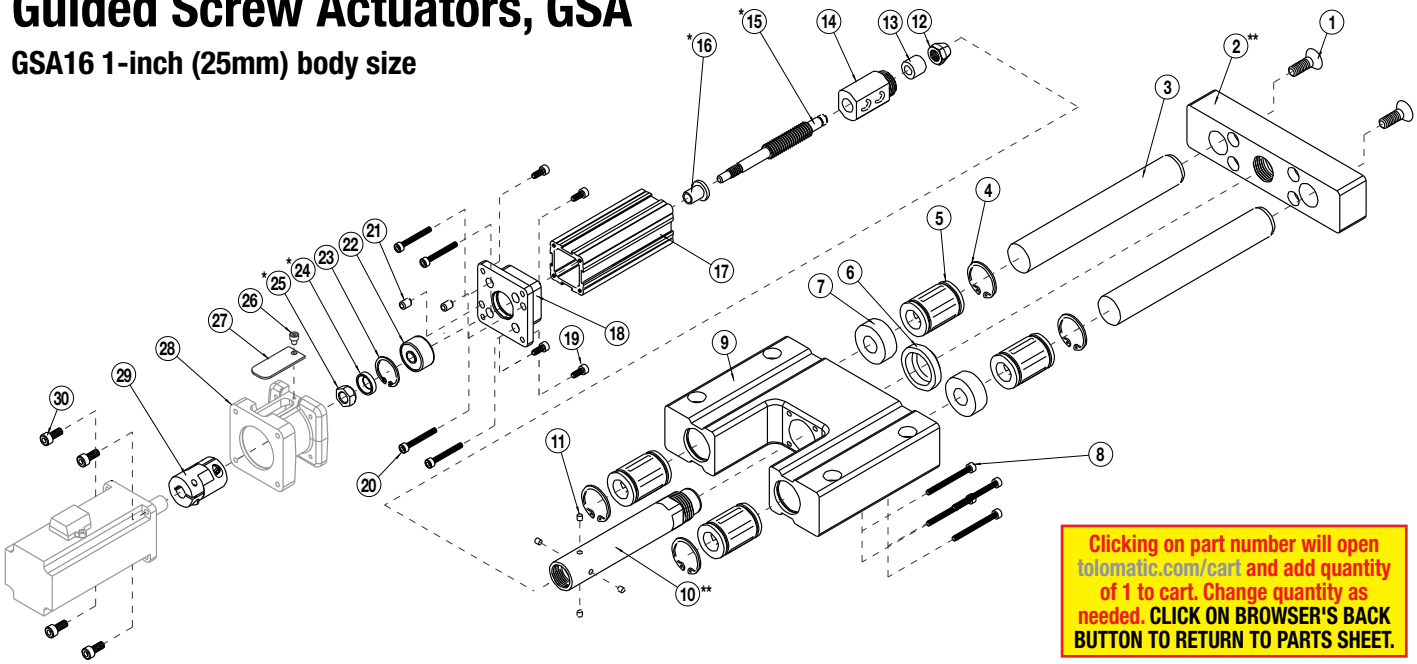
Tolomatic™
EXCELLENCE IN MOTION

Parts Sheet

3600-4116_13

Guided Screw Actuators, GSA

GSA16 1-inch (25mm) body size



Clicking on part number will open tolomatic.com/cart and add quantity of 1 to cart. Change quantity as needed. CLICK ON BROWSER'S BACK BUTTON TO RETURN TO PARTS SHEET.

Inline Models (LMI)

Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY.
1.	2216-1010	SOCKET HEAD FLAT CAP SCREWS (US CONV)	2
	3216-1010	SOCKET HEAD FLAT CAP SCREWS (METRIC)	2
[2]2.	2216-1060	TOOLING PLATE (STANDARD SIZE US CONV)	1
	2216-1061	TOOLING PLATE (OVERSIZED US CONV)	1
	3216-1060	TOOLING PLATE (STANDARD SIZE METRIC)	1
	3216-1061	TOOLING PLATE (OVERSIZED METRIC)	1
[3]3.	CONFIGURED	GUIDE ROD	2
4.	2216-1007	RETAINING RING	4
◊5.	1004-1332	LINEAR BEARING (LB)	4
	2216-1009	COMPOSITE BEARING STANDARD (CB & CBS)	4
	2216-1012	COMPOSITE BEARING OVERSIZED (COB & CBSO)	4
6.	2216-1008	WIPER RING	1
7.	2216-1005	WICK STANDARD ROD	2
	2216-1006	WICK OVERSIZED ROD	2
8.	2212-1011	SOCKET HEAD CAP SCREW	4
9.	2216-1001	HOUSING (US CONV)	1
	3216-1001	HOUSING (METRIC)	1
[2]10.	TRAGSA16 SK_	REPLACEMENT THRUST ROD (SPECIFY STROKE)	1
11.	0905-1109	MAGNET ROD	4
12.	0910-1288	LOCK NUT	1
13.	2112-1120	LEAD SCREW BEARING	1

Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY.
14.	2212-9005	NUT LEAD, PLASTIC (SN01)	1
	2212-9006	NUT LEAD, PLASTIC (SN02)	1
	2212-9007	NUT LEAD, PLASTIC (SN05)	1
	2212-9008	NUT LEAD, BRONZE (BZ10)	1
	0910-1430	NUT BALL 3/8 ID 8TPI (BN08)	1
[1,4]15.	RLSGSA16 SK_	REPLACEMENT LEAD SCREW (SPECIFY STROKE)	1
[1]16.	1107-1044	SLEEVE, TAPER	1
17.	RTBGSA16 SK_	REPLACEMENT TUBE (SPECIFY STROKE)	1
18.	1112-1037	BEARING PLATE (US CONV)	1
	2107-1037	BEARING PLATE (METRIC)	1
19.	2212-1111	SOCKET HEAD CAP SCREW	4
20.	1124-1159	SOCKET HEAD CAP SCREW	4
21.	6000-1752	DOWEL PIN	2
22.	4510-1060	BEARING, DBL,ROW, ANG	1
23.	2107-1092	RETAINING RING	1
[1]24.	1107-1014	WASHER, SPHERICAL	1
[1]25.	1107-1013	NUT, SPHERICAL	1
26.	1124-1159	SOCKET HEAD CAP SCREW	1
27.	1112-1032	ACCESS COVER	1
[3]28.	CONFIGURED	MOTOR SPACER	1
[3]29.	CONFIGURED	COUPLER KIT	1
[3]30.	CONFIGURED	SOCKET HEAD CAP SCREW	4

[1] Not backward compatible with units manufactured before 01/01/2003

[2] Not backward compatible with units manufactured before 03/01/2003

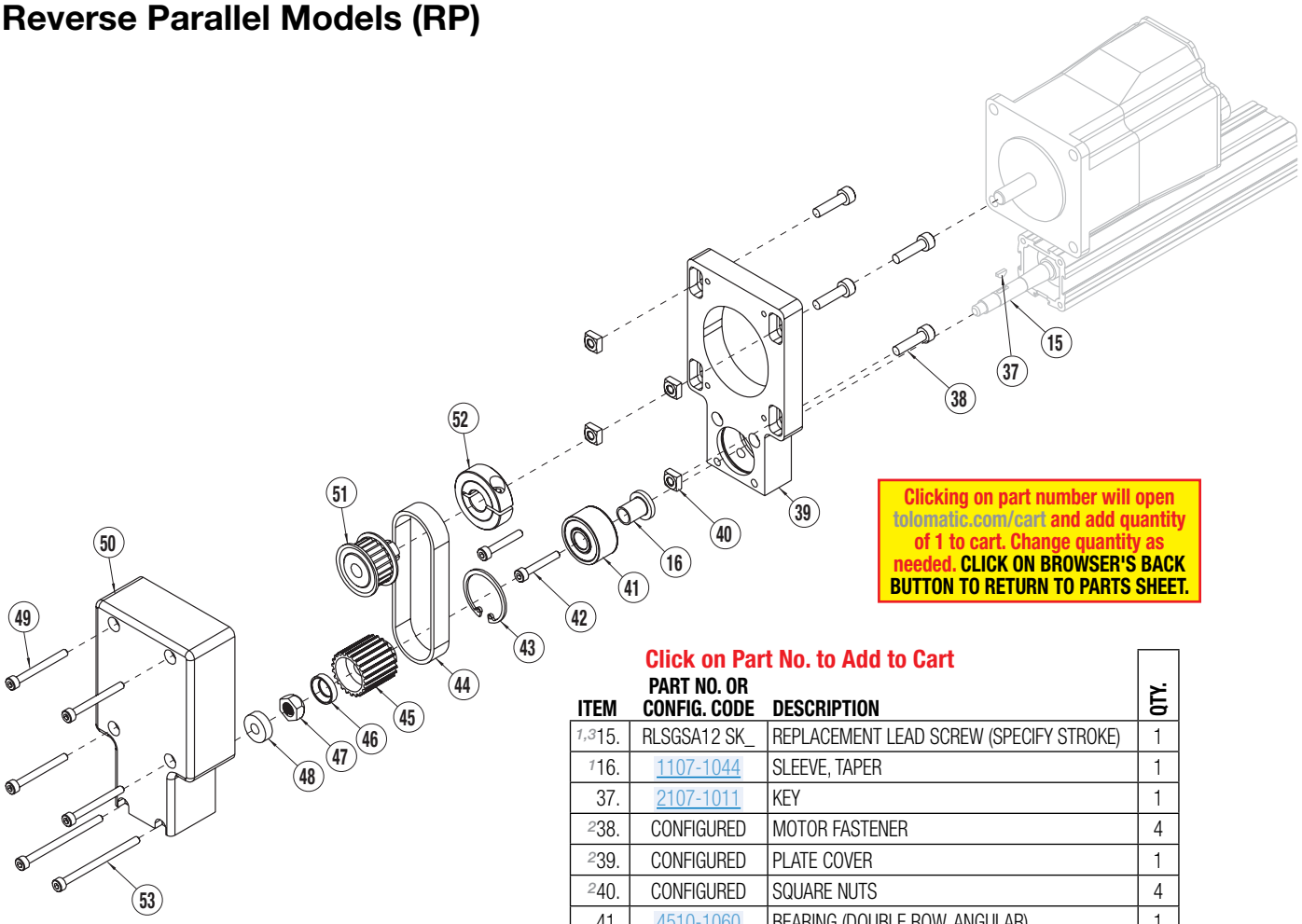
[3] Part number varies depending on YMH (Your Motor Here). Contact help@tolomatic.com for replacement part number.

[4] Replacement Lead Screw ordering method: RLS GSA16 ____ SK____ YM___

EXAMPLE: RLS GSA16 SN01 SK21.25 YM1100 1

Lead Screw — Model & Size — Nut Style & Size — Stroke Length — Motor Code

Reverse Parallel Models (RP)



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Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY.
[1,3]15.	RLSGSA12 SK_	REPLACEMENT LEAD SCREW (SPECIFY STROKE)	1
[1]16.	1107-1044	SLEEVE, TAPER	1
37.	2107-1011	KEY	1
[2]38.	CONFIGURED	MOTOR FASTENER	4
[2]39.	CONFIGURED	PLATE COVER	1
[2]40.	CONFIGURED	SQUARE NUTS	4
41.	4510-1060	BEARING (DOUBLE ROW, ANGULAR)	1
42.	2212-1111	SOCKET HEAD CAP SCREW	4
43.	2107-1092	RETAINING RING	1
[2]44.	CONFIGURED	BELT	1
[2]45.	CONFIGURED	LOWER PULLEY	1
46.	1107-1014	WASHER	1
47.	1107-1013	LOCK NUT	1
48.	0905-1159	RADIAL BALL BEARING	1
49.	2116-1116	SOCKET HEAD CAP SCREW	4
[2]50.	CONFIGURED	REVERSE-PARALLEL HOUSING	1
[2]51.	CONFIGURED	UPPER PULLEY	1
[2]52.	CONFIGURED	LOCK COLLAR	1
53.	8516-1050	SOCKET HEAD CAP SCREW	2

[1] Not backward compatible with units manufactured before 01/01/2003

[2] Part number varies depending on YMH (Your Motor Here). Contact help@tolomatic.com for replacement part number.

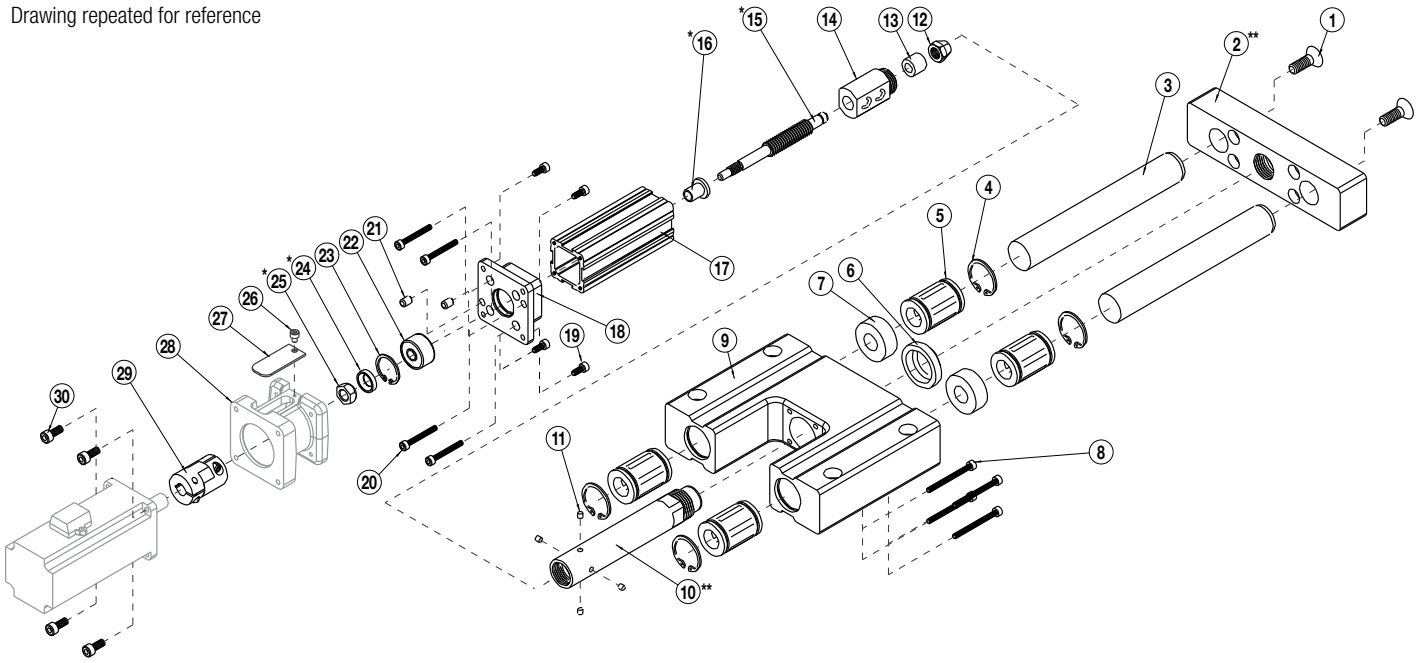
NOTE: Parts 1-18 (except #15) of the Inline model listing are used in the reverse-parallel models.

[3] Replacement Lead Screw ordering method: RLS GSA16 ____ SK____ YM___

EXAMPLE: RLS GSA16 SN01 SK21.25 YM11001

Lead Screw Model & Size — Nut Style & Size — Stroke Length — Motor Code

Drawing repeated for reference



General Cylinder Disassembly Instructions

Begin with a clean work area. Be sure all replacement parts are present and have no visual damage or defects. The following tools are recommended for proper disassembly and assembly.

- Allen wrench set (metric)
- Socket wrench & socket set
- Retaining ring pliers (internal & external)

1. **LMI Unit, Remove motor and motor spacer:** Remove the access cover (27) from the motor spacer (28) to gain access to the screws of the motor coupler (29). Loosen the coupler screw closest to the actuator. Remove 4 screws (19) that hold the motor spacer onto bearing plate (18). Remove the motor spacer/motor assembly.

   RP Unit, Remove motor and belt: Remove the RP Housing (50), loosen the six fasteners (49 and 53) attaching plate cover to the RP case. Remove the belt (44). The motor can now be removed if needed.

2. **Remove the Tooling Plate Assembly:** Using a wrench, unscrew the thrust rod (10) from the tooling plate (2). Note: On the ballnut style it is necessary to remove the cap screws (8) prior to unscrewing the thrust rod, to allow the tube to turn w/ the thrust rod. Slide the tooling plate (shafts still attached) out from the housing.

3. **Remove Bearing Plate/Leadscrew Assembly:** Remove the 4 screws (20) that hold the bearing plate (27) to the tube (17). Slide the bearing plate, leadscrew, thrust rod assembly out of the tube. Note: the thrust rod may need to be "unscrewed" from the wiper seal in the housing in order to do this.

4. **Remove the Thrust Rod/Nut Assembly:** Remove the locknut (12) and lead screw bearing (13) from the non-motor end of the leadscrew.
   Plastic nut style: The leadscrew can be threaded out of the nut at this point.
   Ball nut style: Caution is required if removal of the nut or leadscrew is required. Contact the factory for available parts and procedures. Note: if ball nut is removed from screw, ball bearings will fall out! If nut is threaded out of the thrust rod maintain any shims that are between the nut and thrust rod for re-assembly.

5. **Remove Bearing Plate from Leadscrew:** Hold the leadscrew in a smooth jaw vice and remove the locknut (25). Support the bearing plate, and press the leadscrew out of the bearing/sleeve. The sleeve is a press fit in the bearing and should not be re-used. Remove the retaining ring (23) from bearing plate (18) and press the bearing out of the bearing plate.

6. **Remove the Housing from the Tube:** Remove screws (8) from the housing (9) to detach it from the actuator body. The wiper ring (6) can be removed from the housing at this time.

7. **Remove the Shafts from Tooling Plate:** Remove screws (1) from plate. Use a press and a tool that will fit inside the thread inside the shaft (3) and press out the shafts.

8. **Guide Bearing & Wick removal (linear bearings only):** Remove retaining rings (4) from the housing. Slide out bearings (5). Using a screwdriver or similar tool, remove the lubrication wicks (7). Note: the composite style of bearings are pressed in the housing, they can't be removed.

General Cylinder Assembly Instructions

1. **Install Wick and Guide Bearings (linear bearings only):** Apply a light amount of oil to each wick (7) so that they are damp. Install the wick into each groove of the housing (9). Install 4 bearings (5) into the housing. Rotate them such that the ball races are not aligned with each other on opposite ends of the housing. Install retaining rings (4) to hold them in place. The flat side of the ring goes against the bearing. Install wiper ring (6) into groove in housing. Make sure tapered edge of ring faces "out" of housing.

2. **LMI:** Install Bearing onto Leadscrew: Press sleeve (16) into bearing (22). Clean ID of sleeve and OD of taper on leadscrew. Position bearing/sleeve over the leadscrew. Install the washer (24) over leadscrew. Apply Loctite 242 to threads of leadscrew and threads of locknut (25). Thread on the Locknut and torque to 65 in-lbs [7.34 N-m]. Hold leadscrew in machinist vice as needed.

   RP: Install Bearing onto Leadscrew: Press sleeve (16) into bearing (41). Clean ID of sleeve and OD of taper on leadscrew. Position bearing/sleeve over the leadscrew. Install the key (37), lower pulley (45), washer (46) over leadscrew. Apply Loctite 242 to threads of leadscrew and threads of locknut (47). Thread on the Locknut and torque to 65 in-lbs [7.34 N-m]. Hold leadscrew in machinist vice as needed.

3. **Install bearing into Bearing Plate:** Apply a coating of Loctite 641 to the ID of the bearing plate/RP case and the OD of the bearing. Locate the Bearing Plate/RP housing over the bearing and install the snap ring.

4. **Install guide shafts into tooling plate:** Press shaft (3) into hole in tooling plate (2). The end of the shaft with the threads in it goes into the plate. Note: It is very important to press the shaft in straight! Use some sort of guide if possible. Repeat this for the other shaft. Apply blue Loctite 242 to the threads of each screw (1) and thread into guide rods. Hand tighten.

5. **Install nut, thrust rod onto leadscrew:**
   Plastic nut style: Temporarily thread the nut into thrust rod and drill w/ 1/16th bit. Remove nut from rod and thread the nut onto the leadscrew. Install the guide bushing and locknut on end of leadscrew. Apply a coating of Loctite 271 to the nut and thread into the thrust rod and tighten. Install pins thru thrust rod and into the nut.

   Ball nut style: Ballnut is threaded into thrust rod w/ Loctite 271. The ballnut needs to be properly oriented w/ respect to the tube w/ the use of shims. Contact factory for appropriate procedure and part numbers.

6. **Lubricate the leadscrew:**
   Plastic Nut: Apply a liberal film of Christo-Lube® 405 grease along the leadscrew. Apply a thin film of the same grease along the ID of thrust rod.

   Ballnut: Apply a liberal film of Mobilgrease® HP (Mobil blue) along the leadscrew. Apply a thin film of the same grease along the ID of thrust rod.

7. **Main actuator assembly:** Locate the tube (17) over the thrust rod/leadscrew assembly. Position the Housing (9) over the thrust rod. Insert the tooling plate/guide rods (3) into the housing. Apply loctite 242 to the thread of the thrust rod. Thread into the tooling plate hand tight. With a wrench, tighten the thrust rod 1/2 turn. Then continue tightening until the nearest set of flats on the thrust rod align w/ the edges of the tooling plate. This is necessary in order to align the magnets w/ the switch slots in the tube. Install fasteners (8) thru housing and tighten. Install the bearing plate fasteners (20), and tighten.

8. **LMI Unit, attach Motor:** Attach coupler (29) to the actuator shaft. Attach motor spacer (28) to the actuator. Attach motor to the spacer and tighten down coupler fastener to motor shaft.

RP Unit, Attach Motor and Tension Belt:

Attention: The following order of operations is essential to performance and life of this actuator.

1. Position motor/motor plate on RP plate cover (39) and install fasteners (38) but do not tighten.

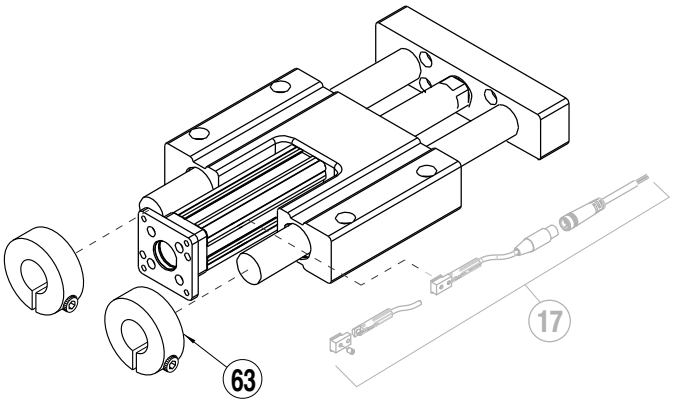
2. Locate belt (44) over the pulleys.

3. Tension the belt by pulling the motor away from the drive shaft with appropriate force from chart below. Tighten the motor fasteners while this force is applied to the motor.

4. Install the reverse parallel cover (50) with fasteners (49 and 53).

SMALLEST SHAFT DIAMETER (Motor or Actuator)		TOTAL WEIGHT TO APPLY	
Inches	mm	lbs	kgs
0.18 to 0.259	4.572 to 6.579	13	5.902
0.260 to 0.499	6.604 to 12.675	22	9.988
0.500 to 0.625	12.7 to 15.875	31	14.074
0.625 and larger	15.875 and larger	40	18.160

Additional tips are found in Tolomatic Electric Actuator Motor Mounts Technical Note # 3600-4203.



Click on Part No. to Add to Cart

STOP COLLARS			
ITEM	**PART #**	**DESCRIPTION**	**QTY**
63.	2317-1005	STANDARD STOP COLLAR	2
	2317-1056	STAINLESS-STEEL STOP COLLAR	2
	2324-1005	OVERSIZE STOP COLLAR	2
	2324-1056	OVERSIZE STAINLESS-STEEL STOP COLLAR	2

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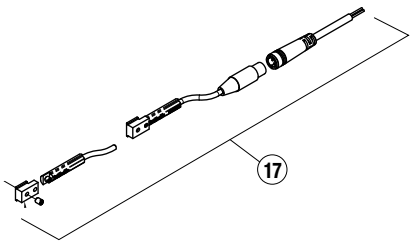


To order switch kits use configuration code for switch preceded by SW and actuator code.

EXAMPLE: SWGSA16KK

KIT	ACTUATOR	SIZE	SWITCH CODE

The example is for a Solid State NPN, Normally Open switch with Quick-disconnect coupler. Each switch is complete with Bracket, Set Screw, Switch and mating QD cable. Note that the bracket/switch size is common and may be used on any size GSA.

ITEM	ORDER CODE	LEAD	SENSOR TYPE	SWITCHING LOGIC	POWER LED	SIGNAL LED	OPERATING VOLTAGE	**POWER RATING (WATTS)	SWITCHING CURRENT (MA MAX.)	CURRENT CONSUMPTION	VOLTAGE DROP	LEAKAGE CURRENT	TEMP. RANGE	SHOCK / VIBRATION
17.	RY	5M	REED	SPST NORMALLY OPEN	—	RED	5 - 240 AC/DC	**10.0	100MA	—	3.0 V MAX.	—	14 TO 158°F [-10 TO 70°C]	50 G / 9 G
	RK	QD*			Tolomatic 81009082									
	NY	5M		SPST NORMALLY CLOSED	—	YELLOW	5 - 110 AC/DC							
	NK	QD*			Tolomatic 81009084									
	TY	5M	SOLID STATE	PNP (SOURCING) NORMALLY OPEN	GREEN	YELLOW	10 - 30 VDC	**3.0	100MA	20 MA @ 24V	2.0 V MAX.	0.05 MA MAX.		
	TK	QD*			Tolomatic 81009088									
	KY	5M		NPN (SINKING) NORMALLY OPEN	GREEN	RED								
	KK	QD*			Tolomatic 81009090									
	PY	5M		PNP (SOURCING) NORMALLY CLOSED	GREEN	YELLOW								
	PK	QD*			Tolomatic 81009092									
	HY	5M		NPN (SINKING) NORMALLY CLOSED	GREEN	RED								
	HK	QD*			Tolomatic 81009094									
switch bracket, set screw & mating QD cable is included														

*QD = Quick-disconnect

Enclosure classification IEC 529 IP67 (NEMA 6)

CABLES: Robotic grade, oil resistant polyurethane jacket, PVC insulation

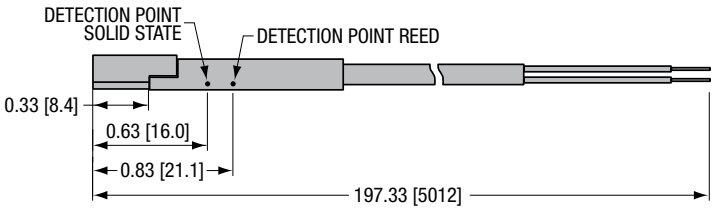
**WARNING: Do not exceed power rating (Watt = Voltage x Amperage). Permanent damage to sensor will occur.

SWITCH INSTALLATION

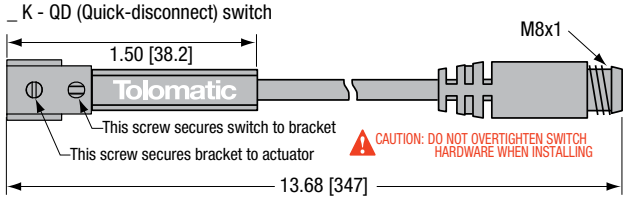
Place switch bracket into one of the four slots that run the length of the extruded tube. Note that there is a cutout on the actuator head (RSA) or tube (GSA) to allow insertion of the bracket. Insert the switch with the word "Tolomatic" facing up and slide it under the bracket. Position the bracket with the switch to the exact location desired, then lock them securely into place by tightening both set screws on the bracket.

SWITCH DIMENSIONS

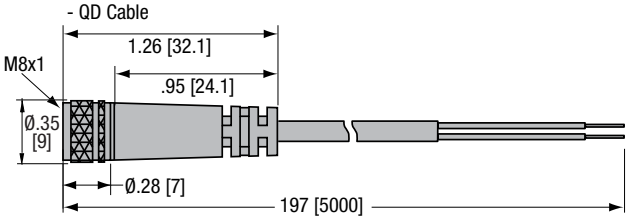
_ Y - direct connect



_ K - QD (Quick-disconnect) switch

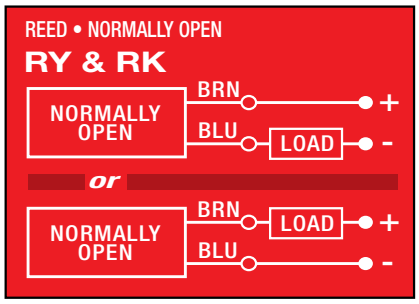


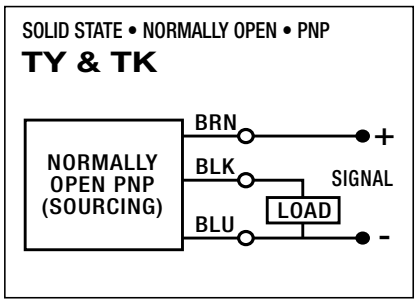
- QD Cable

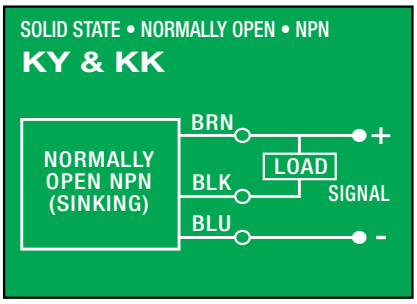


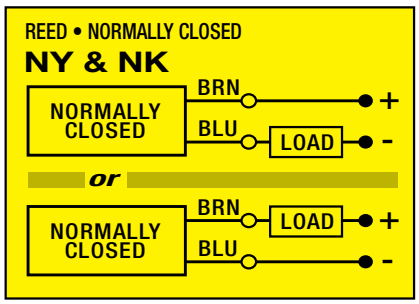
Dimensions in inches [brackets indicate dimensions in millimeters]

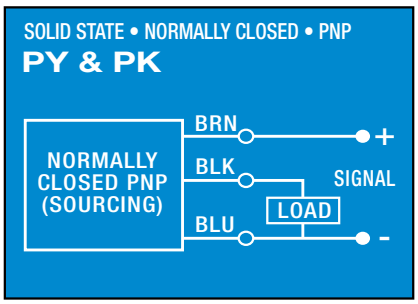
SWITCH WIRING DIAGRAMS AND LABEL COLOR CODING (CE and RoHS Compliant)

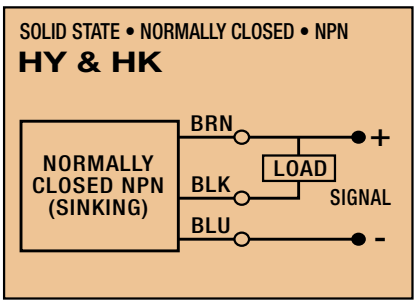


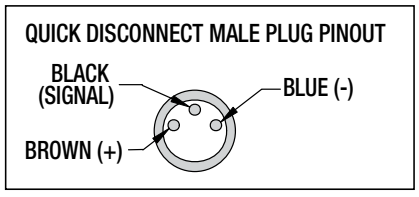


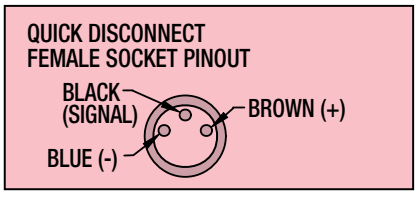












Switches:
- Include retained mounting hardware
- In slot, sit below extrusion profile
- Same for all sizes

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