

# HPG400

## High Pressure Hot Ionization Pirani Gauge

The INFICON High Pressure Hot Ionization Pirani Gauge, HPG400, combines High Pressure Hot Ionization and Pirani sensors in a single, compact, economical package to measure pressure from  $2 \times 10^{-6}$  to atmosphere ( $1.5 \times 10^{-6}$  to atmosphere). The HPG400 provides highly repeatable and reproducible pressure measurement for accurate sputter process pressure control.

### ADVANTAGES

- HPG400 saves cost and tool space and reduces the complexity of vacuum system installation and setup
- The high pressure hot ion gauge delivers accurate, reliable pressure measurements from  $1 \times 10^{-5}$  ... 1 mbar for improved process control
- User selectable hot ion emission activation between  $5 \times 10^{-2}$  and 1 mbar
- Pirani interlock protects the hot filament from premature burnout
- Optional graphic display and Fieldbus interfaces available
- Automatic high vacuum Pirani adjustment reduces operator interventions

### APPLICATIONS

- Sputter applications in semiconductor manufacturing, electronics and media industry
- Industrial coating
- General vacuum measurement and control in the low to high vacuum range



### ORDERING INFORMATION

| Type                         | HPG400<br>without LCD display | HPG400<br>with LCD display | HPG400-SP<br>with Profibus DP <sup>1)</sup> | HPG400-SD<br>with DeviceNet <sup>1)</sup> |
|------------------------------|-------------------------------|----------------------------|---|---|
| DN 25 ISO-KF                 | 353-520                       | 353-521                    | 353-525                                     | 353-527                                   |
| DN 40 CF-F                   | 353-522                       | 353-523                    | 353-526                                     | 353-528                                   |
| Replacement sensor 25 ISO-KF | 354-487                       | 354-487                    | 354-487                                     | 354-487                                   |
| Replacement sensor 40 CF-F   | 354-488                       | 354-488                    | 354-488                                     | 354-488                                   |

<sup>1)</sup> not available with LCD display

### ACCESSORIES

Power supply 24 V DC / RS232C line

353-511

## SPECIFICATIONS

|  |  | HPG400 Standard  | HPG400 Display                   |
|--|--|--|----------------------------------|
| Measurement range (air, N <sub>2</sub> ) | mbar (Torr)                                | 2 x 10 <sup>-6</sup> ... 1000  | (1.5 x 10 <sup>-6</sup> ... 750) |
| Accuracy                                 | 10 <sup>-5</sup> ... 1 mbar                | % of reading   | ±15 <sup>1)</sup>                |
| Repeatability                            | 10 <sup>-5</sup> ... 10 <sup>-1</sup> mbar | % of reading   | 2                                |
|  | 10 <sup>-1</sup> ... 100 mbar              | % of reading   | 30                               |
| Hot ion emission on, selectable          | mbar                                       | 1  |                                  |
|  | mbar                                       | 5 x 10 <sup>-1</sup>   |                                  |
|  | mbar                                       | 2 x 10 <sup>-1</sup>   |                                  |
|  | mbar                                       | 1 x 10 <sup>-1</sup>   |                                  |
|  | mbar                                       | 5 x 10 <sup>-2</sup>   |                                  |
| Pressure, max.                           | bar (absolute)                             | 5  |                                  |
| Temperature                              |  |  |                                  |
| Operation (ambient)                      | °C   | 0 ... +50  |                                  |
| Storage                                  | °C   | -20 ... +70  |                                  |
| Bakeout                                  |  |  |                                  |
| At flange                                | °C   | 80   |                                  |
| Electronics removed                      | °C   | 150  |                                  |
| Supply voltage                           | V / A DC                                   | 20 ... 28 / 0.8  |                                  |
| Output signal analog                     |  |  |                                  |
| Measurement range                        |  |  |                                  |
| Hot cathode                              | V  | 1.5 ... 7.5  |                                  |
| Pirani                                   | V  | 8.5 ... 9.75   |                                  |
| Voltage vs. pressure                     |  |  |                                  |
| Hot cathode                              | V / Decade                                 | 1  |                                  |
| Pirani                                   | V / Decade                                 | 0.25   |                                  |
| Error signal                             |  |  |                                  |
| Hot cathode                              | V  | 0.3  |                                  |
| Pirani                                   | V  | 0.5  |                                  |
| Load impedance, min.                     | kΩ   | 10   |                                  |
| Interface (digital) <sup>2)</sup>        |  | RS232C   |                                  |
| Electrical connection                    |  | D-sub, 15 pin, male  |                                  |
| Cable length, max. <sup>3)</sup>         | m (ft)                                     | 100 (330)  |                                  |
| Materials exposed to vacuum              |  | Yt <sub>2</sub> O <sub>3</sub> , Ir, Pt, Mo, Cu, W, NiFe, NiCr, stainless steel, glass |                                  |
| Internal volume KF / CF                  | cm <sup>3</sup> (inch) <sup>3</sup>        | 20 (1.2) / 30 (1.8)  |                                  |
| Weight KF / CF                           | g  | 430 / 695  |                                  |
| Protection type                          |  | IP30   |                                  |

<sup>1)</sup> Accuracy from 10<sup>-5</sup> mbar to the selected hot ion emission on value

<sup>2)</sup> Simultaneous use of RS232C or VGC400 series controllers and Fieldbus is not allowed

<sup>3)</sup> For RS232C operation <30 m

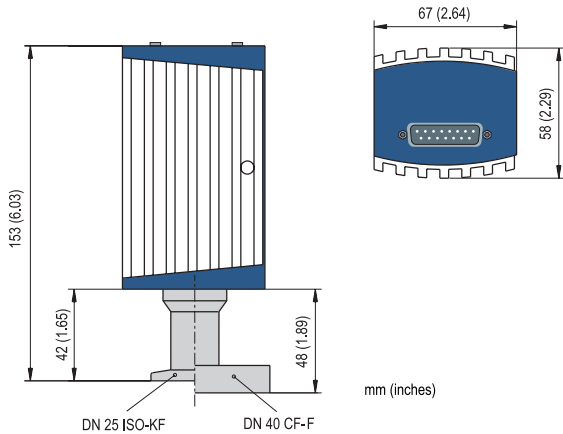
## SPECIFICATIONS

|  |              |  | <b>HPG400-SD DeviceNet™</b>  |
|--|--------------|--|--|
| Protocol   |              |  | DeviceNet™, group 2 slave only   |
| Data rate switch   | kBaud        |  | 125, 250, 500 or network programmable  |
| Cable length   |              |  |  |
| 125 kbps   | m (ft)       |  | 500 (1650)   |
| 250 kbps   | m (ft)       |  | 250 (825)  |
| 500 kbps   | m (ft)       |  | 100 (330)  |
| MAC ID   |              |  | 2 switches (address 00 - 63) or network programmable   |
| Network size   |              |  | up to 64 nodes per segment   |
| Digital functions  |              |  | read pressure, select units: Torr, mbar, Pa<br>Pirani full scale adjust<br>monitor gauge status<br>safe state allows definition of behavior in case of error<br>detailed alarm and warning information |
| Analog functions   |              |  | 0 ... 10 V analog output pressure indication<br>two setpoint relays A + B  |
| Visual communication indicators                              |              |  | LED network status (green / red)<br>LED module status (green / red)  |
| Specification  |              |  | DeviceNet™ "Vacuum Gauge Device Profile"   |
| Device type  |              |  | "CG" for combination gauge   |
| I / O slave messaging  |              |  | polling only   |
| Setpoint relays  |              |  | 2  |
| Range  | mbar         |  | $2 \times 10^{-6} \dots 100$   |
| Relay contact  |              |  | n.o., potential free   |
| Hysteresis   | % of reading |  | 10   |
| Contact rating   | V DC / A     |  | 60 / 0.5   |
| Supply voltage for DeviceNet™                                | V DC / A     |  | 11 ... 25 / 0.5  |
| Supply voltage for gauge                                     | V DC         |  | 20 ... 28  |
| Connector for DeviceNet™                                     |              |  | microstyle, 5 pin  |
| Connector for HPG (analog output, supply voltage, setpoints) |              |  | D-sub, 15 pin, male  |

## SPECIFICATIONS

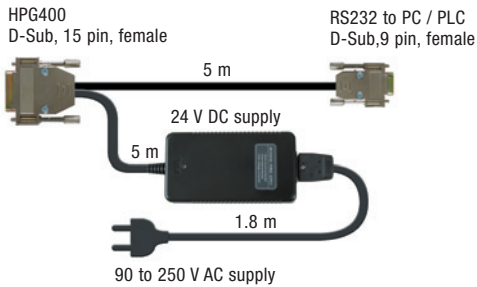
|  |                |  | <b>HPG400-SP Profibus DP</b>   |
|--|----------------|--|--|
| Baud rates   | kBaud<br>MBaud |  | 9.6 / 19.2 / 93.75 / 187.5 / 500<br>1.5 / 12   |
| Address  |                |  | 2 switches (address 00 - 127) or network programmable  |
| Digital functions  |                |  | read pressure, select units: Torr, mbar, Pa<br>Pirani full scale adjust<br>monitor gauge status<br>safe state allows definition of behavior in case of error<br>detailed alarm and warning information |
| Analog functions   |                |  | 0 ... 10 V analog output pressure indication<br>two setpoint relays A + B  |
| Setpoint relays  |                |  | 2  |
| Range  | mbar           |  | $1 \times 10^{-6} \dots 100$   |
| Relay contact  |                |  | n.o., potential free   |
| Hysteresis   | % of reading   |  | 10   |
| Contact rating   | V DC / A       |  | 60 / 0.5   |
| Connector for Profibus DP                                    |                |  | D-sub, 9 pin, female   |
| Connector for HPG (analog output, supply voltage, setpoints) |                |  | D-sub, 15 pin, male  |

## DIMENSIONS



## ACCESSORIES

### Power supply 24 V DC / RS232C line



 **INFICON** Instruments for Intelligent Control™

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Due to our continuing program of product improvements, specifications are subject to change without notice.  
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