

HVAC Valves and Actuators Catalogue

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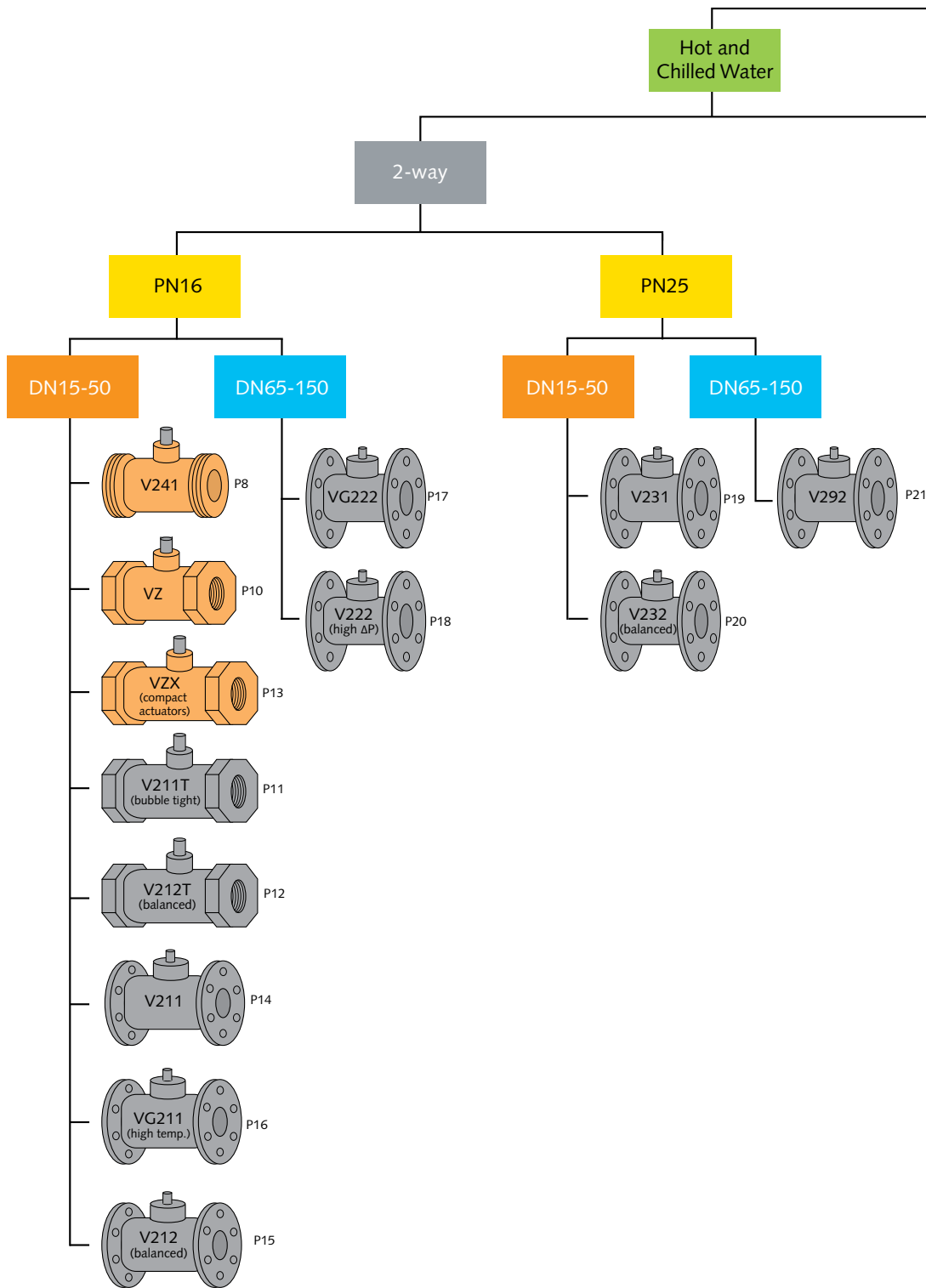
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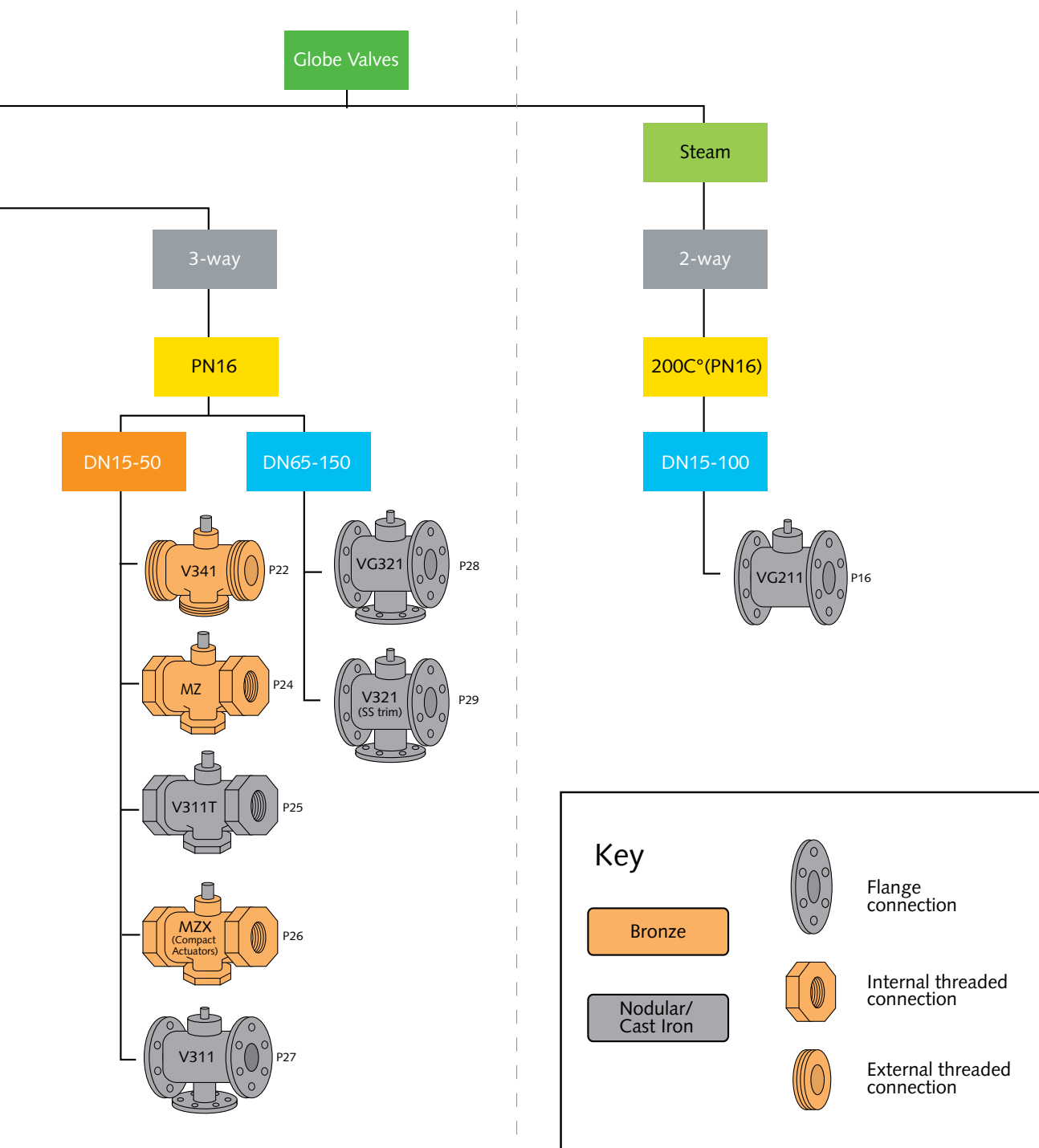
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Globe Valves

Globe valves are the ideal plant room control valve. They deliver the best controllable flow of any proportional valve. The Venta range of valves have excellent rangeability, low leakage and a robust stem sealing. The crown plug is self cleaning in design and is the consultants choice of control valve.

Globe Valve Overview





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

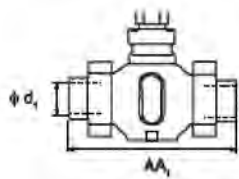
Materials	
Body	Bronze Rg5
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Stem packing	EPDM

V241					Max Close-off Pressure kPa						
					Non Spring Return Actuators					Spring Return	
Part number	DN	Connection	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M700	MG900 SR
					300N	400N	800N	1500N	1500N	700N	900N
721-4106-000	15	G1B	0.25	>50	1000	1000	1600	1600	1600	1600	1600
721-4110-000	15	G1B	0.40	>50	1000	1000	1600	1600	1600	1600	1600
721-4114-000	15	G1B	0.63	>50	1000	1000	1600	1600	1600	1600	1600
721-4118-000	15	G1B	1.0	>50	1000	1000	1600	1600	1600	1600	1600
721-4122-000	15	G1B	1.6	>50	800	800	1600	1600	1600	1400	1600
721-4126-000	15	G1B	2.5	>50	800	800	1600	1600	1600	1400	1600
721-4130-000	15	G1B	4.0	>50	800	800	1600	1600	1600	1400	1600
721-4134-000	20	G1½B	6.3	>100	650	650	1500	1600	1600	1100	1510
721-4138-000	25	G1½B	10	>100	400	500	1150	1600	1600	850	1160
721-4142-000	32	G2B	16	>100	300	350	850	1350	1350	650	855
721-4146-000	40	G2½B	25	>100	150	250	600	950	950	450	605
721-4150-000	50	G2¾B	38	>100	50	150	400	650	650	300	415

Replacement packing box: 1-001-0800-0

Connections V241

Internal Thread Connection



Materials

Union nut: malleable iron casting, galv.

Union end: malleable iron casting, galv.

Packing, standard: Klingersil C4400

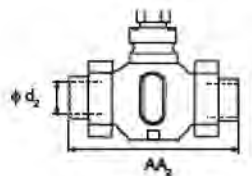
or

Packing, spec: Klingersil Top Chem 1,5mm

Valve		Φd_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	RP 1/2"	146	911-2100-015	911-2103-015
20	G1 1/4B	RP 3/4"	146	911-2100-020	911-2103-020
25	G1 1/2B	RP 1"	159	911-2100-025	911-2103-025
32	G2B	RP 1 1/4"	169	911-2100-032	911-2103-032
40	G2 1/4B	RP 1 1/2"	197	911-2100-040	911-2103-040
50	G2 3/4B	RP 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

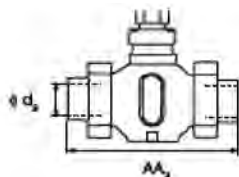
or

Packing, spec: Klingersil Top Chem 1,5mm

Valve		Φd_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	G1 1/4B	22	146	911-2101-020	911-2104-020
25	G1 1/2B	28	155	911-2101-025	911-2104-025
32	G2B	35	163	911-2101-032	911-2104-032
40	G2 1/4B	42	200	911-2101-040	911-2104-040
50	G2 3/4B	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: Klingersil Top Chem 1,5mm

Valve		Φd_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	G1 1/4B	26.9	182	911-2102-020	911-2105-020 (1)
25	G1 1/2B	33.7	187	911-2102-025	911-2105-025 (1)
32	G2B	42.4	197	911-2102-032	911-2105-032 (1)
40	G2 1/4B	48.3	232	911-2102-040	911-2105-040
50	G2 3/4B	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

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	Materials	
Pressure class	PN 16	Body	Nodular iron EN-JS 1030
Flow characteristic	Equal percentage modified	Stem	Stainless steel SS 2346
Stroke	20 mm	Plug	Brass CW602N
Rangeability (Kvs/Kv min)	>50	Seat Sealing	EPDM
Leakage	Tight sealing	Seat	Nodular iron EN-JS 1030
ΔPm	400 kPa, water	Stem packing	EPDM
Max. temperature of medium	120°C		
Min. temperature of medium	-20°C		
Max. glycol concentration	50%		
Connections	Internal pipe thread Rp		

V211T					Max Close-off Pressure kPa						
					Non Spring Return Actuators					Spring Return	
Part number	DN	Connection	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M700	MG900 SR
					300N	400N	800N	1500N	1500N	700N	900N
721-1716-000	15	Rp ½	1.6	>50	800	800	1600	1600	1600	1400	1600
721-1720-000	15	Rp ½	2.5	>50	800	800	1600	1600	1600	1400	1600
721-1724-000	15	Rp ½	4.0	>50	800	800	1600	1600	1600	1400	1600
721-1728-000	20	Rp ¾	6.3	>50	650	650	1500	1600	1600	1100	1510
721-1732-000	25	Rp 1	10	>50	400	500	1150	1600	1600	850	1160
721-1736-000	32	Rp 1¼	16	>50	300	350	850	1350	1350	650	855
721-1740-000	40	Rp 1½	25	>50	150	250	600	950	950	450	605
721-1744-000	50	Rp 2	38	>50	50	150	400	650	650	300	415

Replacement packing box: 1-001-0800-0

VZ

The VZ valve is a general purpose valve with the 1/2" and 3/4" 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	Max. glycol concentration	25%
Pressure class	PN 16	Connections	Screwed BSP to BS21 (Rp)
Flow characteristic	Equal Percentage	Materials	
Stroke 1/2" and 3/4" valves	9.5mm	Body	Bronze: Leaded Gunmetal BS1400 LG2
Stroke 1" to 2" valves	15.9mm	Stem	Stainless steel BS970 Grade 303 S42
Rangeability (Kvs/Kv min)	>50	Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ110
Leakage 1/2" and 3/4" valves	tight sealing	Sealing	Gland O Ring
Leakage 1" to 2" valves	<0.1%	Seat	Integral with body
Max. temperature of medium	120°C	Stem packing	PTFE Chevrons
Min. temperature of medium	2°C		

VZ				Max Close-off Pressure kPa		
				Non Spring return	Spring return actuator	
Part number	Size (inches)	Kvs	Rangeability	M800 ¹	M700 ²	MG900 SR ¹
				800N	700N	900N
VZ1401	1/2"	0.2	50	1600	1600	1600
VZ1402	1/2"	0.5	50	1600	1600	1600
VZ1403	1/2"	1	50	1600	1600	1600
VZ1404	1/2"	2.1	50	1600	1600	1600
VZ1451	3/4"	4.2	50	1600	1600	1600
VZ2501	1"	8.3	50	1262	1262	1300
VZ2551	1 1/4"	12.5	50	755	755	775
VZ2601	1 1/2"	21	50	533	533	550
VZ2651	2"	33	50	312	312	320

(1) Use Linkage Kit L2SV

(2) Use Linkage Kit L7SV

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	Materials	
Pressure class	PN 16	Body	Nodular iron EN-JS 1030
Flow characteristic	Equal percentage modified	Stem	Stainless steel SS 2346
Stroke	20 mm	Plug	Brass CW602N
Rangeability (Kvs/Kv min)	>50	Seat Sealing	EPDM
Leakage	Tight sealing	Seat	Nodular iron EN-JS 1030
ΔP_m	400 kPa, water	Stem packing	EPDM
Max. temperature of medium	120°C		
Min. temperature of medium	-20°C		
Max. glycol/concentration	-20°C		
Connections	Internal pipe thread Rp		

V212T					Max Close-off Pressure kPa						
					Non Spring Return Actuators					Spring Return	
Part number	DN	Connection	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M700	MG900 SR
					300N	400N	800N	1500N	1500N	700N	900N
721-1832-000	25	R _p 1	10	>50		800	1600	1600	1600	1600	1600
721-1836-000	32	R _p 1¼	16	>50		750	1600	1600	1600	1600	1600
721-1840-000	40	R _p 1½	25	>50		700	1600	1600	1600	1600	1600
721-1844-000	50	R _p 2	38	>50		600	1600	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
Seat/Sealing	Gland O Ring
Seat	Integral with body
Stem packing	PTFE Chevrons

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

VZX				Max Close-off Pressure kPa			
				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

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	Materials	
Pressure class	PN 16	Body	Nodular iron EN-JS 1030
Flow characteristic	Equal percentage modified	Stem	Stainless steel SS 2346
Stroke	20 mm	Plug	Brass CW602N
Rangeability (Kvs/Kv min)	>50	Sealing	EPDM
Leakage	Tight sealing	Seat	Nodular iron EN-JS 1030
ΔP_{ma}	400 kPa, water	Stem packing	EPDM
Max. temperature of medium	120°C		
Min. temperature of medium	-20°C		
Max. glycol/concentration	50%		
Connections	Flange according to ISO 7005-2		

V211				Max Close-off Pressure kPa					
				Non Spring Return Actuators					Spring Return
Part number	DN	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	MG900 SR
				300N	400N	800N	1500N	1500N	900N
721-1116-000	15	1.6	>50	800	800	1600	1600	1600	1600
721-1120-000	15	2.5	>50	800	800	1600	1600	1600	1600
721-1124-000	15	4.0	>50	800	800	1600	1600	1600	1600
721-1128-000	20	6.3	>50	650	650	1500	1600	1600	1600
721-1132-000	25	10	>50	400	500	1150	1600	1600	1160
721-1136-000	32	16	>50	300	350	850	1350	1350	855
721-1140-000	40	25	>50	150	250	600	950	950	605
721-1144-000	50	38	>50	50	150	400	650	650	415

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
Stem packing	EPDM

V212				Max Close-off Pressure kPa					
				Non Spring Return Actuators					Spring Return
Part number	DN	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M900C SR
				300N	400N	800N	1500N	1500N	900N
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

VGS211F 15-100CS (VG211)

The VGS211F...CS is a flanged high temperature valve for media temperatures up to 200°C

Primarily designed for steam but also 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	Connections	Flange according to ISO 7005-2
Pressure class	PN 16	Materials	
Flow characteristic	Equal Percentage	Body	Cast iron
Rangeability (Kvs/Kv min)		Stem	Stainless steel
DN15-20	>50	Plug	Stainless steel
DN25-100	>35	Seat	Stainless steel
Leakage	0,02% of Kvs	Packing box	Spring Loaded PTFE V-Ring
ΔPm	600 kPa	Stroke	
Max. temperature of medium	200°C	DN 15 to DN 25	16.5 mm
Min. temperature of medium	-10°C	DN 32 to DN 65	25 mm
Max. glycol/concentration	50%	DN 80 to DN 100	45 mm

VGS211F...CS					Max Close-off Pressure kPa						
					Non Spring Return Actuators					Spring Return	
Part number	Part Designation	DN	Kvs	Rangeability	M400	M800	M1500	MV15B	M3000	M700	MG900 SR
					400N	800N	1500N	1500N	3000N	700N	900N
VGS211F-15CS03	VGS211F-15CS 0.63M SD00	15	0.6	>50	1600	1600	1600	1600	-	1600	1600
VGS211F-15CS04	VGS211F-15CS 1M SD00	15	1.0	>50	1600	1600	1600	1600	-	1600	1600
VGS211F-15CS05	VGS211F-15CS 1.6M SD00	15	1.6	>50	1600	1600	1600	1600	-	1600	1600
VGS211F-15CS07	VGS211F-15CS 2.5M SD00	15	2.5	>50	1300	1600	1600	1600	-	1600	1600
VGS211F-15CS08	VGS211F-15CS 4M SD00	15	4.0	>50	1300	1600	1600	1600	-	1600	1600
VGS211F-20CS	VGS211F-20CS 6.3 M SD00	20	6.3	>50	750	1600	1600	1600	-	1500	1600
VGS211F-25CS	VGS211F-25CS 10M SD00	25	10	>35	450	1300	1600	1600	-	900	1300
VGS211F-32CS	VGS211F-32CS 16M SD00	32	16	>35	450	1300	1600	1600	-	900	1300
VGS211F-40CS	VGS211F-40CS 25M SD00	40	25	>35	250	800	1350	1350	-	550	800
VGS211F-50CS	VGS211F-50CS 40M SD00	50	40	>35	150	500	900	900	-	350	500
VGS211F-65CS	VGS211F-65CS 63M SD00	65	63	>35	-	210	350	350	720	150	210
VGS211F-80CS	VGS211F-80CS 110M SD00	80	110	>35	-	150	250	250	550	100	-
VGS211F-100CS	VGS211F-100CS 140M SD00	100	140	>35	-	90	150	150	350	60	-

Replacement packing box: 1-001-0811-0

VG221F 65-150C (VG222)

The VG221F...C 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	Max. temperature of medium	150°C
Pressure class	PN 16	Min. temperature of medium	-10°C
Flow characteristics	Equal Percentage	Connection	Flange according ISO 7005-2
Rangeability (Kvs/Kv min)	>50	Materials	
Stroke		Body	Grey cast iron
DN 65	25 mm	Stem	stainless steel
DN 80 – DN 150	45 mm	Plug	Brass
Leakage	<0.03% of Kv	Seat	Grey cast iron
ΔPm	200 kPa, water	Packing box	Viton

VG221F...C						Max Close-off Pressure kPa					
						Non Spring Return Actuators				Spring Return	
Part number	Part Designation	Stroke	DN	Kvs	Range-ability	M800	M1500	MV15B	M3000	M700	MG900 SR
						800N	1500N	1500N	3000N	700N	900N
VG221F-65C	VG221F-65C 63M SU00	25	65	63	>50	1600	1600	1600	1600	1300	1600
VG221F-80C	VG221F-80C 100M SU00	45	80	100	>50	1450	1600	1600	1600	1000	-
VG221F-100C	VG221F-100C 130M SU00		100	130	>50	1000	1600	1600	1600	700	-
VG221F-125C	VG221F-125C 200M SU00		125	200	>50	750	1600	1600	1600	470	-
VG221F-150C	VG221F-150C 300M SU00		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	Max. temperature of medium	150°C
Pressure class	PN 16	Min. temperature of medium	-10°C
Flow characteristics	Equal Percentage	Connection	Flange according ISO 7005-2
		Max. glycol/concentration	50%
Stroke		Materials	
DN 65 – DN 100	30 mm	Body	Cast iron GG25
DN 125 – DN 150	50 mm	Stem	Stainless steel SS 1.4021
Rangeability (Kvs/Kv min)	50	Plug	Stainless steel SS 1.4021
Leakage	<0.05% of Kv	Seat	Stainless steel SS 1.4021
ΔPm	800 kPa, water	Packing box	Spring-loaded PTFE-V-ring

V222				Max Close-off Pressure kPa						
				Non Spring Return Actuators					Spring Return	
Part number	DN	Kvs	Rangeability	M800	M1500	MV15B	M22	M50	M700	MG900 SR
				800N	1500N	1500N	2200N	5000N	700N	
721-2254-000	65	63	>50	1500	1600	1600	---	---	1200	1500
721-2258-000	80	100	>50	1500	1600	1600	---	---	1200	1500
721-2262-000	100	160	>50	1100	1600	1600	---	---	800	1100
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 where a very fine resolution of flow control 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	Min. temperature of medium	-20°C
Pressure class	PN 25	Max. Glycol concentration	50%
Flow characteristic	Equal percentage modified	Flanges drilling	According to SS 335 and ISO 2084
Stroke	20 mm		
Rangeability (Kvs/Kv min)	See table	Materials	
Leakage	Up to 0.02% of Kv	Body	Nodular iron SS 0727 (GGG40.3)
ΔPm	Max. 800 kPa, water	Plug and seat	Stainless steel SS 2346
Max. temperature, water	150°C	Stem	Stainless steel SS 2346
Max. temperature, saturated steam	120°C	Standard packing box	Venta

V231				Max Close-off Pressure kPa					
				Non Spring Return Actuators					Spring Return
Part number	DN	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	MG900 SR
				300N	400N	800N	1500N	1500N	900N
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	1600
721-3126-000	15	2.5	>50	800	800	1600	1600	1600	1600
721-3130-000	15	4.0	>50	800	800	1600	1600	1600	1600
721-3134-000	20	6.3	>200	650	650	1500	1600	1600	1500
721-3138-000	25	10	>200	400	500	1150	1600	1600	1150
721-3142-000	32	16	>200	300	350	850	1350	1350	850
721-3146-000	40	25	>200	150	250	600	950	950	600
721-3150-000	50	38	>200	50	150	400	650	650	400

Replacement packing box: 1-001-0800-0

V232

The V232 is a pressure balanced flanged PN25 valve with high rangeability and a high differential pressure capability. 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 a very fine resolution of controllable flow 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	Materials	
Pressure class	PN 25	Body	Nodular iron SS 0727 (GGG40.3)
Flow characteristic	Equal percentage modified	Plug and seat	Stainless steel SS 2346
Stroke	20 mm	Stem	Stainless steel SS 2346
Rangeability (Kvs/Kv min)	See table	Stem packing	EPDM
Leakage	Up to 0.02% of Kv		
ΔP_m	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		

V232				Max Close-off Pressure kPa				Spring Return
				Non Spring Return Actuators				
Part number	DN	Kvs	Rangeability	M400	M800	M1500	MV15B	MG900 SR
				400N	800N	1500N	1500N	900N
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	Max. temperature of medium	150°C
Pressure class	PN 25	Min. temperature of medium	-10°C
Flow characteristics	Equal Percentage	Max. Glycol concentration	50%
Stroke		Connection	Flange according ISO 7005-2
DN 65 – DN 100	30 mm	Materials	
DN 125 – DN 150	50 mm	Body	Nodular iron GGG40.3
Rangeability (Kvs/Kv min)	> 50	Stem	Stainless steel SS 1.4021
Leakage	<0.05% of Kv	Plug	Stainless steel SS 1.4021
ΔPm	1600 kPa, water	Seat	Stainless steel SS 1.4021
		Packing box	Spring-loaded PTFE-V-ring

V292				Max Close-off Pressure kPa						
				Non Spring Return Actuators					Spring Return	
Part number	DN	Kvs	Rangeability	M800	M1500	MV15B	M22	M50	M700	MG900 SR
				800N	1500N	1500N	2200N	5000N	700N	900N
721-9254-000	65	63	>50	1500	2500	2500	---	---	1200	1500
721-9258-000	80	100	>50	1500	2500	2500	---	---	1200	1500
721-9262-000	100	160	>50	1100	1600	1600	---	---	800	1100
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.



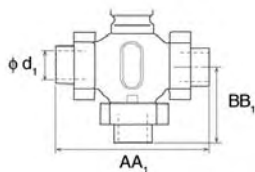
Design	3-way plug valve Stem up closed, A port (B-AB open)	Max. temperature of medium	150°C
Pressure class	PN 16	Min. temperature of medium	-20°C
Flow characteristics A-AB	Equal percentage modified	Connection	External pipe thread according to ISO 228/1
Flow characteristics B-AB	Complementary	Materials	
Stroke	20 mm	Body	Bronze Rg5
Rangeability (Kvs/Kv min)	See table	Plug and seat	Stainless steel SS 2346
Leakage A-AB	up to 0.02% of Kv	Stem	Stainless steel SS 2346
Leakage B-AB	up to 0.05% of Kv	Stem packing	EPDM
ΔPm	600 kPa, water		

V341					Max Close-off Pressure kPa						
					Non Spring Return Actuators					Spring Return	
Part number	DN	Connection	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M700	MG900 SR
					300N	400N	800N	1500N	1500N	700N	900N
731-4121-000	15	G1B	1.6	>50	800	800	1600	1600	1600	1400	1600
731-4125-000	15	G1B	2.5	>50	800	800	1600	1600	1600	1400	1600
731-4129-000	15	G1B	4.0	>50	800	800	1600	1600	1600	1400	1600
731-4133-000	20	G1¼B	6.3	>100	650	650	1500	1600	1600	1100	1510
731-4137-000	25	G1½B	10	>100	400	500	1150	1600	1600	850	1160
731-4141-000	32	G2B	16	>100	300	350	850	1350	1350	650	855
731-4145-000	40	G2¼B	25	>100	150	250	600	950	950	450	605
731-4149-000	50	G2¾B	38	>100	50	150	400	650	650	300	415

Replacement packing box: 1-001-0800-0

Connections V341

Internal Thread Connection



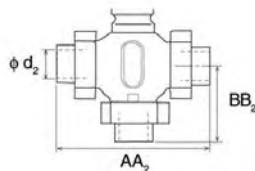
Materials

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		Φd_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	RP 1/2"	146	911-2100-015	911-2103-015
20	G1 1/4B	RP 3/4"	146	911-2100-020	911-2103-020
25	G1 1/2B	RP 1"	159	911-2100-025	911-2103-025
32	G2B	RP 1 1/4"	169	911-2100-032	911-2103-032
40	G2 1/4B	RP 1 1/2"	197	911-2100-040	911-2103-040
50	G2 3/4B	RP 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



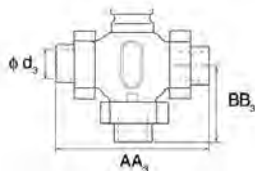
Materials

Union nut: malleable iron casting, galv.
 Union end: Bronze, SS 5204
 Packing, standard: Klingersil C4400
 or
 Packing, spec: Kingersil Top Chem 1,5mm

Valve		Φd_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	G1 1/4B	22	146	911-2101-020	911-2104-020
25	G1 1/2B	28	155	911-2101-025	911-2104-025
32	G2B	35	163	911-2101-032	911-2104-032
40	G2 1/4B	42	200	911-2101-040	911-2104-040
50	G2 3/4B	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		Φd_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	G1 1/4B	26.9	182	911-2102-020	911-2105-020 (1)
25	G1 1/2B	33.7	187	911-2102-025	911-2105-025 (1)
32	G2B	42.4	197	911-2102-032	911-2105-032 (1)
40	G2 1/4B	48.3	232	911-2102-040	911-2105-040
50	G2 3/4B	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)	Materials	
Pressure class	PN 16	Body	Bronze: Leaded Gunmetal BS1400 LG2
Flow characteristic Port 2	Modified Parabolic	Stem	Stainless steel BS970 Grade 303 S42
Flow characteristic Port 3	Linear	Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ 110
Stroke ½" and ¾" Valves	9.5mm	Sealing	Gland O Ring
Stroke 1" to 2" Valves	15.9mm	Seat Top	Integral with body
Rangeability (Kvs/Kv min)	50	Seat Bottom (½" & ¾" valves)	Copper Alloy BS2874 CZ 132
Leakage (Ports 2-1)	0.1% max.	Seat Bottom (1" to 2" valves)	Leaded Gunmetal BS1400 LG2
Leakage (Ports 3-1)	0.5% max.	Standard packing box	PTFE Chevron
Max. temperature of medium	120°C		
Min. temperature of medium	2°C		
Connections	Screwed BSP to BS21		

MZ				Max Close-off Pressure kPa		
				Non Spring return actuator		Spring return actuator
Part number	Size (inches)	Kvs	Rangeability	M800 ¹	M700 ²	M900 SR ¹
				800N	700N	900N
MZ3402	½"	2.6	50	1600	1600	1600
MZ3452	¾"	4.2	50	1600	1600	1600
MZ3501	1"	8.3	50	1262	1262	1300
MZ3551	1¼"	12.5	50	755	755	775
MZ3601	1½"	21	50	533	533	550
MZ3651	2"	33	50	312	312	320

(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 Rp

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

V311T					Max Close-off Pressure kPa						
					Non Spring Return Actuators					Spring Return	
Part number	DN	Connection	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M700	MG900 SR
					300N	400N	800N	1500N	1500N	700N	900N
731-1717-000	15	Rp ½	1.6	>50	800	800	1600	1600	1600	1400	1600
731-1721-000	15	Rp ½	2.5	>50	800	800	1600	1600	1600	1400	1600
731-1725-000	15	Rp ½	4.0	>50	800	800	1600	1600	1600	1400	1600
731-1729-000	20	Rp ¾	6.3	>50	650	650	1500	1600	1600	1100	1510
731-1733-000	25	Rp 1	10	>50	400	500	1150	1600	1600	850	1160
731-1737-000	32	Rp 1¼	16	>50	300	350	850	1350	1350	650	855
731-1741-000	40	Rp 1½	25	>50	150	250	600	950	950	450	605
731-1745-000	50	Rp 2	38	>50	50	150	400	650	650	300	415

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	Materials	
Pressure class	PN 16	Body	Bronze: Leaded Gunmetal BS1400 LG2
Flow characteristic Port 2	Modified Parabolic	Stem	Stainless steel BS970 Grade 303 S42
Flow characteristic Port 3	Linear	Plug	Copper Alloy BS2874 CZ132 or BS2871 CZ 110
Stroke	12.7mm	Sealing	Gland O Ring
Rangeability (Kvs/Kv min)	50	Seat Top	Integral with body
Leakage (Ports 2-1)	0.1 % max.	Seat Bottom (½" & ¾" valves)	Copper Alloy BS2874 CZ 132
Leakage (Ports 3-1)	0.5 % max.	Seat Bottom (1" to 2" valves)	Leaded Gunmetal BS1400 LG2
Max. temperature of medium	120°C	Standard packing box	PTFE Chevron
Min. temperature of medium	2°C		
Max. Glycol concentration	25%		
Connections	Screwed BSP to BS21		

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

MZX				Max Close-off Pressure kPa			
				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

V311				Max Close-off Pressure kPa						
				Non Spring Return Actuators					Spring Return	
Part number	DN	Kvs	Rangeability	M310	M400	M800	M1500	MV15B	M700	MG900 SR
				300N	400N	800N	1500N	1500N	700N	900N
731-1117-000	15	1.6	>50	800	800	1600	1600	1600	1400	1600
731-1121-000	15	2.5	>50	800	800	1600	1600	1600	1400	1600
731-1125-000	15	4.0	>50	800	800	1600	1600	1600	1400	1600
731-1129-000	20	6.3	>50	650	650	1500	1600	1600	1100	1510
731-1133-000	25	10	>50	400	500	1150	1600	1600	850	1160
731-1137-000	32	16	>50	300	350	850	1350	1350	650	855
731-1141-000	40	25	>50	150	250	600	950	950	450	605
731-1145-000	50	38	>50	50	150	400	650	650	300	415

Replacement packing box: 1-001-0800-0

VG311F 65-150C (VG321)

The VG311F...C 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)	Max. temperature of medium	150°C
Pressure class	PN 16	Min. temperature of medium	-10°C
Connection	Flange according ISO 7005-2	Max. Glycol concentration	50%
Rangeability (Kvs/Kv min)	> 50	Materials	
Flow characteristics A – AB	Equal Percentage	Body	Grey Cast iron
Flow characteristics B – AB	Linear	Stem	Stainless steel
Stroke DN65	25 mm	Plug	Brass
DN80-150	45mm	Seat	Grey Cast iron
Leakage A – AB DN65 – DN150	< 0.03% of Kv	Packing box	Viton OR
Leakage B – AB DN65 – DN150	< 2% of Kv		
ΔPm	200 kPa, water		

VG311F...C					Max Close-off Pressure kPa					
					Non Spring Return Actuators				Spring Return	
Part number	Part Designation	DN	Kvs	Rangeability	M800	M1500	MV15B	M3000	M700	MG900 SR
					800N	1500N	1500N	3000N	700N	900N
VG311F-65C	VG311F-65C 63M SU00	65	63	>50	240	400	400	850	220	290
VG311F-80F	VG311F-80C 100M SU00	80	100	>50	160	240	240	570	140	--
VG311F-100C	VG311F-100C- 130M SU00	100	130	>50	100	150	150	370	80	--
VG311F-125C	VG311F-125C 200M SU00	125	200	>50	60	90	90	230	50	--
VG311F-150C	VG311F-150C 300M SU00	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

V321				Max Close-off Pressure kPa						
				Non Spring Return Actuators					Spring Return	
Part number	DN	Kvs	Rangeability	M800	M1500	MV15B	M22	M50	M700	MG900 SR
				800N	1500N	1500N	2200N	5000N	700N	900N
731-2153-010	65	63	>30	140	290	290	---	---	80	145
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 factory for details

Globe Valve Actuators

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

The 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

Forta: M310, M400, M800, M1500 and M3000

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

Tall Forta Actuators		Force	Modulating control 0-10 V Running time / stroke			Avg. power consumption	Transformer sizing
Part number	Description	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	---	7	30
880-0231-030	M400 S2	400	60s	60s	---	7	30
880-0310-030	M800	800	15s	20s	30s	10	50
880-0311-030	M800 S2	800	15s	20s	30s	10	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	3000	15s	20s	30s	25	50

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

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
880-0129-000	Linkage Forta-Spirax Sarco (M30:KE, KF, and KL; DN 15-100) [AG52]
880-0127-000	AG50 linkage – Controlli flanged Valves with M40 threaded bonnet, installed pre July 2009 types: VSG, VMB16, VBG (up to DN65). Spirax Sarco Valves, type KE, KF, KL. DN15-100.
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 4AAC-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 -8°C

(1) Note: Not for Forta M700

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 $\pm 10\%$, 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
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 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 -8°C

Forta MG900 SR

The Forta MG900 SR is a spring return actuator for the control of linear globe valves. Units are available in IP54 enclosures.

The Manual override is operated by a hex key retained in the cover. The manual override can be locked into position for commissioning.



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 32 mm
Thrust	900 N
Duty cycle	Max. 20%/60 minutes (and 80%/ 60 min) for half load / amb. temp

Running time	
Modulating 10 to 25 mm (0.39 to 1 in.)	15s
Modulating 25 to 32 mm (1 to 1.26 in.)	20s
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

Forta MG900 SR

Spring Return Function	Part number	Type Designation	IP Rating
Stem Up	MG900-SU	MG900 SRU-24FM T54 00	54
Stem Down	MG900-SD	MG900 SRD-24FM T54 00	54

Forta MG900 SR Accessories

Part number	Explanation
880 0104 000	S2 auxiliary end point switches
FYH50	Yoke Heater
MG900C-SU-PCB	Circuit board for MG900C SRU
MG900C-SD-PCB	Circuit board for MG900C SRD

Forta M700 - Spring Return

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
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Power consumption	Average 30 VA
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Transformer sizing	50 VA
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Spring return close off time at power failure

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

Modulating 10 to 25 mm (0.39 to 1 in.)	15s
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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
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Analogue input

Voltage	0-10 V
---------	--------

Impedance	Min. 100 kΩ
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Digital inputs VH-VC

Voltage across open input	24 V AC
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Current through closed input	5 mA
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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
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Storage	-10 to 50 °C
---------	--------------

Ambient humidity	Max. 90% RH
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Enclosure rating	IP 54
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Standards	
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Emission	EN 50081-1:1992
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Immunity	EN 50082-1:1992
----------	-----------------

Material	
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Housing	Aluminium
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Cover	ABS/PC plastic
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Colour	Black/red
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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

Forta M700 Accessories

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
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SRSU	spring return stem up
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SRSD	spring return stem down
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L7SV	Satchwell linkage to VZ and MZ valves
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AVUX, AVUM, AVUE

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

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
Stroke	12.7mm	Connection cable	1.5m
		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	Standards	
Power consumption	Average 15 VA	Emission	EN 50081-1: 03.1993
		Immunity	EN 50082-1: 11.1997 EN 50082-2: 02.1996
Running time		Material	
0 to 50mm	50Hz, 132s	Housing	CoPA – Grivory GV-4H
60Hz, 112s	Duty cycle Max. 80%/60 minutes	Cover	PC – Polycarbonate
Analogue input		Weight	
Voltage	0 (2) – 10 V	M22A	5,4 kg
Impedance	30 kOhm	M50A	6,0 kg
Current	0 (4) – 20 mA		
Impedance	125 Ohm	Optional travel switch S2	
Ambient temperature		Type	Zero potential
Operation	-20 to +70°C	Capacity	10A, 250V
Storage	-20 to +70°C		
Ambient humidity	<95 %RH		
Enclosure rating	IP 65		

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

M22B, M50B 3-Point floating actuators		Force	Power supply	Power consumption
Part number	Description	N	Vac +10% / -15%	50 Hz
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

S2-Auxiliary end point switch

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.



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

* Nuts and Olives supplied with Valve

These particular valves are designed to be used with thermo-electric actuators

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	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			
DN20	4	721-0436-000	G3/4A			4	--	150	
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	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	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	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	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		

MZ88/MZ89

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

MZ88T / MZ88TA & MZ89T / MZ89TA (Normally Closed)

Temperature		Max stroke	4 mm
Working	2 to 50°C	Coupling ring	M30 x 1,5
Storage	-10 to 60°C	Power cable	2m bipolar (0.75mm ²)
Stem force (MZ88)	90N	Material	Fire-resistant case: Class V0
Stem force (MZ89)	140N	Protection class	IP 44 (for vertical mounting)

Part number	Description	Control signal	Power	Power consumption	Initial consumption	Suitable Valve Type
			VAC	VA	A	
845-5011-000	MZ88T-SU-230	On/Off	110-230	1.8	0.25	VZ*8 Kv 0.25 to 2.5
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	VZ*8 Kv 4-6
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:

- 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 hydraulic 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

* Nuts and Olives supplied with Valve

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		
DN 20	2,5	721-0537-000	G3/4A	721-0557-000	22mm	2.5		250
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	100 A-AB 40 B-AB
DN 20	4	731-0538-000	G3/4A			4	2.5	
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	100 A-AB 40 B-AB
DN 20	4	741-0538-000	G3/4A			4	2.5	
DN 20	6	741-0539-000	G3/4A			6	4	

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)

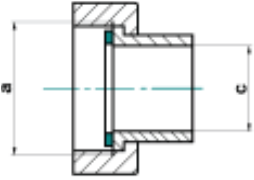
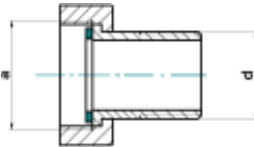
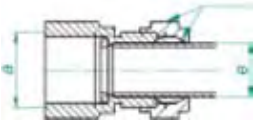
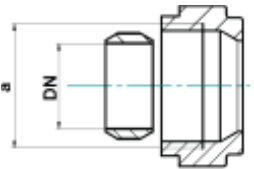
MZ20A/B zone valve actuator for VZ29/39/49 valves

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

Contact TAC for LON actuators for zone valves.

Connections for VZ Series Zone Valves

	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 compres- sion*	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 LON-MARK® capabilities together with radiator valves and is used in fan coil units, induction units, small reheaters and coolers, 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

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, central 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
- Hand lever/gearbox



Pressure Class	PN 16	Materials	
Leakage (EN 12266-1)	Tight, (Leakage Rate A)	Body	Nodular Iron (EN-JS1030)
Temperature Range	-10°C to +100 °C	Lining	EPDM
Max glycol concentration	50%	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	Max 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	DN125-200
2-10V Proportional	24V AC/DC	40Nm	MF40-24M	MF40-24M T54 00	DN125-200
LON	24V AC/DC	40Nm	MF40-24L	MF40-24L 1M54 00	DN125-200

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

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	Max pressure drop	50 kPa
Flow characteristic	Modified linear	Leakage	Max. 1% of KV
Operating angle	90°		
Pressure class	PN 6	Materials	
		Body	Cast iron
		Sleeve	Brass
Water temperature		Connections	Flanged DIN 2531
Max.	110°C		
Min.	-10°C		
Max glycol concentration	50%		

VTRE			Max Close-off Pressure kPa	
			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	Connection MB	Screwed Parallel (female) BSP to BS21
Pressure Class (MB)	PN10	Connection MBF	Flanged BS4504, Table 6/11
Pressure Class (MBF)	PN6		
Flow Characteristic	Port 2 Modified Parabolic	Materials	
Flow Characteristic	Port 3 Linear	Body 1/2" to 1" valves	Hot Pressed Brass to BS218
Operating angle	90°	Body 1 1/4" to 2" valves	Close Grained Cast Iron BS1452 Grade 260
Rangeability Kv / Kv min.	50	Body 65mm to 100mm	Close Grained Cast Iron BS1452 Grade 260 or 220
Leakage	0.5% (%of Cv)	Spindle	High Tensile Brass to BS2874 CZ114
Max. temperature of medium	120°C	O Rings	Ethylene Propylene
Min. temperature of medium	2°C		

MB				Max Close-off Pressure kPa				
Part number	Size (inches)	Kvs	Rangeability	RM	XRM	MD10B-2301	MD10B-241	MD10A-241
				2Nm	2Nm	10Nm	10Nm	10Nm
MB1402	1/2"	1.9	50	70	70	70	70	70
MB1452	3/4"	4.1	50	70	70	70	70	70
MB1502	1"	8.3	50	70	70	70	70	70
MB1552	1 1/4"	12.5	50	35	35	35	35	35
MB1602	1 1/2"	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	Material	
Duty cycle	10%	Enclosure material	Reinforced plastic PA66
Torque	15 Nm	Colour	Black/red
Operating temperature	-15 to +55°C		
Protection class	IP 54		

M9B, EM9 actuators for valves VTRE		Control signal	Working range	Running 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



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

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 $\pm 20\%$, 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	
Input signal range 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° (adjustable by mechanical stops)	Operation	-30 to +50°C
Running time	150 s	Storage	-40 to +80°C
Position indication	Mechanical	Maintenance	Maintenance free

Part number	Description	Torque	Power Consumption		
		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

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.



Connection cable		EMC, immunity	SS EN 50082-1
Actuator	1 m (3.3 ft), 3x0.75 mm ² (AWG 18)	LVD Safety; MD5B-230(-S)	SS EN 60335-1
Auxiliary switches (-S)	1 m (3.3 ft), 3x0.75 mm ² (AWG 18)		
Angle of rotation	max. 95° (adjustable by mechanical stops)	Protection class	
Running time	150 s	MD5B-24(-S)	III Safety extra-low voltage
Direction of rotation	Reversible with switch	MD5B-230(-S)	II Totally insulated
Position indication	Mechanical	Enclosure rating	IP 54
		Ambient humidity	95% r.H (EN 60730-1)
Auxiliary switch	1 mA to 3 (0.5) A, 250 V AC	Ambient temperature	
Switching point	(adjustable 0-100%)	Operation	-30 to +50°C
Standards conformity		Storage	-40 to +80°C
EMC, emission	SS EN 50081-1	Maintenance	Maintenance free

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 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

LF24, LF230, LF24-SR

The LF series are compact, low-torque, 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	2x0.75 mm ² (AWG 18)	Standards conformity	
Angle of rotation	Max. 95° (adjustable 37-100% with additional limit stop ZDB-LF)	EMC, emission	SS EN 50081-1
		EMC, immunity	SS EN 50082-1
Torque		LVD Safety; LF230	SS EN 60335-1
Spring return	Min. 4 Nm (3 ft-lbf)	Enclosure rating	IP 54
		Ambient humidity	EN 60335-1
Running time		Ambient temperature	
Actuator	40-75 s (0-4 Nm (0-3 ft-lbf))	Operation	-30 to +50°C
Spring return	Approx. 20 s (at -20 to +50°C max. 60 s (at -30°C	Storage	-40 to +80 °C
Direction of rotation	Selected by mounting L/R	Service life	min. 60,000 operations
Position indication	Mechanical	Maintenance	Maintenance free

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 page 50.

AF / AFR series

The AF / AFR are robust, high-torque, 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



Aux. switches AF24-S / AF230-S	2×SPDT 6 (3) A, 250 V AC
Switching points	Fixed 5%, adjustable 26-89%
Aux. 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 6×0.75 mm ² (AWG 18)
Auxiliary switch AFR230-S	1 m 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
Storage	-40 to +80°C
Service life	Approx. 60,000 operations
Maintenance	Maintenance free

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

Mechanical Accessories

Name	Description	Part number	Actuators					
			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			

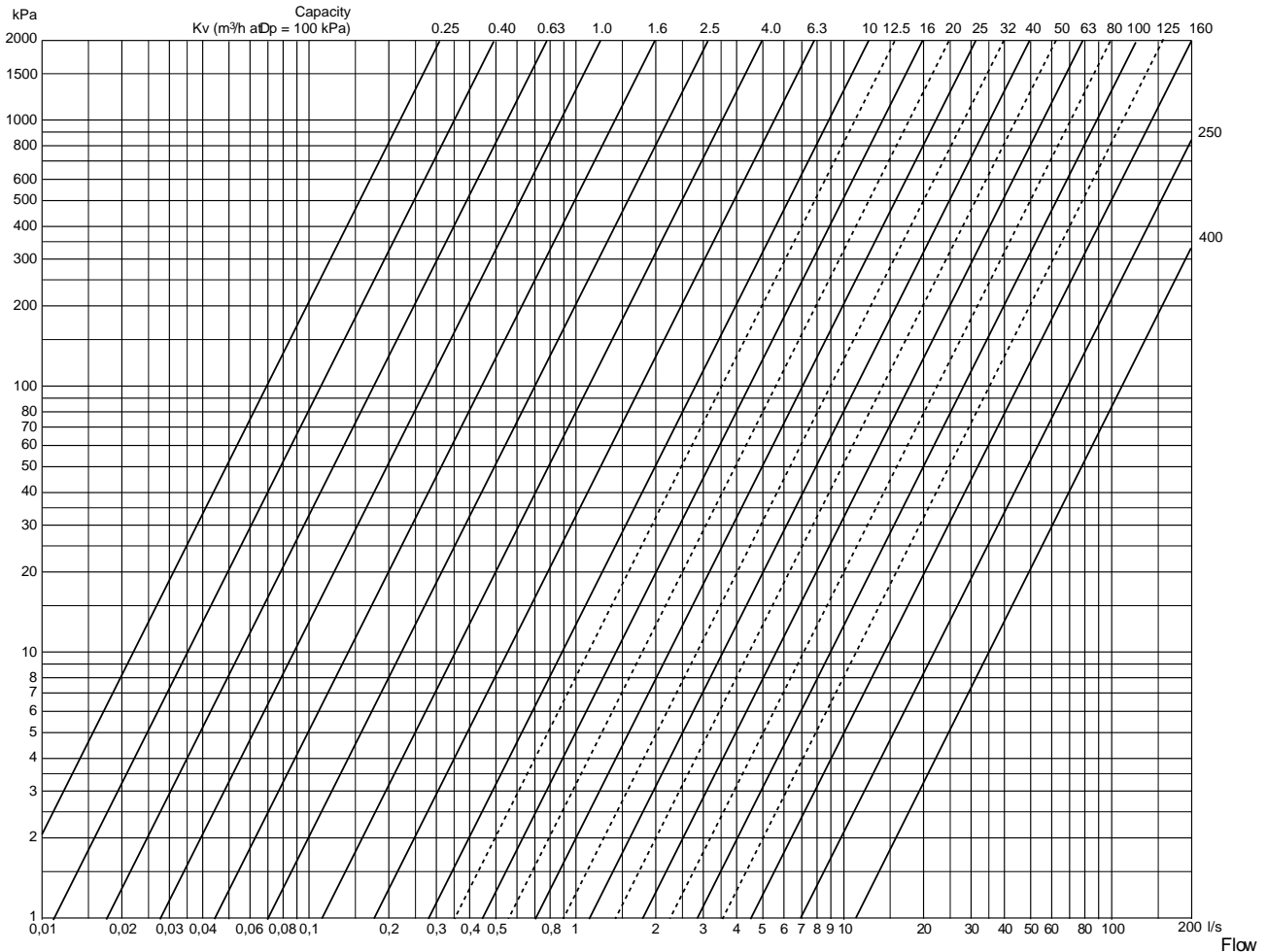
Electrical Accessories

Name	Description	Part number	Actuators					
			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

Water Valve Sizing Chart

Pressure drop



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

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

Calculation of Pressure drop, ΔP

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

Steam Valve Sizing Chart

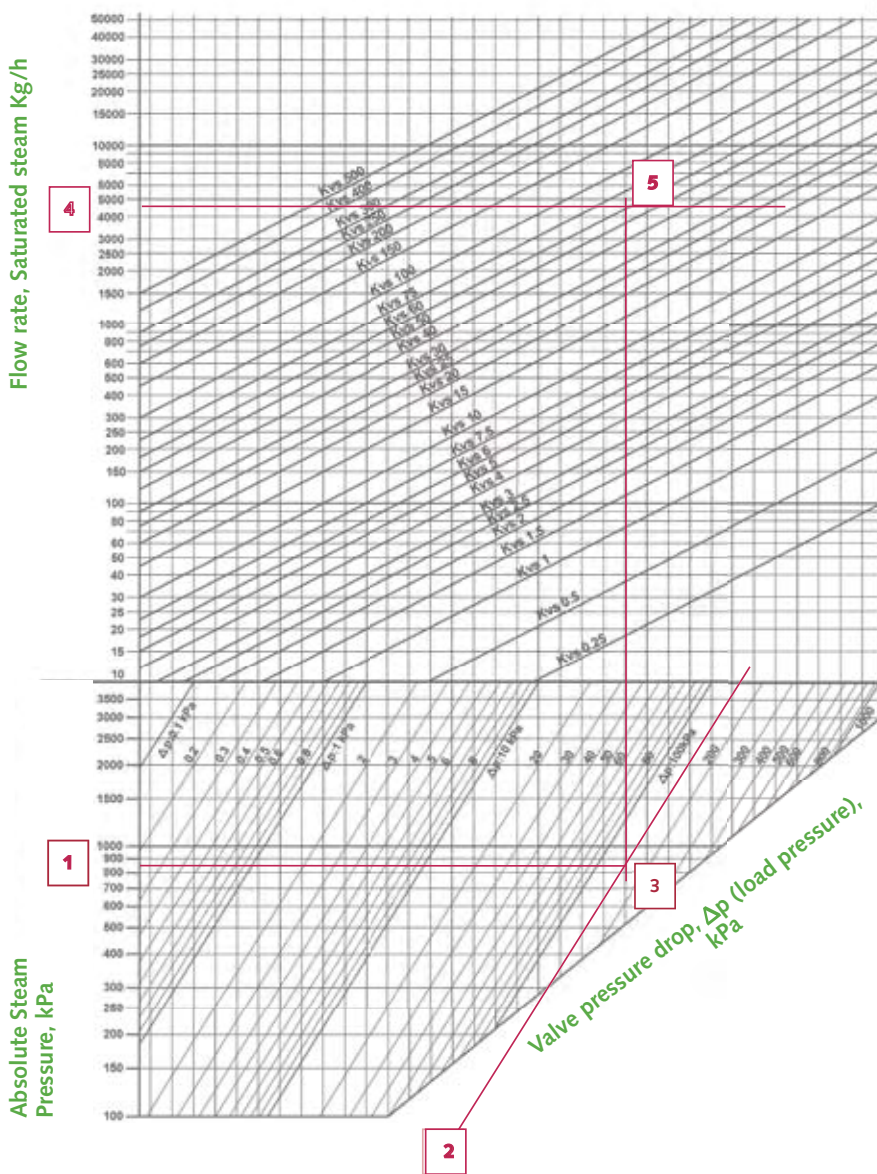
Example for saturated Steam:

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]



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

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

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

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

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

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

Key:

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

G = Mass flow rate (Kg/h)

v₂ = Specific volume (from steam table) for p₂ and t₁ condition

V* = Specific volume (from steam table) for $\frac{p_1}{2}$ and t₁ condition

p₁ = pressure before valve

p₂ = pressure after valve

Δp = Valve Pressure drop (bar)

Notes

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