Magnehelic®

Accessory Guide

Dwyer®

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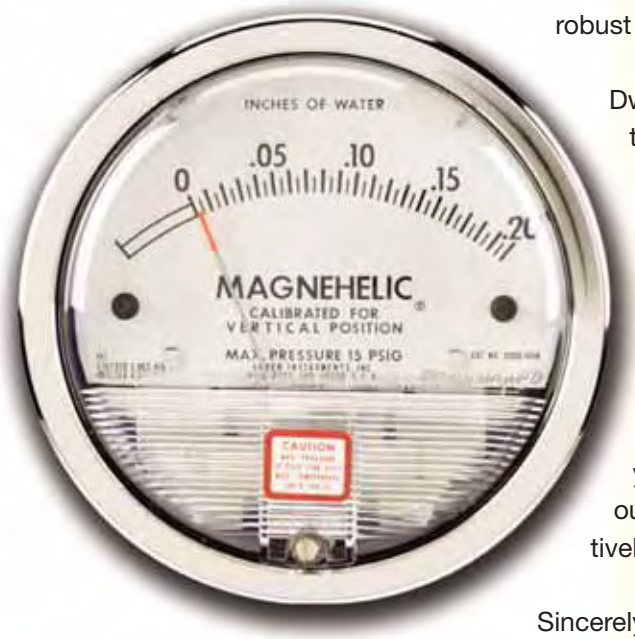
Introduction

Dwyer Instruments has and continues to be the leading manufacturer and innovator in specialty gage application and design. Most notably, the Dwyer Magnehelic® remains the hallmark of the industry for low pressure indication and measurement, and has been industry proven through its robust design and field performance.



Dwyer is proud to compliment this versatile instrument with the new Magnehelic® Accessory Guide. This guide will assist with selecting the proper features, options and accessories required in your unique applications that utilize the Magnehelic® gage. From air flow scales to the new flush mounting kit for panels to popular static pressure sensors, this guide includes the complete offering of Magnehelic® options and accessories.

We have always felt that the best does not have to cost you the most, and encourage you, the customer, to check out our value and what we believe to be the most competitively priced products on the market.

Sincerely,
Dwyer Instruments Team

Magnehelic® Accessories

INDEX

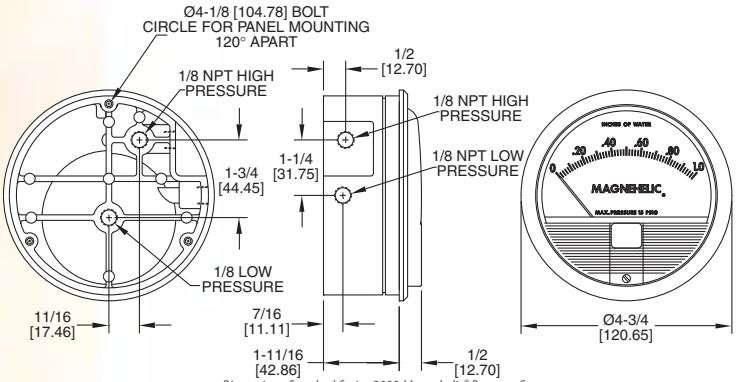
Magnehelic® Differential Pressure Gages

Indicate Positive, Negative or Differential, Accurate within 2%

Series 2000

Patent Nos. 4,030,365 and 5,012,678

Standard Magnehelic® Pressure Gage has a large, easy-to-read 4" dial.



Dimensions, Standard Series 2000 Magnehelic® Pressure Gages.

Select the Dwyer Magnehelic® gage for high accuracy — guaranteed within 2% of full scale — and for the wide choice of models available to suit your needs precisely. Using Dwyer's simple, frictionless Magnehelic® movement, it quickly indicates low air or non-corrosive gas pressures — either positive, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems. It's inexpensive, too.

The Magnehelic® is the industry standard to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems and pressures in fluid amplifier or fluidic systems. It also checks gas-air ratio controls and automatic valves, and monitors blood and respiratory pressures in medical care equipment.

NOTE: May be used with Hydrogen where pressures are less than 35 psi.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. (Natural Gas option available.)
Wetted Materials: Aluminum, silicone, acrylic, polycarbonate, high carbon steel, low carbon steel, brass, paper, acrylic paint, enamel paint, alkyd coating, nickel plate, zinc plate, Helsel® FC, 300 series stainless steel, Teflon®, Loctite® AV sealant, commercial black rubber, neoprene, samarium cobalt, nickel alloy steel, beryllium copper.
Housing: Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.
Accuracy: ±2% of full scale (±3% on - 0, -100PA, -125PA, 10MM and ±4% on -00, -60PA, -6MM ranges), throughout range at 70°F (21.1°C).
Pressure Limits: -20˝ Hg. to 15 psig. (-0.677 bar to 1.034 bar); MP option: 35 psig (2.41 bar), HP option: 80 psig (5.52 bar).For applications with high cycle rate within gage total pressure rating, next higher rating is recommended.
Overpressure: Relief plug opens at approximately 25 psig (1.72 kPa), standard gages only.
Temperature Limits: 20 to 140°F (-6.67 to 60°C).
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 adapters and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for 3 adapters in MP & HP gage accessories.)

Quality Design and Construction Features

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.

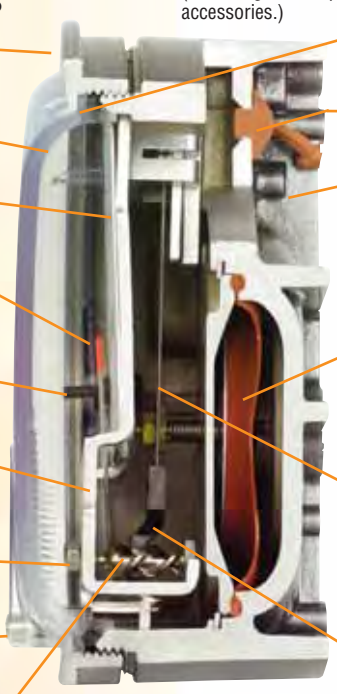
Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on the helix shaft.

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.

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.

Blowout plug of silicone rubber protects against overpressure on 15 psig rated models. Opens at approximately 25 psig.

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.

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.

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

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.

Magnehelic® Accessories

Dwyer Instruments, Inc./P.O. Box 373/Michigan City, IN 46361/Phone 219 879-8000/Fax 219 872-9057 • U.K. Phone (+44) (0)1494-461707 • Australia Phone 61 2 4272-2055

Series 2000 Magnehelic® - Models & Ranges

STOCKED MODELS in bold

Model Number	Range Inches of Water
2000-00N†••	.05-0-.2
2000-00†••	0-.25
2000-0†•	0-.50
2001	0-1.0
2002	0-2.0
2003	0-3.0
2004	0-4.0
2005	0-5.0
2006	0-6.0
2008	0-8.0
2010	0-10
2015	0-15
2020	0-20
2025	0-25
2030	0-30
2040	0-40
2050	0-50
2060	0-60
2080	0-80
2100	0-100
2150	0-150
2300-0†•	.25-0-.25
2301	.5-0-.5
2302	1-0-1
2304	2-0-2
2310	5-0-5
2320	10-0-10
2330	15-0-15

†These ranges calibrated for vertical scale position.
• Accuracy +/-3%.
•• Accuracy +/-4%.

Model Number	Range PSI
2201	0-1
2202	0-2
2203	0-3
2204	0-4
2205	0-5
2210*	0-10
2215*	0-15
2220*	0-20
2230**	0-30

*MP option standard
**HP option standard

Model Number	Range, Inches HG
2000-5HG	0-5
2000-6HG	0-6
2000-10HG	0-10
2000-15HG*	0-15
2000-20HG*	0-20
2000-25HG*	0-25
2000-30HG*	0-30
2000-40HG*	0-40
2000-50HG**	0-50
2000-60HG**	0-60

*MP option standard
**HP option standard

Model Number	Range, MM HG
2000-4MMHG	0-4
2000-10MMHG	0-10

Dual Scale Air Velocity Units

Model Number	Range in W.C. Velocity, F.P.M.
2000-00AV†••	0-.25/300-2000
2000-0AV†•	0-.50/500-2800
2001AV	0-1.0/500-4000
2002AV	0-2.0/1000-5600
2010AV	0-10/2000-12500

For use with Pitot tube.

Model Number	Range MM of Water
2000-6MM†••	0-6
2000-8MM†•	0-8
2000-10MM†•	0-10
2000-15MM	0-15
2000-20MM	0-20
2000-25MM	0-25
2000-30MM	0-30
2000-40MM	0-40
2000-50MM	0-50
2000-60MM	0-60
2000-80MM	0-80
2000-100MM	0-100
2000-150MM	0-150
2000-200MM	0-200
2000-250MM	0-250
2000-300MM	0-300
2000-500MM	0-500
2000-1000MM	0-1000
2300-20MM†•	10-0-10
2300-30MM	15-0-15

Model Number	Range, mBar
2000-20MBAR	0-20
2000-25MBAR	0-25
2000-50MBAR	0-50
2000-60MBAR	0-60
2000-500MBAR*	0-500
2300-20MBAR	10-0-10

*MP option standard

Model Number	Range, CM of Water
2000-1CM	0-1
2000-2CM	0-2
2000-3CM	0-3
2000-4CM	0-4
2000-5CM	0-5
2000-6CM	0-6
2000-8CM	0-8
2000-10CM	0-10
2000-15CM	0-15
2000-20CM	0-20
2000-25CM	0-25
2000-30CM	0-30
2000-40CM	0-40
2000-50CM	0-50
2000-60CM	0-60
2000-80CM	0-80
2000-100CM	0-100
2000-150CM	0-150
2000-200CM	0-200
2000-250CM	0-250
2000-300CM	0-300
2300-2CM	1-0-1
2300-4CM	2-0-2
2300-10CM	5-0-5
2300-20CM	10-0-10
2300-30CM	15-0-15

Model Number	Range, Pascals
2000-60PA†••	0-60
2000-100PA†•	0-100
2000-125PA†•	0-125
2000-250PA	0-250
2000-300PA	0-300
2000-500PA	0-500
2000-750PA	0-750
2300-60PA†••	30-0-30
2300-120PA†•	60-0-60
2300-250PA	125-0-125
2300-500PA	250-0-250

Model Number	Range, Kilopascals
2000-1KPA	0-1
2000-1.5KPA	0-1.5
2000-2KPA	0-2
2000-3KPA	0-3
2000-4KPA	0-4
2000-5KPA	0-5
2000-8KPA	0-8
2000-10KPA	0-10
2000-15KPA	0-15
2000-20KPA	0-20
2000-25KPA	0-25
2000-30KPA	0-30
2300-1KPA	.5-0-.5
2300-3KPA	1.5-0-1.5

Dual Scale English/Metric Models

Model Number	Range, In. W.C.	Range, Pa or kPa
2000-0D†•	0-0.5	0-125PA
2001D	0-1.0	0-250PA
2002D	0-2.0	0-500PA
2003D	0-3.0	0-700PA
2004D	0-4.0	0-1.0KPA
2006D	0-6.0	0-1.5KPA
2008D	0-8.0	0-2.0KPA
2010D	0-10	0-2.5KPA

OPTIONS (add below suffixes to model number, example: 2001-SB)

-ASF, Adjustable Signal Flag
-SP, Set Point Indicator
-AT, Aluminum Tag
-ST, Stainless Steel Tag

-BUNA, BUNA-N Elastomers
-VIT, Viton® Elastomers

-HP, High Pressure Option, rated for internal pressures up to 80 psig
-MP, Medium Pressure Option, rated for internal pressures up to 35 psig
-LT, Low Temperature, temperatures to -20°F (-29°C)

-NIST, NIST Certificate of Calibration
-CB, Chrome Bezel
-SB, 304 Stainless Steel Bezel

-SF, Silicone Free

-R, Red Scale Overlay
-Y, Yellow Scale Overlay
-G, Green Scale Overlay
-M, Mirror Scale Overlay

Natural Gas Model
-BUNA-IC, BUNA-N Elastomers & Impregnated Case

Magnehelic® Options

AVAILABLE OPTIONS

LED Setpoint Indicator
Bright red LED on right of 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.
-SP

Adjustable Signal Flag
Integral with plastic gage cover. Available for most models except those with medium or high pressure construction. Can be ordered with gage or separate.
-ASF

Transparent Overlays
Furnished in red, yellow, or green to highlight and emphasize critical pressures.
-R (Red)
-Y (Yellow)
-G (Green)

Mirrored Scale Overlay
A Mirrored Scale Overlay is also available to assist in reducing parallax error.
-M

MODELS FOR HIGH STATE PRESSURE APPLICATIONS

Medium Pressure Option:
for pressures to 35 psig.

-MP

High Pressure Option:
for pressures to 80 psig.

-HP

Installation is similar to standard gages except that a 4-13/16″ hole is needed for flush mounting. The medium pressure construction is rated for internal pressures up to 35 psig and the high pressure up to 80 psig. Available for all models. Because of larger case, the medium pressure and high pressure models will not fit in a portable case size. Installation of the A-321 safety relief valve on standard Magnehelic® gages often provides adequate protection against infrequent overpressure.

VELOCITY AND VOLUMETRIC FLOW UNITS

Scales are available on the Magnehelic® that read in velocity units (FPM, m/s) or volumetric flow units (SCFM, m^3/s, m^3/h). Stocked velocity units with dual range scales in inches w.c. and feet per minute are shown on page 2. For other ranges contact the factory.

When ordering volumetric flow scales please specify the maximum flow rate and its corresponding pressure. Example: 0.5″ w.c. = 16,000 CFM.

PRIVATE LABELED GAGES

Special scales with company logo or information can be crafted for the Magnehelic®. Please consult the factory for pricing.

NEW! Magnehelic® Chrome/Steel Bezels

Series 2000

Stainless Steel Bezel Option:

304 Stainless Steel Electro polished Ra 16 finished bezel for the Magnehelic® is now available. This stainless steel bezel is ideal for Magnehelics® mounted in clean rooms, pharmaceutical plants, medical and bio-medical facilities and in many locations where a chemical washdown occurs.

To Order Add Suffix -SB

Chrome Bezel Option:

A Chrome Plated Aluminum Bezel is now available on the Magnehelic® gage for an aesthetically pleasing finish when mounting on metal surfaces such as control panels.

To Order Add Suffix -CB

Portable Magnehelic® Pressure-Air Velocity Gages

Use with Pitot tube for air velocity measurement or without for pressure measurement. Easy and quick to use, Portable Magnehelic® Gages with dual scale are less sensitive to level than liquid gages, yet offer accuracy to ±2% over the full scale. †Air Velocity Scale provides direct reading for standard air without conversions. They are handy to use on a ladder or in confined locations encountered in field testing. Dwyer magnetic linkage provides exceptionally responsive, consistently accurate indication of air velocity, positive, negative or differential pressures in air and non-corrosive gases. Pointer movement is inertia-free and drift-free. Highly resistant to shock and vibration.

Portable Magnehelic® Unit Includes:

Choice of 5 models — Scales from 0-.25" w.c., 300-2000 FPM. to 0-10" w.c., 2000-12,500 FPM. Maximum total pressure rating 15 psig. Ambient temperature range 30 to 140°F. Aluminum stand iridite-dipped; gage has baked gray hammerloid finish. Furnished in gray plastic carrying case. Connections include 1/8" NPT high and low pressure taps, duplicated-one pair side and one pair back. Two 1/8" NPT plugs included. Rubber Tubing and Adapters — One 9 ft. length of 3/16" I.D. tubing, terminal tube and two pipe thread to tubing adapters.

POPULAR MODELS

Model	Pressure, Inches w.c.	Velocity, FPM
2000-00AV-Port†	0-.25	300-2000
2000-0AV-Port†	0-.50	500-2800
2001AV-Port	0-1.0	500-4000
2002AV-Port	0-2.0	1000-5600
2010AV-Port	0-10	2000-12,500

†2000-00 - 4% accuracy; 2000-0 - 3% accuracy

Mounting Accessories

MOUNTING. 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®. The A-300 is ideal for mounting the Magnehelic® on control panel doors.

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

The A-369 allows the Magnehelic® 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.

Flush

A-300

A-300, Flush Mounting Bracket

Surface

A-368

A-368, Surface Mounting Plate, aluminum, for Magnehelic® gage

Portable

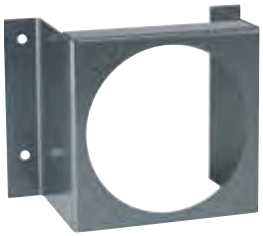
A-369

A-369, Stand-Hang Bracket, aluminum, for Magnehelic® gage

Other Mounting Options

Pipe

A-610, Pipe Mounting Kit for installing on 1-1/4″ to 2″ horizontal or vertical pipe



A-299

A-371

A-299, Mounting Bracket, flush mount for Magnehelic® Gage. Bracket is then surface mounted. Steel with gray hammertone epoxy finish

A-371, Surface Mounting Bracket. Use with medium pressure (-MP) or high pressure (-HP) models only

NEW! Flush-Mount Kit for Magnehelics®

A-464

Ideal for Clean Rooms & Control Panels

The A-464 mounting kit provides a flush mounting solution for Magnehelic® gage installations for applications such as clean rooms and mechanical equipment rooms. The A-464 can also be used as an alternative means to flush mount Magnehelic® gages on control panel enclosures. The space pressure reference port eliminates the need to drill separate holes and run tubing long distances. Utilizing the A-464 for Magnehelic® installations reduces installation time while also producing an aesthetically pleasing result.

Advantages and Specifications of the A-464 Kit

- Provides an innovative solution for flush mounting Magnehelic® gages.
- Space pressure reference integral to mounting plate.
- Mounting applications include: Sheetrock walls, control panel enclosures and air handling equipment.
- Eliminates the need for special hole saws.
- Creates a professional look.
- Saves installation time and money.
- Outside dimensions: 6-1/4 x 6-1/4 x 1/4 inches (15.9 x 15.9 x 0.6 cm).
- Material: White ABS plastic.

STOCKED MODEL

A-464

A-464 Back View
Shown with A-465

NEW! Flush-Mount Space Pressure Sensor

A-465

Ideal for Clean Rooms

The A-465 Space Pressure Sensor Kit provides a clean solution for sensing space pressure. Typical applications include: sensing the pressure in clean rooms, laboratories and building lobbies. The kink resistant tubing provided in the kit is connected to the tubing running to a pressure transducer, Magnehelic® Gage, VAV unit or any other types of pressure sensing devices. The sensor can be mounted on sheetrock walls, single gang electrical boxes or on ceiling tiles. The block free pressure reference opening along with the kink resistant tubing ensure accurate readings at all times.

Advantages and Specifications of the A-465 Kit

- The professional way to sense space pressure.
- Mounting options include: Sheetrock walls, ceiling tiles or single gang electrical boxes.
- Non block reference opening prevents plugging.
- Saves time and money.
- Outside dimensions: 2-3/4 x 4-1/2 x 1/4 inches (6.9 x 11.4 x 0.6 cm).
- Attractive design blends in with building decor.
- Materials: White ABS plastic.

STOCKED MODEL

A-465

Static Pressure Accessories

Sensing Static Pressure

For most industrial and scientific applications, the only air measurements needed are those of static pressure, total pressure and temperature. With these, air velocity and volume can be quickly calculated.

To sense static pressure, six types of devices are commonly used. These are connected with tubing to a pressure indicating instrument.

Fig. 1-A shows a simple thru-wall static pressure tap. This is a sharp, burr-free opening through a duct wall provided with a tubing connection of some sort on the outside. The axis of the tap or opening must be perpendicular to the direction of flow. This type of tap or sensor is used where air flow is relatively slow, smooth and without turbulence. If turbulence exists, impingement, aspiration or unequal distribution of moving air at the opening can reduce the accuracy of readings significantly.

Types of Static Pressure Sensing Devices

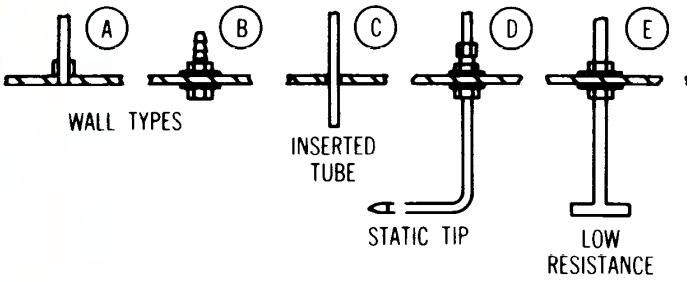


Fig. 1

Fig. 1-B shows the Dwyer No. A-308 Static Pressure Fitting. Designed for simplified installation, it is 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 ¼" metal tubing connection
A-307-SS, same as above in Stainless Steel
A-308, Static Pressure Fitting, for 3/16" and ⅛" I.D. plastic or rubber tubing
A-414, SS Clean Room Pressure Sensor

A-308 A-414 A-307

Fig. 1-C shows a simple tube through the wall. Limitations of this type are similar to wall type Fig. 1-A.

A-304, Duct Connector

A-304

Fig. 1-D shows a static pressure tip which is 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 insure 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 ¼" 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, same as A-301 in Stainless Steel
A-302, Static Pressure Tip, for 3/16" and ⅛" I.D. 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" I.D. rubber or plastic tubing with 4″ insertion

A-345, Flange for mounting A-301, A-302, A-307, A-308 or ⅛" dia. Pitot Tubes with compression fitting when interior of duct is not accessible. Aluminum, with gasket and sheet metal screws

A-301 A-302 A-303 A-345

Fig. 1-E shows a Dwyer No. A-305 low resistance Static Pressure Tip. It 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 ⅛" NPT pipe thread for pressure connection
A-305-SS, same as A-305 in Stainless Steel

A-305

Fittings & Connectors

Fittings - Adapters


A-324


A-326


A-330


A-332


A-333


A-334


A-337


A-339


A-340


A-342


A-346


A-349

A-323, Elbow Compression Fitting, brass ⅛" NPT to ¼" metal tubing
A-324, Compression Fitting, brass ⅛" NPT to ¼" metal tubing
A-326, Compression Fitting, brass ⅛" NPT to ⅜" tubing

A-330, ⅛" Pipe Plug, socket hex, plated steel

A-332, Bushing, brass, ⅛" to ¼" NPT
A-333, Bushing, brass, ⅛" to ½" NPT
A-334, Close Nipple, brass, ⅛" NPT
A-336, 90° Street L, brass, ⅛" NPT
A-337, Coupling, brass, ⅛" NPT

A-339, Adapter, brass, ⅛" NPT to 3⁄16" rubber and ⅛" I.D. plastic tubing
A-340, Adapter, nylon, ⅛" NPT to 3⁄16" I.D. rubber or ¼" plastic tubing

A-342, "T" Assembly, plastic, for 3⁄16" I.D. rubber or ¼" plastic tubing
A-343, "T" Assembly, plastic, for 3⁄16" plastic tubing
A-343-1, "T" Assembly, plastic, for ⅛" I.D. plastic tubing
A-346, "T" Compression Fitting, brass, ¼" metal tubing

A-349, Reducer, brass, ¼" female NPT to ⅛" male NPT

Valves - Connectors - Snubbers


A-310A A-310B


A-311


A-312


A-355


A-365


Series PS

A-310A, 3-Way Vent Valve, plastic, ⅛" NPT to ¼" metal tubing. Positions are: (1) Line: Gage connected to pressure source. (2) Off: Both gage and connection to pressure source closed. (3) Vent: Gage vented to atmosphere and connection to pressure source closed. 80 psi rating. Replaces former model A310 (brass). 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-310B, same as A-310A but with 10 PSI rating

A-311, Shut Off Valve, brass, ⅛" NPT to ⅛" NPT

A-312, Shut Off Valve, brass, ⅛" NPT to ¼" metal tubing

A-355, Porting Valve, acrylic plastic, ⅛" NPT inserts. Used for convenient indication of pressure at two points with a single gage

A-365, Dual Porting Valve, acrylic plastic, ⅛" NPT fittings. For monitoring three pressures, two at a time, with one gage

Series PS Pressure Snubber
Designed to protect pressure instrumentation by dampening surges and pulsations and assuring steady average pressure readings
PS114, Brass 1/8˝ NPT
PS214, Stainless Steel 1/8˝ NPT

Optional Accessory Kits for Air Filters


A-602


A-604


A-603


A-605

A-602, Air Filter Kit. Accessory package includes two pressure tips with integral compression fittings, two 5 ft. 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 a pressure switch in conjunction with an air filter kit equipped Magnehelic®. Includes two 1/8˝ NPT to 1/4˝ tubing compression fittings and two compression tees.

A-604, "T" Kit. Accessory package for using a pressure switch in conjunction with a Magnehelic®. Includes two plastic tubing connector tees and two plastic tubing to 1/8˝ NPT adapters.

A-605, Air Filter Gage Accessory package. Adapts any standard Magnehelic® 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.

Miscellaneous Accessories

Filters


A-391


A-392


F222


F451


A-331

In Line Filters

A-331, ⅛" NPT Filter Vent Plug, nylon and sintered metal

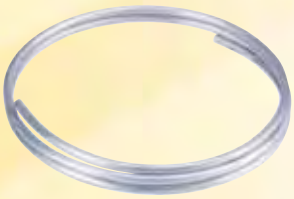
A-391, Line Filter, ¼" female NPT x ¼" male NPT
A-392, Line Filter, ⅛" female NPT x ⅛" male NPT

F222, Liquid/Particle Filter for compressed air. Removes dirt, water and oil. 22 scfm maximum flow, ¼" female NPT inlet and outlet
1201-2, Replacement Filter Element for F222 filter, package of 3
F451, Liquid/Particle Filter for compressed air. Removes dirt, water and oil. 45 scfm maximum flow, ¼" female NPT inlet and outlet
1201-3, Replacement Filter Element for F451 filter, package of 3

Gage Tubing


A-222


A-201


A-210

Clear Tubing for Inspection

Clear plastic tubing is easily inspected and is therefore best for test applications where a possibility of fluid entering the tubing exists.

A-220, Flexible Vinyl Tubing, Clear 3⁄16" I.D. x 5⁄16" O.D., lengths to 500 ft, 45 psi maximum pressure @ 73°F

A-221, Flexible Vinyl Tubing, Clear ⅛" I.D. x 3⁄16" O.D., lengths to 500 ft, 40 psi maximum pressure @ 165°F

A-222, Flexible Vinyl Tubing, Clear .240" I.D. x .375" O.D., lengths to 500 ft, 35 psi maximum pressure @ 73°F

Rubber Tubing for Portable Work

Rubber tubing has less tendency to kink in storage and occupies less space, thus is best for portable work.

A-201, Rubber Tubing, 3⁄16" I.D., 9 ft length

A-202, Rubber Tubing, 3⁄16" I.D. length to 50 ft

Metal Tubing for Permanent Installation

Metal tubing is the most durable and is recommended for using in permanent installations.

A-210, Aluminum Tubing, ¼" O.D., 5 ft length, 500 psi maximum pressure 200°F

A-211, Aluminum Tubing, ¼" O. D., lengths to 50 ft, 500 psi maximum pressure @ 200°F

Pumps


A-394


A-350


A-396A

Air Source for Bubbler Level Systems

A-394, Electric Air Pump. Provides convenient source of purge air in bubbler type liquid level systems. Dual diaphragm design allows operation of two systems simultaneously.

Aspirator Bulb for Quick Leak Checks

A-350, Aspirator Bulb. Used as pressure source in calibration and leakage tests.

Calibration Pump with Precise Adjustment

A-396A, Calibration pump. Serves as pressure source to calibrate gages and transmitters or to set pressure switches. Use with manometer or other pressure standard. Includes volume adjuster enabling fine pressure control and bleed valve. Generates pressures from a fraction of an inch w.c. to 72 psig (5 bar). Includes barbed fitting, tee connector and three 36" lengths of vinyl tubing.

Related Products

Series A-304 Duct Connector

The Series A-304 Duct Connector allows for easy and fast connection of sensing tubes to ducting for static pressure reading to be taken. The low profile plastic connector is supplied complete with two screws and extension piece (80 mm long) for use with lagged or insulated ducts. The A-304 is suitable for use with 5 mm ID, PVC tubing.

APPLICATIONS

Pressure connection point for fan proving applications, filter monitoring, damper control for the HVAC, dust control and fume extraction industries.

SPECIFICATIONS

- Plastic Duct Connector.
- Plastic Extension Piece 3.15″ long x 0.39″ dia.(80 mm long x 10 mm dia).

FEATURES

- Easy Installation & Low Cost
- Plastic Construction.
- Supplied with Mounting Screws and Extension Probe

STOCKED MODEL

Series A-304 Duct Connector

Model A-720 Strap Wrench

The A-720 offers the user a versatile tool to grip, undo & tighten a wide variety of awkwardly shaped and sized objects.
The A-720 also makes the job of fitting Adjustable Signal Flags (ASF) to Magnehelic® Gages much easier by simply following the instruction included with each cover supplied.

FEATURES

- Reinforced plastic handle provides extra leverage.
- Rubber strap reinforced with 38 cords of high tensile polycarbon to give a breaking strength in excess of 2,000 lbs.
- Strap will grip objects from 20mm to 160mm diameter.
- Low cost, rugged and simple to use.
- Handy multi-purpose tool.

STOCKED MODEL

Model A-720 Strap Wrench

Clean Room Pressure Sensors

The Stainless Steel room sensors are a static pressure pick-up point for use in clean rooms and other contained environment areas. The all stainless steel construction offers a low profile, cleanable and neat answer to tubing termination within these areas. Three models exist to cover all needs: The A-414 has a push-on termination suitable for 5mm flexible plastic tubing, the A-415 has a compression fitting, for use with 6mm OD SS tubing and the A-416 is designed for fixing to standard partitions so that no fittings are shown on the clean room side; this model is clamped in place across the partition. The A-414 and A-415 are supplied with stainless steel mounting screws.

SPECIFICATIONS

- All Stainless Steel construction (satin finish).
- Supplied with SS mounting screws (not A-416).

APPLICATIONS

These units offer a convenient, cost effective and neat way to terminate the static pressure connection points in Clean Rooms and Controlled Environments.

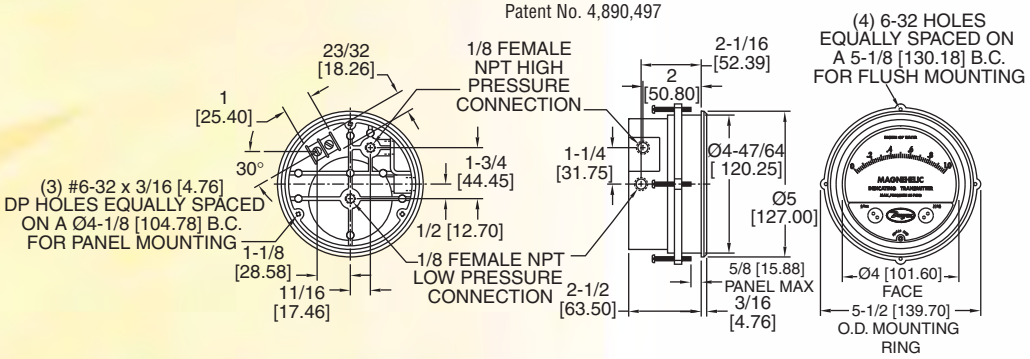
STOCKED MODELS in bold

A-414
A-415
A-416

Magnehelic® with 4-20 mA Transmitter Output

Series 605

Patent No. 4,890,497



Do you need a Magnehelic® gage and a transmitter? The Dwyer Series 605 offers both in one product! The 605 Magnehelic® 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, 4-20 mA control signal utilizing the time-proven Dwyer Magnehelic® gage mechanical design and Series 600 transmitter technology. The compact package reduces needed panel space by eliminating an additional transmitter plus reduces installation time.

The Transmitter can be surface mounted or flush mounted in a 4-13/16 (122 mm) diameter panel hole. Hardware is included for either option. Duplicate 1/8″ female NPT pressure connections on side and back ease installation. Based on its unique combination of price and performance, the Series 605 transmitter is ideal for use in commerical and industrial energy management systems. Typical applications include control of variable speed fans and blowers as well as the positioning of system dampers. Continuous data on air velocities in ducts and air filter pressure drops can be fed to the controlling computer.

SPECIFICATIONS

GAGE SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult Factory.
Accuracy: See chart.
Stability: ±1% F.S./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) O.D. x 2-11/16″ (68.3 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% F.S./°F (0.045% F.S./°C).
Power Requirements: 10-35 VDC (2 wire).
Output Signal: 4 to 20 mA.
Zero and Span Adjustments: Protected potentiometers.
Loop Resistance: DC; 0-1250 ohms maximum.
Current Consumption: DC; 38 mA maximum.
Electrical Connections: Screw terminal block.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

STOCKED MODELS in bold

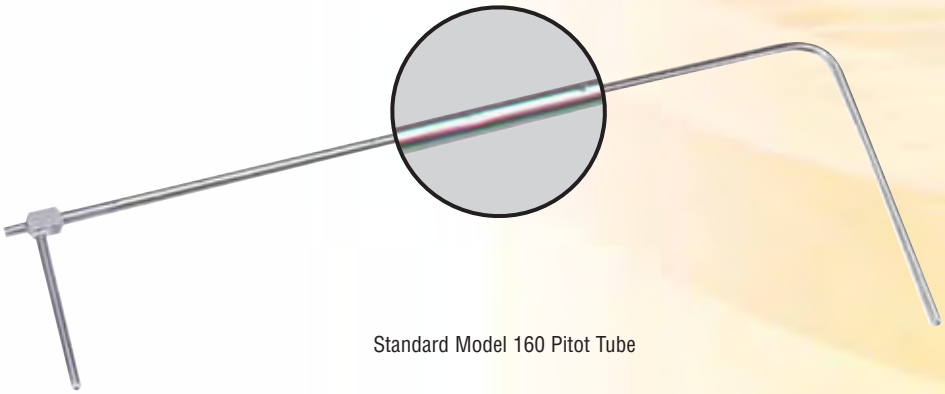
Model Number	Range in w.c.	Maximum Pressure	Electrical Accuracy +/-%	Mechanical Accuracy +/-%
605-00N	.05-0-.20	25 psi (1.7 bar)	2	4
605-11	.25-0-.25	25 psi (1.7 bar)	2	3
605-0	0-.50	25 psi (1.7 bar)	2	2
605-1	0-1.0	25 psi (1.7 bar)	2	2
605-2	0-2.0	10 in. w.c. (2.5 kPa)	0.5	2
605-3	0-3.0	5 psi (34.5 kPa)	0.5	2
605-6	0-6.0	5 psi (34.5 kPa)	0.5	2
605-10	0-10	5 psi (34.5 kPa)	0.5	2

Model Number	Range in w.c.	Maximum Pressure	Electrical Accuracy +/-%	Mechanical Accuracy +/-%
605-20	0-20.0	20 psi (1.4 bar)	0.5	2
605-30	0-30	20 psi (1.4 bar)	0.5	2
605-50	0-50	20 psi (1.4 bar)	0.5	2
	Range in Pa			
605-60Pa	0-60	25 psi (1.7 bar)	2	4
605-125Pa	0-125	25 psi (1.7 bar)	2	2
605-250Pa	0-250	25 psi (1.7 bar)	2	2
605-500Pa	0-500	10 in. w.c. (2.5 kPa)	0.5	2

Series 160

Pitot Tubes for Sensing Air Velocity

Use with the Magnehelic® in Air Flow Applications



Standard Model 160 Pitot Tube

Ideal for use with our precision manometers and air velocity gages, Dwyer Pitot Tubes are constructed from corrosion resistant stainless steel for a lifetime of service. ASME design meets AMCA and ASHRAE specifications for maximum accuracy over a wide variety of flow conditions. No correction factors required as ASHRAE tip design yields a calibration factor of 1. ASHRAE design needs no calibration! Permanent, stamped insertion depth graduations on sides of 160 series facilitate accurate positioning. Static pressure port is parallel to sensing tube allowing quick, easy alignment of tube with air flow. Low sensitivity to misalignment gives accurate reading even when tube is misaligned up to 15 degrees. Various standard sizes are available for use in ducts as small as 4″ dia. or as large as 36 ft. dia. A universal model fits user supplied 3/4″ schedule 40 (standard) pipe in any length. Several convenient mounting options are available for permanent installations.

- No calibration needed.
- Precisely located, burr-free static pressure holes.
- Hemispherical tip design, best for accuracy if imperfectly aligned and nearly impossible to damage.
- Long lasting 304 stainless steel construction.
- Silver soldered connections for leak-proof operation.
- ASME design meets AMCA and ASHRAE specifications.
- Coefficient of "1."
- 5/16" models rated to 1500°F.
- Extended static connection helps guide tip within recommended 15° of air flow direction.
- Inch graduations on sides of 160 series to quickly determine exact insertion depth.
- Dwyer Air Velocity Calculator, direct reading flow charts and instructions included.
- Use 1/8" models in ducts as small as 4", 5/16" models in ducts 10" or larger.
- Optional mounting gland or split flange make permanent installation fast and simple.

STOCKED MODELS in bold

Standard 5/16" Dia.		Longer Length w/ Stiffener	
Model Number	**Insertion Length**	**Model Number**	**Insertion Length**
160-8	8"	160-96	96"
160-12	12"	160-120	120"
160-18	18"	160-168	168"
160-24	24"	160-216	216"
160-36	36"	**Pocket Size 1/8" Dia.**	
160-48	48"	**166-6**	6"
160-60	60"	**166-12**	12"
Universal Model for 3/4" Pipe		**167-6**	6"
160-U	*	**167-12**	12"

*Universal model for permanent installation and connection to metal tubing. Make any length Pitot tube with 3/4" schedule 40 pipe, 3/4" to 1/2" reducing bushing and 1/4" metal tubing.

Accessories & Options

A-156 Flange Mounting Plate
A-158 Split Flange
A-159 Mounting Gland
A-397 Step Drill

Compression Fitting mounting option for 166/167 Series. Add -CF suffix (166-6-CF).

ACCESSORIES

No. A-158 Split Flange Mounting can be added to any Dwyer No. 160 Standard Pitot Tube. Cadmium plated steel. Gasket is pattern for mounting holes. Secure flange loosely to tube, adjust tube depth and tighten screws. Gasket of 1/16″ Neoprene fits tightly around tube and against duct for leak-proof seal. Nuts, washers included.

A-158 Split Flange Mounting

No. A-159 Mounting Gland — Versatile adapter slips on any Series 160, 5/16″ standard Pitot tube made after Dec. 1990. Two-part stainless steel fitting slides over tube and provides permanent, secure mounting. Where duct interior is accessible, use the washers and jam nut supplied. For blind applications or in thicker materials, use model A-156 flange mounting plate. Once tube is adjusted to proper depth and angle, tighten smaller hex bushing to lock position. Graphite bushing inside assures leak-proof seal even at higher temperatures. Teflon® bushing also available. **NOTE:** For full insertion with this fitting, order next longer Pitot tube.

A-159 Duct Mounting Gland

A-156 Flange Mounting Plate

A-159 Mounting Gland is used for both duct mounting and flange mounting. To flange mount, the A-159 must be used with the A-156 flange mounting plate.

No. A-397 Step Drill. For fast, convenient installation of Pitot tubes in sheet metal ducts. No center punch needed; automatic de-burring. Drills six sizes from 3/16″ - 1/2″ in 1/16″ increments.

A-397 Step Drill

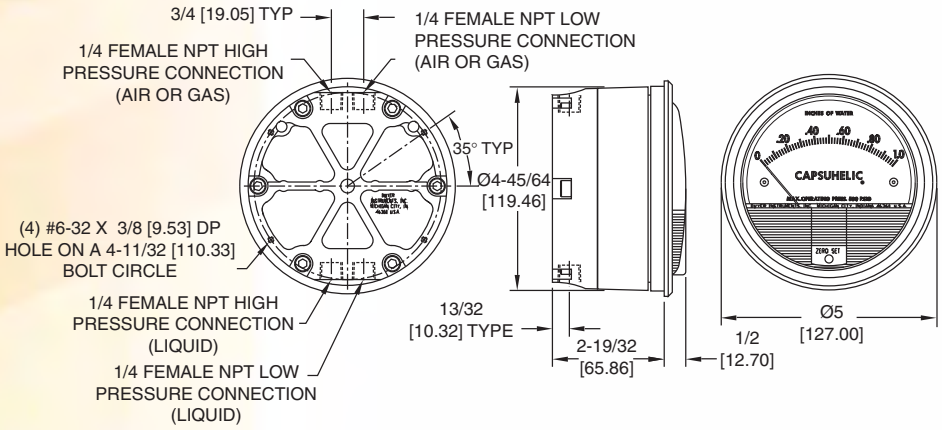
Magnehelic® Accessories

Capsuhelic® Differential Pressure Gage

Series 4000

Ideal for High Pressure Applications with Internal Pressure Rating to 500 psig

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



Dimensions, Series 4000 Capsuhelic® Pressure Gages.

Do you need to monitor low differential pressures but have potentially high system static pressures. If the answer is yes, then the Capsuhelic® is the perfect solution!

Using the basic design of Dwyer's time-proven Magnehelic® gage, the Capsuhelic® contains a simple, frictionless movement that permits full scale readings as low as 0.5 inch water column. 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 inch w.c.

The Capsuhelic® 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 diaphragm-actuated Capsuhelic® gage requires no filling liquid which might limit its outdoor applications. Zero and range adjustments are made from outside the gage, and there is no need to disassemble the gage in normal service.

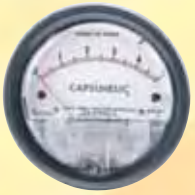
NOTE: May be used with Hydrogen where pressures are less than 35psi.

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 full scale at 70°F (21.1°C). (±2% on 4000S models, ±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.
Standard Accessories: Two 1/4˝ NPT plugs for duplicate pressure taps, four flush mounting adapters with screws and four surface mounting screws.

MOUNTING

Capsuhelic® gages may be flush mounted in a panel or surface mounted. Hardware is included for either. For flush mounting, a 4-13/16˝ diameter cutout in panel is required. Where high shock or vibration are problems, order optional A-496 Heavy Duty flush mount bracket. Optional A-610 kit provides simple means of attaching gage to 1-1/4˝-2˝ horizontal or vertical pipe. Installation is same as Magnehelic® gage shown on page 1. All standard models are calibrated for vertical mounting. Gages with ranges above 5 in. w.c. can be factory calibrated for horizontal or inclined mounting on special order.



Flush mounted in panel.

Back view shows flush mounting adapters.

Back view for surface mounting.

OPTIONS AND ACCESSORIES

Adjustable Signal Flag — Integral with plastic gage cover; has external reset screw. May be ordered factory installed on gage or separately for field installation. Specify ASF suffix after model number.

A-314 Bleed Fitting — For easier, safer purging of trapped air when using gage with liquids. Also useful for draining condensate when installed in lower ports. To open, simply loosen hex nut. Solid brass.

Forged Brass Case — For applications involving water or water based liquids. To order, add suffix "B" after model number. Example: 4205B.

Transparent Scale Overlays — Available in bright red, green or yellow to accent critical pressure zones. Specify which color and portion of scale to be covered with each.

A-471 Portable Kit — Includes plastic case, mounting bracket, A-309 3-way manifold valve, (2) A-230 high pressure hoses and all necessary fittings. Assembly required. Gage not included.

Straightforward Design Assures Maintenance-free Performance

Top low pressure connection (*for Air or Gas*) connects to chamber in back of diaphragm. High pressure air or gas port (cut away; not shown) connects with chamber in front of diaphragm through passageways in case.

Precision made case is offered in two materials. Standard is die cast aluminum coated inside for resistance to most oils and similar fluids. Optional forged brass case is recommended when using water or water based liquids. One case size for all pressure ranges — can be either surface or flush mounted.

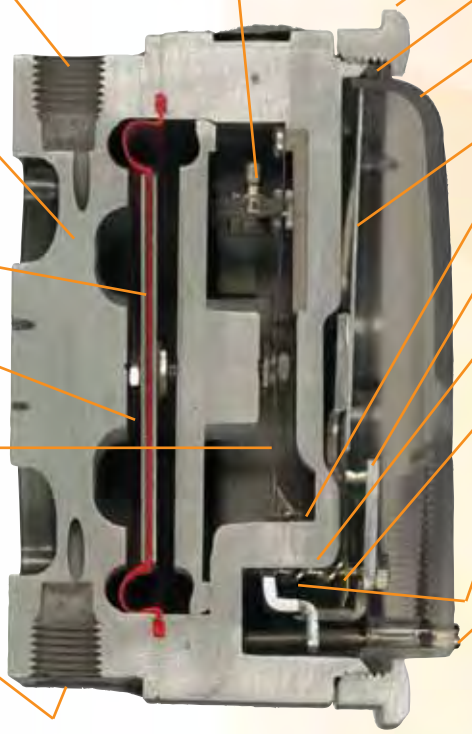
Silicone rubber diaphragm with integrally molded O-ring is sealed between the case and backplate. Diaphragm motion is restricted to prevent damage due to over-pressure.

Diaphragm support plate of stainless steel minimizes position or attitude sensitivity.

Calibrated range spring is a flat leaf of nickel plated spring steel. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length factory adjusted for calibration.

Bottom high pressure connection *(for Liquids)* connects to chamber in front of diaphragm. Low pressure liquid connection (not visible) connects with chamber in back of diaphragm through passageways in case.

Range spring calibration is set by custom camlock. Rate adjust and rate adjust lock are coaxial and are factory set and sealed.



Bezel provides flange for flush mounting in panel.

O-ring seal for cover assures dust tight integrity of case.

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

Precision scale, screen printed on aluminum, is accurate and easy to read.

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

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

Thin wall magnetic "window" is well braced and of minimum area for maximum pressure capability.

Jeweled bearings for helix are shock resistant mounted. They provide virtually friction-free rotation for helix. Rotation is damped with high viscosity silicone fluid.

Helix is precision milled from an alloy of high magnetic permeability, mounted in jeweled bearings, and rotates to align with magnetic field of magnet and transmit pressure indication to pointer.

Zero adjustment screw is conveniently located in plastic cover, accessible without removing cover. "O" ring seal provides dust seal.

Patent Nos. 4,011,759
4,030,365

SERIES 4000 CAPSUHELIC® — MODELS AND RANGES

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

STOCKED MODELS in bold

Model Number	Range, Inches of Water
***4000-0**	0-.50
***4001**	0-1.0
***4002**	0-2.0
***4003**	0-3.0
***4004**	0-4.0
***4005**	0-5.0
4006	0-6.0
4008	0-8.0
4010	0-10
4015	0-15
4020	0-20
4025	0-25
4030	0-30
4040	0-40
4050	0-50
4060	0-60
4080	0-80
4100	0-100
4150	0-150
4200	0-200
4300	0-300
4400	0-400
4500	0-500

Model Number	Range Zero Center Inches of Water
*4302	1-0-1
*4304	2-0-2
4310	5-0-5
4320	10-0-10
4330	15-0-15

Model Number	Range PSI
4201	0-1
4202	0-2
4203	0-3
4204	0-4
4205	0-5
4210	0-10
4215	0-15
4220	0-20
†**4230S**	0-30
†**4240S**	0-40
†**4260S**	0-60
†**4280S**	0-80
†**42100S**	0-100
†42200S	0-200
†42300S	0-300

Model Number	Range MM of Water
*4000-25MM	0-25
*4000-50MM	0-50
4000-80MM	0-80
4000-100MM	0-100

Special Purpose Ranges

Scale No. 4401
Square Root
Specify Range

Scale No. 4402
Blank Scale
Specify Range

Model Number	Range, CM of Water
4000-15CM	0-15
4000-20CM	0-20
4000-25CM	0-25
4000-40CM	0-40
4000-50CM	0-50
4000-80CM	0-80
4000-100CM	0-100
4000-150CM	0-150
4000-200CM	0-200
4000-250CM	0-250
4000-300CM	0-300

Zero Center Ranges

*4300-4CM	2-0-2
4300-10CM	5-0-5
4300-30CM	15-0-15

Model Number	Range, Pascals
*4000-125PA	0-125
*4000-250PA	0-250
*4000-500PA	0-500
4000-750PA	0-750

Zero Center Ranges

*4300-500PA	250-0-250

Model Number	Range, Kilopascals
4000-1KPA	0-1
4000-1.5KPA	0-1.5
4000-2KPA	0-2
4000-3KPA	0-3
4000-4KPA	0-4
4000-5KPA	0-5
4000-8KPA	0-8
4000-10KPA	0-10
4000-15KPA	0-15
4000-20KPA	0-20
4000-25KPA	0-25
4000-30KPA	0-30

Zero Center Ranges

4300-1KPA	.5-0- .5
4300-3KPA	1.5-0-1.5

Model Number	Range Feet of Water
4616B	0-16
4635B	0-35

Available with brass case only

Accessories

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

Options

Add Options as Suffix, Example 4001-ASF
-ASF (Adjustable Signal Flag)
-B (Brass Case)
Scale Overlays - Red, Green, Mirrored or combination. Specify Locations

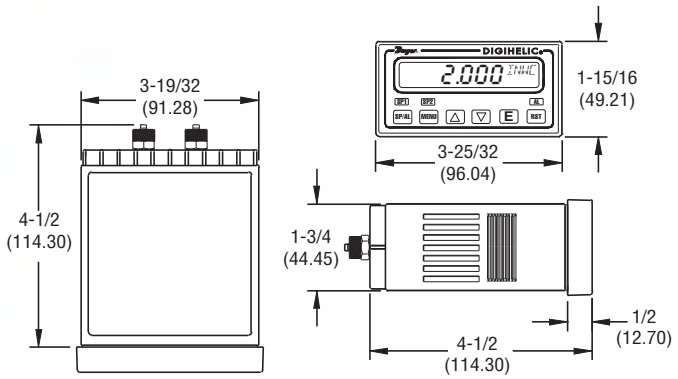
*These ranges available for vertical scale position only. †These ranges use Spiralhelic® movement.

Magnehelic® Accessories

Series DH

Digihelic® Differential Pressure Controller

Pressure, Velocity & Volumetric Flow Operation



The Dwyer Series DH Digihelic® Differential Pressure Controller is the ideal instrument for pressure, velocity and flow applications, achieving a 0.5% full scale accuracy on ranges from 5 to 100 in. w.c.

The Digihelic® provides a 4-20 mA process output, 2 SPDT relays with adjustable dead bands, and selection of pressure, velocity or flow operation. Units operate from either 120/220 VAC or 24 VDC.

Programming is simplified using a menu key, and includes: security level; set point or set point and alarm operation; auto or manual alarm reset; English or Metric engineering units; K-factor adjustment for use with various Pitot tubes and flow sensors; and circular or rectangular duct size for volumetric flow operation.

FEATURES

- Field Programmable for Pressure, Velocity or Flow Operation
- 4-20 mA Process Output
- 2 SPDT Relays with Selectable Dead Bands
- Universal Power Supply of 120/220 VAC & 24 VDC
- Retrievable Peak and Valley Readings
- 0.5% Full Scale Accuracy Sensor
- Modbus® Communications
- Compact, 1/8 DIN Housing with NEMA 4X (IP66) Front Face

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Housing Material: ABS plastic, UL approved 94-V-0.
Accuracy: ±0.5% at 77°F (25°C) including hysteresis and repeatability.
Stability: < ±1% per year.
Pressure Limits: 3 X range.
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).
Power Requirements: High Voltage Power = 100 to 240 VAC, 50 to 400 Hz or 132 to 240 VDC.
Low Voltage Power = 24 VDC ±20%.
Power Consumption:
Low Voltage Power = 24 VDC - 130 mA max.
High Voltage Power = 100 to 240 VAC, 132 to 240 VDC - 7VA max.
Output Signal: 4-20 mA DC into 900 ohms max.
Zero & Span Adjustments: Accessible via menus.
Response Time: 250 ms.
Display: 4 digit LCD 0.4˝ height
LED indicators for set point and alarm status.
Electrical Connections: Screw terminals.
Process Connections: Compression fitting for use with 1/8˝ ID X 1/4˝ OD tubing (3.175 mm ID x 6.35 mm OD).
Enclosure Rating: Face designed to meet NEMA 4X (IP66).
Mounting Orientation: Mount unit in horizontal plane.
Size: 1/8 DIN. Panel Cutout: 1.772 x 3.620 in (45 x 92 mm).
Weight: 14.4 oz. (408 g).
Serial Communications: Modbus® RTU, RS485, 9600 Baud.

SWITCH SPECIFICATIONS

Switch Type: 2 SPDT relays.
Electrical Rating: 8 Amps at 240 VAC resistive.
Set Point Adjustment: Adjustable via keypad on face.

STOCKED MODELS in bold

Available Pressure Engineering Units

Model No.	in. wc	ft. wc	mm wc	cm wc	psi	in. Hg	mm Hg	mbar	Pa	kPa	hPa	oz. in.
DH-006	5.000	.4167	127.0	12.70	.1806	.3678	9.342	12.45	1245	1.245	12.45	2.890
DH-007	10.00	.8333	254.0	25.40	.3613	.7356	18.68	24.91	2491	2.491	24.91	5.780
DH-008	25.00	2.083	635.0	63.50	.9032	1.839	46.71	62.27	6227	6.227	62.27	14.45
DH-009	50.00	4.167	1270	127.0	1.806	3.678	93.42	124.5		12.45	124.5	28.90
DH-010	100.00	8.333	2540	254.0	3.613	7.356	186.8	249.1		24.91	249.1	57.80

Bi-Directional Ranges also available: DH-015 Range: 2.5 - 0 - 2.5˝ w.c.
DH-016 Range: 5 - 0 - 5˝ w.c.

Note: Velocity and volumetric flow only available on models DH-006 & DH-007.

Pressure Conversion Chart

in/H_2O	P.S.I.	in/Hg	mm/H_2O	mm/Hg	kg/cm²	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	.0289	.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	.0274	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	736.8	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	836.2	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	2.940	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	.1146	.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	2265	164.4	.2233	.2190	219.0	21898	21.90
89	3.212	6.450	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	3.456	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_2O	in/Hg	mm/H_2O	mm/Hg	kg/cm²	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	3.686	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	8.775	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	2164	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	12.62	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
7.8	215.9	15.88	5484	403.4	.5484	.5378	537.8	53780	53.78
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	98630	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	101400	101.4
15.0	415.2	30.54	10550	775.7	1.055	1.034	1034	103400	103.4
16.0	442.9	32.58	11250	827.4	1.125	1.103	1103	110300	110.3
17.0	470.6	34.61	11950	879.1	1.195	1.172	1172	117200	117.2
18.0	498.2	36.65	12660	930.9	1.265	1.241	1241	124100	124.1
19.0	525.9	36.68	13360	982.6	1.336	1.310	1310	131000	131.0
20.0	553.6	40.72	14060	1034	1.406	1.379	1379	137900	137.9
21.0	581.3	42.76	14770	1086	1.476	1.448	1448	144800	144.8
22.0	609.0	44.79	15470	1138	1.547	1.517	1517	151700	151.7
23.0	636.7	46.83	16170	1189	1.617	1.586	1586	158600	158.6
24.0	664.3	48.86	16870	1241	1.687	1.655	1655	165500	165.5
25.0	692.0	50.90	17580	1293	1.758	1.724	1724	172400	172.4

CONVERSION FACTORS

NOTE:
CONVERSION FACTORS ROUNDED

P.S.I. x 27.71 = in. H_2O
P.S.I. x 2.036 = in. Hg
P.S.I. x 703.1 = mm/H_2O
P.S.I. x 51.75 = mm/Hg
P.S.I. x .0703 = kg/cm²
P.S.I. x .0689 = bar
P.S.I. x 68.95 = mbar
P.S.I. x 6895 = Pa
P.S.I. x 6.895 = kPa

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