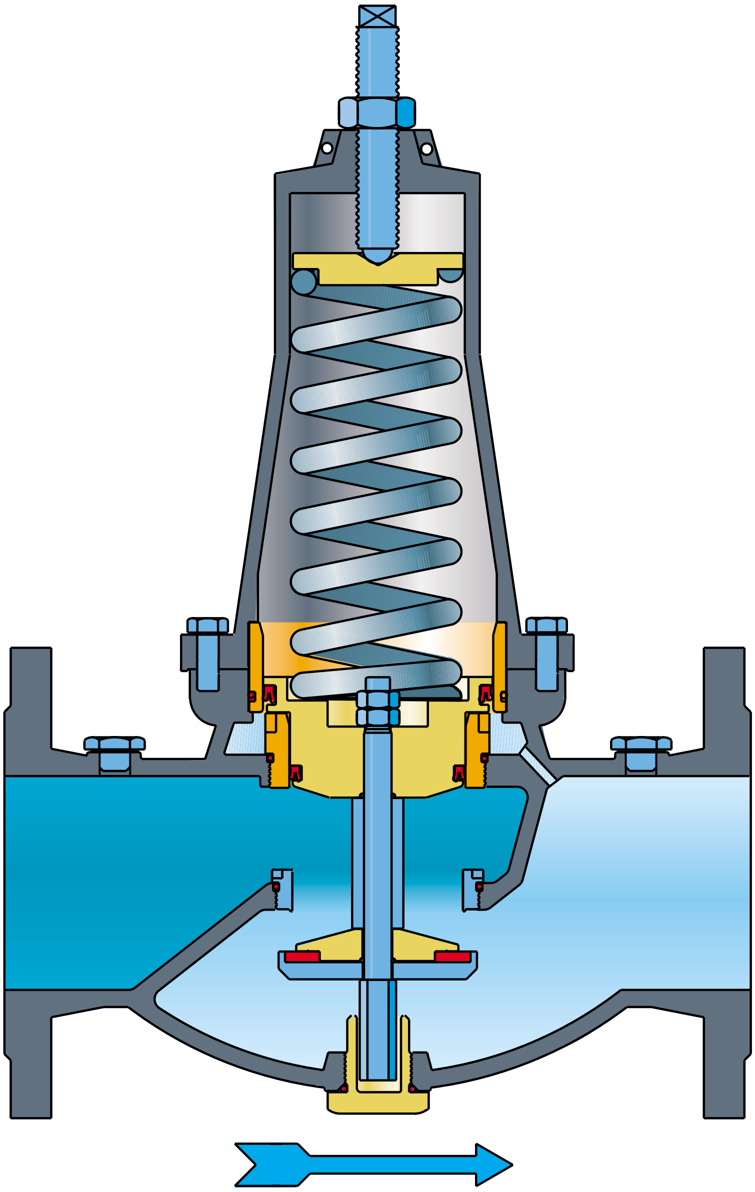
Flanged pressure reducer/stabilizer

VRCD

This unit reduces and stabilizes the upstream pressure by operating on its load losses with a constant downstream pressure irrespective of the rate of flow value.
It can be used for water and unagressive fluids up to a temperature of 70° C and a max. pressure of 40 bar as well as in pneumatic systems



Project features

- Flanged manufacturing dn 50-150.
- Ductile cast iron for body and cap, inside piston in stainless steel and brass, packing slide seats in bronze, gasket seat, gasket disk and other mobile parts as well as bolts and nuts in stainless steel. Upstream/downstream connections for manometers.
- Holed flanges according to UNI ISO 2531 (standard PN 16).
- Epoxy-polyester powder coating electrostatically applied.

Operation

The heart of the reducer consists of a piston whose upper part slides into two-bronze ring-nuts of different diameters. These ring-nuts, tightly connected to the body, form a watertight chamber also known as compensation chamber.Two lip seals assure the tightness between the piston and the above mentionned cases.

The effect of the upstream pressure on the lower part of the piston is balanced by the same effect below the lower ring-nut so that the function of the valve does not suffer any influence.
The downstream pressure operates on the lower part of the gasket disk as well as in the compensation chambers through a hole machined in the body. The pressure is balanced by the compression of the spring, which can be fixed by rotating the threaded shaft.
Should the downstream pressure be lower than the regulated pressure, the spring compels the piston to descend thus opening the valve.
Shloud the downstream pressure be higher, the piston ascends thus reducing the flow and increasing the load losses and consequently bringing the downstream pressure to the desired values.
A hexagonal tightening screw, running inside the lower guide plug together with an upper teflon lead ring (for ND 125/150) assures perfect centering.

Duties

The reducer is mainly used for:
- Feeding of a low pressure network deriving from a high pressure net.
- Protection of a sector or of sensitive equipment.
- Hydrosanitary equipments where it keeps the level of pressure constant.
- Pneumatic systems where it maintains constant pressure whatever the pressure variations caused by compressors.
- Downstream of resevoirs or storage cylinders for the reduction or stabilization of the pressure in the distribution net.

Selection of the nominal diameter

When selecting a reducer you must take into consideration its max. rate of flow and the working conditions. Never consider the nominal diameter (ND) of the pipe line only.

For your easy reference we are giving here below the best rate of flow suggested:

Dn 50 = 2.9 l/s
Dn 65 = 5.0 l/s
Dn 80 = 7.5 l/s
Dn 100 = 11.8 l/s
Dn 125 = 18.4 l/s
Dn 150 = 26.5 l/s

The above values have been defined considering an input speed of 1,5 m/s. It goes without saying that such a level limit can be exceeded at the cost of precision in the downstream adjustment or may lead to a marked increase of load losses and high discharging noise.

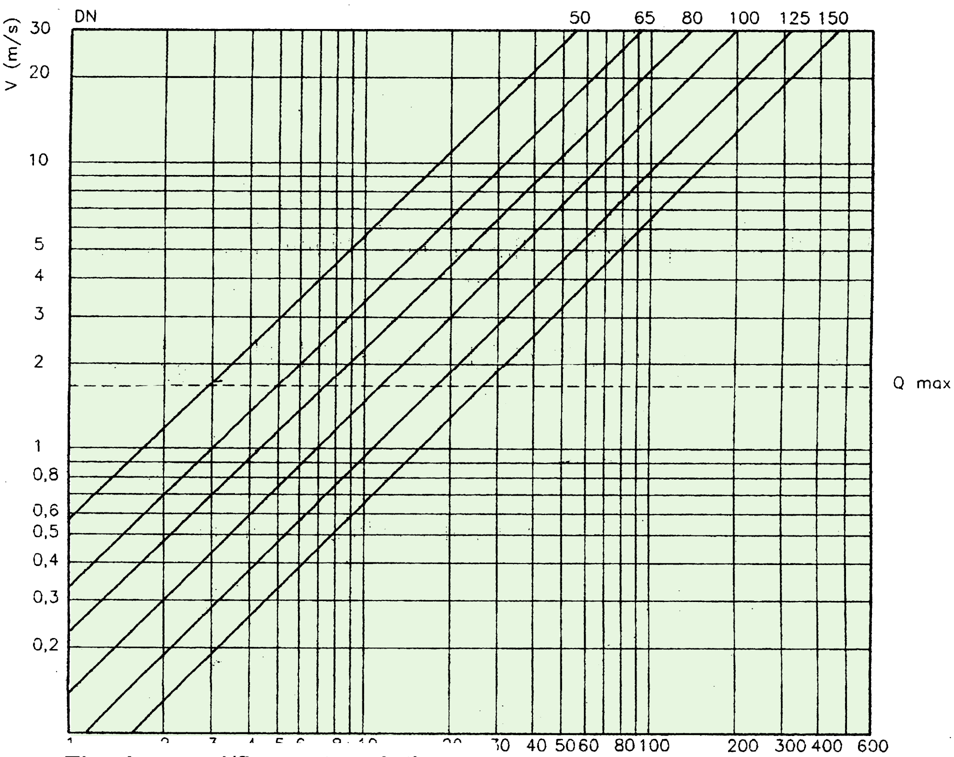


Fig. A speed/flow rate relation

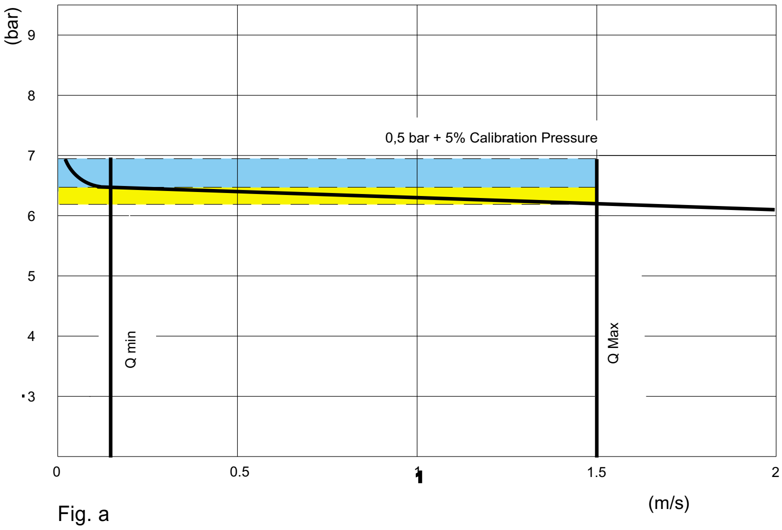


Fig. a

Determination of a load loss

Once the reducer size is selected with the help of the diagram (fig.a), the load loss can be determined by means of the adjustment curve.
The adjustment is assured by an extremely low variation of the downstream pressure. The load loss can be assumed as being equal to 0.5 bar added of 5% of the downstream calibration pressure.

Preset

The a.m. adjustment curve makes it possible to determine the value of the load losses of a selected reducer for a fixed “Q” rate of flow. The adjustment must be carried out in static conditions (flow rate = 0), the spring must be completely released and the threaded shaft totally raised.
By rotating the screw clockwise towards the “+” indication the downstream pressure will be increased. Rotating the screw anticlockwise towards the “-“ indication the downstream pressure will be reduced. For example: We preset the downstream pressure (**dp**) which must not go below the desired value when the rate of flow “Q” reaches the calculated measure. Then it will be necessary to calibrate the equipment to a value of (**sp**) (static pressure) equal to the value of **dp** + **Δp** (load loss).

Working limits

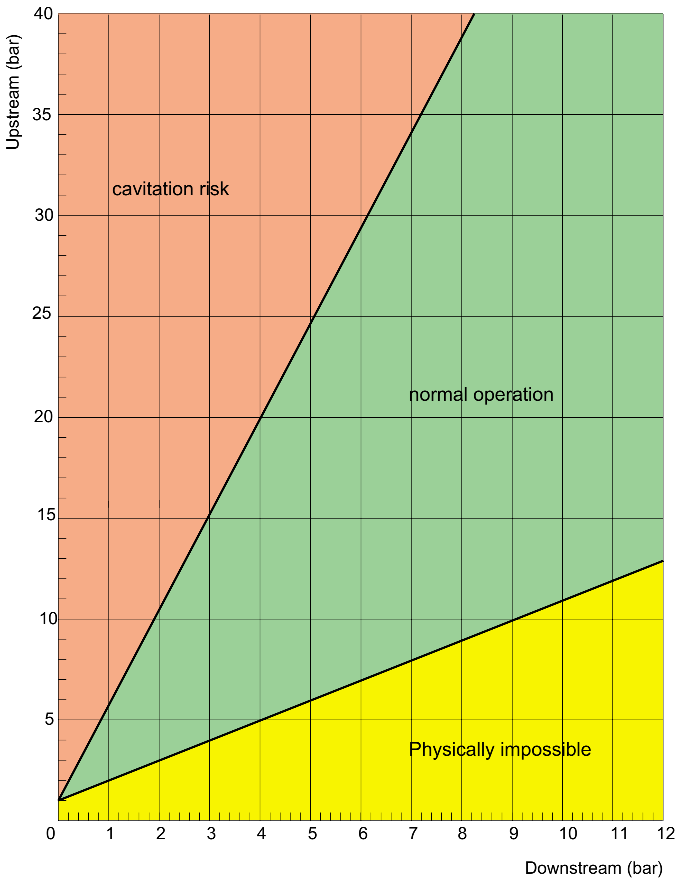
- Drinkable water/air: max. T 70° C
- Upstream pressure (in): max. 40 bar
- Downstream pressure (out):
  Upon request from 1.5 to 6 bar or from 5 to 12 bar;
  Over 12 bar kindly contact us.

Performances

It is a modern, reliable, simple and sturdy instrument which can be completely disassembled from the top. The adjustment is given by a very low variation of the downstream pressure.
In clean waters, **the reducer closes perfectly at rate null**, with a consequent negligible over pressure.

Cavitation inspection

Figure b shows three working sections:
Red section: cavitation risk due to excessive drop of pressure;
Green section: normal operation;
Yellow section: no operation (physically impossible).



Installation

The reducer must be installed in a level position in order to obtain maximum efficiency and to avoid wear of the moving parts. However, a standing position set-up is also feasible.
We recomend moreover accurate cleaning of the water pipe before installation thus avoiding damage the inside seatings caused by foreign bodies such as earth, pebbles, stones or other building materials,.
Take care that the pit is sufficiently large and easy accessible for the maintenance operations and the control of manometers. The pit must be equiped with an adequate drainage for the cleaning of the filter.
The positioning of the reducer must be carried out following of the arrow moulded on the body.
For maintenance purposes also place two gate-valves and a filter before the reducer (see fig. d).
It should be taken into consideration also that when the waterpipe ascends or is level it is advisable to position an air release valve upstream of the reducer. If the waterpipe instead descends the air release valve must be placed downstream. Notice: a safety valve must always be placed downstream of the reducer.

Picture d - assembly diagram of the VRCD reducer

1) Gate valve
2) Y filter - our fly16
3) Pressure reducer - our vrcd
4) Anti-extraction flange
5) Safety valve against water hammering.

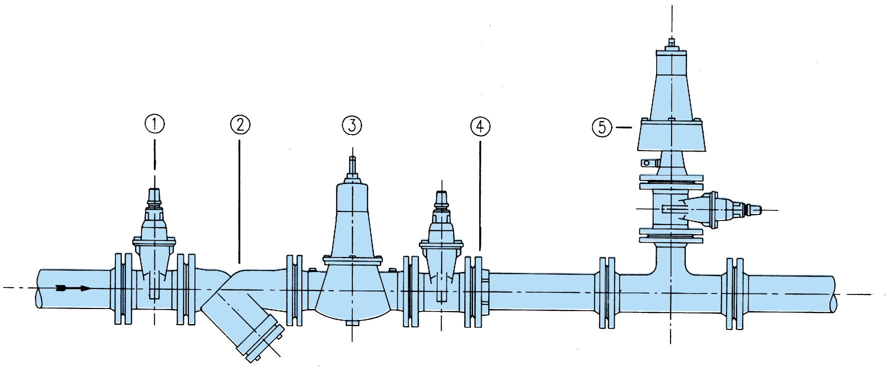
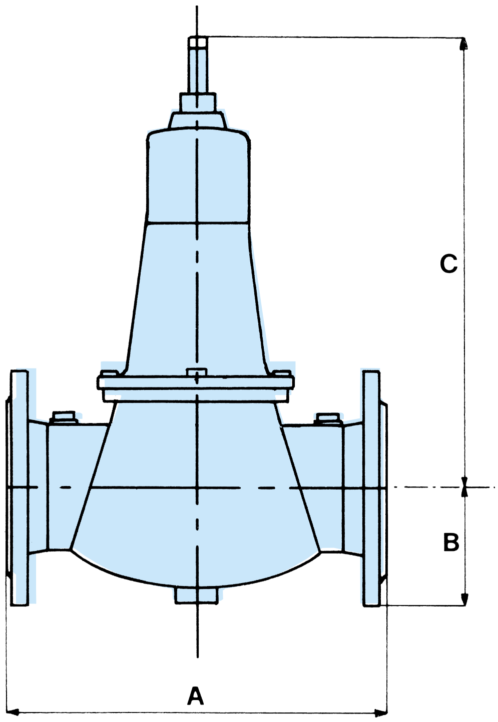


Fig. d



DN	50	65	80	100	125	150
A	230	290	310	350	400	450
B	83	93	100	117	135	150
C	280	320	350	420	590	690
Pesi	12	19	24	34	-	74

Specifications

PN10/16/25/40

Body and cap: GS400-12 coating by means of epossy-polyester powder
Cap: GS400-12
Spring: 55sicr6
Upper seal bushing: bronze
Lower seal ring nut: bronze
Seat seal: stainless steel
Obturator: stainless steel/brass
Packing & o-ring: nbr
Tightening screw & drive: stainless steel
Nuts and bolts: stainless steel
Sliding shoes (ND 125/150): ptfe
Drive stopper: brass

Conformity to standards:
ISO 5752 series 1, DIN 3202, NF 29305-1.

Strada S.Giuseppe loc. Ponteghiara, 15 - 43039 Salsomaggiore Terme - Tel. +39-0524-523978 - Fax +39-0524-524031 - e-mail info@csasrl.it