# DPE-400 Parallel Gripper- Electric Gripper Series


NO ADAPTER PLATES!

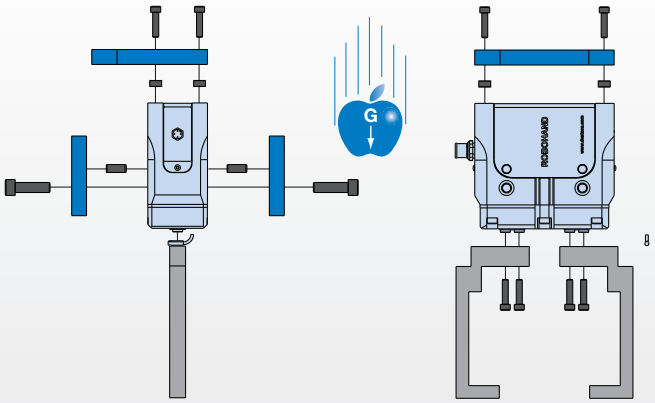
DIRECT CONNECT™
ADVANCED MODULAR AUTOMATION TECHNOLOGY

- **Electrically Actuated**
  24VDC, 8-wire input with integrated sensors and force adjustment capability, 100% duty-cycle for high throughput. Power lines are reverse polarity protected.
- **"Light Switch" Simplicity**
  Plug and Play. No programming, tuning or adjusting required. As easy as a pneumatic gripper to control and operate.
- **Energy Efficient**
  Only 10W average required to operate gripper.
- **High Cycle Life**
  Gripper was tested to 3 million cycles with zero maintenance. High reliability eliminates downtime. Low cost of ownership.
- **Built-in Electronics**
  All electronics are housed within the gripper. No external controller needed. 8-pin cable sold separately.
- **Internal Sensors**
  Integrated electronics can detect when the motor is stalled and generate feedback signals to mimic external sensors. Depending on the application, external sensors may not be needed.
- **Force Adjustment**
  Grip-force can be changed on the fly by using the 0-5V analog input. Total output force can be cut in half by using this feature.
- **Failsafe Operation**
  In the event of a power loss, the jaws will not separate but grip force will be diminished. Finger design should retain the part for critical applications.

Patent Pending.

## Mounting Information:

**Gripper can be mounted and operated in any orientation**




Body mounts with screws and locates with slip fit dowel pins for accuracy

Fingers attach to jaws with screws and locate with dowel pins

## Technical Specifications:

**Product Specifications**

| | |
|---|---|
| Voltage | 24 VDC |
| Power Max. | 10 W |
| Operating Temperature | 0° / 55° C [32° / 131°F] |
| Protection Class | IP50 |

*Contact Tech Support.

**Maintenance Specifications**

| | |
|---|---|
| Field Repairable | Yes |

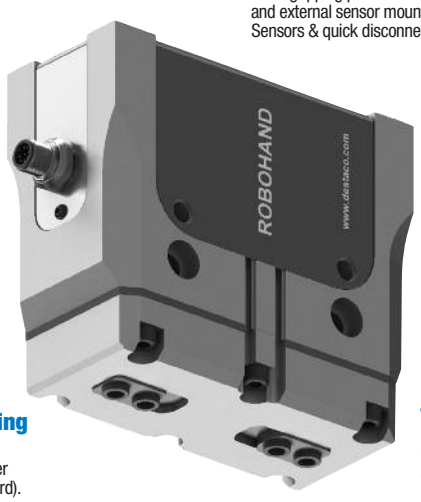
**Application Restrictions**

- Timing, power and load beyond specifications
- Suitable for internal or external gripping

# Product Features

**DirectConnect Mounting**
Mounts directly to other automation products without adaptor plates. Versatile mounting on front and back of body.

**Multiple Position Sensing**
Slot mounted magneto-resistive sensing. Sense up to 4 gripping positions. Internal magnetic targets and external sensor mounting slots come standard. Sensors & quick disconnect cables sold separately.




**Superior Jaw Support**
Ridged design and full body support of the jaws allows for long finger lengths.

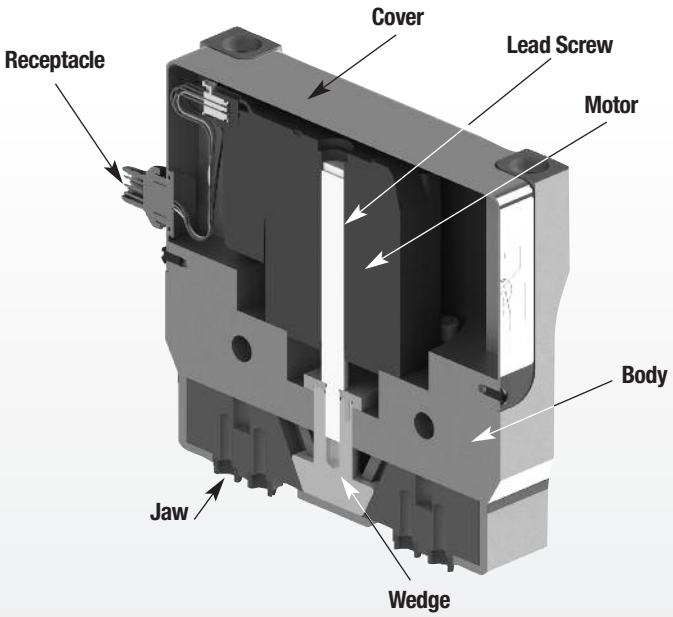
**Slip Fit Dowel Pin Holes**
Located in body and jaws for precision mounting.

**Finger Locating Sleeves**
For precise finger mounting (standard).

**Jaw Components**
Hardened and precision ground steel for minimum jaw play with hard plating for wear resistance and long life.

**Standard and Extended Stroke**
Gripper is available in two stroke lengths.

# Operating Principle




- To close the gripper, apply +24V to the "Close" wire. This will cause the internal motor to rotate. This rotational force is converted to linear force by an integrated leadscrew. This leadscrew drives the internal wedge.
- Power must be maintained on the "Close" signal throughout the grip cycle to ensure grip force is maintained.
- To open the gripper, remove the "Close" signal, and apply +24V on the "Open" wire. The motor will rotate in the opposite direction, which causes the wedge to open the jaws.
- Design is suitable for internal or external gripping

**Patent Pending**

## Style-DPE-400
## Size -10

| | DPE-400-10 | |
|---|---|---|
| **Total Stroke:** | 0.39 in. | 10 mm |
| **Grip Force:** | 150-300 lbs | 667-1334 N |
| **Weight:** | 5.56 lbs | 2.52 Kg |

See Page 3

## Style-DPE-400
## Size -20

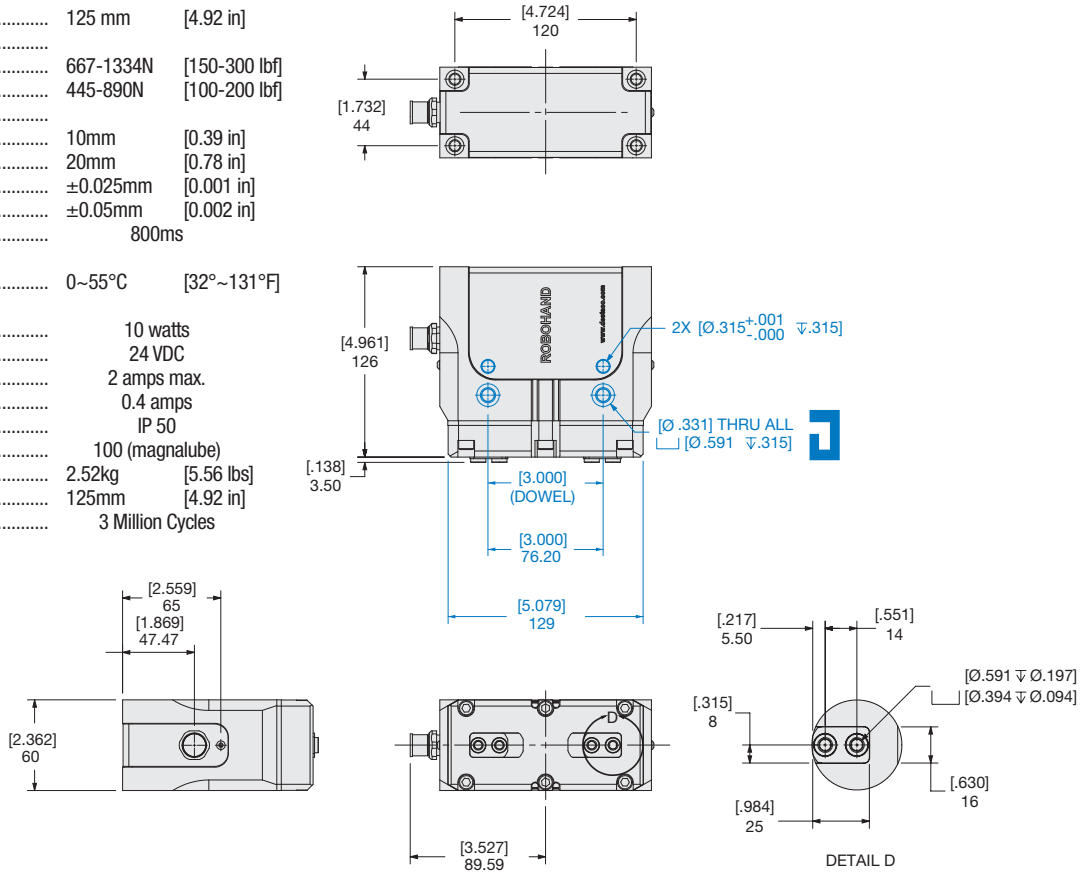
| | DPE-400-20 | |
|---|---|---|
| **Total Stroke:** | 0.78 in. | 20 mm |
| **Grip Force:** | 100-200 lbf | 445-890 N |
| **Weight:** | 5.56 lbs | 2.52 Kg |

See Page 3

DIRECTCONNECT™

# PARALLEL GRIPPER DPE-400
# E-GRIPPER SERIES

| Specifications | DPE-400 | |
|---|---|---|
| Maximum Finger Length | 125 mm | [4.92 in] |
| Total Rated Grip Force | | |
| **DPE-400-10** | 667-1334N | [150-300 lbf] |
| **DPE-400-20** | 445-890N | [100-200 lbf] |
| Total Stroke | | |
| **DPE-400-10** | 10mm | [0.39 in] |
| **DPE-400-20** | 20mm | [0.78 in] |
| Repeatability | ±0.025mm | [0.001 in] |
| Accuracy | ±0.05mm | [0.002 in] |
| Actuation Time | 800ms | |
| Operating Temperature Min/Max | 0~55°C | [32°~131°F] |
| Power Requirements @ 100% Duty Cycle | 10 watts | |
| Voltage | 24 VDC | |
| DC Current (Peak) | 2 amps max. | |
| DC Current: (Continuous) | 0.4 amps | |
| Protection Class | IP 50 | |
| Clean Room | 100 (magnalube) | |
| Weight | 2.52kg | [5.56 lbs] |
| Maximum Finger Length | 125mm | [4.92 in] |
| Durability | 3 Million Cycles | |




NOTE: REVERSE POLARITY PROTECTED

**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 ±.0005" or [±.013mm] | Metric Threads Course Pitch | Imperial in. | Metric [mm] |
|---|---|---|---|---|---|
| | | | | 0.00 = ± .01 | [0.] = [±.25] |
| | | | | 0.000 = ± .005 | [0.0] = [±.13] |
| | | | | 0.0000 = ± .0005 | [0.00] = [±.013] |

## How to Order: (Order Accessories separately from Basic Model)

BASE MODEL | STROKE | SENSOR

**DPE-400 - [ ] - [ ] - [ ]**

GRIPPING MODE

| | | |
|---|---|---|
| **BASE MODEL** | **DPE-400** | |
| **SIZE** | **10** | 10mm [0.39 in] |
| | **20** | 20mm [0.78 in] |
| **GRIPPING MODE** | **OD** | Outer Diameter-Applies max force on close |
| | **ID** | Inner Diameter-Applies max force on open |
| **INTERNAL SENSOR** | **P** | PNP |
| | **N** | NPN |

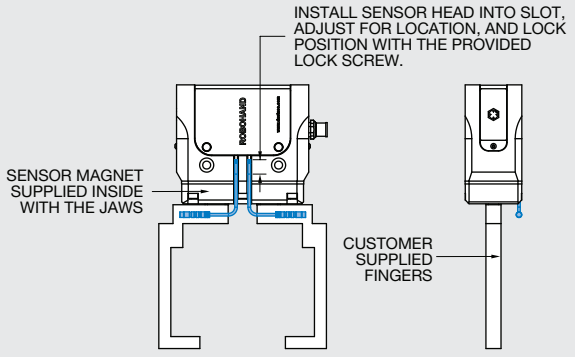
**SAMPLE ORDER: DPE-400-20-OD-P**

Ex: DPE-400 Parallel Gripper, 20mm Stroke, Outer Diameter Gripping Mode, PNP Internal Sensors

**ACCESSORIES***

| | | |
|---|---|---|
| PNP Magneto Resistive Sensor Short Barrel w/Qk Disc* | **OHSP-017** | **1 or 2** |
| NPN Magneto Resistive Sensor Short Barrel w/Qk Disc* | **OHSN-017** | **1 or 2** |
| Quick Disconnect 5 Meter Cable Length | **CABL-013** | **1 or 2** |
| 8-wire Power and Signal Cable 5M length, with Straight M12 Connector | **CABL-052** | **1 or 2** |
| 8-wire Power and Signal Cable 5M length, with 90° M12 Connector | **CABL-053** | **1 or 2** |
| Upper Mounting Bushings | **20966-11** | **1** |

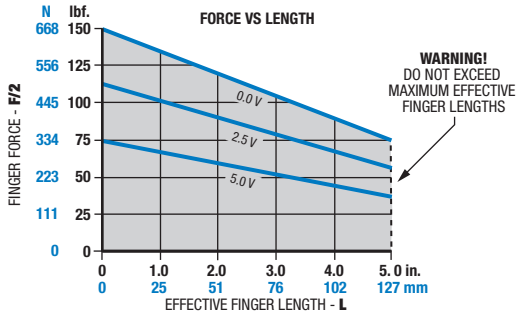
*Sensor and cable sold separately.

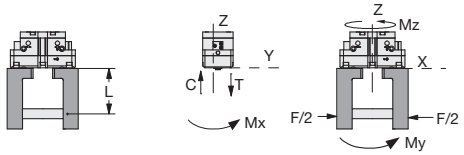



DIRECT CONNECT

## DPE-400-10 Loading Information

Voltage shown above is applied to the FORCE pin, which accepts a 0-5V avnalog signal



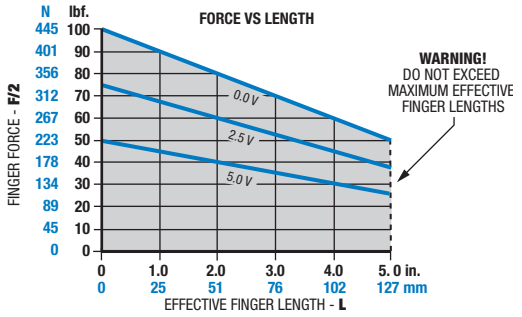



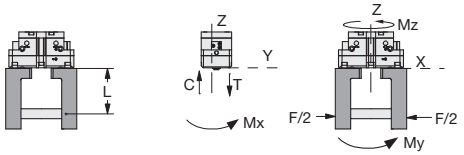

| Loading Capacity† | Static | Dynamic |
|---|---|---|
| Maximum Tensile **T** | 352 lbs. [1564 N] | 58 lbs. [259 N] |
| Maximum Compressive **C** | 465 lbs. [2070 N] | 58 lbs. [259 N] |
| Maximum Moment $\mathbf{M_X}$ | 673 in.-lbs. [76 Nm] | 89 in.-lbs. [10 Nm] |
| Maximum Moment $\mathbf{M_Y}$ | 938 in.-lbs. [106 Nm] | 124 in.-lbs. [14 Nm] |
| Maximum Moment $\mathbf{M_X}$ | 620 in.-lbs. [70 Nm] | 124 in.-lbs. [14 Nm] |

†Capacities are per set of jaws and are not simultaneous

## DPE-400-20 Loading Information

Voltage shown above is applied to the FORCE pin, which accepts a 0-5V avnalog signal




| Loading Capacity† | Static | Dynamic |
|---|---|---|
| Maximum Tensile **T** | 313 lbs. [1394 N] | 38 lbs. [168 N] |
| Maximum Compressive **C** | 415 lbs. [1845 N] | 38 lbs. [168 N] |
| Maximum Moment $\mathbf{M_X}$ | 602 in.-lbs. [68 Nm] | 53 in.-lbs. [6 Nm] |
| Maximum Moment $\mathbf{M_Y}$ | 743 in.-lbs. [84 Nm] | 71 in.-lbs. [8 Nm] |
| Maximum Moment $\mathbf{M_X}$ | 496 in.-lbs. [56 Nm] | 71 in.-lbs. [8 Nm] |

†Capacities are per set of jaws and are not simultaneous

## Installation and Operation:

a. Mount fingers to gripper jaws using locating bushings and threaded fasteners. See dimensional drawing for hole size. Use Loctite 242 threadlocker or equivalent.

b. Mount gripper body using dowel pins and threaded fasteners. Gripper can be mounted and operated in any orientation. See dimensional drawing for mounting hole pattern and sizes. Use Loctite 242 threadlocker or equivalent.

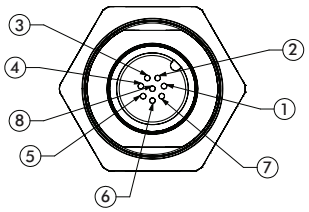
c. To operate the DPE-400 gripper, follow the instructions below:
   i. Apply +24VDC to pin 2 (brown) and Ground to pin 7 (blue) to turn on the gripper. Note that these lines are reverse polarity protected.
   ii. To close the jaws, apply +24VDC to pin 5 (grey).
   iii. To open the jaws, apply +24VDC to pin 3 (green). The +24VDC signal must remain present on the open/close lines to maintain the output force. The gripper will do nothing if +24VDC is present on the open and close lines at the same time.
   iv. Using the integrated sensors is optional. These wires will give the user feedback when then gripper is in a stalled position. For example, if the gripper is opening, when the end of stroke or ID gripping point is met, pin 4 (yellow) will become active. If the gripper is closing, when the end of stroke or OD gripping point is met, pin 6 (pink) will become active. Removing the input signal (either pin 3 or pin 5) will deactivate the sensor output. Electrically, this output is identical to an external sensor and can be configured to either have PNP or NPN outputs. Note that these outputs are NOT tied to any physical position of the gripper and will only be applied when the gripper motion has been stalled.

v. Using the analog input pin is also optional. Injecting a 0-5V analog signal on pin 1 (white) allows the user to control the force output of the gripper. See the force curves for details on how this pin impacts the output force. If not used, this pin needs to be connected to ground. This will ensure the gripper outputs maximum force. If this pin is left floating, the gripper output force will be cut in half.

**WARNING:**

a. Operating the gripper outside of the rated voltage level can cause damage and void warranty.
b. Disconnect power from gripper before performing maintenance.
c. DO NOT disconnect the power cable while gripper is in motion. Ensure that all inputs are turned off first.
d. DO NOT remove power while the gripper is clamped on a part. This event could lead to a reduction in grip-force when power returns. Should this happen, simply move the gripper fingers off the part and cycle power. Full grip-force will then be restored.

## Electrical Interface: Pin Out (Looking into the head of the connector on gripper)




| Pin # | Color | Signal | Description | Current |
|---|---|---|---|---|
| 1 | White | Force | 0-5 VDC (Analog) | 5mA |
| 2 | Brown | +24V | Motor Power | 2A (max), 0.4 A (avg) |
| 3 | Green | Open | 24 VDC Active (Inputs) | 10mA |
| 4 | Yellow | Open Sense | NPN/PNP (Outputs) | 300mA (max) |
| 5 | Gray | Close | 24 VDC Active (Inputs) | 10mA |
| 6 | Pink | Close Sense | NPN/PNP (Outputs) | 300mA (max) |
| 7 | Blue | Ground | Motor Ground | 2A (max), |
| 8 | Red | I/O Power | 24 VDC (PNP Outputs Only) | 300mA (max) |