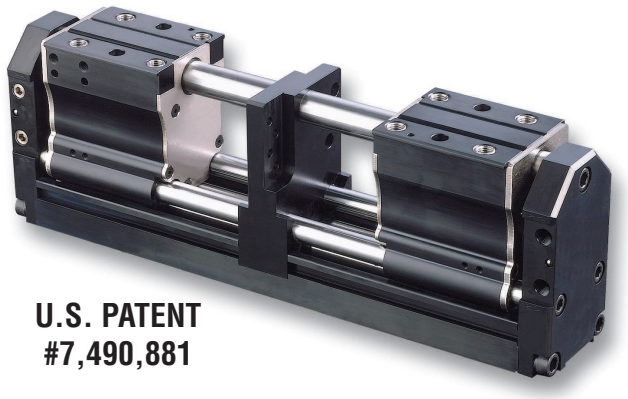
GRR

GUARDIAN® HIGH CAPACITY PNEUMATIC PARALLEL GRIPPER

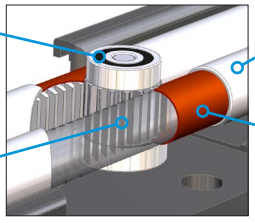


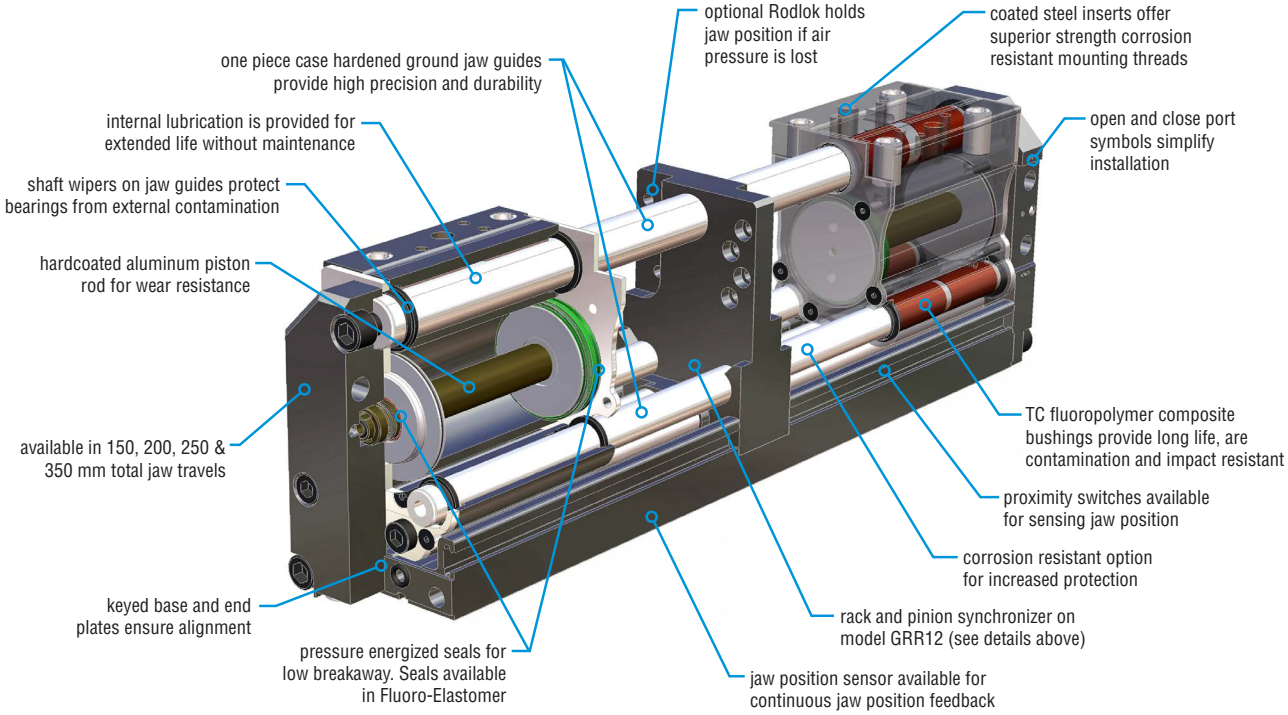
U.S. PATENT #7,490,881

GUARDIAN® GRIPPER

Major Benefits

- Narrow width and a wide range of available jaw travels.
- Compact design provides high grip force and large moment capacities with low overall weight.
- Rugged build withstands high impact and shock loads.
- Double acting for both internal and external gripping.
- Unique dual air-passage piston rod design promotes rapid bore pressurization for short cycle times.
- Three large diameter jaw guides spanning the length of the gripper provide stable jaw travel, long allowable tooling length, and high moment capacities.





TO ORDER SPECIFY:
Product Line, Series, Type, Synchronization, Jaw, Design No., Size, Total Jaw Travel, and Options required.

SERIES
Regular Duty

SYNCHRONIZATION
0- Non-synchronized
1- Synchronized
2- Non-synchronized independently powered jaws

DESIGN NO.
(See Note 1)
2 - Imperial
6 - Metric

OPTIONS (OMIT IF NOT REQUIRED)
PORT OPTIONS
L9 - NPT Ports (metric units only)
UNIT OPTIONS
H47 - Rodlok (See Note 2)
V1 - Fluoro-Elastomer Seals except for Rodlok mechanism
Z1 - Corrosion resistant coating on exposed external parts except for Rodlok mechanism and Rodlok parts
SENSOR OPTIONS
SPP99- Rotary jaw position sensor installed (see Note 3)
STT99 - Coupled rotary jaw position sensor installed (see Note 4)

OPTIONS (OMIT IF NOT REQUIRED)
JAW TRAVEL LIMITING OPTIONS
GRR02, GRR12 & GRR22
ANxxx - Jaw travel limitation on open, both jaws
ATxxx - Jaw travel limitation on closed, both jaws
GRR02 & GRR22 ONLY
APxxx - Jaw travel limitation on open, Jaw A only
AQxxx - Jaw travel limitation on open, Jaw B only
ARxxx - Jaw travel limitation on closed, Jaw A only
AUxxx - Jaw travel limitation on closed, Jaw B only

G	R	R	1	2	-	6	-	63	x	200	-	Z1 - H47

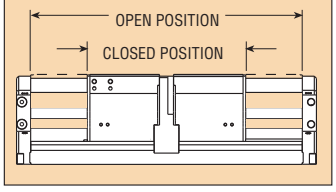
PRODUCT LINE
G - Gripper

TYPE
Long Travel, High Capacity, Parallel Gripper

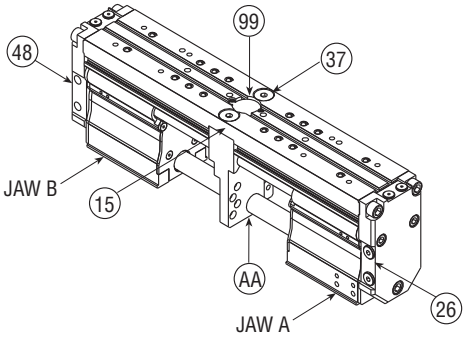
JAW
Style 2

BORE SIZE

MINIMUM TOTAL JAW TRAVEL
150 = 150 mm (5.906 in)
200 = 200 mm (7.874 in)
250 = 250 mm (9.843 in)
350 = 350 mm (13.780 in)



Total Jaw Travel = (Open position - Closed Position)



NOTES:
1) Design number indicates imperial or metric mounting holes and ports. Dowel pin holes are metric regardless of design number.
2) Standard unit is Rodlok ready.
3) Available on GRR1 only. GRR1 unit is SPP99 ready.
4) Available on GRR1 only. -STT99 option must be ordered with the gripper. Only sensor replacement kits are available.

SPP99 JAW POSITION SENSOR KITS

KIT	STANDARD	CORROSION RESISTANT
Sensor Replacement Kit	74209-31	74209-32

Kit includes 1 jaw position sensor, 2 mounting screws, 1 seal and 1 coupling seal

REPLACEMENT STT99 JAW POSITION SENSOR KITS

KIT	STANDARD	CORROSION RESISTANT
Sensor Replacement Kit	84404-11	84404-12

Kit includes 1 jaw position sensor, 2 mounting screws, 1 seal and spring

8 mm & 12 mm THREADED INDUCTIVE PROXIMITY SWITCH TARGET KITS

STANDARD	CORROSION RESISTANT
74994-31	74994-32

Kit includes 1 proximity switch target and 2 target mounting screws

8 mm THREADED INDUCTIVE PROXIMITY SWITCHES

PART NUMBER	DESCRIPTION
51422-005-02	NPN (Sink), 2 meter cable
51422-006-02	PNP (Source), 2 meter cable

12 mm THREADED INDUCTIVE PROXIMITY SWITCHES

PART NUMBER	DESCRIPTION
15561-001	NPN (Sink), 2 meter cable
15561-002	PNP (Source), 2 meter cable
15561-003	VAC Solid State, 3 meter cable

Options may affect unit length. See dimensional pages and option information details.

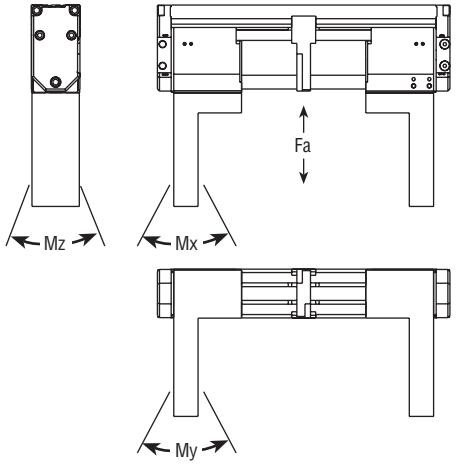
Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

SPECIFICATIONS	SERIES GRR
OPERATING PRESSURE STANDARD UNIT	30 psi min to 120 psi [2 to 8 bar] max air
OPERATING TEMPERATURE	-20° to +180°F [-28° to +82°C] Higher temperature service available. Consult PHD.
RATED LIFE	5 million cycles minimum with standard seals
GRIP REPEATABILITY	Within ±0.002 in [±0.05 mm] of original centered position
CYCLE TIME	See table below
LUBRICATION	Factory lubricated for rated life
MAINTENANCE	Field repairable

MODEL NUMBER	MINIMUM TOTAL JAW TRAVEL		GRIPPER WEIGHT		CLOSE OR OPEN TIME 87psi [6 bar]	ONE DIRECTION DISPLACEMENT		GRIP FORCE FACTOR G_F GRIP FORCE VARIES WITH TOOLING LENGTH			
								EXTERNAL GRIP		INTERNAL GRIP	
	in	mm	lb	kg	sec	in³	cm³	IMPERIAL	METRIC	IMPERIAL	METRIC
GRRx2-x-63 x 150	5.91	150	28.0	12.7	0.28	28.8	472	8.09	522	7.27	469
GRRx2-x-63 x 200	7.87	200	33.0	15.0	0.36	38.4	629				
GRRx2-x-63 x 250	9.84	250	39.2	17.8	0.42	48.0	787				
GRRx2-x-63 x 350	13.8	350	49.0	22.2	0.57	67.0	1098				

MAXIMUM ALLOWABLE FORCES AND MOMENTS

MODEL NUMBER	Fa		Mx		My		Mz	
	lb	N	in-lb	Nm	in-lb	Nm	in-lb	Nm
GRRx2-x-63 x 150	3500	15570	8000	880	6500	715	6500	715
GRRx2-x-63 x 200	3500	15570	9000	990	7500	825	7500	825
GRRx2-x-63 x 250	3500	15570	9000	990	7500	825	7500	825
GRRx2-x-63 x 350	3500	15570	9000	990	7500	825	7500	825



Fa: Total for both jaws.
Mx: Allowable moment per jaw, measured from jaw mounting surface.
My: Allowable moment per jaw, measured from geometric center of jaw.
Mz: Allowable moment per jaw, measured from jaw mounting surface.

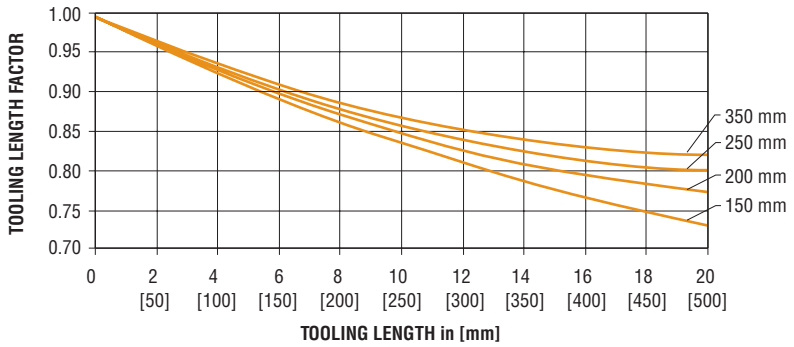
When calculating the value for Fa, include weight of tooling, part weight, acceleration, and external forces. When calculating values for Mx, My, and Mz, include the grip force per jaw, part weight, external forces, and acceleration as applicable.

MOMENT VALUES ASSUME THE USE OF ALL THREADED MOUNTING HOLES.

TOOLING LENGTH FACTOR

Jaw tooling should be designed so that the grip point is as close to the jaw surface as possible. As the grip point is moved away from the jaw surface, the applied moment causes jaw friction to increase, resulting in reduced effective grip force. The grip force factor (G_F) values given in the table above are for zero tooling length (jaw surface).

The maximum load that grippers can handle will vary based on: size of the part being picked up, shape of the part, texture of the part, speed at which the part is transferred, working pressure, shape of the fingers, etc. PHD recommends that the fingers of jaws be tooled or machined to conform to the shape of the part being gripped.



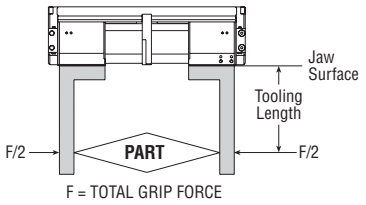
UNIT SIZING ONLINE

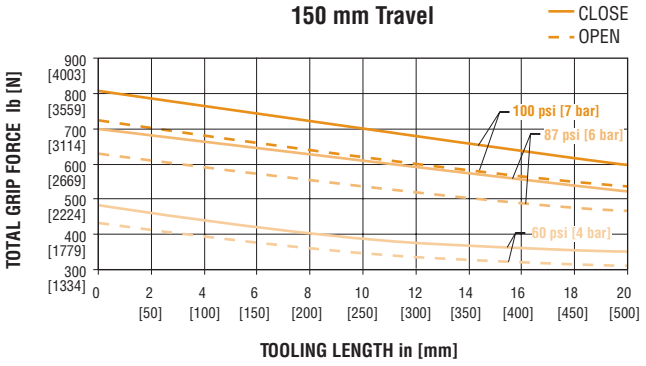
Sizing & Application Assistance

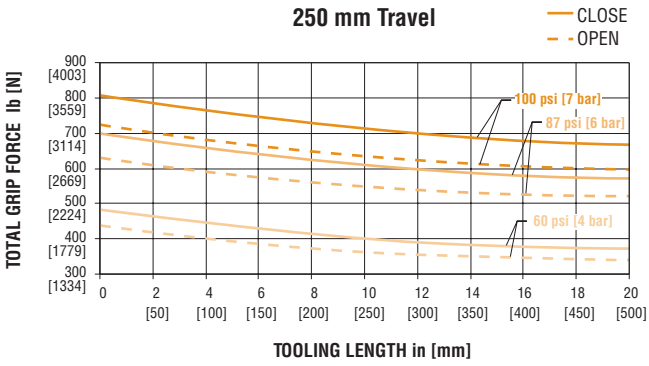
Use PHD's free online Product Sizing Application or view the Product Sizing Catalog at: www.phdinc.com/apps/sizing

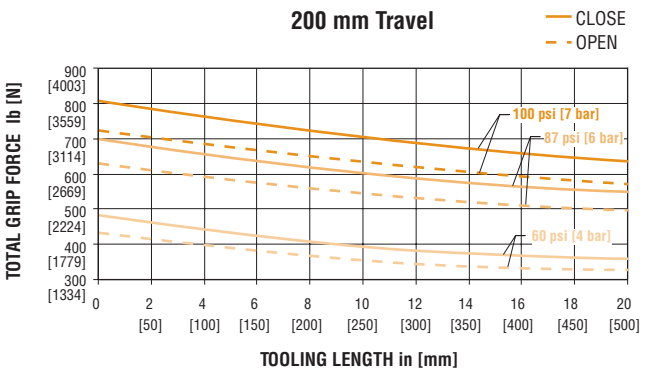
GRIP FORCE

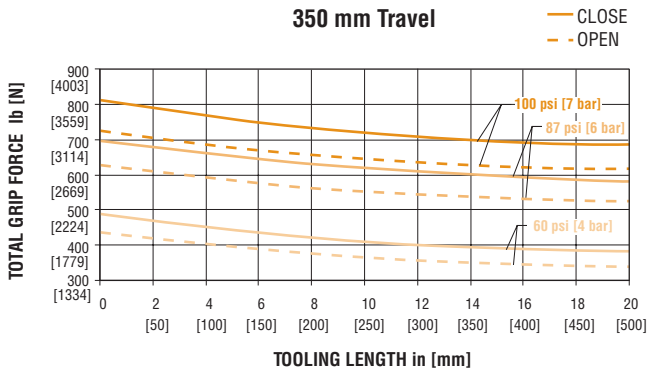
Total gripping force relative to tooling length is shown below at the stated actuating pressure. Grip force per jaw equals the total grip force divided by two. The graphs also indicate the maximum tooling length for each gripper size.











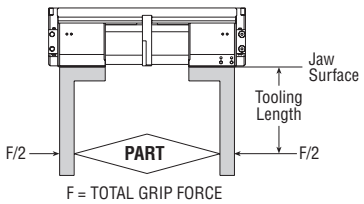
GRIP FORCE CALCULATION EQUATIONS:

IMPERIAL:

TOTAL GRIP FORCE [lb] = (Pressure [psi] x G_F) x Tooling Length Factor

METRIC:

TOTAL GRIP FORCE [N] = (Pressure [bar] x G_F) x Tooling Length Factor



GRIP FORCE CALCULATION EXAMPLE:

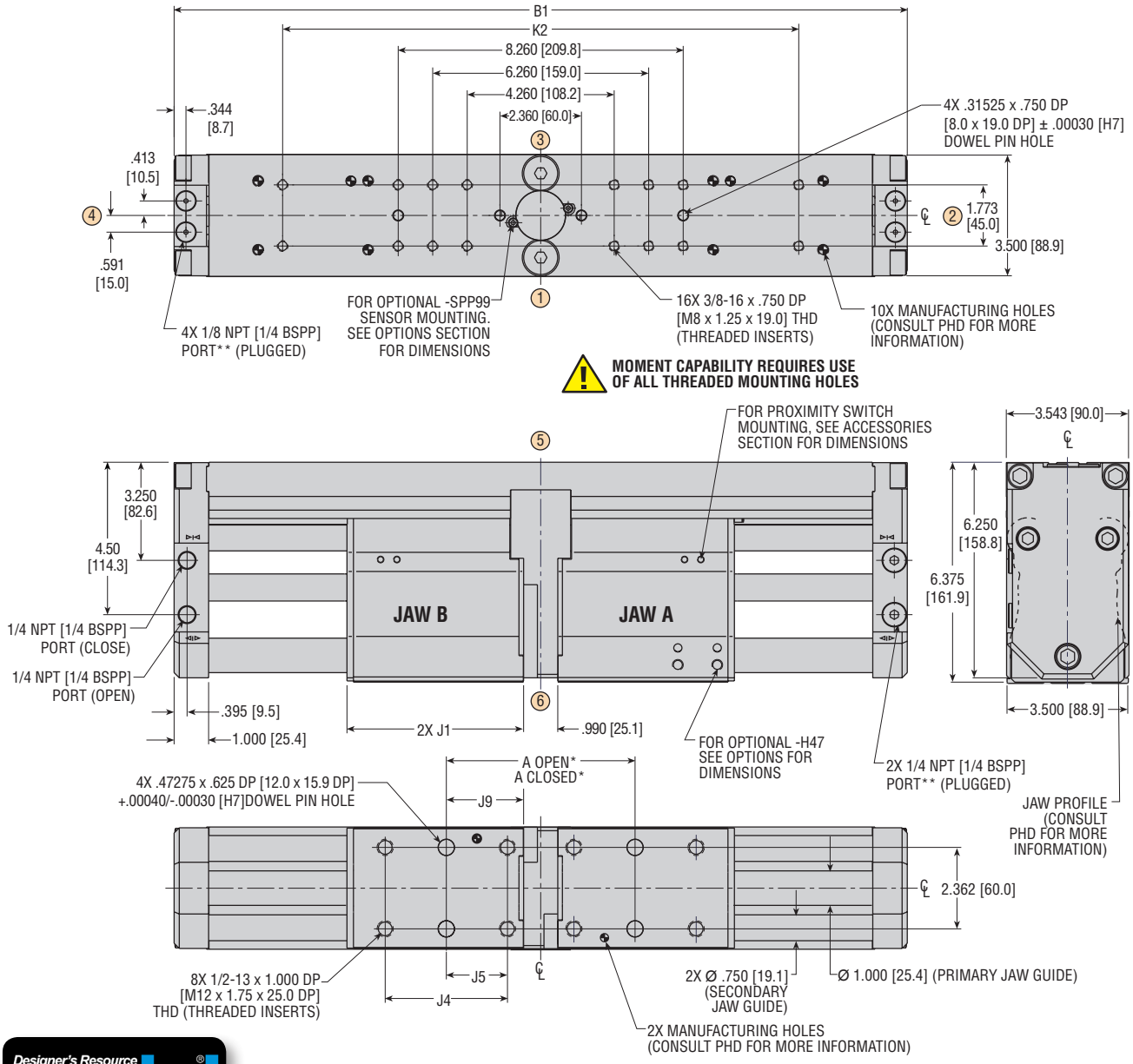
Gripper: Series GRR Size 63 x 200
Common Parameters:
Operating Pressure = 87 psi [6 bar]
Tooling Length = 10 in [254 mm]

1. **Determine Grip Force Factor G_F =** 8.09 [522] (from table on page 4-91)
2. **Determine Tooling Length Factor =** 0.84 [0.84] (from Tooling Length Factor graph)
3. **Total Grip Force Calculations:**

For Standard Unit: GRR12-2-63 x 200 [GRR12-6-63 x 200]

Total Grip Force = 87 psi x 8.09 x 0.84 = 591 lb [6 bar x 522 x 0.84 = 2630 N]

All dimensions are reference only unless specifically toleranced.



Designer's Resource myphd

CAD & Sizing Assistance

Use PHD's free online Product Sizing and CAD Configurator at www.phdinc.com/myphd

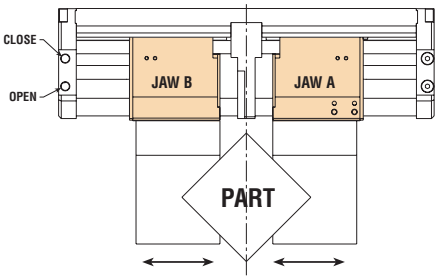
NOTES:

1) DESIGNATED ℄ IS CENTERLINE OF UNIT.
2) METRIC INFORMATION SHOWN IN [ ] OR SHOWN IN COLUMNS DESIGNATED mm.
3) CIRCLED NUMBERS INDICATE POSITION.
4) *A OPEN REFLECTS THE SMALLEST POSSIBLE OPEN DIMENSION. A CLOSED REFLECTS THE LARGEST POSSIBLE CLOSED DIMENSION.
5) **PLUGGED PORTS CAN BE USED FOR GRIPPER ACTUATION.

LETTER DIM	MODEL NUMBER							
	GRRx2-x-63 X 150		GRRx2-x-63 X 200		GRRx2-x-63 X 250		GRRx2-x-63 X 350	
	in	mm	in	mm	in	mm	in	mm
MIN. TRAVEL PER JAW	2.953	75.0	3.937	100.0	4.921	125.0	6.890	175.0
A CLOSED*	4.724	120.0	5.504	139.8	5.504	139.8	12.992	330.0
A OPEN*	10.630	270.0	13.379	339.8	15.347	389.8	26.772	680.0
B1	17.314	439.8	21.251	539.8	26.016	660.8	33.890	860.8
J1	4.136	105.1	5.120	130.0	6.518	165.6	8.487	215.6
J4	2.598	66.0	3.544	90.0	3.544	90.0	3.544	90.0
J5	1.2990	33.0	1.7720	45.0	1.7720	45.0	1.7720	45.0
J9	1.850	47.0	2.240	56.9	2.240	56.9	5.984	152.0
K2	12.598	320.0	14.960	380.0	14.960	380.0	23.228	590.0

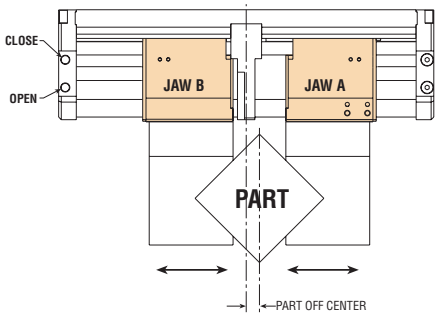
GRR12 SYNCHRONIZED

This model synchronizes the jaws for use with parts that must be centered. Jaws are pressurized by a single set of ports.



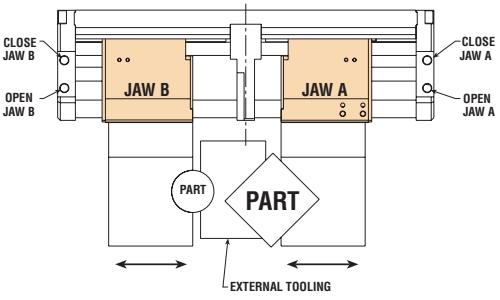
GRR02 NON-SYNCHRONIZED

This model allows each jaw to move independently while being pressurized by a single set of ports. This feature allows the gripping of off center parts.



GRR22 NON-SYNCHRONIZED AND INDEPENDENTLY POWERED JAWS

This model adds the ability to independently power each jaw. The jaws are not synchronized and may be cycled at differing rates or pressures.



Z1 CORROSION RESISTANT

Corrosion resistant coating on exposed external parts except for Rodlok mechanism and Rodlok parts.

L9 METRIC UNIT WITH IMPERIAL (NPT) PORTS

Metric unit is provided with NPT ports in all locations.

V1 FLUORO-ELASTOMER SEALS

Fluoro-elastomer seals and PTFE jaw guide scrapers are available to achieve seal compatibility with certain fluids. Seal compatibility should be checked with the fluid manufacturer for proper application.

NOTE: Rodlok (part of -H47 option) does not include -V1 components. Consult PHD for fluid compatibility with -STT99 and -SPP99 option. Consult PHD for high temperature use.

Options may affect unit length. See dimensional pages and option information details.

Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

TRAVEL LIMITING STOPS

These options provide corrosion resistant jaw travel stop tubes for use in limiting jaw travel on open or close. The travel limiting stop tubes provide a repeatable positive stop.

Model GRR12 requires identical stops for both jaws while traveling in the same direction. Synchronized units may only use the ANxxx and ATxxx options. Non-synchronized models (GRR02 & GRR22) may use the APxxx, ARxxx, AUxxx, or AQxxx in any combination for limiting the travel of either jaw independently.

Non-synchronized units may also be ordered with ANxxx or ATxxx options.

Travel limiting tubes are available in lengths from 3.0 to 99.9 mm in .1 mm increments. See Note 2.

For adjustable jaw travel, see travel adjustment collars on page 4-94.

EXAMPLE:

-ATxxx stop with 25.1 mm length = -AT251

NOTES:

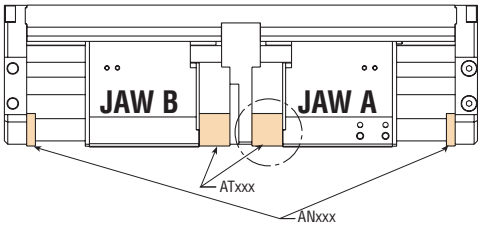
1) Options' xxx are in .1 mm increments with implied decimal point one place from right, and must be 3 digits long with values ranging between 03.0 and 99.9 mm.
2) ANxxx and ATxxx or APxxx and ARxxx or AUxxx and AQxxxx option combinations or singularly can not add up to more than 1/2 the ordered jaw travel.

Example for 150 mm jaw travel:

ANxxxx + ATxxx ≤ 75
APxxxx + ARxxx ≤ 75
AUxxxx + AQxxx ≤ 75

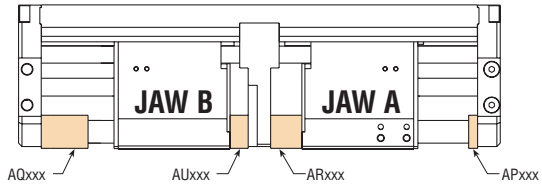
ANxxx **ATxxx**

AVAILABLE ON GRR02, GRR12, & GRR22



APxxx **ARxxx** **AUxxx** **AQxxx**

AVAILABLE ON GRR02 & GRR22 MODELS ONLY



H47 RODLOK

PHD's Rodlok is ideal for locking the jaws while in a static/stationary position. When the pressure is removed from the port of the Rodlok, the mechanism will grip on the external guide shaft and prevent the jaws from moving. The loads are held indefinitely without power. Rodlok performance is application and environment sensitive. Cleanliness of shaft or Rodlok will also affect performance.

THE RODLOK IS NOT DESIGNED TO BE USED AS A PERSONNEL SAFETY DEVICE.

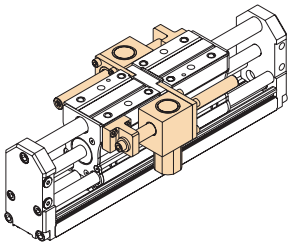
Option -H47 provides the Rodlok pre-assembled to the gripper. The port of the Rodlok device will be in position 5.

Option -H47 may be purchased with the -Z1 (corrosion resistant) option and -V1 (fluid compatibility) option. However the Rodlok and Rodlok rod DO NOT PROVIDE corrosion resistance or fluid compatibility.

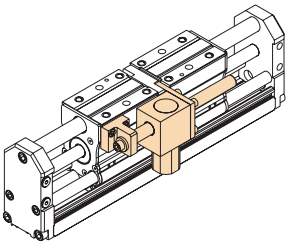
OPERATING PRESSURE: The operating pressure for the locking device is different than the operating pressure for the gripper with the Rodlok attached. The locking device of the Rodlok is designed with an operating pressure range of 60 psi minimum to 150 psi maximum [4 to 10 bar]. The Series GRR Gripper with a Rodlok attached has an operating pressure range of 30 psi minimum to 120 psi maximum [2 to 8 bar].

SIZE	STATIC LOCKING FORCE (see Note 1)	
	lb	N
63	495	2200

NOTE: LOCKING FORCE INDICATED IS THE ACTUAL LOCKING FORCE WITH A DRY, CLEAN ROD AND DOES NOT INCLUDE ANY SAFETY FACTOR. IT IS POSSIBLE TO OVERRIDE THE RODLOK WITH VERY HIGH FORCE APPLIED TO THE GRIPPER. STATIC LOCKING FORCE MAY BE INCREASED ON SYNCHRONIZED UNITS, GRR12, WITH THE ADDITION OF A SECOND RODLOK. SEE KITS BELOW.



GRR02 & GRR22 WITH -H47 OPTION



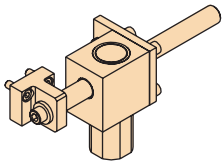
GRR12 WITH -H47 OPTION

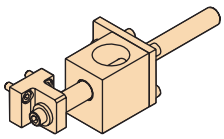
Options may affect unit length. See dimensional pages and option information details.

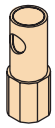
Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

ACCESSORIES - RODLOK

The Series GRR is -H47 ready as standard. The following items may be added to the Design 2 [6] GRR or may be used as replacement parts. Note that the kits below are for one jaw only.







RODLOK SEAL KIT (PER JAW)

Full unit description - H9115

Kit includes seals and wear rings for a single (1) jaw.

COMPLETE RODLOK KIT (PER JAW)

Full unit description - H9110

Kit includes Rodlok and Rodlok adaptor for a single (1) jaw.

RODLOK ADAPTOR KIT (PER JAW)

Full unit description - H9105

Kit includes Rodlok adaptor for a single (1) jaw. Does not include Rodlok.

RODLOK KIT (PER JAW)

Full unit description - H9100

Kit includes Rodlok for a single (1) jaw. Does not include Rodlok imperial port adaptor.

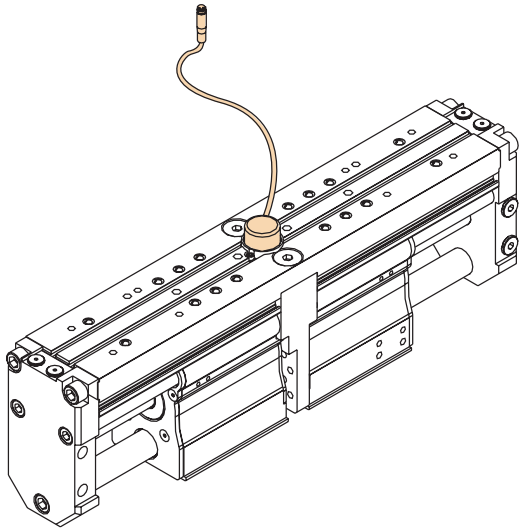
SPP99 JAW POSITION SENSOR

Provides an easy to use, economical, fully integrated solution to continuously monitor the grip position of the jaws. The sensor mounts directly to the gripper making field installation or replacement quick and easy. The 3-pin quick-connect connector provides a 0-10 volt analog output compatible with standard analog control modules.

STT99 COUPLED JAW POSITION SENSOR

Has the same functional performance as the -SPP99 option, except it is mechanically coupled and **must be specified when the order is placed**. This option cannot be added to the unit at a later time.

Consult PHD for use with -V1 option on both of these options.



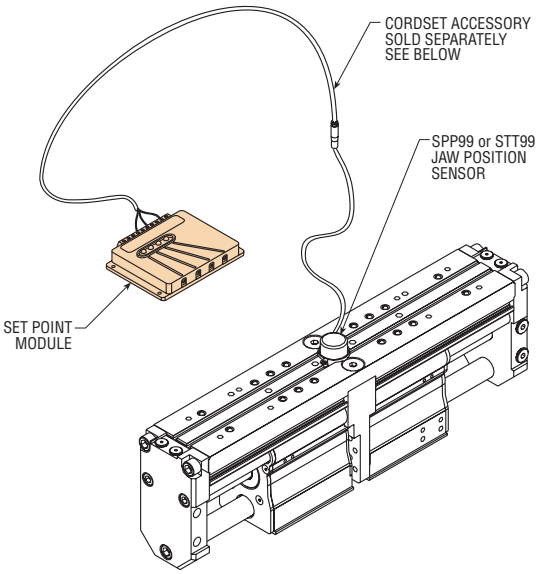
SET POINT MODULE

Set Point Module converts analog output from sensor into discrete on-off outputs. Module provides four independently adjustable set points throughout jaw travel. Available with NPN (sink) or PNP (source) outputs.

SET POINT MODULE

PART NO.	DESCRIPTION
9800-01-0300	4.5-24 VDC, Sink Type Output
9800-01-0400	4.5-24 VDC, Source Type Output

See Switches and Sensors section in main catalog for more information.



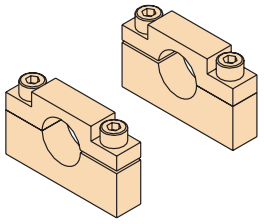
CORDSET

Provides a cordset with female quick connect and additional cable. Perfect for use with the Set Point Module.

MODEL NO.	CABLE LENGTH
63549-02	2 m
63549-05	5 m

TRAVEL ADJUSTMENT COLLARS

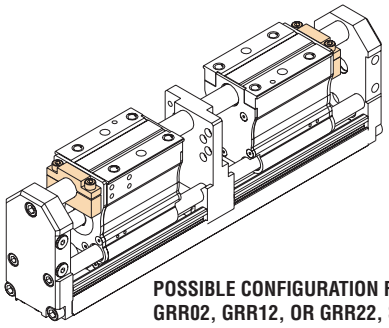
This accessory provides travel adjustment stop collars for use in limiting jaw travel on open or close. The travel adjustment stop collars provide infinite adjustment. Synchronized model (GRR12) requires travel adjustment collars to be identically located for both jaws, in the same direction of travel. Non-synchronized models (GRR02 & GRR22) do not require identical stop locations for each jaw. For non-adjustable jaw travel limiting, see options ANxxx, ATxxx, APxxx, ARxxxx, AUxxx, and AQxxx on the online catalog page 4-98-1.



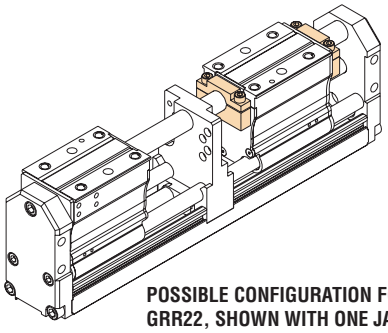
STROKE ADJUSTMENT COLLAR KITS

STANDARD	CORROSION RESISTANT
74211-01	74211-02

Kit includes 2 stroke adjustment collars and 4 mounting screws.



POSSIBLE CONFIGURATION FOR GRR02, GRR12, OR GRR22, SHOWN WITH STROKE LIMITED ON OPEN



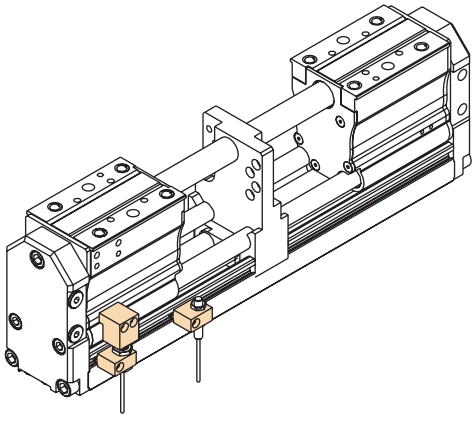
POSSIBLE CONFIGURATION FOR GRR22, SHOWN WITH ONE JAW RESTRICTED

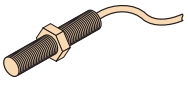
GRR

PROXIMITY SWITCHES - EXTERNAL

This accessory provides for the external mounting of 8 or 12 mm threaded round metal sensing inductive proximity switches. Multiple switches may be mounted using multiple brackets. Proximity switches, targets, and mounting brackets are ordered separately. See the Switches and Sensors section for complete switch specifications.

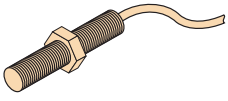
NOTE: Target and bracket kits do not interchange with Series 1 [5] GRR Grippers.





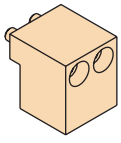
8 mm THREADED INDUCTIVE PROXIMITY SWITCHES

PART NUMBER	DESCRIPTION
51422-005-02	NPN (Sink), 2 meter cable
51422-006-02	PNP (Source), 2 meter cable



12 mm THREADED INDUCTIVE PROXIMITY SWITCHES

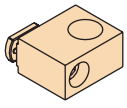
PART NUMBER	DESCRIPTION
15561-001	NPN (Sink), 2 meter cable
15561-002	PNP (Source), 2 meter cable
15561-003	VAC Solid State, 3 meter cable



8 mm & 12 mm THREADED INDUCTIVE PROXIMITY SWITCH TARGET KITS

STANDARD	CORROSION RESISTANT
74994-31	74994-32

Kit includes 1 proximity switch target and 2 target mounting screws



THREADED INDUCTIVE PROXIMITY SWITCH MOUNTING BRACKET KITS

8 mm SWITCH	CORROSION RESISTANT 8 mm SWITCH	12 mm SWITCH	CORROSION RESISTANT 12 mm SWITCH
74992-31	74992-32	74993-31	74993-32

Kit includes 1 proximity switch mounting bracket, 1 mounting nut, and 1 mounting screw

Options may affect unit length. See dimensional pages and option information details.

Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

TRAVEL LIMITING STOPS

These options provide corrosion resistant jaw travel stop tubes for use in limiting jaw travel on open or close. The travel limiting stop tubes provide a repeatable positive stop.

Model GRR12 requires identical stops for both jaws while traveling in the same direction. Synchronized units may only use the ANxxx and ATxxx options. Non-synchronized models (GRR02 & GRR22) may use the APxxx, ARxxx, AUxxx, or AQxxx in any combination for limiting the travel of either jaw independently.

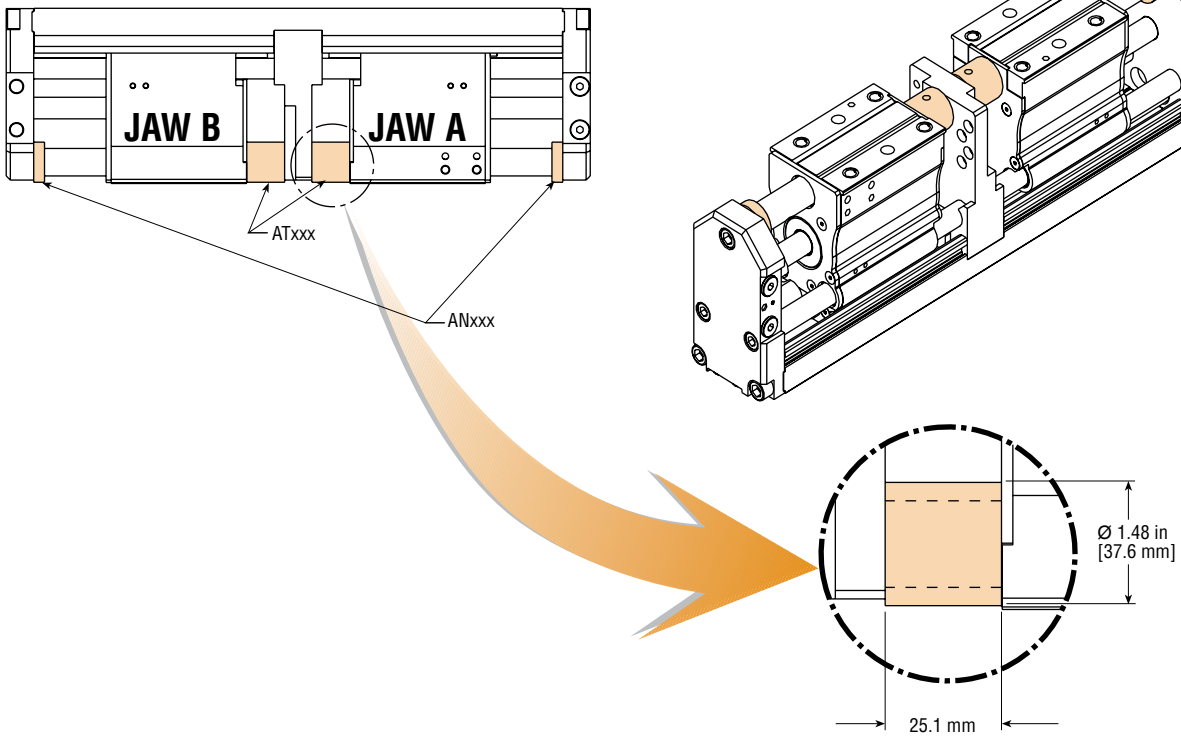
Non-synchronized units may also be ordered with ANxxx or ATxxx options.

Travel limiting tubes are available in lengths from 3.0 to 99.9 mm in .1 mm increments. See Note 2.

For adjustable jaw travel, see travel adjustment collars on page 4-145.

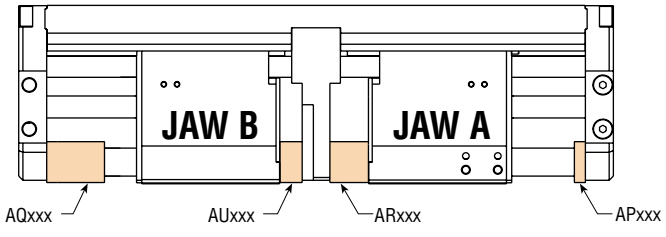
ANxxx **ATxxx**

AVAILABLE ON GRR02, GRR12, & GRR22



APxxx **ARxxx** **AUxxx** **AQxxx**

AVAILABLE ON GRR02 & GRR22 MODELS ONLY



EXAMPLE:
-ATxxx stop with 25.1 mm length = -AT251

NOTES:
1) Options' xxx are in .1 mm increments with implied decimal point one place from right, and must be 3 digits long with values ranging between 03.0 and 99.9 mm.
2) ANxxx and ATxxx or APxxx and ARxxx or AUxxx and AQxxxx option combinations or singularly can not add up to more than 1/2 the ordered jaw travel.

Example for 150 mm jaw travel:
ANxxx + ATxxx ≤ 75
APxxx + ARxxx ≤ 75
AUxxx + AQxxx ≤ 75

All dimensions are reference only unless specifically toleranced.

H47 RODLOK

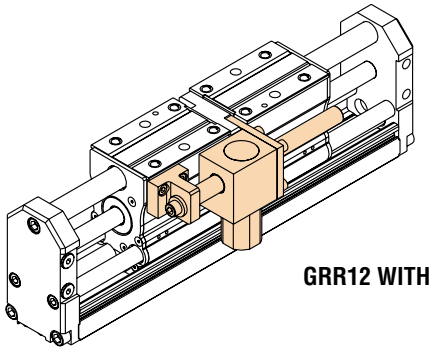
PHD's Rodlok is ideal for locking the jaws while in a static/ stationary position. When the pressure is removed from the port of the Rodlok, the mechanism will grip on the external guide shaft and prevent the jaws from moving. The loads are held indefinitely without power. Rodlok performance is application and environment sensitive. Cleanliness of shaft or Rodlok will also affect performance.

THE RODLOK IS NOT DESIGNED TO BE USED AS A PERSONNEL SAFETY DEVICE.

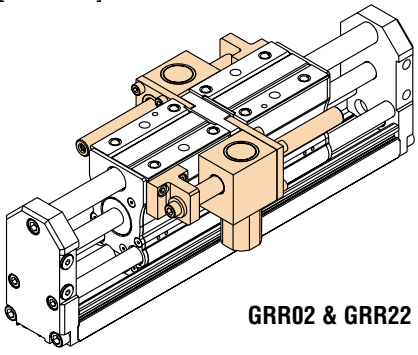
Option -H47 provides the Rodlok pre-assembled to the gripper. The port of the Rodlok device will be in position 5.

Option -H47 may be purchased with the -Z1 (corrosion resistant) option and -V1 (fluid compatibility) option. However the Rodlok and Rodlok rod DO NOT PROVIDE corrosion resistance or fluid compatibility.

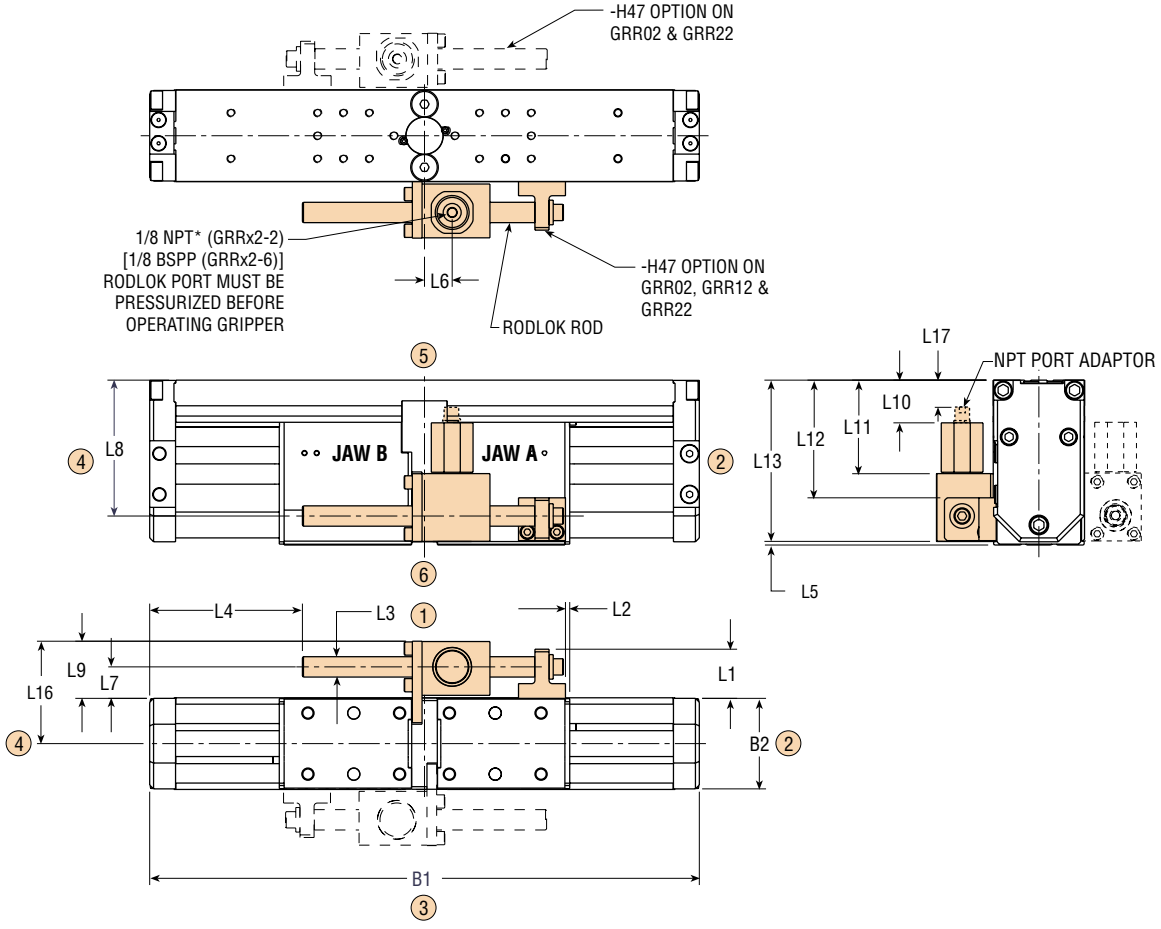
OPERATING PRESSURE: The operating pressure for the locking device is different than the operating pressure for the gripper with the Rodlok attached. The locking device of the Rodlok is designed with an operating pressure range of 60 psi minimum to 150 psi maximum [4 to 10 bar]. The Series GRR Gripper with a Rodlok attached has an operating pressure range of 30 psi minimum to 120 psi maximum [2 to 8 bar].



GRR12 WITH -H47 OPTION



GRR02 & GRR22 WITH -H47 OPTION



All dimensions are reference only unless specifically toleranced.

LETTER DIM	MODEL NUMBER							
	GRRx2-x-63 X 150		GRRx2-x-63 X 200		GRRx2-x-63 X 250		GRRx2-x-63 X 350	
	in	mm	in	mm	in	mm	in	mm
B1	17.314	439.8	21.251	539.8	26.016	660.8	33.890	860.8
B2	3.500	88.9	3.500	88.9	3.500	88.9	3.500	88.9
L1	1.900	48.3	1.900	48.3	1.900	48.3	1.900	48.3
L2	.165	4.2	.165	4.2	1.630	41.4	3.370	85.6
L3	.787	20.0	.787	20.0	.787	20.0	.787	20.0
L4	4.920	125.0	5.900	149.9	7.280	184.9	9.250	235.0
L5	.141	3.6	.141	3.6	.141	3.6	.141	3.6
L6	1.070	27.2	1.070	27.2	1.070	27.2	1.070	27.2
L7	1.217	30.9	1.217	30.9	1.217	30.9	1.217	30.9
L8	5.254	133.5	5.254	133.5	5.254	133.5	5.254	133.5
L9	2.209	56.1	2.209	56.1	2.209	56.1	2.209	56.1
L10	1.150	41.9	1.150	41.9	1.150	41.9	1.150	41.9
L11	3.618	91.9	3.618	91.9	3.618	91.9	3.618	91.9
L12	4.550	115.6	4.550	115.6	4.550	115.6	4.550	115.6
L13	6.234	158.3	6.234	158.3	6.234	158.3	6.234	158.3
L14	3.95 lb	1.79 kg	4.22 lb	1.91 kg	4.35 lb	1.97 kg	4.65 lb	2.11 kg
L15	7.90 lb	3.58 kg	8.44 lb	3.83 kg	8.70 lb	3.95 kg	9.30 lb	4.22 kg
L16	3.960	100.6	3.960	100.6	3.960	100.6	3.960	100.6
L17	1.06	27.1	1.06	27.1	1.06	27.1	1.06	27.1

L14 = WEIGHT ADDER FOR GRR12
L15 = WEIGHT ADDER FOR GRR02 & GRR22

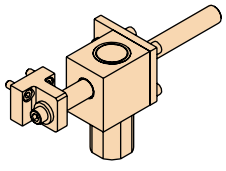
NOTES:

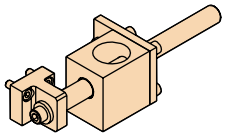
1) LOCKING FORCE INDICATED IS THE ACTUAL LOCKING FORCE WITH A DRY, CLEAN ROD AND DOES NOT INCLUDE ANY SAFETY FACTOR. IT IS POSSIBLE TO OVERRIDE THE RODLOK WITH VERY HIGH FORCE APPLIED TO THE GRIPPER. STATIC LOCKING FORCE MAY BE INCREASED ON SYNCHRONIZED UNITS, GRR12, WITH THE ADDITION OF A SECOND RODLOK. SEE KITS BELOW.
2) CIRCLED NUMBERS INDICATE POSITION.
3) *1/8" NPT PORT IS AN ADAPTOR INCLUDED WITH IMPERIAL UNITS.

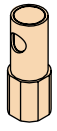
SIZE	STATIC LOCKING FORCE (see Note 1)	
	lb	N
63	495	2200

ACCESSORIES - RODLOK

The Series GRR is -H47 ready as standard. The following items may be added to the Design 2 [6] GRR or may be used as replacement parts. Note that the kits below are for one jaw only.







COMPLETE RODLOK KIT (PER JAW)

Full unit description - H9110

Kit includes Rodlok and Rodlok adaptor for a single (1) jaw.

RODLOK SEAL KIT (PER JAW)

Full unit description - H9115

Kit includes seals and wear rings for a single (1) jaw.

RODLOK ADAPTOR KIT (PER JAW)

Full unit description - H9105

Kit includes Rodlok adaptor for a single (1) jaw. Does not include Rodlok.

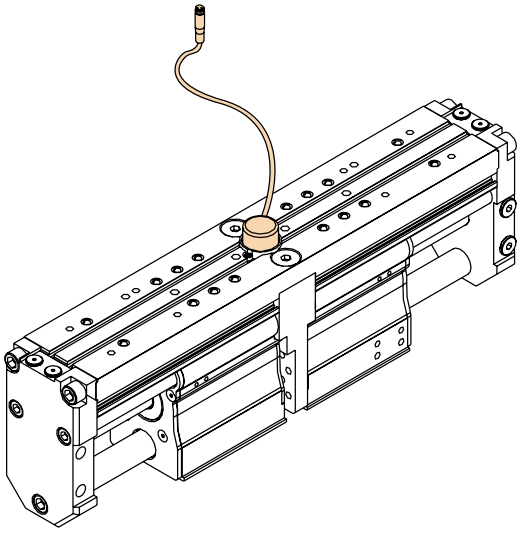
RODLOK KIT (PER JAW)

Full unit description - H9100

Kit includes Rodlok for a single (1) jaw. Does not include Rodlok imperial port adaptor.

SPP99 JAW POSITION SENSOR

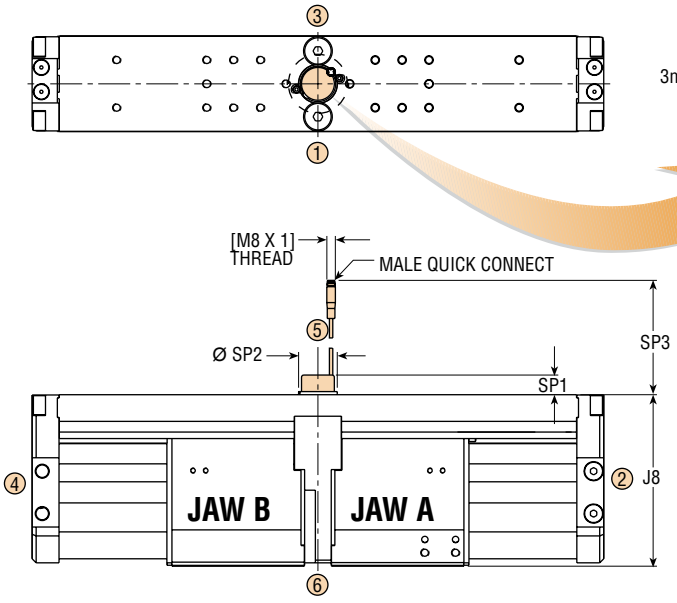
Provides an easy to use, economical, fully integrated solution to continuously monitor the grip position of the jaws. The sensor mounts directly to the gripper making field installation or replacement quick and easy. The 3-pin quick-connect connector provides a 0-10 volt analog output compatible with standard analog control modules.



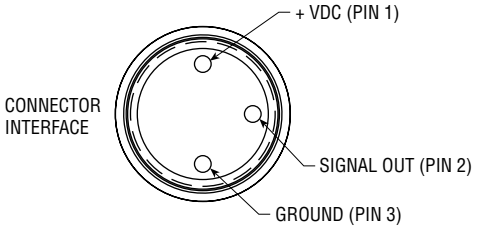
STT99 COUPLED JAW POSITION SENSOR

Has the same functional performance as the -SPP99 option, except it is mechanically coupled and **must be specified when the order is placed**. This option cannot be added to the unit at a later time.

Consult PHD for use with -V1 option on both of these options..



LETTER DIM	MODEL NUMBER GRRx2-x-63 in	mm
J8	6.375	161.9
SP1	.748	19.0
SP2	1.437	36.5
SP3	10.000	254



RESOLUTION

Resolution of sensor installed into gripper is 0.001 inch [0.025 mm] in conjunction with an analog control module having 15 bits or greater input resolution.

REPEATABILITY

Maximum variation of reported grip dimension when repeatedly gripping the same object is ±0.002 in [±0.05 mm].

ENVIRONMENTAL

Temperature Limits: -20 to 180°F [-28 to 82°C]
IP67 compliant when installed in gripper.

ELECTRICAL

Supply Voltage: 15-30 VDC, reverse polarity protected
Output Voltage: 0-10 VDC, short-circuit protected
Output Constant: 663 ± 1mV/inch [26.10 ± 0.04 mV/mm] of grip change
Output Voltage Offset: <10mV typical
Output Linearity: ± 0.3%

All dimensions are reference only unless specifically toleranced.

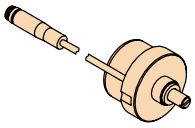
SPP99 JAW POSITION SENSOR

Series GRR1 is supplied -SPP99 ready. Kit below provides the same jaw position sensor and mounting hardware supplied pre-assembled with the -SPP99 option. See option details for further information.

SPP99 JAW POSITION SENSOR KITS

KIT	STANDARD	CORROSION RESISTANT
Sensor Replacement Kit	74209-31	74209-32

Kit includes 1 jaw position sensor, 2 mounting screws, 1 seal and 1 coupling seal



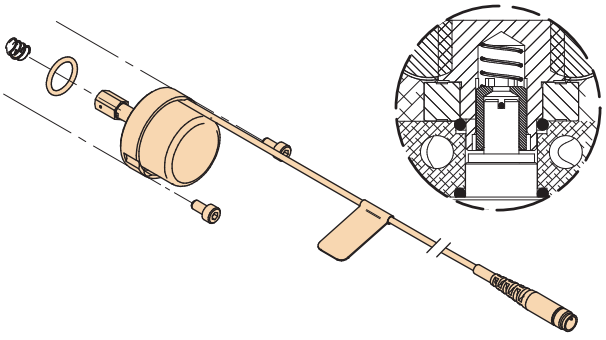
STT99 JAW POSITION SENSOR

Kits below provide the same jaw position sensor and mounting hardware supplied pre-assembled with the -STT99 option. See option details for further information.

REPLACEMENT STT99 JAW POSITION SENSOR KITS

KIT	STANDARD	CORROSION RESISTANT
Sensor Replacement Kit	84404-11	84404-12

Kit includes 1 jaw position sensor, 2 mounting screws, 1 seal and spring



GRR

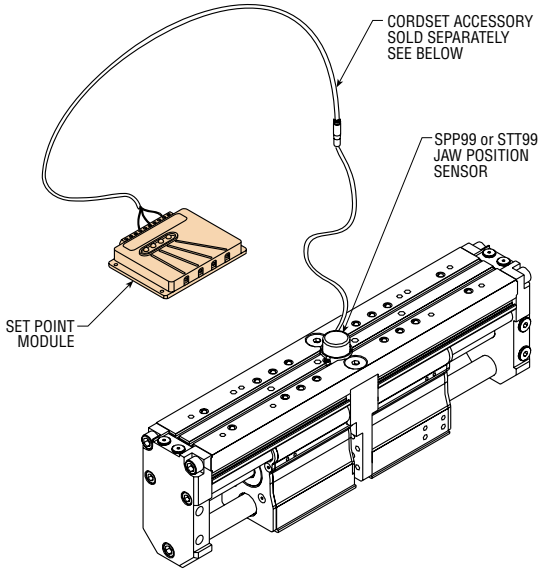
SET POINT MODULE

Set Point Module converts analog output from sensor into discrete on-off outputs. Module provides four independently adjustable set points throughout jaw travel. Available with NPN (sink) or PNP (source) outputs.

SET POINT MODULE

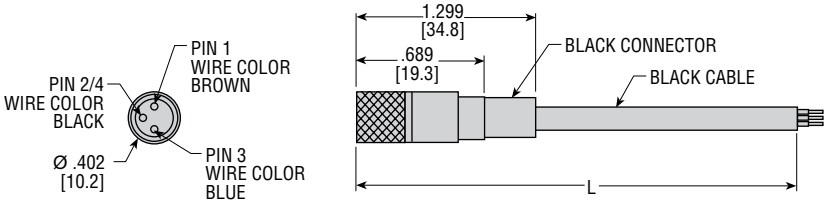
PART NO.	DESCRIPTION
9800-01-0300	4.5-24 VDC, Sink Type Output
9800-01-0400	4.5-24 VDC, Source Type Output

See Switches and Sensors section in main catalog for more information.



CORDSET

Provides a cordset with female quick connect and additional cable. Perfect for use with the Set Point Module.



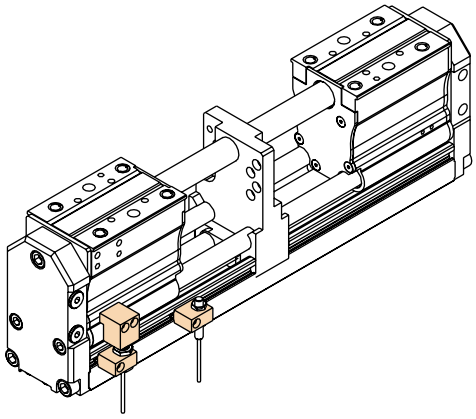
MODEL NO.	LETTER DIM. L
63549-02	78.74 [2 m]
63549-05	196.85 [5 m]

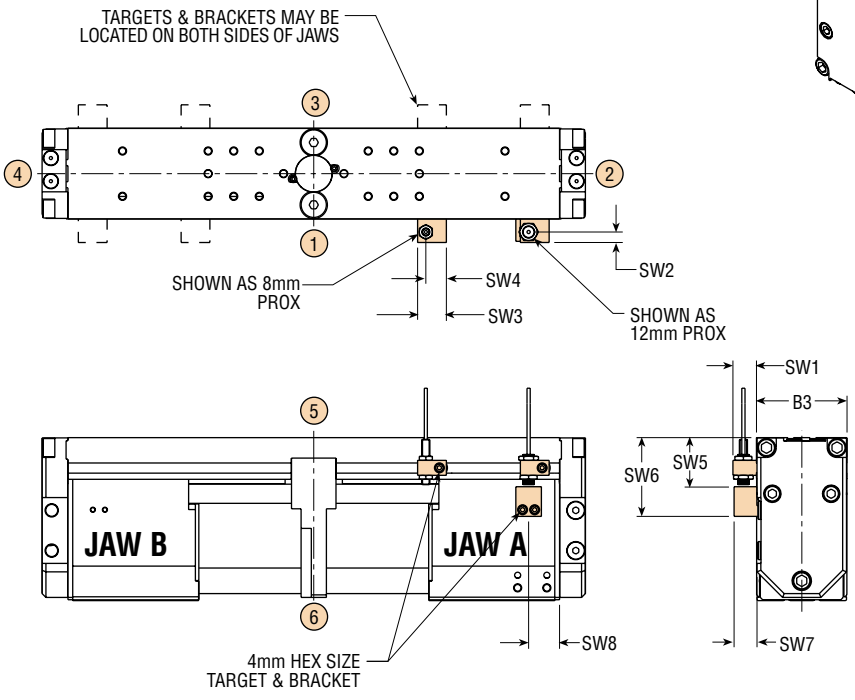
All dimensions are reference only unless specifically toleranced.

PROXIMITY SWITCHES - EXTERNAL

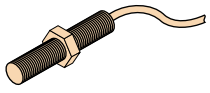
This accessory provides for the external mounting of 8 or 12 mm threaded round metal sensing inductive proximity switches. Multiple switches may be mounted using multiple brackets. Proximity switches, targets, and mounting brackets are ordered separately. See the Switches and Sensors section for complete switch specifications.

NOTE: Target and bracket kits do not interchange with Series 1 [5] GRR Grippers.



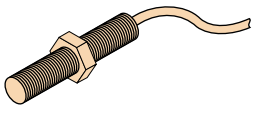


DIM LETTER	GRRx2-x-63 in	mm
B3	3.544	90.0
SW1	.920	23.4
SW2	.410	10.4
SW3	1.125	28.6
SW4	.852	21.6
SW5	1.920	48.8
SW6	3.080	78.2
SW7	.900	22.9
SW8	1.211	30.8



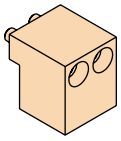
8 mm THREADED INDUCTIVE PROXIMITY SWITCHES

PART NUMBER	DESCRIPTION
51422-005-02	NPN (Sink), 2 meter cable
51422-006-02	PNP (Source), 2 meter cable



12 mm THREADED INDUCTIVE PROXIMITY SWITCHES

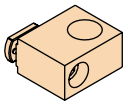
PART NUMBER	DESCRIPTION
15561-001	NPN (Sink), 2 meter cable
15561-002	PNP (Source), 2 meter cable
15561-003	VAC Solid State, 3 meter cable



8 mm & 12 mm THREADED INDUCTIVE PROXIMITY SWITCH TARGET KITS

STANDARD	CORROSION RESISTANT
74994-31	74994-32

Kit includes 1 proximity switch target and 2 target mounting screws



THREADED INDUCTIVE PROXIMITY SWITCH MOUNTING BRACKET KITS

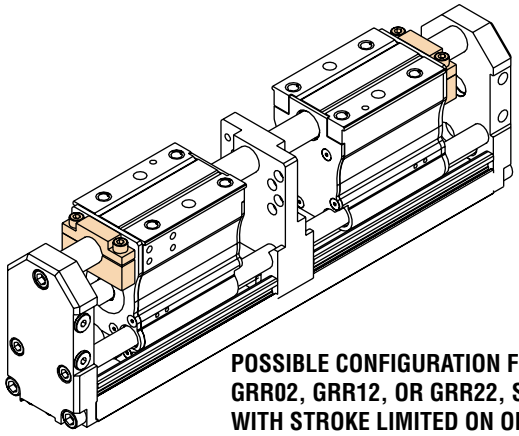
8 mm SWITCH	CORROSION RESISTANT 8 mm SWITCH	12 mm SWITCH	CORROSION RESISTANT 12 mm SWITCH
74992-31	74992-32	74993-31	74993-32

Kit includes 1 proximity switch mounting bracket, 1 mounting nut, and 1 mounting screw

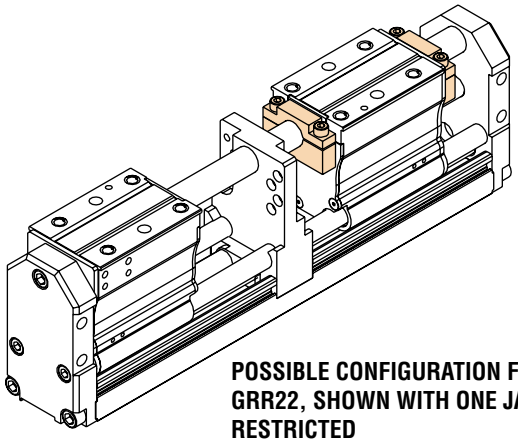
All dimensions are reference only unless specifically toleranced.

TRAVEL ADJUSTMENT COLLARS

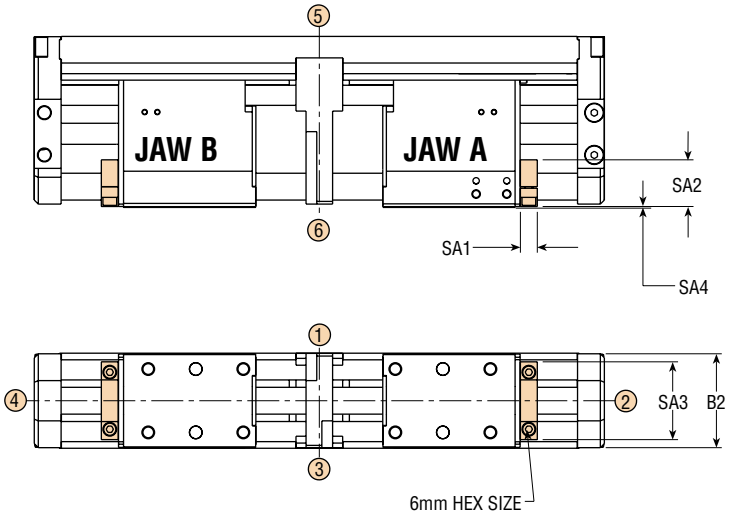
This accessory provides travel adjustment stop collars for use in limiting jaw travel on open or close. The travel adjustment stop collars provide infinite adjustment. Synchronized model (GRR12) requires travel adjustment collars to be identically located for both jaws, in the same direction of travel. Non-synchronized models (GRR02 & GRR22) do not require identical stop locations for each jaw. For non-adjustable jaw travel limiting, see options ANxxx, ATxxx, APxxx, ARxxxx, AUxxx, and AQxxx on page 4-139.



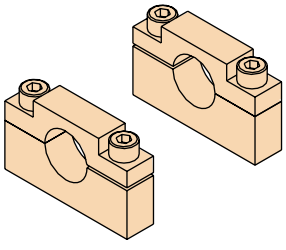
POSSIBLE CONFIGURATION FOR GRR02, GRR12, OR GRR22, SHOWN WITH STROKE LIMITED ON OPEN



POSSIBLE CONFIGURATION FOR GRR22, SHOWN WITH ONE JAW RESTRICTED



DIM LETTER	GRRx2-x-63 in	mm
B2	3.500	88.9
SA1	.630	16.0
SA2	1.740	44.2
SA3	2.900	73.7
SA4	.035	.9



STROKE ADJUSTMENT COLLAR KITS

STANDARD	CORROSION RESISTANT
74211-01	74211-02

Kit includes 2 stroke adjustment collars and 4 mounting screws.

All dimensions are reference only unless specifically toleranced.