GRIPPERS PNEUMATIC PRECISION PARALLEL MOVEMENT DPP DIRECTCONNECT™ SERIES

- **DPP Series**

- **No Adaptor Plates Required!**

- **2-axis pick-n-place with rotation**

- **Top Manifold Air Ports**
  - Eliminates the need for airlines.

- **Accessory Mounting Slots**
  - For Magneto Resistive and Inductive sensors (sensors sold separately).

- **Superior Jaw Support**
  - Jaws are supported using our patented “Dual-V” roller bearing design.

- **Hardened Plated Jaws**
  - For wear resistance and longer life.

- **“Dual-V” Roller Bearings**
  - Provide low friction motion and are preloaded for maximum support and zero side play.

- **Adjustable Pre-load Screws**
  - Allows for adjustment of preload on roller bearings.

- **Hard Coat Anodized**
  - One piece, aircraft quality aluminum body, has hard-coat anodize 60 RC with FFA impregnation.

- **FMK Seals**
  - Available for high temperature applications.

- **Shielded Design**
  - Shielded design repels contamination from penetrating the “Dual-V” roller bearings.

- **Top Manifold Air Ports**

- **DMEX Series mounting stanchions.**

- **DLT-10M-E-C-50 linear thruster slide.**

- **DRF-075M-90 rotary actuator.**

- **DPP-10M-06 shown slightly smaller than actual size.**

- **Dowel Holes**
  - H7 dowel pin holes in body and jaws. Jaws also have key slot for better finger alignment.

- **Multiple Sensor Capabilities**
  - Capable of sensing both jaws in the open and closed positions (up to 4 sensors can be used for multi-position sensing). Sensor magnets on pistons come standard for Magneto Resistive Sensing.

- **Standard Purge/Scavenge Port**
  - Used with a vacuum for clean room environments or positive pressure for harsh environments and jaw surfaces.

- **Multiple Air Port Locations**
  - 4 standard locations; front, top and both sides

- **Mounting Patterns**
  - DIRECTCONNECT™ tapped and dowel mounting surfaces on top and side of body (except DPP-28).

- **Optional Spring Assist**
  - For close stroke.

- **Self Lubricating Dynamic Seals**
  - (Buna-N only)

- **High Grip Force**
  - With respect to weight due to extremely efficient drive mechanism.

**Proven Performance Features**

- **Highly Configurable Modular Automation—Exclusive Direct Connect™ Technology Provides Multiple Mounting Options**

- **Multiple Pneumatic Port Locations—Tapped Ports on Front, Top and Both Sides are Standard**

- **Rigid and Low Friction Design Provides Longer Gripper Finger Lengths and the Ability to Handle Delicate Parts**

- **Non Synchronous Motion Option Provides Independent Jaw Motion**

- **Up to 5 Million Cycles in Typical Application—Up to 10 Million with Maintenance**

- **Temperature Operating Range -35 to 80°C (-30 to 180°F)**

- **System Requires 0.3 to 7 bar (5 to 100 psi) Dry Filtered (40 Micron or Better) Air Supply**

- **Accessory Equipment Required—4-Way, 2 Position Pneumatic Directional Control Valve**

**Product Features**

- **Excellent Accuracy**
  - Excellent parallelism and accuracy between gripper mounting surface and jaw surfaces.

- **Top Manifold Air Ports**
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  - (Buna-N only)

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  - With respect to weight due to extremely efficient drive mechanism.
Dual Double Acting Opposed Pistons, Connected to Both a Jaw and a Synchronizing Bar by a Drive Pin, Actuate in Opposite Directions

The Synchronizing Bars are Connected to the Equalizer Which Synchronizes the Motion

Suitable for Internal and External Gripping

The Synchronizing Elements Can be Removed for Non-Synchronous Operation

**OPERATING PRINCIPLE**

**SPECIFICATIONS**

**PNEUMATIC SPECIFICATIONS**

Pressure Operating Range:
- Standard: 5 to 100 psi (0.3 to 7 bar)
- -C Spring Closed Option: 20 to 100 psi (1.5 to 7 bar)

Cylinder Type: Double acting or single acting spring return or double acting spring assist

Dynamic Seals: Internally lubricated buna-N

Valve Required to Operate: 4-way, 2-position for double acting or 3-way, 2-position for single acting

**AIR QUALITY REQUIREMENTS**

Air Filtration: 40 micron or better

Air Lubrication: Not necessary*

Air Humidity: Low moisture content (dry)

Temperature Operating Range:
- Buna-N Seals (Standard): -35 to 80°C (-30 to 180°F)
- FKM Seals (Optional): -30 to 120°C (-20 to 250°F)

**MAINTENANCE SPECIFICATIONS**

Expected Life:
- Normal Application: 5 million cycles
- With Preventative Maintenance: 10+ million cycles*

Field Repairable: Yes

Seal Repair Kits Available: Yes

Application Restrictions:
- Dirty or gritty environments
- Machine operations generating chips
- Environments with loose particulate
- Applications where mechanism lubricant could cause contamination

* Addition of lubrication will greatly increase service life.
**Dimensions:** mm (inch)

| DIRECTCONNECT™ dimensions shown in blue |

**UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW**

- Dimensions are symmetrical about centerline
- Third Angle Projection
- All Dowel Holes are SF (Slip Fit).
- Locational Tolerance ±0.013 mm or (±.0005")

**SPECIFICATIONS**

- **Total Rated Grip Force F @ 100 psi, 7 bar**: 120 N (27 lb)
- **Stroke**: 6.4 mm (0.25")
- **Weight**: 0.16 Kg (0.35 lb)
- **Pressure Range (Without Springs)**: 0.3 to 7 bar (5 to 100 psi)
- **Pressure Range (With Springs)**: 1.4 to 7 bar (20 to 100 psi)
- **Cylinder Bore (2X)**: 10.3 mm (0.406")
- **Displacement**: 0.5 cm³ (0.032 in³)
- **Temperature Range**:
  - Standard Seals: -35 to 80°C (-30 to 180°F)
  - FKM Seals: -30 to 150°C (-20 to 250°F)
- **Actuation (Without Spring/With Spring)**:
  - 0.10/0.11 sec (0.10/0.11 sec)
- **Accuracy**: ±0.03 mm (±0.001")
- **Repeatability**: ±0.01 mm (±0.0005")
- **Valve Required to Actuate Single Acting**: 3-way, 2-position
- **Valve Required to Actuate Double Acting**: 4-way, 2-position

*With springs*
Dimensions: mm (inch)
DIRECTCONNECT™ dimensions shown in blue

UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

WARNING! DO NOT EXCEED MAXIMUM EFFECTIVE FINGER LENGTHS

SPECIFICATIONS
Total Rated Grip Force F @ 100 psi, 7 bar**: 120 N (27 lb)
Stroke: 12.7 mm (0.50")
Weight: 0.20 Kg (0.45 lb)
Pressure Range (Without Springs):
0.3 to 7 bar (5 to 100 psi)
Pressure Range (With Springs):
1.4 to 7 bar (20 to 100 psi)
Cylinder Bore (2X): 10.3 mm (0.406")
Displacement: 1.1 cm³ (0.065 in³)
Temperature Range:
Standard Seals: -35 to 80°C (-30 to 180°F)
FKM Seals: -30 to 120°C (-20 to 250°F)
Actuation (Without Spring/With Spring):
0.11/0.12 sec (0.11/0.12 Sec)
Accuracy: ±0.03 mm (±0.001")
Repeatability: ±0.01 mm (±0.0005")
Valve Required to Actuate Single Acting:
3-way, 2-position
Valve Required to Actuate Double Acting:
4-way, 2-position
* With springs
Loading Capacity

<table>
<thead>
<tr>
<th>Static</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Tensile T</td>
<td>556 N (125 lb)</td>
</tr>
<tr>
<td>Maximum Compressive C</td>
<td>556 N (125 lb)</td>
</tr>
<tr>
<td>Maximum Moment Mx</td>
<td>9.0 Nm (80 in-lb)</td>
</tr>
<tr>
<td>Maximum Moment My</td>
<td>12 Nm (105 in-lb)</td>
</tr>
<tr>
<td>Maximum Moment Mz</td>
<td>9.0 Nm (80 in-lb)</td>
</tr>
</tbody>
</table>

Note: Capacities are per set of jaws and are not simultaneous.

**SPECIFICATIONS**

Total Rated Grip Force F @ 100 psi, 7 bar*: 227 N (51 lb)

Stroke: 15.9 mm (0.63")

Weight: 0.48 Kg (1.05 lb)

Pressure Range (Without Springs): 0.3 to 7 bar (5 to 100 psi)

Pressure Range (With Springs): 3.4 to 7 bar (50 to 100 psi)

Cylinder Bore (2X): 14.3 mm (0.563")

Displacement: 2.5 cm³ (0.156 in³)

Temperature Range:

- Standard Seals: -35 to 80°C (-30 to 180°F)
- FKM Seals: -30 to 120°C (-20 to 250°F)

Actuation (Without Spring/With Spring):

0.15/0.16 sec (0.15/0.16 sec)

Accuracy: ±0.03 mm (±0.001")

Repeatability: ±0.01 mm (±0.0005")

Valve Required to Actuate Single Acting:

- 3-way, 2-position

Valve Required to Actuate Double Acting:

- 4-way, 2-position

* With springs
**DPP-14M-25 AND DPP-14M-25-C**

**Loading Capacity**
- **Static** 734 N (165 lb)
- **Dynamic** 245 N (55 lb)

**Max Tensile** 734 N (165 lb)
**Max Compressive** 734 N (165 lb)
**Max Moment MX** 11 Nm (100 in-lb)
**Max Moment MY** 14 Nm (125 in-lb)
**Max Moment MZ** 11 Nm (100 in-lb)

**Note:** Capacities are per set of jaws and are not simultaneous.

**Dimensions:** mm (inch)

**DIRECTCONNECT™ dimensions shown in blue**

**UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW**

<table>
<thead>
<tr>
<th>Metric Threads</th>
<th>Course Pitch</th>
<th>Imperial in</th>
<th>Unit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 = ±0.0005</td>
<td>±0.0005</td>
<td>±0.001</td>
<td></td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

- **Total Rated Grip Force F @ 100 psi, 7 bar**: 214 N (48 lb)
- **Stroke**: 25.4 mm (1.00")
- **Weight**: 0.57 Kg (1.25 lb)
- **Pressure Range (Without Springs)**: 0.3 to 7 bar (5 to 100 psi)
- **Pressure Range (With Springs)**: 3.4 to 7 bar (50 to 100 psi)
- **Cylinder Bore (2X)**: 14.3 mm (0.563")
- **Displacement**: 4.1 cm³ (0.249 in³)
- **Temperature Range**:
  - **Standard Seals**: -35 to 80°C (-30 to 180°F)
  - **FKM Seals**: -30 to 120°C (-20 to 250°F)
- **Actuation (Without Spring/With Spring)**: 0.19/0.20 sec (0.19/0.20 sec)
- **Accuracy**: ±0.03 mm (±0.001")
- **Repeatability**: ±0.01 mm (±0.0005")
- **Valve Required to Actuate Single Acting**: 3-way, 2-position
- **Valve Required to Actuate Double Acting**: 4-way, 2-position

* With springs
**To Order** Visit omega.com/dpp_10m_14m for Pricing

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>JAW LGTH CLOSED mm (inch)</th>
<th>JAW LGTH OPEN mm (inch)</th>
<th>BODY DEPTH mm (inch)</th>
<th>BODY LGTH mm (inch)</th>
<th>BODY HEIGHT mm (inch)</th>
<th>MAX STROKE mm (inch)</th>
<th>GRIP FORCE N (lbs)</th>
<th>WEIGHT Kg (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPP-10M-06</td>
<td>47 (1.85)</td>
<td>53 (2.10)</td>
<td>25 (0.98)</td>
<td>63 (2.47)</td>
<td>35 (1.36)</td>
<td>6.4 (0.25)</td>
<td>111 (25)</td>
<td>0.16 (0.35)</td>
</tr>
<tr>
<td>DPP-10M-12</td>
<td>49 (1.93)</td>
<td>62 (2.43)</td>
<td>25 (0.98)</td>
<td>74 (2.90)</td>
<td>35 (1.36)</td>
<td>12.7 (0.50)</td>
<td>111 (25)</td>
<td>0.20 (0.45)</td>
</tr>
<tr>
<td>DPP-14M-15</td>
<td>63 (2.47)</td>
<td>79 (3.10)</td>
<td>34 (1.34)</td>
<td>90 (3.55)</td>
<td>42 (1.66)</td>
<td>15.9 (0.63)</td>
<td>200 (45)</td>
<td>0.48 (1.05)</td>
</tr>
<tr>
<td>DPP-14M-25</td>
<td>82 (3.23)</td>
<td>107 (4.23)</td>
<td>34 (1.34)</td>
<td>119 (4.67)</td>
<td>42 (1.66)</td>
<td>25.4 (1.00)</td>
<td>200 (45)</td>
<td>0.57 (1.25)</td>
</tr>
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<td>DPP-10M-06-C</td>
<td>47 (1.85)</td>
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Ordering Example: DPP-14M-25, pneumatically powered precision gripper with DirectConnect easy mounting technology, 25.4 mm (1") jaw stroke and 200 N (45 lbs) of gripping force. All models have a temperature range of -35 to 80°C (-30 to 180°F). The temperature range can be modified to -30 to 120°C (-20 to 250°F) with FKM seals. Add “V” to the end of the model number for additional cost. All models come standard with synchronous jaws, if non synchronous is required consult sales. All models with the “-C” option have a spring assist closing mechanism on the jaws to provide fail safe closing and additional gripping force. Detailed specifications and CAD drawings are available at omega.com.

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**Accessories**

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>OISN-014</td>
<td>NPN inductive proximity sensor</td>
</tr>
<tr>
<td>OISP-014</td>
<td>PNP inductive proximity sensor</td>
</tr>
<tr>
<td>OHSN-011</td>
<td>NPN magneto resistive sensor 90° barrell with quick disconnect fitting</td>
</tr>
<tr>
<td>OHSP-011</td>
<td>PNP magneto resistive sensor 90° barrell with quick disconnect fitting</td>
</tr>
<tr>
<td>OHSN-017</td>
<td>NPN magneto resistive sensor short barrell with quick disconnect fitting</td>
</tr>
<tr>
<td>OHSP-017</td>
<td>PNP magneto resistive sensor short barrell with quick disconnect fitting</td>
</tr>
<tr>
<td>CABL-010</td>
<td>2 m (6.6') sensor extension cable with quick disconnect fitting</td>
</tr>
<tr>
<td>CABL-013</td>
<td>5 m (16') sensor extension cable with quick disconnect fitting</td>
</tr>
<tr>
<td>OSMK-119</td>
<td>DPP-10M-14M inductive sensor mounting kit</td>
</tr>
</tbody>
</table>

**PNEUMATIC ACCESSORIES**

- Polyurethane tubing in multiple diameters and colors available, see omega.com
- Poly-Tube fittings in Male or Female NPT in multiple configurations, see omega.com
- Adjustable flow control fittings and directional control valves, see omega.com

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**Sensors**
- Magneto Resistive or Inductive Proximity Available
- Capable of Sensing 4 Positions
- Open and Closed on Both Jaws
- PNP and NPN Available
- Magneto Resistive Sensors Are Slot Mounted, No Mounting Kits Required
- Threaded Quick Disconnect with Built-In LED Output
- Sensors Mount on Either Side of Gripper
- Sensors Magnets in Pistons Are Standard

**Plumbing Fittings**
- Adjustable Flow Controls
- Have Thumb Screw Adjust with Locking Nut for Adjusting Actuation Time
- Available for 3 or 6 mm OD Tubing
- Failsafe Valve for Applications
- Where it is Critical That the Part Being Gripped Not be Dropped if Air Pressure is Lost
- Can Mount Directly to Gripper or In-Line with Plumbing to Gripper
- For M5 Air Ports
- Consult Factory for Additional Plumbing Fittings

**Multiple Air Port Locations**
- Standard M5 Air Ports on Front Surface
- 3 M3 Air Port Locations (Left, Right, and Top Surface) Are Plugged as Standard

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**Dimensions:**

- **mm (inch)**

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