Pietro Fiorentini

Dival-**SQD**

Pressure regulator with cartridge filters

Classification and Area of Application

The **Dival-SQD** is a downstream pressure regulator, self actuated, spring loaded for medium and low pressure applications it equipped with incorporated relief valve against temporary overpressure.
Its innovative feature is represented by the particular geometry of the valve body. This allowed creating a regulator that can be integrated with a high flow rate and low pressure loss cartridge filter. This construction concept allows creating pressure reduction assemblies, to be mounted within a cabinet or even to “on board of the machine”, having extremely reduced overall dimensions, compared to the conventional groups assembled in a conventional manner.
It allows remarkable savings in the assembly installation, in terms of development of the connection pipes, bends and special pieces, as well as in terms of a smaller number of man-hours needed for assembly operations.

It is suitable for gaseous, non-corrosive, previously filtered fluids, and it is characterized by a quick reaction to changes in the operating conditions. Therefore, it is particularly suitable for use serving **ON/OFF** burners and in any industrial processes characterized by quick changes in the flow rate.
The constant regulated pressure and its accuracy, even in presence of significant variations of the upstream pressure and/or flow rate, make the **Dival-SQD** regulator also particularly suitable in distribution networks for civil use.

The **Dival-SQD**,regulator, in its basic version, is classified according to the European standard **EN 334**, as a regulator which reacts in opening (**Fail to Open**).

It is Truly a **TOP ENTRY** design, which confers to the regulator management advantages, for example the ability to performs full maintenance without uninstalling it from the connection pipe.

The **Dival-SQD**,regulator is classified according to European standard **EN 334**, as Differential Strength (DS) pressure regulator for version **SQD2** - **SQD6**, as Integral Strength (IS) pressure regulator for version **SQD1**.

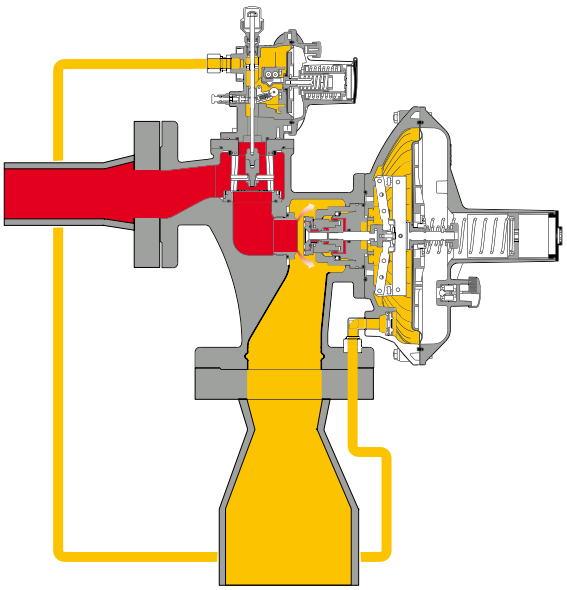


Fig.1 **Dival-SQD** - standard version

Features

Functional features:

- **Maximum inlet pressure pu max:** 6 bar
- **Maximum allowable pressure PS:** 6 bar
- **Specific maximum allowable pressure (actuator casing) PSD:** (only for SQD2 - SQD6) 0,5 bar
- **Outlet range pressure pd:** From 10 to 300 mbar
- **Accuracy class AC:** Up to 5
- **Look-up pressure class SG:** Up to 10
- **Minimum ambient temperature:** Execution up -30°C
- **Maximum ambient temperature:** +60°C (higher values on request).
- **Inlet gas temperature:** Up to -10°C + 60°C (standard execution)
  -20°C + 60°C (on request)

Design features::

- **Nominal dimensions DN inlet:**
  Dival-SQD 1: 40 (1”1/2”)
  Dival-SQD 2: 50 (2”)
  Dival-SQD 6: 50 (2”)
- **Nominal dimensions DN outlet:**
  Dival-SQD 1: 40 (1”1/2”)
  Dival-SQD 2: 50 (2”)
  Dival-SQD 6: 80 (3”)
- **Flanged connections:** PN 16; CLASS 150 RF

Materials: **

- **Body:** Spheroidal ductile iron GS 400 – 18 ISO 1083.
- **Covers:** Alluminium 46100
- **Diaphragm:** Rubberized canvas (performed by hot-pressing process).
- **Seat:** Brass
- **Sealing ring:** Nitril rubber
- **Connection fittings:** Standard execution, zinc-plated carbon steel according to DIN 2353;

REMARK: ** The materials indicated above refer to the standard version.
Different materials can be provided according to specific needs.

Modularity and accessories

The project of **Dival-SQD** regulator has been designed with a high degree of modularity that allows to incorporate, within the basic regulator, alternative devices and additional accessories.

Slam shut device model LA/...

It is a **Safety Accessory** whose task is that of blocking the gas flow if abnormal pressure conditions appear, compared to the one set during calibration of the dedicated pressure switch.
The calibration can be varied in, according to the operating needs, in the fields referred to in the table N.2 below, according to the model of pressure switch forecast.
There are two available models: LA/BP and LA/MP, the accuracy class of the block device is up to **AG up to 5**.
The slam shut device is equipped with a button for local manual control of the block operation.
The slam shut valve can be calibrated for pressure increase, **over pressure shut off (OPSO)** and/or for pressure drop, **under pressure shut off (UPSO).**
The two intervention modes can be tuned independently, using the dedicated calibration springs: a spring for the intervention of maximum pressure and a second spring for the intervention of minimum pressure.

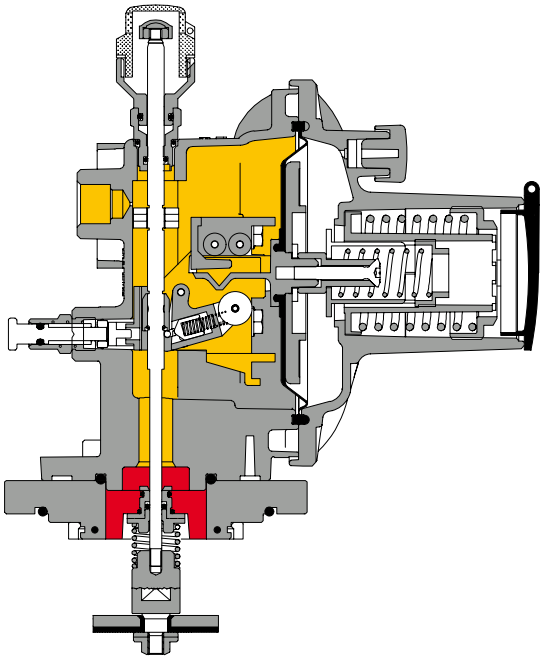


Fig.2 **Dival-SQD** - Slam shut device

Cartridge Filter

The regulators **Dival-SQD** are arranged to mount a high flow rate capacity cartridge filter with low pressure loss; the cartridge is of synthetic type with 5 microns filtration.
For **Dival-SQD** 1-2 models, the filter body is integrated in the pressure reduction unit body, allowing for considerable advantages in terms of size and ease of installation.
For the model **Dival- SQD** 6, the filter consists of a containing body in spheroidal cast iron, which is integrated in the regulator by means of a special flanged coupling.
All filters are characterized by a great accessibility to the filtering cartridge which makes maintenance and any replacement of the cartridge easy, without the need to disassemble the body of the filter from the regulator.

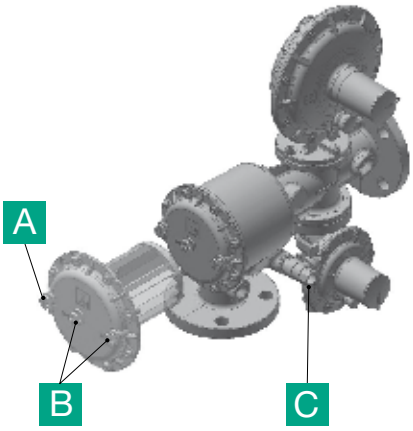
Coupling Filter / Regulator Model	
REGULATOR	SIZE FILTER CARTRIDGE
DIVAL-SQD 1	G. 0,5
DIVAL-SQD 2	G. 1
DIVAL-SQD 6	G. 2

Tab.1

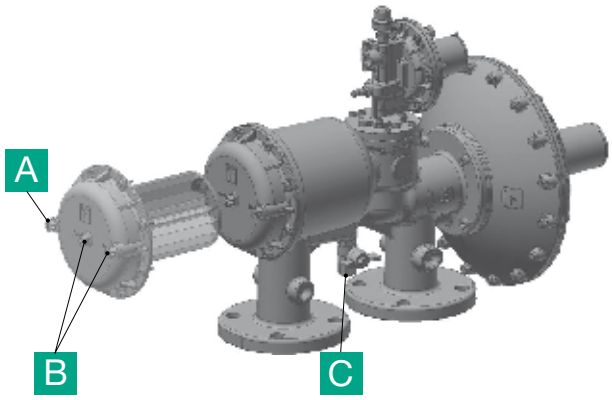
Cartridge filter

All filters version are equipped with:

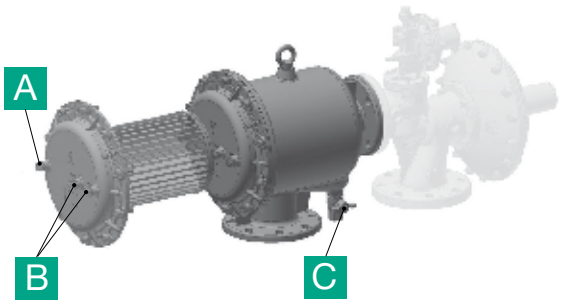
- Connections for the installation of a pressure gauge for measuring the inlet pressure (**A**)
- Connections for the installation of a differential pressure indicator (**B**)
- Drain valve (**C**)



Dival-SQD 1



Dival-SQD 2



Dival-SQD 6

Fig.3

Control heads

The regulated outlet pressure range is determined by the control head installed. The table below sums up the heads available for every size and the ranges of outlet pressure expressed in mbar.

Pressure regulator	
DIVAL-SQD 1BP	13 ÷ 100
DIVAL-SQD 1MP	101 ÷ 300
DIVAL-SQD 2	10 ÷ 300
DIVAL-SQD 6	10 ÷ 300

Tab.2

Values in mbar

Sizing of pressure Regulator

In general, the choice of a regulator is made based on the calculation of the flow rate determined by the use of formulas and on the flow rate coefficients (Cg or KG) as indicated by the EN 334 standard.

However, the analytical method of calculation is not suitable for a correct sizing of the regulator, because it is necessary not to consider the whole theoretical flow rate obtainable from the analytical method, but only a percentage of it, which varies from case to case, depending on the desired class of accuracy and on the available pressure drop.
It is therefore more appropriate to refer to the following tables that provide directly the value of the flow rates that can be distributed by the regulator considered, depending on the reference operating conditions.
The table provide the value of the flow rate, expressed in Stmc/h, of a natural gas having a relative density to air of 0.61 and at a temperature of 15 °C, with AC 10.

Flow rate (Stm3/h NG)

Dival SQD												
	Outlet pressure pd 20 (mbar)			Outlet pressure pd 70 (mbar)			Outlet pressure pd 130 (mbar)			Outlet pressure pd 300 (mbar)		
Inlet pressure Pu (bar)	Dival SQD 1	Dival SQD 2	Dival SQD 6	Dival SQD 1	Dival SQD 2	Dival SQD 6	Dival SQD 1	Dival SQD 2	Dival SQD 6	Dival SQD 1	Dival SQD 2	Dival SQD 6
0,5	105	240	530	120	230	485	105	220	450	95	200	350
0,7	130	290	590	140	270	600	140	260	580	120	250	475
1	200	370	740	190	370	740	180	380	740	160	380	690
2	230	530	810	320	530	1270	320	550	1160	310	570	1370
3	230	580	900	420	600	1580	440	620	1480	450	640	1790
4	230	630	980	420	650	1790	475	690	1900	475	720	2215
6	230	790	1055	420	820	2000	475	840	2430	475	880	2640

Tab.3

For operating conditions and dimensions not covered by the tables above please contact our customer care.

For different gases and for natural gas with a different density than 0,61shall be applied the correction coefficients resulting from the following formula:

$$Fc = \sqrt{\frac{175.8}{S \times (273.16 + t)}}$$

S = relative density to air

Correction factors FC		
Type of gas	**Relative density**	**Fc factor**
Air	1.0	0.78
Propane	1.53	0.63
Butane	2.0	0.55
Nitrogen	0.97	0.79
Oxygen	1.14	0.73
Carbon dioxide	1.52	0.63

Tab.3

The chart show the correction factors FC valid for above mentioned gas at15 °C and the relative density declared..

Flow rate conversion				
Stm^3/h	x	**0,94795**	=	**Nm^3/h**

Tab.5

Typical connection diagrams

The following examples are provided as a recommendation to get the best performance from the regulator **DIVAL-SQD**.

Dival-SQD 1: only with internal sensing line

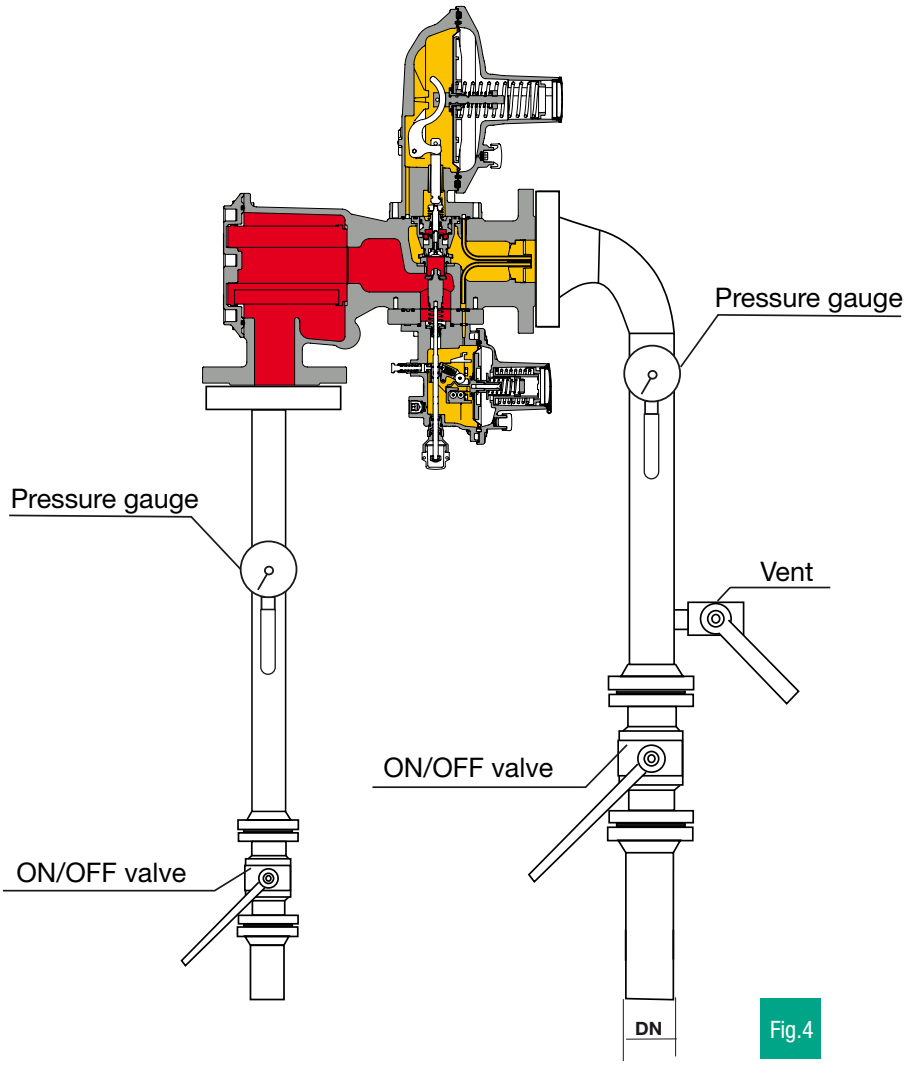


Fig.4

Inlet pressure

Outlet pressure

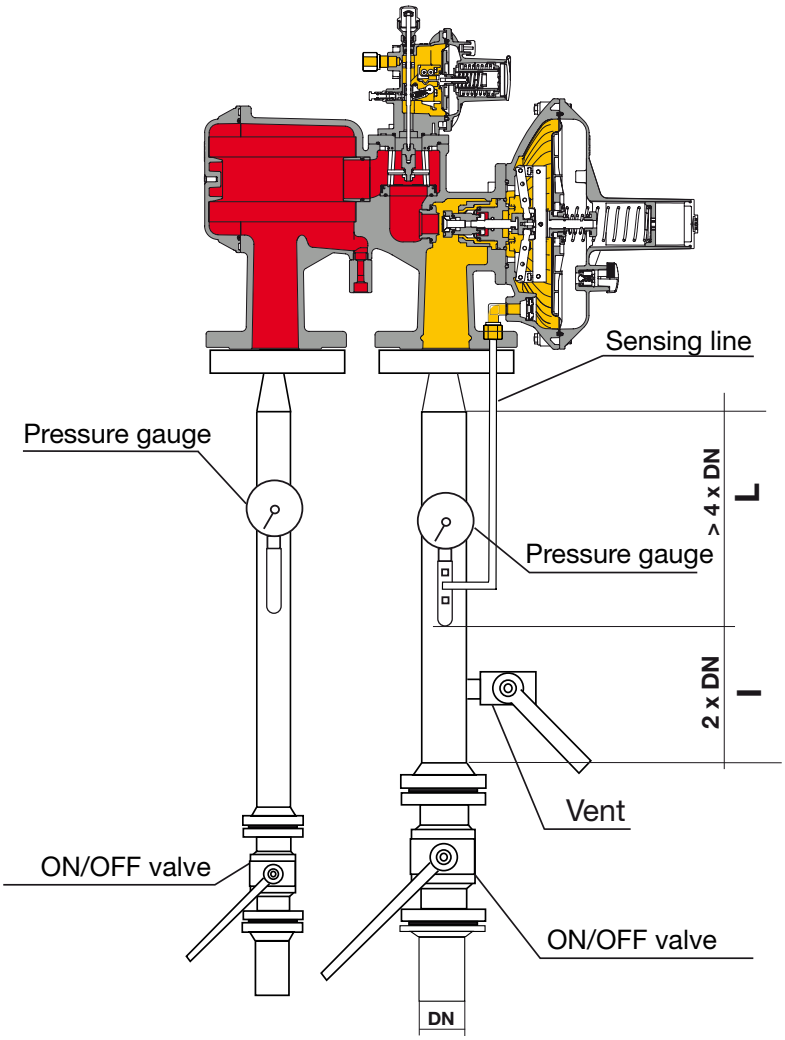


Fig.5

Inlet pressure

Outlet pressure

Dival-SQD 6

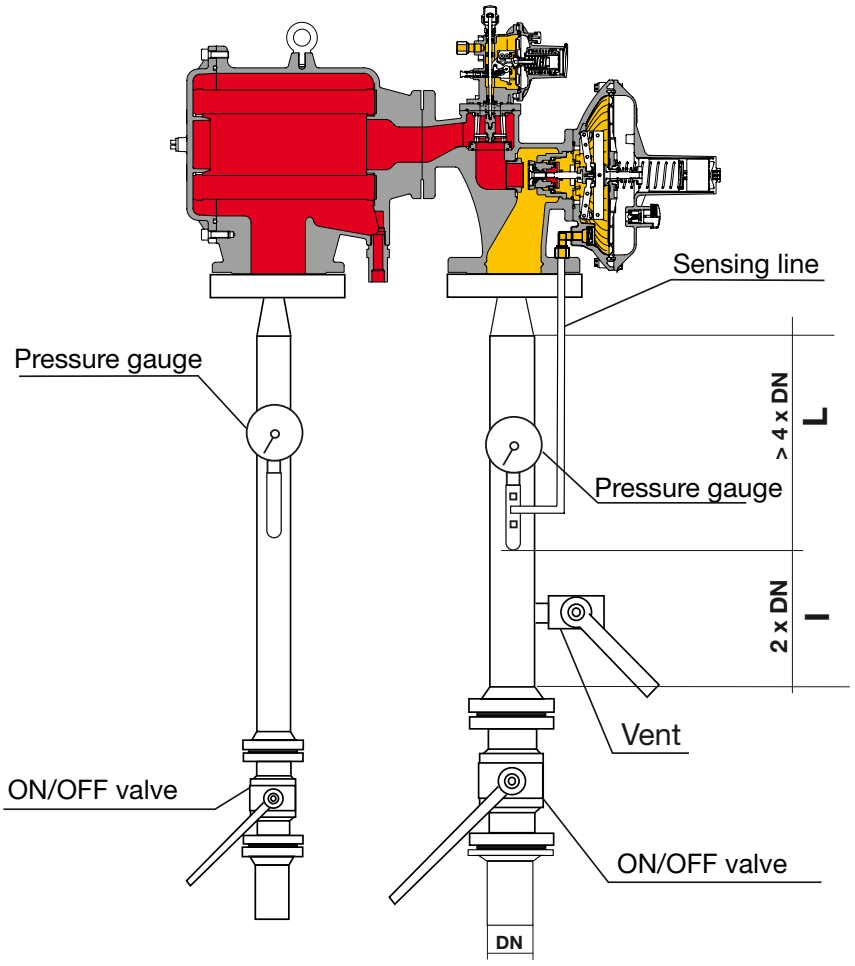


Fig.6

Inlet pressure

Outlet pressure

Dimensions Dival-SQD 1

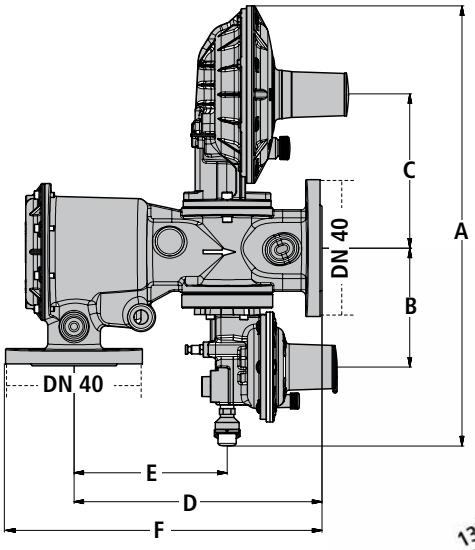


Fig.7

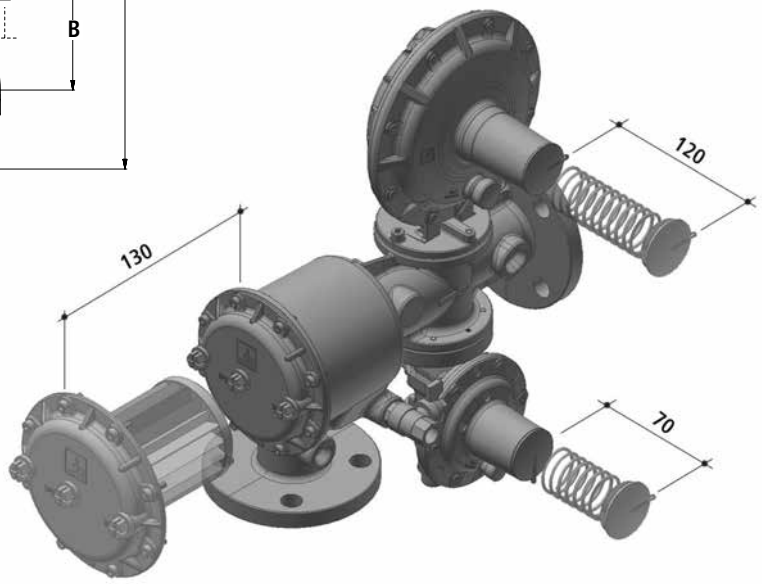


Fig.8

Dimensions in mm	
A	460
B	125
C	160,5
D	259
E	160
F	330,5

Tab.6

Weight in KGF	
Regulator with slam shuth	12

Tab.7

Dimensions Dival-SQD 2

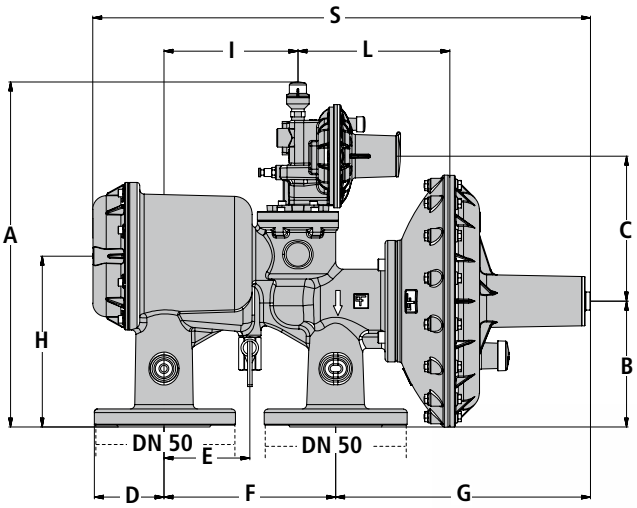


Fig.9

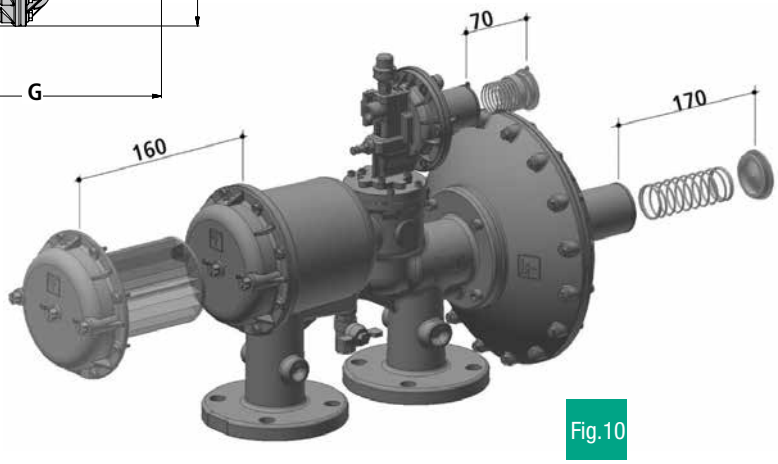


Fig.10

Dimensions in mm	
A	384
B	140
C	161,5
D	77,5
E	95,5
F	191
G	283
H	190
I	149
L	169
S	553,8

Tab.8

Weight in KGF	
Regulator with slam shuth	21

Tab.9

Dimensions Dival-SQD 6

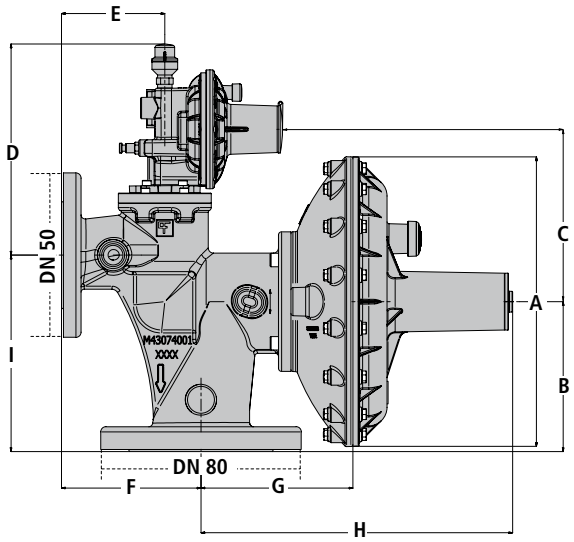


Fig.11

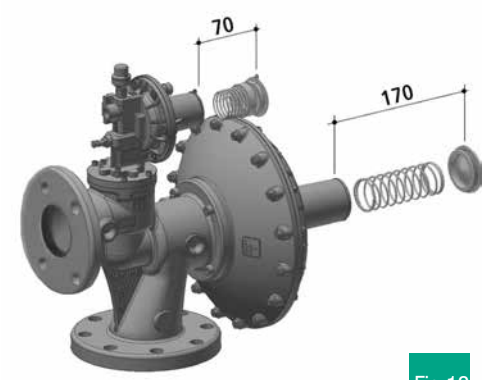


Fig.12

Dimensions in mm	
A	280
B	145
C	167
D	205
E	100
F	135
G	147
H	303,5
I	190

Tab.10

Weight in KGF	
Regulator with slam shuth	18

Tab.11

Dimensions Dival-SQD 6 + filter serie 51301F4

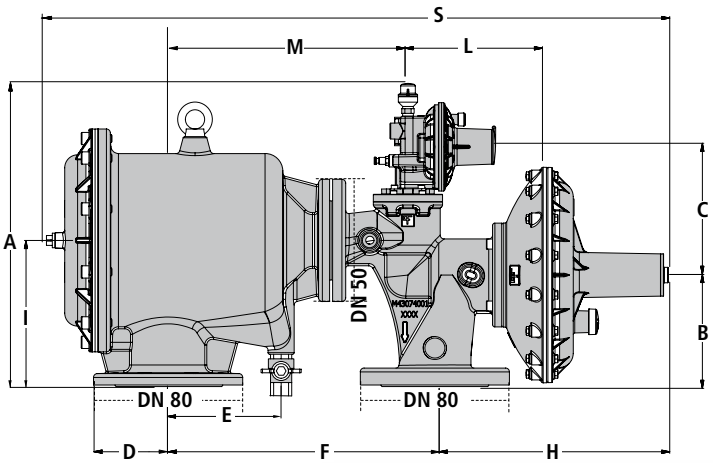


Fig.13

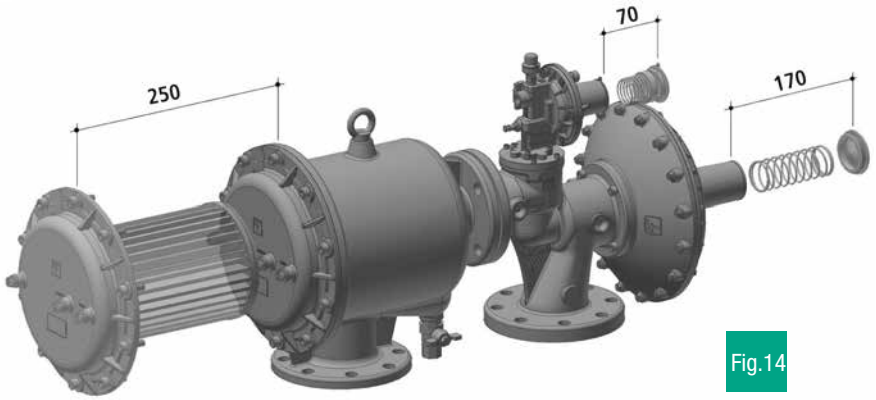


Fig.14

Dimensions in mm	
A	395
B	145
C	167
D	97
E	147
F	347
H	303,5
I	190
M	312
L	182
S	810

Tab.12

Weight in KGF	
Regulator with slam shuth	18+24

Tab.13

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The data are not binding. We reserve the right to make eventual changes without prior notice.

CT-s 626-E April 20