actuators

TAC Forta: M310, M400, M800, M1500 and M3000

The TAC Forta is a family of actuators for the control of 2 way and 3 way globe valves.

The TAC Forta has a very fine resolution PCBA board which ensures good rangeability of the valve. The software in the actuator performs a self adapting valve stroke learning process and will automatically adjust the running time regardless of the valve stroke.

The actuator can be set up for 0-10V modulating or 3 point floating control. It may also be configured for different flow characteristics, inverse signal or sequence control.

The U bolt mounting makes for a very easy and quick installation. The manual override allows the actuator to be overridden and valve position adjusted without disconnecting the power supply.

M310, M400, M800, M1500

M3000

Supply voltage	24 V AC +25% / -35%, 50-60 Hz
Increase/decrease	300 s/60 s
Duty cycle	Max. 20%/60 minutes
Analogue input	
Voltage	0-10 V
Impedance	Min. 100 kΩ
Digital inputs VH–VC	
Voltage across open input	24 V AC
Current through closed input	5 mA
S2 Output – Auxiliary end point switch (optional)	
type	2 x SPDT
Voltage	24V AC
Load	4A, AC-1
Output G1	
Voltage	16 V DC ±0.3 V
Load	25 mA, short-circuit proof
Output Y	
Voltage	2-10 V (0-100%)
Load	2 mA
Ambient temperature	
Operation	-10 to +50°C
Storage	-10 to +50°C
Ambient humidity	Max. 90% RH
Enclosure rating	IP 54
Standards	
Emission	EN 50081-1:1992
Immunity	EN 50082-1:1992
Material	
Housing	Aluminium
Cover	ABS/PC plastic
Colour (M310,M400,M800,M1500)	Aluminium/red
Colour (M3000)	Black/red

TAC Forta actuators			Modulating control 0-10 V Running time / stroke			Avg. power consumption	Transformer sizing
Part number	Description	Force N	9-25 mm	25-32 mm	32-51 mm	VA	
880-0210-030	M310	300	15s	20s	---	6	30
880-0211-030	M310 S2	300	15s	20s	---	6	30
880-0230-030	M400	400	60s	60s	---	6	30
880-0231-030	M400 S2	400	60s	60s	---	6	30
880-0310-030	M800	800	15s	20s	30s	15	50
880-0311-030	M800 S2	800	15s	20s	30s	15	50
880-0450-000	M1500	1500	15s	20s	30s	15	50
880-0451-000	M1500-S2	1500	15s	20s	30s	15	50
880-0500-000	M3000	3000	15s	20s	30s	25	50
880-0510-000	M3000 S2	3000N	15s	20s	30s	25	50

S2 – 2 x SPDT Auxiliary end point switches, 24V AC, 4A AC-1

TAC Forta actuators for Satchwell valves c/w linkage			Modulating control 0-10 V Running time / stroke			Avg. power consumption	Transformer sizing
Part number	Description	Force N	9-25 mm	25-32 mm	32-51 mm	VA	
880-0610-000	M310+L2SV	300	15s	20s	---	6	30
880-0611-000	M310-S2+L2SV	300	15s	20s	---	6	30
880-0620-000	M400+L2SV	400	60s	60s	---	6	30
880-0621-000	M400-S2+L2SV	400	60s	60s	---	6	30
880-0650-000	M800+L2SV	800	15s	20s	30s	15	50
880-0651-000	M800-S2+L2SV	800	15s	20s	30s	15	50

S2 – 2 x SPDT Auxiliary end point switches, 24V AC, 4A AC-1

TAC Forta Accessories & linkage kits for other valves	
Part number	Description
880-0124-000	Linkage Forta-Satchwell L2SV
880-0114-000	Linkage Forta-Honeywell M6
880-0115-000	Linkage Forta-Honeywell 1/4"
880-0118-000	Linkage Forta-Siemens
880-0125-000	Linkage Forta-Danfoss
880-0127-000	AG50 linkage – Controlli flanged Valves with M40 threaded bonnet, installed pre July 2009 types: VSG, VMB16, VBG (up to DN65)
880-0128-000	AG51 Linkage – Controlli Flanged Valves with M40 threaded bonnet, installed Pre July 2009 types: VBG, SS, DS, VSS, VBA, 3V, VMS (all sizes) types: VSG, VMB16, (DN80 or larger)
880-0129-000	AG52 linkage – Controlli Threaded valves, types: VSB, VMB, VSB_F, VMB_F
880-0252-000	Linkage DN15-V298
880-0253-000	Linkage DN15-V2XX/V3XX
880-0104-000	S2 – 2 x SPDT Axillary End Point Switches (24Vac 4A AC-1) (1)
880-0108-000	Stem heater Forta-Venta (1) – for media temp 0°C to -20°C
880-0109-000	Forta Yoke Heater for amb. temp -10°C, media temp -5°C

(1) Note: Not for TAC Forta M700

TAC Forta M700

The TAC Forta M700 is a spring return actuator for the control of 2 and 3 way globe valves.

It utilises the same PCBA as the non spring return versions and so has the same capability with regard to self adapting to the valve stroke, and the same flexibility with regard to set up configuration.

The U bolt mounting makes for a very easy and quick installation. A manual override is standard on all models.

Supply voltage	24 V AC +25% / -30%, 50-60 Hz
Power consumption	Average 30 VA
Transformer sizing	50 VA

Spring return close off time at power failure

20 mm stroke	Less than 50 seconds
45 mm stroke	Less than 95 seconds
Stroke	9 to 52 mm
Thrust	700 N (180 lbf.)
Duty cycle	Max. 20%/60 minutes

Running time

Modulating 10 to 25 mm (0.39 to 1 in.)	15s
Modulating 25 to 32 mm (1 to 1.26 in.)	20s
Modulating 10 to 52 mm (0.39 to 2.05 in.)	30s
Increase/decrease	300s/60s

Analogue input

Voltage	0-10 V
Impedance	Min. 100 kΩ

Digital inputs VH–VC

Voltage across open input	24 V AC
Current through closed input	5 mA
Pulse time	Min. 20 ms

Output G1

Voltage	16 V DC ±0.3 V
Load	25 mA, short-circuit proof

Output Y

Voltage	2-10 V (0-100%)
Load	2 mA

Ambient temperature

Operation	-10 to 50 °C
Storage	-10 to 50 °C
Ambient humidity	Max. 90% RH
Enclosure rating	IP 54

Standards

Emission	EN 50081-1:1992
Immunity	EN 50082-1:1992

Material

Housing	Aluminium
Cover	ABS/PC plastic
Colour	Black/red

TAC Forta M700 actuators

Part number	Description
880-0430-000	M700-SRSU
880-0431-000	M700-S2-SRSU
880-0440-000	M700-SRSD
880-0441-000	M700-S2-SRSD

TAC Forta M700
actuators for Satchwell valves c/w linkage

Part number	Description
880-0630-000	M700-SRSU+L7SV
880-0631-000	M700-S2-SRSU+L7SV
880-0640-000	M700-SRSD+L7SV
880-0641-000	M700-S2-SRSD+L7SV

TAC Forta M700
linkage kits for other valves

Part number	Description
880-0126-000	Linkage M700-Satchwell L7SV
880-0109-000	Forta Yoke Heater for amb. temp -10°C, media temp -5°C

Key:

S2	auxiliary switch
SRSU	spring return stem up
SRSD	spring return stem down
L7SV	Satchwell linkage to VZ and MZ valves

MV15B

The MV15B is a powerful 3 point floating actuator for the control of 2 way and 3 way globe valves.

The actuator is available in both a 24V AC and 230V AC versions

The actuator self adjusts to the stroke of whatever valve it is connected to.

The U bolt mounting makes for a very easy and quick installation. A manual override is standard on all models.

Supply voltage	24 V AC ±10%, 50-60 Hz
	230 V AC ±10%, 50-60 Hz
Power consumption	12 VA
Transformer sizing	15 VA
Running speed	0.75 mm/s
Running time for 20 mm (0.78 in.)	27s
Stroke	9 to 52 mm
Thrust	1500 N (337 lbf.)

Ambient temperature	
Operation	15 to 50°C
Storage	-25 to +65°C
Enclosure rating	IP 55

Standards	
Emission	EN 50081-1:1992
Immunity	EN 50082-1:1992

Material	
Housing	Aluminium
Cover	ABS plastic
Colour	Black/red

Optional auxiliary travel switch S2-MV15B	
Type	SPDT 10A (inductive) 3A (resistive)
Capacity	250 V

MV15B actuators		Power supply
Part number	**Description**	**Vac +10%/ -10%**
880-0460-000	MV15B-230	230
880-0462-000	MV15B-24	24

MV15B actuators for Satchwell valves c/w linkage		Power supply
Part number	**Description**	**Vac +10%/ -10%**
880-0660-000	MV15B-230-L7SV	230
880-0662-000	MV15B-24+L7SV	24

MV15B accessories & linkage kits	
Part number	**Description**
880-0126-000	Linkage M700-Satchwell L7SV
880-0469-000	Switch S2-MV15B
880-0109-000	Forta Yoke Heater for amb. temp -10°C, media temp -5°C

AVUX, AVUM, AVUE

The AVUX, AVUM and AVUE are compact actuators used to operate the VZX and MZX ranges.

The AVUE 5304 and 5354 are modulating actuators. They have a linear output drive, and they can be used with any controller providing a 0-10Vdc output signal.

The AVUX is a 24Vac modulating linear actuator suitable to be driven from any 24Vac 3-point controller or device.

The AVUM is a mains voltage (230Vac) modulating linear actuator that can be controlled from any controller or device having a 3-point mains switched output.

Input voltage AVUX	24 Vac, ±10% 50 Hz	Running time	85 to 110 secs
Input voltage AVUM	230 Vac, ±10% 50 Hz	Stem force	220N
Input voltage AVUE	24 Vac, ±10% 50 Hz	Protection standard	IP 40
Power consumption	Max 3.6VA	Connection cable	1.5m
Stroke	12.7mm	Ambient operating temperature	0 to 50°C

AVUE,AVUX,AVUM **Actuators for VZX, MZX valves**	**Force**	**Control Action**	**Control signal**	**Power supply**	**Power consumption 50Hz**
Part number	N			Vac ±10%	VA
AVUE5304	220	Direct Acting	0-10 V	24Vac	3.1
AVUE5354	220	Reverse Acting	0-10 V	24Vac	3.1
AVUX5202	220	Floating	---	24Vac	2.3
AVUM5601	220	Floating	---	230Vac	3.6

M22, M50

The M22 and M50 actuators are powerful actuators suitable for driving DN125 and DN150 sizes of valve types V222, V292 and V321.

The actuators are available in modulating or 3 point floating versions.

The 3 point floating versions are available in 24V AC or 230V AC voltages and also with optional end switches

Supply voltage	24 V AC +10% / -15%, 50-60 Hz
Power consumption	Average 15 VA

Running time

0 to 50mm	50Hz, 132s
60Hz, 112s	
Duty cycle	Max. 80%/60 minutes

Analogue input

Voltage	0 (2) – 10 V
Impedance	30 kOhm
Current	0 (4) – 20 mA
Impedance	125 Ohm

Ambient temperature

Operation	-20 to +70°C
Storage	-20 to +70°C

Ambient humidity	<95 %RH
Enclosure rating	IP 65

Standards

Emission	EN 50081-1: 03.1993
Immunity	EN 50082-1: 11.1997 EN 50082-2: 02.1996

Material

Housing	CoPA – Grivory GV-4H
Cover	PC – Polycarbonate

Weight

M22A	5,4 kg
M50A	6,0 kg

Optional travel switch S2

Type	Zero potential
Capacity	10A, 250V

M22A, M50A **modulating actuators**		**Force**
Part number	**Description**	**Newtons**
890-0104-000	M22A-24V	2200
890-0204-000	M50A-24V	5000

M22B, M50B **3-Point floating actuators**		**Force** **N**	**Power supply** **Vac +10% / -15%**	**Power consumption** **50 Hz**
Part number	**Description**			
890-0106-000	M22B-24V	2200	24	12 VA
890-0108-000	M22B-24V-S2	2200	24	12 VA
890-0110-000	M22B-230V	2200	230	11 VA
890-0112-000	M22B-230V-S2	2200	230	11 VA
890-0206-000	M50B-24V	5000	24	19 VA
890-0208-000	M50B-24V-S2	5000	24	19 VA
890-0210-000	M50B-230V	5000	230	28 VA

Zone valves

Zone Valves – Short Stroke

VZ28, VZ38, VZ48

These small linear valves are designed for control of hot and chilled water in fan coils or other terminal unit applications.

The valves with a Kv up to 2.5 are supplied with an adjustment cap to aid hydronic commissioning.

These particular valves are designed to be used with thermo-electric actuators type MZ88/MZ89, which is available in an on/off or modulating variant.

Valve types

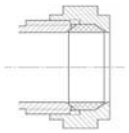
2-way, 3-way, 3-way with bypass (see part numbers in table below)

Pressure class	PN16
Stroke	2.5 mm
Max fluid speed	3 m/s
Media	Water, water+glycol (30% max)
Temperature	5 to 95°C
Leakage	0% tight close-off

Materials

Valve body	Brass
Stem	Stainless steel
Stem packing	Double Viton O-ring
Plug sealing	Viton O-ring

Two-way valves

		VZ28		VZ28C					
									
		Flat face		Compression*		Kvs		Max Close-off – kPa	
Size	Kv	Part Number	Connection	Part Number	Connection	A-AB	B-AB	MZ88T/TA	MZ89T/TA
DN15	0,25	721-0430-000	G1/2A	721-0450-000	15mm	0.25	--	250	--
DN15	0,4	721-0431-000	G1/2A	721-0451-000	15mm	0.4			
DN15	0,6	721-0432-000	G1/2A	721-0452-000	15mm	0.6			
DN15	1	721-0433-000	G1/2A	721-0453-000	15mm	1			
DN15	1,6	721-0434-000	G1/2A	721-0454-000	15mm	1.6			
DN20	2,5	721-0435-000	G3/4A	721-0455-000	22mm	2.5		--	150
DN20	4	721-0436-000	G3/4A			4			
DN20	6	721-0437-000	G3/4A			6			
Three-way valves									
DN15	0,25	731-0431-000	G1/2A	731-0451-000	15mm	0.25	0.25	250	--
DN15	0,4	731-0432-000	G1/2A	731-0452-000	15mm	0.4	0.4		
DN15	0,6	731-0433-000	G1/2A	731-0453-000	15mm	0.6	0.6		
DN15	1	731-0434-000	G1/2A	731-0454-000	15mm	1	0.8		
DN15	1,6	731-0435-000	G1/2A	731-0455-000	15mm	1.6	1		
DN20	2,5	731-0436-000	G3/4A	731-0456-000	22mm	2.5	1.6	150	--
DN20	4	731-0437-000	G3/4A			4	2.5	--	100 A-AB 40 B-AB
DN20	6	731-0438-000	G3/4A			6	4		
Three-way valves with integral by-pass (4 ports)									
DN15	0,25	741-0430-010	G1/2A	741-0450-000	15mm	0.25	0.25	250	--
DN15	0,4	741-0431-010	G1/2A	741-0451-000	15mm	0.4	0.4		
DN15	0,6	741-0432-010	G1/2A	741-0452-000	15mm	0.6	0.6		
DN15	1	741-0433-010	G1/2A	741-0453-000	15mm	1	0.8		
DN15	1,6	741-0434-010	G1/2A	741-0454-000	15mm	1.6	1		
DN20	2,5	741-0435-000	G3/4A	741-0455-000	22mm	2.5	1.6	150	--
DN20	4	741-0436-000	G3/4A			4	2.5	--	100 A-AB 40 B-AB
DN20	6	741-0437-000	G3/4A			6	4		

* Nuts and Olives supplied with Valve

MZ88T / TA & MZ89T / TA

MZ88T / TA thermo-electric actuators are wax filled actuators that provide either on/off or modulating control for the VZ28, VZ38 and VZ48 zone valves with a Kv up to 2.5

MZ89T / TA thermo-electric actuators are higher force actuators for driving the same valves but with a Kv from 4 to 6.

MZ88T / MZ89T

MZ88TA / MZ89TA

Temperature	
Working	2 to 50°C
Storage	-10 to 60°C
Stem force (MZ88)	90N (20lbf)
Stem force (MZ89)	140N (31lbf)

Max stroke	4 mm
Coupling ring	M30 x 1,5
Power cable	2m bipolar (0.75mm^2)
Material	Fire-resistant case: Class V0
Protection class	IP 44 (for vertical mounting)

MZ88T / MZ88TA & MZ89T / MZ89TA
MZ88T/MZ88TA actuators for valves VZ28/38/48 with Kv upto 2.5. MZ89T/TA for valves with Kv 4 and 6

Part number	Description	Control signal	Power VAC	Power consumption VA	Initial consumption A
845-5011-000	MZ88T-SU-230	On/Off	110-230	1.8	0.25
845-5013-000	MZ88T-SU-24	On/Off	24	1.8	0.17
845-5015-000	MZ88TA-SU	0-10V Modulating	24	1.8	0.2
845-5012-000	MZ89T-SU-230	On/Off	110-230	1.8	0.25
845-5014-000	MZ89T-SU-24	On/Off	24	1.8	0.17
845-5016-000	MZ89TA-SU-24	0-10V modulating	24	1.8	0.2

Contact technical support for:
– Normally open thermic actuators
– LON Actuators for short stroke small linear valves

Zone Valves – Long Stroke

VZ29, VZ39, VZ49

These small linear valves are designed for control of hot and chilled water in fan coils or other terminal unit applications. The valves with a Kv up to 2.5 are supplied with an adjustment cap to aid hydronic commissioning. These particular valves are designed to be used with the compact electro-mechanical actuators type MZ20A / MZ20B which are available as 3 point floating or modulating control.

Valve types

2-way, 3-way valve, 3-way with bypass, (see part numbers in table below)

Pressure class	PN16
Stroke	5.5 mm
Max fluid speed	3 m/s
Allowed fluids Water, water+glycol (30% max)	
Media temperature range	2 to 95°C
Max. Glycol concentration	30%

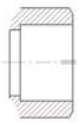
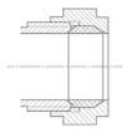
Flow Characteristics

Equal percentage	On direct (A-AB) way
Linear	On by-pass (B-AB) way
Leakage	0% tight close-off
Connections Flat face external or compression thread	
Rangeability	50:1

Materials

Valve body	Brass
Stem	Stainless steel
Stem packing	Double Viton O-ring
Plug sealing	Viton O-ring

Two-way valves

		VZ29		VZ29C				
								
		Flat face		Compression*		Kvs		Close-off
Size	Kv	Part Number	Connection	Part Number	Connection	A-AB	B-AB	MZ20 actuator
DN 15	0,25	721-0531-000	G1/2A	721-0551-000	15mm	0.25	--	350
DN 15	0,4	721-0532-000	G1/2A	721-0552-000	15mm	0.4		
DN 15	0,6	721-0533-000	G1/2A	721-0553-000	15mm	0.6		
DN 15	1	721-0534-000	G1/2A	721-0554-000	15mm	1		
DN 15	1,6	721-0535-000	G1/2A	721-0555-000	15mm	1.6		
DN 15	2	721-0536-000	G1/2A	721-0556-000	15mm	2		250
DN 20	2,5	721-0537-000	G3/4A	721-0557-000	22mm	2.5		
DN 20	4	721-0538-000	G3/4A			4		150
DN 20	6	721-0539-000	G3/4A			6		
Three-way valves								
DN 15	0,25	731-0531-000	G1/2A	731-0551-000	15mm	0.25	0.25	350
DN 15	0,4	731-0532-000	G1/2A	731-0552-000	15mm	0.4	0.25	
DN 15	0,6	731-0533-000	G1/2A	731-0553-000	15mm	0.6	0.4	
DN 15	1	731-0534-000	G1/2A	731-0554-000	15mm	1	0.6	
DN 15	1,6	731-0535-000	G1/2A	731-0555-000	15mm	1.6	1	
DN 15	2	731-0536-000	G1/2A	731-0556-000	15mm	2	1.6	150
DN 20	2,5	731-0537-000	G3/4A	731-0557-000	22mm	2.5	1.6	
DN 20	4	731-0538-000	G3/4A			4	2.5	100 A-AB 40 B-AB
DN 20	6	731-0539-000	G3/4A			6	4	
Three-way valves with integral by-pass (4 ports)								
DN 15	0,25	741-0531-010	G1/2A	741-0551-000	15mm	0.25	0.25	350
DN 15	0,4	741-0532-010	G1/2A	741-0552-000	15mm	0.4	0.25	
DN 15	0,6	741-0533-010	G1/2A	741-0553-000	15mm	0.6	0.4	
DN 15	1	741-0534-010	G1/2A	741-0554-000	15mm	1	0.6	
DN 15	1,6	741-0535-010	G1/2A	741-0555-000	15mm	1.6	1	
DN 15	2	741-0536-010	G1/2A	741-0556-000	15mm	2	1.6	250
DN 20	2,5	741-0537-000	G3/4A	741-0557-000	22mm	2.5	1.6	
DN 20	4	741-0538-000	G3/4A			4	2.5	100 A-AB 40 B-AB
DN 20	6	741-0539-000	G3/4A			6	4	

* Nuts and Olives supplied with Valve

Zone valve actuator – long stroke

MZ20A, MZ20B

The MZ20 is an electro-mechanical zone valve actuator designed for use with the VZ29, VZ39 and VZ49 valves.

Reliable long term operation is provided by the optimal design without feedback potentiometer or end switches.

The actuator provides exact valve position and flow adjustment due to the 100 second running time.

Input voltage MZ20A	24 V AC, 50/60 Hz
Input voltage MZ20B	24V or 230V AC 50/60 Hz
Power consumption MZ20A	1 VA
Power consumption MZ20B	0.5 VA
Speed	18 s/mm (50 Hz) – 15 s/mm (60 Hz)
Temperature	
Working	-5 to +55°C
Storage	-25 to +65°C
Stem force	200 N
Max stroke	6.5 mm
Connection cable	3 wires 1.5 m
Protection class	IP 43 (for vertical mounting)

Contact TAC for LON actuators for zone valves.

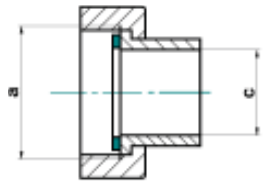
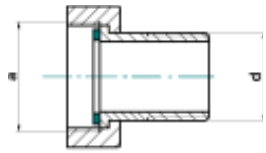
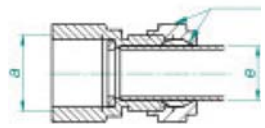
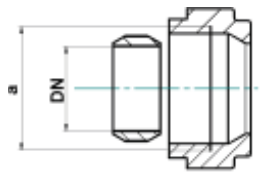
MZ20A/B
zone valve actuator for VZ29/39/49 valves

Part number	Description	Control
845-5051-000	MZ20A	Selectable*
845-5052-000	MZ20A-R	0-10V
845-5001-000	MZ20B-24	3P-24V AC
845-5003-000	MZ20B-230	3P-230V AC

* 0-10V, 6-9V,1-5V, 2-10V, 4-7V, 6-10V, 8-11V

Connections for VZ Series Zone Valves

VZ28, VZ38, VZ48, VZ29, VZ39, VZ49

	Connection type	Pipe size	DN	a	c (mm)	d	e	Part number	Pack quantity
	Solder *	15mm 12mm	15 20	G 1/2 G 3/4	12 15	-- --	-- --	911-2076-000 911-2077-000	1 1
	External Thread	R 3/8″ R 1/2″	15 20	G 1/2 G 3/4	-- --	R 3/8 R 1/2	-- --	911-2078-010 911-2079-010	10 10
	Flat to compression*	15 mm 22 mm	15 20	G 1/2 G 3/4	-- --	-- --	15 22	911-2080-000 911-2081-000	1 1
	Compression Capnut and olive	15 mm 20 mm	15 20	G1/2A Withworth 1 1/8″ - 14	-- --	-- --	15 22	911-2082-000 911-2083-000	10 10

*One set required per valve port.

Radiator valve actuators

MZ09L

The MZ09L LON® actuator is designed for decentralised building structures and gives customers an effective new capability in energy management and product flexibility. The actuator works with standard SNVTs to provide interoperability with controllers based on LonWorks® technology.

The MZ09L small linear actuator is specifically designed to provide LonMark® capabilities together with radiator valves and is used in fan coil units, induction units, small reheaters and recoolers, and for zone control applications. The MZ09L actuator is suitable for LonWorks technology. Using standard Echelon configuration tools, the actuator can be configured with job specific settings.

Power supply	24 VAC, ± 20%, 50/60 Hz
Power consumption	1.4 VA
Control signal	SNVT_lev_percent 0-100%
Network protocol	LonTalk®
Channel	FTT10A
Stroke	2.5mm
Running time	53s at 50 Hz
	44s at 60 Hz
Stem force	90 N (for valves DN 15-20)
Protection standard	IP 42
Insulation class	III
Connection cables	1.5 m, three leads
	1.5 m, two leads
Coupling ring	M 30 x 1.5
Ambient operating temperature	0 to 55°C
Enclosure rating	IP 42

MZ09L actuator for radiator valves	
Part number	**Description**
845-5112-000	MZ 09L(LON) 2,5mm

Suitable valves		
Manufacturer	**Valve type**	**Adapter**
Honeywell	V100, V200	Not required
Heimeier		Not required
Siemens L&S	Duogyr	Not required
Danfoss	Series RA2000, RA-PN, RA-N, RA-U, RA-G	911-2075-000
Danfoss	Series RAVL	911-2074-000

MZ09B

The MZ09B actuator is designed to provide 3-point control together with radiator valves. The MZ09B actuator is used for radiator valves in fan coil units, induction units, small reheaters and recoolers, and for zone control applications. The absence of end switches and feedback potentiometer ensures longtime reliability.

Input voltage	24 Vac + 10 % / -30 %; 50/60 Hz
Power consumption	0.7 VA
Control mode	Floating (3-point)
Stroke	1.6 mm controlled valve stroke
	7.9 mm complete actuator stroke
Running time	36 s / 1.6 mm valve stroke
Stem force	90 N
Protection standard	IP 43 in accordance with EN 60529
Connection cable	0.9 m
Coupling ring	M 30 x 1.5
Ambient operating temperature limits	0 to 60°C
Enclosure rating	IP 42

MZ09B actuator for radiator valves	
Part number	**Description**
845-5111-000	MZ 09B 2,5mm

Suitable valves		
Manufacturer	**Valve type**	**Adapter**
Honeywell	V100, V200	Not required
Heimeier		Not required
Siemens L&S	Duogyr	Not required
Danfoss	Series RA2000, RA-PN, RA-N, RA-U, RA-G, RA-UR, RA-KE, RA-K	911-2075-000
Danfoss	Series RAVL	911-2074-000

MZ09T

The MZ09T is a thermoelectric actuator designed to provide on/off control together with radiator valves. The actuators are used for radiators, in fan coil units, induction units, and small reheaters. The actuator operates together with controllers using on/off control signal.

Opening/closing time	Approx. 5.5 min.
Stem force	90 N (20 lbf)
Max stroke	4 mm
Coupling ring	M30 x 1.5
Connection cable	1.0 m
Max. Ambient temperature	50°C
Protection class	IP 43

MZ09T actuator for radiator valves		Power	Power consumption	Initial consumption	Operating consumption
Part number	**Description**	**VAC**	**W**	**A**	**A**
845-4110-010	MZ 09T-NO 2,5mm	24	2	0.20	0.07
845-4111-010	MZ 09T-NC 2,5mm	24	2	0.20	0.07
845-4112-000	MZ09T-NO-230 2,5	230	2	0.25	0.07
845-4113-000	MZ09T-NC-230 2,5	230	2	0.25	0.07

Suitable valves		
Manufacturer	**Valve type**	**Adapter**
Honeywell	V100, V200	Not required
Heimeier		Not required
Siemens L&S	Duogyr	Not required
Danfoss	Series RA2000, RA-PN, RA-N, RA-U, RA-G	911-2075-000
Danfoss	Series RAVL	911-2074-000

Butterfly Valves

VF208W 25-80NS & 100-200NZ

The VF208W is a new generation butterfly valve for the isolation and control of water for HVAC systems such as boiler isolation or heat pump change over from cooling to heating. The butterfly valves have elongated wafer type eyelets for fitment between flanges

- Energy saving: EPDM soft seats provide tight shut off and zero leakage (Complete insulation possible according to German energy saving order, EnEV)
- Approved for use with drinking water DN 25-80 (DVGW)
- Maintenance free, double sealing of stem, centrical disc bearing
- Good flow control characteristics
- Integrated dew point barrier
- No linkage kits required

OPTIONS: (upon special request)
- Lugged flange connections
- Stainless steel disc for DN100 to DN 200 for drinking water applications

Pressure Class	PN 16
Leakage (EN 12266-1)	Tight, (Leakage Rate A)
Temperature Range	-10°C to +100 °C

Materials	
Body	Nodular Iron (EN-JS1030)
Lining	EPDM
Disc with zinc-lamella coating	DN25-80: 1.4581 (AISI316) DN100-200: (EN-JS1030)
Stem	1.4021-QT

Size	Kv	Part Number	Full type Designation	Maz ΔP (kPa)	Actuator
DN25	26	VF208W-25NS	VF208W-25NS 26E B00	600	MF20
DN32	26.5	VF208W-32NS	VF208W-32NS 26.5E B00	600	MF20
DN40	50	VF208W-40NS	VF208W-40NS 50E B00	600	MF20
DN50	115	VF208W-50NS	VF208W-50NS 115E B00	600	MF20
DN65	260	VF208W-65NS	VF208W-65NS 260E B00	600	MF20
DN80	375	VF208W-80NS	VF208W-80NS 375E B00	600	MF20
DN100	760	VF208W-100NZ	VF208W-100NZ 760E B00	600	MF20
DN125	1025	VF208W-125NZ	VF208W-125NZ 1025E B00	600	MF40
DN150	1790	VF208W-150NZ	VF208W-150NZ 1790E B00	300	MF40
DN200	3500	VF208W-200NZ	VF208W-200NZ 3500 B00	300	MF40

Butterfly Valve Actuators

MF20 / MF40

The MF20 and MF40 are robust reliable actuators for the control of the VF208W butterfly valves. These actuators mount to the VF208W series valves without linkage kits and connect using terminal blocks to simplify and reduce installation time.

- Models for Floating / Proportional / On-Off and LON control
- 2-10V Positional feedback
- Latching Manual override
- Direct Handlever / position indicator
- Auxillary switch available as an accessory

MF20

MF40

Product	Control	Torque	Supply Voltage	Power consump'n (rest)	Power consump'n (oper.)	Power consumption (wire sizing)	Operating time, 90°
MF20-24F	On-Off / 3P	20Nm	24V AC/DC	0.2W	2.5W	5.5VA	90 sec
MF20-230F	On-Off / 3P	20Nm	203V AC	0.4W	3W	7VA	90 sec
MF20-24M	2-10V	20Nm	24V AC/DC	0.4W	2.5W	5VA	90 sec
MF20-24L	LON	20Nm	24V AC/DC	1.25W	3W	6VA	90 sec
MF40-24F	On-Off / 3P	40Nm	24V AC/DC	2W	4W	6VA	150 sec
MF40-230F	On-Off / 3P	40Nm	230V AC	2W	5W	9VA	150 sec
MF40-24M	2-10V	40Nm	24V AC/DC	1.5W	4.5W	6.5VA	150 sec
MF40-24L	LON	40Nm	24V AC/DC	1.5W	4W	7VA	90 sec

Control	Voltage	Torque	Part Number	Full Type Designation	Suitable VF208W valve size
Floating and ON-Off	24V AC/DC	20Nm	MF20-24F	MF20-24F T54 00	DN25-100
Floating and ON-Off	230V AC	20Nm	MF20-230F	MF20-230F T54 00	DN25-100
2-10V Proportional	24V AC/DC	20Nm	MF20-24M	MF20-24M T54 00	DN25-100
LON	24V AC/DC	20Nm	MF20-24L	MF20-24L 1M54 00	DN25-100
Floating and ON-Off	24V AC/DC	40Nm	MF40-24F	MF40-24F T54 00	DN125-200
Floating and ON-Off	230V AC	40Nm	MF40-230F	MF40-230F T54 00	DN125-201
2-10V Proportional	24V AC/DC	40Nm	MF40-24M	MF40-24M T54 00	DN125-202
LON	24V AC/DC	40Nm	MF40-24L	MF40-24L 1M54 00	DN125-203

Accessories:
MD-S1, 1 x SPDT auxiliary switch, Part No. 914-1060-000
MD-S2, 2 x SPDT auxiliary switch, Part No. 914-1061-000

Shaded items are stocked products

Shoe valves

TAC shoe valves are designed to be used in both mixing and diverting circuits.
Typical applications include heating, cooling and air conditioning.

VTRE

The VTRE is a 3-way flanged rotary hydronic shoe valve.

The valve is delivered with a handle for manual operation.

Valve type	3 way rotary shoe
Flow characteristic	Modified linear
Operating angle	90°
Pressure class	PN 6

Water temperature	
Max.	110°C
Min.	-10°C
Max glycol concentration	50%

Max pressure drop	50 kPa
Leakage	Max. 1% of KV

Materials	
Body	Cast iron
Sleeve	Brass
Connections	Flanged DIN 2531

			Max Close-off Pressure kPa	
VTRE			**Mixing Application**	**Diverting Application**
Part number	**DN**	**Kvs**	**EM9, M9**	**EM9, M9**
			15Nm	15Nm
731-7039-000	20	12	50	50
731-7041-000	25	18	50	50
731-7045-000	32	28	50	50
731-7049-000	40	44	50	50
731-7053-000	50	60	50	50
731-7057-000	65	90	50	50
731-7061-000	80	150	50	50
731-7065-000	100	225	50	50
731-7067-000	125	280	50	50
731-7069-000	150	400	50	50

MB

The MB is a 3-port screwed rotary shoe valve.

MBF

The MBF is a 3-port flanged rotary shoe valve.

MB

MBF

Design	3-way rotary shoe valve
Pressure Class (MB)	PN10
Pressure Class (MBF)	PN6
Flow Characteristic	Port 2 Modified Parabolic
Flow Characteristic	Port 3 Linear
Operating angle	90°
Rangeability Kv / Kv min.	50
Leakage	0.5% (%of Cv)
Max. temperature of medium	120°C
Min. temperature of medium	2°C

Connection MB	Screwed Parallel (female) BSP to BS21
Connection MBF	Flanged BS4504, Table 6/11
Materials	
Body ½" to 1" valves	Hot Pressed Brass to BS218
Body 1¼" to 2" valves	Close Grained Cast Iron BS1452 Grade 260
Body 65mm to 100mm	Close Grained Cast Iron BS1452 Grade 260 or 220
Spindle	High Tensile Brass to BS2874 CZ114
O Rings	Ethylene Propylene

MB				Max Close-off Pressure kPa				
Part number	Size (inches)	Kvs	Rangeability	RM	XRM	MD10B-230[1]	MD10B-24[1]	MD10A-24[1]
				2Nm	2Nm	10Nm	10Nm	10Nm
MB1402	½"	1.9	50	70	70	70	70	70
MB1452	¾"	4.1	50	70	70	70	70	70
MB1502	1"	8.3	50	70	70	70	70	70
MB1552	1¼"	12.5	50	35	35	35	35	35
MB1602	1½"	21	50	35	35	35	35	35
MB1652	2"	33	50	35	35	35	35	35

(1) The MD10B is a damper actuator requiring a linkage kit for use with the MB shoe valves. (LMD/AR-MB linkage kit part number 914-1071-000).
Order Auxiliary switches separately, type MD-S2 part number 914-1061-000

MBF				Max Close-off Pressure kPa		
Part number	DN	Kvs	Rangeability	MD20B-24	MD20B-230	MD20A-24
				20Nm	20Nm	20Nm
MBF4732	65	65	50	35	35	35
MBF4782	80	83	50	25	25	25
MBF4857	100	125	50	25	25	25

The MD20B is a damper actuator requiring linkage kit (LMD/AR-MBF part number 914-1070-000).
Order auxiliary switches separately, type MD-S2 part number 914-1061-000

Rotary shoe valve actuators

EM9/M9B

The EM9/M9B are electronic actuators for motorising VTRE rotary shoe valves. EM9 operates on 24 V and is controlled by selectable 0-10 VDC, 2-10 VDC, 0-20 mA or 4-20 mA control signal. The running time can be programmed. EM9/M9B can be operated manually and has a valve position indicator on the front of the unit.

Power consumption	3 VA
Duty cycle	10%
Torque	15 Nm
Operating temperature	-15 to +55°C
Protection class	IP 54

Material	
Enclosure material	Reinforced plastic PA66
Colour	Black/red

M9B, EM9 actuators for valves VTRE		Control signal	Working range	Runing time	Power
Part number	**Description**				**VAC ±10%**
860-1010-000	M9B/24	3-point	30-180°	90° 4 min	24
860-1020-000	M9B/230	3-point	30-180°	90° 4 min	230
860-1100-000	EM9/90	modulating (1)	90°	60/90/120s	24
860-1110-000	EM9/180	modulating (1)	180°	120/180/240s	24

(1) Selectable 0-10V, 2-10V, 0-20mA, 4-20mA

M9B, EM9 linkage kits for other valves	
Part number	Description
860-0990-000	Linkage E/M9-VTRA
860-0991-000	Linkage E/M9-TRV (2)

(2) Note: Not suitable for TRV-S

RM and XRM

These actuators operate the MB Shoe Valves.

The XRM actuator is designed to be operated by a three point floating controller providing an output of 24V ac.

The RM actuator is a mains voltage reversing actuator, designed for two position control when used with a changeover type thermostat or modulating control when used with an appropriate controller. On power failure the actuator can be operated manually.

Input voltage XRM	24 Vac, 50 Hz, 0.5VA
Input voltage RM	230 Vac, 50 Hz, 5VA
Stroke	90°angular. Reversing
Running time	240 secs
Torque	2Nm
Protection standard	IP 41
Ambient operating temperature with water at 120°C	-20°C to +35°C

RM, XRM Actuators for MB Valves		Force
Part number	**Description**	**Nm**
XRM3201	Rotary 24Vac 3-point	2
RM3601	Rotary 230Vac 2-point reversing/ modulating	2

Damper Actuators

Rotary Damper Actuators, Non Spring Return

MD5A, MD10A, MD20A, MD40A

The MD.A series are 2-10V modulating damper actuators designed for operating air control dampers in ventilation and air conditioning systems for building services installations.

As an accessory, these modulating actuators have a fully adjustable auxiliary switch unit.

Power supply	24 V AC ±20%, 50-60 Hz, 24 V DC ±20%
Connection cable	1 m (3.3 ft), 4×0.75 mm² (AWG 18)
Input signal range X	0-10 V DC
Input resistance	100 k Ohm
Operating range	2-10 V DC (for set angle of rotation)
Synchronisation tolerance	±5%
Position feedback Y	2-10 V DC (max. 1 mA)
Direction of rotation	Reversible with switch 0 / 1 at switch position 0 resp 1
Angle of rotation	Max. 95° (adjustable by mechanical stops)
Running time	150 s
Position indication	Mechanical

Manual override	Gearing latch disengaged with pushbutton, self-resetting, manual locking
Standards conformity	
EMC, emission	SS EN 50081-1
EMC, immunity	SS EN 50082-1
Protection class	III Safety extra-low voltage
Enclosure rating	IP 54
Ambient humidity	95% r.H (EN 60730-1)
Ambient temperature	
Operation	-30 to +50°C
Storage	-40 to +80°C
Maintenance	Maintenance free

MD5A, MD10A, MD20A, MD40A Modulating 2-10V damper actuators		Torque	Power Consumption		
Part number	Description	Nm	In operation	At rest	For wire sizing
875-1009-000	MD5A-24	5	1 W	0.4 W	2 VA
875-1019-000	MD10A-24	10	2 W	0.4 W	4 VA
875-1029-000	MD20A-24	20	2 W	0.4 W	4 VA
875-1039-000	MD40A-24	40	4 W	2 W	6.5 VA

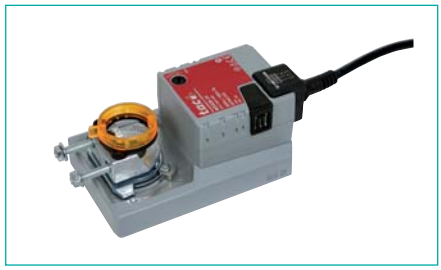
Description	For air control dampers area	Damper spindle	Spindle length mm	Spindle diameter mm
MD5	approx. 1 m²		min 37	6-20
MD10	approx. 2 m²	Clamp on top	min 40	8-26.7
		Clamp on bottom*	min 20	8-20
MD20	approx. 4 m²	Clamp on top	min 42	10-20
		Clamp on bottom	min 20	10-20
MD40	approx. 8 m²	Clamp on top	min 42	14-26
		Clamp on bottom	min 20	14-26

* Optional accessory K-MD10 part number 914-1062-000 For damper actuator accessories see appendix C

MD5B, MD10B, MD20B, MD40B

The MD.B series are 3 point floating or on/off damper actuators designed for operating air control dampers in ventilation and air conditioning systems for building services installations.

The actuators are available in 24V AC/DC or 230V AC versions.
Versions available with integrated end point switch (-S types).
Auxiliary switch also available as an accessory.



Power Supply	See ordering table

Connection cable	
Actuator	1 m (3.3 ft), 3×0.75 mm² (AWG 18)
Auxiliary switches (-S)	1 m (3.3 ft), 3×0.75 mm² (AWG 18)
Angle of rotation	max. 95° (adjustable by mechanical stops)
Running time	150 s
Direction of rotation	Reversible with switch
Position indication	Mechanical

Auxiliary switch	1 mA to 3 (0.5) A, 250 V AC
Switching point	(adjustable 0-100%)

Standards conformity	
EMC, emission	SS EN 50081-1
EMC, immunity	SS EN 50082-1
LVD Safety; MD5B-230(-S)	SS EN 60335-1

Protection class	
MD5B-24(-S)	III Safety extra-low voltage
MD5B-230(-S)	II Totally insulated
Enclosure rating	IP 54
Ambient humidity	95% r.H (EN 60730-1)

Ambient temperature	
Operation	-30 to +50°C
Storage	-40 to +80°C
Maintenance	Maintenance free

MD5B, MD10B, MD20B, MD40B
3-point or on/off damper actuators

Part number	Description	Torque Nm	Power supply	Power Consumption		
				In operation	At rest	For wire sizing
875-1001-000	MD5B-230	5	230Vac -60%/+15%	1.5 W	0.4 W	3.5 VA
875-1003-000	MD5B-230-S	5	230Vac -60%/+15%	1.5 W	0.4 W	3.5 VA
875-1005-000	MD5B-24	5	24Vac/dc±20%	1 W	0.2 W	1.5 VA
875-1007-000	MD5B-24-S	5	24Vac/dc±20%	1 W	0.2 W	1.5 VA
875-1011-000	MD10B-230	10	230Vac -60%/+15%	2.5 W	0.6 W	5.5 VA
875-1015-000	MD10B-24	10	24Vac/dc±20%	1.5 W	0.2 W	3.5 VA
875-1021-000	MD20B-230	20	230Vac -60%/+15%	2.5 W	0.6 W	6 VA
875-1025-000	MD20B-24	20	24Vac/dc±20%	2 W	0.2 W	4 VA
875-1035-000	MD40B-24	40	24Vac/dc±20%	4 W	2 W	6 VA

Description	For air control dampers area	Damper spindle	Spindle length mm	Spindle diameter mm
MD5	approx. 1 m²		min 37	6-20
MD10	approx. 2 m²	Clamp on top	min 40	8-26.7
		Clamp on bottom*	min 20	8-20
MD20	approx. 4 m²	Clamp on top	min 42	10-20
		Clamp on bottom	min 20	10-20
MD40	approx. 8 m²	Clamp on top	min 42	14-26
		Clamp on bottom	min 20	14-26

* Optional accessory K-MD10 part number 914-1062-000 For damper actuator accessories see Appendix C

Damper Actuators, Spring Return

LF24, LF230, LF24-SR

The LF series are spring return damper actuators suitable for controlling air dampers up to 0.8m² cross sectional area.

The LF24 and LF230 versions are on/off controlled. The LF24-SR version is for 0-10V modulating control with 2-10V position feedback

Connection cable	2×0.75 mm² (AWG 18)
Angle of rotation	Max. 95° (adjustable 37-100% with additional limit stop ZDB-LF)

Torque	
Spring return	Min. 4 Nm (3 ft-lbf)

Running time	
Actuator	40-75 s (0-4 Nm (0-3 ft-lbf))
Spring return	Approx. 20 s (at -20 to +50°C max. 60 s (at -30°C
Direction of rotation	Selected by mounting L/R
Position indication	Mechanical

Standards conformity	
EMC, emission	SS EN 50081-1
EMC, immunity	SS EN 50082-1
LVD Safety; LF230	SS EN 60335-1
Enclosure rating	IP 54
Ambient humidity	EN 60335-1

Ambient temperature	
Operation	-30 to +50°C
Storage	-40 to +80 °C
Service life	min. 60,000 operations
Maintenance	Maintenance free

LF24-SR, LF24, LF230
modulating or on/off spring return damper actuators

Part number	Description	Torque Nm	Control Signal	Power supply	Power Consumption		
					Opening	Open	For wire sizing
874-0003-000	LF24	4	on/off	24Vac±20%	5 W	2.5 W	7 VA
875-0003-000	LF230	4	on/off	230Vac±14%	5 W	3 W	7 VA
877-0003-000	LF24-SR	4	0-10V	24Vac±20%	2.5 W	1 W	5 VA

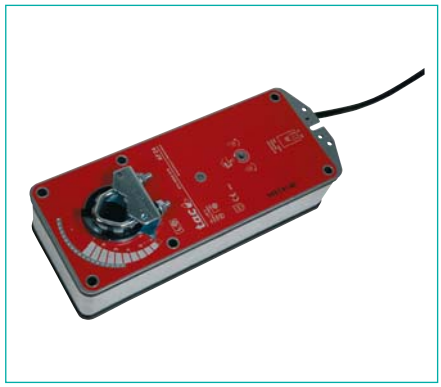
For damper actuator accessories see appendix C

AF / AFR series

The AF / AFR are spring return damper actuators suitable for controlling air dampers up to 3m² cross sectional area. Either direction of rotation and spring return can be provided with these actuators. The spring return tension can be adjusted to suit the installed equipment.

The AF24 and AF230 are 24V and 230V on/off actuators which can be manually operated

The AFR24 and AFR230 are on/off actuators which can not be manually operated
-S types have auxiliary switches
-SR types are 0-10V proportional controlled and incorporate a 2-10V position feedback



Auxiliary switches AF24-S / AF230-S

2×SPDT 6 (3) A, 250 V AC	
Switching points	Fixed 5%, adjustable 26-89%
Auxiliary switch AFR230-S	1×SPDT 6 (3) A, 250 V AC
Switching point	Adjustable 0-89%

Connection cable

Actuator (all)	1 m (3.3 ft), 2×0.75 mm² (AWG 18)
Auxiliary switches AF24-S / AF230-S	1 m
	6×0.75 mm² (AWG 18)
Auxiliary switch AFR230-S	1 m
	3×0.75 mm² (AWG 18)
Angle of rotation	Max. 95° (adjustable AF: 26-95%, AFR: 33-95%, with additional limit stop ZDB-AF)

Torque

Spring return	Min. 15 Nm (11 ft-lbf)

Running time

Actuator	Approx. 150 s
Spring return	Approx. 16 s
Direction of rotation	Selected by L/R mounting
Position indication	Mechanical

Standards conformity

EMC, emission	SS EN 50081-1
EMC, immunity	SS EN 50082-1
LVD Safety; AF230(-S) / AFR230(-S)	SS EN 60335-1
Enclosure rating	IP 54
Ambient humidity	EN 60335-1

Ambient temperature

Operation	-30 to +50°C
Storage	-40 to +80°C
Service life	Approx. 60,000 operations
Maintenance	Maintenance free

AF24-SR, AFR24-SR, AF24(-S), AF230(-S), AFR24(-S), AFR230(-S)
modulating or on/off spring return damper actuators

Part number	Description	Torque Nm	Control Signal	Power supply	Power Consumption		
					Opening	Open	For wire sizing
874-0000-010	AF24	15	on/off	24Vac±20%	5 W	1.5 W	10 VA
874-0010-010	AF24-S	15	on/off	24Vac±20%	5 W	1.5 W	10 VA
875-0000-010	AF230	15	on/off	230Vac±14%	6.5 W	2.5 W	11 VA
875-0010-010	AF230-S	15	on/off	230Vac±14%	6.5 W	2.5 W	11 VA
877-0000-010	AF24-SR	15	0-10V	24Vac±20%	6 W	2.5 W	10 VA
875-1041-000	AFR230	15	on/off	230Vac±14%	6.5 W	2.5 W	11 VA
875-1043-000	AFR230-S	15	on/off	230Vac±14%	6.5 W	2.5 W	11 VA
875-1045-000	AFR24	15	on/off	24Vac±20%	5 W	1.5 W	10 VA
875-1049-000	AFR24-SR	15	0-10V	24Vac±20%	6 W	2.5 W	10 VA

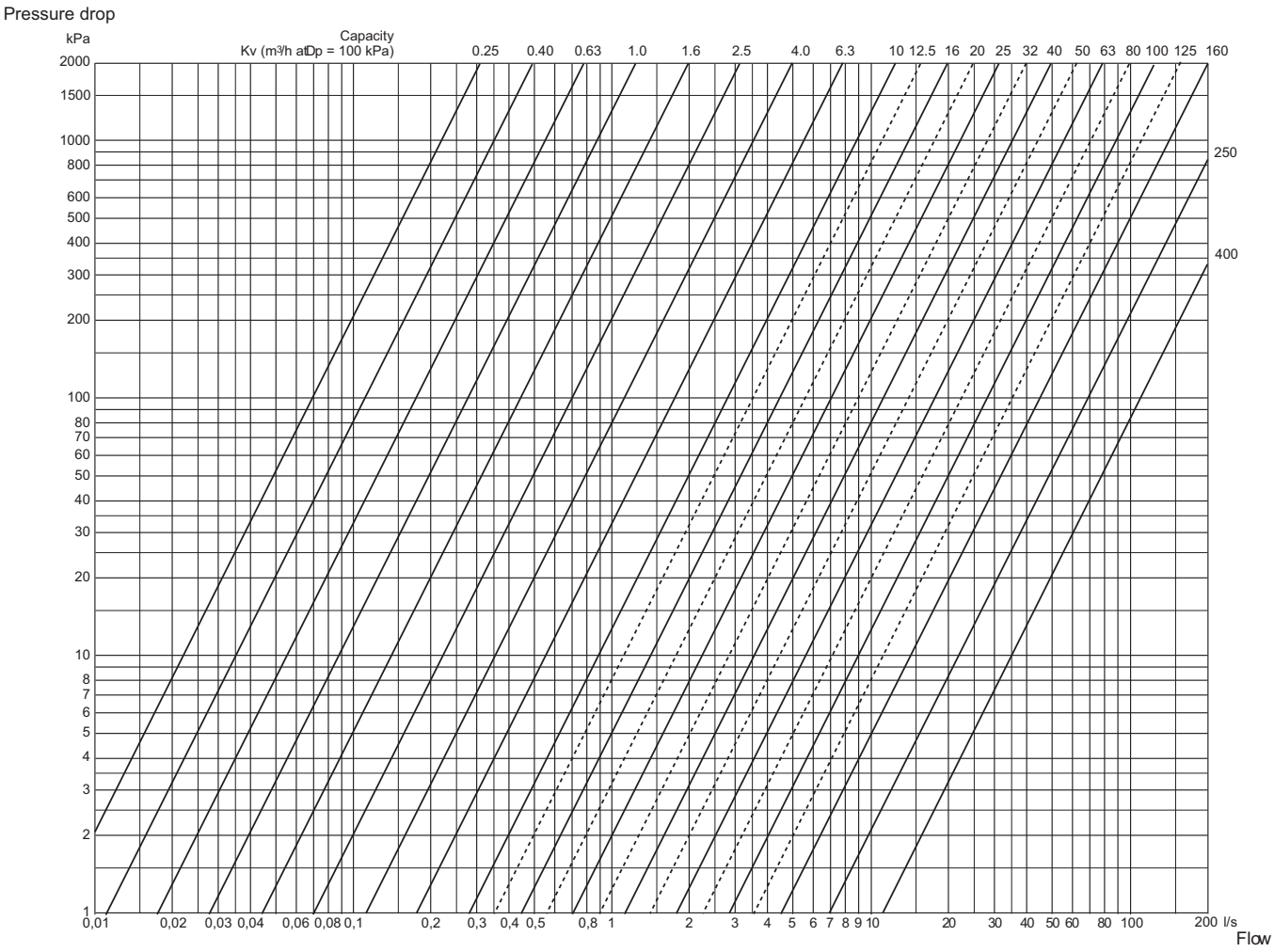
For damper actuator accessories see appendix C

Accessories for Damper Actuators

Mechanical Accessories								
			Actuators					
Name	Description	Part number	MD5	MD10	MD20	MD40	LF	AF
AV8-25	Shaft extension Length approx. 250 mm For damper spindles 8-25 mm dia. or 10-25 mm square	914-1023-010		x	x		x	x
K-MD10	Reversible spindle clamp	914-1062-000		x				
KH8	Universal damper crank arm Zinc-plated steel For damper spindles 10-18 mm dia. or 10-14 mm square Slot width 8.2 mm	914-1021-000			x		x	x
ZDB-AF	Angle of rotation limiter	914-1026-000						x
ZDB-LF	Angle of rotation limiter and pointer	914-1045-000					x	
ZG-AF	Damper linkage kit For flat and side mounting	914-1025-000						x
ZG-MD20	Damper linkage kit	914-1063-000			x			

Electrical Accessories								
			Actuators					
Name	Description	Part number	MD5	MD10	MD20	MD40	LF	AF
MD-S1	Auxiliary switch, add-on 1xSPDT 1mA…3(0.5)A, 250V AC	914-1060-000	x	x	x	x		
MD-S2	Auxiliary switch, add-on 2xSPDT 1mA…3(0.5)A, 250V AC	914-1061-000	x	x	x	x		

Appendix – TAC Venta Water Valve Sizing Chart



1 litre per second = 3.6m³/h
100 kPa = 1 Bar. = 14.5psi

Valve sizing formulae for water service

In order to size a valve, the following must be known:The volumetric flow rate through the valve, Q.
The differential pressure across the valve, ΔP.

Calculation of valve flow coefficient, Kv

$$K_v = \frac{Q \text{ (Flow rate, m}^3\text{/h)}}{\sqrt{\Delta P \text{ (Pressure drop, bar)}}}$$

Calculation of valve flow rate, Q

$$Q \text{ (Flow rate, (m}^3\text{/h)} = Kv\sqrt{\Delta P \text{ (Pressure drop, bar)}}$$

Calculation of Pressure drop, ΔP

$$\Delta P \text{ (Pressure Drop, bar)} = \left(\frac{Q \text{ (Flow rate, m}^3\text{/h)}}{Kv}\right)^2$$

Appendix – TAC Venta Steam Valve sizing Chart

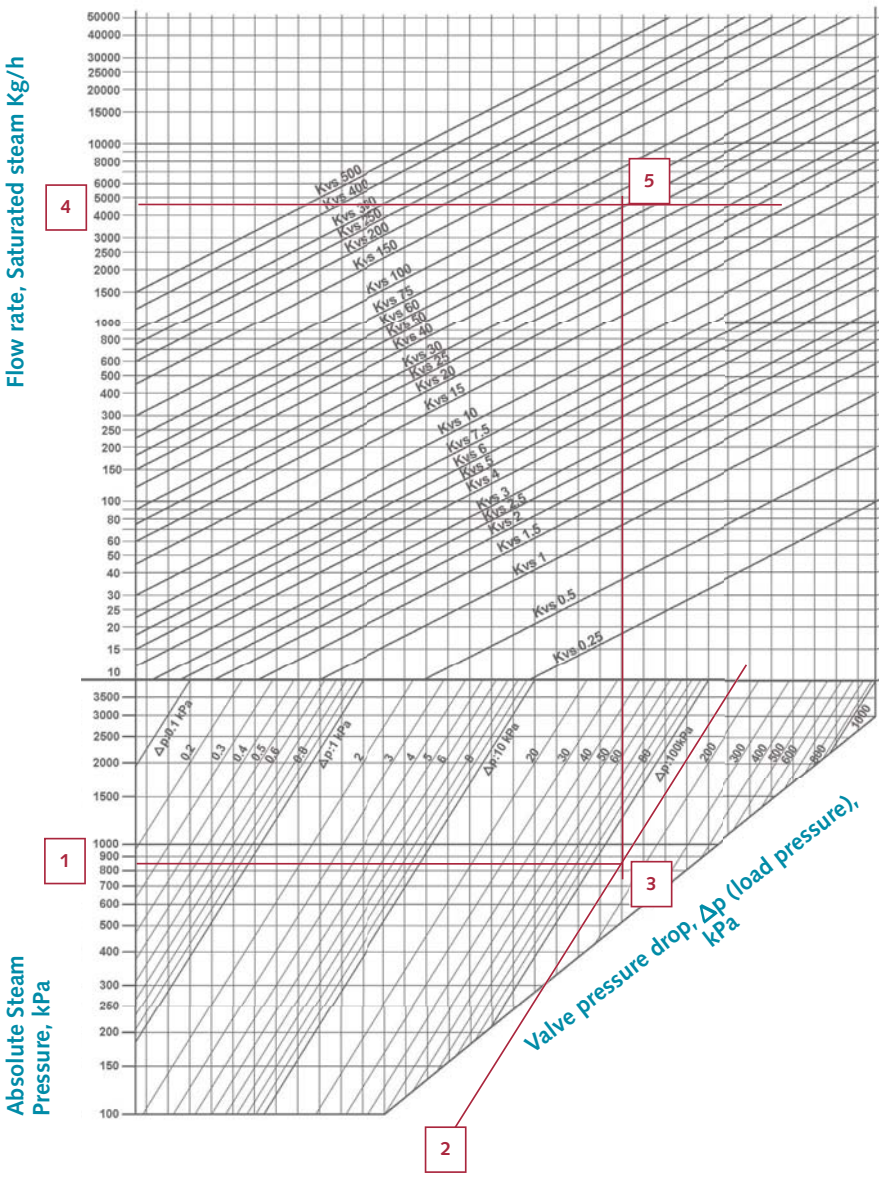
Example for saturated Steam:

Flow rate, (G)	4700 Kg/h
Abs. Pressure upstream (p1)	850 kPa
Load Pressure (ΔPv)	160 kPa

Mark the point of intersection [3] between the line originating from the absolute upstream pressure [1] and the inclined line corresponding to the load pressure (valve pressure drop)[2].

Identify the point of intersection between point [3] found above and the flow rate of Saturated steam [4]

The last found point would corresponds to a valve with a Kvs of 63 [5]



$P_2 > \frac{P_1}{2}$

$\Delta P > \frac{P_1}{2}$

$$K_{vs} = \frac{G}{31.6} \times \sqrt{\frac{v_2}{\Delta p}}$$

$P2 < \frac{P_1}{2}$

$\Delta P > \frac{P_1}{2}$

$$K_{vs} = \frac{G}{31.6} \times \sqrt{\frac{2 \times v^*}{p_1}}$$

Key:

Kvs = Valve flow co-efficient, (Control valve fully open).

G = Mass flow rate (Kg/h)

v_2 = Specific volume (from steam table) for p_2 and t_1 condition

V* = Specific volume (from steam table) for $\frac{P_1}{2}$ and t_1 condition

p1 = pressure before valve

p2 = pressure after valve

Δp = Valve Pressure drop (bar)

Notes

Notes

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On October 1st, 2009, TAC became the Buildings Business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.

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