Honeywell

MLH Series

All Metal Pressure Sensors

DESCRIPTION

MLH Series pressure sensors combine Application Specific Integrated Circuit (ASIC) technology with a media isolated, metal diaphragm design. This digitally compensated sensor offers value and performance, 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 ±0.25% full scale accuracy Best Fit Straight Line (BFSL) and as low as 2% total error over a temperature range of -40 °C to 125 °C [-40 °F to 257 °F]. Industry standard connectors and process ports are offered for enhanced reliability and user flexibility.

The MLH has six standard output options:

A. 0.5 Vdc to 4.5 Vdc ratiometric from 5 Vdc excitation
B. 4 mA to 20 mA
C. 1 Vdc to 6 Vdc regulated
D. 0.25 Vdc to 10.25 Vdc regulated
E. 0.5 Vdc to 4.5 Vdc regulated
G. 1 Vdc to 5 Vdc regulated

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
- Input reverse voltage protection guards against mis-wiring
- Less than 2 ms response time provides accurate, high speed measurement
- Rated IP65 or better for protection from harsh environments

POTENTIAL APPLICATIONS

- Compressors
- Refrigeration and HVAC/R
- General industrial
- General hydraulics
- Multiple transportation applications including braking and alternate fuels
- Medical

MLH Series

Table 1. Pressure Range Specifications[1] (At 25 °C [77 °F] and at rated excitation unless otherwise specified.)

psi												
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
bar												
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

Note:

1. Comparable metric units follow same proof and burst specifications.

Table 2. Physical and Environmental Specifications

Parameter	**Characteristic**
Material in contact with media	port: stainless steel 304L; diaphragm: Haynes 214 alloy
Housing material	black plastic – Amodel AS-4133 HS – PPA
Weight	57.0 g [2.0 oz] (typical for Delphi Metri-Pack 150 and 1/8 NPT port)
Shock	100 g peak [11 ms]
Vibration	MIL-STD-810C, Figure 514.2-5, Curve AK, Table 514.2-V, Random Vibration Test [overall g rms = 20.7 min.]
Compensated and operating temperature range: 0.5 Vdc to 4.5 Vdc ratiometric output all regulated and 4 mA to 20 mA outputs	 -40 °C to 125 °C [-40 °F to 257 °F] -40 °C to 125 °C [-40 °F to 257 °F] See Figures 2 and 3 for operating area details.
Storage temperature range	-40 °C to 125 °C [-40 °F to 257 °F]
Approvals	UL Component Recognition for USA and Canada: File No. E258956

Table 3. Electrical Specifications (At 25 °C [77 °F] and at rated excitation unless otherwise specified.)

Parameter	**Ratiometric (A)**	**Current (B)**	**Regulated (C)**	**Regulated (D)**	**Regulated (E)**	**Regulated (G)**
Zero output	0.5 Vdc	4 mA	1 Vdc	0.25 Vdc	0.5 Vdc	1 Vdc
Full scale span (FSS)	4 Vdc (0.5 Vdc to 4.5 Vdc)	16 mA (4 mA to 20 mA)	5 Vdc (1 Vdc to 6 Vdc)	10 Vdc (0.25 Vdc to 10.25 Vdc)	4 Vdc (0.5 Vdc to 4.5 Vdc)	4 Vdc (1 Vdc to 5 Vdc)
Excitation	5 Vdc (6 Vdc max.)[1]	9.5 Vdc to 30 Vdc[2]	8 Vdc to 30 Vdc[2]	14 Vdc to 30 Vdc[2]	7 Vdc to 30 Vdc[2]	8 Vdc to 30 Vdc[2]
Supply current	4 mA typ. (8 mA max.)	N/A	5 mA typ. (17 mA max.)	5 mA typ. (17 mA max.)	5 mA typ. (17 mA max.)	5 mA typ. (17 mA max.)
Source (nominal)	1 mA	N/A	1 mA	1 mA	1 mA	1 mA
Sink (nominal)	1 mA at zero output	N/A	1 mA at zero output	1 mA at zero output	1 mA at zero output	1 mA at zero output
Supply rejection ratio	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB
Output impedance	25 Ω max.	N/A	25 Ω max.	25 Ω max.	25 Ω max.	25 Ω max.

Notes:

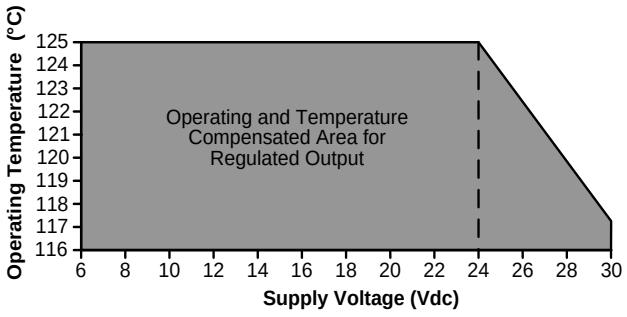
1. Maintains ratiometricity at 5 ±0.25 Vdc excitation. Product can tolerate 6 Vdc excitation without damage.
2. See Figures 2 and 3 for more information regarding maximum excitation voltage vs. operating temperature.

Table 4. Performance Specifications (At 25 °C [77 °F] and at rated excitation unless otherwise specified.)

Parameter	Characteristic
Response time	<2 ms
Accuracy[1]:	
≥100 psi	±0.25% FSS
<100 psi	±0.50% FSS
Total error band[2]:	
Gage:	
<300 psig	±3% FSS
≥300 psig	±2% FSS
Seal gage:	
≥300 psis	±2% FSS
Seal gage without L, M, P termination:	
100 psis to 299 psis (-40 °C to 85 °C [-40 °F to 185 °F])	±3% FSS
100 psis to 299 psis (>85 °C to 125 °C [>185 °F to 257 °F])	±10% FSS
≥300 psis (-40 °C to 125 °C [-40 °F to 257 °F])	±2% FSS
Seal gage with L, M, P termination:	
100 psis to 299 psis (-40 °C to 65 °C [-40 °F to 149 °F])	±10% FSS
100 psis to 299 psis (>65 °C to 125 °C [>149 °F to 257 °F])	±15% FSS
≥300 psis (-40 °C to 65 °C [-40 °F to 149 °F])	±5% FSS
≥300 psis (>65 °C to 125 °C [>149 °F to 257 °F])	±15% FSS

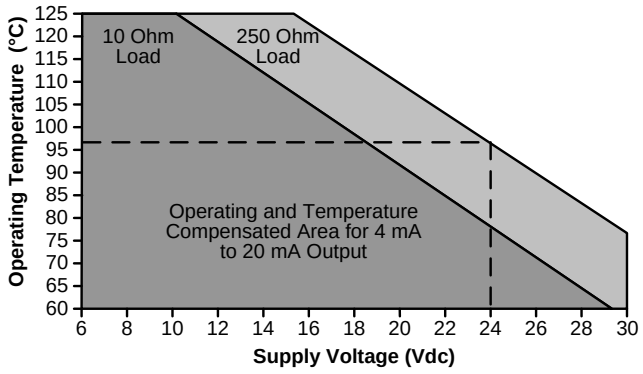
Notes:
1. Includes pressure non-linearity (BFSL), pressure hysteresis and non-repeatability. Thermal errors are not included.
2. Includes zero error, span error, thermal effect on zero, thermal effect on span, thermal hysteresis, pressure-non-linearity, pressure hysteresis and non-repeatability.

Figure 2. Operating and Temperature Compensated Area for All Regulated Output Options



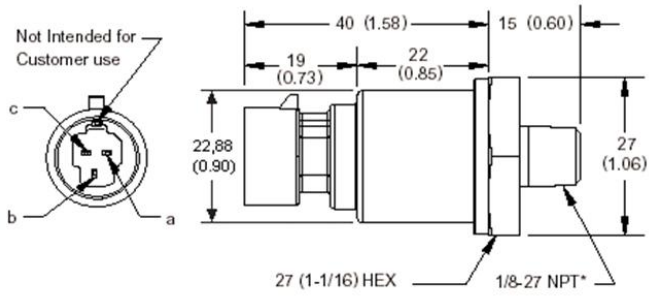
Note:
The dashed line indicates the operating and temperature compensated area with a 24 V supply.

Figure 3. Operating and Temperature Compensated Area for 4 mA to 20 mA Output



Note:
The operating area is extended with a 250 Ohm resistor. Higher loads extend the operating area. The dashed line indicates the operating and temperature compensated area with a 24 V supply using a 250 Ohm load.

Figure 4. Mounting Dimensions (For reference only. mm/(in).)



Pin and Wire Codes (Option B – Packard)

Pin	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.

Nomenclature and Order Guide[1]

MLH _ _ _ _ _ _ _ _

Series

Pressure Range

psi		bar	
050	500	006	100
100	01K	010	160
150	02K	016	250
200	03K	025	350
250	05K	040	500
300	08K	060	550

Unit
P = psi
B = bar

Measurement Type
G = Gage (psi)
S = Sealed gage (psi)[4]

Electrical Termination
B = Delphi Metri-Pack 150
C = Hirschmann (mates with G4W1F)
D = M12 x 1 (Brad Harrison micro)
G = DIN 43650-C, 8 mm-male
H = Amp Superseal 1.5[2]
L = Cable (1 m)
M = Cable (3 m)
P = Flying leads (20 AWG – 6 in)
T = Deutsch DTM04-3P (integral)

(Mating connectors are not supplied.)

Output Signal
A = 0.5 Vdc to 4.5 Vdc ratiometric from 5 Vdc excitation
B = 4 mA to 20 mA
C = 1 Vdc to 6 Vdc regulated
D = 0.25 Vdc to 10.25 Vdc regulated
E = 0.5 Vdc to 4.5 Vdc regulated
G = 1 Vdc to 5 Vdc regulated

Pressure Connection
01 = 1/4-18 NPT
02 = M12 x 1.5 (ISO 6149)[3]
03 = M14 x 1.5 (ISO 6149)[3]
04 = 3/8-24 UNF (SAE-3 O-ring boss)[3]
05 = M18 x 1.5 (ISO 6149)[3]
06 = 1/8 in-27 NPT
07 = 1/2 in-20 UNF (SAE-5 O-ring boss)[3]
08 = M10 x 1 (ISO 6149)[3]
09 = 1/4 in SAE female Schrader (7/16-20 UNF-2B internal thread)
10 = 7/16-20 UNF (SAE-4 O-ring boss)[3]
11 = 1/2 in NPT
12 = 9/16-18 UNF (SAE-6 O-ring boss)[3]
13 = R 1/4-19 BSPT (ISO 7-1 tapered thread)
14 = G 1/4-19 (DIN 3852-2)[3]
15 = G 1/8 with O-ring groove[3]
16 = M16 x 1.5 (ISO 6149)[3]
17 = G 1/4 with O-ring groove[3]
18 = G 1/8 (DIN 3852-2)[3]
19 = R 1/8-28 BSPT (ISO 7-1 tapered thread)
20 = M20 x 1.5 (ISO 6149)[3]
21 = 1/2-20 (SAE J514)[3]

Notes:
1. Not all combinations are available. Minimum quantity orders apply. Additional pressure ranges, port styles and special calibration versions are available. Contact your local sales representative for assistance.
2. Available with "A" output only.
3. Supplied with O-ring.
4. Sealed gage devices are not available for pressure ranges below 100 psi.

⚠ 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.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

⚠ WARNING

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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.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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