

Gemini[®] MPG5xx / MAG5xx

Inverted Magnetron/Inverted Magnetron Pirani Gauge

The INFICON Gemini™ Inverted Magnetron Vacuum Gauge is the workhorse for all vacuum measurement applications. While Gemini MPG5xx combines two sensor technologies in one small device to measure from atmosphere down to 1×10^{-9} mbar, the Gemini MAG5xx is a pure cold cathode sensor system (without Pirani element) which covers the range from 1×10^{-2} mbar to 1×10^{-9} mbar. The patented ultra-low magnetic stray field design opens up a whole new range of applications. A unique interchangeable dual chamber sensor unit avoids cleaning cycles and reduces maintenance, making Gemini the most robust and economical vacuum gauge of its kind.

MAG and MPG Gemini are available with EtherCAT and PROFINET fieldbus.

For corrosive applications we suggest to use the ceramic coated version MxG5x4. Feedthrough and Pirani inside the sensor head are fully ceramic coated for enhanced corrosion resistance.



ADVANTAGES

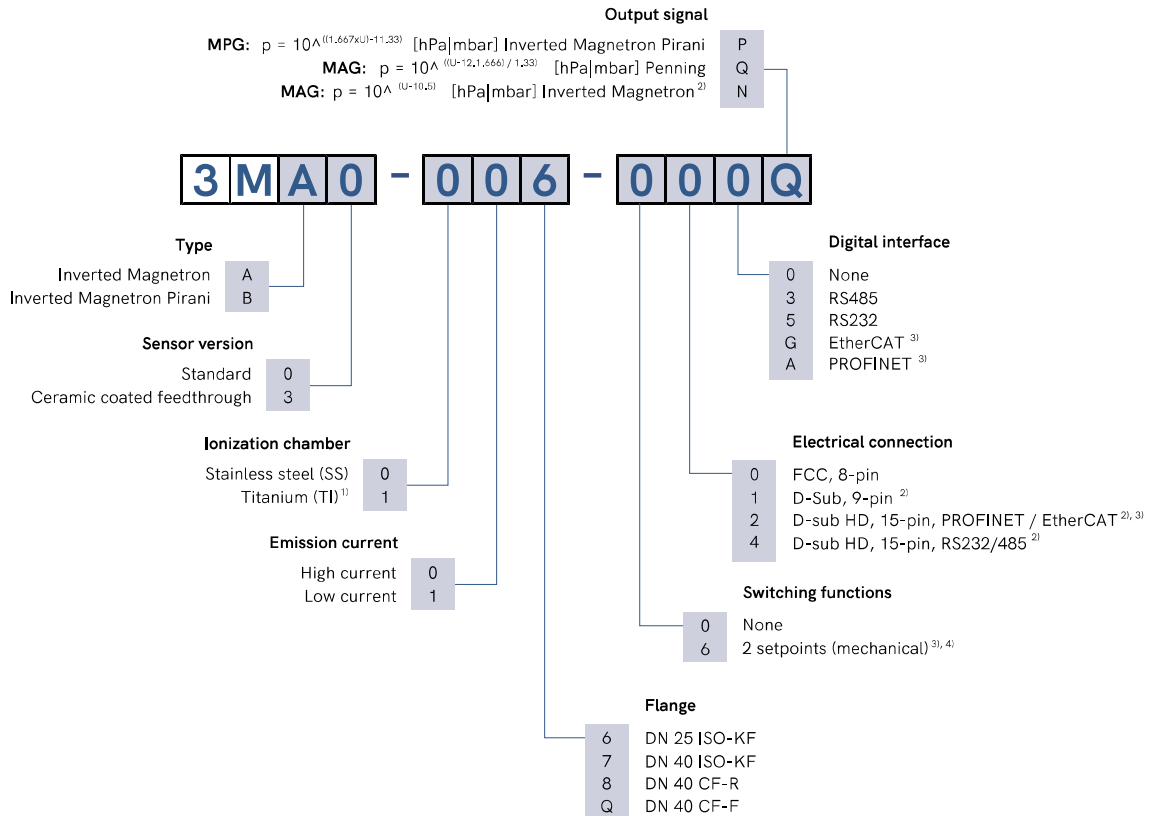
- Long lifetime in harsh environments
- Reliable fast ignition
- Low magnetic stray field
- Selectable measuring current
- Fast maintenance - replaceable ionization chamber
- Corrosion resistant feedthrough & sensor element
- PROFINET, EtherCAT and RS232/ RS485 digital interface
- Compact size - easy to integrate
- 2 relay setpoints (MxG55x)

APPLICATIONS

- Base pressure monitoring and control, from atmosphere to high vacuum in evaporation and sputter coating applications.
- General vacuum measurement - industrial furnaces, architectural glass, semiconductor, production laboratory's..
- Analytical and R&D applications - mass spectrometry, electron microscopes, ophthalmic, optical, medical and high energy physics.

Gemini® MPG5xx / MAG5xx

ORDERING INFORMATION



- 1) For low current version only
- 2) Not suited for operation with an INFICON vacuum gauge controller VGC40x or VGC50x
- 3) MxG55x in large housing and with switching functions
- 4) Set points only available with PROFINET & EtherCAT digital interface (mandatory) and not with any other digital interface or electrical connection

Gemini[®] MPG5xx / MAG5xx

Spare parts	MAG5xx	MPG5xx
MAG500 spare sensor		
25 KF, SS	351-500	-
25 KF, Ti	351-502	-
40 KF, SS	351-512	-
40 KF, Ti	351-514	-
40 CF-F, SS	351-524	-
40 CF-F, Ti	351-526	-
40 CF-R, SS	351-536	-
40 CF-R, Ti	351-538	-
MAG504 spare sensor		
25 KF, SS	351-501	-
25 KF, Ti	351-503	-
40 KF, SS	351-513	-
40 KF, Ti	351-515	-
40 CF-F, SS	351-525	-
40 CF-F, Ti	351-527	-
40 CF-R, SS	351-537	-
40 CF-R, Ti	351-539	-
MPG500 spare sensor		
25 KF, SS	-	351-506
25 KF, Ti	-	351-508
40 KF, SS	-	351-518
40 KF, Ti	-	351-520
40 CF-F, SS	-	351-530
40 CF-F, Ti	-	351-532
40 CF-R, SS	-	351-542
40 CF-R, Ti	-	351-544
MPG504 spare sensor		
25 KF, SS	-	351-507
25 KF, Ti	-	351-509
40 KF, SS	-	351-519
40 KF, Ti	-	351-521
40 CF-F, SS	-	351-531
40 CF-F, Ti	-	351-533
40 CF-R, SS	-	351-543
40 CF-R, Ti	-	351-545
MxG50x spare parts ignition aid (10 pieces)	351-995	351-995
Spare ion chamber SS	351-555	351-555
Spare ion chamber Ti	351-556	351-556

Gemini[®] MPG5xx / MAG5xx

Accessories	MAG5xx	MPG5xx
Baffle for DN 25 KF flange	353-512	353-512
Centering ring with baffle DN 25 KF	211-113	211-113
Centering ring with fine filter DN 25 KF	211-098	211-098
MxG50x ignition tool set	351-550	351-550

Gemini[®] MPG5xx / MAG5xx

SPECIFICATIONS

Type	MAG5xx	MPG5xx
Measurement system	Cold Cathode ionization measurement sensor (according to the inverted magnetron principle)	Pirani and Cold Cathode ionization measurement sensor (according to the inverted magnetron principle)
Measurement range (air, N ₂)		
mbar	$1 \times 10^{-9} \dots 1 \times 10^{-2}$	$1 \times 10^{-9} \dots 1000$
Torr	$7.6 \times 10^{-10} \dots 7.6 \times 10^{-3}$	$7.6 \times 10^{-10} \dots 760$
Accuracy (N ₂)		
$1 \times 10^{-8} \dots 1 \times 10^{-2}$ mbar	30% of reading	30% of reading
$1 \times 10^{-2} \dots 100$ mbar	-	30% of reading
100 ... 1000 mbar	-	50% of reading
Repeatability (N ₂)		
$1 \times 10^{-8} \dots 1 \times 10^{-2}$ mbar	5% of reading	5% of reading
$1 \times 10^{-2} \dots 100$ mbar	-	5% of reading
Mounting orientation	any	
Admissible pressure (absolute)	10 bar (limited to inert gases <55°C)	
Admissible temperature		
Operation (ambient)	+5 ... +55°C	
Bakeout at flange ¹⁾	+150°C	
Storage	-40 ... +70°C	
Filament	120°C (MPG5xx only)	
Relative humidity for 30 days a year		
$1 \times 10^{-7} \dots 1 \times 10^{-2}$ mbar	≤95% RH (non-condensing)	
$1 \times 10^{-8} \dots 1 \times 10^{-2}$ mbar	≤70% RH (non-condensing)	
Supply voltage		
At gauge ²⁾	+14.5 ... +30 V (dc)	
Ripple	≤1 V _{pp}	
Power consumption	≤3 W	
Fuse to be connected	≤1 AT	
Voltage range (analog output)	0 ... +10.5 V	
Output impedance	2 × 4.7 Ω (short circuit-proof)	
Load impedance	≥10 kΩ (short circuit-proof)	
Measurement range		
3MAx-xxx-xxxN	+1.5 ... +8.5 V	
3MBx-xxx-xxxP	+1.398 ... +8.598 V	
3MAx-xxx-xxxQ	+0.667 ... +10 V	
Voltage vs. pressure		
3MAx-xxx-xxxN	1 V/decade (logarithmic)	
3MBx-xxx-xxxP	0.6 V/decade (logarithmic)	
3MAx-xxx-xxxQ	1.33 V/decade (logarithmic)	

¹⁾ Without electronics

²⁾ The minimum voltage of the supply unit must be increased proportionally to the length of the sensor cable

Gemini[®] MPG5xx / MAG5xx

Type	MAG5xx	MPG5xx
Step response time (pressure dependent)		
>1x10 ⁻⁶ mbar		<100 ms
1x10 ⁻⁶ ... 1x10 ⁻⁸ mbar		≈1 s
Gauge identification	100 kΩ	85 kΩ
Status signal (digital output)		
FCC connector		
Current rating		100 mA
High voltage is ON	+14.5 ... +30 V (dc) (depending on supply voltage)	
High voltage is OFF		0 V (dc)
D-sub connector		
Current rating		100 mA (sink)
High voltage is ON		0 V (dc)
High voltage is OFF		open
Supply voltage		≤30 V (dc)
Cable length		
50 m cable		≤50 m (8x0.14 mm ²)
75 m cable		≤75 m (8x0.25 mm ²)
100 m cable		≤100 m (8x0.34 mm ²)
300 m cable		≤300 m (8x1.00 mm ²)
FCC connector cable		≤50 m (0.14 mm ² /conductor)
High voltage (in the measuring chamber)		
Ignition voltage		≤4.5 kV
Operating voltage		≤3.3 kV
Current (in the measuring chamber)		
High current		≤380 μA
Low current		≤130 μA
Setpoint relays (MxG55x)		
Range (N2)		5 × 10 ⁻⁵ ... 1500 mbar
Relay contact		normally open (ON), potential free
Hysteresis		10% of threshold
Contact rating of mechanical relays		≤30 V / ≤1 A
Switching time		≤30 ms
Materials exposed to vacuum	W, Ni alloy, Mo, Al ₂ O ₃ , glass, Ti, stainless steels	
Internal volume		
DN 25 ISO-KF		≈19.9 cm ³
DN 40 ISO-KF		≈20.9 cm ³
DN 40 CF-F		≈25.2 cm ³
DN 40 CF-R		≈25.6 cm ³

¹⁾ Without electronics

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Gemini[®] MPG5xx / MAG5xx

Type	MAG5xx	MPG5xx
Weight		
MxG50x		
DN 25 ISO-K		<280 g
DN 40 ISO-KF		<320 g
DN 40 CF-F & CF-R		<570 g
MxG55x		
DN 25 ISO-K		≤500 g
DN 40 ISO-KF		≤530 g
DN 40 CF-F & CF-R		≤780 g
Degree of protection		IP40
Standards CE conformity		
EMC	2014/30/EU (EN 61000-6-2, EN61000-6-3 EN61326-1)	
RoHS	2011/65/EU	
Safety	EN 61010-1	
Baud rates (RS232C/485C)	9.6 / 19.2 / 38.4 / 57.6 kBaud	
Address (RS232C/485C)	2 switches (address 00 - 255)	
Digital functions	Read pressure, select units: Torr, mbar, Pa, micron, counts monitor gauge status, detailed alarm and warning information, soft state allows definition of behaviour in case of error	
Connector for RS232 & RS485	D-sub HD, 15-pin, male	

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SPECIFICATIONS INTERFACES

EtherCAT[®]

Protocol	EtherCAT [®]
Communication standards	Semiconductor Device Profile ETG.5003 Part 1 Common Device Profile ETG.5003 Part 2080 "Specific Device Profile - Vacuum Pressure Gauge"
Process Data	Fixed PDO mapping and configurable PDO mapping
EtherCAT connector	RJ45, 8-pin (socket), IN and OUT
Cable	Shielded Ethernet CAT5e or higher
Cable length	≤100 m (330 ft.)
Data rate	100000 Kbps

PROFINET™

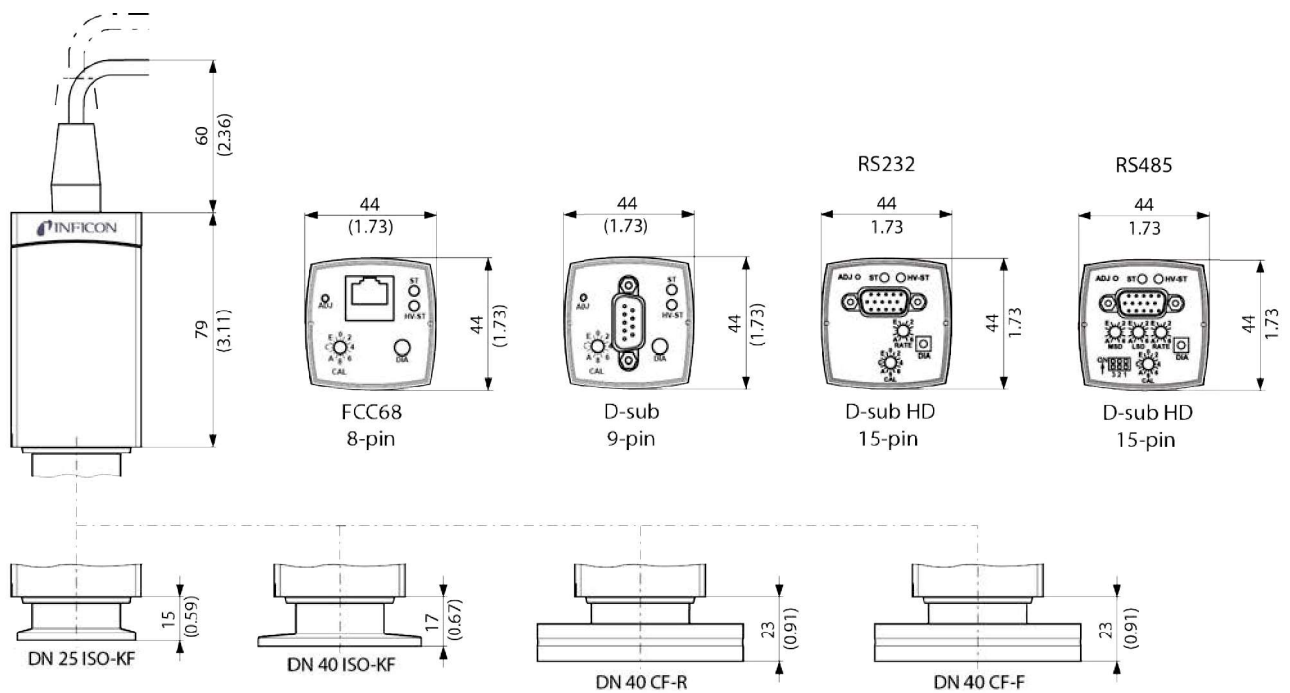
Communication protocol	protocol specialized for PROFINET
Physical Layer	100BASE-Tx (IEEE 802.3)
Digital functions	
read	pressure, status, ID
set	set points, filter, zero adjust, reset, DC offset
Profinet connector	2 × RJ45, 8-pin (socket), IN and OUT
Cable	Special Ethernet Patch Cable or Crossover Cable, shielded (CAT5e quality or higher)
Cable length	≤100 m (330 ft.)
Data rate	100000 Kbps

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DIMENSIONS

[mm (inch)]

MxG50x



MxG55x

