



Rev. 03/2019

2 - 3 - 4 WAY MOTORISED COMPACT ZONE VALVES

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- +** Reduced overall dimensions
- Extremely quiet operation
- Valve with union connections



Zone 2C

Zone 3C

Zone 4C

PRODUCTION RANGE

VALVE BODY			
Nominal size	Code 2-way valves	Code 3-way valves	Code 4-way valves
1/2"	814.04.20	813.04.20	736.04.20
3/4"	814.05.20	813.05.20	736.05.20
1"	814.06.20	813.06.20	736.06.20

SERVOMOTOR			
	Code	Power supply	Description
	2944.00.02	230 V AC	Thermo-electrically controlled servo motor without auxiliary micro switch (2 wires)
	2944.00.12	24 V AC	Thermo-electrically controlled servo motor without auxiliary micro switch (2 wires)
	2944.00.42	230 V AC	Thermo-electrically controlled servo motor with auxiliary micro switch (2 wires)
	2944.00.52	24 V AC	Thermo-electrically controlled servo motor with auxiliary micro switch (2 wires)

DESCRIPTION

The **compact zone valve** is a device that allows shutting-off or deviating (manual or automatic) the flow in transit.

In the versions with two, three and four ways it is supplied, as standard, with a knob for manual opening and closing control; it can be easily automated by coupling it directly with a thermo-electric servo control from the series 2944.00.X2.

USE

The small dimensions and the limited hydraulic through sections make it particularly suitable for direct connection to the supply terminals or at the service of small heating areas.

It is particularly indicated in the following cases:

- interception of small utilities in general;
- automatic shut-off of thermal zones to be coupled or not with coplanar manifolds;

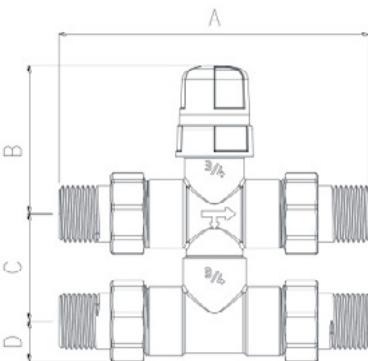
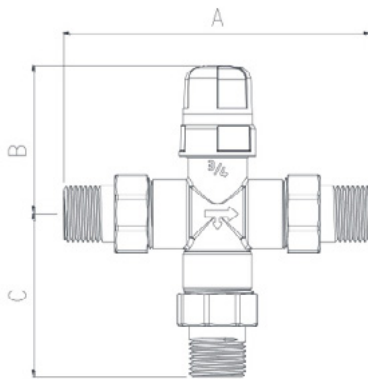
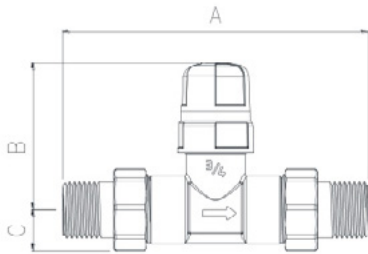
- interception of power fan coils from circuits with two and/or four tubes.

THE CHOICE

There are no special precautions to be followed when choosing the **compact zone valve**. In particular:

- The connection diameter must be chosen according to the diameter of the components or of the piping with which the valve must be coupled; in the offered production range the valve body and their internal passages, in fact, remain the same;
- As for all the rod-shutter valves, particular attention must be given to the differential pressure generated by the valve when the fluid passes. To guarantee the correct operation of the thermo-electric servo control, verify that the differential pressure across the valve does not exceed the value indicated in this technical data sheet.

DIMENSIONAL FEATURES



Valve with handwheel for manual movement

SERIES 814 - 2-WAY COMPACT ZONE VALVES

Code	Dimension	A [mm]	B [mm]	C [mm]	D [mm]
814.04.20	1/2"	109,8	51	19,5	-
814.05.20	3/4"	116	51	19,5	-
814.06.20	1"	123	51	19,5	-

SERIES 813 - 3-WAY COMPACT ZONE VALVES

Code	Dimension	A [mm]	B [mm]	C [mm]	D [mm]
813.04.20	1/2"	109,8	51	55,2	-
813.05.20	3/4"	116	51	55,2	-
813.06.20	1"	123	51	55,2	-

SERIES 736 - 4-WAY COMPACT ZONE VALVES

Code	Dimension	A [mm]	B [mm]	C [mm]	D [mm]
736.04.20	1/2"	109,8	51	50÷60	19,5
736.05.20	3/4"	116	51	50÷60	19,5
736.06.20	1"	123	51	50÷60	19,5

CONSTRUCTION FEATURES

Body	nickel-plated brass
Shutter and seal	elastomer
Rod seals	ethylene-propylene
Springs	stainless steel AISI302
Handwheel manual opening	ABS
Threaded connections	unions MM UNI-EN-ISO 228
Connection for ABS handwheel or thermo-electric servo control	M 30x1.5

TECHNICAL FEATURES

Indicated fluid	clean water water + glycol 50%
Fluid temperature	+5÷+95 °C
Max. operating pressure	10 bar (1000 kPa)
Maximum differential pressure	1 bar (100 kPa)
Valve stroke	4 + 0.2 mm

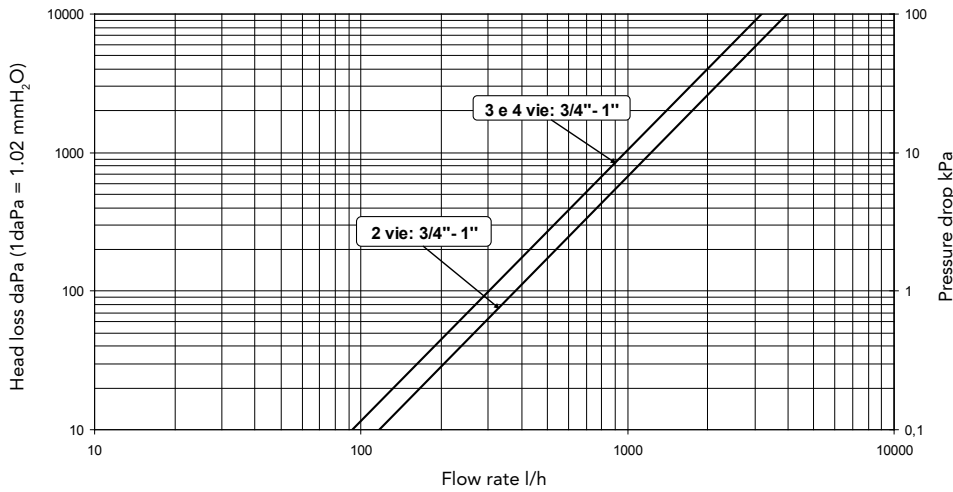
Predisposition for RBM electrothermal motors code 2944.00.X2. With mounted servomotor and electrically NOT POWERED the straight way of the compact zone valve is CLOSED.

FLUID DYNAMIC FEATURES

Motorised compact zone valves with electrothermally controlled servomotor series 2944.00.X2

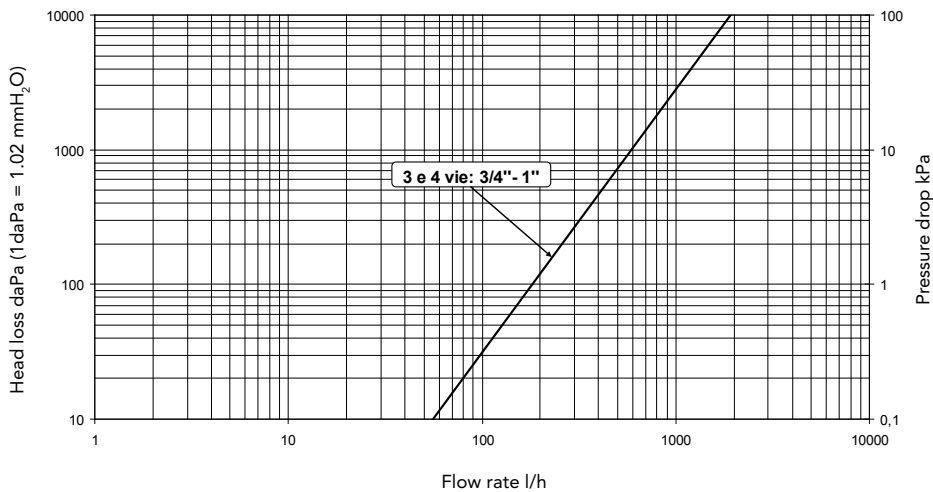
Description	Code	Dimension	Kv (m ³ /h)		Value of leakage Δp_{max} (bar)
			Straight	By-pass	
2-way valve	814.04.20	1/2"		-	
2-way valve	814.05.20	3/4"	3,6	-	2,7
2-way valve	814.06.20	1"	3,6	-	2,0
3-way valve	813.04.20	1/2"			
3-way valve	813.05.20	3/4"	2,9	1,7	2,7
3-way valve	813.06.20	1"	2,9	1,7	2,0
4-way valve	736.04.20	1/2"			
4-way valve	736.05.20	3/4"	2,9	1,7	2,7
4-way valve	736.06.20	1"	2,9	1,7	2,0

'OPEN' RUNNING VALVE



Motorised compact zone valves with electrothermal servomotor series 2944.00.X2

'BY-PASS' RUNNING VALVE



Motorised compact zone valves with electrothermal servomotor series 2944.00.X2

Analytical procedure for determining the pressure drop for liquids with $\rho \approx 1 \text{ kg/dm}^3$

$$\Delta P = \left(\frac{Q}{Kvs} \right)^2 \times 10.000 \quad \text{valid for water with Temp. from 0 to 30 } ^\circ \text{C}$$

ΔP correction for fluids with ρ different from 1 kg/dm^3

$$\Delta P' = \Delta P \times \rho'$$

Analytical procedure for the adjustment valve dimensioning valid for liquids with $\rho \approx 1 \text{ kg/dm}^3$

$$Kvs = Q * \left(\frac{10000}{\Delta P} \right)^{0.5} \quad \text{valid for water with Temp. from 0 to 30 } ^\circ \text{C}$$

Kvs correction for fluids with ρ different from 1 kg/dm^3

$$Kvs' = Kvs * \sqrt{\rho'}$$

LEGENDA

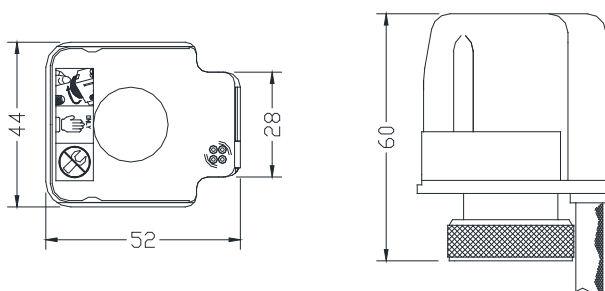
- ΔP head loss in daPa (1daPa=10Pa)
- $\Delta P'$ correct head loss in daPa (1daPa=10Pa)
- ΔP_{max} pressure difference recommended for correct operation
- Q_{max} flow rate in m^3/h
- Kvs hydraulic feature in m^3/h
- ρ' liquid density in kg/dm^3

COD. 2944.00.X2

SERVOMOTOR WITH ELECTRO-THERMAL CONTROL,
WITH AND WITHOUT AUXILIARY MICRO SWITCH



DIMENSIONAL FEATURES



TECHNICAL FEATURES

Version	without Micro switch		with Micro switch	
Code	2944.00.02	2944.00.12	2944.00.42	2944.00.52
Operation	N.C.	N.C.	N.C.	N.C.
Auxiliary switch	NO	NO	YES	YES
Position indicator	YES	YES	YES	YES
Voltage	230 VAC	24 VAC	230 VAC	24 VAC
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Input power in normal conditions	2,5 W	2,5 W	2,5 W	2,5 W
Switching current auxiliary switch	-	-	3 A	3 A
Connection	Threaded ring nut M30X1.5	Threaded ring nut M30X1.5	Threaded ring nut M30X1.5	Threaded ring nut M30X1.5
Protection class	IP 54 assembly all installation positions	IP 54 assembly all installation positions	IP 54 assembly all installation positions	IP 54 assembly all installation positions
Connection cable	Wired cable Length 1 m	Wired cable Length 1 m	Wired cable Length 1 m	Wired cable Length 1 m
Opening time	approx. 3 min	approx. 5 min	approx. 3 min	approx. 5 min
Stroke	approx. 5 mm	approx. 5 mm	approx. 5 mm	approx. 5 mm
Max thrust	110 N	110 N	110 N	110 N
Ambient temperature	max 50 °C	max 50 °C	max 50 °C	max 50 °C
Certifications	CE	CE	CE	CE

ELECTROTHERMALLY CONTROLLED SERVOMOTOR ON-OFF

APPLICATION

Shutter valves activation On-Off.

FUNCTIONING

Thermal activation, Normally Closed, with two positions (open / close). By electrically powering the servomotor, the thermostatic element is heated with wax expansion; after the heating period, the valve opens, quietly, making the stroke.

By interrupting the electrical power supply the thermosensitive element is cooled with the consequent closure of the servomotor and of the relative valve coupled to it.

ASSEMBLY

Simple direct assembly on the valve body by tightening the basic me-

tal ring nut.

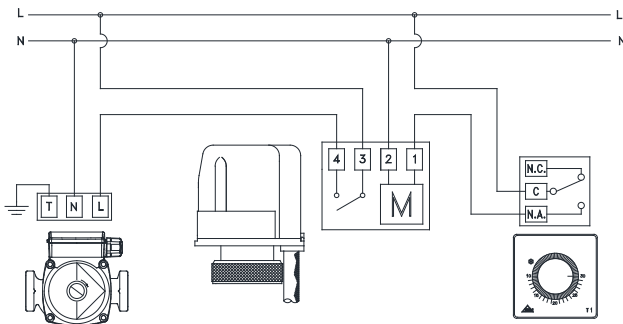
MANUAL CONTROL

The servomotor does not allow manual activation in the case of failure; however, it is possible to manually activate the zone valve by simply removing the servomotor and reapplying the manual handwheel originally fitted on the valve.

AUXILIARY CONTACT

If the logic of the system involves associating a status or alarm indicator when it reaches the open valve position, there is a specific version of the servo control with auxiliary micro switch with potential-free contacts free of voltage.

WIRING DIAGRAM

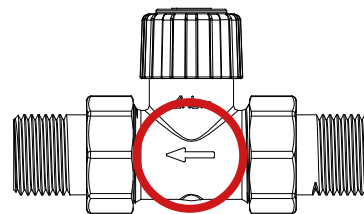


Typical principle diagram

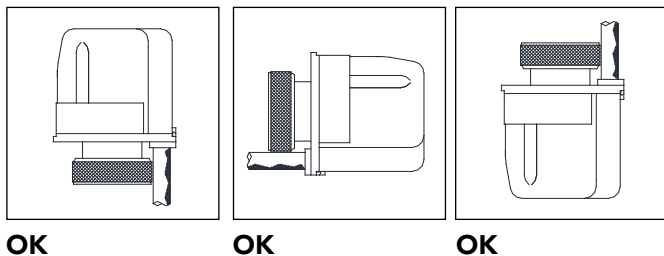
- 1 Brown
- 2 Blue
- 3 Black
- 4 Grey

INSTALLATION TIPS

- The zone valves must be installed respecting the flow direction indicated by the arrows on the body of the valve itself.



- The zone valves can be installed either with the electrothermal control servomotor facing upwards, in horizontal position or overturned.

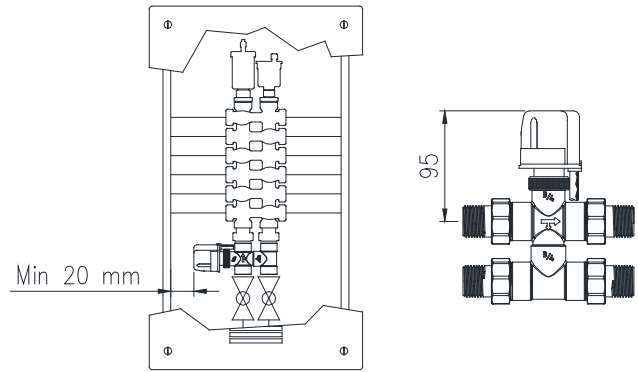
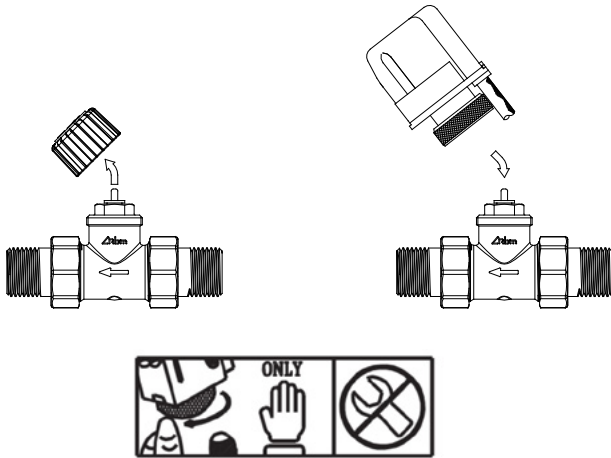


Degree of protection IP54 !

- The 2-way zone valve can be installed either on the delivery piping or on the return piping.
- The 3-way zone valve must be installed only on the delivery pipe.
- The 4-way zone valve, as well as being able to vary its distance from 50 mm to 55 mm, always keeping the hydraulic seal, must be installed only on the delivery pipe.

ASSEMBLY DIAGRAM
VALVE - SERVOMOTOR CODE 2944.00.X2

OVERALL ASSEMBLY DIMENSIONS
VALVE - SERVOMOTOR CODE 2944.00.X2



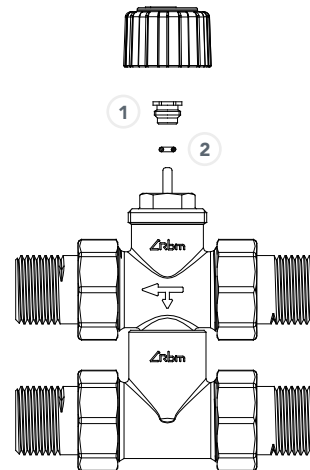
The compact zone valves are supplied, as standard, with the knob for the manual opening and closing control. To automate the valves, simply unscrew the ABS knob and fully tighten the electrothermal control servomotor up to the locking ring with a slight pressure. Do not use pliers, screwdrivers or other similar tools for this operation.

If installing the valves in any plastic boxes, according to the type of assembly, leave sufficient space at the side or above the servo control to allow the replacement of the same. For this reason, we recommend the use of plastic boxes suitable for the containment of the compact zone valves, including the servo motor series 2944.00.X2.

MAINTENANCE

A repair of the hydraulic sealing of the adjustment components can be carried out with the system running. First of all, remove the BS knob or the electrothermally controlled servomotor and unscrew the stuffing box using a 10 mm spanner.

Replace the O-rings gasket (code 5001.045) that is housed under the stuffing box itself. Then tighten the stuffing box up to the stop, making sure that the closing is forced slightly. The replacement of said O-ring gasket shows the condition of perfect functionality of the compact zone valve.



- 1 Stuffing box
- 2 OR gasket (To be replaced)

TYPICAL APPLICATIONS

Figure 1

Application of the **compact zone 4-way valve**, coupled with a coplanar distribution manifold. It is the classic application and allows interception of two or more thermally powered zones from a mutual pumping station.

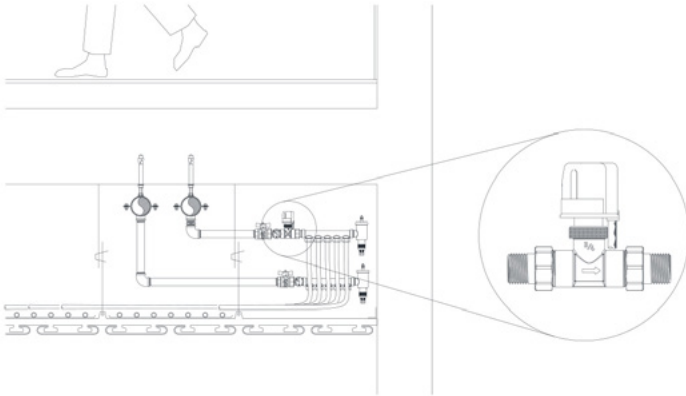
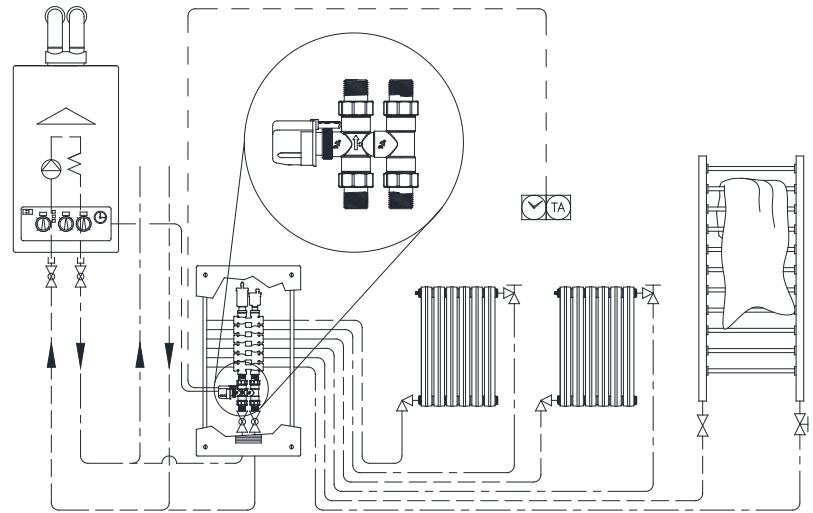


Figure 2

Application of the **compact zone 2- or 3-way valve** in combination with a simple distribution manifold. This application is normally used to shut-off ceiling and/or wall radiant systems. The 2-way valve is recommended in combination with variable flow circuits.

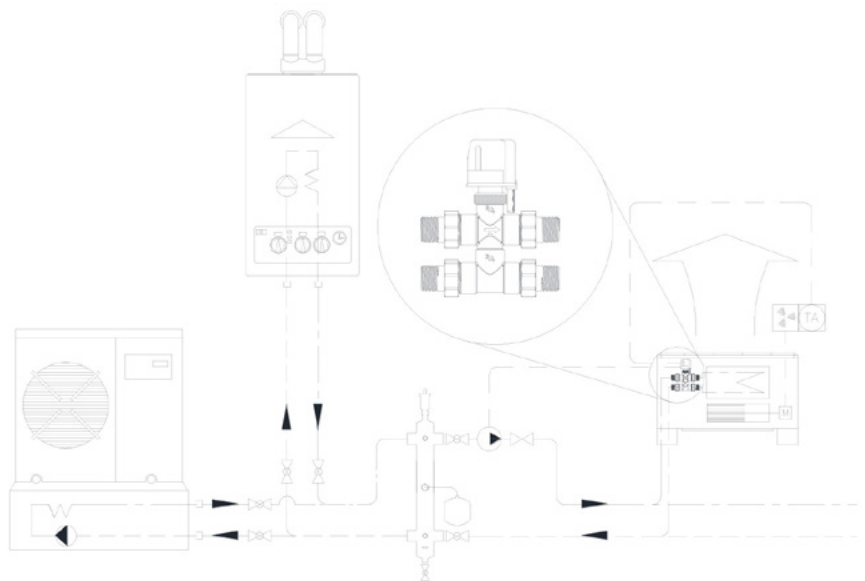
Figure 3

In addition to the classic application on 4-pipe fan coils, the growing increase of ambient comfort levels has recently favoured the application of the **compact zone valve**, even in the shutting-off of 2-pipe fan coils with season reversal.

In these systems, the room thermostat normally acts directly on the operation of the on-board valve. This adjustment mode is acceptable in environments such as offices or shops.

In places such as hotel rooms, nursing homes or residential bedrooms, the cyclical switch-on and off of the fan causes the continuous variation of the background noise of the environment, bothering people trying to sleep.

It is, therefore, convenient for the human ear to get used to the constant background noise (fixed ventilation at minimum speed), by causing the intervention of the room thermostat directly on the **compact zone valve**.



SPECIFICATION ITEMS

SERIES 814

2-way motorised compact zone valve. Normally closed with servo motor mounted, not powered. Nickel plated brass body. Obturator valve and seal in elastomer. Rod seals in ethylene-propylene. Stainless steel springs. Handwheel for manual opening in ABS. Predisposition for RBM electrothermal motors code 2944.00.X2. Union threaded connections MM UNI-EN-ISO 228. Max temperature 5... 95 °C. Max. operating pressure 10 bar. Differential pressure max. 1 bar. Available sizes 1/2" ÷ 1".

SERIES 813

3-way motorised compact zone valve. Normally closed on straight way with servo motor mounted, not powered. Nickel plated brass body. Obturator valve and seal in elastomer. Rod seals in ethylene-propylene. Stainless steel springs. Handwheel for manual opening in ABS. Predisposition for RBM electrothermal motors code 2944.00.X2. Union threaded connections MM UNI-EN-ISO 228. Max temperature 5... 95 °C. Max. operating pressure 10 bar. Differential pressure max. 1 bar. Available sizes 1/2" ÷ 1".

SERIES 736

4-way motorised compact zone valve. Normally closed on straight way with servo motor mounted, not powered. Can be coupled to Monoblock coplanar manifolds. Nickel plated brass body. Obturator valve and seal in elastomer. Rod seals in ethylene-propylene. Stainless steel springs. Handwheel for manual opening in ABS. Predisposition for RBM electrothermal motors code 2944.00.X2. Union threaded line connections MF UNI-EN-ISO 228. Centre distance 50...55 mm. Max temperature 5... 95 °C. Max. operating pressure 10 bar. Differential pressure max. 1 bar. Available sizes 1/2" ÷ 1".

SERIES 2944

Thermo-electrically controlled servo motor for compact zone valves, complete with valve body clamping ring nut and electric power cable. Normally closed valve position when power missing. Power supply 24/230 V, consumption 2 W, frequency 50/60 Hz, electrical protection IP54, operating temperature 5...50 °C, stroke 5 mm.

RBM spa reserves the right to improve and change the described products and related technical data at any moment and without prior notice: always refer to the instructions attached with the supplied components; this sheet is an aid, should the instructions be extremely schematic. Our technical office is always at your disposal for any doubt, problem or explanation.

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