Rev. 01/2023

RINOXDUE

Piston pressure reducing valve.

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Piston pressure reducing valve.

- For use in heating-plumbing systems
- Reduce the fluid pressure to optimum operating values
- Inlet pressures no higher than 25 bar

ACS conformity according to DGS/SD7A n°571 of 25/11/2002

“RINOXDUE FF” PRESSURE REDUCING VALVE					
Code	**Size**	**Connection**	**P_{max} before**	**P_{after} adjustable**	**Preset P**
87.03.70	G 3/8”	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-
87.04.70	G 1/2”	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-
87.05.70	G 3/4”	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-
87.06.70	G 1”	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-
87.07.70	G 1”1/4	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-
87.08.70	G 1”1/2	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-
87.09.70	G 2”	FF UNI-EN-ISO 228	2500 KPa [25 bar]	50÷700 KPa [0,5÷7 bar]	-

DESCRIPTION

The **RBM RinoxDue range of pressure reducing valves** are piston pressure reducing valves.

PURPOSE

The main purpose of **RBM RinoxDue pressure reducing valves** is to reduce the fluid pressure to optimum operating values, constantly below the maximum permitted vales so as not to damage equipment fitted after the reducing valve.

USE

RBM RinoxDue pressure reducing valves is an **adjustment unit and not a security unit**. In order to guarantee this task, it is necessary to supply the system with suitable security unit.

RBM RinoxDue pressure reducing valves are especially recommended for use in heating-plumbing systems.

In particular they are recommended for final reduction of the pressure to the use.

CHOICE

The **RBM RinoxDue range of pressure reducing valves** is recommended for use in heating-plumbing systems with inlet pressures no higher than 25 bar.

The pressure reducing valve is factory prepared with a regulation outlet pressure value: P = 300 KPa.

The correct choice of the number of pressure reducing valves necessary to obtain the pressure reduction, is important to avoid cavitation phenomena.

These phenomena in fact cause excessive noise in the reducing valve with consequent disturbances to users and possible damage to the reducing valve itself.

For this reason, please refer to the dedicated section inside the technical sheet for the optimum choice of the number of reducing valves in function to the pressure differential to be obtained.

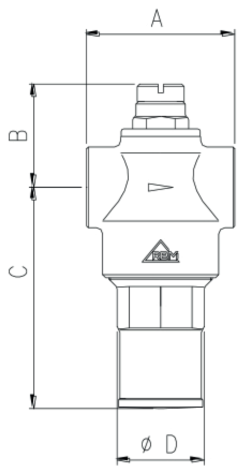
CARATTERISTICHE COSTRUTTIVE

Body	Brass CW 617N UNI EN 12165
Internal component metal	Brass CW614N UNI EN 12164
Shutter seal seat	Stainless steel AISI 303
N° of shutter seal seats	1
Rod	Brass CW614N UNI EN 12164
Seals	NBR nitrile elastomer
Plastic parts	Nylon 6 with 30% fibreglass
Gauge attachment connection	F G 1/4”

TECHNICAL CHARACTERISTICS

Compatible fluid	Water
Nominal pressure	PN25
Maximum inlet pressure	2500 KPa – 25 bar
Adjustable outlet pressure	50÷400 KPa (0,5÷4 bar); 50÷700 KPa (0,5÷7 bar) depending on model
Factory presetting	300 KPa (only model with adjustable outlet pressure 0,5÷4 bar)
Thread	UNI-EN-ISO 228
Maximum operating temperature	80 °C

DIMENSIONAL CHARACTERISTICS

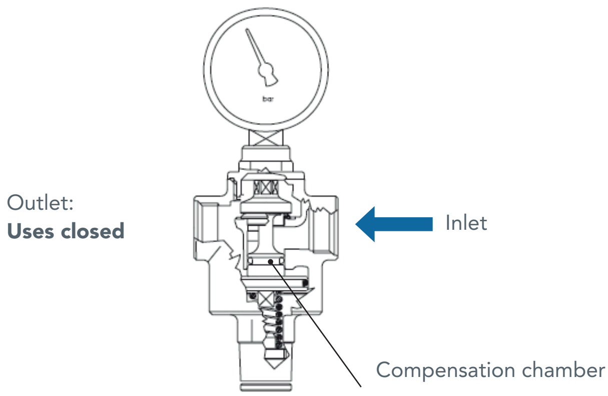


Code	Size	A [mm]	B [mm]	C [mm]	ø D [mm]
87.03.70	3/8" F	60	41,5	89	47
87.04.70	1/2" F	60	41,5	89	47
87.05.70	3/4" F	60	41,5	89	47
87.06.70	1" F	86	60,5	91,5	61
87.07.70	1"1/4 F	91	64,5	93	61
87.08.70	1"1/2 F	91	64,5	98	61
87.09.70	2" F	91	69,5	101	61

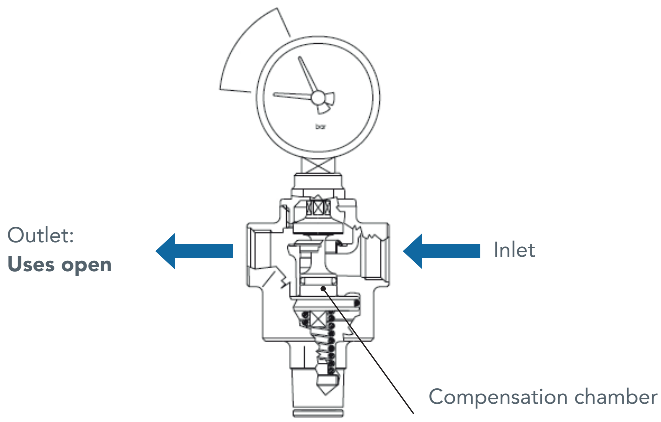
OPERATION

The **RBM RinoxDue pressure reducing valve** bases its operation on balancing between the antagonist force of the spring and the thrust pressure of the fluid on the diaphragm. In fact, the spring tends to open the reducing valve shutter while the pressure exerted on the useful surface on the piston tends to close the shutter itself.

PRESSURE STILL AT REGULATION VALUE OF 3 BAR



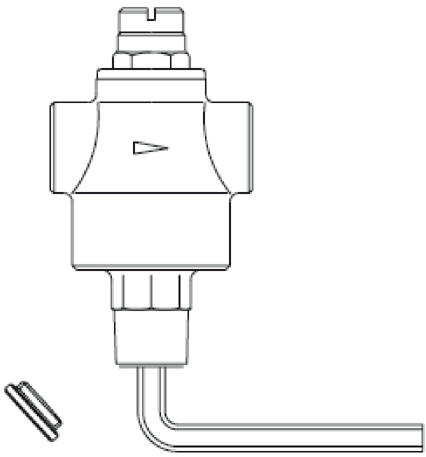
PRESSURE LOSS P<3 BAR



When the uses to be served are closed, the downstream pressure increases, pushing the reducer piston downwards. In this way, the shutter closes the passage section of the reducer maintaining the setting value set on the spring constant; in fact, the minimum pressure difference across the shutter permits the perfect closing of this latter.

When the uses are opened downstream, the pressure exerted on the piston is lessened in favour of the force exerted by the spring on the shutter permitting it to open with the constant passage of the fluid. As the water demand from the user network increases the pressure on the piston decreases and more water passes.

PRESSURE REDUCING VALVE CALIBRATION



The final calibration of the pressure reducing valve must be performed with the hydraulic circuit completely full and with all the uses closed, otherwise false values would be obtained owing to the fact that the downstream pressure reduces in relation to the necessary flow rate, during any supply.

The pressure reducing valve is calibrated using the internal lock-ring: screw clockwise to increase the value, anticlockwise to reduce it.

Calibration operations:

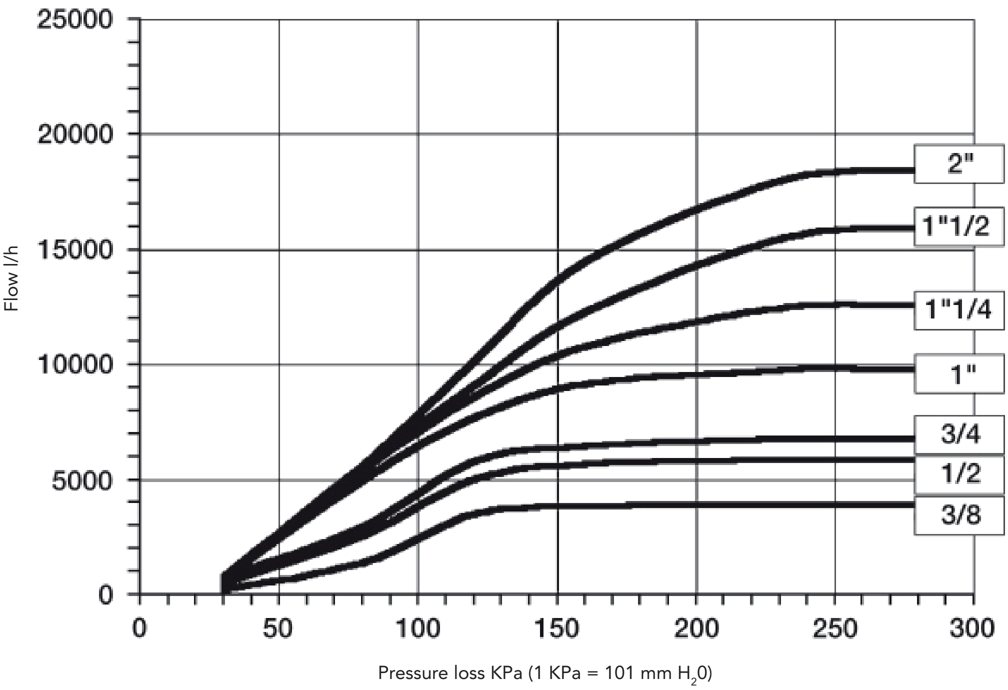
- Close the interception valve after the pressure reducing valve.
- Calibrate the pressure reducing valve using a spanner appropriate for the model.
- The calibration operation is considered to be complete when the desired pressure is read on the gauge.

WARNINGS: Perform several discharge actions to check the stability of the calibration.

With the system operating, the pressure read at the gauge could be falsified by the overpressure of the thermal system; any correction made should always be performed with the system at a standstill and at ambient temperature.

FLUID DYNAMIC CHARACTERISTICS

Load loss diagram



The values described in the diagrams are obtained with:

- Inlet pressure of 800 KPa (8 bar);
- Outlet pressure of 300 KPa (3 bar).

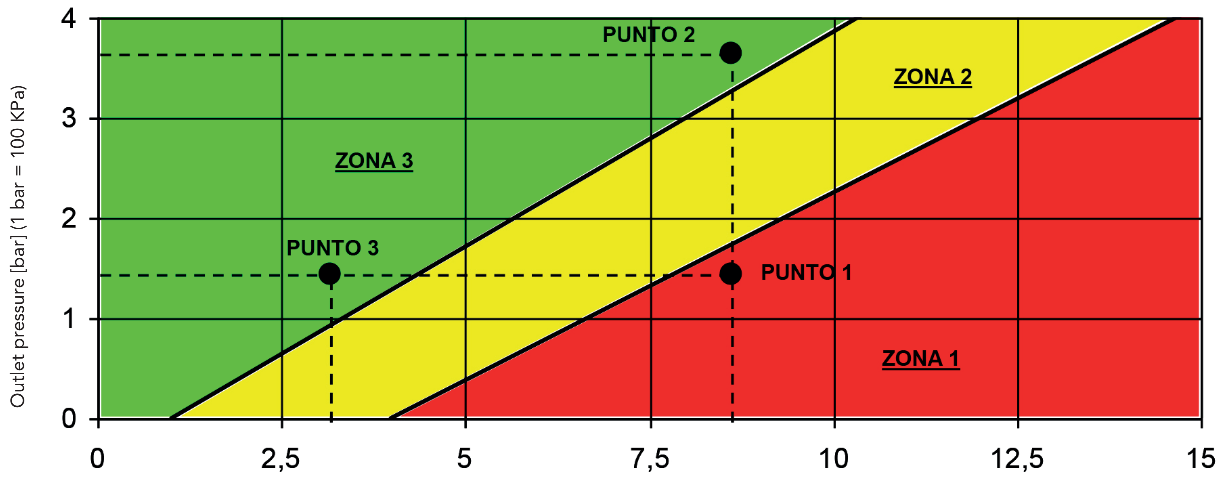
READING THE DIAGRAM:

The pressure reducing valve load loss diagram represents the pressure loss in function to the flow rate at the user outlets.

Example: I consider a 3/4” pressure reducing valve with a preset pressure of P = 300 KPa and I hypothesise a flow rate of Q = 1.500 l/h at the user outlets. From the diagram we find that the pressure value is P_1 = 60 KPa for this flow rate Q. On the pressure reducing valve gauge we read the following pressure value P_0 = 300 - 60 = 240 KPa which represents the pressure value at the user outlets.

SIZING THE PRESSURE REDUCING VALVE

Cavitation diagram *



In order to avoid cavitation phenomena and therefore excessive component noise, we recommend choosing the number of pressure reducing valves necessary for a determinate pressure differential, according to the information in the "CAVITATION DIAGRAM".

The cavitation diagram shows the three operating zones of the pressure reducing valve in function to the inlet and outlet pressures:

- **ZONE 1: Malfunctioning zone.** The cavitation phenomena are clearly and present inside the pressure reducing valve. We recommend against using the pressure reducing valve at these pressures.
- **ZONE 2: Critical zone.** The possible occurrence of cavitation phenomena inside the pressure reducing valve is evidenced. We recommend against using the pressure reducing valve at these pressures.
- **ZONE 3: Operating zone.** The pressure reducing valve operates in optimum conditions and there is no cavitation. This is the optimum interval of pressure values for the operation of the pressure reducing valve.

In order to avoid cavitation phenomena, we recommend making the pressure reducing valve operate inside ZONE 3, and also, to prevent the ratio between the maximum inlet pressure and the regulation outlet pressure of the pressure reducing valve from exceeding the value of 2.5.

DIMENSIONING

If we want to make a pressure reducing valve work between the following pressure values:

- Inlet P: P_M = 8,5 bar
- Outlet P: P_V = 1,5 bar

As we can see in the diagram, (POINT 1) the pressure reducing valve runs into certain cavitation phenomena at these work pressures.

In order to avoid these phenomena and considering that the ratio between the maximum inlet pressure and the outlet regulation pressure must not exceed the value of 2.5, we could take recourse to introducing a second pressure reducing valve in series, so as to obtain the same pressure differential, via two distinct pressure differentials.

The suggested solution is therefore to use two pressure reducing valves in series which must both work in ZONE 3 of the diagram, to divide the pressure difference over two reduction differentials and where the pressure ratio does not exceed 2.5.

POSSIBLE SOLUTION:

Pressure reducing valve A [POINT 2]:

- Inlet pressure P: P_{MA} = 8,5 bar
- Outlet pressure: P_{VA} = 3,5 bar

Pressure ratio: 8,5/3,5 = 2,4 < 2,5

Pressure reducing valve B [POINT 3]:

- Inlet P: P_{MB} = 3,5 bar
- Outlet P: P_{VB} = 1,5 bar

Pressure ratio: 3,5/1,5 = 2,3 < 2,5

N.B.: The reducer inlet pressure must never be higher than the maximum operating temperature of the components downstream from the pressure reducing valve, so as to avoid damaging them or malfunctioning.

Apart from acting on the pressure differential, the cavitation phenomena of the pressure reducing valve can also be controlled by choosing an optimum speed value of the fluid passing through it.

We therefore recommend choosing the diameter of the pressure reducing valve so that the speed of the fluid passing through it is between the following values:

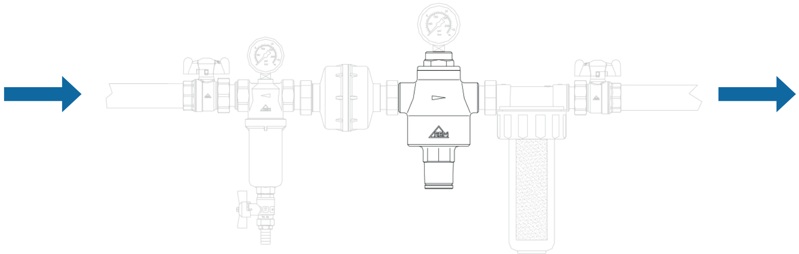
- **Per water:** V = 0,7 ÷ 1,5 m/s (residential use)
  V = 1 ÷ 3,5 m/s (industrial use)

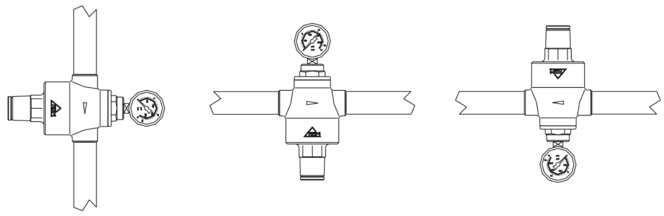
* **N.B: The cavitation diagram is only intended to supply technicians with a rapid, guide reference for associating the chosen component with a given size of system. The values shown in the table are not binding and do not therefore represent the performance limits of the components.**

FITTING

FITTING PRECAUTIONS:

- Always fit a filter before the system.
- Perform ordinary filter maintenance.
- Respect the direction indicated by the flow direction arrow on the body.
- Use interception valves to permit eventual maintenance work.
- Clean the pipes before and after the pressure reducing valve to prevent damage to the same.
- The pressure reducing valve can be fitted vertically, horizontally or facing downwards.





OK OK OK

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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