MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 · ISO 14001
ISO 45001

EQA
Con energía hacia el futuro

# PRESSURE REGULATORS EQA S-502/503/525/527

The model S-500 is a gas or air pressure reducer regulator for a variety of aplications.

It features a protection system to keep the outlet pressure regulated by a shutoff (SSV) system that can be reseted manually (only for models 527 and 525). This system is used in cases where it isn´t possible to install a vent for safety relief.

This is a pilot-operated valve that uses fluid to operate.

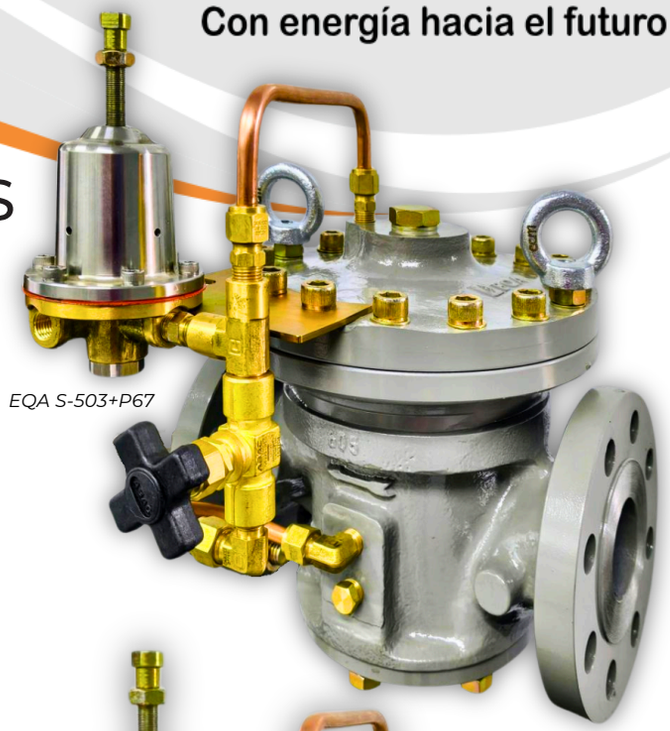
To cover all regulated outlet pressure ranges, the pilot is used according to the following characterístics:

- Low pressure from 0.160 bar to 0.5 bar. (For outlet pressures less than 0.160 bar consult sales personnel)
- Medium pressure from 0.5 bar to 7 bar.
- High pressure from 7 bar to 40 bar.

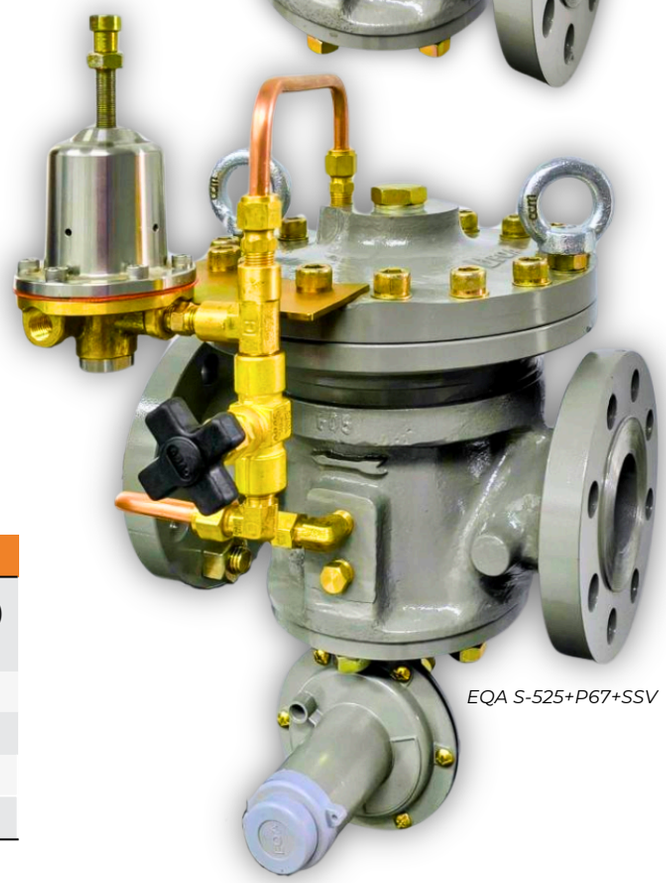
Regulators with SSV (527 and 525) work in a range of 0.160 bar to 4 bar outlet pressure.

Regulators without SSV (502 and 503) work in a range of 0.160 bar to 40 bar outlet pressure.

If required, a silencer may be added to the system according to the acoustic pressure generated by the valve.



*EQA S-503+P67*



*EQA S-525+P67+SSV*

| TECHNICAL DATA | | |
|---|---|---|
| **CONNECTIONS** | **Models 527/502** | Threaded 2" (BSP or NPT) (DN50)<br>Flange 2" ANSI B16.5 S150 |
| | **Models 525/503** | Flange 2" ANSI B16.5 S300 |
| **OPERATING TEMP** | -20°C to 60°C (-4°F to 140°F) | |
| **ACCURACY CLASS** | Up to AC 5 (5%) (1*) | |
| **CLOSURE CLASS** | Up to SG 5 (2*) | |

| WORKING RANGE | 527 | 525 | 502 | 503 |
|---|---|---|---|---|
| **Maximum Inlet Pressure (bar)** | 19 | 36 | 19 | 50 |
| **Maximum Outlet Pressure (bar)** | 4 | 4 | 15 | 40 |

*(1*) Depending on the process.*
*(2*) Depending on the outlet presure.*

| MATERIALS | |
|---|---|
| **MAIN BODY** | (502/527) Nodular cast iron ASTM A 536 GR. 65- 45-12 (IRAM 700 42012).<br>(503/525) Cast steel ASTM A-216 WCB. |
| **DIAPHRAGM** | NBR |
| **SEATS** | AISI 410 Stainless steel |
| **SEALS AND GASKETS** | NBR |

## CAPACITY CHART - NATURAL GAS in Nm³/hour | Density 0.6 | (min. DP 1 bar.) - AC10

| Regulated Pressure (Bar) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Inlet Pressure (bar)** | **0.16** | **0.2** | **0.3** | **0.4** | **0.5** | **0.7** | **1** | **1.5** | **2** | **2.5** | **3** | **4** | **5** | **6** | **7** | **8** |
| **1.5** | 1500 | 1500 | 1500 | 1500 | 1500 | | | | | | | | | | | |
| **1.75** | 1650 | 1650 | 1650 | 1650 | 1650 | 1600 | | | | | | | | | | |
| **2** | 1750 | 1800 | 1850 | 1850 | 1850 | 1800 | 1700 | | | | | | | | | |
| **2.5** | 1750 | 1800 | 1850 | 2100 | 2100 | 2100 | 2100 | 1900 | | | | | | | | |
| **3** | 1750 | 1800 | 1950 | 2100 | 2250 | 2400 | 2400 | 2350 | 2100 | | | | | | | |
| **4** | 1750 | 1800 | 1950 | 2100 | 2250 | 2550 | 3000 | 3050 | 2985 | 2750 | 2400 | | | | | |
| **5** | 1750 | 1800 | 1950 | 2100 | 2250 | 2550 | 3000 | 3650 | 3650 | 3600 | 3400 | 2700 | | | | |
| **7** | | | 1950 | 2100 | 2250 | 2550 | 3000 | 3700 | 4500 | 4850 | 4800 | 4700 | 4200 | 3200 | | |
| **10** | | | | 2100 | 2250 | 2550 | 3000 | 3750 | 4500 | 5250 | 6000 | 6700 | 6650 | 6400 | 5950 | 5150 |
| **15** | | | | 2100 | 2250 | 2550 | 3000 | 3750 | 4500 | 5250 | 6000 | 7400 | 9000 | 9700 | 9700 | 9600 |
| **20** | | | | | 2250 | 2550 | 3000 | 3750 | 4500 | 5250 | 6000 | 7500 | 9000 | 12000 | 12000 | 12700 |
| **25** | | | | | 2100 | 2500 | 2900 | 3700 | 4450 | 5200 | 5900 | 7400 | 8900 | 12000 | 12000 | 13500 |

Regulator with and without SSV

Regulator without SSV

Note: Consult flow rates for high outlet pressures greater than 8 Bar.

## CAPACITIES WITH OTHER GASES CONVERSION

In order to calculate capacities with other gases, multiply the values of the chart by K factor.

| GAS | DENSITY | K FACTOR |
|---|---|---|
| Butane | 2 | 0.55 |
| Propane (LPG) | 1.5 | 0.63 |
| Carbonic Anhydride | 1.5 | 0.63 |
| Oxygen | 1.1 | 0.74 |
| Air | 1 | 0.77 |
| Nitrogen | 0.97 | 0.79 |

| GAS | DENSITY | K FACTOR |
|---|---|---|
| Acetylene | 0.9 | 0.82 |
| Ammonia | 0.59 | 1.02 |
| Hydrogen | 0.07 | 3 |
| Biogas* | max 1.2 | 0.7 |
| | min 0.8 | 0.75 |

**The proper operation is guaranteed only for treated Biogas (Low content of sulfur)*

## TECHNICAL SPECIFICATION CALCULATIONS

### SIZING ACCORDING TO EN-334 STANDARD

**(Standard conditions STP / 15°C (59°F) / 1,01325 bar)**

The S-500 line operates with a flow coefficient (Cg) according to the need in percentages, in accordance with the following table:

| |
|---|
| Cg 1296 (100%) |
| Cg 648 (50%) |
| Cg 388,8 (30%) |

*The reduced CG of 30% and 50% is achieved through an internal silencer.*

To calculate process necessary CG, consider following information:

| |
|---|
| Q= Flow in Sm³/h |
| P1= Absolute inlet pressure |
| P2= Absolute outlet pressure |
| d= Density relative to air |
| t= Temperature in °C |

### CRITICAL CONDITION P1 ≥ 2P2

$$Cg = \frac{Q}{6,97 \times P_1} \times \sqrt{d \times (273,15 + t)}$$

### SUBCRITICAL CONDITION P1 < 2P2

$$Cg = \frac{Q}{13,94} \times \sqrt{\frac{d \times (273,15 + t)}{P_2 \times (P_1 - P_2)}}$$

### VELOCITY

- To guarantee regulator proper performance, **velocity on pressure connections** (see "Connections A, B and C", in section "Installation") must be less than following values:

| |
|---|
| Vmax= 30 m/s for Pd > 5 bar |
| Vmax= 25 m/s for 0.5 < Pd < 5 bar |
| Vmax= 15 m/s for Pd < 0.5 bar |

  - It's recommended to oversize the regulator 20% to avoid operation at 100% opening.
  - It's recommended that regulator does not operate below 5% of shutter opening to avoid oscillations in process.
  - Should you have any questions concerning the regulator sizing, feel free to reach out to our sales department.
- Recommended maximum velocity of gas at regulator outlet flange shall be calculated using the following formula:

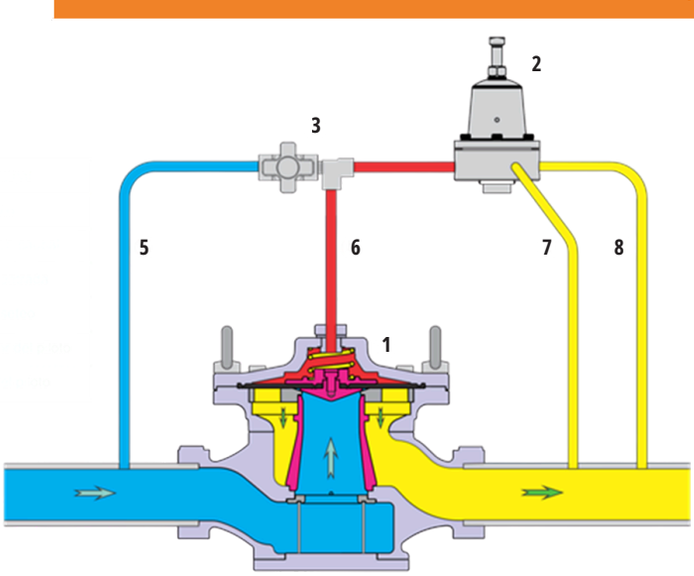
$$v = \frac{345.92Q(1 - 0.002Pd)}{DN^2(Pd + Pb)}$$

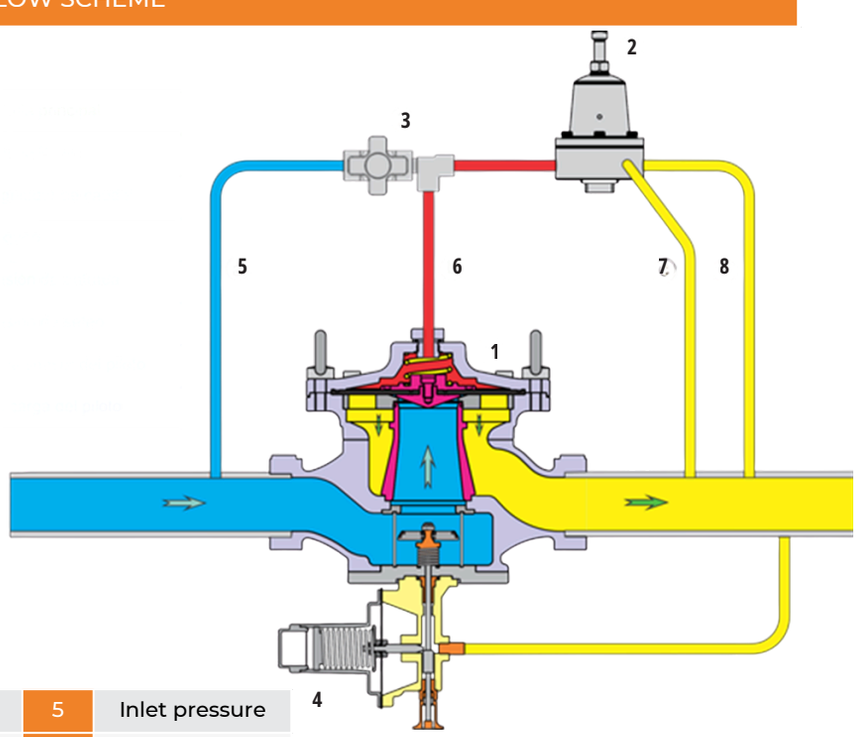
| ALLOWABLE VELOCITY | |
|---|---|
| DOWNSTREAM PRESSURE Pd (bar g) | MAX. ALLOWABLE VELOCITY V (m/s) |
| 1 | 250 |
| 3 | 230 |
| 5 and higher | 200 |

### NOISE LEVEL

To establish the maximum gas velocity recommendations according to IEC-60534-8-3, contact our sales department to request the calculation spreadsheet.
It's very important to keep gas velocity on shutter outlet below 0,5 mach to guarantee right performance, useful life and maximum noise conditions on regulator. To learn about this condition, request regulator technical sheet to seller according necessity.

## FLOW SCHEME




| | | | |
|---|---|---|---|
| 1 | Main valve | 5 | Inlet pressure |
| 2 | Pilot valve | 6 | Set pressure |
| 3 | Flow regulator | 7 | Pilot sensor line |
| 4 | SSV | 8 | Pilot discharge |

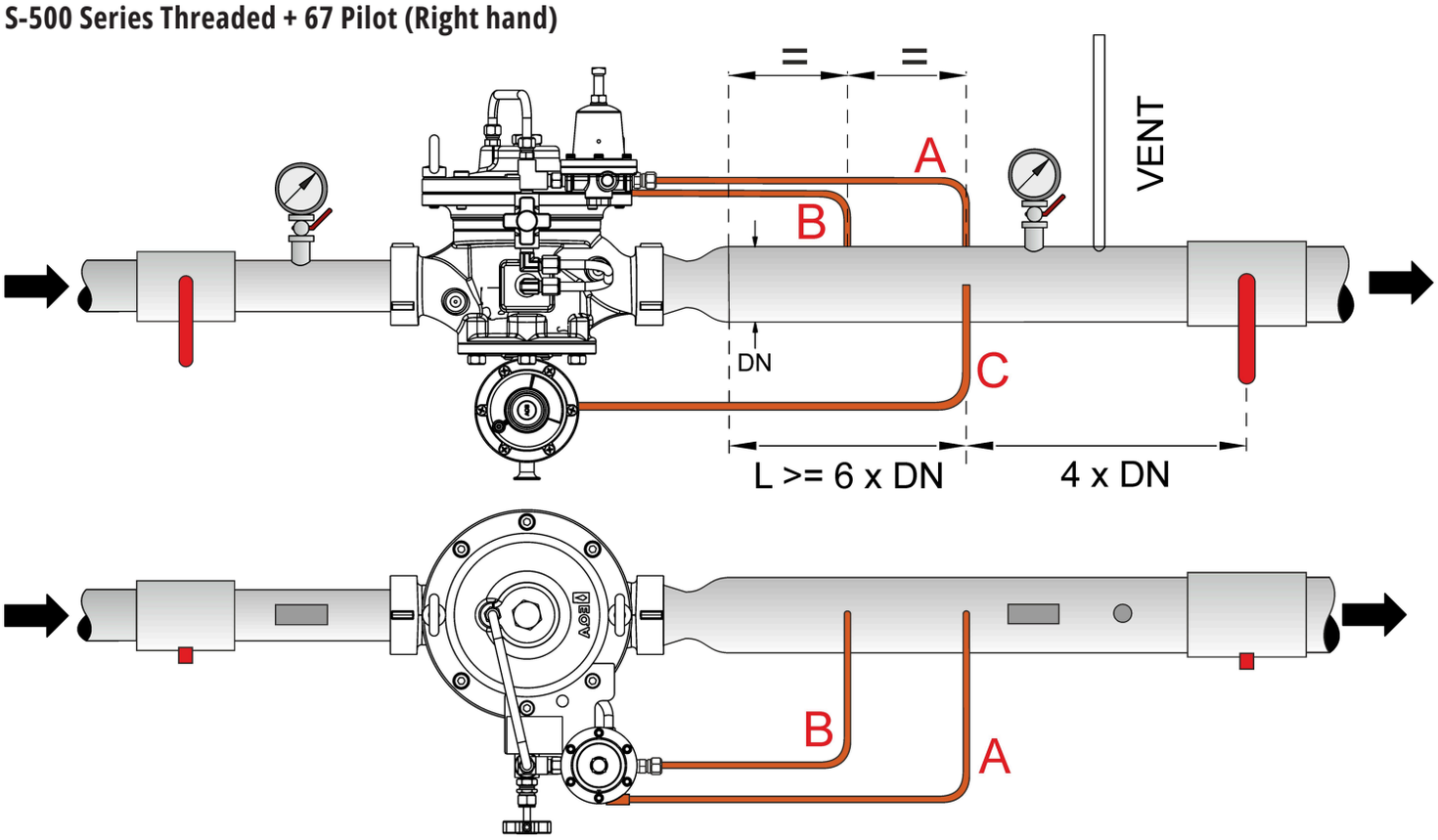
## INSTALLATION

The installation position is as indicated in the installation diagram.

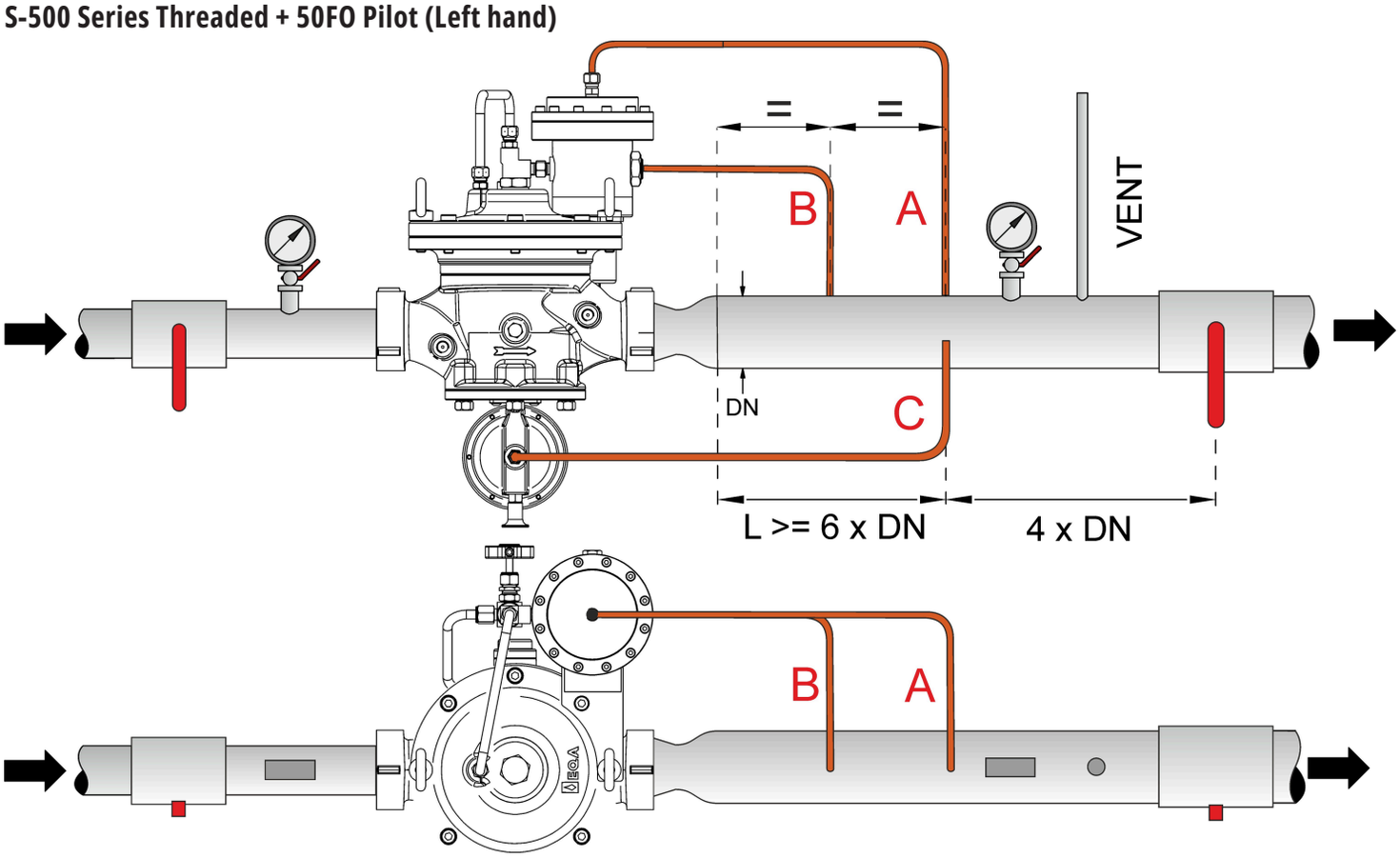
Make sure that the flow follows the direction indicated by the arrow on the body.

**Connections A, B and C are to be installed by the user.**
The tube diameter for connections A and B is 3/8" x 1 mm, the tube for SSV connection C is 1/4" x 0.8 mm.
Ensure mínimum distances as per the installation diagram.

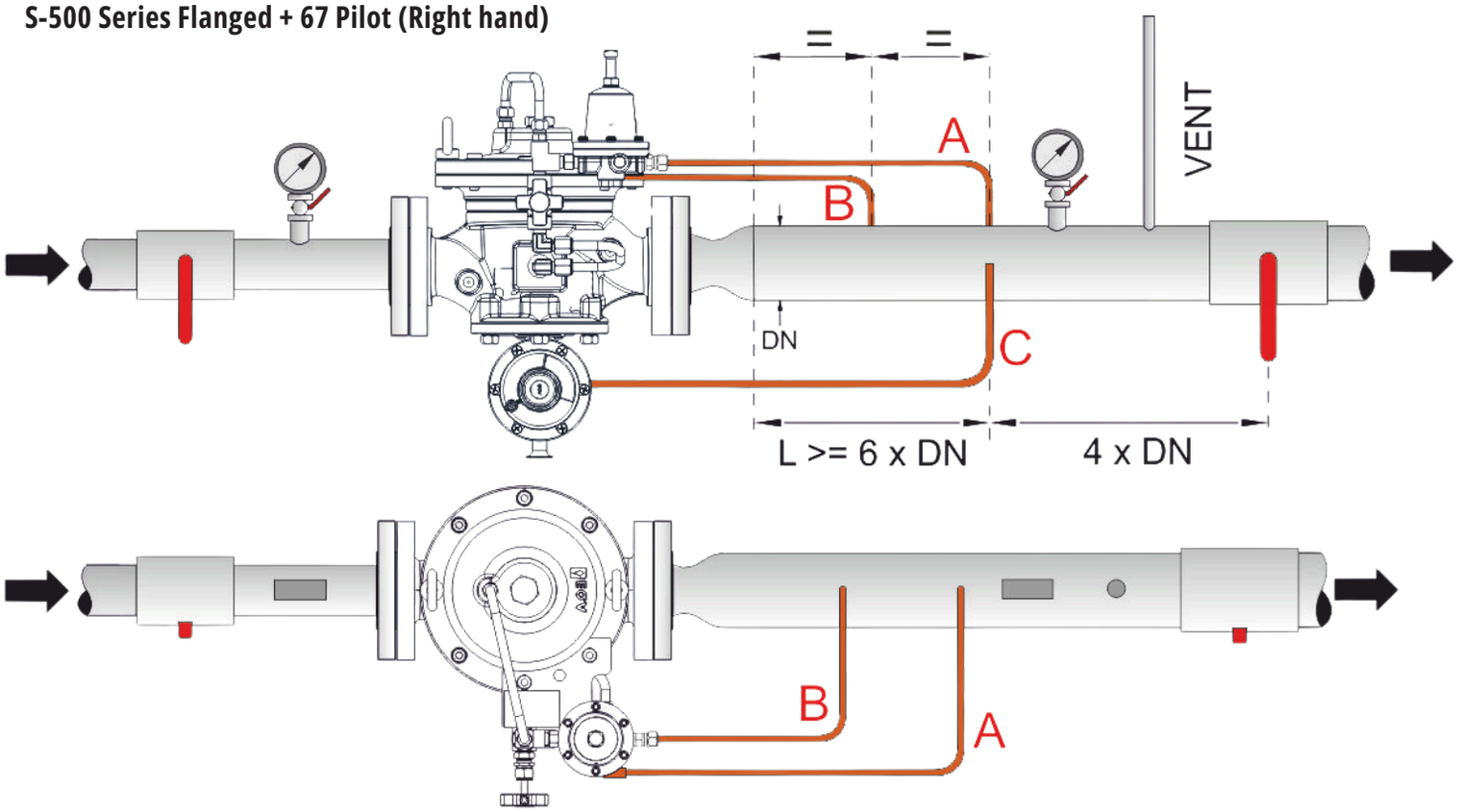
### S-500 Series Threaded + 67 Pilot (Right hand)



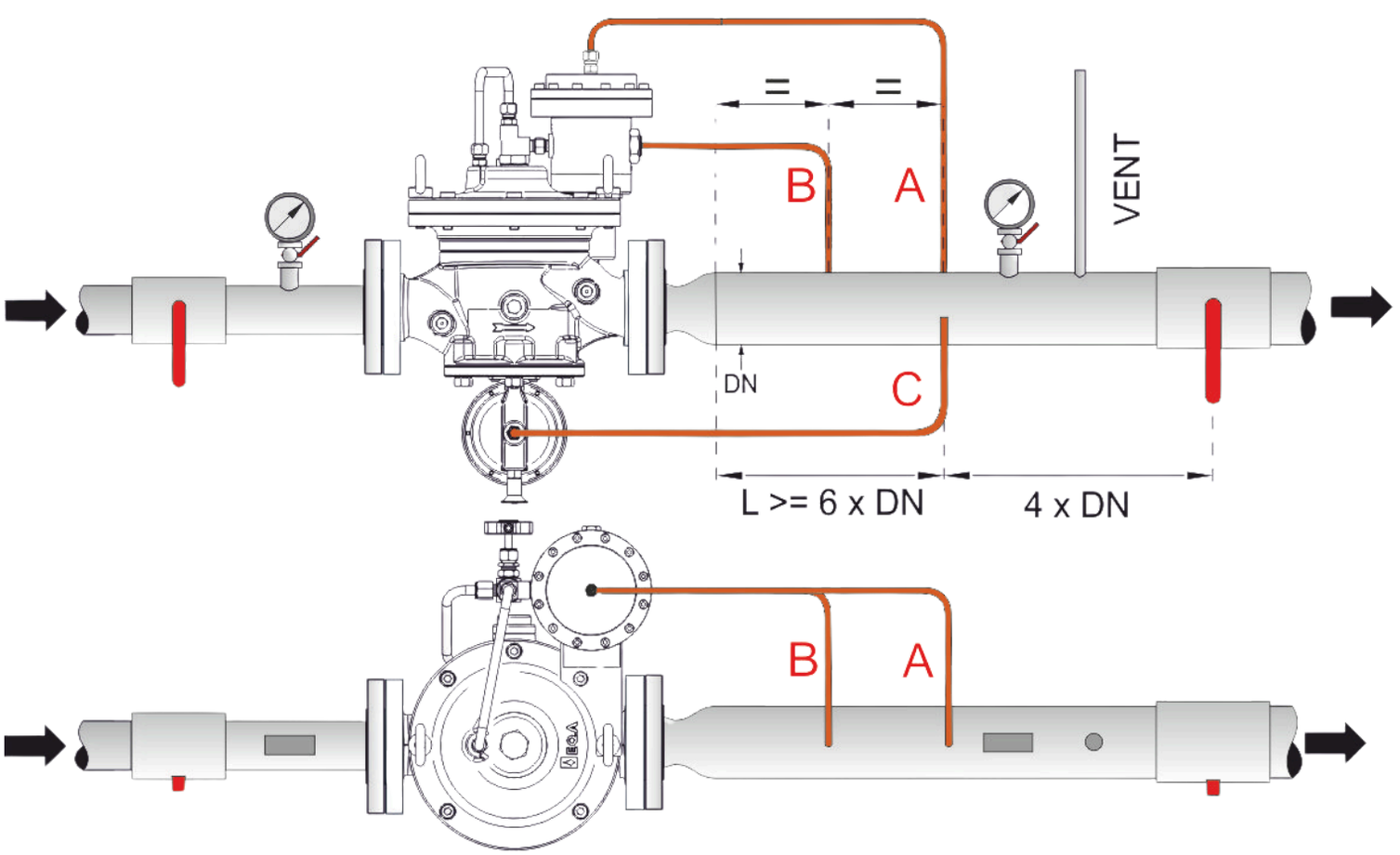

### S-500 Series Threaded + 50FO Pilot (Left hand)



## S-500 Series Flanged + 67 Pilot (Right hand)



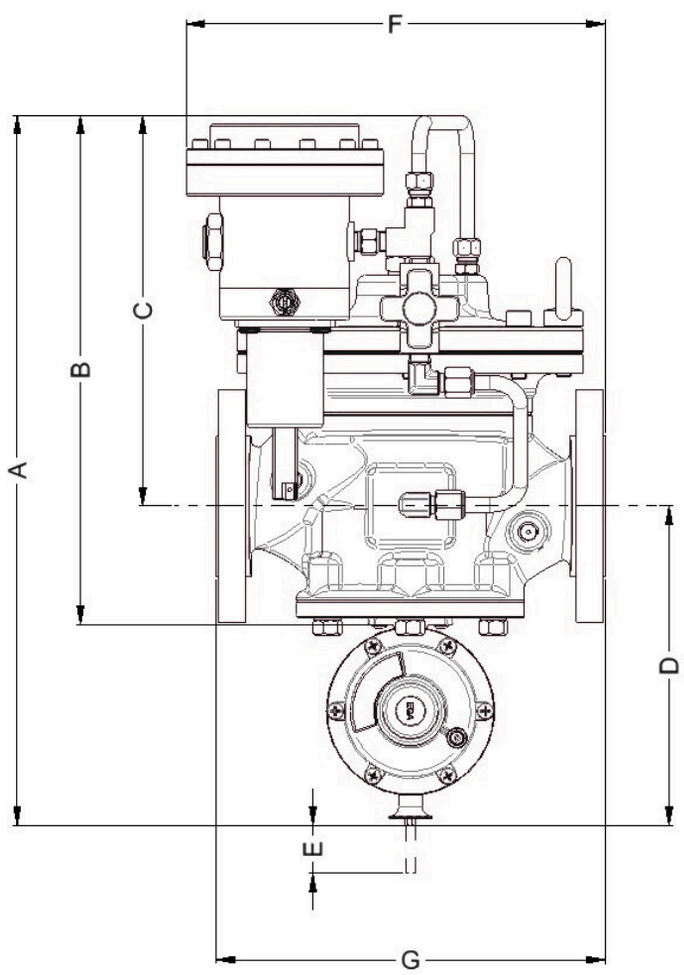

## S-500 Series Flanged + 50FO Pilot (Left hand)

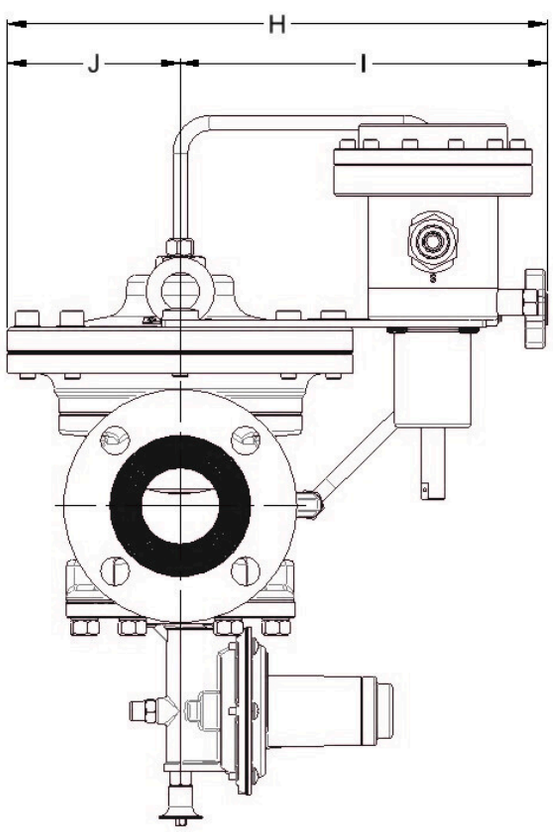


## GENERAL SIZING (mm) AND WEIGHT (Kg and lbs)

| | | DIMENSIONS | | | | | | | | | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E* | F | G | H | I | J | Kg | lbs |
| THREADED (BSP / NPT) | 527 + P67 + SSV | 463 | 332 | 254 | 208 | 100 | 266 | 294 | 349 | 236 | 113 | 25 | 55 |
| | 527 + 50FO + SSV | 503 | 372 | 255 | 248 | 100 | 274 | 294 | 353 | 240 | 113 | 28 | 62 |
| | 502 + P67 | - | 332 | 254 | - | - | 266 | 294 | 349 | 236 | 113 | 24 | 53 |
| | 502 + 50FO | - | 372 | 255 | - | - | 274 | 294 | 353 | 240 | 113 | 27 | 60 |
| FLANGED (#150) | 527 + P67 + SSV | 463 | 332 | 254 | 208 | 100 | 266 | 254 | 349 | 236 | 113 | 36 | 80 |
| | 527 + 50FO + SSV | 503 | 372 | 255 | 248 | 100 | 274 | 254 | 353 | 240 | 113 | 36 | 80 |
| | 502 + P67 | - | 332 | 254 | - | - | 266 | 254 | 349 | 236 | 113 | 34 | 75 |
| | 502 + 50FO | - | 372 | 255 | - | - | 274 | 254 | 353 | 240 | 113 | 34 | 75 |
| FLANGED (#300) | 525 + P67 + SSV | 470 | 339 | 258 | 212 | 100 | 250 | 267 | 349 | 236 | 113 | 36 | 80 |
| | 525 + 50FO + SSV | 510 | 379 | 298 | 212 | 100 | 280 | 267 | 349 | 240 | 113 | 36 | 80 |
| | 503 + P67 | - | 339 | 259 | - | - | 250 | 267 | 353 | 236 | 113 | 34 | 75 |
| | 503 + 50FO | - | 379 | 299 | - | - | 280 | 267 | 353 | 240 | 113 | 34 | 75 |

(E*) A minimum 10 cm clearance should be maintained between the Models 525 / 527 base and the floor to ensure easy access to the shutoff valve.



## FLOW RATE CONVERSION

| TO OBTAIN | CUBIC FOOT PER HOUR | CUBIC METER PER HOUR | CUBIC FOOT PER DAY | CUBIC METER PER DAY |
|---|---|---|---|---|
| **MULTIPLY** | **(Scf/h)** | **(Scm/h)** | **(Scf/d)** | **(Scm/d)** |
| **Cubic foot per hour** | 1 | 0.028 | 24 | 0.672 |
| **Cubic meter per hour (15°C, 1.01325 bara)** | 35.71 | 1 | 857.04 | 24 |
| **Cubic foot per day** | 0.0417 | 0.0012 | 1 | 0.028 |
| **Cubic meter per day** | 1.4879 | 0.0417 | 35.71 | 1 |

## UNIT CONVERSION

| TO OBTAIN | POUNDS PER SQUARE INCH | INCHES OF WATER COLUMN | MILIMETERS OF WATER COLUMN | INCHES OF MERCURY | MILIMETERS OF MERCURY | BAR | MILIBAR | KILOGRAMS PER SQUARE CENTIMETER | KILOPASCALS |
|---|---|---|---|---|---|---|---|---|---|
| **MULTIPLY** | **psi** | **in H2O** | **mm H2O** | **in Hg** | **mm Hg** | **bar** | **mbar** | **Kg/cm²** | **Kpa** |
| **psi** | 1 | 27.68 | 703.1 | 2.036 | 51.7 | 0.06895 | 68.95 | 0.0703 | 6.895 |
| **in H2O** | 0.0361 | 1 | 25.4 | 0.07355 | 1.87 | 0.002491 | 2.491 | 0.00254 | 0.22491 |
| **mm H20** | 0.0014 | 0.0394 | 1 | 0.00289 | 0.07355 | 0.000098 | 0.0981 | 0.0001 | 0.00981 |
| **in Hg** | 0.4911 | 13.6 | 345.4 | 1 | 25.4 | 0.03386 | 33.86 | 0.03453 | 3.386 |
| **mm Hg** | 0.01934 | 0.535 | 13.6 | 0.03937 | 1 | 0.001333 | 1.333 | 0.00136 | 0.1333 |
| **bar** | 14.5 | 401.5 | 10198.1 | 29.53 | 750.06 | 1 | 1000 | 1.02 | 100 |
| **mbar** | 0.0145 | 0.4015 | 10.1981 | 0.02953 | 0.7501 | 0.001 | 1 | 0.00102 | 0.1 |
| **Kg/cm²** | 14.22 | 393.7 | 10000 | 28.96 | 735.58 | 0.9807 | 980.7 | 1 | 98.07 |
| **Kpa** | 0.145 | 4.015 | 101.98 | 0.2953 | 7.501 | 0.01 | 10 | 0.0102 | 1 |

*At EQA, we strive to minimize our environmental impact through sustainable and responsible practices. Therefore, we encourage you to join our commitment and, at the end of the product's lifecycle, adhere to the current Municipal, Provincial, and National regulations regarding the classification, recycling, destruction, or disposal of the product, spare parts, non-reusable parts, and packaging. By doing so, we prevent environmental damage and promote reuse and recycling whenever possible. Thank you for your commitment and efforts in joining these actions.*

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**DISTRIBUIDOR** | DISTRIBUTOR



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