

## Gemini™ MxG5xx ATM to Ultra-High Vacuum Gauge

The INFICON Gemini™ Inverted Magnetron Vacuum Gauge is the workhorse for all vacuum measurement applications. While Gemini MPG50x combines two sensor systems in one small device to measure from atmosphere down to  $1 \times 10^{-9}$  mbar, the Gemini MAG50x is a pure cold cathode sensor System (without Pirani element) which covers the range from  $1 \times 10^{-2}$  mbar to  $1 \times 10^{-9}$  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.

Gemini Cold Cathode and combination comes with fully integrated digital electronics, providing ultimate flexibility for system integration. The Cold cathode and Pirani combination version (MPG) option provides seamless transition, reliability, practicality and flexibility across wide ranging applications.

MAG and MPG Gemini are now available with EtherCAT fieldbus and setpoints as MAG55x and MPG55x.

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.

Gemini™ Cold Cathode and combination sensor's come with fully integrated digital electronics, providing ultimate flexibility for System Integration.

Both, cold cathode and Pirani combination sensor Option provide seamless Transition, reliability, proactivity and flexibility across wide ranging applications.

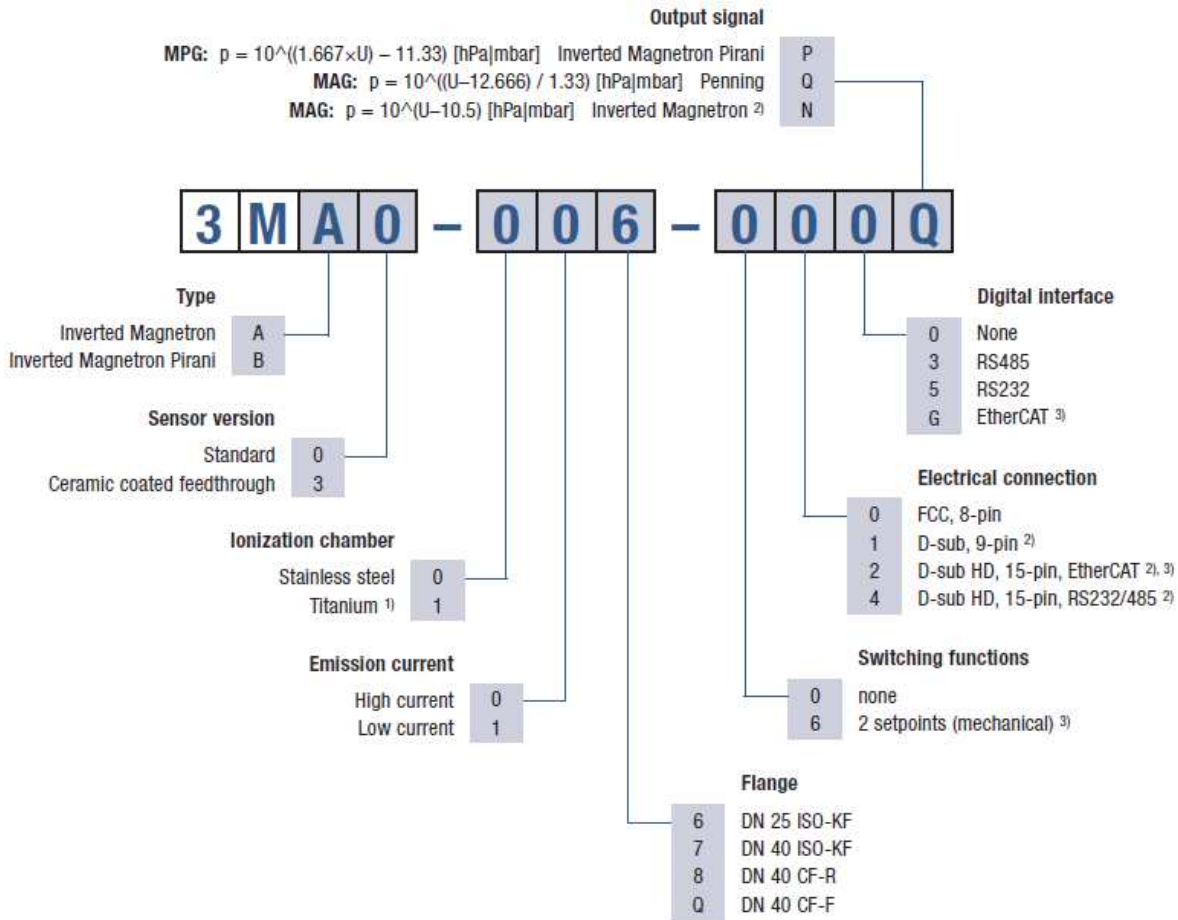


## ADVANTAGES

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- Long lifetime in harsh environments
- Low magnetic stray field
- Reliable fast ignition
- Fastest maintenance - replaceable insert
- Compact size - easy to integrate
- Corrosion proof feed-through & sensor element
- Selectable measuring current
- 2 relay setpoints (MxG55x)
- EtherCAT and RS232/ RS485 digital interace

# ORDER INFORMATION



<sup>1)</sup> For low current version only.

<sup>2)</sup> Not suited for operation with an INFICON vacuum gauge controller VGC40x or VGC50x.

<sup>3)</sup> New sensor MxG55x in large housing and with switching functions.

## SPECIFICATIONS

Type		MAG5xx	MPG5xx
Measurement system		Cold cathode ionization measurement system (according to the inverted magnetron principle)	Pirani and cold cathode ionization measurement system (according to the inverted magnetron principle)
Measurement range (air, N <sub>2</sub> )	mbar	1×10 <sup>-9</sup> ... 1×10 <sup>-2</sup>	1×10 <sup>-9</sup> ... 1000
Measurement range (air, N <sub>2</sub> )	Torr	(7.6×10 <sup>-10</sup> ... 7.6×10 <sup>-3</sup> )	(7.6×10 <sup>-10</sup> ... 760)
Accuracy (N <sub>2</sub> )			
1×10 <sup>-8</sup> ... 1×10 <sup>-2</sup> mbar	% of reading	30	-
1×10 <sup>-2</sup> ... 100 mbar	% of reading	-	30
100 ... 1000 mbar	% of reading	-	50
Repeatability (N <sub>2</sub> )			
1×10 <sup>-8</sup> ... 1×10 <sup>-2</sup> mbar	% of reading	5	-
1×10 <sup>-8</sup> ... 100 mbar	% of reading	-	5
Mounting orientation		any	any
Admissible pressure	bar (absolute)	10 (limited to inert gases <55°C)	10 (limited to inert gases <55°C)
Admissible temperature			
Operation (ambient)	°C	+5 ... +55	+5 ... +55
Bakeout at flange (1)	°C	≤150	≤150
Storage	°C	-40 ... +70	-40 ... +70
Filament temperature	°C	-	120
Relative humidity for 30 days a year			
1×10 <sup>-7</sup> ... 1×10 <sup>-2</sup> mbar	%	≤95 (non-condensing)	≤95 (non-condensing)
1×10 <sup>-8</sup> ... 1×10 <sup>-2</sup> mbar	%	≤70 (non-condensing)	≤70 (non-condensing)
Supply voltage			
At gauge (2)	V (dc)	+14.5 ... +30	+14.5 ... +30
Supply voltage			
Ripple	V (p-p)	≤1	≤1
Supply voltage			
Power consumption	W	≤2	≤2
Supply voltage			
Fuse to be connected	AT	≤1	≤1

## SPECIFICATIONS

Type		MAG5xx	MPG5xx
Voltage range			
analog output	V	0 ... +10.5	0 ... +10.5
Error signal			
Output impedance	$\Omega$		2x10
Error signal			
Load impedance	k $\Omega$		$\geq 10$ (short circuit-proof)
Step response time			
p > 1 x 10 <sup>-6</sup> mbar	ms		<100
Step response time			
p=1x10 <sup>-6</sup> ...1x10 <sup>-8</sup> mbar	s		~1
Gauge identification	k $\Omega$		85
Measurement range			
3MAx-00x-0x0N	V		-
3MBx-00x-0x0P	V		+1.398 ... +8.598
3MAx-00x-0x0Q	V		-
3MAx-xxx-xxxN	V	+1.5 ... +8.5	
3MBx-xxx-xxxP	V	-	
3MAx-xxx-xxxQ	V	+0.667 ... +10	
Status (pin 6)			
Cold cathode ignited	V		-
Pirani-only mode	V		0 (low)
Combined Pirani/ cold cathode mode 3)	V		+15 ... +30 (high)
Operating voltage	kV		$\leq 3.3$
High operating current	$\mu$ A		$\leq 500$
Voltage vs. pressure			
3MAx-00x-0x0N	volts per decade		-
3MBx-00x-0x0P	volts per decade		0.6 (logarithmic)
3MAx-00x-0x0Q	volts per decade		-
3MAx-xxx-xxxN	volts per decade	1 (logarithmic)	
3MBx-xxx-xxxP	volts per decade	-	
3MAx-xxx-xxxQ	volts per decade	1.33 (logarithmic)	

## SPECIFICATIONS

Type		MAG5xx	MPG5xx
Low operating current	$\mu\text{A}$		$\leq 100$
Weight			
DN 25 ISO-KF	g		<280
DN 40 ISO-KF	g		<320
DN 40 CF-F & CF-R	g		<570
Error signal			
Error signal	V		09.5 ... +10.5
3MAx-xxx-xxxN	V	<+0.5	
3MA-xxx-xxxQ	V	$\leq +0.3$	
3MBx-xxx-xxxP	V	-	
Output impedance	$\Omega$	2 x 4.7 (short circuit-proof)	
Standards			
CE conformity			EMC (EN 61000-6-2, EN 61000-6-3), EN 61010-1 & RoHS
Load impedance	$k\Omega$	$\geq 10$ (short circuit-proof)	
Maintenance			none
Step response time (pressure dependent)			
$p > 1 \times 10^{-6}$ mbar	ms	<100	
Step response time (pressure dependent)			
$p = 1 \times 10^{-6} \dots 1 \times 10^{-8}$ mbar	s	~1	
Gauge identification (FCC connector gauges)			
3MAx-0xx-000N	$k\Omega$	-	
3MAx-0xx-000Q	$k\Omega$	100	
3MBx-0xx-000P	$k\Omega$	-	

## SPECIFICATIONS

Type		MAG5xx	MPG5xx
Status signal, digital output (FCC connector)			
Current rating	mA	100	
Status signal, digital output (FCC connector)			
High Voltage is ON	V (dc)	+14.5 ... +30 (depending on supply voltage)	
High Voltage is OFF	V (dc)	0	
Status signal, digital output (D-sub connector)			
Supply voltage	V (dc)	≤30	
High voltage ON	V (dc)	0	
Status signal, digital output (D-sub connector)			
Current rating	mA	100 (sink)	
Status signal, digital output (D-sub connector)			
High voltage OFF		open	
Electrical connection			
3Mxx-00x-000x			FCC68, 8-pin, female
3Mxx-00x-010x			D-sub, 9-pin, male
3Mxx-0xx-000x		FCC68, 8-pin, female	
3Mxx-0xx-010x		D-sub, 9-pin, male	
3Mxx-0xx-04xx		D-Sub HD, 15-pin, male (for RS232/485 version)	
3Mxx-xxx-x2Gx		D-Sub HD, 15-pin, male (for EtherCAT Version)	
Sensor cable			
3Mxx-00x-000x			8-pin, shielded
3Mxx-0xx-000x		8-pin, shielded	
3Mxx-0xx-010x		9-pin, shielded	
3Mxx-0xx-04xx		15-pin, shielded (for RS232/485 version)	

## SPECIFICATIONS

Type		MAG5xx	MPG5xx
3Mxx-xxx-x2Gx		15-pin, shielded (for EtherCAT version)	
Cable length			
50 m cable	m		≤ 50 (8x0.14 mm <sup>2</sup> )
75 m cable	m		≤ 75 (8x0.25 mm <sup>2</sup> )
100 m cable	m		≤ 100 (8x0.34 mm <sup>2</sup> )
300 m cable	m		≤ 300 (8x1.00 mm <sup>2</sup> )
FCC connector cable	m	≤50 (0.14 mm <sup>2</sup> / conductor)	
High voltage (in the measuring chamber)			
Ignition voltage	kV	≤4.5	
Operating voltage	kV	≤3.3	
Current (in the measuring chamber)			
High current	μA	≤380	
Low current	μA	≤130	
Setpoint relays (MxG55x)			
Range (N2)	mbar bar	5x10 <sup>-5</sup> ... 1500	
Setpoint relays (MxG55x)			
Relay contact		normally open (NO), potential free	
Setpoint relays (MxG55x)			
Hysteresis	% of threshold	10	
Setpoint relays (MxG55x)			
Contact rating of mechanical relays	V/A	≤30/ ≤1	
Setpoint relays (MxG55x)			
Switching time	ms	≤30	
Materials exposed to vacuum			
3Mx0-00x-0x0x		W, Ni alloy, Al <sub>2</sub> O <sub>3</sub> , glass, stainless steels	
3Mx3-00x-0x0x		Ni alloy, Al <sub>2</sub> O <sub>3</sub> , stainless steels	
3Mx0-xxx-xxxx		Ni alloy, Mo, Al <sub>2</sub> O <sub>3</sub> , glass, stainless steels	



## SPECIFICATIONS

Type		MAG5xx	MPG5xx
3Mx3-xxx-xxxx		Mo, Al <sub>2</sub> O <sub>3</sub> , stainless steels	
3Mx0-11x-xxxx		Ni alloy, Mo, Al <sub>2</sub> O <sub>3</sub> , glass, Ti, stainless steels	
3Mx3-11x-xxxx		Mo, Al <sub>2</sub> O <sub>3</sub> , Ti, stainless steels	
Internal volume			22.8
DN 25 ISO-KF	cm <sup>3</sup>	~19.9	
DN 40 ISO-KF	cm <sup>3</sup>	~20.9	
DN 40 CF-F	cm <sup>3</sup>	~25.2	
DN 40 CF-R	cm <sup>3</sup>	~25.6	
	cm <sup>3</sup>	22.8	22.8
Weight (MxG50x)			
DN 25 ISO-KF	g	<280	
DN 40 ISO-KF	g	<320	
DN 40 CF-F & CF-R	g	<570	
Weight (MxG55x)			
DN 25 ISO-KF	g	≤500	
DN 40 ISO-KF	g	≤320	
DN 40 CF-F & CF-R	g	≤780	
Degree of protection		IP 40	IP 40
CE conformity			
EMC		2014/30/EU, EN 61000-6-2, EN 61000-6-3, EN 61326-1	
RoHS		2011/65/EU	
Safety		EN 61010-1	
RS232C / 485C (MxG50x)			
Baud rates	kBaud	9.6/ 19.2/ 38.4/ 57.6	
RS232C / 485C (MxG50x)			
Address		2 switches (address 00 - 255)	
Digital functions		Read pressure, select Units: Torr, mbar, Pa, micron, counts. Monitor gauge Status, detailed Alarm and warning Information, safe state allows Definition of behaviour in case of error.	

## SPECIFICATIONS

Type	MAG5xx	MPG5xx
Connector for RS232 & RS485	D-Sub HD, 15-pin, male	
EtherCAT® (MxG55x)		
Protocol	EtherCAT	
Communication standard	ETG.5003.1 S (R) V1.1.0 <sup>4)</sup> ETG.5003.2080 S (R) V1.3.0 <sup>5)</sup>	
Node address	Explicit Device Identification	
Physical layer	100Base-Tx (IEEE 802.3)	
Digital functions	Read pressure, select Units: Torr, mbar, Pa, micron, Counts. Monitor gauge Status, detailed Alarm and warning Information, safe state allows Definition of behaviour in case of error.	
EtherCAT connector	2 x RJ45, 8-pin (socket), Input & output	
EtherCAT cable	Special Ethernet Patch cable or crossover cable, shielded (CAT5e Quality or higher)	
EtherCAT® (MxG55x)		
Cable length	m (ft.)	≤100 (330)

1) Without electronics.

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

3) Cold cathode ignited.

4) Semiconductor Device Profile

5) Specific Device Profile: Vacuum Pressure Gauge

## SPAREPARTS

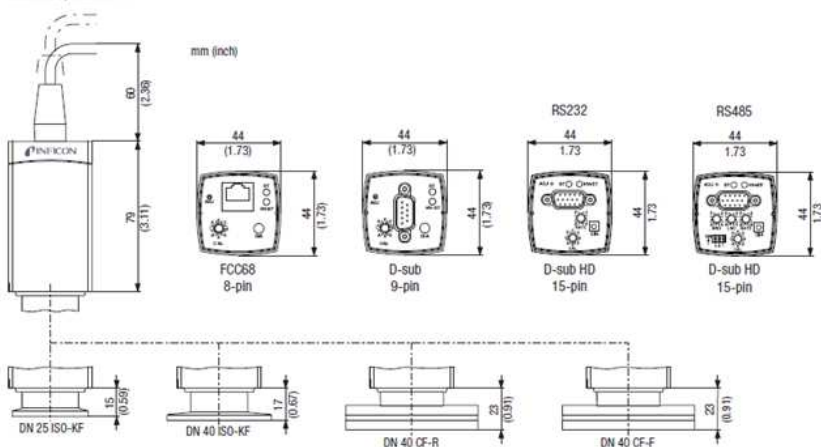
	MAG5xx	MPG5xx
MAG500 spare sensor, 25KF, SS	351-500	-
MAG500 spare sensor, 25KF, TI	351-502	-
MAG500 spare sensor, 40CF-F, SS	351-524	-
MAG500 spare sensor, 40CF-F, TI	351-526	-
MAG500 spare sensor, 40CF-R, SS	351-536	-
MAG500 spare sensor, 40CF-R, TI	351-538	-
MAG500 spare sensor, 40KF, SS	351-512	-
MAG500 spare sensor, 40KF, TI	351-514	-
MAG504 Ersatzsensor, 25KF, TI	351-503	-
MAG504 spare sensor, 25KF, SS	351-501	-
MAG504 spare sensor, 40CF-F, SS	351-525	-
MAG504 spare sensor, 40CF-F, TI	351-527	-
MAG504 spare sensor, 40CF-R, SS	351-537	-
MAG504 spare sensor, 40CF-R, TI	351-539	-
MAG504 spare sensor, 40KF, SS	351-513	-
MAG504 spare sensor, 40KF, TI	351-515	-
MPG500 spare sensor, 25KF, SS	-	351-506
MPG500 spare sensor, 25KF, TI	-	351-508
MPG500 spare sensor, 40CF-F, SS	-	351-530
MPG500 spare sensor, 40CF-F, TI	-	351-532
MPG500 spare sensor, 40CF-R, SS	-	351-542
MPG500 spare sensor, 40CF-R, TI	-	351-544
MPG500 spare sensor, 40KF, SS	-	351-518
MPG500 spare sensor, 40KF, TI	-	351-520
MPG504 spare sensor, 25KF, SS	-	351-507
MPG504 spare sensor, 25KF, TI	-	351-509
MPG504 spare sensor, 40CF-F, SS	-	351-531
MPG504 spare sensor, 40CF-F, TI	-	351-533
MPG504 spare sensor, 40CF-R, SS	-	351-543
MPG504 spare sensor, 40CF-R, TI	-	351-545
MPG504 spare sensor, 40KF, SS	-	351-519
MPG504 spare sensor, 40KF, TI	-	351-521
MxG40x/50x Spare parts ignition aid (10)	351-995	351-995
Spare ion chamber ss	351-555	351-555
Spare ion chamber ti	351-556	351-556

## ACCESSORIES

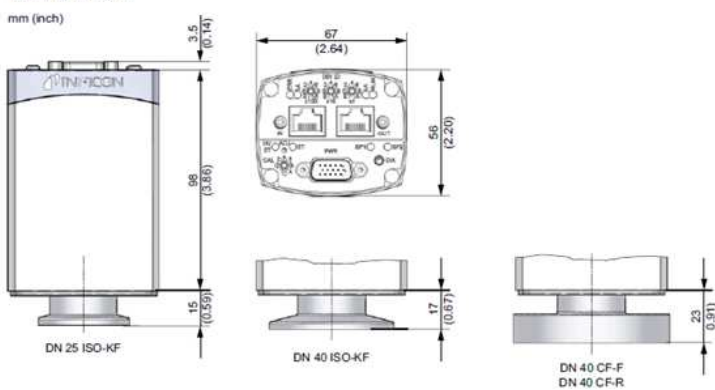
	MAG5xx	MPG5xx
Baffle for BPG400	353-512	353-512
Centering ring with baffle DN 25 KF	211-113	211-113
Centering ring with fine filter DN 25 KF	211-098	211-098
MxG50x Ignition tool set	351-550	351-550

## DIMENSIONS

MxG500, MxG504



MxG550, MxG554



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