

## **280 Series**

*Digital Pressure / Vacuum Sensors*



# numatics®

Numatics, Inc. is a leading manufacturer of pneumatic products and motion control products. Our broad spectrum of standard, custom developed products and application components, have made a significant impact on pneumatic innovation as well as pneumatic and motion control technology. Our company has an extensive history of generating innovative concepts and technological breakthroughs. Many of today's standard features in pneumatic technology were industry firsts from Numatics. We continue our innovative approach to product development by developing electric motion control solutions and enhancing our embedded Fieldbus and I/O products to continually meet and solve our customer's application requirements.

Today Numatics is proud to be a part of the Industrial Automation Division of Emerson Electric Co.

Emerson (NYSE: EMR) is a global company that brings together technology and engineering to provide innovative solutions for customers in a wide range of industrial, commercial, and consumer markets.

Numatics, along with the vast resources of the Emerson organization, will assure that our proud history of innovation and service will continue to meet the needs of our global customers.



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### 280 Series Digital Pressure / Vacuum Sensor



#### Application

Numatics DPS / DVS 280 series digital sensors can be used as a digital pressure / vacuum gauge for accurate visual display of the current value. It can also be used as a controls device designed for applications requiring extremely accurate measurement of a specific value, then generating a digital input to the PLC or controls system. The large LCD display is easy to view. It changes color indicating the set point is achieved, causing the digital output to change state. Other features include quick response (2.5 ms or less), repeatable to  $\pm 0.2\%$  of full scale  $\pm 1$  digit, raised set buttons for simple intuitive programming of the hysteresis or window comparator modes of operation.

Applications include verification of part present, quality assurance using decay leak testing, control of edges on film winding, clamping forces, evacuate and fill circuits, pump up and down circuits and many more.



DPS280



DVS280

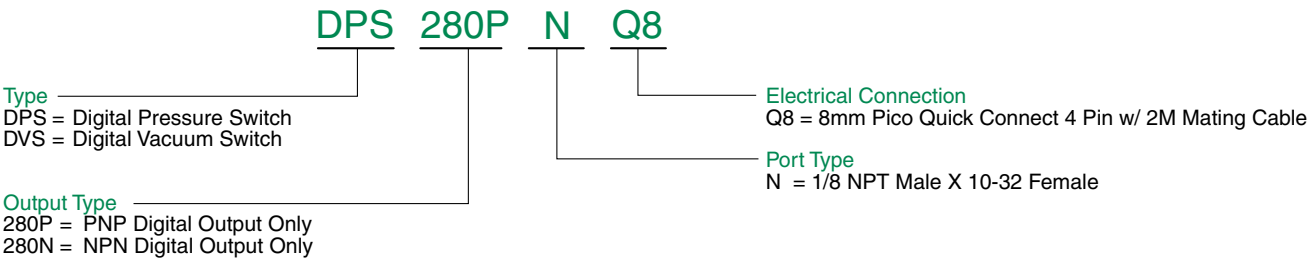
#### Features

- Hysteresis and Window comparator modes of operation
- Large 7 segment LCD display
- Selectable Two Color Display (Red / Green or Green / Red)
- Large display changes color at set point achieved
- Selectable Single Color Only Display (Red or Green)
- "OUT" Displayed when digital output is "ON"
- Panel display shows - Selected units, operation mode, output type (n.o. / n.c.), setting mode and key lock
- Ease of wiring 8 mm 4 Pin Pico Connector ( 2M Mating cable included)
- CE Marked - RoHs Compliant

| SPECIFICATIONS                                                   |                        | DPS280<br>(PRESSURE)                                                                                                                         | DVS280<br>(VACUUM)                                                                                                                           |
|------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Rated pressure range                                             |                        | 0 ~ 1000 kPa<br>0 ~ 145 PSIG                                                                                                                 | 0.0 ~ - 101.3 kPa<br>0 ~ 29.9" Hg Vacuum                                                                                                     |
| Operating / Set pressure range                                   |                        | -100 ~ 1000 kPa<br>- 14.5 PSIG ~ + 145 PSIG                                                                                                  | 10.0 ~ - 101.3 kPa<br>1.45 PSIG ~ 29.9" Hg Vacuum                                                                                            |
| Maximum pressure<br>(Exceeding max pressure could damage switch) |                        | 1500 kPa<br>217.5 PSIG                                                                                                                       | 300 kPa<br>43.5 PSIG                                                                                                                         |
| Fluid                                                            |                        | Air, Non-corrosive gases, incombustible gases                                                                                                |                                                                                                                                              |
| Set pressure resolution                                          | kPa                    | 1                                                                                                                                            | 0.1                                                                                                                                          |
|                                                                  | kgf/cm <sup>2</sup>    | 0.01                                                                                                                                         | 0.001                                                                                                                                        |
|                                                                  | bar                    | 0.01                                                                                                                                         | 0.001                                                                                                                                        |
|                                                                  | psi                    | 0.1                                                                                                                                          | 0.01                                                                                                                                         |
|                                                                  | InHg                   | -                                                                                                                                            | 0.1                                                                                                                                          |
|                                                                  |                        | mmHg                                                                                                                                         | 1                                                                                                                                            |
| Power supply voltage                                             |                        | 12 to 24VDC $\pm 10\%$ , Ripple (P-P) 10 % or less                                                                                           |                                                                                                                                              |
| Current consumption                                              |                        | $\leq 45\text{mA}$ (with no load)                                                                                                            |                                                                                                                                              |
| Switch output                                                    |                        | PNP open collector<br>Max. load current: 125mA<br>Max. supply voltage: 24VDC<br>Residual voltage: $\leq 1.5\text{V}$<br>(load current 125mA) | NPN open collector<br>Max. load current: 125mA<br>Max. supply voltage: 30VDC<br>Residual voltage: $\leq 1.5\text{V}$<br>(load current 125mA) |
|                                                                  |                        |                                                                                                                                              |                                                                                                                                              |
| Repeatability (Switch output)                                    |                        | $\leq \pm 0.2\%$ F.S. $\pm 1$ digit                                                                                                          |                                                                                                                                              |
| Hysteresis mode                                                  |                        | Adjustable                                                                                                                                   |                                                                                                                                              |
| Window comparator mode                                           |                        |                                                                                                                                              |                                                                                                                                              |
| Response time                                                    |                        | $\leq 2.5\text{ms}$ (chatter-proof function: 24ms, 250ms, 500ms, 1000ms and 1500ms selections)                                               |                                                                                                                                              |
| Output short circuit protection                                  |                        | Yes                                                                                                                                          |                                                                                                                                              |
| 7 segment LCD display                                            |                        | Two color (red/green) display (sampling rate: 5 times/1sec.)                                                                                 |                                                                                                                                              |
| Indicator accuracy                                               |                        | $\leq \pm 2.0\%$ F.S. $\pm 1$ digit (ambient temp: 77°F $\pm 5^\circ\text{F}$ / 25°C $\pm 3^\circ\text{C}$ )                                 |                                                                                                                                              |
| Switch ON Indicator                                              |                        | Green OUT Indicator                                                                                                                          |                                                                                                                                              |
| Environment                                                      | Enclosure              | IP40                                                                                                                                         |                                                                                                                                              |
|                                                                  | Ambient temp. range    | Operation: 0°F ~ 122°F / 0°C ~ 50°C, Storage: 14°F ~ 140°F / -10°C ~ 60°C<br>(no condensation or freezing)                                   |                                                                                                                                              |
|                                                                  | Ambient humidity range | Operation/Storage: 35 ~ 85% RH (no condensation)                                                                                             |                                                                                                                                              |
|                                                                  | Withstand voltage      | 1000VAC in 1-min (between case and lead wire)                                                                                                |                                                                                                                                              |
|                                                                  | Insulation resistance  | 50Mohm min. (at 500 VDC, between case and lead wire)                                                                                         |                                                                                                                                              |
| Vibration                                                        |                        | Total amplitude 1.5mm, 10Hz-55Hz-10Hz scan for 1 minute, two hours each direction of X,Y and Z                                               |                                                                                                                                              |
| Shock                                                            |                        | 100m/s <sup>2</sup> (10G), 3 times each in direction of X,Y and Z                                                                            |                                                                                                                                              |
| Temperature characteristic                                       |                        | $\leq \pm 2\%$ F.S. of detected pressure (77°F / 25°C) at temp. Range of 0°F ~ 122°F / 0°C ~ 50°C                                            |                                                                                                                                              |
| Port size                                                        |                        | 1/8" NPT Male x 10-32 UNF Female                                                                                                             |                                                                                                                                              |
| Lead wire                                                        |                        | Oil-resistant cable (0.15 mm <sup>2</sup> )                                                                                                  |                                                                                                                                              |
| Weight                                                           |                        | Approx *45g - Switch only                                                                                                                    |                                                                                                                                              |
|                                                                  |                        | Approx *90g - Switch with 2M mating cable                                                                                                    |                                                                                                                                              |



### How to Order

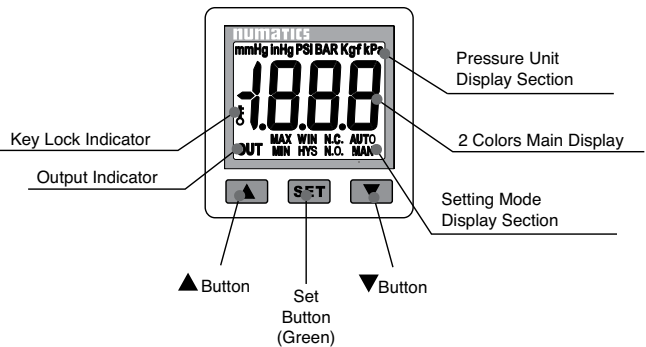


### Accessory Numbers

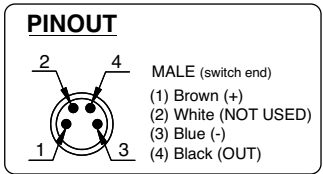
| Model            | Accessory Description                    | Model    | Accessory Description   |
|------------------|------------------------------------------|----------|-------------------------|
| DPS280-8-4-ST-2  | Mating Cable 8 mm 4 Pin 2 Meter          | BRK280-1 | Mounting Bracket (S)    |
| DPS280-8-4-ST-5  | Mating Cable 8 mm 4 Pin 5 Meter          | BRK280-2 | Mounting Bracket (L)    |
| PC0402MEETA03000 | Patch Cable M8 4 Pin X M12 3 Pin 2 Meter | PMK280-C | Panel Mount Kit w/Cover |

**Mating Cable:** Cable O.D. - 4.0mm  
 Conductor Gauge - 26 AWG

### Panel Instructions



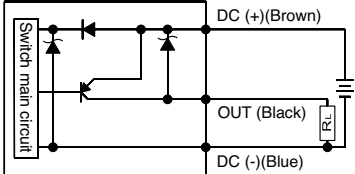
### Switch Wiring



### Output Circuit Wiring

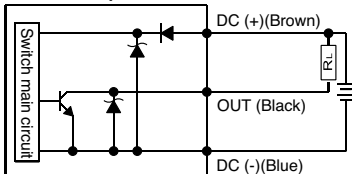
#### DPS / DVS280P

##### PNP output



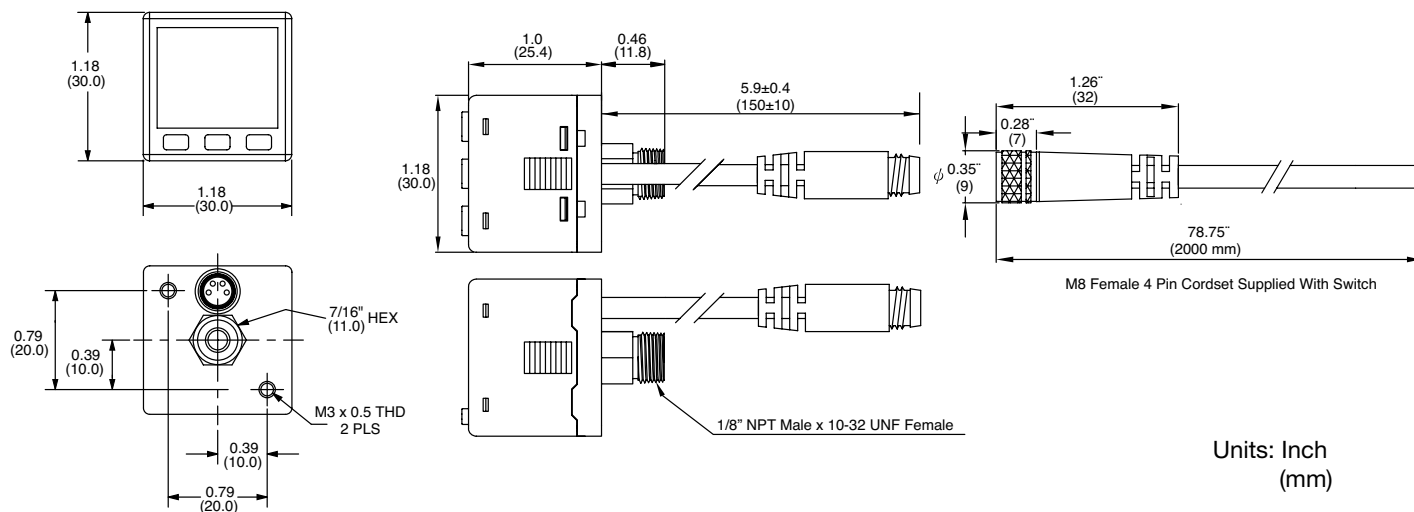
#### DPS / DVS280N

##### NPN output

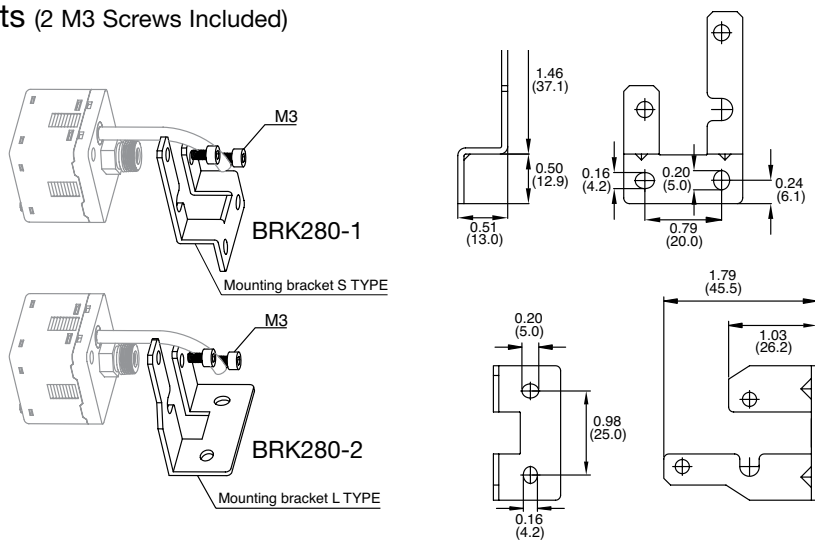




### Dimensions

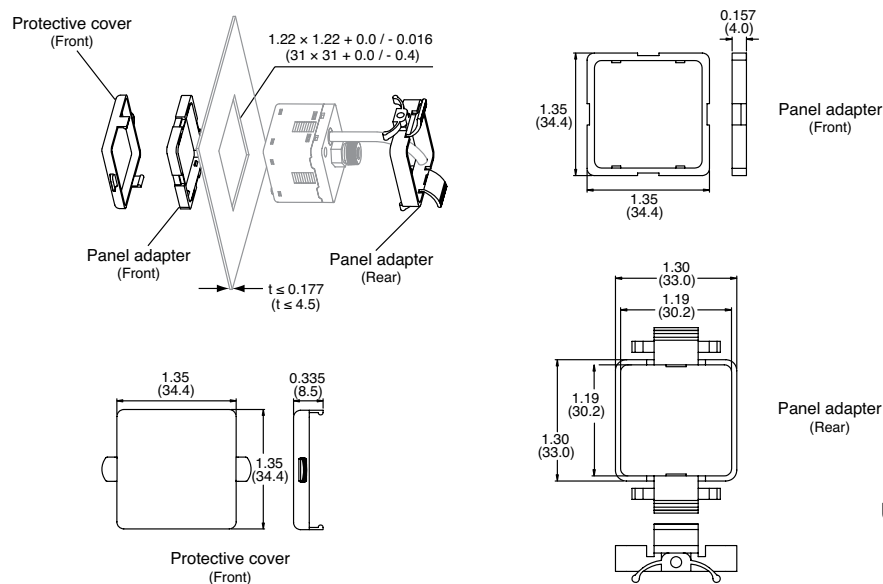


### Mounting Bracket Kits (2 M3 Screws Included)



### Panel Mounting Kit (Includes 2 adapters & 1 cover)

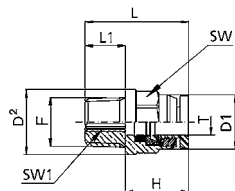
PMK280-C





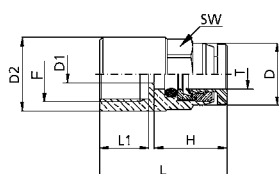
### Inch Fittings (Nickel Plated Brass)

#### INB103 Male Connector



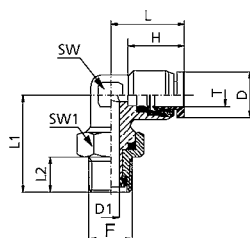
| Model Number   | Tube Diameter (T) | Thread (F) | D1    | D2    | L     | L1    | H     | SW | SW1  |
|----------------|-------------------|------------|-------|-------|-------|-------|-------|----|------|
| INB103-108-036 | 1/8               | 10-32 UNF  | 0.370 | 0.370 | 0.697 | 0.165 | 0.472 | /  | 5/64 |
| INB103-532-036 | 5/32              | 10-32 UNF  | 0.394 | 0.394 | 0.717 | 0.165 | 0.492 | /  | 5/64 |
| INB103-104-036 | 1/4               | 10-32 UNF  | 0.472 | 0.472 | 0.772 | 0.165 | 0.531 | /  | 5/64 |

#### INB105 Female Connector



| Model Number   | Tube Diameter (T) | Thread (F) | D     | D1    | D2    | L     | L2    | H     | SW    |
|----------------|-------------------|------------|-------|-------|-------|-------|-------|-------|-------|
| INB105-108-020 | 1/8               | 1/8 NPTF   | 0.370 | 0.094 | 0.551 | 0.945 | 0.335 | 0.472 | 3/8   |
| INB105-532-020 | 5/32              | 1/8 NPTF   | 0.394 | 0.118 | 0.551 | 0.965 | 0.335 | 0.492 | 7/16  |
| INB105-104-020 | 1/4               | 1/8 NPTF   | 0.472 | 0.157 | 0.551 | 0.965 | 0.335 | 0.531 | 1/2   |
| INB105-516-020 | 5/16              | 1/8 NPTF   | 0.591 | 0.236 | 0.669 | 1.055 | 0.335 | 0.630 | 19/32 |

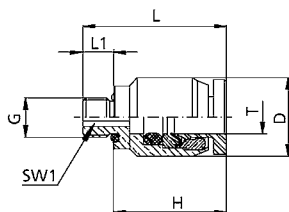
#### INB109 Swivel Elbow



| Model Number   | Tube Diameter (T) | Thread (F) | D     | D1    | L     | L1    | L2    | H     | SW    | SW1   |
|----------------|-------------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| INB109-108-036 | 1/8               | 10-32 UNF  | 0.394 | 0.087 | 0.638 | 0.630 | 0.165 | 0.472 | 0.354 | 0.354 |
| INB109-532-036 | 5/32              | 10-32 UNF  | 0.394 | 0.087 | 0.657 | 0.630 | 0.165 | 0.492 | 0.354 | 0.354 |
| INB109-104-036 | 1/4               | 10-32 UNF  | 0.472 | 0.087 | 0.740 | 0.709 | 0.165 | 0.531 | 0.433 | 0.354 |

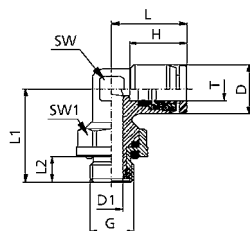
### Metric Fittings (Nickel Plated Brass)

#### NB104 Male Connector without External Hex



| Model Number  | Tube Diameter (T) | Thread (G) | D    | H    | L    | L1  | SW1 |
|---------------|-------------------|------------|------|------|------|-----|-----|
| NB104-004-005 | 4.0               | M5         | 10.0 | 14.4 | 18.4 | 4.0 | 2   |
| NB104-005-005 | 5.0               | M5         | 11.0 | 14.7 | 18.7 | 4.0 | 2   |
| NB104-006-005 | 6.0               | M5         | 12.0 | 15.3 | 19.3 | 4.0 | 2   |

#### NB108 Swivel Elbow

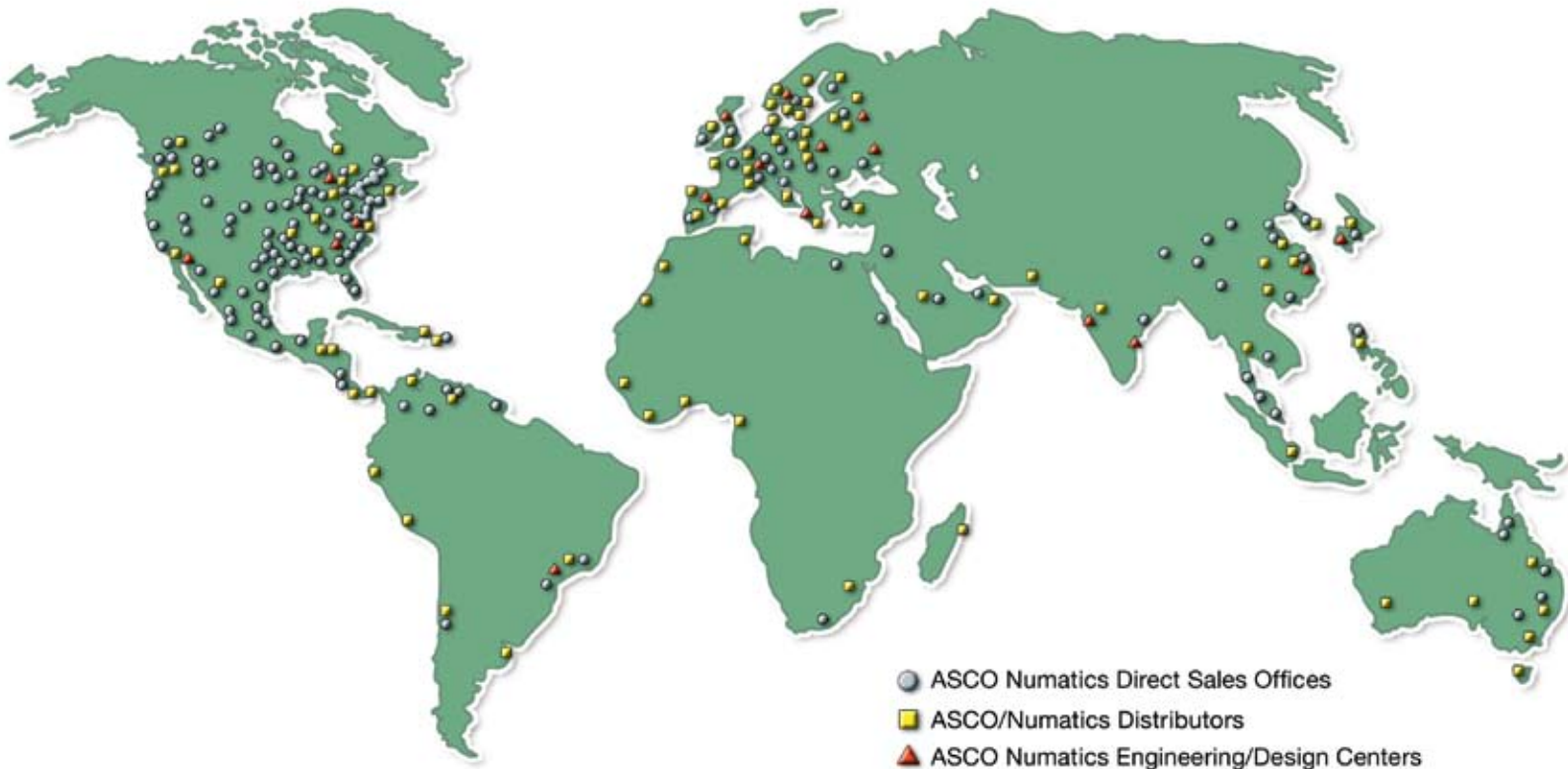


| Model Number  | Tube Diameter (T) | Thread (G) | D    | D1  | H    | L    | L1   | L2  | SW | SW1 |
|---------------|-------------------|------------|------|-----|------|------|------|-----|----|-----|
| NB108-004-005 | 4.0               | M5         | 9.9  | 2.3 | 12.2 | 16.6 | 16.5 | 4.0 | 9  | 9   |
| NB108-005-005 | 5.0               | M5         | 10.9 | 2.3 | 12.7 | 16.6 | 18.0 | 4.0 | 10 | 9   |
| NB108-006-005 | 6.0               | M5         | 11.9 | 2.3 | 13.3 | 19.1 | 18.5 | 4.0 | 11 | 9   |



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