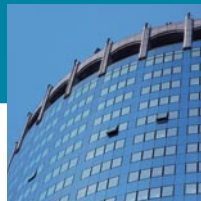


HVAC Valves and Actuators Catalogue



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

This catalogue presents the comprehensive valve and actuator portfolio offered by TAC's Field Device Product Division. The Division provides a single source for the field products our customers require to complete their system installations. 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 in this catalogue, consult the relevant data sheets on the TAC extranet, ExchangeOnline at <http://extranet.tac.com/> (registration requirement applies) or contact your local TAC sales office.

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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. TAC offers its customers a total capability in terms of hardware and software supply, installation and support.

With over 80 years experience in the HVAC, building automation and security arenas, TAC employs more than 5,000 people worldwide, with partners and branches in 80 countries. TAC's parent company, Schneider Electric, is the world leader in automation and electricity management, with over 90,000 employees worldwide, and operations in 130 countries.

TAC is the fastest growing, most innovative company in the Building Automation industry. We are at the forefront of growth because we deliver what our customers want, year after year, building after building.

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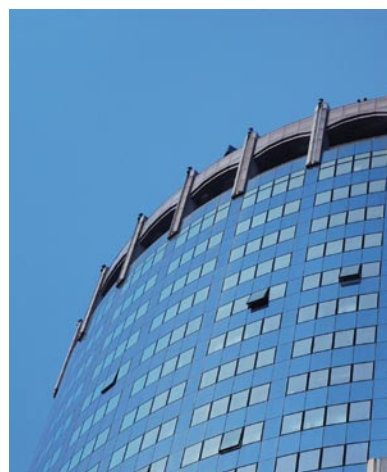


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Valves

TAC provides a wide range of valves to meet all the different operating conditions and applications found in a modern building. TAC valves offer high rangeability, providing close and accurate control of the medium and ensuring minimum energy usage.

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

The valve can handle the following types of media:

- Hot and chilled water.
- Water containing phosphate or hydrazine additives.
- Water with antifreeze additives such as glycol 50%.

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



Design	2-way plug valve	Connections	
Pressure class	PN 16 (232 psi)	Valve	External pipe thread according to ISO 228/1
Flow characteristic	Equal percentage modified	Connection sets	See appendix A
Stroke	20 mm (0.79 in.)	Materials	
Rangeability Kv/Kvmin	See table	Body	Bronze Rg5
Leakage	up to 0.02% of Kv/Cv	Plug and seat	Stainless steel SS 2346
ΔPm	600 kPa (87 psi), water	Stem	Stainless steel SS 2346
Max. temperature of medium	150°C (302°F)	Standard packing box	Venta
Min. temperature of medium	-20°C (-4°F)		

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

V211T

The V211T is suitable for a wide range of applications, such as heating, cooling and air handling systems. The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	2-way plug valve	Connections	Internal pipe thread Rp
Pressure class	PN 16 (232 psi)	Materials	
Flow characteristic	Equal percentage modified	Body	Nodular iron EN-JS 1030
Stroke	20 mm (0.79 in.)	Stem	Stainless steel SS 2346
Rangeability Kv/Kvmin	>50	Plug	Brass CW602N
Leakage	Tight sealing	Sealing	EPDM
ΔPm	400 kPa (58 psi), water	Seat	Nodular iron EN-JS 1030
Max. temperature of medium	120°C (248 °F)	Standard packing box	Venta
Min. temperature of medium	-20°C (-4°F)		

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

V212T

The V212T is suitable for a wide range of applications, such as heating, cooling and air handling systems. The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	2-way pressure balanced plug valve
Pressure class	PN 16 (232 psi)
Flow characteristic	Equal percentage modified
Stroke	20 mm (0.79 in.)
Rangeability Kv/Kvmin	>50
Leakage	Tight sealing
ΔPm	400 kPa (58 psi), water
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	-20°C (-4°F)

Connections	Internal pipe thread Rp
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	Size (mm)	Kv	Rangeability	M310	M400	M800	M1500	MV15B	M700
				300N	400N	800N	1500N	1500N	700N
721-1832-000	25	10	>50		800	1600	1600	1600	1600
721-1836-000	32	16	>50		750	1600	1600	1600	1600
721-1840-000	40	25	>50		700	1600	1600	1600	1600
721-1844-000	50	38	>50		600	1600	1600	1600	1600

V211

The V211 is suitable for a wide range of applications, such as heating, cooling and air handling systems. The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	2-way plug valve
Pressure class	PN 16 (232 psi)
Flow characteristic	Equal percentage modified
Stroke	20 mm (0.79 in.)
Rangeability Kv/Kvmin	>50
Leakage	Tight sealing
ΔPm	400 kPa (58 psi), water
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	-20°C (-4°F)

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	Size (mm)	Kv	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

VG211

The VG211 is suitable for a wide range of applications, such as heating, cooling and air handling systems. The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol (50%)
- Steam up to 200°C

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



Design	2-way plug valve	Max. temperature of medium	200°C (392°F)
Pressure class	PN 16 (232 psi)	Min. temperature of medium	-10°C (14°F)
Flow characteristic	Equal Percentage	Connections	Flange according to ISO 7005-2
Rangeability Kv/Kv min.		Materials	
DN15-20	>50	Body	Cast iron
DN25-50	>35	Stem	Stainless steel
		Plug	Stainless steel
Leakage	0,02% of Kvs	Seat	Stainless steel
ΔPm	6 bar (86 psi)	Packing box	Spring Loaded PTFE V-Ring

				Max Close-off Pressure kPa					
VG211				Non Spring Return Actuators					Spring Return
Part number	Size (mm)	Kv	Rangeability	M310	M400	M800	M1500	MV15B	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

V212

The V212 is suitable for a wide range of applications, such as heating, cooling and air handling systems. The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	2-way pressure balanced plug valve
Pressure class	PN 16 (232 psi)
Flow characteristic	Equal percentage modified
Stroke	20 mm (0.79 in.)
Rangeability Kv/Kvmin	>50
Leakage	Tight sealing
ΔPm	400 kPa (58 psi), water
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	-20°C (-4°F)

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	Size (mm)	Kv	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

V222

The V222 is a flanged plug valve, designed for control of large flows in heating and air conditioning installations. The plug is balanced, whereby only a low actuating force is required. For other types of applications, please contact your nearest TAC sales office.

The V222 valve can be used with the following types of fluids:

- hot water, or de-aerated cooling water.
- de-aerated water with glycol-type antifreeze agent 50%

With cooling media at temperatures below 0°C (32°F), a stem heater must be fitted to protect against stem seizure due to freezing.



Design	2-way pressure balanced plug valve	Max. temperature of medium	150°C (302°F)
Pressure class	PN 16 (232 psi)	Min. temperature of medium	-10°C (14°F)
Flow characteristics	Equal Percentage	Connection	Flange according ISO 7005-2
Stroke		Materials	
DN 65 – DN 100	30 mm (1.18 in.)	Body	Cast iron GG25
DN 125 – DN 150	50 mm (1.97 in.)	Stem	Stainless steel SS 1.4021
Rangeability Kv/Kv min	50	Plug	Stainless steel SS 1.4021
Leakage	<0.05% of Kv/Cv	Seat	Stainless steel SS 1.4021
ΔPm	800 kPa (116 psi), water	Packing box	Spring-loaded PTFE-V-ring

				Max Close-off Pressure kPa					
V222				Non Spring Return Actuators					Spring Return
Part number	Size (mm)	Kv	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	---

VG222

The VG222 valve is primarily intended to be used in heating, cooling and air conditioning application.

For other types of applications, please contact your nearest TAC sales office.

The VG222 valve can be used with the following types of fluids:

- hot water, or de-aerated cooling water.
- de-aerated water with glycol-type antifreeze agent 50%

With cooling media at temperatures below 0°C (32°F), a stem heater must be fitted to protect against stem seizure due to freezing.



Design	2-way pressure balanced plug valve
Pressure class	PN 16 (232 psi)
Flow characteristics	Equal Percentage
Rangeability Kv/Kv min.	>50

Stroke	
DN 65	25 mm (1 in.)
DN 80 – DN 150	45 mm (1.8 in.)
Leakage	<0.03% of Kv/Cv
ΔPm	200 kPa (29 psi), water

Max. temperature of medium	150°C (302°F)
Min. temperature of medium	-10°C (14°F)
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	Size (mm)	Kv	Rangeability	M800	M1500	MV15B	M700
				800N	1500N	1500N	700N
721-2052-000	65	63	>50	1600	1600	1600	1300
721-2056-000	80	100	>50	1600	1600	1600	1000
721-2060-000	100	130	>50	1600	1600	1600	700
721-2064-000	125	200	>50	1400	1600	1600	470
721-2068-000	150	300	>50	1150	1450	1450	300

V231

The V231 is suitable for a wide range of applications, such as heating, district heating and air handling systems.

The valve can handle the following types of media:

- Hot and chilled water.
- Water containing phosphate or hydrazine additives.
- Water with antifreeze additives such as glycol 50%.
- Steam max 2bar 120 °C

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



Design	2-way plug valve	Flanges drilling	According to SS 335 and ISO 2084
Pressure class	PN 25 (362 psi)	Materials	
Flow characteristic	Equal percentage modified	Body	Nodular iron SS 0727 (GGG40.3)
Stroke	20 mm (0.79 in.)	Plug and seat	Stainless steel SS 2346
Rangeability Kv/Kvmin	See table	Stem	Stainless steel SS 2346
Leakage	Up to 0.02% of Kv/Cv	Standard packing box	Venta
ΔPm	Max. 800 kPa (116 psi), water		
Max. temperature of medium	150°C (302°F)		
Min. temperature of medium	-20°C (-4°F)		

				Max Close-off Pressure kPa					
V231				Non Spring Return Actuators					Spring Return
Part number	Size (mm)	Kv	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

V232

The V232 is suitable for a wide range of applications, such as heating, district heating and air handling systems.

The valve can handle the following types of media:

- Hot and chilled water.
- Water containing phosphate or hydrazine additives.
- Water with antifreeze additives such as glycol 50%.

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



Design	2-way, pressure balanced plug valve
Pressure class	PN 25 (362 psi)
Flow characteristic	Equal percentage modified
Stroke	20 mm (0.79 in.)
Rangeability Kv/Kvmin	See table
Leakage	Up to 0.02% of Kv/Cv
ΔPm	Max. 800 kPa (116 psi), water
Max. temperature of medium	150°C (302°F)
Min. temperature of medium	-20°C (-4°F)

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					
V232				Non Spring Return Actuators					Spring Return
Part number	Size (mm)	Kv	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

V292

The V292 valve is primarily intended to be used in heating, air conditioning and district heating installations with large pressure drops. For other types of applications, please contact your nearest TAC sales office.

The V292 valve can be used with the following types of fluids:

- Hot water, or de-aerated cooling water.
- Water with additives such as phosphate or hydrazine.
- De-aerated water with glycol-type antifreeze agent 50%

With cooling media at temperatures below 0°C (32°F), a stem heater must be fitted to protect against stem seizure due to freezing.



Design	2-way pressure balanced plug valve
Pressure class	PN 25 (362 psi)
Flow characteristics	Equal Percentage

Max. temperature of medium	150°C (302°F)
Min. temperature of medium	-10°C (14°F)
Connection	Flange according ISO 7005-2

Stroke	
DN 65 – DN 100	30 mm (1.18 in.)
DN 125 – DN 150	50 mm (1.97 in.)

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

Rangeability Kv/Kv min	> 50
Leakage	<0.05% of Kv/Cv
ΔPm	1600 kPa (232 psi), water

				Max Close-off Pressure kPa					
V292				Non Spring Return Actuators					Spring Return
Part number	Size (mm)	Kv	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	---

V341

The V341 is suitable for a wide range of applications, such as heating, cooling, air handling and domestic hot water systems.

The valve can handle the following types of media:

- Hot and chilled water.
- Water containing phosphate or hydrazine additives.
- Water with antifreeze additives such as glycol 50%.

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



Design	3-way plug valve
Pressure class	PN 16 (232 psi)
Flow characteristics A-AB	Equal percentage modified
Flow characteristics B-AB	Complementary
Stroke	20 mm (0.79 in.)
Rangeability Kv/Kvmin	See table
Leakage A-AB	up to 0.02% of Kv/Cv
Leakage B-AB	up to 0.05% of Kv/Cv
ΔPm	600 kPa (87 psi), water
Max. temperature of medium	150°C (302°F)
Min. temperature of medium	-20°C (-4°F)

Connections	
Valve	External pipe thread according to ISO 228/1
Connection sets	See Appendix A
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	Size (mm)	Kv	Rangeability	M310	M400	M800	M1500	MV15B	M700
				300N	400N	800N	1500N	1500N	700N
731-4121-000	15	1.6	>50	800	800	1600	1600	1600	1400
731-4125-000	15	2.5	>50	800	800	1600	1600	1600	1400
731-4129-000	15	4.0	>50	800	800	1600	1600	1600	1400
731-4133-000	20	6.3	>100	650	650	1500	1600	1600	1100
731-4137-000	25	10	>100	400	500	1150	1600	1600	850
731-4141-000	32	16	>100	300	350	850	1350	1350	650
731-4145-000	40	25	>100	150	250	600	950	950	450
731-4149-000	50	38	>100	50	150	400	650	650	300

V311T

The V311T is suitable for a wide range of applications, such as heating, cooling and air handling systems.

The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	3-way plug valve	Connection	Internal pipe thread Rp
Pressure class	PN 16 (232 psi)	Materials	
Flow characteristic A-AB	Equal percentage modified	Body	Nodular iron EN-JS 1030
Flow characteristic B-AB	Complementary	Stem	Stainless steel SS 2346
Stroke	20 mm (0.79 in.)	Plug	Brass CW602N
Rangeability Kv/Kvmin	>50	Sealing	EPDM
Leakage A-AB and B-AB	Tight sealing	Seat	Nodular iron EN-JS 1030
ΔPm	400 kPa (58 psi), water	Standard packing box	Venta
Max. temperature of medium	120°C (248°F)		
Min. temperature of medium	-20°C (-4°F)		

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

V311

The V311 is suitable for a wide range of applications, such as heating, cooling and air handling systems.

The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	3-way plug valve
Pressure class	PN 16 (232 psi)
Flow characteristic A-AB	Equal percentage modified
Flow characteristic B-AB	Complementary
Stroke	20 mm (0.79 in.)
Rangeability Kv/Kvmin	>50
Leakage A-AB and B-AB	Tight sealing
ΔPm	400 kPa (58 psi), water
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	-20°C (-4°F)

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	Size (mm)	Kv	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

V321

The V321 is suitable for a wide range of applications, such as heating, cooling, and air handling.

The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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

Design	3-way plug mixing valve
Pressure class	PN 16 (232 psi)
Connection	Flange according ISO 7005-2



DN 65 – DN100

Flow characteristics A – AB	Equal Percentage
Flow characteristics B – AB	Complementary
Stroke	30 mm (1.18 in.)
Rangeability Kv/Kv min	>30
Leakage A – AB DN65 – DN100	Tight sealing
Leakage B – AB DN65 – DN100	Tight sealing
ΔPm	400 kPa (58 psi), water
Max. temperature of medium	130°C (266°F)
Min. temperature of medium	-10°C (14°F)

Materials

Body	Cast iron GG25
Stem	Stainless steel SS 1.4571
Plug	Brass CuZn39Pb3, 2.0401
Sealing	EPDM
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 (1.97 in.)
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 (58 psi), water
Max. temperature of medium	200 °C (392 °F)
Min. temperature of medium	-10 °C (14 °F)

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	Size (mm)	Kv	Rangeability	M800	M1500	MV15B	M22	M50	M700
				800N	1500N	1500N	2200N	5000N	700N
731-2153-000	65	63	>30	140	290	290	---	---	80
731-2157-000	80	100	>30	80	180	180	---	---	40
731-2161-000	100	160	>30	40	110	110	---	---	---
731-2165-000	125	250	>30	---	---	---	90	340	---
731-2169-000	150	320	>30	---	---	---	60	240	---

VG321

The VG321 is suitable for a wide range of applications, such as heating, cooling and air handling.

The valve can handle the following types of media:

- Hot and chilled water.
- Water with antifreeze additives such as glycol 50%.

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



Design	3-way plug mixing valve
Pressure class	PN 16 (232 psi)
Connection	Flange according ISO 7005-2
Rangeability Kv/Kv min.	> 50
Flow characteristics A – AB	Equal Percentage
Flow characteristics B – AB	Linear
Stroke DN65	25 mm (1 in.)
DN80-150	45mm(1.8 in.)
Leakage A – AB DN65 – DN150	< 0.03% of Kv/Cv
Leakage B – AB DN65 – DN150	< 2% of Kv/Cv

ΔP_m	200 kPa (28 psi), water
Max. temperature of medium	150°C (302°F)
Min. temperature of medium	-10°C (14°F)
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	Size (mm)	Kv	Rangeability	M800	M1500	MV15B	M700
				800N	1500N	1500N	700N
731-2053-000	65	63	>50	240	400	400	220
731-2057-000	80	100	>50	160	240	240	140
731-2061-000	100	130	>50	100	150	150	80
731-2065-000	125	200	>50	60	90	90	50
731-2069-000	150	300	>50	40	50	50	35

Zone Valves – Long Stroke

Zone valves are typically used to control the flow of either chilled water or hot water through a fan coil air handling unit. TAC offer two, three or four port zone valves.



VZ22, VZ32, VZ42

These small linear valves are used for the control of hot and/or chilled water for fan coil units, and small reheaters/recoolers in electric/electronic temperature control systems. The valves are used together with actuators MZ18 or MZ10.

Valve types

2-way valve	VZ22
3-way valve	VZ32
3-way with bypass	VZ42
Nominal pressure rating	PN16 (232 psi)
Flow characteristics	Equal percentage port A-AB Linear for bypass B-AB

Rangeability

2-way valve	50:1
3-way valve	50:1 for controlled port
Leakage rate	< 0.02% of kv
Connections	External thread
Suitable medium	Water according to VDI 2035 max. 50% glycol
Controlled water temperature	2 to 120°C (36 to 248°F)

Material

Valve body	DN15 yellow brass DN20 red brass
Stem	Stainless steel
Plug	Brass

Function

2-way valve	Stem up to open port A to B
3-way valve	Stem up to close port A to AB
Stroke	6.5 mm (0.26 in.)

(1) Up to 1000 kPa system pressure

For fittings please see appendix B

			Max Close-off Pressure kPa	
VZ22			MZ18L / MZ18A / MZ18B	MZ10T
Part number	Size (mm)	Kv	180N	96N
721-0702-000	15	0.16	1600	600
721-0706-000	15	0.25	1600	600
721-0710-000	15	0.4	1600	600
721-0714-000	15	0.63	1600	600
721-0718-000	15	1	1200	180
721-0722-000	15	1.6	1200	180
721-0726-000	20	2.5	400	50 (1)
721-0730-000	20	4	400	50 (1)

				Max Close-off Pressure kPa	
VZ32				MZ18L/ MZ18A/ MZ18B	MZ10T
Part number	Size (mm)	Kv		180N	96N
		A-AB	B-AB		
731-0706-000	15	0.25	0.16	800	600
731-0710-000	15	0.4	0.25	800	600
731-0714-000	15	0.63	0.4	800	600
731-0718-000	15	1	0.63	250	180
731-0722-000	15	1.6	1	250	180
731-0726-000	20	2.5	1.6	240	---
731-0730-000	20	4	2.5	240	---
731-0727-000	20	2.5	1.6	100	50 (1)
731-0731-000	20	4	2.5	100	50 (1)

				Max Close-off Pressure kPa	
VZ42				MZ18L/ MZ18A/ MZ18B	MZ10T
Part number	Size (mm)	Kv		180N	96N
		A-AB	B-AB		
741-0706-000	15	0.25	0.16	800	500
741-0710-000	15	0.4	0.25	800	500
741-0714-000	15	0.63	0.4	800	500
741-0718-000	15	1	0.63	250	150
741-0722-000	15	1.6	1	250	150
741-0726-000	20	2.5	1.6	240	---
741-0730-000	20	4	2.5	240	---

VZ29, VZ39, VZ49

These small linear valves are used for the control of hot and/ or chilled water for fan coils units, and small reheaters/recoolers in electric/electronic temperature control systems. VZ29/39/49 models have flat connections to pipes. VZ29C/39C/49C have conic connections to pipe. The valves are supplied with an adjustment cap and are used together with actuators MZ20.



Valve types

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

Operating pressure	1600 KPa max (16 bar)
Stroke	5.5 mm (0.2 in.)
Max fluid speed	3 m/s
Allowed fluids	Water, water+glycol (30% max)
Temperature	2 to 95°C (36 to 203°F)

Flow Characteristics

Equal percentage	On direct (A-AB) way
Linear	On by-pass (B-AB) way
Connections	Gas male threaded, Flat or Conic tight

Materials

Valve body	Brass
Stem	Stainless steel
Stem packing	Double OR ring in Viton
Plug sealing	OR in Viton

				Max Close-off Pressure kPa
VZ29 Flat fitting				MZ20A / MZ20B
Part number	Size (mm)	Kv		200N
721-0531-000	15	0.25		350
721-0532-000	15	0.4		350
721-0533-000	15	0.6		350
721-0534-000	15	1		350
721-0535-000	15	1.6		350
721-0536-000	15	2		250
721-0537-000	20	2.5		250
VZ39		A-AB	B-AB	
731-0531-000	15	0.25	0.25	350
731-0532-000	15	0.4	0.25	350
731-0533-000	15	0.6	0.4	350
731-0534-000	15	1	0.6	350
731-0535-000	15	1.6	1	350
731-0536-000	15	2	1.6	250
731-0537-000	20	2.5	1.6	250
VZ49 (1)		A-AB	B-AB	
741-0531-010	15	0.25	0.25	350
741-0532-010	15	0.4	0.25	350
741-0533-010	15	0.6	0.4	350
741-0534-010	15	1	0.6	350
741-0535-010	15	1.6	1	350
741-0536-010	15	2.0	1.6	250
741-0537-000	20	2.5	1.6	250

(1) 40mm centre to centre (C/C) on 4-ports DN15, 44mm C/C on 4-ports DN20

For fittings please see appendix B

Zone Valves – Short Stroke



VZ28, VZ38, VZ48

These small linear valves are used for the control of hot and/or chilled water for fan coils units, and small reheaters/recoolers in electric/electronic temperature control systems. All models have flat connections to pipes. The valves are supplied with an adjustment cap. The valves are used together with actuators MZ88T/TA and are normally closed. The actuators are available in ON-OFF (230V and 24V) or modulating (24V) with 0-10V signal versions.

Valve types

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

Operating pressure	1600 kPa (232 psi)
Stroke	2.5 mm (0.1 in.)
Max fluid speed	3 m/s
Media	Water, water+glycol (30% max)
Temperature	5 to 95°C (41 to 203°F)
Leakage	0% tight close-off

Materials

Valve body	Brass
Stem	Stainless steel
Stem packing	Double OR ring in Viton
Plug sealing	OR in Viton

				Max Close-off Pressure kPa
VZ28 Flat fitting				MZ88T / MZ88TA
Part number	Size (mm)	Kv		90N
721-0430-000	15	0.25		250
721-0431-000	15	0.4		250
721-0432-000	15	0.6		250
721-0433-000	15	1		250
721-0434-000	15	1.6		250
721-0435-000	20	2.5		150
VZ38		A-AB	B-AB	
731-0431-000	15	0.25	0.25	250
731-0432-000	15	0.4	0.25	250
731-0433-000	15	0.6	0.4	250
731-0434-000	15	1	0.6	250
731-0435-000	15	1.6	1	250
731-0436-000	20	2.5	1.6	150
VZ48 (1)		A-AB	B-AB	
741-0430-010	15	0.25	0.25	250
741-0431-010	15	0.4	0.25	250
741-0432-010	15	0.6	0.4	250
741-0433-010	15	1	0.6	250
741-0434-010	15	1.6	1	250
741-0435-000	20	2.5	1.6	150

(1) 40mm C/C on 4-ports DN15, 50mm C/C on 4-ports DN20

For fittings please see appendix B

Shoe valves

TAC shoe valves are designed to be used in both mixing and diverting applications in heating systems.

VTRE

The VTRE is a 3-way rotating sleeve valve, designed to be used either as a mixing or a diverting valve. Typical applications include hydronic heating, and air handling systems with moderate demands on differential pressure and leakage.

The VTRE valve is suitable for systems containing up to 50% glycol.

The valve is delivered with a handle for manual operation.

The actuator is supplied separately.



Valve type	Rotating sleeve	Max pressure drop	50 kPa
Characteristic	Modified linear	Leakage	Max. 1 % of KV
Operating angle	90°		
Pressure rating	PN 6	Materials	
		Body	Cast iron
Water temperature		Sleeve	Brass
Max.	110°C (230°F)	Connections	Flanged DIN 2531
Min.	-10°C (14°F)		

			Max Close-off Pressure kPa	
VTRE			Mixing Application	Diverting Application
Part number	Size (mm)	Kv	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

Butterfly valves

TRV-S

The TRV-S is a butterfly valve designed to be fitted between two counter flanges PN6, PN10 or PN16.

The valve is provided with an ethylene-propylene rubber lining for tight close off, eliminating the need for flange gaskets.

The TRV-S can be direct mounted to an electric actuator.

The actuator is connected by a flange according to EN ISO 5211.

Actuator type is determined by control system type, actuator force, running time etc. Suitable actuators are MB15 and MB30.

The TRV-S can handle the following types of media:

- Hot water and de-aerated cooling water.
- Low-pressure steam up to 110 °C (230 °F)
- Water with hydrazine and phosphate water treatment
- De-aerated water with anti-freeze additives, such as glycol (up to 50%) and brines.



Design	Butterfly valve	Materials	
Pressure rating	PN16 (232 psi)	Body	Cast iron GG25
Temperature of media	-10 to +130°C (14°F to 266°F)	Lining	Ethylene-propylene rubber
ΔPm	Max. 400 kPa (58 psi)	Disc	Stainless steel 1.4408 / CF8M
Leakage rate	<0.0001 % of Kv/Cv	Stem	Stainless steel 1.4104 / 430F

Suitable counter flange type

PN6 (87 psi) according to DIN 2631

PN10 (145 psi) according to DIN 2632

PN16 (232 psi) according to DIN 2633

TRV-S				Max Close-off Pressure kPa			
				Application			
				M15B 3-point	M15A 0-10 V	M30B 3-point	M30A 0-10 V
Part number	Size (mm)	Kv	15Nm		30Nm		
			Assembly kit (1)	kPa	Assembly kit (1)	kPa	
721-6010-000	25	36	A	1000	C	1000	
721-6014-000	32	40	A	1000	C	1000	
721-6018-000	40	50	A	1000	C	1600	
721-6022-000	50	85	A	1000	C	1600	
721-6026-000	65	215	A	700	C	1600	
721-6030-000	80	420	B	400	D	1000	
721-6034-000	100	800	B	200	D	1000	
721-6038-000	125	1010	---	---	D	600	
721-6042-000	150	2100	---	---	E	500	
721-6046-000	200	4000	---	---	E	300	

(1) Required assembly kit A = 911-3010-000 Assy.Kit MB15/TRV-S DN25-65 B = 911-3014-000 Assy.Kit MB15/TRV-S DN80-100
 C = 911-3018-000 Assy.Kit MB30/TRV-S DN25-65 D = 911-3022-000 Assy.Kit MB30/TRV-S DN80-125
 E = 911-3026-000 Assy.Kit MB30/TRV-S DN150-200

Actuators

TAC manufactures a complete range of actuators for the control of two, three and four port valves. The different thrusts available allow different maximum differential pressures to be achieved and enable competitive solutions to be provided.

Globe valve actuators

TAC Forta M310, M400, M800, M1500

The TAC Forta is a family of actuators for the control of 2-way and 3-way plug valves in:

- domestic hot water systems
- heating systems
- air handling systems

TAC Forta can be controlled by a raise/lower signal or by a modulating 0-10 V control signal. Modulating control makes for a faster positioning of the actuator. The electronic circuitry of the actuator ensures that the running time is the same, regardless of the stroke of the valve in question. It is easy to mount and connect the actuator. It can be mounted directly onto TAC's control valves, without any mounting kit. For Satchwell valves a linkage is included (see below). The stroke of the actuator is automatically adjusted depending on the stroke of the valve. The electronic circuitry of the actuator then takes care of the adjustment of the valve end positions. The STS (Self testing Safety Device) option provides battery power failure return.



Part numbers	See the table on next page		Output Y	
Supply voltage	24 V AC +25% / -35%, 50-60 Hz		Voltage	2-10 V (0-100%)
Increase/decrease	300 s/60 s		Load	2 mA
Close off time with STS, at power failure			Ambient temperature	
Stroke 10 to 25 mm (0.39 to 1 in.)	Max. 20 s		Operation	-10 to +50°C (14°F to 122°F)
Stroke 25 to 32 mm (1 to 1.26 in.)	Max. 25 s		Storage	-10 to +50°C (14°F to 122°F)
Stroke 32 to 52 mm (1.26 to 2 in.)	Max. 35 s		Ambient humidity	Max. 90% RH
Duty cycle	Max. 20%/60 minutes		Enclosure rating	IP 54
Analogue input			Standards	
Voltage	0-10 V		Emission	EN 50081-1:1992
Impedance	Min. 100 kΩ		Immunity	EN 50082-1:1992
Digital inputs VH-VC			Material	
Voltage across open input	24 V AC		Housing	Aluminium
Current through closed input	5 mA		Cover	ABS/PC plastic
Output G1			Colour	Aluminium/black
Voltage	16 V DC ±0.3 V			
Load	25 mA, short-circuit proof			

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
880-0212-040	M310 STS	300	15s	20s	---	6	30
880-0213-040	M310 S2 STS	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
880-0312-040	M800 STS	800	15s	20s	30s	15	50
880-0313-040	M800 S2 STS	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

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

TAC Forta linkage kits for other valves and accessories	
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
880-0252-000	Linkage DN15-V298
880-0253-000	Linkage DN15-V2XX/V3XX
880-0104-000	S2-Forta (1)
880-0108-000	Stem heater Forta-Venta (1)
010-0190-240	STS -Forta battery-pack NiCd Spare

(1) Note: Not for TAC Forta M700

TAC Forta M700

The TAC Forta M700 is a spring return actuator, for the control of 2-way and 3-way plug valves in:

- domestic hot water systems
- heating systems
- air handling systems

The M700 is either controlled by an increase/decrease signal or by a modulating 0-10 V control signal. Modulating control makes for a faster positioning of the actuator. The electronic circuitry of the actuator ensures that the running time is the same, regardless of the stroke of the valve in question. It is easy to mount and connect the actuator. It can be mounted directly onto TAC's control valves, without any mounting kit. For Satchwell valves a linkage is included (see table). The working range of the actuator is adjusted automatically depending on the stroke of the valve. The electronic circuitry of the actuator then takes care of the adjustment of the valve end positions.



Part numbers	See table on next page
Supply voltage	24 V AC +25% / -30%, 50-60 Hz
Power consumption	Average 30 VA
Transformer sizing	50 VA

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

Spring return close off time at power failure	
Less than 50 seconds	20 mm (0.78 in.)
Less than 95 seconds	45 mm (1.77 in.)
Stroke	9 to 52 mm (0.35 to 2.04 in.)
Thrust	700 N (180 lbf.)
Duty cycle	Max. 20%/60 minutes

Analogue input	
Voltage	0-10 V
Impedance	Min. k Ω

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 \pm 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 (14°F to 122°F)
Storage	-10 to 50 °C (14°F to 122°F)
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	Aluminium/black

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

Key:

S2	auxiliary switch
SRSU	stem up
SRSD	stem down
L7SV	Satchwell linkage

MV15B

The MV15B-24 and MV15B-230 are 3-point floating (increase/decrease) actuators for the control of 2-way and 3-way globe valves in:

- heating systems
- air handling systems

It is easy to mount and connect the actuator, which can be mounted directly onto TAC control valves, without any mounting kit.

For Satchwell valves a linkage is included (see part numbers on this page).

The working range of the actuator is adjusted automatically, depending on the stroke of the valve, by means of switches actuated by a limit torque mechanism.

The actuator is supplied in two versions: 24 V AC or 230 V AC.



Part numbers	See table
Supply voltage	24 V AC $\pm 10\%$, 50-60 Hz 230 V AC $\pm 10\%$, 50-60 Hz
Power consumption	12 VA
Transformer sizing	15 VA
Running speed	0.75 mm/s (0.03 in/s)
Running time for 20 mm (0.78 in.)	27s
Stroke	9 to 45 mm (0.35 to 1.8 in.)
Thrust	1500 N (337 lbf.)

Ambient temperature	
Operation	15 to 50°C (5°F to 122°F)
Storage	-25 to +65°C (-13°F to +149°F)
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 linkage kits and accessories	
Part number	Description
880-0126-000	Linkage M700-Satchwell L7SV
880-0469-000	Switch S2-MV15B

M22A, M50A

The M22A and M50A are electromechanical actuators suitable for driving DN125 and DN150 2-way and 3-way valves, type V222, V292 and V321.

The actuators are powered by 24 V and controlled by a 0-10 V DC or 0-20 mA signal.

The M22A and M50A can be ordered factory-mounted on the valve. See table on page 32.

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



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

Running time	
Modulating 0 to 50mm (0 to 2 in.)	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 (-4°F to +158°F)

Storage	-20 to +70°C (-4°F to +158°F)
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
Colour	Black/blue

Weight	
M22A	5,4 kg (11.9 lb.)
M50A	6,0 kg (13.2 lb.)

M22B, M50B

The M22B and M50B are electromechanical actuators suitable for driving DN125 and DN150 2-way and 3-way valves type V222, V292 and V321. M22B and M50B actuators are powered by 24 Vac or 230 Vac and controlled by 3-point action (increase/decrease). The actuators have optional end switches, and can be ordered factory-mounted on the valve – see table on next page.



Part numbers See table below

Running time

3-point 0-50 mm (0-2 in.)	50Hz, 132s
	60Hz, 112s

Duty cycle Max. 80%/60 minutes

Optional travel switch S2

Type	Zero potential
Capacity	10A, 250V

Ambient temperature

Operation	-20 to +70°C (-4°F to +158°F)
Storage	-20 to +70°C (-4°F to +158°F)
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
Colour	Black/blue

Weight

M22B	5.4 kg (11.9 lb.)
M50B	6.0 kg (13.2 lb.)

M22B, M50B 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
890-0212-000	M50B-230V-S2	5000	230	28 VA

2-way valves

Factory-mounted Valve + Actuator Assemblies		V222		V292	
		721-2266-000	721-2270-000	721-9266-000	721-9270-000
		DN125	DN150	DN125	DN150
Part number	Description				
890-0104-000	M22A-24v	119-0104-000	119-0106-000	119-0108-000	119-0110-000
890-0106-000	M22B-24V	119-0116-000	119-0118-000	119-0120-000	119-0122-000
890-0108-000	M22B-24V-S2	119-0128-000	119-0130-000	119-0132-000	119-0134-000
890-0110-000	M22B-230V	119-0140-000	119-0142-000	119-0144-000	119-0146-000
890-0112-000	M22B-230V-S2	119-0154-000	119-0154-000	119-0156-000	119-0158-000
890-0204-000	M50A-24V		119-0204-000	119-0206-000	119-0208-000
890-0206-000	M50B-24V		119-0214-000	119-0216-000	119-0218-000
890-0208-000	M50B-24V-S2		119-0224-000	119-0226-000	119-0228-000
890-0210-000	M50B-230V		119-0234-000	119-0236-000	119-0238-000
890-0212-000	M50B-230V-S2		119-0244-000	119-0246-000	119-0248-000

3-way valves

Factory-mounted Valve + Actuator Assemblies		V321	
		731-2165-000	731-2169-00
		DN125	DN150
Part number	Description		
890-0104-000	M22A-24v	119-0112-000	119-0114-000
890-0106-000	M22B-24V	119-0124-000	119-0126-000
890-0108-000	M22B-24V-S2	119-0136-000	119-0138-000
890-0110-000	M22B-230V	119-0148-000	119-0150-000
890-0112-000	M22B-230V-S2	119-0160-000	119-0162-000
890-0204-000	M50A-24V	119-0210-000	119-0212-000
890-0206-000	M50B-24V	119-0220-000	119-0122-000
890-0208-000	M50B-24V-S2	119-0230-000	119-0232-000
890-0210-000	M50B-230V	119-0240-000	119-0242-000
890-0212-000	M50B-230V-S2	119-0250-000	119-0252-000

Zone valve actuators

MZ18L

The MZ18L 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 MZ18L small linear actuator is specifically designed to provide LONMARK® capabilities together with valve series VZ22, VZ32, VZ42 and is used in fan coil units, induction units, small reheaters, recoolers and for zone control applications. The MZ18L actuator is suitable for controllers based on 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	6.5 mm
Running time	150s at 50 Hz 120s at 60 Hz



Stem force	180 N (for valves DN 15-20)
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 (32 to 131°F)
Enclosure rating	IP 42

MZ18L zone valve actuator for VZ22/32/42 valves

Part number	Description
845-5102-000	MZ18L (LON)

MZ18A

The MZ18A actuator is specifically designed to provide modulating control together with the VZ22, VZ32 and VZ42 series of small linear valves. The MZ18A is used in fan coil units, induction units, small reheaters and recoolers, and for zone control applications. The actuator is compatible with controllers providing 0-10 V or 2-10 V output signals. Reliable long term operation is ensured by the fact that no mechanical feedback potentiometer and no mechanical end switches are needed. Due to an automatic synchronization function the close-off point is self-adjusting. Based on a running time of 150 seconds, valve positioning and flow adjustment is very exact.

Input voltage	24 VAC, $\pm 15\%$, 50/60 Hz
Power consumption	1,4 VA
Input signal	Modulating 0-10 V, 2-10 V Adjustable $<0,1$ mA
Operation	Direct/reverse (adjustable)
Stroke	6,5 mm
Running time	150s at 50 Hz 120s at 60 Hz
Stem force	180 N (for valves DN 15-20)
Protection class	IP 40 in accordance with EN 60529
Insulation class	III in accordance with EN 60730
Connection cable	1,5 m
Coupling ring	M 30 x 1,5
Ambient operating temperature	0 to 55°C (32 to 131°F)
Enclosure rating	IP 42



MZ18A zone valve actuator for VZ22/32/42 valves

Part number	Description
845-5100-000	MZ18A-24

MZ18B

The MZ18B actuator is specifically designed to provide 3-point control together with the VZ22, VZ32 and VZ42 series of small valves. The MZ18B actuator is used in fan coil units, induction units, small reheaters and recoolers and for zone control applications. The absence of end switches or feedback potentiometer ensures long term reliability.

Input voltage	24 Vac + 10 % / -30 %; 50/60 Hz
Power consumption	0,7 VA
Control mode	Floating (3-point)
Stroke	6.5 mm
Running time	150s at 50 Hz 120s at 60 Hz
Stem force	180 N (for valves DN 15-20)
Protection standard	IP 43 in accordance with EN 60529
Insulation class	III in accordance with EN 60730
Connection cable	1.5 m
Coupling ring	M 30 x 1,5
Ambient operating temperature	0 to 60°C (32 to 140°F)
Enclosure rating	IP 42



MZ18B zone valve actuator for VZ22/32/42 valves

Part number	Description
845-5101-000	MZ18B

MZ10T

The MZ10T is a thermoelectric actuator designed to provide on/off control together with the VZ22, VZ32 and VZ42 series of valves in sizes DN15. MZ10T actuators are used in fan coil units, induction units, and small reheaters. There are two models with similar properties, but using different input voltages. The actuator operates together with controllers using on/off control signal.

MZ10T-24V

Input voltage	24 V AC 50/60 Hz
Power consumption	3 W
Initial consumption	0.6 A
Operating consumption	0.09 A
Part number	845-4100

MZ10T-230V

Input voltage	230 V AC 50/60 Hz
Power consumption	3 W
Initial consumption	0.3 A
Operating consumption	0.013 A
Part number	845-4101



MZ10T-24V / 230V

Stem force	96 N (22 lbf)
Max stroke	8 mm (0.31 in.)
Opening time	2 mins
Closing time	4 mins maximum (1)
Coupling ring	M30 x 1,5

(1) At an ambient temperature of 20°C

Connection cable	1.5 m (5 ft)
Max. Ambient temperature	50°C (122°F)
Protection class	Vertical, mounting upwards IP 43
	Horizontal mounting IP 40

MZ10T zone valve actuator for VZ22/32/42 valves

Part number	Description
845-4100-000	MZ10T-24V
845-4101-000	MZ10T-230V

MZ20A

The MZ20A is a zone actuator designed to provide modulating control together with the VZ29/VZ39/VZ49 series of small valves. The M20A is used in fan coil units, induction units, small reheaters and recoilers, and for zone control applications. Reliable long term operation is ensured due to the fact that no mechanical feedback potentiometer and no mechanical end switches are needed. Due to an automatic synchronization function the close-off point is self-adjusting. Based on a running time of 100 seconds, valve positioning and flow adjustment is very exact.

Input voltage	24 VAC 50/60 Hz
Power consumption	1 VA
Speed	18s/mm (50 Hz) – 15s/mm (60 Hz)

Temperature

working	-5 to 55°C (23 to 131°F)
storage	25 to 65°C (77 to 149°F)
Stem force	200 N (45 lbf)
Max stroke	6,5 mm (0.25 in.)
Connection cable	3 wires 1,5 m (5 ft)
Protection class	IP 43 (for vertical mounting)



MZ20A zone valve actuator for VZ29/39/49 valves

Part number	Description	Control signal
845-5051-000	MZ20A	Selectable *
845-5052-000	MZ20A-R	0-10 V

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

MZ20B

The MZ20B is an electro-mechanical actuator designed for 3-point (increase/decrease) control together with the VZ29/VZ39/VZ49 series of small valves. The MZ20B actuator is used in fan coil units, induction units, small reheaters and recoolers and for zone control applications. The absence of end switches or feedback potentiometer ensures long term reliability.

Input voltage	24 V DC or AC, 50/60 Hz
Power consumption	0.5 VA
Speed	18 s/mm (50 Hz) – 15 s/mm (60 Hz)

Temperature

Working	-5 to +55°C (23 to 131°F)
Storage	-25 to +65°C (77 to 149°F)
Stem force	200 N (45 lbf)
Max stroke	6.5 mm (0.25 in.)
Connection cable	3 wires 1.5 m (5 ft)
Protection class	IP 43 (for vertical mounting)



MZ20B zone valve actuator for VZ29/39/49 valves	
Part number	Description
845-5001-000	MZ20B-24

MZ88T/MZ88TA

The MZ88T/MZ88TA are thermoelectric actuators designed to provide on/off or modulating control together with the VZ28/VZ38/VZ48 series of small valves. The actuator keeps the valve closed with power off or 0V control signal. The actuator operation is based on a built-in wax thermostatic element. When this component is heated a small piston comes out, starting the valve stroke.

Temperature

Working	2 to 50°C (36 to 122°F)
Storage	-10 to 60°C (14 to 140°F)

Stem force	90 N (20 lbf)
Max stroke	4 mm (0.16 in.)
Coupling ring	M30 x 1,5
Power cable	2m (6.7 ft.) bipolar (0.75 mm ²)
Material	Fire-resistant case: Class V0
Protection class	IP 44 (for vertical mounting)



MZ88T



MZ88TA-SU

MZ88T / MZ88TA zone valve actuator for VZ28/38/48 and VZ28C/38C/48C valves					
Part number	Description	Control signal	Power VAC	Power consumption VA	Initial consumption A
845-5011-000	MZ88T-SU-230	On/Off	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

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 (0.1 in.)
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 (32 to 131°F)
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
Markaryd	Series NT	911-2073-000
Markaryd	Series MIMA Minor	911-2072-000



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 (0.06 in.) controlled valve stroke 7.9 mm (0.31 in.) 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 (3 ft)
Coupling ring	M 30 x 1.5
Ambient operating temperature limits	0 to 60°C (32 to 140°F)
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
Markaryd	Series NT	911-2073-000
Markaryd	Series MIMA Minor	911-2072-000

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. The actuators are available in normally open and normally closed versions, and for different input voltages.

Opening/closing time	Approx. 5.5 min.
Stem force	90 N (20 lbf)
Max stroke	4 mm (0.16 in.)
Coupling ring	M30 x 1.5
Connection cable	1.0 m (3.3 ft)
Max. Ambient temperature	50°C (122°F)
Protection class	IP 43



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
Markaryd	Series NT	911-2073-000
Markaryd	Series MIMA Minor	911-2072-000

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

Rotary actuators

EM9/M9B

The EM9/M9B are electronic actuators for motorising valves type VTRE with rotating valve stem. 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 indicates the valve position on the front of the unit.

Power consumption	3 VA
Duty cycle	10%
Torque	15 Nm
Operating temperature	-15 to +55°C (5 to 131°F)
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

Butterfly valve actuators

MB15A/MB30A

The MB15A/MB30A is an electromechanical actuator for motorising TRV-S butterfly valves. MB15A/MB30A is available for 24 V and is controlled by a 0-20 V or 0-20 mA signal. The actuator's working range is set in the factory to 90° to suit the TRV-S valve. The actuators can be operated manually. A pointer between the actuator and the valve indicates the valve position.



Duty cycle	100%	Standards conformity	
Output Y		EMC, emission	SS EN 50081-1
Voltage	0-10 V	EMC, immunity	SS EN 50082-1
Impedance	Min. 2.5 kΩ	Enclosure rating	IP 55
Enclosure material		Ambient humidity	< 95 %rH
Cover	Lexan 940	Ambient temperature	
House	Cast light alloy	Operation	-5 to +60°C (23 to 140°F)
Colour	Black/aluminium	Storage	-30 to +70°C (-22 to +158°F)
		Maintenance	Maintenance free

MB15A, MB30A modulating 0-10V actuators for valves TRV-S		Torque	Control signal	Runing time
Part number	Description	Nm		
865-1518-000	MB15A-60s-24V	15	0-10V (1)	60s
865-1528-000	MB15A-120s-24V	15	0-10V (1)	120s
865-3018-000	MB30A-60s-24V	30	0-10V (1)	60s
865-3028-000	MB30A-120s-24V	30	0-10V (1)	120s

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

TRV-S			Max Close-off Pressure kPa			
			M15B	M15A	M30B	M30A
Part number	Size (mm)	Application	3-point	0-10v	3-point	0-10v
		Kv	15Nm		30Nm	
			Assembly Kit (1)	kPa	Assembly Kit (1)	kPa
721-6010-000	25	36	A	1000	C	1000
721-6014-000	32	40	A	1000	C	1000
721-6018-000	40	50	A	1000	C	1600
721-6022-000	50	85	A	1000	C	1600
721-6026-000	65	215	A	700	C	1600
721-6030-000	80	420	B	400	D	1000
721-6034-000	100	800	B	200	D	1000
721-6038-000	125	1010	---	---	D	600
721-6042-000	150	2100	---	---	E	500
721-6046-000	200	4000	---	---	E	300

(1) Requires assembly kit A= 911-3010-000 Assy.Kit MB15/TVR-S DN25-65 B= 911-3014-000 Assy.Kit MB15/TVR-S DN80-100
 C= 911-3018-000 Assy.Kit MB30/TVR-S DN25-65 D= 911-3022-000 Assy.Kit MB30/TVR-S DN80-125
 E= 911-3026-000 Assy.Kit MB30/TVR-S DN150-200

MB15B/MB30B

The MB15B/MB30B is a 3-point control electromechanical actuator for motorizing TRV-S butterfly valve. The actuator's working range is set in the factory to 90 degrees to suit the TRV-S valves. The MB15B/MB30B can be operated manually. A pointer between the actuator and the valve indicates the valve position.

Optional end switches

S2 Auxillary MB15	965-1510-000
S2 Auxillary MB30	965-3010-000

Duty cycle	100%
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Enclosure material

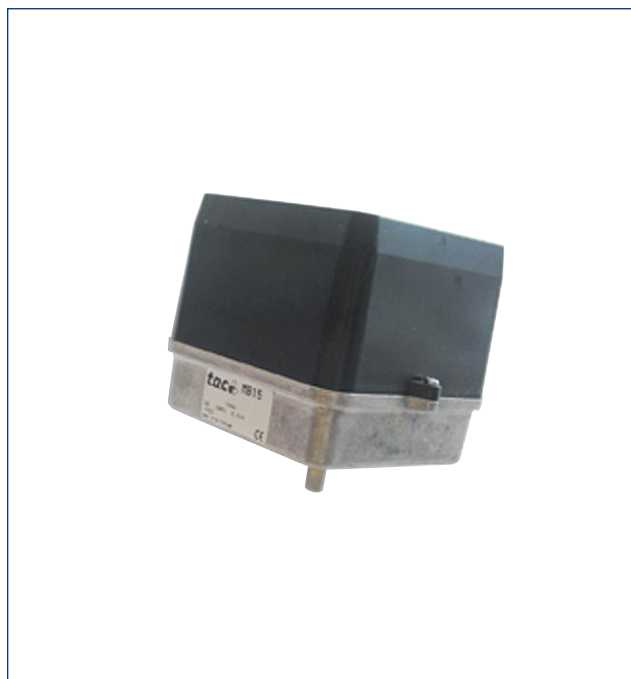
Cover	Lexan 940
Housing	Cast light alloy
Colour	Black/aluminium

Standards conformity

EMC, emission	SS EN 50081-1
EMC, immunity	SS EN 50082-1
Enclosure rating	IP 55
Ambient humidity	< 95 %rH

Ambient temperature

Operation	-20 to +60°C (-4 to +140°F)
Storage	-30 to +70°C (-22 to +158°F)
Maintenance	Maintenance free



MB15B, MB30B 3-point (inc/dec) actuators for valves TRV-S		Torque	Runing time	Power supply	Power Consumption	
Part number	Description	Nm			50Hz	60Hz
865-1510-000	MB15B-60s-230V	15	60s	230Vac±15%	3.7 VA	4.2 VA
865-1514-000	MB15B-60s-24V	15	60s	24Vac±20%	4.8 VA	5.4 VA
865-1520-000	MB15B-120s-230V	15	120s	230Vac±15%	3.7 VA	4.2 VA
865-1524-000	MB15B-120s-24V	15	120s	24Vac±20%	4.8 VA	5.4 VA
865-3010-000	MB30B-60s-230V	30	60s	230Vac±15%	9.2 VA	10.4 VA
865-3014-000	MB30B-60s-24V	30	60s	24Vac±20%	9.2 VA	10.4 VA
865-3020-000	MB30B-120s-230V	30	120s	230Vac±15%	3.8 VA	4.8 VA
865-3024-000	MB30B-120s-24V	30	120s	24Vac±20%	3.8 VA	4.8 VA

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

Damper Actuators

Damper Actuators, Non Spring Return

MD5A, MD10A, MD20A, MD40A

MD5A, MD10A, MD20A, MD40A damper actuators are designed for operating air control dampers in ventilation and air conditioning systems for building services installations

- Nominal voltage AC/DC 24 V
- Control: modulating 0-10 V
- Position feedback: 2-10 V
- Option Integrated auxiliary switches (see appendix C)



Power supply	24 V AC $\pm 20\%$, 50-60 Hz, 24 V DC $\pm 20\%$	Manual override	Gearing latch disengaged with pushbutton, self-resetting, manual locking
Connection cable	1 m (3.3 ft), 4x0.75 mm ² (AWG 18)	Standards conformity	
Control signal X	0-10 V DC	EMC, emission	SS EN 50081-1
Input resistance	100 k Ohm	EMC, immunity	SS EN 50082-1
Operating range	2-10 V DC (for set angle of rotation)	Protection class	III Safety extra-low voltage
Synchronisation tolerance	$\pm 5\%$	Enclosure rating	IP 54
Position feedback Y	2-10 V DC (max. 1 mA)	Ambient humidity	95% r.H (EN 60730-1)
Direction of rotation	Reversible with switch 0 / 1 at switch position 0 resp 1	Ambient temperature	
Angle of rotation	Max. 95°	Operation	-30 to +50°C (-22 to +122°F)
(adjustable by mechanical stops)		Storage	-40 to +80°C (-40 to +176°F)
Running time	150 s	Maintenance	Maintenance free
Position indication	Mechanical		

MD5A, MD10A, MD20A, MD40A Modulating 0-10V 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 m ²		min 37	6-20
MD10	approx. 2 m ²	Clamp on top	min 40	8-26.7
		Clamp on bottom*	min 20	8-20
MD20	approx. 4 m ²	Clamp on top	min 42	10-20
		Clamp on bottom	min 20	10-20
MD40	approx. 8 m ²	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

MD5B,MD10B,MD20B,MD40B series damper actuators for operating air control dampers in ventilation and air-conditioning systems for building services installations

- Nominal voltage AC/DC 24 V or 230V
- Control: On/Off or 3-point
- Option Integrated auxiliary switches (see appendix C)

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

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

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 (-22 to +122°F)

Storage -40 to +80°C (-40 to +176°F)

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±20%	1 W	0.2 W	1.5 VA
875-1007-000	MD5B-24-S	5	24Vac±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±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±20%	2 W	0.2 W	4 VA
875-1035-000	MD40B-24	40	24Vac±20%	4 W	2 W	6 VA

Description	For air control dampers area	Damper spindle	Spindle length mm	Spindle diameter mm
MD5	approx. 1 m ²		min 37	6-20
MD10	approx. 2 m ²	Clamp on top	min 40	8-26.7
		Clamp on bottom*	min 20	8-20
MD20	approx. 4 m ²	Clamp on top	min 42	10-20
		Clamp on bottom	min 20	10-20
MD40	approx. 8 m ²	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-SR, LF24, LF230

LF24-SR, LF24, LF230 on off / modulating spring return damper actuators are intended for operation of air dampers up to approximately 0.8 m² (8.6 ft²) cross sectional area. Either direction of rotation can be selected. The spring return operates as a safety function if the power supply fails or is interrupted. The spring pre-tensioning can be manually adjusted.

For the LF24-SR the control is effected by means of an electronic controller with a signal of 0-10 V DC and a continuous position feedback of 2-10 V DC.



Connection cable	1 m (3.3 ft), 2x0.75 mm ² (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 (-4 to +122°F), max. 60 s (at -30°C (-22°F))
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 (-22 to +122°F)
Storage	-40 to +80 °C (-40 to +176°F)
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

AF24-SR, AFR24-SR, AF24(-S), AF230(-S), AFR24(-S), AFR230(-S)

AF24-SR, AFR24-SR, AF24(-S), AF230(-S), AFR24(-S), AFR230(-S) are on/off / modulating spring return damper actuators intended for operation of air dampers up to approximately 3m² (32 ft²) cross sectional area. Either direction of rotation can be selected.

For the modulating types the control is effected by means of an electronic controller with a signal of 0-10 V DC and a continuous position feedback of 2-10 V DC. The spring return operates as a safety function if the power supply fails or is interrupted. The spring pre-tensioning can be manually adjusted. The actuator incorporates an electronic positioning relay. The measuring range Y (output signal of 2-10 V DC) allows electrical indication of damper position 0-100% and also the master-slave control of additional AF24-SR/AFR24-SR actuators. The AF24-SR, AF24, AF230 can be manually operated, whereas the AFR24-SR, AFR24, AFR230 has no facility for manual operation.



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 mm ² (AWG 18)
Auxiliary switches AF24-S / AF230-S	1 m (3.3 ft), 6×0.75 mm ² (AWG 18)
Auxiliary switch AFR230-S	1 m (3.3 ft), 3×0.75 mm ² (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 (-22 to +122°F)
Storage	-40 to +80°C (-40 to +176°F)
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

Satchwell valves

Globe valves

VZ

Satchwell VZ valves are suitable for a wide range of applications, such as heating, cooling, air handling and domestic hot water systems. The ½" and ¾" valves have a soft seat and are tight shut off. They may be used with steam with a maximum gauge pressure of 140kPa.

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



Design	2-way plug valve
Pressure class	PN 16
Flow characteristic	Equal Percentage
Stroke ½" and ¾" valves	9.5mm (0.37 in.)
Stroke 1" to 2" valves	15.9mm (0.63 in.)
Rangeability Cv/Cvmin	50
Leakage ½" and ¾" valves	tight sealing
Leakage 1" to 2" valves	0.1% max
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	2°C (36°F)

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 CZ110
Sealing	Gland O Ring
Seat	Integral with body
Standard packing box	PTFE Chevron

VZ				Max Close-off Pressure kPa	
				Non Spring return actuator	Spring return actuator
Part number	Size (inches)	Cvs	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	50	1600	1600
VZ1451	¾"	4	50	1600	1600
VZ2501	1"	8	50	1262	1262
VZ2551	1¼"	12	50	755	755
VZ2601	1½"	20	50	533	533
VZ2651	2"	32	50	312	312

(1) Use Linkage Kit L2SV

(2) Use Linkage Kit L7SV

VZX

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

VZX valves are suitable for the control of hot or chilled water and brine (max. 15%) or glycol (max. 25%) solutions within the temperature limits given below.

Design	2-way plug valve
Pressure class	PN 16
Flow characteristic	Equal Percentage
Stroke	12.7mm (0.5 in.)
Rangeability Cv/Cvmin	50
Leakage	0.1% max
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	2°C (36°F)
Connection	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 CZ110
Sealing	Gland O Ring
Seat	Integral with body
Standard packing box	PTFE Chevron

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

VZX				Max Close-off Pressure kPa			
Part number	Size (inches)	Cvs	Rangeability	AVUE5304 (1)	AVUE5354 (2)	AVUX5202	AVUM5601
				220N	220N	220N	220N
VZX4404	½"	2	50	1180	1180	1180	1180
VZX4451	¾"	4	50	720	720	720	720
VZX4501	1"	8	50	340	340	340	340
VZX4551	1¼"	12	50	200	200	200	200
VZX4601	1½"	20	50	120	120	120	120
VZX4651	2"	32	50	60	60	60	60

- (1) direct acting
- (2) reverse acting

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
Pressure class	PN 16
Flow characteristic Port 2	Modified Parabolic
Flow characteristic Port 3	Linear
Stroke ½" and ¾" Valves	9.5mm (0.37 in.)
Stroke 1" to 2" Valves	15.9mm (0.63 in.)
Rangeability Cv/Cvmin	50
Leakage (Ports 2-1)	0.1% max.
Leakage (Ports 3-1)	0.5% max.
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	2°C (36°F)
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

MZ				Max Close-off Pressure kPa	
				Non Spring return actuator	Spring return actuator
Part number	Size (inches)	Cvs	Rangeability	M800 (1)	M700 (2)
				800N	700N
MZ3402	½"	2.5	50	1600	1600
MZ3452	¾"	4	50	1600	1600
MZ3501	1"	8	50	1262	1262
MZ3551	1¼"	12	50	755	755
MZ3601	1½"	20	50	533	533
MZ3651	2"	32	50	312	312

(1) Use Linkage Kit L2SV

(2) Use Linkage Kit L7SV

MZX

Satchwell MZX 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.

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



Design	3-way plug valve
Pressure class	PN 16
Flow characteristic Port 2	Modified Parabolic
Flow characteristic Port 3	Linear
Stroke	12.7mm (0.5 in.)
Rangeability Cv/Cvmin	50
Leakage (Ports 2-1)	0.1% max.
Leakage (Ports 3-1)	0.5% max.
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	2°C (36°F)
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.

MZX				Max Close-off Pressure kPa			
Part number	Size (inches)	Cvs	Rangeability	AVUE5304 (1)	AVUE5354 (2)	AVUX5202	AVUM5601
				220N	220N	220N	220N
MZX4402	½"	2.5	50	1180	1180	1180	1180
MZX4452	¾"	4	50	720	720	720	720
MZX4501	1"	8	50	340	340	340	340
MZX4551	1¼"	12	50	200	200	200	200
MZX4601	1½"	20	50	120	120	120	120
MZX4651	2"	32	50	60	60	60	60

- 1) direct acting
- (2) reverse acting

Shoe valves

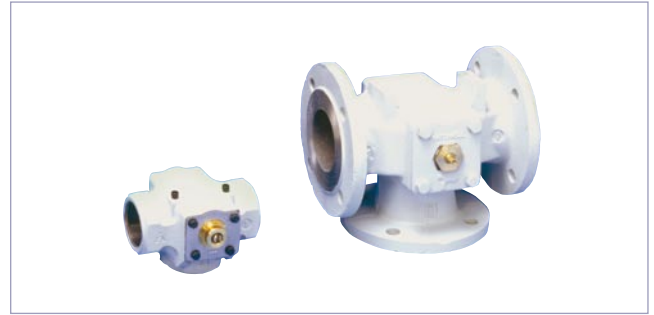
MB and MBF

MB

The MB is a 3-port screwed rotary shoe valve that can be used either as a mixing valve or a diverting valve. Typical applications include heating, cooling and air conditioning applications.

MBF

The MBF is a 3-port flanged rotary shoe valve that can be used either as a mixing valve or a diverting valve. Typical applications include heating, cooling and air conditioning applications.



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
Angular Stroke	90°
Rangeability Cv/Cvmin	50
Leakage	0.5% (% of Cv)
Max. temperature of medium	120°C (248°F)
Min. temperature of medium	2°C (36°F)

Connection MB	Screw 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)	Cvs (1)	Rangeability	RM	XRM	MD20B-230 (2)	MD20B-24 (2)	MD20A-24 (2)
				2Nm	2Nm	20Nm	20Nm	20Nm
MB1402	½"	1.8	50	70	70	70	70	70
MB1452	¾"	4	50	70	70	70	70	70
MB1502	1"	8	50	70	70	70	70	70
MB1552	1¼"	12	50	35	35	35	35	35
MB1602	1½"	20	50	35	35	35	35	35
MB1652	2"	32	50	35	35	35	35	35

(1) $K_v = 1,038 \times C_{vs}$

(2) MD actuators require linkage kit LMD/AR-MB 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	Size (mm)	Cvs	Rangeability	MD20B-24	MD20B-230	MD20A-24
				20Nm	20Nm	20Nm
MBF4732	65	63	50	35	35	35
MBF4782	80	80	50	25	25	25
MBF4857	100	120	50	25	25	25

MD actuators require Linkage kit LMD/AR-MBF part number 914-1070-000

Order auxiliary switches separately, type MD-S2 part number 914-1061-000

Satchwell Actuators

Globe valve actuators

AVUX, AVUM, AVUE

The AVUE 5304 and 5354 are modulating actuators having a linear output drive, and they can be used with any controller providing a 0-10Vdc output signal. They may be used to operate VZX or MZX valves.

The AVUX is a 24Vac modulating linear actuator suitable for modulating compatible Satchwell valves 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.

Part numbers	See table below
Input voltage AVUX	24 Vac, $\pm 10\%$ 50 Hz
Input voltage AVUM	230 Vac, $\pm 10\%$ 50 Hz
Input voltage AVUE	24 Vac, $\pm 10\%$ 50 Hz
Power consumption	Max 3.6VA
Stroke AVUE (1)	12.7mm (0.5")
Running time	85 to 110 secs
Stem force	220N
Protection standard	IP 40
Connection cable	1.5m (5 ft)
Ambient operating temperature	0 to 50°C (32 to 122°F)



AVUE, AVUX, AVUM Actuators for VZX, MZX valves	Force	Control Action	Control signal	Power supply	Power consumption 50Hz
Part number	N			Vac $\pm 10\%$	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

Rotary actuators

RM and XRM

These actuators operate Satchwell MB 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.

Part numbers	See table below
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 (248°F)	-20°C to +35°C (-4 to +95°F)

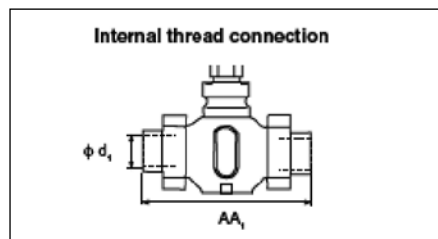
RM, XRM Actuators for MB Valves		Force
Part number	Description	Nm
XRM3201	Rotary 24Vac	2
RM3601	Rotary 230Vac	2



Appendix A

Connections V241 and V341

(pages 4 and 15 of this catalogue)



Materials

Union nut
malleable iron casting, galv.

Union end
malleable iron casting, galv.

Packing, standard
Klingsil C4400

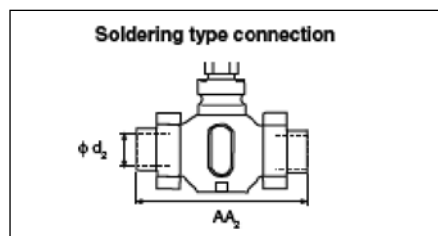
or

Packing, spec
Kingersil Top Chem 1,5mm(0.059 in.)

Valve		Int. thread	AA1		Item no. for connection, one pkg/port	
DN	in.	$\Phi d1^*$	mm	in.	w/Packing, std	w/Packing, spec.**
15	1/2"	R 1/2"	146	5.75	911-2100-015	911-2103-015
20	3/4"	R 3/4"	146	5.75	911-2100-020	911-2103-020
25	1"	R 1"	159	6.26	911-2100-025	911-2103-025
32	1 1/4"	R 1 1/4"	169	6.65	911-2100-032	911-2103-032
40	1 1/2"	R 1 1/2"	197	7.76	911-2100-040	911-2103-040
50	2"	R 2"	222	8.74	911-2100-050	911-2103-050

* Thread according to ISO 7/1

** The accessory combination "w/packing special" is intended for the primary circuit of district heating connections.



Materials

Union nut
malleable iron casting, galv.

Union end
Bronze, SS 5204

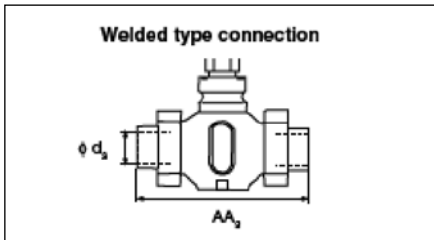
Packing, standard
Klingsil C4400

or

Packing, spec
Kingersil Top Chem 1,5mm(0.059 in.)

Valve		$\Phi d2$		AA2		Item no. for connection, one pkg/port	
DN	in.	mm	In.	mm	in.	w/Packing, std	w/Packing, spec.*
15	1/2"	15	0.59	136	5.35	911-2101-015	911-2104-015
20	3/4"	22	0.87	146	5,75	911-2101-020	911-2104-020
25	1"	28	1.10	155	6.10	911-2101-025	911-2104-025
32	1 1/4"	35	1.38	163	6.42	911-2101-032	911-2104-032
40	1 1/2"	42	1.65	200	7.87	911-2101-040	911-2104-040
50	2"	54	2.13	232	9.13	911-2101-050	911-2104-050

* The accessory combination "w/packing special" is intended for the primary circuit of district heating connections.



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 (0.059 in.)

Valve		$\Phi d3$		AA3		Item no. for connection, one pkg/port	
DN	in.	mm	in.	mm	in.	w/Packing, std	w/Packing, spec.*
15	1/2"	21.8	0.84	182	7.17	911-2102-015	911-2105-015 (1)
20	3/4"	26.9	1.06	182	7.17	911-2102-020	911-2105-020 (1)
25	1"	33.7	1.33	187	7.36	911-2102-025	911-2105-025 (1)
32	1 1/4"	42.4	1.67	197	7.76	911-2102-032	911-2105-032 (1)
40	1 1/2"	48.3	1.90	232	9.13	911-2102-040	911-2105-040
50	2"	60.3	2.37	262	10.32	911-2102-050	911-2105-050

(1) Material Union nut: brass SS 5252

Appendix B – Connections for VZ Series Zone Valves

VZ22, VZ32, VZ42, VZ28, VZ38, VZ48, VZ29, VZ39, VZ49
(pages 20-22 of this catalogue)

Connection Type	Pipe Size		DN		Part Number
	mm	in.	mm	in.	
Soldering	15	0.59	15	½"	911-2076-0000
Soldering	22	0.87	20	¾"	911-2077-0000
External Thread		R 3/8"	15	½"	911-2078-0000
External Thread		R ½"	20	¾"	911-2079-0000
Conex to flat	15	0.59	15	½"	911-2080-0000
Conex to flat	22	0.87	20	¾"	911-2081-0000

* One set required per valve port.
Each set consists of 1 union nut, 1 solder bush (soldering) or tailpiece (external thread), and 1 gasket.

Appendix C – Accessories for Damper Actuators

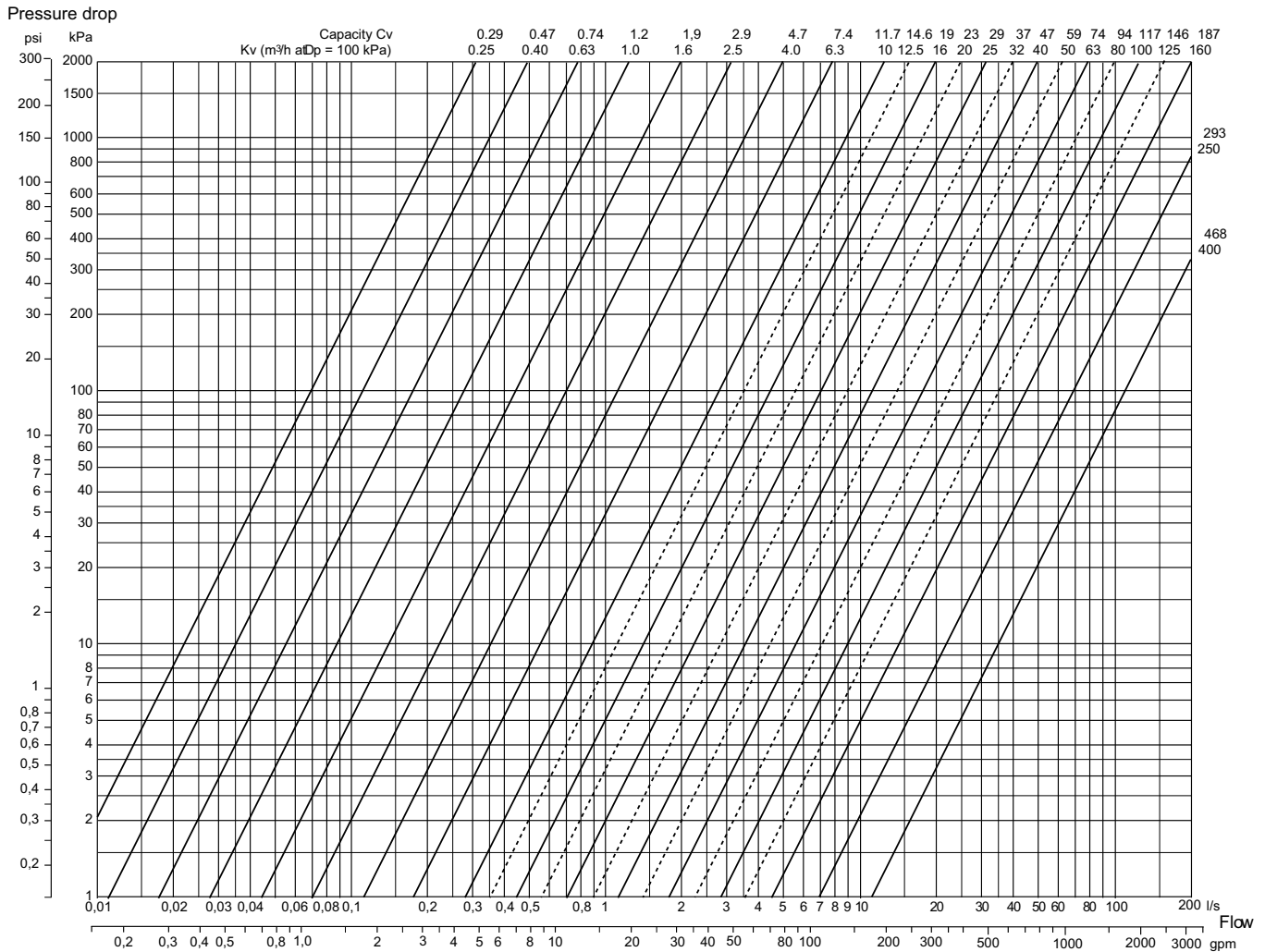
(pages 43-46 of this catalogue)

Mechanical Accessories								
			Actuators					
Name	Description	Part number	MD5	MD10	MD20	MD40	LF	AF
AV8-25	Shaft extension Length approx. 250 mm (9.8 in.) For damper spindles 8-25 mm (0.32-0.98 in.) dia. or 10-25 mm (0.40-0.98 in.) 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 (0.39-0.71 in.) dia. or 10-14 mm (0.39-0.55 in.) square Slot width 8.2 mm (0.32 in.)	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 D – TAC Venta Water Valve Sizing Chart

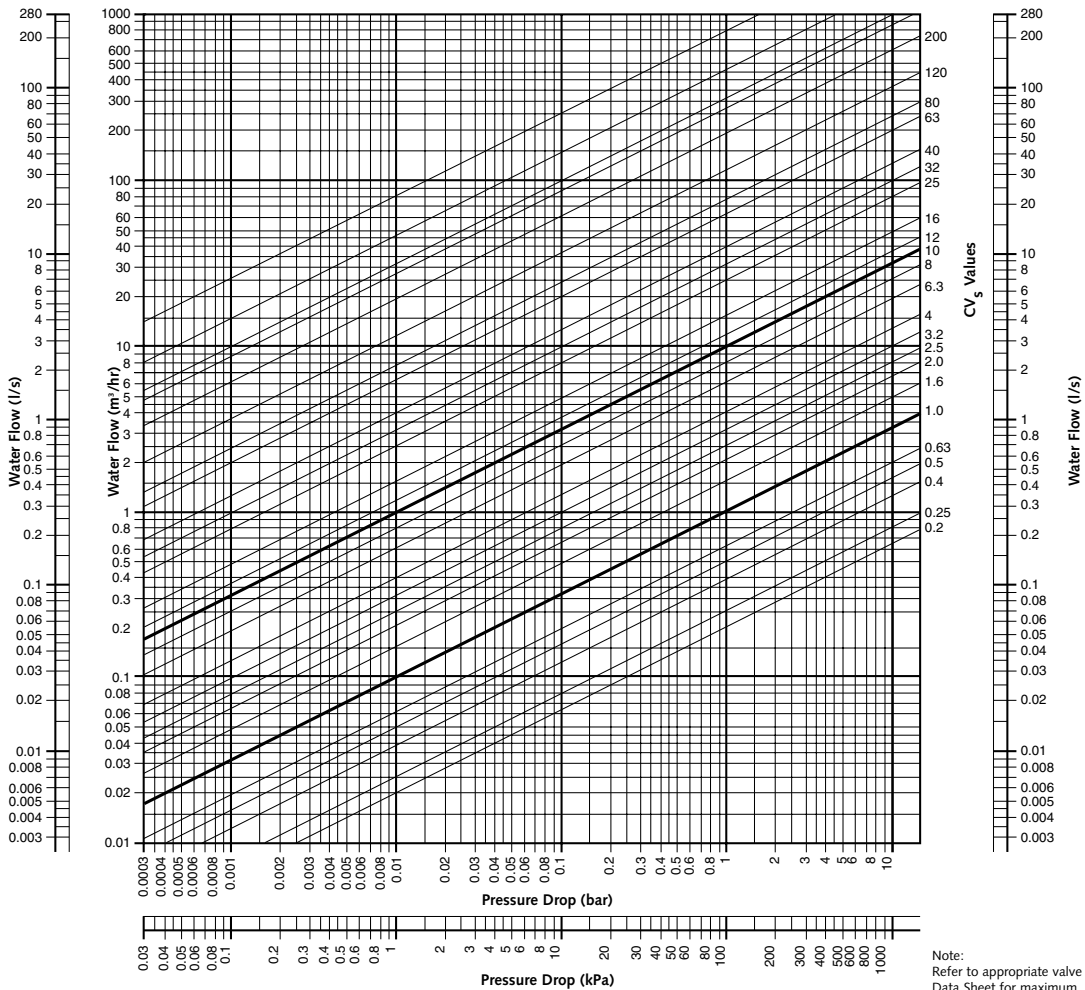
(pages 4-23 of this catalogue)



Appendix E

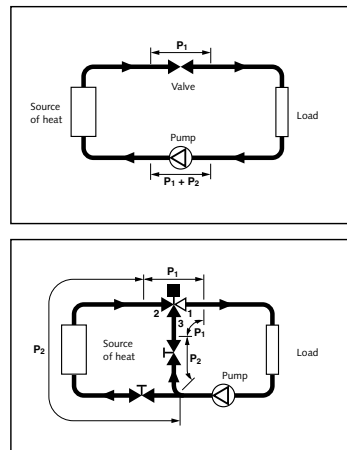
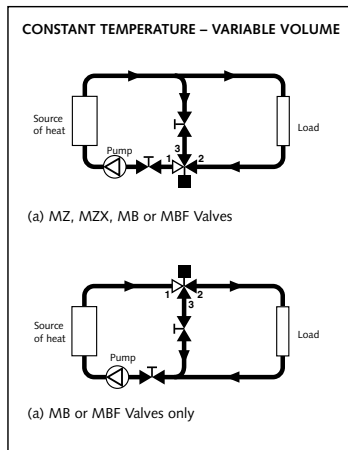
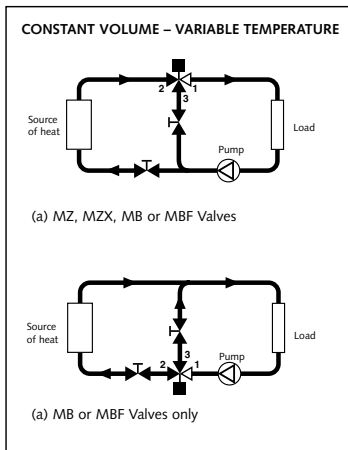
Satchwell Water Valve Sizing Chart

(pages 47-51 of this catalogue)



1 l/s = 3.6m³/h

100 kPa = 1 Bar approximately equal to 1.02 kgf/cm² approximately equal to 14.5 lbf/in



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