



BUILDING AUTOMATION SYSTEMS

Pressure | Temperature | Air Quality | Flow | Level | Process Control



The mission of Dwyer Instruments, Inc. is to continuously improve our position as a global leader in designing and manufacturing innovative controls, sensors, and instrumentation solutions to the HVAC and Process Automation markets.

CUSTOMER SATISFACTION

Meet and exceed customer and market expectations

INNOVATIVE

Sustained R&D and product development

COMPETITIVE

Highly automated and flexible manufacturing capabilities

CONTINUOUS IMPROVEMENT

High-quality, reliable, and readily available products and solutions

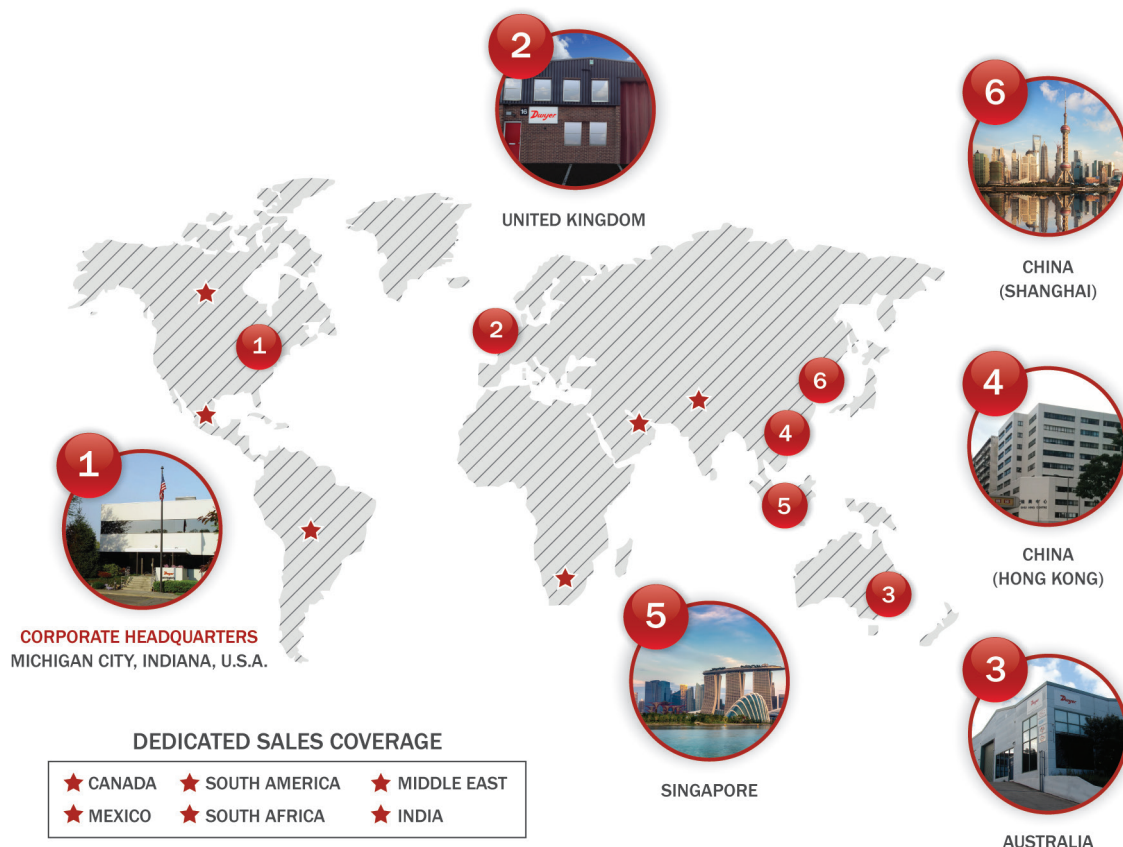
GLOBAL SUPPORT

Global sales and marketing presence

ESTABLISHED DWYER BRANDS



DWYER AROUND THE GLOBE



CONTACT INFORMATION

CORPORATE HEADQUARTERS

DWYER INSTRUMENTS, INC.
102 Indiana Highway 212
P.O. Box 373
Michigan City, IN 46360, U.S.A.

DWYER-INST.COM

Phone | (219) 879-8000
Toll-Free | (800) 872-9141
Fax | (219) 872-9057

UNITED KINGDOM

DWYER INSTRUMENTS LTD
Unit 16, The Wye Estate, London Road
High Wycombe, Bucks HP11 1LH-U.K.

DWYER-INST.CO.UK

Phone | +44 (0) 1494 461707
Fax | +44 (0) 1494 465102

AUSTRALIA

DWYER INSTRUMENTS, PTY. LTD.
Unit 1, 11 Waverley Drive
P.O. Box 359
Unanderra, NSW 2526 Australia

DWYER-INST.COM.AU

Phone | +61 (0) 2 4272 2055
Fax | +61 (0) 2 4272 4055

HONG KONG

DWYER INSTRUMENTS HK, LTD.
Unit 605A, 6/F, Shui Hing Centre
13 Sheung Yuet Road,
Kowloon Bay, Hong Kong

DWYER-INST.COM.HK

Phone | +852-23181007
Fax | +852-27561565

OTHER CONTACTS

ORDERS

orders@dwyermail.com

TECHNICAL SUPPORT

tech@dwyermail.com

LITERATURE REQUESTS

lit@dwyermail.com

QUOTATION/BID REQUESTS

quotes@dwyermail.com

GENERAL INFORMATION

info@dwyermail.com

INTERNATIONAL CUSTOMERS

Dwyer has local distributors in over 79 countries. Contact the office of your country or contact the corporate headquarters to find your local distributor. You can also go to our website at the following address to be contacted by your local distributor: dwyer-inst.com/Distributor

ABOUT US

Since the company was founded in 1931, customers have come to recognize Dwyer Instruments, Inc. to stand for quality, reliability, and readily available competitively priced products. As a leading manufacturer in the controls and instrumentation industry, we continue to grow and serve major markets including, but not limited to: HVAC, chemical, agriculture, food, oil and gas, water, wastewater, powder and bulk, and pollution control.

Dwyer holds over 650 technical patents and that number grows every year. We are an enthusiastic group of people headquartered in Michigan City, Indiana, with satellite locations around the globe. We take great pride in the intellect and integrity of our employees, who are passionate about the work we do, the products we develop, and the industries we serve.

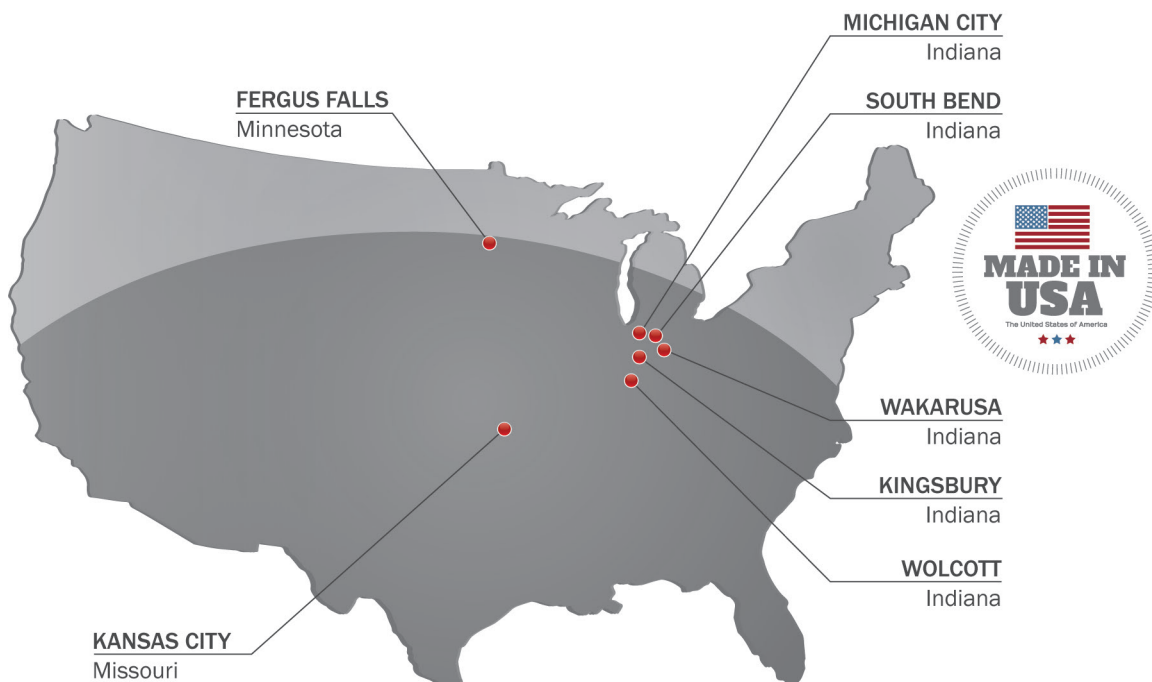
MANUFACTURING EXCELLENCE

At Dwyer, it all starts with commitment to meeting the needs of our customers. We strive to make dependable, easy-to-use products.

With nearly 90 years of manufacturing expertise, we stand behind our high quality products. Dwyer products are trusted in applications all over the world in nearly every industry.



MANUFACTURING & DESIGN CENTER LOCATIONS



OUR PEOPLE MAKE THE DIFFERENCE

CUSTOMER SERVICE

CUSTOMER CARE

Courteous and professional customer service representatives are available via phone and email to process and provide assistance with your order. Dwyer provides industry leading response time to answer your call quickly without waiting.

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PRODUCT DELIVERY

LARGE INVENTORY LOCATED CENTRALLY IN THE U.S.A.

Dwyer is committed to process and ship your order as quickly as possible, with more than 5,000 items stocked in our South Bend, Indiana warehouse. In most cases lead time is less than one week for non-stocked products.

FAST PROCESSING & PACKING

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TECHNICAL SUPPORT

All of our technical sales staff members are degreed engineers trained to be product and industry experts. We listen to your needs and get you the answers you want quickly.

WE HELP YOU FIND A SOLUTION

Product Selection | Application Assistance | Regulatory and Agency Approval Compliance
Installation Guidance | Maintenance and Repair | Product Customization for OEMs

TO CONTACT A TECHNICAL SUPPORT ENGINEER

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KEY FEATURES INCLUDE:

- Search by keyword or phrase
- Download and print pages
- Share any page directly
- Add notes to pages
- Navigate using thumbnails
- Click to order online

PRODUCT INFORMATION

- Product search by series, model number, keywords, or manuals
- Agency approval certificates – CE, IECEx, FM, UL, CSA and ATEX
- Video library of informative and instructional videos
- Instruction manuals, catalog pages, and data sheets
- CAD product drawings and high-resolution product photos
- 360° spin product photography
- Product applications and technical guides
- Digital catalogs, brochures, and other literature

PRODUCT CONFIGURATOR

- Customize a Dwyer product for your specific application needs
- Navigate graphic interface to see all available options and make selections
- View option rules to learn which selections are not compatible with specific features

SOCIAL MEDIA

STAY CONNECTED



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Our social media platforms allow you to stay up-to-date on Dwyer happenings and product offerings.

Visit us at: dwyer-inst.com/social

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Constantly expanding, consistently informative, the Dwyer Instruments, Inc. blog brings the latest HVAC and Process Automation market news to your desktop, tablet, or mobile device. The Dwyer executive and product management teams strive to honestly and authentically provide customers with industry insights through thought leadership.



SPECIAL MODELS FOR OEM REQUIREMENTS

Special instrument designs can be supplied to meet a wide range of OEM requirements and specific application needs. Custom scales and private brand identification can easily be furnished. These include: chrome or specially painted bezels, special membranes, special ranges and calibrations, dual scales, reflective scales, special cleaning and OEM identification. For specific information please contact our customer service department at 219-879-8000.

CUSTOMIZED FOR YOU

OFFERED IN A WIDE VARIETY OF DESIGNS, FEATURES & SCALES



CALIBRATION & CERTIFICATE SERVICES



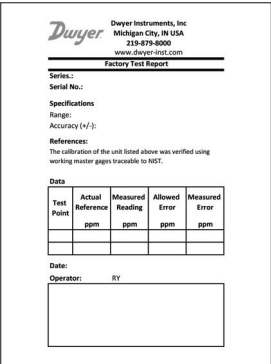
CERTIFICATE OF CONFORMANCE

A standard Certificate of Conformance is available FREE of charge at the time of order for most products. This document certifies that the product was manufactured to conform to the published specifications in Dwyer Instruments literature.



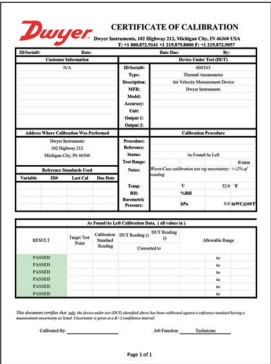
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A standard Certificate of Calibration is available FREE of charge at the time of order for most products. This document certifies that the product was tested to conform to the published accuracy specification published in Dwyer Instruments literature.



FACTORY CALIBRATION CERTIFICATE

A Factory Calibration Certificate gives you assurance that the unit has been tested for performance at the time of manufacture. The certificate includes testing points with recorded test data. Factory Calibration Certificates are available for many popular products. Pricing and availability varies by product. Please consult the options listing for the product on the catalog page or see the product on our website for availability.



CERTIFICATE OF NIST CALIBRATION

A Certificate of NIST Calibration is available for most indicating and transmitting instrumentation products at an additional charge. This certificate is created in our testing lab to NIST traceable test instruments and includes test points with recorded data and the reference standard. Pricing and availability varies by product. Please consult the options listing for the product on the catalog page or see the product on our website for availability. For some products customer specified test points can be specified for an additional charge.

STANDARD TERMS & CONDITIONS OF SALE

DWYER INSTRUMENTS, INC. - TERMS AND CONDITIONS OF SALE – MARCH 15, 2017

1. **Prices and Specifications** are subject to change without notice.
2. **Shipping dates** are approximate. They are dependent upon credit approval and subject to delays beyond our control.
3. **Terms:** Net 30 days to companies with established credit rating. In the event Buyer fails to fulfill previous terms of payment, or in case Seller shall have any doubt at any time as to Buyer's financial responsibility, Seller may decline to make further deliveries except upon receipt of cash in advance or other special arrangements.
4. **Point and Title:** All material is sold EXW Ex Works Dwyer Instruments, Inc. Title to all material sold shall pass to buyer upon delivery by Seller to carrier at shipping point.
5. **State and Local Taxes:** Any taxes which the Seller may be required to pay or collect upon or with respect to the sale, purchase, delivery, use or consumption of any of the material covered hereby shall be for the account of the Buyer and shall be added to the purchase price.
6. **Special tooling,** dies, silk screens and molds acquired specially to produce goods for Buyer remain the property of Dwyer Instruments, Inc., and may not be removed. They will be maintained in good condition for a minimum period of three years from the date of the original purchase order.
7. **Trade Compliance:** Buyer acknowledges that the products, software, and technology, including technical information and documents (collectively "Items"), of Dwyer Instruments, Inc., are subject to regulation by agencies of the U.S. government including, but not limited to, the U.S. Department of Commerce. Buyer shall comply with the Export Administration Regulations (EAR) and all applicable U.S. laws and regulations regarding the sale, delivery and transfer of said Items. Buyer shall not, without first obtaining the required licenses, authorizations or approvals from the appropriate U.S. government agency; (i) export, re-export, transfer or divert any Item directly or indirectly to any country or national resident thereof, or any person, entity or country that has restrictions imposed upon them by the U.S. government, (ii) engage in, or knowingly sell to any party engaged in activity related to the development, production, use, testing, or maintenance of Weapons of Mass Destruction, including uses related to nuclear, missile, chemical or biological warfare, or (iii) engage in, or knowingly sell to any party engaged in activity related to the development, production, use, or maintenance of any safeguarded or unsafeguarded nuclear fuel facility or components for such facilities. Buyer shall fully cooperate with Seller, without charge, in any official audit or inspection by an authorized agent, official, employee, or accredited representative of the U.S. government. Buyer shall indemnify and hold Seller harmless from, or in connection with, any violation of this Section by Buyer, its employees, consultants, agents, or customers. The obligations, requirements and claims described herein shall survive the expiration of any business relationship with Dwyer Instruments, Inc., including its divisions, subsidiaries and affiliated companies.
8. **Distribution:** Products sold to any entity located in the U.S. must remain in the U.S. unless a Global Distribution Agreement is in force with said entity. OEM's are excluded from this requirement. Those who violate this term are subject to a reduction of discount, loss of discount, or exclusion from purchasing future products. If you want to be a Global Distributor, please contact your Global Sales Manager in your region.
9. **Limited Warranty:** The Seller warrants all Dwyer instruments and equipment to be free from defects in workmanship or material under normal use and service for a period of one year from date of shipment. Products qualifying for an extended warranty period will have the extended warranty as expressly indicated on the catalog page, web page, IOM, or will be covered by a specific written agreement that is (i) approved by an officer of Dwyer Instruments, Inc. and (ii) defines the warranty period. If no express statement of extended warranty is made, then the standard 1 year warranty applies. The Extended Limited Warranty only applies to products manufactured after April 1, 2017. The Warranty period extends from the date of shipment to the initial customer and not the project installation date or use.

Specific warranty exclusions include, but are not limited to:

- Specific product components not covered by the extended warranty:
 - o Humidity Sensors
 - o Batteries
 - o Electro-Chemical Gas Sensors
 - o Snap Switches
 - o Any component which exceed its normal life cycle
 - o Other Specific items added as required.
- Normal or excessive wear and tear is not cause for warranty replacement.
- Products not properly maintained, operated, installed, or use in an application not suited for the product.
- Modifications, alterations, changes, or additions outside those which are required for normal operation.
- Failure to notify Dwyer of any defect within a reasonable time.
- Damage which the customer has not taken timely action to minimize or mitigate.
- Products on which the labels, markings, nameplates, etc. have been tampered with.
- Products which contain broken factory seals or have been tampered with shall void warranty.

Liability under this warranty is limited to repair or replacement EXW Ex Works Dwyer Instruments, Inc. of any parts which prove to be defective within that time or repayment of the purchase price at the Seller's option. All products must be returned to the Seller, transportation prepaid, unless other arrangements have been pre-approved by Seller. All technical advice, recommendations and services are based on technical data and information which the Seller believes to be reliable and are intended for use by persons having skill and knowledge of the business, at their own discretion. In no case is Seller liable beyond replacement of equipment EXW Ex Works Dwyer Instruments, Inc. or the full purchase price. This warranty does not apply if the maximum ratings label is removed or if the instrument or equipment is abused, altered, used at ratings above the maximum specified, or otherwise misused in any way.

THIS EXPRESS LIMITED WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER REPRESENTATIONS MADE BY ADVERTISEMENTS OR BY AGENTS AND ALL OTHER WARRANTIES, BOTH EXPRESS AND IMPLIED. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE FOR GOODS COVERED HEREUNDER.

10. **Buyer's Remedies:** THE BUYER'S EXCLUSIVE AND SOLE REMEDY ON ACCOUNT OF OR IN RESPECT TO THE FURNISHING OF NON-CONFORMING OR DEFECTIVE MATERIAL SHALL BE TO SECURE REPLACEMENT THEREOF AS AFORESAID. THE SELLER SHALL NOT IN ANY EVENT BE LIABLE FOR THE COST OF ANY LABOR EXPENDED ON ANY SUCH MATERIAL OR FOR ANY SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES TO ANYONE BY REASON OF THE FACT THAT IT SHALL HAVE BEEN NON-CONFORMING OR DEFECTIVE.
11. **Acceptance:** All orders shall be subject to the terms and conditions contained or referred to in the Seller's quotation, acknowledgment, and to those listed here and to no others whatsoever. By placing an order you accept our terms and conditions. No waiver, alteration or modification of these terms and conditions shall be binding unless in writing and signed by an executive officer of the Seller. All orders are subject to written acceptance by Dwyer Instruments, Inc., Michigan City, Indiana, U.S.A.

KEY MARKETS



HVAC

- Building Automation
- Test Equipment
- Controlled Environments
- Original Equipment
(Chillers, Boilers, Air Handlers, Cooling Towers)
- Valve Automation



PROCESS AUTOMATION

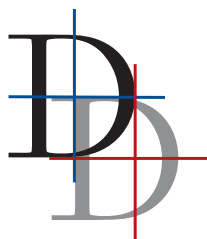
- Water and Wastewater
- Pharmaceutical
- Agriculture and Livestock
- Powder and Bulk
- Industrial Process
- Mining and Heavy Earth Moving
- Oil, Gas and Petrochemical
- Power
- Valve Automation

INNOVATION AWARDS



WINNER

Wireless Hydronic Balancing Kit
Series 490W



The ACHR News is the leading trade magazine in the heating, ventilating, air conditioning, and refrigeration industries.

GOLD

- HVAC Mobile Meter® Software Test Instrument App
- PredictAir™ Application Software
- Air Velocity Transmitter | Series AVUL

SILVER

- Universal Handheld Test Instrument | Model UHH2
- Wireless Hydronic Balancing Kit | Series 490W

BRONZE

- SMART Air Hood® Balancing Instrument | Series SAH
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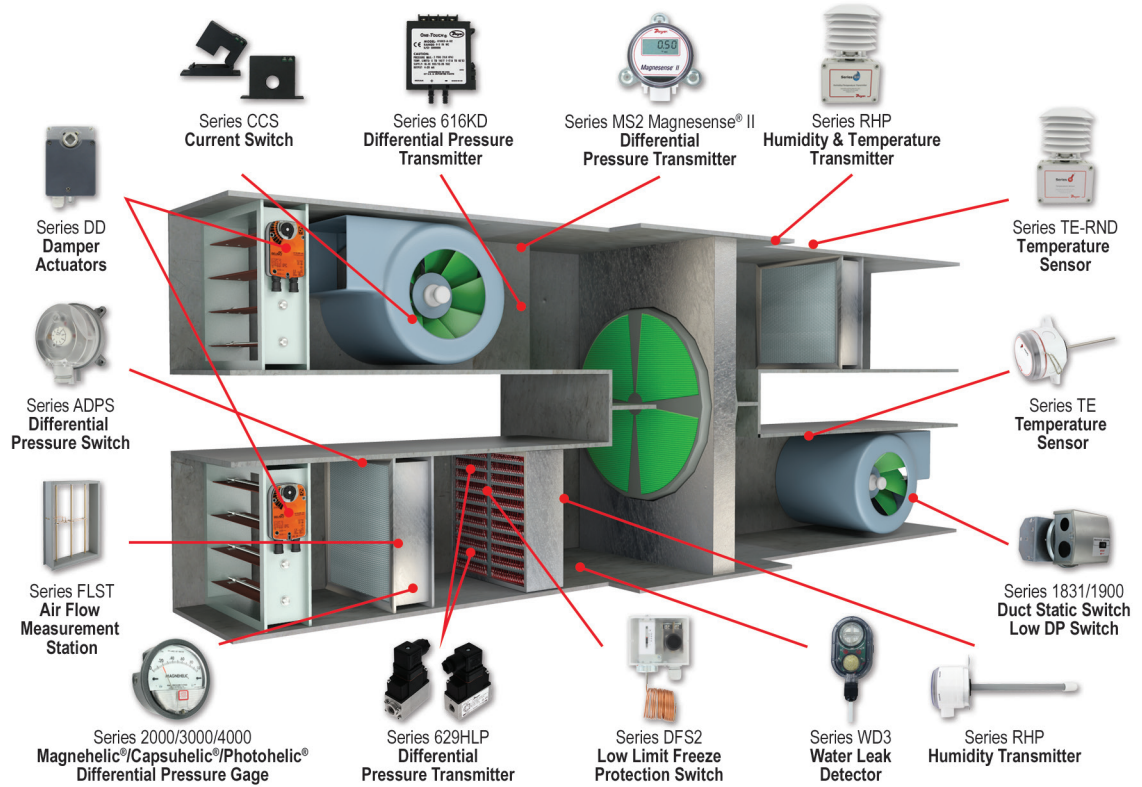
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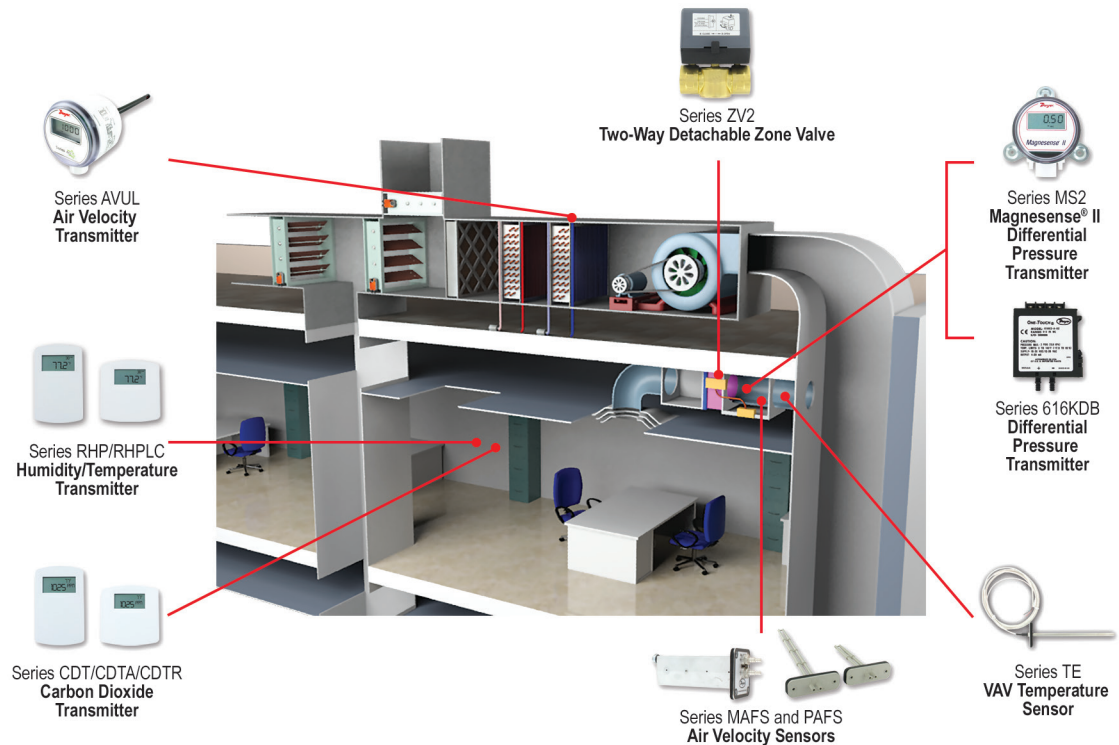
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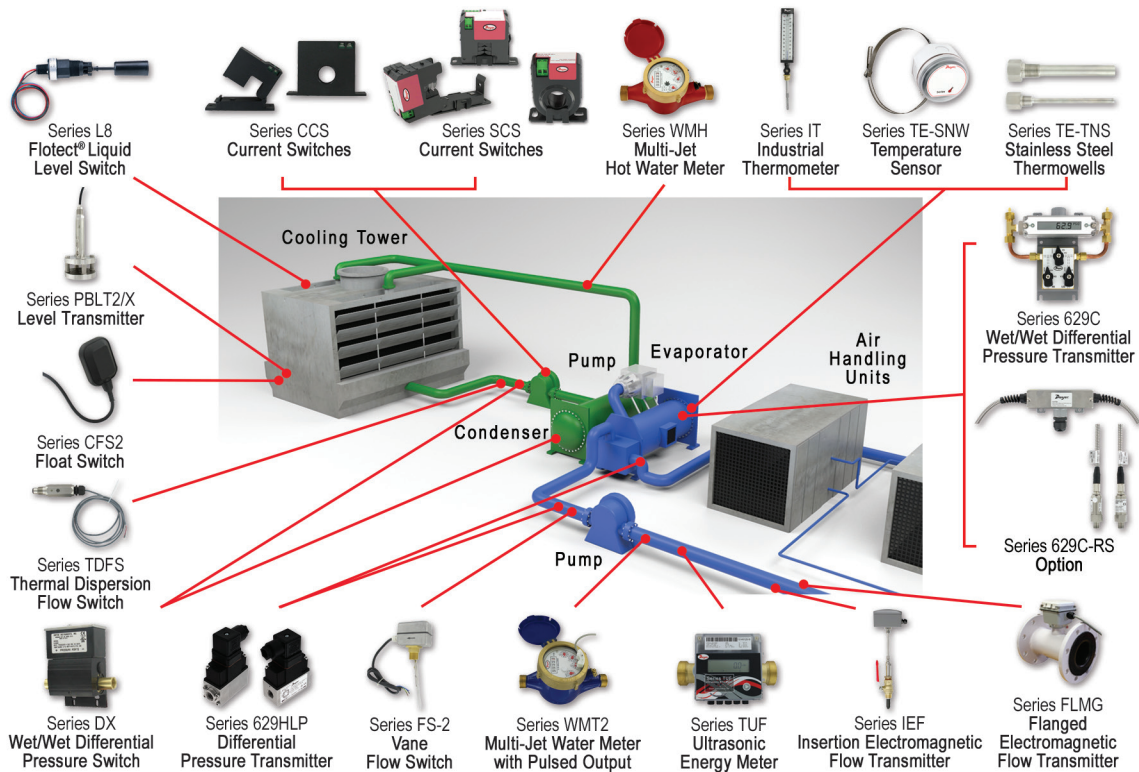
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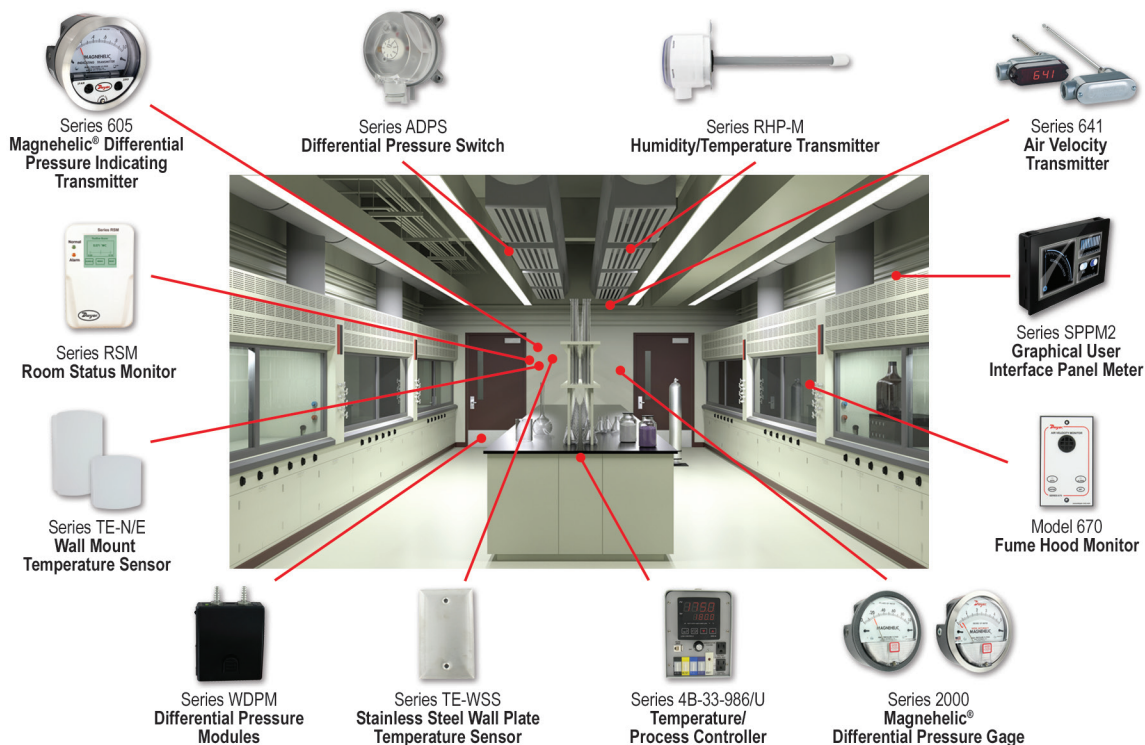
TERMINAL UNIT



CHILLER PLANT

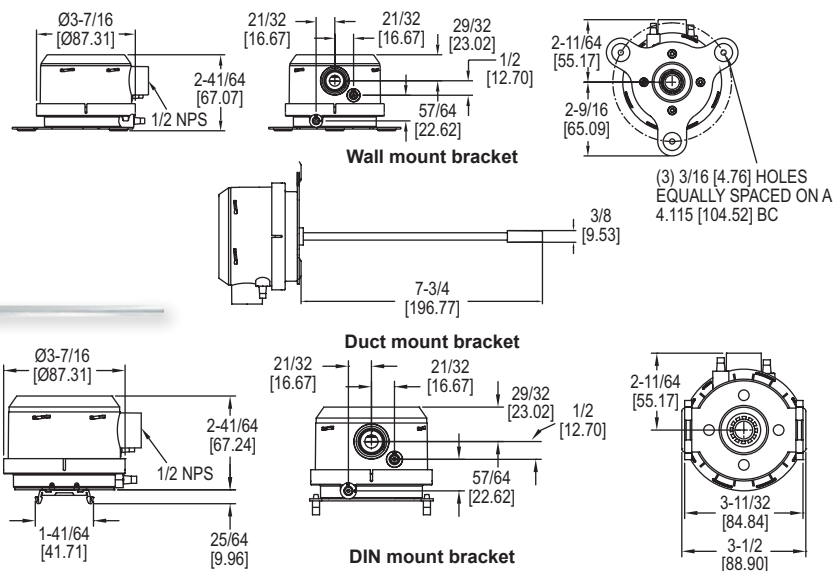
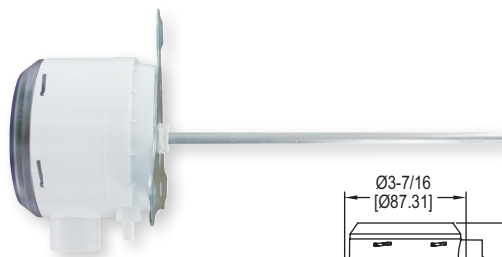


CLEAN ROOM



MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity and Air Flow, BACnet or Modbus® Communications



The **Series MS2 Magnesense® II Differential Pressure Transmitter** combines the proven stable piezo technology and the versatility of our original Series MS with additional features to reduce installation time and simplify ordering. Like the original Series MS, the second generation transmitter can be used as a linear pressure output or a linear velocity output with the square root extraction done in the transmitter. Additional parameters have been included to expand the square root capability to include flow measurements.

FEATURES/BENEFITS

- Field selectable ranges and output signal reduce inventory and the chances of ordering an incorrect part
- BACnet or Modbus® serial communications reduce wiring cost by daisy-chaining the transmitters
- Our integral field-upgradeable display or plug-in remote display tool save upfront material cost and allow for local viewing of measurements

APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical-semiconductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

SPECIFICATIONS

Supported Baud Rates: 9600, 19200, 38400, 57600, 76800, 115200.

Data Size: 8.

Parity: None.

Stop Bits: 1.

Service: Air and non-combustible, compatible gases.

Wetted Materials: Consult factory.

Typical Accuracy: $\pm 1\%$ FS for 0.15 in w.c. (40 Pa), 0.25 in w.c. (50 Pa), 0.5 in w.c. (125 Pa), 2 in w.c. (500 Pa), 3 in w.c. (750 Pa), 5 in w.c. (1250 Pa), 10 in w.c. (2 kPa), 15 in w.c. (3 kPa), 25 in w.c. (5 kPa), 28 in w.c. (6.975 kPa); $\pm 2\%$ FS for 0.1 in w.c. (25 Pa), 1 in w.c. (250 Pa), and all bi-directional ranges.

Stability: $\pm 1\%$ / year FSO.

Temperature Limits: 0 to 150°F (-18 to 66°C).

Pressure Limits: 1 psi max., operation; 10 psi burst.

Power Requirements: 10 to 35 VDC (2-wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).

Output Signals: 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).

Response Time: Adjustable: 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.

Zero & Span Adjustments: Digital push-buttons.

Loop Resistance: Current output: 0 to 1250 Ω max; Voltage output: Min. load resistance 1 k Ω .

Current Consumption: 40 mA max.

Display (Optional): 5 digit LCD.

Electrical Connections: 3-wire removable European style terminal block for 16 to 22 AWG.

Electrical Entry: 1/2" NPS thread.

Process Connection: 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

Enclosure Rating: IP66.

Mounting Orientation: Not position sensitive.

Weight: 8.0 oz (230 g).

Agency Approvals: BTL, CE.

MODEL CHART

Model	in w.c.	Pa	mm w.c.	kPa
MS2-W101	0.10, 0.15, 0.25, 0.50	25, 40, 50, 125	2.5, 4, 6, 10	0.025, 0.04, 0.05, 0.125
MS2-W111	± 0.10 , ± 0.15 , ± 0.25 , ± 0.50	± 25 , ± 40 , ± 50 , ± 125	± 2.5 , ± 4 , ± 6 , ± 10	± 0.025 , ± 0.04 , ± 0.05 , ± 0.125
MS2-W102	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
MS2-W112	± 1 , ± 2 , ± 3 , ± 5	± 250 , ± 500 , ± 750 , ± 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
MS2-W103	10, 15, 25, 28	2500, 3500, 5000, 6975	250, 350, 500, 697.5	2.5, 3.5, 5.0, 6.975
	± 10 , ± 15 , ± 25 , ± 28	± 2500 , ± 3500 , ± 5000 , ± 6975	± 250 , ± 350 , ± 500 , ± 697.5	± 2.5 , ± 3.5 , ± 5.0 , ± 6.975

Note: For duct mount static probe change W to D. **Example:** MS2-D101

For DIN rail mounting change W to N. **Example:** MS2-N101

OPTIONS

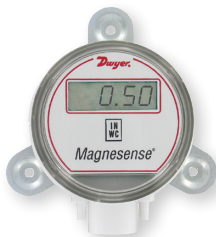
To order add suffix:	Description
-LCD	Units with display
Example: MS2-W101-LCD	
-BC	BACnet Communications
Example: MS2-W101-BC	
-MC	Modbus® Communications
Example: MS2-W101-MC	
-NIST	NIST traceable calibration certificate
Example: MS2-W101-NIST	
-FC	Factory calibration certificate
Example: MS2-W101-FC	

ACCESSORIES

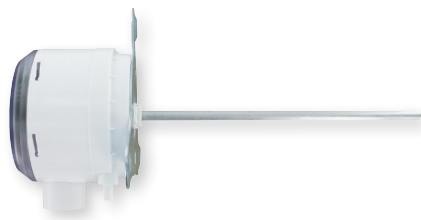
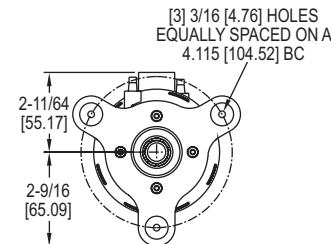
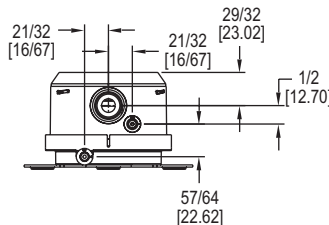
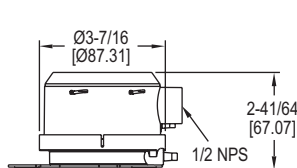
Model	Description
A-151	Cable gland for 5 to 10 mm diameter cable
A-MS2-LCD	Field upgradeable display
A-435-A	Remote display tool
A-480	Plastic static pressure tip
A-481	Installer kit; includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-489	4" 303 SS straight static pressure tip with flange
A-302F-A	4" 303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing
SCD-PS	100 to 240 VAC/VDC to 24 VDC power supply

MAGNESENSE® DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure and Air Velocity



Standard MS with optional LCD



MS with optional LCD and static probe

The **Series MS Magnesense® Differential Pressure Transmitter** is an extremely versatile transmitter for monitoring pressure and air velocity. This compact package is loaded with features such as:

FEATURES/BENEFITS

- Field selectable English or Metric ranges
- Field upgradeable LCD display
- Adjustable damping of output signal (with optional display)
- Ability to select a square root output for use with pitot tubes and other similar flow sensors

APPLICATIONS

- Building pressure monitoring
- Duct pressure monitoring
- Fan velocity measurement
- Zone differential pressure monitoring
- Filter condition monitoring

Along with these features, the patented magnetic sensing technology provides exceptional long term performance and enables the Magnesense® Differential Pressure Transmitter to be the single solution for your pressure and flow applications.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. Wetted Materials: Consult factory. Accuracy: ±1% for 0.25" (50 Pa), 0.5" (100 Pa), 2" (500 Pa), 5" (1250 Pa), 10" (2 kPa), 15" (3 kPa), 25" (5 kPa); ±2% for 0.1" (25 Pa), 1" (250 Pa) and all bi-directional ranges. Stability: ±1% FS/year. Temperature Limits: 0 to 150°F (-18 to 66°C). Pressure Limits: 1 psi maximum, operation; 10 psi, burst. Power Requirements: 10 to 35 VDC (2-wire); 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire). Output Signals: 4 to 20 mA (2-wire); 0 to 5 V, 0 to 10 V (3-wire). Response Time: Adjustable 0.5 to 15 s time constant. Provides a 95% response time of 1.5 to 45 seconds.	Zero & Span Adjustments: Digital push-button. Loop Resistance: Current output: 0-1250 Ω max; Voltage output: min. load resistance 1 kΩ. Current Consumption: 40 mA max. Display (optional): 4 digit LCD. Electrical Connections: 4 to 20 mA, 2-Wire: European style terminal block for 16 to 26 AWG; 0 to 10 V, 3-Wire: European style terminal block for 16 to 22 AWG. Electrical Entry: 1/2" NPS thread; Accessory (A-151): Cable gland for 5 to 10 mm diameter cable. Process Connections: 3/16" (5 mm) ID tubing. Maximum OD 9 mm. Enclosure Rating: NEMA 4X (IP66). Mounting Orientation: Diaphragm in vertical position. Weight: 8.0 oz (230 g). Agency Approvals: CE.
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MODEL CHART		
Model	Output	Selectable Ranges
MS-121*	4 to 20 mA	0.1 in, 0.25 in, 0.5 in w.c. (25, 50, 100 Pa)
MS-321*	0 to 10 V	0.1 in, 0.25 in, 0.5 in w.c. (25, 50, 100 Pa)
MS-721*	0 to 5 V	0.1 in, 0.25 in, 0.5 in w.c. (25, 50, 100 Pa)
MS-111*	4 to 20 mA	1 in, 2 in, 5 in w.c. (250, 500, 1250 Pa)
MS-311*	0 to 10 V	1 in, 2 in, 5 in w.c. (250, 500, 1250 Pa)
MS-711*	0 to 5 V	1 in, 2 in, 5 in w.c. (250, 500, 1250 Pa)
MS-131	4 to 20 mA	10 in w.c. (2 kPa)
MS-141	4 to 20 mA	15 in w.c. (3 kPa)
MS-151	4 to 20 mA	25 in w.c. (5 kPa)
MS-331	0 to 10 V	10 in w.c. (2 kPa)
MS-341	0 to 10 V	15 in w.c. (3 kPa)
MS-351	0 to 10 V	25 in w.c. (5 kPa)
MS-021	4 to 20 mA	±0.1 in, 0.25 in, 0.5 in w.c. (±25, 50, 100 Pa)
MS-221	0 to 10 V	±0.1 in, 0.25 in, 0.5 in w.c. (±25, 50, 100 Pa)
MS-621	0 to 5 V	±0.1 in, 0.25 in, 0.5 in w.c. (±25, 50, 100 Pa)

*Note: For duct mount static pressure probe, change last digit from 1 to 2. **Example:** MS-122

ACCESSORIES	
Model	Description
A-435	Field upgradeable LCD
A-480	Plastic static pressure tip
A-481	Installer kit. Includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-489	4" straight static pressure tip with flange
A-302F-A	303 SS Static Pressure Tip with mounting flange. For 3/16" ID rubber or plastic tubing. 4" insertion depth. Includes mounting screws
SCD-PS	100 to 240 VAC/VDC to 24 VDC Power supply

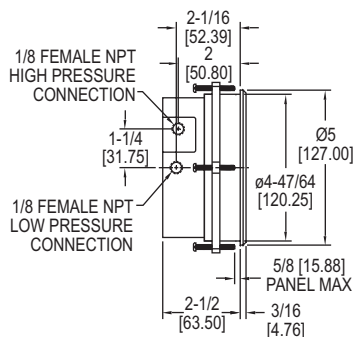
OPTIONS	
To order add suffix:	Description
-LCD	Units with display
Example: MS-121-LCD	
-NIST	NIST traceable calibration certificate
Example: MS-021-NIST	
-FC	Factory calibration certificate
Example: MS-021-FC	

DIGIHELIC® 3 DIFFERENTIAL PRESSURE CONTROLLERS

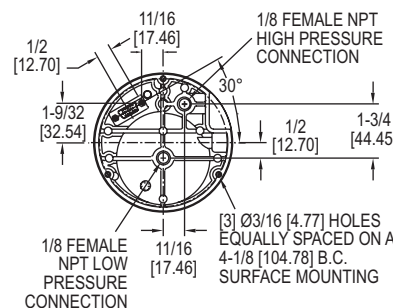
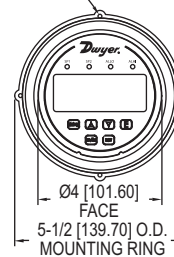
Digihelic® Controller in Photohelic® Gage, Square Root Output for Flow



Note: Shown with optional -SS bezel.
Backward compatible* with Magnehelic® gage.



[4] 6-32 HOLES EQUALLY SPACED ON A 5-1/8 [130.18] B.C. PANEL MOUNTING



The **Series DH3 Digihelic® 3 Differential Pressure Controllers** are 3-in-1 instruments possessing a digital display gage, control relay switches, and a transmitter with current output all packed in the popular Photohelic® gage style housing. Combining these 3 features allows the reduction of several instruments with one product, saving inventory, installation time and money. The Digihelic® controller is the ideal instrument for pressure, velocity and flow applications, achieving a 1% full-scale accuracy on ranges down to the extremely low 0.25 in w.c. to 2.5 in w.c. full-scale. Ranges of 5 in w.c. and greater maintain 0.5% FS accuracy. Bi-directional ranges are also available. The Series DH3 Digihelic® controller allows the selection of pressure, velocity or volumetric flow operation in several commonly used engineering units. 2 SPDT control relays with adjustable deadbands are provided along with a scalable 4 to 20 mA process output.

Programming is easy using the menu key to access 5 simplified menus which provide access to: security level; selection of pressure, velocity or flow operation; selection of engineering units; K-factor for use with flow sensors; rectangular or circular duct for inputting area in flow applications; set point control or set point and alarm operation; alarm operation as a high, low or high/low alarm; automatic or manual alarm reset; alarm delay; view peak and valley process reading; digital damping for smoothing erratic process applications; scaling the 4 to 20 mA process output to fit your applications range and field calibration.

FEATURES/BENEFITS

- 3-in-1 instrument allows the reduction of several instruments with one product, saving inventory, installation time and money
- Full-scale accuracy of 1% even on extremely low ranges, and 0.5% for ranges above 5 in w.c. provide for greater measurement precision
- Secure menu program provides access to device operation only for the right skill level
- Optional stainless steel bezel is the same installation diameter as Magnehelic® gage and simplifies field upgrade to DH3 pressure controller

APPLICATIONS

- SCFM duct flow
- Filter status
- Duct or building static pressure
- Damper and fan control

MODEL CHART			
Model	Ranges	Model	Ranges
DH3-002	0 to 0.25 in w.c.	*DH3-010	0 to 50 in w.c.
DH3-003	0 to 0.5 in w.c.	*DH3-011	0 to 100 in w.c.
DH3-004	0 to 1 in w.c.	*DH3-013	0 to ±0.25 in w.c.
DH3-005	0 to 2.5 in w.c.	*DH3-014	0 to ±0.5 in w.c.
DH3-006	0 to 5 in w.c.	*DH3-015	0 to ±1 in w.c.
DH3-007	0 to 10 in w.c.	*DH3-016	0 to ±2.5 in w.c.
DH3-009	0 to 25 in w.c.	*DH3-017	0 to ±5 in w.c.
		*DH3-018	0 to ±10 in w.c.

*Velocity and volumetric flow not available on bi-directional range units and models DH3-010 and DH3-011.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Housing Material: Die cast aluminum case and bezel.
Accuracy: ±1.5% for 0.25 in and ±0.25 in w.c. ranges. Ranges 0.5 in to 5 in w.c. and corresponding bi-directional (except ±2.5 in w.c.) ±1%; All other ranges: ±0.5% @ 77°F (25°C) including hysteresis and repeatability (after 1 hour warm-up).
Stability: < ±1% per year.
Pressure Limits: Ranges ≤ 2.5 in w.c.: 25 psi; ±2.5", 5 in w.c.: 5 psi; 10 in w.c.: 5 psi; 25 in w.c.: 5 psi; 50 in w.c.: 5 psi; 100 in w.c.: 9 psi.
Temperature Limits: 32 to 140°F (0 to 60°C).
Compensated Temperature Limits: 32 to 140°F (0 to 60°C).
Thermal Effects: 0.020%/°F (0.036/°C) from 77°F (25°C). For 0.25 in and ±0.25 in w.c. ranges: ±0.03%/°F (±0.054/°C).
Power Requirements: 12-28 VDC, 12-28 VAC 50 to 400 Hz.
Power Consumption: 3 VA max.

Output Signal: 4 to 20 mA DC into 900 Ω max.
Zero & Span Adjustments: Accessible via menus.
Response Time: 250 ms (damping set to 1).
Display: Backlit 4 digit LCD 0.4" height LED indicators for set point and alarm status.
Electrical Connections: 15 pin male high density D-sub connection. 18" (46 cm) cable with 10 conductors included.
Process Connections: 1/8" female NPT. Side or back connections.
Mounting Orientation: Mount unit in vertical plane.
Size: 5" (127 mm) OD x 3-1/8" (79.38 mm); -SS bezel: 4-3/4" (120.7 mm) OD x 2-21/32 (67.5 mm).
Weight: 1.75 lb (794 g).
Agency Approvals: CE.

SWITCH SPECIFICATIONS

Switch Type: 2 SPDT relays.
Electrical Rating: 1 A @ 30 VAC/VDC.
Set Point Adjustment: Adjustable via keypad on face.

ACCESSORIES

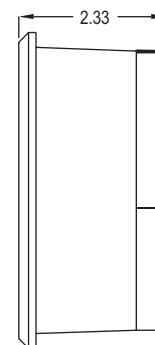
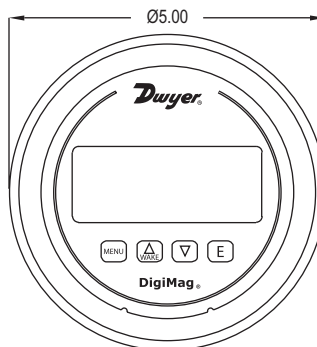
Model	Description
A-298	Flat aluminum bracket for flush mounting
A-301	Static pressure tip for 1/4" metal tubing connection
A-302	Static pressure tip for 3/16" and 1/8" I.D. plastic or rubber tubing
A-302F-A	303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing; 4" insertion depth; includes mounting screws
A-370	Mounting bracket flush mount bracket; bracket is then surface mounted; steel with gray hammertone epoxy finish
A-489	4" straight static pressure tip with flange

OPTIONS

To order add suffix:	Description
-SS	304 brushed stainless steel bezel. *Backward compatible with standard Magnehelic® gage installation diameter
Example: DH3-004-SS	
-NIST	NIST traceable calibration certificate
Example: DH3-004-NIST	
-FC	Factory calibration certificate
Example: DH3-004-FC	

DIGIMAG® DIGITAL DIFFERENTIAL PRESSURE AND FLOW GAGE

24 Volt or Battery Powered, Fits in Magnehelic® Gage Cut-Out



The **Series DM-1000 DigiMag® Digital Differential Pressure and Flow Gage** monitors the pressure of air and compatible gases just as its famous analog predecessor the Magnehelic® differential pressure gage. All models are factory calibrated to specific ranges. The 4-digit LCD can display readings in common English and metric units so conversions are not necessary. The simplified four button operation reduces set up time and simplifies calibration with its digital push-button zero and span.

FEATURES/BENEFITS

- Field programmed reduces installation time
- User selectable parameters for pressure, air velocity or flow permits same device for multiple applications
- Specialized filter set point for alerts when maintenance is due
- Security levels permit matches the correct access to right skill
- Power versatility works with 9-24 VDC or 9 V battery allows deployment in a variety of spaces wired or not

APPLICATIONS

- Filter monitoring
- Air velocity or flow
- Blower vacuum monitoring
- Fan pressure indication
- Duct, room or building pressures
- Clean room positive pressure indication

ACCESSORIES

Model	Description
A-300	Flat flush mounting bracket
A-286	4-1/2" gage panel mounting flange
A-489	4" straight static pressure tip with flange
A-480	Plastic static pressure tip

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Housing Materials: Glass filled plastic.
Accuracy: ±1% FS including linearity, hysteresis and repeatability; ±2% FS for ranges 1 in w.c. and below.
Temperature Limits: 0 to 140°F (-18 to 60°C).
Compensated Temperature Limits: 32 to 122°F (0 to 50°C).
Long Term Stability: ±1% FS per year.
Thermal Effect: ±0.05% FS/°F typ.; ±0.10% FS/°F for ranges 1 in w.c. and below.
Display: 4-digit LCD (digits: 0.60H x 0.33W).
Display Update: Selectable for 1 second to 10 minutes or update only from button push.
Pressure Limits: Normal and bi-directional ranges 5 in w.c. and lower = 2 psi (13.7 kPa); Normal and bi-directional ranges 10 in w.c. and higher = 11 psi (75 KPa).
Selectable Engineering Units: in w.c., psi, kPa, Pa, mm w.c., mBar, in Hg, mm Hg, FS (0-100%).
Power Requirements: 9 V alkaline battery, included, user replaceable or external power supply 9-24 VDC.
Battery Service Life: Battery life depending on the display update setting: 150 hours (typical) if display update = 1 second; 9 month (typical) if display update = 10 minutes; 1.5 years (typical) if display update is disabled. Battery may last up to four times longer when using lithium-based battery ULTRALIFE U9VL-J.
Current Consumption: 5 mA max.
Electrical Connections: Removable terminal block for 16 to 26 AWG.
Electrical Entry: Cable gland for 0.114 to 0.250" (2.9 to 6.4 mm) diameter cable.
Process Connections: 1/8" (3 mm) ID tubing.
Enclosure Rating: NEMA 4X (IP66).
Weight: 1.18 lb (535 g).
Size: 5" (127 mm) OD front face.
Agency Approvals: CE.

MODEL CHART

Model	Range									Resolution in w.c.
	in w.c.	psi	kPa	Pa	mbar	mm w.c.	in Hg	mm Hg	% of FS	
DM-1102	0.250	—	0.062	62.20	0.622	6.35	—	0.467	100.0	0.001
DM-1103	0.500	—	0.124	124.5	1.245	12.70	—	0.934	100.0	0.001
DM-1104	1.000	—	0.249	249.1	2.492	25.40	—	1.868	100.0	0.001
DM-1105	2.000	—	0.498	498.2	4.982	50.80	—	3.736	100.0	0.001
DM-1107	5.000	0.181	1.245	1245	12.45	127.0	0.368	9.34	100.0	0.002
DM-1108	10.00	0.361	2.491	2491	24.91	254.0	0.736	18.68	100.0	0.010
DM-1109	15.00	0.543	3.738	3738	37.38	381.0	1.104	28.02	100.0	0.010
DM-1110	25.00	0.903	6.227	6227	62.27	635.0	1.839	46.71	100.0	0.010
DM-1111	50.00	1.806	12.45	—	124.5	1270	3.678	93.42	100.0	0.020
DM-1112	100.0	3.613	24.91	—	249.1	2540	7.355	186.8	100.0	0.100

Contact the factory for available bi-directional ranges from ±0.25 to ±10 in w.c.

Note: For air flow models change -11XX to -12XX.

OPTIONS

To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: DM-1103-NIST	

DIFFERENTIAL PRESSURE TRANSMITTERS

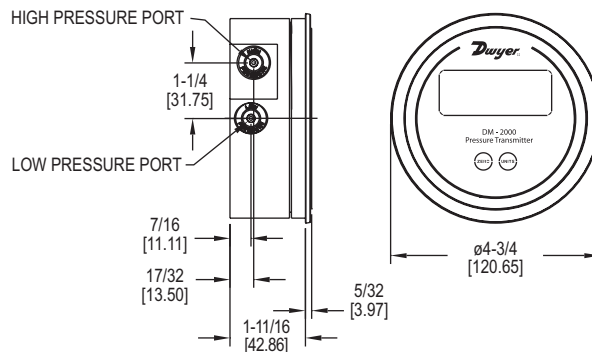
Same Size as Standard Magnehelic® Differential Pressure Gage



DM-2000-LCD



DM-2100-LCD



The Dwyer **Series DM-2000 Differential Pressure Transmitters** sense the pressure of air and compatible gases and sends a standard 4 to 20 mA output signal. The DM-2000 housing is specifically designed to mount in the same diameter cutout as a standard Magnehelic® gage. A wide range of models are available factory calibrated to specific ranges.

Pressure connections are inherent to the glass filled plastic molded housing making installation quick and easy. Digital push-button zero and span simplify calibration over typical turn-potentiometers. An optional 3.5 digit LCD shows process and engineering units. A single push-button allows field selection of 4 to 6 engineering units depending on range.

FEATURES/BENEFITS

- Zero and span controls provide easy calibration checks and shorter installation time to get device running and monitoring
- Quick response to pressure changes means no delay in signaling and alerting to critical situations
- Easy to read LCD display provides immediate local alerts allowing corrective action to be taken quicker to eliminate the problem from becoming widespread
- Same size as Magnehelic® simplifies field upgrade to digital pressure gage by reducing install steps
- Tamper proof button configuration to prevent accidental changes to the settings

APPLICATIONS

- Differential pressure across filters
- Fan control
- Static pressures in ducts or buildings

MODEL CHART						
Model	Range (in w.c.)	Pa	mm w.c.	mBar	kPa	psi
DM-2001-LCD	0 to .100	24.9	2.54	.249	-	-
DM-2002-LCD	0 to .250	62.2	6.35	.622	-	-
DM-2003-LCD	0 to .500	124.3	12.70	1.243	.124	-
DM-2004-LCD	0 to 1.000	249	25.4	2.49	.249	-
DM-2005-LCD	0 to 2.00	497	50.8	4.97	.497	-
DM-2006-LCD	0 to 3.00	746	76.2	7.46	.746	.108
DM-2007-LCD	0 to 5.00	1243	127.0	12.43	1.243	.180
DM-2012-LCD	0 to ±.250	0 to ±62.2	0 to ±6.35	0 to ±.622	-	-
DM-2013-LCD	0 to ±.500	0 to ±124.3	0 to ±12.70	0 to ±1.243	-	-
DM-2019-LCD	0 to ±.200	49.8	5.08	.498	-	-

Note: For white overlay change -20 to -21. **Example:** DM-2102-LCD

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: ±1% FS at 70°F.
Stability: ±1% FS/yr.
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Pressure Limits: 10 psig (0.69 bar).
Thermal Effect: ±0.055% FS/°F (0.099% FS/°C).
Power Requirements: 10 to 35 VDC (2 wire).
Output Signal: 4 to 20 mA.
Zero and Span Adjustments: Digital push-button zero and span.
Loop Resistance: DC: 0 to 1250 Ω maximum.
Current Consumption: DC: 38 mA max.
Electrical Connections: Screw-type terminal block.
Display: 3.5 digit LCD, 0.7" H.
Process Connections: 1/8" ID tubing.
Mounting Orientation: Vertical.
Weight: 4.8 oz (136 g).

ACCESSORIES

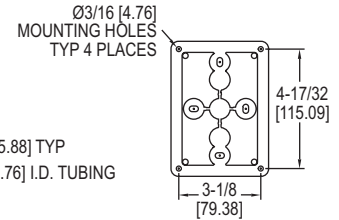
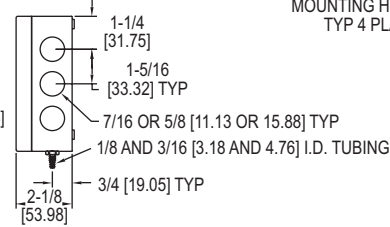
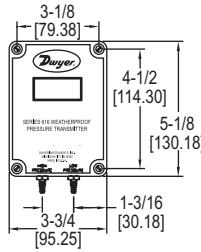
Model	Description
A-299	Surface mounting bracket
A-300	Flat flush mounting bracket
A-302F-A	303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing; 4" insertion depth; includes mounting screws
A-320-A	Instrument enclosure
A-489	4" straight static pressure tip with flange
SCD-PS	100 to 240 VAC/VDC to 24 VDC power supply

OPTIONS

To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: DM-2002-LCD-NIST	
-FC	Factory calibration certificate
Example: DM-2002-LCD-FC	

DIFFERENTIAL PRESSURE TRANSMITTER

NEMA 4X Enclosure, 0.25% FS Accuracy



Positive, negative and differential pressures can be measured within a full span accuracy of ± 0.25 with the **Series 616W Differential Pressure Transmitter**. Units are enclosed in a polycarbonate case, rated NEMA 4X (IP66) and operate by sensing the pressure of air and compatible gases then sending a standard 4 to 20 mA output signal. Design enables operation in 2-wire current loops. A wide range of models are available factory calibrated to specific ranges. The span and zero controls are for use when checking calibration. They are not intended for re-ranging to a significantly different span. The LCD display allows local indication of pressure.

FEATURES/BENEFITS

- NEMA 4X rated enclosure provides protection in harsh environments permitting outdoor monitoring or in areas where dust and particulate matter exists
- Easy to read LCD display provides immediate local alerts allowing corrective action to be taken quicker to eliminate the problem from becoming widespread
- Zero and span controls provides easy calibration checks and shorter installation time to get device running and monitoring

APPLICATIONS

- Dust collection
- Outdoor HVAC
- Roof-top equipment

MODEL CHART		
Model	Range	Max. Pressure
616W-2-LCD	0 to 6 in w.c.	10 psig
616W-3-LCD	0 to 10 in w.c.	10 psig
616W-4-LCD	0 to 20 in w.c.	20 psig
616W-5-LCD	0 to 40 in w.c.	20 psig
616W-6-LCD	0 to 100 in w.c.	15 psig
616W-7-LCD	0 to 200 in w.c.	45 psig
616W-20B-LCD	0 to ± 10 in w.c.	10 psig
616W-3M-LCD	0 to 2.5 kPa	68.9 kPa

Note: Units with "M" in the model number are metric units.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: $\pm 0.25\%$ FS @ 77°F (25°C), display accuracy $\pm 0.5\%$.
Stability: $\pm 1\%$ FS/yr.
Temperature Limits: 14 to 185°F (-10 to 85°C).
Pressure Limits: See chart.
Power Requirements: 10 to 35 VDC (2-wire), 17 to 36 VDC, or isolated 21.6 to 33 VAC (3-wire).
Output Signal: 4 to 20 mA (2-wire), 0 to 5 VDC, or 0 to 10 VDC (3-wire).
Zero and Span Adjustments: Push-buttons.

Loop Resistance: Current output: 0 to 1250 Ω max; Voltage output: Load resistance 1 k Ω (min).
Current Consumption: 40 mA (max).
Electrical Connections: 3-wire removable European style terminal block for 16 to 26 AWG.
Process Connections: Barbed, dual size to fit 1/8" and 3/16" (3.12 and 4.76 mm) ID rubber or vinyl tubing.
Enclosure Rating: NEMA 4X (IP66).
Mounting Orientation: Any orientation.
Weight: Without LCD 8.8 oz. (249 g); with LCD 9.6 oz (272 g).
Agency Approvals: CE.

OPTIONS

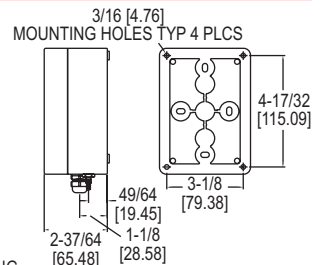
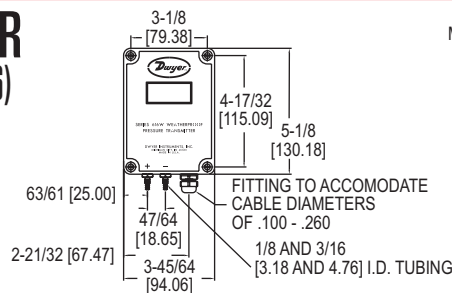
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: 616W-3-LCD-NIST	

Process Tubing Options: See page 91 (Gage Tubing Accessories)

SERIES 616WL

DIFFERENTIAL PRESSURE TRANSMITTER

Low Ranges Down to 0.25 in w.c. (60 Pa), NEMA 4X Housing (IP66)



The **Series 616WL Differential Pressure Transmitter** senses very low pressures of air and non-combustible, compatible gases and sends a standard 4 to 20 mA output signal. All models, including those featuring the 3 digit LCD digital read-out, are factory calibrated to specific ranges as listed in the chart below. Positive, negative and differential pressures can be measured within a full span accuracy of $\pm 0.50\%$. This weatherproof unit is enclosed in a polycarbonate case, designed to meet (IP66/ NEMA 4X). Internal digital push-button zero and span allow for quick and simple field calibration.

FEATURES/BENEFITS

- NEMA 4X rated enclosure provides protection in harsh environments permitting outdoor monitoring or in areas where dust and particulate matter exists
- Easy to read LCD display provides immediate local alerts allowing corrective action to be taken quicker to eliminate the problem from becoming widespread
- Zero and span controls provides easy calibration checks and shorter installation time to get device running and monitoring
- High precision accuracy at low pressure ranges provides exceptional accuracy for insuring tight-control and minimizing costly out of specification conditions

APPLICATIONS

- Low pressure applications
- Dust collection
- Outdoor HVAC
- Roof-top equipment

OPTIONS	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: 616WL-4-LCD-NIST	

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: $\pm 0.50\%$ FS, display accuracy $\pm 0.5\%$.
Stability: $\pm 1\%$ FS/yr.
Temperature Limits: 0 to 140°F (-17.8 to 60°C).
Compensated Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Pressure Limits: See chart.
Thermal Effect: $\pm 0.02\%$ FS/°F (0.036% FS/°C).
Power Requirements: 12 to 30 VDC (2-wire).
Output Signal: 4 to 20 mA.

Zero and Span Adjustments: Digital, push-button adj.
Loop Resistance: DC; 0 to 900 Ω max.
Current Consumption: DC; 38 mA max.
Electrical Connections: Screw-type terminal block.
Process Connections: Barbed, dual size to fit 1/8" and 3/16" (3.12 and 4.76 mm) ID rubber or vinyl tubing.
Enclosure Rating: NEMA 4X (IP66).
Mounting Orientation: Vertical, consult factory for other position orientations.
Weight: Without LCD 17 oz (482 g); with LCD 18 oz (510 g).
Agency Approvals: CE.

MODEL CHART		
Model	Range	Max. Pressure
616WL-2-LCD	0 to 0.25 in w.c.	2 psig
616WL-4-LCD	0 to 1 in w.c.	4 psig
616WL-12-LCD	0 to ± 0.25 in w.c.	2 psig
616WL-14-LCD	0 to ± 1 in w.c.	4 psig
616WL-22-LCD	0 to 60 Pa	2 psig
616WL-32-LCD	0 to ± 60 Pa	2 psig
616WL-25-LCD	0 to 250 Pa	4 psig
616WL-35-LCD	0 to ± 250 Pa	4 psig

Process Tubing Options: See page 91 (Gage Tubing Accessories)

MAGNEHELIC® DIFFERENTIAL PRESSURE GAGES

Indicate Positive, Negative or Differential, Accurate within 1%

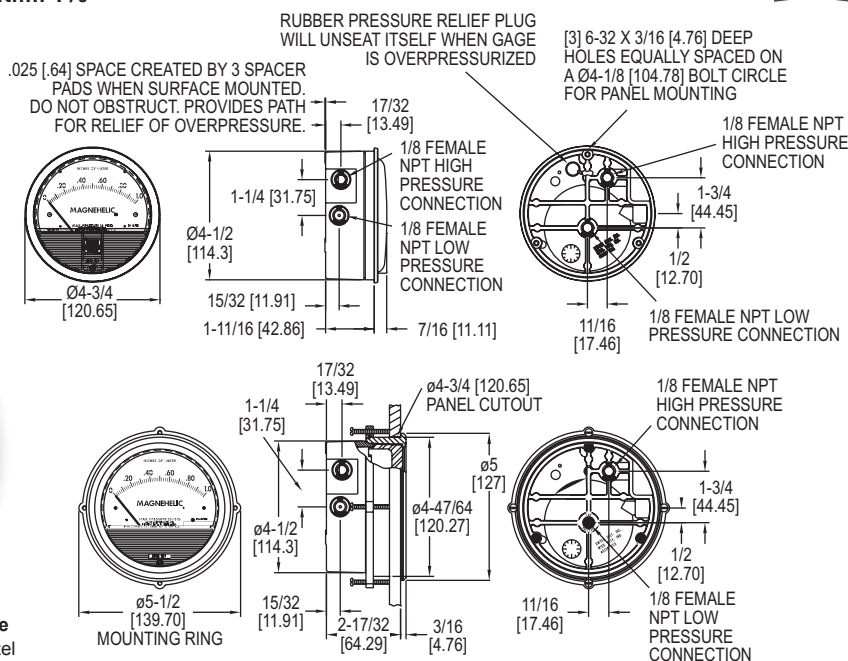


Standard Magnehelic® gage



High Accuracy Magnehelic® gage

Note: Shown with optional -SS bezel



Select the **Series 2000 Magnehelic® Differential Pressure Gages** for a versatile low differential pressure gage with a wide choice of 81 models and 27 options to choose from. Using Dwyer's simple, frictionless Magnehelic® gage movement, it quickly indicates air or non-corrosive gas pressures—either positive, negative (vacuum) or differential. The design resists shock, vibration, over-pressures and is weatherproof to IP67.

Select the -HA High Accuracy Magnehelic® gage option for an accuracy within 1% of full-scale. Also included with the -HA option at no extra cost are a mirrored scale overlay and a 6 point calibration certificate.

FEATURES/BENEFITS

- Easy to read gage through undistorted plastic face permits viewing from far away
- Patented design provides quick response to pressure changes means no delay in assessing critical situations
- Durable and rugged housing and high-quality components combine to provide long-service life and minimized down-time
- High accuracy option is twice as accurate as the standard Magnehelic® gage

APPLICATIONS

- Filter monitoring
- Air velocity with Dwyer pitot tube
- Blower vacuum monitoring
- Fan pressure indication
- Duct, room or building pressures
- Clean room positive pressure indication

ACCESSORIES

Model	Description
A-432	Portable kit; combine carrying case with any Magnehelic® gage of standard range, except high pressure connection. Includes 9 ft (2.7 m) of 3/16" ID rubber tubing, standhang bracket and terminal tube with holder
A-605	Air filter gage accessory kit; adapts any standard Magnehelic® gage for use as an air filter gage. Includes aluminum surface mounting bracket with screws, two 5 ft (1.5 m) lengths of 1/4" aluminum tubing, two static pressure tips and two molded plastic vent valves, integral compression fittings on both tips and valves
A-605B	Air filter gage accessory kit; air filter kit with two plastic open/close valves, two 4" steel static tips, plastic tubing and mounting flange
A-605C	Air filter gage accessory kit; air filter kit with two plastic open/close valves, two plastic static tips, plastic tubing and mounting flange

SPECIFICATIONS

Service: Air and non-combustible, compatible gases (natural gas option available). **Note:** May be used with hydrogen. Order a Buna-N diaphragm. Pressures must be less than 35 psi.

Wetted Materials: Consult factory.

Housing: Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.

Accuracy: $\pm 2\%$ (-HA model ± 1) of FS ($\pm 3\%$ (-HA $\pm 1.5\%$) on -0, -100PA, -125PA, -10MM and $\pm 4\%$ (-HA $\pm 2\%$) on -00, -60PA, -6MM ranges), throughout range at 70°F (21.1°C).

Pressure Limits: -20 in Hg to 15 psig (-0.677 to 1.034 bar); MP option: 35 psig (2.41 bar); HP option: 80 psig (5.52 bar).

Enclosure Rating: IP67.

Overpressure: Relief plug opens at approximately 25 psig (1.72 bar), standard gages only. ①

Temperature Limits: 20 to 140°F* (-6.67 to 60°C). -20°F (-28°C) with temperature option.

Size: 4" (101.6 mm) diameter dial face.

Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

Process Connections: 1/8" female NPT duplicate high and low pressure taps - one pair side and one pair back.

Weight: 1 lb 2 oz (510 g), MP & HP 2 lb 2 oz (963 g).

Standard Accessories: Two 1/8" NPT plugs for duplicate pressure taps, two 1/8" pipe thread to rubber tubing adapter, and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for three adapters in MP & HP gage accessories.)

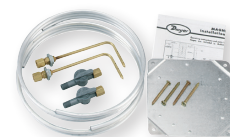
Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II). **Note:** -SP models not RoHS approved.

Note: For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options.

*Low temperature models available as special options



A-432



A-605

MAGNEHELIC® DIFFERENTIAL PRESSURE GAGES

Indicate Positive, Negative or Differential, Accurate within 1%

Bezel provides flange for flush mounting in panel.

Clear plastic face is highly resistant to breakage. Provides undistorted viewing of pointer and scale.

Precision litho-printed scale is accurate and easy to read.

Calibrated range spring is flat spring steel. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length adjustable for calibration.

Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on the helix shaft.

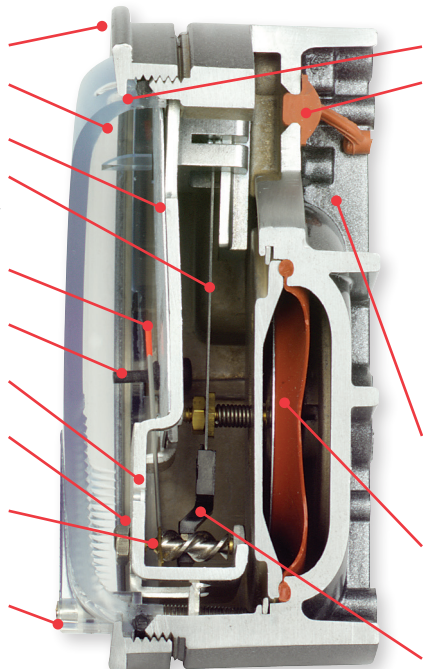
Pointer stops of molded rubber prevent pointer over-travel without damage.

"Wishbone" assembly provides mounting for helix, helix bearings and pointer shaft.

Jeweled bearings are shock-resistant mounted; provide virtually friction-free motion for helix. Motion damped with high viscosity silicone fluid.

Helix is precision made from an alloy of high magnetic permeability. Mounted in jeweled bearings, it turns freely, following the magnetic field to move the pointer across the scale.

Zero adjustment screw is conveniently located in the plastic cover, and is accessible without removing cover. O-ring seal provides pressure tightness.



O-ring seal for cover assures pressure integrity of case.

OVERPRESSURE PROTECTION

Blowout plug is comprised of a rubber plug on the rear which functions as a relief valve by unseating and venting the gage interior when over pressure reaches approximately 25 psig (1.7 bar). To provide a free path for pressure relief, there are four spacer pads which maintain 0.023" clearance when gage is surface mounted. Do not obstruct the gap created by these pads.

The blowout plug is not used on models above 180" of water pressure, medium or high pressure models, or on gages which require an elastomer other than silicone for the diaphragm.

The blowout plug should not be used as a system overpressure control. High supply pressures may still cause the gage to fail due to over pressurization, resulting in property damage or serious injury. Good engineering practices should be utilized to prevent your system from exceeding the ratings of any component.

Die cast aluminum case is precision made and iridite-dipped to withstand 168 hour salt spray corrosion test. Exterior finished in baked dark gray hammerloid. One case size is used for all standard pressure options, and for both surface and flush mounting.

Silicone rubber diaphragm with integrally molded O-ring is supported by front and rear plates. It is locked and sealed in position with a sealing plate and retaining ring. Diaphragm motion is restricted to prevent damage due to overpressures.

Samarium Cobalt magnet mounted at one end of range spring rotates helix without mechanical linkages.

MODEL CHART

Model	Range, Inches of Water	Model	Range, PSI	Model	Range, MM of Water	Model	Range, kPa	Dual Scale Air Velocity Units For use with pitot tube	
2000-00N†	0.05-0.2	2201	0-1	2000-6MM†	0-6	2000-0.5KPA	0-0.5	Model	Range, in w.c./ Velocity F.P.M.
2000-00†	0-25	2202	0-2	2000-10MM†	0-10	2000-1KPA	0-1		
2000-0†	0-50	2203	0-3	2000-15MM	0-15	2000-1.5KPA	0-1.5	2000-00AV†	0-25/ 300-2000
2001	0-1.0	2204	0-4	2000-25MM	0-25	2000-2KPA	0-2		
2002	0-2.0	2205	0-5	2000-30MM	0-30	2000-2.5KPA	0-2.5	2000-0AV†	0-50/ 500-2800
2003	0-3.0	2210*	0-10	2000-50MM	0-50	2000-3KPA	0-3		
2004	0-4.0	2215*	0-15	2000-80MM	0-80	2000-4KPA	0-4	2001AV	0-1.0/ 500-4000
2005	0-5.0	2220*	0-20	2000-100MM	0-100	2000-5KPA	0-5		
2006	0-6.0	2230**	0-30	2000-125MM	0-125	2000-8KPA	0-8	2002AV	0-2.0/ 1000-5600
2008	0-8.0			2000-150MM	0-150	2000-10KPA	0-10		
2010	0-10			2000-200MM	0-200	2000-15KPA	0-15	2005AV	0-5.0/ 2000-8800
2012	0-12			2000-250MM	0-250	2000-20KPA	0-20		
2015	0-15			2000-300MM	0-300	2000-25KPA	0-25	2010AV	0-10/ 2000-12500
2020	0-20					2000-30KPA	0-30		
2025	0-25								
2030	0-30								
2040	0-40								
2050	0-50								
2060	0-60								
2080	0-80								
2100	0-100								
2120	0-120								
2150	0-150								
2160	0-160								
2180*	0-180								
2250*	0-250								
Zero Center Ranges		Zero Center Ranges		Zero Center Ranges		Zero Center Ranges		Zero Center Ranges	
2300-00†	0.125-0.125	2300-4CM	2-0-2	2300-6MM†	3-0-3	2300-1KPA	1.5-0-1.25	Dual Scale English/Metric Models	
2300-0†	.25-0.25	2300-10CM	5-0-5	2300-10MM†	5-0-5	2300-2KPA	1.0-0-1		
2301	.5-0.5	2300-30CM	15-0-15	2300-20MM†	10-0-10	2300-2.5KPA	1.25-0-1.25	Model	Range, in w.c. Pa or kPa
2302	1-0-1					2300-3KPA	1.5-0-1.5		
2304	2-0-2							2000-00D†	0-25 0-62 Pa
2310	5-0-5								
2320	10-0-10							2000-0D†	0-0.5 0-125 Pa
2330	15-0-15							2001D	0-1.0 0-250 Pa
								2002D	0-2.0 0-500 Pa
								2003D	0-3.0 0-750 Pa
								2004D	0-4.0 0-1.0 kPa
								2005D	0-5.0 0-1.25 kPa
								2006D	0-6.0 0-1.5 kPa
								2008D	0-8.0 0-2.0 kPa
								2010D	0-10 0-2.5 kPa
								2015D	0-15 0-3.7 kPa
								2020D	0-20 0-5 kPa
								2025D	0-25 0-6.2 kPa
								2050D	0-50 0-12.4 kPa
								2060D	0-60 0-15 kPa

†These ranges calibrated for vertical scale position • Accuracy ±3% ** Accuracy ±4% *MP option standard **HP option standard

VELOCITY AND VOLUMETRIC FLOW UNITS

Scales are available on the Magnehelic® gage that read in velocity units (FPM, m/s) or volumetric flow units (SCFM, m³/s, m³/h). Stocked velocity units with dual range scales in inches w.c. and feet per minute are shown above. For other ranges contact the factory. When ordering volumetric flow scales please specify the maximum flow rate and its corresponding pressure. Example: 0.5 in w.c. = 16,000 CFM.

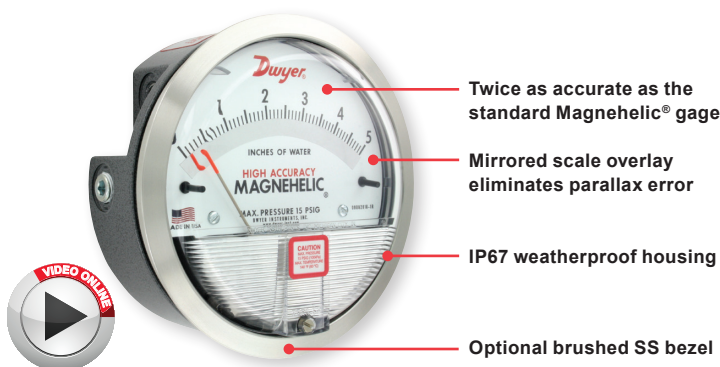
ACCESSORIES

Model	Description
A-321	Safety relief valve
A-448	3-piece magnet kit for mounting Magnehelic® gage directly to magnetic surface
A-135	Rubber gasket for panel mounting
A-401	Plastic carry case
A-310A	3-way vent valves. In applications where pressure is continuous and the Magnehelic® gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.



A-310A

HIGH ACCURACY MAGNEHELIC® DIFFERENTIAL PRESSURE GAGE

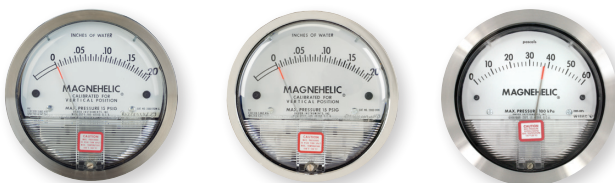


6-point calibration certificate included

OPTIONS - HIGH ACCURACY MAGNEHELIC® GAGE	
To order add suffix:	Description
-HA	High Accuracy Magnehelic® Gage. Accuracy within 1% and weatherproof. Also includes mirrored scale overlay and a six point calibration certificate
-SS	Corrosion resistant brushed 304 stainless steel bezel

Accuracy Specifications: See page 7 (Series 2000)

ADDITIONAL GAGE OPTIONS



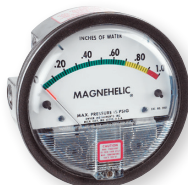
OPTIONS - OTHER OPTIONAL BEZELS	
To order add suffix:	Description
-CB	Chrome bezel option: A chrome plated aluminum bezel for an aesthetically pleasing finish when mounting on metal surfaces such as control panels.
-SB	Stainless steel bezel option: 304 stainless steel electro polished Ra 16 finished bezel.
-SS	Corrosion resistant brushed 304 stainless steel bezel



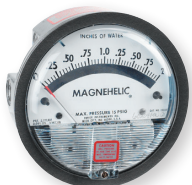
LED setpoint indicator



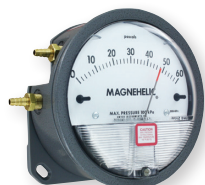
Adjustable signal flag



Transparent overlay



Mirrored scale overlay



Integrated mounting plate

OPTIONS - LED SETPOINT INDICATOR	
To order add suffix:	Description
-SP	Bright red LED on right scale shows when setpoint is reached. Field adjustable from gage face, unit operates on 12-24 VDC. Setpoint indicator option comes with medium pressure (MP) bezel.

Note: 4-13/16" hole for flush mounting.

OPTIONS - ADJUSTABLE SIGNAL FLAG	
To order add suffix:	Description
-ASF	Integral with plastic gage cover. Available for most models except those with medium or high pressure construction. Can be ordered with gage or separate.

OPTIONS - TRANSPARENT OVERLAYS	
To order add suffix:	Description
-G	Green (to highlight and emphasize critical pressures)
-R	Red (to highlight and emphasize critical pressures)
-Y	Yellow (to highlight and emphasize critical pressures)

OPTIONS - MIRRORED SCALE OVERLAY	
To order add suffix:	Description
-M	A mirrored scale overlay is also available to assist in reducing parallax error.

OPTIONS - INTEGRATED MOUNTING PLATE	
To order add suffix:	Description
-AHU1	Furnished with attached surface mounting plate
-AHU2	Furnished with attached surface mounting plate and including A-481 installer kit (2 plastic static pressure tips and 7' of PVC tubing)

OPTIONS - FOR HIGH STATE PRESSURE APPLICATIONS	
To order add suffix:	Description
-HP	High pressure option: for pressures to 80 psig
-MP	Medium pressure option: for pressures to 35 psig

OPTIONS	
To order add suffix:	Description
-FC	Factory calibration certificate
-LT	Low temperatures to -20°F (-28°C)
-NIST	NIST traceable calibration certificate

MAGNEHELIC® GAGE MOUNTING ACCESSORIES



A-610

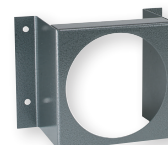


A-369



Pressure
reference
port

A-464



A-299



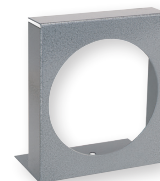
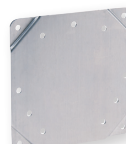
A-286



A-300



A-368



A-371

A single case size is used for most models of Magnehelic® gages. They can be flush or surface mounted with standard hardware supplied. Complete mounting and connection fittings plus instructions are furnished with each instrument. A 4-9/16" hole is required for flush panel mounting.

Flush mounting is easily accomplished with the new A-300 Flush Mounting bracket. This bracket provides a solution to quickly and conveniently flush mount the Magnehelic® gage. The A-300 is ideal for mounting the Magnehelic® gage on control panel doors.

The A-368 is a simple bracket for quickly surface mounting the Magnehelic® gage. After securing the Magnehelic® gage to the A-368 bracket, mount the bracket on any flat surface.

The A-369 allows the Magnehelic® gage to be easily carried to locations where pressure readings need to be taken. The A-369 can stand on its own or hang on a nail or hook.

ACCESSORIES	
Model	Description
A-610	Pipe mounting kit for installing on 1-1/4" to 2" horizontal or vertical pipe
A-286	Magnehelic® gage panel mounting flange
A-369	Stand-hang bracket, aluminum, for Magnehelic® gage
A-300	Flush mounting bracket
A-464	Flush mount kit for Magnehelic® gage
A-368	Surface mounting plate, aluminum, for Magnehelic® gage
A-299	Mounting bracket, flush mount for Magnehelic® gage, bracket is then surface mounted, steel with gray hammeroid epoxy finish
A-371	Surface mounting bracket, use with medium pressure (-MP) or high pressure (-HP) models only

SERIES A-320

INSTRUMENT ENCLOSURES

Protects Various Instruments



A-320-A



A-320-A with gage installed



A-320-B



A-320-B with gage installed

Series A-320 Instrument Enclosures protect instruments in all applications. The A-320-A fits standard Magnehelic® size instruments (4-9/16" diameter) and the A-320-B fits standard 3000MR Photohelic® switch/gage size instruments (4-13/16" diameter). Both models include silicone tubing, gage barbs and mounting hardware.

MODEL CHART	
Model	Compatible Instruments
A-320-A	2000 Magnehelic® Gage, DM-1000 Digital Differential Pressure Gage, DM-2000 Differential Pressure Transmitter
A-320-B	3000MR Photohelic® Switch/Gage, Series 605 Magnehelic® Differential Pressure Transmitter, DH3 DigiHelic® Pressure Controller, 2000 Magnehelic® Gage with medium and high pressure options

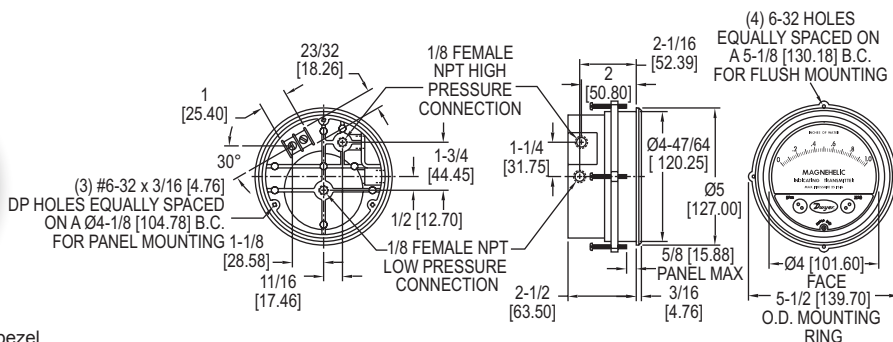
SPECIFICATIONS	
Housing: ABS.	
Process Connections: Anodized aluminum.	
Enclosure Rating: NEMA 1 (IP10). Note: Check instruments rating.	
Weight: Model A-320-A: 11.29 oz (320 g); A-320-B: 16.23 oz (420 g).	
Gage Size Opening: A-320-A: 4-9/16 in (115.89 mm); A-320-B: 4-13/16 in (122.24 mm).	

MAGNEHELIC® DIFFERENTIAL PRESSURE INDICATING TRANSMITTER

Same Size as Standard Magnehelic® Differential Pressure Gage



Note: Shown with optional -SS bezel.
Backward compatible* with Magnehelic® gage.



The Series 605 Magnehelic® Differential Pressure Indicating Transmitter provides for both visual monitoring and electronic control of very low differential pressure. The Series 605 is ideal for control applications in building HVAC systems where local indication is desired during routine maintenance checks or necessary when trouble shooting the system. The easily read dial gage is complimented by the two-wire, 4 to 20 mA control signal utilizing the time-proven Dwyer® Magnehelic® gage mechanical design and Series 600 transmitter technology. The two-wire design with terminal strip on the rear simplifies connection in any 4 to 20 mA control loop powered by a 10-35 VDC supply.

FEATURES/BENEFITS

- Easy to read gage permits viewing from far away
- Patented design provides quick response to pressure changes means no delay in signaling and alerting to critical situations
- Durable and rugged housing and high-quality components combined provides long-service life and minimized down-time
- Optional stainless steel bezel is the same installation diameter as Magnehelic® gage and simplifies field upgrade to 605 indicating transmitter

APPLICATIONS

- Monitor pressures in ducts, rooms, or total building pressures
- Filter monitoring
- Local indication of clean room pressures with process signal sent to control room

MODEL CHART				
Model	Range in w.c.	Maximum Pressure	Electrical Accuracy ±%	Mechanical Accuracy ±%
605-00N	0.05-0-0.2	25 psi (1.7 bar)	4	4
605-11	0 to ±.25	25 psi (1.7 bar)	2	3
605-0	0 to .50	25 psi (1.7 bar)	2	3
605-1	0 to 1.0	25 psi (1.7 bar)	2	2
605-2	0 to 2.0	2 psi (13.79 kPa)	0.5	2
605-3	0 to 3.0	2 psi (13.79 kPa)	0.5	2
605-6	0 to 6.0	2 psi (13.79 kPa)	0.5	2
605-10	0 to 10	2 psi (13.79 kPa)	0.5	2
605-20	0 to 20.0	11 psi (75.8 kPa)	0.5	2
605-30	0 to 30	11 psi (75.8 kPa)	0.5	2
605-50	0 to 50	11 psi (75.8 kPa)	0.5	2
Model	Range in Pa	Maximum Pressure	Electrical Accuracy ±%	Mechanical Accuracy ±%
605-12	0 to ±60	25 psi (1.7 bar)	4	4
605-13	0 to ±100	25 psi (1.7 bar)	2	2
605-60PA	0 to 60	25 psi (1.7 bar)	2	4
605-125PA	0 to 125	25 psi (1.7 bar)	2	3
605-250PA	0 to 250	25 psi (1.7 bar)	2	2
605-500PA	0 to 500	2 psi (13.79 kPa)	0.5	2

OPTIONS	
To order add suffix:	Description
-SS	304 brushed stainless steel bezel. *Backward compatible with standard Magnehelic® gage installation diameter
Example: 605-3-SS	
-NIST	NIST traceable calibration certificate
Example: 605-3-NIST	

SPECIFICATIONS

GAGE SPECIFICATIONS

Service: Air and non-combustible, compatible gases.

Wetted Materials: Consult factory.

Accuracy: See chart.

Stability: ±1% FS/yr.

Pressure Limits: See chart.

Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).

Process Connections: 1/8" female NPT.

Size: 4" (101.6 mm) dial face, 5" (127 mm) OD x 2-11/16" (68.3 mm); -SS bezel: 4-3/4" (120.7 mm) OD x 2-21/32 (67.5 mm).

Weight: 1 lb 12.6 oz (811 g).

Agency Approvals: CE.

TRANSMITTER SPECIFICATIONS

Accuracy: See chart (includes linearity, hysteresis, repeatability).

Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).

Compensated Temperature Range: 32 to 120°F (0 to 48.9°C).

Thermal Effect: ±0.025% FS/°F (0.045% FS/°C).

Power Requirements: 10 to 35 VDC (2-wire).

Output Signal: 4 to 20 mA.

Zero and Span Adjustments: Protected potentiometers.

Loop Resistance: DC: 0 to 1250 Ω max.

Current Consumption: DC: 38 mA max.

Electrical Connections: Screw terminal block.

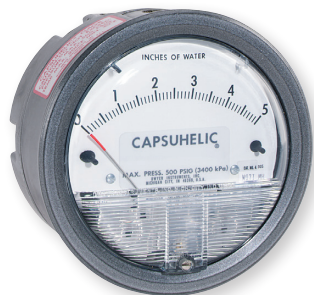
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

ACCESSORIES	
Model	Description
A-298	Flat aluminum bracket for flush mounting
A-370	Mounting bracket; flush mount Series 605 transmitter in bracket; bracket is then surface mounted; steel with gray hammertone epoxy finish

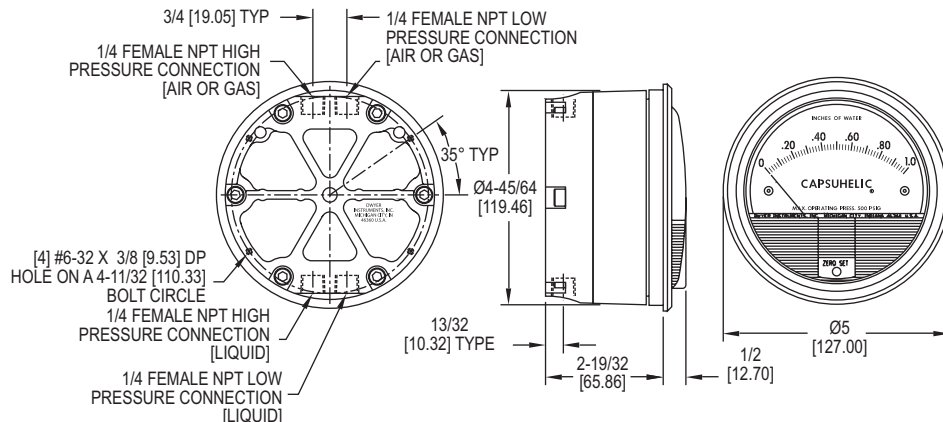
Static Fitting Options: See page 92 (Static Pressure Tips)
Process Tubing Options: See page 91 (Gage Tubing Accessories)

CAPSUHELIC® DIFFERENTIAL PRESSURE GAGE

Measures Pressure, Vacuum or Differential, Suitable for Internal Pressures to 500 psig



Capsuhelic® pressure gage has a large, easy-to-read 4" (102 mm) dial.



The **Series 4000 Capsuhelic® Differential Pressure Gage** is designed to give fast, accurate indication of differential pressures. The gage may be used as a readout device when measuring flowing fluids, pressure drop across filters, liquid levels in storage tanks and many other applications involving pressure, vacuum or differential pressure.

The pressure being measured is held within a capsule which is an integral part of the gage. This containment of the pressure permits the use of the gage on system pressures of up to 500 psig, even when differentials to be read are less than 0.1 in. w.c.

FEATURES/BENEFITS

- Gage capsule permits high-pressure usage with small differentials
- Zero and range adjust side of gage means no disassembly in normal service
- Time-proven, simple, frictionless movement that permits full-scale readings as low as 0.5 in. w.c.
- Diaphragm-actuated versus liquid filled gage supports outdoor use

APPLICATIONS

- Fluid flow
- Liquid storage tanks
- Filter pressure drops
- Vacuum or differential pressure

Note: May be used with hydrogen where pressures are less than 35 psi. Order with a Buna-N diaphragm.

MODEL CHART			
Model	Range	Model	Range
4005*	0-5.0 in w.c.	4310	5-0-5 in w.c.
4006*	0-6.0 in w.c.	4330	15-0-15 in w.c.
4010*	0-10 in w.c.	4205	0-5 psid
4015*	0-15 in w.c.	4210	0-10 psid
4020*	0-20 in w.c.	4215	0-15 psid
4025*	0-25 in w.c.	4220	0-20 psid
4030*	0-30 in w.c.	4616B**	0-16 ft w.c.
4040*	0-40 in w.c.	4635	0-35 ft w.c.
4050*	0-50 in w.c.		
4060*	0-60 in w.c.		
4080*	0-80 in w.c.		
4100*	0-100 in w.c.		
4200*	0-200 in w.c.		

*These ranges available for vertical scale position only.

**Available only with the brass case for water service.

Note: Scales reading directly in flow, heights, etc., are also available.

SPECIFICATIONS

Service: Aluminum case: Air and compatible gases and oil based liquids; Brass case: Air and compatible gases and water based liquids.

Wetted Materials: Consult factory.

Housing: Die cast aluminum with impregnated hard coating, standard. Optional forged brass housing is required for water or water based fluids. Special material diaphragms available, contact factory.

Accuracy: ±3% of FS at 70°F (21.1°C). (±4% on 4200, 4210, 4215, 4220, 4300, 4400, and 4500).

Pressure Limits: -20" Hg to 500 psig (-0.677 bar to 34.4 bar).

Temperature Limits: 20 to 200°F (-6.67 to 93.3°C).

Size: 4" (101.6 mm) diameter dial face.

Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

Process Connections: 1/4" female NPT high and low pressure taps, duplicated - one pair top for air and gas, and one pair bottom for liquids.

Weight: 3 lb, 3 oz (1.45 kg) aluminum case; 7 lb, 13 oz (3.54 kg) brass case.

OPTIONS

To order add suffix:	Description
-ASF	Adjustable signal flag
B	Brass case
Scale Overlays	Red, green, mirrored or combination; specify locations
-NIST	NIST traceable calibration certificate

ACCESSORIES - STANDARD

Description
Two 1/4" NPT plugs for duplicate pressure taps, four flush mounting adapters with screws and four surface mounting screws.

ACCESSORIES

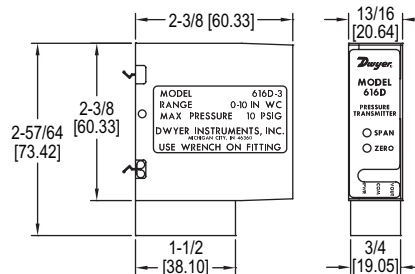
Model	Description
A-298	Flat flush mounting bracket
A-309	3-way manifold valve
A-314	Bleed fitting
A-370	Mounting bracket
A-471	Portable kit
A-496	Flush mount bracket
A-610	Pipe mount kit

USA: California Proposition 65
⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Process Tubing Options: See page 91 (Gage Tubing Accessories)

DIN RAIL DIFFERENTIAL PRESSURE TRANSMITTER

Mounts on 35 mm DIN Rail, $\pm 0.25\%$ Full-Scale Accuracy



The **Series 616D Din Rail Differential Pressure Transmitter** senses the pressure of air and compatible gases and sends a standard 4 to 20 mA or 0 to 10 VDC output signal. The 616D enclosure is specifically designed to mount on a 35 mm DIN rail in a panel. This mounting style allows for several units to be mounted closely together reducing required space. The span and zero controls are for use when checking calibration. They are not intended for re-ranging. Versatile circuit design enables operation in 2-wire current loops.

FEATURES/BENEFITS

- Simple calibration push-buttons to set zero and span
- Cost effective and compact device suitable for OEM applications where space, simplicity, and value are key

APPLICATIONS

- Air handlers
- Duct pressure
- Variable air volume
- Filter monitoring

MODEL CHART		
Model	Range	Max. Pressure
616D-2	0 to 6 in w.c.	10 psig
616D-3	0 to 10 in w.c.	10 psig
616D-4	0 to 20 in w.c.	20 psig
616D-5	0 to 40 in w.c.	20 psig
616D-6	0 to 100 in w.c.	15 psig
616D-7	0 to 200 in w.c.	45 psig
616D-8	0 to 10 psid	45 psig

SPECIFICATIONS

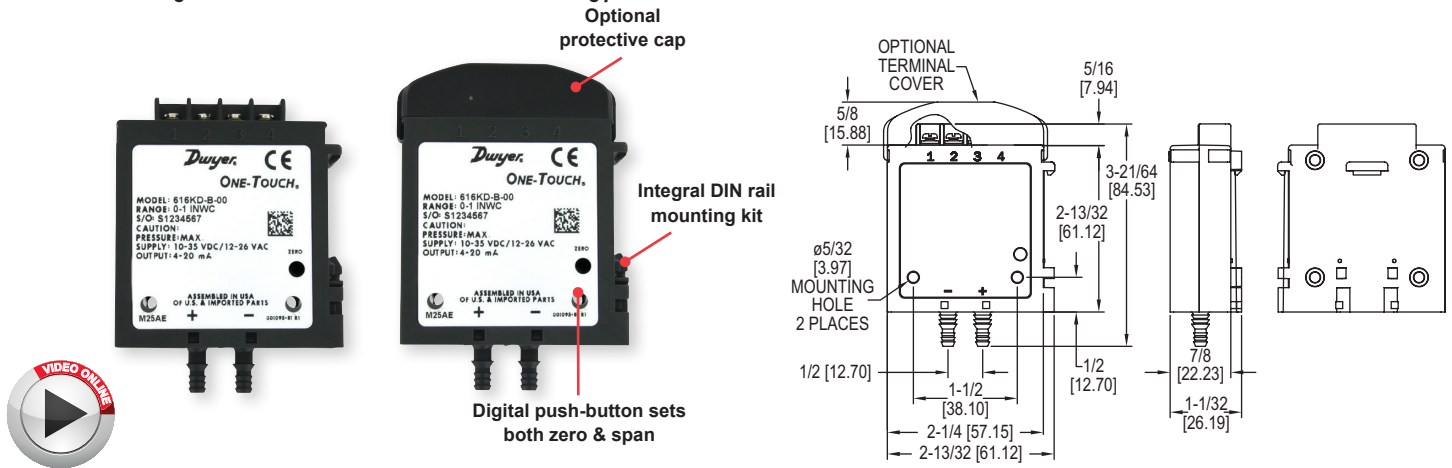
Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: $\pm 0.25\%$ FS @ 77°F (25°C).
Thermal Effect: ± 0.02 FS/°F ($\pm 0.036\%$ FS/°C).
Stability: $\pm 1\%$ FS/yr.
Temperature Limits: 14 to 185°F (-10 to 85°C).
Pressure Limits: See chart.
Power Requirements: 10 to 35 VDC (2-wire); 17 to 36 VDC, or isolated 21.6 to 33 VAC (3-wire).
Output Signal: 4 to 20 mA (2-wire); 0 to 10 VDC (3-wire).
Zero and Span Adjustments: Push-buttons.
Loop Resistance: Current output: 0 to 1250 Ω max; Voltage output: Load resistance 1 k Ω min.
Current Consumption: 40 mA max.
Electrical Connections: Screw-type terminal block.
Process Connections: 1/8" female NPT. Accessories included are 2 barbed fittings for 1/8" (3.12 mm) and 3/16" (4.77 mm) ID rubber or vinyl tubing.
Mounting Orientation: Vertical, on a 1.378" (35 mm) DIN rail.
Weight: 4.8 oz (136 g).
Agency Approvals: CE.

ACCESSORIES

Model	Description
A-360	Aluminum DIN Rail 1 m

DIFFERENTIAL PRESSURE TRANSMITTERS ± 0.25 , ± 1 , OR $\pm 2\%$ ACCURACY

One-Touch® Digital Push-Button Calibration Technology



The Series 616KD Differential Pressure Transmitters ± 0.25 , ± 1 , or $\pm 2\%$ Accuracy with One-Touch® Digital Push-Button Calibration Technology are designed for simplicity, making them the ideal choice for installers and maintenance professionals. These instruments not only alleviate cumbersome turn pots typically found in most transmitters, but eliminate entirely the need to span the instruments during calibration. With a single digital push-button, both ZERO AND SPAN are calibrated properly, nothing else is required. No additional reference pressure sources or separate calibration devices are necessary.

FEATURES AND BENEFITS

- Simple calibration push-button sets back zero and span, saving time installing and over the service life
- Cost effective and compact device suitable for OEM applications where space, simplicity, and value are key
- Ranges and accuracy selection cover a wide range of applications minimizing components and determining standardizing on design
- Optional 1/8" NPT process connection allows for use with metal barbed fittings or compression fittings for use with metal tubing
- Optional plenum rated units meeting UL Standard 2043 are available

APPLICATIONS

- Air handlers
- Variable air volume
- Duct pressure
- Filter monitoring

MODEL CHART				
Example	616KD	-A	-12	-AT
Series	616KD			
Accuracy		A B		Differential pressure transmitter
Range			00 01 02 03 04 05 06 07 08 10 11 12 13 14 15 50 51 57 52 53 54 55 56 58	0 to 1 in w.c. 0 to 2 in w.c. 0 to 3 in w.c. 0 to 5 in w.c. 0 to 10 in w.c. 0 to 15 in w.c. 0 to 20 in w.c. 0 to 25 in w.c. 0 to 40 in w.c. 0 to 250 Pa 0 to 500 Pa 0 to 750 Pa 0 to 1250 Pa 0 to 2500 Pa 0 to 5000 Pa 0 to ± 1 in w.c. 0 to ± 2 in w.c. 0 to ± 3 in w.c. 0 to ± 5 in w.c. 0 to ± 10 in w.c. 0 to ± 250 Pa 0 to ± 500 Pa 0 to ± 750 Pa 0 to ± 1250 Pa
Options			AT FC NIST TC V N PR	Aluminum tag Factory calibration NIST certification Terminal cover Voltage output 0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC (field selectable) 1/8" female NPT Plenum rated

Note: 0.25% FS accuracy is not available in the following ranges 00, 01, 10, 11, 50, 51, 54, 55

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: 616KD-A: $\pm 0.25\%$ FS; 616KD-B: $\pm 1\%$ FS, 616KD: $\pm 2\%$ FS.
Stability: $\pm 1\%$ FS/year.
Temperature Limits: 0 to 140°F (-17.8 to 60°C).
Compensated Temperature Range: 20 to 122°F (-6.67 to 50°C).
Pressure Limits: 2 psig (ranges 5 in w.c. or lower); 5 psig (ranges 10 to 40 in w.c.).
Thermal Effect: 616KD-A: $\pm 0.02\%$ FS/°F; 616KD-B: $\pm 0.04\%$ FS/°F; 616KD: $\pm 0.06\%$ FS/°F, includes zero and span.
Power Requirements: 4 to 20 mA output: 10 to 35 VDC (2 wire) or 12 to 26 VAC (4 wire); 5V output: 10 to 35 VDC (3 wire) or 12-26 VAC (4 wire); 10V output: 13 to 35 VDC (3 wire) or 12-26 VAC (4 wire) for 616KD A and B. 16 to 36 VDC (2 or 3 wire): 20 to 28 VAC (3 wire) for 616KD.
Output Signal: 4 to 20 mA or option with field selectable 0 to 10, 0 to 5, 2 to 10, 1 to 5 volts.
Zero and Span Adjustments: Push button.
Loop Resistance: 4 to 20 mA output (DC): 0 to 1250 Ω max. $R_{max} = 50(V_{psDC} - 10) \Omega$; 4 to 20 mA output (AC): 0 to 1200 Ω max. $R_{max} = 50(1.4 V_{psAC} - 12) \Omega$; Voltage output: 5K Ω minimum.
Current Consumption: 24 mA max for 616KD A and B. 21 mA max for 616KD.
Electrical Connections: Screw-type terminal block.
Process Connections: Barbed, dual size to fit 1/8" & 3/16" (3 mm and 5 mm) ID rubber or vinyl tubing.
Enclosure Rating: NEMA 1 (IP20).
Mounting Orientation: Vertical with pressure connections pointing down.
Weight: 1.8 oz (51 g).
Agency Approvals: CE, optional plenum rated units meet UL Standard 2043.

ACCESSORIES

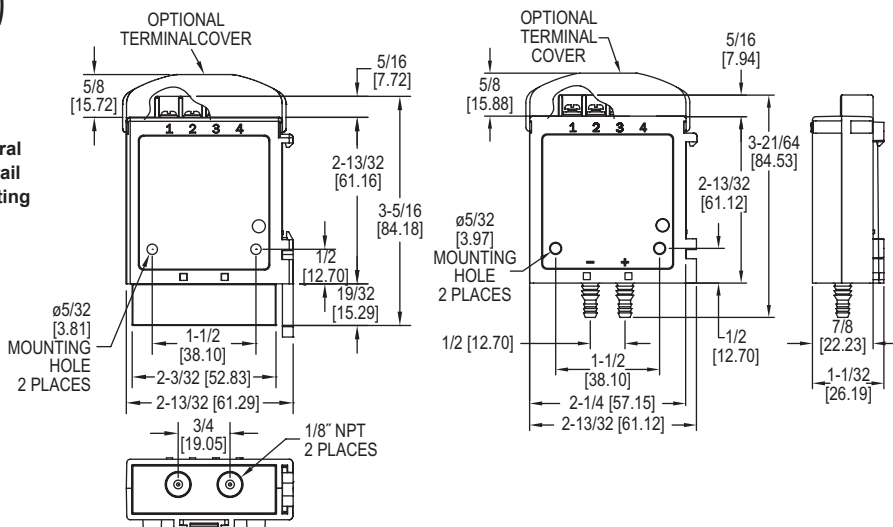
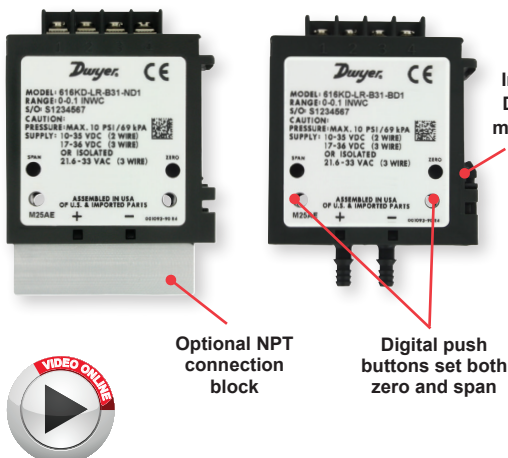
Model	Description
A-360	Aluminum DIN rail 1 m
A-618	Protective terminal cap



Optional NPT connection block

DIFFERENTIAL PRESSURE TRANSMITTERS - LOW RANGES

High Accuracy, Ranges Down to 0.1 in w.c. (25 Pa)



The **Series 616KD-LR Differential Pressure Transmitters - Low Ranges** are designed for simplicity, making it the ideal choice for installers and maintenance professionals. These low range instruments not only alleviate cumbersome turn pots typically found in most transmitters, but eliminate entirely the need to span the instruments during calibration. With single digital push-button, both ZERO AND SPAN are calibrated properly, nothing else is required. No additional reference pressure sources or separate calibration devices are necessary.

FEATURES/BENEFITS

- Wide selection of low ranges and accuracy cover numerous applications minimizing components and standardizing on design
- Simple calibration push-buttons to set zero and span, saving time installing and maintaining over the service life
- Cost effective and compact device suitable for OEM applications where space, simplicity, and value are key
- Simultaneous current and voltage outputs
- Optional 1/8" NPT process connection allows for use with metal barbed fittings or compression fittings for use with metal tubing
- Optional plenum rated units meeting UL Standard 2043 are available

APPLICATIONS

- Air handlers
- Variable air volume
- Duct pressure
- Filter monitoring

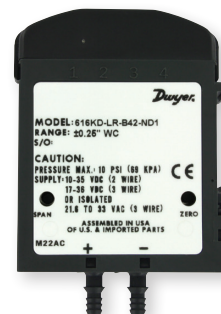
SPECIFICATIONS

Service: Air and non-combustible, compatible gases.	Zero and Span Adjustments: Push buttons.
Wetted Materials: Consult factory.	Loop Resistance: Current Output: 0 to 1250Ω max; Voltage Output: Min. load resistance 1kΩ.
Accuracy: ±0.25% FS for ±0.4" (100 Pa) and ±0.5" (125 Pa), ±0.5% FS for ±0.25" (60 Pa), and ±1% FS for ±0.1" (25 Pa).	Current Consumption: 40 mA max.
Stability: ±1% / year FSO.	Electrical Connections: Screw-type terminal block.
Temperature Limits: 0 to 140°F (-17.8 to 60°C).	Process Connections: Barbed, dual size to fit 1/8" & 3/16" (3 mm & 5 mm) ID rubber or vinyl tubing, or 1/8" NPT.
Pressure Limits: 1 psi max., operation; 10 psi burst.	Enclosure Rating: NEMA1 (IP20).
Power Requirements: 10 to 35 VDC (2 wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3 wire).	Mounting Orientation: Vertical with pressure connections pointing down.
Output Signal: 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).	Weight: 1.8 oz (51 g).
Response Time: 2.5 Hz sample rate.	Agency Approvals: CE, optional plenum rated units meets UL Standard 2043.

MODEL CHART						
Example	616KD-LR	-A	34	-B	D1	-FC
Series	616KD-LR					Differential pressure transmitter
Accuracy		A B D				0.25% FS accuracy 1.0% FS accuracy 0.5% FS accuracy
Range			31 32 34 35 41 42 44 45 61 62 64 65 71 72 74 75			0 to 0.1 in w.c. ① 0 to 0.25 in w.c. ② 0 to 0.4 in w.c. 0 to 0.5 in w.c. 0 to ±0.1 in w.c. ① 0 to ±0.25 in w.c. ② 0 to ±0.4 in w.c. 0 to ±0.5 in w.c. 25 Pa ① 60 Pa ② 100 Pa 125 Pa 0 to ±25 Pa ① 0 to ±60 Pa ② 0 to ±100 Pa 0 to ±125 Pa
Process Connection				B N		Plastic barb 1/8" female NPT with front push-button
Output					D1 D2 D3 D4	4 to 20 mA and 0 to 10 V 4 to 20 mA and 0 to 5 V 4 to 20 mA and 2 to 10 V 4 to 20 mA and 1 to 5 V
Options					AT COC FC NIST TC PR	Aluminum tag Certificate of Conformance Factory calibration certificate NIST traceable calibration certificate Terminal cover Plenum rated

①B accuracy only. ②B and D accuracies only.

ACCESSORIES	
Model	Description
A-360	Aluminum DIN rail 1 m
A-618	Protective terminal cap



COMPACT DIFFERENTIAL PRESSURE TRANSMITTERS

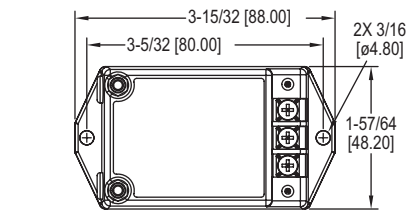
Ranges from 0.1 to 100 in w.c., Overpressure Protection to 15 psig, $\pm 0.8\%$ Accuracy



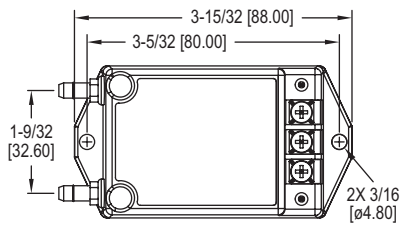
668B



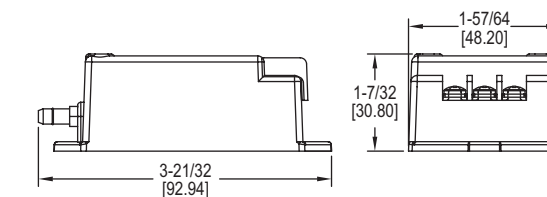
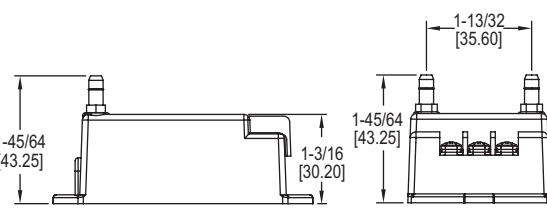
668D



668B



668D



Our low cost **Series 668B/D Compact Differential Pressure Transmitters** are capable of sensing differential gage pressure with $\pm 0.8\%$ FS accuracy, and converts this pressure difference to a proportional high level analog output for both unidirectional and bi-directional pressure ranges. These transmitters can withstand up to 15 psig overpressure with no damage to the unit. The compact, lightweight design makes installation simple and easy. Units are protected against incorrect wiring, and include a protective terminal cover.

FEATURES/BENEFITS

- Protection from 15 psi overpressure & incorrect wiring
- High accuracy at low pressure ranges
- Two package selections allows easy device mounting to best fit application pressure connections

APPLICATIONS

- HVAC and VAV control
- Clean rooms and isolation rooms
- Duct static pressure measurement

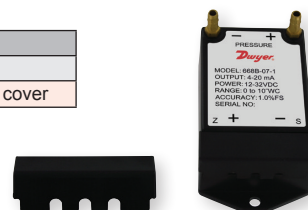
SPECIFICATIONS

Service: Air and non-conductive gases.
Accuracy: $\pm 0.8\%$ FS.
Temperature Limits: Operating: 0 to 170°F (-18 to 77°C); Storage: -40 to 185°F (-40 to 85°C).
Pressure Limits: 15 psig (1.0 bar).
Thermal Effects: $\pm 0.03\%$ FS/°F ($\pm 0.054\%$ FS/°C).
Compensated Range: From 40 to 170°F (4.4 to 77°C).
Power Requirements: 12 to 32 VDC.
Output Signals: 4 to 20 mA (2-wire), 0 to 10 VDC (3-wire), or 0 to 5 VDC (3-wire).
Zero Adjustment: Accessible under the small terminal cover.
Electrical Connection: Terminal strip.
Process Connection: 3/16" OD barbed brass for 1/8" ID push-on tubing.
Enclosure: Stainless steel and PC+ABS alloy, UL 94 V-0 rated.
Weight: 4.0 oz (113 g).

MODEL CHART				
Example	668	B	-08	-1 668B-08-1
Series	668			Compact differential pressure transmitter
Connection		B		Front
		D		Bottom
Unidirectional Pressure Ranges		01		0 to 0.1 in w.c.
		21		0 to 0.2 in w.c.
		02		0 to 0.25 in w.c.
		22		0 to 0.4 in w.c.
		03		0 to 0.5 in w.c.
		04		0 to 1 in w.c.
		05		0 to 2.5 in w.c.
		06		0 to 5 in w.c.
		07		0 to 10 in w.c.
		08		0 to 25 in w.c.
		09		0 to 50 in w.c.
		10		0 to 100 in w.c.
		12		0 to ± 0.1 in w.c.
		13		0 to ± 0.25 in w.c.
		14		0 to ± 0.5 in w.c.
		15		0 to ± 1 in w.c.
		16		0 to ± 2.5 in w.c.
		17		0 to ± 5 in w.c.
		18		0 to ± 10 in w.c.
		19		0 to ± 25 in w.c.
Output			1	4 to 20 mA
			2	0 to 10 VDC
			3	0 to 5 VDC

ACCESSORIES

Model	Description
A-TC	Replacement protective terminal cover



A-TC shown attached

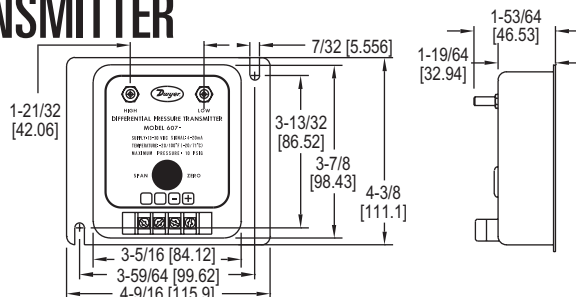
OPTIONS

Use order code:	Description
NISTCAL-PT1	NIST traceable calibration certificate

USA: California Proposition 65
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

LOW RANGE DIFFERENTIAL PRESSURE TRANSMITTER

±0.25% or ±0.5% Full-Scale Accuracy, Ranges from 0 to 25 in w.c.



The Series 607 Low Range Differential Pressure Transmitter combines very low ranges with exceptional stability, reliability and either ±0.25% or ±0.5% accuracy for the most demanding applications. Ranges from 0-0.1" to 0-25 in w.c. Ultra-thin glass clad silicon diaphragm design resists shock and vibration, practically eliminates drift. Certification to NIST standards is included with each unit. Tough stainless steel housing is NEMA 2 rated to protect against moisture and dirt. Use with air and other compatible gases.

FEATURES/BENEFITS

- High stability at low pressure ranges provides exceptional accuracy for ensuring tight-control and minimizing costly out of specification conditions
- Provides sensitivity to pressure changes but resists vibration preventing drift and less accurate readings
- Stainless steel housing meets standards for lab and clean room applications

APPLICATIONS

- Leak detection
- Clean room control
- Lab and fume hood pressure control

MODEL CHART			
Model	Range (in w.c.)	Model	Range (in w.c.)
607-0	0 to .10	607-71*	0 to 5.0
607-01*	0 to .10	607-8	0 to 10
607-1	0 to .25	607-0B	0 to ±.10
607-11*	0 to .25	607-1B	0 to ±.25
607-2	0 to .50	607-2B	0 to ±.50
607-21*	0 to .50	607-9	0 to 25
607-3	0 to 1.0	607-3B	0 to ±1.0
607-4	0 to 2.0	607-4B	0 to ±2.0
607-7	0 to 5.0	607-7B	0 to ±5.0

*Models have a ±0.25% FS accuracy.

SPECIFICATIONS

Service: Air and non-conductive, non-corrosive gases.

Wetted Materials: Contact factory.

Accuracy: ±0.5% or ±0.25% FS.

Stability: ±0.5% FS/yr.

Temperature Limits: -20 to 160°F

(-29 to 71°C), 10 to 95% RH.

Pressure Limits: 10 psig (0.69 bar).

Compensated Temp. Range: 35 to 135°F (2 to 57°C).

Thermal Effects: ±0.015% FS/°F (zero and span).

Power Requirements: 12 to 36 VDC.

Output Signal: 4 to 20 mA DC, 2-wire.

Zero & Span Adjustments: Externally accessible potentiometers, non-interactive, ±10% FS adjustment.

Response Time: 250 ms max.

Loop Resistance: 0 to 1045 Ω

V_{min}=12V+[(.22A)(RL)].

Current Consumption: 3.6 mA (min).

Electrical Connection: Screw terminals.

Process Connection: Barbed stainless steel for 3/16" ID tubing.

Housing: 300 Series SS (NEMA 2, IP11).

Weight: 1.04 lb (472 g).

Agency Approvals: CE.

ACCESSORIES

Model	Description
A-302F-A	303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing; 4" insertion depth; includes mounting screws

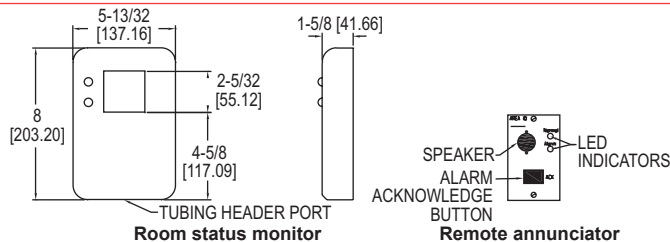
OPTIONS

Use order code:	Description
NISTCAL-PT1	NIST traceable calibration certificate

SERIES RSM

ROOM STATUS MONITOR

For Sensing Low Pressure Using High Accuracy



The Series RSM Room Status Monitor is designed for critical low differential pressure applications that require stringent pressure monitoring and alarming. The Series RSM can be configured to monitor positive or negative pressure in protected environments and hospital isolation rooms per CDC guidelines. The RSM is a complete system with a graphic user interface which enables access to pressure, security, calibration, and alarm setup. The RSM has a NEMA 1 (IP20) rated fire retardant plastic for indoor applications.

FEATURES/BENEFITS

- Accurately monitors protective environments for negative or positive pressure ensuring safety and reducing risk of catastrophic events
- Audible and visual alarm provides immediate local alerts allowing corrective action to be taken quicker to eliminate the problem from becoming widespread
- Password protected set up menu ensures no errors by untrained personnel
- Optional BACnet communication from devices provides integration into building control system for automated control and centralized monitoring and alarming

APPLICATIONS

- Hospital isolation wards
- Pharmaceutical
- Manufacturing
- Clean rooms
- Research labs
- Animal facilities

MODEL CHART			
Model*	Operating Range	Model**	Operating Range
RSM-1-A	±0.05 in w.c.	RSM-1-B	±0.05 in w.c.
RSM-2-A	±0.1 in w.c.	RSM-2-B	±0.1 in w.c.
RSM-3-A	±0.25 in w.c.	RSM-3-B	±0.25 in w.c.
RSM-4-A	±0.5 in w.c.	RSM-4-B	±0.5 in w.c.
RSM-5-A	±1 in w.c.	RSM-5-B	±1 in w.c.
RSM-6-A	±2.5 in w.c.	RSM-6-B	±2.5 in w.c.

*Excitation/Output: 24 VAC/4 to 20 mA or 0 to 5 or 0 to 10 VDC.

**Excitation/Output: 120 VAC/4 to 20 mA or 0 to 5 or 0 to 10 VDC.

Note: For optional BACnet communication change end from -A to -C for 24 VAC power or from -B to -D for 120 VAC power models.

SPECIFICATIONS

Service: Air or non-conductive, nonexplosive gases.

Accuracy: ±0.5% FS.

Temperature Limits: 32 to 120°F (0 to 50°C).

Humidity Limits: 5 to 95% relative humidity (non-condensing).

Thermal Effects: ±0.03% FS/°F (±0.05% FS/°C).

Pressure Limits: ±15 in w.c. (±3.7 kPa).

Supply Voltage: Order code A (24 VAC):

18 to 32 VAC, 50 to 60 Hz; Order code

B (120 VAC): 85 to 265 VAC, 50 to 60

Hz; Main supply voltage fluctuations up

to 10%.

Power Requirements: 5 W.

Power Consumption (Voltage output):

5 W.

Output Signal: Selectable 4 to 20 mA

(2-wire), 0 to 5 VDC (3-wire), or 0 to 10

VDC (3-wire).

Switch Type: SPST.

Loop Resistance (4 to 20 mA output):

0 to 510 Ω.

Electrical Connection: Removable

terminal block.

Process Connections: Barbed fittings

for 3/16" ID tubing.

Enclosure Rating: NEMA 1 (IP20) rated

for indoor applications.

Housing: Fire retardant plastic.

Mounting: Mount to standard double

gang metal electrical box using 4x4"

plaster ring adapter.

Dimensions: 8" H x 5.4" W x 1.8" D

(20.3 H x 13.7 W x 4.1 D cm).

Weight: 1.5 lb (680 g).

Communications: BACnet MSTP ASC

optional.

Agency Approvals: CE, CSA (RSM

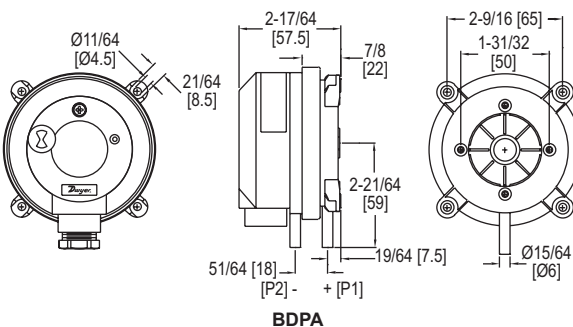
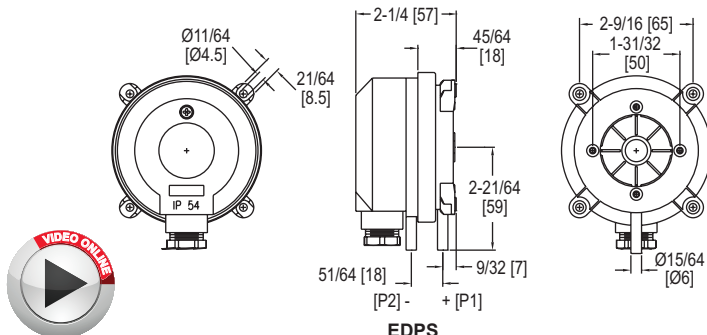
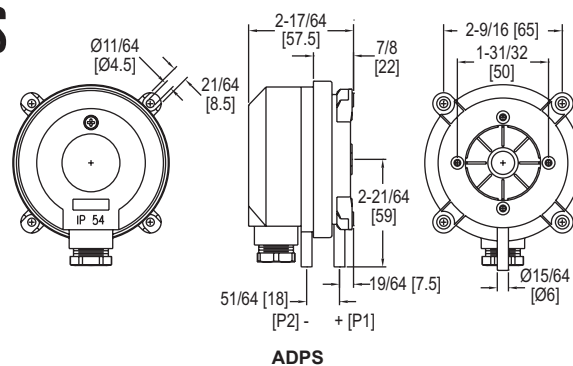
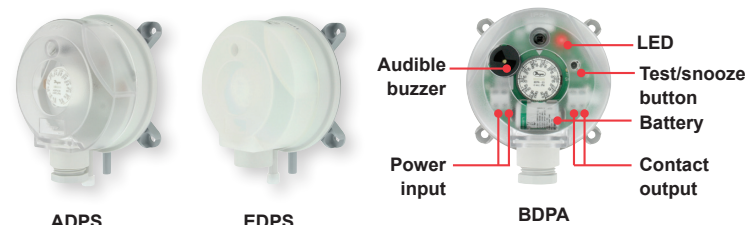
only).

ACCESSORIES

Model	Excitation/Output
A-285	Remote alarm annunciator with visible/audible alarm and acknowledge switch

HVAC DIFFERENTIAL PRESSURE SWITCHES

With Dual Scale Field Adjustable Set Point Knob



The **Series ADPS/EDPS/BDPA HVAC Differential Pressure Switches** are designed for pressure, vacuum, and differential pressures. The dual scaled adjustment knob in inches water column and pascals allows changes to the switching pressure to be made without a pressure gage. The ADPS/EDPS/BDPA are available with settings from 0.08 in w.c. (20 Pa) up to 20 in w.c. (5000 Pa). The silicone diaphragm and PA 6.6 body make the series ADPS ideal for use with air and other noncombustible gases. Series EDPS models meet UL508 and are constructed of plenum rated plastics. The series BDPA Adjustable Differential Pressure Alarms offer a versatile range of configurations allowing utilization of their many features including buzzer and LED notification, and battery or line powered. The compact size, adjustment knob and low cost make the ADPS/EDPS/BDPA the perfect choice for HVAC applications.

FEATURES/BENEFITS

- Adjustment knob changes switching pressure easily with a pressure gage reducing components for application
- Low cost device makes it an excellent solution in BAS and HVAC applications requiring duct control and monitoring
- Relay contact allows simple integration with DDC or building systems

APPLICATIONS

- Air filter and ventilator monitoring
- Industrial cooling circuits
- Fire-protection damper control
- Ventilation duct monitoring
- Fan heater overheating protection
- Heat exchanger frost protection

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: ADPS: Diaphragm material: Silicone; Housing material: POM; Switch body: PA 6.6; Cover: Polystyrene; EDPS: Diaphragm material: Silicone; Housing material: Switch body: PA 6.6; Cover: Polystyrene; Materials UL 94 V-0 rated.
Temperature Limits: Process and ambient temperature from -4 to 185°F (-20 to 85°C).
Pressure Limits: Max. operating pressure: 40 in w.c. (10 kPa) for all pressure ranges.
Switch Type: Single-pole double-throw (SPDT).
Electrical Rating: Max. 1.5 A res./0.4 A ind./250 VAC, 50/60 Hz; Max. switching rate: 6 cycles/min.
Electrical Connections: Push-on screw terminals. M20x1.5 with cable strain relief or optional 1/2" NPT.
Process Connections: 5/16" (7.94 mm) outside diameter tubing, 1/4" (6.0 mm) inside diameter tubing.
Enclosure Rating: NEMA 13 (IP54).
Mounting Orientation: Vertically, with pressure connections pointing downwards.
Mechanical Working Life: Over 10⁶ switching operations.
Weight: 5.6 oz (160 g).
Agency Approvals: ETL approved to UL508 and CSA C22.2#14 (EDPS only).

MODEL CHART - ADPS			
Model	Set Point Range in w.c. (Pa)	Approx. Dead Band @ Min Set Point in w.c. (Pa)	Approx. Deadband @ Max Set Point in w.c. (Pa)
ADPS-08-2-N	0.08 to 1.20 (20-300)	0.04 (10)	0.05 (12)
ADPS-04-2-N	0.12 to 1.60 (30-400)	0.06 (15)	0.09 (23)
ADPS-03-2-N	0.20 to 2.00 (50-500)	0.08 (20)	0.09 (23)
ADPS-05-2-N	0.80 to 4.00 (200-1000)	0.4 (100)	0.5 (130)
ADPS-06-2-N	2.00 to 10.00 (500-2500)	0.6 (150)	0.8 (200)
ADPS-07-2-N	4.00 to 20.00 (1000-5000)	1.0 (250)	1.4 (350)

Note: For optional 1/2" NPT conduit connection, change -2-N to -1-N. Models that include installer kit add -C to the end of the model number (-2-N cable gland models only). Installer kit includes two static tips and 7 ft of PVC tubing. Order installer kit separately with 1/2" NPT conduit connection models. See A-481 in the accessories list. Consult factory for bulk packaging option.

MODEL CHART - EDPS			
Model	Set Point Range in w.c. (Pa)	Approx. Dead Band @ Min Set Point in w.c. (Pa)	Approx. Dead Band @ Max Set Point in w.c. (Pa)
EDPS-08-1-N	0.08 to 1.20 (20-300)	0.04 (10)	0.05 (12)
EDPS-04-1-N	0.12 to 1.60 (30-400)	0.06 (15)	0.09 (23)
EDPS-03-1-N	0.20 to 2.00 (50-500)	0.08 (20)	0.09 (23)
EDPS-05-1-N	0.80 to 4.00 (200-1000)	0.4 (100)	0.5 (130)
EDPS-06-1-N	2.00 to 10.00 (500-2500)	0.6 (150)	0.8 (200)
EDPS-07-1-N	4.00 to 20.00 (1000-5000)	1.0 (250)	1.4 (350)

Note: For optional M20 cable gland connection, change -1-N to -2-N.

MODEL CHART - BDPA			
Model	Set Point Range in w.c. (Pa)	Approx. Dead Band @ Min Set Point in w.c. (Pa)	Approx. Dead Band @ Max Set Point in w.c. (Pa)
BDPA-08-2-N	0.08 to 1.20 (20 to 300)	0.04 (10)	0.05 (12)
BDPA-04-2-N	0.12 to 1.60 (30 to 400)	0.06 (15)	0.09 (23)
BDPA-03-2-N	0.20 to 2.00 (50 to 500)	0.08 (20)	0.09 (23)
BDPA-05-2-N	0.80 to 4.00 (200 to 1000)	0.4 (100)	0.5 (130)
BDPA-06-2-N	2.00 to 10.00 (500 to 2500)	0.6 (150)	0.8 (200)
BDPA-07-2-N	4.00 to 20.00 (1000 to 5000)	1.0 (250)	1.4 (350)

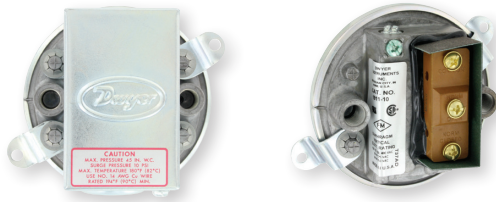
ACCESSORIES	
Model	Description
A-288	"L" type metal mounting bracket with screws
A-289	"S" type metal mounting bracket with screws
A-480	Plastic static pressure tip
A-481	Installer kit, includes 2 plastic static pressure tips & 7' (2.1 m) of PVC tubing
A-489	4" straight static pressure tip with flange



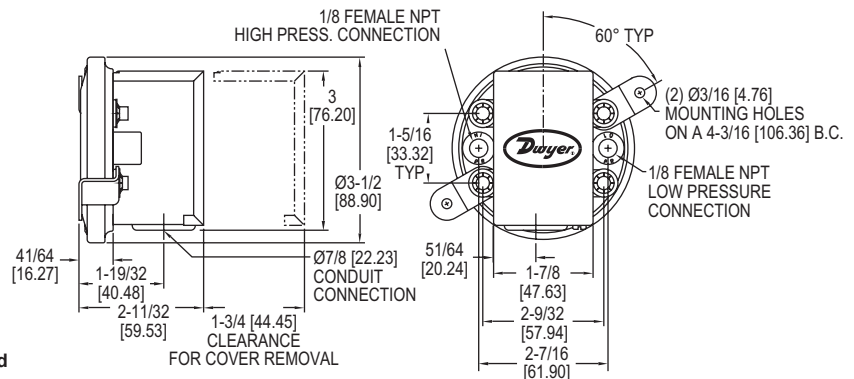
A-480

COMPACT LOW DIFFERENTIAL PRESSURE SWITCHES

Set Points from 0.07 to 20 in w.c. Repetitive Accuracy within 3%



Series 1910 switch with conduit enclosure off.
Shows electric switch and set point adjustment screw located on same side for easy installation.



The Dwyer-engineered force-motion amplifier increases the leverage of diaphragm movement and results in a switch with excellent sensitivity and repeatability.

Our most popular **Series 1900 Compact Low Differential Pressure Switches** combine advanced design and precision construction to make these switches able to perform many of the tasks of larger, costlier units. Designed for air conditioning service, they also serve many fluidics, refrigeration, oven and dryer applications. Series 1900 switches have set points from 0.07 to 20 in w.c. (1.8 to 508 mm). Set point adjustment is easy with range screw located inside conduit enclosure. Internal location helps prevent tampering. UL, CE and CSA listed, and FM approved. For use with air or compatible gages.

FEATURES/BENEFITS

- Compact size and repeatability, provides a high-value switch for many industrial and OEM applications
- Wide range of models from 0.07 in w.c. to 20 in w.c. can meet exacting OEM specifications for a low pressure switch
- Range screw protected inside enclosure provides simplifies making adjustments but prevents tampering

APPLICATIONS

- Air conditioning refrigeration coil icing detection; defrost cycle initiation
- Clogged filter detection
- Variable air volume controller

MODEL CHART			
Model	Operating Range in w.c.	Approximate Deadband	
		At Min. Set Point	At Max. Set Point
1910-00	0.07 to 0.15	0.04	0.04
1910-0	0.15 to 0.5	0.10	0.10
1910-1	0.40 to 1.6	0.15	0.16
1910-5	1.40 to 5.5	0.30	0.30
1910-10	3.0 to 11.75	0.40	0.40
1910-20	4.0 to 20.0	0.40	0.50

ACCESSORIES	
Model	Description
A-399	Duct pressure monitor kit; for use with standard or manual reset model switches; includes mounting flange, tubing and adapters
A-329	Street ell; brass adapter for applications requiring right angle connections; two required for differential pressures
A-302F-A	303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing; 4" insertion depth; includes mounting screws
A-489	4" straight static pressure tip with flange

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. Wetted Materials: Consult factory. Temperature Limits: -30 to 180°F (-34 to 82.2°C). Pressure Limits: 45 in w.c. (11.2 kPa) continuous, 10 psig (68.95 kPa) surge. Switch Type: Single-pole double-throw (SPDT). Repeatability: ±3%. Electrical Rating: 15 A @ 120-480 VAC, 60 Hz. Resistive 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 60 Hz. Derate to 10 A for operation at high cycle rates.	Electrical Connections: 3 screw type, common, normally open and normally closed. Process Connections: 1/8" female NPT. Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations. Set Point Adjustment: Screw type inside conduit enclosure. Weight: 1 lb 4.5 oz (581 g). Agency Approvals: CE, CSA, FM, and UL. Optional-EXPL explosion-proof enclosure does not possess any agency approvals.
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OPTIONS

Weatherproof Housing

16 ga. steel enclosure with gasketed cover (NEMA 4, IP66) for wet or oily conditions. Withstands 200 hour salt spray test. Wt. 5-1/2 lb (2.5 kg). Switch must be factory installed.

Note: To order, change 1910 base number to 1911, add -WP suffix.

Example: 1911-1-WP

Explosion-Proof Housing

Cast iron base with brass cover. Rated Class I, Groups D; Class II, Div. 2, Groups E, F, G; Class III and NEMA 7, 9 NEMA 3. (7 lb). Switch must be factory installed.

Note: To order, change 1910 base number to 1911, add -EXPL suffix.

Example: 1911-1-EXPL

Manual Reset Option (Model 1900 MR)

Includes special snap switch which latches on pressure increase above the setpoint. Switch must be manually reset after pressure drops below the setpoint. Available on -1, -5, -10 or -20 ranges only. Option is not UL, CSA or FM listed. For use only in single positive pressure applications.

Note: To order, change 1910 base number to 1900, add -MR suffix.

Example: 1900-10-MR



Manual reset option

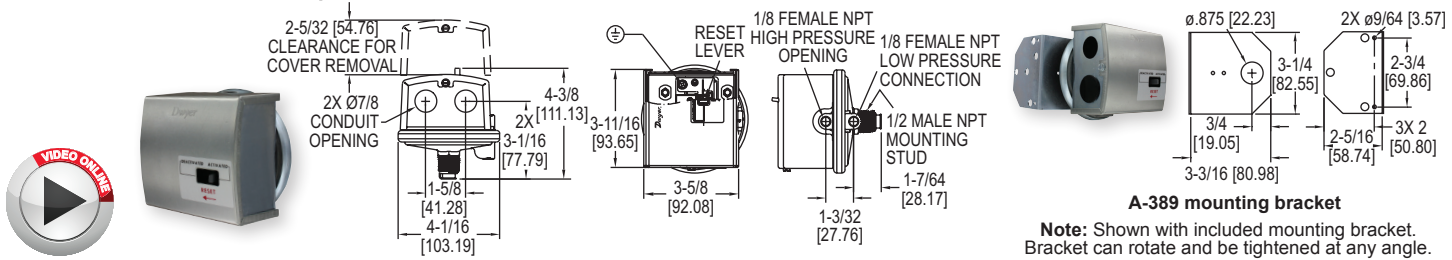
USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Process Tubing Options: See page 91 (Gage Tubing Accessories)

DPDT LOW DIFFERENTIAL PRESSURE SWITCHES

Manual Reset, No Power Required



A-389 mounting bracket

Note: Shown with included mounting bracket. Bracket can rotate and be tightened at any angle.

One of our most popular differential pressure switches is now available with a DPDT switch and manual reset. The **Series 1831 DPDT Low Differential Pressure Switches** combine small size with 4% set point repeatability. Absolutely no power is required to operate the DPDT switch. Set point adjustment on the switch is easily accessible for modifying the set point. The Series 1831 DPDT Low Differential Pressure Switches with Manual Reset eliminate common problems associated with typical high duct static cutout installations. Since the 1831 requires absolutely no power to drive its outputs, a separate power loop and its associated additional wiring and conduit is alleviated, reducing material and labor installation costs. Both control contacts of the Series 1831 activate at the same time. The potential of the lead switch shutting down the fan preventing the lag switch from sending an alarming signal to the DDC is no longer a probable system liability. Potential costly maintenance calls are diminished. Unlike typical switches that possess only a single conduit entry for both control loops, the Series 1831 provides two conduit connections simplifying wiring while eliminating additional conduit tees.

FEATURES/BENEFITS

- No power to operate DPDT switch means no additional wiring or conduit reduces material and installation labor costs
- Easy access for modifying set point simplifies adjustment
- Both control contacts activate at the same time eliminating system issues where lead switch activities prevent the lagging switch from sending a signal

APPLICATIONS

- High duct static cutout applications
- HVAC

MODEL CHART		
Model	Description	Range (in w.c.)
1831-1-RA-S	Manual reset DPDT, activate on increase	2.5 to 9
1831-2-RA-S	Manual reset DPDT, activate on increase	7.5 to 23

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. Wetted Materials: Consult factory. Temperature Limits: -30 to 180°F (-34 to 82.2°C). Pressure Limits: 10 psig (68.95 kPa) continuous, 25 psig (172.4 kPa) surge. Switch Type: 2 SPDT. Actuation Time Difference: 1 millisecond maximum actuation delay between contacts. Repeatability: ±4% max.	Electrical Rating: 4 A @ 125/250 VAC. Electrical Connections: Screw type terminal block. Process Connections: 1/8" female NPT. Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations. Set Point Adjustment: Screw type inside mounting stud. Weight: 1 lb 2 oz (522 g).
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ACCESSORIES

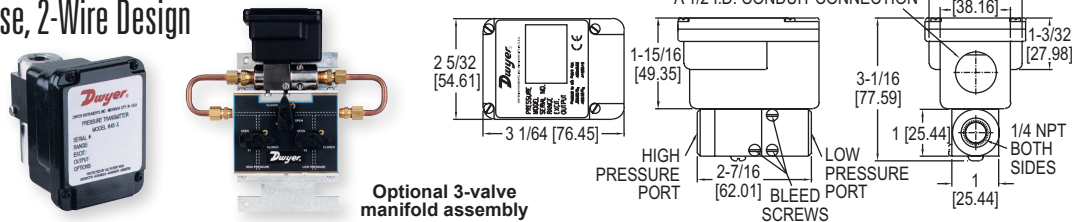
Model	Description
A-489	4" straight static pressure tip with flange
A-491	6" straight static pressure tip with flange
A-493	8" straight static pressure tip with flange
A-302F-A	303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing; 4" insertion depth; includes mounting screws
A-302F-B	303 SS static pressure tip with mounting flange; for 3/16" rubber or plastic tubing; 6" insertion depth; includes mounting screws
A-302F-C	303 SS static pressure tip with mounting flange; for 3/16" rubber or plastic tubing; 8" insertion depth; includes mounting screws

Process Tubing Options: See page 91 (Gage Tubing Accessories)

SERIES 645

WET/WET DIFFERENTIAL PRESSURE TRANSMITTERS

±0.25% Accuracy, Quick Response, 2-Wire Design



Optional 3-valve manifold assembly

Series 645 Wet/Wet Differential Pressure Transmitters are designed for use with compatible gases and liquids which can be applied to both the pressure and reference ports. Quick response capacitance sensor delivers a 4 to 20 mA output signal proportional to differential pressure with ±0.25% accuracy. The Series 645 transmitters are ideal for process control, filter condition monitoring, refrigeration equipment, pump speed control, HVAC equipment, and liquid level measurement. For ease of installation and maintenance, order optional 3-valve manifold assembly. Bleed ports allow for total elimination of air in the line and pressure cavities.

FEATURES/BENEFITS

- Versatile, high-accuracy device for liquid or gas supports designs requiring more precise measurements in support of application
- Optional 3-valve manifold supports simplifying installation or removal of transmitter without interrupting process

APPLICATIONS

- Process control
- Refrigeration equipment
- HVAC equipment
- Filter monitoring
- Pump speed control
- Liquid level measurement

MODEL CHART			
Model	Range	Model	Range
645-0	0 to 1 psid	645-4	0 to 25 psid
645-1	0 to 2 psid	645-5	0 to 50 psid
645-2	0 to 5 psid	645-6	0 to 100 psid
645-3	0 to 10 psid		

Note: For optional 3-valve manifold assembly, add -3V to end of model number

OPTIONS	
Use order code:	Description
NISTCAL-PT1	NIST traceable calibration certificate

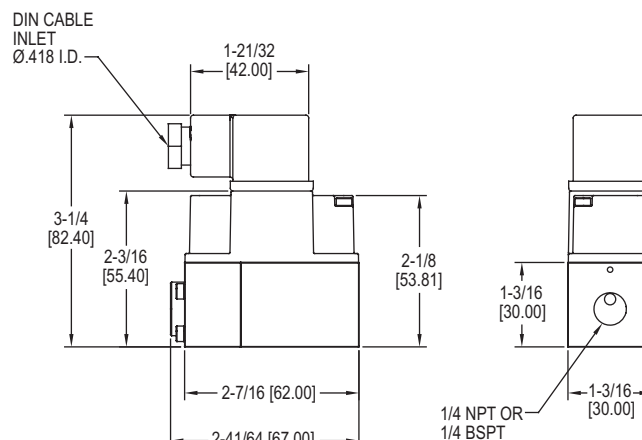
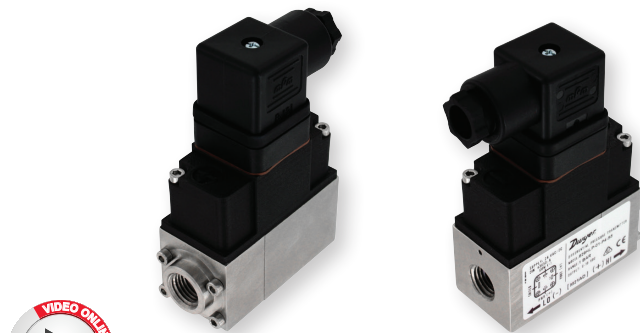
SPECIFICATIONS

Service: Compatible gases or liquids on both pressure and reference sides. Wetted Materials: 17-4 PH stainless steel, 300 Series stainless steel, fluorocarbon and silicone O-rings and bleed screw seals. Accuracy: ±0.25% FS (RSS). Temperature Limits: Operating: 0 to 175°F (-22 to 80°C); Storage: -65 to 260°F (-54 to 126°C). Pressure Limits: (High side) 1 to 5 psi: 20 x FS, 10 to 25 psi: 10 x FS, 50 psi: 5 x FS, 100 psi: 2.5 x FS; (low side) 2.5 x FS. Thermal Effects: (includes zero and span) ±0.02% FS/°F, 30 to 150°F (-1 to 65°C). Power Requirements: 11 to 30 VDC. Output Signal: 4 to 20 mA, 2-wire.	Zero and Span Adjustments: Adjustable, ±1 mA, non-interactive. Response Time: 30 to 50 ms. Loop Resistance: 0 to 1000Ω. Electrical Connection: Barrier strip terminal block with conduit enclosure and .875" (22 mm) diameter conduit opening. Process Connection: 1/4"-18 female NPT. Housing: Stainless steel/aluminum, NEMA 4X (IP56). Weight: 14.4 oz (0.4 kg). Agency Approvals: CE. 3-VALVE MANIFOLD ASSEMBLY Manifold: Brass. Valve Type: 90° on/off. Process Connection: 1/4"-18 female NPT.
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USA: California Proposition 65
 ⚠ WARNING: Cancer and Reproductive Harm
 www.P65Warnings.ca.gov

DIFFERENTIAL PRESSURE TRANSMITTERS

High Accuracy, IP65 Enclosure



The **Series 629HLP Differential Pressure Transmitters** are suitable for measuring over-pressure, under-pressure, and differential pressure in compatible gases and liquids with 1% accuracy. The 629HLP is suitable for all measuring tasks in commercial, industrial or sanitary applications. Its single sensor design, allows it to measure small increment pressure changes, and converts them to a linear analog output signal from 4 to 20 mA or 0 to 10 VDC.

FEATURES/BENEFITS

- Rugged, versatile, high accuracy device
- For liquid or gas systems requiring precise measurements
- Provide excellent response and reliability
- Suitable for static and dynamic measurements
- Converts pressure changes into 4 to 20 mA or 0 to 10 VDC output
- Compact, lightweight, capable to be installed in any arrangement making installation very simple

APPLICATIONS

- Heat exchangers
- Fan coils/air handlers
- Core testing applications
- Hydraulic systems
- High line pressures/low DP
- Pumps
- Commercial/industrial processes
- Sanitary process

MODEL CHART					
Example	629HLP	-01	-P2	-S1	-FC
Series	629HLP				
Range		01 02 04 06 15 30 60 90			
Process Connections			P2 P4		
Output Signal				S1 S5	
Options					FC NIST
Note: PSI ranges available upon request. Contact factory for details.					

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Material: 304 SS.
Housing Material: ABS.
Enclosure Rating: IP65.
Accuracy: $\pm 1\%$ from -5 to 60°C (23 to 140°F).
Stability: $\pm 1\%$ FS/year.
Temperature Limits: Ambient: -10 to 60°C (14 to 122°F); Process: -10 to 80°C (14 to 176°F).
Relative Humidity: 10% to 90% non-condensing.
Installation Position: Not position sensitive.
Pressure Limits: See Pressure Range Limits chart.
Burst Pressure: See Pressure Range Limits chart.
Static Pressure Limits: See Pressure Range Limits chart.
Output Signal: 4 to 20 mA, 0 to 10 VDC.
Response Time: 50 ms.
Rated Supply Voltage: 0 to 10 VDC Output: 12 to 36 VDC or 12 to 32 VAC (@ Max load of 2k Ω) 4 to 20mA output: 8 to 36 VDC.
Max Loop resistance: (Supply Voltage – 8 V) / 0.02 for 4 to 20mA output.
Power Consumption: $V_{\text{out}} = 13$ mA max, $I_{\text{out}} = 24$ mA max.
Electrical Connections: Form A DIN 43650.
Process Connections: 1/4" female NPT, 1/4" female BSPT.
Weight: 1 lb 4 oz (567 g).
Approvals: CE, RCM.

PRESSURE RANGE LIMITS

Pressure Range	Maximum Static Pressure (bars)	*Maximum Differential Over Pressure	**Burst Differential Pressure
0 to 1 bar	25 bar	5 bar	8 bar
0 to 2.5 bar	25 bar	5 bar	8 bar
0 to 4 bar	25 bar	12 bar	18 bar
0 to 6 bar	25 bar	12 bar	18 bar
0 to 15 psi	360 psi	70 psi	115 psi
0 to 30 psi	360 psi	70 psi	115 psi
0 to 60 psi	360 psi	174 psi	260 psi
0 to 90 psi	360 psi	174 psi	260 psi

Note: *The differential pressure limit, between high and low ports, that the transmitter can withstand without affecting transmitter performance
 **Differential pressures between high and low ports that exceed overpressure limits will result in permanent diaphragm deformation, and any pressure higher than the burst pressure limits will rupture the diaphragm.

ACCESSORIES

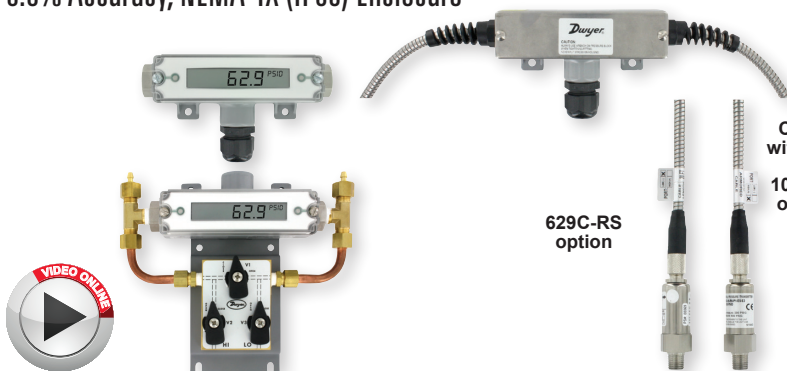
Model	Description
A-629HLP-BKT	Mounting bracket kit
BBV-1B	3-Valve block manifold
A-228	12" SS flex hose

WET/WET DIFFERENTIAL PRESSURE TRANSMITTERS

0.5% Accuracy, NEMA 4X (IP66) Enclosure

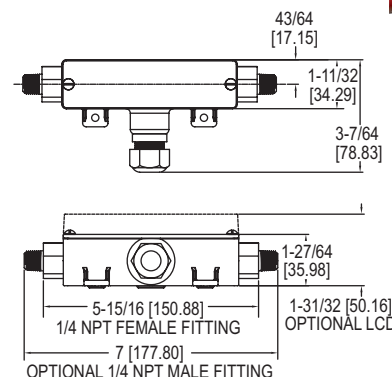


PRESSURE



Conduit housing
with remote sensor
available in
10' or 20' shielded
or armored cable

629C-RS
option



The **Series 629C Wet/Wet Differential Pressure Transmitters** monitor differential pressure of air and compatible gases and liquids with 0.5% accuracy. The design employs dual pressure sensors converting pressure changes into a standard 4 to 20 mA output signal or field selectable voltage. Small internal volume and minimal moving parts result in exceptional response and reliability. The terminal block, as well as a zero adjustment button, are easily accessed under the top cover. The Series 629C Differential Pressure Transmitter is designed to meet NEMA 4X (IP66) construction.

FEATURES/BENEFITS

- Powered by either DC or AC - take advantage of most readily available power source reducing installation costs
- Optional LCD does not need a separate power supply - lowers installed cost
- Selectable voltage range - provides flexible choice for changing design or inputs for process/HVAC controllers being used to monitor and control
- Push-button zero (versus trim pot) - more simple zeroing provides easy install and calibration reducing installation time and possibility of operator error
- Optional LCD indicator provides local status to identify operational condition
- Remote sensor option reduces installation labor and material

APPLICATIONS

- Flow elements
- Heat exchangers
- Filters
- Coils
- Chiller
- Pumps

SPECIFICATIONS

Service: Compatible gases and liquids.
Wetted Materials: Without valve: 316, 316L SS. Additional wetted parts with valve option: Buna-N, silicone grease, PTFE, brass 360, copper, and reinforced copolymer.
Accuracy: $\pm 0.5\%$ FS (includes linearity, hysteresis & repeatability).
Stability: $\pm 1\%$ FS/year.
Temperature Limits: 0 to 200°F (-18 to 93°C).
Compensated Temperature Limits: 0 to 175°F (-18 to 79°C).
Pressure Limits: See Table 1.
Thermal Effects: Avg 0.04%/°F (0.072%/°C) (includes zero and span).
Power Requirements: 2-wire: 10 to 35 VDC; 3-wire: 13 to 35 VDC or isolated 16 to 33 VAC (reverse polarity protected).
Output Signal: 2-wire: 4 to 20 mA; 3-wire: Field selectable 0 to 5, 1 to 5, 0 to 10, or 2 to 10 VDC.

Zero and Units: Push-buttons inside conduit enclosure.
Response Time: 400 msec.
Loop Resistance: Current output: 0 to 1250 Ω (max), $R_{max} = 50(V_{ps}-10)$; Voltage output: Minimum load resistance = 5 k Ω .
Current Consumption: 28 mA (max).
Electrical Connections: Removable terminal block; 1/2" female NPT conduit.
Process Connections: 1/4" female or male NPT.
Display: Optional 4-1/2 digit LCD field attachable display.
Enclosure Rating: Designed to meet NEMA 4X.
Mounting Orientation: Not position sensitive.
Weight: 629C-XX-CH: 10.1 oz (286 g); 629C-XX-R2-P1-E5-XX: 2.3 lbs (1.04 kg); 629C-XX-R6-P1-E5-XX: 4.55 lbs (2.06 kg).
Agency Approvals: CE.

MODEL CHART									
Example	629C	-01	-CH	-P1	-E1	-S1	-3V	629C-01-CH-P1-E1-S1-3V	
Series	629C							Wet/wet differential pressure transmitter	
Range		01 02 03 04 05 06 07 08 09 11 12 13 14 15 16 17 18 19						0 to 5 psid 0 to 10 psid 0 to 25 psid 0 to 50 psid 0 to 100 psid 0 to 150 psid 0 to 200 psid 0 to 300 psid 0 to 500 psid 0 to 0.5 bar differential 0 to 1 bar differential 0 to 2 bar differential 0 to 4 bar differential 0 to 6 bar differential 0 to 10 bar differential 0 to 15 bar differential 0 to 20 bar differential 0 to 30 bar differential	
Housing			CH R1 R2 R5 R6					Conduit housing, NEMA 4X (IP66) Conduit housing, NEMA 4X (IP66) with Remote Sensor and 10' shielded cable Conduit housing, NEMA 4X (IP66) with Remote Sensor and 20' shielded cable Conduit housing, NEMA 4X (IP66) with Remote Sensor and 10' armored cable Conduit housing, NEMA 4X (IP66) with Remote Sensor and 20' armored cable	
Process Connection				P1 P2 P3 P4				1/4" male NPT 1/4" female NPT 1/4" male BSPT 1/4" female BSPT	
Electrical Connection					E1 E2 E3 E5 E9			Cable gland with 3' of prewired cable Cable gland with 6' of prewired cable Cable gland with 9' of prewired cable 1/2" female NPT conduit M-12 4 pin connector	
Signal Output						S1 S3		4 to 20 mA Field selectable 0-5, 1-5, 0-10, 2-10 VDC	
Options							3V AT FC LCD NIST	3-way valve Aluminum tag Factory calibration certificate LCD indication NIST traceable certificate	

RANGE			
Range Number	Range	Working Pressure*	Over Pressure
01	0 to 5 psid	10 psi	50 psi
02	0 to 10 psid	20 psi	50 psi
03	0 to 25 psid	50 psi	120 psi
04	0 to 50 psid	100 psi	250 psi
05	0 to 100 psid	200 psi	500 psi
06	0 to 150 psid	300 psi	750 psi
07	0 to 200 psid	400 psi	1000 psi
08	0 to 300 psid	600 psi	1200 psi
09	0 to 500 psid	1000 psi	2000 psi
11	0 to 0.5 bar differential	1 bar	3 bar
12	0 to 1 bar differential	2 bar	8 bar
13	0 to 2 bar differential	4 bar	8 bar
14	0 to 4 bar differential	8 bar	18 bar
15	0 to 6 bar differential	12 bar	18 bar
16	0 to 10 bar differential	20 bar	50 bar
17	0 to 15 bar differential	30 bar	60 bar
18	0 to 20 bar differential	40 bar	80 bar
19	0 to 30 bar differential	60 bar	120 bar

*Pressures exceeding the working pressure limit may cause a calibration shift of up to $\pm 3\%$ of full-scale.

Note: Over pressure of all models with 3-way valve is 100 psi.

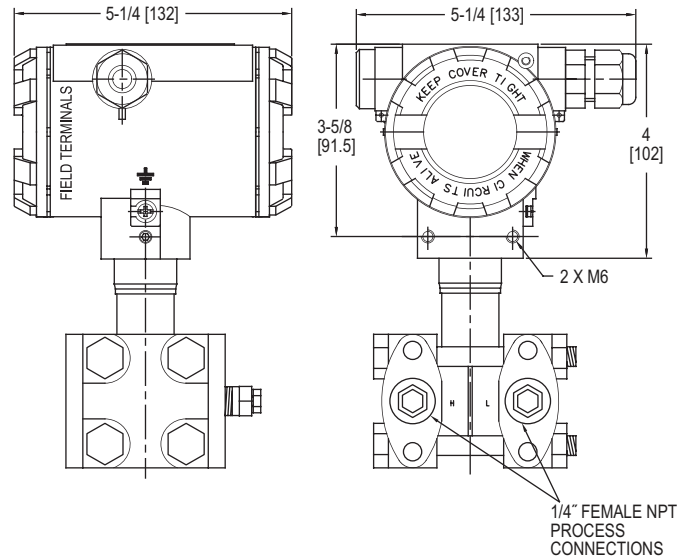
ACCESSORIES	
Model	Description
A-155	Cable gland with 1/2" NPT male
A-228	12" SS flex hose
A-62X-LCD	Field-upgradeable LCD
BBV-1B	Mini SS 3-valve block manifold

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

SMART DIFFERENTIAL PRESSURE TRANSMITTER

HART® Communication, Push Button Configuration, Rangeability (Up to 25:1)



The **Series 3500 Smart Differential Pressure Transmitter** is a microprocessor-based high performance transmitter, which has flexible pressure calibration, push button configuration, and is programmable using HART® Communication. The Series 3500 is capable of being configured for differential pressure or level applications with the zero and span buttons. A field calibrator is not required for configuration. The transmitter software compensates for thermal effects, improving performance. EEPROM stores configuration settings and stores sensor correction coefficients in the event of shutdowns or power loss. The Series 3500 can be configured to be ATEX or IECEx approved for use in hazardous (classified) locations. The rangeability allows the smart transmitter to be configured to fit any application.

FEATURES/BENEFITS

- High accuracy ($\pm 0.075\%$ FS)
- Rangeability (up to 25:1)
- Configurable using zero/span buttons (no calibrator required)
- Fail-mode process function
- Automatic ambient temperature compensation

APPLICATIONS

- Flow measurement
- Level monitoring
- Filter or pump differential pressure
- Critical process monitoring

MODEL CHART	
Model	Range
3500-AL-02-NF-2	-10 to 10 in w.c.
3500-AL-04-NF-2	0 to 30 in w.c.
3500-AL-08-NF-2	0 to 100 in w.c.
3500-AL-10-NF-2	-200 to 200 in w.c.
3500-AL-15-NF-2	0 to 1000 in w.c.
3500-AL-20-NF-2	0 to 15 psi
3500-AL-25-NF-2	0 to 100 psi

Note: Bar ranges are also available.

SPECIFICATIONS

Service: Compatible gases, steam, liquids or vapors.

Wetted Materials: 316L SS and FPM; with diaphragm seal: 316L SS.

Accuracy: $\pm 0.075\%$ FS (@ 20°C).

Rangeability: Up to 25:1 turn down.

Stability: $\leq 0.075\%$ FSO/3 years.

Temperature Limits: Ambient: -40 to 185°F (-40 to 85°C); Process with -DS: -40 to 400°F (-40 to 204°C).

Thermal Effect: $< \pm 0.05\%$ span/10°C.

Power Requirements: 10 to 55 VDC.

Output Signal: 4 to 20 mA.

Response Time: 16 to 480 ms (programmable).

Damping Time: 0 to 60 seconds.

Electrical Connection: Packing gland M20x1.5, two 1/2" female NPT conduit, screw terminal.

Process Connections: 1/4" female NPT.

Enclosure Rating: NEMA 4X IP66/IP67.

Agency Approvals: CE.

SMART DIFFERENTIAL PRESSURE TRANSMITTER

HART® Communication, Push-Button Configuration, Rangeability (Up to 25:1)

MODEL CHART													
Example	3500	-AL	-01	-DS	-1	-SPRB	A	0	-1	-1	-NIST	3500-AL-01-DS-1-SPRBA0-1-1-NIST	
Series	3500											Smart differential pressure smart transmitter	
Housing		AL AS										Aluminum housing Stainless steel housing	
Range			02 04 08 10 15 20 25 38 40 50 60									-10 to 10 in w.c. 0 to 30 in w.c. 0 to 100 in w.c. -200 to 200 in w.c. 0 to 1000 in w.c. 0 to 15 psi 0 to 100 psi 0 to 230 psi 0 to 1000 psi -2.5 to 2.5 in w.c. -1.5 to 1.5 psi	
Process Connections				NF DS								1/4" female NPT adapter Diaphragm seal selection	
Electrical Connections					1 2							Packing gland M20x1.5 Thread 1/2" female NPT	
Diaphragm Seal Type						SPDH SPRB SPRH STDH STRB STRH						S-P flush diaphragm seal direct mount high side S-PK flush diaphragm seal capillary type both sides S-PK flush diaphragm seal capillary type high side S-T extended diaphragm seal direct mount high side S-TK extended diaphragm seal capillary type both sides S-TK extended diaphragm seal capillary type high side	
Mounting Flange							A B C D					2" ANSI 2" DN50 3" ANSI 3" DN80	
Extension Length								0 2 4 6				No extension, flush mount 2" (50 mm) 4" (100 mm) 6" (150 mm)	
Capillary Length High Side									#			High side capillary length, 1 to 20 ft (increments of 1)	
Capillary Length Low Side										#		Low side capillary length, 1 to 20 ft (increments of 1)	
Options											FP IS MT NIST GB SB ST	ATEX/IECEx flameproof ATEX/IECEx intrinsically safe Stainless steel tag plate mounted on wire NIST traceable calibration certificate 2" galvanized steel mounting bracket 2" SS mounting bracket Stainless steel plate riveted to the housing	

ACCESSORIES	
Model	Description
A-630	Stainless steel angle type bracket with SS bolts
A-631	Stainless steel flat type bracket with SS bolts
BBV-0N	2-valve block manifold
DevCom2000	HART® communication protocol software

INDUSTRIAL PRESSURE TRANSMITTERS

Complete Offering of Ranges, Connections and Outputs



626/628 pressure transmitters
with general purpose housing (-GH)



626/628 pressure transmitters
with conduit box housing (-CB) and LCD display



*Please see our website for dimensional drawings.

The **Series 626 Industrial Pressure Transmitters** possess a highly precise 0.25% full-scale accuracy piezo-resistive sensor contained in a compact, rugged, NEMA 4X (IP66) stainless steel general purpose housing or cast aluminum conduit housing. The **Series 628 Industrial Pressure Transmitters** are ideal for OEMs with 1% full-scale accuracy sensors. The corrosion resistant 316L stainless steel wetted parts allow the Series 626 and 628 transmitters to measure the pressure in a multitude of processes from hydraulic oils to chemicals. The Series 626 and 628 are available in absolute and pressure ranges with a variety of optional outputs, process connections and electrical terminations to allow you to select the right transmitter for your application.

FEATURES/BENEFITS

- NEMA 4X rated enclosure provides protection in harsh environments permitting outdoor monitoring or in areas where dust and particulate matter exists
- Robust 316 SS oil filled sensor provides shock and vibration resistance insuring stability in controlling pressure for process applications
- A wide range of models and connections that can meet pressure measurement specifications from low to very high

APPLICATIONS

- Compressors
- Pumping systems
- Irrigation equipment
- Hydraulic
- Industrial process monitoring

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Type 316L SS.

Accuracy: 626: 0.25% FS; 626: 0.20% RSS; 628: 1.0% FS; 628: 0.5% RSS; 626 Absolute Ranges: 0.5% FS; 626 absolute ranges: 0.30% RSS. (Includes linearity, hysteresis, and repeatability.)

Temperature Limit: 0 to 200°F (-18 to 93°C).

Compensated Temperature Range: 0 to 175°F (-18 to 79°C).

Thermal Effect: ±0.02% FS/°F (includes zero and span).

Pressure Limits: See table.

Power Requirements: 10 to 30 VDC (for 4 to 20 mA, 0 to 5, 1 to 5, 1 to 6 VDC outputs); 13 to 30 VDC (for 0 to 10, 2 to 10 VDC outputs); 5 VDC ±0.5 VDC (for 0.5 to 4.5 VDC ratio-metric output), 10 to 35 VDC (for 4 to 20 mA with -CB option); 13 to 35 VDC or isolated 16 to 33 VAC (for selectable output with -CB option).

Output Signal: 4 to 20 mA, 0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC, or 0.5 to 4.5 VDC, or selectable 0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC for -CB option.

Response Time: 300 ms.

Loop Resistance: 0 to 1000 Ohms max. $R_{max} = 50 (V_{ps} - 10)$ Ohms (4 to 20 mA output), 0 to 1250 Ohms max. $R_{max} = 50 (V_{ps} - 10)$ Ohms (4 to 20 mA output with -CB option), 5K Ohms (0 to 5, 1 to 5, 1 to 6, 0 to 10, 2 to 10, 0.5 to 4.5 VDC output).

Stability: 1.0% FS/year (Typ.).

Current Consumption: 38 mA maximum (for 4 to 20 mA output); 10 mA maximum (for 0 to 5, 1 to 5, 1 to 6, 0 to 10, 2 to 10, 0.5 to 4.5 VDC output); 140 mA maximum (for all 626/628/629-CH with optional LED).

Electrical Connections: Conduit Housing (-CH): terminal block, 1/2" female NPT conduit; General Purpose Housing (-GH): cable DIN EN 175801-803-C.

Process Connection: 1/4" male or female NPT and BSPT.

Enclosure Rating: NEMA 4X (IP66).

Mounting Orientation: Mount in any position.

Weight: 10 oz (283 g).

Agency Approvals: CE, NSF, UL.

INDUSTRIAL PRESSURE TRANSMITTERS

Complete Offering of Ranges, Connections and Outputs

MODEL CHART									
Example	626	-00	-CH	-P1	-E1	-S1	-AT	626-00-CH-P1-E1-S1-AT	
Accuracy	626 628							0.25% full-scale accuracy 1.0% full-scale accuracy	
Range		00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 22 15 16 18 19 26 67 71 75 81						0 to 15 psia ^⑤ 0 to 30 psia ^⑤ 0 to 50 psia ^⑤ 0 to 100 psia ^⑤ 0 to 200 psia ^⑤ 0 to 300 psia ^⑤ 0 to 5 psi 0 to 15 psi 0 to 30 psi 0 to 50 psi 0 to 100 psi 0 to 150 psi 0 to 200 psi ^⑥ 0 to 300 psi ^⑥ 0 to 500 psi ^⑥ 0 to 600 psi ^⑥ 0 to 1000 psi 0 to 1500 psi ^⑥ 0 to 3000 psi 0 to 5000 psi 0 to 8000 psi 0 to 0.5 bar 0 to 2.5 bar 0 to 10 bar 0 to 40 bar	
Housing			CB GH					Conduit box housing General purpose housing	
Process Connection				P1 P2 P3 P5 P9				1/4" male NPT 1/4" female NPT 1/4" male BSPT 1/4" female SAE with refrigerant valve depressor ^① 1/2" male NPT ^①	
Electrical Connection					E1 E3 E4 E5 E6 E8 E9			Cable gland with 3' of prewired cable Cable gland with 9' of prewired cable DIN EN 175801-803-C ^① 1/2" female NPT conduit ^② M-12 4 pin connector-UL ^④ Packard connector M-12 4 pin connector non-UL	
Signal Output						S1 S2 S4 S5 S7 S8		4 to 20 mA 1 to 5 VDC 0 to 5 VDC 0 to 10 VDC 0.5 to 4.5 VDC ^{①③} Selectable 0 to 5, 1 to 5, 0 to 10, 2 to 10 VDC ^②	
Options							AT LCD NIST NW	Aluminum tag LCD indication ^② NIST traceable certificate NSF/ANSI 61/372 certified	
①Available with -GH housing only, NEMA 4 (IP65) ②Available with -CB housing only ③Power requirement: 5 VDC ±10% ④Available with -GH housing only ⑤Absolute ranges for 626 are 0.5% FS accuracy and for 628 are 2% FS accuracy ⑥UL listed pump controllers, fire-component - See online certificate for information and limitations									
Note: Bar and absolute ranges are only available with -GH housing.									

PRESSURE LIMITS							
Range Number	Pressure Range	Maximum Pressure (psig)	Over Pressure (psig)	Range Number	Pressure Range (psig)	Maximum Pressure (psig)	Over Pressure (psig)
00	0 to 15 psia	30	45	12	0 to 200	400	1000
30	15 to 0 psia	30	45	13	0 to 300	600	1500
06	0 to 5 psig	10	50	14	0 to 500	1000	2500
07	0 to 15 psig	30	150	15	0 to 1000	2000	5000
08	0 to 30 psig	60	300	16	0 to 1500	3000	5000
09	0 to 50 psig	100	300	18	0 to 3000	6000	7500
10	0 to 100 psig	200	500	19	0 to 5000	7500	10000
11	0 to 150 psig	300	750	26	0 to 8000	10000	12000

ACCESSORIES	
Model	Description
A-164	16.4' (5 m) cable with M-12 4-pin female connector
A-62X-LCD	Field-upgradeable LCD
A-960	3' packard cable
A-961	9' packard cable
A-962	20' packard cable

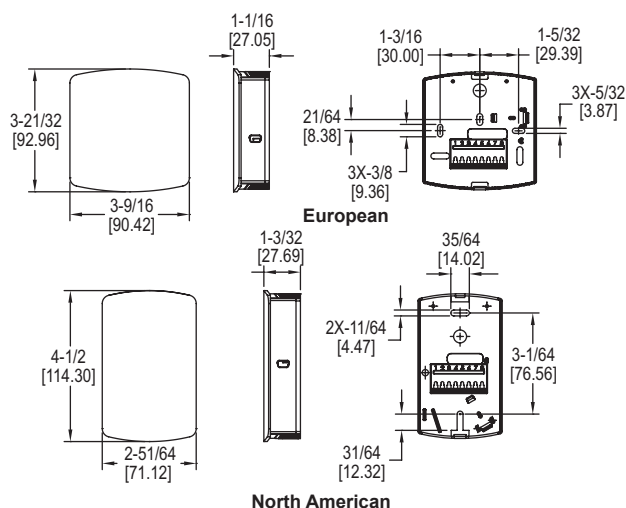
WALL MOUNT TEMPERATURE SENSORS

Discrete Wall Mount Housing



European

North American



The **Series TE-E/N Wall Mount Temperature Sensors** provide a low cost temperature input for any building management system.

FEATURES/BENEFITS

- North American or European housing aesthetic options
- Uniform look matches other Dwyer wall mount devices
- Universal mounting plate meets various installation requirements

APPLICATIONS

- Building automation
- Room temperature monitoring

MODEL CHART			
North American Model	Sensor Type	European Model	Sensor Type
TE-NND-A	10k Ω type III thermistor	TE-END-A	10k Ω type III thermistor
TE-NND-B	10k Ω type II thermistor	TE-END-B	10k Ω type II thermistor
TE-NND-C	3k Ω thermistor	TE-END-C	3k Ω thermistor
TE-NND-D	Pt100 Ω RTD	TE-END-D	Pt100 Ω RTD
TE-NND-E	Pt1000 Ω RTD	TE-END-E	Pt1000 Ω RTD
TE-NND-F	20k Ω thermistor	TE-END-F	20k Ω thermistor

SPECIFICATIONS

Accuracy: Thermistor temp sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temp sensor: DIN class B; $\pm 0.3^{\circ}\text{C}$ @ 0°C ($\pm 0.5^{\circ}\text{F}$ @ 32°F).

Temperature Limits: -40 to 140°F (-40 to 60°C).

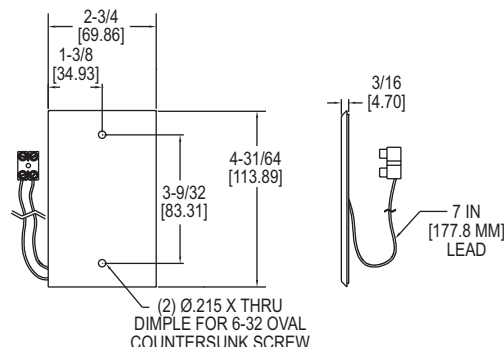
Housing Material: ABS plastic.

Weight: 0.3 lb (136 g).

SERIES TE-WSS

STAINLESS STEEL WALL PLATE TEMPERATURE SENSOR

Screw Terminal Connection, Suitable for Wash Down Applications



The **Series TE-WSS Stainless Steel Wall Plate Temperature Sensor** measures the ambient air temperature in classrooms and industrial environments.

FEATURES/BENEFITS

- SS flush plate design
- Standard single gang junction box cover plate mounting

APPLICATIONS

- Building automation
- Room temperature monitoring
- Wash down environments

SPECIFICATIONS

Accuracy: Thermistor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD: DIN Class B $\pm 0.3^{\circ}\text{C}$ @ 0°C .

Temperature Limits: Operating -40 to 140°F (-40 to 60°C).

Sensor Curves: See page reference 1 below.

Housing Material: 304 SS wall plate.

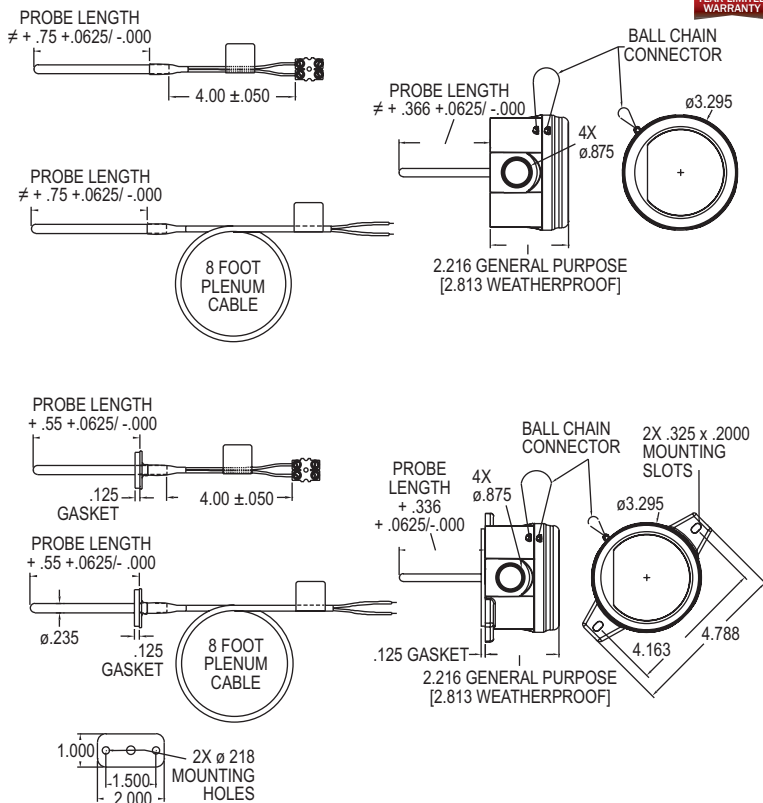
Weight: 2.3 oz (65 g).

MODEL CHART	
Model	Sensor Type
TE-WSS-A	10k Ω type III thermistor
TE-WSS-B	10k Ω type II thermistor
TE-WSS-C	3k Ω thermistor
TE-WSS-D	PT100 Ω RTD
TE-WSS-E	PT1000 Ω RTD
TE-WSS-F	20k Ω thermistor

● Resistance vs. Temperature Table: See page 32 (Series TE-OND/RND/OSA)

DUCT AND IMMERSION BUILDING AUTOMATION TEMPERATURE SENSORS

Available up to 18" Probe Length, Thermistor or RTD Outputs



The **Series TE Duct and Immersion Building Automation Temperature Sensors** can be used to monitor air or water temperature throughout a building management system or an air handler unit. Duct or immersion options available with or without an enclosure.

FEATURES/BENEFITS

- Easy to mount external tab housing and flange options for duct applications
- 1/4 turn housing cover with chain to prevent dropping
- Multiple conduit knockouts for easy installation positioning
- 8' plenum rated cable option
- Terminal connector eliminates need for wire nuts

APPLICATIONS

- Building automation
- VAV temperature sensing
- Chiller or boiler loops
- AHU monitoring

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^\circ\text{C}$ @ 25°C ($\pm 0.4^\circ\text{F}$ @ 77°F); RTD temperature sensor: DIN class A: $\pm 0.15^\circ\text{C}$ @ 0°C ($\pm 0.28^\circ\text{F}$ @ 32°F).

Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).

Sensor Curves: See page reference 1 below.

Cable Rating: Plenum option includes UL listed plenum cable.

Housing Material: Meets UL, 94 V-O polycarbonate plastic.

Housing Rating: NEMA 4X (IP66) (DFW, IBW only).

Weight: 5.3 oz (150.3 g).

Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

MODEL CHART									
Example	TE	-DFN	-A	04	4	8	-00	TE-DFN-A0448-00	
Series	TE							Temperature sensor	
Mounting Configuration	DFN							Duct mount probe only	
	DFG							Duct mount probe in general purpose housing	
	DFW							Duct mount probe in NEMA 4X housing	
	IBN							Immersion probe only	
	IBG							Immersion probe in general purpose housing	
	IBW							Immersion probe in NEMA 4X housing	
Sensor Type			A					10k Ω type III thermistor	
			B					10k Ω type II thermistor	
			C					3k Ω thermistor	
			D					Pt100 Ω RTD	
			E					Pt1000 Ω RTD	
			F					20k Ω thermistor	
			Q					10k Ω type III with 11k Ω shunt	
Probe Length			25					2.5"	
			04					4"	
			06					6"	
			08					8"	
			12					12"	
			18					18" (DFN/DFG only)	
Probe Diameter					4			1/4"	
					5			1/4" double encapsulated	
Termination						3		4" leads with spade connectors	
						4		4" leads	
						7		8' plenum rated cable with spade connectors	
						8		8' plenum rated cable	
Fittings							00	None (probe only)	
							12	1/2" NPT compression fitting	
							14	1/4" NPT compression fitting	

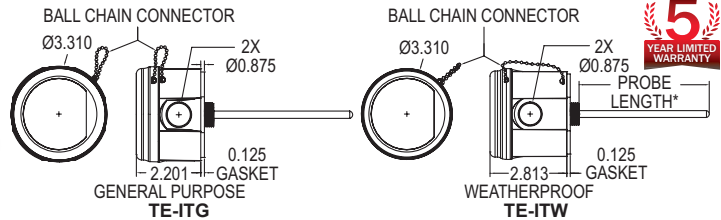
●Resistance vs. Temperature Table: See page 32 (Series TE-OND/RND/OSA)



SERIES TE-I

IMMERSION TEMPERATURE SENSORS

Integral Mounting Connection, Welded Thermowells



The **Series TE-I Immersion Style Temperature Sensors** accurately measure water temperature inside chilled and hot water loops in HVAC systems. Thermowells are required to protect the electrical connection from the process water and to allow replacement of the sensors without draining the system.

FEATURES/BENEFITS

- Integral 1/2" NPSM connection for direct mounting to a thermowell
- 1/4 turn housing cover with chain to prevent dropping
- Multiple conduit knockouts for easy installation positioning
- General purpose or weatherproof enclosure options
- Terminal connection eliminates need for wire nuts

APPLICATIONS

- Chiller or boiler loops
- Building automation

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor DIN Class A: $\pm 0.15^{\circ}\text{C}$ @ 0°C ($\pm 0.28^{\circ}\text{F}$ @ 32°F).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Sensor Curves: See page reference 1 below.
Housing Material: Meets UL, 94 V-O polycarbonate plastic.
Thermowell Material: 304 SS.
Thermowell Connections: Internal = 1/2" NPSM; External = 1/2" NPT.
Weight: 5.3 oz (150.3 g).

MODEL CHART

Example	TE	-ITG	-A	25	4	4	-00	TE-ITG-A2544-00
Series	TE							Duct and immersion building automation temperature sensor
Mounting Configuration		ITG ITW						Immersion in general purpose housing Immersion in NEMA 4X housing
Sensor Type			A B C D E F Q					10k Ω type III thermistor 10k Ω type II thermistor 3k Ω thermistor Pt100 Ω RTD Pt1000 Ω RTD 20k Ω thermistor 10k Ω type III with 11k Ω shunt
Probe Length*				25 04 06 08 12 18				2.5" 4" 6" 8" 12" 18"
Probe Diameter					4 5			1/4" 1/4" double encapsulated
Termination						4		4" flying leads terminal block
Fittings							00	None (integral)
*Actual probe length is approximately 0.75" longer than listed probe length to ensure maximum immersion into thermowells.								

●Resistance vs. Temperature Table: See page 32
(Series TE-OND/RND/OSA)

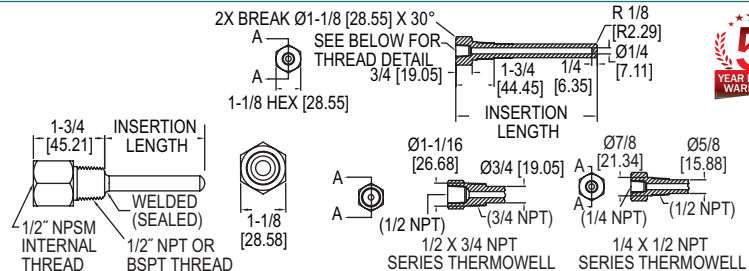
TE-TNS

THERMOWELLS

Thermowells for Building Automation Temperature Sensors



Machined thermowell
Fabricated (welded) thermowell



The **Series TE-TNS Stainless Steel Thermowells** are used to separate the instrument from the surrounding media. When used with the Series TE and TE-I Immersion Temperature Sensors, further protection is offered from aggressive media, high pressures, and flow rates while allowing for quick and easy installation of temperature sensors without having to drain process media. Thermowells are offered in both 304 and 316 stainless steel allowing for superior corrosion resistance. Fabricated, or welded, thermowells are constructed from a tube that is closed at the tip by a welded solid tip. Solid-machined thermowells are manufactured from barstock.

FEATURES/BENEFITS

- Configurable materials and sizes
- Fabricated (welded) or machined construction
- 1/2" or 3/4" NPT process connections

APPLICATIONS

- Building automation
- Chiller or boiler loops
- Chemical industry or process technology

MODEL CHART

Example	TE-TNS	-N	9	5N	-14	TE-TNS-N095N-14
Series	TE-TNS					Stainless steel thermowell
Thread Type		N				NPT
Length			2.5 04 06 09 12 18			2.5" 4" 6" 9" 12" 18"
Material & Construction				3N 4N 5N		304 SS fabricated (welded) 304 SS machined 316 SS machined
Connection (Internal & External)					00 12 14	1/2" NPSM / 1/2" NPT 1/2" NPT / 3/4" NPT 1/4" NPT / 1/2" NPT

SPECIFICATIONS

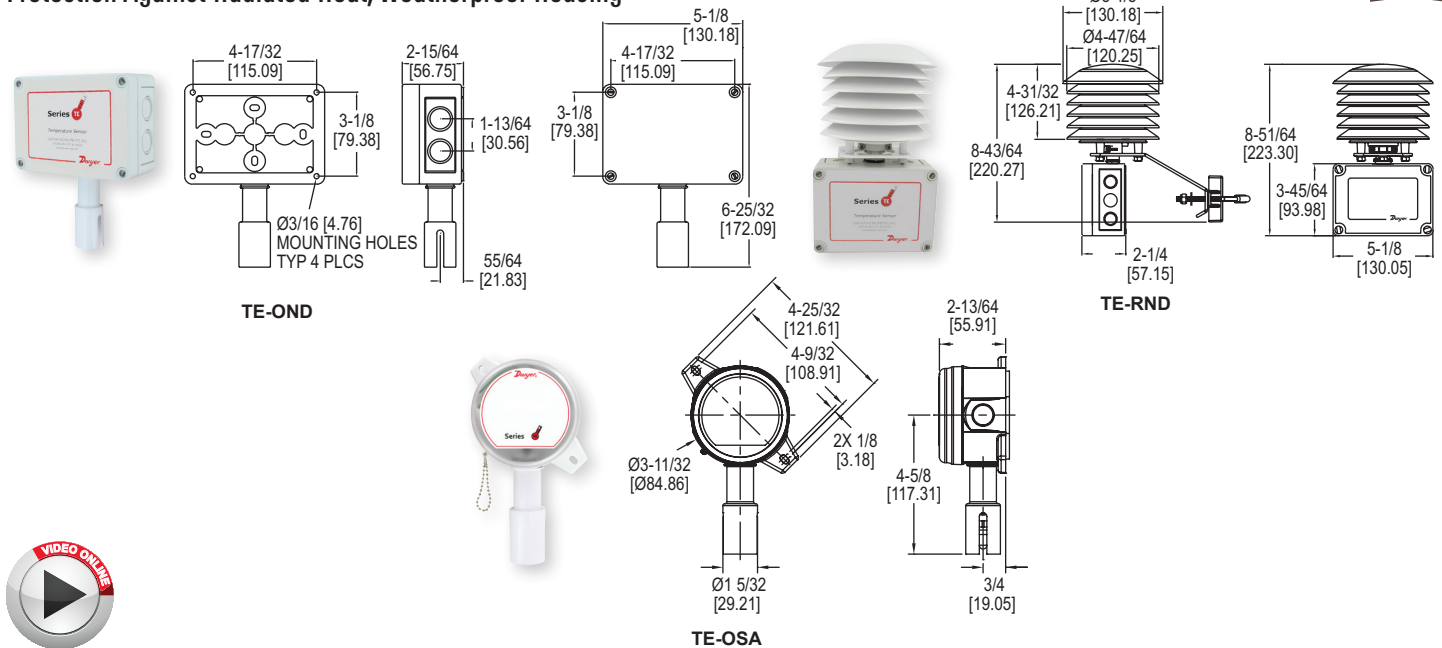
Maximum Pressure: Fabricated: 140 psi; Machined: 304 SS: 3700 psi; 316 SS: 5500 psi.
Maximum Temperature: Fabricated: 1000°F (538°C); Machined: 1200°F (648°C).
Construction: Fabricated (welded) or machined model specific.

MODEL CHART

Model	Material	Length	Construction	Connection (Internal/External)
TE-TNS-N044N-14	304 SS	4"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N044N-12	304 SS	4"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N064N-14	304 SS	6"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N064N-12	304 SS	6"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N094N-14	304 SS	9"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N094N-12	304 SS	9"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N124N-14	304 SS	12"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N124N-12	304 SS	12"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N045N-14	316 SS	4"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N045N-12	316 SS	4"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N065N-14	316 SS	6"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N065N-12	316 SS	6"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N095N-14	316 SS	9"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N095N-12	316 SS	9"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N125N-14	316 SS	12"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N125N-12	316 SS	12"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N253N-00	304 SS	2.5"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N043N-00	304 SS	4"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N063N-00	304 SS	6"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N083N-00	304 SS	8"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N123N-00	304 SS	12"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N183N-00	304 SS	18"	Fabricated	1/2" NPSM / 1/2" NPT

OUTDOOR TEMPERATURE SENSORS

Protection Against Radiated Heat, Weatherproof Housing



The **Series TE-OND/TE-RND/TE-OSA Outdoor Temperature Sensors** are offered different configurations to increase measurement accuracy by reducing radiated heat effects. For applications where the north side of the building is accessible, the TE-OND/TE-OSA can be used to protect against low levels of radiated heat.

FEATURES/BENEFITS

- Weatherproof for outdoor installation
- Radiation shield available to eliminate heating effects following installation in direct sunlight
- Terminal connector eliminates need for wire nuts

APPLICATIONS

- Building automation
- Outdoor temperature reference

MODEL CHART	
Model	Sensor Type
TE-OND-A	10k Ω type III thermistor
TE-OND-B	10k Ω type II thermistor
TE-OND-C	3k Ω thermistor
TE-OND-D	PT100 Ω RTD
TE-OND-E	PT1000 Ω RTD
TE-OND-F	20k Ω thermistor
TE-OND-Q	10k Ω type III thermistor with 11k Ω shunt
TE-RND-A	10k Ω type III thermistor
TE-RND-B	10k Ω type II thermistor
TE-RND-C	3k Ω thermistor
TE-RND-D	PT100 Ω RTD
TE-RND-E	PT1000 Ω RTD
TE-RND-F	20k Ω thermistor
TE-RND-Q	10k Ω type III thermistor with 11k Ω shunt
TE-OSA-A	10k Ω type III thermistor
TE-OSA-B	10k Ω type II thermistor
TE-OSA-C	3k Ω thermistor
TE-OSA-D	PT100 Ω RTD
TE-OSA-E	PT1000 Ω RTD
TE-OSA-F	20k Ω thermistor
TE-OSA-Q	10k Ω type III thermistor with 11k Ω shunt

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor: DIN class A: $\pm 0.15^{\circ}\text{C}$ @ 0°C ($\pm 0.28^{\circ}\text{F}$ @ 32°F).

Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).

Sensor Curves: See Resistance vs. Temperature Table.

Housing Material: Polycarbonate.

Enclosure Rating: TE-OND/TE-RND: NEMA 4X (IP65); TE-OSA: NEMA 3R (IP54).

Weight: 0.65 lb (295 g).

RESISTANCE VS TEMPERATURE TABLE

Temperature Resistance Curves (Ω)

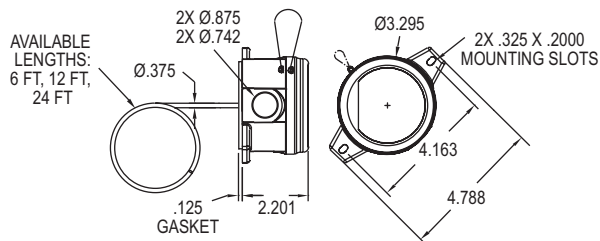
$^{\circ}\text{C}$	$^{\circ}\text{F}$	A - 10k Ω type III thermistor		B - 10k Ω type II thermistor		C - 3k Ω thermistor		D - PT100 Ω RTD		E - PT1000 Ω RTD		F - 20k Ω thermistor		Q - 10k Ω type III thermistor with 11k Ω shunt	
		Green/Green	Red/Green	Red/Green	Black/Black	Yellow/Yellow	Red/Red	Green/Blue	Red/White	Green/Blue	Red/White	Green/Blue	Red/White	Green/Blue	Red/White
-55	-67.0	607800.00	963849.00	289154.70	78.32	783.2	2394000.00	10804							
-50	-58.0	441200.00	670166.00	201049.80	80.31	803.1	1646200.00	10732							
-45	-49.0	323600.00	471985.00	141595.50	82.29	822.9	1145800.00	10638							
-40	-40.0	239700.00	336479.00	100943.70	84.27	842.7	806800.00	10517							
-35	-31.0	179200.00	242681.00	72804.30	86.25	862.5	574400.00	10364							
-30	-22.0	135200.00	176974.00	53092.20	88.22	882.2	413400.00	10172							
-25	-13.0	102900.00	130421.00	39126.30	90.19	901.9	300400.00	9938							
-20	-4.0	78910.00	97081.00	29124.30	92.16	921.6	220600.00	9654							
-15	5.0	61020.00	72957.00	21887.10	94.12	941.2	163500.00	9320							
-10	14.0	47540.00	55329.00	16598.70	96.09	960.9	122280.00	8933							
-5	23.0	37310.00	42327.00	12698.10	98.04	980.4	92240.00	8495							
0	32.0	29490.00	32650.00	9795.00	100.00	1000.0	70160.00	8012							
5	41.0	23460.00	25392.00	7617.60	101.95	1019.5	53780.00	7489							
10	50.0	18780.00	19901.00	5970.30	103.90	1039.0	41560.00	6937							
15	59.0	15130.00	15712.00	4713.60	105.85	1058.5	32340.00	6369							
20	68.0	12260.00	12493.00	3747.90	107.79	1077.9	25360.00	5798							
25	77.0	10000.00	10000.00	3000.00	109.74	1097.4	20000.00	5238							
30	86.0	8194.00	8057.00	2417.10	111.67	1116.7	15892.00	4696							
35	95.0	6752.00	6531.00	1959.30	113.61	1136.1	12704.00	4184							
40	104.0	5592.00	5326.00	1597.80	115.54	1155.4	10216.00	3707							
45	113.0	4655.00	4368.00	1310.40	117.47	1174.7	8264.00	3271							
50	122.0	3893.00	3602.00	1080.60	119.40	1194.0	6722.00	2875							
55	131.0	3271.00	2986.00	895.80	121.32	1213.2	5498.00	2521							
60	140.0	2760.00	2488.00	746.40	123.24	1232.4	4520.00	2206							
65	149.0	2339.00	2083.00	624.90	125.16	1251.6	3734.00	1929							
70	158.0	1990.00	1752.00	525.60	127.08	1270.8	3100.00	1685							
75	167.0	1700.00	1480.00	444.00	128.99	1289.9	2586.00	1472							
80	176.0	1458.00	1255.00	376.50	130.90	1309.0	2166.00	1287							
85	185.0	1255.00	1070.00	321.00	132.80	1328.0	1822.60	1126							
90	194.0	1084.00	915.50	274.65	134.71	1347.1	1540.00	986.8							
95	203.0	939.30	786.60	235.98	136.61	1366.1	1306.40	865.4							
100	212.0	816.80	678.60	203.58	138.51	1385.1	1112.60	760.3							
105	221.0	712.60	587.60	176.28	140.40	1404.0	951.00	669.2							
110	230.0	623.60	510.60	153.18	142.29	1422.9	815.80	590.1							
115	239.0	547.30	445.30	133.59	144.18	1441.8	702.20	521.4							
120	248.0	481.80	389.60	116.88	146.07	1460.7	606.40	461.6							
125	257.0	425.30	341.90	102.57	147.95	1479.5	525.60	409.5							
130	266.0	376.40	301.00	90.30	149.83	1498.3	N/A	363.9							
135	275.0	334.00	265.80	79.74	151.71	1517.1	N/A	324.2							
140	284.0	297.20	235.30	70.59	153.58	1535.8	N/A	289.4							
145	293.0	265.10	208.90	62.67	155.46	1554.6	N/A	258.9							
150	302.0	237.00	186.10	55.83	157.33	1573.3	N/A	232.0							

Dwyer

SERIES TE-A

AVERAGING TEMPERATURE SENSOR

Available in 6', 12' and 24' Lengths



The **Series TE-A Averaging Temperature Sensor** features a long bendable aluminum capillary to measure the average temperature in large ducts and air handler units.

FEATURES/BENEFITS

- Easy to mount external tab housing
- 1/4 turn housing cover with chain
- Multiple conduit knockouts for easy installation positioning

APPLICATIONS

- Building automations
- Air handler unit monitoring
- Large air duct temperature monitoring

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F).

Temperature Limits: -40 to 302°F (-40 to 150°C).

Capillary Lengths: 6, 12 or 24' (depending on model).

Cable Length: 4'.

Sensor Curves: See page reference ❶ below.

Probe Material: Bendable aluminum probe.

Housing Material: Meets UL, 94 V-0 polycarbonate plastic.

Weight: 14 oz (397 g).

MODEL CHART

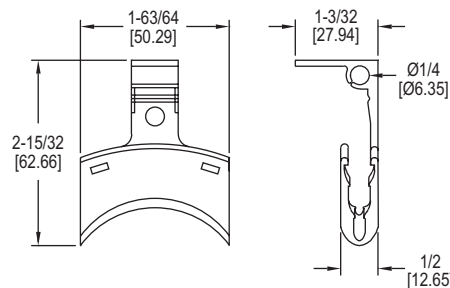
Model	Sensor Type	Capillary Length	Model	Sensor Type	Capillary Length
TE-AAG-A0634-00	10k type III NTC thermistor	6'	TE-AAG-C0634-00	3k NTC thermistor	6'
TE-AAG-A1234-00	10k type III NTC thermistor	12'	TE-AAG-C1234-00	3k NTC thermistor	12'
TE-AAG-A2434-00	10k type III NTC thermistor	24'	TE-AAG-C2434-00	3k NTC thermistor	24'
TE-AAG-B0634-00	10k type II NTC thermistor	6'	TE-AAG-F0634-00	20k NTC thermistor	6'
TE-AAG-B1234-00	10k type II NTC thermistor	12'	TE-AAG-F1234-00	20k NTC thermistor	12'
TE-AAG-B2434-00	10k type II NTC thermistor	24'	TE-AAG-F2434-00	20k NTC thermistor	24'

❶ Resistance vs. Temperature Table: See page 32 (Series TE-OND/RND/OSA)

SERIES CC1

AVERAGING TEMPERATURE SENSOR CLIPS

3/8", 1/4", or 1/8" Sensor Diameters



The **Series CC1 Averaging Temperature Sensor Clips** are used to mount the capillary of an averaging temperature sensor to the wall of the duct or air handler. Slots are provided for using nylon zip ties to hold the tubing in place, if needed.

FEATURES/BENEFITS

- Works with Series TE-A sensors
- Gray or natural color options
- 3/8", 1/4", or 1/8" sensor diameters

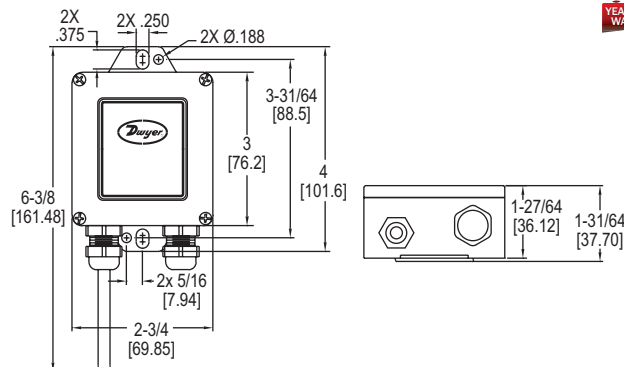
APPLICATIONS

- Building automation
- Averaging temperature sensor mounting

MODEL CHART	
Model	Color
CC1-N	Natural
CC1-GY	Grey
Note: Sold individually	

OUTSIDE AIR TEMPERATURE SENSOR

NEMA 4X, Removable Terminal Block



The **Series O-4 Outside Air Temperature Sensor** is great for monitoring ambient air temperatures in outdoor applications. The temperature sensors are mounted in a NEMA 4X enclosure with integral mounting tabs.

FEATURES/BENEFITS

- NEMA 4X weatherproof housing
- Surface or suspension mount

APPLICATIONS

- Agricultural house ventilation
- HVAC and building automation

MODEL CHART			
Model	Sensor Type	Model	Sensor Type
O-4A	10k Ω type III thermistor	O-4D	Pt100 Ω RTD
O-4B	10k Ω type II thermistor	O-4E	Pt1000 Ω RTD
O-4C	3k Ω thermistor	O-4F	20k Ω thermistor

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor: DIN class B: $\pm 0.3^{\circ}\text{C}$ @ 0°C ($\pm 0.54^{\circ}\text{F}$ @ 32°F).

Operating Temperature: -40 to 250°F .

Probe Diameter: 0.235" (5.97 mm).

Probe Length: 3.5".

Probe Material: 304 SS.

Mounting: Suspension or surface.

Enclosure Rating: NEMA 4X (IP66).

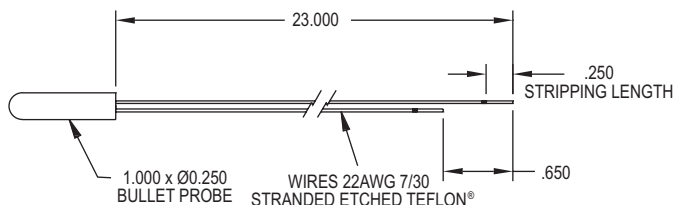
Weight: 3 oz (85 g).

Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

SERIES S2-1

SURFACE MOUNT TEMPERATURE SENSOR

RTD and Thermistor, 304 SS Probe



S2-1X no housing

The **Series S2-1 Surface Mount Temperature Sensor** provides a cost effective and reliable solution for surface contact temperature measurement of conditioned water pipes, low pressure steam or refrigerant lines.

FEATURES/BENEFITS

- Low profile sensor can be taped or strapped to the outside of a pipe
- Ideal for applications where immersion wells are not feasible

APPLICATIONS

- Heating or cooling loop line temperature monitoring
- HVAC systems

MODEL CHART			
Model	Sensor Type	Model	Sensor Type
S2-11	Pt100 Ω RTD	S2-17	5k Ω NTC thermistor
S2-12	Pt1000 Ω RTD	S2-18	100k Ω NTC thermistor
S2-13	Ni1000 Ω RTD	S2-19	20k Ω NTC thermistor
S2-14	1000 Ω Balco® RTD	S2-1A	2252 Ω NTC thermistor
S2-15	10k Ω type II thermistor	S2-1B	10k Ω type III NTC thermistor
S2-16	3k Ω NTC thermistor		

SPECIFICATIONS

Accuracy: Platinum RTD: $\pm 0.1\%$ @ 32°F (0°C), alpha 385 per DIN 43760; Nickel RTD: $\pm 0.5^{\circ}\text{F}$ @ 70°F (21.1°C); Balco®: $\pm 0.5^{\circ}\text{F}$ @ 70°F (21.1°C); Thermistor: $\pm 0.2^{\circ}\text{C}$ interchangeable @ 77°F (25°C).

Operating Temperature: -40 to 250°F (-40 to 125°C).

Probe Diameter: 1/4" (6.3 mm).

Probe Length: 1" (25 mm).

Probe Material: 304 SS.

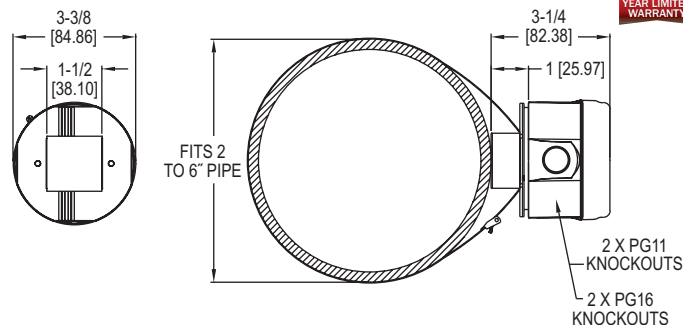
Balco® is a registered trademark of CRS Holdings, Inc.
Teflon® is a registered trademark of E.I. DuPont De Nemours and Company

Dwyer

SERIES TE-SNW

WEATHER RESISTANT SURFACE TEMPERATURE SENSOR

Strap On Design, Twist Off Cover, 2 to 6" Pipe Sizes



The **Series TE-SNW Weather Resistant Surface Temperature Sensor** non-intrusively measures the process temperature in hot and cold water loops in buildings. In order to work with most common building controllers, the output of the sensor can be chosen from 6 different RTD and Thermistor curves.

FEATURES/BENEFITS

- Easy to mount external tab housing
- 1/4 turn housing cover with chain
- Multiple conduit knockouts for easy installation positioning
- Non-intrusive temperature measurement of 2 to 6" pipes

APPLICATIONS

- Heating or cooling loop line temperature monitoring
- HVAC systems

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor: DIN Class A $\pm 0.15^{\circ}\text{C}$ @ 0°C ($\pm 0.28^{\circ}\text{F}$ @ 32°F).
Temperature Limits: Operating: -32 to 240°F (-35.5 to 115.5°C).
Sensor Curves: See page reference 1 below.
Housing Material: Meets UL 94 V-0 polycarbonate plastic, NEMA 3R.
Weight: 7 oz (198 g).

MODEL CHART

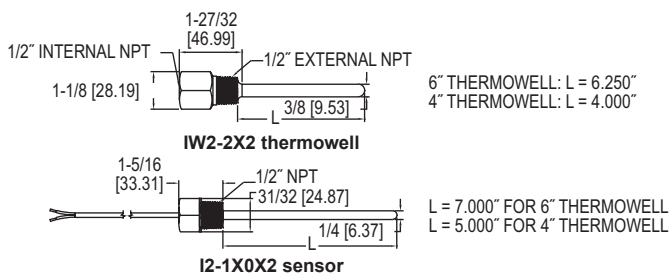
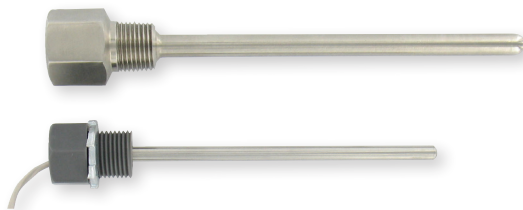
Model	Sensor Type
TE-SNW-A	10k Ω type III thermistor
TE-SNW-B	10k Ω type II thermistor
TE-SNW-C	3k Ω thermistor
TE-SNW-D	Pt100 Ω RTD
TE-SNW-E	Pt1000 Ω RTD
TE-SNW-F	20k Ω thermistor

● Resistance vs. Temperature Table: See page 32 (Series TE-OND/RND/OSA)

SERIES I2-1

IMMERSION TEMPERATURE PROBES

RTD & Thermistor Outputs, 304 SS Probes



The **Series I2-1 Immersion Temperature Probes** are designed to monitor the hot and chilled water lines throughout a building's water distribution loop.

Note: A Series IW2 Thermowell must be used on pressurized air and water lines to prevent leakage around the probe.

FEATURES/BENEFITS

- Direct wall mounting
- 6' cable
- 1/2" internal NPT accepts conduit for more industrial installation

APPLICATIONS

- Hot or chilled water line monitoring
- HVAC and building automation systems

SPECIFICATIONS

Accuracy: Platinum RTD: $\pm 0.6\%$ @ 32°F (0°C); Nickel RTD: $\pm 0.5^{\circ}\text{F}$ @ 32°F (0°C); Balco RTD: $\pm 0.1\%$ @ 32°F (0°C); Thermistors: $\pm 0.36^{\circ}\text{F}$ from 32 to 158°F (0 to 70°C).
Operating Temperature: -32 to 240°F (-35.5 to 115.5°C).
Probe Diameter: 1/4" (6.3 mm).
Cable Length: 6' (1.8 m).
Probe Material: 304 SS.
Mounting: 1/2" threaded connection to fit Series IW2 thermowell.

MODEL CHART - 6" INSERTION LENGTH

Model	Sensor Type
I2-11062	Pt100 Ω RTD
I2-12062	Pt1000 Ω RTD
I2-13062	Ni1000 Ω RTD
I2-14062	Balco 1000 Ω RTD
I2-15062	10k Ω type 2 thermistor
I2-16062	3k Ω thermistor
I2-17062	5k Ω thermistor
I2-18062	100k Ω thermistor
I2-19062	20k Ω thermistor
I2-1A062	2252 Ω thermistor
I2-1B062	10k Ω type 3 thermistor

MODEL CHART - 4" INSERTION LENGTH

Model	Sensor Type
I2-11042	Pt100 Ω RTD
I2-12042	Pt1000 Ω RTD
I2-13042	Ni1000 Ω RTD
I2-14042	Balco 1000 Ω RTD
I2-15042	10k Ω type 2 thermistor
I2-16042	3k Ω thermistor
I2-17042	5k Ω thermistor
I2-18042	100k Ω thermistor
I2-19042	20k Ω thermistor
I2-1A042	2252 Ω thermistor
I2-1B042	10k Ω type 3 thermistor

MODEL CHART - THERMOWELLS

Model	Material	Insertion Length
IW2-262	304 SS	6"
IW2-242	304 SS	4"

TEMPERATURE TRANSMITTERS

Current or Voltage Output, NEMA 4X Enclosures



Duct mount



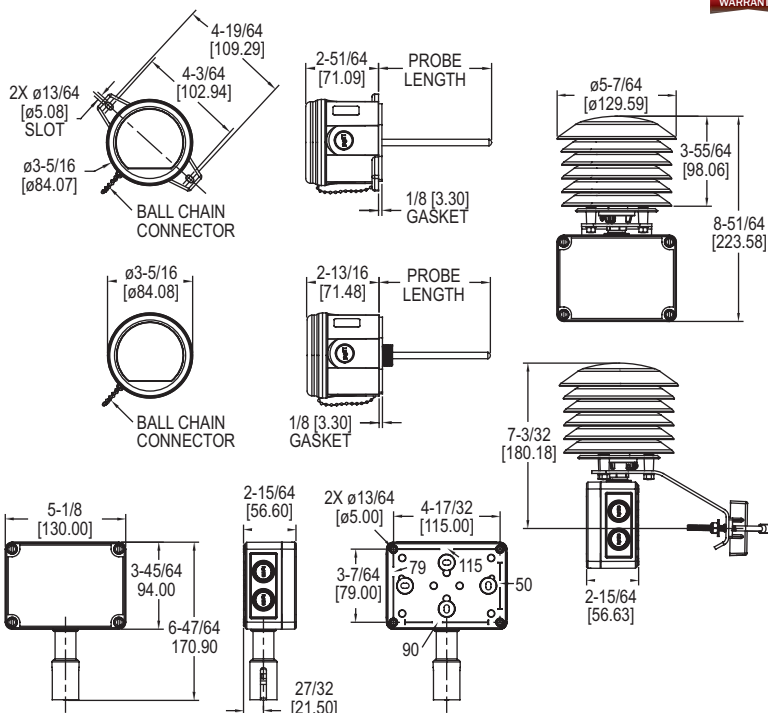
Outside air with radiation shield



Immersion mount



Outside air without radiation shield



The **Series BTT Temperature Transmitters** offer transmitter output signals with the same form and fit as our popular TE thermistor and RTD sensors for building HVAC applications. Thermowells are required when using immersion models in liquid applications.

FEATURES/BENEFITS

- Duct, immersion, and outside air models available
- Radiation shield available for mounting in direct sunlight
- Transmitter output allows for longer wire runs than standard thermistor sensors

APPLICATIONS

- Building automation system temperature monitoring

SPECIFICATIONS

Temperature Sensor: Pt1000 RTD.
Range: -40 to 140°F (-40 to 60°C).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Accuracy: $\pm 0.5^\circ\text{C}$ @ 25°C .
Thermal Effect: $\pm 0.01\%/^\circ\text{C}$.
Response Time: 100 ms.
Wetted Materials: All models: 304 SS (probe), polycarbonate (housing); Duct and immersion models: Neoprene (gasket); Outside air models: Nylon (insert), silicone (O-ring).
Process Connection: 1/2" NPT (immersion models only).
Electrical Connection: Removable terminal block, knocks out for conduit fitting.
Conduit Connection: 1/2" NPT.
Probe Lengths: 2.5 to 18" (depending on configuration).
Power Requirements: 13 to 36 VDC for current models, 13 to 36 VDC or 16 to 28 VAC for voltage models.
Output Signal: 4 to 20 mA or 0 to 10 VDC (depending on model).
Enclosure Rating: NEMA 4X (IP66) (immersions models require thermowell).
Weight: 5.11 oz (145 g) (duct/immersion); 8.4 oz (238 g) (OSA without radiation shield); 1 lb 7.4 oz (663.4 g) (OSA with radiation shield).
Agency Approvals: CE.

MODEL CHART					
Example	BTT	-D	04	-1	BTT-D04-1
Series	BTT				Temperature transmitter
Mounting Configuration		D I O R			Duct mount Immersion mount Outside air Outside air with radiation shield
Probe Length*			25 04 06 08 12 18		2.5" (required for "O" and "R" models) 4" 6" 8" 12" 18"
Output				1 2	4 to 20 mA 0 to 10 V
Options				Blank FC NIST	None Factory calibration certificate NIST calibration certificate

*For BTT-I models, actual probe length is approximately 0.75" longer than listed probe length to ensure maximum immersion into thermowells.

THERMOWELLS - WELDED			
Model	Material	Connection (Internal/External)	Insertion Length
TE-TNS-N253N-00	304 SS	1/2" NPSM/1/2" NPT	2.5"
TE-TNS-N043N-00	304 SS	1/2" NPSM/1/2" NPT	4"
TE-TNS-N063N-00	304 SS	1/2" NPSM/1/2" NPT	6"
TE-TNS-N083N-00	304 SS	1/2" NPSM/1/2" NPT	8"
TE-TNS-N123N-00	304 SS	1/2" NPSM/1/2" NPT	12"
TE-TNS-N183N-00	304 SS	1/2" NPSM/1/2" NPT	18"

TEMPERATURE TRANSMITTER

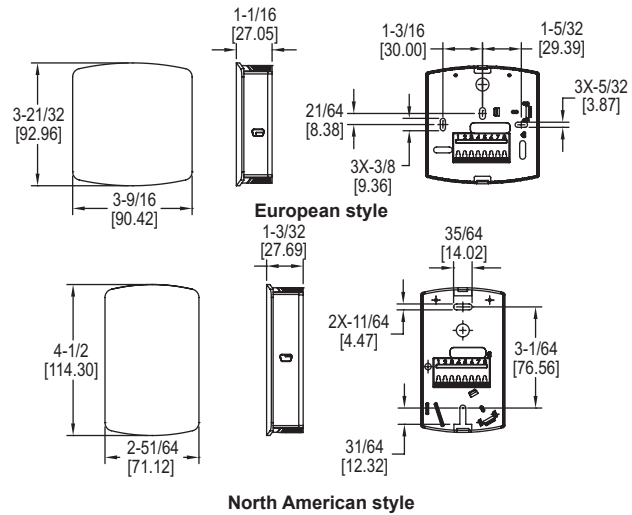
Wall Mount for Building Applications



European style



North American style



The **Series BTT-E/N Temperature Transmitters** offer transmitter output signals with the same form and fit as our popular Series TE-E/N thermistor and RTD sensors for Building Automation and HVAC installations.

FEATURES/BENEFITS

- Transmitter signal offers reliable accuracy for installations with long wire runs between the transmitter and the receiver/controller

APPLICATIONS

- Room or indoor building space temperature monitoring

MODEL CHART			
Model	Housing	Output	Price
BTT-N00-3	North American style	4 to 20 mA	\$46.50
BTT-N00-4	North American style	0 to 10 VDC	46.50
BTT-E00-3	European style	4 to 20 mA	46.50
BTT-E00-4	European style	0 to 10 VDC	46.50

SPECIFICATIONS

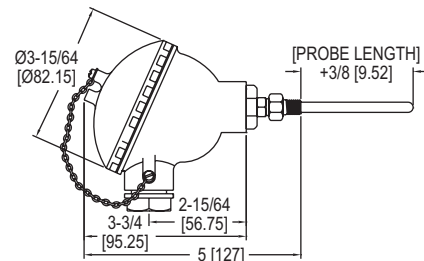
Temperature Sensor: Pt 1000 Ω RTD DIN Class A 0.00385 $^{\circ}\text{C}$.
Range: 32 to 122 $^{\circ}\text{F}$ (0 to 50 $^{\circ}\text{C}$).
Temperature Limits: 32 to 122 $^{\circ}\text{F}$ (0 to 50 $^{\circ}\text{C}$).
Accuracy: ± 0.5 $^{\circ}\text{C}$ @ 25 $^{\circ}\text{C}$.
Thermal Effect: ± 0.01 $^{\circ}\text{C}$.
Response Time: 100 ms.

Power Requirements: 13 to 36 VDC for current models, 13 to 36 VDC or 16 to 28 VAC for voltage models.
Output Signal: 4 to 20 mA or 0 to 10 VDC (depending on model).
Electrical Connections: Screw terminal block.
Enclosure Rating: IP20.
Weight: 2.6 oz (73.7 g).
Agency Approvals: CE.

SERIES TTW

WEATHERPROOF IMMERSION TEMPERATURE TRANSMITTER

Pt100 RTD, PC Programmable Transmitter



The **Series TTW Weatherproof Immersion Temperature Transmitter** offers a field adjustable temperature transmitter pre-assembled with an RTD sensor and weatherproof enclosure.

FEATURES/BENEFITS

- Preset to 32 to 212 $^{\circ}\text{F}$ (0 to 100 $^{\circ}\text{C}$) output range
- USB port for easy output scale adjustment in the field

APPLICATIONS

- Immersion temperature sensing in HVAC systems

MODEL CHART		
Model	Probe Length	Price
TTW-104	4"	\$206.00
TTW-106	6"	206.00
TTW-108	8"	206.00
TTW-112	12"	206.00
TTW-118	18"	210.00

THERMOWELLS - MACHINED				
Model	Material	Length	Connection (Internal/External) (NPT)	Price
TE-TNS-N044N-14	304 SS	4"	1/4" / 1/2"	\$17.75
TE-TNS-N064N-14	304 SS	6"	1/4" / 1/2"	19.00
TE-TNS-N094N-14	304 SS	9"	1/4" / 1/2"	32.25
TE-TNS-N124N-14	304 SS	12"	1/4" / 1/2"	46.75

SPECIFICATIONS

TEMPERATURE SENSOR

Accuracy: $\pm 3^{\circ}\text{F}$ ($\pm 1.7^{\circ}\text{C}$).
Temperature Limits: Operating: -40 to 302 $^{\circ}\text{F}$ (-40 to 150 $^{\circ}\text{C}$).
Sensor Curves: Pt100 RTD (TE Series Curve D).

TEMPERATURE TRANSMITTER

Input Range: -328 to 986 $^{\circ}\text{F}$ (-200 to 530 $^{\circ}\text{C}$).
Output: Two-wire 4 to 20 mA.
Output Impedance: 600 Ω @ 24 VDC.
Power Requirements: 12 to 35 VDC.
Accuracy: $\pm 0.2\%$ FS.
Temperature Limits: -40 to 185 $^{\circ}\text{F}$ (-40 to 85 $^{\circ}\text{C}$).
Response Time: <100 ms.

ENCLOSURE

Temperature Limits: -40 to 212 $^{\circ}\text{F}$ (-40 to 100 $^{\circ}\text{C}$).
Rating: NEMA 4X (IP65).
Material: Painted aluminum housing.



Machined thermowell

● Technical Specifications and Additional Thermowell Models: See page 31 (Series TE-TNS)

EXPLOSION-PROOF RTD TEMPERATURE TRANSMITTER

User Selectable Ranges, Optional LCD Display



*Shown with optional LCD display



The **Series TTE Explosion-Proof RTD Temperature Transmitter** is the ideal product for hazardous temperature measurement applications. The TTE series has seven pre-programmed temperature ranges that are selectable via an internal dip switch. For those applications that need a custom range, the transmitter can be easily configured for any range between -30 to 250°F with a minimum span of 40°F. The span and zero can be quickly adjusted with a simple push-button design. This unit has optional listings of FM for use in Class I, Division 1, Groups B, C and D, Class II, Division 1, Groups E, F and G and Class III atmospheres or ATEX (Directive 2014/34/EU) for **CE** II 2 G Ex db IIC T6...T4 Gb (-20°C ≤ Ta ≤ +70°C), **CE** II 1 D Ex ta IIIC T111°C Da (-20°C ≤ Ta ≤ +70°C) and IECEx for Ex db IIC T6...T4 Gb (-20°C ≤ Ta ≤ +70°C), Ex ta IIIC T111°C Da (-20°C ≤ Ta ≤ +70°C). The compact housing allows for the transmitter to be mounted in virtually any application.

FEATURES/BENEFITS

- FM approved for Class I, Groups B, C, D; Class II, Groups E, F, G classified explosive environments
- Optional LCD
- Output span selected from seven common ranges or user determined

APPLICATIONS

- Explosive process environments
- Offshore HVAC monitoring

MODEL CHART

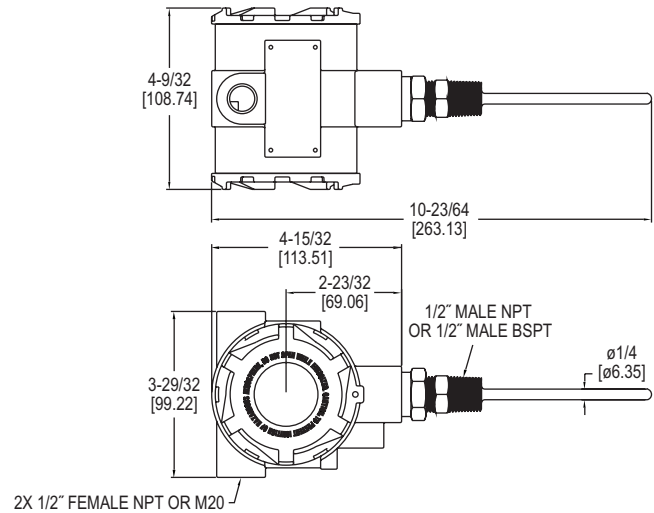
Example	TTE	-1	04	-W	-LCD	TTE-104-W-LCD
Series	TTE					Explosion-proof RTD temperature transmitter
Agency		1				FM*
		2				ATEX/IECEx flameproof
Probe Length			02 04 06 09 12 15 18			2" probe 4" probe 6" probe 9" probe 12" probe 15" probe 18" probe
Construction				W		Well probe
Options					Blank BSPT C5 LCD M20	No LCD display 1/2" male BSPT process connection C5-M housing paint specification LCD display Female M20 thread electrical connection

*Options that do not have ATEX and IECEx.

Attention: Units without the "2" suffix following "TTE" are not directive 2014/34/EU (ATEX) Compliant. These units are not intended for use in potentially hazardous atmospheres in the EU. These units may be CE marked for other directives of the EU.

ACCESSORIES

Model	Description
A-287	Mounting bracket for pipe or surface mounting (Includes bracket and two 2" U-bolts)



SPECIFICATIONS

Temperature Sensor: Pt1000, 0.00385 DIN.

Output Temperature Ranges: User selectable – any range between -30 to 250°F with a minimum span of 40°F.

Temperature Limits: Ambient: -4 to 158°F (-20 to 70°C); Process: -30 to 250°F (-34.4 to 120°C).

Accuracy: Transmitter ±0.1% FS; Probe ±0.3% FS.

Thermal Drift Effects: ±0.02%/°C max.

Response Time: 250 ms.

Wetted Materials: 316 SS.

Process Connection: 1/2" male NPT or 1/2" male BSPT.

Conduit Connection: 1/2" female NPT or M20.

Probe Length: 2" to 18" (depending on model).

Pressure Limits: 2000 psi (137.9 bar).

Power Requirements: 10 to 35 VDC.

Output Signal: 4 to 20 mA (two wire loop powered).

Optional Display: 2 lines X 8 character LCD.

Enclosure Rating: Weatherproof and Explosion-proof. Listed with FM for Class I, Division 1, Groups B, C and D, and dust-ignitionproof for Class II, Division 1, Groups E, F and G and Class III atmospheres.

ATEX Certified: **CE** 0518 **Ex** II 2 G Ex db IIC T6...T4 Gb, **CE** II 1 D Ex ta IIIC T111°C Da, T6 Process Temp ≤80°C, Temperature Class T5 Process Temp ≤95°C, Temperature Class T4 Process Temp ≤120°C as defined on nameplate. EU-type Certificate No.: EMT17ATEX0021 X.

ATEX Standards: EN 60079-0:2012+A11:2013; EN 60079-1:2015; EN 60079-31:2014.

IECEx Certified: For Ex db IIC T6...T4 Gb, Ex ta IIIC T111°C Da, T6 Process Temp ≤80°C, Temperature Class T5 Process Temp ≤95°C, Temperature Class T4 Process Temp ≤120°C as defined on nameplate.

IECEx Certificate of Conformity: Element IECEx EMT 17.0007X; IECEx Standards: IEC 60079-0:2011 (Edition 6); IEC 60079-1:2014 (Edition 7); IEC 60079-31:2013 (Edition 2).

Weight: 2 lb 8 oz (1134 g).

Agency Approvals: FM, CE, ATEX/IECEx.

THERMOWELLS - MACHINED

Model	Material	Length	Connection (Internal/External) (NPT)
TE-TNS-N044N-12	304 SS	4"	1/2" / 3/4"
TE-TNS-N064N-12	304 SS	6"	1/2" / 3/4"
TE-TNS-N094N-12	304 SS	9"	1/2" / 3/4"
TE-TNS-N124N-12	304 SS	12"	1/2" / 3/4"



Machined thermowell

FIELD-SELECTABLE RANGES

40 to 90°F (4.4 to 32.2°C)
 -20 to 140°F (-28.9 to 60°C)
 0 to 100°F (-17.8 to 37.8°C)
 30 to 240°F (-1.1 to 115.6°C)
 32 to 212°F (0 to 100°C)
 32 to 122°F (0 to 50°C)
 -30 to 65°C (-1.1 to 18.3°C)
 Custom range between -30 to 250°F (-34.4 to 121.1°C)

● Technical Specifications and Additional Thermowell Models: See page 31 (Series TE-TNS)

WALL MOUNT HUMIDITY/TEMPERATURE/DEW POINT TRANSMITTERS

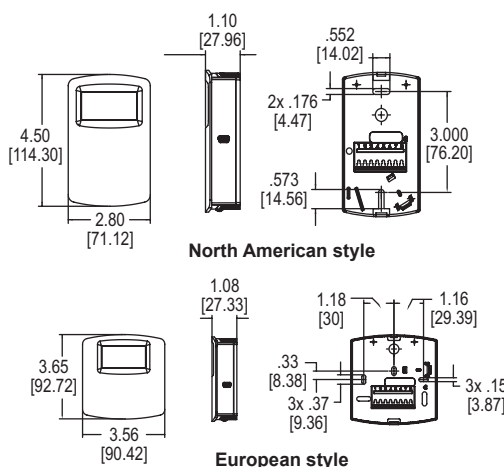
Optional LCD Display



European style



North American style



North American style

European style

The Series RHP-E/N Wall Mount Humidity/Temperature/Dew Point Transmitters are the most versatile room transmitter on the market. The stylish housing is well vented to provide air flow across the sensor to improve measurement accuracy. The humidity and the dew point are measured using a capacitive polymer sensor. The humidity and dew point can have either a current or voltage output, while the optional temperature output can be a current, voltage, RTD or thermistor. For models with current or voltage for the temperature output, the temperature range is field selectable.

FEATURES/BENEFITS

- Field selectable relative humidity or dew point output
- Universal analog outputs
- Integral or service tool LCD display options
- Two housing designs to match North American and European aesthetics

APPLICATIONS

- Air economizers
- Room comfort monitoring
- Greenhouse monitoring

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.

Temperature Range: -40 to 140°F (-40 to 60°C) for thermistor and RTD sensors. -20 to 140°F (-28.9 to 60°C) for solid state band gap temperature sensors.

Dew Point Temperature Range: -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C) field-selectable ranges.

Accuracy: RH: Model RHP-2XXX $\pm 2\%$ 10 to 90% RH @ 25°C; Model RHP-3XXX $\pm 3\%$ 20 to 80% RH @ 25°C; Model RHP-5XXX $\pm 5\%$ 20 to 80% RH @ 25°C; Thermistor temperature sensor: $\pm 0.36^\circ\text{F}$ @ 77°F ($\pm 0.2^\circ\text{C}$ @ 25°C); RTD temperature sensor: DIN Class B; $\pm 0.54^\circ\text{F}$ @ 32°F ($\pm 0.3^\circ\text{C}$ @ 0°C); Solid state band gap temperature sensor: $\pm 0.9^\circ\text{F}$ @ 77°F ($\pm 0.3^\circ\text{C}$ @ 25°C).

Hysteresis: $\pm 1\%$.

Repeatability: $\pm 0.1\%$ typical.

Temperature Limits: Operating: -40 to 140°F (-40 to 60°C); Storage: -40 to 176°F (-40 to 80°C).

Compensated Temperature Range: -4 to 140°F (-20 to 60°C).

4 to 20 mA Loop Powered Outputs: Power requirements: 10 to 35 VDC; Output signal: 4 to 20 mA, 2 channels for humidity/solid state temperature sensor models (loop powered on RH). Switch selectable RH/dew point. Switch selectable normal or reverse output.

0-5/10V Outputs: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output load: 5 mA max., 2 channels for humidity/solid state temperature sensor models. Switch selectable 0-10 V/2-10 V or 0-5 V/1-5 V output. Switch selectable RH/dew point. Switch selectable normal or reverse output.

Solid State Band Gap Temperature Sensor Output Ranges: Switch selectable, -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C).

Response Time: 15 s.

Electrical Connections: Screw terminal block.

Drift: $< 1\%$ RH/year.

RH Sensor: Capacitance polymer.

Enclosure Material: Polycarbonate.

Enclosure Rating: IP20.

Display: Optional LCD; Switch selectable %RH or dew point, °F/°C.

Display Resolution: RH: 1%; Temperature: 0.1°F (0.1°C); Dew point: 1°F (1°C).

Weight: 4.4 oz (125 g).

Agency Approvals: CE.

MODEL CHART						
Example	RHP	-3	N	4	A	-LCD RHP-3N4A-LCD
Series	RHP					Humidity/temperature/dew point transmitter
Accuracy		2 3 5				2% accuracy 3% accuracy 5% accuracy
Housing			E N			European style wall mount North American style wall mount
Humidity/Dew Point Output				4		4 to 20 mA/0 to 5 VDC/0 to 10 VDC
Temperature Output					0 4 A B C D E F	None 4 to 20 mA/0 to 5 VDC/0 to 10 VDC 10K Ω @ 25°C thermistor type III 10K Ω @ 25°C thermistor type II 3K Ω @ 25°C thermistor 100 Ω RTD DIN 385 1K Ω RTD DIN 385 20K Ω @ 25°C thermistor
Options					LCD NIST	LCD display NIST traceable calibration certificate

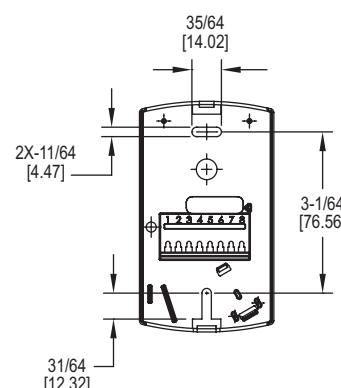
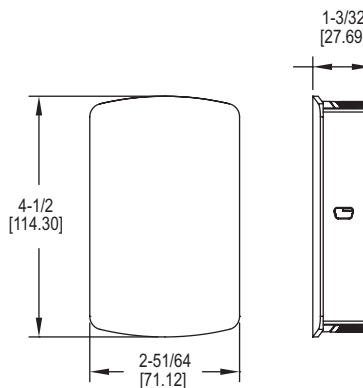
ACCESSORIES	
Model	Description
A-449	Remote LCD display allows remote indication of select Dwyer wall mount transmitters for validation or certification purposes
SCD-PS	100 to 240 VAC/VDC to 24 VDC power supply



A-449

WALL MOUNT HUMIDITY/TEMPERATURE TRANSMITTER

2% or 3% Humidity Sensor, Passive Temperature Outputs



The **Series RHPLC Wall Mount Humidity/Temperature Transmitter** is a compact economical sensor for the building automation marketplace. The stylish housing is well vented to provide air flow across the sensor to improve measurement accuracy. Each unit utilizes a capacitive polymer sensing element to deliver a proportional analog output. A combination humidity and temperature model can be configured with current, voltage, RTD, or thermistor output. A wide selection of passive RTD or thermistor temperature sensors are available in this series.

FEATURES/BENEFITS

- 2% or 3% accuracy models
- Humidity only or temperature and humidity combo
- Wide selection of passive thermistor or RTD temperature sensors

APPLICATIONS

- Air economizers
- Room comfort monitoring

SPECIFICATIONS

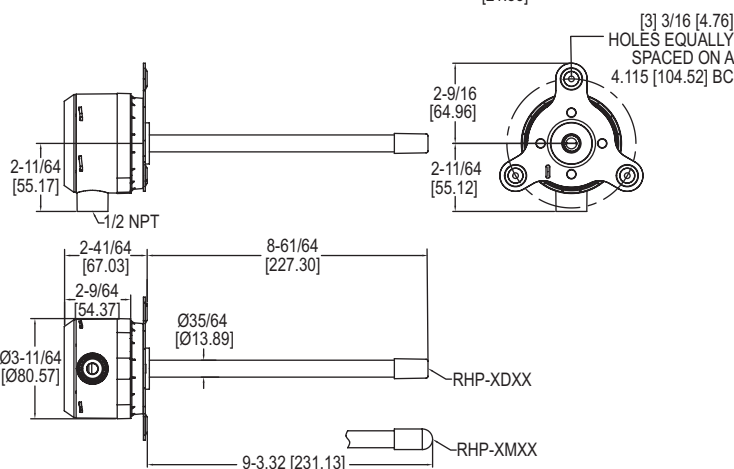
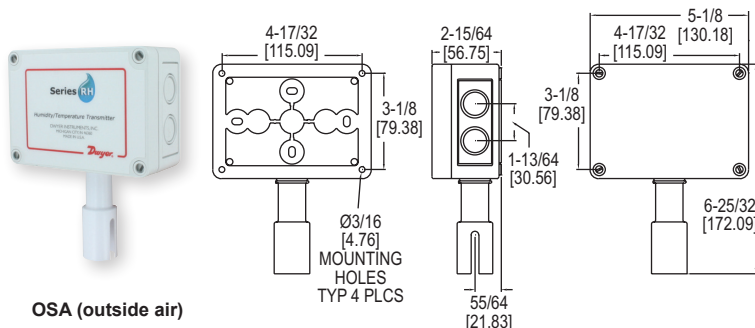
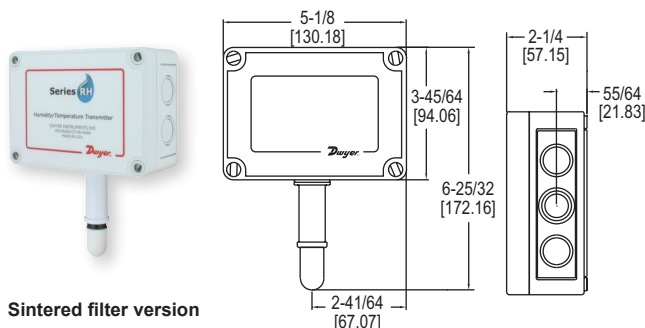
Sensor: Capacitive polymer.
Relative Humidity Range: 0-100% RH.
RH Accuracy: $\pm 2\%$ 10 to 90% RH @ 25°C for 2% accuracy units; $\pm 3\%$ 20 to 80% RH @ 25°C for 3% accuracy units.
RH Hysteresis: $\pm 0.8\%$.
RH Repeatability: $\pm 0.1\%$ typical.
Temperature Output Range: -40 to 140°F (-40 to 60°C).
Passive Thermistor Temperature Sensor Accuracy: $\pm 0.36^\circ\text{F}$ @ 77°F ($\pm 0.2^\circ\text{C}$ @ 25°C).
Accuracy RTD Temp Sensor: DIN Class B; $\pm 0.3^\circ\text{C}$ @ 0°C ($\pm 0.54^\circ\text{F}$ @ 77°F).
Accuracy Current/Voltage Temperature Output: $\pm 0.9^\circ\text{F}$ @ 72°F ($\pm 0.3^\circ\text{C}$ @ 25°C).
Temperature Limits: Operating: -40 to 140°F (-40 to 60°C); Storage: -40 to 176°F (-40 to 80°C).
Power Requirements: 10 to 35 VDC for 4 to 20 mA or 0 to 5 VDC output; 15 to 35 VDC for 0 to 10 VDC output; 10 to 29 VAC for 0 to 5 VDC output; 15 to 29 VAC for 0 to 10 VDC output.
Response Time: 8 s (τ_{63}).
Electrical Connections: Screw terminal block.
Drift: $<0.25\%$ RH/year.
Enclosure Material: Polycarbonate.
Weight: 4.4 oz (125 g).
Agency Approvals: CE.

MODEL CHART							
Example	RHPLC	-3	N	2	A	-FC	RHPLC-3N2A-FC
Series	RHPLC						Humidity/temperature transmitter
Accuracy		2 3					2% accuracy 3% accuracy
Housing			N				North American style wall mount
Humidity Output				1 2 3			Current 4 to 20 mA Voltage 0 to 10 VDC Voltage 0 to 5 VDC
Temperature Output					0 1 2 3 A B C D E F		None Current 4 to 20 mA Voltage 0 to 10 VDC Voltage 0 to 5 VDC 10K Ω @ 25°C thermistor type III 10K Ω @ 25°C thermistor type II 3K Ω @ 25°C thermistor 100 Ω RTD DIN 385 1K Ω RTD DIN 385 20K Ω @ 25°C thermistor
Options						FC	Factory calibration certificate (3% accuracy units)

ACCESSORIES	
Model	Description
SCD-PS	100-240 VAC/VDC to 24 VDC power supply
APT-40-5DN	AC power transformer, 120/208/240/277/480 VAC input, 24 VAC isolated output, 40 VA, dual hub

HUMIDITY/TEMPERATURE TRANSMITTERS

Passive Temperature Outputs, Sintered Filter Options



The **Series RHP Temperature and Humidity Transmitters** combine the voltage or current humidity transmitter output with a passive temperature thermistor or RTD output. Featuring polymer capacitance humidity sensors, models are available with 2%, 3% or 5% accuracies. Duct mounted transmitters are available with an optional two-line alpha numeric LCD display.

FEATURES/BENEFITS

- 2%, 3%, or 5% accuracy models
- Optional LCD display on duct mount models
- Radiation shield option for outdoor installation in direct sunlight

APPLICATIONS

- Air economizers
- Outdoor temperature and relative humidity reference
- Pool room humidity monitoring

MODEL CHART									
Example	RHP	-2	D	1	A	-LCD	RHP-2D1A-LCD		
Series	RHP						RH/passive temperature sensor transmitter		
Accuracy		2 3 5					2% accuracy 3% accuracy 5% accuracy		
Housing Type			D M O S R				Duct mount with filter Duct mount with HDPE filter OSA (outside air) OSA with sintered filter* Radiation shield		
RH Output				1 2 3			4 to 20 mA 0 to 10 V 0 to 5 VDC		
Temperature Sensor					0 1 2 3 A B C D E F		None 4 to 20 mA 0 to 10 VDC 0 to 5 VDC 10K @ 25°C thermistor type III 10K @ 25°C thermistor type II 3K @ 25°C thermistor 100 Ω RTD DIN 385 1K Ω RTD DIN 385 20K Ω @ 25°C thermistor		
Options						LCD NIST	LCD display NIST traceable calibration certificate		

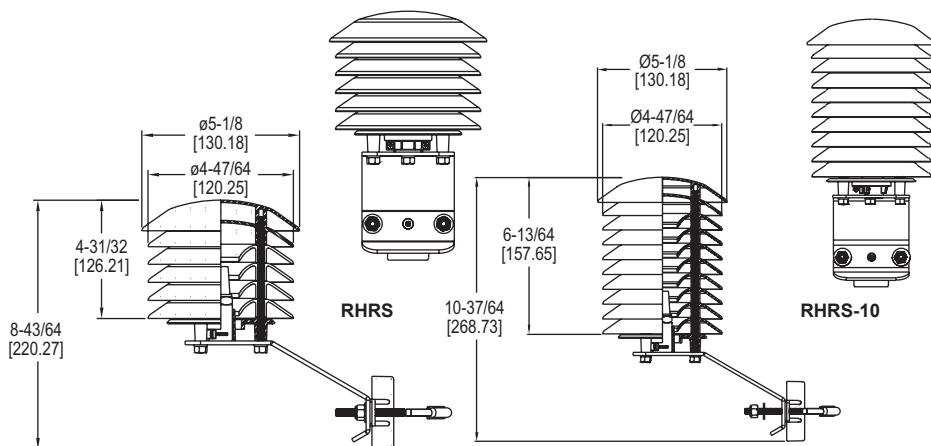
*Use OSA with sintered filter models when purchasing Series RHRS radiation shield separately.

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.
Temperature Range: -40 to 140°F (-40 to 60°C).
Accuracy, RH: RHP-2XXX ±2% 10-90% RH @ 25°C; RHP-3XXX ±3% 20-80% RH @ 25°C; RHP-5XXX ±5% 20-80% RH @ 25°C.
Accuracy, Thermistor Temp Sensor: ±0.2°C @ 25°C (±0.36°F @ 77°F).
Accuracy, RTD Temp Sensor: DIN Class B; ±0.3°C @ 0°C (±0.54°F @ 32°F).
Accuracy, Solid State Band Gap: ±0.9°F @ 77°F (±0.3°C @ 25°C).
Hysteresis: ±1%.
Repeatability: ±0.1% typical.
Temperature Limits: -40 to 140°F (-40 to 60°C).
Storage Temperature: -40 to 176°F (-40 to 80°C).
Compensated Temperature Range: -4 to 140°F (-20 to 60°C).
4 to 20 mA Loop Powered Models: Power requirements: 10 to 35 VDC; Output signal: 4 to 20 mA.
0-5/10V Output Models: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output signal: 0 to 10 V @ 5 mA max.
Solid State Band Gap Temperature Sensor Output Ranges: Switch selectable, -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C).
Response Time: 15 s.
Electrical Connections: Removable screw terminal block.
Conduit Connection: Duct mount: 1/2" NPS; OSA: 1/2" (22.3 mm).
Drift: < 1% RH/year.
RH Sensor: Capacitance polymer.
Temperature Sensor: Types 1, 2, 3: Solid state band gap; Curves A, B, C: Thermistor; Curves D, E: Platinum RTD DIN 385.
Enclosure: Duct mount: PBT; OSA: Polycarbonate.
Enclosure Rating: Duct mount: NEMA 4X (IP66) for housing only; OSA: NEMA 4X (IP66).
Display: Duct mount only, optional 2-line alpha numeric, 8 characters/line.
Display Resolution: RH: 0.1%; 0.1°F (0.1°C).
Weight: Duct mount: .616 lb (.3 kg); OSA: 1 lb (.45 kg).
Agency Approvals: CE.

OUTSIDE AIR HUMIDITY RADIATION SHIELDS

6 or 10 Plate Design, Integral Pipe Mounting Kit



The **Series RHRS Outside Air Humidity Radiation Shields** protects outside air humidity transmitters from rain and radiated heat. With the curved shape and color of the plates, air flow is able to move across the sensor to keep radiated temperatures from rooftops and surrounding surfaces from affecting humidity readings.

FEATURES/BENEFITS

- Adjustable sensor mounting collar works with Dwyer RHP sintered filter outdoor air humidity transmitters or other RH devices
- Universal mount fits 3/4" to 1-1/2" pipe or flat surfaces

APPLICATIONS

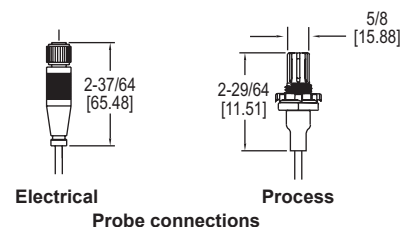
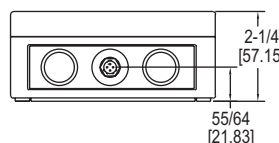
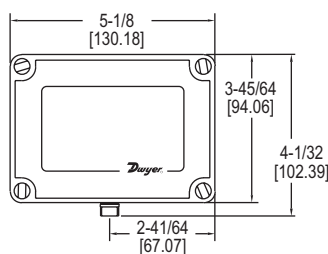
- Building outside air reference
- Weather stations

MODEL CHART	
Model	Description
RHRS	6 plate radiation shield
RHRS-10	10 plate radiation shield
Note: Only sintered filter OSA models of Series RHP are compatible with the shield.	

SERIES RH-R

HUMIDITY/TEMPERATURE TRANSMITTER

Remote Mount, Field Replaceable Sensor Filter, Up to 16' Cable



The **Series RH-R Humidity and Temperature Transmitter** is the ideal transmitter for those applications where space is limited. The compact sensor is protected by a removable filter. It can be mounted up to 16 feet away from the weatherproof base. The Series RH-R is ideal for environmental chambers, rubber bladder burst detection and air handler applications.

FEATURES/BENEFITS

- Cable lengths from 4 to 16'
- Remote housing allows for flexibility sensing where space may be limited

APPLICATIONS

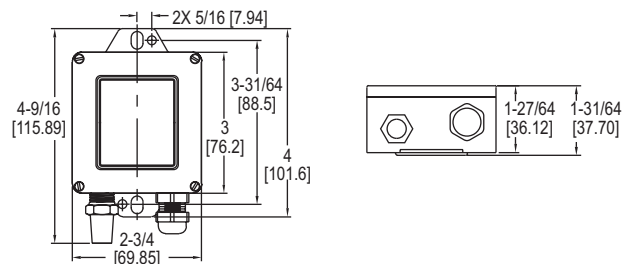
- Process system monitoring
- Environmental chambers
- Air economizers

SPECIFICATIONS	
Service: Dry clean air. Relative Humidity Range: 0 to 100% RH. Temperature Range: -40 to 140°F (-40 to 60°C). Accuracy: $\pm 2\%$ @ 10-90%. Temperature Limits: -40 to 140°F (-40 to 60°C). Storage Temperature: -40 to 176°F (-40 to 80°C). Compensated Temperature Range: -4 to 140°F (-20 to 60°C). Power Requirements: 10 to 35 VDC.	Output Signal: 4 to 20 mA loop powered. Response Time: Less than 15 s. Electrical Connections: Terminal block. Conduit Connection: 1/2" NPT. Process Connection: 1/2" NPSM. Drift: < 1%/year. RH Sensor: Capacitance polymer Cable Length: Up to 16'. Housing Material: Polycarbonate, aluminum enclosure. Enclosure Rating: NEMA 4X (IP66).

MODEL CHART							
Model	Cable Length	Description	Output	Model	Cable Length	Description	Output
RHU-R004	4'	Humidity	Current	RHT-R004	4'	Humidity/temperature	Current
RHU-R008	8'	Humidity	Current	RHT-R008	8'	Humidity/temperature	Current
RHU-R012	12'	Humidity	Current	RHT-R012	12'	Humidity/temperature	Current
RHU-R016	16'	Humidity	Current	RHT-R016	16'	Humidity/temperature	Current

WEATHER-RESISTANT HUMIDITY/TEMPERATURE TRANSMITTER

Compact Housing, Sintered Filter



The compact **Series WHT Weather-Resistant Humidity/Temperature Transmitter** is designed to withstand the elements. A removable sintered filter protects the polymer capacitance sensor from solid objects that may come in contact with the transmitter. The transmitter is available with 4 to 20 mA or 0 to 10 VDC output signals for both temperature and humidity. This transmitter is ideal for measuring outside air temperature and humidity levels for air handling economizer applications.

FEATURES/BENEFITS

- RH or RH and temperature outputs
- Compact NEMA 3S construction

APPLICATIONS

- Air handling economizers
- Air environment monitoring in agriculture or livestock cultivation houses

MODEL CHART

Model	Accuracy	RH Output	Temperature
WHT-310	3%	4 to 20 mA	None
WHT-311	3%	4 to 20 mA	4 to 20 mA
WHT-320	3%	0 to 10 VDC	None
WHT-322	3%	0 to 10 VDC	0 to 10 VDC
WHT-330	3%	0 to 5 VDC	None
WHT-333	3%	0 to 5 VDC	0 to 5 VDC
WHT-31A	3%	4 to 20 mA	10K Ω Type III
WHT-32A	3%	0 to 10 VDC	10K Ω Type III

Note: For 2% accuracy, change the leading 3 to a 2.
Example: WHT-210.

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.

Temperature Range: -40 to 140°F (-40 to 60°C).

Accuracy, RH: $\pm 3\%$ 20 to 80% RH, $\pm 4\%$ @ 10-20%, 80 to 90%.

Accuracy, Temp Models with 4 to 20 mA Temp. Output: $\pm 0.9^\circ\text{F}$ @ 72°F ($\pm 0.3^\circ\text{C}$ @ 25°C).

Accuracy, Temp Models with Passive Thermistor Temp Sensor: $\pm 0.36^\circ\text{F}$ @ 77°F ($\pm 0.2^\circ\text{C}$ @ 25°C).

Hysteresis, RH: $\pm 1\%$.

Repeatability, RH: $\pm 0.1\%$ typical.
Temperature Limits: -40 to 140°F (-40 to 60°C).

Storage Temperature: -40 to 176°F (-40 to 80°C).

Compensated Temperature Range, RH: -4 to 140°F (-20 to 60°C).

4 to 20 mA Loop Powered Models:
 Power requirements: 10 to 35 VDC;
 Output signal: 4 to 20 mA.

0 to 10 V Output Models: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output signal: 0 to 10 V @ 5 mA max.

0 to 5 V Output Models: Power requirements: 10 to 35 VDC or 10 to 29 VAC; Output signal: 0 to 5 V @ 5 mA max.

Response Time: 15 s.

Electrical Connections: Removable screw terminal block.

Drift: < 1% RH/year.

RH Sensor: Capacitance polymer.

Temperature Sensor: 4 to 20 mA output, solid state band gap. Passive output: 10K @ 25°C thermistor (Dwyer curve A).

Enclosure: ABS.

Enclosure Rating: Designed to meet NEMA 3S (IP54).

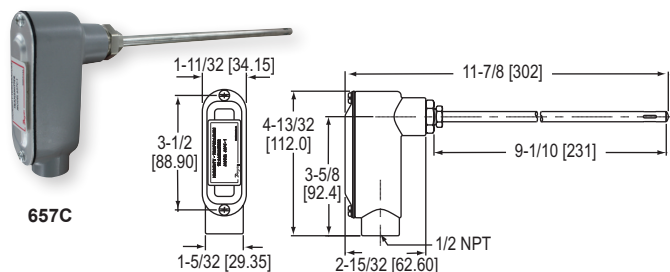
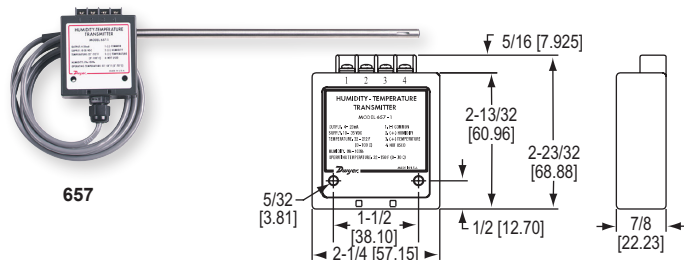
Weight: 0.3 oz (8.5 g).

Agency Approvals: CE.

SERIES 657

RELATIVE HUMIDITY/TEMPERATURE TRANSMITTERS

Dual Channel Design for Simultaneous 4 to 20 mA Output Signals



The **Series 657 Relative Humidity/Temperature Transmitters** provide two 4 to 20 mA channels to produce separate output signals for both relative humidity and temperature. These devices deliver $\pm 2\%$ accuracy for humidity and $\pm 1^\circ\text{F}$ for temperature measurements. Stainless steel probe can be easily mounted to most ductwork using either of the two optional kits below.

FEATURES/BENEFITS

- Polymer film humidity and thin film RTD temperature sensors offer highly reliable and stable measurements.
- Remote mount housing offers installation flexibility (657-1)
- Rugged die-cast aluminum housing is great for industrial applications (657C-1)

APPLICATIONS

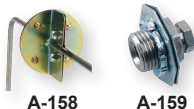
- Cleanroom monitoring
- HVAC/building control monitoring

MODEL CHART

Model	Description
657-1	RH/temperature transmitter
657C-1	RH/temperature transmitter - conduit housing

ACCESSORIES

Model	Description
A-158	Split flange
A-159	Mounting gland



SPECIFICATIONS

Service: Dry clean air.

Range: Relative humidity: 0 to 100%; Temperature: 32 to 212°F (0 to 100°C).

Accuracy: Relative humidity: $\pm 2\%$ (10 to 90% RH), $\pm 3\%$ (0 to 10% and 90 to 100% RH); Temperature $\pm 1^\circ\text{F}$ (0.5°C).

Temperature Limits: 32 to 140°F (0 to 60°C).

Pressure Limits: 1 psi (.07 bar).

Compensated Temperature Range: 32 to 140°F (0 to 60°C).

Power Requirements: 10 to 35 VDC.

Output Signal: 2 channels each 4 to 20 mA. Loop powered on the RH channel.

Electrical Connections: 4 screw type terminals.

Mounting Orientation: Mount in any position.

Probe: 657-1: Stainless steel 5/16" x 10" (0.8 x 25.4 cm); 657C-1: 5/16" x 9-1/10" (0.8 x 23.1 cm).

Weight: 657-1: 5.5 oz (156 g); 657C-1: 10 oz (284 g).

OPTIONS

To order add suffix:	Description
-NIST	NIST traceable humidity calibration certificate
Example: 657C-1-NIST	

CARBON DIOXIDE/TEMPERATURE TRANSMITTERS

NDIR CO₂ Sensor, Universal Outputs, Optional Relay



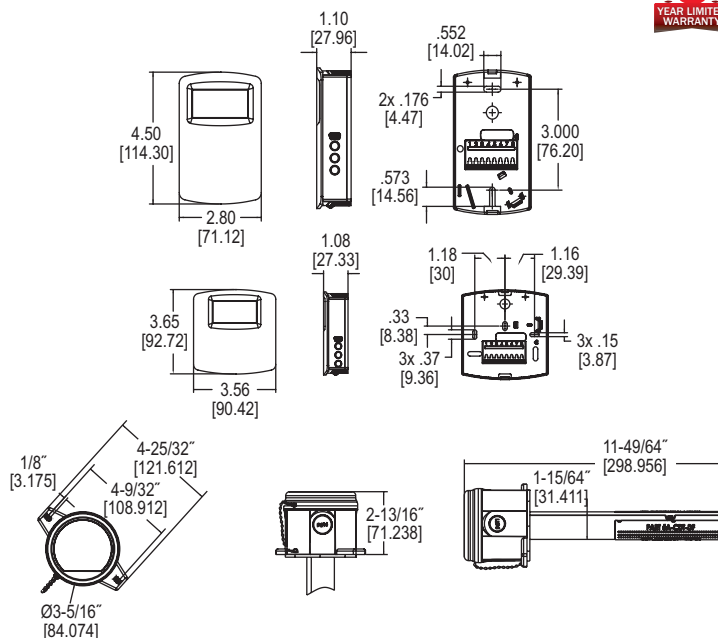
European style



North American style



Duct



The **Series CDT Carbon Dioxide and Temperature Transmitters** accurately monitor the CO₂ concentration and temperature in indoor environments to help achieve energy savings. For increased sensor accuracy, a single beam dual wavelength non-dispersive infrared (NDIR) sensor is used to automatically correct the measurement in both occupied* and unoccupied buildings against light source aging effects. The single beam dual wavelength sensor technology provides the highest level of accuracy compared to Automatic Baseline Correction methods which can unintentionally shift the calibration based on CO₂ levels and barometric pressure conditions. In order to achieve a higher level of accuracy, the Series CDT includes digital barometric pressure adjustment and the ability to field-calibrate the sensor.

For applications that require visual indication, the wall mount configurations of the Series CDT can be ordered with an integral LCD display. Push-buttons are standard on all configurations of the transmitters for access to the menu structure, but wall mount configurations can be ordered without the buttons. To prevent tampering, the action of the buttons can be locked out using an internal dip switch selection.

FEATURES/BENEFITS

- Single beam dual wavelength NDIR sensor eliminates drift due to light source aging
- Integral passive temperature outputs reduce number of devices mounted in the space
- Service display tool available for models without an integral LED
- Optional integral display and relay output

APPLICATIONS

- Demand control ventilation in schools, office buildings, hospitals, and other indoor environments
- LEED® certification

*For buildings occupied 24 hours per day, it is recommended that calibration be verified every 6 to 12 months depending on application.

SPECIFICATIONS

Sensor: Single beam, dual wavelength NDIR.
Range: CO₂: 0 to 2000 or 0 to 5000 ppm (depending on model); Temperature: 32 to 122°F (0 to 50°C).
Accuracy: CO₂: ±40 ppm ±3% of reading; Temperature: ±1°C @ 25°C.
Temperature Dependence: ±8 ppm/°C at 1100 ppm.
Non-Linearity: 16 ppm.
Pressure Dependence: 0.13% of reading per mm of Hg.
Response Time: 2 min for 99% step change.
Duct Air Velocity Range: 0-4000 FPM (20.32 m/s).
Temperature Limits: 32 to 122°F (0 to 50°C).
Humidity Limits: 10 to 95% RH (non-condensing).
Power Requirements: 16 to 35 VDC or 19 to 28 VAC.
Power Consumption: Average: 2 w; Peak: 3.75 w.
Output: Current: 4 to 20 mA (max. 500 Ω); Voltage: 0 to 5 VDC or 0 to 10 VDC (min. 500 Ω); Relay: SPST NO rated 2 A @ 30 VDC.
Weight: 4.4 oz (125 g).
Enclosure Rating: Duct mount: NEMA 4X (IP66) for housing only; Wall mount: IP20.
Agency Approvals: CE.

MODEL CHART						
Example	CDT	-2	N	4	-LCD	CDT-2N44-LCD
Series	CDT					Carbon dioxide/temperature transmitter
Range		2 5				0 to 2000 ppm CO ₂ range 0 to 5000 ppm CO ₂ range
Configuration			N E D			North American style wall mount European style wall mount Duct mount
CO ₂				4		4 to 20 mA / 0 to (5 or 10) VDC
Temperature Output				0 4 A B C D E F		None 4 to 20 mA / 0 to (5 or 10) VDC 10 KΩ NTC thermistor type III 10 KΩ NTC thermistor type II 3 KΩ NTC thermistor Pt100 Ω RTD Pt1000 Ω RTD 20 KΩ NTC thermistor
Options					FC LCD RLY NBC	Factory calibration certificate LCD display (wall only) Relay No buttons (wall only)

ACCESSORIES	
Model	Description
GCK-200CO-2000CO2	Calibration gas kit includes a 99.99% nitrogen gas cylinder for calibrating the zero point and a 200 PPM CO / 2000 PPM CO ₂ gas cylinder for calibrating the span point on Dwyer's gas sensing transmitters
A-449	Remote LCD display allows remote indication of select Dwyer® wall mount transmitters for validation or certification purposes
A-449A	Remote LCD display with buttons allows remote indication and calibration of select Dwyer® wall mount transmitters for validation and certification purposes
A-CDT-KIT	Accessory kit including terminal block and power supply



GCK-200CO-2000CO2



A-449

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COMMUNICATING CARBON DIOXIDE DETECTORS

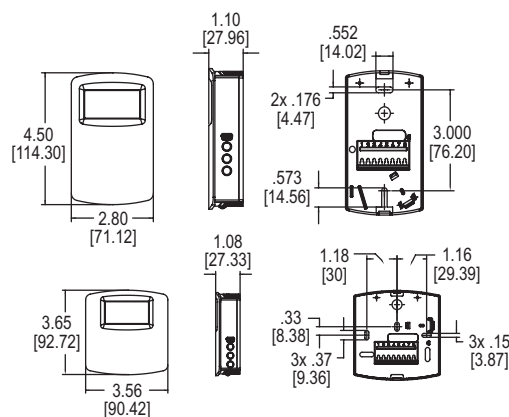
Measures CO₂, Humidity, Temperature, Temperature Set Point, and Override



European style



North American style



The **Series CDTA Communicating Carbon Dioxide Detectors** combine the function of three room sensors into a single, compact housing. Parameters include carbon dioxide, humidity, temperature, and temperature set point with override. By having field selectable Modbus® and BACnet Communications, only four wires are needed for power and the communication signal. The communicating detectors can be daisy chained together to further reduce installation cost. In order to reduce the set up time, the RS-485 MAC address is set up using on board dip switches. A second set of dip switches are used to select whether output is Modbus® RTU or BACnet MS/TP communication protocols and to limit access to the set up menu.

Like our Series CDT Carbon Dioxide Transmitter, the Series CDTA uses a Single Beam Dual Wavelength Non-Dispersive Infrared (NDIR) sensor to measure the carbon dioxide level. This technology can be used in installations that will be occupied 24 hours per day. For improved accuracy, the transmitter can be field calibrated to the environmental conditions of the installation. Also, the barometric pressure can be programmed to correct for altitude. The humidity uses a capacitive polymer sensor and the temperature is measured using a 10KΩ thermistor. The humidity sensor is field replaceable without the need for additional calibration.

Optional local and remote displays are available to display any of the parameters. For applications in which the building occupants aren't familiar with CO₂ concentrations, the LCD can be programmed to display temperature, humidity, or temperature set point instead.

FEATURES/BENEFITS

- Digital Intelligent Temperature Compensation Algorithm (DITCA™) corrects for errors due to self heating effects of combination wall sensors
- Field selectable Modbus® and BACnet communications reduces wiring
- Single beam dual wavelength CO₂ sensor
- Replaceable humidity/temperature sensor
- Physical hardware lockout
- Optional remote display tool

APPLICATIONS

- Demand control ventilation in schools, office buildings, hospitals, and other indoor environments
- LEED® certification

MODEL CHART			
Model	CO ₂ Concentration	Housing Style	Display
CDTA-2N000	2000 PPM	North American	No
CDTA-2N000-LCD	2000 PPM	North American	Yes
CDTA-2E000	2000 PPM	European	No
CDTA-2E000-LCD	2000 PPM	European	Yes
CDTA-5N000	5000 PPM	North American	No
CDTA-5N000-LCD	5000 PPM	North American	Yes
CDTA-5E000	5000 PPM	European	No
CDTA-5E000-LCD	5000 PPM	European	Yes

OPTIONS	
To order add suffix:	Description
-FC	Factory calibration certificate
Example: CDTA-2N000-FC	

SPECIFICATIONS

Sensor (CO₂): Single beam, dual wavelength NDIR; Humidity: Capacitive polymer; Temperature: 10KΩ thermistor.
Range: CO₂: 0 to 2000 or 5000 PPM CO₂ (depending on model); Humidity: 0 to 100% RH; Temperature: 32 to 122°F (0 to 50°C).
Accuracy: CO₂: ±40 ppm ±3% of reading; RH: ±2% (10 to 90% RH); Temperature: ±1°C @ 25°C.
Temperature Dependence (CO₂): ±8 ppm / °C at 1100 ppm.
Non-Linearity (CO₂): 16 ppm.
Pressure Dependence (CO₂): 0.13% of reading per mm of Hg.
Response Time (CO₂): 2 min. for 99% step change.
Temperature Limits: 32 to 122°F (0 to 50°C).
Humidity Limits: 10 to 95% RH (non-condensing).
Power Requirements: 10 to 42 VDC / 10 to 30 VAC.
Power Consumption: Average: 0.5 watts; Peak: 1.2 watts.
Output: 2-wire RS-485, Modbus® RTU or BACnet MS/TP communication protocol.
Weight: 4.4 oz (125 g).
Enclosure Rating: IP20.
Agency Approvals: BTL, CE.

ACCESSORIES

Model	Description
GCK-200CO-2000CO2	Calibration gas kit includes a 99.99% nitrogen gas cylinder for calibrating the zero point and a 200 PPM CO / 2000 PPM CO ₂ gas cylinder for calibrating the span point on Dwyer's gas sensing transmitters
A-449	Remote LCD display allows remote indication of select Dwyer® wall mount transmitters for validation or certification purposes
A-449A	Remote LCD display with buttons allows remote indication and calibration of select Dwyer® wall mount transmitters for validation and certification purposes
A-CDT-KIT	Accessory kit including terminal block and power supply



GCK-200CO-2000CO2



A-449

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 Modbus® is a registered trademark of Schneider Automation, Inc.

CARBON DIOXIDE/RH/TEMPERATURE TRANSMITTERS

NDIR CO₂ Sensor, Universal CO₂/RH Outputs, Optional Relay



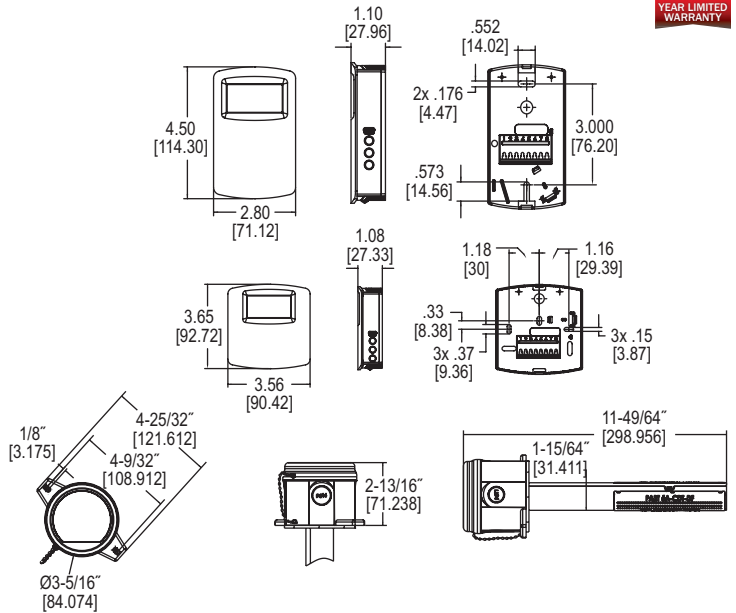
European style



North American style



Duct



The **Series CDTR Carbon Dioxide, Relative Humidity and Temperature Transmitters** reduce the number of sensors mounted on a wall or in a duct. By combining CO₂, RH, and temperature in one device, system integrators are able to reduce installation time while lowering material cost at the same time. Like our popular Series CDT Carbon Dioxide Transmitter, a single beam dual wavelength non-dispersive infrared (NDIR) sensor is used to automatically correct the measurement in both occupied* and unoccupied buildings against light source aging effects. In order to achieve the best possible accuracy, the Series CDTR also includes digital barometric pressure adjustment and the ability to field calibrate the sensor. Universal outputs for both carbon dioxide and relative humidity allow users to select the transmitter output to be 4 to 20 mA, 0 to 5 VDC, or 0 to 10 VDC to work with virtually any building management controller. Additionally, passive thermistor or RTD sensor can be ordered for a temperature output. For applications that require visual indication, the wall mount configurations of the Series CDTR can be ordered with an integral LCD display. The display can be configured to display temperature only, relative humidity only, CO₂ only, CO₂ and humidity, or CO₂ and temperature. Push-buttons are standard on all configurations of the transmitters for access to the menu structure. To prevent tampering, the action of the buttons can be locked out using an internal jumper selection.

FEATURES/BENEFITS

- Digital Intelligence Temperature Compensation Algorithm (DITCA™) eliminates error due to the self heating effects of wall mount combination devices.
- Single beam dual wavelength NDIR CO₂ sensor
- Replaceable humidity/temperature sensors
- Physical hardware lockout
- Service display tool available for duct mount and wall mount units without an LCD
- Relay output option

APPLICATIONS

- Demand control ventilation in schools, office buildings, hospitals, and other indoor environments
- LEED® certification

*For buildings occupied 24 hours per day, it is recommended that calibration be verified every 6 to 12 months depending on application.

SPECIFICATIONS

Range: CO ₂ : 0 to 2000 or 0 to 5000 ppm (depending on model); Relative humidity: 0 to 100%; Temperature: 32 to 122°F (0 to 50°C).	Humidity Limits: 10 to 95% RH (non-condensing).
Accuracy: ±40 ppm + 3% of reading (CO ₂); ±2% (RH).	Power Requirements: 16 to 35 VDC / 19 to 28 VAC.
Temperature Dependence: ±8 ppm / °C at 1100 ppm.	Power Consumption: Average: 2 watts; Peak: 3.75 watts.
Non-Linearity: 16 ppm.	Sensor: Single beam, dual wavelength NDIR.
Pressure Dependence: 0.13% of reading per mm of Hg.	Output: Current: 4 to 20 mA (max 500 Ω); Voltage: 0 to 5 VDC or 0 to 10 VDC (min 500 Ω); Relay: SPST NO 2 A @ 30 VDC; RTD or thermistor per r-t curves (depending on model).
Response Time: 2 minutes for 99% step change.	Weight: 5.6 oz (158.8 g).
Temperature Limits: 32 to 122°F (0 to 50°C).	Enclosure Rating: Duct mount: NEMA 4X (IP66) for housing only; Wall mount: IP20.
Duct Air Velocity Range: 0-4000 FPM (20.32 m/s)	Agency Approvals: CE.

MODEL CHART

Example	CDTR	-2	N	4	A	4	-LCD	CDTR-2N4A4-LCD
Series	CDTR							Carbon dioxide/RH/temperature transmitter
Range		2	5					0 to 2000 ppm CO ₂ range 0 to 5000 ppm CO ₂ range
Configuration			N	E	D			North American style wall mount European style wall mount Duct mount
CO₂ Output				4				4 to 20 mA / 0 to (5 or 10) VDC
Temperature Output					0	A		None 10K Ω NTC thermistor type III 10K Ω NTC thermistor type II 3K Ω NTC thermistor Pt100 Ω RTD Pt1000 Ω RTD 20K Ω NTC thermistor
RH Output						4		4 to 20 mA / 0 to (5 or 10) VDC
Options							FC LCD RLY NBC	Factory calibration certificate LCD display (wall only) Relay No buttons (wall only)

ACCESSORIES	
Model	Description
GCK-200CO-2000CO2	Calibration gas kit includes a 99.99% nitrogen gas cylinder for calibrating the zero point and a 200 PPM CO / 2000 PPM CO ₂ gas cylinder for calibrating the span point on Dwyer's gas sensing transmitters
A-449	Remote LCD display allows remote indication of select Dwyer® wall mount transmitters for validation or certification purposes
A-449A	Remote LCD display with buttons allows remote indication and calibration of select Dwyer® wall mount transmitters for validation and certification purposes
A-CDT-KIT	Accessory kit including terminal block and power supply

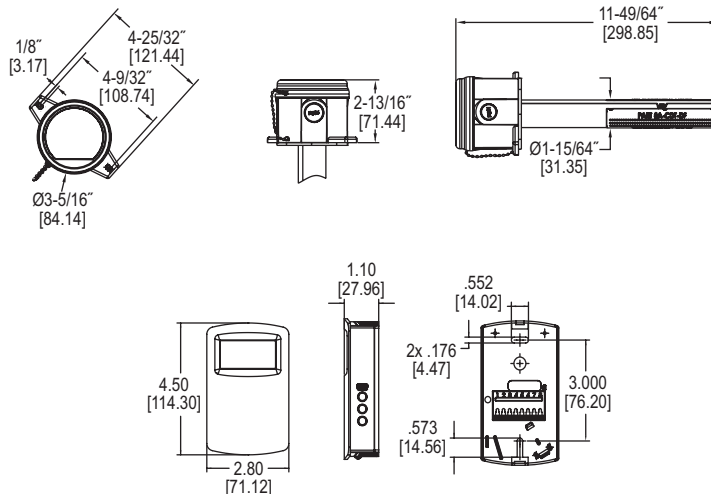


CARBON DIOXIDE/VOLATILE ORGANIC COMPOUND TRANSMITTERS

Simultaneously Outputs Both CO₂ / VOC



North American style



The **Series CDTV Carbon Dioxide/Volatile Organic Compound Transmitters** reduce energy cost in buildings by lowering the amount of conditioned air based on the occupancy of the space. By sensing both CO₂ and VOC, the transmitter can detect fumes that may need to be exhausted during lower occupancy periods.

FEATURES/BENEFITS

- Combination VOC and CO₂ outputs reduce labor and material costs
- Single beam dual wavelength NDIR CO₂ sensor allows for use in spaces that may be occupied 24 hours a day
- VOC output is correlated to be equivalent to CO₂ measurements
- Ventilate using ASHRAE's occupancy-based VRP Algorithm

APPLICATIONS

- HVAC applications in hospitals, schools, and commercial buildings
- Demand control ventilation
- Odor control
- Waiting rooms or other spaces that may be occupied 24 hours a day

MODEL CHART									
Example	CDTV	-2	D	4	A	4	-RLY	CDTV-2D4A4-RLY	
Series	CDTV							Carbon dioxide/VOC transmitter	
Range		2						0 to 2000 ppm CO ₂ range	
		5						0 to 5000 ppm CO ₂ range	
Configuration			D					Duct	
			N					North American style wall mount	
CO ₂ Output				4				4 to 20 mA / 0 to (5 or 10) VDC	
Temperature Output				0				None	
				A				10 KΩ NTC thermistor type III	
				B				10 KΩ NTC thermistor type II	
				C				3 KΩ NTC thermistor	
				D				Pt100 Ω RTD	
				E				Pt1000 Ω RTD	
				F				20 KΩ NTC thermistor	
VOC Output					4			4 to 20 mA / 0 to (5 or 10) VDC	
Options						RLY		Relay	
						FC		Factory calibration certificate	
						LCD		LCD display (wall only)	
						COC		Certificate of calibration	

SPECIFICATIONS

Range: CO₂: 0 to 2000 or 0 to 5000 ppm (depending on model); VOC: 0 to 2000 ppm CO₂ equivalent.

Accuracy: CO₂: ±40 ppm ±3% of reading.

Temperature Dependence: ±8 ppm / °C at 1100 ppm.

Non-Linearity: CO₂: 16 ppm.

Pressure Dependence: CO₂: 0.13% of reading per mm of Hg.

Response Time: CO₂: 2 minutes for 99% step change; VOC: 5 minutes.

Temperature Limits: 32 to 122°F (0 to 50°C).

Duct Air Velocity Range: 0-4000 FPM (20.32 m/s).

Power Requirements: 16 to 35 VDC / 19 to 28 VAC.

Power Consumption: Average: 2 watts; Peak: 3.75 watts.

Sensor: CO₂: Single-beam, dual-wavelength NDIR; VOC: MEMS metal oxide semiconductor.

Output: Current: 0 to 20 mA, 4 to 20 mA, 0 to 10 mA, or 2 to 10 mA (depending on selection jumper, max 500 Ω); Voltage: 0 to 10 VDC, 2 to 10 VDC, 0 to 5 VDC, or 1 to 5 VDC (depending on selection jumper, min 500 Ω); Relay: SPST NO 2A @ 30 VDC.

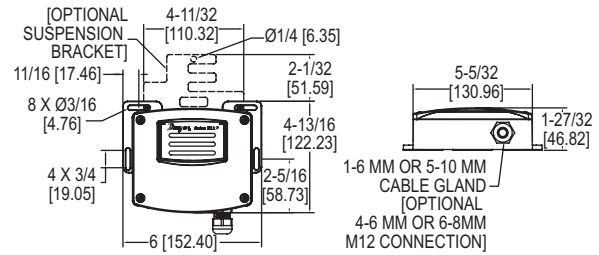
Weight: 5.6 oz (158.8 g).

Enclosure Rating: Duct mount: NEMA 4X (IP66) for housing only; Wall mount: IP20.

Agency Approvals: CE.

CARBON DIOXIDE TRANSMITTER

NDIR CO₂ Sensor with Universal Outputs in an Industrial Housing



The **Series CDWP Carbon Dioxide Transmitter** accurately monitors the CO₂ concentration in industrial and indoor environments to help achieve energy savings. For increased sensor life and accuracy, a single-beam dual-wavelength non-dispersive infrared (NDIR) sensor is used to eliminate light source aging effects. This sensing technology provides the highest level of accuracy compared to Automatic Baseline Correction methods, which can unintentionally shift the calibration based on CO₂ levels and barometric pressure conditions.

FEATURES/BENEFITS

- IP54 aluminum housing
- Gray finish tested to withstand 168 hour salt spray test
- Single-beam dual-wavelength sensor automatically corrects for aging effects
- Measures unfiltered light intensity directly and eliminates error from incorrect assumptions of gas concentration in theoretical logic assumption methods
- Universal outputs to work with any building management system

APPLICATIONS

- Animal husbandry
- CO₂ refrigeration monitoring
- Mechanical room
- Greenhouses

MODEL CHART						
Example	CDWP	-05	W	-M4	-FC	CDWP-05W-M4
Series	CDWP					Carbon dioxide transmitter
Range		02 05 10				2000 PPM 5000 PPM 10000 PPM
Mounting			W H			Wall mount Suspended mount
Electrical Connection				C1 C5 M4 M6		Cable gland 1 to 6 mm cable Cable gland 5 to 10 mm cable M12 connection 4 to 6 mm cable M12 connection 6 to 8 mm cable
Option					FC	Factory calibration certificate

SPECIFICATIONS

Sensor: Single beam, dual-wavelength NDIR.
Range: CO₂: 0 to 2000, 0 to 5000, or 0 to 10000 ppm (depending on model).
Accuracy: CO₂: ± 40 ppm ± 3% of reading.
Temperature Dependence: ± 8 ppm/°C at 1100 ppm.
Non-Linearity: 16 ppm.
Pressure Dependence: 0.13% of reading per mm of Hg.
Response Time: 300 s (T₆₃).
Temperature Limits: 32 to 122°F (0 to 50°C).
Humidity Limits: 10 to 95% RH (non-condensing).
Power Requirements: 16 to 35 VDC or 19 to 28 VAC.
Power Consumption: Average: 2 w; Peak: 3.75 w.
Output: Current: 4 to 20 mA (max. 500 Ω); Voltage: 0 to 5 VDC or 0 to 10 VDC (min. 500 Ω).
Enclosure Rating: IP54.
Mounting Orientation: Vertically, with electrical connections points downward.
Weight: 26.24 oz (744 g).
Agency Approvals: CE.

ACCESSORIES

Model	Description
A-CDWP-L	Replacement lid with filter material
A-CDWP-H	Suspended mount bracket

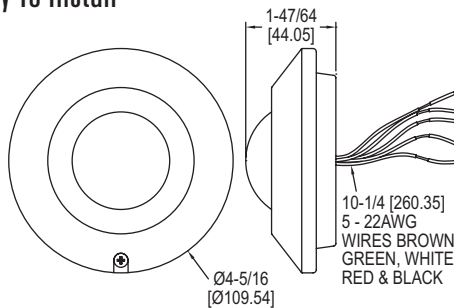
MODEL OSC-200 & OSW-100

OCCUPANCY SENSORS

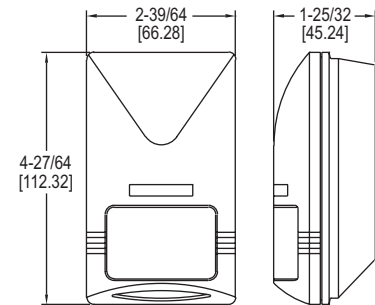
Wide Viewing Angle, Easy To Install



OSC-200



OSW-100



The **Model OSC-200 Occupancy Sensors** help to automate building control systems. A spherical Fresnel lens provides a 360° detection zone with the use of infrared technology.

The **Model OSW-100 Occupancy Sensor** is an infrared sensor designed to help automate building control systems. The Model OSW-100 has a wide 110° viewing angle to capture movement up to 49.2' (15 m) away.

FEATURES/BENEFITS

- Delay processor suppresses switch activation during momentary occupancy

APPLICATIONS

- Lighting control
- Building energy conservation

MODEL CHART	
Model	Description
OSC-200	Omnidirectional occupancy sensor
OSW-100	Wall mount occupancy sensor

SPECIFICATIONS

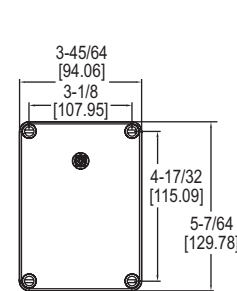
Infrared Sensor: Dual element.
Range: OSC-200: 34.4' (10.5 m) diameter at 13.8' (4.2 m) mount height; OSW-100: 49.2' (15 m).
Detectable Speed: 0.33 to 9.8 ft/s (0.1 to 3.0 m/s).
Control Output Rating: SPDT, 0.2 A @ 30 VDC.
Ambient Operating Temperature: -4 to 140°F (-20 to 60°C).
Power Consumption: Standby: 5 mA; Operating: 18 mA.
Mounting Height: OSC-200: 7.9 to 13.8' (2.4 to 4.2 m); OSW-100: 5.9 to 11.8' (1.8 to 3.6 m).
Power Requirements: 22 to 26 VAC/DC.
Weight: OSC-200: 2.4 oz (68 g); OSW-100: 3.2 oz (90.7 g).
Agency Approvals: CE.

CARBON MONOXIDE/NITROGEN DIOXIDE GAS TRANSMITTERS

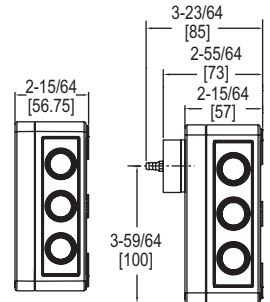
High Accuracy Electrochemical Sensor, Universal Output or BACnet or Modbus® Communication Protocol Options

Wall mount
with LCDWall mount
without LCD

Duct mount



Wall mount



Duct mount

The **Series GSTA & GSTC Carbon Monoxide/Nitrogen Dioxide Gas Transmitters** monitor gas concentrations in mechanical rooms, underground parking garages and loading docks. The carbon monoxide transmitter is used to measure the exhaust of gasoline engines, while the nitrogen dioxide transmitter is used for diesel engines. The Series GSTA features field selectable current and voltage outputs while the Series GSTC features BACnet or Modbus® communication protocol, allowing gas sensing solutions that can be used with almost any building management controller.

FEATURES/BENEFITS

- Industrial grade replaceable CO or NO₂ sensors
- Field selectable current or voltage output on GSTA models, and field selectable BACnet or Modbus® communication on GSTC models
- Integral LCD display option
- Service display tool for set-up and calibration of models without a LCD

APPLICATIONS

- Garage or loading dock ventilation
- Mechanical room monitoring

MODEL CHART				
Example	GSTA	-C		GSTA-C
Series	GSTA GSTC			Field selectable analog outputs Field selectable BACnet or Modbus®
Gas Sensed		C N		CO, carbon monoxide NO ₂ , nitrogen dioxide
Options		- D LCD		Wall mount without LCD Duct mount Wall mount with LCD

ACCESSORIES	
Model	Description
GCK-200CO-2000CO2	Calibration gas
A-449	Remote LCD display
A-505	CO replacement sensor
A-506	NO ₂ replacement sensor
A-507	Calibration adapter

SPECIFICATIONS

Sensor: Field replaceable electrochemical, 4 years typical lifespan.

Range: CO: 0 to 500 PPM, NO₂: 10 PPM.

Output Drift: <5% per year in air.

Coverage Area: 5000 to 7500 sq ft typical.

Accuracy: CO: 2% FS, NO₂: 3% FS, at the time of calibration.

Resolution: CO: 1 PPM; NO₂: 0.1 PPM.

Temperature Limits: -4 to 122°F (-20 to 50°C).

Storage Temperature: For best sensor life, 32 to 68°F (0 to 20°C).

Humidity Limits: 15 to 90% RH constant; 0 to 99% RH intermittent.

Response Time: <45 s to 90% CO, <25 s to 90% NO₂.

Span and Zero Adjustment: Via push-button, using optional A-449 display. Zero only via BACnet or MODBUS® communication protocol.

Housing: UV resistant glass filled polycarbonate.

Output Signals: GSTA: Switch selectable 4 to 20 mA (loop powered), 0 to 5 V @ 5 mA, or 0 to 10 V @ 5 mA; Switch selectable 0 to 5 V / 1 to 5 V and 0 to 10 V / 2 to 10 V; Switch selectable normal or reverse output; GSTC: BACnet MS/TP, Modbus® RTU, or Modbus® ASCII (switch selectable) communication protocol.

Power Requirements: GSTA: Current output: 10 to 35 VDC, Voltage output: 15 to 35 VDC or 15 to 29 VAC; GSTC: 10 to 36 VDC or isolated 21.6 to 33 VAC.

Electrical Connection: Removable terminal block, knock outs for conduit fitting.

Calibration: Via pushbuttons using A-449 auxiliary display. Span gas concentration is field selectable.

Enclosure Rating: IP64.

Weight: 1 lb (0.45 kg).

Agency Approvals: CE.



GCK-200CO-2000CO2



A-449



A-505



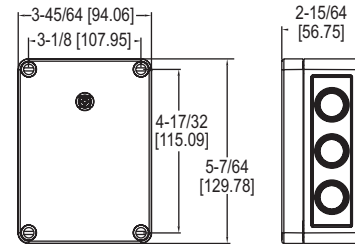
A-506



A-507

CARBON MONOXIDE TRANSMITTER AND SWITCH

Current/Voltage Selectable Output, Jumper Selectable SPDT Relay Contact



The **Model CMS300 Carbon Monoxide Transmitter and Switch** provides a field selectable current or voltage output that is proportional to the carbon monoxide concentration in underground parking garages, vehicle maintenance facilities, or mechanical rooms. An integral relay can be used for alarm conditions and is configured with preset jumper selectable ranges of 25, 60, or 150 PPM. Field calibration can be done by using Model GCK-200CO-2000CO2 calibration gas, Model A-507 calibration adapter, and the on board zero and span potentiometers.

FEATURES/BENEFITS

- Field selectable current or voltage analog outputs
- Integral SPDT relay contact for low or high alarm
- Jumper selectable alarm set points of 25, 60, or 150 PPM
- UL recognized carbon monoxide sensing element
- Field calibration kits

APPLICATIONS

- Garage or loading dock ventilation
- Vehicle maintenance facilities
- Mechanical room monitoring

MODEL CHART	
Model	Description
CMS300	Carbon monoxide transmitter and switch

SPECIFICATIONS

Sensor: Electrochemical, 5 years typical lifespan.
Range: 0-300 PPM.
Output Drift: <5% per year in air.
Temperature Effect: ±2% over range.
Coverage Area: 7,500 ft² (700 m²) or 50 ft (15 m) radius.
Accuracy: ±5 PPM or 5% of reading for 0-300 PPM (whichever is greater).
Resolution: 1 PPM.
Temperature Range: -4 to 122°F (-20 to 50°C).
Storage Temperature: For best sensor life, 32°F to 68°F (0 to 20°C).
Humidity Range: 15-90% RH constant; 0-99% RH intermittent.
Response Time: <45 seconds to 90% of final value.
Calibration: 15 turn span and zero adjustment potentiometers.

Housing: UV resistant glass filled polycarbonate.
Analog Output: Jumper selectable 4 to 20 mA (loop powered) or 2 to 10 V (maximum load 2K Ω).
Enclosure Rating: IP64.
Weight: 1 lb (0.45 kg).
Switch Type: Single-pole double-throw (SPDT).
Electrical Rating: 30 VAC/VDC. N/O = 5 A. N/C = 3 A.
Set Point: Jumper selectable 25, 60, or 150 PPM.
Set Point Differential/Hysteresis: 3% of scale.
Relay Action: Factory set for direct acting.
Agency Approvals: Sensor is UL recognized component for ANSI/UL-2034, UL-2075, E340403, CE.

ACCESSORIES

Model	Description
GCK-200CO-2000CO2	Calibration gas
A-507	Calibration adapter

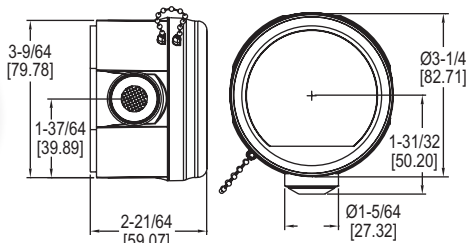
SERIES CMT200

CARBON MONOXIDE TRANSMITTERS

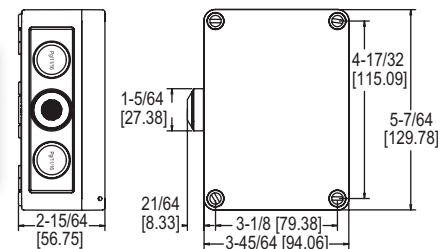
Current/Voltage Selectable Output, 200 PPM Range



CMT200



CMT200-R



The **Series CMT200 Carbon Monoxide Transmitters** provides a field selectable current or voltage output that is proportional to the gas concentration in underground parking garages, vehicle maintenance facilities, or mechanical rooms.

FEATURES/BENEFITS

- Field selectable current or voltage outputs
- Replaceable sensor
- Field calibration kits

APPLICATIONS

- Garage ventilation
- Mechanical room monitoring

MODEL CHART	
Model	Description
CMT200	Carbon monoxide transmitter
CMT200-R	Carbon monoxide transmitter with rugged housing

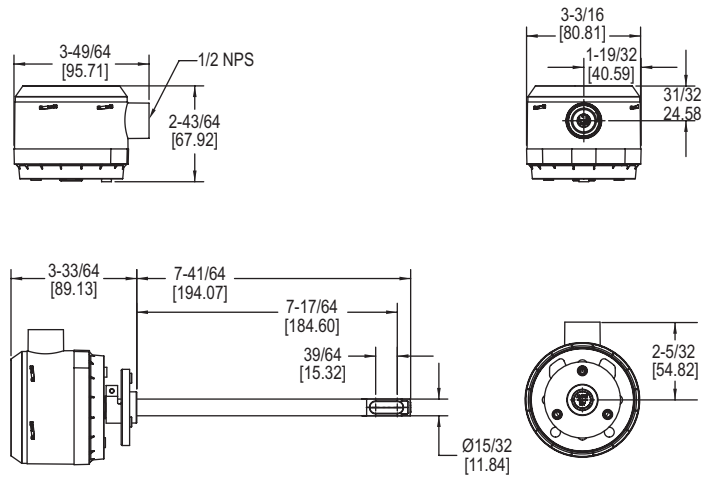
ACCESSORIES	
Model	Description
GCK-200CO-2000CO2	Calibration gas
A-505	Replacement Carbon Monoxide Sensor
A-507A	Calibration adaptor

SPECIFICATIONS

Sensor: Field replaceable electrochemical, 4 year typical lifespan.
Range: 0 to 200 ppm.
Coverage Area: 5000 to 7000 sq. ft. typical.
Accuracy: ±2% FS at the time of calibration.
Output Drift: <5% per year in air.
Temperature Limits: -4 to 122°F (-20 to 50°C).
Storage Temperature: For best sensor life, 32 to 68°F (0 to 20°C).
Humidity Limits: 15 to 90% RH constant; 0 to 99% RH intermittent.
Response Time: <45 s to 90% of final value.
Calibration: 15 turn span and zero adjustment potentiometers.
Housing: UV resistant polycarbonate.
Output: Jumper selectable 4 to 20 mA (loop powered) or 2 to 10 V (load must be >50 KΩ).
Power Requirements: Current Output: 18 to 28 VDC; Voltage Output: 18 to 28 VDC/VAC, reverse polarity protected.
Electrical Connection: Removable terminal block, includes two PG11 and one PG 16 knockouts for conduit fitting.
Weight: 0.28 lb (0.11 kg).
Agency Approvals: CE.

AIR VELOCITY TRANSMITTERS

3% and 5% Models, Optional BACnet or Modbus® Communication Protocols



The **Series AVUL Air Velocity Transmitters** quickly and accurately measures air velocity or volumetric flow in imperial or metric units. Simultaneous current and voltage outputs on all models provide universal inputs to monitoring equipment while the output range, units, and 0 to 5/10 VDC output can be configured via local DIP switches. The optional integral display, or the portable remote display tool, provide a convenient way to locally monitor process values and configure the unit. Models are available in 3% and 5% accuracy models to suit a variety of needs, and the optional BACnet MS/TP or Modbus® RTU/ASCII communication protocol allows units to be daisy-chained while providing access to all of the velocity and flow data, as well as additional information such as air temperature.

FEATURES/BENEFITS

- Sensing elements have been coated with an engineered conformal coating to ensure durability and longevity
- Field selectable ranges can be quickly configured without power to the unit

APPLICATIONS

- VAV systems
- Building ducts

MODEL CHART	
Model	Description
AVUL-5DA1	Air velocity transmitter, 5% accuracy, duct mount, Universal current/voltage outputs
AVUL-5DA1-LCD	Air velocity transmitter, 5% accuracy, duct mount, Universal current/voltage outputs, with LCD
AVUL-5DB1	Air velocity transmitter, 5% accuracy, duct mount, BACnet communications
AVUL-5DB1-LCD	Air velocity transmitter, 5% accuracy, duct mount, BACnet communications, with LCD
AVUL-5DM1	Air velocity transmitter, 5% accuracy, duct mount, Modbus® communications
AVUL-5DM1-LCD	Air velocity transmitter, 5% accuracy, duct mount, Modbus® communications, with LCD
AVUL-3DA1	Air velocity transmitter, 3% accuracy, duct mount, Universal current/voltage outputs
AVUL-3DA1-LCD	Air velocity transmitter, 3% accuracy, duct mount, Universal current/voltage outputs, with LCD
AVUL-3DB1	Air velocity transmitter, 3% accuracy, duct mount, BACnet communications
AVUL-3DB1-LCD	Air velocity transmitter, 3% accuracy, duct mount, BACnet communications, with LCD
AVUL-3DM1	Air velocity transmitter, 3% accuracy, duct mount, Modbus® communications
AVUL-3DM1-LCD	Air velocity transmitter, 3% accuracy, duct mount, Modbus® communications, with LCD

SPECIFICATIONS

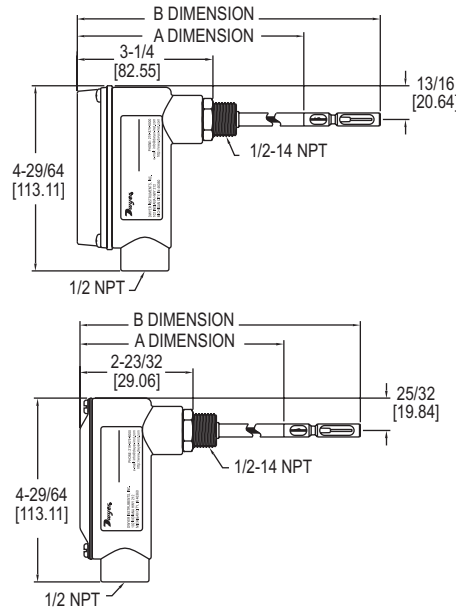
Service: Clean air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Range: 1000, 2000, 3000, 4000 FPM (5, 10, 15, 20 m/s); Field selectable.
Accuracy: $\pm(5\%$ of reading + 0.2 m/s) or $\pm(3\%$ of reading + 0.2 m/s) @ standard conditions, depending on model.
Temperature Limits: 32 to 122°F (0 to 50°C).
Power Requirements: 24 VDC $\pm 20\%$ or 24 VAC $\pm 20\%$.
Humidity Limits: 5 to 95% RH, non-condensing.
Output Signals: 4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC.
Response Time (90%): 10 s, typical.
Zero & Span Adjustments: Digital push-buttons.
Output Load Resistance: Current output: 0 to 1100 Ω max.; Voltage output: Minimum load resistance 1 k Ω .
Current Consumption: 60 mA max.
Display (optional): 5 digit LCD.
Electrical Connections (Analog): Power and output: four wire removable European style terminal block for 16 to 26 AWG.
Communication (optional): Connections: BACnet MS/TP or Modbus® RTU/ASCII: three wire removable European style terminal block for 16 to 26 AWG; Supported baud rates: 9600, 19200, 38400, 57600, 76800, 115200.
Device Load: 1/8th unit load.
Electrical Entry: 1/2" NPS thread. Accessory (A-151): Cable gland for 5 to 10 mm diameter cable.
Enclosure Rating: NEMA 4X (IP66).
Mounting Orientation: Flow direction must be parallel to the sensor tip.
Weight: 6.0 oz (160 g).
Agency Approval: BTL, CE.

ACCESSORIES

Model	Description
A-151	Cable gland for 5 to 10 mm diameter cable
A-435-A	Remote display tool
A-AVUL-LCD	Field upgradeable display
A-AVUL-MTG	Replacement mounting flange
SCD-PS	100 to 240 VAC/VDC to 24 VDC power supply

AIR VELOCITY TRANSMITTERS

High Accuracy, Field Selectable Ranges



641 AVT WITH DISPLAY OPTION	
A Dimension	B Dimension
7-63/64 [202.80]	9-13/16 [249.24]
13-63/64 [355.20]	15-13/16 [401.64]
19-63/64 [507.60]	21-13/16 [554.04]
26-63/64 [685.40]	28-13/16 [731.84]
32-63/64 [837.80]	34-13/16 [884.24]
37-63/64 [964.80]	39-13/16 [1011.24]

641 AVT WITHOUT DISPLAY OPTION	
A Dimension	B Dimension
7-7/16 [188.91]	9-9/32 [235.74]
13-7/16 [341.31]	15-9/32 [388.14]
19-7/16 [493.71]	21-9/32 [540.54]
26-7/16 [671.51]	28-9/32 [718.34]
29-7/16 [747.71]	34-9/32 [870.74]
37-7/16 [950.91]	39-9/32 [997.74]

The **Series 641 Air Velocity Transmitters** are the ideal instrument for monitoring air flow. This transmitter uses a heated mass flow sensor which allows for precise velocity measurements at various flow rates and temperatures. The 641's 16 field-selectable ranges provides it the versatility to be selected for several air flow applications. The optional LED produces a complete, low-cost solution for local indication of air flow.

FEATURES/BENEFITS

- Ranges from 250 FPM (1.25 MPS) to 15,000 FPM (75 MPS)
- Optional bright LED display
- Easy push-button set-up
- Compact housing
- 4 to 20 mA output
- Digital filter for signal damping

APPLICATIONS

- Exhaust stack flow monitoring
- Air control in drying processes
- HVAC air velocity measurements
- Fan supply and exhaust tracking
- Clean room ventilation monitoring

MODEL CHART	
Model	Probe Length*
641-6	6" (152.4 mm)
641-6-LED	6" (152.4 mm)
641-12	12" (304.8 mm)
641-12-LED	12" (304.8 mm)
641-18	18" (457.2 mm)
641-18-LED	18" (457.2 mm)
641-24	24" (609.6 mm)
641-24-LED	24" (609.6 mm)

*Other probe lengths available contact factory.

OPTIONS	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: 641-6-NIST	

ACCESSORIES	
Model	Description
A-156	Universal mounting plate, 1/2" female NPT
A-158	Split flange mounting kit
A-159	Duct mounting gland
641-LED	Field-upgradeable LED

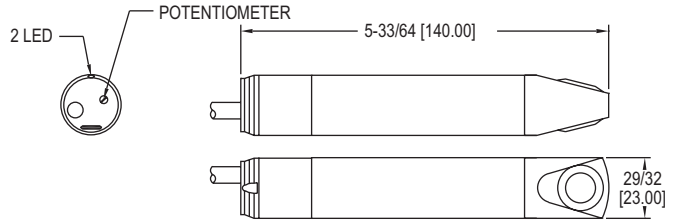
SPECIFICATIONS

Service: Clean air and compatible, non-combustible gases.
Accuracy: 3% FS process gas: 32 to 122°F (0 to 50°C); 4% FS process gas: -40 to 32°F & 122 to 212°F (-40 to 0°C & 50 to 100°C).
Response Time: Flow: 1.5 s to 95% of final value (output filter set to minimum).
Temperature Limits: Process: -40 to 212°F (-40 to 100°C); Ambient: 32 to 140°F (0 to 60°C).
Pressure Limit: 100 psi (6.89 bar) maximum.
Humidity Limit: Non-condensing.
Power Requirements: 12 to 35 VDC, 10 to 16 VAC. 1.5 A rating required on supply due to initial power surge drawn by transmitter.
Output Signal: 4 to 20 mA, isolated 24 V source, 3 or 4-wire connection.
Output Filter: Selectable 0.5 –15 (s).
Loop Resistance: 600 Ω max.
Current Consumption: 300 mA max.
Electrical Connections: Screw terminal.
Process Connections: 1/2" male NPT.
Enclosure Rating: Designed to meet NEMA 4X (IP66) for non LED models only.
Mounting Orientation: Unit not position sensitive. Probe must be aligned with airflow.
Weight: 12.6 oz (357.2 g).
Agency Approval: CE.

OPTIONAL DISPLAY VERSION:
Display: 4-1/2 digit 1/2" red LED.
Resolution: 1 FPM, 0.01 MPS (10 FPM @ 10,000 and 15,000 FPM ranges).
Weight: 13.3 oz (377 g).

AIR FLOW SWITCH

Monitors Flow in Ducts with Contact Output and Local LED Indication



The **Series AVFS Air Flow Switch** is specifically designed to monitor air flow in ducts and provides a 3 A contact output to indicate a change or loss of flow. The AVFS provides a +/-5% set-point repeatability across a full-scale range of 1-10 m/s (197-1969 fpm) and includes a mounting bracket for quick duct mounting.

FEATURES/BENEFITS

- Integral red/green air flow status LED's
- Flush sensor design limits issues due to dust or particulate in the air flow
- IP65 construction

APPLICATIONS

- Fan monitoring
- Filter monitoring
- Damper feedback
- Air handlers

MODEL CHART

Model	Description
AVFS-1	80-250 AC/DC power thermo air flow switch
AVFS-2	24 VDC power thermo air flow switch

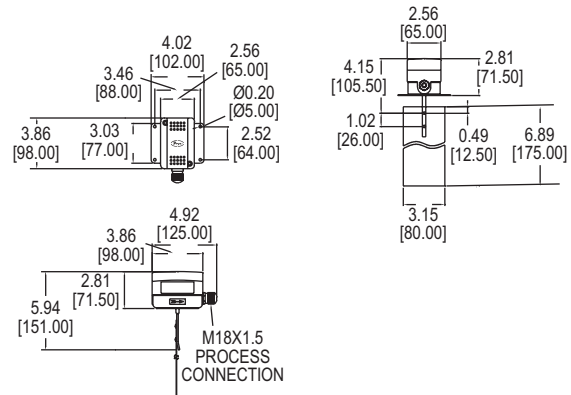
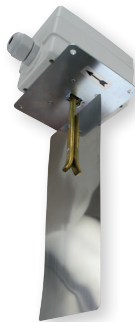
SPECIFICATIONS

Air Velocity Range: 197-1969 FPM (1-10 m/s).
Temperature Limits: 5 to 122°F (-10 to 50°C).
Humidity Limits: 0-90% RH.
Wetted Materials: PBT body, titanium sensor.
Pressure Limit: 14.7 psig (1 bar).
Housing: PBT.
Repeatability: ±5% FS.
Switch Type: N.O. SPST.
Electrical Rating: 3 A @ 30 VDC/250 VAC.
Response Time: 3-60 seconds. Varies with flow and set point.
Power Requirement: AVFS-1: 80 to 250 AC/DC (47 to 63 Hz AC); AVFS-2: 24 VDC ±25%.
Power Consumption: 3 VA.
Electrical Connection: 6.5' (2 m) cable.
Enclosure Rating: IP65.
Display: 1 Red LED/1 Green LED.
Weight: 7.2 oz (203 g).
Agency Approvals: CE.

MODEL AAFS

ADJUSTABLE AIR FLOW PADDLE SWITCH

Ranges from 200 to 1800 FPM, Stainless Steel Vane, ABS Housing



The **Model AAFS Adjustable Air Flow Paddle Switch** is capable of detecting a wide range of air velocities with minimal user calibration. Quality features include a stainless steel vane, galvanized steel base, and ABS enclosure.

FEATURES/BENEFITS

- Adjustable air flow sensitivity from 200 to 1800 FPM
- High current (15 A) rated SPDT contact
- IP65 enclosure rating

APPLICATIONS

- Air flow proving in HVAC systems

MODEL CHART

Model	Description
AAFS	Adjustable air flow paddle switch

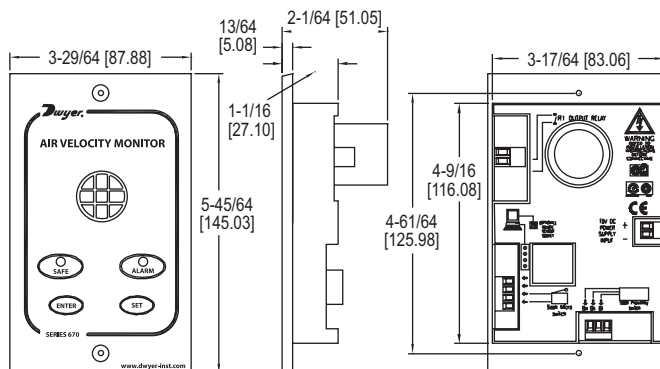
SPECIFICATIONS

Service: Air and compatible gas.
Wetted Materials: Vane: SS; Lever: Brass; Base: Galvanized steel.
Housing: ABS.
Temperature Limits: Ambient: -40 to 180°F (-40 to 85°C); Process: -14 to 185°F (-10 to 85°C).
Humidity Limits: 10 to 90%, non-condensing.
Switch Type: SPDT.
Electrical Rating: 15 (8) A @ 250 VAC.
Electrical Connection: Screw terminal with M18 x 1.5 cable gland.
Process Connection: Flange.
Mounting Orientation: Horizontal duct flow.
Set Point: Internal screw.
Enclosure Rating: IP65.
Weight: 13.6 oz (380 g).
Agency Approvals: CE.

USA: California Proposition 65
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

FUME HOOD MONITOR

Ensures Proper Fume Hood Performance



The **Model 670 Fume Hood Monitor** continuously senses air flow through the face of the fume hood, ensuring safe levels of fresh air are exhausting. The 670 provides a highly accurate hot wire sensor to detect very low flows common on fume hoods. The Model 670 comes with everything required to quickly install the unit including a mounting bracket, 24" of tubing for connecting to the inside of the hood wall and a 120 Volt AC power adapter.

FEATURES/BENEFITS

- Flexible surface or flush mounting
- LED safe and alarm status indicators
- Audible alarm
- Sash alarm input
- Night time set-back

APPLICATIONS

- Fume hood ventilation monitoring

MODEL CHART	
Model	Description
670	Fume hood monitor

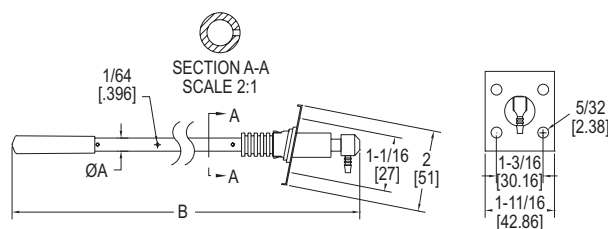
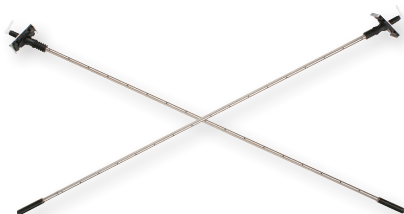
SPECIFICATIONS

Service: Fume hood face velocity air flow.
Alarm Range: 30-400 FPM (0.15-2.0 m/s).
Alarm Indication: Red LED & audible alarm.
Low Air Velocity Alarm Delay: Fixed 5 secs.
Visual LED Display: 15 VDC 500 mA; 120 VAC, 60 Hz power transformer included.
Relay Output Low Air Flow Alarm: 5 A @ 250 VAC.
Relay Input For Night Setback: 2 wire rated for 24 VDC usage.
Sash High Indication: Using a two wire micro switch or 3 wire proximity switch input, rated for y: Red: Alarm; Green: Normal.
Horn Silence: Yes-temporary and permanent.
Accuracy: Face velocity $\pm 10\%$.
Temperature Limits: Operating temperature: 55 to 86°F (13 to 30°C); Storage temperature: -40 to 150°F (-40 to 65°C).
Power Requirement: 24 VDC usage.
Mounting: Semi flush, flush or surface mounted when using included bracket.
Weight: 5.0 oz (141 g).

SERIES AFG

AVERAGING FLOW GRID

Cost Effective Air Flow Station for Ducts up to 60"



The **Series AFG Averaging Flow Grid** is a fundamental pressure-sensing device designed to sense velocity pressure in an air duct. When this output is connected to a suitable measuring instrument (i.e. manometer, pressure transducer, etc.) it may be used to determine air velocity or air flow rate.

FEATURES/BENEFITS

- Kit complete with 2 probes and installation hardware
- Trimmable length for any duct size up to 60"
- Alternative to costly air flow stations

APPLICATIONS

- To display differential pressure, velocity or volume flow using a micro manometer, gage or transmitter
- To give a warning of over or under flow rate using a pressure switch
- To control air supply in a system by connecting the grid to a pressure transmitter with an electrical output which can be used to feed into a control system
- To display differential pressure on a simple fluid manometer to give visual indication of changes in volume flow rate in the duct

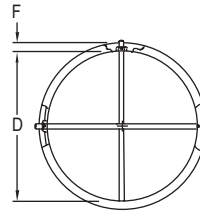
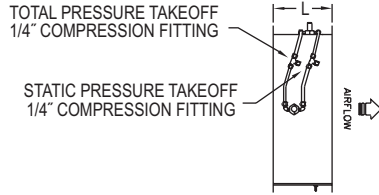
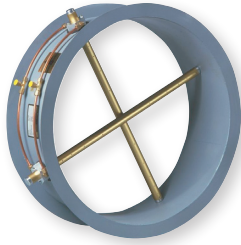
SPECIFICATIONS

Service: Monitor air or compatible gas flow.
Wetted Materials: 304 SS, PVC, polyurethane, acetyl plastics, and neoprene rubber.
Accuracy: $\pm 5\%$.
Maximum Temperature: 176°F (80°C).
Velocity Range: 295.2 ft/min to 5904 ft/min (1.5 to 30 m/s).
Diameter of Tubes: 5/16" (8 mm) or 5/8" (16 mm).
Maximum Duct Diagonal: 60.4" (153.4 cm).
Maximum Duct Diameter: 59.4" (150.9 cm).
Process Connections: 5/16" barbed.
Weight: AFG-1: 1 lb (454 g); AFG-2: 3 lb (1361 g).

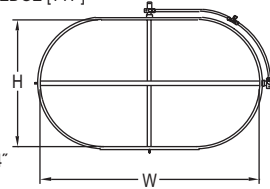
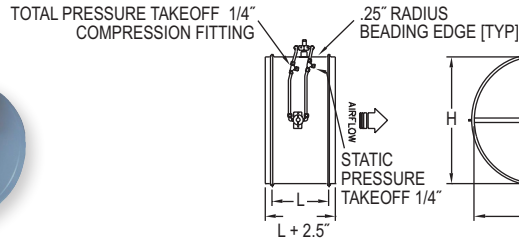
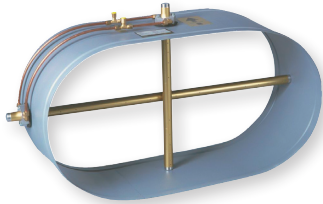
MODEL CHART		
Model	Diameter Tube (Dim. A) in (mm)	Length (Dim. B) in (mm)
AFG-1	5/16 (8)	27 (688)
AFG-2	5/8 (16)	59-4/5 (1518)

DUCT MOUNTED AIRFLOW MEASUREMENT STATIONS

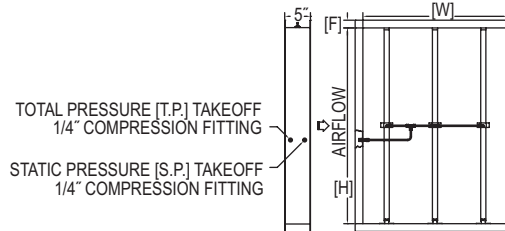
Rectangular, Oval or Circular Configurations



DIMENSIONS - CIRCULAR FLANGE			
Station Size "D"	Flange Thickness	Flange Size "F"	Casing Length "L"
8" - 15"	.064"	1"	6"
16" - 44"	.064"	1-1/2"	6"
45" - 72"	.188"	1-1/2"	10"
73" & over	.188"	2"	12"



DIMENSIONS - OVAL FLANGE			
Station Width "W"	Flange Thickness	Flange Size "F"	Casing Length "L"
Up to 48"	.064"	1-1/2"	6"
Over 48"	.188"	1-1/2"	8"



DIMENSIONS - RECTANGULAR FLANGE	
Station Size "H" or "W"	Flange Size "F"
8" - 72"	1-1/2"
73" & Over	2"

The **Series FLST Duct Mounted Airflow Measurement Stations** utilize an airflow averaging element generating a velocity pressure signal similar to the orifice, venturi, and other primary elements. Single or multiple airflow elements are factory mounted and pre-piped in a casing designed for flanged connection to the ductwork. Multiple elements are joined together for connection to a differential measurement device (gauge, transmitter, etc.) for flow measurement and indication purposes.

FEATURES/BENEFITS

- Low signal-to-noise ratio
- Factory mounted and pre-piped in a flanged duct section (casing)
- Standard construction includes galvanized casing and 6063-T5 anodized aluminum flow sensors
- Standard airflow stations can be operated (in air) continuously in temperatures up to 350°F or intermittently in temperatures up to 400°F





APPLICATIONS

- Building air intake and exhaust flow rate measurement
- HVAC air flow measurement

Circular Models

FLST-C 
 DIAMETER (IN)*

Rectangular or Oval Models

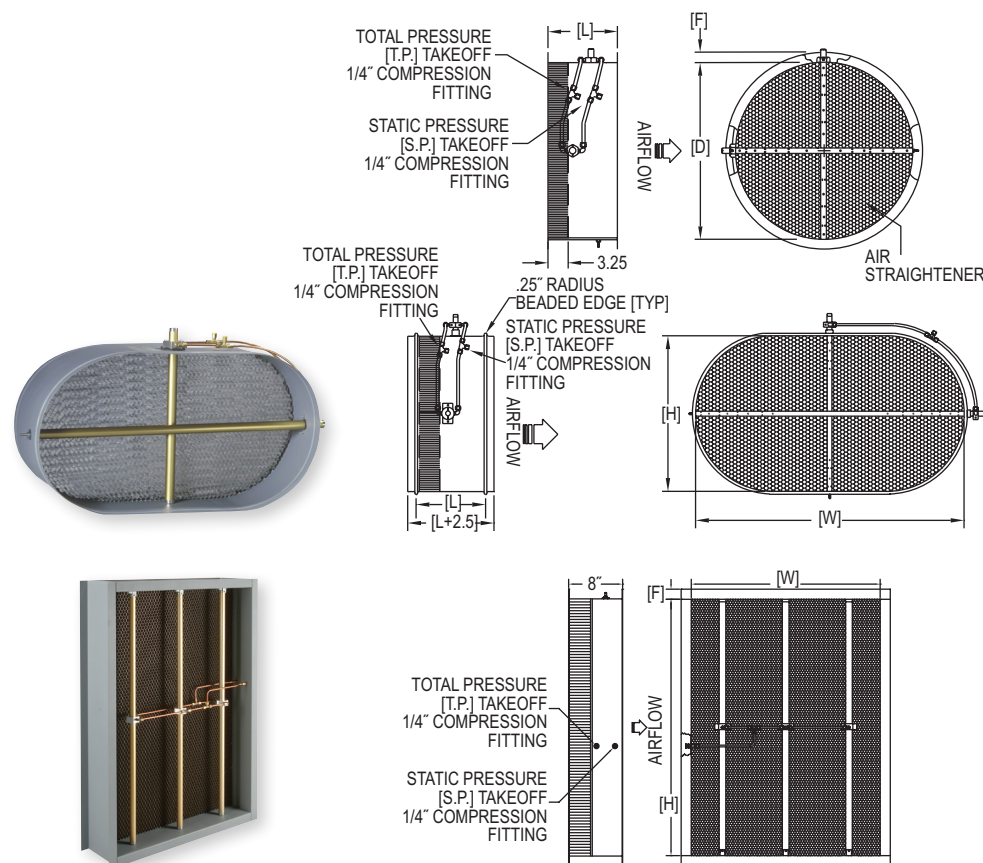
FLST -   x  - 
 CONFIGURATION HEIGHT (IN) x WIDTH (IN)* OPTION
 R – Rectangular IM – Internal pressure connections
 O – Oval F – Flange for oval mount station

Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

*Metric dimensions available upon request.

DUCT MOUNTED AIRFLOW MEASUREMENT STATIONS

Integral Flow Straightener, Ideal for Turbulent Measuring Conditions



DIMENSIONS - CIRCULAR FLANGE			
Station Size "D"	Flange Thickness	Flange Size "F"	Casing Length "L"
8" - 15"	.064"	1"	8"
16" - 44"	.064"	1-1/2"	8"
45" - 72"	.188"	1-1/2"	10"
73" & over	.188"	2"	12"

DIMENSIONS - OVAL FLANGE (OPTIONAL)			
Station Width "W"	Flange Thickness	Flange Size	*Casing Length "L"
Up to 44"	.064"	1-1/2"	8"
Over 44"	.188"	1-1/2"	10"

*All oval flow stations without flange have a casing length of 8".

DIMENSIONS - RECTANGULAR FLANGE	
Station Size "H" or "W"	Flange Size "F"
8" - 72"	1-1/2"
73" & Over	2"

The **Series STRA Duct Mounted Airflow Measurement Stations** utilize an airflow averaging element generating a velocity pressure signal similar to the orifice, venturi, and other primary elements. Single or multiple airflow elements are factory mounted and pre-piped in a casing designed for flanged connection to the ductwork. Multiple elements are joined together for connection to a differential measurement device (gauge, transmitter, etc.) for flow measurement and indication purposes. It has been developed with a honeycomb airflow straightening section for use in duct systems having highly turbulent conditions at the point of measurement.

FEATURES/BENEFITS

- Honeycomb airflow straightening section with 1/2 opening by 3" depth
- Low signal-to-noise ratio
- Factory mounted and pre-piped in a flanged duct section (casing)
- Standard construction includes galvanized casing and 6063-T5 anodized aluminum flow sensors
- Standard airflow stations can be operated (in air) continuously in temperatures up to 350°F or intermittently in temperatures up to 400°F




APPLICATIONS

- Building air intake and exhaust flow rate measurement
- HVAC air flow measurement

Circular Models

STRA-C 
DIAMETER (IN)*

Rectangular or Oval Models

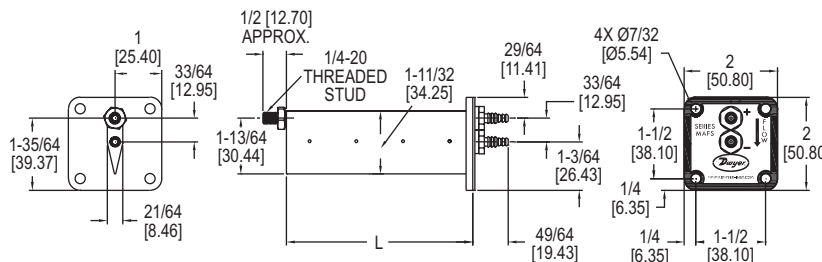
STRA -  x  - 
CONFIGURATION HEIGHT (IN) x WIDTH (IN)* OPTION
R - Rectangular IM - Internal pressure connections
O - Oval F - Flange for oval mount station

Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

*Metric dimensions available upon request.

METAL AVERAGING FLOW SENSOR

Blade Profile Provides Enhanced Performance and Minimal Flow Disruption



The **Series MAFS Metal Averaging Flow Sensor** is ideal for use with Dwyer Instruments, Inc. precision air velocity gages, transmitters and switches. The Series MAFS uses evenly distributed total and static pressure measuring points to deliver an accurate measurement of velocity pressure in a duct.

FEATURES/BENEFITS

- Blade design limits disruption of air stream
- Lightweight aluminum construction
- Flange mount for rectangular or square ducts

APPLICATIONS

- VAV air flow measurement
- Fume hood exhaust flow verification
- HVAC retrofit air flow measurement

SPECIFICATIONS

Service: Clean air.

Wetted Materials: Aluminum AA6063.

Accuracy: 400 to 9000 FPM (45.7 m/s); $\pm 2\%$ FS, $\pm 3\%$ FS for 6" (160 mm) and 48" (1200 mm) length models.

K-Factor: 0.81, 0.80 for 6" (160 mm) and 48" (1200 mm) lengths, 4" (100 mm) length=0.82.

Maximum Temperature: 400°F (204°C); Gasket: -31 to 230°F (-35 to 110°C).

Minimum Design Flow: 400 fpm (2 m/s).

Maximum Design Flow: 12,000 fpm (60.91 m/s).

Process Connections: Dual barb for 3/16" or 1/4" ID tubing.

Straight Run Requirements: 5 diameters or longest side dimensions.

Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

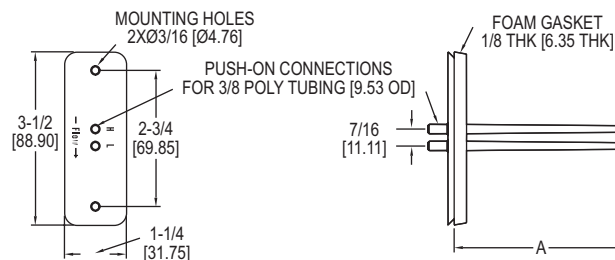
MODEL CHART

Model	Probe Length (in)	Model	Probe Length (in)	Model	Probe Length (mm)	Model	Probe Length (mm)
MAFS-4	4	MAFS-24	24	MAFS-100MM	100	MAFS-550MM	550
MAFS-6	6	MAFS-26	26	MAFS-125MM	125	MAFS-600MM	600
MAFS-8	8	MAFS-28	28	MAFS-160MM	160	MAFS-630MM	630
MAFS-10	10	MAFS-30	30	MAFS-200MM	200	MAFS-650MM	650
MAFS-12	12	MAFS-32	32	MAFS-250MM	250	MAFS-750MM	750
MAFS-14	14	MAFS-34	34	MAFS-300MM	300	MAFS-800MM	800
MAFS-16	16	MAFS-36	36	MAFS-315MM	315	MAFS-1000MM	1000
MAFS-18	18	MAFS-40	40	MAFS-400MM	400	MAFS-1500MM	1500
MAFS-20	20	MAFS-48	48	MAFS-450MM	450	MAFS-2000MM	2000
MAFS-22	22			MAFS-500MM	500		

SERIES PAFS-1000

AVERAGING FLOW SENSORS

Ideal for Sensing Fan Flow Rates



The **Series PAFS-1000 Averaging Flow Sensors** are ideal for sensing velocity pressure in the inlet section of variable air volume terminal units and fan terminal units.

FEATURES/BENEFITS

- Simple mounting flange works with both round or rectangular ducts

APPLICATIONS

- Zone control in HVAC systems
- Retrofit HVAC air flow measurement

SPECIFICATIONS

Service: Air and compatible gases.

Wetted Materials: ABS/polycarbonate (UL94-5V)

Temperature Limits: Operating: 40 to 120°F (4 to 49°C); Storage: -40 to 140°F (-40 to 60°C).

Process Connection: 1/4" (6 mm) ID, 3/8" (10 mm) OD tubing.

Mounting Orientation: Integral flange with gasket.

Weight: 1 oz (28 g).

Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

MODEL CHART

Model	Length (Dim. A) in (cm)	Model	Length (Dim. A) in (cm)
PAFS-1002	3-5/32 (8.02)	PAFS-1007	14-3/4 (37.47)
PAFS-1003	5-13/32 (13.73)	PAFS-1008	17-1/8 (43.50)
PAFS-1004	7-21/32 (19.55)	PAFS-1009	19-13/32 (49.29)
PAFS-1005	9-29/32 (25.26)	PAFS-1010	21-21/32 (55.01)
PAFS-1006	12-1/2 (31.75)	PAFS-1011	23-29/32 (60.72)

INSERTION ELECTROMAGNETIC FLOW TRANSMITTER

Field Configurable, High Accuracy, BACnet or Modbus® Protocol



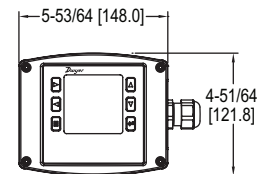
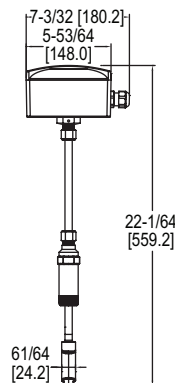
Shown with
A-IEF-VLV-BR**
accessory valve



-LCD option shown



A-IEF-KIT



The **Series IEF Insertion Electromagnetic Flow Transmitter** is an adjustable insertion flowmeter featuring electromagnetic technology that accurately and reliably measures fluid velocity in addition to providing several continuous signal outputs. This series is specifically designed to offer superior performance paired with simple installation and use. One unit is adjustable to fit pipe sizes from 4 to 36" (102 to 914 mm), and offers several output options including selectable BACnet MS/TP or Modbus® RTU communications protocol over 2-wire RS-485 in addition to the standard analog, frequency and alarm outputs.

FEATURES/BENEFITS

- Field configurable setup displays (-LCD integral option or remote accessory A-IEF-DSP) allow for ultimate flexibility by accommodating a variety of application configurations with one model through multiple display configurations i.e. pipe size, pipe material, liquid type, analog output, pulse/frequency output, alarm outputs, communication outputs, damping, and calibration factor.
- High performance accuracy is maintained through changes in temperature, density or viscosity.
- Setup Wizard and installation tool are simple to use allowing for quick and precise installation.
- Accessory setup kit A-IEF-KIT ensures exact installation application depth with included thickness gage and measuring tape.
- Long Life Cycle and minimal maintenance requirements with no moving parts to wear or break and electrodes that discourage fouling.
- Isolation valve accessory options allow for installation in operational systems via hot-tap kit or easy removal without system downtime.
- NIST traceable pass/fail verification certificate included standard for Carbon Steel Schedule 40 pipes sized 4" (102 mm), 6" (150 mm), 8" (200 mm), and 10" (250 mm) with high accuracy option; 10" (250 mm) with standard option.

APPLICATIONS

- Boiler feed water
- Chilled water
- Open and closed loop condenser water
- Irrigation system
- Municipal water distribution
- Process and coolant flow
- Ground water remediation
- Chemical processing
- Pump protection
- Wastewater
- Mining

SPECIFICATIONS

Service: Compatible clean or dirty non coating, conductive liquids.
Range: 0 to 20 ft/s (0 to 6 m/s).
Wetted Materials: Body shaft/fitting: 316 SS; Electrodes: 316 SS; Electrode cap: Polymer/Polystyrene; O-ring: Silicon.
Accuracy: High accuracy units: $\pm 0.5\%$ of reading at calibrated velocity; $\pm 1\%$ of reading from 2 to 20 ft/s (0.6 to 6 m/s); ± 0.02 ft/s (± 0.006 m/s) at < 2 ft/s (0.6 m/s); Standard accuracy units: $\pm 1\%$ FS.
Temperature Limits: Ambient: -20 to 160°F (-29 to 71°C); Process: 15 to 250°F (-9 to 121°C); Storage: -40 to 185°F (-40 to 85°C).
Process Connection: 1" NPT or BSPT with accessory full port ball valve options.
Pressure Limits: 400 psi (27.6 bar) @ 100° F (37.8°C).
Pressure Drop: < 0.1 psi at 12 ft/s in 4" (101.6 mm) and larger pipe.
Outputs: (1) Analog: 4 to 20 mA, 0 to 5 V, 0 to 10 V or 2 to 10 V (display selectable); (1) Pulse/Frequency: 0 to 15 V peak pulse, 0 to 500 Hz or scalable pulse output (display selectable); (2) Alarm: (1) Empty pipe detection or minimum/maximum velocity, (display selectable); (1) Reverse flow output indication.
Power Requirements: 12 to 42.4 VDC, .25 A @ 24 VDC; 12 to 36 VAC.

Electrical Connection: Removable terminal blocks, model selectable 1/2" female NPT conduit connection, PG 16 gland or PG 16 gland with (2) 10 ft (3 m) 9 conductor 22 AWG plenum rated cables, accessory cable lengths up to 200 ft (61 m) optional.
Display (-LCD option): 2" (5.08 cm) x " (5.08 cm) graphic LCD with backlight.
Conductivity: > 20 microsiemens.
Enclosure Material: Powder coated die cast aluminum.
Enclosure Ratings: NEMA 6P (IP68) (Non display models); NEMA 4X (IP66) (-LCD option).
Agency Approvals: BTL, CE, NSF/ANSI 61 and 372.

COMMUNICATIONS (-COM OPTION)

Type: BACnet MS/TP or Modbus® RTU communication protocol (default disabled, display selectable).
Supported Baud Rates: 9600, 19200, 38400, 57600, 76800, or 115200 bps (display selectable).
Device Load: 1/8 unit load.

ADDITIONAL SPECIFICATIONS

Applicable Pipe Material: Most popular plastic and metal pipes; i.e. Carbon steel, SS, copper, UPVC/PVDF, galvanized steel, mild steel, and brass.
Applicable Pipe Size: 4-36" (101 to 914 mm), model dependent. See model chart.
Diameter Length Requirements: > 10 upstream; > 5 downstream.
Glycol: 0 to 100% display selectable.

*For max flowrates > 10 ft/s (3 m/s) order option -CC.

†Brass fittings and pipe are not to be used with NSF Certified models.

MODEL CHART					
Example	IEF	-H	N	-CND	-LCD
Series	IEF				
Accuracy		L G S F I E T H			
					Standard accuracy $< 10"$ (250 mm) pipe; 1% FS Standard accuracy $> 10"$ (250 mm) pipe; 1% FS Standard accuracy 4 to 36" (100 to 900 mm) pipe; 1% FS High accuracy 4" (100 mm) pipe; 1% of reading High accuracy 6" (150 mm) pipe; 1% of reading High accuracy 8" (200 mm) pipe; 1% of reading High accuracy 10" (250 mm) pipe; 1% of reading High accuracy 4 to 10" (100 to 250 mm) pipe; 1% of reading
Process Connection			N B		
					1" male NPT 1" male BSPT
Housing Electrical Connection				CND PG 10	
					1/2" female NPT conduit connection without cable PG gland without cable PG gland with 10' (3 m) cable
Options					LCD COM NIST FC CC NW
					Integral LCD display BACnet or Modbus® communication protocol (display selectable) Six point NIST traceable calibration certificate Factory calibration certificate for 0.5% of reading at single point Custom configured for specific installation NSF certified

Note: For CC option, must provide completed configuration paperwork.

ACCESSORIES	
Model	Description
A-IEF-KIT	Setup kit (includes setup display, thickness gage and measuring tape), and universal power adapter
A-IEF-DSP	Setup display
A-IEF-CBL-50	Plenum rated cable 50 ft (15.2 m)
A-IEF-VLV-BR	1-1/4" full port isolation valve brass**
A-IEF-VLV-SS	1-1/4" full port isolation valve 316 SS
A-IEF-PA	AC wall adapter

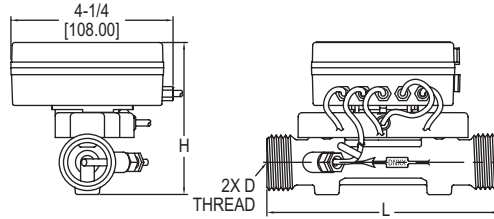
**Brass fittings and pipe are not to be used with NSF Certified models. Brass valves are non-RoHS compliant.

ULTRASONIC ENERGY METERS

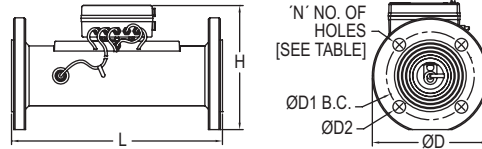
Flow & Temperature Monitoring Capability, Modbus® or BACnet Communication



TUF-150/400



TUF-500



DIMENSIONS in [mm]				
Model	L	D	H	
TUF-150-XX	4-21/64 [110.00]	G3/4B	3-31/32 [101.00]	
TUF-200-XX	5-1/8 [130.00]	G1B	3-31/32 [101.00]	
TUF-250-XX	6-19/64 [160.00]	G11/4B	4-11/64 [106.00]	
TUF-320-XX	7-3/32 [180.00]	G11/2B	4-29/64 [113.00]	
TUF-400-XX	7-7/8 [200.00]	G2B	4-49/64 [121.00]	

DIMENSIONS in [mm]						
Model	L	ØD	H	ØD1	ØD2	N
TUF-500-XX	7-7/8 [200]	6-1/2 [165.00]	9-27/32 [250]	4-59/64 [125.00]	45/64 [18.00]	4
TUF-650-XX	7-7/8 [200]	7-9/32 [185.00]	10-7/16 [265]	5-45/64 [145.00]	45/64 [18.00]	4
TUF-800-XX	8-55/64 [225]	7-7/8 [200.00]	11-1/32 [280]	6-19/64 [160.00]	45/64 [18.00]	8
TUF-1000-XX	9-27/32 [250]	8-21/32 [220.00]	12-13/64 [310]	7-3/32 [180.00]	45/64 [18.00]	8
TUF-1250-XX	9-27/32 [250]	9-27/32 [250.00]	12-63/64 [330]	8-17/64 [210.00]	45/64 [18.00]	8

The **Series TUF Ultrasonic Energy Meters** are highly accurate and stable energy meter that utilizes ultrasonic technology to measure heating and cooling energy consumption. The Series TUF is a compact meter with a flowmeter and energy calculator in one, making it great for installation on chillers and boilers.

FEATURES/BENEFITS

- Lower maintenance costs with local parameter display and no moving parts
- Serial communication output allows for easy transfer of data
- Flow and temperature monitor in one unit eliminates the need for multiple units

APPLICATIONS

- Heat metering
- Tenant billing
- Utilities billing
- Monitoring of water heating or cooling: radiators, fan coils

INSTRUCTIONS FOR ORDERING

- Choose 1 ultrasonic energy meter model (includes 2 BSPP pipe fittings, 2 tightening nuts, 2 O-rings, and 1 thermowell with welding collar)
- Choose 1 pipe fitting model given the appropriate fitting size if NPT or BSPT connections are required (for DN15 to DN40 only)*

Example: TUF-150-MD, Fitting Size: A, select pipe fitting Model WM-ACC-C01 or WM-ACC-C11.

SPECIFICATIONS

Service: Clean, compatible liquids. Wetted Materials: Brass and 316L SS. Range: See chart. Display: 8-digit LED. Accuracy: BTU: EN1434/CJ128 Class 2; Flow: $\pm(2+(0.02 Q_p / Q))\%$; Temperature: $\pm 0.1^\circ\text{C}$. Power Requirements: 24 VDC/VAC (model dependent) or 3.6 V ER26500 lithium metal battery, user supplied and installed, battery acts as back-up if power is lost. Power Consumption: 1 W. Temperature Limits: Ambient: 41 to 131°F (5 to 55°C); Process: 36 to 203°F (2 to 95°C). Humidity Limit: < 93%.	Pressure Limits: 232 psi (16 bar) for DN15 to DN40; 362 psi (25 bar) for >DN50. Pressure Drop: < 1.5 psi (10 kPa). Process Connection: See chart. Serial Communications: Modbus® RTU or BACnet MSTP (selectable)**. Enclosure Rating: IP65. Enclosure Material: Plastic. Repeatability: Flowmeter: 1%. Electrical Connections: 3' (0.91 m) 4x0.2 mm2 cable with terminal block. Flow Direction: Unidirectional. Mounting Orientation: Horizontal or vertical. Weight: See chart. Agency Approvals: CE.
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**M-BUS available upon request.

MODEL CHART										
Ultrasonic Energy Meter Model	Body Size†	Pipe Size		Fitting Size	Communication	Meter Connection	GPM (LPM)			Weight lb (kg)
		in	mm				Min Flow (Qi)	Nominal Flow Range (Qp)	Max Flow (Qs)	
TUF-150-MD	DN15	1/2	15	A	Modbus®	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)	3.1 (1.4)
TUF-200-MD	DN20	3/4	20	B	Modbus®	G1	0.2 (0.8)	11 (42)	22 (83)	3.1 (1.4)
TUF-250-MD	DN25	1	25	C	Modbus®	G1-1/4	0.3 (1.2)	15 (58)	31 (117)	4.1 (1.8)
TUF-320-MD	DN32	1-1/4	32	D	Modbus®	G1-1/2	0.5 (2)	26 (100)	53 (200)	5.2 (2.3)
TUF-400-MD	DN40	1-1/2	40	E	Modbus®	G2	0.9 (3)	44 (167)	88 (333)	6.6 (3)
TUF-500-MD*	DN50	2	50	-	Modbus®	Flange	1.3 (5)	66 (250)	132 (500)	33 (15)
TUF-650-MD	DN65	2-1/2	65	-	Modbus®	Flange	2.2 (8.3)	110 (417)	220 (833)	10.1 (4.6)
TUF-800-MD	DN80	3	80	-	Modbus®	Flange	3.5 (13.3)	176 (667)	352 (1333)	13.5 (6.1)
TUF-1000-MD	DN100	4	100	-	Modbus®	Flange	5.3 (20)	264 (1000)	528 (2000)	16.5 (7.5)
TUF-1250-MD	DN125	5	125	-	Modbus®	Flange	8.8 (33)	440 (1667)	881 (3333)	21.1 (9.6)
TUF-150-BN	DN15	1/2	15	A	BACnet	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)	3.1 (1.4)
TUF-200-BN	DN20	3/4	20	B	BACnet	G2	0.2 (0.8)	11 (42)	22 (83)	3.1 (1.4)
TUF-250-BN	DN25	1	25	C	BACnet	G1-1/4	0.3 (1.2)	15 (58)	31 (117)	4.1 (1.8)
TUF-320-BN	DN32	1-1/4	32	D	BACnet	G1-1/2	0.5 (2)	26 (100)	53 (200)	5.2 (2.3)
TUF-400-BN	DN40	1-1/2	40	E	BACnet	G2	0.9 (3)	44 (167)	88 (333)	6.6 (3)
TUF-500-BN*	DN50	2	50	-	BACnet	Flange	1.3 (5)	66 (250)	132 (500)	33 (15)
TUF-650-BN	DN65	2-1/2	65	-	BACnet	Flange	2.2 (8.3)	110 (417)	220 (833)	10.1 (4.6)
TUF-800-BN	DN80	3	80	-	BACnet	Flange	3.5 (13.3)	176 (667)	352 (1333)	13.5 (6.1)
TUF-1000-BN	DN100	4	100	-	BACnet	Flange	5.3 (20)	264 (1000)	528 (2000)	16.5 (7.5)
TUF-1250-BN	DN125	5	125	-	BACnet	Flange	8.8 (33)	440 (1667)	881 (3333)	21.1 (9.6)
Model		Power Requirements								
TUF-XXX-XX		24 VAC/VDC								
TUF-XXX-XX-DC		24 VDC								

*A pipe fitting is required to use the DN15 to DN40 energy meters. The DN50 has a flange connection and does not require a pipe fitting.

†For additional sizes up to 8" (203.2 mm) contact factory.

MODEL CHART							
Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)	Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)
A	WM-ACC-C01	1/2" NPT	0.6 (0.3)	C	WM-ACC-C13	1" BSPT	1.8 (0.8)
A	WM-ACC-C11	1/2" BSPT	0.6 (0.3)	D	WM-ACC-C04	1-1/4" NPT	2.3 (1.1)
B	WM-ACC-C02	3/4" NPT	1.2 (0.5)	D	WM-ACC-C14	1-1/4" BSPT	2.3 (1.1)
B	WM-ACC-C12	3/4" BSPT	1.2 (0.5)	E	WM-ACC-C05	1-1/2" NPT	4.4 (2)
C	WM-ACC-C03	1" NPT	1.8 (0.8)	E	WM-ACC-C15	1-1/2" BSPT	4.4 (2)

*Each model includes 1 fitting.

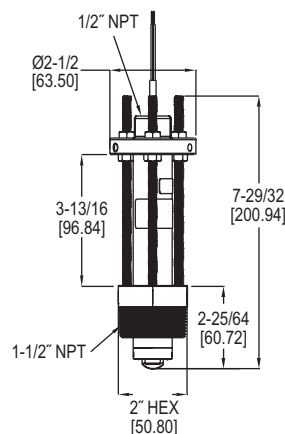
USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Modbus® is a registered trademark of Schneider Automation, Inc.

PADDLEWHEEL FLOW SENSOR

Non-Magnetic Sensing, Adjustable for 1-1/2 to 40" (38.1 to 1016 mm) Pipe, Pulse or 4 to 20 mA



The **Series PFT Paddlewheel Flow Sensor** is used to monitor liquid flow rates in pipes from 1-1/2 to 40" and is available in brass or 316 SS body. The unit outputs a frequency proportional pulsed or 4 to 20 mA output. The pulse models are a square wave output signal with frequency proportional to the flow velocity and the 4 to 20 mA models have a linear output of the velocity with 4 mA equal to 0 ft/s and 20 mA equal to 25 ft/s.

FEATURES/BENEFITS

- Bearings and shaft offer excellent wear protection even in applications with particulate for long life
- Weatherproof and submersible rated for irrigation applications
- One unit adjustable over a large pipe size range
- Multiple wetted material choices offer application versatility
- Integral 4 to 20 mA output with no need for additional external components
- Sensor technology uses inductive sensing to sense the blades of the impeller therefore does not use magnets allowing low flow rate monitoring with no concerns regarding magnetic material in the flow

APPLICATIONS

- Irrigation
- Ground water remediation
- Cooling systems
- Pump protection
- Leak detection
- Filtration systems

SPECIFICATIONS

Service: Water-based fluids.

Range: 1.2 to 25 ft/s (0.37 to 7.62 m/s).

Wetted Materials: Body and fitting: Brass or 316 SS; fitting O-ring: FKM standard, silicone or Buna-N optional; impeller: 316 SS; shaft: Tungsten carbide standard or 316 SS optional; bearing: PTFE standard.

Linearity: ±1.0% of FS.

Repeatability: ±0.5% of FS.

Temperature Limits: -40 to 212°F (-40 to 100°C).

Pressure Limits: 400 psig (27.6 bar) @ 100°F (37.8°C), 325 psig (22.4 bar) @ 212°F (100°C).

Process Connection: 1-1/2" NPT male or 1-1/2" BSPT male standard, 2" NPT male or 2" BSPT male optional.

Output: Pulse: NPN open collector with square wave output, rated 60 V @ 50 mA max; Frequency: 3.2 to 200 Hz. Pulse Width: 2.5 msec ±25%; 4 to 20 mA: 4 mA is 0 ft/s, 20 mA is 25 ft/s.

Power Requirement: 10 to 35 VDC.

Power Consumption: 40 mA (max.).

Electrical Connection: 22 AWG shielded UL type PTLC rated 105°C, 20' (6.1 m) long with cable gland. Can be extended up to 2000' (609 m) with similar cable. Optional UL listed burial rated cable.

Enclosure Rating: NEMA 6P (IP67)*.

Housing Materials: Brass or 316 SS.

Weight: 3 lb (1.36 kg).

Agency Approvals: CE.

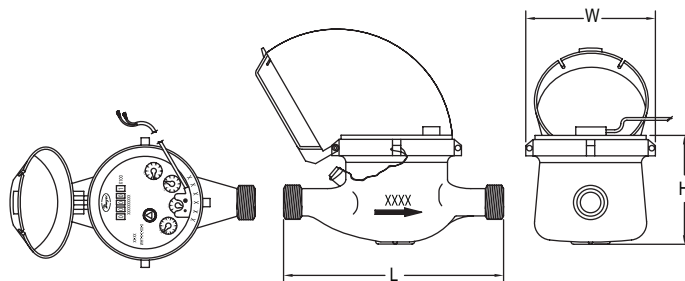
*Brass units IP67 only.

MODEL CHART			
Model	Body Material	Output	Description
PFT-IAN-B111-S	Brass	4 to 20 mA	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IAN-S111-S	316 SS	4 to 20 mA	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-B111-S	Brass	Pulse	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-S111-S	316 SS	Pulse	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IAN-B311-S	Brass	4 to 20 mA	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IAN-S311-S	316 SS	4 to 20 mA	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-B311-S	Brass	Pulse	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-S311-S	316 SS	Pulse	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable

Consult factory for longer cable lengths, burial rated cable, 2" NPT connection, or other wetted materials.

MULTI-JET HOT WATER METER

High Temperature Threshold, Pulsed Output



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2 (165)	3-45/64 (94)	4-15/64 (107.5)	3.75 (1.7)
5/8 x 3/4	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	3.97 (1.8)
3/4 (20)	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	4.9 (2.2)
1 (25)	1-1/4" (1-1/4")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.4 (2.9)
1-1/4 (32)	1-1/2" (1-1/2")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	8.2 (3.7)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64 (122)	5-9/16 (141.5)	13.52 (6.17)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64 (145)	6-31/32 (177)	18.74 (8.5)

The **Series WMH Multi-Jet Hot Water Meter** is a series of mechanical, water totalizing meters that display the total water usage in gallons with m³ options. They are available in a range of body sizes and include NPT or BSPT optional couplings. The high temperature resistant brass body is compatible in applications with high temperature water not suitable with standard brass water meters and maintains its accuracy.

FEATURES/BENEFITS

- High temperature threshold of 190°F (88°C) ideal for high temperature applications
- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

APPLICATIONS

- HVAC applications
- Measuring total condenser water flow in residential, commercial and industrial applications
- Remote hot water monitoring

SPECIFICATIONS

Service: Water.
Wetted Materials: Body: Brass; Couplings: Brass; Measuring Chamber: Brass.
Flow Range: See model chart.
Accuracy: WMH-A-X-XX: Transitional Flow: ±3%; Nominal Flow: ±1.5%.
Temperature Limit: 190°F (88°C).
Pressure Limit: 150 psi (10 bar).
Totalizing Display Maximum: See model chart.
Output Signal: Pulse output with frequency proportional to flow rate.
Pulse Options: 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1 L, 10 L, 100 L, 1000 per pulse) See model chart.*
Electrical Rating: 0.01A @ 24VAC/DC.
Electrical Connections: Color-coded lead wires, 4.5' (1.5 m) long.
Mounting Orientation: Horizontal with register facing up.
Weight: See dimension chart.

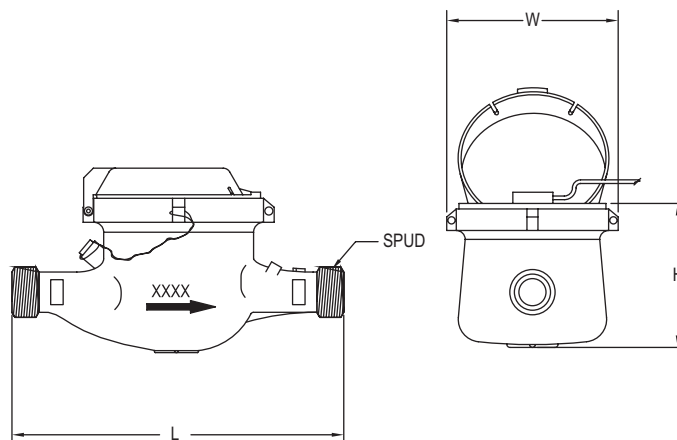
*Consult factory for m³, BSPT units or additional pulse output options

MODEL CHART

Model	Size	Coupling Size	GPM (Gallons Per Minute)			Display Max (Gallons)	Pulse Rate (Gal/Pulse)
			Max Flow	Nominal Flow Range	Transitional Flow		
WMH-A-C-01	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WMH-A-C-02	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WMH-A-C-03	3/4" SL	3/4" NPT	30	2 to 30	0.5	9,999,999.99	0.1
WMH-A-C-06	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	0.1
WMH-A-C-01-1	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	1
WMH-A-C-02-1	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	1
WMH-A-C-03-1	3/4" SL	3/4" NPT	30	2 to 30	0.5	9,999,999.99	1
WMH-A-C-06-1	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	1
WMH-A-C-07-1	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	1
WMH-A-C-08-1	2"	2" NPT	160	8 to 160	2	9,999,999.9	1
WMH-A-C-01-10	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	10
WMH-A-C-02-10	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	10
WMH-A-C-03-10	3/4" SL	3/4" NPT	30	2 to 30	0.5	9,999,999.99	10
WMH-A-C-06-10	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	10
WMH-A-C-07-10	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	10
WMH-A-C-08-10	2"	2" NPT	160	8 to 160	2	9,999,999.9	10

MULTI-JET BRASS BODY WATER METER

NSF Certified, Lead Free, Economical



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	7-31/64 (190)	3-45/64 (94)	4-15/64 (107.5)	3.58 (1.63)
5/8 x 3/4 (15)	1" (1")	7-31/64 (190)	3-45/64 (94)	4-15/64 (107.5)	3.81 (1.73)
3/4 (20)	1" (1")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.02 (2.73)
1 (25)	1-1/4" (1-1/4")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.02 (2.73)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64 (122)	4-5/8 (117.5)	12.02 (5.45)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64 (145)	5-9/16 (141.5)	13.23 (6)



The **Series WNT Multi-Jet Brass Body Water Meter** is a series of mechanical, water totalizing meters that display the total water usage in gallons or cubic meter. They are available in a range of body sizes and include NPT or BSPT couplings. Its lead free, NSF certified body is ideal for potable water applications.

FEATURES/BENEFITS

- NSF/ANSI makes it ideal for no lead portable water requirements
- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

APPLICATIONS

- Potable water applications
- Residential water measurement
- Remote water monitoring

SPECIFICATIONS

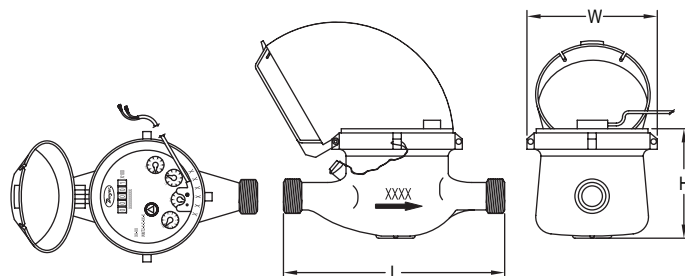
Service: Water.
Wetted Materials: Body: ECO BRASS®; Couplings: ECO BRASS®; Measuring chamber: ABS Plastic.
Flow Range: See model chart.
Accuracy: Transitional Flow: ±3%; Nominal Flow: ±1.5%.
Temperature Limit: 122°F (50° C).
Pressure Limit: 150 psi (10 bar).
Totalizing Display Maximum: See model chart.
Output Signal: Pulse output with frequency proportional to flow rate.
Pulse Options: 0.1 gal, 1 gal, 10 gal, 100 gal per pulse.
Electrical Rating: 0.01 A @ 24 VAC/DC.
Electrical Connections: Color-coded lead wires, 4.5' (1.5 m) long.
Mounting Orientation: Horizontal with register facing up.
Weight: See dimension chart.
Agency Approvals: NSF.

MODEL CHART

Model	Size	Coupling Size	GPM (Gallons Per Minute)			Display Max (Gallons)	Pulse Rate (Gal/Pulse)
			Max Flow	Nominal Flow Range	Transitional Flow		
WNT-A-C-01	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WNT-A-C-02	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WNT-A-C-05	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	0.1
WNT-A-C-06	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	0.1
WNT-A-C-07-1	1-1/2"	1-1/2" NPT	100	5 to 100	1.25	9,999,999.9	1
WNT-A-C-08-1	2"	2" NPT	160	8 to 160	2	9,999,999.9	1

MULTI-JET PLASTIC WATER METER

Lead Free, Economical Plastic Body, Pulse Output



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2 (165)	3-23/32 (94)	4-15/64 (107.5)	1.55 (0.7)
5/8 x 3/4	1" (1")	7-1/2 (190)	3-23/32 (94)	4-15/64 (107.5)	1.77 (0.8)
3/4 x 1 (20)	1-1/4" (1-1/4")	10-1/4 (260)	3-23/32 (94)	4-15/64 (107.5)	2.43 (1.1)
1 (25)	1-1/4" (1-1/4")	10-1/4 (260)	3-23/32 (94)	4-15/64 (107.5)	2.43 (1.1)
1-1/2 (40)	2" (2")	9-5/8 (245)	4-13/16 (122)	5-45/64 (141.5)	4.41 (2)



The **Series WPT Multi-Jet Plastic Water Meter** is a series of mechanical, water totalizing meters that display the total water usage in gallons with m³ options. They are available in a range of body sizes and include NPT or BSPT optional couplings. The plastic body water meters can be used in potable water applications, some corrosive environments, or where an economical water totalizer is desired.

FEATURES/BENEFITS

- Plastic body ideal for lead free requirements
- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

APPLICATIONS

- Low cost residential water measurement
- Agriculture (fertilizers, pesticides, and herbicides)
- Irrigation
- Remote water monitoring

SPECIFICATIONS

Service: Water.
Wetted Materials: Body: Nylon 66; Couplings: Nylon 66, 1-1/2" (40 mm) sizes lead free ECO BRASS® alloy; Measuring Chamber: ABS Plastic.
Flow Range: See model chart.
Accuracy: WPT-A-X-XX: Transitional Flow: ±3%; Nominal Flow: ±1.5%.
Temperature Limit: 122°F (50°C).
Pressure Limit: 150 psi (10 bar).
Totalizing Display Maximum: See model chart.
Output Signal: Pulse output with frequency proportional to flow rate.
Pulse Options: 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1 L, 10 L, 100 L, 1000 per pulse) See model chart.*
Electrical Rating: 0.01 A @ 24 VAC/DC.
Electrical Connections: Color-coded lead wires, 4.5' (1.5 m) long.
Mounting Orientation: Horizontal with register facing up.
Weight: See dimension chart.

*Consult factory for m³, BSPT units or additional pulse output options

MODEL CHART

Model	Size	Coupling Size	GPM (Gallons Per Minute)			Display Max (Gallons)	Pulse Rate (Gal/Pulse)
			Max Flow	Nominal Flow Range	Transitional Flow		
WPT-A-C-01	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WPT-A-C-02	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WPT-A-C-03	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	0.1
WPT-A-C-04	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	0.1
WPT-A-C-01-1	1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	1
WPT-A-C-02-1	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	1
WPT-A-C-03-1	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	1
WPT-A-C-04-1	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	1
WPT-A-C-05-1	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	1
WPT-A-C-01-10	1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	10
WPT-A-C-02-10	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	10
WPT-A-C-03-10	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	10
WPT-A-C-04-10	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	10
WPT-A-C-05-10	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	10

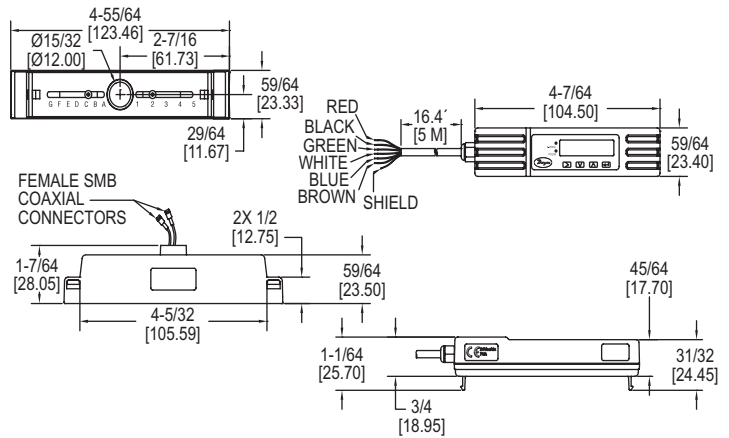
USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

ECO BRASS® is a registered mark patented by Mitsubishi Shindoh

COMPACT ULTRASONIC FLOWMETERS

Cost Effective, Compact & Adjustable Design, Non-Invasive



The **Model UFM Compact Ultrasonic Flowmeters** are economical, clamp-on, ultrasonic flowmeter. The Model UFM implements the transit-time difference to measure flow rates in pipes and can measure velocity and flow in pipes with outside diameters ranging from 0.98 to 4.62" (24.89 to 117.35 mm). This model comes with a volume pulse and 4 to 20 mA flow rate output.

FEATURES/BENEFITS

- Non-invasive pipe measurement
- Simple installation with all necessary components included such as converter, sensor, cables and mounting accessories
- Compact and lightweight design, featuring an easily installed, all in one clamp-on unit intended for homogeneous liquids that contain no air
- Screen offers easy to read text displaying both flow rate and total with a convenient backlight for visual comfort

APPLICATIONS

- Flow measurement for heat metering
- Chilled water metering & monitoring
- Potable water metering & monitoring
- Process water metering & monitoring

KIT INCLUDES

- Converter with adjustable guiderail
- Set of 1.81 to 2.75" (46 to 70 mm) clamps
- Set of 2 to 5" (51 to 127 mm) clamps
- Set of small pipe adaptor circle clamps
- Set of small pipe adaptor V clamps
- Ultrasonic coupling grease

MODEL CHART	
Model	Description
UFM-1	Compact ultrasonic flowmeter

SPECIFICATIONS

Service: Clean water with < 3% by volume of particulate content.
Range: 0.33 to 32.8 ft/s (0.1 to 10 m/s).
Display: Backlit: 3.27" H x 0.74" W (83.1 mm x 18.8 mm), 2 line x 16 characters.
Accuracy: ±3% of flow reading for > 0.98 ft/s (> 0.3 m/s).
Power Requirements: 12 to 24 VDC or VAC.
Power Consumption: 7 W max.
Temperature Limits: Process: 32 to 185°F (0 to 85°C); Ambient: 32 to 122°F (0 to 50°C).
Outputs: Analog: 1 opto-isolated: 4 to 20 mA; Error current: 3.5 mA; Load resistance: 620 Ω max; Pulse: 1 opto-isolated MOSFET relay, 500 mA max, 166 pps max, 200 Hz max.

Enclosure Rating: IP54.
Enclosure Material: Plastic polycarbonate.
Repeatability: ±0.5% of measured value.
Electrical Connections: 16.4" (5 m) cable.
Response Time: < 1 s.
Weight: 2.9 lb (1.315 kg).
Agency Approvals: CE.

ADDITIONAL SPECIFICATIONS

Applicable Pipe Material: Steel, copper, or plastic.
Pipe Outside Diameter: 0.98 to 4.62" (24.89 to 117.35 mm).
Applicable Pipe Lining: None.
Pipe Wall Thickness: 0.02 to 0.39" (0.5 to 10 mm).

OPTIONS

Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

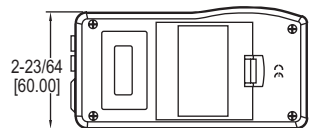
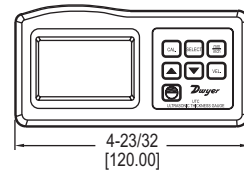
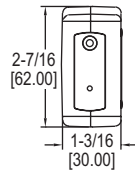
USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

MODEL UTG

ULTRASONIC THICKNESS GAGE

Ideal For Use with Ultrasonic Flow Transmitters, Adjustable Sound Velocity



The **Model UTG Ultrasonic Thickness Gage** measures the thickness of a variety of materials. The UTG works on a variety of parallel surface material ranging from 0.05 to 7.9" (1.2 to 200 mm).

FEATURES/BENEFITS

- Non-invasive thickness measurement
- Reads in inches or millimeters and features an adjustable sound velocity to allow for an array of materials to be measured
- Allows the user to find the wall thickness of the pipe when programming an ultrasonic transmitter without cutting or removing a section of the pipe to measure it
- Ideal for monitoring corrosion in closed vessels such as boilers and chemical tanks and with any ultrasonic flow transmitter

APPLICATIONS

- Pipe thickness measurement
- Finding wall thickness
- Monitoring corrosion in closed vessels
- Industrial applications
- Automotive
- HVAC
- Plumbing

SPECIFICATIONS

Service: Steel, cast iron, aluminum, red copper, brass, zinc, quartz glass, polyethylene, PVC, gray cast iron, nodular cast iron, other. Selectable option for special materials with known sound propagation rate.*
Range: 0.047 to 7.874" (1.2 to 200 mm).
Accuracy: ±0.5%.
Resolution: 0.001" / 0.1 mm.

Sound Velocity: 1118 to 20132 mph (500 to 9000 m/s).
Temperature Limits: 32 to 122°F (0 to 50°C).
Humidity Limit: < 80%.
Display: 4 digits, 0.394" (10 mm) LCD.
Power Requirement: (4) 1.5 V AAA alkaline batteries, not included, user replaceable.
Weight: 5.78 oz (164 g).

*Material must be uniform with minimal coating/paint.

MODEL CHART

Model	Description
UTG	Ultrasonic thickness gage

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

ULTRASONIC FLOWMETER SETS

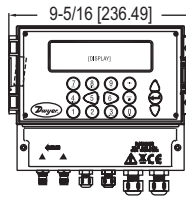
Non-Invasive Pipe Flow Measurement, Easy Operation and Data Logging Option



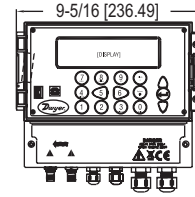
UFB



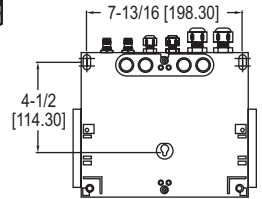
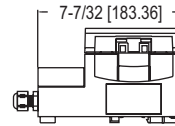
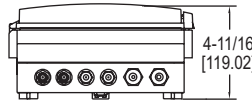
UFC



UFB



UFC



The **Series UFB & UFC Ultrasonic Flowmeter Sets** utilize the transit-time difference for measuring flow rates in pipes. These units are permanent mount, where the converters can be mounted on a surface or pipe with a 4 to 20 mA and pulse output capabilities for pipe sizes from 1/2 to 79" (13 to 2000 mm). The Series UFC offers the same features plus data logging capability.

FEATURES/BENEFITS

- Non-invasive pipe measurement
- Easy-to-use compact and lightweight design, intended for homogeneous liquids that contain no air
- Simple installation with all necessary components included such as converter, sensor, cables and mounting accessories
- Sturdy IP65 rating, protecting it from dust and direct water contact

APPLICATIONS

- Water treatment
- Industrial systems
- Irrigation applications
- Treated water flow
- River water
- Sea water
- Potable water
- Demineralized water
- Glycol/water mix
- Hydraulic system
- Diesel oil
- Water use data logging

KIT INCLUDES

- Converter
- Set of transducers
- Ruled guide rail
- Steel banding
- Banding clips
- Set of transducer cables
- Set of high temperature interface cables
- Ultrasonic coupling grease

MODEL CHART - STANDARD VERSION

Model	Pipe Size Range in (mm)	Power Supply
UFB-122	0.5 to 4.5 (13 to 115)	86 to 264 VAC
UFB-123	2 to 79 (50 to 2000)	86 to 264 VAC
UFB-222	0.5 to 4.5 (13 to 115)	24 VAC/VDC
UFB-223	2 to 79 (50 to 2000)	24 VAC/VDC

MODEL CHART - DATA LOGGING VERSION

Model	Pipe Size Range in (mm)	Power Supply
UFC-122	0.5 to 4.5 (13 to 115)	86 to 264 VAC
UFC-123	2 to 79 (50 to 2000)	86 to 264 VAC
UFC-222	0.5 to 4.5 (13 to 115)	24 VDC/VAC
UFC-223	2 to 79 (50 to 2000)	24 VDC/VAC

SPECIFICATIONS

Service: Homogeneous liquids that do not contain more than 3% of air bubbles or particulate and capable of ultrasonic wave propagation.

Inputs: TNC cable from sensors.

Range: 0.33 to 33 ft/s (0.1 to 10 m/s).

Display: 240 x 64 pixel graphic display, high contrast black on white with backlight; Languages: English, French, German, Swedish, Italian, Spanish, Portuguese, Russian, Norwegian, and Dutch; 5" W x 1.3" H (5 x 33.02 mm).

Accuracy: ± 0.5 to $\pm 2\%$ of flow reading of flow rate > 0.03 ft/s (0.01 m/s) and pipe OD > 3.0 in (75 mm); $\pm 3\%$ of flow reading for flow rate > 0.03 ft/s (0.01 m/s) and pipe OD 0.5 to 3 in (13 to 75 mm); $\pm 6\%$ of flow reading for flow rate < 0.03 ft/s (0.01 m/s).

Power Requirements: 86 to 264 VAC (50 to 60 Hz) or 24 VAC/VDC (1 A max).

Power Consumption: 10.5 W.

Temperature Limits: Transducer: -4 to 275°F (-20 to 135°C); Controller: -4 to 122°F (-20 to 50°C).

Outputs: Analog 1 opto-isolated output: 4 to 20 mA, 0 to 16 mA or 0 to 20 mA (selectable); Error current: 0 to 26 mA (selectable); Load resistance: 620 Ω max; Alarm: 2 opto-isolated MOSFET NO relays, 48 V at 500 mA, maximum 200 Hz; Pulsed: 1 opto-isolated MOSFET relay, 48 V at 500 mA, 1 to 250 pps; Pulse width: 2 to 500 ms (selectable).

Serial Communications: USB (UFC only).

Enclosure Rating: IP65 when using TNC connector; Transducers IP54.

Materials: Plastic ABS and aluminum.

Repeatability: $\pm 0.5\%$ of measured value or 0.03 ft/s (0.01 m/s).

Electrical Connections: Removable screw-in type terminal block.

Mounting: Wall mounted using 3 type M4 screws.

Turbidity: $< 3\%$ by volume of particulate content.

Permissible Air Content: $< 3\%$ by volume.

Response Time: < 500 ms.

Weight: Unit not including accessories: 2.80 lb (1.26 kg); Unit including accessories: 9.92 lb (4.5 kg).

Agency Approvals: CE.

ADDITIONAL SPECIFICATIONS

Applicable Pipe Material: Carbon steel, SS, copper, UPVC/PVDF, concrete, mild steel, glass, brass.

Applicable Pipe Lining: Rubber, glass, concrete, epoxy, steel, other*.

Pipe Wall Thickness: 0.04 to 3" (1 to 75 mm).

Pipe Lining Thickness: $< 1"$ (< 25 mm).

*Selectable option for special material with known propagation rate of lining material.

OPTIONS

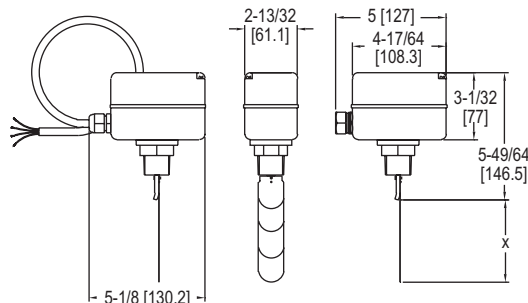
Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

VANE FLOW SWITCH

Low Cost, Field Adjustable Set Point and Paddle



Shown with conduit connection option

The **Series FS-2 Vane Flow Switch** offers an economical flow proving solution. The FS-2 paddles are adjustable to fit 1 to 8" size pipe.

FEATURES/BENEFITS

- Field adjustable set point adjustment screw allows for easy flow switch modification
- Custom application set points enabled by field adjustable vane layers
- Aluminum weatherproof housing permits outdoor installation

APPLICATIONS

- Boiler flow proving
- Hot water heaters
- Chillers
- Cooling lines
- Machinery
- Liquid transfer systems

MODEL CHART	
Model	Description
FS-2	Paddle flow switch

SPECIFICATIONS

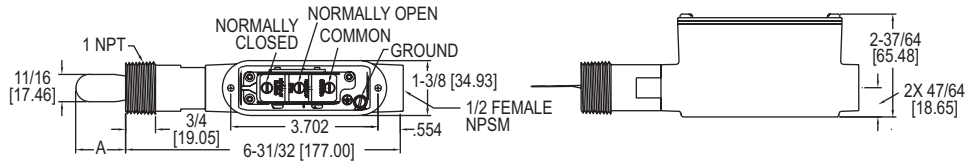
Service: Compatible liquids.
Wetted Materials: Bellow: Tin-bronze; Vane: SS; Body: Forged brass.
Temperature Limit: 230°F (110°C).
Pressure Limit: 145 psig (10 bar).
Enclosure Rating: NEMA 4 (IP64).
Switch Type: SPDT snap switch.
Electrical Rating: 10 A res, 3 A ind @ 250 VAC.
Electrical Connection: Cable gland with attached wire leads or optional conduit connection.
Process Connection: 1" male NPT or BSPT.
Mounting Orientation: Switch must be installed vertically on horizontal pipe runs.
Set Point Adjustment: Four vane combinations and an adjustment screw.
Enclosure: Die-cast aluminum alloy.
Weight: 28.22 oz (0.8 kg).
Agency Approvals: CE.

OPTIONS	
To order add suffix:	Description
-BSPT	Process connection
Example: FS-2-BSPT	
-CND	Conduit connection, 1" NPT female conduit connection with no wire leads.
Example: FS-2-CND	

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR WATER; GPM (LPM)					
Pipe Size	Blade Vane Length in (mm) Dim. X	Minimum Setting		Maximum Setting	
		Actuate	Deactuate	Actuate	Deactuate
1"	1.34 (34)	4.0 (15.0)	1.8 (6.7)	8.8 (33.3)	6.6 (25.0)
1-1/4"	1.34 (34)	5.3 (20.0)	2.6 (10.0)	11.4 (43.3)	8.4 (31.7)
1-1/2"	2.24 (57)	7.0 (26.7)	4.0 (15.0)	14.5 (55.0)	11.4 (43.3)
2"	2.24 (57)	14.1 (53.3)	9.7 (36.7)	31.3 (118.3)	22.5 (85.0)
2-1/2"	3.46 (88)	18.5 (70.0)	15.4 (58.3)	35.2 (133.3)	30.8 (116.7)
3"	3.46 (88)	27.7 (105.0)	25.1 (95.0)	52.8 (200.0)	46.2 (175.0)
4"	3.46 (88)	59.4 (225.0)	52.8 (200.0)	123.3 (466.7)	114.5 (433.3)
5"	6.57 (167)	52.8 (200.0)	39.6 (150.0)	132.1 (500.0)	123.3 (466.7)
6"	6.57 (167)	75.7 (286.7)	52.8 (200.0)	154.1 (583.3)	140.9 (533.3)
8"	6.57 (167)	184.9 (700.0)	158.5 (600.0)	396.3 (1500.0)	374.2 (1416.7)

FLOTECT® VANE OPERATED FLOW SWITCH

Magnetic Linkage, UL Approved



The **Series V7 Flotect® Vane Flow Switch** is an inexpensive range switch for use with compatible liquids to start or stop electronic operated equipment when flow or no-flow conditions occur. Design is standard weatherproof, meeting NEMA 4X.

FEATURES/BENEFITS

- Magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Lower body is machined solid metal bar stock assuring no leak points, no matter how long the unit is in service
- Robust vane design is rigid and field trimmable for set point adjustment

APPLICATIONS

- Proof of boiler flow
- Shuts down burner when air flow through heating coil fails
- Protects pumps, motors and other equipment against low or no flow
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)

Pipe Size	Actuate	Deactuate
1"	7.5 (28.4)	6.8 (25.7)
1-1/4"	8.1 (30.8)	7.6 (28.9)
1-1/2"	11.7 (44.1)	10.9 (41.3)
2"	16.9 (64.0)	15.6 (59.1)
2-1/2"	19.6 (74.2)	18.1 (68.5)
3"	31.6 (120)	29.6 (112)
4"	58.0 (218)	52.0 (197)

Contact the factory for different actuation-deactuation rates.

SPECIFICATIONS

Service: Liquids compatible with wetted materials that are non-coating and non-crystallizing.

Wetted Materials: Vane: 301 SS; Process connection: Brass or 316 SS; Magnet: Ceramic; Other: 301, 302 SS.

Upper Body Material: Die cast aluminum.

Temperature Limits: -40 to 250°F (-40 to 121°C).

Pressure Limits: 250 psi (17.2 bar).

Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).

Switch Type: SPDT snap switch.

Electrical Rating: 10 A @ 125, 250, 480 VAC; 1/8 hp @ 125 VAC, 1/4 hp @ 250 VAC.

Electrical Connections: 3 screw type, common, normally open and normally closed.

Conduit Connection: 1/2" NPSM.

Process Connection: 1" male NPT. Contact factory for optional tees.

Pipe Size: 1" to 4".

Mounting Orientation: Horizontal or vertical (actuation flow rates are based on horizontal pipe runs in the vertical position). Will not work in vertical pipe with down flow.

Set Point Adjustment: Vane is trimmable, see set point chart.

Weight: 1 lb 2 oz (500 g).

Agency Approvals: CE, UL.

MODEL CHART

Model	Body Material
V7-WBS-30N	Brass
V7-WSS-30N	316 SS

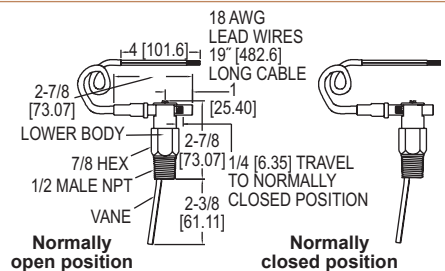
USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES V10 | W. E. ANDERSON™ BY DWYER

FLOTECT® MINI-SIZE FLOW SWITCH

Proof of Flow or No Flow in 1/2 to 2" Pipe, Cost Effective, Leak Proof Body, Weatherproof



The **Series V10 Flotect® Mini-Size Flow Switch** is designed to provide inexpensive, reliable monitoring of the presence or absence of flow in a system. This series is available for field installation in pipelines from 1/2 to 2" diameter and available in brass or 303 SS body.

FEATURES/BENEFITS

- Magnetically actuated switching design gives superior performance with rugged, hermetically sealed reed switch
- Simple field switch adjustment allows user to toggle between Normally Open (NO) or Normally Closed (NC) with no change in the electrical connection
- Switch housing is located outside the process media, allowing simple switch change-over or maintenance without interruption of process flow
- Full size, field trimmable stainless steel vane provided with removable template calibrated for brass or ductile iron reducing tees with forged steel straight tee/bushing combinations

APPLICATIONS

- Proving flow in boilers, hot water heaters, and chillers
- Protects pumps, motors and other equipment against low or no flow
- Automatically starts auxiliary pumps and engines

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)

Pipe Size	Trim	N.O.	N.C.
1/2"	L	2.6/2.3 (9.8/8.7)	2.6/2.5 (9.8/9.5)
3/4"	J	3.1/2.7 (11.7/10.2)	3.1/2.8 (11.7/10.6)
1"	H	4.8/4.5 (18.2/17)	4.8/4.4 (18.2/16.7)
1-1/4"	E	6.2/5.6 (23.5/21.2)	6.1/5.6 (23.1/21.2)
1-1/2"	C	8.2/7.7 (31/29.1)	8.2/7.7 (31/29.1)
2"	Full	9.5/9.1 (36/34.4)	9.5/9 (36/34.1)

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)

Pipe Size	Trim	N.O.	N.C.
1/2"	L	10.3/8.8 (291.7/250)	10.2/9.2 (288/260)
3/4"	J	13/11.6 (368.3/328)	12.9/11.6 (365/328)
1"	H	19.2/17.6 (543.3/498)	18.9/17.6 (535/498)
1-1/4"	E	24.8/22.2 (701.7/628)	24.5/22.5 (693/637)
1-1/2"	C	33.4/31.2 (946.7/883)	33/30.6 (935/867)
2"	Full	50.2/48.4 (1422/1370)	50.2/47.7 (1422/1352)

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials: Vane: 301 SS; Body: Brass or 303 SS; Pin and Magnet: Ceramic 8.

Temperature Limit: 200°F (93°C).

Pressure Limit: Brass body: 1000 psig (69 bar); 303 SS body: 2000 psig (138 bar).

Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).

Switch Type: SPST hermetically sealed reed switch. Field adjustable for normally open or normally closed.

Electrical Rating: 0.5 A @ 120 VAC; 1.5 A @ 24 VDC res.; 0.001 A @ 200 VDC res.

Electrical Connections: 18 AWG, 19" (483 mm) long, PVC jacket. Rated 221°F (105°C).

Process Connection: 1/2" male NPT or 1/2" male BSPT.

Mounting Orientation: Switch can be installed in any position but the actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values.

Set Point Adjustment: Vane is trimmable.

Weight: 5.5 oz (0.16 kg).

Agency Approvals: CE, CSA, UR.

Switch Enclosure: Nylon.

MODEL CHART

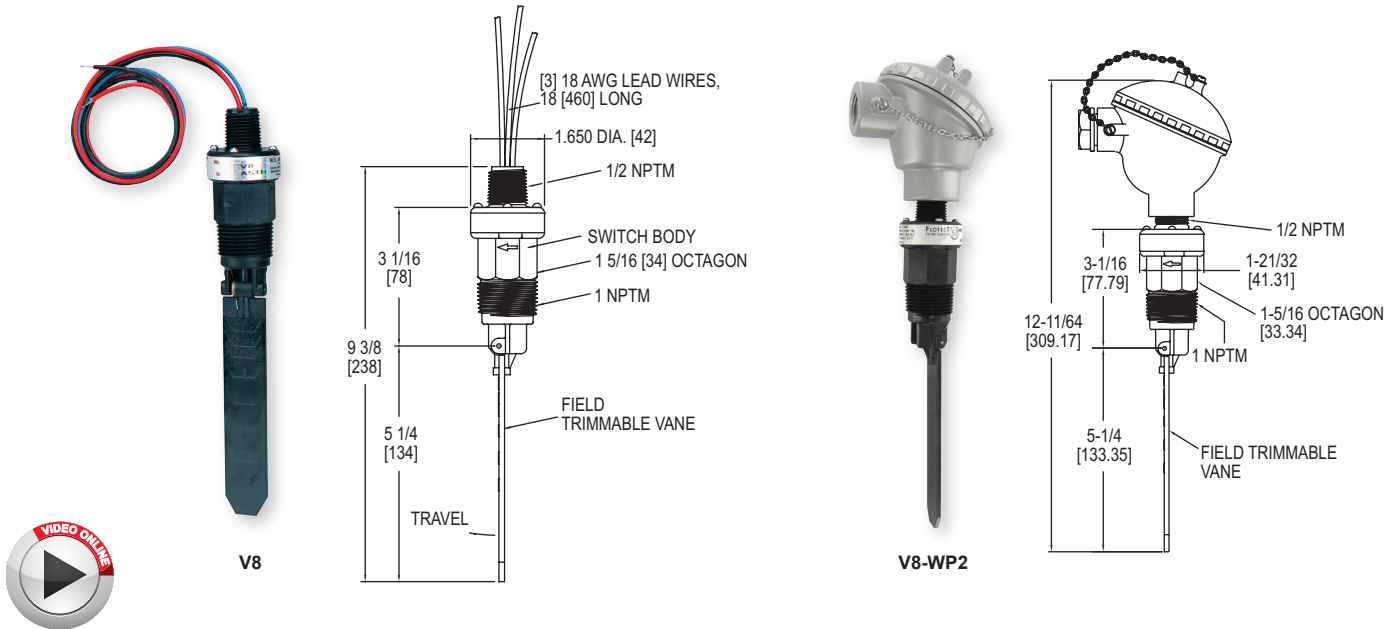
Model	Body Material	Connection Type	Switch Configuration
V10	Brass	NPT	Normally open or closed
V10SS	303 SS	NPT	Normally open or closed
V10-BSPT	Brass	BSPT	Normally open or closed
V10SS-BSPT	303 SS	BSPT	Normally open or closed

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

FLOTECT® VANE OPERATED FLOW SWITCHES

Field Adjustable — 1 to 6 Inch Pipe, Leak Proof Body, Chemical Resistance



The **Series V8 Flotect® Vane Operated Flow Switches** are ideal for protecting unattended equipment from damage or loss of production. This Series is available for installation in a 1 to 6" pipe with operating pressures up to 150 psig (10 bar) and temperatures to 212°F (100°C).

FEATURES/BENEFITS

- UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment
- Magnetically actuated switching design gives superior performance with free-swinging vane which attracts a magnet within the switch body, actuating a snap switch with no bellows, springs, or seals to fail
- Leak proof body and vane constructed of tough durable polyphenylene sulfide which has excellent chemical resistance
- A full size trimmable vane is provided with molded-in graduations

APPLICATIONS

- Chemical processing
- Air conditioning
- Refrigeration
- Heating systems
- Cooling lines
- Machinery
- Liquid transfer systems
- Water treatment
- Food processing
- Machine tools

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)	
Pipe Size	Actuate/Deactuate
1"	10.8/9.1 (40.9/34.6)
1-1/4"	9.8/8.3 (37.2/31.4)
1-1/2"	8.6/6.8 (32.4/25.7)
2"	10.9/8.8 (41.2/33.4)
3"	12.9/8.9 (48.8/33.5)
4"	21.1/13.8 (79.7/52.2)
6"	45/33 (170.2/124.7)

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)	
Pipe Size	Actuate/Deactuate
1"	39/32.6 (1105/923)
1-1/4"	37.5/32.2 (1062/912)
1-1/2"	33.4/26.7 (945/757)
2"	43/36.8 (1218/1042)
3"	52.7/38.9 (1493/1100)
4"	87.6/63.6 (2482/1802)
6"	168.6/137.4 (4775/3890)

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Materials: Vane and body: Polyphenylene Sulfide (PPS); Pin and spring: 316 SS or Inconel®; Magnet: Ceramic 8.
Temperature Limit: 212°F (100°C).
Pressure Limit: 150 psig (10.34 bar).
Enclosure Rating: General purpose, WP/WP2 option is weatherproof.
Switch Type: SPDT snap switch, MV option: SPDT gold contact snap switch.
Electrical Rating: 5 A @ 125/250 VAC, 5 A resistive, 3 A inductive @ 30 VDC; MV option: 1 A @ 125 VAC, 1 A resistive, 0.5 A inductive @ 30 VDC.
Electrical Connections: 18 AWG, 18" (460 mm) long.
Conduit Connection: 1/2" male NPT, 1/2" female NPT on WP and WP2.
Process Connection: 1" male NPT.
Mounting Orientation: Actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values. Unit cannot be used with vertical down flow.
Set Point Adjustment: Vane is trimmable.
Weight: 4.5 oz (0.13 kg).
Agency Approvals: CE, cURus.

MODEL CHART	
Model	Description
V8	Flow switch

OPTIONS	
To order add suffix:	Description
-MV	Gold plated contacts, for dry circuits; rated 1A @ 125 VAC; 1A resistive, 0.5A inductive @ 30 VDC
Example: V8-MV	
-INC	Inconel® alloy option; Inconel® alloy replaces standard 316 SS wetted parts; wetted parts are Inconel® alloy, ceramic 8, and polyphenylene sulfide
Example: V8-INC	
-WP	Weatherproof enclosure; optional housing is phenylpolioxide and provides weatherproof protection for electrical wiring; not UL approved
Example: V8-WP	
-WP2	Optional housing is aluminum and provides weatherproof protection for electrical wiring; not UL approved
Example: V8-WP2	

SUBMERSIBLE LEVEL TRANSMITTERS

Perfect for Ground Water and Wells, Lightning Protected, Standard 72 Hour Lead Time



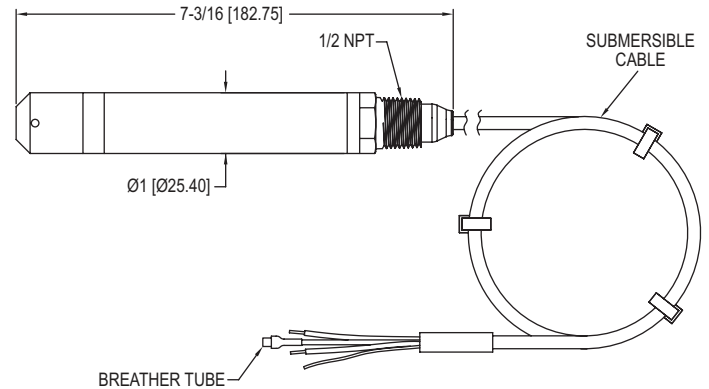
SBLT2



SBLTX



NOW WITH 72 HOUR
OUT OF STOCK LEAD TIME!



The Series SBLT2 & SBLTX Submersible Level Transmitters are manufactured for years of trouble free service. These series measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a 316 SS housing.

FEATURES/BENEFITS

- Slim design for tight applications with bullet nose design which protects the diaphragm from damage
- Incorporates lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty) on SBLT2 models
- Maintenance free filter eliminates particulate or water droplets from entering the transducer
- UL approved intrinsically safe on SBLTX models for use in hazardous locations when used with proper barrier
- 270 lb tensile strength shielded and vented cable
- Excellent chemical compatibility
- NPT connection allows the unit to be rigidly installed in a pipe/conduit, or the addition of a A-625 hanging loop for attaching a chain for pulling out of the installation
- Standard 72 hour lead time ensures minimal downtime

APPLICATIONS

- Well monitoring
- Ground water monitoring
- Environmental remediation
- Surface water monitoring
- Down hole
- Water tanks

MODEL CHART			
Model	Range psi* (ft w.c.) [m w.c.]	Cable Length ft (m)	Cable Type
SBLT2-5-40-ETFE	5 (11.54) [3.52]	40 (12.2)	ETFE
SBLT2-10-40-ETFE	10 (23.09) [7.04]	40 (12.2)	ETFE
SBLT2-15-60-ETFE	15 (34.63) [10.56]	60 (18.3)	ETFE
SBLT2-20-60-ETFE	20 (46.18) [14.08]	60 (18.3)	ETFE
SBLT2-5-40	5 (11.54) [3.52]	40 (12.2)	Polyurethane
SBLT2-10-40	10 (23.09) [7.04]	40 (12.2)	Polyurethane
SBLT2-15-60	15 (34.63) [10.56]	60 (18.3)	Polyurethane
SBLT2-20-60	20 (46.18) [14.08]	60 (18.3)	Polyurethane
SBLT2-3.5M-5M	4.97 (11.48) [3.5]	16.40 (5)	Polyurethane
SBLT2-5M-10M	14.21 (32.81) [10]	32.81 (10)	Polyurethane
SBLT2-10M-18M	25.58 (59.06) [18]	59.06 (18)	Polyurethane

*Configured ranges below 5 psi (11.54' w.c.) (3.52 m w.c.) ±1% FS accuracy

Note: For intrinsically safe approval, change model number from SBLT2 to SBLTX. For custom ranges or cable lengths, contact factory.

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: 316 SS, 316L SS, epoxy; Cable: Polyurethane or ETFE; Bullet nose: PVC.

Accuracy: ±0.25% FS.

Temperature Limit: SBLT2: Polyurethane: 0 to 150°F (-18 to 66°C); ETFE: 0 to 200°F (-18 to 93°C); SBLTX -4 to 176°F (-20 to 80°C); Polyurethane: -4 to 149°F (-20 to 65°C).

Compensated Temperature Range: SBLT2: 0 to 140°F (-18 to 60°C); SBLTX: 0 to 176°F (-18 to 80°C).

Thermal Effect: ±0.02% FS/°F.

Pressure Limit: 2X FS.

Power Requirement: SBLT2: 10 to 30 VDC (≤ 1000 ft (305 m) of cable); SBLTX: 10 to 28 VDC.

Output Signal: 4 to 20 mA DC, 2-wire.

Response Time: 50 ms.

Max. Loop Resistance: 900 Ω at 30 VDC.

Electrical Connections: Wire pigtail.

Mounting Orientation: Suspended in tank below level being measured.

Electrical Protection: SBLT2: Lightning and surge protection; SBLTX: None.

Weight: 2.2 lb (1.0 kg).

Agency Approvals: SBLT2: CE; SBLTX: CE, cULus intrinsically safe for Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III Div. 1. (according to control drawing 001833-43)*.

*Up to 196' (59.5 m) for ETFE cable; Up to 333' (101.5 m) for polyurethane cable

OPTIONS

Model	Description
-P1	1/4" NPT male
-P2	1/4" NPT female
-P3	1/4" BSPT male ISO 228 R
-P4	1/4" BSPT female ISO 228 RC
-P11	3/4" clean-out type



-P11 option

ACCESSORIES

Model	Description
MTL5541	Galvanic barrier
MTL7706	Intrinsically safe zener barrier
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
A-625	316 SS cable hanger use with NPT option for attaching chain for easy pulling out of application



A-297



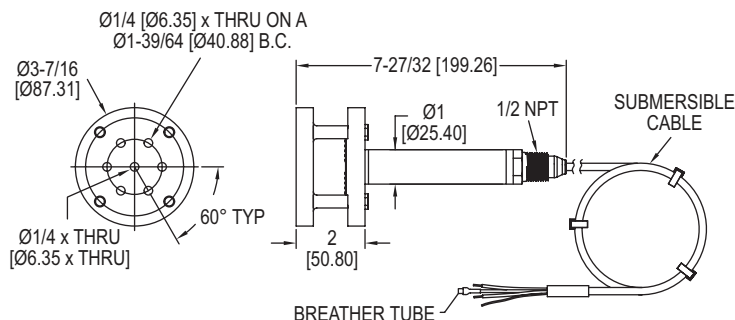
A-625

SUBMERSIBLE LEVEL TRANSMITTERS

Perfect for Sludge and Slurries, Lightning Protected, Standard 72 Hour Lead Time



NOW WITH 72 HOUR
OUT OF STOCK LEAD TIME!



The **Series PBLT2 & PBLTX Submersible Level Transmitters** are manufactured for years of trouble free service in the harshest applications. These Series measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a 316 SS housing with cage and large diameter 316 SS diaphragm seal.

FEATURES/BENEFITS

- Durable cage design with large diameter 316 SS diaphragm seal that is non-clogging and damage resistant to floating solids
- Incorporates lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty) on PBLT2 models
- Maintenance free filter eliminates particulate or water droplets from entering the transducer
- UL approved intrinsically safe on PBLTX models for use in hazardous locations when used with proper barrier
- 270 lb tensile strength shielded and vented cable
- Excellent chemical compatibility
- NPT connection allows the unit to be rigidly installed in a pipe/conduit, or the addition of a A-625 hanging loop for attaching a chain for pulling out of the installation
- Standard 72 hour lead time ensures minimal downtime

APPLICATIONS

- Wastewater
- Sludge pits, clarifiers, digesters
- Alum tanks
- Chemical storage tanks
- Oil tanks
- Lime slurry
- Sumps
- Reservoirs

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: 316 SS, 316L SS, epoxy, cable: ETFE or polyurethane.
Accuracy: $\pm 0.25\%$ FS (includes linearity, hysteresis, and repeatability).
Temperature Limit: PBLT2: 0 to 200°F (-18 to 93°C); PBLTX: ETFE -4 to 176°F (-20 to 80°C); Polyurethane: -4 to 149°F (-20 to 65°C).
Compensated Temperature Range: PBLT2: 0 to 180°F (-18 to 82°C); PBLTX: 0 to 176°F (-18 to 80°C).
Thermal Effect: $\pm 0.02\%$ FS/°F.
Pressure Limit: 2X FS.
Power Requirement: PBLT2: 13 to 30 VDC; PBLTX: 10 to 28 VDC.
Output Signal: 4 to 20 mA DC, two wire.
Response Time: 50 ms.
Loop Resistance: 900 Ω .
Electrical Connection: Wire pigtail.
Mounting Orientation: Suspended in tank below level being measured.
Electrical Protection: PBLT2: Lightning and surge protection, PBLTX: none.
Weight: 4.3 lb (2.0 kg).
Agency Approvals: PBLT2: CE, PBLTX: CE, cULus intrinsically safe for Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, Div. 1. (According to control drawing 001833-44)*.
***Up to 196' (59.5 m) for ETFE cable; Up to 333' (101.5 m) for polyurethane cable**

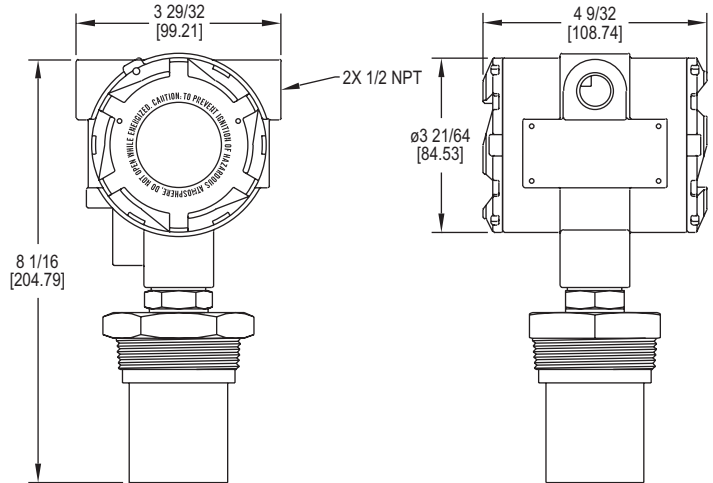
MODEL CHART			
Model	Range psi* (ft w.c.) [m w.c.]	Cable Length ft (m)	Cable Type
PBLT2-5-40	5 (11.54) [3.52]	40 (12.2)	ETFE
PBLT2-10-40	10 (23.09) [7.04]	40 (12.2)	ETFE
PBLT2-15-60	15 (34.63) [10.56]	60 (18.3)	ETFE
PBLT2-20-60	20 (46.18) [14.08]	60 (18.3)	ETFE
PBLT2-5-40-PU	5 (11.54) [3.52]	40 (12.2)	Polyurethane
PBLT2-10-40-PU	10 (23.09) [7.04]	40 (12.2)	Polyurethane
PBLT2-15-60-PU	15 (34.63) [10.56]	60 (18.3)	Polyurethane
PBLT2-20-60-PU	20 (46.18) [14.08]	60 (18.3)	Polyurethane
PBLT2-3.5M-5M-PU	4.97 (11.48) [3.5]	16.40 (5)	Polyurethane
PBLT2-5M-10M-PU	7.10 (16.38) [5]	32.81 (10)	Polyurethane
PBLT2-10M-18M-PU	14.21 (32.78) [10]	59.06 (18)	Polyurethane
*Configured ranges below 5 psi (11.54' w.c.) (3.52 m w.c.) $\pm 1\%$ FS accuracy			
Note: For intrinsically safe approval, change model number from PBLT2 to PBLTX. For custom ranges or cable lengths, contact factory.			

ACCESSORIES	
Model	Description
MTL5541	Galvanic barrier
MTL7706	Intrinsically safe zener barrier
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
A-625	316 SS cable hanger use with NPT option for attaching chain for easy pulling out of application



ULTRASONIC LEVEL TRANSMITTER

Explosion-Proof, Mapping Software, 3" (76.2 mm) Measuring Column



The **Series ULT Ultrasonic Level Transmitter** provides non-contact measurement of liquid levels in an explosion-proof body. It is capable of measuring up to 32.8' (10 m) with a PVDF sensor and 4 to 20 mA output.

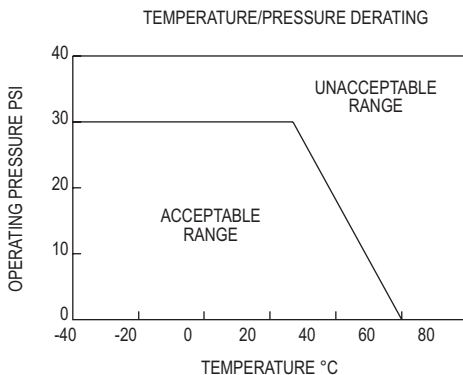
FEATURES/BENEFITS

- Provides reliable, accurate, and non-contact level measurement of compatible liquids
- Non-contact technology offers no moving parts to wear, jam, corrode, or get coated like contact technologies
- Mapping software makes effective measuring surface only a 3" (76.2 mm) diameter column with no concerns of ladders, pipes, or other tank intrusions in the remaining sound cone
- FM approved explosion-proof making it ideal for use in hazardous locations
- Easy programming with 6 digit LCD display and simple menu structure
- Output range is adjustable with choices of inputting tank dimensions or by filling and emptying the tank while calibrating and it automatically and scaling to levels it senses
- Window cover allows easy viewing of display
- Fail-safe output options and diagnostic capabilities

APPLICATIONS

- Water and wastewater
- Pulp and paper processing
- Chemical processing
- Food and beverage

MODEL CHART	
Model	Range
ULT-11	24.6' (7.5 m)
ULT-21	32.8' (10 m)



SPECIFICATIONS

Service: Compatible fluids. Not for use with powder and bulk solids.

Wetted Materials: Sensor: PVDF; Process connection: 303 SS; O-ring: Fluoroelastomer.

Ranges: 24.6' (7.5 m), 32.8' (10 m).

Accuracy: ±0.2% FS.

Resolution: 0.079" (2 mm).

Blind Zone: Under 8" (20 cm).

Beam Width: 3" (7.6 cm) diameter.

Temperature Limits: Ambient: -40 to 140°F (-40 to 60°C); Process: -4 to 140°F (-20 to 60°C).

Temperature Compensation: -40 to 140°F (-40 to 60°C).

Pressure Limits: 30 psi (2 bar) up to 25°C (77°F). Above 25°C (77°F), rating decreases 1.667 psi per 1°C increase. See chart.

Power Requirement: 18 to 28 VDC (two-wire).

Output Signal: 4 to 20 mA or 20 to 4 mA (two-wire).

Max. Loop Resistance: 250 Ω at 24 VDC.

Electrical Connections: Screw terminal.

Conduit Connection: 1/2" NPT female (two) or optional M20.

Process Connection: 2" NPT male or optional BSPT.

Enclosure Rating: Weather-proof meets NEMA 4X (IP66), explosion-proof rated Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G.

Mounting Orientation: Vertical.

Failsafe: On lost echo after 30 seconds, user selectable to 4, 20, 21, 22 mA or last signal.

Memory: Non-volatile.

Display: 6 character LCD.

Units: In, cm, ft, m, percent.

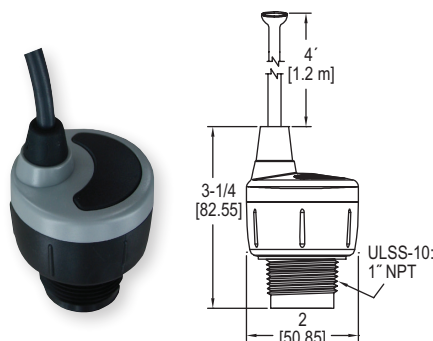
Programming: 4 button.

Weight: 4.0 lb (1.8 kg).

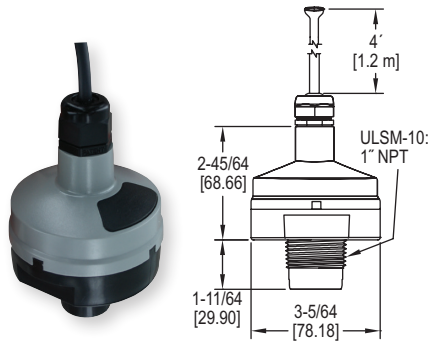
Agency Approvals: CE, FM.

ULTRASONIC LEVEL SENSORS

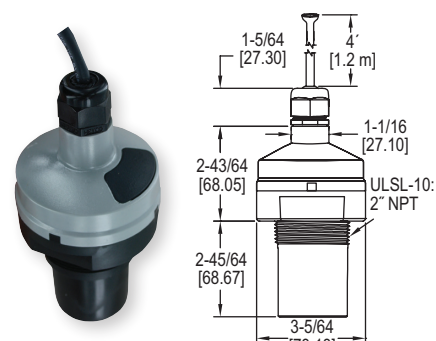
Non-Contact Transmitter, SPST Programmable Relays



ULSS



ULSM



ULSL



The **Series ULSS Ultrasonic Level Sensor** provides non-contact, continuous ultrasonic level measurement of fluids for short range applications. It has a 4.1' (1.2 m) measuring range with a 0.125" (3 mm) accuracy.

The **Series ULSM Ultrasonic Level Sensor** provides non-contact, continuous ultrasonic level measurement of fluids for medium range applications. It has a 9.8' (3 m) measuring range with a $\pm 0.2\%$ of range accuracy.

The **Series ULSL Ultrasonic Level Sensor** provides non-contact, continuous ultrasonic level measurement of fluids for tall range applications. It has a 18' (5.5 m) measuring range with a $\pm 0.2\%$ of range accuracy.

FEATURES/BENEFITS

- Via free software, units can be programmed to transmit an output signal and operate four relays for control applications
- Provides reliable, accurate, and non-contact level measurement of compatible liquids
- Non-contact technology offers no moving parts to wear, jam, corrode, or get coated like contact technologies
- Mapping software makes effective measuring surface only a 3" (76.2 mm) diameter column with no concerns of ladders, pipes, or other tank intrusions in the remaining sound cone
- Ultrasonic technology paired with automatic temperature compensation provides accurate and reliable measurements in almost all conditions
- Fail-safe logic is easily configured to custom applications via free software removing the need for target calibration
- Full NEMA 6P submersible enclosure rating to ensure excellent product durability

APPLICATIONS

- Water and wastewater
- Pulp and paper processing
- Sump and process tanks
- Chemical processing
- Food and beverage

MODEL CHART	
Model	Range
ULSS-10	4.1' (1.25 m)
ULSM-10	9.8' (3 m)
ULSL-10	18' (5.5 m)

Note: USB adapter necessary for calibration. One adapter can program multiple units.

SPECIFICATIONS

Service: Compatible fluids.
Wetted Materials: Sensor: PVDF; O-ring: FKM.
Ranges: See chart.
Accuracy: ULSS: 0.125" (3 mm); ULSM & ULSL: $\pm 0.2\%$ of range.
Resolution: ULSS: 0.019" (0.5 mm); ULSM: 0.039" (1 mm); ULSL: 0.079" (2 mm).
Blind Zone: ULSS: 2" (5 cm); ULSM: 4" (10 cm); ULSL: 8" (20 cm).
Beam Width: ULSS & ULSM: 2" (5 cm); ULSL: 3" (7.62 cm).
Temperature Limits: Process: 20 to 140°F (-7 to 60°C); Ambient: -31 to 140°F (-35 to 60°C).
Temperature Compensation: Automatic.
Pressure Limit: 30 psi (2 bar).
Power Requirement: 12 to 28 VDC.
Output Signal: 4 to 20 mA, 2-wire; Invert: 4 to 20 mA or 20 to 4 mA; Fail-safe: 4 mA, 20 mA, 21 mA, 22 mA, or hold last.
Loop Resistance: 400 Ω max.
Electrical Connections: 4' (1.2 m) 9 conductor shielded cable.
Contact Type: 4 SPST relays.
Contact Rating: 1 A max @ 28 VDC max.
Deadband: Selectable (no hysteresis, 1/4", 1/2", 1", 1/2 cm, 1 cm, 2 cm, 5 cm or not available).
Process Connection: 1" NPT, 1" BSPP (optional).
Enclosure Rating: NEMA 6P (IP68).
Enclosure Material: Polycarbonate; Gland: TPE.
Mounting Orientation: Vertical.
Memory: Non-volatile.
Failsafe: Contact: Power loss: Holds last contact; Power on: Open, close, or last contact.
Programming: Free PC software download (USB adapter required).
Weight: 1 lb (0.45 kg).
Agency Approvals: CE.

ACCESSORIES

Model	Description
ULS-ACC-USB	USB adapter for calibration, PVC
ULS-ACC-121	2" x 1" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-122	2" x 1" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-131	3" x 2" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-132	3" x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-142	4" x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-221	2" socket x 1" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-222	2" socket x 1" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-231	3" socket x 2" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-232	3" socket x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-241	4" socket x 2" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-242	4" socket x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-510	1" NPT polypropylene side mount bracket
ULS-ACC-520	2" NPT polypropylene side mount bracket

WATER LEAK DETECTORS

Battery or External Powered, SPST or DPDT Relays



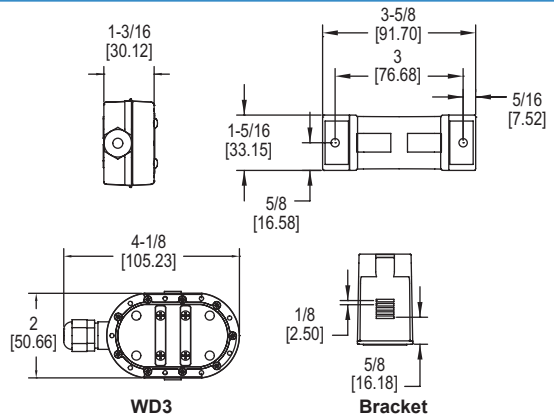
WD3-BP



WD3-LP



Bracket



The **Series WD3 Water Leak Detectors** protect equipment from water damage by detecting the presence of water. Model WD3-BP-D1-A is battery powered, all others require AC or DC supply voltages.

FEATURES/BENEFITS

- Audible and visual alerts provide local indication of the alarm condition and internal switch will give remote indication or control to prevent further buildup of water
- Sensing height can be adjusted as low as 1/32" (0.79 mm) using the included adjustable mounting bracket
- Mounting bracket can attach to any flat surface by either using the attached adhesive strips or mounting screws for easy installation

APPLICATIONS

- AHU drip pans
- Radiant floors
- Data centers
- Sump pumps
- Drains

MODEL CHART

Model	Output	Power	Audible Alarm
WD3-BP-D1-A	SPST NO SSR	Battery	Yes
WD3-LP-D2	DPDT relay	24 VAC (±10%) or 11 to 27 VDC	No
WD3-LP-D2-A	DPDT relay	24 VAC (±10%) or 11 to 27 VDC	Yes

ACCESSORIES

Model	Description
A-WD3-BRK	Replacement mounting bracket

SPECIFICATIONS

Service: Water or conductive fluids.

Minimum Sensing Gap: 1/32".

Switch Type: Battery powered model: SPST NO SSR; External powered models: DPDT relay.

Electrical Ratings: Battery powered model: Pilot duty rating 250 mA @ 24 VDC; External powered models: 1 A @ 24 VAC/DC.

Audible Alarm: At least 85 dB @ 1' distance (depends on model).

Visual Alarm: Red LED for water level; Yellow LED for low battery (battery powered model only); Green LED for power condition (external powered models only).

Temperature Limits: 32 to 122°F (0 to 50°C).

Power Requirements: Battery powered model: 3V CR2450 lithium metal battery, installed functional, user replaceable; External powered models: 24 VAC (±10%) or 11 to 27 VDC.

Power Consumption: Battery powered model: 0.9 mA steady state / 3.0 mA during alarm condition; External powered models: 30 mA steady state / 85 mA during alarm condition.

Battery Life: 5 years steady state / 48 hours during alarm condition.

Electrical Connections: 4.9' (1.5 m), 22 AWG, PVC, UL plenum rated cable.

Enclosure Material: ABS and polycarbonate with flammability classification UL 94 V-0.

Enclosure Rating: Audible alarm models: Watertight up to 3/4 of the body height; Non-audible alarm models: NEMA 6P (IP 68) submersible.

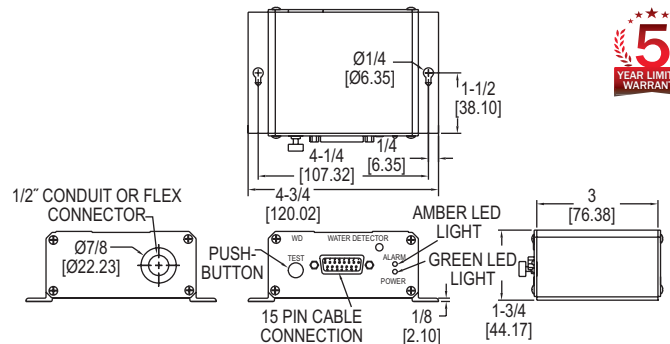
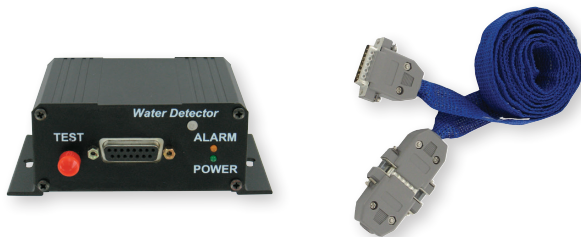
Weight: 4.85 oz (137.5 g).

Agency Approvals: CE.

SERIES WD | W.E. ANDERSON™ BY DWYER

WATER DETECTOR AND SENSOR TAPE

Detects Low Levels Of Conductive Liquids, Large Measuring Area



The **Series WD Water Detector and Sensor Tape** is designed for dependable detection of water presence even of low conductive liquids. The water sensing tape attaches to module and if any liquid comes in contact with the tape the resistance is changed and the alarm will be triggered. The sensing tape is 1" wide and can be bought in lengths of 5, 10, 15 and 25' and is powered by 24 VAC or 24 to 30 VDC.

FEATURES/BENEFITS

- Sturdy and reliable aluminum enclosure
- Hydrophobic tape does not absorb any liquid allowing for faster drying time and faster return to service after water leak
- Multiple tapes can be connected together to extend the coverage area

APPLICATIONS

- Drip pans under HVAC equipment
- Computer rooms
- Telecommunication facilities
- Leak detection around water pumps

SPECIFICATIONS

Service: Conductive liquid.

Switch Type: DPDT.

Electrical Rating: 1 A @ 24 VAC/VDC.

Power Requirements: 24 VAC, 24 to 30 VDC.

Power Consumption: 35 mA maximum.

Electrical Connections: Screw terminals.

Conduit Connections: Hole for 1/2" conduit.

Enclosure: Extruded aluminum.

Sensor Tape: 1" (25.4 mm) wide and 5', 10', 15' or 25' long.

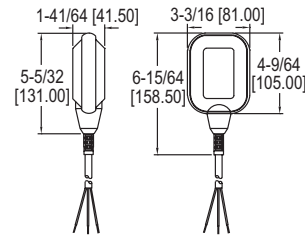
Weight: 8 oz (.23 kg).

MODEL CHART

Model	Description
WD	Water module
TP05	5' (1.52 m) tape
TP10	10' (3.05 m) tape
TP15	15' (4.57 m) tape
TP25	25' (7.62 m) tape

CABLE FLOAT SWITCH

Mercury-Free, UL/CSA Approved Options



The Series CFS2 Cable Float Switch is a mechanically actuated floating switch intended to activate electrical components, such as pumps, to start and stop automatically. Optional cables are available. Contact factory for cable length options ranging from 10 to 70' (3 to 21 m).

FEATURES/BENEFITS

- High reliability with mercury-free, magnetic, mechanical internal design
- Economical pricing with multiple option available for increased versatility
- Easy installation with counterweights and cable hangers to suit a variety of mounting applications

APPLICATIONS

- Water level monitoring
- Tank level control
- High or low level alarm
- Municipal water control
- Industrial water control
- Filling or draining reservoirs and tanks
- Pump automation

MODEL CHART

Model	Cable Type	Approvals	Switch Type	Cable Length	Model	Cable Type	Approvals	Switch Type	Cable Length
CFS2-ONBPN-20	PVC	CE	SPST NO	20' (6.10 m)	CFS2-DNBPN-40	PVC	CE	SPDT	40' (12.19 m)
CFS2-ONBPN-30	PVC	CE	SPST NO	30' (9.14 m)	CFS2-DNBPN-50	PVC	CE	SPDT	50' (15.24 m)
CFS2-ONBPN-40	PVC	CE	SPST NO	40' (12.19 m)	CFS2-DNBPN-60	PVC	CE	SPDT	60' (18.29 m)
CFS2-ONBPN-50	PVC	CE	SPST NO	50' (15.24 m)	CFS2-DNBPN-80	PVC	CE	SPDT	80' (24.38 m)
CFS2-CNBPN-20	PVC	CE	SPST NC	20' (6.10 m)	CFS2-DNBPN-100	PVC	CE	SPDT	100' (30.48 m)
CFS2-CNBPN-30	PVC	CE	SPST NC	30' (9.14 m)	CFS2-OGDSN-20	SJOW	UL/CSA	SPST NO	20' (6.10 m)
CFS2-CNBPN-40	PVC	CE	SPST NC	40' (12.19 m)	CFS2-OGDSN-30	SJOW	UL/CSA	SPST NO	30' (9.14 m)
CFS2-CNBPN-50	PVC	CE	SPST NC	50' (15.24 m)	CFS2-OGDSN-40	SJOW	UL/CSA	SPST NO	40' (12.19 m)
CFS2-DNBPN-7	PVC	CE	SPDT	7' (2.13 m)	CFS2-OGDSN-50	SJOW	UL/CSA	SPST NO	50' (15.24 m)
CFS2-DNBPN-10	PVC	CE	SPDT	10' (3.05 m)	CFS2-CGDSN-20	SJOW	UL/CSA	SPST NC	20' (6.10 m)
CFS2-DNBPN-15	PVC	CE	SPDT	15' (4.57 m)	CFS2-CGDSN-30	SJOW	UL/CSA	SPST NC	30' (9.14 m)
CFS2-DNBPN-20	PVC	CE	SPDT	20' (6.10 m)	CFS2-CGDSN-40	SJOW	UL/CSA	SPST NC	40' (12.19 m)
CFS2-DNBPN-30	PVC	CE	SPDT	30' (9.14 m)	CFS2-CGDSN-50	SJOW	UL/CSA	SPST NC	50' (15.24 m)

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Enclosure: Polypropylene; Cable: See model chart.
Temperature Limits: 32 to 122°F (0 to 50°C).
Pressure Limits: 14.5 psi (1 bar).
Enclosure Rating: IP68.
Switch Type: See model chart.

Electrical Rating: CFS2-XXBXX-XX: 10 (8) A @ 250 VAC; CFS2-XXDXX-XX: 1 HP @ 125 VAC 16 FLA; 2 HP @ 250 VAC 12 FLA.
Shipping Weight: Enclosure: 5.43 oz (154 g); Cable: 0.77 oz (21.27 g) per ft.
Agency Approvals: See model chart.

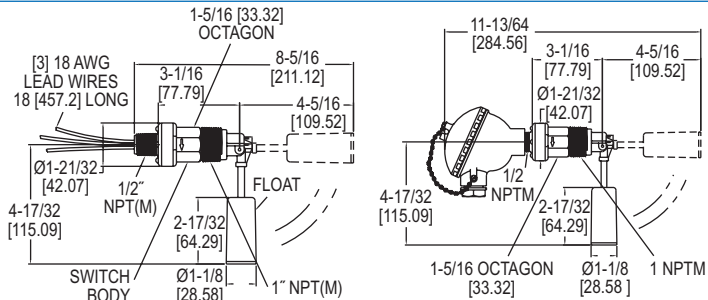
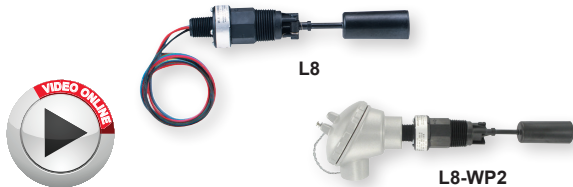
ACCESSORIES

Model	Description	Model	Description
A-457	7.76 oz (220 g) counterweight	A-459	Cable hanger

MODEL L8 | W.E. ANDERSON™ BY DWYER

FLOTECT® LIQUID LEVEL SWITCHES

Low Cost, Leak Proof Body, Excellent Chemical Resistance



The Model L8 Flotect® Liquid Level Switches are float switches constructed of polyphenylene sulfide, Ceramic 8 and 316 SS. This liquid level switch provides accurate set point control of liquids with specific gravities as low as 0.6.

FEATURES/BENEFITS

- Features a leak proof body and float constructed from tough, durable polyphenylene sulfide which has excellent chemical resistance
- Liquid level snap switch is magnetically actuated with no direct mechanical linkage to leak or fail, assuring longer life and decreased maintenance costs
- Quick and easy installation with simple placement of the unit in a horizontal position with the index arrow pointing down
- UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment

APPLICATIONS

- Environmental control
- Waste water
- Scrubber systems
- Holding tanks
- Cooling towers
- Chemical/petroleum processing
- Plating and washing tanks
- Sewage treatment
- Car washes
- Remediation systems
- Thermal storage systems
- HVAC and building automation systems

Model	Description
L8	Level switch

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Float and body: Polyphenylene sulfide (PPS); Pin and spring: 316 SS or Inconel®; Magnet: Ceramic 8.
Temperature Limit: 212°F (100°C).
Pressure Limit: 150 psig (10.34 bar).
Enclosure Rating: General purpose. WP/WP2 option is weatherproof.
Switch Type: SPDT snap switch. MV option is a SPDT gold contact snap switch.

Electrical Rating: 5 A @ 125/250 VAC, 5 A resistive, 3 A inductive @ 30 VDC. MV option: 1 A @ 125 VAC, 1 A resistive, 0.5 A inductive @ 30 VDC.
Electrical Connections: 18 AWG, 18" (460 mm) long.
Conduit Connection: 1/2" male NPT, 1/2" female NPT on WP and WP2.
Process Connection: 1" male NPT.
Mounting Orientation: Horizontal with index arrow pointing down.
Weight: 5 oz (0.142 kg).
Specific Gravity: 0.6 minimum.
Agency Approvals: CE, cURus.

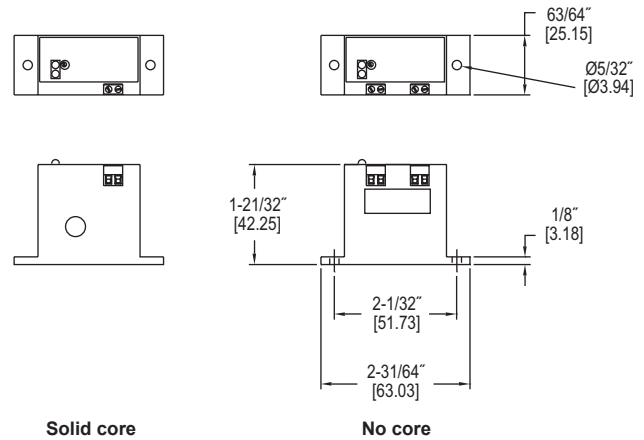
OPTIONS

To order add suffix:	Description
-MV	Gold plated contacts for dry circuits. Rated 1 A @ 125 VAC; 1 A resistive, 0.5 A inductive @ 30 VDC
Example: L8-MV	
-INC	Inconel® alloy. Inconel® alloy replaces standard 316 SS wetted parts. Wetted parts are Inconel® Alloy, Ceramic 8, and Polyphenylene Sulfide.
Example: L8-INC	
-WP	Weatherproof enclosure. Optional housing is phenylpolioxide and provides weatherproof protection for electrical wiring. (Not UL approved)
Example: L8-WP	
-WP2	Weatherproof enclosure. Optional housing is aluminum and provides weatherproof protection for electrical wiring. (Not UL approved)
Example: L8-WP2	

Inconel® is a registered trademark of Huntington Alloys Corporation

MINIATURE CURRENT SWITCHES

Low Cost, Solid or No Core, LED Confirmation, Adjustable Set Point



The **Series MCS Miniature Current Switches** are ideal for monitoring the current usage in fuse boxes and small control panels. Both models have adjustable set points and LED indication to show there is power to the unit and when the switch activates. Set points can be adjusted using the potentiometer next to the LED's. Due to the size of the switch, it is only offered in solid core and no core versions. The no core version has terminal blocks which can accept currents up to 1 A directly into the unit.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Compact size fits in any space

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

Amperage Range: MCS-111050: 0.5 to 50 AAC continuous; MCS-111001: 0.01 to 1 AAC continuous.
Output Rating: Isolated, N.O. 0.3 A @ 130 V DC/AC.
Power Requirements: None, self-powered.
Hysteresis: 1%.
Response Time: <200 ms.
Temperature Limits: 32 to 122°F (0 to 50°C).
Humidity Limits: 10 to 95% RH (non-condensing).
Enclosure Rating: UL 94 V-0 flammability rated ABS, insulation class 600 V.
Weight: 0.5 oz (14.5 g).
Agency Approvals: CE, cULus.

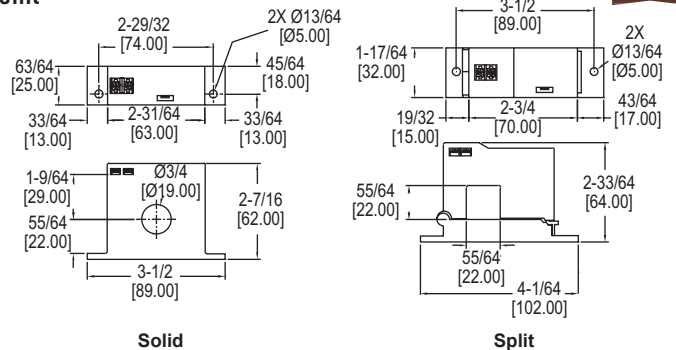
MODEL CHART

Model	Case	Set Point	Minimum Set Point	LED
MCS-111050	Solid core	Adjustable	0.50	Red/veen
MCS-111001	No core (terminal connection)	Adjustable	0.01	Red/green

SERIES CCS

CURRENT SWITCHES

Solid or Split Core, LED Visual Confirmation, Fixed or Adjustable Set Point



Solid

Split

The **Series CCS Current Switches** are ideal for monitoring the operating status of fans, pumps, and motors. These self-powered switches can be hung or tied directly to cables or wires. For use on existing installations, split core models can be installed without disconnecting cables. LED indicators provide a visual confirmation that the current is flowing through the core. Both fixed and adjustable set points are available. The adjustable models utilize a potentiometer to easily adjust the set point.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Solid core or split core configurations
- LED Indicator

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

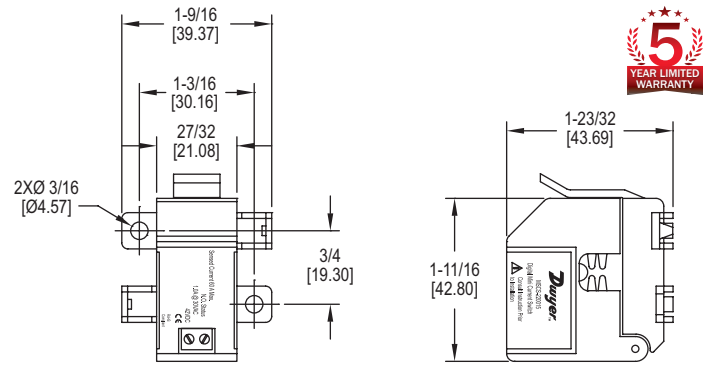
Amperage Range: 0 to 200 AAC.
Maximum Switch Rating: For dry contact models: 0.3 A @ 135 VAC/DC; For non-dry contact models: 1 A @ 240 VAC.
Power Requirements: None, self-powered.
Temperature Limits: -22 to 158°F (-30 to 70°C).
Humidity Limits: 0 to 95% (non-condensing).
Isolation Voltage: 2000 V.
Frequency: 40 to 400 Hz.
Enclosure Rating: UL 94 V-0 flammability rated, ABS plastic housing.
Agency Approvals: CE, cULus.

MODEL CHART

Model	Case	Set Point	Minimum Set Point (A)	LED	Dry Contact Output
CCS-121050	Solid core	Fixed	0.50 (±0.2)	Red	Yes
CCS-111100	Solid core	Adjustable	1.00 (±0.2)	Red/green	No
CCS-221100	Split core	Fixed	1.00 (±0.2)	Red	Yes
CCS-211150	Split core	Adjustable	1.50 (±0.2)	Red/green	No
CCS-131100	Solid core	Adjustable	1.00 (±0.2)	Red/green	Yes
CCS-231150	Split core	Adjustable	1.50 (±0.2)	Red/green	Yes

Dwyer**MODEL MSCS****MINIATURE CURRENT SWITCHES**

Split Core, Integral Mounting Tabs



CE cUL US LISTED

5 YEAR LIMITED WARRANTY

The **Model MSCS Miniature Current Switches** are low cost solutions for monitoring on and off status of light to medium current loads in compact spaces. This unit has a split core design and has a fixed set point of 0.15 amps. It is designed to detect changes in operating current to prevent motor belt loss, slippage, or mechanical failure.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Compact size fits in any space

APPLICATIONS

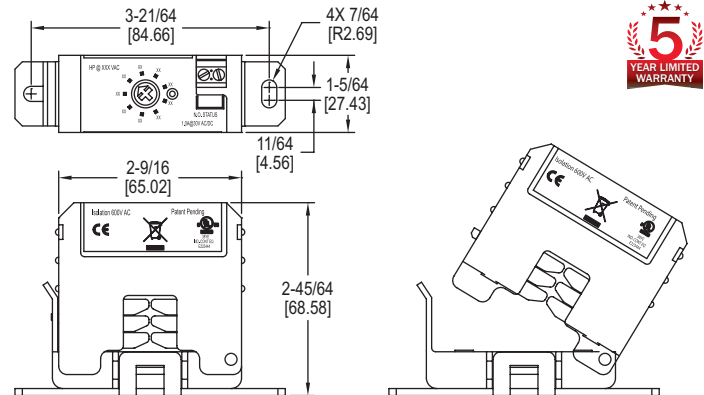
- BAS
- HVAC
- Small industrial motors

MODEL CHART

Model	Motor Application
MSCS-220015	Miniature split core current switch

SPECIFICATIONS**Amperage Range:** 0.15 to 60 A.**Output:** NO.**Power Requirements:** None, self-powered.**Temperature Limits:** 5 to 140°F (-15 to 60°C).**Humidity Limits:** 0 to 95%, non-condensing.**Isolation Voltage:** 300 VAC RMS.**Frequency:** 50/60 Hz.**Enclosure Rating:** UL 94 V-0 flammability rated, ABS plastic housing.**Agency Approvals:** CE, cULus.**SERIES SSCS****SURE-SET CURRENT SWITCHES**

Split Core, Adjustable Set Point



CE cUL US LISTED

5 YEAR LIMITED WARRANTY

The **Series SSCS Sure-Set Current Switches** provide a unique approach to calibration and installing current sensors in a low cost, fast, and accurate design. Selecting the set point has never been easier, with each model having 9 pre-configured adjustable HP set points. This feature eliminates the need to work within a live enclosure, reducing the risk of arc flash on installation.

FEATURES/BENEFITS

- Models for 230 VAC or 480 VAC applications
- Low and high motor HP ranges available
- 9 pre-set HP set points for faster installation

APPLICATIONS

- BAS
- HVAC
- Industrial motors

MODEL CHART

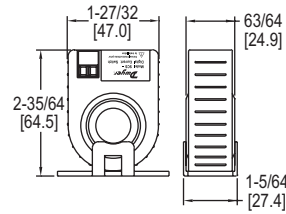
Model	Case	Motor HP Range	Motor Application
SSCS-211100-230	Split	1, 2, 3, 5, 7.5, 10, 15, 20, 25	230 VAC
SSCS-211200-480	Split	2, 3, 5, 7.5, 10, 15, 20, 25, 30	480 VAC
SSCS-211500-230	Split	5, 7.5, 10, 15, 20, 25, 30, 40, 50	230 VAC
SSCS-211150-480	Split	15, 20, 25, 30, 40, 50, 60, 75, 100	480 VAC

SPECIFICATIONS**Output:** Isolated, NO.**Power Requirements:** None, self-powered.**Temperature Limits:** 5 to 140°F (-15 to 60°C).**Humidity Limits:** 0 to 95%, non-condensing.**Isolation Voltage:** 600 VAC RMS.**Frequency:** 50/60 Hz.**Enclosure Rating:** UL 94 V-0 flammability rated, ABS plastic housing.**Agency Approvals:** CE, cULus.**ACCESSORIES**

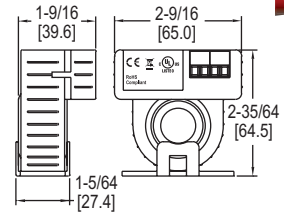
Model	Description
SCT-RLY-12	12 VAC trigger voltage relay module
SCT-RLY-24	24 VAC trigger voltage relay module

CURRENT SWITCHES

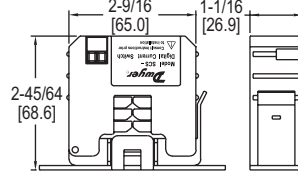
Optional Relay Output, Solid or Split Core Case



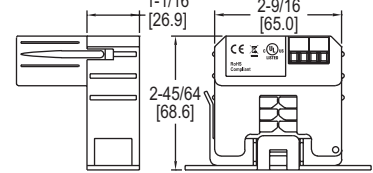
SCS-111100 and SCS-120025



SCS-111100-R



SCS-220015, SCS-220150, and SCS-211125



SCS-220150-R and SCS-211125-R

The **Series SCS Current Switches** are ideal for monitoring whether fans, pumps, or motors are operating. The current flowing through the core of the device powers the circuit without an external power supply. All models have a built in solid state output and are easy to install. Optional LED's and 10 Amp relay modules are available. The Series SCS is available in both split and solid core configurations.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Solid core or split core configurations

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

Output: Isolated, 1 A @ 30 VAC/DC max, NO.
External Relay: SPST N.O., 10 A at 260 VAC (5 A at 30 VDC).
Power Requirements: None, self-powered.
Temperature Limits: 5 to 140°F (-15 to 60°C).
Isolation Voltage: 600 VAC RMS.
Frequency: 50/60 Hz.
Enclosure Rating: UL, 94 V-O flammability rated, ABS plastic housing.
Agency Approvals: CE, cULus.

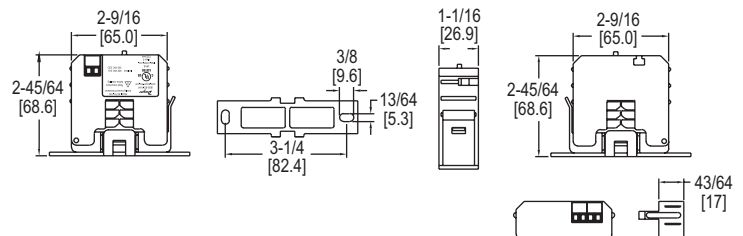
MODEL CHART

Model	Case	Amperage Range	Set Point	Switch Mode	Snap-on Relay	Model	Case	Amperage Range	Set Point	Switch Mode	Snap-on Relay
SCS-120025	Solid	.25 to 200 A	0.25 fixed	Under	No	SCS-220150	Split	1.5 to 200 A	1.5 fixed	Under	No
SCS-111100	Solid	1 to 135 A	Adjustable	Over/under	No	SCS-211125	Split	1.25 to 135 A	Adjustable	Over/under	No
SCS-111100-R	Solid	1 to 135 A	Adjustable	Over/under	Yes	SCS-220150-R	Split	1.5 to 200 A	1.5 fixed	Under	Yes
SCS-220015	Split	.15 to 200 A	0.15 fixed	Under	No	SCS-211125-R	Split	1.25 to 135 A	Adjustable	Over/under	Yes

SERIES SCT

CURRENT TRANSFORMER

Optional Auxillary, Relay Output, Split Core



The **Series SCT Current Transformer** continuously measures the current consumption of pumps, fans, boilers, solar panels and chillers for use in energy monitoring. Current or voltage outputs can be scaled using a slider switch to select between three factory set ranges. Split core configuration allows the current transformer to be installed on new and existing installations. Snap-on mounting bracket allows for quick installation of replacement transformers. An optional 10 A command relay can snap onto the current switch, which eliminates the need to mount an additional relay.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Solid core or split core configurations
- Switch selectable range
- Optional snap on relay eliminates need to mount an additional relay

APPLICATIONS

- BAS
- HVAC
- Industrial motors

MODEL CHART

Model	Range	Output	Power Requirements	Max. Continuous Operating Current
SCT10-100	30/60/120 A	O-4D	24 VDC	120 A
SCT10-102	30/60/120 A	O-4E	Self-powered	120 A
SCT20-103	20/100/150 A	O-4F	Self-powered	150 A

SPECIFICATIONS

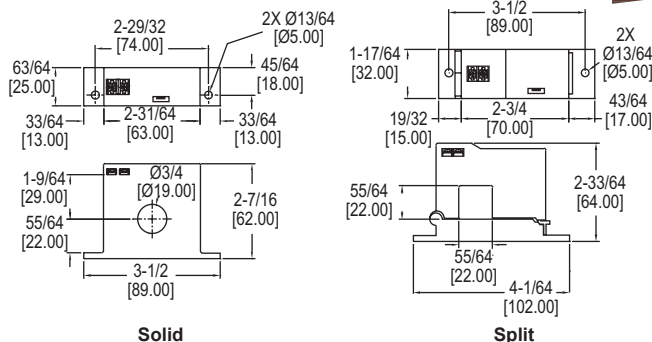
Amperage Range: 30/60/120 A or 20/100/150 A (depending on model).
Continuous Operating Current: 120 A or 150 A (depending on model).
Output: 4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC (depending on model). Optional relay NO SPST; 10 A @ 260 VAC, 5 A @ 30 VDC.
Power Requirements: Self-powered or 24 VDC (depending on model).
Accuracy: ±2% from 10 to 100% of selected range.
Temperature Limits: 5 to 140°F (-15 to 60°C).
Humidity Limits: 0 to 95% non-condensing.
Response Time: 2 s.
Isolation Voltage: 600 VAC RMS.
Frequency: 50/60 Hz.
Enclosure Rating: UL, V-O flammability rated, type 66 nylon.
Agency Approvals: CE, RoHS, cUL, UL.

ACCESSORIES

Model	Range
SCT-RLY-12	12 VAC Trigger Voltage Relay Module
SCT-RLY-24	24 VAC Trigger Voltage Relay Module

CURRENT TRANSFORMERS

Solid or Split Core, Field Selectable Range



Solid

Split

The **Series CCT40/50 Current Transformers** are a low cost alternative for measuring power and monitoring the operation of fans, pumps, or other equipment. For use on existing installations, split core models can be installed without disconnecting cables. Each model offers three jumper selectable ranges and a choice of three different outputs.

MODEL CHART				
Model	Range	Output	Power Requirements	Case
CCT40-202	10/20/50 A	0 to 5 V	Self-powered	Solid core
CCT50-202	100/150/200 A	0 to 5 V	Self-powered	Solid core
CCT40-102	10/20/50 A	0 to 5 V	Self-powered	Split core
CCT50-102	100/150/200 A	0 to 5 V	Self-powered	Split core
CCT40-203	10/20/50 A	0 to 10 V	Self-powered	Solid core
CCT50-203	100/150/200 A	0 to 10 V	Self-powered	Solid core
CCT40-200	10/20/50 A	4 to 20 mA	15 to 42 VDC, loop powered	Solid core
CCT50-200	100/150/200 A	4 to 20 mA	15 to 42 VDC, loop powered	Solid core
CCT40-100	10/20/50 A	4 to 20 mA	15 to 42 VDC, loop powered	Split core
CCT50-100	100/150/200 A	4 to 20 mA	15 to 42 VDC, loop powered	Split core

SPECIFICATIONS

Amperage Range: Field selectable; up to 200 A (depending on model).

Output: 0 to 5 V, 0 to 10 V, or 4 to 20 mA (depending on model).

Power Requirements: Self-powered or 15 to 42 VDC loop powered (depending on model).

Accuracy: 1%.

Temperature Limits: -22 to 158°F (-30 to 70°C).

Humidity Limits: 0 to 95% (non-condensing).

Response Time: 250 ms to 90%.

Isolation Voltage: 2000 V.

Frequency: 10 to 400 Hz.

Enclosure Rating: UL 94 V-0 flammability rated, ABS plastic housing.

Agency Approvals: CE, cULus.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Solid core or split core configurations
- Jumper selectable range

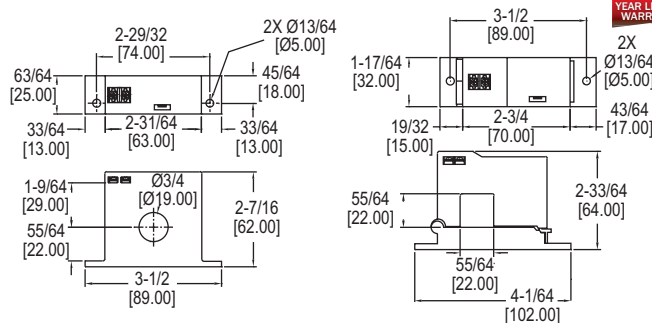
APPLICATIONS

- BAS
- HVAC

SERIES CCT60/70

TRUE RMS CURRENT TRANSFORMERS

Solid or Split Core, Field Selectable Range



Solid

Split

The **Series CCT60/70 True RMS Current Transformers** are a low cost alternative for providing true RMS outputs on distorted AC waveforms. True RMS outputs are ideal for nonlinear loads or noisy circuits. For existing installations, split core models can be installed without disconnecting cables. Each model offers three jumper selectable ranges to reduce the risk of ordering the wrong model.

FEATURES/BENEFITS

- Integral mounting flange for quick installation
- Solid core or split core configurations
- Jumper selectable range
- True RMS

APPLICATIONS

- BAS
- HVAC

MODEL CHART		
Model	Range	Case
CCT60-200	10/20/50 A	Solid core
CCT70-200	100/150/200 A	Solid core
CCT60-100	10/20/50 A	Split core
CCT70-100	100/150/200 A	Split core

SPECIFICATIONS

Amperage Range: Up to 200 A (depending on model).

Output: 4 to 20 mA, true RMS.

Power Requirements: 24 VDC nominal.

Accuracy: 1%.

Temperature Limits: -22 to 158°F (-30 to 70°C).

Humidity Limits: 0 to 95% (non-condensing).

Response Time: 250 ms to 90%.

Isolation Voltage: 2000 V.

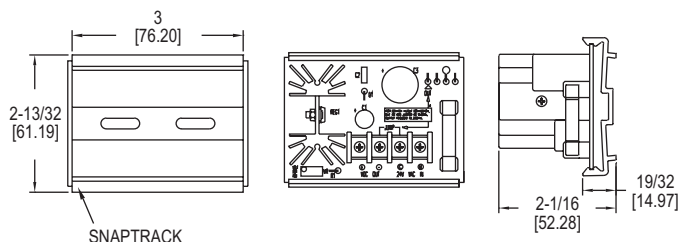
Frequency: 10 to 400 Hz.

Enclosure Rating: UL 94 V-0 flammability rated, ABS plastic housing.

Agency Approvals: CE, cULus.

LOW COST DC POWER SUPPLY

Regulated 0.5 A, 1 A Fuse Protection



The **Model BPS-005 Low Cost DC Power Supply** is a regulated .5 A power supply that accepts 24 VAC input and provides an adjustable 1.5 to 29 VDC output. Output voltage adjustments are made using the on-board potentiometer while measuring the output with a multimeter. A compact snap track design allows the power supply to be surface mounted within a panel.

FEATURES/BENEFITS

- Snap track design allowing for easy panel installation
- Regulated 0.5 Amp

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

Input: 24 VAC/VDC 50/60 Hz.
Output: 24 VDC (full wave rectified and regulated) adjustable 1.5 to 29 VDC, 0.5 A max.
Maximum Current Output: 0.5 A.
Over-Current Protection: 1 A fuse.
Operating Temperature: 32 to 130°F (0 to 55°C).

Humidity Limits: 95% (non-condensing).
Weight: 0.4 lb.
Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

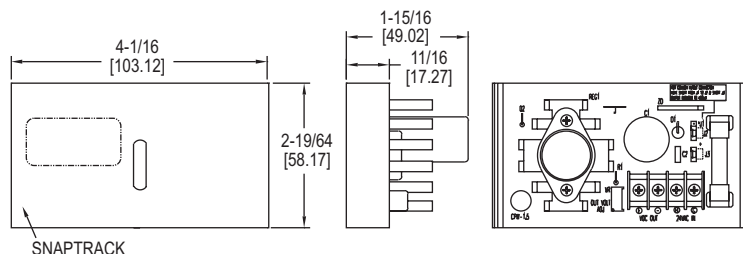
MODEL CHART

Model	Description
BPS-005	Low cost DC power supply

MODEL BPS-015

LOW COST DC POWER SUPPLY

Regulated 1.5 A, 3 A Fuse Protection



The **Model BPS-015 Low Cost DC Power Supply** is used to convert 24 VAC to a regulated DC power source for transmitters with 4 to 20 mA outputs. The output voltage can be field adjusted from 1.5 V to 27 V using a potentiometer. The 3 A fuse protects the power supply from over-current conditions. The snap-on bracket can be quickly surface mounted to any flat surface.

FEATURES/BENEFITS

- Snap track design allowing for easy panel installation
- Regulated 1.5 Amp

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

Input: 24 VAC/VDC 50/60 Hz.
Output: 24 VDC (full wave rectified and regulated) adjustable 1.5 to 27 VDC.
Maximum Current Output: 1.5 A (de-rated to 400 mA for non-isolated circuits).

Temperature Limits: 32 to 130°F (0 to 55°C).
Humidity Limits: 95% (non-condensing).
Weight: 0.4 lb.

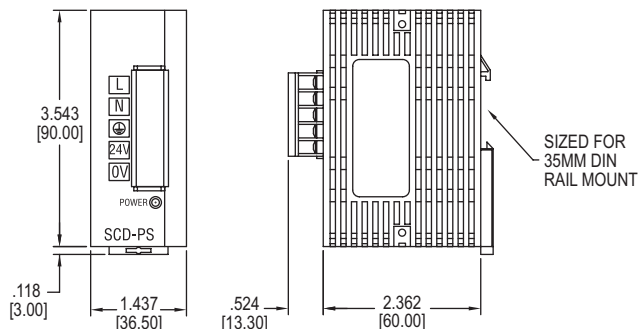
MODEL CHART

Model	Description
BPS-015	Power supply

MODEL SCD-PS

DIN RAIL MOUNT DC POWER SUPPLY

Regulated 1 A, 24 VDC Output



The **Model SCD-PS DIN Rail Mount DC Power Supply** is a compact and economical solution for providing DC power to any Dwyer pressure, humidity, temperature, level or air velocity transmitters. Input voltage can range from 100 to 240 VAC, 50/60 Hz without any jumpers or dip switch selections. A plastic cover slides over the terminals in order to prevent shock from accidental touching of high voltage wires.

FEATURES/BENEFITS

- DIN rail mount
- Universal supply voltage input

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

AC Input: 100 to 240 VAC, 50/60 Hz.
DC Output: 24 VDC (±3% VDC).
Maximum Current Output: 1 A.
Noise: Under 100 mVp-p typical at full load.

Temperature Limits: 32 to 131°F (0 to 55°C).
Weight: 5.6 oz (158 g).
Agency Approvals: CE, cULus.

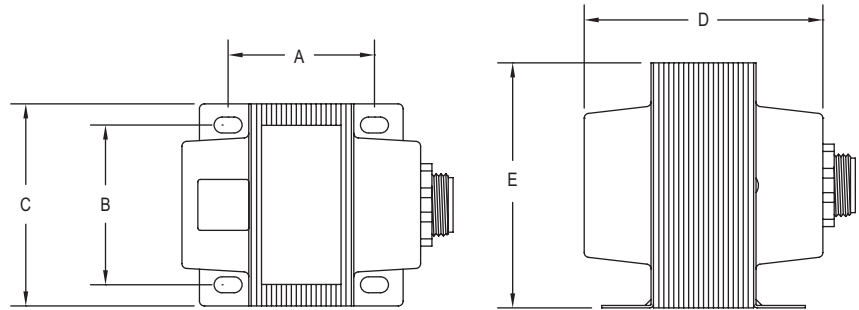
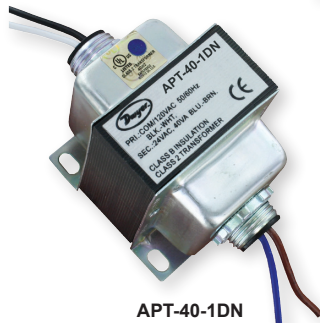
MODEL CHART

Model	Description
SCD-PS	DIN Rail DC Power Supply



AC POWER TRANSFORMERS

20 VA to 150 VA, Single or Dual Hub, Circuit Breaker, UL Class 2



Model	Dimensions in [mm]				
	A	B	C	D	E
APT-20-0SN	1-31/64 (37.6)	1-21/32 (41.9)	1-7/8 (47.5)	2-17/64 (57.4)	2-39/64 (66.2)
APT-20-1SN	1-31/64 (37.6)	1-21/32 (41.9)	1-7/8 (47.5)	2-17/64 (57.4)	2-39/64 (66.2)
APT-40-0SN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-43/64 (68.0)	2-7/8 (73.0)
APT-40-1SN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-43/64 (68.0)	2-7/8 (73.0)
APT-40-1DN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-43/64 (68.0)	2-7/8 (73.0)
APT-40-2SN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-43/64 (68.0)	2-7/8 (73.0)
APT-40-2DN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-43/64 (68.0)	2-7/8 (73.0)
APT-40-3SN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-43/64 (68.0)	2-7/8 (73.0)
APT-40-5DN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-3/4 (70.0)	2-7/8 (73.0)
APT-50-1SN	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	2-61/64 (75.0)	3-1/32 (77.0)
APT-50-1DN	1-61/64 (49.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-3/4 (70.0)	2-7/8 (73.0)
APT-50-1SB	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-31/64 (88.5)	3-1/32 (77.0)
APT-50-1DB	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-31/64 (88.5)	3-1/32 (77.0)
APT-50-2SN	2-1/32 (51.5)	1-25/32 (45.2)	2-11/64 (55.0)	2-3/4 (70.0)	2-7/8 (73.0)
APT-50-2DN	1-61/64 (49.5)	1-31/32 (50.2)	2-11/64 (55.0)	2-3/4 (70.0)	2-7/8 (73.0)
APT-50-2SB	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/16 (87.1)	3-1/32 (77.0)
APT-50-2DB	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/16 (87.1)	3-1/32 (77.0)
APT-50-5SB	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/16 (87.1)	3-1/32 (77.0)
APT-50-5DB	1-13/16 (46.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/16 (87.1)	3-1/32 (77.0)
APT-75-1SB	2-13/64 (56.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/8 (98.5)	3-1/32 (77.0)
APT-75-1DB	2-13/64 (56.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/8 (98.5)	3-1/32 (77.0)
APT-75-2SB	2-13/64 (56.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-7/8 (98.5)	3-1/32 (77.0)
APT-75-2DB	2-13/64 (56.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-53/64 (97.1)	3-1/32 (77.0)
APT-75-5SB	2-13/64 (56.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-53/64 (97.1)	3-1/32 (77.0)
APT-75-5DB	2-13/64 (56.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-53/64 (97.1)	3-1/32 (77.0)
APT-100-1SB	2-13/32 (61.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-5/64 (103.5)	3-1/32 (77.0)
APT-100-1DB	2-13/32 (61.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-5/64 (103.5)	3-1/32 (77.0)
APT-100-1DB-20*	2-13/32 (61.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-5/64 (103.5)	3-1/32 (77.0)
APT-100-2SB	2-13/32 (61.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-5/64 (103.5)	3-1/32 (77.0)
APT-100-2DB	2-13/32 (61.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-1/32 (102.1)	3-1/32 (77.0)
APT-100-5SB	2-39/64 (66.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-1/4 (107.1)	3-1/32 (77.0)
APT-100-5DB	2-39/64 (66.0)	1-31/32 (50.2)	2-1/2 (63.5)	4-1/4 (107.1)	3-1/32 (77.0)
APT-150-1DB	2-33/64 (64.0)	1-31/32 (50.2)	2-1/2 (63.5)	3-9/16 (90.5)	3-1/32 (77.0)

*20" wire 18 AWG leads.

The **Series APT AC Power Transformers** provide isolated step-down to 24 VAC with models offering VA ratings of 20, 40, 50, 75, 96, or 150 VA's. These cost efficient transformers are offered in single or dual 1/2" NPT threaded hub mounts with 8-1/2" 18 AWG wire leads, to meet the installation requirements of a variety of building automation and control panel applications in HVAC. All models are UL Class 2 listed.

FEATURES/BENEFITS

- Single or dual 1/2" NPT
- Universal supply voltage input
- With or without integral circuit breaker

APPLICATIONS

- BAS
- HVAC

SPECIFICATIONS

Input Voltage: See model chart.

Input Frequency: 50/60 Hz.

Output Voltage: See model chart.

Output VA Rating: 20, 40, 50, 75, 96, or 150 VA.

Mounting: Slotted foot mount with single, or dual 1/2" NPT hub.

Current Protection: See model chart.

Electrical Connections: Models ending in -20: 20" (508 mm) 18 AWG leads; All other models: 8.5" (210 mm) 18 AWG leads.

Weight: See model chart.

Agency Approvals: CE, cULus.

AC POWER TRANSFORMERS

20 VA to 150 VA, Single or Dual Hub, Circuit Breaker, UL Class 2

MODEL CHART							
Model	Rating	Input Voltage	Output Voltage	Mounting	Current Protection	Wiring	Weight
APT-20-0SN	20 VA	24 VAC	24 VAC	Foot mount w/ single hub	Inherent	Diagram B	1.25 lb (0.57 kg)
APT-20-1SN	20 VA	120 VAC	24 VAC	Foot mount w/ single hub	Inherent	Diagram A	1.29 lb (0.59 kg)
APT-40-0SN	40 VA	24 VAC	24 VAC	Foot mount w/ single hub	Internal fuse	Diagram B	1.96 lb (0.89 kg)
APT-40-1SN	40 VA	120 VAC	24 VAC	Foot mount w/ single hub	Internal fuse	Diagram A	1.98 lb (0.90 kg)
APT-40-1DN	40 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Internal fuse	Diagram A	2.03 lb (0.92 kg)
APT-40-2SN	40 VA	240 VAC	24 VAC	Foot mount w/ single hub	Internal fuse	Diagram C	1.98 lb (0.90 kg)
APT-40-2DN	40 VA	240 VAC	24 VAC	Foot mount w/ dual hub	Internal fuse	Diagram C	2.03 lb (0.92 kg)
APT-40-3SN	40 VA	120/208/240/277 VAC	24 VAC	Foot mount w/ single hub	Internal fuse	Diagram E	2.07 lb (0.94 kg)
APT-40-5DN	40 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ dual hub	Internal fuse	Diagram D	2.29 lb (1.04 kg)
APT-50-1SN	50 VA	120 VAC	24 VAC	Foot mount w/ single hub	Internal fuse	Diagram A	2.43 lb (1.10 kg)
APT-50-1DN	50 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram A	2.47 lb (1.12 kg)
APT-50-1SB	50 VA	120 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram A	2.77 lb (1.26 kg)
APT-50-1DB	50 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Internal fuse	Diagram A	2.77 lb (1.26 kg)
APT-50-2SN	50 VA	240 VAC	24 VAC	Foot mount w/ single hub	Internal fuse	Diagram C	2.49 lb (1.13 kg)
APT-50-2DN	50 VA	240 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram C	2.53 lb (1.15 kg)
APT-50-2SB	50 VA	240 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram C	2.77 lb (1.26 kg)
APT-50-2DB	50 VA	240 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram C	2.81 lb (1.28 kg)
APT-50-5SB	50 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram D	2.69 lb (1.22 kg)
APT-50-5DB	50 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram D	2.73 lb (1.24 kg)
APT-75-1SB	75 VA	120 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram A	3.53 lb (1.60 kg)
APT-75-1DB	75 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram A	3.57 lb (1.62 kg)
APT-75-2SB	75 VA	240 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram C	3.53 lb (1.60 kg)
APT-75-2DB	75 VA	240 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram C	3.57 lb (1.62 kg)
APT-75-5SB	75 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram D	3.60 lb (1.63 kg)
APT-75-5DB	75 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram D	3.62 lb (1.64 kg)
APT-100-1SB	100 VA	120 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram A	3.97 lb (1.80 kg)
APT-100-1DB	100 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram A	4.01 lb (1.82 kg)
APT-100-1DB-20*	100 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram A	4.05 lb (1.84 kg)
APT-100-2SB	100 VA	240 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram C	3.97 lb (1.80 kg)
APT-100-2DB	100 VA	240 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram C	4.01 lb (1.82 kg)
APT-100-5SB	100 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ single hub	Button circuit breaker	Diagram D	4.03 lb (1.83 kg)
APT-100-5DB	100 VA	120/208/240/277/480 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram D	4.05 lb (1.84 kg)
APT-150-1DB	150 VA	120 VAC	24 VAC	Foot mount w/ dual hub	Button circuit breaker	Diagram A	4.98 lb (2.26 kg)

*20" wire 18 AWG leads.

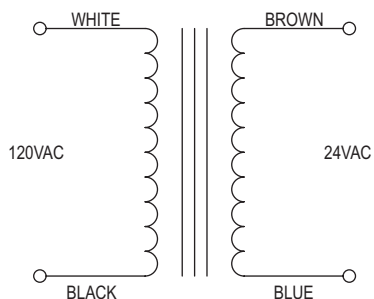


Diagram A

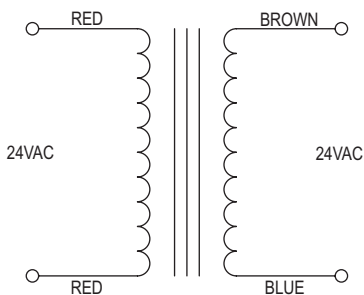


Diagram B

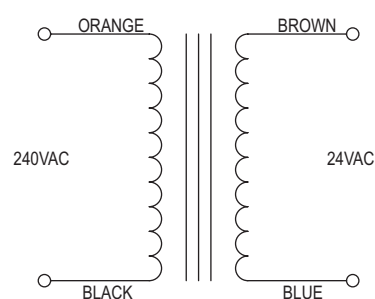


Diagram C

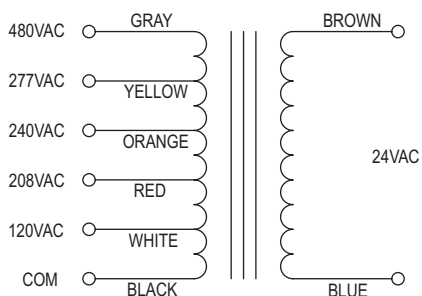


Diagram D

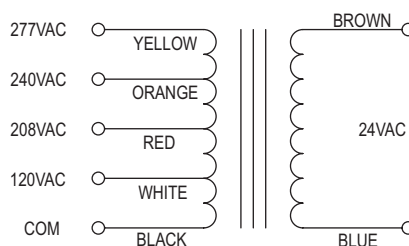
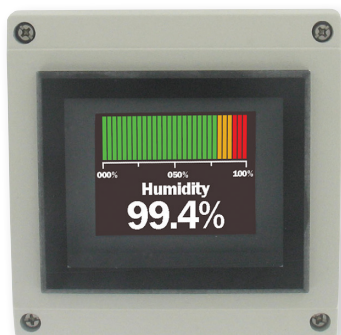


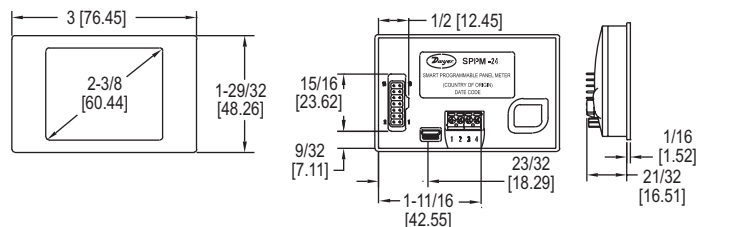
Diagram E

SMART PROGRAMMABLE PANEL METERS

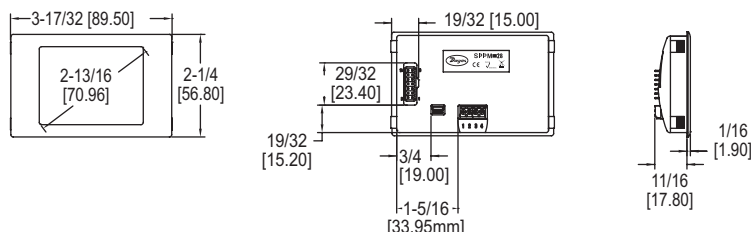
Fully Field Configurable, 16-Bit Color Touch Screen Display



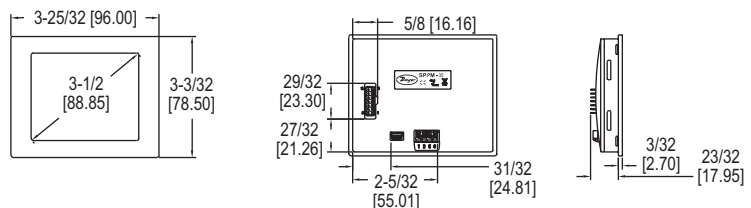
SPPM-HSG



SPPM-24 and SPPM-24-C



SPPM-28 and SPPM-28-C



SPPM-35 and SPPM-35-C

The **Series SPPM Smart Programmable Panel Meters** are configurable full-color touch screen displays that can be used in a variety of applications. By using a USB connection, the panel meter can be configured with downloadable software for any computer running Windows® based software. The display features remarkable graphics that can easily be customized to read and/or graph pressure, temperature, humidity, gas concentration, or many other parameters.

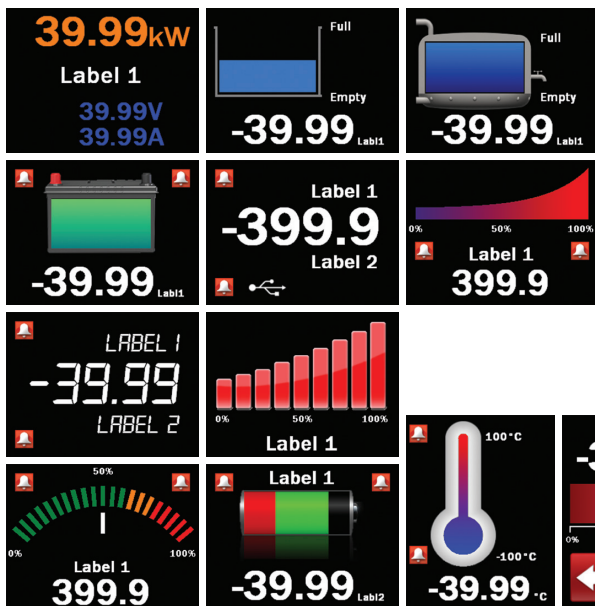
FEATURES/BENEFITS

- Available with 2.4", 2.8", or 3.5" color touch screen display
- Free downloadable Windows® software allows the unit to be customized to specific applications

APPLICATIONS

- Tank level
- Power monitoring
- Room pressurization condition
- Indoor air quality conditions

SAMPLE PROGRAMMABLE DISPLAY CONFIGURATIONS



SPECIFICATIONS

SPPM SPECIFICATIONS

Inputs: Current: 0 to 50 mA, scalable (factory set from 4 to 20 mA); Voltage: 0 to 40 VDC, scalable (factory set from 0 to 10 V).
Accuracy: 0.1%.
Resolution: 0.3 to 9.8 mV (depending on input range).
Power Supply: 4 to 30 VDC max or via USB.
Current Consumption: 190 mA max.
Display: 2.4", 2.8" or 3.5" TFT full color touch screen.
Display Resolution: 320 x 240 pixels.
Sampling Rate: 3 samples/s.
Temperature Limits: 32 to 104°F (0 to 40°C).
Warm Up: 30 s.
Mounting: Panel mount.
Electrical Connection: Screw terminals, pin connection, or USB.
Computer Requirements: Compatible with Windows® 7, Windows® 8 and Windows® 10.
Weight: 2.8 oz (79.4 g).
Agency Approvals: CE.

SPPM-HSG SPECIFICATIONS

Service: Indoor or outdoor.
Material: Painted aluminum or glass.
Enclosure Rating: NEMA 4X (IP66).

A-SPPM-TC SPECIFICATIONS

Probe Measurement Range:
 K-type: -328 to 2462°F (-200 to 1350°C);
 J-type: -328 to 2174°F (-200 to 1190°C);
 T-type: -328 to 734°F (-200 to 390°C).
Temperature Limits: 14 to 104°F (-10 to 40°C).
Resolution: 1.0°F (0.5°C).
Power Requirements: Powered by USB port through SPPM panel meter.
Accuracy: ±2.0°F (±1.0°C).
Weight: 0.9 oz (25.5 g).
Agency Approvals: CE.

MODEL CHART

Model	Display	Input
SPPM-24	2.4"	Voltage
SPPM-28	2.8"	Voltage
SPPM-35	3.5"	Voltage
SPPM-24-C	2.4"	Current
SPPM-28-C	2.8"	Current
SPPM-35-C	3.5"	Current

ACCESSORIES

Model	Description
A-SPPM-TC	Thermocouple input board
SPPM-CA	Mini USB to full USB cable
SPPM-HSG24	2.4" display housing
SPPM-HSG28	2.8" display housing

Note: Additional configurations available via online software.

Windows® is a registered trademark of Microsoft Corporation

GRAPHICAL USER INTERFACE PANEL METER

4.3" (109 mm) Touch Screen Display, Fully Customizable



The **Series SPPM2 Graphical User Interface Panel Meter** is a configurable, full-color 4.3" (109 mm) touch screen display that can be used in a variety of applications. By using the free Windows® based Interface Panel Design Studio software, users can personalize the display with buttons, switches, and analog and digital scales to suit their needs. A development kit is also available, which includes a development board with buttons, dials, LEDs, and screw terminals to test the functionality of all inputs and outputs.

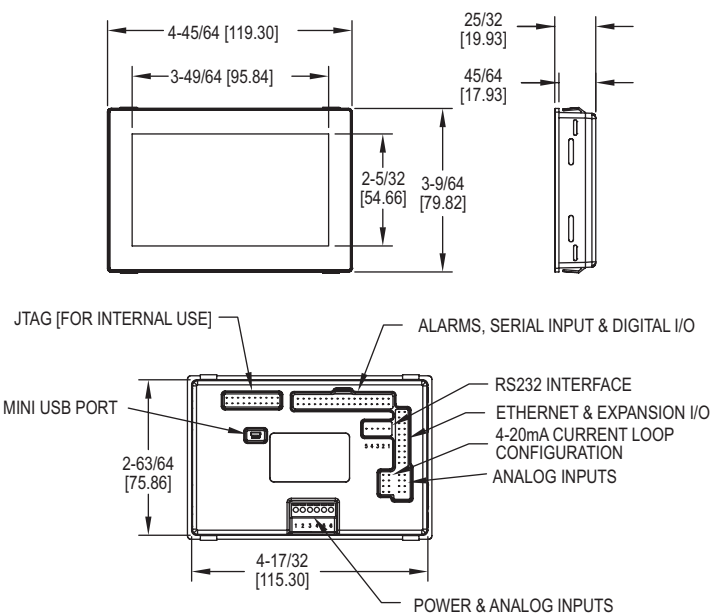
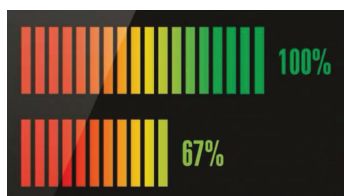
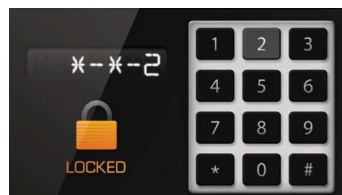
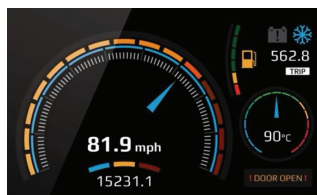
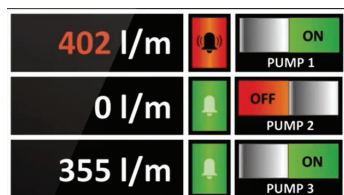
FEATURES/BENEFITS

- Large 4.3" touch screen display can be powered from USB or 5 to 30 VDC supply
- Free design software allows users to drag and drop elements onto the screen to quickly develop their specific interface
- Accepts up to 4 analog inputs, 8 digital I/O, 4 PWM outputs, and 2 open collector alarm outputs

APPLICATIONS

- Lift station pump control
- Room condition monitoring display
- Walk-in refrigeration/freezer control

MODEL CHART	
Model	Description
SPPM2-43	4.3" interface panel
SPPM2-43-D	4.3" interface panel with development board



SPECIFICATIONS

Inputs: Mini-USB, 6-line screw terminal analog, 4 x ± 40 V, or 4 to 20 mA, 8 x digital I/O.

Outputs: 4 x PWM, 2 x alarms (open collector).

Accuracy: $\pm 0.05\%$ ± 0.1 mV (typ).

Resolution: 0.04 mV (max) or 4 decimal places.

Power Supply: USB port or 5 to 30 VDC.

Current Consumption: 400 mA at 5 VDC.

Display: 4.3" (10.9 cm) TFT LCD with 262k colors.

Display Resolution: 480 x 272 pixels.

Sampling Rate: 10 samples/s.

Temperature Limits: 32 to 104°F (0 to 40°C).

Warm Up: 15 s.

Mounting: Panel mount.

Electrical Connection: Multi-pin DIL's, 1 mini-USB, and 1 RS232.

Software Requirements: Compatible with Windows® 7, Windows® 8 and Windows® 10.

Weight: 6.7 oz (181 g).

Approvals: CE.

DEVELOPMENT BOARD SPECIFICATIONS

Inputs: 4 x ± 5 VDC.

Outputs: 8 x digital I/O's, 4 x PWM outputs.

Serial Communication: RS232.

Power Supply: USB port or 5 to 30 VDC.

Weight: 19.7 oz (560 g).

LCD DIGITAL PANEL METERS

3-1/2 & 4-1/2 Digit LCD, User Selectable Engineering Units, Panel Mount



DPMA



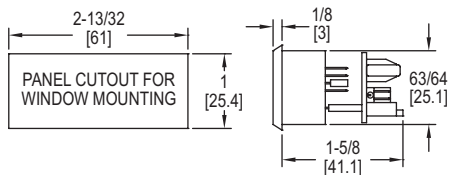
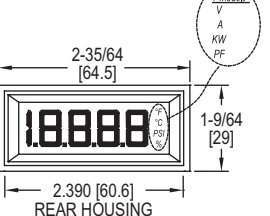
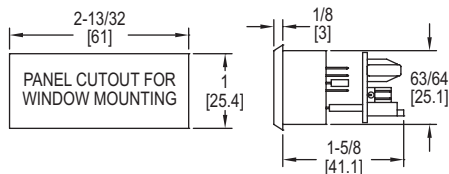
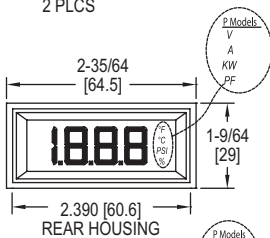
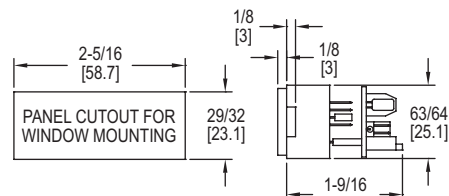
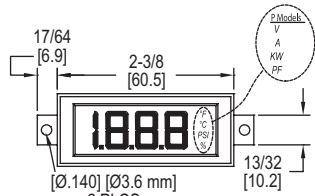
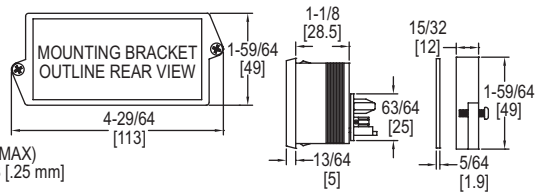
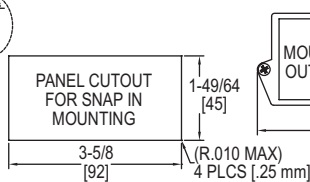
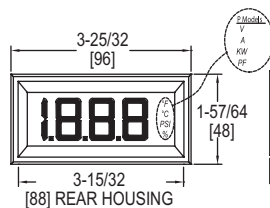
DPMW



DPMP



DPML



The Series DPMA, DPMW, DPMP, & DPML LCD Digital Panel Meters provide easy viewing on the 3-1/2 or 4-1/2 digit LCD display. On the DPMP and DPML the snap-in bezel mount eliminates mounting hardware for quick installation. The DPMA has a high contrast display for easy viewing in a standard 1/8 DIN package. The DPMW window mounts using two screws to sit flush within the panel cutout. This series can accept 4 to 20 mA, 0 to 200 mVDC, 0 to 5 VDC, or 0 to 10 VDC input signal and requires a 24 VDC power supply to illuminate the colored segments.

FEATURES/BENEFITS

- Panel mount for quick installation
- 3-1/2 or 4-1/2 digit with 0.45" or 1" segments
- Colored segments available in black, red, amber, green, or blue
- Jumper selectable engineering units and decimal point positions

APPLICATIONS

- Display process values from pressure, humidity, temperature, voltage, current, watt, or power factor transmitters

ACCESSORIES

Model	Description
DPM-12P	Regulated 120 VAC to 12 VDC power supply
DPM-24P	Regulated 120 VAC to 24 VDC power supply

SPECIFICATIONS

Input: DPMX-4XX(P): 4 to 20 mA; DPMX-5XX(P): 0 to 200 mVDC, 0 to 5 VDC, or 0 to 10 VDC.
Input Impedance: DPMX-4XX(P): 300Ω nominal; DPMX-5XX(P): 390Ω nominal.
Accuracy: DPMA: $\pm(0.05\% \text{ FS} + 1 \text{ count})$; DPMW/P/L: $\pm(0.1\% \text{ FS} + 2 \text{ count})$.
Power Supply: DPMX-4XX(P): Powered by control loop; DPMX-5XX(P): 12 VDC or 24 VDC.
Backlight Power Supply: 24 VDC @ 35 mA typical.
Span and Zero: Adjustable (± 1999 counts).
Display: DPMA: 3-1/2 digits, 7 segments, 1" (25.4 mm) H; DPMP/W: 3-1/2 digits, 7 segments, 0.45" (11.4 mm) H; DPML: 4-1/2 digits, 7 segments, 0.45" (11.4 mm) H.

Decimal Points: DPMA/W/P: 3-position, user selectable; DPML: 4-position, user selectable.
Polarity: Automatic, "-" displayed.
Operating Temperature: 32 to 122°F (0 to 50°C).
Storage Temperature: -4 to 158°F (-20 to 70°C).
Mounting: DPMA: Snap-in panel mount or clamp (gasket included); DPMW: Window mount; DPMP/L: Snap-in bezel mount.
Connection: Screw terminals.
Conversion Rate: 3 per s.
Warm-Up: 10 minutes typical.
Weight: DPMA: 4 oz (113.4 g); DPMW/P/L: 2 oz (56.7 g).

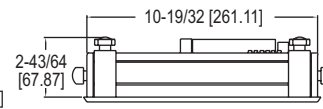
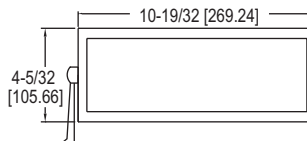
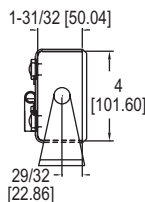
MODEL CHART

Model	Input	Segments	Engineering Units	Digit	Model	Input	Segments	Engineering Units	Digit
DPMA-401	Current	Amber	°F, °C, %, PSI	3-1/2"	DPMW-401P	Current	Amber	V, A, KW, PF	3-1/2"
DPMA-402	Current	Red	°F, °C, %, PSI	3-1/2"	DPMW-402P	Current	Green	V, A, KW, PF	3-1/2"
DPMA-404	Current	Green	°F, °C, %, PSI	3-1/2"	DPMW-403P	Current	Red	V, A, KW, PF	3-1/2"
DPMA-501	Voltage	Amber	°F, °C, %, PSI	3-1/2"	DPMP-401*	Current	Amber	°F, °C, %, PSI	3-1/2"
DPMA-502	Voltage	Red	°F, °C, %, PSI	3-1/2"	DPMP-402*	Current	Green	°F, °C, %, PSI	3-1/2"
DPMA-504	Voltage	Green	°F, °C, %, PSI	3-1/2"	DPMP-403*	Current	Red	°F, °C, %, PSI	3-1/2"
DPMA-401P	Current	Amber	V, A, KW, PF	3-1/2"	DPMP-501*	Voltage	Amber	°F, °C, %, PSI	3-1/2"
DPMA-402P	Current	Red	V, A, KW, PF	3-1/2"	DPMP-502*	Voltage	Green	°F, °C, %, PSI	3-1/2"
DPMA-404P	Current	Green	V, A, KW, PF	3-1/2"	DPMP-503*	Voltage	Red	°F, °C, %, PSI	3-1/2"
DPMA-501P	Voltage	Amber	V, A, KW, PF	3-1/2"	DPMP-401P*	Current	Amber	V, A, KW, PF	3-1/2"
DPMA-502P	Voltage	Red	V, A, KW, PF	3-1/2"	DPMP-402P*	Current	Green	V, A, KW, PF	3-1/2"
DPMA-504P	Voltage	Green	V, A, KW, PF	3-1/2"	DPMP-403P*	Current	Red	V, A, KW, PF	3-1/2"
DPMW-401	Current	Amber	°F, °C, %, PSI	3-1/2"	DPMP-501P*	Voltage	Amber	V, A, KW, PF	3-1/2"
DPMW-402	Current	Green	°F, °C, %, PSI	3-1/2"	DPMP-502P*	Voltage	Green	V, A, KW, PF	3-1/2"
DPMW-403	Current	Red	°F, °C, %, PSI	3-1/2"	DPMP-503P*	Voltage	Red	V, A, KW, PF	3-1/2"

*For 4-1/2 digit display, change DPMP to DPML. Example: DPML-401

EXTRA LARGE DIGITAL PANEL METER

3-1/2 Digit LED Display, 2.3" Segment Height, Process Inputs



The **Series DPMX Extra Large Digital Panel Meter** can be easily viewed from across a room or in dark areas. The 2.3" LED segments are available in red, green, or blue. These panel meters come equipped with a universal power supply and user selectable process inputs to fit most applications.

FEATURES/BENEFITS

- Large 10.6" (269.2 mm) x 4.2" (105.7 mm) backlit display
- Protective metal casing with adjustable mounting bracket

APPLICATIONS

- Display process values from various transmitters

MODEL CHART		
Model	Segments	Power Supply
DPMX-1	Blue	90 to 250 VAC
DPMX-2	Green	90 to 250 VAC
DPMX-3	Red	90 to 250 VAC
DPMX-1-LV	Blue	10.5 to 30 VAC/VDC
DPMX-2-LV	Green	10.5 to 30 VAC/VDC
DPMX-3-LV	Red	10.5 to 30 VAC/VDC

SPECIFICATIONS

Inputs: Set voltage: ± 200 mVDC, ± 2 VDC, ± 20 VDC; Adjustable voltage: 200 mVDC, 5 VDC, 10 VDC; Adjustable current: 0(4) to 20 mA DC.
Input Impedance: Set voltage: > 1 M Ω (> 10 M Ω on 200 mV range); Adjustable voltage: 392 k Ω ; Adjustable current: 300 Ω nominal.
Accuracy: $\pm (1\% \text{ FS} + 1 \text{ count})$.
Power Supply: 90 to 250 VAC @ 12 VA or 10.5 to 30 VAC/DC @ 6 VA (depending on model).
Display: 3-1/2 digits, 2.3" H, 7 segment LED.
Sampling Rate: 3 readings per s.
Operating Temperature: 14 to 122°F (-10 to 50°C).
Storage Range: -40 to 167°F (-40 to 75°C).
Warm Up: 10 minutes.
Mounting: 180° gimbal mounting with 30° stops or bezel mount.

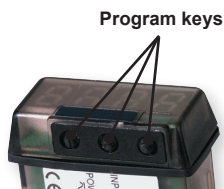
SERIES LCI132

COMPACT PROCESS INDICATOR

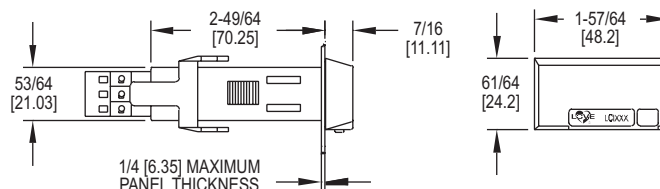
1/32 DIN, Fully Programmable



Process display



Program keys



The **Series LCI132 Compact Process Indicator** offers flexibility and value in a low cost, compact 1/32 DIN package. The shallow depth of these full size panel meters allows installation in panels only 2.76" (70 mm) deep with room to spare.

FEATURES/BENEFITS

- Fits in 1/32 DIN panel cutouts
- IP65 (NEMA 4X) front housing
- Fully programmable
- Various voltage and current inputs fit most processes

APPLICATIONS

- Display process values from various transmitters

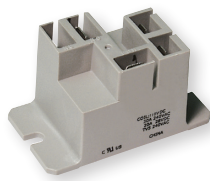
MODEL CHART		
Model	Input	Supply Voltage
LCI132-00	± 100 VDC; ± 20 VDC; ± 10 VDC; ± 200 VDC; ± 20 mA DC	120/240 VAC
LCI132-01	± 100 VDC; ± 20 VDC; ± 10 VDC; ± 200 VDC; ± 20 mA DC	24/48 VAC
LCI132-10	± 100 VAC; 600 VAC; 5 A (DC) 1 A (AC); -199.9 to +600 VDC; ± 100 VDC -1.999 to 5 A (DC) ± 1 A (DC)	120/240 VAC
LCI132-11	± 100 VAC; 600 VAC; 5 A (DC) 1 A (AC); -199.9 to +600 VDC; ± 100 VDC -1.999 to 5 A (DC) ± 1 A (DC)	24/48 VAC

SPECIFICATIONS

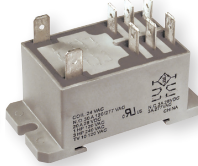
LCI132-0X
Range: Input volts (DC): ± 200 V, ± 20 V, ± 10 V; Input amperes: ± 100 mV, ± 20 mA.
Resolution: Input volts (DC): 0.1 V, 0.01 V, 1 mV; Input amperes: 0.1 mV, 0.01 mA; Input impedance: Volts: 1 M Ω , mV: 100 M Ω , mA: 12.1 Ω .
LCI132-1X
Range AC: Input volts: 600.0, 100.0; Input amperes: 5.000, 1.000.
Range DC: Input volts: -199.9, ± 600.0 , ± 100.0 ; Input amperes: -1.999, +5.000, ± 1.000 .
Resolution: Input volts: 0.1 V; Input amperes: 1 mA; Input impedance: Volts: 3 M Ω (106), Amps: 12 m Ω (10-3).
Accuracy at 23°C $\pm 5^\circ$ C: 100/600 VDC 1/5 A DC; 600 V/5 AAC: $\pm (0.2\% \text{ reading} + 3 \text{ digits})$. 100 V / 1 A AC: $\pm (0.4\% \text{ reading} + 4 \text{ digits})$.
Temperature Coefficient: 100 ppm/ $^\circ$ C.
Warm Up: 5 minutes.
Power Supply and Fuses (DIN 41661) (Not supplied): LCI132-X0: 85-265 VAC 50/60 Hz and 100-300 VDC: Fuse: 0.1 A/ 250 V; LCI132-X1: 21-53 VAC 50/60 Hz and 10.5-70 VDC: Fuse 0.5 A/ 250 V.
DISPLAY
Range: -1999 to 9999 (DC) 0 to 9999 (AC).
Type: 4 red digits 10 mm.
Reading Rate: 4/s.
Overflow Indication: OVR.
ENVIRONMENTAL
Operating Temperature: 14 to 140°F (-10 to 60°C).
Storage Temperature: -13 to 185°F (-25 to 85°C).
Relative Humidity (non condensed): < 95% @ 40°C.
Panel Sealing: NEMA 4X (IP66).

ELECTROMECHANICAL RELAYS

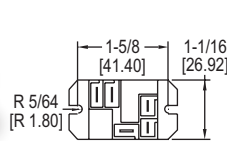
30 Amp, SPDT and DPDT Operation



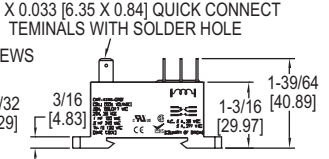
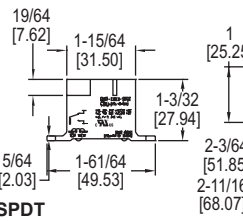
SPDT



DPDT



SPDT



DPDT

The **Series 9 Electromechanical Relays** are small in size, features Class F insulation for a max coil temperature of 155°C, quick-connect terminals for simple connection, and is panel mountable. The relays are compact and impervious to shock and vibration.

FEATURES/BENEFITS

- Compact size for flange mounting
- Quick-connect terminals to allow for easy installation

APPLICATIONS

- Motor control
- Lighting control
- Refrigeration compressor systems

MODEL CHART			
Model	Operation	Input Voltage	Coil Resistance
9AS5A5224	AC	24 VAC 50/60 Hz	500 Ω
9AS5A52120	AC	120 VAC 50/60 Hz	3000 Ω
92S11A22D24	AC	24 VAC 50/60 Hz	250 Ω
92S11A22D120	AC	120 VAC 50/60 Hz	1600 Ω
9AS5D5224	DC	24 VDC	576 Ω
92S11D22D12	DC	12 VDC	86 Ω
92S11D22D24	DC	24 VDC	1600 Ω

SPECIFICATIONS

Operating and Load Voltage Range: 12 to 277 VAC; 5 to 110 VDC.

Electrical Connection: Quick-connect tab terminals. SPDT 0.187" coil terminal/0.25" contact terminal; DPDT 0.25" coil terminal/0.25" contact terminal.

Switching Operation: SPDT or DPDT.

Electrical Rating: SPDT: NO 30 A @ 240 VAC / 28 VDC; NC 10 A @ 240 VAC / 28 VDC; DPDT: 30 A @ 240 VAC 20 A @ 28 VDC.

Temperature Limits: Storage: -40 to 185°F (-40 to 85°C); Operation: -40 to 131°F (-40 to 55°C).

Voltage Loss: 2.5 VA (VAC); 1W (VDC).
Cycle Life: 100,000 cycles (electrical); 10,000,000 cycles (mechanical).

Housing: Polyester resin.

Weight: 1.16 oz (45 g) (SPDT); 3 oz (85 g) (DPDT).

Agency Approvals: CE, cULus, (EMR-XXXX-DPDT), cURus (EMR-XXXX-SPDT).

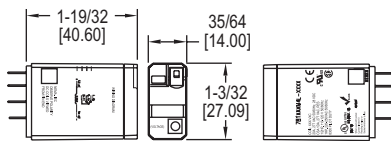
ACCESSORIES

Model	Description
16-9ADIN1	Din adaptor
A-360	Aluminum DIN rail 1 m

SERIES 781 & 782

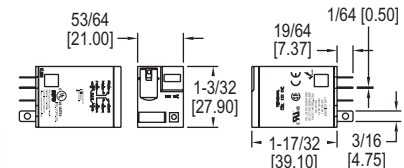
ICE CUBE RELAYS

SPDT or DPDT Operation



781

Pictures shown with socket accessory (sold separately)



782

The **Series 781 & 782 Ice Cube Relays** are full-featured relays that can be used to handle loads up to 15 amps for AC or DC circuits. It features a flag status indicator and a LED status lamp to let the user know when the relay is activated. In order to differentiate between AC and DC actuated models, the push-to-test button is color coded and a removable lock-down lever holds the test button in place.

FEATURES/BENEFITS

- Clear plastic housing to easily view the contacts
- Flag and LED status indicators for visual confirmation of relay state
- Socket mounted for quick installation/replacement

APPLICATIONS

- Refrigeration compressor systems
- HVAC motor controls
- Water/wastewater pump control

SPECIFICATIONS

Operating and Load Voltage Range: 24 to 240 VAC; 24 VDC.

Electrical Connection: Silver alloy plug-in contacts.

Switching Operation: SPDT or DPDT.

Electrical Rating: Depends on model, see model chart.

Temperature Limits: Storage: -40 to 185°F (-40 to 85°C); Operation: -40 to 131°F (-40 to 55°C).

Power Consumption: 781: 0.9 VA; 0.7W; 782: 1.2 VA; 0.9W.

Cycle Life: 100,000 cycles (electrical); 10,000,000 cycles (mechanical).

Housing: Plastic polycarbonate.

Weight: 781: 1.02 oz (29 g); 782: 1.3 oz (36 g).

Agency Approvals: CE, CSA, cULus, cURus.

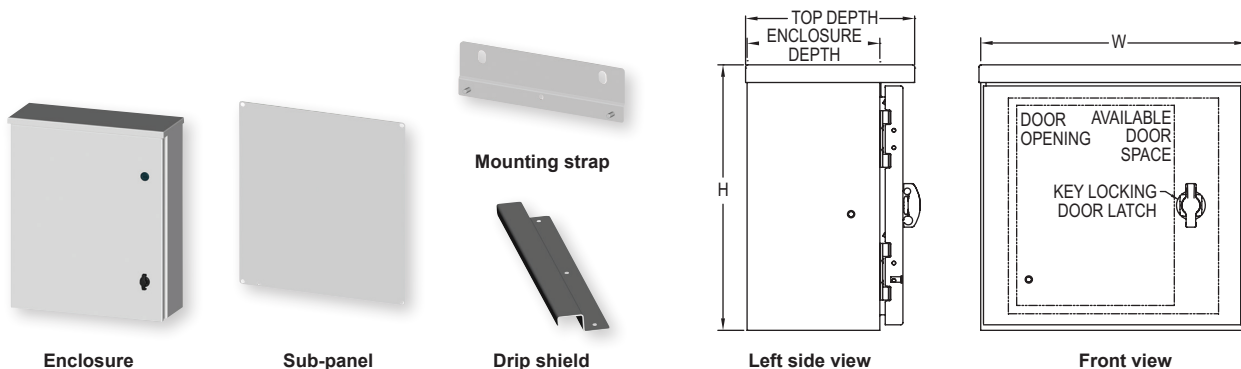
ACCESSORIES

Model	Description
70-781D5-1A	Socket for 781 series relay
70-782D8-1A	Socket for 782 series relay

MODEL CHART				
Model	Operation	Input Voltage	Coil Resistance	Electrical Rating
781XAXRM4L-24A	AC	24 VAC 50/60 Hz	180 Ω	15 A @ 277 VAC (50/60 Hz) or 28 VDC
781XAXRM4L-120A	AC	120 VAC 50/60 Hz	4430 Ω	15 A @ 277 VAC (50/60 Hz) or 28 VDC
781XAXRM4L-240A	AC	240 VAC 50/60 Hz	15720 Ω	15 A @ 277 VAC (50/60 Hz) or 28 VDC
781XAXRM4L-24D	DC	24 VDC	750 Ω	15 A @ 277 VAC (50/60 Hz) or 28 VDC
782XBXRM4L-24A	AC	24 VAC 50/60 Hz	180 Ω	15 A @ 120 VAC 50/60 Hz; 12 A @ 277 VAC 50/60 Hz or 28 VDC (UL); 10 A @ 277 VAC 50/60 Hz (CSA)
782XBXRM4L-120A	AC	120 VAC 50/60 Hz	4430 Ω	15 A @ 120 VAC 50/60 Hz; 12 A @ 277 VAC 50/60 Hz or 28 VDC (UL); 10 A @ 277 VAC 50/60 Hz (CSA)
782XBXRM4L-240A	AC	240 VAC 50/60 Hz	15720 Ω	15 A @ 120 VAC 50/60 Hz; 12 A @ 277 VAC 50/60 Hz or 28 VDC (UL); 10 A @ 277 VAC 50/60 Hz (CSA)
782XBXRM4L-24D	DC	24 VDC	650 Ω	15 A @ 120 VAC 50/60 Hz; 12 A @ 277 VAC 50/60 Hz or 28 VDC (UL); 10 A @ 277 VAC 50/60 Hz (CSA)

GALVANNEALED STEEL ENCLOSURES

Wall Mounted, NEMA 3R, UL Approved



The **Series CSE-3R Galvannealed Steel Enclosures** are spot-welded, wall mounted enclosures designed to house electrical controls, instruments, and components in an outdoor environment. These units are made of carbon steel, NEMA 3R outdoor environment rated and carry a UL approval.

FEATURES/BENEFITS

- Concealed hinges that allow 180° of rotation for easy instrumentation access
- Quarter turn latch that can be opened/closed with a screwdriver, and ground studs on the door and body
- Mounting holes on the back of the enclosure allow for versatile mounting and standoffs provide easy installation of optional sub-panels. A rain cap and an oil resistant door gasket will protect instruments from rain, sleet, and snow. Each unit includes a 3/8-16 grounding kit and has the option of including a sub-panel, mounting strap, and/or a drip shield. This series is the perfect accessory for a variety of instrumentation in need of outdoor protection

APPLICATIONS

- HVAC indoor applications
- Housing general controls and gages

MODEL CHART											
Enclosure* Model	Height in (cm)	Width in (cm)	Depth in (cm)	Weight lb (kg)	Sub Panel* Model	Weight lb (kg)	Mounting Strap* Model	Weight lb (kg)	Drip Shield* Model	Weight lb (kg)	
CSE-3R-121206	12 (30)	12 (30)	6 (15)	15 (7)	A-SSE-P-1212	3 (1.4)	A-CSE-3M-12	2 (0.9)	A-CSE-D-12	2 (0.9)	
CSE-3R-161206	16 (41)	12 (30)	6 (15)	16 (7)	A-SSE-P-1612	4 (1.8)	A-CSE-3M-16	2 (0.9)	A-CSE-D-16	2 (0.9)	
CSE-3R-201606	20 (51)	16 (41)	6 (15)	25 (11)	A-SSE-P-2016	8 (3.6)	A-CSE-3M-20	3 (1.4)	A-CSE-D-20	3 (1.4)	
CSE-3R-242006	24 (61)	20 (51)	6 (15)	32 (15)	A-SSE-P-2420	14 (6.4)	A-CSE-3M-24	4 (1.8)	A-CSE-D-24	4 (1.8)	
CSE-3R-302408	30 (76)	24 (61)	8 (20)	60 (27)	A-SSE-P-3024	22 (10)			A-CSE-D-30	4 (1.8)	
CSE-3R-362408	36 (91)	24 (61)	8 (20)	62 (28)	A-SSE-P-3624	27 (12.2)					
CSE-3R-363008	36 (91)	30 (76)	8 (20)	70 (32)	A-SSE-P-3630	34 (15.4)					

*For additional sizes contact factory.

ACCESSORIES	
Model	Description
A-CSE-L	Keylocking wing knob door latch, Includes 1 lock and 2 keys
A-CSE-K	Replacement keys, includes 2 keys

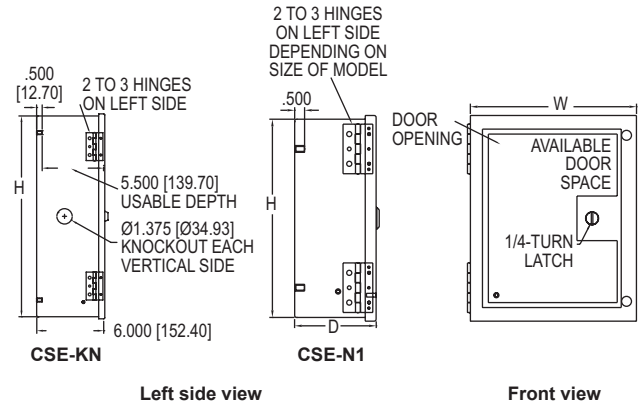
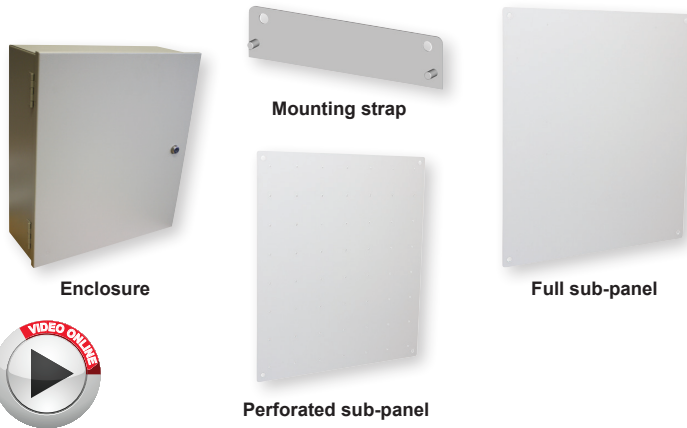


A-CSE-L

SPECIFICATIONS
Materials: Galvannealed steel enclosure; All other components: Carbon steel.
Rating: NEMA 3R (IP32).
Dimensions: See chart for enclosure dimensions; Sub-panel height = enclosure height - 3" (76 mm); Sub-panel width = enclosure width - 3" (76 mm); Mounting strap width = enclosure width - 4" (102 mm); Drip shield width = enclosure width.
Thickness: 0.048" (1.22 mm) for drip shields; 0.060" (1.52 mm) for enclosures < 24" wide; 0.075" (1.91 mm) for enclosures ≥ 24" wide; 0.125" (3.18 mm) for sub-panels; 0.078" (1.98 mm) for mounting straps.
Weight: See chart.
Agency Approvals: CSA, cULus. (Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

CARBON STEEL ENCLOSURES

Wall Mounted, General Purpose Enclosure, UL Approved



The **Series CSE-N1 & CSE-KN Carbon Steel Enclosures** are spot-welded, wall mounted, general purpose enclosures designed to house electrical controls, instruments, and components in general purpose areas. The Series CSE-KN also includes knockouts to allow cords to pass easily into the unit.

FEATURES/BENEFITS

- The door features hinges that allow 180° of rotation for easy instrumentation access
- Quarter turn latch can easily opened or closed with a screwdriver
- Included ground stud for easy electrical grounding
- Mounting holes included on the back of the enclosure allow for versatile mounting and standoffs provide easy installation of optional sub-panels
- Each unit offers optional solid or perforated sub-panel and mounting straps for easy instrument mounting
- The CSE-KN series includes a sub-panel with a 2" x 2" (50.8 mm x 50.8 mm) mounting grid mounted on standoffs and lock with keys

APPLICATIONS

- HVAC indoor applications
- Housing general controls and gages
- Securing instrumentation and avoiding tampering

SPECIFICATIONS

Materials: Carbon steel.

Rating: NEMA 1.

Dimensions: See chart.

Thickness: 0.060" (1.52 mm) for enclosures <24" wide; 0.075" (1.91 mm) for enclosures ≥ 24" wide; 0.060" (1.52 mm) for perforated sub-panels; 0.075" (1.91 mm) for solid sub-panels; 0.078" (1.98 mm) for mounting straps.

Weight: See chart.

Agency Approvals: CSA, cULus. (Meets the technical requirements of EU Directive 2011/65/EU (RoHS II)).

MODEL CHART												
Enclosure* Model	Height in (cm)	Width in (cm)	Depth in (cm)	Weight lb (kg)	Sub-Panel* Model**	Height in (cm)	Width in (cm)	Weight lb (kg)	Sub-Panel* Model**	Height in (cm)	Width in (cm)	Weight lb (kg)
CSE-N1-100804	10 (25)	8 (20)	4 (10)	7 (3.2)	A-CSE-1S-1008	8 (20)	6 (15)	2 (0.9)	A-CSE-1S-2016	18 (46)	14 (36)	6 (2.7)
CSE-N1-101004	10 (25)	10 (25)	4 (10)	8.5 (3.9)	A-CSE-1P-1008	8 (20)	6 (15)	1 (0.5)	A-CSE-1P-2016	18 (46)	14 (36)	3 (1.4)
CSE-N1-121004	12 (30)	10 (25)	4 (10)	5 (2.3)	A-CSE-1S-1010	8 (20)	8 (20)	1 (0.5)	A-CSE-1S-2020	18 (46)	18 (46)	7 (3.2)
CSE-N1-121204	12 (30)	12 (30)	4 (10)	10 (4.5)	A-CSE-1P-1010	8 (20)	8 (20)	1 (0.5)	A-CSE-1P-2020	18 (46)	18 (46)	4 (1.8)
CSE-N1-141204	14 (36)	12 (30)	4 (10)	10 (4.5)	A-CSE-1S-1210	10 (25)	8 (20)	3 (1.4)	A-CSE-1S-2416	22 (56)	14 (36)	7 (3.2)
CSE-N1-161206	16 (41)	12 (30)	6 (15)	11 (5)	A-CSE-1P-1210	10 (25)	8 (20)	1 (0.5)	A-CSE-1P-2416	22 (56)	14 (36)	5 (2.3)
CSE-N1-161606	16 (41)	16 (41)	6 (15)	16 (7.3)	A-CSE-1S-1212	10 (25)	10 (25)	4 (1.8)	A-CSE-1S-2420	22 (56)	18 (46)	9 (4.1)
CSE-N1-201606	20 (51)	16 (41)	6 (15)	21 (9.5)	A-CSE-1P-1212	10 (25)	10 (25)	2 (0.9)	A-CSE-1P-2420	22 (56)	18 (46)	7 (3.2)
CSE-N1-202006	20 (51)	20 (51)	6 (15)	25 (11.3)	A-CSE-1S-1412	12 (30)	10 (25)	3 (1.4)	A-CSE-1S-2424	22 (56)	22 (56)	11 (5)
CSE-N1-241606	24 (61)	16 (41)	6 (15)	27 (12.2)	A-CSE-1P-1412	12 (30)	10 (25)	2 (0.9)	A-CSE-1P-2424	22 (56)	22 (56)	8 (3.6)
CSE-N1-242006	24 (61)	20 (51)	6 (15)	31 (14.3)	A-CSE-1S-1612	14 (36)	10 (25)	3 (1.4)	A-CSE-1S-3024	28 (71)	22 (56)	13 (6)
CSE-N1-242406	24 (61)	24 (61)	6 (15)	41 (18.6)	A-CSE-1P-1612	14 (36)	10 (25)	2 (0.9)	A-CSE-1P-3024	28 (71)	22 (56)	11 (5)
CSE-N1-302406	30 (76)	24 (61)	6 (15)	54 (24.5)	A-CSE-1S-1616	14 (36)	14 (36)	4 (1.8)	A-CSE-1S-3030	28 (71)	28 (71)	17 (8)
CSE-N1-303008	30 (76)	30 (76)	8 (20)	60 (27.2)	A-CSE-1P-1616	14 (36)	14 (36)	2 (0.9)	A-CSE-1P-3030	28 (71)	28 (71)	14 (6)

*For additional sizes contact factory. **1S denotes a solid steel panel; 1P denotes a perforated steel panel.

MODEL CHART		
Mounting Strap* Model	Width in (cm)	Weight lb (kg)
A-CSE-1M-08	7.1 (18)	1 (0.5)
A-CSE-1M-10	9.1 (23)	1 (0.5)
A-CSE-1M-12	11.1 (28)	1 (0.5)
A-CSE-1M-16	15.1 (38)	2 (0.9)
A-CSE-1M-20	19.1 (49)	2 (0.9)
A-CSE-1M-24	23.1 (59)	3 (1.4)

*For additional sizes contact factory.

MODEL CHART							
Enclosure Model	Height in (cm)	Width in (cm)	Depth in (cm)	Weight lb (kg)	Mounting Strap Model	Width in (cm)	Weight lb (kg)
CSE-KN-181606	18 (46)	16 (41)	6 (15)	22 (10)	A-CSE-1M-16	15.1 (38)	2 (0.9)
CSE-KN-242006	24 (61)	20 (51)	6 (15)	35 (16)	A-CSE-1M-20	19.1 (49)	2 (0.9)
CSE-KN-362406	36 (91)	24 (61)	6 (15)	58 (26)	A-CSE-1M-24	23.1 (59)	3 (1.4)

ACCESSORIES

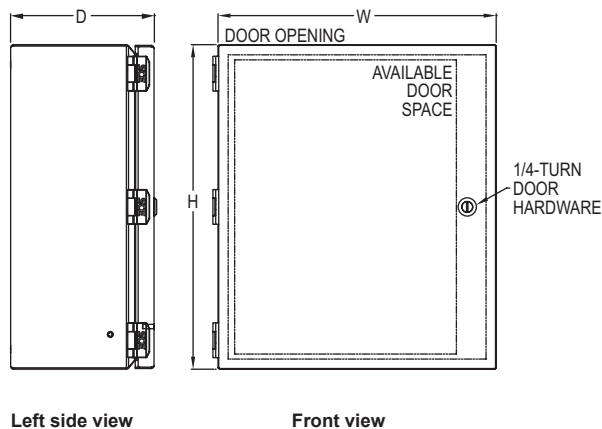
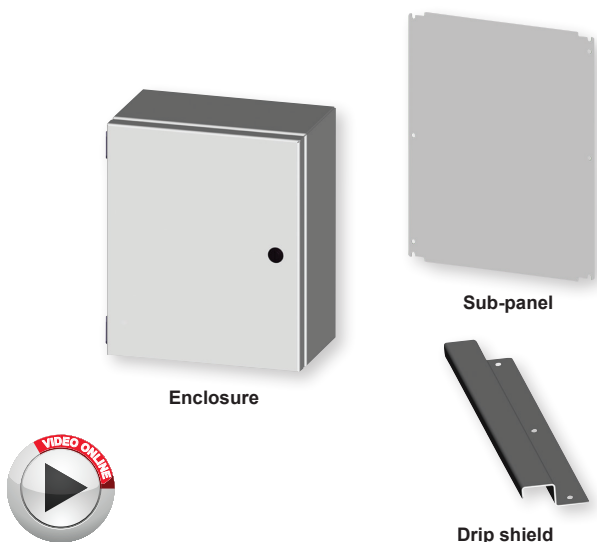
Model	Description
A-CSE-L	Keylocking wing knob door latch, includes 1 lock and 2 keys
A-CSE-K	Replacement keys, includes 2 keys



A-CSE-L

STAINLESS STEEL ENCLOSURES

Wall Mounted, NEMA 4X, UL Approved



The **Series SSE Stainless Steel Enclosures** are wall mounted enclosures designed to house electrical controls, instruments, and components in locations that are wet, oily, or may be regularly hosed down. These units are made of 304 SS, NEMA 4X outdoor environment rated and carry a UL approval.

FEATURES/BENEFITS

- Concealed hinges that allow 180° of rotation for easy instrumentation access
- Quarter turn latch can easily opened or closed with a screwdriver
- Included ground studs on the door and body for easy electrical grounding
- Standoffs that provide easy installation of optional sub-panels
- Mounting holes included on the back of the enclosure allow for versatile mounting and standoffs provide easy installation of optional sub-panels
- Oil-resistant gasket, sealing washers, and hole plugs that ensure that the components are protected at all times
- Optional sub-panels and drip shields can be purchased separately for added protection
- Mounting feet are included with the SSE-J but must be purchased separately for the SSE-E enclosures

SPECIFICATIONS

Materials: Enclosure: 304 SS; Mounting feet: 316 SS†; Hinges: Plastic; All other components: Carbon steel.

Rating: NEMA 4X (IP66).

Dimensions: See chart.

Thickness: 0.048" (1.22 mm) for A-SSE-D-XX; 0.063" (1.60 mm) for SSE-J-XXXXXX; 0.075" (1.91 mm) for SSE-E-XXXXXX and A-SSE-PJ-XXXX; 0.088" (2.24 mm) for A-SSE-P-XXXX; 0.13" (3.30 mm) for A-SSE-F.

Weight: See chart.

Agency Approvals: CSA, cULus. (Meets the technical requirements of EU Directive 2011/65/EU (RoHS II)).

†Included with SSE-J models only.

APPLICATIONS

- Outdoor applications
- Water Production
- Wastewater Process
- Housing general controls and gages
- Securing instrumentation and avoiding tampering

MODEL CHART											
Enclosure** Model*	Height in (cm)	Width in (cm)	Depth in (cm)	Weight lb (kg)	Sub-Panel Model	Height in (cm)	Width in (cm)	Weight lb (kg)	Drip Shield Model	Width in (cm)	Weight lb (kg)
SSE-J-100804	10 (25)	8 (20)	4 (10)	6 (2.7)	A-SSE-PJ-1008	9 (23)	7 (18)	4 (1.8)	A-SSE-D-12	12 (30)	3 (1.4)
SSE-J-121006	12 (30)	10 (25)	6 (15)	10 (4.5)	A-SSE-PJ-1210	11 (29)	9 (23)	2 (0.9)	A-SSE-D-16	16 (41)	4 (1.8)
SSE-J-121206	12 (30)	12 (30)	6 (15)	11 (5)	A-SSE-PJ-1212	11 (29)	11 (29)	3 (1.4)	A-SSE-D-20	20 (51)	4 (1.8)
SSE-J-141206	14 (36)	12 (30)	6 (15)	13 (5.9)	A-SSE-PJ-1412	13 (34)	11 (29)	3 (1.4)	A-SSE-D-24	24 (61)	5 (2.3)
SSE-J-161406	16 (41)	14 (36)	6 (15)	16 (7.3)	A-SSE-PJ-1614	15 (39)	13 (34)	3 (1.4)	A-SSE-D-30	30 (76)	4 (1.8)
SSE-E-161606	16 (41)	16 (41)	6 (15)	21 (10)	A-SSE-P-1616	13 (33)	13 (33)	6 (2.7)			
SSE-E-201606	20 (51)	16 (41)	6 (15)	28 (13)	A-SSE-P-2016	17 (43)	13 (33)	8 (3.6)			
SSE-E-202006	20 (51)	20 (51)	6 (15)	34 (15)	A-SSE-P-2020	17 (43)	17 (43)	10 (4.5)			
SSE-E-202408	20 (51)	24 (61)	8 (20)	43 (20)	A-SSE-P-2416	21 (53)	13 (33)	14 (6.4)			
SSE-E-241608	24 (61)	16 (41)	8 (20)	36 (16)	A-SSE-P-2420	21 (53)	17 (43)	11 (5)			
SSE-E-242006	24 (61)	20 (51)	6 (15)	40 (18)	A-SSE-P-2424	21 (53)	21 (53)	17 (7.7)			
SSE-E-242408	24 (61)	24 (61)	8 (20)	49 (22)	A-SSE-P-3016	27 (69)	13 (33)	14 (6.4)			
SSE-E-301606	30 (76)	16 (41)	6 (15)	41 (19)	A-SSE-P-3020	27 (69)	17 (43)	18 (8.2)			
SSE-E-302008	30 (76)	20 (51)	8 (20)	52 (24)	A-SSE-P-3024	27 (69)	21 (53)	22 (10)			
SSE-E-302408	30 (76)	24 (61)	8 (20)	53 (24)	A-SSE-P-3030	27 (69)	27 (69)	28 (13)			
SSE-E-303008	30 (76)	30 (76)	8 (20)	67 (30)							

*For additional sizes contact factory. **For 316 SS enclosures contact factory.

ACCESSORIES

Model	Description
A-CSE-L	Keylocking wing knob door latch, includes 1 lock and 2 keys
A-CSE-K	Replacement keys, includes 2 keys
A-SSE-F	Mounting feet, includes 4 feet†

†Included with SSE-J models only.



A-CSE-L



A-SSE-F

GAGE TUBING ACCESSORIES



A-200-1/A-200-2



A-201/A-202



A-203



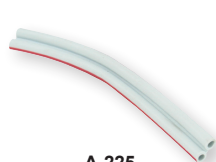
A-220



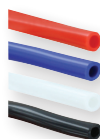
A-221



A-222



A-225



A-204-A/A-204-B/A-204-C/A-204-D



A-223



A-223P-1/A-223P-2

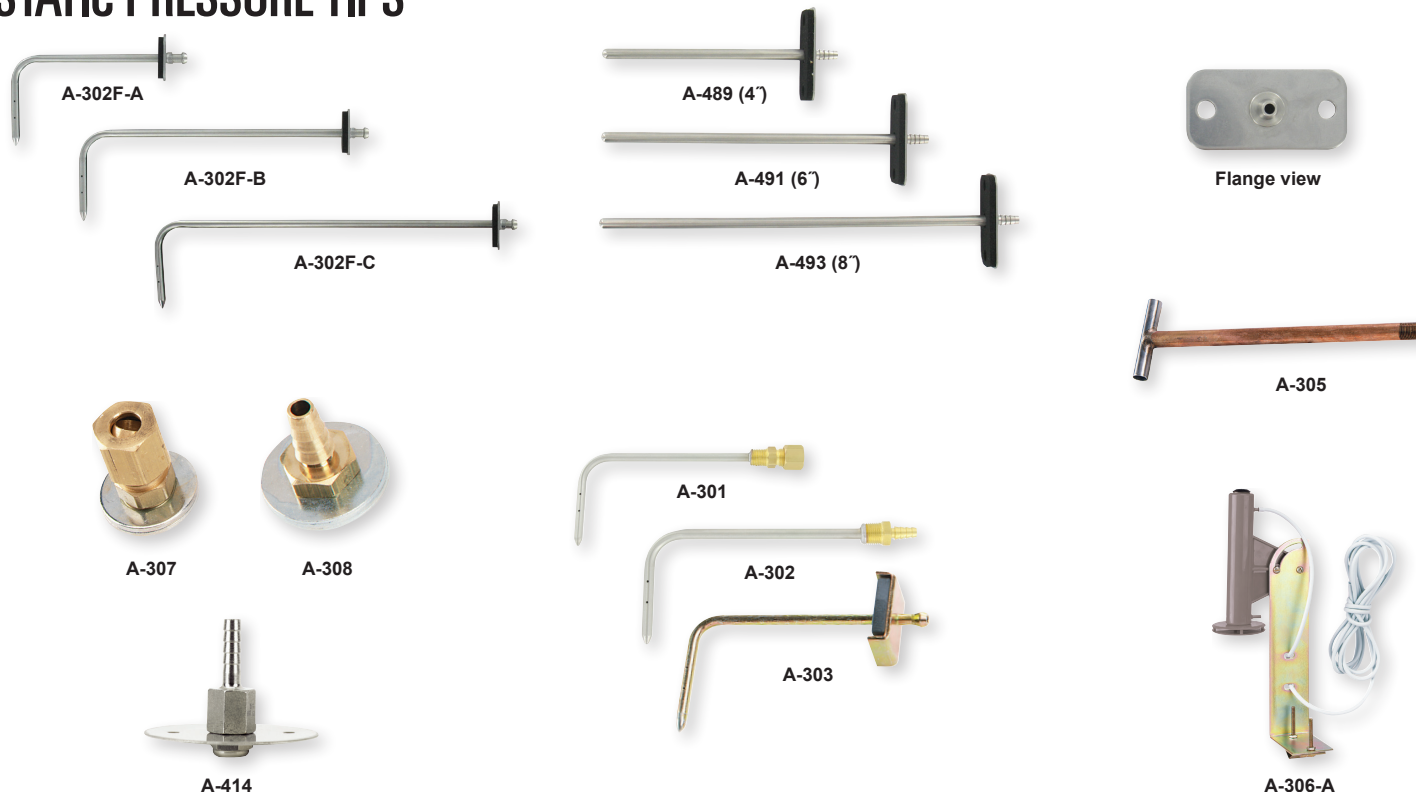


A-210/A-211

MODEL CHART

Model	Description
Norprene® tubing is useful in a wide range of temperatures from -75 to 275°F (-60 to 135°C) and will not weaken after long term exposure to heat and ozone.	
A-200-1	3/16" ID x 5/16" OD, 13 psi maximum pressure @ 73°F (90 kPa @ 23°C); 50'
A-200-2	1/4" ID x 3/8" OD, 10 psi maximum pressure @ 73°F (69 kPa @ 23°C); 50'
Rubber latex tubing has less tendency to kink in storage and occupies less space, thus is best for portable work.	
A-201	3/16" ID, 9' length
A-202	3/16" ID, lengths to 50'
Clear PVC tubing is easily inspected and is therefore best for test applications where a possibility of fluid entering the tubing exists.	
A-203	1/8" ID x 1/4" OD, lengths to 100'; 60 psi max. pressure @ 73°F (22°C)
Clear flexible vinyl tubing is easily inspected, and is therefore best for test applications where a possibility of fluid entering the tubing exists.	
A-220	3/16" ID x 5/16" OD, lengths to 500'; 45 psi maximum pressure @ 73°F (310 kPa @ 23°C)
A-221	1/8" ID x 3/16" OD, lengths to 500'; 40 psi maximum pressure @ 165°F (276 kPa @ 74°C)
A-222	.240" ID x .375" OD, lengths to 500'; 35 psi maximum pressure @ 73°F (240 kPa @ 23°C)
Flexible double column plastic tubing is used with Mark II manometers and the Wind Speed Indicator. Light gray with red color code stripe.	
A-225	1/8" ID, lengths to 750'
Flexible colored vinyl tubing is quickly distinguishable in applications where more than one line is required aiding installation.	
A-204-B	3/16" ID x 5/16" OD, lengths to 500'; 45 psi maximum pressure @ 165°F (310 kPa @ 74°C); Opaque blue
A-204-C	3/16" ID x 5/16" OD, lengths to 500'; 45 psi maximum pressure @ 165°F (310 kPa @ 74°C); Opaque white
A-204-D	3/16" ID x 5/16" OD, lengths to 500'; 45 psi maximum pressure @ 165°F (310 kPa @ 74°C); Opaque black
Black polyethylene tubing offers long life, great stability and resistance to corrosion.	
A-223	1/8" ID x 1/4" OD, 10' length; 200 psi maximum @ 140°F (1379 kPa @ 60°C)
Black nylon tubing is recommended for high temperature and pressure applications. -40 to 248°F (-40 to 120°C).	
Black plenum fire retardant polyethylene tubing meets NFPA standard 90A for installation in air-conditioning and ventilating plenum spaces; also used in building automation systems. Lengths to 500', 100 psig maximum pressure @ 75°F (689 kPa @ 24°C).	
A-223P-1	.17" ID x .25" OD
A-223P-2	1/4" ID x 3/8" OD
Aluminum tubing is recommended for permanent installations.	
A-210	1/4" OD, 5' length, 500 psi maximum pressure @ 200°F (3447 kPa @ 93°C)
A-211	1/4" OD, 50' length, 500 psi maximum pressure @ 200°F (3447 kPa @ 93°C)

STATIC PRESSURE TIPS



MODEL CHART	
Model	Description
The stainless steel static pressure tips are used to measure static pressures in ducts or rooms. They are to be connected to differential pressure switches and transmitters. Two static sensors are used in applications where differential pressure is required across a filter or coil. These sensors include a mounting flange with integral rubber gasket and two screws for simplifying mounting on a duct.	
A-302F-A	4" hook style SS static pressure tip with mounting flange
A-302F-B	6" hook style SS static pressure tip with mounting flange
A-302F-C	8" hook style SS static pressure tip with mounting flange
A-489	4" straight SS static pressure tip with mounting flange
A-491	6" straight SS static pressure tip with mounting flange
A-493	8" straight SS static pressure tip with mounting flange
Designed for simplified installation, these are easy to install, inexpensive, and provides accurate static pressure sensing in smooth air at velocities up to 1500 FPM.	
A-307	Static pressure fitting, for 1/4" metal tubing connection
A-307-SS	SS static pressure fitting, for 1/4" metal tubing connection
A-308	Static pressure fitting, for 3/16" and 1/8" ID plastic or rubber tubing
A-414	SS clean room pressure sensor
These static pressure tips are ideal for applications such as sensing the static pressure drop across industrial air filters and refrigerant coils. Here the probability of air turbulence requires that the pressure sensing openings be located away from the duct walls to minimize impingement and aspiration, and thus ensure accurate readings. For a permanent installation of this type, the Dwyer No. A-301 or A-302 static pressure tip is used. It senses static pressure through radially-drilled holes near the tip and can be used in air flow velocities up to 12,000 FPM. The angled tips shown have 4" insertion depth. Each has four radially drilled .040" sensing holes. All except Model A-303 mount in 3/8" hole in duct. For portable use, a magnet holds No. A-303 in place.	
A-301	Static pressure tip, for 1/4" metal tubing connection
A-301-A	Static pressure tip, same as A-301 with 6" insertion depth
A-301-B	Static pressure tip, same as A-301 with 8" insertion depth
A-301-C	Static pressure tip, same as A-301 with 12" insertion depth
A-301-SS	SS static pressure tip, for 1/4" metal tubing connection
A-302	Static pressure tip, for 3/16" and 1/8" ID plastic or rubber tubing
A-302-A	Static pressure tip, same as A-302 with 6" insertion depth
A-303	Portable static pressure tip, for 3/16" ID rubber or plastic tubing with 4" insertion
A-305 low resistance static pressure tip is designed for use in dust-laden air and for rapid response applications. It is recommended where a very low actuation pressure is required for a pressure switch or indicating gage — or where response time is critical.	
A-305	Static pressure tip, low resistance application, furnished with two (2) hex jam nuts and two (2) mounting washers for duct mounting and with 1/8" NPT pipe thread for pressure connection
A-305-SS	SS static pressure tip, low resistance application, furnished with two (2) hex jam nuts and two (2) mounting washers for duct mounting and with 1/8" NPT pipe thread for pressure connection
A-306	Outdoor static pressure sensor. Provides average outdoor pressure signal for reference in building pressurization applications. Includes sensor, 50' vinyl tubing, mounting bracket and hardware. Red sensor
A-306-A	Outdoor static pressure sensor. Provides average outdoor pressure signal for reference in building pressurization applications. Includes sensor, 50' vinyl tubing, mounting bracket and hardware. Gray sensor



STATIC PRESSURE ACCESSORIES



A-465



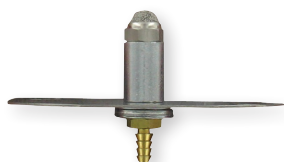
A-417A ++



A-418E



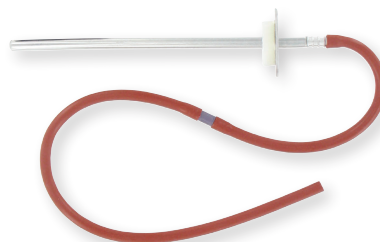
A-418N



A-419A



A-420A



A-421

Surge
Damper

MODEL CHART

Model	Description
A-465	Static pressure pick-up provides a clean solution for sensing space pressure. The sensor can be mounted on sheetrock walls, single gang electrical boxes, or on ceiling tiles. Molded from ABS plastic, the A-465 provides an integral barb fitting and includes tubing, mounting screws and anchors.
A-417A	Static pressure pickup. For use in clean rooms, 60 micron filter picks up static pressure. Stainless steel wall plate fits 2" x 4" electrical box. Sealed with foam gasket, screws included. Barbed brass fitting holds 1/8" to 3/16" ID tubing.
A-418E	Static pressure pickup. Room mount with plastic enclosure fits 2" x 4" electrical box. Fine mesh screen hides static pressure pickup port. Clean connection to 1/8" to 3/16" ID tubing and pressure sensor. Sealed with foam gasket, screws included.
A-418N	Static pressure pickup. Room mount with plastic enclosure fits 2" x 4" electrical box. Fine mesh screen hides static pressure pickup port. Clean connection to 1/8" to 3/16" ID tubing and pressure sensor. Sealed with foam gasket, screws included.
A-419A	Static pressure pickup ceiling mount. Plate rests on top of standard 3/4" thick ceiling tile while 60 micron filter faces down through 5/8" hole in tile. Filter is barely noticeable in room being monitored. Unit mounts to junction box. Barbed brass fitting holds 1/8" to 3/16" ID tubing.
A-420A	Static pressure pickup for roof or outside mount. Reduces effects of wind gusts to keep pressure readings stable when plate is parallel to ground. Structure withstands harsh environmental elements. Structure is 3-1/4" across and 2-3/8" deep. EMT Conduit fitting is 1/2". Pressure connection is brass barbed fitting for 1/8" and 3/16" ID tubing.
A-421	Static pressure tip measures duct static air pressure. Assembly includes 6" probe, silicon rubber hose, and screws. Built-in surge damper ensures stable readings on pressure sensor. Pressure spike reducer can be added to end of tube to further smooth over pressure fluctuations.

ACCESSORIES - KITS FOR AIR FILTER SWITCHES



A-602



A-603



A-604

MODEL CHART

Model	Description
A-602	Air filter kit, accessory package for using switch without a gage includes two pressure tips with integral compression fittings, two 5' lengths of 1/4" aluminum tubing and two 1/8" NPT to 1/4" tubing compression fittings
A-603	"T" kit, accessory package for using pressure switch in conjunction with an air filter kit equipped Magnehelic® or Series 250 AF gages includes two 1/8" NPT to 1/4" tubing compression fittings and two compression tees
A-604	"T" kit, accessory package for using pressure switch in conjunction with Mark II gages, includes two plastic tubing connector tees and two plastic tubing to 1/8" NPT adapters

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

PRESSURE CONVERSION CHART

in/H ₂ O	P.S.I.	in/Hg	mm/H ₂ O	mm/Hg	kg/cm ²	bar	mbar	Pa	kPa
.1	.0036	.0073	2.534	.1863	.0002	.0002	.2482	24.82	.0248
.2	.0072	.0146	5.067	.3726	.0005	.0005	.4964	49.64	.0496
.4	.0144	.0293	10.13	.7452	.0010	.0010	.9928	99.28	.0993
.6	.0216	.0440	15.20	1.118	.0015	.0015	1.489	148.9	.1489
.8	.0288	.0588	20.34	1.496	.0020	.0020	1.992	199.2	.1992
1.0	.0361	.0735	25.41	1.868	.0025	.0025	2.489	248.9	.2489
2	.0722	.1470	50.81	3.736	.0051	.0050	4.978	497.8	.4978
3	.1083	.2205	76.22	5.604	.0076	.0075	7.467	746.7	.7476
4	.1444	.2940	101.62	7.472	.0102	.0099	9.956	995.6	.9956
5	.1804	.3673	127.0	9.335	.0127	.0124	12.44	1244	1.244
6	.2165	.4408	152.4	11.203	.0152	.0149	14.93	1493	1.493
7	.2526	.5143	177.8	13.072	.0178	.0174	17.42	1742	1.742
8	.2887	.5878	203.2	14.940	.0203	.0199	19.90	1990	1.990
9	.3248	.6613	228.6	16.808	.0228	.0224	22.39	2239	2.239
10	.3609	.7348	254.0	18.676	.0254	.0249	24.88	2488	2.488
11	.3970	.8083	279.4	20.544	.0279	.0273	27.37	2737	2.737
12	.4331	.8818	304.8	22.412	.0304	.0299	29.86	2986	2.986
13	.4692	.9553	330.2	24.280	.0330	.0324	32.35	3235	3.235
14	.5053	1.029	355.6	26.148	.0355	.0348	34.84	3484	3.484
15	.5414	1.102	381.0	28.016	.0381	.0373	37.33	3733	3.733
16	.5774	1.176	406.4	29.879	.0406	.0398	39.81	3981	3.981
17	.6136	1.249	431.8	31.752	.0431	.0423	42.31	4231	4.231
18	.6496	1.322	457.2	33.616	.0457	.0448	44.79	4479	4.479
19	.6857	1.396	482.6	35.484	.0482	.0473	47.28	4728	4.728
20	.7218	1.470	508.0	37.352	.0507	.0498	49.77	4977	4.977
21	.7579	1.543	533.4	39.22	.0533	.0523	52.26	5226	5.226
22	.7940	1.616	558.8	41.09	.0558	.0547	54.74	5474	5.474
23	.8301	1.690	584.2	42.96	.0584	.0572	57.23	5723	5.723
24	.8662	1.764	609.6	44.82	.0609	.0597	59.72	5972	5.972
25	.9023	1.837	635.0	46.69	.0634	.0622	62.21	6221	6.221
26	.9384	1.910	660.4	48.56	.0660	.0647	64.70	6470	6.470
27	.9745	1.984	685.8	50.43	.0685	.0672	67.19	6719	6.719
28	1.010	2.056	710.8	52.26	.0710	.0696	69.64	6964	6.964
29	1.047	2.132	736.5	54.18	.0736	.0722	72.19	7219	7.219
30	1.083	2.205	762.2	56.04	.0761	.0747	74.67	7467	7.467
31	1.119	2.278	787.5	57.91	.0787	.0772	77.15	7715	7.715
32	1.155	2.352	812.8	59.77	.0812	.0796	79.63	7963	7.963
33	1.191	2.425	838.2	61.63	.0837	.0821	82.12	8212	8.212
34	1.227	2.498	863.5	63.49	.0862	.0846	84.60	8460	8.460
35	1.263	2.571	888.9	65.36	.0888	.0871	87.08	8708	8.708
36	1.299	2.645	914.2	67.22	.0913	.0896	89.56	8956	8.956
37	1.335	2.718	939.5	69.08	.0938	.0920	92.04	9204	9.204
38	1.371	2.791	964.9	70.95	.0964	.0945	94.53	9453	9.453
39	1.408	2.876	990.9	72.86	.0990	.0971	97.08	9708	9.708
40	1.444	2.949	1016	74.72	.1015	.0996	99.56	9956	9.956
41	1.480	3.013	1042	76.59	.1040	.1020	102.0	10204	10.20
42	1.516	3.086	1067	78.45	.1066	.1045	104.5	10452	10.45
43	1.552	3.160	1092	80.31	.1091	.1070	107.0	10701	10.70
44	1.588	3.233	1118	82.18	.1116	.1095	109.5	10949	10.95
45	1.624	3.306	1143	84.04	.1142	.1120	112.0	11197	11.20
46	1.660	3.378	1168	85.90	.1167	.1144	114.5	11445	11.44
47	1.696	3.453	1194	87.76	.1192	.1169	116.9	11694	11.69
48	1.732	3.526	1219	89.63	.1218	.1194	119.4	11942	11.94
49	1.768	3.600	1244	91.49	.1243	.1219	121.9	12190	12.19
50	1.804	3.673	1270	93.35	.1268	.1244	124.4	12438	12.44
51	1.841	3.748	1296	95.27	.1294	.1269	126.9	12693	12.69
52	1.877	3.822	1321	97.13	.1320	.1294	129.4	12941	12.94
53	1.913	3.895	1346	98.99	.1345	.1319	131.9	13190	13.19
54	1.949	3.968	1372	100.8	.1370	.1344	134.4	13438	13.44
55	1.985	4.041	1397	102.7	.1395	.1369	136.9	13686	13.69
56	2.021	4.115	1422	104.6	.1421	.1393	139.3	13934	13.93
57	2.057	4.188	1448	106.4	.1446	.1418	141.8	14182	14.18
58	2.093	4.261	1473	108.3	.1471	.1443	144.3	14431	14.43
59	2.129	4.335	1498	110.2	.1497	.1468	146.8	14679	14.68
60	2.165	4.408	1524	112.0	.1522	.1493	149.3	14927	14.93
61	2.202	4.483	1550	113.9	.1548	.1518	151.8	15182	15.18
62	2.238	4.556	1575	115.8	.1573	.1543	154.3	15430	15.43
63	2.274	4.630	1600	117.7	.1599	.1568	156.8	15679	15.68
64	2.310	4.703	1626	119.5	.1624	.1593	159.3	15927	15.93
65	2.346	4.776	1651	121.4	.1649	.1618	161.8	16175	16.18
66	2.382	4.850	1676	123.3	.1674	.1642	164.2	16423	16.42
67	2.418	4.923	1702	125.1	.1700	.1667	166.7	16672	16.67
68	2.454	4.996	1727	127.0	.1725	.1692	169.2	16920	16.92
69	2.490	5.070	1752	128.8	.1750	.1717	171.7	17168	17.17
70	2.526	5.143	1778	130.7	.1776	.1742	174.2	17416	17.42
71	2.562	5.216	1803	132.6	.1801	.1766	176.6	17664	17.66
72	2.598	5.290	1828	134.4	.1826	.1791	179.1	17912	17.91
73	2.635	5.365	1854	136.4	.1852	.1817	181.7	18168	18.17
74	2.671	5.438	1880	138.2	.1878	.1842	184.2	18416	18.42
75	2.707	5.511	1905	140.1	.1903	.1866	186.6	18664	18.66
76	2.743	5.585	1930	141.9	.1928	.1891	189.1	18912	18.91
77	2.779	5.658	1956	143.8	.1954	.1916	191.6	19160	19.16
78	2.815	5.731	1981	145.7	.1979	.1941	194.1	19409	19.41
79	2.851	5.805	2006	147.5	.2004	.1966	196.6	19657	19.66
80	2.887	5.878	2032	149.4	.2030	.1991	199.1	19905	19.90
81	2.923	5.951	2057	151.2	.2055	.2015	201.5	20153	20.15
82	2.959	6.024	2082	153.1	.2080	.2040	204.0	20402	20.40
83	2.996	6.100	2108	155.0	.2106	.2066	206.6	20657	20.66
84	3.032	6.173	2134	156.9	.2131	.2091	209.1	20905	20.90
85	3.068	6.246	2159	158.8	.2157	.2115	211.5	21153	21.15
86	3.104	6.320	2184	160.6	.2182	.2140	214.0	21401	21.40
87	3.140	6.393	2210	162.5	.2207	.2165	216.5	21650	21.65
88	3.176	6.466	2235	164.4	.2232	.2190	219.0	21898	21.90
89	3.212	6.540	2260	166.2	.2258	.2215	221.5	22146	22.15
90	3.248	6.613	2286	168.1	.2283	.2239	223.9	22394	22.39
91	3.284	6.686	2311	169.9	.2309	.2264	226.4	22642	22.64
92	3.320	6.760	2336	171.8	.2334	.2289	228.9	22890	22.89
93	3.356	6.833	2362	173.7	.2359	.2314	231.4	23139	23.14
94	3.392	6.906	2387	175.5	.2384	.2339	233.9	23387	23.39
95	3.429	6.981	2413	177.4	.2410	.2364	236.4	23642	23.64
96	3.465	7.055	2438	179.3	.2436	.2389	238.9	23890	23.89
97	3.501	7.128	2464	181.2	.2461	.2414	241.4	24138	24.14
98	3.537	7.201	2489	183.0	.2486	.2439	243.9	24387	24.39
99	3.573	7.275	2514	184.9	.2512	.2464	246.4	24635	24.64
100	3.609	7.348	2540	186.8	.2537	.2488	248.8	24883	24.88

P.S.I.	in/H ₂ O	in/Hg	mm/H ₂ O	mm/Hg	kg/cm ²	bar	mbar	Pa	kPa
1.0	27.71	2.036	703.1	51.75	.0703	.0689	68.95	6895	6.895
1.1	30.45	2.240	773.4	56.89	.0773	.0758	75.84	7584	7.584
1.2	33.22	2.443	843.7	62.06	.0844	.0827	82.74	8274	8.274
1.3	35.98	2.647	914.0	67.23	.0914	.0896	89.63	8963	8.963
1.4	38.75	2.850	984.3	72.40	.0984	.0965	96.52	9652	9.652
1.5	41.52	3.054	1055	77.57	.1055	.1034	103.4	10340	10.34
1.6	44.29	3.258	1125	82.74	.1125	.1103	110.3	11030	11.03
1.7	47.06	3.461	1195	87.92	.1195	.1172	117.2	11720	11.72
1.8	49.82	3.665	1266	93.09	.1266	.1241	124.1	12410	12.41
1.9	52.59	3.868	1336	98.26	.1336	.1310	131.0	13100	13.10
2.0	55.36	4.072	1406	103.4	.1406	.1379	137.9	13790	13.79
2.1	58.13	4.276	1476	108.6	.1476	.1448	144.8	14480	14.48
2.2	60.90	4.479	1547	113.8	.1547	.1517	151.7	15170	15.17
2.3	63.67	4.683	1617	118.9	.1617	.1586	158.6	15860	15.86
2.4	66.43	4.886	1687	124.1	.1687	.1655	165.5	16550	16.55
2.5	69.20	5.090	1758	129.3	.1758	.1724	172.4	17240	17.24
2.6	71.97	5.294	1828	134.5	.1828	.1793	179.3	17930	17.93
2.7	74.74	5.497	1898	139.6	.1898	.1862	186.2	18620	18.62
2.8	77.51	5.701	1969	144.8	.1968	.1930	193.0	19300	19.30
2.9	80.27	5.904	2039	150.0	.2039	.1999	199.9	19990	19.99
3.0	83.04	6.108	2109	155.1	.2109	.2068	206.8	20680	20.68
3.1	85.81	6.312	2180	160.3	.2180	.2137	213.7	21370	21.37
3.2	88.58	6.515	2250	165.5	.2250	.2206	220.6	22060	22.06
3.3	91.35	6.719	2320	170.7	.2320	.2275	227.5	22750	22.75
3.4	94.11	6.922	2390	175.8	.2390	.2344	234.4	23440	23.44
3.5	96.88	7.126	2461	181.0	.2461	.2413	241.3	24130	24.13
3.6	99.65	7.330	2531	186.2	.2531	.2482	248.2	24820	24.82
3.7	102.4	7.535	2601	191.3	.2601	.2551	255.1	25510	25.51
3.8	105.2	7.737	2672	196.5	.2672	.2620	262.0	26200	26.20
3.9	108.0	7.940	2742	201.7	.2742	.2689	268.9	26890	26.89
4.0	110.7	8.144	2812	206.9	.2812	.2758	275.8	27580	27.58
4.1	113.5	8.348	2883	212.0	.2883	.2827	282.7	28270	28.27
4.2	116.3	8.551	2953	217.2	.2953	.2896	289.6	28960	28.96
4.3	119.0	8.755	3023	222.4	.3023	.2965	296.5	29650	29.65
4.4	121.8	8.958	3094	227.5	.3094	.3034	303.4	30338	30.34
4.5	124.6	9.162	3164	232.7	.3164	.3103	310.3	31030	31.03
4.6	127.3	9.366	3234	237.9	.3234	.3172	317.2	31720	31.72
4.7	130.1	9.569	3304	243.1	.3304	.3240	324.0	32400	32.40
4.8	132.9	9.773	3375	248.2	.3375	.3310	331.0	33100	33.10
4.9	135.6	9.976	3445	253.4	.3445	.3378	337.8	33780	33.78
5.0	138.4	10.18	3515	258.6	.3515	.3447	344.7	34470	34.47
5.1	141.2	10.38	3586	263.7	.3586	.3516	351.6	35160	35.16
5.2	143.9	10.59	3656	268.9	.3656	.3585	358.5	35850	35.85
5.3	146.7	10.79	3726	274.1	.3726	.3654	365.4	36540	36.54
5.4	149.5	10.99	3797	279.3	.3797	.3723	372.3	37230	37.23
5.5	152.2	11.20	3876	284.4	.3867	.3792	379.2	37920	37.92
5.6	155.0	11.40	3973	289.6	.3937	.3861	386.1	38610	38.61
5.7	157.8	11.60	4008	294.8	.4007	.3930	393.0	39300	39.30
5.8	160.5	11.81	4078	299.9	.4078	.3999	399.9	39990	39.99
5.9	163.3	12.01	4148	305.1	.4148	.4068	406.8	40680	40.68
6.0	166.1	12.22	4218	310.3	.4218	.4137	413.7	41370	41.37
6.1	168.8	12.42	4289	315.5	.4289	.4206	420.6	42060	42.06
6.2	171.6	12.63	4359	320.6	.4359	.4275	427.5	42750	42.75
6.3	174.4	12.83	4429	325.8	.4429	.4344	434.4	43440	43.44
6.4	177.2	13.03	4500	331.0	.4500	.4413	441.3	44130	44.13
6.5	179.9	13.23	4570	336.1	.4570	.4482	448.2	44820	44.82
6.6	182.7	13.44	4640	341.3	.4640	.4550	455.0	45500	45.50
6.7	185.5	13.64	4711	346.5	.4710	.4619	461.9	46190	46.19
6.8	188.2	13.84	4781	351.7	.4781	.4688	468.8	46880	46.88
6.9	191.0	14.05	4851	356.8	.4851	.4757	475.7	47570	47.57
7.0	193.8	14.25	4922	362.0	.4921	.4826	482.6	48260	48.26
7.1	196.5	14.46	4992	367.2	.4992	.4895	489.5	48950	48.95
7.2	199.3	14.66	5062	372.3	.5062	.4964	496.4	49640	49.64
7.3	202.1	14.86	5132	377.5	.5132	.5033	503.3	50330	50.33
7.4	204.8	15.07	5203	382.7	.5203	.5102	510.2	51020	51.02
7.5	207.6	15.27	5273	387.9	.5273	.5171	517.1	51710	51.71
7.6	210.4	15.47	5343	393.0	.5343	.5240	524.0	52400	52.40
7.7	213.2	15.68	5413	398.2	.5413	.5308	530.8	53080	53.08
8.0	221.4	16.29	5625	413.7	.5625	.5516	551.6	55160	55.16
8.2	227.0	16.70	5765	424.1	.5765	.5654	565.4	56540	56.54
8.4	232.5	17.10	5906	434.4	.5906	.5792	579.2	57920	57.92
8.6	238.0	17.51	6047	444.7	.6046	.5929	592.9	59290	59.29
8.8	243.6	17.92	6187	455.1	.6187	.6067	606.7	60670	60.67
9.0	249.1	18.32	6328	465.4	.6328	.6205	620.5	62050	62.05
9.2	254.7	18.73	6468	475.8	.6468	.6343	634.3	63430	63.43
9.4	260.2	19.14	6609	486.1	.6609	.6481	648.1	64810	64.81
9.6	265.7	19.54	6750	496.5	.6749	.6619	661.9	66190	66.19
9.8	271.3	19.95	6890	506.8	.6890	.6757	675.7	67570	67.57
10.0	276.8	20.36	7031	517.1	.7031	.6895	689.5	68950	68.95
11.0	304.5	22.40	7734	568.9	.7734	.7584	758.4	75840	75.84
12.0	332.2	24.43	8437	620.6	.8437	.8274	827.4	82740	82.74
13.0	359.8	26.47	9140	672.3	.9140	.8963	896.3	89630	89.63
14.0	387.5	28.50	9843	724.0	.9843	.9652	965.2	96520	96.52
14.7	406.9	29.93	10340	760.2	1.033	1.014	1014	10140	101.4
15.0	415.2	30.54	10550	775.7	1.055	1.034	1034	10340	103.4
16.0	442.9	32.58	11250	827.4	1.125	1.103	1103	11030	110.3
17.0	470.6	34.61	11950	879.1	1.195	1.172	1172	11720	117.2
18.0	498.2	36.65	12660	930.9	1.265	1.241	1241	12410	124.1
19.0	525.9	38.68	13360	982.6	1.336	1.310	1310	13100	131.0
20.0	553.6	40.72	14060	1034	1.406	1.379	1379	13790	137.9
21.0	581.3	42.76	14770	1086	1.476	1.448	1448	14480	144.8
22.0	609.0	44.79	15470	1138	1.547	1.517	1517	15170	151.7
23.0	636.7	46.83	16170	1189	1.617	1.586	1586	15860	158.6
24.0	664.3	48.86	16870	1241	1.687	1.655	1655	16550	165.5
25.0	692.0	50.90	17580	1293	1.758	1.724	1724	17240	172.4



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