

## MLH Series

### All Metal Pressure Sensors



#### DESCRIPTION

MLH Series pressure sensors combine the latest in Application Specific Integrated Circuit (ASIC) technology with proven media isolated, metal diaphragm design. This digitally compensated sensor offers an unparalleled value and performance combination making it the ideal pressure sensing solution for demanding applications. Fully temperature compensated, calibrated and amplified, the MLH is available in 50 psi to 8,000 psi pressure ranges.

MLH sensors deliver  $\pm 0.25\%$  full scale accuracy Best Fit Straight Line (BFSL) and 2 % total error over a temperature range of  $-40\text{ }^{\circ}\text{C}$  to  $125\text{ }^{\circ}\text{C}$  [ $-40\text{ }^{\circ}\text{F}$  to  $257\text{ }^{\circ}\text{F}$ ]. Industry standard, field proven connectors and process ports are offered for high reliability and user flexibility.

#### FEATURES

- All metal wetted parts for use in wide variety of fluid applications
- No internal elastomeric seals mean no o-ring compatibility issues
- Amplified outputs eliminate cost of external amplifiers
- Reverse polarity and overvoltage protection provide protection against reversed excitation
- Less than 2 ms response time provides accurate, high speed measurement
- Rated IP65 or better for protection from harsh environments
- Exceeds CE heavy industrial EMC for use in areas of high RFI/EMI

The MLH has seven standard output options:

- A. 0.5 Vdc to 4.5 Vdc ratiometric output from 5 Vdc excitation
- B. 4 mA to 20 mA current from 9.5 Vdc to 30 Vdc excitation
- C. 1.0 Vdc to 6.0 Vdc regulated output from 8 Vdc to 30 Vdc excitation
- D. 0.25 Vdc to 10.25 Vdc regulated output from 14 Vdc to 30 Vdc excitation
- E. 0.5 Vdc to 4.5 Vdc regulated output from 7 Vdc to 30 Vdc excitation
- F. 0 mV to 50 mV from 5 Vdc excitation
- G. 1 Vdc to 5 Vdc output from 8 Vdc to 30 Vdc excitation

#### TYPICAL APPLICATIONS

- Diesel engines
- Refrigeration and HVAC/R
- General industrial
- General hydraulics
- Off road vehicles
- Braking systems
- Natural gas vehicles

# MLH Series

## SPECIFICATIONS

**Pressure Ranges** (Comparable metric units follow same proof and burst specifications)

| Units (psi)    | psiG | psiG | psiG | psiG | psiG | psiS | psiS | psiS  | psiS  | psiS  | psiS  | psiS  |
|----------------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Pressure       | 50   | 100  | 150  | 200  | 250  | 300  | 500  | 1000  | 2000  | 3000  | 5000  | 8000  |
| Proof Pressure | 150  | 300  | 450  | 600  | 750  | 900  | 1500 | 2000  | 4000  | 6000  | 7500  | 12000 |
| Burst Pressure | 500  | 1000 | 1500 | 2000 | 2500 | 3000 | 5000 | 10000 | 20000 | 30000 | 30000 | 30000 |

| Units (bar)    | barG | barG | barG | barS | barS | BarS | barS | barS | barS | barS | barS | barS |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Pressure       | 6    | 10   | 16   | 25   | 40   | 60   | 100  | 160  | 250  | 350  | 500  | 550  |
| Proof Pressure | 18   | 30   | 48   | 75   | 80   | 120  | 200  | 320  | 500  | 700  | 750  | 825  |
| Burst Pressure | 60   | 100  | 160  | 250  | 400  | 600  | 1000 | 1600 | 2068 | 2068 | 2068 | 2068 |

### Physical

|                                |                                                                                                                      |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Material in contact with media | Stainless steel and Haynes 214 alloy (all wetted materials are equivalent or better than 300 series stainless steel) |  |  |  |  |  |  |  |  |  |  |  |
| Housing material               | Black plastic Valox; HR426 - PTB polyester                                                                           |  |  |  |  |  |  |  |  |  |  |  |
| Weight                         | 57.0 g [2.0 oz]                                                                                                      |  |  |  |  |  |  |  |  |  |  |  |

### Environmental

|           |                                                                                            |  |  |  |  |  |  |  |  |  |  |  |
|-----------|--------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Shock     | 50 g peak [5 ms], 100 g peak [11 ms]                                                       |  |  |  |  |  |  |  |  |  |  |  |
| Vibration | Figure 514.2-5, Curve AK, Table 514.2-V, Random Vibration Test [overall g rms = 20.7 min.] |  |  |  |  |  |  |  |  |  |  |  |

### Electrical

|                                | Ratiometric (A)                 | Current (B)            | Regulated (C)                  | Regulated (D)                   | Regulated (E)                  | milliVolt (F)                  | Regulated (G)                  |
|--------------------------------|---------------------------------|------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Zero output                    | 0.5 Vdc                         | 4.0 mA                 | 1.0 Vdc                        | 0.25 Vdc                        | 0.5 Vdc                        | 0 +/- 2.5 mV                   | 1.0 Vdc                        |
| Full scale output <sup>1</sup> | 4.0 Vdc<br>(0.5 to 4.5 Vdc)     | 16 mA<br>(4 to 20 mA)  | 5.0 Vdc<br>(1.0 to 6.0 Vdc)    | 10.0 Vdc<br>(0.25 to 10.25 Vdc) | 4.0 Vdc<br>(0.5 to 4.5 Vdc)    | 50 mV<br>(0 to 50 mV)          | 4.0 Vdc<br>(1.0 to 5.0 Vdc)    |
| Excitation                     | 5 Vdc ±250 mV<br>(6.0 Vdc max.) | 9.5 Vdc to<br>30.0 Vdc | 8.0 Vdc to<br>30.0 Vdc         | 14.0 Vdc to<br>30.0 Vdc         | 7.0 Vdc to<br>30.0 Vdc         | 5.0 Vdc<br>(6.0 Vdc max.)      | 8.0 Vdc to<br>30.0 Vdc         |
| Supply current                 | 4.0 mA typical<br>(8 mA max.)   | N/A                    | 5.0 mA typical<br>(17 mA max.) | 5.0 mA typical<br>(17 mA max.)  | 5.0 mA typical<br>(17 mA max.) | 8.0 mA typical<br>(17 mA max.) | 5.0 mA typical<br>(17 mA max.) |
| Source (nominal)               | 1.0 mA                          | N/A                    | 1.0 mA                         | 1.0 mA                          | 1.0 mA                         | N/A                            | 1.0 mA                         |
| Sink (nominal)                 | 1.0 mA<br>@ zero output         | N/A                    | 1.0 mA<br>@ zero output        | 1.0 mA<br>@ zero output         | 1.0 mA<br>@ zero output        | N/A                            | 1.0 mA<br>@ zero output        |
| Supply rejection ratio         | 90 db                           | 90 db                  | 90 db                          | 90 db                           | 90 db                          | N/A                            | 90 db                          |
| Output impedance               | 25 Ω max.                       | N/A                    | 25 Ω max.                      | 25 Ω max.                       | 25 Ω max.                      | ≥2000 Ω                        | 25 Ω max.                      |

**Notes:** 1. All specifications are measured at 25 °C [77 °F] and at rated excitation unless otherwise specified.

### Performance

|                                                      |                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Response time                                        | <2 ms                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  |  |  |
| EMI/RFI                                              | <ul style="list-style-type: none"> <li>• EC Directive 2004/108/EC (consolidated 89/336) Standard IEC 61326 2002</li> <li>• IEC 61000-4-3-2002 &amp; IEC 61000-4-6</li> <li>ISO 11452-2</li> <li>400 MHz to 2 GHz, 100 V/M incl. 1 kHz AM 80 %</li> <li>ISO 11452-4</li> <li>1MHz to 100MHz, 100 mA incl. 1 kHz AM 80 %</li> </ul> |  |  |  |  |  |  |  |  |  |  |  |
| Accuracy                                             | ±0.25 % F.S.O. best fit straight line. Includes: non-linearity, hysteresis, non-repeatability. Thermal errors not included. 0.5 % <100 psi                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |
| Total error band                                     | ≤2 % FSO includes zero offset error, span error, thermal effect on zero, thermal effect on span, non-linearity, hysteresis and non-repeatability. (≤3 % FSO on ranges ≤250 psig)                                                                                                                                                  |  |  |  |  |  |  |  |  |  |  |  |
| Compensated, operating and storage temperature range | -40 °C to 125 °C [-40 °F to 257 °F]                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |  |  |  |

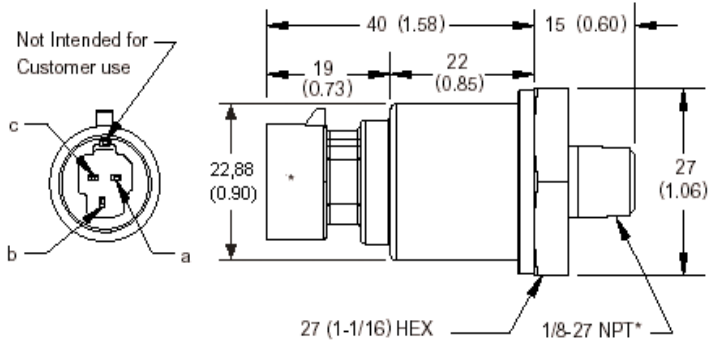
## All Metal Pressure Sensors

## ORDER GUIDE

|                               |                                               |     |            |          |          |          |           |          |                                     |
|-------------------------------|-----------------------------------------------|-----|------------|----------|----------|----------|-----------|----------|-------------------------------------|
| <b>Model</b>                  | <u>MLH</u>                                    |     | <u>500</u> | <u>P</u> | <u>S</u> | <u>B</u> | <u>06</u> | <u>B</u> |                                     |
| <b>Pressure Range</b>         |                                               |     |            |          |          |          |           |          | <b>Output</b>                       |
|                               | <u>PSI</u>                                    |     | <u>BAR</u> |          |          |          |           |          |                                     |
|                               | 050                                           | 500 | 006        | 100      |          |          |           |          | A = 0.5 Vdc to 4.5 Vdc Ratiometric  |
|                               | 100                                           | 01K | 010        | 160      |          |          |           |          | B = 4 mA to 20 mA Current Loop      |
|                               | 150                                           | 02K | 016        | 250      |          |          |           |          | C = 1 Vdc to 6 Vdc Regulated        |
|                               | 200                                           | 03K | 025        | 350      |          |          |           |          | D = 0.25 Vdc to 10.25 Vdc Regulated |
|                               | 250                                           | 05K | 040        | 500      |          |          |           |          | E = 0.5 Vdc to 4.5 Vdc Regulated    |
|                               | 300                                           | 08K | 060        | 550      |          |          |           |          | F = 0 mV to 50 mV                   |
|                               |                                               |     |            |          |          |          |           |          | G = 1 Vdc to 5 Vdc Regulated        |
| <b>Unit</b>                   |                                               |     |            |          |          |          |           |          | <b>Pressure Connection</b>          |
|                               | P = psi   K = Kg/cm <sup>2</sup>              |     |            |          |          |          |           |          | 01 = 1/4-18 NPT                     |
|                               | B = bar   M = MPa                             |     |            |          |          |          |           |          | 02 = M12 x 1.5                      |
| <b>Reference</b>              |                                               |     |            |          |          |          |           |          | 03 = M14 x 1.5                      |
|                               | S = Sealed Gage (psiS)                        |     |            |          |          |          |           |          | 04 = 3/8-24 UNF                     |
|                               | A = Absolute (psiA)                           |     |            |          |          |          |           |          | 05 = M18 x 1.5                      |
|                               | G = Gage (psiG)                               |     |            |          |          |          |           |          | 06 = 1/8 in-27 NPT                  |
| <b>Electrical Termination</b> |                                               |     |            |          |          |          |           |          | 07 = 1/2 in-20 UNF                  |
|                               | B = Packard MetriPak 150 (IP65)               |     |            |          |          |          |           |          | 08 = M10 x1                         |
|                               | C = Hirschman (mates with G4W1F) (IP65)       |     |            |          |          |          |           |          | 09 = 1/4 in SAE female Schrader     |
|                               | D = M12 x 1 (Brad Harrison micro) (IP67)      |     |            |          |          |          |           |          | 10 = 7/16-20 UNF                    |
|                               | F = DIN 72585 (Cannon APD type) (IP69K)       |     |            |          |          |          |           |          | 11 = 1/2 in NPT                     |
|                               | G = DIN43650-C (IP65)                         |     |            |          |          |          |           |          | 12 = 9/16-18 UNF                    |
|                               | H = Amp Superseal 1.5 (IP67)                  |     |            |          |          |          |           |          | 13 = PT 1/4-19 Tapered Thread       |
|                               | L = Cable (1 meter) (IP69K)                   |     |            |          |          |          |           |          | 14 = G 1/4-19 per DIN 3852-2        |
|                               | M = Cable (3 meter) (IP69K)                   |     |            |          |          |          |           |          | 15 = G 1/8 with O Ring Groove       |
|                               | P = Flying Leads (20 AWG – 6 in) (IP65)       |     |            |          |          |          |           |          | 16 = M16 x 1.5                      |
|                               | R = Deutsch DT06-W3S (on 15 in cable) (IP69K) |     |            |          |          |          |           |          | 17 = G 1/4 with O Ring Groove       |
|                               | S = Deutsch DT06-W4S (on 15 in cable) (IP69K) |     |            |          |          |          |           |          | 18 = G 1/8 per DIN 3852-2           |
|                               | T = Deutsch DTM04-3P (integral) (IP67)        |     |            |          |          |          |           |          |                                     |

Note: Not all combinations are available. Minimum quantity orders apply. Additional pressure ranges and special calibration versions are available. Contact your local sales representative for assistance.

## DIMENSIONS (For reference only mm/(in).)



## PIN AND WIRE CODES

| Pins | Voltage      | Current       |
|------|--------------|---------------|
| a    | + Excitation | + Excitation  |
| b    | Output       | - Excitation  |
| c    | Common       | No Connection |

A variety of pressure ports and electrical termination connection options are available. Refer to the "How to Order" on previous page for possible combinations. Contact your Honeywell representative for details.

## ⚠ WARNING

### MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

## ⚠ WARNING

### PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

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## SALES AND SERVICE

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