



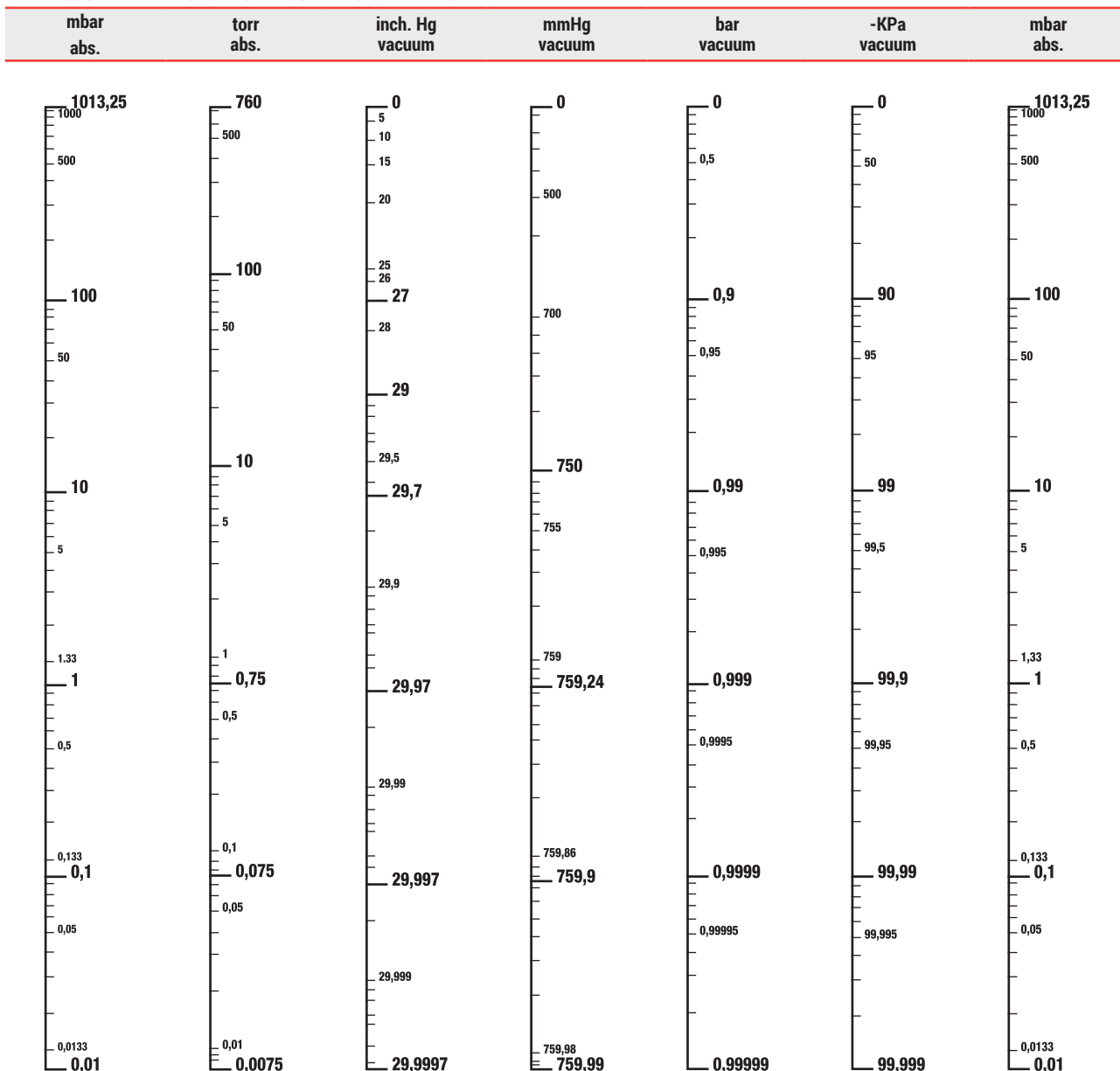
# VACUUM MEASUREMENT, CONTROL AND ADJUSTMENT INSTRUMENTS

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## CONVERSION TABLES

VACUUM AND PRESSURE UNIT CONVERSION TABLES



## PRESSURE MEASUREMENT UNIT CONVERSION FACTORS (ABSOLUTE VALUES)

PRESSURE MEASUREMENT UNIT CONVERSION FACTORS (ABSOLUTE VALUES)

|                            |   | = mbar                  | = bar                   | = torr                  | = inch. Hg              | = psi (lbf/in <sup>2</sup> ) | = atm                    | = Kg/cm <sup>2</sup> (at) | = mm H <sub>2</sub> O | = m H <sub>2</sub> O     | = Pa (N/m <sup>2</sup> ) |
|----------------------------|---|-------------------------|-------------------------|-------------------------|-------------------------|------------------------------|--------------------------|---------------------------|-----------------------|--------------------------|--------------------------|
| mbar                       | x | 1                       | 10 <sup>-3</sup>        | 0,75                    | 2,95 x 10 <sup>-2</sup> | 14,5 x 10 <sup>-3</sup>      | 9,87 x 10 <sup>-4</sup>  | 1,02 x 10 <sup>-3</sup>   | 10,2                  | 1,02 x 10 <sup>-2</sup>  | 100,0                    |
| bar                        | x | 1000,0                  | 1                       | 750,0                   | 29,53                   | 14,6                         | 0,987                    | 1,02                      | 10197,0               | 10,19                    | 100000                   |
| torr                       | x | 1,33                    | 1,33 x 10 <sup>-3</sup> | 1                       | 3,94 x 10 <sup>-2</sup> | 1,93 x 10 <sup>-2</sup>      | 1,316 x 10 <sup>-3</sup> | 1,359 x 10 <sup>-3</sup>  | 13,59                 | 1,359 x 10 <sup>-3</sup> | 133,32                   |
| inch. Hg                   | x | 33,9                    | 33,9 x 10 <sup>-3</sup> | 25,4                    | 1                       | 0,491                        | 3,34 x 10 <sup>-2</sup>  | 3,45 x 10 <sup>-2</sup>   | 345,0                 | 0,345                    | 3386,0                   |
| psi (lbf/in <sup>2</sup> ) | x | 68,9                    | 6,89 x 10 <sup>-2</sup> | 51,7                    | 2,04                    | 1                            | 6,8 x 10 <sup>-2</sup>   | 7,03 x 10 <sup>-2</sup>   | 703                   | 0,703                    | 6897                     |
| atm                        | x | 1013,25                 | 1,013                   | 760,0                   | 30,0                    | 14,696                       | 1                        | 1,033                     | 10332                 | 10,332                   | 101325,0                 |
| Kg/cm <sup>2</sup> (at)    | x | 981                     | 0,981                   | 735,6                   | 28,96                   | 14,2                         | 0,968                    | 1                         | 10000                 | 10                       | 98067,0                  |
| mm H <sub>2</sub> O        | x | 9,81 x 10 <sup>-2</sup> | 9,81 x 10 <sup>-5</sup> | 7,35 x 10 <sup>-2</sup> | 2,89 x 10 <sup>-3</sup> | 1,42 x 10 <sup>-3</sup>      | 9,67 x 10 <sup>-5</sup>  | 10 <sup>-4</sup>          | 1                     | 10 <sup>-3</sup>         | 9,8067                   |
| m H <sub>2</sub> O         | x | 98,067                  | 9,81 x 10 <sup>-2</sup> | 73,5                    | 2,89                    | 1,42                         | 9,67 x 10 <sup>-2</sup>  | 10                        | 10000                 | 1                        | 9806,7                   |
| Pa (N/m <sup>2</sup> )     | x | 0,01                    | 10 <sup>-5</sup>        | 7,5 x 10 <sup>-3</sup>  | 2,95 x 10 <sup>-4</sup> | 1,45 x 10 <sup>-4</sup>      | 9,87 x 10 <sup>-6</sup>  | 1,02 x 10 <sup>-5</sup>   | 0,102                 | 1,02 x 10 <sup>-4</sup>  | 1                        |

Example: To transform 10 mbar in Torr = 10 x 0,75 = 7.5 Torr

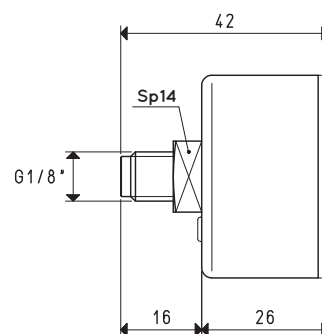
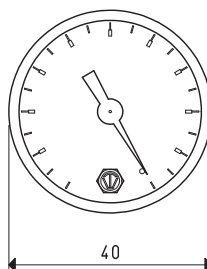
## VACUUM AND PRESSURE GAUGES

The measurement method of our vacuum gauges is based on the principle of the Bourdon spring (Eugène Bourdon, France, 1808 – 1884).

It is made using section tubes in special copper alloy, one end is welded to the threaded pin of the vacuum-pressure gauge, thus forming a single body with it, while the other closed end is free. As the vacuum or the pressure inside increases, it tends to shift from the initial position (Bourdon effect). The movement of the free end of the spring determines the vacuum-pressure measurement. For easier reading, this movement is amplified by means of a connection lever and transmitted to the pointer.

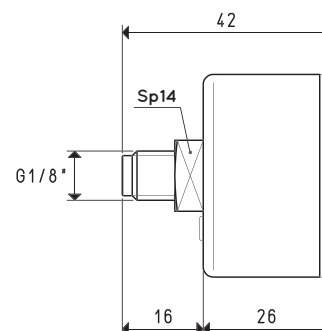
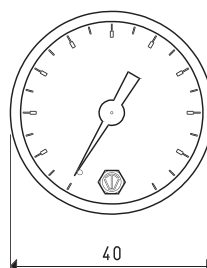
Everything is contained in a sturdy case made from different materials according to the function of models, fastened onto a threaded fitting for connection to the system. The face and index are visible thanks to a clear plastic protective disc. They are available in various versions, with radial or coaxial connectors, with built-in or external flange, dry or glycerine filled. With the exception of the F 40 mm vacuum gauges, all other models have a double scale dial.

All the vacuum and pressure gauges we will describe on these pages are made in compliance with all the safety standards and measurement units in force in the European Union.



VACUUM GAUGE

| Item     | Scale<br>kPa | Double Scale | Admissible<br>scale error | Temperature of<br>use | Notes | Case<br>material | Weight<br>g |
|----------|--------------|--------------|---------------------------|-----------------------|-------|------------------|-------------|
| 09 03 15 | 0 ÷ -100     | --           | 2.5%                      | -10 °C ÷ +50 °C       | dry   | Black plastic    | 52          |

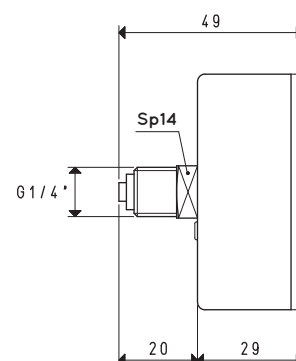
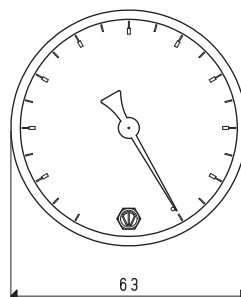


PRESSURE GAUGES

| Item     | Scale<br>bar | Double Scale | Admissible<br>scale error | Temperature of<br>use | Notes | Case<br>material | Weight<br>g |
|----------|--------------|--------------|---------------------------|-----------------------|-------|------------------|-------------|
| 09 03 20 | 0 ÷ 1.6      | 0 ÷ 23 psi   | 2.5%                      | -10 °C ÷ +50 °C       | dry   | Black plastic    | 54          |
| 09 03 25 | 0 ÷ 10       | 0 ÷ 1.0 MPa  | 2.5%                      | -10 °C ÷ +50 °C       | dry   | Black plastic    | 54          |

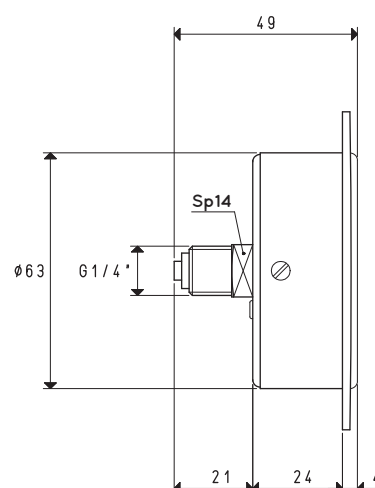
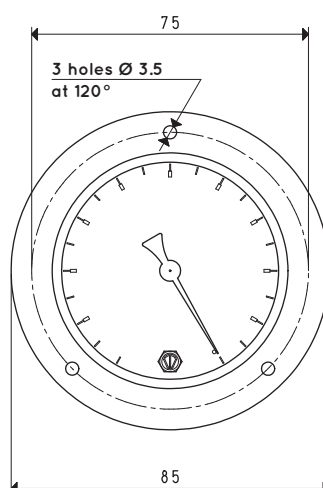


## VACUUM GAUGES



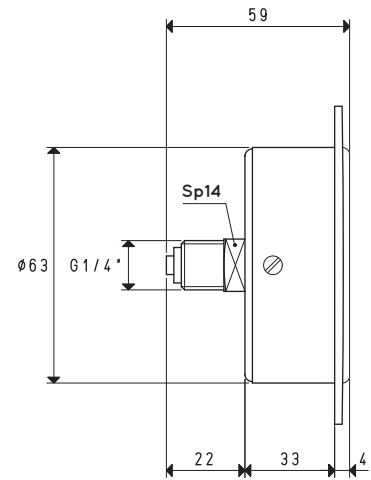
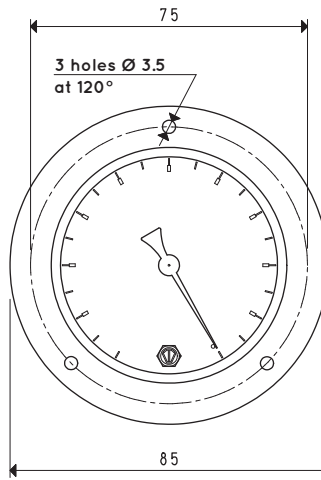
### VACUUM GAUGE

| Item     | Scale<br>mbar | Double Scale<br>KPa | Admissible<br>scale error | Temperature of<br>use | Notes | Case<br>material | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------|------------------|-------------|
| 09 03 10 | 0 ÷ -1000     | 0 ÷ -100            | 2.5%                      | -10 °C ÷ +50 °C       | dry   | black plastic    | 134         |



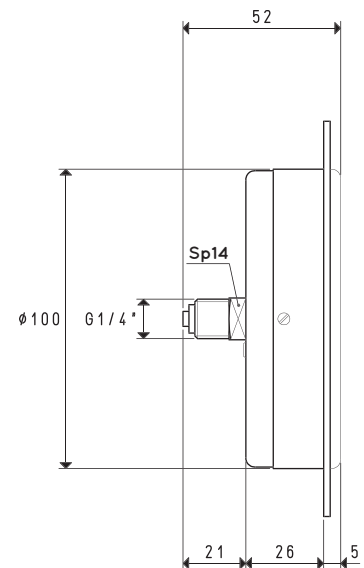
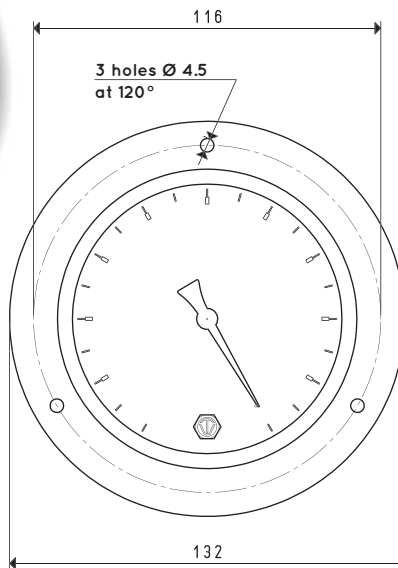
### VACUUM GAUGE

| Item     | Scale<br>mbar | Double Scale<br>KPa | Admissible<br>scale error | Temperature of<br>use | Notes | Case<br>material | Flange<br>material  | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------|------------------|---------------------|-------------|
| 09 01 10 | 0 ÷ -1000     | 0 ÷ -100            | 2.5%                      | -10 °C ÷ +50 °C       | dry   | black plastic    | chrome-plated steel | 162         |



VACUUM GAUGE

| Item     | Scale<br>mbar | Double Scale<br>KPa | Admissible<br>scale error | Temperature of<br>use | Notes             | Case<br>material | Flange<br>material  | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------------------|------------------|---------------------|-------------|
| 09 01 16 | 0 ÷ -1000     | 0 ÷ -100            | 1.6%                      | -10 °C ÷ +50 °C       | in glycerine bath | Die-cast brass   | chrome-plated steel | 348         |

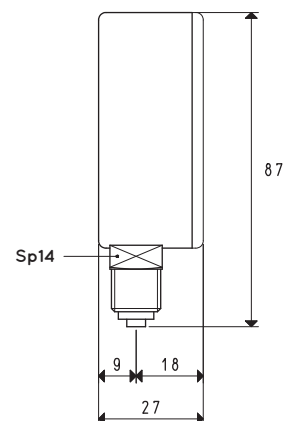
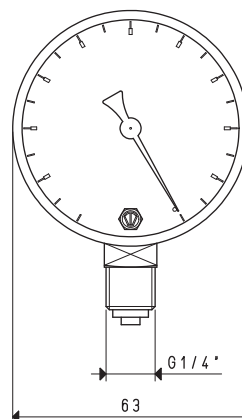


VACUUM GAUGE

| Item     | Scale<br>mbar | Double Scale<br>KPa | Admissible<br>scale error | Temperature of<br>use | Notes | Case and flange<br>material | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------|-----------------------------|-------------|
| 09 02 10 | 0 ÷ -1000     | 0 ÷ -100            | 1%                        | -10 °C ÷ +50 °C       | dry   | black steel                 | 346         |

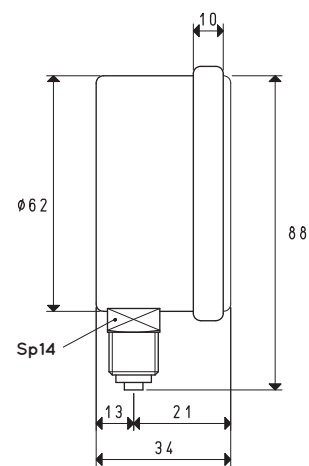
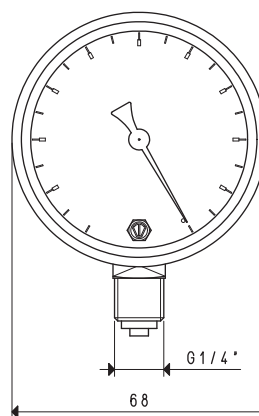


## VACUUM GAUGES



VACUUM GAUGE

| Item     | Scale<br>mbar | Double Scale<br>KPa | Admissable<br>scale error | Temperature of<br>use | Notes | Case<br>material | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------|------------------|-------------|
| 09 05 10 | 0 ÷ -1000     | 0 ÷ -100            | 2.5%                      | -10 °C ÷ +50 °C       | dry   | black plastic    | 136         |



VACUUM GAUGE

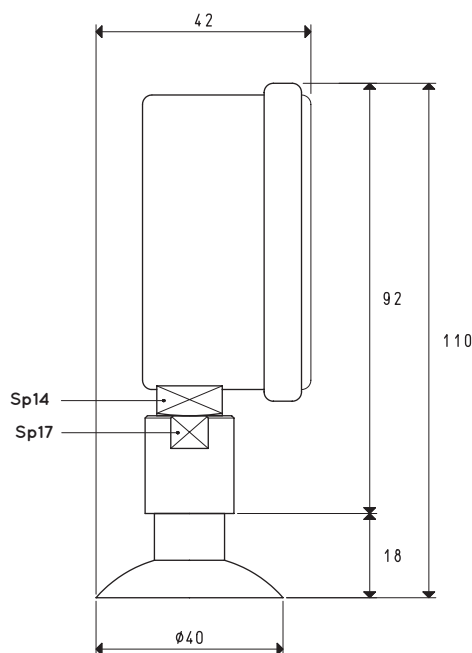
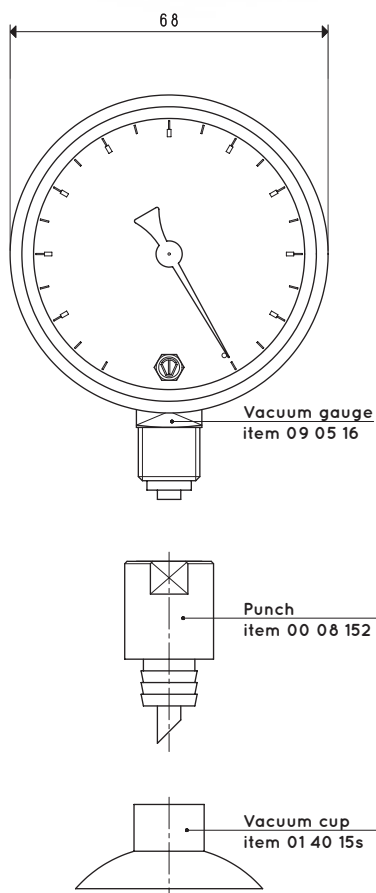
| Item     | Scale<br>mbar | Double Scale<br>KPa | Admissable<br>scale error | Temperature of<br>use | Notes             | Case<br>material | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------------------|------------------|-------------|
| 09 05 16 | 0 ÷ -1000     | 0 ÷ -100            | 1.6%                      | -10 °C ÷ +50 °C       | in glycerine bath | stainless steel  | 218         |

## VACUUM GAUGE WITH STEEL PUNCH

This vacuum gauge with punch has been designed to allow the immediate detection of the level of vacuum inside tin cans and food containers in general.

The glycerine bath vacuum gauge item 09 05 16 used for this application (features described on the previous page) is provided with a hardened steel punch to easily perforate the containers and with a vacuum cup in silicon compound to guarantee vacuum seal after perforation.

It is available in the standard version, which is the one shown on this page, but can be provided in other versions upon request.



### VACUUM GAUGE

| Item     | Scale<br>mbar | Double Scale<br>kPa | Admissible<br>scale error | Temperature of<br>use | Notes             | Case<br>material | Weight<br>g |
|----------|---------------|---------------------|---------------------------|-----------------------|-------------------|------------------|-------------|
| 09 05 99 | 0 ÷ -1000     | 0 ÷ -100            | 1.6%                      | -10 °C ÷ +50 °C       | in glycerine bath | stainless steel  | 250         |

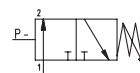
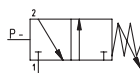
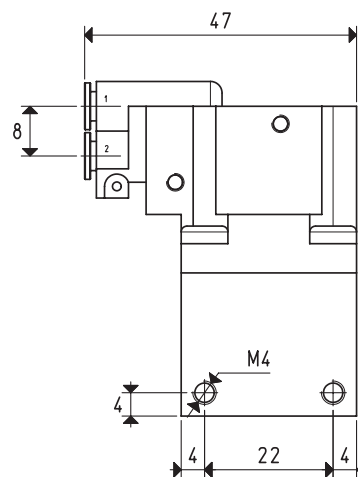
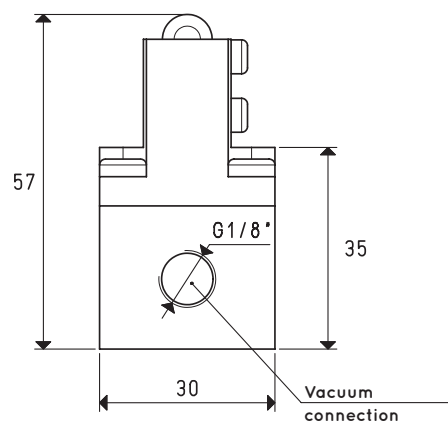
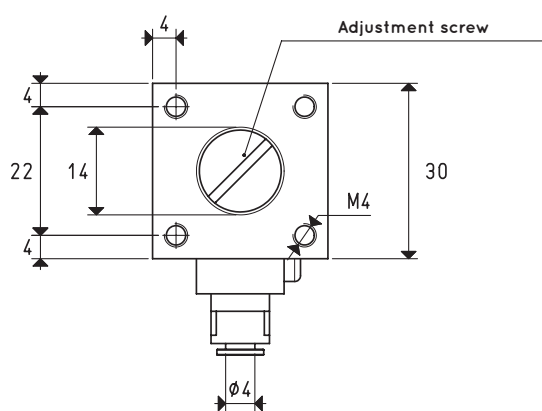


## MINI PNEUMATIC VACUUM SWITCHES

These extremely compact vacuum switches give or remove a pneumatic signal, depending on the model, when a certain adjustable level of vacuum is reached.

The pressure differential existing between the set maximum value and that of the signal recovery at rest is not adjustable.

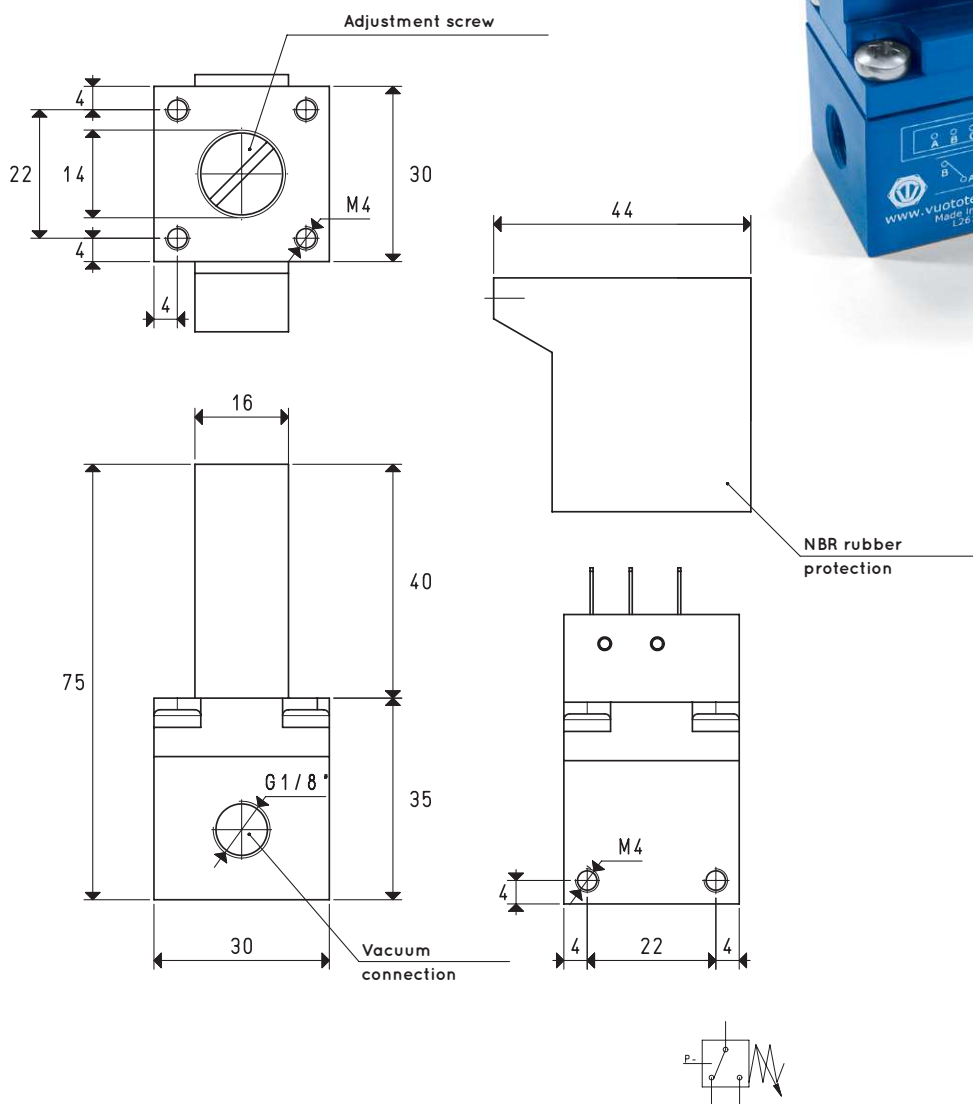
They are particularly suited for controlling vacuum generators and for activating pneumatic valves.



| Item                                     |           | 12 01 30  | 12 02 30  |
|------------------------------------------|-----------|-----------|-----------|
| Adjustment range                         | mbar abs. | 930 ÷ 50  | 900 ÷ 40  |
| Fixed differential                       | mbar      | 50 ÷ 80   | 150 ÷ 180 |
| Repeatability                            | mbar      | ± 5       | ± 5       |
| Signal at rest                           |           | NC        | NO        |
| Supply pressure                          | bar       | 2 ÷ 8     | 2 ÷ 8     |
| Pneumatic microvalve                     | item      | 00 12 17  | 00 12 18  |
| Max flow rate of the microvalve at 6 bar | NI / s    | 1.2       | 1.2       |
| Operating temperature                    | °C        | -10 ÷ +60 | -10 ÷ +60 |
| Weight                                   | g         | 104       | 102       |

## MINI ELECTROMECHANICAL VACUUM SWITCH

This extremely compact vacuum switch gives an electric signal when a certain adjustable level of vacuum is reached.  
The pressure differential existing between the set maximum value and the value of reset of the rest signal is 50- 60 mbar and it is not adjustable.  
They are particularly suited when an electrical signal is needed when a certain level of vacuum is reached, for safety, for starting a cycle, for checking the cup grip, etc.



| Item                   |           | 12 02 10                        |
|------------------------|-----------|---------------------------------|
| Adjustment range       | mbar abs. | 930 - 10                        |
| Fixed differential     | mbar abs. | from 50 to 60                   |
| Repeatability          | mbar      | ±1.5                            |
| Maximum overpressure   | bar       | 5                               |
| Microswitch            | item      | 00 12 12                        |
| Contacts               |           | one in commutation              |
| Flow rate of contacts  | A         | 0.1 at 30 VDC - 10.1 at 250 VAC |
| Electrical connections |           | Type 110 fast-on terminals      |
| Operating temperature  | °C        | -25 - +80                       |
| Protection             |           | IP 55                           |
| Weight                 | g         | 102                             |



## MICRO DIGITAL VACUUM SWITCHES

If accurately calibrated and compensated for temperatures, these small devices are able to give very precise digital signals to the set maximum measuring value.

The switching point, which is within the scale value, can be easily programmed by means of an adjustment screw located on the upper part of the device.

A red LED near the screw indicates the digital output signal commutation status.

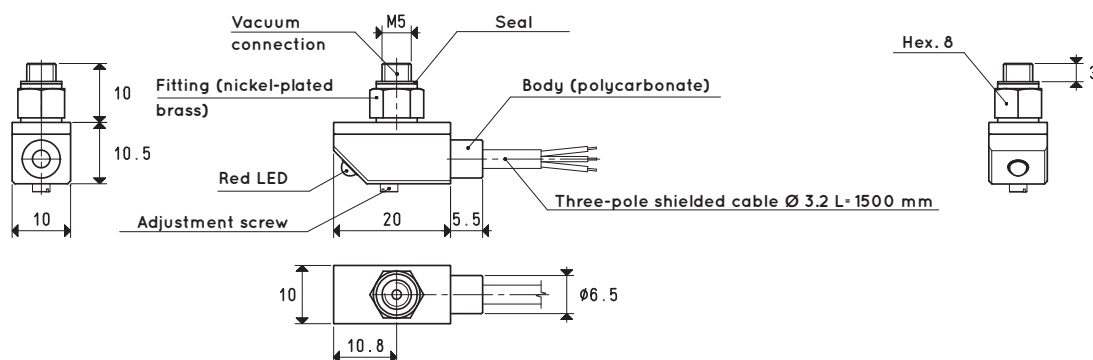
The pressure differential (hysteresis) between the set maximum value and the value of reset of the rest signal is 2% of the set value and cannot be adjusted.

They are composed of a polycarbonate enclosure, which includes the sensor and the electric circuit, and of a coupler or a small aluminium manifold with the vacuum connections.

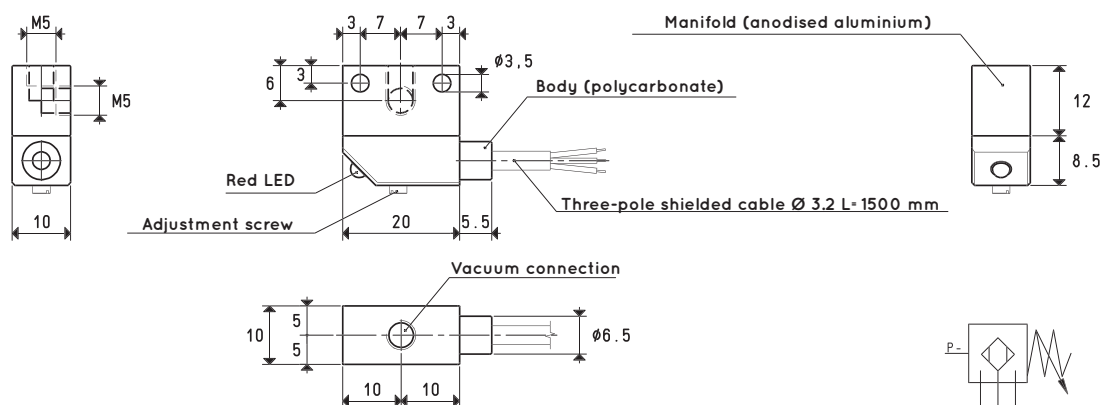
Item 12 05 10 can also be rotated freely to place the display in the desired position, without having to unscrew it from the vacuum connection. The vacuum connection can be carried out via male or female M5 connectors, while the electrical connection is made via a three-connector cable with which they are equipped. Mini digital vacuum switches are suited for controlling dry air and non-corrosive gasses. They are recommended in all those cases that require a signal when a certain level of vacuum is reached, for safety, for starting a cycle, for checking the cup grip, etc.



### Item 12 05 10



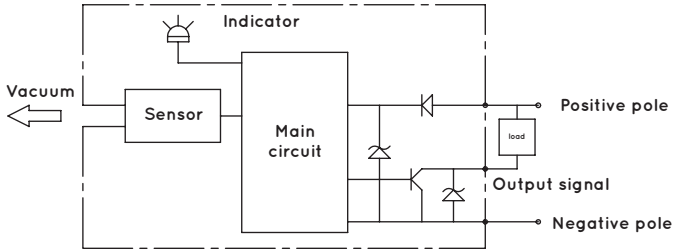
### Item 12 05 11



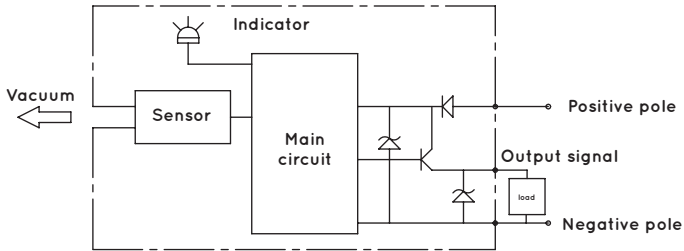
| Cable colour | Delivery        |
|--------------|-----------------|
| brown        | positive pole ⊕ |
| black        | output signal   |
| blue         | negative pole ⊖ |

## INTERNAL ELECTRICAL DIAGRAMS

### NPN open contact

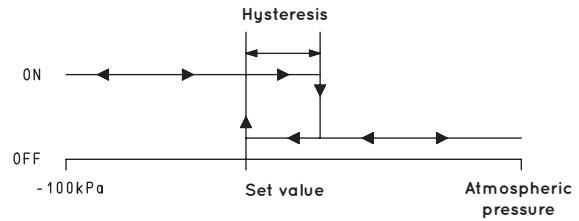


### PNP open contact



## OUTPUT CONTACT DIAGRAM

The LED lights up at the pre-set pressure and switches off at the pre-set pressure minus the hysteresis



| Characteristics and electrical specifications | Item 12 05 10 P<br>Item 12 05 11 P                    | Item 12 05 10 N<br>Item 12 05 11 N |
|-----------------------------------------------|-------------------------------------------------------|------------------------------------|
| Adjustment range                              | from 0 to -1 bar                                      |                                    |
| Maximum overpressure                          | 2 bar                                                 |                                    |
| Operating voltage                             | 10.8 - 30 VDC (Protection against polarity inversion) |                                    |
| Electrical absorption                         | ≤20 mA                                                |                                    |
| Commutation outputs                           | 1 digital PNP, NO                                     | 1 digital NPN, NO                  |
| Reaction time                                 | ≤1 ms                                                 |                                    |
| Commutation frequency                         | 1000Hz                                                |                                    |
| Hysteresis                                    | Not adjustable, 2% of the maximum set value           |                                    |
| Repeatability                                 | ±2% of the measuring range                            |                                    |
| Commutation indicator                         | Red LED                                               |                                    |
| Insulation resistance                         | 100 MΩ                                                |                                    |
| Test voltage                                  | 500 VAC, 1 min                                        |                                    |
| Degree of protection                          | IP 40                                                 |                                    |
| Environmental operating conditions            |                                                       |                                    |
| Installation position                         | Any                                                   |                                    |
| Controllable fluids                           | Dry air and non-corrosive gas                         |                                    |
| Operating temperature                         | -10 - +60 °C                                          |                                    |
| Storage temperature                           | -20 - +70 °C                                          |                                    |
| Interference emission                         | In compliance with EN 55011, Group 1, Class B         |                                    |
| Resistance to interference                    | In compliance with EN 61326 - 1                       |                                    |
| Characteristics and mechanical specifications |                                                       |                                    |
| Container material                            | Polycarbonate PC                                      |                                    |
| Connection material                           | Nickel-plated brass and aluminium                     |                                    |
| Weight (without cable)                        | About 5g                                              |                                    |
| Electrical connection                         | Three-conductor cable, 1.5 m long                     |                                    |
| Connection to the fluid                       | M5 male or female threading                           |                                    |



## ANALOGUE VACUUM SWITCH

These compact and extremely light switches come enclosed in a sturdy ABS casing; these features allow their installation on the machine and close to the application. If accurately calibrated, these analogue switches provide very precise measurements values.

The adjustment range is from 0 to -1 bar and can be interfaced with external logics via an analogue output from 1 to 5 Volts and a digital PNP output, configurable via Teach-In.

The switching point, as well as the hysteresis from 0 to 100% of the set value, can be easily programmed via push buttons located on the control panel; the two two-colour LEDs on the control panel signal the commutation status and the error code, if any.

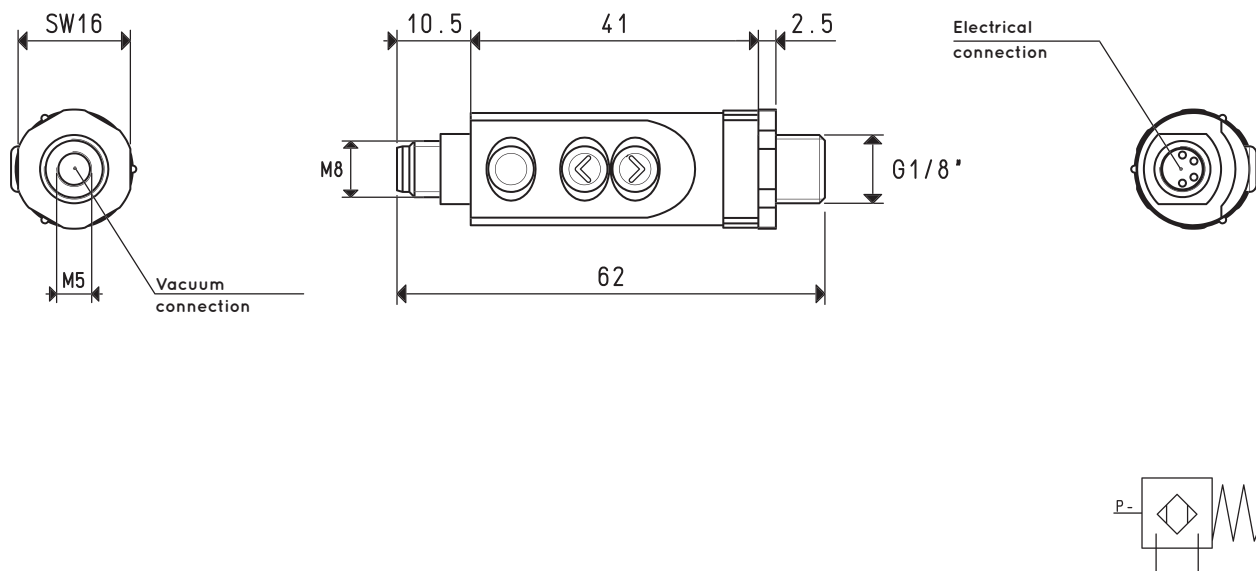
These devices can be rotated freely to place the display in the desired position, without having to unscrew them from the vacuum connection.

The vacuum connection is dual threaded: male G 1/8" or female M5.

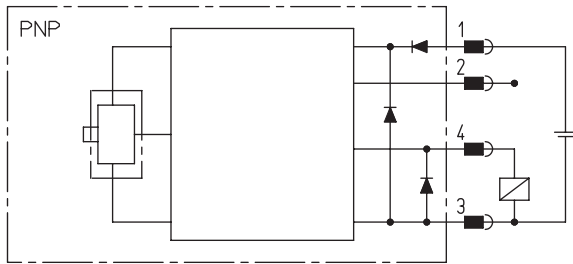
The electrical connection is an M8 4-pin threaded plug and upon request the connection cable is available in PUR, with an axial or radial connector.

These vacuum switches are suited for measuring and controlling dry air and non-corrosive gasses.

They are recommended in all those cases that require a measurement and commutation to be installed on safety or energy-saving devices, on systems for optimising the work cycle time and in circuit level of vacuum adjustment circuits.

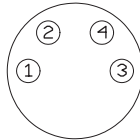


WIRING DIAGRAM



Connections

1. V+
2. analogue output
3. V-
4. commutation output

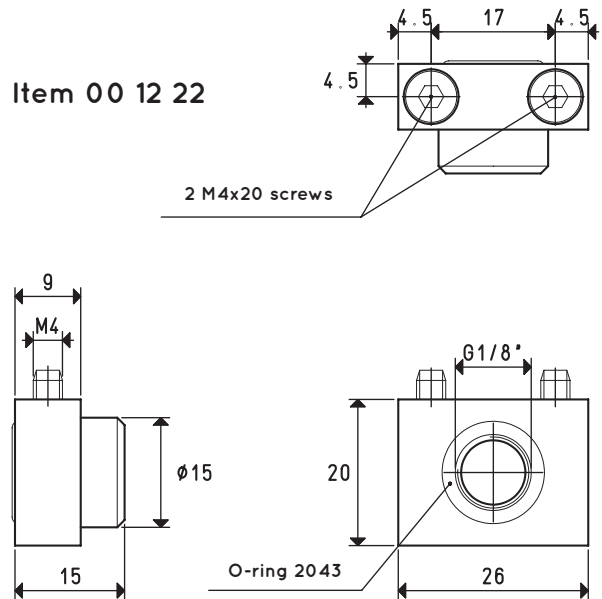


Cable colours

- Pin1 = brown  
Pin2 = white  
Pin3 = blue  
Pin4 = black

WALL FIXING KIT

Item 00 12 22



| Characteristics and electrical specifications | Item 12 07 10<br>Vacuum switch                                           |
|-----------------------------------------------|--------------------------------------------------------------------------|
| Adjustment range                              | from 0 to -1 bar                                                         |
| Maximum overpressure                          | 5 bar                                                                    |
| Operating voltage                             | 10.8 - 30 VDC (Protection against polarity inversion)                    |
| Electrical absorption                         | ≤30 mA                                                                   |
| Commutation output                            | 1 digital PNP, NO or NC programmable, maximum commutation current 250 mA |
| Analogue output                               | 1 - 5 V; impedance load ≥500 Ω                                           |
| Output tolerance                              | ±1%                                                                      |
| Offset                                        | 1 V - 0.1 Volt                                                           |
| Reaction time                                 | ≤2.5 ms                                                                  |
| Commutation frequency                         | 400Hz                                                                    |
| Hysteresis                                    | Adjustable from 0 to 100% of the maximum set value                       |
| Repeatability                                 | ±0.2% of the measuring range                                             |
| Error code signal                             | Two-colour LED                                                           |
| Insulation resistance                         | 100 MΩ to 500 VDC                                                        |
| Test voltage                                  | 1000 VAC, 1 min                                                          |
| Degree of protection                          | IP 65                                                                    |
| Environmental operating conditions            |                                                                          |
| Installation position                         | Any                                                                      |
| Measurable fluids                             | Non-corrosive gas and dry air                                            |
| Operating temperature                         | 0 - +50 °C                                                               |
| Storage temperature                           | -20 - +80 °C                                                             |
| Interference emission                         | In compliance with DIN EN 50081 - 1                                      |
| Resistance to interference                    | In compliance with DIN EN 50082 - 2                                      |
| Characteristics and mechanical specifications |                                                                          |
| Container material                            | ABS plastic - PC                                                         |
| Connection material                           | Nickel-plated brass                                                      |
| Weight                                        | 19 g                                                                     |
| Electrical connection                         | With M8 - 4 pin coupler                                                  |
| Connection to the fluid                       | Male G 1/8" or female M5 threading                                       |
| Accessories                                   |                                                                          |
| Electrical connection cable                   | With axial connector, 5 m - PUR M8 x 1x 0.25 mm - Item 00 12 20          |
| Electrical connection cable                   | With radial connector, 5 m - PUR M8 x 1x 0.25 mm - Item 00 12 21         |
| Wall fixing kit                               | Support with o-ring and screws - Item 00 12 22                           |



## DIGITAL VACUUM AND PRESSURE SWITCHES

These compact and extremely light digital vacuum and pressure switches are enclosed in a sturdy ABS casing.

These features allow installation on the machine and close to the application.

These digital switches are accurately calibrated and compensated for temperatures and therefore are able to give very precise measurements values. The detected values are shown on the display, making it unnecessary to use a vacuum gauge. The two LEDs, one red and one green, built-in the control panel, indicate the commutation status of the two digital output signals.

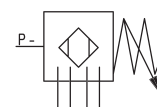
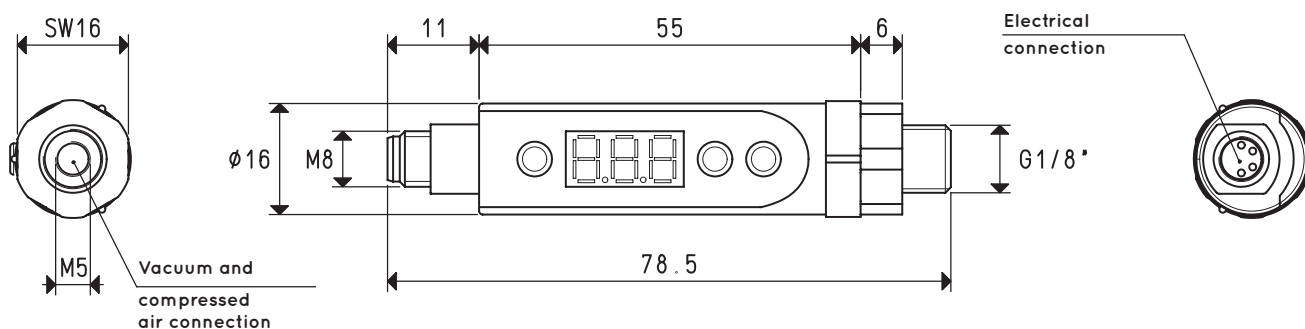
The two commutation outputs are completely independent.

The switching points within the scale values, including hysteresis from 0 to 100% of the set value, are easily programmable via the buttons located on the control panel.

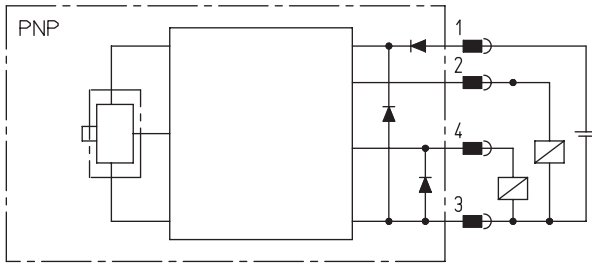
Other additional functions can be configured, such as the comparison between two values, NO and NC contacts, choice of the measurement unit, locking the programmed values and functions, display reversal, etc. These devices can be rotated freely to place the display in the desired position, without having to unscrew them from the vacuum connection.

The vacuum or the pressure connections can be carried out via a dual male G 1/8" or female M5 threading. The electrical connection is an M8 4-pin threaded plug and upon request the connection cable is available in PUR, with an axial or radial connector. These switches are suited for measuring and controlling dry air and non-corrosive gas.

They are recommended in all those cases that require a signal when a certain level of vacuum is reached set for safety, for starting a cycle, for checking the cup grip, etc. Moreover, the hysteresis function allows managing the vacuum generator compressed air supply, allowing considerable energy saving.

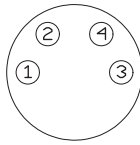


## WIRING DIAGRAM



### Connections

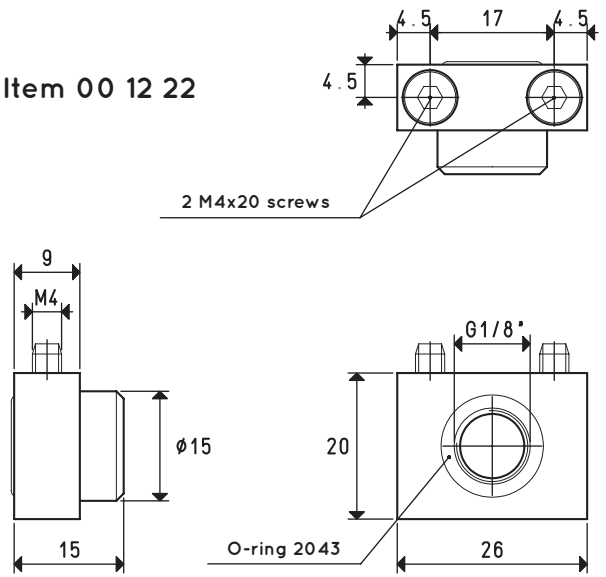
1. V+
2. commutation output 2
3. V-
4. commutation output 1



**Cable colours**  
 Pin1 = brown  
 Pin2 = white  
 Pin3 = blue  
 Pin4 = black

## WALL FIXING KIT

Item 00 12 22



3D drawings are available on [vuotecnica.net](http://vuotecnica.net)

3

| Characteristics and electrical specifications        | Item 12 10 10<br>Vacuum switch                                                          | Item 12 25 11<br>Pressure switch |
|------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------|
| <b>Adjustment range</b>                              | from 0 to -1 bar                                                                        | from 0 to 10 bar                 |
| <b>Maximum overpressure</b>                          | 5 bar                                                                                   | 16 bar                           |
| <b>Minimum detectable values</b>                     | 0.01 bar<br>1 KPa<br>1 mmHg<br>0.1 InHg                                                 | 0.01 bar<br>--<br>--<br>--       |
| <b>Operating voltage</b>                             | 10.8 - 30 VDC (Protection against polarity inversion)                                   |                                  |
| <b>Electrical absorption</b>                         | <15 mA / <3 mA energy saving mode                                                       |                                  |
| <b>Commutation output</b>                            | 2 digital PNP, 2 digital NPN, NO or NC programmable, maximum commutation current 250 mA |                                  |
| <b>Display tolerance</b>                             | ≤ ±2% F.S.                                                                              |                                  |
| <b>Reaction time</b>                                 | ≤2.8 ms                                                                                 |                                  |
| <b>Commutation frequency</b>                         | 200Hz                                                                                   |                                  |
| <b>Hysteresis</b>                                    | Adjustable from 0 to 100% of the maximum set value                                      |                                  |
| <b>Repeatability</b>                                 | ±0.2% of the measuring range                                                            |                                  |
| <b>Display</b>                                       | 3-digit, 7-segment LED                                                                  |                                  |
| <b>Insulation resistance</b>                         | 100 MΩ to 500 VDC                                                                       |                                  |
| <b>Test voltage</b>                                  | 1000 VAC, 1 min                                                                         |                                  |
| <b>Degree of protection</b>                          | IP 65                                                                                   |                                  |
| <b>Environmental operating conditions</b>            |                                                                                         |                                  |
| <b>Installation position</b>                         | Any                                                                                     |                                  |
| <b>Measurable fluids</b>                             | Non-corrosive gas and dry air                                                           |                                  |
| <b>Operating temperature</b>                         | 0 - +50 °C                                                                              |                                  |
| <b>Storage temperature</b>                           | -20 - +80 °C                                                                            |                                  |
| <b>Interference emission</b>                         | In compliance with DIN EN 50081 - 1                                                     |                                  |
| <b>Resistance to interference</b>                    | In compliance with DIN EN 50082 - 2                                                     |                                  |
| <b>Characteristics and mechanical specifications</b> |                                                                                         |                                  |
| <b>Container material</b>                            | ABS plastic - PC                                                                        |                                  |
| <b>Connection material</b>                           | Nickel-plated brass                                                                     |                                  |
| <b>Weight</b>                                        | 20 g                                                                                    |                                  |
| <b>Electrical connection</b>                         | With M8-4 pin coupler                                                                   |                                  |
| <b>Connection to the fluid</b>                       | Male G 1/8" or female M5 threading                                                      |                                  |
| <b>Accessories</b>                                   |                                                                                         |                                  |
| <b>Electrical connection cable</b>                   | With axial connector, 5 m - PUR M8 x 1x 0.25 mm - Item 00 12 20                         |                                  |
| <b>Electrical connection cable</b>                   | With radial connector, 5 m - PUR M8 x 1x 0.25 mm - Item 00 12 21                        |                                  |
| <b>Wall fixing kit</b>                               | Support with o-ring and screws - Item 00 12 22                                          |                                  |



## DIGITAL VACUUM SWITCHES

Changes the shape of these digital vacuum switches with respect to those previously described, from cylindrical to parallelepiped. However, the container in which they are enclosed remains in ABS and is also especially compact and extremely light to allow for its installation on board automatism and near use. These carefully calibrated devices are able to provide very accurate measurement values. The detected values are shown on the display, making it unnecessary to use a vacuum gauge. The panel includes two LED indicators, one green and one red, which indicate the switching status of the two digital output signals. The switching outputs are completely independent. The switching points within the scale values, including hysteresis from 0 to 100% of the set value, are easily programmable via the buttons located on the control panel. Other additional functions can be configured, such as the comparisons between values, NO and NC contacts, the choice of the units of measure, the blocking of functions and programmed values, etc. The vacuum connection can be made by means of a G 1/8" male or M5 female double threading connection.

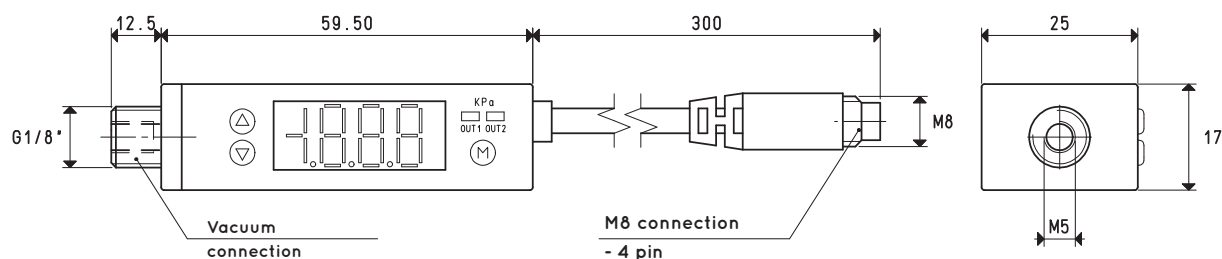
Electrical connection for item 12 30 10 is push-in with a M8-4 pin threaded jack. A connection cable can be provided in PUR upon request with corresponding axial or radial connector.

Instead, item 12 30 10 A already has an integrated PUR, 2-metre long connection cable. The adjustment range of vacuum switch 12 30 10 is from 0 to -1 bar, with two digital PNP outputs that can be set by means of Teach-in. The adjustment range of item 12 30 10 A, while it is also between 0 and -1 bar, can instead be interfaced with external logics via a 1 to 5 volt analogue output and two digital PNP outputs.

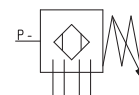
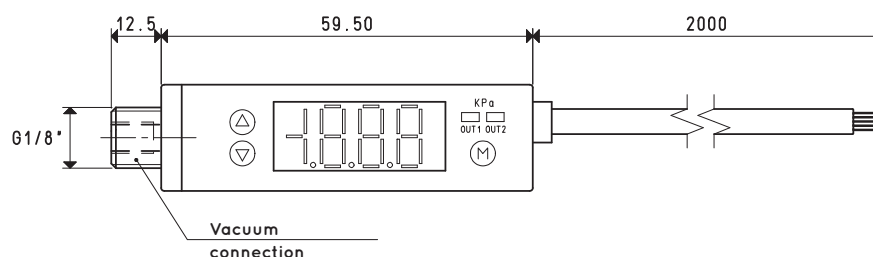
This series of digital vacuum switches is suitable for measuring and control of dry air and non-corrosive gases. These are recommended in all cases where maximum and minimum value signalling is required, set for safety reasons, in order to start a work cycle, to control vacuum cup gripping, and so on. In addition, with the hysteresis function, it is possible to manage the compressed air supply to the vacuum generators, allowing for considerable energy savings.



**Item 12 30 10**

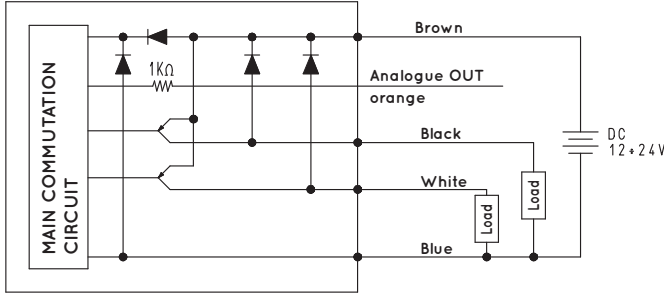


**Item 12 30 10 A**



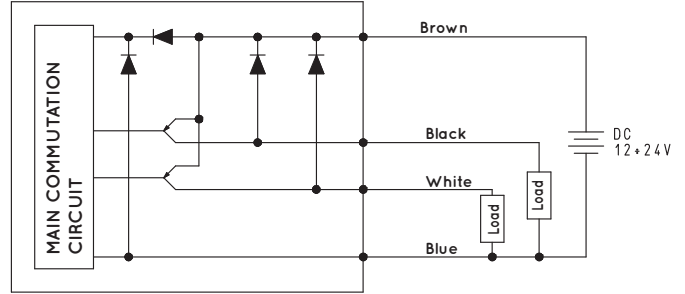
## WIRING DIAGRAMS

PNP



Item 12 30 10 A

PNP



Item 12 30 10

| Characteristics and electrical specifications | Item 12 30 10 A<br>Vacuum switch                                                                             | Item 12 30 10<br>Vacuum switch   |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------|
| Adjustment range                              | from 0 to -1 bar                                                                                             |                                  |
| Maximum overpressure                          | 3 bar                                                                                                        |                                  |
| Minimum detectable values                     | 0.1 KPa<br>0.001 Kg/cm <sup>2</sup><br>0.001 bar<br>0.01 psi<br>0.1 InHg<br>1 mmHg<br>0.1 mmH <sub>2</sub> O |                                  |
| Operating voltage                             | 12 - 24 VDC ±10% (Protection against polarity inversion)                                                     |                                  |
| Electrical absorption                         | ≤60 mA                                                                                                       |                                  |
| Digital output                                | 2 PNP, maximum commutation current 100 mA                                                                    |                                  |
| Analogue output                               | 1 analogue, 1 + 5 V ±2% F.S.                                                                                 | --                               |
| Display tolerance                             | ≤ ±2% F.S. ±1 digit                                                                                          |                                  |
| Reaction time                                 | ≤2.5 ms                                                                                                      |                                  |
| Hysteresis                                    | Adjustable                                                                                                   |                                  |
| Repeatability                                 | ±0.2% ±1 digit of the measuring range                                                                        |                                  |
| Display                                       | LED at 3 1/2 digit, 7 segments, OUT 1 green OUT 2 red                                                        |                                  |
| Insulation resistance                         | 50 MΩ to 500 VDC                                                                                             |                                  |
| Test voltage                                  | 1000 VAC, 1 min                                                                                              |                                  |
| Degree of protection                          | IP 40                                                                                                        |                                  |
| Environmental operating conditions            |                                                                                                              |                                  |
| Installation position                         | Any                                                                                                          |                                  |
| Measurable fluids                             | Non-corrosive gas and dry air                                                                                |                                  |
| Operating temperature                         | 0 - +50 °C                                                                                                   |                                  |
| Storage temperature                           | -20 - +60 °C                                                                                                 |                                  |
| Interference emission                         | In compliance with EN 55011, Group 1, class B                                                                |                                  |
| Resistance to interference                    | In compliance with EN 61326 - 1                                                                              |                                  |
| Characteristics and mechanical specifications |                                                                                                              |                                  |
| Container material                            | ABS plastic - PC                                                                                             |                                  |
| Connection material                           | Nickel-plated brass                                                                                          |                                  |
| Weight                                        | 65 g, including electrical cable                                                                             | 35 g, including electrical cable |
| Electrical connection                         | --                                                                                                           | With M8-4 pin coupler            |
| Electrical connection cable                   | 5-wire 2m cable                                                                                              | 4-wire 0.3 m cable               |
| Connection to the fluid                       | Male G 1/8" or female M5 threading                                                                           |                                  |



## DIGITAL VACUUM AND PRESSURE SWITCHES

These compact and extremely light switches come enclosed in a sturdy ABS casing; these features allow their installation on the machine and close to the application.

These digital switches are accurately calibrated and compensated for temperatures and therefore are able to give very precise measurements values. The detected values are shown on the display, making it unnecessary to use a vacuum gauge. The two LEDs, one red and one green, built-in the control panel, indicate the commutation status of the two digital output signals.

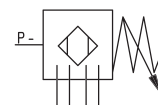
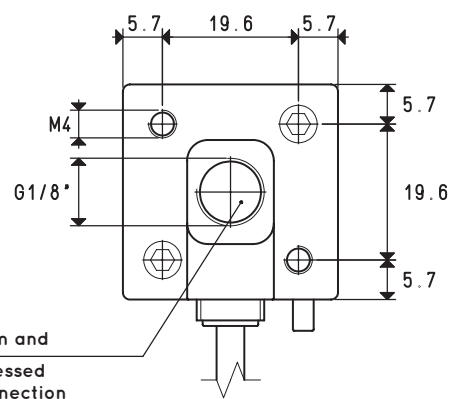
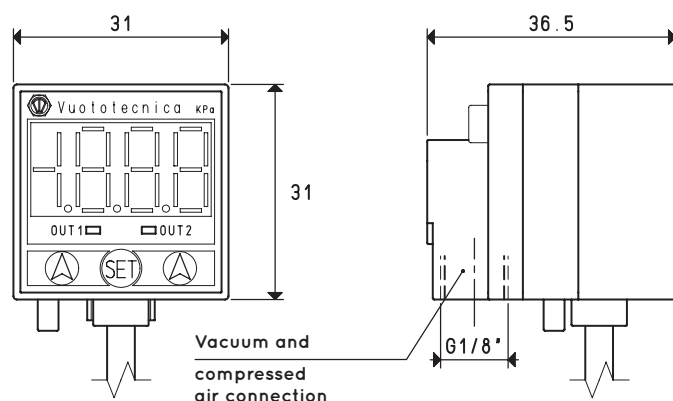
The two commutation outputs are completely independent.

The switching points within the scale values, including hysteresis, are easily programmable via the buttons located on the control panel.

Additional functions are also programmable, such as comparison between two values, NO and NC contacts, choice of the unit of measurement, programmed value and function blocking, etc.

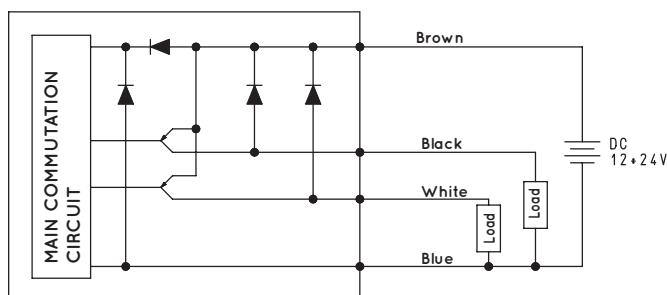
The vacuum or the pressure connections can be carried out via a dual connection with female G 1/8" thread, while the electrical connection is carried out through the 4-conductor cable with which they are equipped. These switches are suited for measuring and controlling dry air and non-corrosive gas.

They are recommended in all those cases that require a signal when a certain level of vacuum is reached set for safety, for starting a cycle, for checking the cup grip, etc. Moreover, the hysteresis function allows managing the vacuum generator compressed air supply, allowing considerable energy saving.

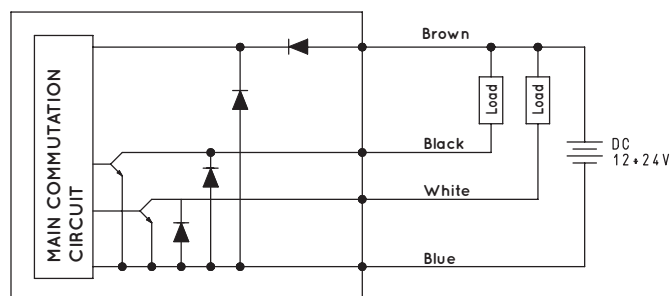


## WIRING DIAGRAMS

PNP



NPN



| Characteristics and electrical specifications | Item 12 20 10 P<br>Vacuum switch                                       | Item 12 35 10 P<br>Pressure switch |
|-----------------------------------------------|------------------------------------------------------------------------|------------------------------------|
| Adjustment range                              | from 0 to -1 bar                                                       | from 0 to 10 bar                   |
| Maximum overpressure                          | 5 bar                                                                  | 15 bar                             |
| Minimum detectable values                     | 1 mbar                                                                 | 10 mbar                            |
|                                               | 0.1 KPa                                                                | 0.001 MPa                          |
|                                               | 0.001 Kg/cm²                                                           | 0.01 Kg/cm²                        |
|                                               | 0.001 bar                                                              | 0.01 bar                           |
|                                               | 0.01 psi                                                               | 0.1 psi                            |
|                                               | 0.1 InHg                                                               | --                                 |
|                                               | 1 mmHg                                                                 | --                                 |
|                                               | 10 mmH <sub>2</sub> O                                                  | --                                 |
| Operating voltage                             | 12 - 24 VDC ±10% (Protection against polarity inversion)               |                                    |
| Electrical absorption                         | ≤55 mA                                                                 |                                    |
| Commutation output                            | 2 digital PNP, NO or NC, maximum commutation current 80 mA             |                                    |
| Display tolerance                             | ≤ ±2% F.S. ±1 digit                                                    |                                    |
| Reaction time                                 | ≤2.5 ms                                                                |                                    |
| Hysteresis                                    | Adjustable                                                             |                                    |
| Repeatability                                 | ±0.2% of the measuring range                                           |                                    |
| Display                                       | LED at 3 1/2 digit, 7 segments, OUT 1 green OUT 2 red                  |                                    |
| Insulation resistance                         | 50 MΩ to 500 VDC                                                       |                                    |
| Test voltage                                  | 1000 VAC, 1 min                                                        |                                    |
| Degree of protection                          | IP 40                                                                  |                                    |
| Environmental operating conditions            |                                                                        |                                    |
| Installation position                         | Any                                                                    |                                    |
| Measurable fluids                             | Non-corrosive gas and dry air                                          |                                    |
| Operating temperature                         | 0 - +50 °C                                                             |                                    |
| Storage temperature                           | -20 - +60 °C                                                           |                                    |
| Interference emission                         | In compliance with EN 55011, Group 1, class B                          |                                    |
| Resistance to interference                    | In compliance with EN 61326 – 1                                        |                                    |
| Characteristics and mechanical specifications |                                                                        |                                    |
| Container material                            | ABS plastic - PC                                                       |                                    |
| Connection material                           | Nickel-plated brass                                                    |                                    |
| Weight                                        | 105 g, including electrical cable                                      |                                    |
| Electrical connection                         | With 4-conductor wire cable length 2 m                                 |                                    |
| Connection to the fluid                       | Female G 1/8" threading                                                |                                    |
| Accessories                                   |                                                                        |                                    |
| Fixing kit                                    | wall - Item 00 12 30<br>table - Item 00 12 31<br>panel - Item 00 12 32 |                                    |

Note: Add the letter N after the item (for example 12 20 10 N) for NPN and non PNP commutation output.



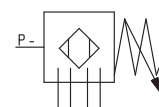
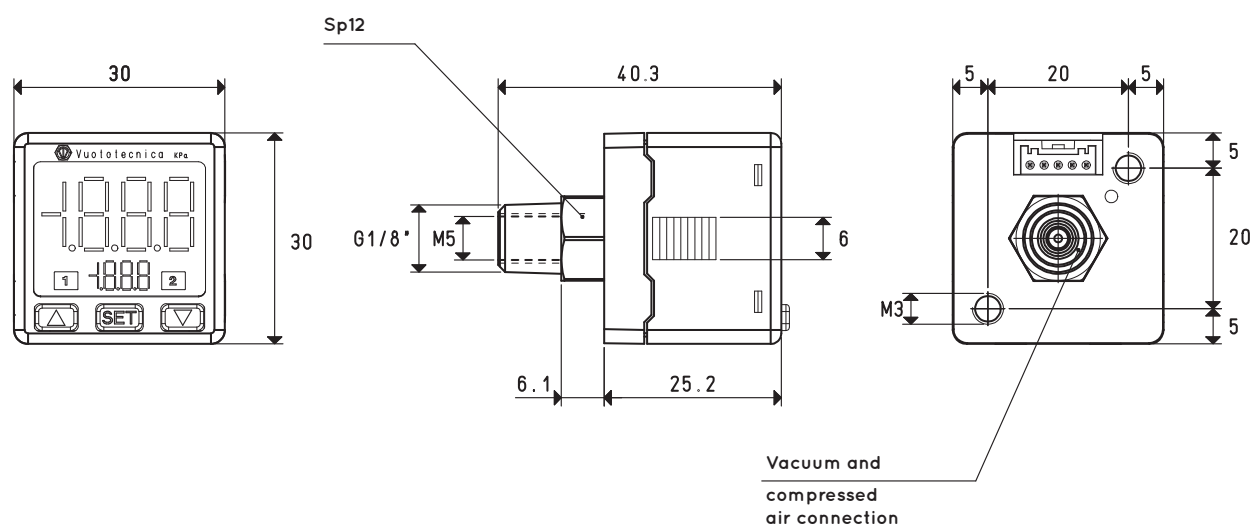
## DIGITAL VACUUM AND PRESSURE SWITCHES WITH TWO-COLOUR DISPLAY

These devices are also enclosed within a robust ABS container. They are carefully calibrated and at compensated temperature, ensuring high-precision measurement values. Detected values are viewed on the main two-colour (red and green) display and programmable by the user to set different conditions. Setting values are easily viewable on a secondary display within the command panel. Two luminous indicators pertaining to outlets 1 and 2 indicate the switching status of both digital and the analogue output signals.

The switching outputs are completely independent.

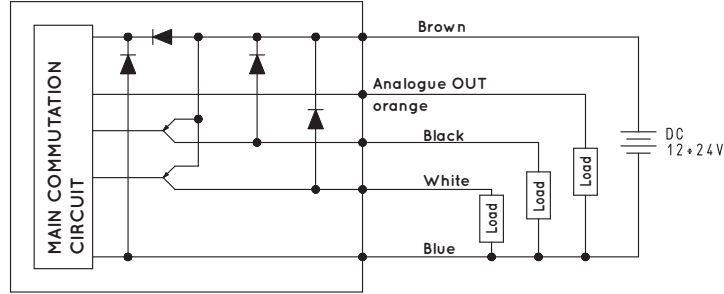
The switching points within the scale values, including hysteresis, are easily programmable via the buttons located on the control panel. Additional functions are also programmable, such as comparison between two values, NO and NC contacts, choice of measurement unit, programmed value and function blocking, etc. The connection to the vacuum may be established by means of a male G 1/8" or female M5 double threading connection. It is possible to establish an electric connection by means of a removable, rapid installation data cable, supplied as standard.

Digital vacuum and pressure switches are suitable for measuring and controlling dry air and non-corrosive gases. They are recommended in all those cases that require a signal when a certain level of vacuum is reached set for safety, for starting a cycle, for checking the cup grip, etc. Moreover, the hysteresis function allows managing the vacuum generator compressed air supply, allowing considerable energy saving.



## WIRING DIAGRAMS

PNP



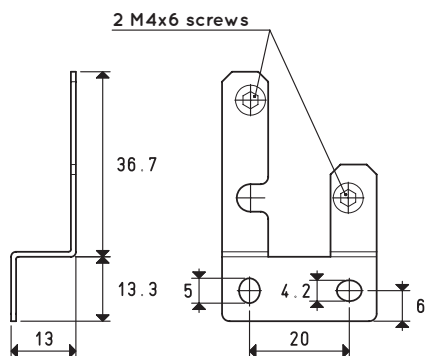
| Characteristics and electrical specifications | Item 12 40 10<br>Vacuum switch                                                                               | Art. 12 40 12<br>Vacuum switch | Item 12 40 20<br>Vacuum Switch - Pressure Switch |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| Adjustment range                              | from 0 to -1 bar                                                                                             | from 0 a -1 bar                | from -1 to 10 bar                                |
| Maximum overpressure                          | 3 bar                                                                                                        | 3 bar                          | 15 bar                                           |
| Minimum detectable values                     | 1 mbar                                                                                                       | 1 mbar                         | 10 mbar                                          |
|                                               | 0.001 Kgf/cm <sup>2</sup>                                                                                    | 0.001 Kgf/cm <sup>2</sup>      | 0.01 Kgf/cm <sup>2</sup>                         |
|                                               | 0.001 bar                                                                                                    | 0.001 bar                      | 0.01 bar                                         |
|                                               | 0.01 psi                                                                                                     | 0.01 psi                       | 0.1 psi                                          |
|                                               | 0.1 inHg                                                                                                     | 0.1 inHg                       | --                                               |
| Operating voltage                             | 12 - 24 VDC ±10% (Protection against polarity inversion)                                                     |                                |                                                  |
| Electrical absorption                         | ≤40 mA                                                                                                       |                                |                                                  |
| Digital output                                | 2 PNP, maximum commutation current 125 mA                                                                    |                                |                                                  |
| Analogue output                               | 1 analogue, 4 - 20 mA ±2.5% F.S.    1 ÷ 5 V ±2,5% F.S. for Item 12 40 12                                     |                                |                                                  |
| Display tolerance                             | ≤ ±2% F.S. ±1 digit                                                                                          |                                |                                                  |
| Reaction time                                 | ≤ 2.5 ms                                                                                                     |                                |                                                  |
| Hysteresis                                    | Adjustable                                                                                                   |                                |                                                  |
| Repeatability                                 | ±0.2% F.S. ±1 digit of the measuring range                                                                   |                                |                                                  |
| Display                                       | 7 segments, main two-colour (red - green) display, secondary display (orange)                                |                                |                                                  |
| Insulation resistance                         | 50 MΩ to 500 VDC                                                                                             |                                |                                                  |
| Test voltage                                  | 1000 VAC, 1 min                                                                                              |                                |                                                  |
| Degree of protection                          | IP 40                                                                                                        |                                |                                                  |
| Environmental operating conditions            |                                                                                                              |                                |                                                  |
| Installation position                         | Any                                                                                                          |                                |                                                  |
| Measurable fluids                             | Non-corrosive gas and dry air                                                                                |                                |                                                  |
| Operating temperature                         | 0 - +50 °C                                                                                                   |                                |                                                  |
| Storage temperature                           | -20 - +60 °C                                                                                                 |                                |                                                  |
| Interference emission                         | In compliance with EN 55011, Group 1, class B                                                                |                                |                                                  |
| Resistance to interference                    | In compliance with EN 61326 – 1                                                                              |                                |                                                  |
| Characteristics and mechanical specifications |                                                                                                              |                                |                                                  |
| Container material                            | ABS plastic - PC                                                                                             |                                |                                                  |
| Connection material                           | Nickel-plated brass                                                                                          |                                |                                                  |
| Weight                                        | 80 g, including electrical cable                                                                             |                                |                                                  |
| Electrical connection                         | 4-wire 2 m cable                                                                                             |                                |                                                  |
| Connection to the fluid                       | Male G 1/8" or female M5 threading                                                                           |                                |                                                  |
| Accessories                                   |                                                                                                              |                                |                                                  |
| Fixing kit                                    | wall - Item 00 12 40<br>table - Item 00 12 41<br>panel - Item 00 12 42<br>panel + protection - Item 00 12 43 |                                |                                                  |



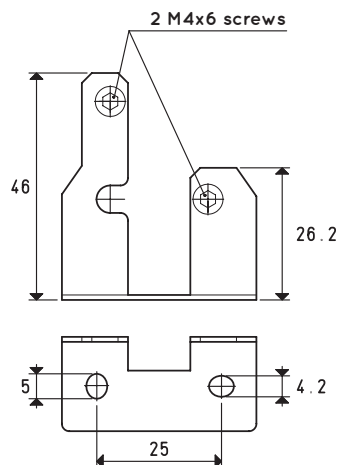
# ACCESSORIES FOR ANALOGUE AND DIGITAL VACUUM AND PRESSURE SWITCHES ITEM 12 20 10P and 12 35 10P

## FIXING KIT

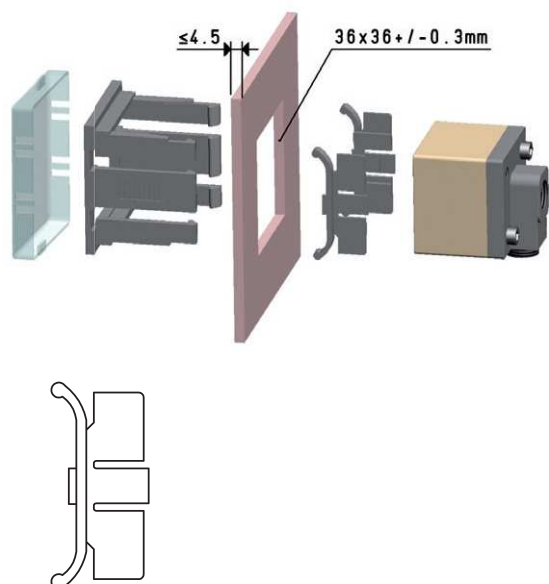
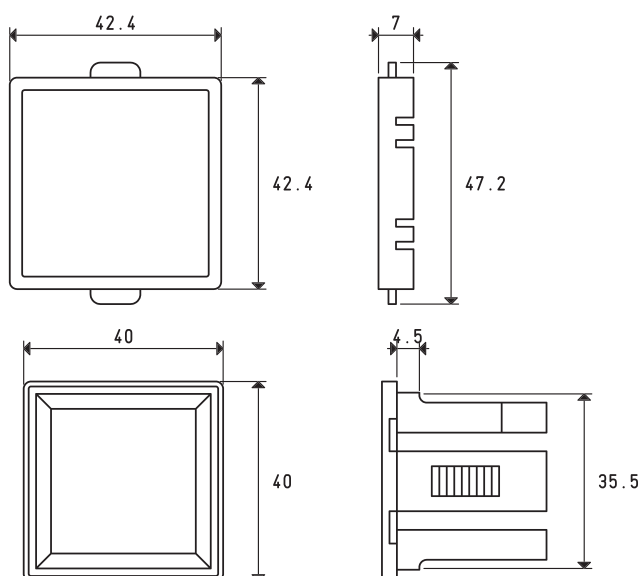
### Wall Item 00 12 30



### Table Item 00 12 31



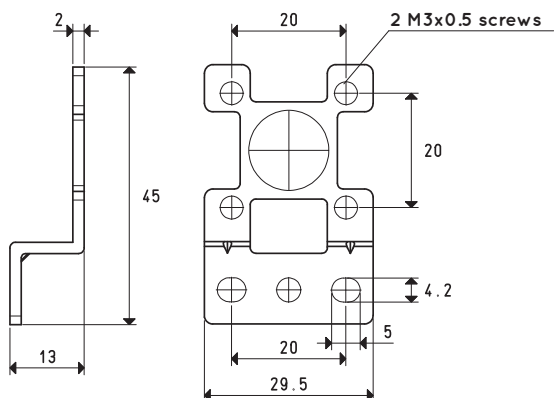
### Panel Item 00 12 32



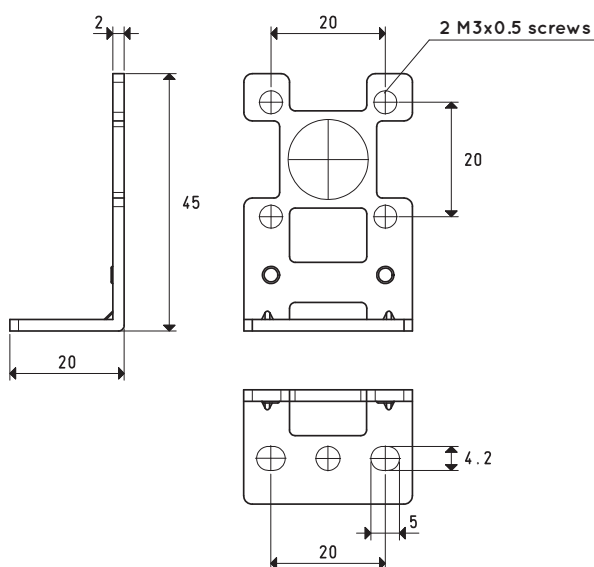
# ACCESSORIES FOR ANALOGUE AND DIGITAL VACUUM AND PRESSURE SWITCHES ITEM 12 40 10, 12 40 12 and 12 40 20

## FIXING KIT

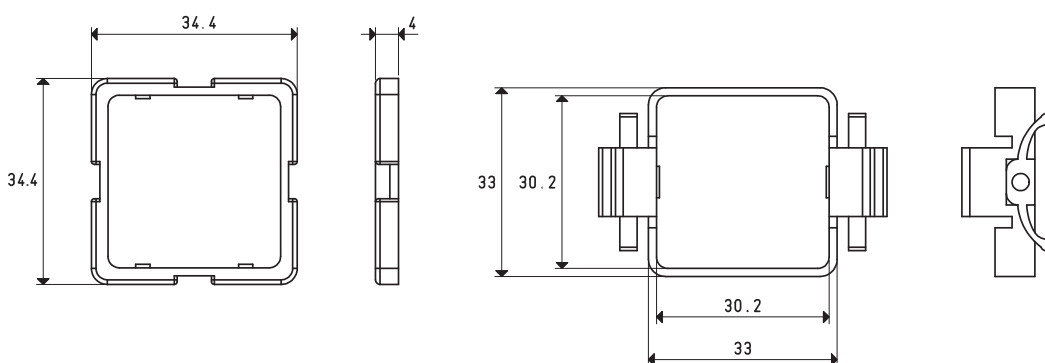
### Wall Item 00 12 40



### Table Item 00 12 41



### Panel Item 00 12 42



### Panel plus protection Item 00 12 43





## Cable with axial connector



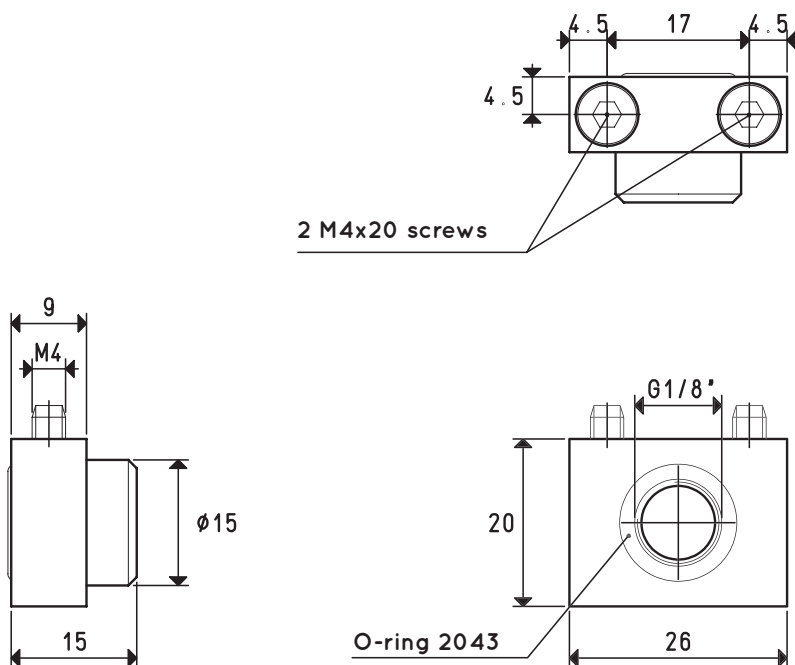
| Item     | Description                                                                                                      |
|----------|------------------------------------------------------------------------------------------------------------------|
| 00 12 20 | Electrical connection cable with axial connector<br>for digital vacuum and pressure switches<br>Cable length 5 m |

## Cable with radial connector



| Item     | Description                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------|
| 00 12 21 | Electrical connection cable with radial connector<br>for digital vacuum and pressure switches<br>Cable length 5 m |

## Wall fixing kit



| Item     | Description                                              |
|----------|----------------------------------------------------------|
| 00 12 22 | Wall-fixing kit for digital vacuum and pressure switches |

## VACUUM ADJUSTMENT VALVES

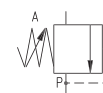
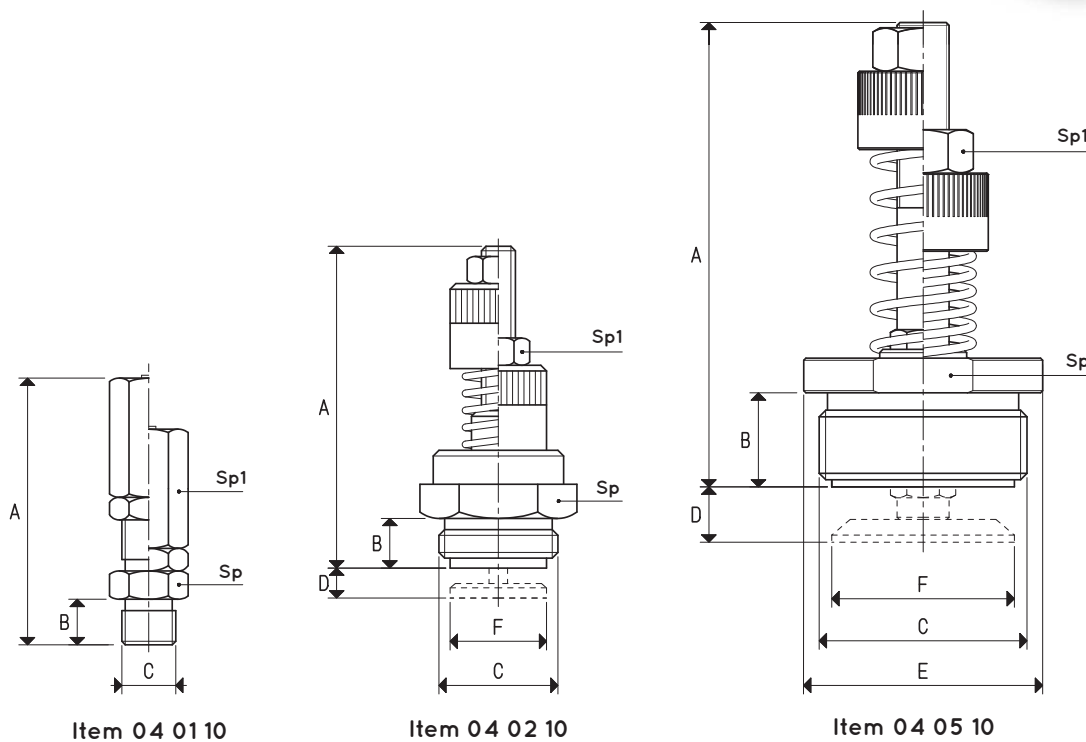
When these valves reach a certain pre-calibrated vacuum degree, they introduce atmospheric air into the circuit to prevent the increase of the set value and to keep it constant.

They can be used as regulators only on circuits having only one vacuum pump and only one use (or more uses but all working at the same vacuum degree).

In most cases, they are used as safety valves on non-commissioned tanks or containers at high levels of vacuum and on vacuum cup lifting systems.

The level of vacuum is adjusted by rotating the knurled bush in both directions. The fine thread with which the valve is provided ensures a very accurate calibration.

The temperature values within which the valves can operate go from -20 °C to +120 °C.



| Item              | Vacuum adj.<br>mbar abs. | A   | B    | C<br>Ø  | D  | E<br>Ø | F<br>Ø | Sp | Sp1 | Material            | Max flow rate<br>of the pump<br>m³/h | Weight<br>g |
|-------------------|--------------------------|-----|------|---------|----|--------|--------|----|-----|---------------------|--------------------------------------|-------------|
| <b>04 01 10</b>   | 670 ÷ 1                  | 45  | 8    | G1/8"   | -  | -      | -      | 12 | 12  | nickel-plated brass | 4                                    | 30          |
| <b>04 01 10 I</b> | 670 ÷ 1                  | 45  | 8    | G1/8"   | -  | -      | -      | 12 | 12  | stainless steel     | 4                                    | 30          |
| <b>04 02 10</b>   | 670 ÷ 1                  | 57  | 9    | G1/2"   | 5  | -      | 17     | 24 | 10  | nickel-plated brass | 20                                   | 78          |
| <b>04 02 10 I</b> | 670 ÷ 1                  | 57  | 9    | G1/2"   | 5  | -      | 17     | 24 | 10  | stainless steel     | 20                                   | 78          |
| <b>04 03 10</b>   | 670 ÷ 1                  | 60  | 11   | G3/4"   | 5  | -      | 23     | 30 | 17  | nickel-plated brass | 60                                   | 150         |
| <b>04 03 10 I</b> | 670 ÷ 1                  | 60  | 11   | G3/4"   | 5  | -      | 23     | 30 | 17  | stainless steel     | 60                                   | 150         |
| <b>04 04 10</b>   | 670 ÷ 1                  | 65  | 14.5 | G1"     | 7  | -      | 29     | 35 | 17  | nickel-plated brass | 100                                  | 212         |
| <b>04 04 10 I</b> | 670 ÷ 1                  | 65  | 14.5 | G1"     | 7  | -      | 29     | 35 | 17  | stainless steel     | 100                                  | 212         |
| <b>04 05 10</b>   | 670 ÷ 1                  | 104 | 22   | G1" 1/2 | 15 | 55     | 42     | 50 | 20  | nickel-plated brass | 250                                  | 490         |
| <b>04 05 10 I</b> | 670 ÷ 1                  | 104 | 22   | G1" 1/2 | 15 | 55     | 42     | 50 | 20  | stainless steel     | 250                                  | 490         |



## VACUUM REGULATORS

These devices control the level of vacuum, maintaining it constant at the pre-set value (secondary vacuum), regardless of the network's flow rate and the fluctuations in vacuum level (primary vacuum). They operate by membrane-piston and exploit the pressure differential between the secondary vacuum and the atmospheric pressure.

Unlike the vacuum control valves, reducers do not release air into the circuit, thereby allowing for the creation more grip points taken at different degrees of vacuum, from a single vacuum source.

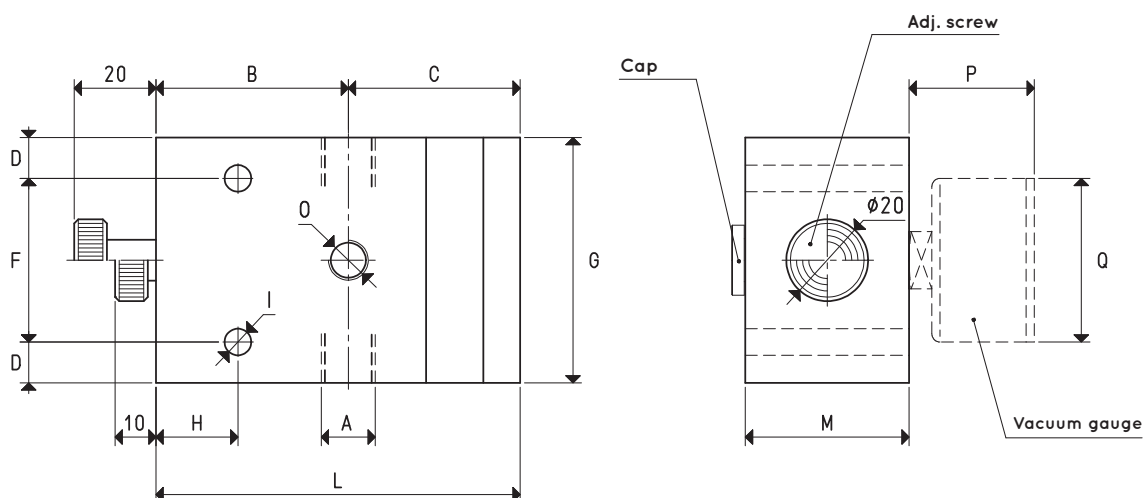
The level of vacuum is adjusted manually by turning the knurled thumb screw clockwise to increase it, and counter clockwise to decrease it.

### Technical features

- Operation: membrane-piston regulator
- Adjustable operating pressure: from 800 to 1 mbar abs.
- Flow rate : from 2 to 160 m<sup>3</sup>/h.
- Room temperature: from -10 to +80 °C
- Installation position: any

### Usage

The best use of vacuum reducers is in centralised plants where, regardless of the plant's level of vacuum, each outlet can be adjusted within that value. Moreover, they are necessary whenever the working vacuum must be lower than the primary vacuum.



| Item     | A<br>Ø  | Max capac.<br>m <sup>3</sup> /h | B  | C    | D  | F   | G   | H  | I<br>Ø | L     | M  | O<br>Ø | P  | Q<br>Ø | Vacuum gauge<br>item | Weight<br>Kg |
|----------|---------|---------------------------------|----|------|----|-----|-----|----|--------|-------|----|--------|----|--------|----------------------|--------------|
| 11 01 10 | G1/4"   | 6                               | 47 | 42.0 | 10 | 40  | 60  | 20 | 6.5    | 89.0  | 40 | G1/8"  | 30 | 40     | 09 03 15             | 0.60         |
| 11 02 10 | G3/8"   | 10                              | 47 | 42.0 | 10 | 40  | 60  | 20 | 6.5    | 89.0  | 40 | G1/8"  | 30 | 40     | 09 03 15             | 0.58         |
| 11 03 10 | G1/2"   | 20                              | 53 | 52.0 | 15 | 55  | 85  | 25 | 8.5    | 105.0 | 50 | G1/4"  | 36 | 63     | 09 03 10             | 1.15         |
| 11 04 10 | G3/4"   | 40                              | 55 | 55.5 | 15 | 70  | 100 | 30 | 8.5    | 110.5 | 50 | G1/4"  | 36 | 63     | 09 03 10             | 1.39         |
| 11 05 10 | G1"     | 80                              | 60 | 58.0 | 15 | 90  | 120 | 30 | 8.5    | 118.0 | 60 | G1/4"  | 36 | 63     | 09 03 10             | 2.08         |
| 11 06 10 | G1" 1/2 | 160                             | 54 | 77.5 | 15 | 130 | 160 | 20 | 8.5    | 131.5 | 99 | G1/4"  | 36 | 63     | 09 03 10             | 5.49         |

Note: The vacuum gauges are not integral parts of the regulators and, therefore, must be ordered separately.

Transformation ratio: N (newton) = Kg x 9.81 (force of gravity)

inch =  $\frac{\text{mm}}{25.4}$  ; pounds =  $\frac{\text{g}}{453.6} = \frac{\text{Kg}}{0.4536}$

Adapters for GAS - NPT threading available on page 1.130

## REGULATORS FOR ROUGH VACUUM LEVELS

The regulators on this page are based on the same operation principle as the ones described in the previous page and have the same function. The only difference is that in these ones the minimum adjustable level of vacuum is close to the atmospheric pressure value. The level of vacuum is adjusted manually by turning the knurled thumb screw clockwise to increase it, and counter clockwise to decrease it.

### Technical features

- Operation: membrane-piston regulator
- Adjustable operating pressure: from 980 to 1 mbar abs.
- Flow rate: from 20 to 160 m<sup>3</sup>/h
- Room temperature: from -10 to +80 °C
- Installation position: any

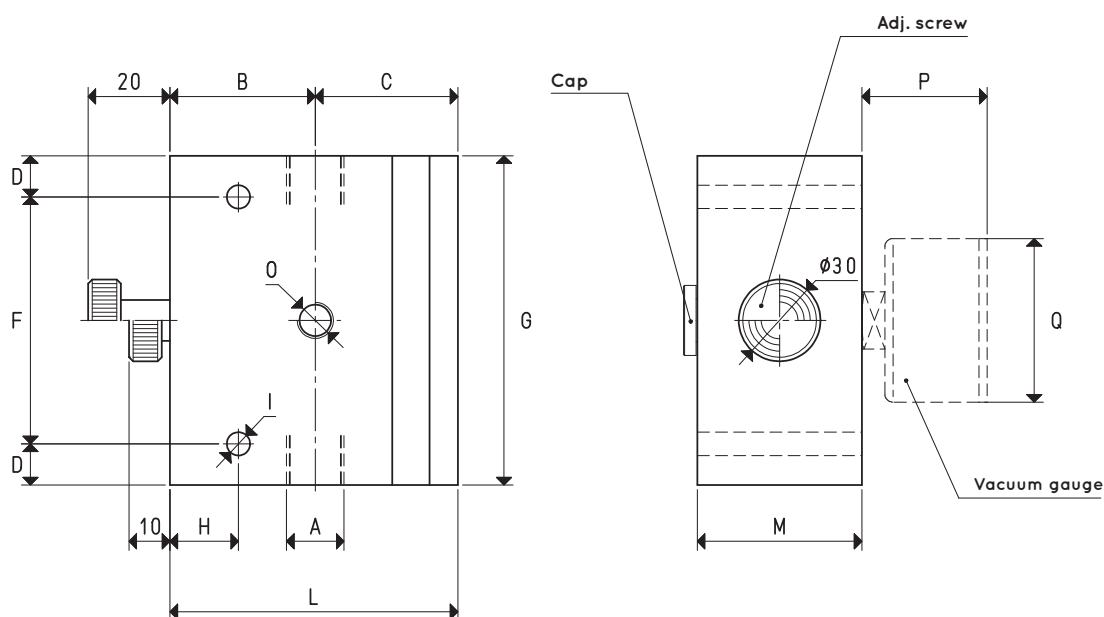
### Usage

These regulators are used as the previously described ones, but they offer the additional advantage of regulating even levels of vacuum close to the atmospheric pressure.



3D drawings are available on [vuototecnica.net](http://vuototecnica.net)

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| Item            | A<br>Ø  | Max capac.<br>m <sup>3</sup> /h | B  | C    | D  | F   | G   | H  | I<br>Ø | L     | M   | O<br>Ø | P  | Q<br>Ø | Vacuum gauge<br>item | Weight<br>Kg |
|-----------------|---------|---------------------------------|----|------|----|-----|-----|----|--------|-------|-----|--------|----|--------|----------------------|--------------|
| <b>11 03 50</b> | G1/2"   | 20                              | 53 | 52.0 | 15 | 90  | 120 | 25 | 8.5    | 105.0 | 60  | G1/4"  | 36 | 63     | 09 03 10             | 2.07         |
| <b>11 05 50</b> | G1"     | 80                              | 60 | 58.0 | 15 | 90  | 120 | 30 | 8.5    | 118.0 | 100 | G1/4"  | 36 | 63     | 09 03 10             | 3.74         |
| <b>11 06 50</b> | G1" 1/2 | 160                             | 54 | 77.5 | 15 | 130 | 160 | 20 | 8.5    | 131.5 | 99  | G1/4"  | 36 | 63     | 09 03 10             | 5.54         |

Note: The vacuum gauges are not integral parts of the regulators and, therefore, must be ordered separately

Transformation ratio: N (newton) = Kg x 9.81 (force of gravity)

inch =  $\frac{\text{mm}}{25.4}$  ; pounds =  $\frac{\text{g}}{453.6} = \frac{\text{Kg}}{0.4536}$

Adapters for GAS - NPT threading available on page 1.130



## VACUUM REGULATORS WITH PNEUMATIC ADJUSTMENT

Vacuum regulators with pneumatic adjustment differ from the previous ones for the way they adjust the level of vacuum; in fact, instead of acting manually on the adjustment screw, it is necessary to act on the pneumatic cylinder compressed air supply: the higher the pressure, and the higher the level of vacuum and vice-versa.

Vacuum regulators are used to adjust the pre-set level of vacuum and keep it constant (secondary vacuum), regardless of the pump vacuum level or the vacuum level (primary vacuum).

Unlike the vacuum adjusting valves, regulators do not introduce atmospheric air into the circuit, thus producing more gripping points with different vacuum values, from only one vacuum source.

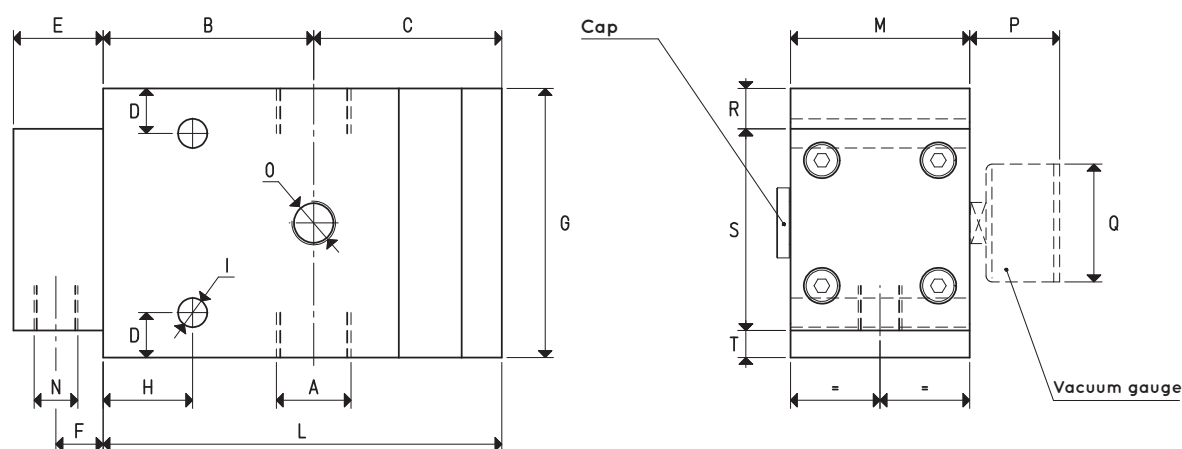
Their operating principle is based on the contrasting action between a pneumatic cylinder with short stroke and a fluctuating piston driven by the pressure differential existing between the secondary vacuum and the atmospheric pressure.

### Technical features

- Operation: membrane-piston regulator
- Supply pressure: from 0 to 3 bar for regulators item 11 .. 30;  
from 0 to 5 bar for regulators item 11 .. 80.
- Adjustable working pressure: from 800 to 1 mbar abs. for regulators item 11 .. 30;  
from 980 to 1 mbar abs. for regulators item 11 .. 80:
- Flow rate: from 2 to 160 m<sup>3</sup>/h.
- Room temperature: from -10 to +80 °C
- Installation position: any

### Usage

Vacuum regulators are mainly used on centralised plants where, regardless of the plant level of vacuum, each grip can be adjusted within that value. Moreover, they are necessary whenever the working vacuum must be lower than the primary vacuum and kept constant. Vacuum regulators with pneumatic adjustment can be installed away from the control point, since it is sufficient to have a pressure regulator on the control panel to act on them.



| Item     | A<br>Ø  | Max capac.<br>m <sup>3</sup> /h | B  | C    | D  | E  | F    | G   | H  | I<br>Ø | L     | M   | N<br>Ø | O<br>Ø | P  | Q<br>Ø | R    | S  | T    | Vacuum gauge<br>item | Weight<br>Kg |
|----------|---------|---------------------------------|----|------|----|----|------|-----|----|--------|-------|-----|--------|--------|----|--------|------|----|------|----------------------|--------------|
| 11 01 30 | G1/4"   | 6                               | 47 | 42.0 | 10 | 20 | 10.5 | 60  | 20 | 6.5    | 89.0  | 40  | G1/8"  | G1/8"  | 30 | 40     | 9.0  | 45 | 6.0  | 09 03 15             | 0.71         |
| 11 02 30 | G3/8"   | 10                              | 47 | 42.0 | 10 | 20 | 10.5 | 60  | 20 | 6.5    | 89.0  | 40  | G1/8"  | G1/8"  | 30 | 40     | 9.0  | 45 | 6.0  | 09 03 15             | 0.69         |
| 11 03 30 | G1/2"   | 20                              | 53 | 52.0 | 15 | 26 | 16.5 | 85  | 25 | 8.5    | 105.0 | 50  | G1/8"  | G1/4"  | 36 | 63     | 16.5 | 58 | 10.5 | 09 03 10             | 1.32         |
| 11 04 30 | G3/4"   | 40                              | 55 | 55.5 | 15 | 26 | 16.5 | 100 | 30 | 8.5    | 110.5 | 50  | G1/8"  | G1/4"  | 36 | 63     | 24.0 | 58 | 18.0 | 09 03 10             | 1.94         |
| 11 05 30 | G1"     | 80                              | 60 | 58.0 | 15 | 26 | 16.5 | 120 | 30 | 8.5    | 118.0 | 60  | G1/8"  | G1/4"  | 36 | 63     | 34.0 | 58 | 28.0 | 09 03 10             | 2.35         |
| 11 06 30 | G1" 1/2 | 160                             | 54 | 77.5 | 15 | 30 | 19.5 | 160 | 20 | 8.5    | 131.5 | 99  | G1/4"  | G1/4"  | 36 | 63     | 37.5 | 80 | 42.5 | 09 03 10             | 5.56         |
| 11 03 80 | G1/2"   | 20                              | 53 | 52.0 | 15 | 26 | 16.5 | 120 | 25 | 8.5    | 105.0 | 60  | G1/8"  | G1/4"  | 36 | 63     | 34.0 | 58 | 28.0 | 09 03 10             | 2.28         |
| 11 05 80 | G1"     | 80                              | 60 | 58.0 | 15 | 26 | 16.5 | 120 | 30 | 8.5    | 118.0 | 100 | G1/8"  | G1/4"  | 36 | 63     | 34.0 | 58 | 28.0 | 09 03 10             | 3.96         |
| 11 06 80 | G1" 1/2 | 160                             | 54 | 77.5 | 15 | 30 | 19.5 | 160 | 20 | 8.5    | 131.5 | 99  | G1/4"  | G1/4"  | 36 | 63     | 37.5 | 80 | 42.5 | 09 03 10             | 5.60         |

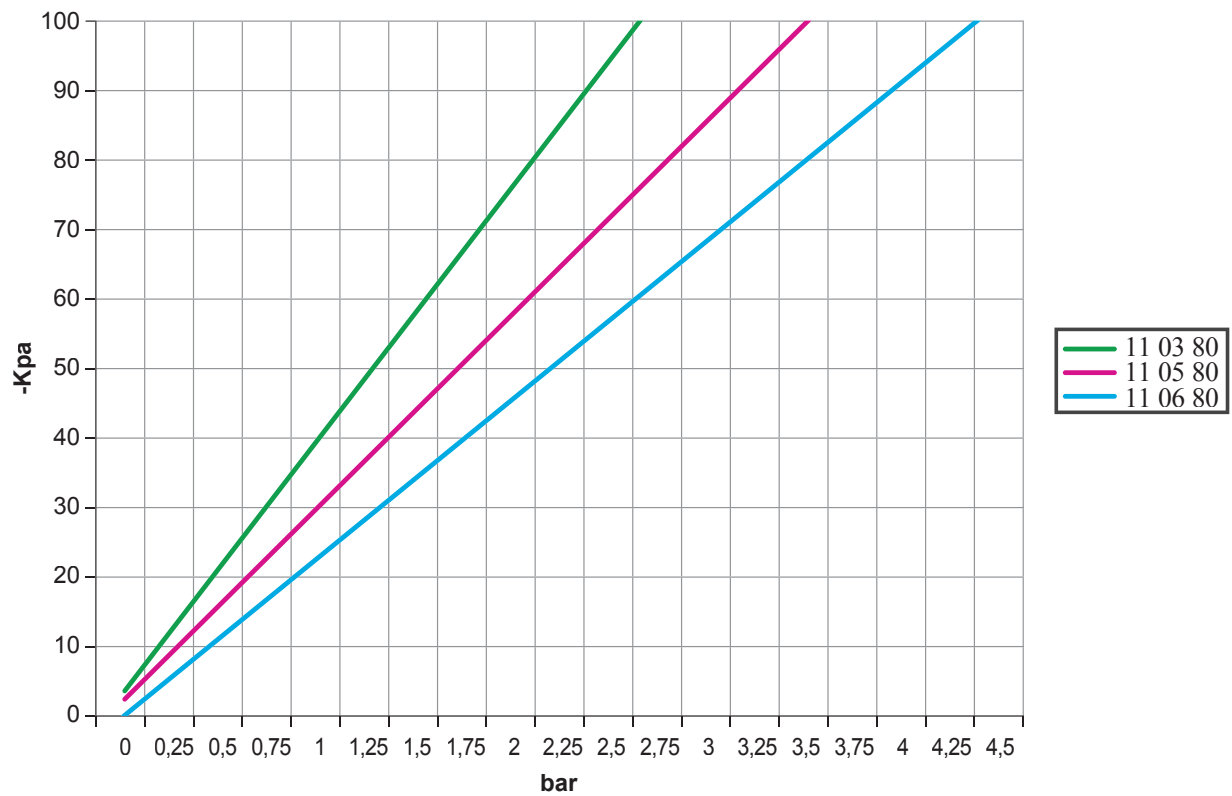
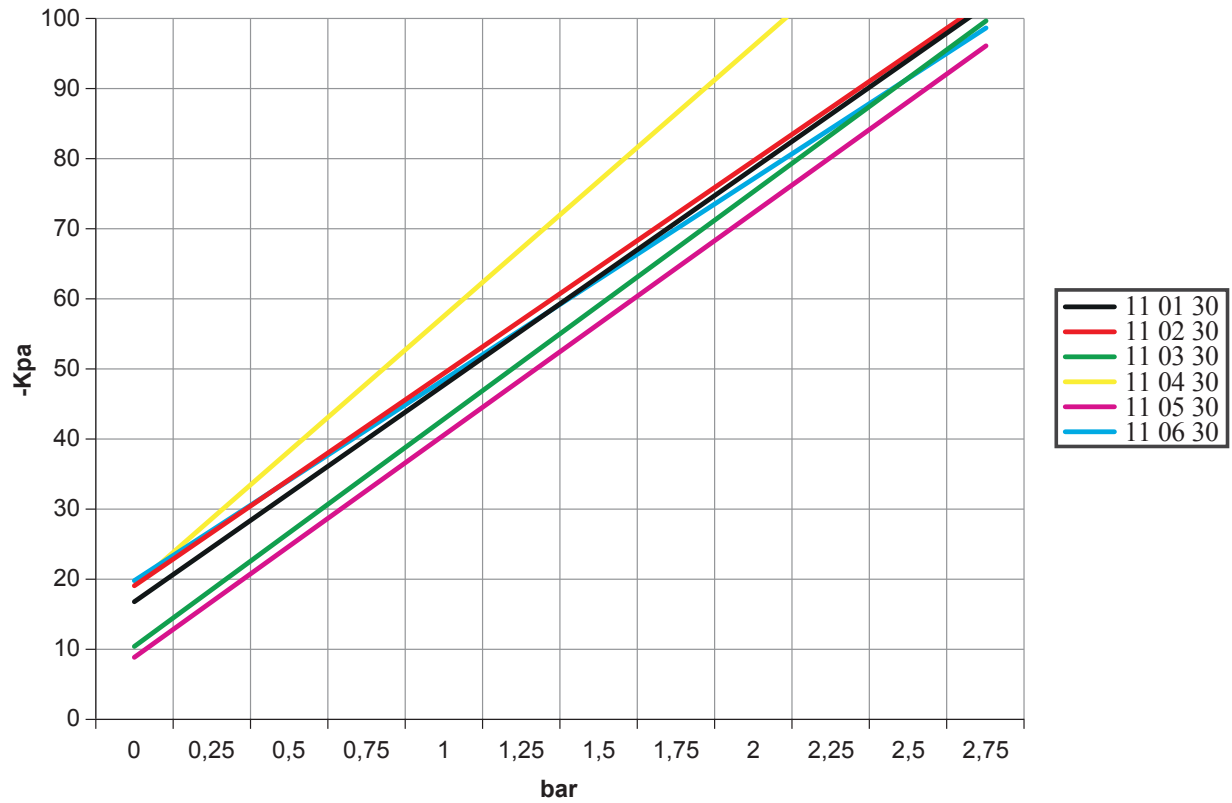
Note: The vacuum gauges are not integral parts of the regulators and, therefore, must be ordered separately.

Transformation ratio: N (newton) = Kg x 9.81 (force of gravity)

inch =  $\frac{\text{mm}}{25.4}$  ; pounds =  $\frac{\text{g}}{453.6} = \frac{\text{Kg}}{0.4536}$

Adapters for GAS - NPT threading available on page 1.130

# DIAGRAMS REFERRING TO THE LEVEL OF VACUUM ACCORDING TO THE SERVO-CONTROL SUPPLY PRESSURE



Note: The values shown in the tables are purely indicative as they depend on atmospheric pressure, the flow rate of the vacuum source and the quality of the compressed air supply



## SEALING KIT FOR VACUUM REDUCERS

3D drawings are available on [vuototecnica.net](http://vuototecnica.net)

3



| Item      | Vacuum regulator<br>item |
|-----------|--------------------------|
| 00 11 113 | 11 01 10                 |
| 00 11 114 | 11 02 10                 |
| 00 11 115 | 11 03 10                 |
| 00 11 116 | 11 04 10                 |
| 00 11 117 | 11 05 10                 |
| 00 11 118 | 11 06 10                 |
| 00 11 119 | 11 03 50                 |
| 00 11 120 | 11 04 50                 |
| 00 11 121 | 11 05 50                 |
| 00 11 122 | 11 01 30                 |
| 00 11 123 | 11 02 30                 |
| 00 11 124 | 11 03 30                 |
| 00 11 125 | 11 04 30                 |
| 00 11 126 | 11 05 30                 |
| 00 11 127 | 11 06 30                 |
| 00 11 128 | 11 03 80                 |
| 00 11 129 | 11 05 80                 |
| 00 11 130 | 11 06 80                 |