PULCOM Σ-D System

Digital Measuring Head

 FEATURES

Wide measuring range (maximum diameter difference of 40 mm)

Using an optical scale, replacing the existing LVDT, as a sensor allows continuous measuring to diameters of 40 mm difference, without setup.

High Precision Measuring

The high precision, rigidity and durability proven in the PULCOM Σ-V Series are maintained to make a wide range of high precision measurements possible.

Superior Linearity for All Measurements

Fulcrum measuring mechanism is used in a best-fit method of automatic compensation of problematic diameter deformations caused by centering and measurement deviations, to achieve superior linearity.

Short Setup Time

With the size shift function of previous models, it was necessary to do mastering for each diameter measured, however it is now possible to do all measurements with only three types of mastering required during setup.

(A Standard: to do zero setting. Size master: to adjust linearity)

This makes it possible to greatly reduce setup time to provide a system that is suitable for a wide variety of products and diameters.

A-Quad-B output Digital Transmission

Digital transmission shortens startup time compared to previous size shift mechanisms (1/3 of previous) as well as increasing noise immunity.

Improved Maintenance

Removable connectors are standard equipment which improves maintenance.

 SYSTEM CONFIGURATION A

\[
\begin{array}{cccc}
1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8
\end{array}
\]

\( \begin{align*}
1 & : \text{Measuring head} \\
2 & : \text{Σ - D} \\
3 & : \text{Analog cable} \\
4 & : \text{Relay box} \\
5 & : \text{Digital cable} \\
6 & : \text{Conversion cable} \\
7 & : \text{Control unit} \\
8 & : \text{Double action cylinder for retraction}
\end{align*} \)

Specifications

For continuous outer diameters

<table>
<thead>
<tr>
<th>Model</th>
<th>Σ-D (Σ-D-OD-AR)</th>
<th>Σ-D (Σ-D-ID-AR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main applications</td>
<td>Cylindrical outer diameter and width</td>
<td>Cylindrical inner diameter and width (specifically for post-process)</td>
</tr>
<tr>
<td>Finger length</td>
<td>82 mm</td>
<td>102 mm</td>
</tr>
<tr>
<td>Model</td>
<td>Vertical surface</td>
<td>Horizontal surface</td>
</tr>
<tr>
<td></td>
<td>E-TD-4162</td>
<td>E-TD-4163</td>
</tr>
<tr>
<td>Supported diameters (continuous measuring range)</td>
<td>25 mm, 29 mm, 31 mm, 33 mm, 35 mm, 40 mm, 25 mm</td>
<td></td>
</tr>
<tr>
<td>Measuring range</td>
<td>Standard 84 mm-Ø76.5</td>
<td>Standard 84 mm-Ø50</td>
</tr>
<tr>
<td>Option</td>
<td></td>
<td>±0.5% (±5 μm) / ±500 μm</td>
</tr>
<tr>
<td>Repeatability (Standard measuring range)</td>
<td>0.2 μm/4σ</td>
<td>0.4 μm/4σ</td>
</tr>
<tr>
<td>Measuring force</td>
<td>0.6 - 3 N (Contact us for non-standard requests.)</td>
<td></td>
</tr>
<tr>
<td>Front travel (one side)</td>
<td>±6.5 mm, ±7.5 mm, ±8.0 mm, ±8.5 mm, ±9.0 mm, ±10.3 mm</td>
<td>±6.5 mm</td>
</tr>
<tr>
<td>Retract distance (one side)</td>
<td>±7.3 mm, ±8.8 mm, ±9.3 mm, ±9.8 mm, ±11.0 mm, ±7.3 mm</td>
<td>±7.3 mm</td>
</tr>
<tr>
<td>Wide linear range (reference value)</td>
<td>±0.05% all diameters (for 25 mm diameter fluctuation: ±12.5 μm, for 40 mm diameter fluctuation: ±20 μm)</td>
<td>±0.05% all diameters (for 25 mm diameter fluctuation: ±12.5 μm, for 40 mm diameter fluctuation: ±20 μm)</td>
</tr>
<tr>
<td>Finger offset</td>
<td>±8 mm (standard 8 mm)</td>
<td>Consult us separately for offsets exceeding 8 mm.</td>
</tr>
<tr>
<td>Contact radius</td>
<td>±5R1.5 (Use CPX for contact material)</td>
<td>±5R1.5 (Use CPX for contact material)</td>
</tr>
<tr>
<td>Waterproof standard</td>
<td>IP67 compliant (measuring head, relay box)</td>
<td>IP67 compliant (measuring head, relay box)</td>
</tr>
<tr>
<td>Air pressure supply</td>
<td>0.35 - 0.5 MPa (for double action retract cylinder)</td>
<td>0.35 - 0.5 MPa (for double action retract cylinder)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>Usage temperature range: 0 - 40°C, storage temperature range: -30 - 70°C</td>
<td>Usage temperature range: 0 - 40°C, storage temperature range: -30 - 70°C</td>
</tr>
<tr>
<td>Head weight</td>
<td>Approx. 1.4 Kg</td>
<td>Approx. 1.4 Kg</td>
</tr>
</tbody>
</table>
Machine Control Gages

I/O1 I/O2 I/O3

Number of counter boards (for 2 channels): 1
Possible number of I/O boards: 2

Relay box

Converter cable for 2 channels

Product Code | Product Name
-------------|-----------------|
4411851      | Measuring head 1 - D (outer diameter straight connector)
4411852      | Measuring head 1 - D (outer diameter connector 1 direction)
4411853      | Measuring head 1 - D (outer diameter connector 2 direction)
4411854      | Measuring head 1 - D (inner diameter hole straight connector)
4411855      | Measuring head 1 - D (inner diameter connector 1 direction)
4411856      | Measuring head 1 - D (inner diameter connector 2 direction)
4411857      | Relay box (3 m straight connector)
4411858      | Relay box (6 m straight connector)
4411859      | Relay box (3 m cable with L connector)
4411860      | Relay box (6 m cable with L connector)
4206513      | Converter cable (for 2 channels)
4206512      | Converter cable (for 4 channels)
0930015      | Controller V10A (Σ - D 1 unit specifications)
0930014      | Controller V10A (Σ - D 2 unit specifications)
4300473      | Software (switching up to 40 workpieces)
4300474      | Software (switching up to 128 workpieces)

System Configuration B

A: 1 head specifications

I/O1 I/O2 I/O3

Converter cable for 2 channels

B: 2 head specifications

Number of counter boards (for 2 channels): 2
Possible number of I/O boards: 2

C: 4 head specifications

Number of counter boards (for 4 channels): 2
Possible number of I/O boards: 1

D: Combined with LVDT

LVDT board must be added.

This possible number of measuring heads is determined in balance with the I/O.

Provided by the customer

Provided by the customer

For outside diameter:

For inside diameter:

Air in: Measuring

Air in: Retract

Air source P = 0.35 to 0.5 MPa

Cylinder specifications are double action. Sample Configuration is for the following conditions:
Active measuring
Inactive measuring
Measuring valve should be closed when the measuring head is retracted.
Do not use the oiler.

Do not allow the air filter drain to get full.

Provided by the customer

When using an L connector, choose the cable protrusion angle from the above 2 choices.

Outer Appearance/Dimension Diagram

[Diagram of machine control gages with dimensions and specifications provided]

<Measuring Heads>

<Relay box>