

# OEM pressure sensor For mobile working machines Model MH-4

WIKA data sheet PE 81.63



## Applications

- Working pressure measurement
- Control pressure measurement

## Special features

- Developed for the extreme operating conditions in mobile working machines
- Reliability and highest accuracy over the entire life cycle
- Customer-specific adaptations and individualisation
- High production capacities



OEM pressure sensor, model MH-4

## Description

The model MH-4 is a powerful, reliable and extremely resilient pressure sensor. The challenges in practice are high: For safe machine operation, the sensor must deliver high-precision measured data, even under the most demanding conditions. With constant performance stability throughout the entire life cycle, the model MH-4 ensures the greatest possible operational reliability.

Thanks to numerous interfaces, customer-specific adaptations and individualisation, the model MH-4 is ideal as an OEM pressure sensor. Since it never needs maintenance, the total cost of ownership is minimal.

## Measuring ranges

Gauge pressure				
bar	0 ... 40	0 ... 60	0 ... 100	0 ... 160
	0 ... 250	0 ... 400	0 ... 600	0 ... 1,000
psi	0 ... 500	0 ... 1,000	0 ... 1,500	0 ... 2,000
	0 ... 3,000	0 ... 5,000	0 ... 8,000	0 ... 10,000

1 bar = 0.1 MPa

Other measuring ranges on request

### Overload safety

≤ 400 bar [≤ 5,000 psi]:	3 times
600 bar [8,000 psi, 10,000 psi]:	2 times
1,000 bar:	1.5 times

The overload safety is based on the measuring range. Depending on the selected process connection and sealing, restrictions in overload safety can result.

### Vacuum tightness

Yes

## Output signals

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	DC 1 ... 10 V
	DC 1 ... 5 V
	DC 0.5 ... 4.5 V
Ratiometric (3-wire)	DC 0.5 ... 4.5 V
Pulsewidth modulation PWM (3-wire)	10 ... 90 % pulse-duty factor High level: DC 3 ... 12 V (selectable in 1 V steps) Output frequency: 0.25 ... 2 kHz (selectable in 0.25 kHz steps)

Other output signals on request

### Signal clamping (option)

The range of the output signal can be limited. For this purpose, a lower and an upper signal threshold are defined in the sensor electronics. If the output signal reaches these threshold values, the sensor outputs a defined, constant signal value. Therefore, in operation, unwanted pressure or signal ranges are filtered out.

### Diagnostic function (option)

Permanent errors in the sensor electronics and temporary system overpressures can be output through defined constant output signals. A permanent error signal signifies a sensor defect and cannot be reset. The temporary error signal is reset as soon as the system pressure once again lies under the error threshold. In the application, one can therefore realise an efficient system diagnosis.

### Load

- Current (2-wire): ≤ (power supply - 7.8 V) / 0.022 A
- Voltage (3-wire): ≥ max. output voltage / 1 mA
- Ratiometric (3-wire): ≥ 4.5 kΩ
- Pulsewidth modulation (3-wire): ≥ 10 kΩ

## Voltage supply

### Power supply

Max. power supply with UL approval: DC 35 V

#### ■ Current output (2-wire)

4 ... 20 mA: DC 8 ... 36 V

#### ■ Voltage output (3-wire)

DC 1 ... 10 V: DC 12 ... 36 V

DC 1 ... 5 V: DC 8 ... 36 V

DC 0.5 ... 4.5 V: DC 8 ... 36 V

#### ■ Ratiometric output (3-wire)

DC 0.5 ... 4.5 V: DC 5 V  $\pm$  10 %

#### ■ Pulsewidth modulation PWM (3-wire)

10 ... 90 % pulse-duty factor: (high level + DC 1 V) (min. DC 8 V) ... 36 V

### Total current consumption

■ Current output (2-wire):  $\leq$  25 mA

■ Voltage output (3-wire):  $\leq$  10 mA

■ Ratiometric output (3-wire):  $\leq$  10 mA

■ Pulsewidth modulation (3-wire):  $\leq$  10 mA

## Time response

### Settling time per IEC 62594

1 ms

### Signal damping (option)

2 / 4 / 9 / 18 / 37 / 75 / 150 ms

### Switch-on time

200 ms

## Reference conditions (per IEC 61298-1)

### Temperature

15 ... 25 °C [59 ... 77 °F]

### Atmospheric pressure

860 ... 1,060 mbar [12.5 ... 15.4 psi]

### Air humidity

45 ... 75 % r. h.

### Power supply

DC 24 V (DC 5 V with ratiometric output)

### Mounting position

Calibrated in vertical mounting position with process connection facing downwards.

## Accuracy specifications

### Non-linearity (per IEC 61298-2)

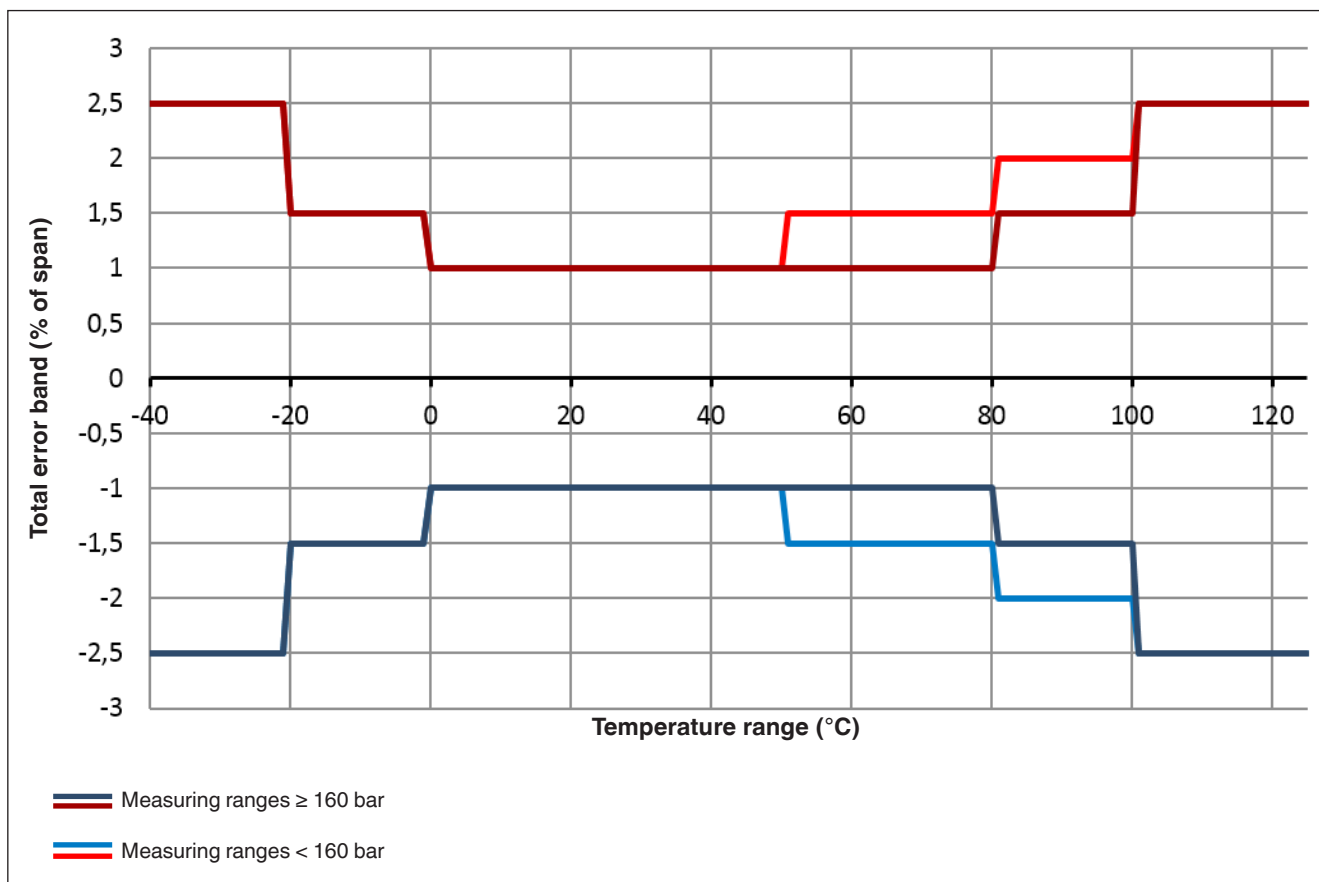
$\leq \pm 0.25$  % of span (BFSL)

### Long-term drift (per IEC 61298-2)

$\leq \pm 0.1$  % of span

### Total error band

Including non-linearity, hysteresis, non-repeatability, zero point and full scale deviation, temperature error, temperature hysteresis and error through atmospheric air pressure fluctuations



## Operating conditions

### Ingress protection (per IEC 60529 and ISO 20653)

see electrical connections

### Permissible temperature ranges

- Ambient: -40 ... +125 °C [-40 ... +257 °F]
- Medium: -40 ... +125 °C [-40 ... +257 °F]
- Storage: -40 ... +70 °C [-40 ... +158 °F]

Depending on the choice of sealing on the process connection, the electrical connection and UL approval, there may be limitations in the medium and ambient temperatures (for restrictions see “Process connections, sealings” and “Electrical connections”).

### Vibration resistance (per IEC 60068-2-6)

40 g, 10 ... 2,000 Hz

### Continuous vibration resistance (per IEC 60068-2-6)

10 g, 10 ... 2,000 Hz

### Shock resistance (per IEC 60068-2-27)

100 g, 11 ms

### EMC field

- Current output (2-wire): 100 V/m (per ISO 11452-2)
- Voltage output (3-wire): 100 V/m (per ISO 11452-2)
- Ratiometric output (3-wire): 100 V/m (per ISO 11452-2)
- Pulsewidth modulation (3-wire): 30 V/m (per IEC 61326-2-3)

### Service life

100 million load cycles

### Free-fall test (following IEC 60721-3-2)

Individual packaging: 1 m [3.28 ft]

Multiple packaging: 0.5 m [1.64 ft]

## Materials

### Wetted parts

304L, PH grade steel

### Non-wetted parts

304L, electrical connection made of highly resistant glass-fibre reinforced plastic (PBT)

## Process connections

Standard	Thread size	Max. nominal pressure	Sealing and temperature range			
			Standard	Option		
DIN EN ISO 1179-2 (formerly DIN 3852-E)	G ¼ A	600 bar [8,700 psi]	NBR -40 ... +100 °C [-40 ... +212 °F]	FPM/FKM -20 ... +125 °C [-4 ... +257 °F]		
DIN EN ISO 9974-2 (formerly DIN 3852-E)	M14 x 1.5	600 bar [8,700 psi]				
ISO 6149-2	M14 x 1.5	600 bar [8,700 psi]				
JIS B2351-1	G ¼ B x 10, form O with collar	600 bar [8,700 psi]				
	G ¾ A, form O with collar	600 bar [8,700 psi]				
SAE J514	7/16-20 UNF-2A, O-ring BOSS	600 bar [8,700 psi]				
	9/16-18 UNF-2A, O-ring BOSS	600 bar [8,700 psi]				
	3/4-16 UNF-2A, O-ring BOSS	600 bar [8,700 psi]				
	7/16-20 UNF-2A, sealing cone 74°	800 bar [11,600 psi]				
ANSI/ASME B1.20.1	½ NPT	400 bar [5,800 psi]			-	-
	¼ NPT	1,000 bar [14,500 psi]				
KS	PT ¼	1,000 bar [14,500 psi]				
	PT ⅜	1,000 bar [14,500 psi]				
ISO 7	R ¼	1,000 bar [14,500 psi]				
	R ⅜	1,000 bar [14,500 psi]				
EN 837	G ⅛ B	400 bar [5,800 psi]	Copper -40 ... +125 °C [-40 ... +257 °F]	Stainless steel -40 ... +125 °C [-40 ... +257 °F]		
	G ¼ B	1,000 bar [14,500 psi]				
	G ⅜ B	1,000 bar [14,500 psi]				

Details must be tested separately in the respective application. The specified values for the max. nominal pressure serve only as a coarse orientation. The values depend upon the temperature, the seals used, the selected torque, the type and the material of the mating thread and the prevailing operating conditions.

Other process connections on request

### Restrictor (option)

As an option, for applications that can lead to pressure spikes, a restrictor with a pressure port of 0.3 mm is available.

### Spanner flats to screw in

Version	
Standard	Hexagon (SW 22) integrated into case
Option	Additional hexagon (SW 27) above the process connection. Suitable for the installation with socket wrench.

For details see dimensions

## Electrical connections

Designation	Ingress protection <sup>1)</sup>	Permissible temperature range
Circular connector M12 x 1, code A, 4-pin	IP67	-40 ... +125 °C [-40 ... +257 °F]
Deutsch connector DT04-2P, 2-pin		
Deutsch connector DT04-3P, 3-pin		
Deutsch connector DT04-4P, 4-pin		
Delphi connector Metri-Pack series 150, 3-pin		
Cable outlet, IP6K9K, 2- or 3-wire	IP6K9K	-40 ... +110 °C [-40 ... +230 °F] <sup>2)</sup>
AMP Micro Quadlok System connector, code A, 3-pin	IP67	-40 ... +125 °C [-40 ... +257 °F]
AMP Superseal connector 1.5 series, 3-pin		
AMP Seal 16 connector, cone, code A, 3-pin		
AMP Econoseal J Mark II series connector, 3-pin		
VW connector, code I, 4-pin, 2 rows		

1) The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

2) Max. permissible temperature for UL approval: 85 °C [185 °F]

### Short-circuit resistance

S+ vs. U-

### Reverse polarity protection

U+ vs. U-

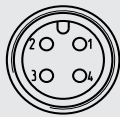
### Overvoltage protection

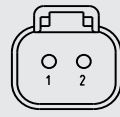
DC 48 V (DC 30 V with ratiometric output signal)

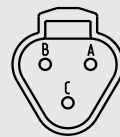
### Insulation voltage

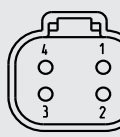
- DC 500 V (optionally DC 850 V)

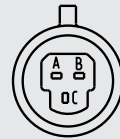
### Connection diagrams

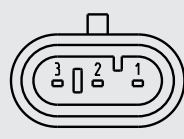
Circular connector M12 x 1, code A, 4-pin			
		2-wire	3-wire
	U+	1	1
	U-	3	3
	S+	-	4

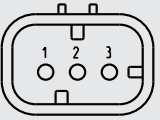
Deutsch connector DT04-2P, 2-pin			
		2-wire	
	U+	1	
	U-	2	
	S+	-	

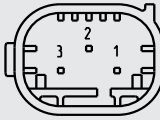
Deutsch connector DT04-3P, 3-pin			
		2-wire	3-wire
	U+	A	A
	U-	B	B
	S+	-	C

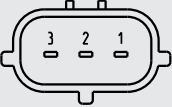
Deutsch connector DT04-4P, 4-pin			
		2-wire	3-wire
	U+	2	2
	U-	1	1
	S+	-	4

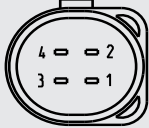
Delphi connector Metri-Pack series 150, 3-pin			
		2-wire	3-wire
	U+	B	B
	U-	A	A
	S+	-	C

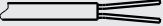
AMP Superseal connector 1.5 series, 3-pin			
		2-wire	3-wire
	U+	3	3
	U-	1	1
	S+	-	2

AMP Seal 16 connector, cone, code A, 3-pin			
		2-wire	3-wire
	U+	3	3
	U-	1	1
	S+	-	2

AMP Micro Quadlok System connector, code A, 3-pin			
		2-wire	3-wire
	U+	3	3
	U-	1	1
	S+	-	2

AMP Econoseal J Mark II series connector, 3-pin			
		2-wire	3-wire
	U+	1	1
	U-	3	3
	S+	-	2




VW connector, code I, 4-pin, 2 rows			
		2-wire	3-wire
	U+	2	2
	U-	1	1
	S+	-	4

Cable outlet, IP6K9K, 2- or 3-wire			
		2-wire	3-wire
	U+	red (RD)	red (RD)
	U-	black (BK)	black (BK)
	S+	-	white (WH)

#### Legend

- U+ Positive power supply terminal
- U- Negative power supply terminal
- S+ Analogue output

## Approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive, EN 61326 emission (group 1, class B) and immunity (industrial application)</li> <li>■ Pressure equipment directive</li> <li>■ RoHS directive</li> </ul>	European Union
	<b>EAC</b> EMC directive	Eurasian Economic Community
	<b>UL</b> Component approval	USA and Canada

## Manufacturer's information and certificates

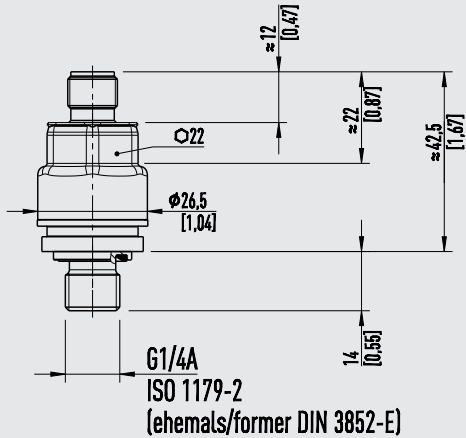
Logo	Description
-	MTTF: > 100 years
-	China RoHS directive

Approvals and certificates, see website



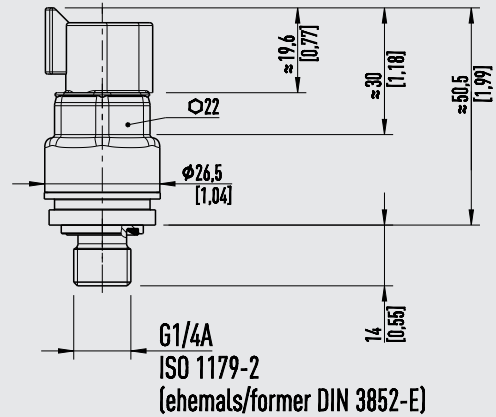
## Dimensions in mm [in]

Circular connector M12 x 1, code A, 4-pin



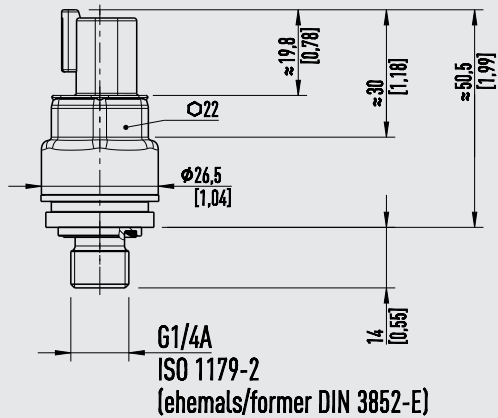
Weight: approx. 80 g [0.18 lbs]

Deutsch connector DT04-3P, 3-pin



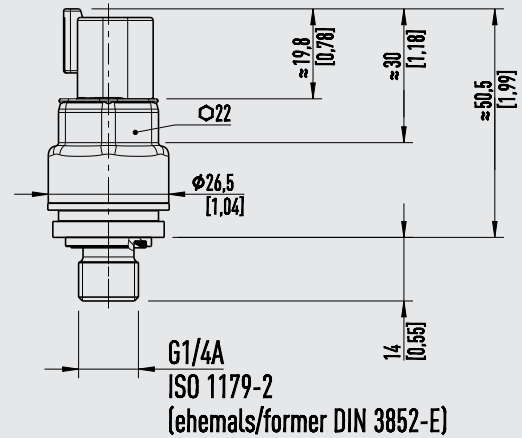
Weight: approx. 80 g [0.18 lbs]

Deutsch connector DT04-2P, 2-pin



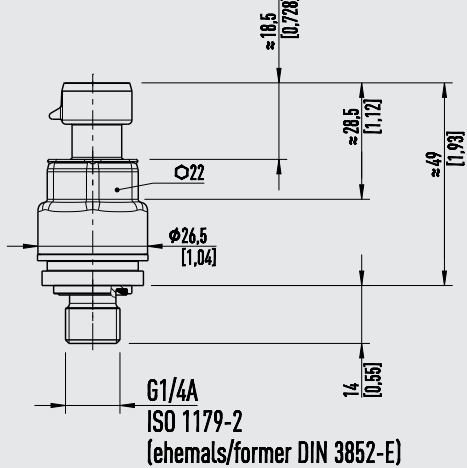
Weight: approx. 80 g [0.18 lbs]

Deutsch connector DT04-4P, 4-pin



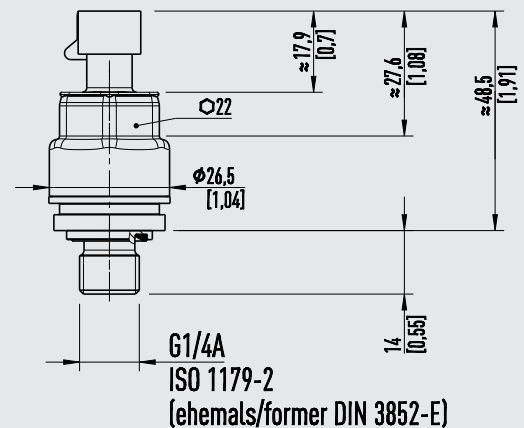
Weight: approx. 80 g [0.18 lbs]

Delphi connector Metri-Pack series 150, 3-pin



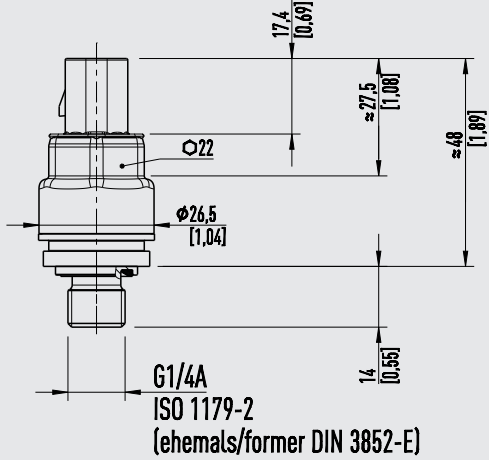
Weight: approx. 80 g [0.18 lbs]

AMP Superseal connector 1.5 series, 3-pin



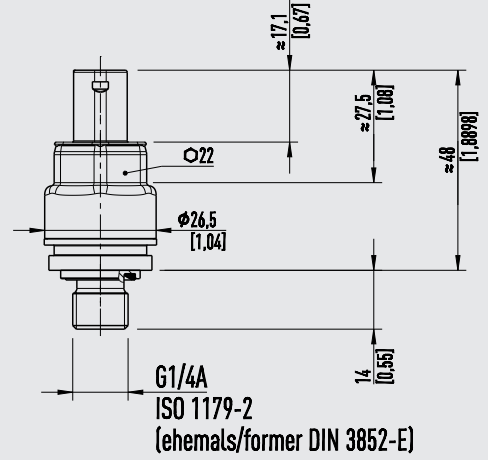
Weight: approx. 80 g [0.18 lbs]

AMP Seal 16 connector, cone, code A, 3-pin



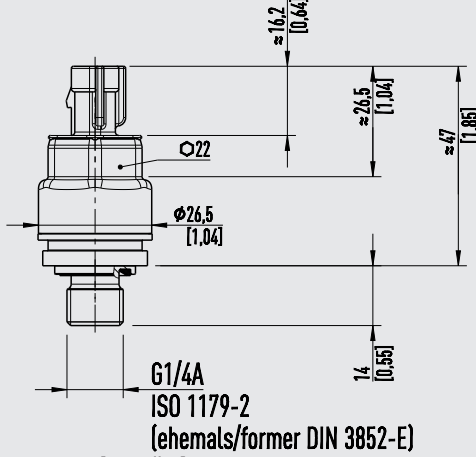
Weight: approx. 80 g [0.18 lbs]

AMP Micro Quadlok System connector, code A, 3-pin



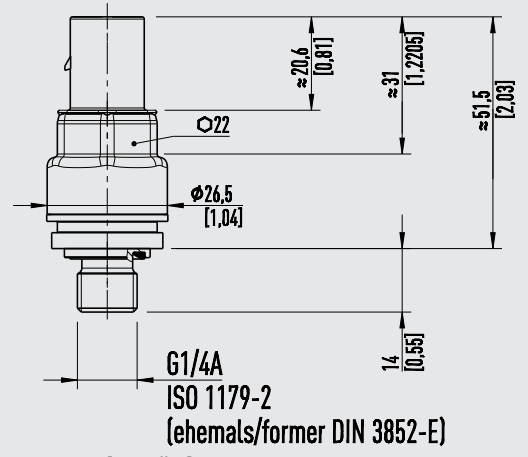
Weight: approx. 80 g [0.18 lbs]

AMP Econoseal J Mark II series connector, 3-pin



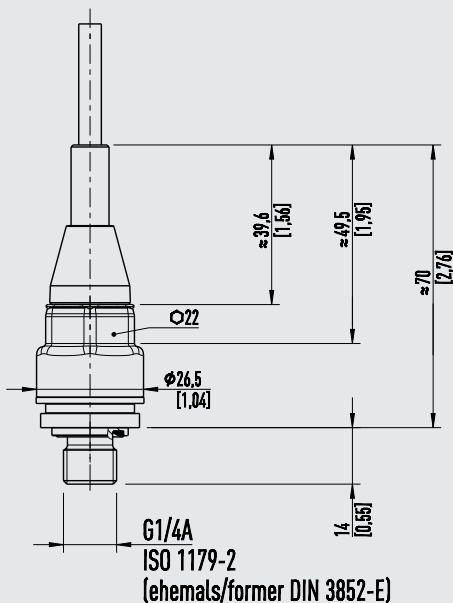
Weight: approx. 80 g [0.18 lbs]

VW connector, code I, 4-pin, 2 rows



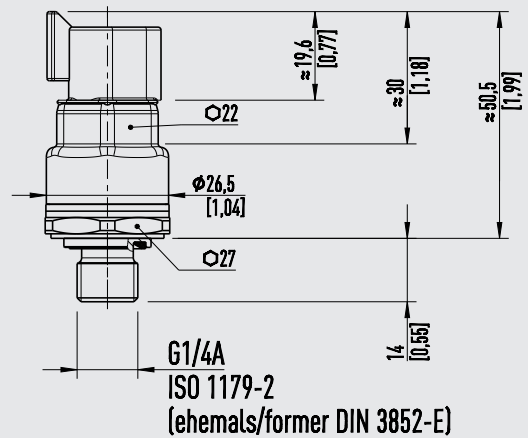
Weight: approx. 80 g [0.18 lbs]

Cable outlet, IP6K9K, 2- or 3-wire



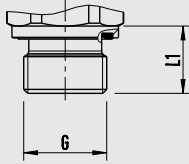
Weight: approx. 80 g [0.18 lbs]

Deutsch connector DT04-3P, 3-pin  
Optional hexagon at the process connection



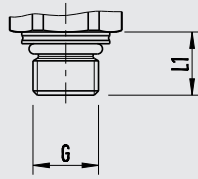
Weight: approx. 80 g [0.18 lbs]

DIN EN ISO 1179-2  
DIN EN ISO 9974-2  
(formerly DIN 3852-E)



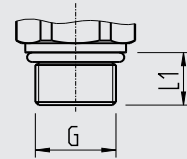
G	L1
G ¼ A	14 [0.55]
M14 x 1.5	14 [0.55]

ISO 6149-2



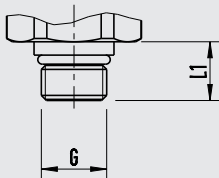
G	L1
M14 x 1.5	13.5 [0.53]

JIS B2351-1



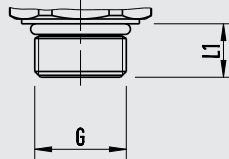
G	L1
G ¼ B	10 [0.39]
G ⅜ A	12 [0.47]

SAE J514 E



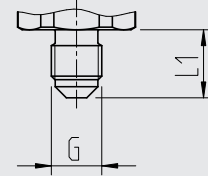
G	L1
7/16-20 UNF-2A	12.06 [0.47]
9/16-18 UNF-2A	12.85 [0.51]

SAE J514 E



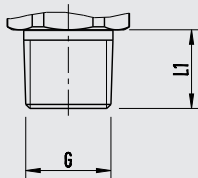
G	L1
3/4-16 UNF-2A	11.13 [0.44]

SAE J514 E



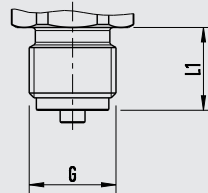
G	L1
7/16-20 UNF-2A, sealing cone 74°	15 [0.59]

ANSI/ASME B1.20.1  
KS  
ISO 7



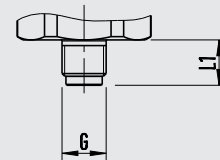
G	L1
⅛ NPT	10 [0.39]
¼ NPT	13 [0.51]
R ¼	13 [0.51]
R ⅜	15 [0.59]
PT ¼	13 [0.51]
PT ⅜	15 [0.59]

EN 837



G	L1
G ¼ B	13 [0.51]
G ⅜ B	16 [0.63]

EN 837



G	L1
G ⅜ B	10 [0.39]

## Ordering information

Model / Measuring range / Output signal / Process connection / Sealing / Electrical connection

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