

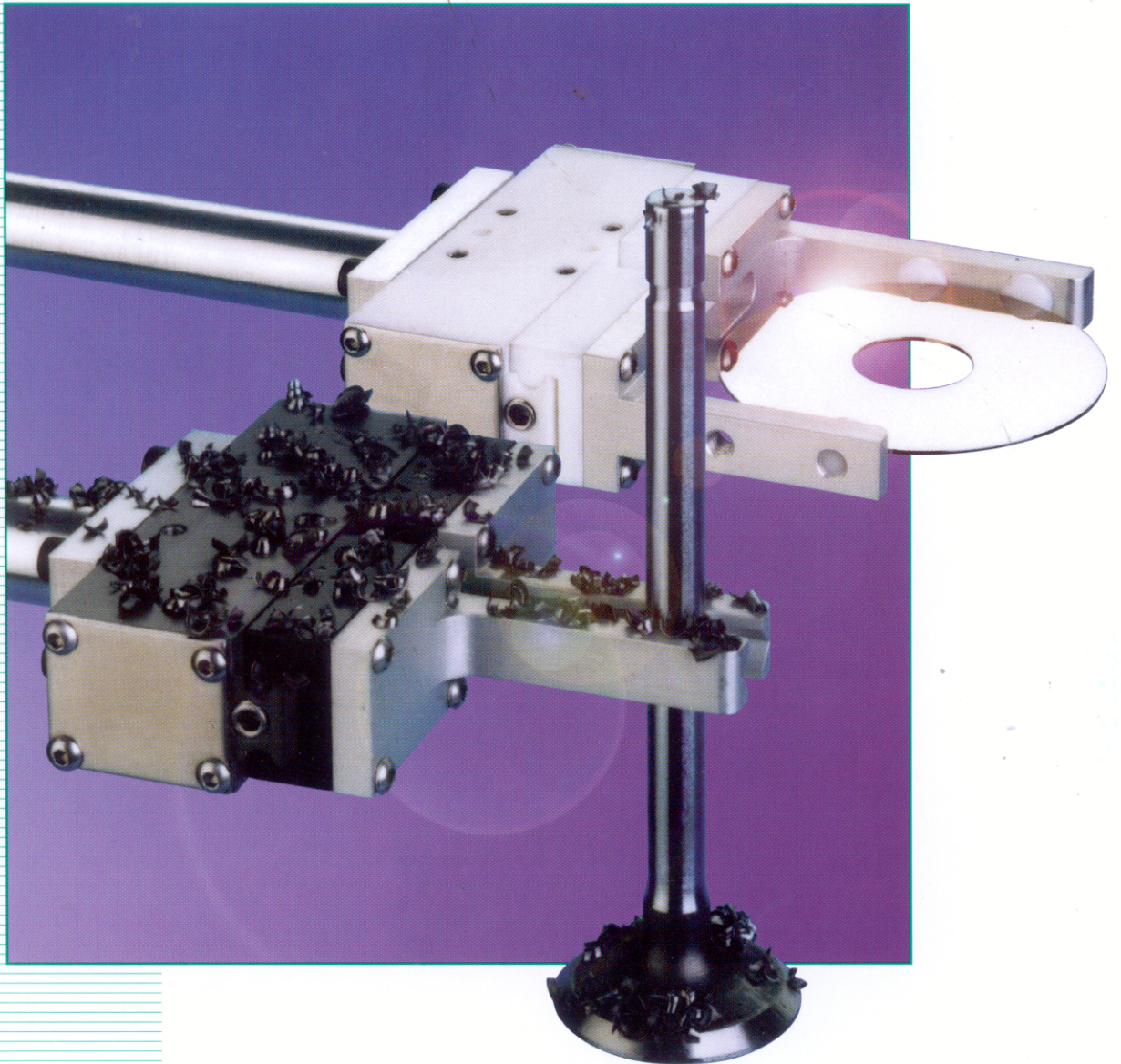


ZM002

Parallel Opening/Closing Type Gripper

# MAGNUM<sup>®</sup> Series

2 Finger  
130N, 450N



Compact gripper with double helix synchronization  
Ultra accurate centering  
PET construction for class one clean rooms  
Aluminum construction for harsh environments  
Auto switch ready

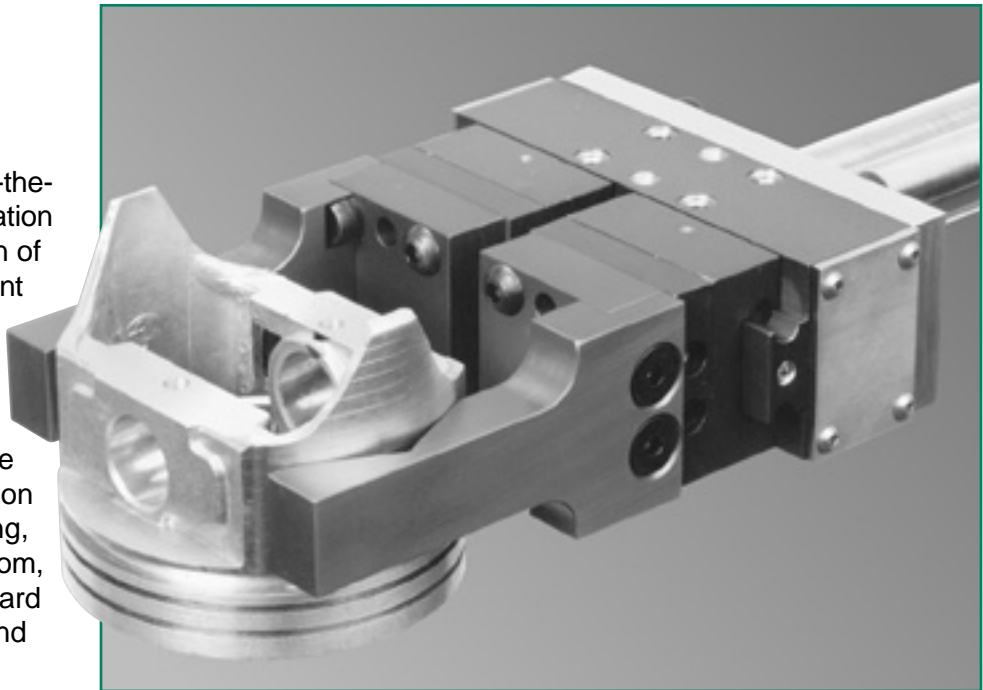
Parallel Opening/Closing Type Gripper

# MAGNUM<sup>®</sup> Series

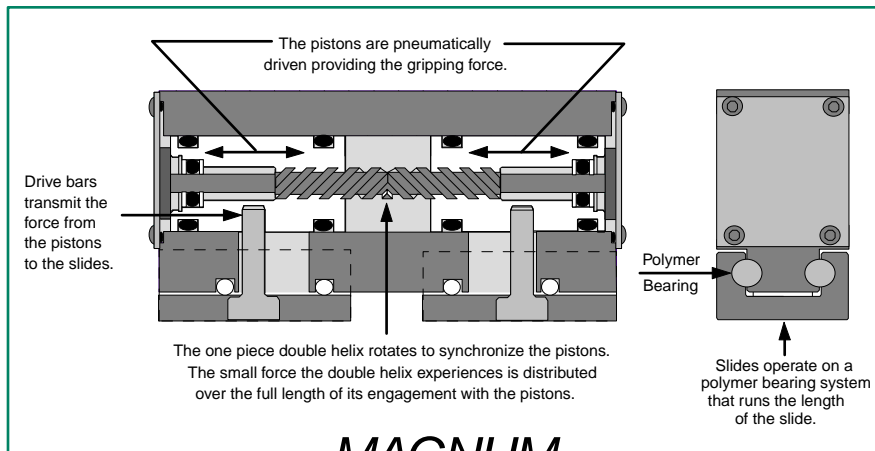
2 Finger 130N, 450N

## Does It All

MAGNUM grippers are universally applicable "out-of-the-box". The use of third-generation technology and the selection of super tough, corrosive resistant materials allows the MAGNUM to efficiently serve day-to-day as well as tough, nearly impossible applications. Examples of the range of MAGNUM application environments include welding, grinding, machining, clean room, epitaxial wafer fabrication, hard disk fabrication, D.I. water and food processing.



## Patented Synchronous Technology – Extended Life



The synchronous MAGNUM utilizes U.S. patent numbers 4,591,199; 5,657,973 and 5,755,475. The force and synchronizing double helix are independent systems. The double helix works only to center the part to  $\pm 0.025$  mm ( $\pm 0.0010$ "). All of the gripping force is provided by two pistons that are driven pneumatically. The independence of the force and synchronization systems provides precision over the typical 10,000,000+ cycle life of the unit. In non-abusive applications the technology may deliver 20,000,000 or more cycles.

# Parallel Opening/Closing Type Gripper

# MAGNUM<sup>®</sup> Series

2 Finger 130N, 450N

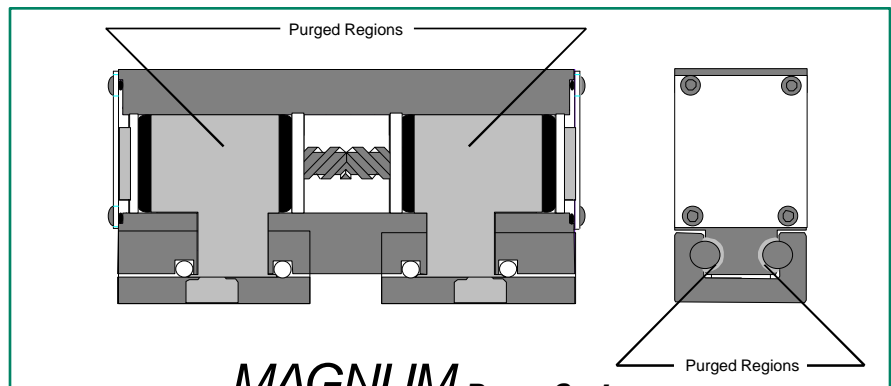
## Double Sealed for Superior Integrity

The MAGNUM mechanism is double sealed to assure that the mechanism is isolated from the environment. In clean rooms and food processing this ensures environmental integrity. In harsh environments the double seals protect the MAGNUM from contamination that could lead to failure.

## Clean and Dirty Purge System

Another patented (U.S. 5,755,475) feature of the MAGNUM family is a dual usage purge system (patent pending) that is part of every gripper.

The purge system facilitates use in up to Class One clean rooms (**An independent lab report is available**) and very dirty environments.



### MAGNUM Purge System

#### Clean Rooms

In clean rooms the purge system is evacuated. Any contaminants from the pneumatic system that pass the seals of the gripper are eliminated from the environment.

#### Very Dirty Environments

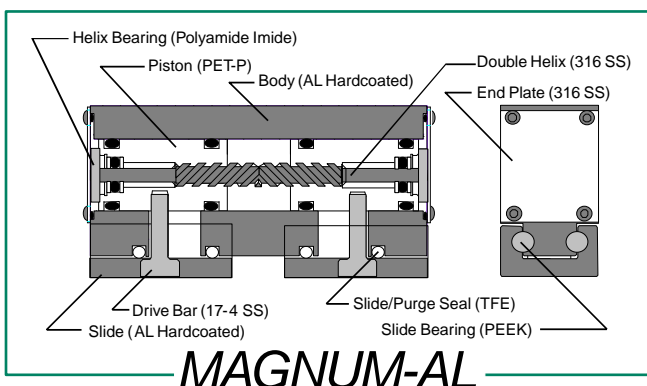
In very dirty environments the purge system is pressurized. Any debris that attempts to make its way under the slide bearings is cleared away by the pressure at the purge port.

## The Ultimate Materials Force/Weight >200

All materials of the MAGNUM gripper are designed to eliminate maintenance and assure that the gripper functions in harsh environments.

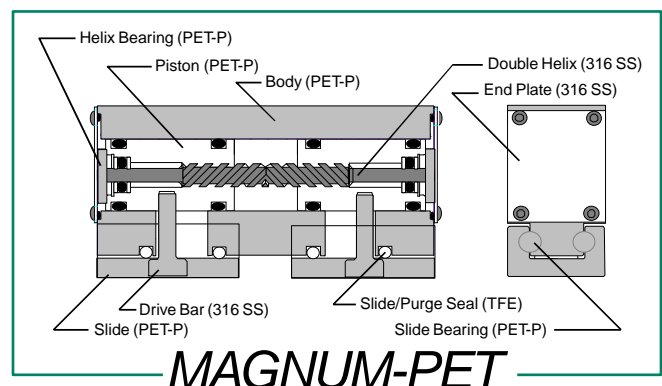
There are two material versions of the MAGNUM gripper: The MAGNUM-AL and the MAGNUM-PET. Each was developed to extend the out-of-the-box

applicability of the MAGNUM technology. The design and material selection allow the MAGNUM to provide Force/Weight ratios in excess of 200.



### MAGNUM-AL

The "AL" version of the MAGNUM is intended for use in very dirty and explosive environments. All of the materials are chosen to be corrosion resistant as well as tough.



### MAGNUM-PET

The PET unit is de-ionized (D.I.) water tolerant for use in hard disk and epitaxial fabrication. All materials used in the "PET" version of the MAGNUM comply with FDA requirements for food handling.

## Parallel Opening/Closing Type Gripper

# MAGNUM<sup>®</sup> Series

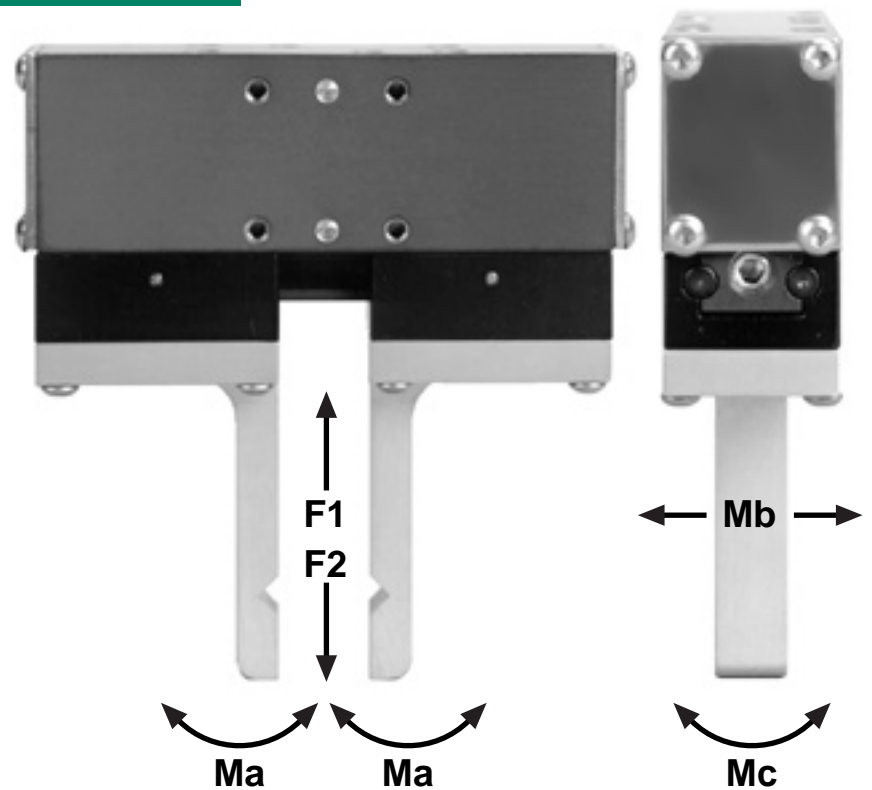
2 Finger 130N, 450N

### Torque and Force Unmatched

The MAGNUM system uses a linear bearing concept. However, to minimize weight and size, advanced polymers are utilized rather than ball bearing rails. The torque and force capabilities of the MAGNUM family are maintained over the life of the gripper due to the length of the bearing surface over which the loads are distributed.

### Lifetime Lubrication

The universal application of the MAGNUM grippers is made possible with the use of a lifetime lubricant. This allows the use of “dry air” and compliance with new and proposed regulations that forbid the use of lubricants in air lines. With an FDA rating of H1, this lifetime lubricant is also people and food “friendly”.



MODEL	Ma : Nm (in-lbs.)	Mb : Nm (in-lbs.)	Mc : Nm (in-lbs.)	F1 : kg (lbs.)	F2 : kg (lbs.)
MAGNUM-AL-130	24 (212)	20 (177)	16 (141)	25 (55)	20 (44)
MAGNUM-PET-130	10 (88)	10 (88)	10 (88)	20 (44)	15 (33)
MAGNUM-450-26	100 (840)	80 (700)	60 (530)	56 (123)	68 (150)

## Parallel Opening/Closing Type Gripper

# MAGNUM<sup>®</sup> Series

2 Finger 130N, 450N

### Gripper Ordering Information

Note: All grippers and seals are lubricated for life. All hardware is stainless steel. The standard lifetime lubricant is FDA rated H1 for food contact. All PET units are clean room ready and AL units are harsh environment ready via the use of the purge port system.

Order Number	Body	Force, Each Jaw	Stroke
MAGNUM-AL-130-13	Aluminum	130N (29lbs.)	13mm (.512")
MAGNUM-AL-130-26	Aluminum	130N (29lbs.)	26mm (1.02")
MAGNUM-PET-130-13	PET	130N (29lbs.)	13mm (.512")
MAGNUM-PET-130-26	PET	130N (29lbs.)	26mm (1.02")
MAGNUM-AL-450-26	Aluminum	450N (100lbs.)	26mm (1.02")

### Gripper Accessory Kit Ordering Information

Note: Each kit includes a sensor and/or hardware to sense one position. Two kits are needed to handle both open and close.

Accessory Kit (Field Installable)	Description	Applicable Models
M-KIT-IND-SOUR	Inductive-LED, DC Sourcing-PNP	All Models
M-KIT-IND-SINK	Inductive-LED, DC Sinking-NPN	All Models
M-KIT-REED	Reed-LED, MOV Protection	All Models
M-KIT-HALL-SINK	Hall Effect, DC Sinking-NPN	All Models
M-KIT-HWO	Hardware, Mounts any of above	All Models
M-KIT-HWO-450-12mm	Hardware, Mounts 12mm prox.	Model 450-26 Only
M-KIT-U-Harsh-4mm	4mm Tubing	All Models
M-KIT-U-Harsh-6mm	6mm Tubing	All Models
M-KIT-AFS-450-26	Fail Safe, Active	Model 450-26 Only

*The right to change designs and specifications without notice is reserved. All data and dimensions in catalogs have been thoroughly checked for accuracy; however, responsibility for possible errors or omissions is not assumed. A one-year limited warranty is provided for this product by ZAYTRAN, Inc. Please view this limited warranty at: [www.grippers.com/warranty.htm](http://www.grippers.com/warranty.htm)*

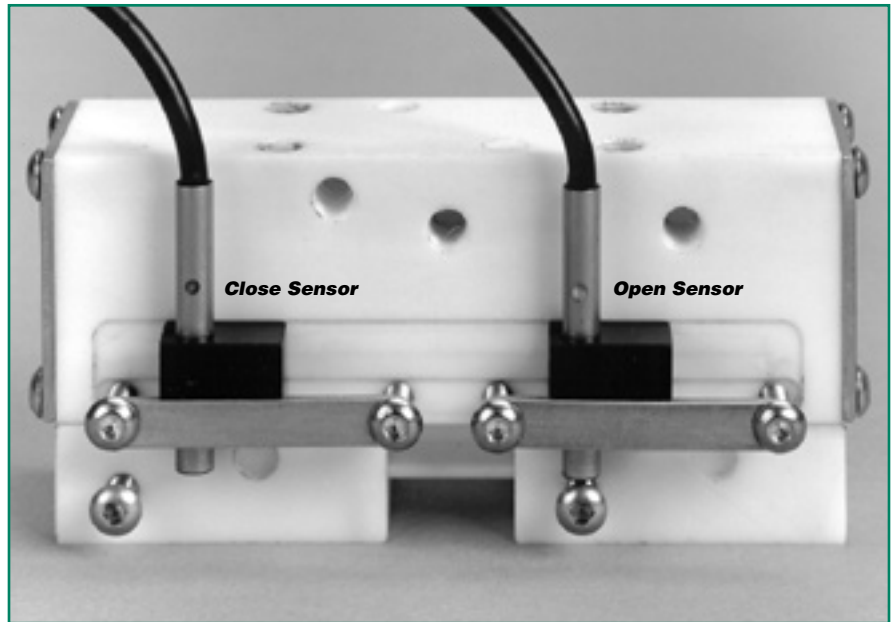
Parallel Opening/Closing Type Gripper

# MAGNUM<sup>®</sup> Series

2 Finger 130N, 450N

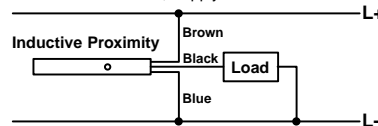
## Sensor System

The complete range of sensors are available as part of the MAGNUM system. All kits shown at right work on all models (130 & 450). To order the mounting hardware only for the types of sensors shown use #M-Kit-HWO. To order mounting hardware for a 12mm proximity on the model 450 use #M-KIT-HWO-450-12mm.



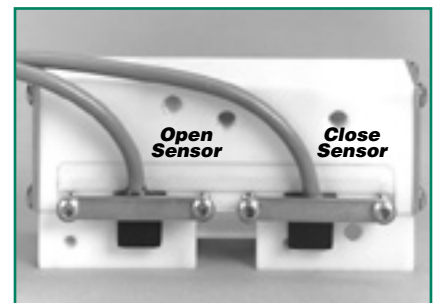
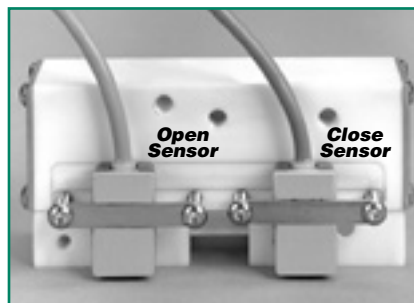
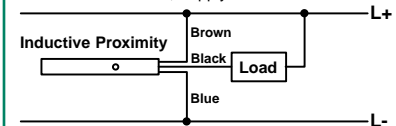
### Inductive Proximity Sensor Kit, 4mm DC-Sourcing, PNP, 2M Cable

Kit #M-Kit-Ind-Sour adds 10.6mm  
10-30 VDC, 100 mA Max. Current & Inrush  
Status Indicator: LED, Supply Current <9.5 mA



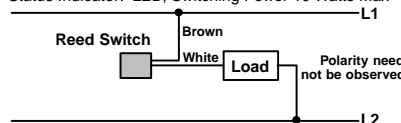
### Inductive Proximity Sensor Kit, 4mm DC-Sinking, NPN, 2M Cable

Kit #M-Kit-Ind-Sink adds 10.6mm  
10-30 VDC, 100 mA Max. Current & Inrush  
Status Indicator: LED, Supply Current <9.5 mA



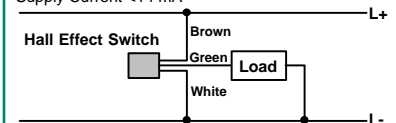
### Reed Switch Sensor Kit SPST Normally Open, 9' Cable

Kit #M-Kit-Reed adds 11.9mm  
10-120 VDC/VAC, 0.5 Amp Max. Current, MOV Protection  
Status Indicator: LED, Switching Power 10 Watts Max



### Hall Effect Sensor Kit DC-Sinking, NPN, 9' Cable

Kit #M-Kit-Hall-Sink adds 7.3mm  
6-24 VDC, 20 mA Max. Current  
Supply Current <14 mA



# Parallel Opening/Closing Type Gripper

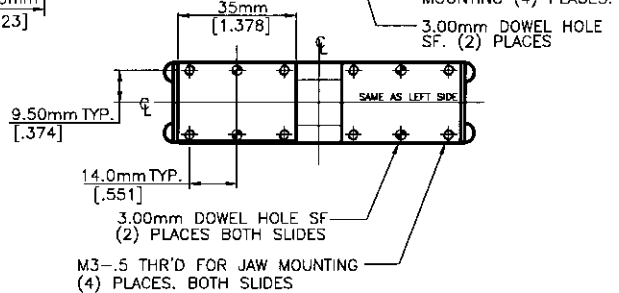
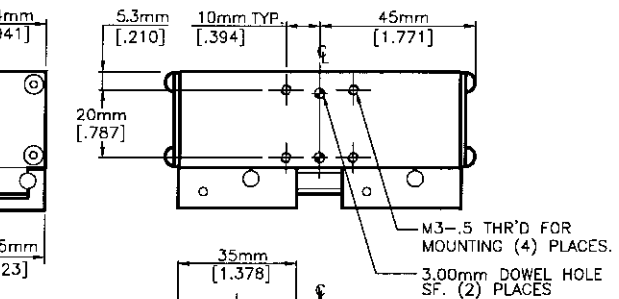
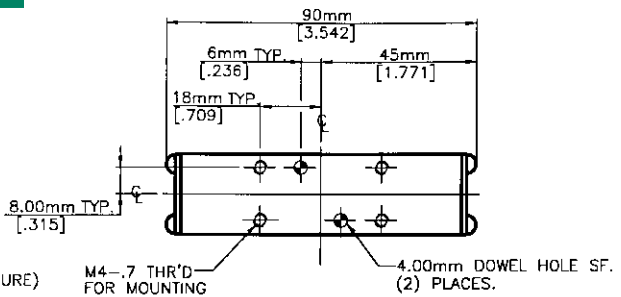
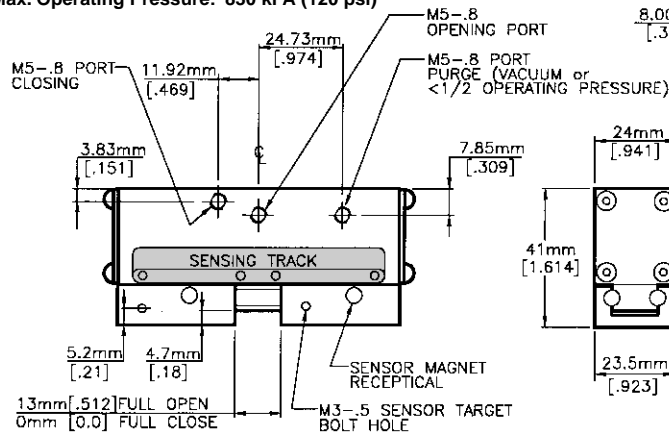
# MAGNUM<sup>®</sup> Series

2 Finger 130N, 450N

## MAGNUM-(AL or PET)-130-13

### Gripping Force, Open & Close, Each Jaw

@ 690 kPa (100 psi):	130N (29 lbs.)
Stroke:	13.0 mm (.512")
Weight PET:	127g (0.28 lbs.)
Weight AL:	188g (0.42 lbs.)
Displacement:	6.1 cm <sup>3</sup> (0.373 in <sup>3</sup> )
Max. Operating Pressure:	830 kPa (120 psi)



NOTE: All jaw and gripper mounting holes are a minimum of one diameter deep on MAGNUM-AL units, one and one half diameters deep on MAGNUM-PET units. MAGNUM-AL jaw and mounting holes have SS coil inserts. MAGNUM-PET maximum torques: .8 Nm [7 in-lb] for 3mm fasteners .9 Nm [8 in-lb] for 4mm fasteners

# Parallel Opening/Closing Type Gripper

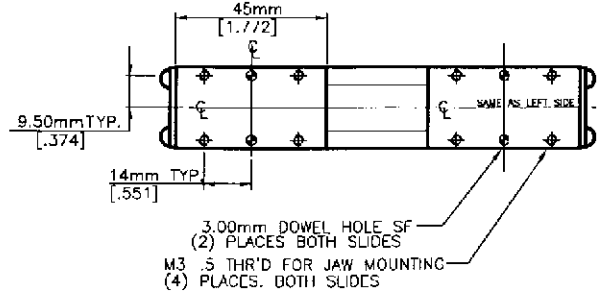
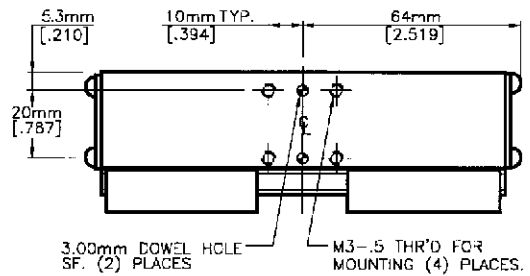
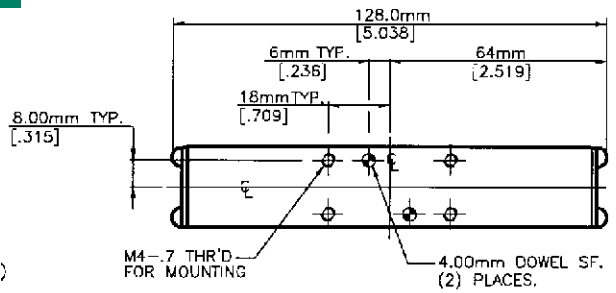
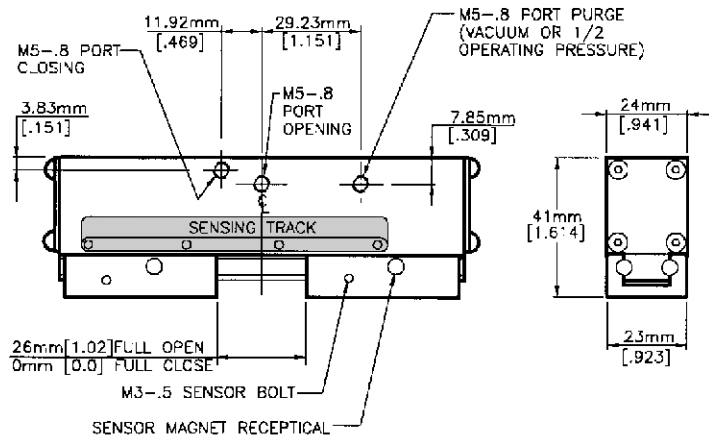
# MAGNUM<sup>®</sup> Series

2 Finger 130N, 450N

## MAGNUM-(AL or PET)-130-26

### Gripping Force, Open & Close, Each Jaw

@ 690 kPa (100 psi):	130N (29 lbs.)
Stroke:	26.0 mm (1.02")
Weight PET:	170g (0.38 lbs.)
Weight AL:	252g (0.56 lbs.)
Displacement:	12.2 cm <sup>3</sup> (0.746 in <sup>3</sup> )
Max. Operating Pressure:	830 kPa (120 psi)



NOTE: All jaw and gripper mounting holes are a minimum of one diameter deep on MAGNUM-AL units, one and one half diameters deep on MAGNUM-PET units. MAGNUM-AL jaw and mounting holes have SS coil inserts. MAGNUM-PET maximum torques: .8 Nm [7 in-lb] for 3mm fasteners .9 Nm [8 in-lb] for 4mm fasteners



# Parallel Opening/Closing Type Gripper

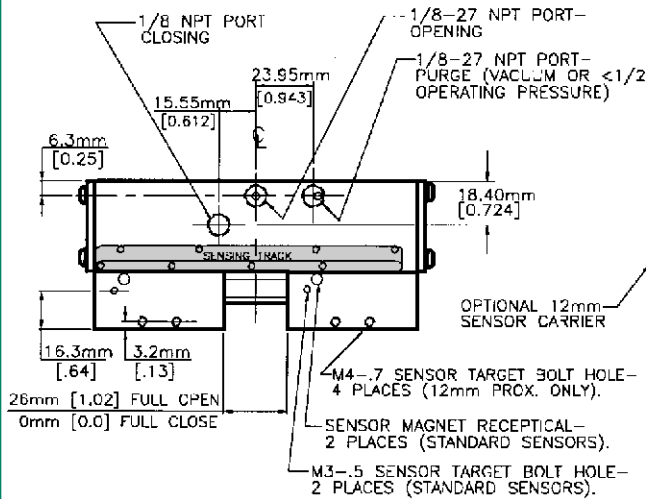
# MAGNUM® Series

2 Finger 130N, 450N

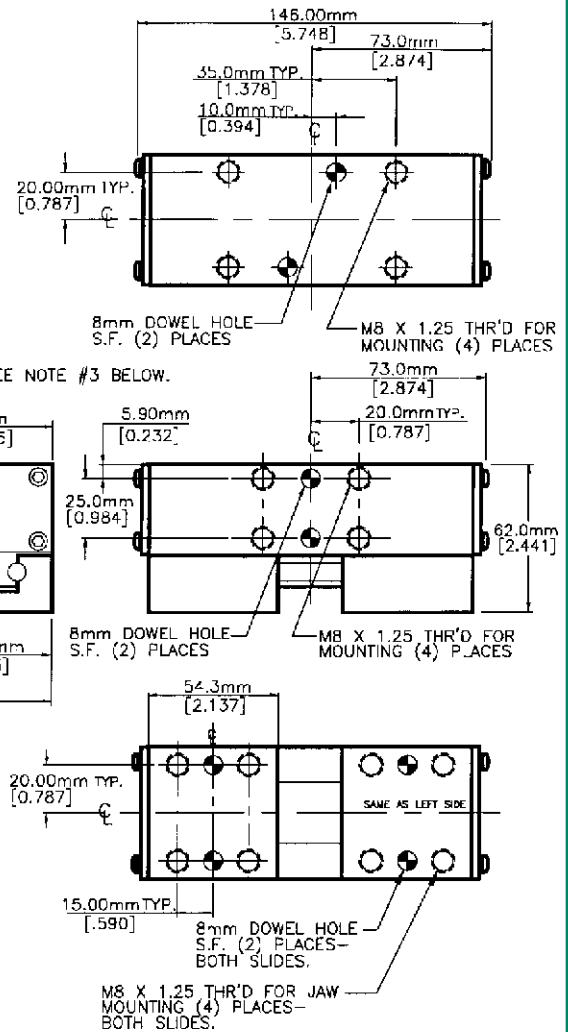
## MAGNUM-AL-450-26

### Gripping Force, Open & Close, Each Jaw

@ 690 kPa (100 psi):	450N (100 lbs.)
Stroke:	26.0 mm (1.02")
Weight:	1.09kg (2.39 lbs.)
Displacement:	18.7 cm³ (1.14 in³)
Max. Operating Pressure:	830 kPa (120 psi)



- NOTE:
1. ALL JAW AND GRIPPER MOUNTING HOLES ARE A MINIMUM OF ONE DIAMETER DEEP.
  2. ALL MAGNUM-450 JAW AND MOUNTING HOLES HAVE STAINLESS STEEL COIL INSERTS.
  3. WHEN USING CERTAIN 12mm PROXIMITY SENSORS, SENSOR MAY EXTEND PAST THE MOUNTING SURFACE.

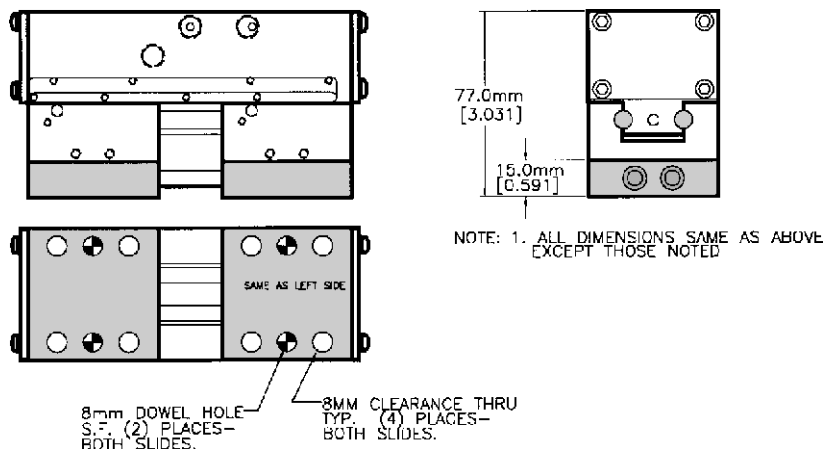


## Active Fail Safe Accessory M-Kit-AFS-450-26

Closing Force @ Full Open:	111N (25 lbs.)
Closing Force @ Full Close:	67N (15 lbs.)
Weight:	1.35kg (2.97 lbs.)
Min. Operating Pressure:	415 kPa (60 psi)

Not intended for use as a single acting gripper.

The AFS accessory will assure that parts are not dropped should the pneumatic pressure fail. Jaws must be designed with "spring", or that encompass the part. Some movement of the jaws will occur as pressure fails.



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For Repair and Technical Support call ZAYTRAN:  
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<http://www.smcusa.com>



Parallel Opening/Closing Type Gripper

# *XRAY<sup>®</sup> Series*

2 Finger

450N, 1250N, 2500N



Compact gripper with double helix synchronization  
High load carrying ceramic bearings  
Ultra accurate centering  
Long strokes for a wide range of parts  
Auto switch ready

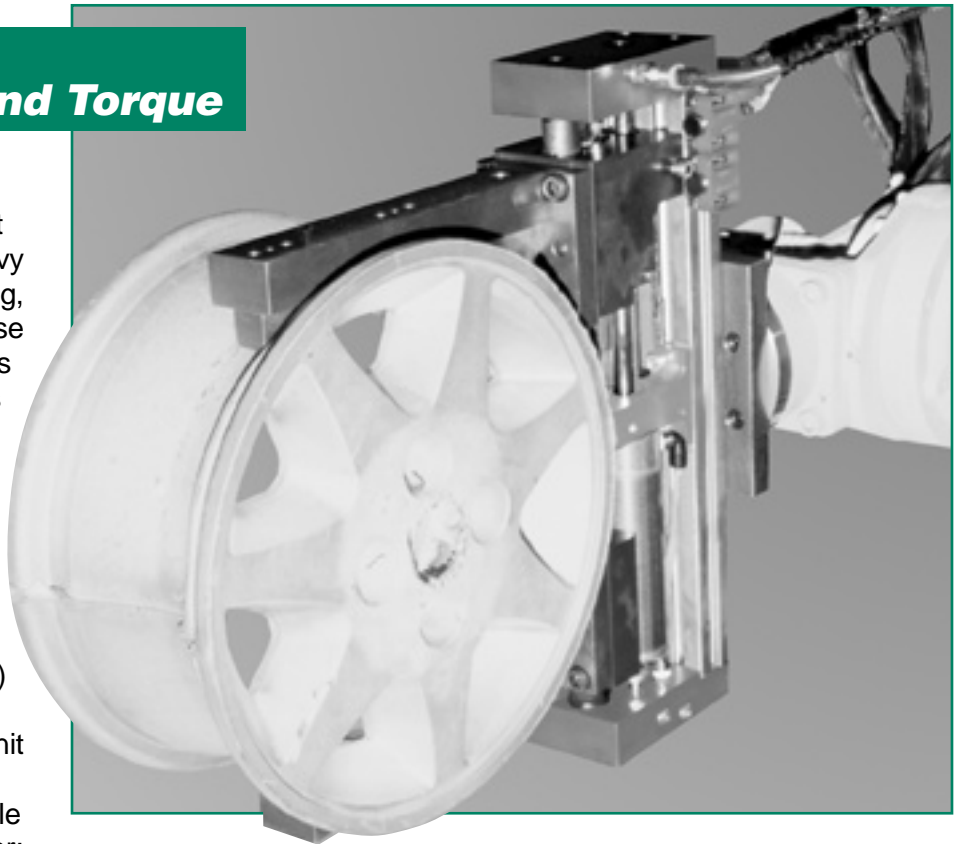
Parallel Opening/Closing Type Gripper

# XRAY<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

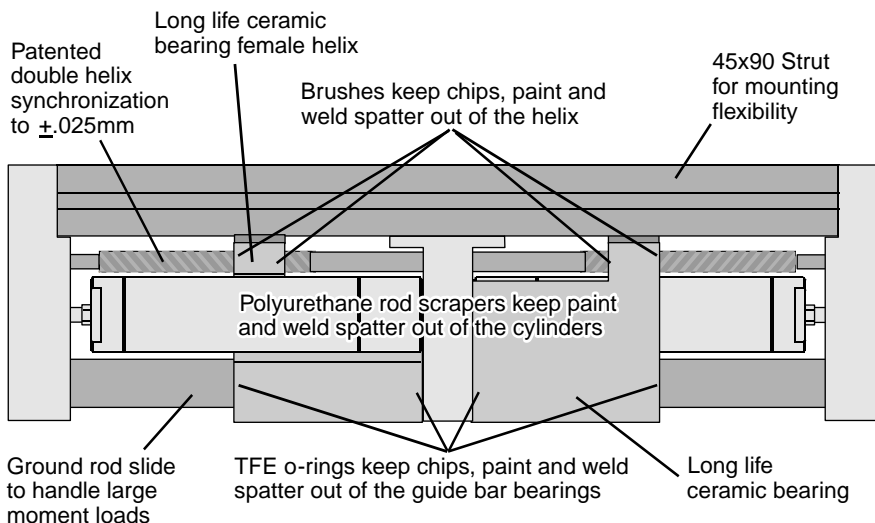
## XRAY Grippers – Extreme Force and Torque

The XRAY concept was developed for applications that impart high acceleration to heavy objects or require extremely long, precisely positioned jaws. These applications put extreme stress on the gripper. XRAY grippers use a ceramic bearing system to isolate the precision jaw positioning system from jaw torque and force. The ceramic bearing rail allows the grippers to be small and lightweight while delivering jaw force in excess of 2500N (560 pounds) and to tolerate jaw torque of 1200NM (880 ft-lb). Multiple unit arrays and special strokes are facilitated by the XRAY's flexible architecture. XRAYs truly deliver:



**“Twice The Force... Half The Size”**

## Patented Synchronous Technology – Extended Life



The synchronous XRAY utilizes U.S. patent numbers 4,591,199 and 5,657,973. The force and synchronizing double helix are independent systems. The double helix works only to center the part to  $.025\text{mm}$  ( $\pm 0.001$  inches). All of the gripping force is provided by two pistons that are driven pneumatically. The independence of the force and synchronization systems provides precision over the typical 10,000,000+ cycle life of the unit.

Parallel Opening/Closing Type Gripper

# XRAY<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

## **Rugged Construction – Low Cost of Ownership**

XRAY takes advantage of dynamic developments in both material science and automation technology to offer new horizons of toughness and cost efficiency. The cost of ownership of the XRAY is minimized by the use of off-the-shelf stainless steel cylinders. These cylinders include magnetic sensing rings for enhanced flexibility.

Harsh environments like casting, welding and machining are tolerated due to seals on the helix and guide bar. The standard seals on the cylinders are supplemented with polyurethane rod wipers in the ZAYTRAN designed nuts that mount the cylinders to the center section. By eliminating boots and covers ZAYTRAN has minimized the weight and allowed the dirt and grime to fall out of the gripper. For welding environments specially plated aluminum covers are available that will keep the weld spatter from attaching to the cylinder rods.

Unparalleled rigidity is achieved by combining a 32mm ground rod and ZAYTRAN's proprietary ceramic bearing technology. Anti-rotation of the jaw mounting system is achieved with polyamide imide bearings running in guides that are precision machined in the extruded backbone of the system.

All of these moving members are lubricated for the life of the XRAY.

The application flexibility of the XRAY is extended by the use of an extruded aluminum backbone that provides multiple options for mounting the gripper and mounting sensors to the gripper as well as reducing the weight of the gripper.



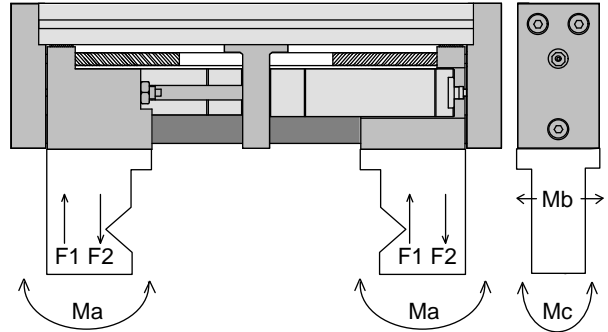
Parallel Opening/Closing Type Gripper

# XRAY<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

## Jaw Torque and Force

MODEL	Ma : Nm (ft.-lbs.)	Mb : Nm (ft.-lbs.)	Mc : Nm (ft.-lbs.)	F1 : kg (lbs.)	F2 : kg (lbs.)
XRAY-450	225 (165)	225 (165)	160 (117)	224 (492)	136 (305)
XRAY-1250	550 (405)	600 (440)	550 (405)	670 (1,500)	450 (1,000)
Tandem XRAY-1250	1,100 (810)	1,200 (880)	1,100 (810)	1,340 (3,000)	900 (2,000)



Parallel Opening/Closing Type Gripper

# *XRAY*<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

## **Optional Power-Off Brake**



In applications that require the part be held even when pneumatic power is lost, the Power-Off Brake option provides an excellent solution. When pneumatic pressure is removed from the option a spring is allowed to rotate a collar that engages a collet brake system on the helix. Thus, the jaws are braked in position.

Either an encompassing jaw system or jaws with compliance must be used with this option. Jarring may cause some jaw movement.

## **Accessory Weld Spatter Covers**

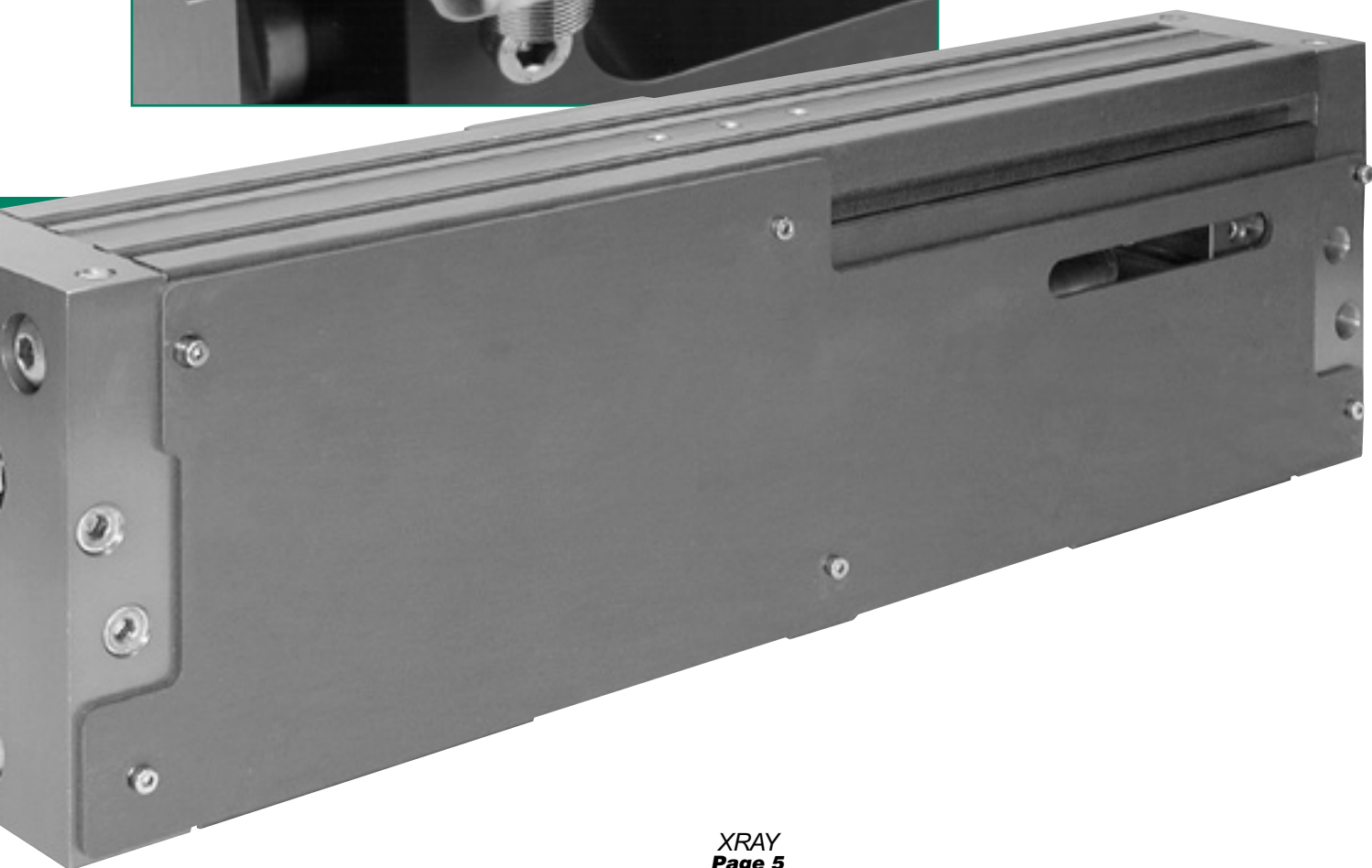
These field installable covers protect the cylinder shafts from weld spatter. They are aluminum that has been plated so that weld spatter does not stick.

Parallel Opening/Closing Type Gripper

# *XRAY*<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

## **Accessory Switch Kits**



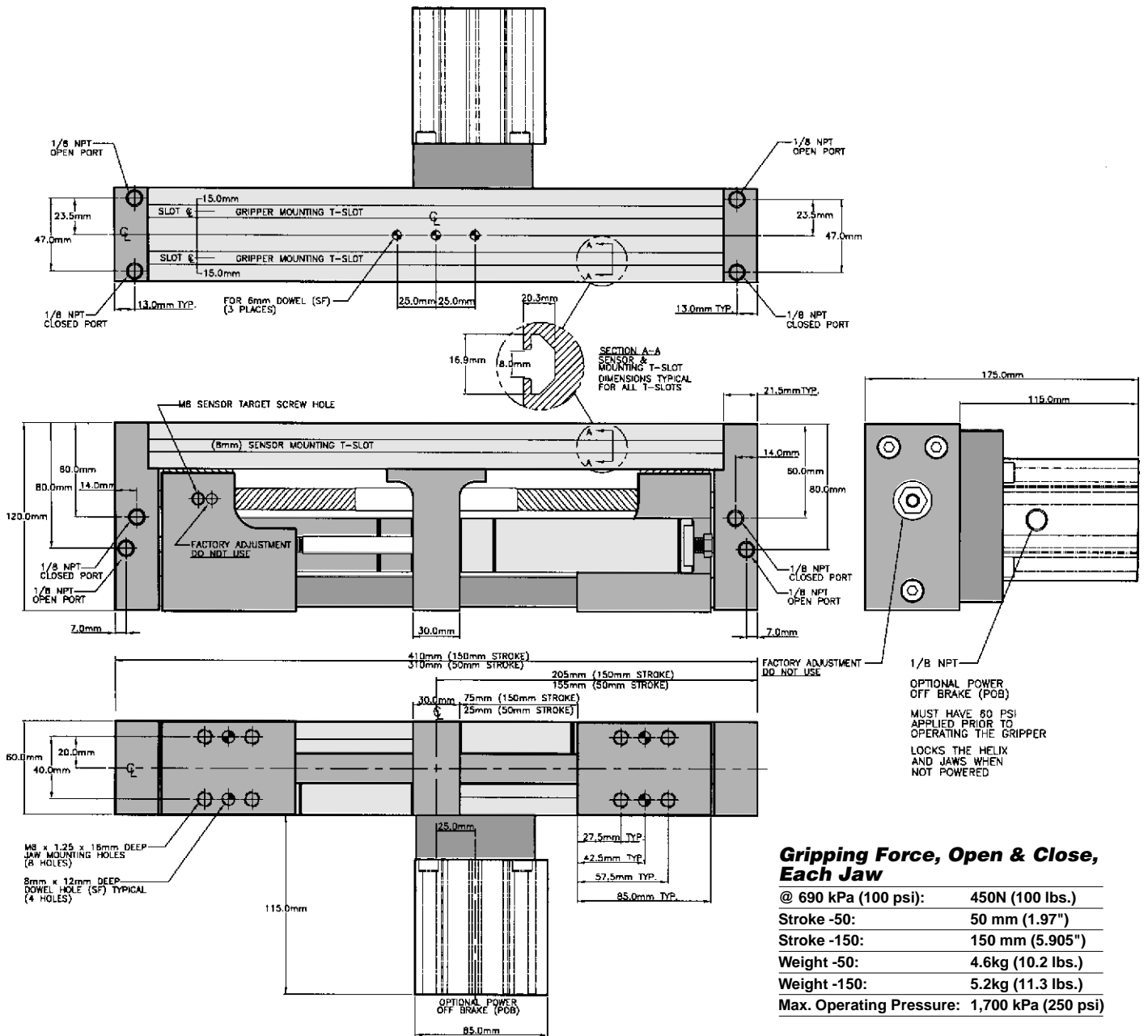


# Parallel Opening/Closing Type Gripper

# XRAY<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

## XRAY-450-50/150



### Gripping Force, Open & Close, Each Jaw

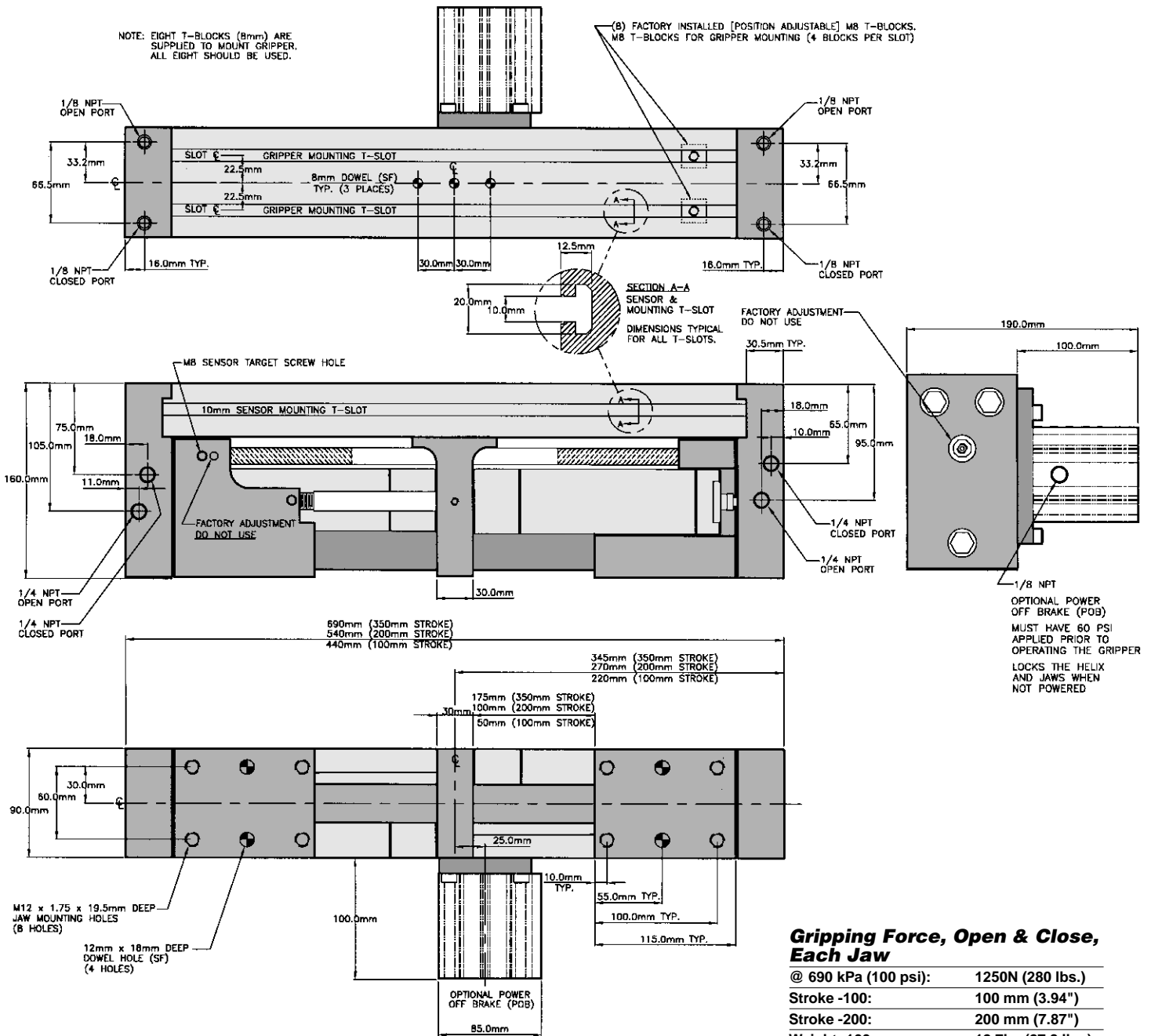
@ 690 kPa (100 psi):	450N (100 lbs.)
Stroke -50:	50 mm (1.97")
Stroke -150:	150 mm (5.905")
Weight -50:	4.6kg (10.2 lbs.)
Weight -150:	5.2kg (11.3 lbs.)
Max. Operating Pressure:	1,700 kPa (250 psi)

# Parallel Opening/Closing Type Gripper

# XRAY® Series

2 Finger 450N, 1250N, 2500N

## XRAY-1250-100/200



### Gripping Force, Open & Close, Each Jaw

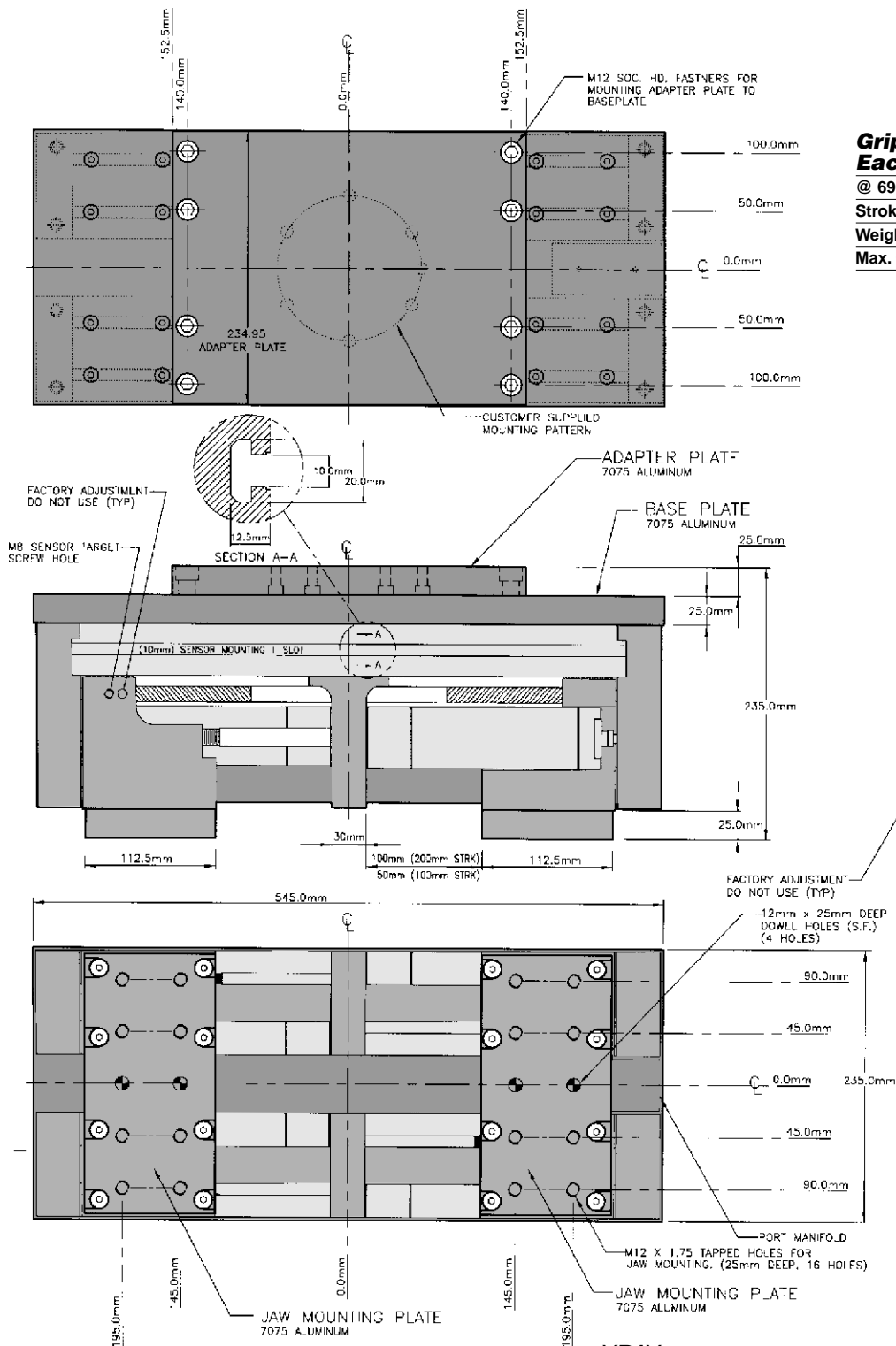
@ 690 kPa (100 psi):	1250N (280 lbs.)
Stroke -100:	100 mm (3.94")
Stroke -200:	200 mm (7.87")
Weight -100:	12.7kg (27.8 lbs.)
Weight -200:	13.6kg (30 lbs.)
Max. Operating Pressure:	1,700 kPa (250 psi)

# Parallel Opening/Closing Type Gripper

# XRAY<sup>®</sup> Series

2 Finger 450N, 1250N, 2500N

## XRAY-Tandem-1250-200



### Gripping Force, Open & Close, Each Jaw

@ 690 kPa (100 psi):	2500N (560 lbs.)
Stroke:	200 mm (7.87")
Weight:	44.4kg (98 lbs.)
Max. Operating Pressure:	1,700 kPa (250 psi)

## Parallel Opening/Closing Type Gripper

# XRAY® Series

2 Finger 450N, 1250N, 2500N

### Ordering Information XRAY-450-50/150

<b>Gripper</b>			
Order Number	Brake	Force, Each Jaw	Stroke
XRAY-450-50	No	450N (100lbs.)	50mm (1.97")
XRAY-450-50-POB	Yes	450N (100lbs.)	50mm (1.97")
XRAY-450-150	No	450N (100lbs.)	150mm (5.905")
XRAY-450-150-POB	Yes	450N (100lbs.)	150mm (5.905")

<b>Accessories</b>		
Order Number	Description	Applicable Models
X-COV-450-50	Field Installed, Weld Spatter Covers	XRAY-450-50
X-COV-450-150	Field Installed, Weld Spatter Covers	XRAY-450-150
X-COV-450-50-POB	Field Installed, Weld Spatter Covers	XRAY-450-50
X-COV-450-150-POB	Field Installed, Weld Spatter Covers	XRAY-450-150
X-KIT-450-6.5MM	Holder Only, To Mount 6.5mm Prox.	All Models
X-KIT-450-12MM	Holder Only, To Mount 12mm Prox.	All Models
X-KIT-450-18MM	Holder Only, To Mount 18mm Prox.	All Models

### Ordering Information XRAY-1250-100/200

<b>Gripper</b>			
Order Number	Brake	Force, Each Jaw	Stroke
XRAY-1250-100	No	1250N (280lbs.)	100mm (3.94")
XRAY-1250-100-POB	Yes	1250N (280lbs.)	100mm (3.94")
XRAY-1250-200	No	1250N (280lbs.)	200mm (7.87")
XRAY-1250-200-POB	Yes	1250N (280lbs.)	200mm (7.87")
XRAY-1250-350	No	1250N (280lbs.)	350mm (13.78")
XRAY-1250-350-POB	Yes	1250N (280lbs.)	350mm (13.78")

<b>Accessories</b>		
Order Number	Description	Applicable Models
X-KIT-1250-100-COV	Weld Spatter Covers	XRAY-1250-100
X-KIT-1250-200-COV	Weld Spatter Covers	XRAY-1250-200
X-KIT-1250-350-COV	Weld Spatter Covers	XRAY-1250-350
X-KIT-1250-100-COV-POB	Weld Spatter Covers	XRAY-1250-100-POB
X-KIT-1250-200-COV-POB	Weld Spatter Covers	XRAY-1250-200-POB
X-KIT-1250-350-COV-POB	Weld Spatter Covers	XRAY-1250-350-POB
X-KIT-1250-6.5MM	Holder Only, To Mount 6.5mm Prox.	All Tandem & 1250 Models
X-KIT-1250-12MM	Holder Only, To Mount 12mm Prox.	All Tandem & 1250 Models
X-KIT-1250-18MM	Holder Only, To Mount 18mm Prox.	All Tandem & 1250 Models

### Ordering Information XRAY-Tandem-1250-200

<b>Gripper</b>			
Order Number	Brake	Force, Each Jaw	Stroke
Tandem XRAY-1250-200	No	2500N (560lbs.)	200mm (7.87")

<b>Accessories</b>		
Order Number	Description	Applicable Models
X-KIT-1250-6.5MM	Holder Only, To Mount 6.5mm Prox.	All Tandem & 1250 Models
X-KIT-1250-12MM	Holder Only, To Mount 12mm Prox.	All Tandem & 1250 Models
X-KIT-1250-18MM	Holder Only, To Mount 18mm Prox.	All Tandem & 1250 Models

The right to change designs and specifications without notice is reserved. All data and dimensions in catalogs have been thoroughly checked for accuracy; however, responsibility for possible errors or omissions is not assumed. A one-year limited warranty is provided for this product by ZAYTRAN, Inc. Please view this limited warranty at: [www.grippers.com/warranty.htm](http://www.grippers.com/warranty.htm)

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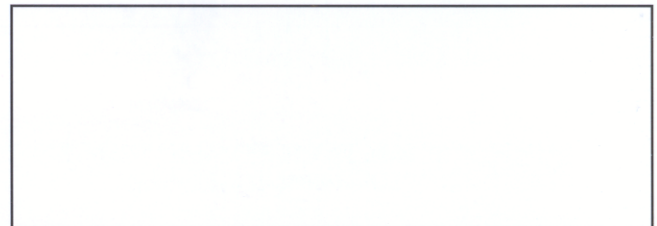
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For Repair and Technical Support call ZAYTRAN:  
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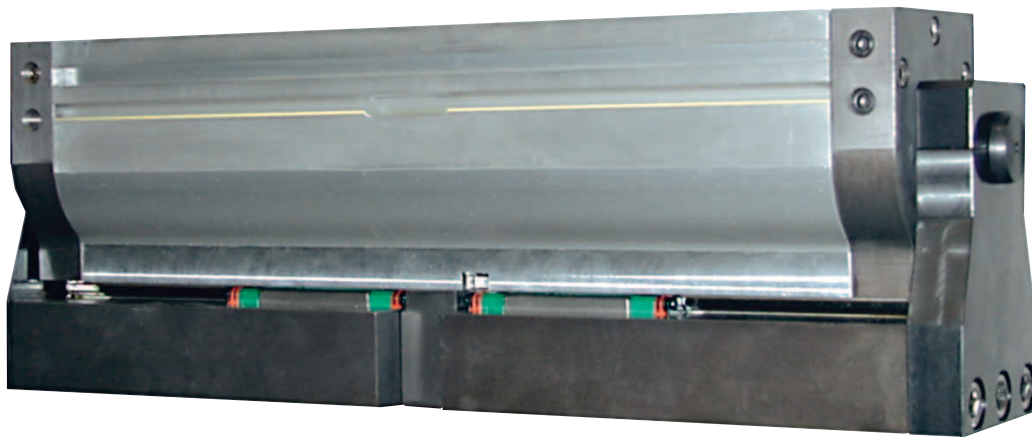
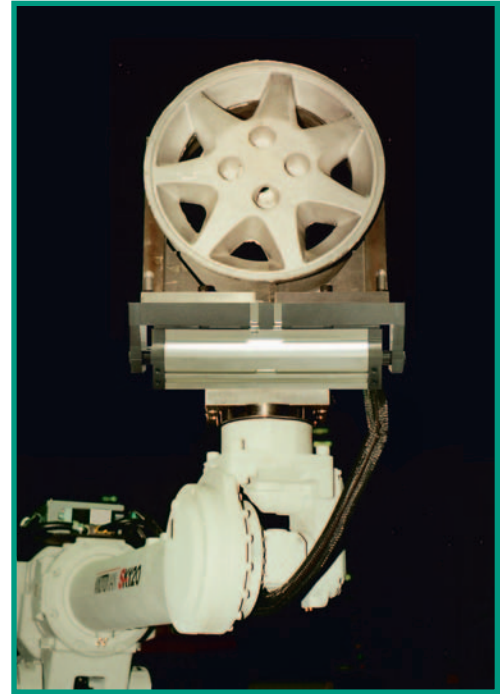


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# XRAY-S-2200

Parallel Opening/Closing Type Gripper  
2 Finger 2200N

- **Handles big jobs with tremendous torque and force capability.**
- **Long jaws are no problem with the incorporated linear bearing rail.**
- **Sealed for years of trouble-free use in tough environments.**
- **Patented double helix for the ultimate precision over the life of the gripper.**



The latest member of the XRAY family offers mounting patterns identical to the XRAY-1250 but with almost twice the force. Drawing on the tradition of the SIGMA series, the XRAY-S incorporates a high-torque linear bearing rail for rigidity and a patented double helix for the ultimate level of precision available in a robotic gripper.

A uni-body extrusion increases rigidity as well as providing mounting and sensing T-slots. The XRAY-S accommodates D-Z73, D-Z76 and D-Z80 SMC sensors for “below surface” mounting and the highest reliability.

Tough environments are not a problem with this sealed unit. The Linear bearing blocks are fitted with wipers and industrial scrapers. The piston shafts are hardened and fitted with welding scrapers and polymer wipers. This combined with lube-for-life helix technology assures years of trouble-free operation.

For applications that require power loss protection, an optional Power Off Brake (POB) aggressively locks the helix and thus the jaws in case of an accidental loss of pneumatic pressure.

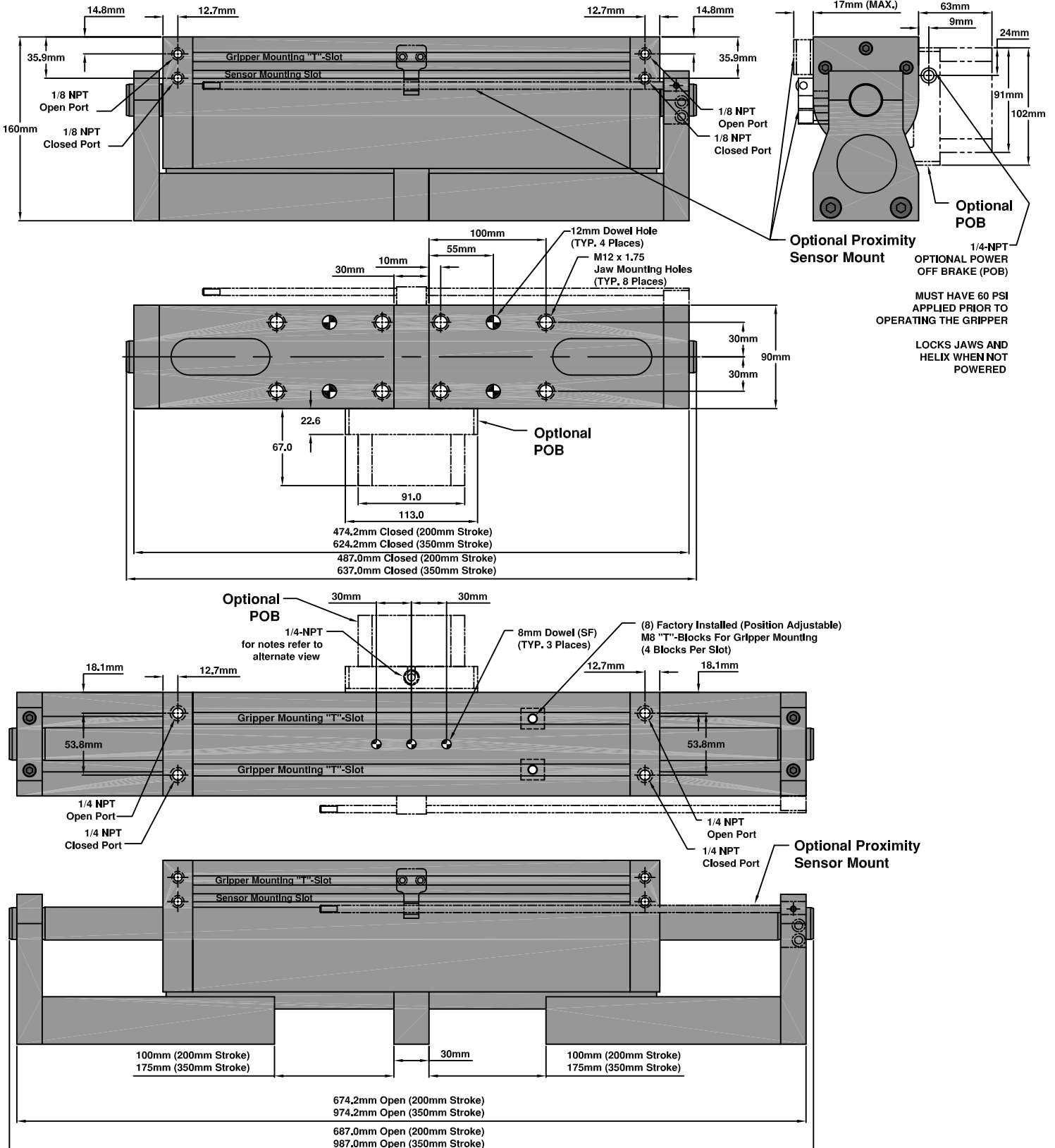


# XRAY-S-2200

Parallel Opening/Closing Type Gripper  
2 Finger 2200N

Force, Each Jaw:	2200N (495 lb)*
Stroke -200:	200mm (7.87")
Stroke -350:	350mm (13.78")
Weight -200:	15KG (33lb.)
Weight -350:	26KG (57lb.)
Jaw Torque Ma:	650NM (476 ft-lb.)
Jaw Torque Mb:	700NM (515 ft-lb.)
Jaw Torque Mc:	620NM (456 ft-lb.)
Max Pressure:	1,700kPa (250 psi)

\*at 690 kPa (100 psi)



# ZAYTRAN SIGMA® Grippers

**“Sigma” - The mathematical term that defines the distance from the norm.  
SIGMA Grippers - The grippers that serve “Beyond Normal” applications.**

## Linear Bearing Rail - The SIGMA Difference

The SIGMA concept was developed for applications that impart high acceleration to heavy objects or require extremely long, precisely positioned jaws. These applications put extreme stress on the gripper. SIGMA grippers use a linear bearing system, the same system that is used in modern machine tools, to isolate the precision jaw positioning system from jaw torque and force. The

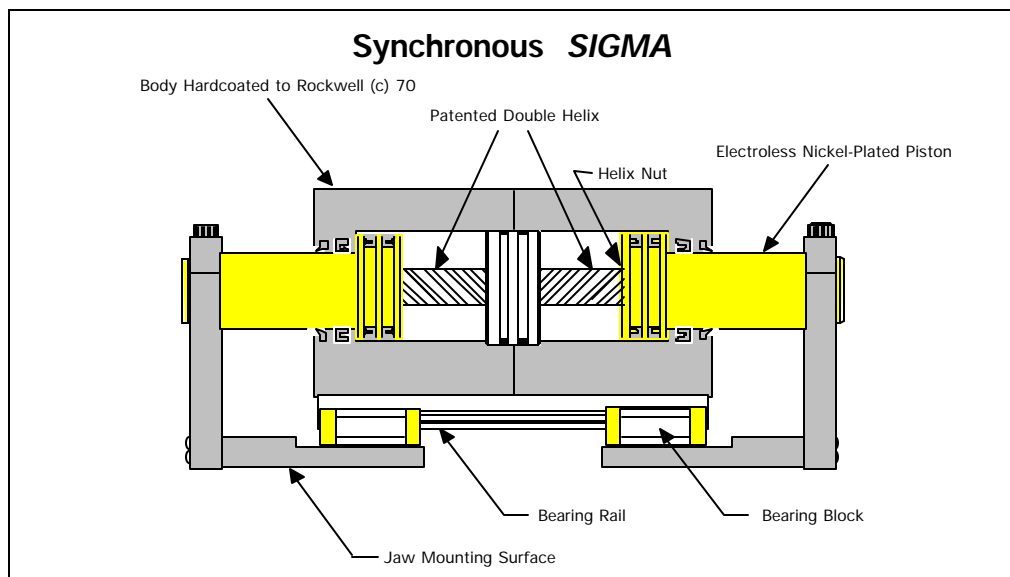
linear bearing rail allows the grippers to be small and light weight while delivering gripping force in excess of 700 pounds (@ 100 psi) and to tolerate jaw torque of 1,000 foot pounds. SIGMA grippers truly deliver:

**“TWICE THE FORCE...HALF THE SIZE”.**

## Patented Synchronous Technology - Extended Life

The synchronous SIGMA utilizes ZAYTRAN US patent number 4591199. The force and synchronizing double helix are independent systems. The double helix works only to center the part to  $\pm 0.001$  inches. All of the gripping

force is provided by two pistons that are driven either pneumatically or hydraulically. The independence of the force and synchronization systems provides precision over the typical 10,000,000+ cycle life of the unit.



## Material and Process Selection - Machine Tool Quality

Hundreds of SIGMA grippers have demonstrated ZAYTRAN machine tool quality in die casting, forging, and other torturous environments. SIGMA bodies are hardcoated to a Rockwell(c) 70

hardness. All cylinder bores are roller burnished and Teflon® impregnated to improve seal life and minimize friction. The pistons are ground and



# Application Flexibility

## *Four Styles of Gripper*

### **SYNCHRONOUS - Moves parts from a poorly defined to a well defined position.**

The synchronized *SIGMA* uses the patented ZAYTRAN double helix technology to implement the classic gripper style. This style centers parts to  $\pm 0.0010$ ". The long stroke offered by all of the

*SIGMA* grippers allows an entire family of parts to be assembled, picked and placed, or held for machining operations without changing the gripper or the tooling.

### **NON-SYNCHRONOUS - Moves parts from a well defined to a poorly defined position.**

In many applications the part is being withdrawn from a well defined position. The part is captured by a holding device like a chuck, nest or mold. In these cases, the holding device determines the centerline of the part. If a synchronous gripper is used it will also dictate a centerline that will be different by the error in the positioning system. Two different centerlines means that the part will be

"racked" or "dinged" when it is removed from the holding device.

The non-synchronous *SIGMA* complies to the position of the part, it does not dictate a centerline but "honors" the existing centerline. This avoids the problems induced by errors in the positioning system.

### **SEQUENCED - References an edge or surface of the part rather than the center.**

When the application requires a family of parts be presented with reference to an edge or surface, a sequenced gripper is required. The sequenced *SIGMA* first closes jaw 1 to a final position (this references the surface or edge), then jaw 2 complies

with the other side of the part. In welding, riveting and other "surface sensitive" operations, the sequenced *SIGMA* will present the surface to the process regardless of the thickness of the material.

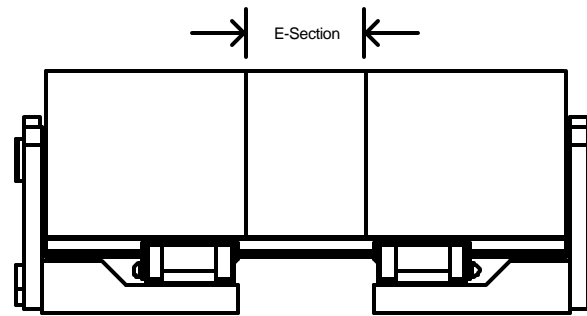
### **QUAD-PORTED - Used when complete system control of each jaw is required.**

In some sequenced or compliant applications, the timing and force exerted by each jaw is critical to the success of the process. In these cases, the Quad-Ported *SIGMA* provides the user with the ultimate

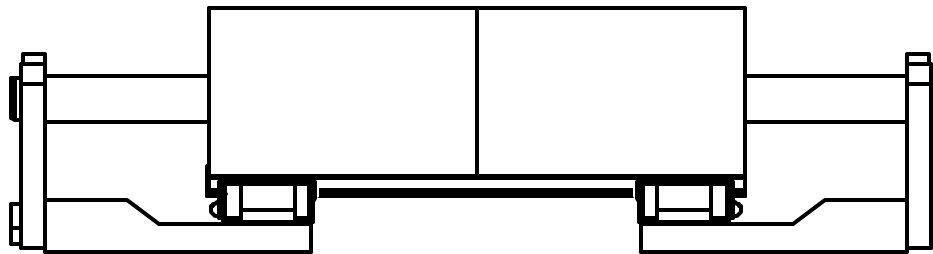
in flexibility. Each jaw is independently ported both open and closed. This porting provides for the ultimate in control. Each jaw can be timed, run at a unique pressure, and driven at a unique speed.

# ZAYTRAN SIGMA™ Grippers

## Special Capabilities

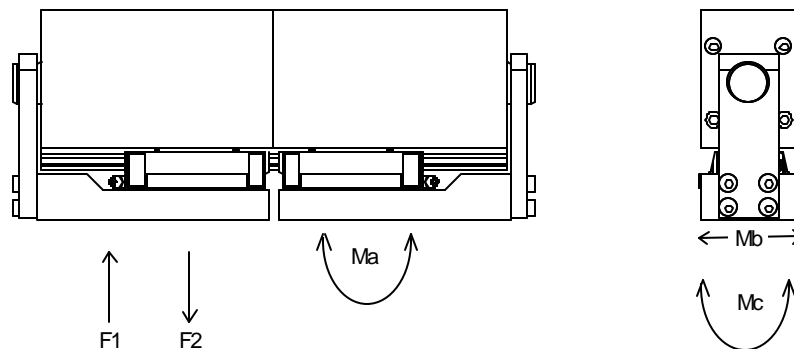


E-Sections can be added to increase the "reach" so that long parts may be picked up by the ends.



Custom, ultra long stroke capability is available to handle a very wide range of part sizes.

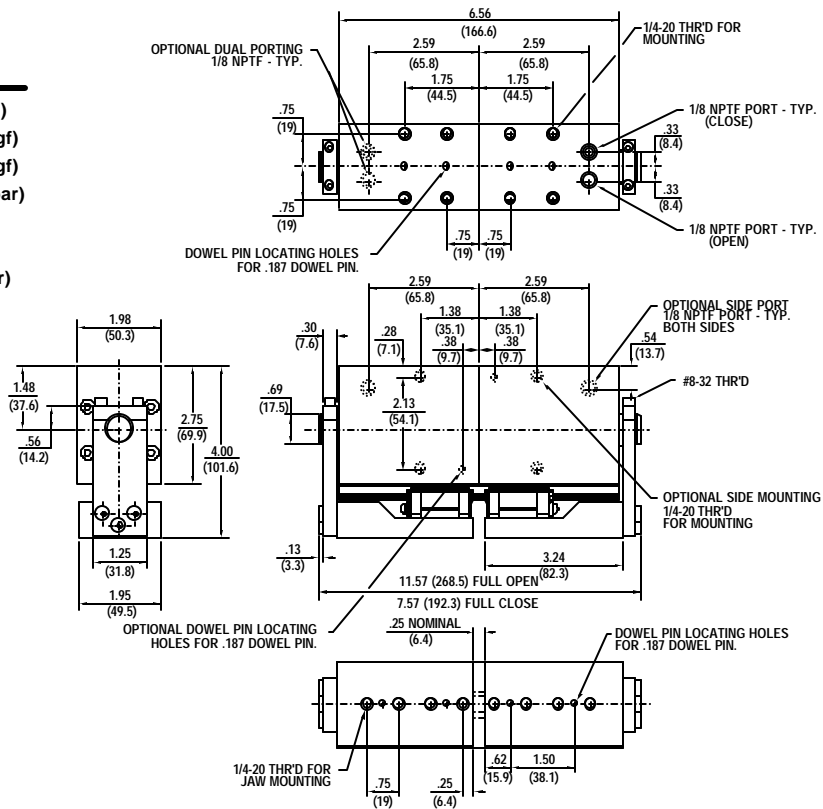
## SIGMA™ JAW TORQUE & FORCE



Model	Ma Ft-Lbs (kgf-M)	Mb Ft-Lbs (kgf-M)	Mc Ft-Lbs (kgf-M)	F1 Lbs (kgf)	F2 Lbs (kgf)
<b>SIGMA 40</b>	91 (13)	80 (12)	56 (8)	123 (56)	76 (34)
<b>SIGMA 1</b>	200 (28)	200 (28)	228 (32)	492 (224)	305 (136)
<b>SIGMA 2</b>	338 (47)	338 (47)	374 (52)	1500 (670)	1000 (450)
<b>SIGMA 4</b>	538 (75)	538 (75)	634 (89)	2000 (895)	1670 (725)
<b>SIGMA 6</b>	803 (103)	883 (111)	1011 (140)	2500 (1110)	1670 (725)

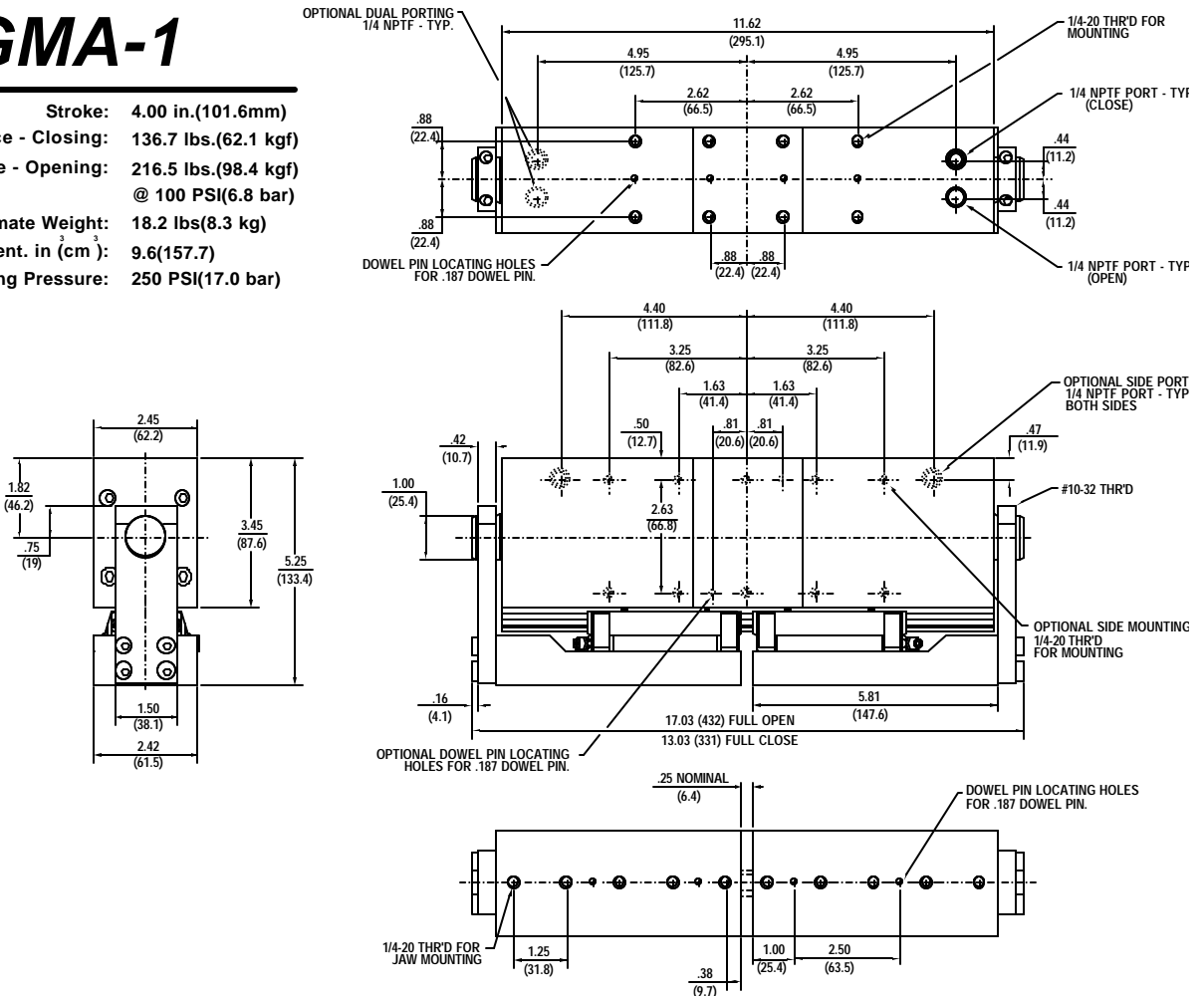
# SIGMA-40

**Stroke:** 3.00 in.(76.2mm)  
**Gripping Force - Closing:** 58.2 lbs.(26.4 kgf)  
**Gripping Force - Opening:** 97.9 lbs.(44.5 kgf)  
 @ 100 PSI(6.8 bar)  
**Approximate Weight:** 6.5 lbs(2.9 kg)  
**Operating displacement, in (cm):** 3.276(53.7)  
**Maximum Operating Pressure:** 250 PSI(17.0 bar)



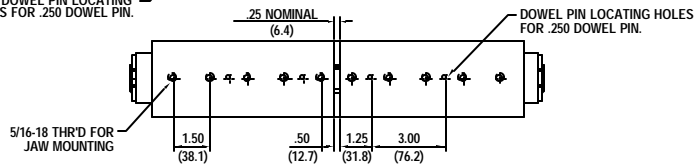
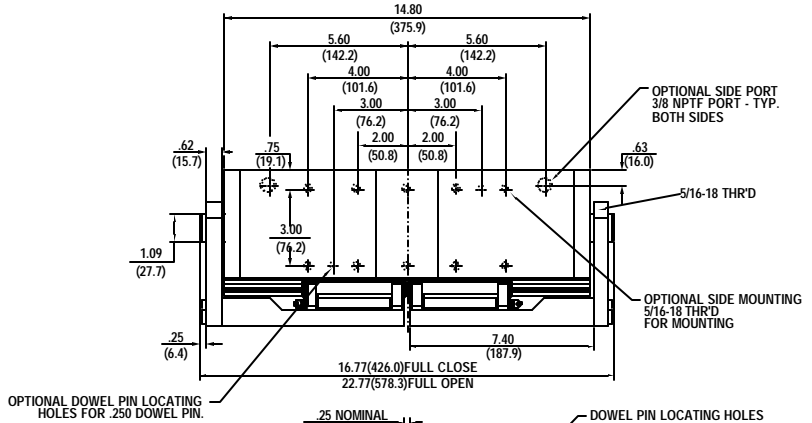
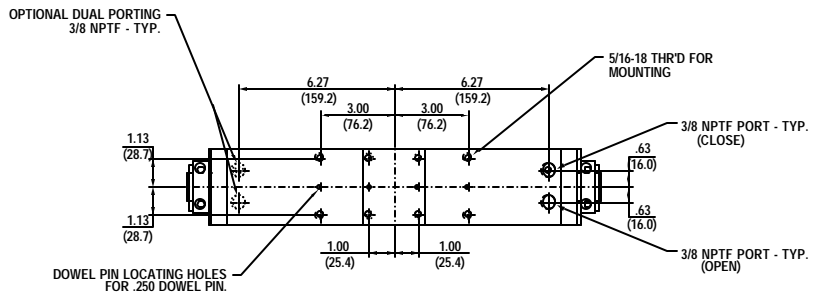
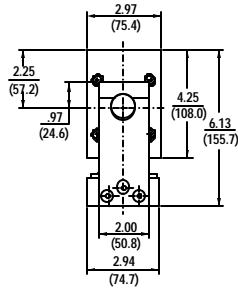
# SIGMA-1

**Stroke:** 4.00 in.(101.6mm)  
**Gripping Force - Closing:** 136.7 lbs.(62.1 kgf)  
**Gripping Force - Opening:** 216.5 lbs.(98.4 kgf)  
 @ 100 PSI(6.8 bar)  
**Approximate Weight:** 18.2 lbs(8.3 kg)  
**Operating displacement, in (cm):** 9.6(157.7)  
**Maximum Operating Pressure:** 250 PSI(17.0 bar)



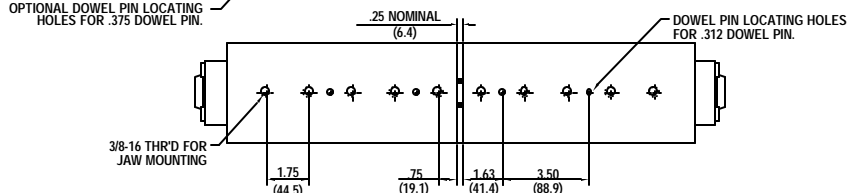
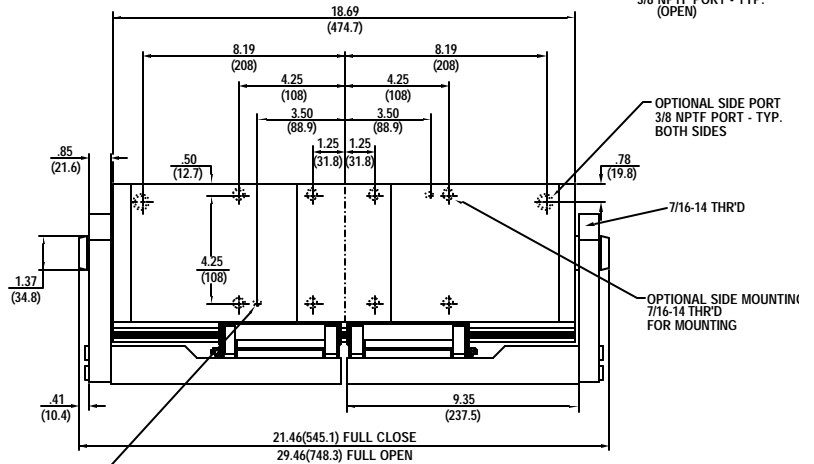
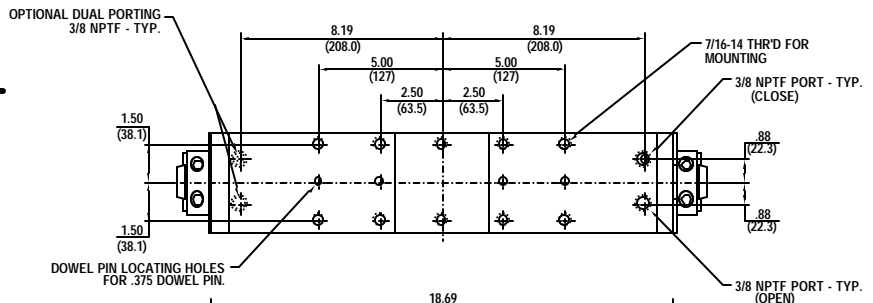
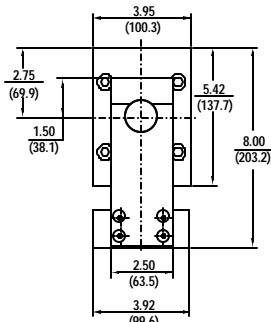
# SIGMA-2

**Stroke:** 6.00 in.(152.4mm)  
**Gripping Force - Closing:** 223.0 lbs.(101.4 kgf)  
**Gripping Force - Opening:** 311.7 lbs.(141.7 kgf)  
 @ 100 PSI(6.8 bar)  
**Approximate Weight:** 29 lbs(13 kg)  
**Operating displacement. in (cm ):** 20.86(341.9)  
**Maximum Operating Pressure:** 250 PSI(17.0 bar)



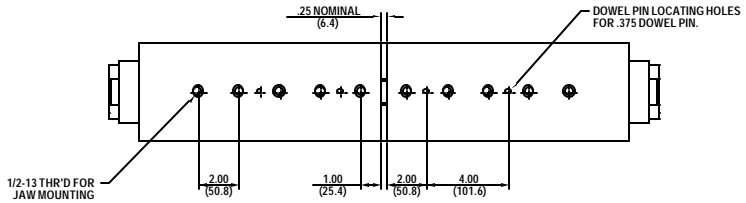
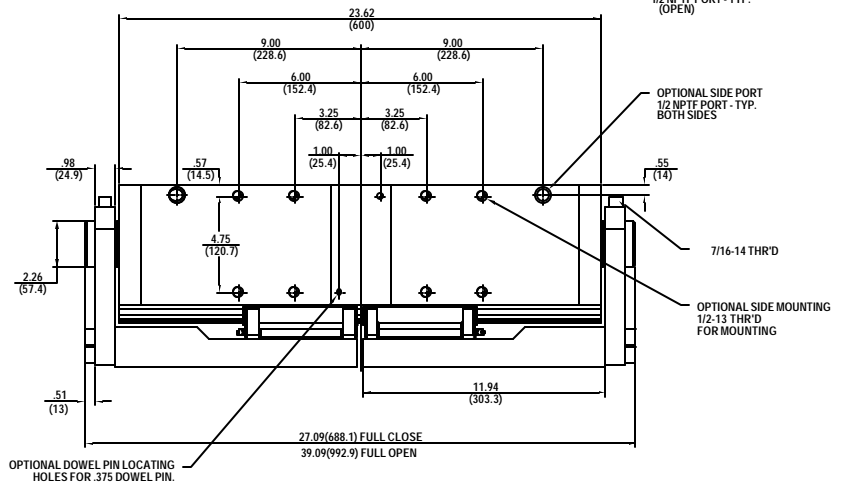
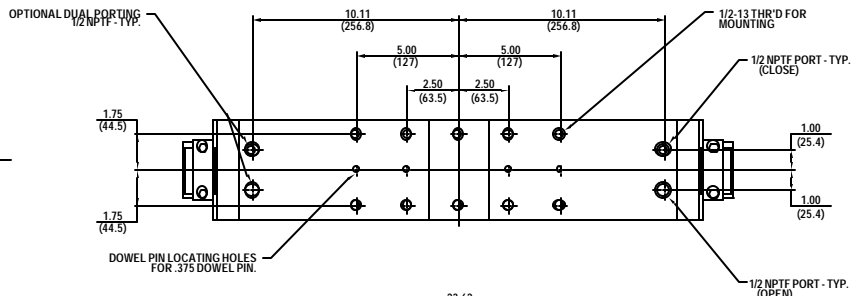
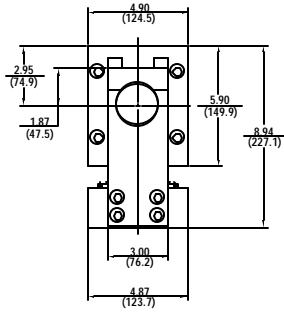
# SIGMA-4

**Stroke:** 8.00 in.(203.2mm)  
**Gripping Force - Closing:** 503.5 lbs.(228.9 kgf)  
**Gripping Force - Opening:** 636.2 lbs.(289.2 kgf)  
 @ 100 PSI(6.8 bar)  
**Approximate Weight:** 62 lbs(28 kg)  
**Operating displacement. in (cm ):** 56.5(926.8)  
**Maximum Operating Pressure:** 250 PSI(17.0 bar)

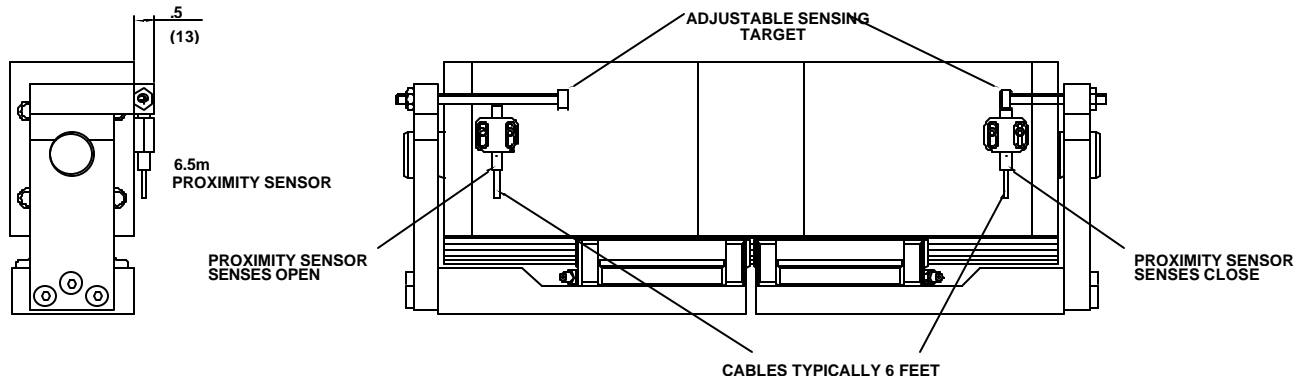


# SIGMA-6

**Stroke:** 12.00 in.(304.8mm)  
**Gripping Force - Closing:** 773.1 lbs.(351.4 kgf)  
**Gripping Force - Opening:** 1130.9 lbs.(514.0 kgf)  
**@ 100 PSI(6.8 bar)**  
**Approximate Weight:** 130 lbs(59 kg)  
**Operating displacement. in (cm):** 151(2747.9)  
**Maximum Operating Pressure:** 250 PSI(17.0 bar)



# Open and Closed Sensors



## High Efficiency Seals & Lubricants

### Seal Composition

Three types of seals are available:

Standard -	Buna-N;	-40 to 180°F
High Temp-	Viton;	-40 to 300°F
Non-Lube-	Nitroxile;	-40 to 180 °F

### Lubricants

All grippers are pre-lubricated with a "lifetime" lubricant. This lubricant is designed to last approximately 10,000,000 cycles in typical applications.

## ORDERING INFORMATION

### Format: SIGMA-2, A, B, XC

#### A=Gripper Style

Blank:	Synchronous
NON:	Non-Synchronous
SEQ:	Sequenced
QUAD:	Quad-Ported

#### B=Seal Requirement

Blank:	Buna-N
N:	Nitroxile
V:	Viton

#### XC=Sensor Requirement

X=1:	One Sensor
X=2:	Two Sensors

C=DCSINK:	DC Sinking
C=DCSOUR:	DC Sourcing
C=ACNO:	AC Normally Open
C=ACNC:	AC Normally Closed

### Example: SIGMA-2, V, 2DCSINK

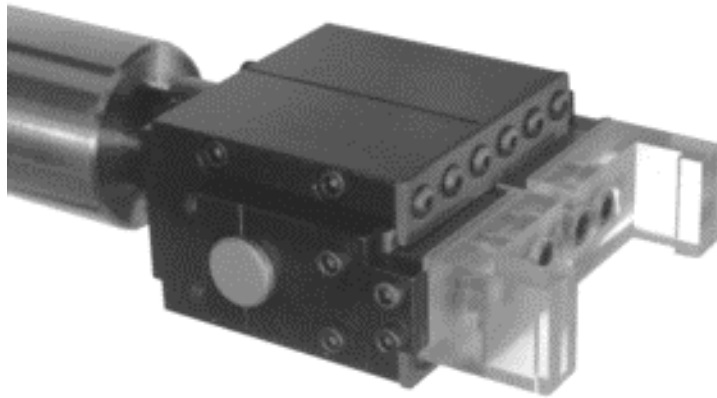
Sigma-2, Synchronous, Viton Seals, two position DC proximity sensors-sinking

# ZAYTRAN Parallel Grippers

## Machine Tool Quality

Thousands of ZAYTRAN parallel grippers have demonstrated machine tool quality in die casting, forging, and other torturous environments. Bodies are hardcoated to a Rockwell(c) 70 hardness. All cylinder bores are roller burnished and TFE impregnated to improve seal life and minimize friction. The pistons are ground and electroless

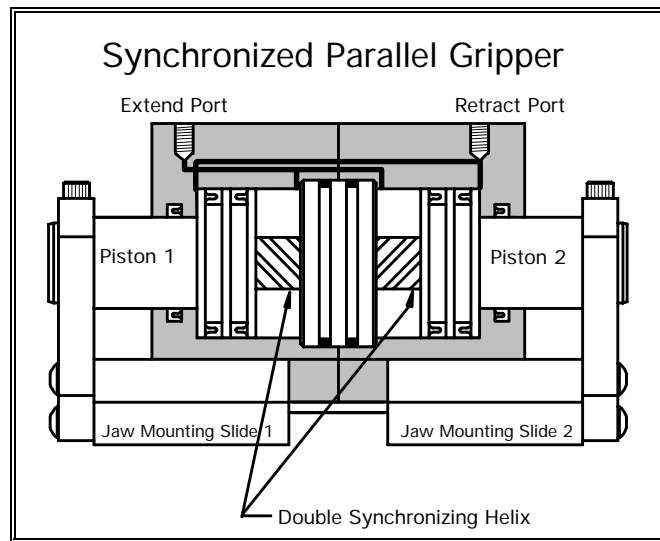
nickel-plated for environmental hardening and to minimize seal friction. Gib plates are hardened and ground and the solid steel movable, jaw-mounting slide is electroless nickel-plated. ZAYTRAN parallel grippers are engineered to go **10,000,000 cycles** and beyond!



## Patented Synchronous Technology - Extended Life

Synchronous grippers utilize ZAYTRAN US patent number 4591199. The force and synchronizing double helix are independent systems. The double helix works only to center the part to  $\pm 0.001$  inches. All of the gripping

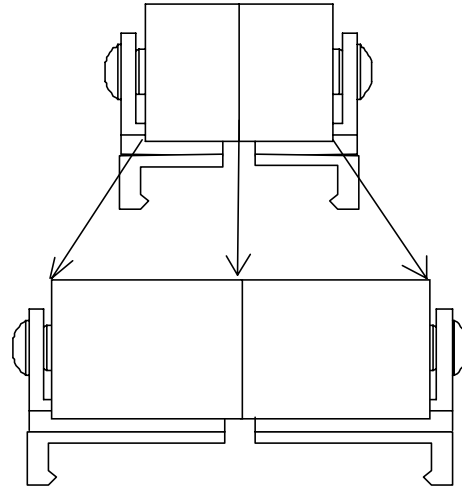
force is provided by two pistons that are driven either pneumatically or hydraulically. The independence of the force and synchronization systems provides precision over the typical 10,000,000+ cycle life of the unit.



# ZAYTRAN Grippers

## Special Capabilities

ZAYTRAN offers the broadest line of parallel grippers available today. The GPL Long stroke grippers provide unsurpassed flexibility in handling a wide variety of parts.

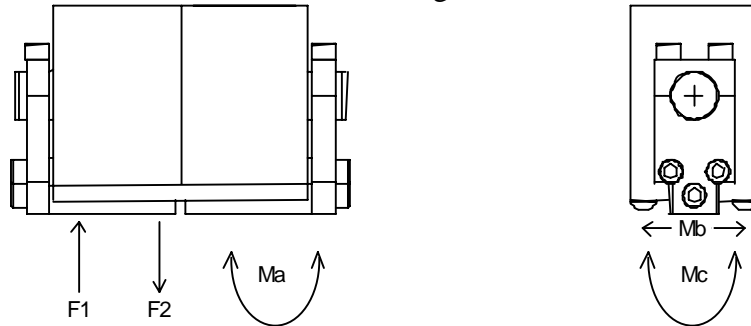


### Ultra Long Stroke

To handle a wide variety of parts

## JAW TORQUE & FORCE

The forces and moments indicated in the chart below are for loads after the gripper has grasped the part and the jaws have completed their motion. If force and torque is applied to the gripper while the jaw is moving please see the ZAYTRAN XRAY® series catalog.



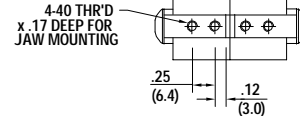
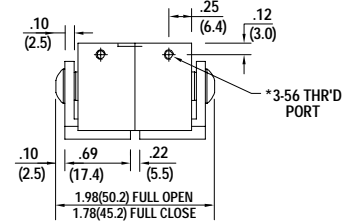
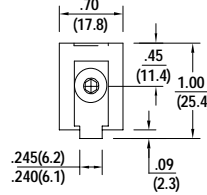
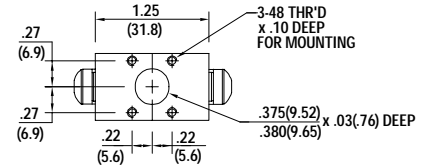
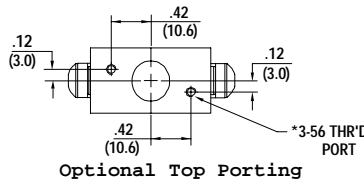
Model	Ma IN-Lbs (kgf-CM)	Mb IN-Lbs (kgf-CM)	Mc IN-Lbs (kgf-CM)	F1 Lbs (kgf)	F2 Lbs (kgf)
GP to GPUL-5	32 (35)	43 (50)	54 (60)	5 (2.3)	5 (2.3)
GP & GPL-10	97 (100)	162 (190)	86 (100)	12 (5.5)	14 (6.4)
GP & GPL-20	162 (180)	270 (300)	130 (150)	24 (10.9)	28 (12.7)
GP & GPL-40	295 (340)	432 (500)	302 (350)	62 (28.0)	42 (19.2)
GP & GPL-100	648 (750)	1080 (1250)	1231 (1400)	246 (111.8)	169 (77.0)
GP & GPL-200	1095 (1250)	1825 (2100)	2020 (2300)	750 (340.9)	556 (252.5)
GP & GPL-400	1743 (2000)	2905 (3350)	3424 (4000)	1000 (454.5)	928 (421.7)



# GP-5

Standard Stroke

- Stroke: 0.20 in.(5.08 mm)
- Gripping Force - Closing: 6.9 lbs.(3.1kgf)
- Gripping Force - Opening: 13.5 lbs.(6.1 kgf)
- Gripping Force: @ 100 PSI(6.80 bar)
- Approximate Weight: 1.63 oz.(45.36 g)
- Operating displacement.  $\text{in}(\text{cm})$  :  $\sqrt[3]{.030(.491)}$
- Maximum Operating Pressure: 150 PSI(10.20 bar), Air only

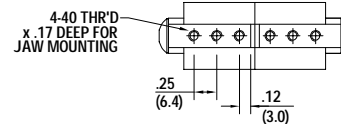
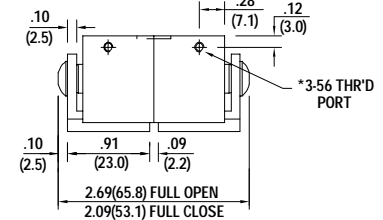
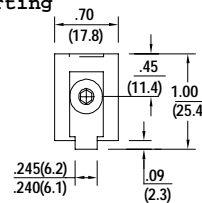
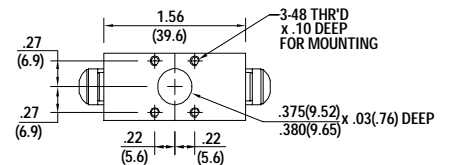
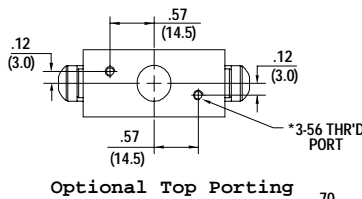


\*BARBED FITTING FOR 1/16 I.D. TUBE SUPPLIED BY ZAYTRAN INC.

# GPL-5

Long Stroke

- Stroke: 0.50 in.(12.7 mm)
- Gripping Force - Closing: 6.9 lbs.(23.1 kgf)
- Gripping Force - Opening: 13.5 lbs.(6.1 kgf)
- Gripping Force: @ 100 PSI(6.80 bar)
- Approximate Weight: 2.02 oz.(57.27 g)
- Operating displacement.  $\text{in}(\text{cm})$  :  $\sqrt[3]{.075(1.23)}$
- Maximum Operating Pressure: 150 PSI(10.20 bar), Air only

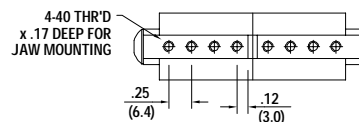
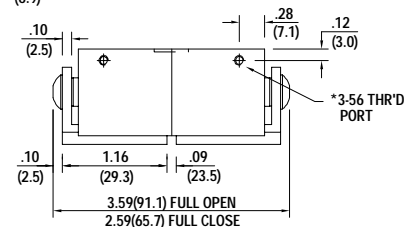
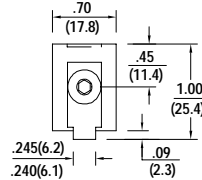
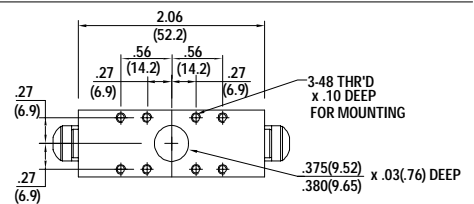
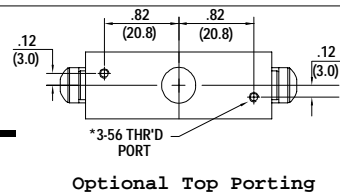


\*BARBED FITTING FOR 1/16 I.D. TUBE SUPPLIED BY ZAYTRAN INC.

# GPUL-5

Ultra Long Stroke

- Stroke: 1.00 in.(25.4 mm)
- Gripping Force - Closing: 6.9 lbs.(3.1 kgf)
- Gripping Force - Opening: 13.5 lbs.(6.1 kgf)
- Gripping Force: @ 100 PSI(6.80 bar)
- Approximate Weight: 2.53 oz.(71.72 g)
- Operating displacement.  $\text{in}(\text{cm})$  :  $\sqrt[3]{.150(2.46)}$
- Maximum Operating Pressure: 150 PSI(10.2 bar), Air only



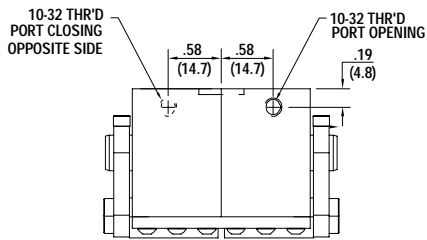
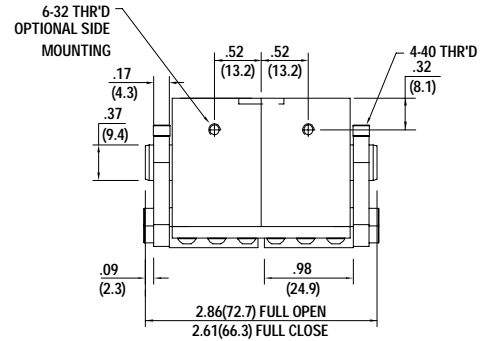
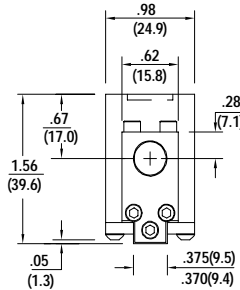
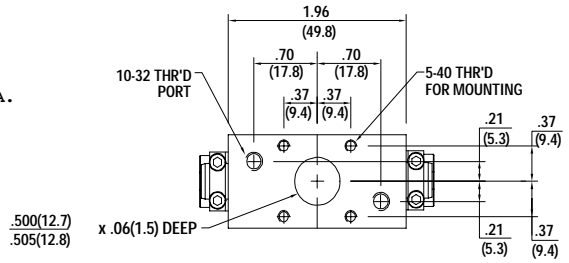
\*BARBED FITTING FOR 1/16 I.D. TUBE SUPPLIED BY ZAYTRAN INC.

# GP-10

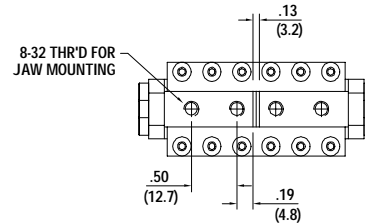
Standard Stroke

Stroke: 0.25 in.(6.35 mm)  
 Gripping Force - Closing: 17.2 lbs.(7.8 kgf)  
 Gripping Force - Opening: 26.9 lbs.(12.2 kgf)  
 Gripping Force: @ 100 PSI(6.8 bar)  
 Approximate Weight: .51 lbs.(231.33 g)  
 Operating displacement. in(cm) : .075(1.23)  
 Maximum Operating Pressure: 250 PSI(17.0 bar)

\* ALL MTG. HOLES 1-1/2 DIA.  
 MIN. THREAD DEPTH.



Optional Side Porting

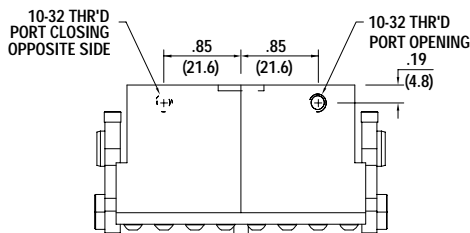
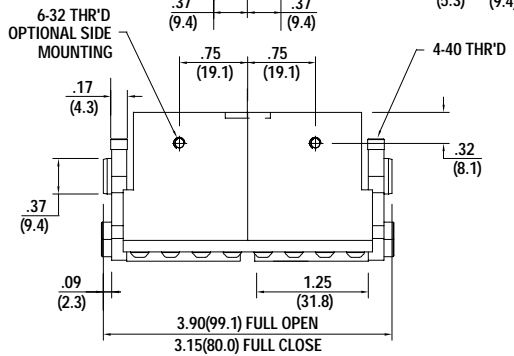
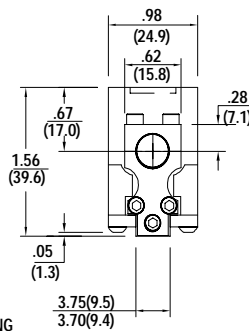
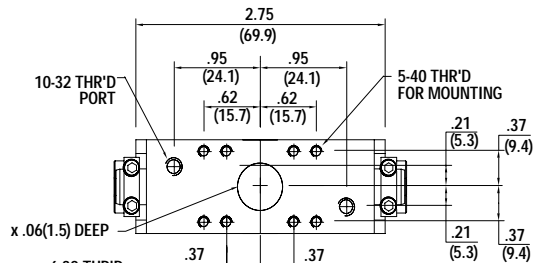


# GPL-10

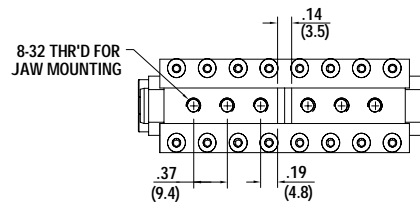
Long Stroke

Stroke: 0.75 in.(19.1mm)  
 Gripping Force - Closing: 17.2 lbs.(7.8 kgf)  
 Gripping Force - Opening: 26.9 lbs.(12.2 kgf)  
 Gripping Force: @ 100 PSI(6.8 bar)  
 Approximate Weight: .75 lbs.(340.2 g)  
 Operating displacement. in(cm) : .225(3.69)  
 Maximum Operating Pressure: 250 PSI(17.0 bar)

\* ALL MTG. HOLES 1-1/2 DIA.  
 MIN. THREAD DEPTH.



OPTIONAL SIDE PORTING

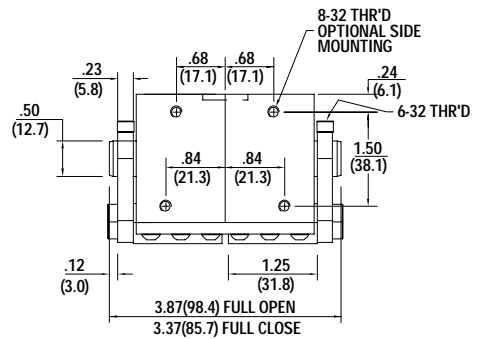
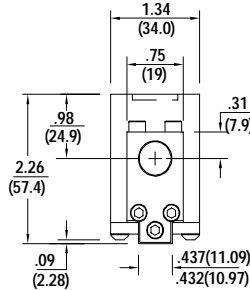
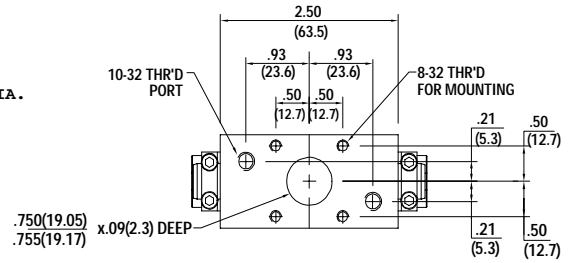


# GP-20

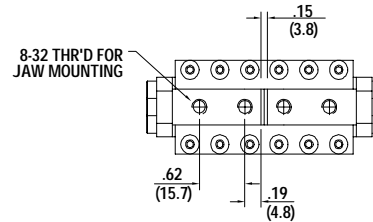
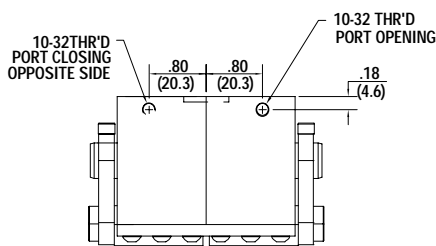
Standard Stroke

Stroke: 0.50 in.(12.7 mm)  
 Gripping Force - Closing: 30.4 lbs.(13.8 kgf)  
 Gripping Force - Opening: 52.5 lbs.(23.8 kgf)  
 Gripping Force: @ 100 PSI(6.8 bar)  
 Approximate Weight: 1.15 lbs.(521.63 g)  
 Operating displacement. in(cm) : .293(4.80)  
 Maximum Operating Pressure: 250 PSI(17.0 bar)

\* ALL MTG. HOLES 1-1/2 DIA.  
 MIN. THREAD DEPTH.



## Optional Side Porting

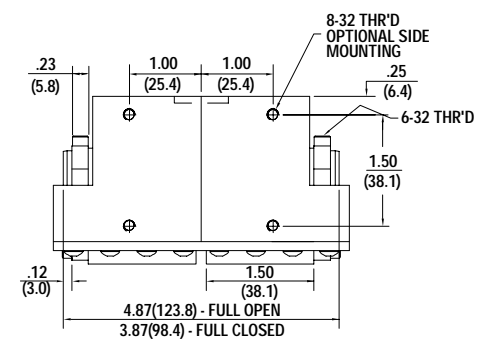
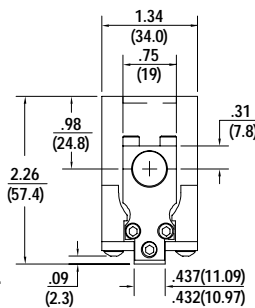
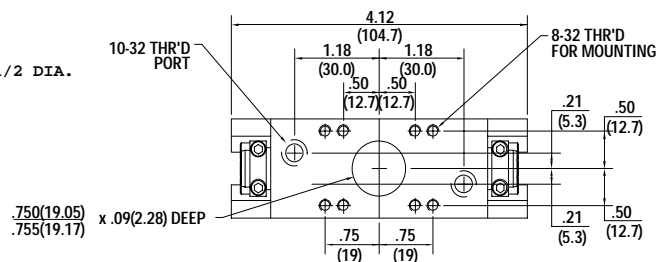


# GPL-20

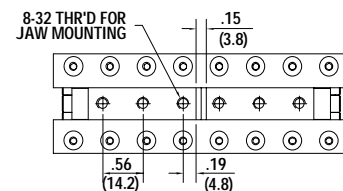
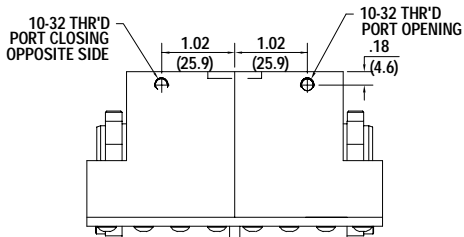
Long Stroke

Stroke: 1.00 in.(25.4mm)  
 Gripping Force - Closing: 30.4 lbs.(13.8 kgf)  
 Gripping Force - Opening: 52.5 lbs.(23.8 kgf)  
 Gripping Force: @ 100 PSI(6.8 bar)  
 Approximate Weight: 1.43 lbs.(648.64 g)  
 Operating displacement. in(cm) : .586(9.60)  
 Maximum Operating Pressure: 250 PSI(17.0 bar)

\* ALL MTG. HOLES 1-1/2 DIA.  
 MIN. THREAD DEPTH.



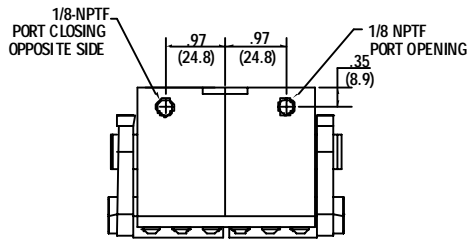
## Optional Side Porting



# GP-40

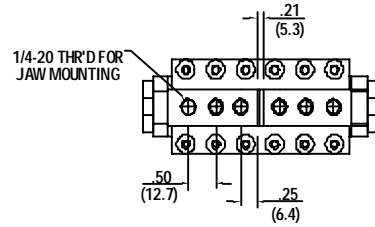
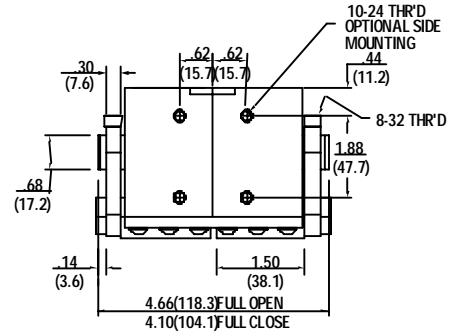
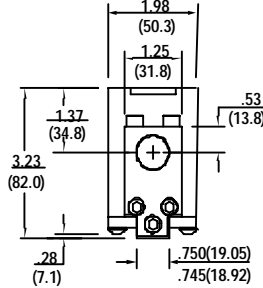
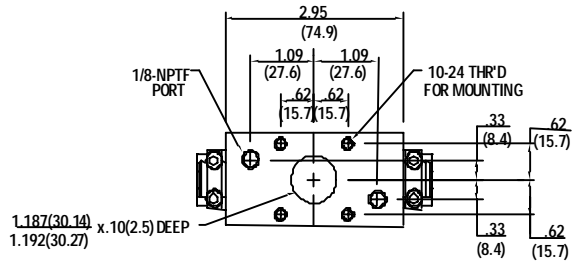
Standard Stroke

Stroke:	0.56 in.(14.2 mm)
Gripping Force - Closing:	58.2 lbs.(26.4 kgf)
Gripping Force - Opening:	97.9 lbs.(44.4 kgf)
Gripping Force:	@ 100 PSI(6.8 bar)
Approximate Weight:	2.95 lbs.(1338.10 g)
Operating displacement. in(cm): <sup>3</sup>	.614(10.06)
Maximum Operating Pressure:	250 PSI(17.0 bar)



OPTIONAL SIDE PORTING

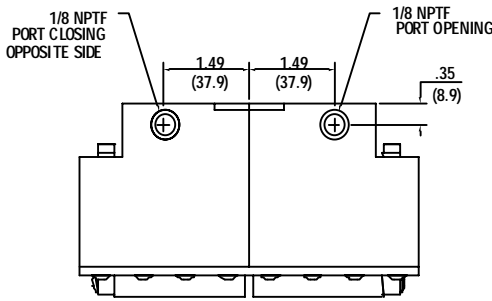
\* ALL MTG. HOLES 1-1/2 DIA. MIN. THREAD DEPTH.



# GPL-40

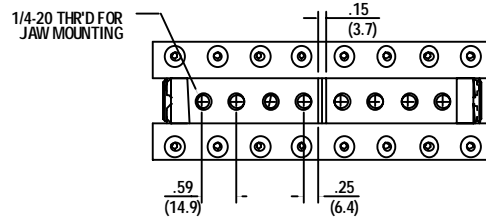
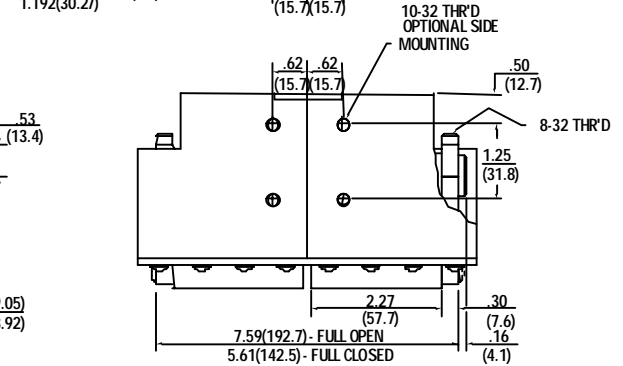
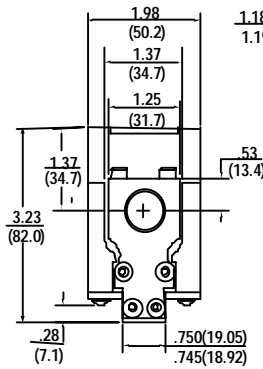
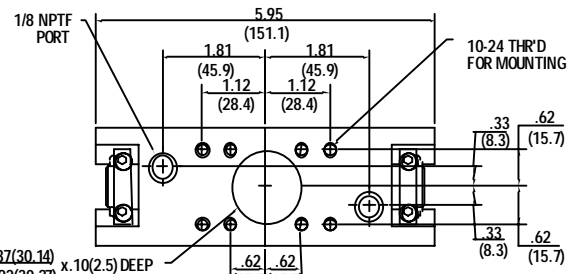
Long Stroke

Stroke:	2.00 in.(50.8mm)
Gripping Force - Closing:	58.2 lbs.(26.4 kgf)
Gripping Force - Opening:	97.9 lbs.(44.4 kgf)
Gripping Force:	@ 100 PSI(6.8 bar)
Approximate Weight:	4.33 lbs.(1964.06 g)
Operating displacement. in(cm): <sup>3</sup>	2.184(35.78)
Maximum Operating Pressure:	250 PSI(17.0 bar)



OPTIONAL SIDE PORTING

\* ALL MTG. HOLES 1-1/2 DIA. MIN. THREAD DEPTH.

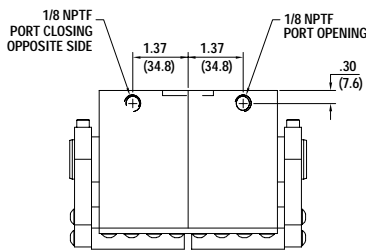


# GP-100

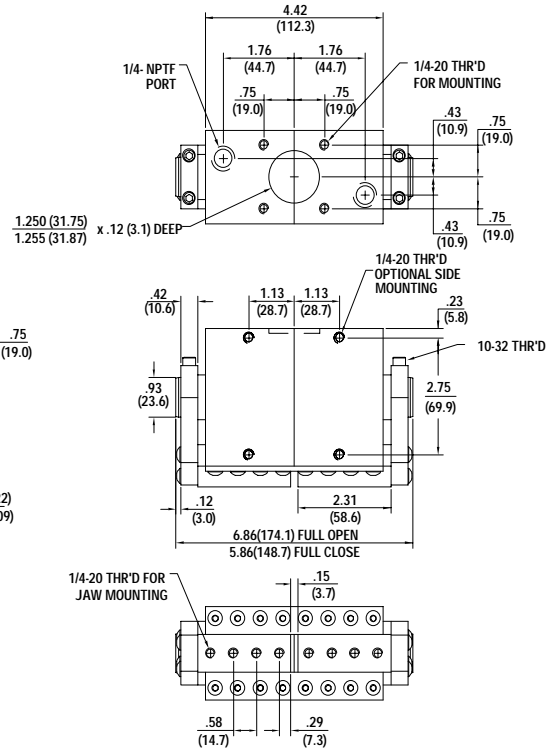
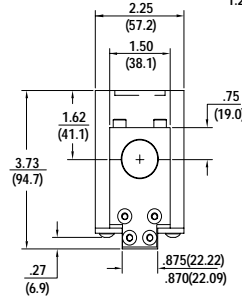
Standard Stroke

Stroke: 1.00 in.(25.4 mm)  
 Gripping Force - Closing: 136.8 lbs.(62.0 kg)  
 Gripping Force - Opening: 216.5 lbs.(98.2 kg)  
 Gripping Force: @ 100 PSI(6.8 bar)  
 Approximate Weight: 6.00 lbs.(2721.55 g)  
 Operating displacement.  $\frac{3}{32}$  in( $\frac{3}{32}$  cm): 2.408 (39.459)  
 Maximum Operating Pressure: 250 PSI(17.0 bar)

\* ALL MTG. HOLES 1-1/2 DIA.  
 MIN. THREAD DEPTH.



Optional Side Porting



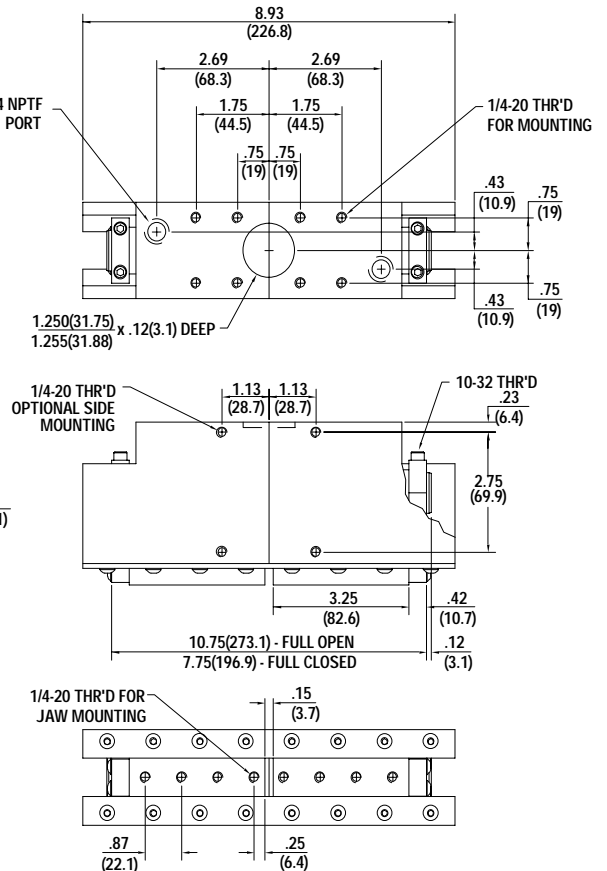
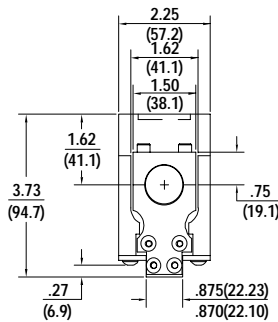
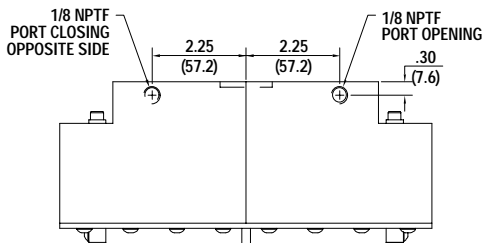
# GPL-100

Long Stroke

Stroke: 3.00 in.(76.2mm)  
 Gripping Force - Closing: 136.8 lbs.(62.0 kgf)  
 Gripping Force - Opening: 216.5 lbs.(98.2 kgf)  
 Gripping Force: @ 100 PSI(6.8 bar)  
 Approximate Weight: 9.24 lbs.(4191.19 g)  
 Operating displacement.  $\frac{3}{32}$  in( $\frac{3}{32}$  cm): 7.216(118.24)  
 Maximum Operating Pressure: 250 PSI(17.0 bar)

\* ALL MTG. HOLES 1-1/2 DIA.  
 MIN. THREAD DEPTH.

## OPTIONAL SIDE PORTING



# GP-200

Standard Stroke

\* ALL MTG. HOLES 1-1/2 DIA.  
MIN. THREAD DEPTH.

Stroke: 1.62 in.(41.15 mm)

Gripping Force - Closing: 223.1 lbs.(101.2 kgf)

Gripping Force - Opening: 311.7 lbs.(141.4 kgf)

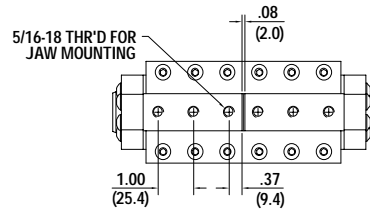
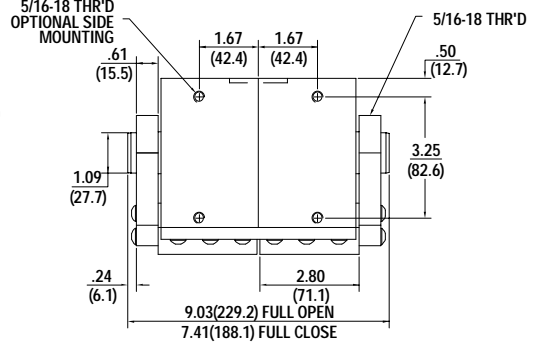
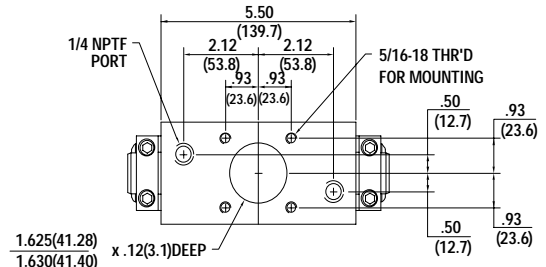
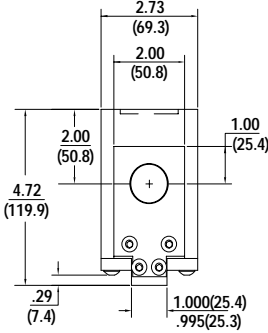
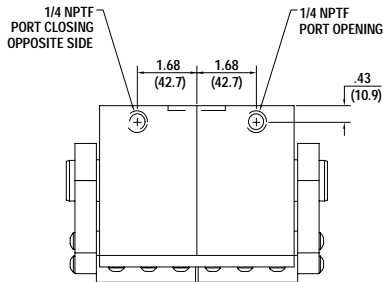
Gripping Force: @ 100 PSI(6.8 bar)

Approximate Weight: 11.63 lbs.(5275.28 g)

Operating displacement. in(cm) : 5.780 (94.72)

Maximum Operating Pressure: 250 PSI(17.0 bar)

## OPTIONAL SIDE PORTING



# GPL-200

Long Stroke

\* ALL MTG. HOLES 1-1/2 DIA.  
MIN. THREAD DEPTH.

Stroke: 4.00 in.(101.6mm)

Gripping Force - Closing: 223.1 lbs.(101.2 kgf)

Gripping Force - Opening: 311.7 lbs.(141.4 kgf)

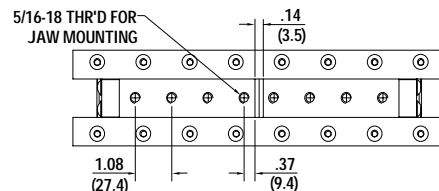
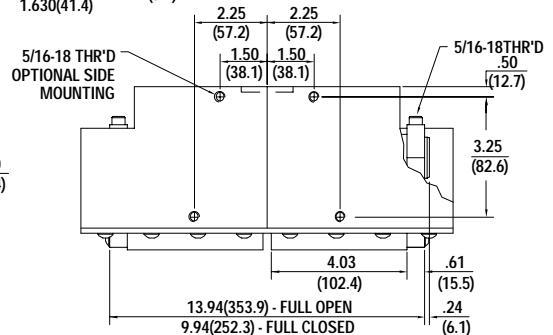
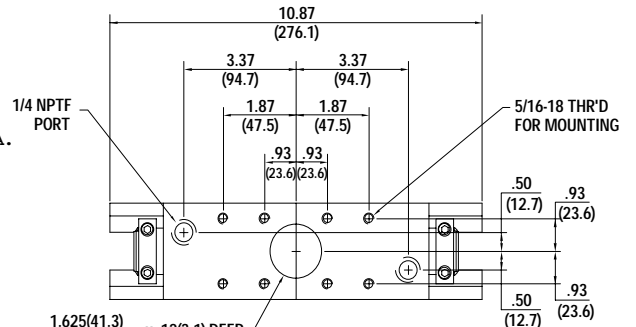
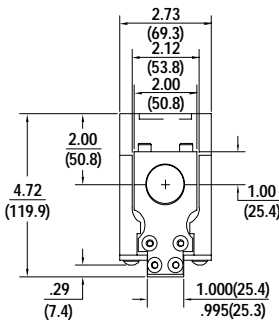
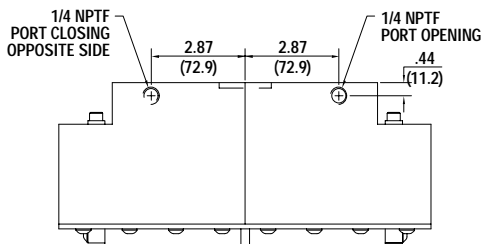
Gripping Force: @ 100 PSI(6.8 bar)

Approximate Weight: 16.38 lbs.(7429.84 g)

Operating displacement. in(cm) : 13.894(227.68)

Maximum Operating Pressure: 250 PSI(17.0 bar)

## OPTIONAL SIDE PORTING



# GP-400

Standard Stroke

\* ALL MTG. HOLES 1-1/2 DIA.  
MIN. THREAD DEPTH.

Stroke: 2.50 in.(83.5 mm)

Gripping Force - Closing: 503.5 lbs.(228.4 kgf)

Gripping Force - Opening: 636.2 lbs.(288.7 kgf)

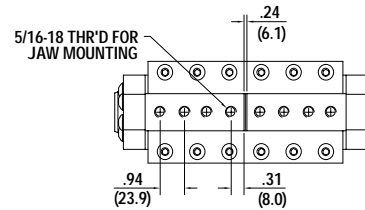
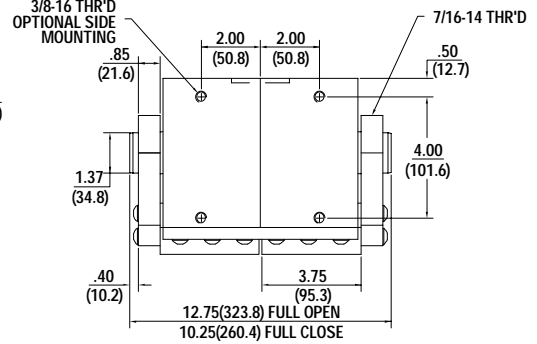
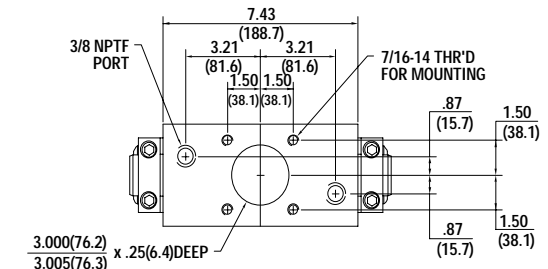
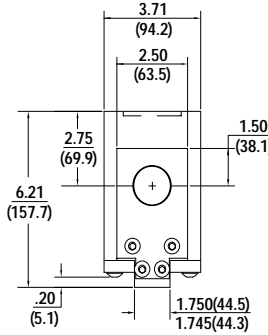
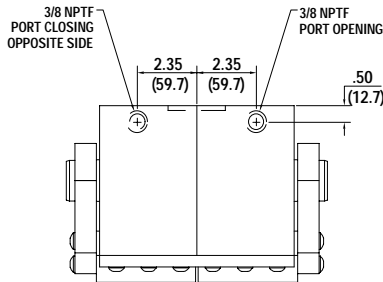
Gripping Force: @ 100 PSI(6.8 bar)

Approximate Weight: 28.5 lbs.(12927.38 g)

Operating displacement. in(cm) : 17.671 (289.6)

Maximum Operating Pressure: 250 PSI(17.0 bar)

## OPTIONAL SIDE PORTING



# GPL-400

Long Stroke

\* ALL MTG. HOLES 1-1/2 DIA.  
MIN. THREAD DEPTH.

Stroke: 6.00 in.(152.4mm)

Gripping Force - Closing: 503.5 lbs.(228.4 kgf)

Gripping Force - Opening: 636.2 lbs.(288.7 kgf)

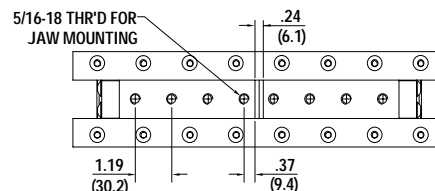
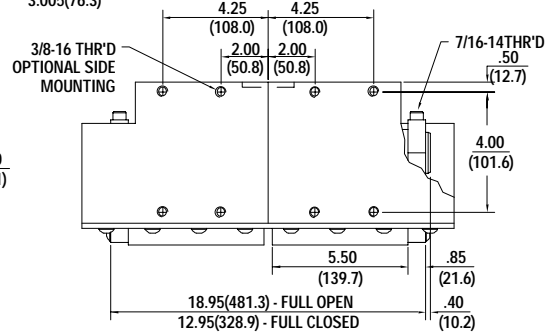
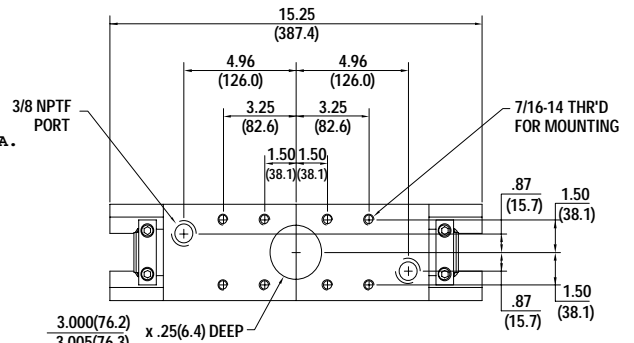
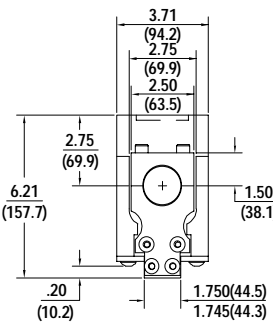
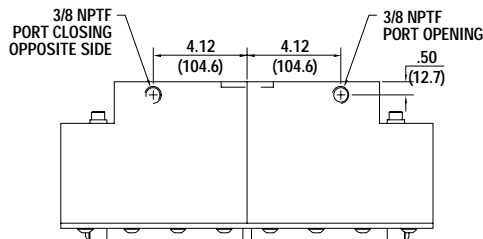
Gripping Force: @ 100 PSI(6.8 bar)

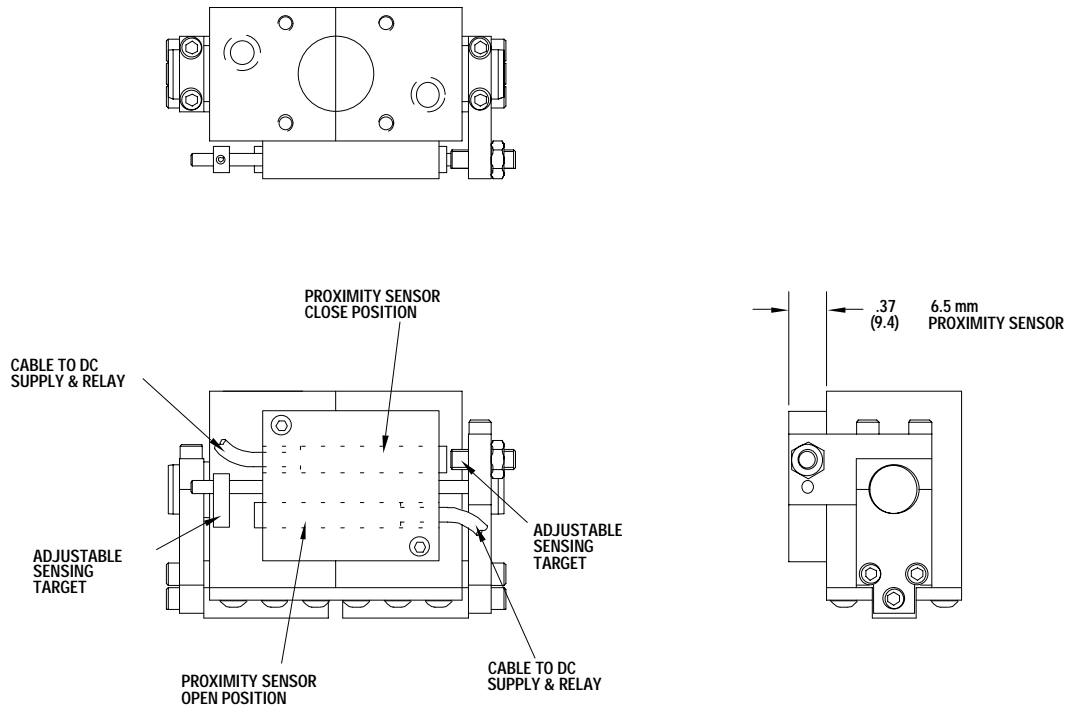
Approximate Weight: 39.88 lbs.(18089.26 g)

Operating displacement. in(cm) : 42.411(695.0)

Maximum Operating Pressure: 250 PSI(17.0 bar)

## OPTIONAL SIDE PORTING

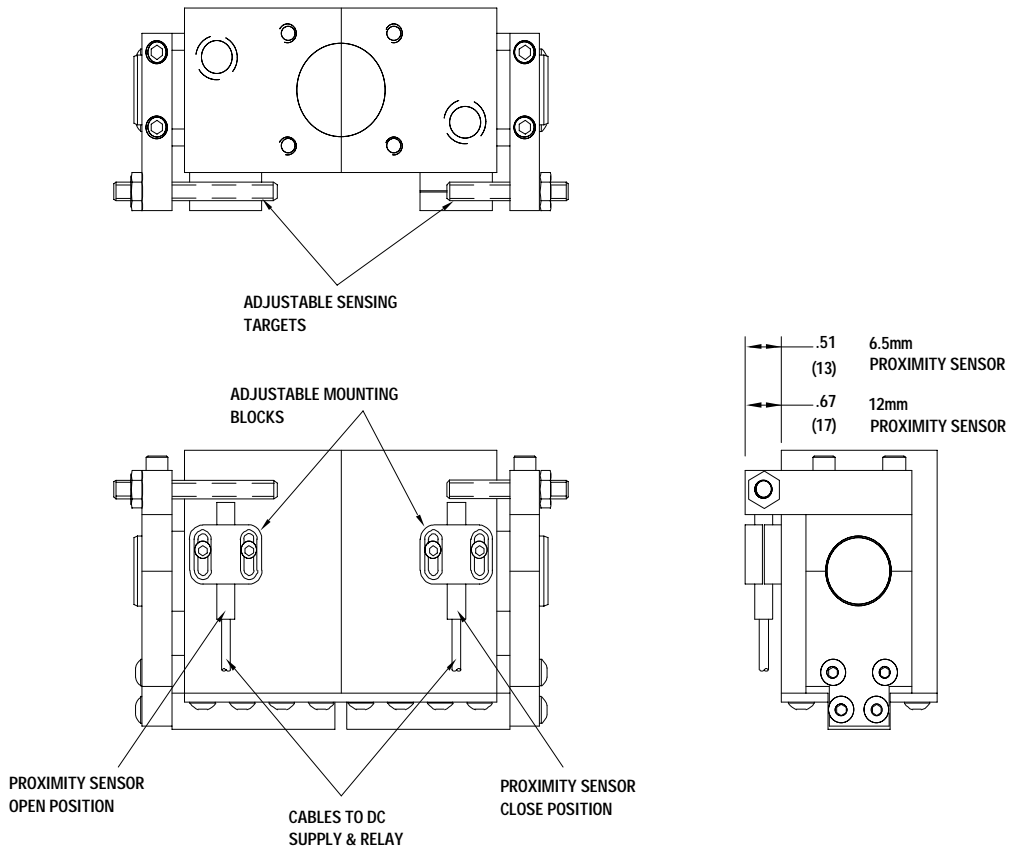




### Specifications & Dimensions

Model	
	6.5 mm/DC
Voltage Range	10-60VDC
Output	Sourcing (PNP)
	Sinking (NPN)
Operating Temperatures	-14° F - +158° F
Shielded	Yes
Overload Protected	Yes



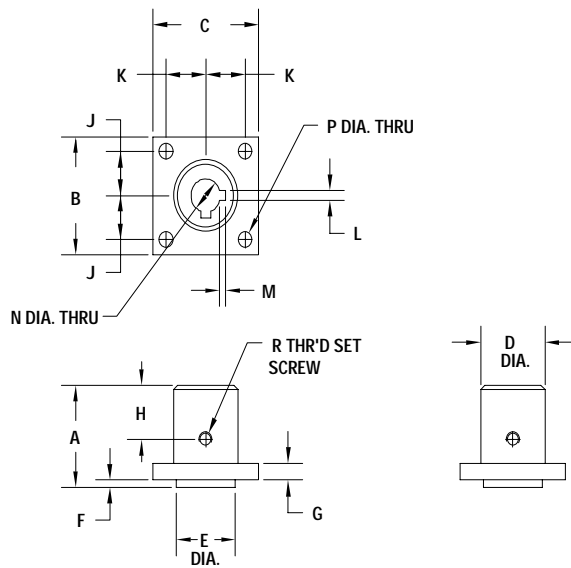


## Specifications & Dimensions

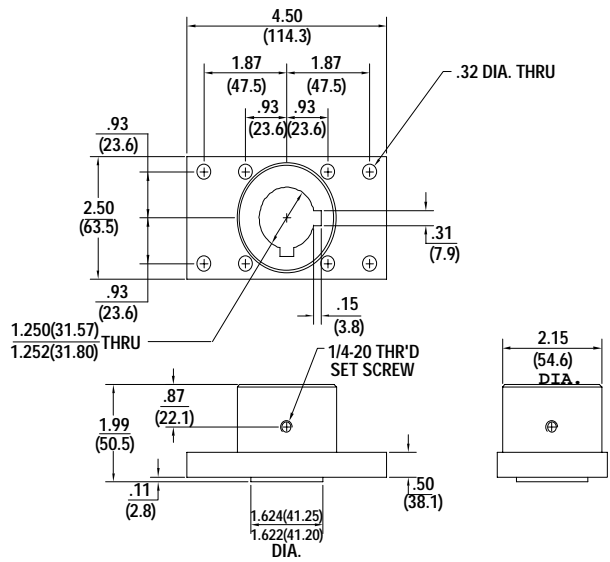
Model		
	6.5 mm/DC	12 mm/AC
Voltage Range	10-60VDC	90-130VAC
Output	Sourcing (PNP)	N.O.
	Sinking (NPN)	N.C.
Operating Temperatures	-14° F - +158° F	-14° F - +158° F
Shielded	Yes	Yes
Overload Protected	Yes	NO

# TA Series FOR ROTARY ACTUATORS

Transitional Adapters



SEE CHART BELOW

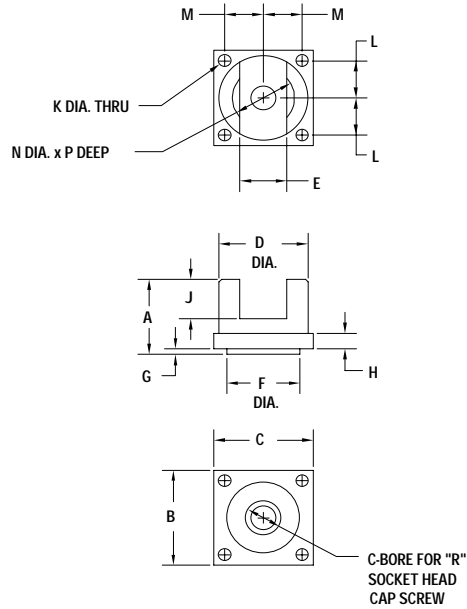


Model: TA-L200 From: RAM-250 to GPL-200

From:	RAM-10	RAM-35	RAM-35	RAM-75	RAM-75	RAM-250
To:	GP-10	GP-10	GP-20	GP-40	GP-100	GP-200
	GPE-10	GPE-10	GPE-20	GPE-40	GPE-100	
	GPL-10	GPL-10	GPL-20	GPL-40	GPL-100	
	GPEL-10	GPEL-10	GPEL-20	GPEL-40	GPEL-100	
Model:	TA-10	TA-15	TA-20	TA-40	TA-100	TA-200
A	0.75 (19.05)	1.10 (27.94)	1.15 (29.21)	1.30 (33.02)	1.30 (33.02)	1.99 (50.55)
B	0.97 (24.63)	0.97 (24.63)	1.33 (33.78)	1.60 (40.64)	1.98 (50.29)	2.50 (63.50)
C	0.97 (24.63)	0.97 (24.63)	1.33 (33.78)	1.60 (40.64)	1.98 (50.29)	2.50 (63.50)
D	0.81 (20.57)	0.81 (20.57)	0.81 (20.57)	1.37 (34.80)	1.37 (34.80)	2.15 (54.6)
E	.498/.496	.498/.496	.748/.746	1.186/1.185	1.248/1.246	1.624/1.622
E (metric)	(12.65/12.60)	(12.65/12.60)	(19.00/18.95)	(30.12/30.10)	(31.70/31.65)	(41.25/41.20)
F	0.05 (1.27)	0.05 (1.27)	0.08 (2.03)	0.10 (2.54)	0.10 (2.54)	0.11 (2.79)
G	0.12 (3.05)	0.17 (4.19)	0.19 (4.83)	0.26 (6.60)	0.26 (6.60)	0.50 (3.05)
H	0.39 (9.91)	0.61 (15.49)	0.61 (15.49)	0.56 (14.22)	0.56 (14.22)	0.87 (22.10)
J	0.37 (9.40)	0.37 (9.40)	0.50 (12.70)	0.62 (15.75)	0.75 (19.05)	0.93 (23.62)
K	0.37 (9.40)	0.37 (9.40)	0.50 (12.70)	0.62 (15.75)	0.75 (19.05)	0.93 (23.62)
L	0.09 (2.29)	0.12 (3.05)	0.12 (3.05)	0.18 (4.57)	0.18 (4.57)	0.31 (7.87)
M	0.04 (1.02)	0.06 (1.52)	0.06 (1.52)	0.09 (2.29)	0.09 (2.29)	0.15 (3.81)
N	.375/.376	.375/.376	.375/.376	.625/.626	.625/.626	1.250/1.252
N(metric)	(9.53/9.55)	(9.53/9.55)	(9.53/9.55)	(15.88/15.90)	(15.88/15.90)	(31.75/31.80)
P	0.13 (3.30)	0.13 (3.30)	0.18 (4.57)	0.20 (5.08)	0.26 (6.60)	0.32 (8.13)
R	8-32	8-32	8-32	10-32	10-32	1/4-20

# TAL Series FOR LINEAR ROTARY ACTUATORS

Transitional Adapters



From:	LRA-10	LRA-35	LRA-35	LRA-75	LRA-75	LRA-250	LRA-250
To:	GP-10	GP-20	GP-40	GP-40	GP-100	GP-100	GP-200
	GPE-10	GPE-20	GPE-40	GPE-40	GPE-100	GPE-100	
	GPL-10	GPL-20	GPL-40	GPL-40	GPL-100	GPL-100	
	GPEL-10	GPEL-20	GPEL-40	GPEL-40	GPEL-100	GPEL-100	
Model:	TAL-10	TAL-20	TAL-40	TAL-45	TAL-100	TAL-150	TAL-200
A	1.00 (25.40)	1.16 (29.46)	1.26 (32.00)	1.26 (32.00)	1.26 (32.00)	1.60 (40.64)	1.60 (40.64)
B	.98 (24.89)	1.34 (34.04)	1.61 (40.89)	1.61 (40.89)	1.99 (50.55)	2.22 (56.39)	2.73 (69.34)
C	.98 (24.89)	1.34 (34.04)	1.61 (40.89)	1.61 (40.89)	1.99 (50.55)	2.22 (56.39)	2.73 (69.73)
D	----	1.06 (26.92)	1.25 (31.75)	1.44 (36.58)	1.50 (38.10)	1.68 (42.67)	2.12 (53.85)
E	.442/.447	.505/.510	.505/.510	.755/.760	.755/.760	1.000/1.005	1.000/1.005
E (metric)	(11.23/11.35)	(12.83/12.95)	(12.83/12.95)	(19.18/19.30)	(19.18/19.30)	(25.40/25.53)	(25.40/25.53)
F	.498/.496	.748/.746	1.186/1.185	1.186/1.185	1.249/1.247	1.249/1.247	1.624/1.623
F (metric)	(12.65/12.60)	(19.00/18.95)	(30.12/30.10)	(30.12/30.10)	(31.72/31.67)	(31.72/31.67)	(41.25/41.22)
G	.05 (1.27)	.08 (2.03)	.10 (2.54)	.10 (2.54)	.10 (2.54)	.11 (2.79)	.11 (2.79)
H	----	.17 (4.32)	.26 (6.60)	.26 (6.60)	.26 (6.60)	.50 (12.70)	.50 (12.70)
J	.63 (16.00)	.67 (17.02)	.67 (17.02)	.67 (17.02)	.67 (17.02)	.94 (23.88)	.94 (23.88)
K	.14 (3.56)	.19 (4.83)	.20 (5.08)	.20 (5.08)	.27 (6.86)	.29 (7.37)	.34 (8.64)
L	.38 (9.65)	.50 (12.70)	.63 (16.00)	.63 (16.00)	.75 (19.05)	.75 (19.05)	.93 (23.62)
M	.38 (9.65)	.50 (12.70)	.63 (16.00)	.63 (16.00)	.75 (19.05)	.75 (19.05)	.93 (23.62)
N	.625/.627	.750/.752	.750/.752	1.000/1.003	1.000/1.003	1.250/1.252	1.250/1.252
N (metric)	(15.88/15.93)	(19.05/19.10)	(19.05/19.10)	(25.40/25.48)	(25.40/25.48)	(31.75/31.80)	(31.75/31.80)
P	.38 (9.65)	.42 (10.67)	.42 (10.67)	.42 (10.67)	.42 (10.67)	.66 (16.76)	.66 (16.76)
R	10-32	5/16-18	5/16-18	3/8-16	3/8-16	3/8-16	3/8-16

# High Efficiency Seals & Lubricants

## Seal Composition

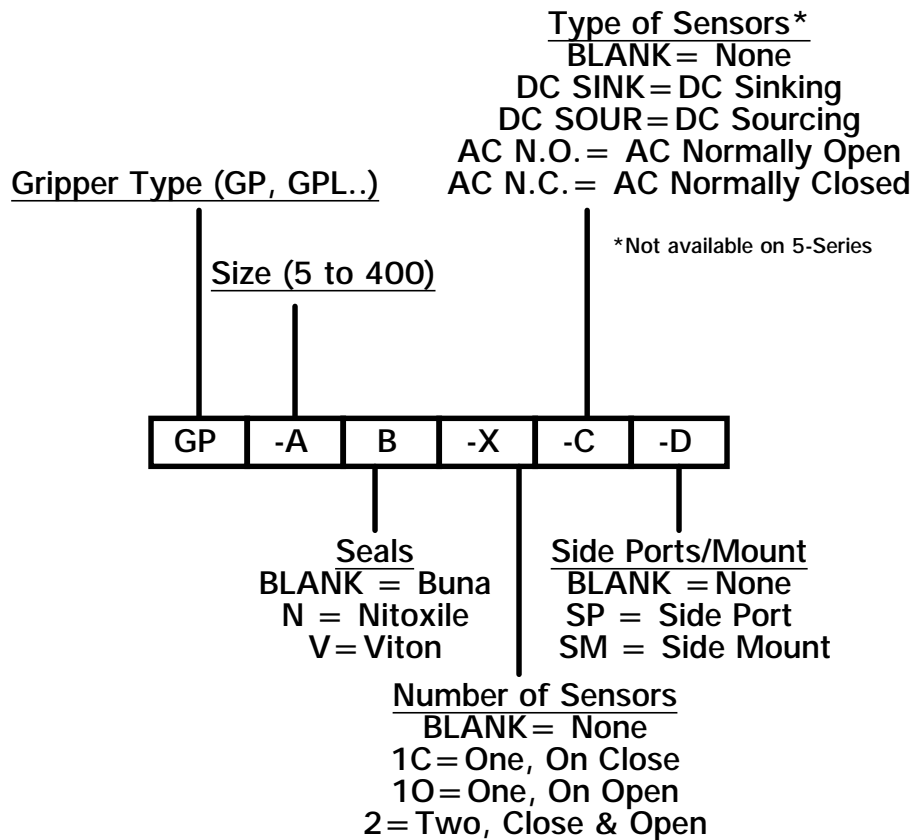
Three types of seals are available:

Standard - Buna-N; -40 to 180°F  
 High Temp- Viton; -40 to 300°F  
 Non-Lube- Nitroxile; -40 to 180 °F

## Lubricants

All grippers are pre-lubricated with "lifetime" lubricant that is designed to last approximately 10,000,000 cycles in typical applications.

## ORDERING INFORMATION



### Example: GP-20-V-2-DC SINK

Gripper, 20 Size, Viton Seals, two position DC proximity sensors-sinking