434, 435, 437 SERIES

008933
Issue 5

Wing Union/Hammer Union Pressure Transducers



DESCRIPTION

Models 434/435/437 Wing Union/Hammer Union Pressure Sensors are designed for demanding oil and gas applications as well as stimulation and circulation systems. They are constructed as an all-welded, stainless steel assembly with the sensor diaphragm and wing union fitting machined as one part, which provides hermetic integrity and minimizes media leakage versus multi-piece parts. The isolated pressure sensing diaphragm minimizes zero-shift during hammer up and eliminates long-term signal drift in the field. The Weco® 1502, 2002, and 2202 Wing Union-compatible fittings are machined of Inconel® X-750, or optional NACE-compliant Inconel® 718, allowing for use with abrasive and corrosive media. The Honeywell proprietary stainless steel electrical connection provides enhanced secondary pressure containment. Special assembly processes provide enhanced shock and vibration for reliable performance in the field.

DIFFERENTIATION

- High or standard accuracy allow ability to obtain tighter system requirements and lower error bands than comparable competitive models
- Shunt calibration option enhances configurability and flexibility; 1-wire shunt calibration is achievable with a single barrier application, helping to minimize installation costs
- IEC Ex approval allows for use in hazardous areas, in Asia-Pacific and EMEA, and by the U.S. Coast Guard
- Protective cage option
- Welded construction

VALUE TO CUSTOMERS

- **Durable:** Weco® Wing Union-compatible fittings are machined of Inconel® X-750, or optional NACE-compliant Inconel® 718, allowing for use with abrasive and corrosive media. Protective cage option provides electrical connection protection.
- **Reliable:** All-welded, stainless steel assembly, shock/vibration ratings, and isolated pressure sensing diaphragm increase reliability.
- **Accurate:** High accuracy option provides confidence in the actual measured pressure value, particularly for smaller changes in pressure, allowing drilling operation adjustments as needed.
- **Availability and service:** Global manufacturing and support allow Honeywell to quickly provide customized products, helping customers meet project timelines

APPLICATIONS

- Acidizing, choke manifold, fracturing and cementing, measurement while drilling (MWD), mud pumps/mud logging, new well development and extraction, oil and gas drilling, service and cement trucks, standpipe, stimulation, well head measurement

FEATURES

- Pressure range 0 to 5000 psi; 0 to 6000 psi; 0 to 10000 psi; 0 to 15000 psi; 0 to 20000 psi; 0 to 350 bar; 0 to 400 bar; 0 to 700 bar; 0 to 1000 bar; 0 to 1350 bar
- High accuracy ±0.1 %FSS BFSL (Model 435); standard accuracy ±0.2 %FSS BFSL (Models 434/435/437)
- Standard aperture (Models 434/435) and wide aperture (Model 437) pressure ports support media blends with high viscosities
- Inconel® X-750 or optional NACE-compliant Inconel® 718 wetted parts
- Multiple electrical connectors supported
- Pressure connections: WECO® 1502, 2002, 2202
- High accuracy 1-wire or 2-wire shunt calibration option allows ability to validate the offset signal in the field, ensuring the sensor is actively plugged into the system
- Protective cage option
- RFI/EMI protected
- Intrinsically safe: CFMUS/ATEX/IEC Ex certification
- CE approved

PORTFOLIO

Models 434/435/437 Wing Union/Hammer Union pressure sensors are part of a comprehensive line of Honeywell pressure sensors.
To view the entire product portfolio, click here.

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TABLE 1. PERFORMANCE SPECIFICATIONS	
Characteristic	**Parameter**
Pressure ranges (Models 435/437)	0 psi to 5000 psi; 0 psi to 6000 psi; 0 psi to 10000 psi; 0 psi to 15000 psi; 0 psi to 20000 psi[2]; 0 bar to 350 bar; 0 bar to 400 bar; 0 bar to 700 bar; 0 bar to 1000 bar; 0 bar to 1350 bar[2]
Pressure ranges (Model 434)	0 psi to 5000 psi; 0 psi to 6000 psi; 0 psi to 10000 psi; 0 psi to 15000 psi; 0 psi to 20000 psi; 0 bar to 350 bar; 0 bar to 400 bar; 0 bar to 700 bar; 0 bar to 1000 bar; 0 bar to 1350 bar
Accuracy[1]	High accuracy: ±0.1 %FSS (Model 435)[3] Standard accuracy: ±0.2 %FSS (Model 434/Model 435/Model 437)
Calibration	Standard 5-point calibration: 0 %, 50 %, and 100 % of full scale Special 10 point and 20 point calibration options available
Output	4 mA to 20 mA, two-wire
Resolution	Infinite

[1]Accuracies stated are with respect to best fit straight line (BFSL) for all errors including linearity, hysteresis, and non-repeatability through zero.

[2]Working pressure and approval limited to 15000 psi [1000 bar]. Amplifier enhancement options 3H and 3HJ will allow overpressure reading to 20000 psi [1350 bar] (for Models 435 and 437).

[3]Optional high accuracy

TABLE 2. ENVIRONMENTAL SPECIFICATIONS	
Characteristic	**Parameter**
Temperature, operating	-40°C to 125°C [-40°F to 257°F]
Temperature, compensating	-40°C to 85°C [-40°F to 185°F]
Temperature effect, zero	<±0.018 %FSS/°C [0.01 %FSS/°F]
Temperature effect, span	<±0.018 % reading/°C [0.01 % reading/°F]
Temperature effect, sealing	IP68 / NEMA 6P

TABLE 3. MECHANICAL SPECIFICATIONS	
Characteristic	**Parameter**
Media	Corrosive and abrasive service, Inconel® X-750 or NACE-compliant Inconel® 718
Overload, safe	150 % rated full scale pressure or limit of Weco® 1502 fitting
Overload, burst	250 % rated full scale pressure or limit of Weco® 1502 fitting
Pressure port	Weco® 1502, 2002, and 2202 wing union, 51 mm [2 in] pipe, male sub end[4]
Wetted parts material	Inconel® X-750, Inconel® 718
Weight (approx.)	4.85 lb [2.2 kg]
Housing material	316L stainless steel (with laser engraved labels)
Protective cage (optional)	316L stainless steel

[4]Pressure port 1502: Models 435, 437; Pressure ports 2002/2202: Model 434.

TABLE 4. ELECTRICAL SPECIFICATIONS

Characteristic	Parameter
Supply voltage	9 Vdc to 28 Vdc
Output signal	4 mA to 20 mA
Output at null pressure	4 mA ±0.2 %FSS
Full Scale Span (FSS)	16 mA ±0.5 %FSS
Insulation resistance	>100 MOhm at 20 Vdc
Max. loop resistance	950 ohm @ 28 V decreasing linearly to 0 ohm @ 9 V
Circuit protection	Reverse polarity protection of supply leads
RFI/EMI protection	Noise immunity up to 2.7 GHz
Frequency response	2500 Hz
Zero and span adjustment	Consult factory for more information.
Electrical termination	MS series compatible 4-pin (32A-14S-2P-10-M2); Bendix PT, 6-pin (PTIH-10-6P); Jupiter M and TP Series 4-pin; Jupiter M and TP Series 7-pin; Rota B-Series 4-pin
Shunt calibration wiring options	None / One-wire / Two-wire
Shunt calibration signal range	100 %FSS
Shunt calibration accuracy	<±0.2 %FSS

NOTE: High Accuracy Shunt Calibration – Shunt calibration option provides a pre-determined change in electrical output as per shunt calibration signal range without the need for a calibrated pressure source.
Example: If sensor output = 4 mA, FSS = 16 mA and shunt calibration signal range = 100 %FSS (i.e. 16 mA), then sensor output while shunt calibration is engaged = 4 mA + 16 mA = 20 mA.

Shunt Calibration Activation/Engaging Mechanisms – Models 434/435/437 Wing Union Pressure Sensors support either one of the following two types of shunt calibration activation/engaging mechanisms:

- 1-wire shunt calibration: Shunt calibration is engaged while the electrical terminal "Shunt Cal" provided on the sensor is shorted with the "Return" terminal. Sensor output returns to previous value as soon as the short is removed.
- 2-wire shunt calibration: Shunt calibration is engaged while a potential in the range of 9 Vdc to 28 Vdc is applied between two electrical terminals "+ Shunt Cal" and "- Shunt Cal" provided on the sensor. Sensor output returns to previous value as soon as the potential is removed.

Refer to installation instruction manual 008-0691-00 for wiring diagrams.

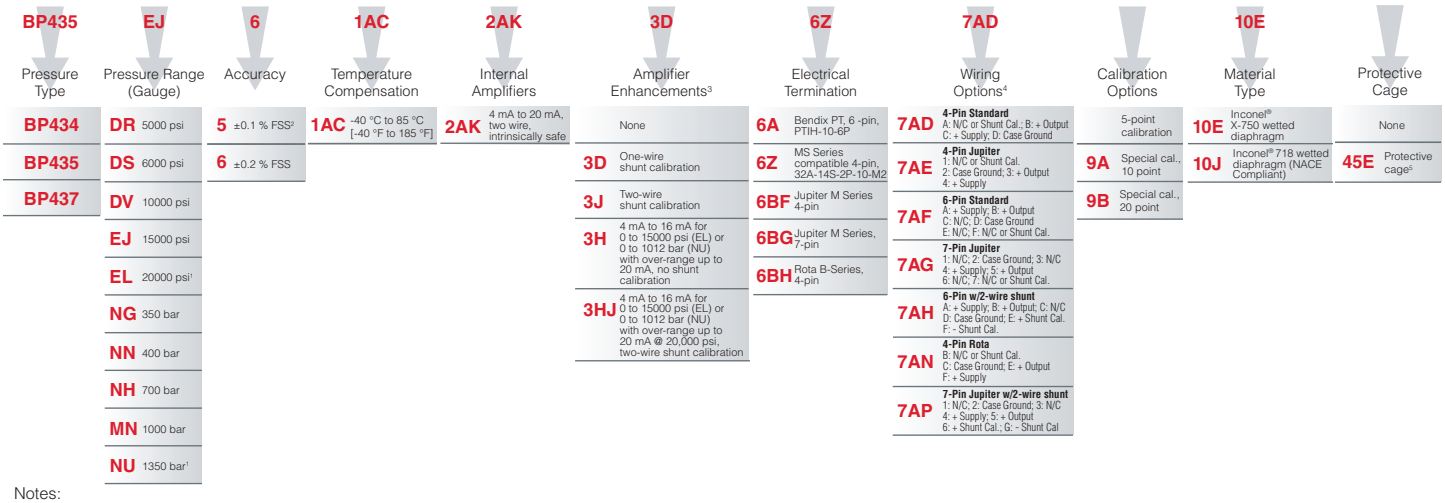
TABLE 5. INTRINSICALLY SAFE APPROVALS

Agency	Approvals
cFMus	Class 1, Div 1, Groups A, B, C, D Class 1, Zone 0, AEx / Ex ia IIC T4/T5 Ga (T4 at Ta≤85 °C, T5 at Ta≤40 °C); Install per 008-0691-00
ATEX	II 1 G Ex ia IIC T4/T5 Ga (T4 at Ta≤85 °C, T5 at Ta≤40 °C)
IEC Ex	Ex ia IIC T4/T5 Ga (T4 at Ta≤85 °C, T5 at Ta≤40 °C)
UKCA	II 1 G Ex ia IIC T4/T5 Ga Ta = -40°C to 40°C (T5), -40°C to 85°C (T4) (Pending Approval)

(See the Honeywell Web site (http://sps.honeywell.com/ast) for up-to-date information regarding intrinsically safe approvals, ref. #008-0691-00.)

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Figure 1. Product Nomenclature and Order Guide



Notes:
[1] Working pressure and approval limited for Models 435/437 to 15000 psi. Amplifier will allow overpressure readings to 20000 psi (for 435/437 only).
[2] ±0.1 % FSS accuracy available on Model 435 only.
[3] 3D and 3J are available with all pressure ranges except EL and NU. 3H and 3HJ are available only with pressure ranges EL and NU (for 435/437 only, 3H and 3HJ are not available for 434).
[4] Wiring option availability varies with electrical termination.
Option 7AD available only with Option 6Z
Option 7AE available only with Option 6BF
Option 7AF and 7AH available only with Option 6A
Option 7AG and 7AP available only with Option 6BG
Option 7AN available only with Option 6BH
Other wiring options available upon request.
[5] Protective cage available only with electrical terminations 6A and 6Z.

TABLE 6. ORDER GUIDE (SAMPLE LISTINGS)

Order Code	Description
BP434EL,6,1AC,2AK,3J,6A,7AH,10J	Model 434, 20000 psi, ±0.2 %FSS accuracy, -40°C to 85°C [-40°F to 185°F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, two-wire shunt calibration, Bendix PT 6-pin connector, Inconel® 718 wetted diaphragm
BP435EJ,6,1AC,2AK,3D,6Z, 7AD,10E	Model 435, 15000 psi, ±0.2 %FSS accuracy, -40°C to 85°C [-40°F to 185°F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, one-wire shunt calibration, MS compatible, 4-pin connector, Inconel® X-750 wetted diaphragm
BP435DS,5,1AC,2AK, 3J, 6A, 7AH,10E	Model 435, 6000 psi, ±0.1 %FSS accuracy, -40°C to 85°C [-40°F to 185°F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, two-wire shunt calibration, Bendix PT 6-pin connector, Inconel® X-750 wetted diaphragm
BP435NU,6,1AC,2AK,3H,6Z, 7AD,10E, 45E	Model 435, 1350 bar, ±0.2 %FSS accuracy, -40°C to 85°C [-40°F to 185°F] temperature compensation, intrinsically safe, 4 mA to 16 mA at 1012 bar with over-range up to 20 mA at 1350 bar, no shunt calibration, MS compatible 4-pin connector, Inconel® X-750 wetted diaphragm, with protective cage
BP437DR,6,1AC,2AK,6BF, 7AE,10E	Model 437, 5000 psi, ±0.2 %FSS accuracy, -40°C to 85°C [-40°F to 185°F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, no shunt calibration, Jupiter M series 4-pin connector, Inconel® X-750 wetted diaphragm

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Figure 2. Model 434

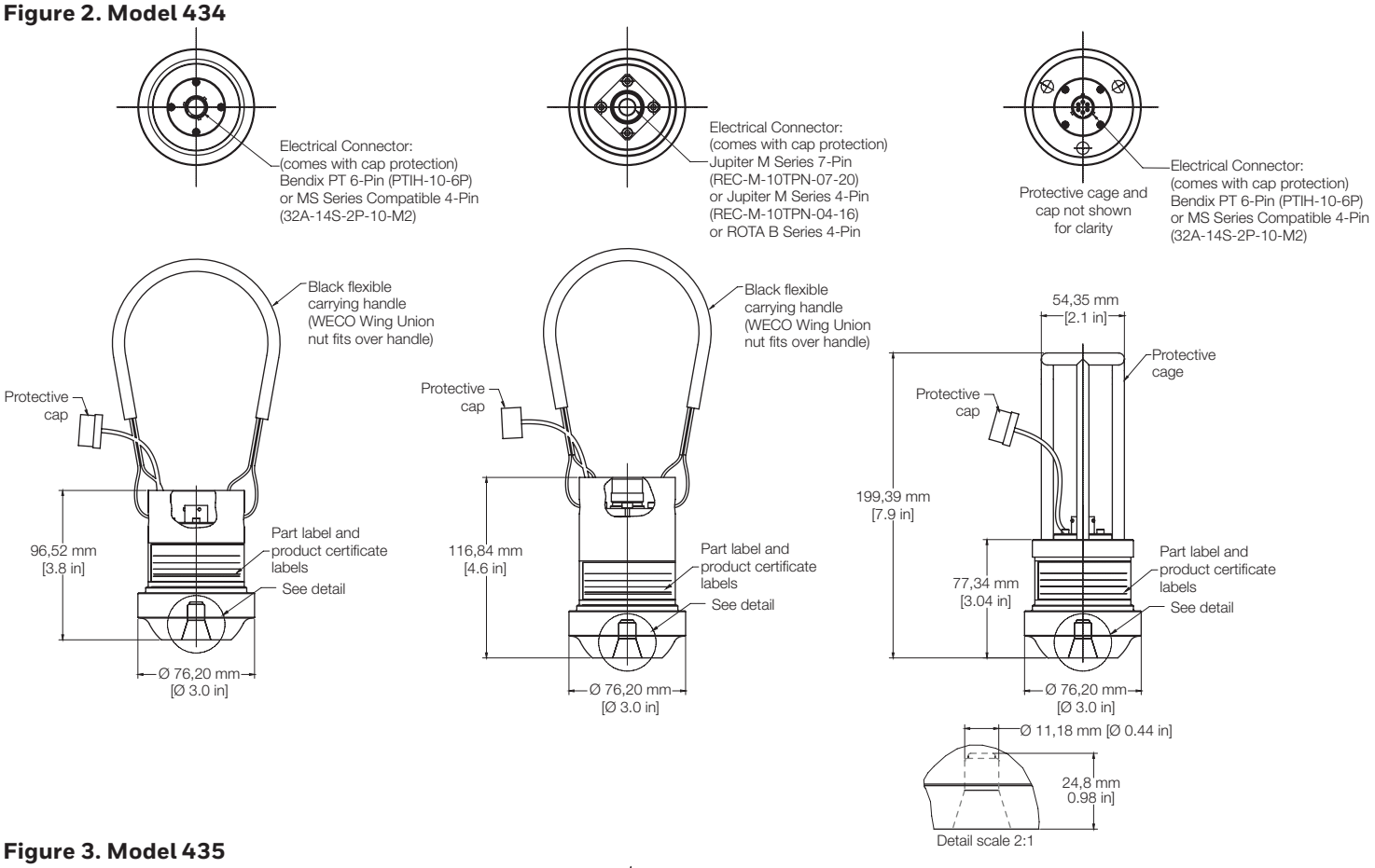
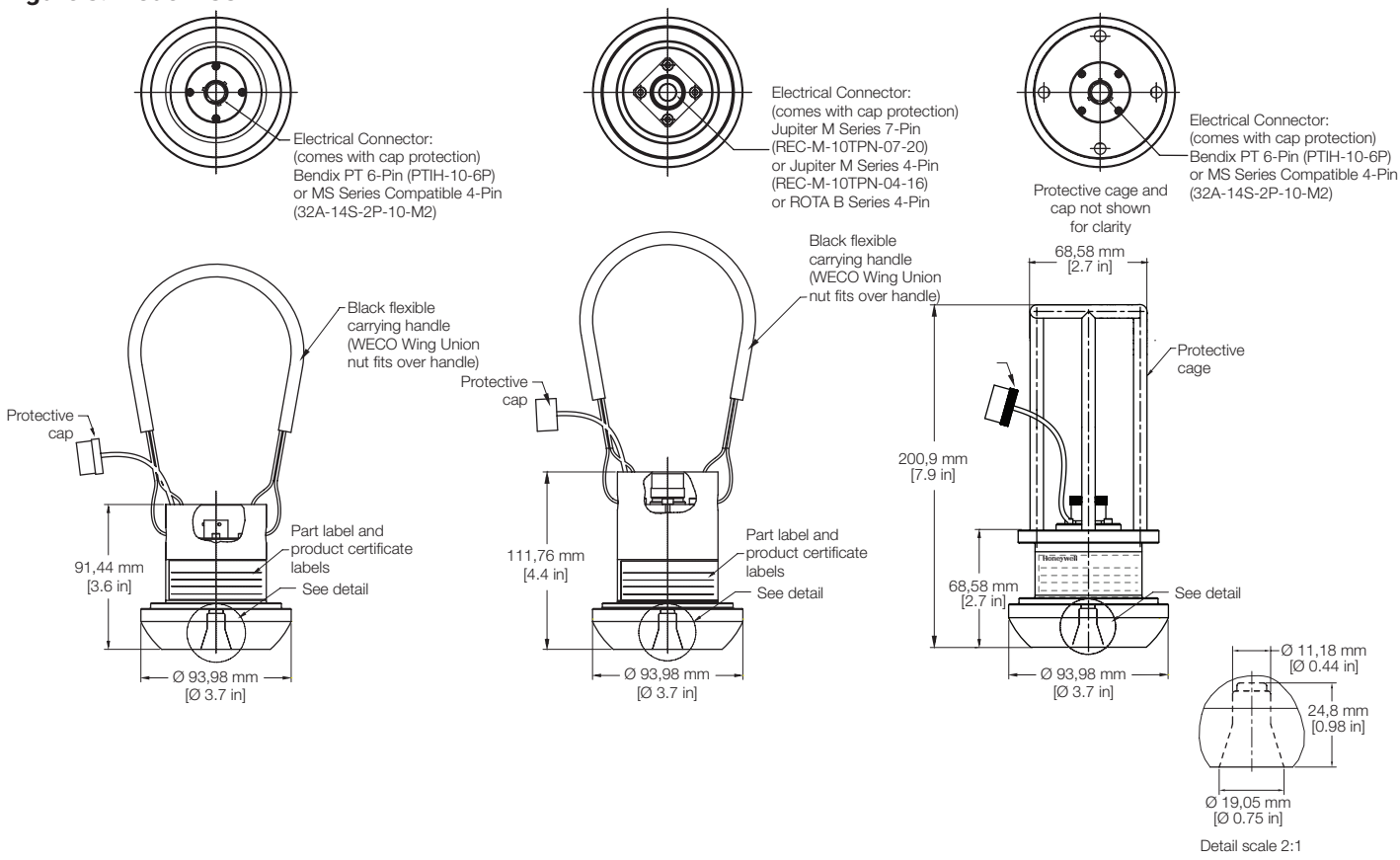
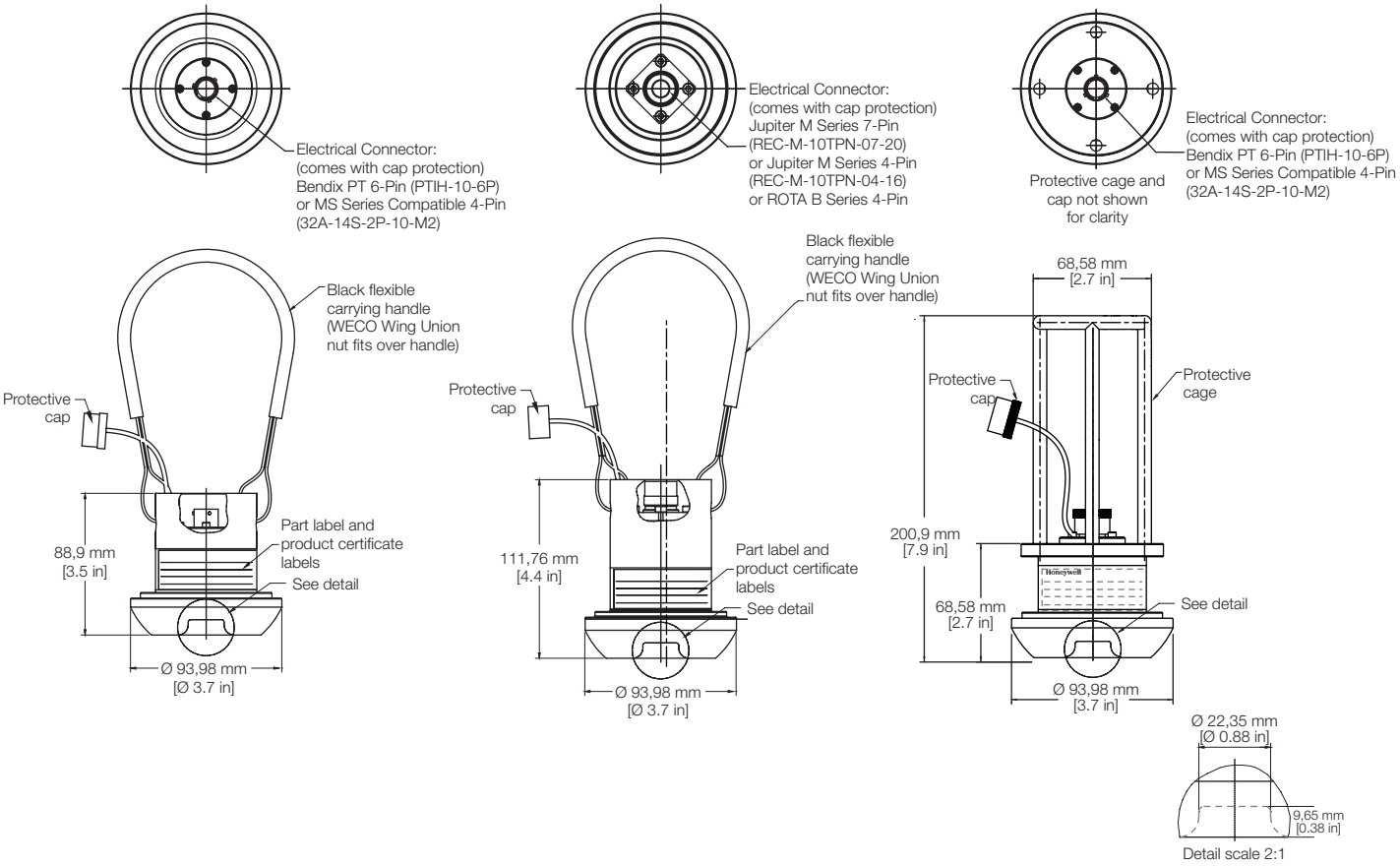


Figure 3. Model 435



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Figure 4. Model 437



WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment 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 that Honeywell, in its sole discretion, 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 Honeywell may provide information or engineering support for its products through Honeywell personnel, literature and website, it is the buyer's sole responsibility to determine the suitability of the Honeywell product(s) for the buyer's requirements.

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

⚠ 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.

⚠ 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.

For more information

Honeywell services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit our website or call:

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008933-5-EN | 5 | 12/24
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