Tolomatic™
EXCELLENCE *IN MOTION*

Parts Sheet

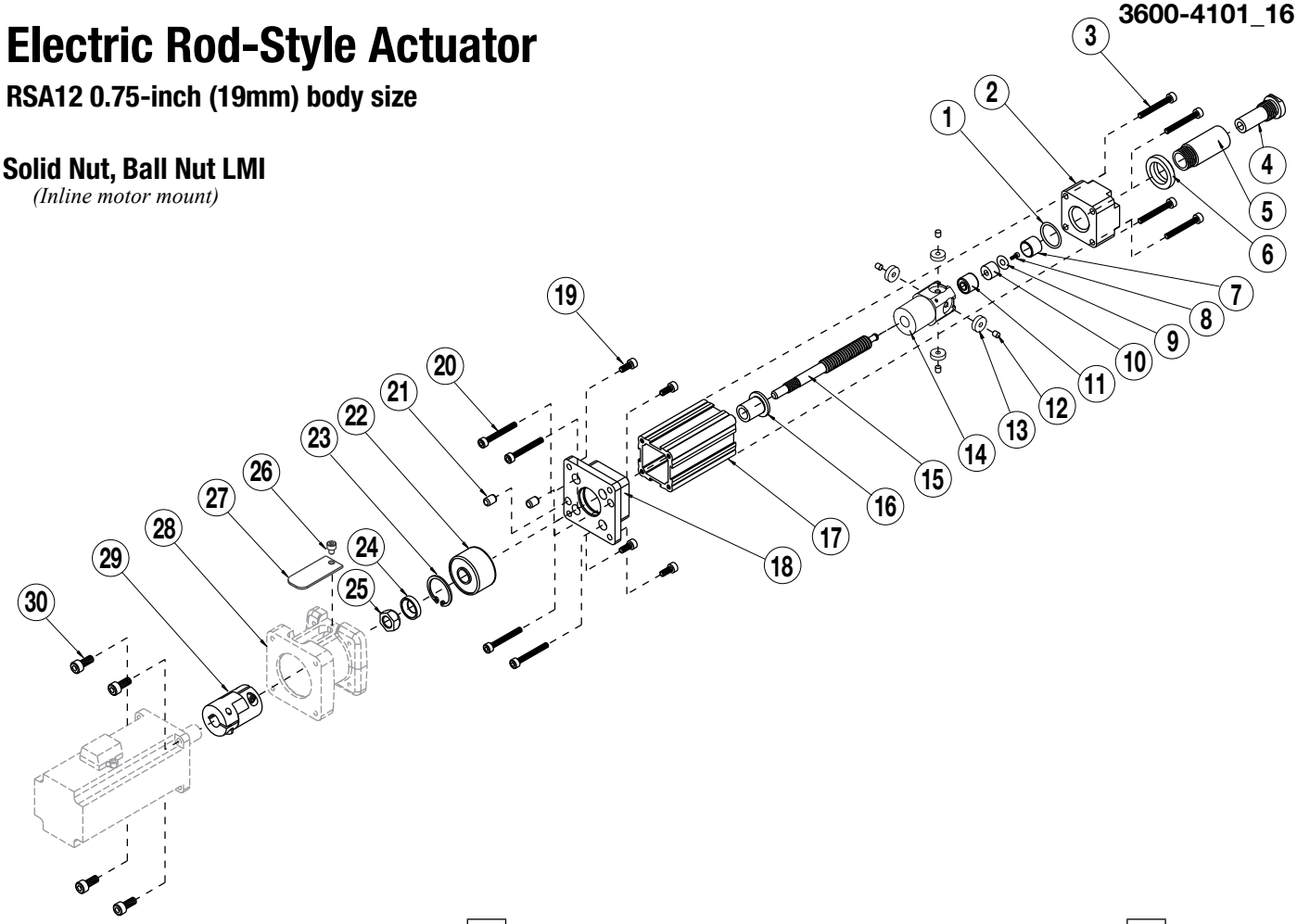
3600-4101_16

Electric Rod-Style Actuator

RSA12 0.75-inch (19mm) body size

Solid Nut, Ball Nut LMI

(Inline motor mount)



ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY.
1.	0740-1069	O-RING	1
2.	1107-1002	MACHINED HEAD (US CONV)	1
	2107-1002	MACHINED HEAD (METRIC)	1
3.	2212-1091	SOCKET HD CAP SCREW	4
4.	1107-1006	MACHINED ROD END (US CONV)	1
	2107-1006	MACHINED ROD END (METRIC)	1
5.	TRARSA12 SK__	THRUST ROD	1
6.	2107-1030	WIPER SEAL	1
7.	2107-1023	BEARING SLEEVE	1
8.	3604-1234	SCREW	1
9.	1107-1045	WASHER	1
10.	2107-1029	BUMPER	1
11.	2107-1083	LEAD SCREW BEARING	1
12.	0905-1109	MAGNETS	4
13.	2112-1120	COUPLER/NUT BEARING	4
[2]14.	2107-9000	NUT ASSEMBLY SN01	1
	2107-9001	NUT ASSEMBLY SN02	1
	2107-9002	NUT ASSEMBLY SN05	1
	2107-9027	NUT ASSEMBLY BN08	1
	2107-9022	NUT ASSEMBLY BZ10	1
[1,4]15.	RLSRSA12 SK_	LEAD SCREW (US CONV)	1
	RLSRSA12 SM_	LEAD SCREW (METRIC)	1
[1]16.	1107-1044	LEAD SCREW SLEEVE	1

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY.
17.	RTBRSA12 SK_	CYLINDER BODY	1
18.	1112-1037	BEARING PLATE (US CONV)	1
	2112-1037	BEARING PLATE (METRIC)	1
19.	0604-1028	SOCKET HD CAP SCREW	4
20.	2212-1111	SOCKET HD 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	1
25.	1107-1013	LOCK NUT	1
26.	1124-1159	SOCKET HEAD CAP SCREW	1
27.	1112-1032	ACCESS COVER	1
[3]28.	CONFIGURED	MTR SPACER	1
[3]29.	CONFIGURED	COUPLER KIT	1
[3]30.	CONFIGURED	SOCKET HD CAP SCREW	4

[1] These parts are not compatible with actuators manufactured before January 2003.

[2] Parts revised on 08-04-2005, when ordering a new nut assembly Kit #1112-9050 must also be ordered.

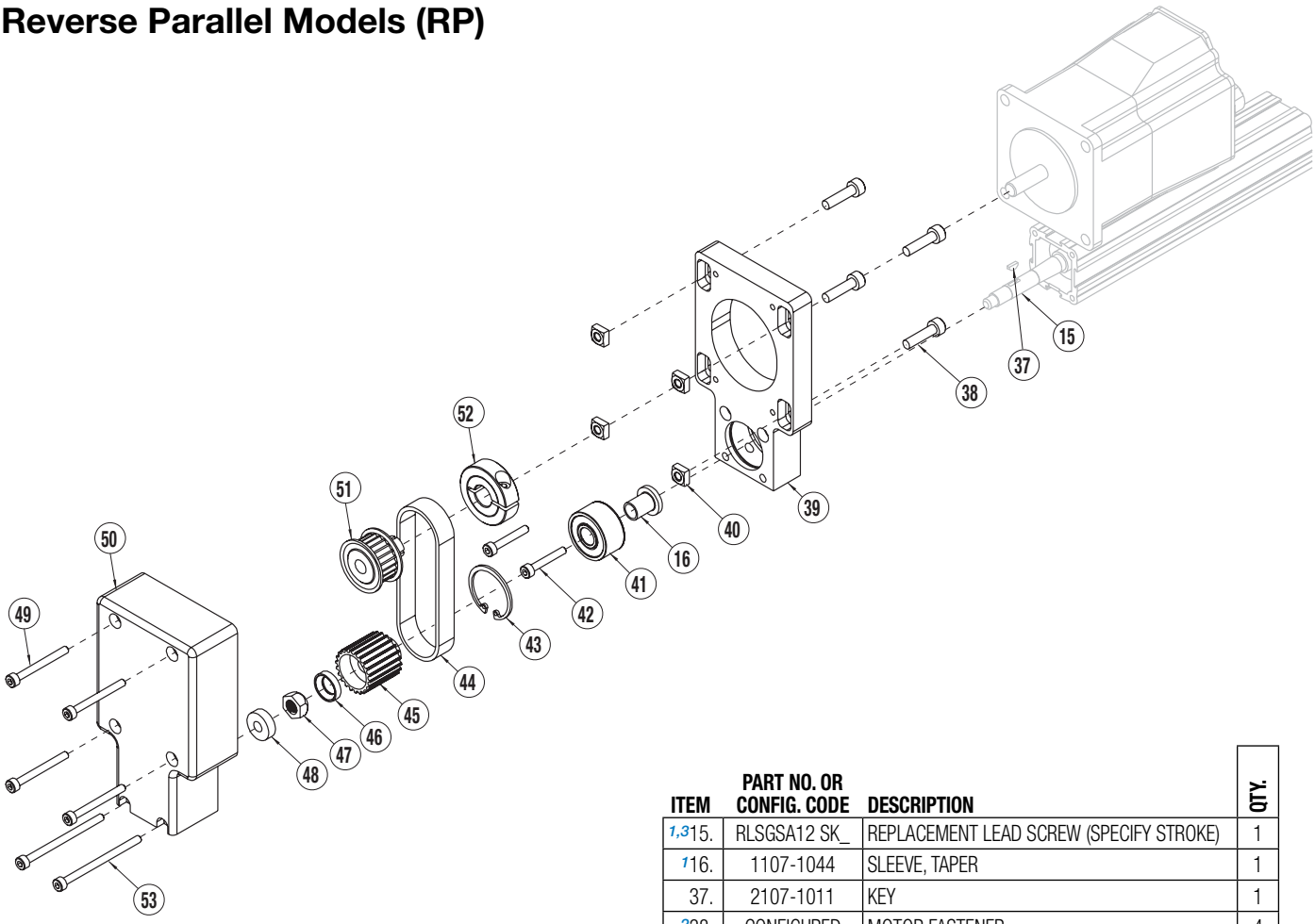
[3] Part number varies depending on YMH (Your Motor Here). Contact help@tolomatic.com for replacement part number.

[4] Replacement Lead Screw ordering method: RLS RSA12 ____ SK____ YM___

EXAMPLE: RLS RSA12 SN01 SK21.25 YM1100 1

Lead Screw — Model & Size: RLS RSA12 | Nut Style & Size: SN01 | Stroke Length: SK21.25 | Motor Code: YM1100 1

Reverse Parallel Models (RP)



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	2
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 RSA12 ____ SK____ YM___

EXAMPLE: RLS RSA12 SN01 SK21.25 YM1100 1

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

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
Socket wrench & socket set
Retaining ring pliers

1. **Remove motor and motor mounting hardware:**
   LMI: Remove components in the following order:
   1) Access cover(27)
   2) Loosen the coupler screw closest to the actuator.
   3) Motor mount fasteners (30) and Motor/coupler assembly
   4) Motor spacer (28)
   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. **Separate cylinder body from bearing plate:** Remove the 4 screws (20) that hold the bearing plate/plate cover (18,39) to the cylinder body (17). Slide the cylinder body away from bearing plate and off of the nut coupler/thrust rod assembly.
   Caution: Mark the location of the 4, nut coupler bearings (13), and the shims that are fitted in the pockets, relative to the cylinder body (17). These bearings are fitted with the appropriately sized shims at the factory and their orientation is critical when reassembling the actuator. The non-motor end head can also be removed from the cylinder body if need be.
3. **Remove the thrust rod from the nut assembly:** The thrust rod (5) is threaded to the nut assy. (14) and held in place with Loctite. To remove the thrust rod, slide the O-ring (1) off the end of the thrust rod, then apply heat at the interface between the nut assy. and thrust rod, until Loctite becomes pliable enough to release the threads. Place a wrench on the flats of the machined rod end (4) and turn counterclockwise to unscrew it and the thrust rod from the nut assy.
4. **Remove the leadscrew from the nut assembly:** Remove the Cap Screw (8), bumper (10) and bearing sleeve (7) from the leadscrew (15).
   Ball nut style: *Caution is required if removal of the nut or leadscrew is required. Contact the factory for available parts and procedures.
   Plastic/Bronze nut style: The leadscrew can be threaded out of the nut assy. at this point. The leadscrew nut and rod/nut coupler are pinned and secured with Loctite at the factory. If nut is worn, a new nut assembly must be ordered.
5. **Remove the leadscrew from the bearing plate:** Secure the body of the leadscrew in a machinist vice or equivalent smooth jaw vice, then remove the locknut (25). Support the bearing on the inner race and press the leadscrew out of the bearing/sleeve. There is a mating taper interface between the sleeve (16) and the leadscrew.
6. **Remove bearing from the bearing plate:** Remove the retaining ring (23) and press the bearing (22) out of the bearing plate (18) as it is secured in place w/ retaining compound.

ASSEMBLY INSTRUCTIONS

1. **Sub assemble wiper seal and bearing sleeve into machined head:** Install wiper seal (6) into groove of machined head (2), (wiper lip on inside diameter of seal faces outward), then press bearing sleeve (7) from opposite end until it is flush to surface of head.
2. Press leadscrew sleeve (16) into main bearing (22). Then apply a coating of Loctite 641 retaining compound to OD of the bearing and ID of the bearing plate/RP housing and install bearing into the bearing plate/RP housing, install the retaining ring (23).
3. **Install bearing plate/RP case assembly onto leadscrew:**
   LMI: Apply Loctite 242 to the threads of the leadscrew, locate washer (24) and locknut (25) over leadscrew. Torque locknut to 65 in-lbs, hold leadscrew in machinist vice as necessary.
   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.
4. **Install nut assembly (14) onto leadscrew:** Thread the nut assembly onto the leadscrew. Threaded end of the nut is away from motor end of the leadscrew.
5. Assemble leadscrew bearing (11) and bumper (10) onto non-motor end of leadscrew. Fix in place w/ washer (9) and cap screw (8).
6. Grease leadscrew and assemble thrust rod (5)to nut assembly (14):
   Grease the leadscrew and ID of the thrust rod.
   - **Ballnut Units:**
     Grease with Mobilith SHC220 grease
   - **Bronze Nut Units:**
     Grease with Cheveron SRI NLGI2 grease
   - **Solid Nut Units:**
     Grease with RheoGel TEK 664 grease

   Apply Loctite 270 to OD threads on thrust rod and assemble thrust rod to nut coupler. For special lubrication option grease, email help@tolomatic.com
7. Grease ID of cylinder body with a coating of appropriate grease, and install leadscrew/nut assembly into the tube. *Make sure to orient bearing plates (13) with respect to tube the same as were removed.
8. **Attach heads to the cylinder body and align prior to tightening:**
   A. Align motor end head to tube w/ thrust rod retracted, then tighten fasteners.
   B. Align non-motor end head to tube w/ thrust rod extended, then tighten fasteners.
9. **Install rod end into thrust rod:** Apply Loctite 271 to threads of the rod end, install and tighten to the thrust rod.
10. Install motor/gearhead.

REVERSE PARALLEL MOTOR ASSEMBLY INSTRUCTIONS

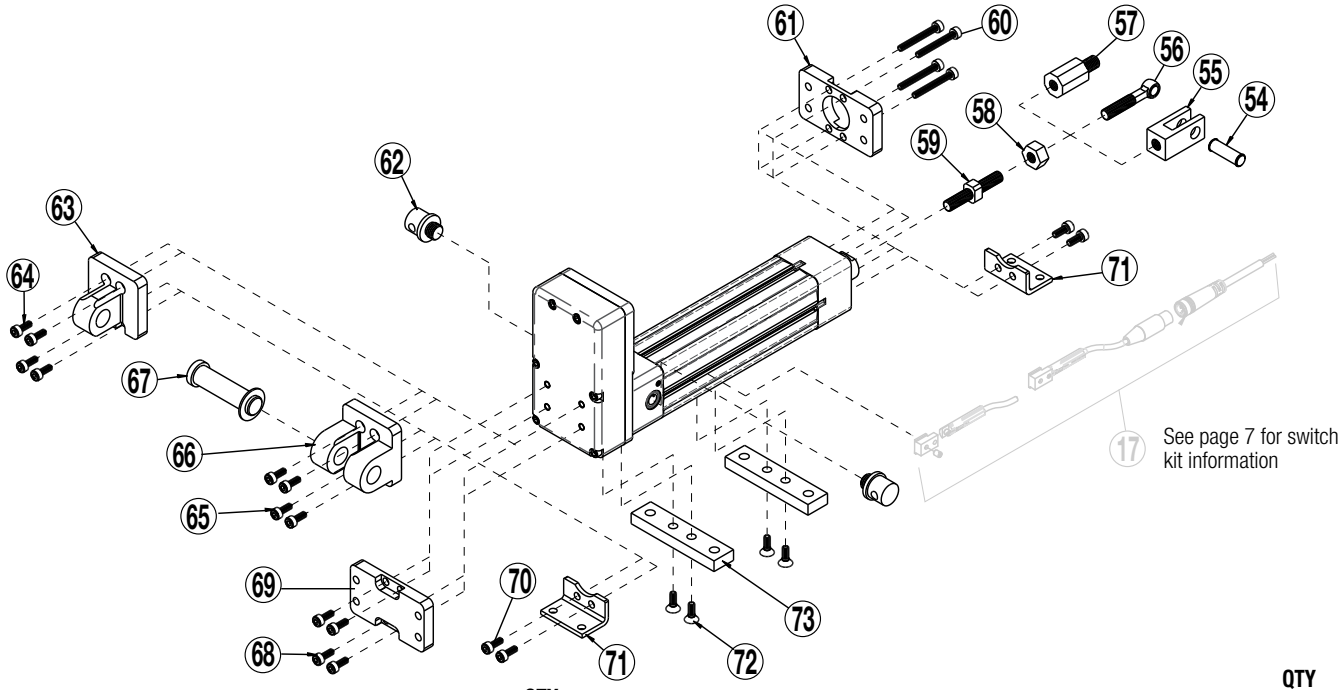
RP Unit, Attach Motor and Tension Belt:

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).

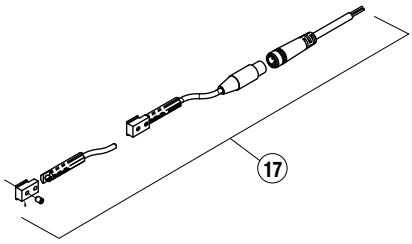
SMALLEST SHAFT DIAMETER (Motor or Actuator)		TOTAL WEIGHT TO APPLY	
Inches	mm	lbs	kgs
0.18 to 0.259	4.572 to 6.579	13	5.902
0.260 to 0.499	6.604 to 12.675	22	9.988
0.500 to 0.625	12.7 to 15.875	31	14.074
0.625 and larger	15.875 and larger	40	18.160

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



ITEM	PART NO.	DESCRIPTION	QTY US CONV (SK)	QTY METRIC (SM)
CLEVIS MOUNT (PCD)				
	1107-9021	CLEVIS MOUNT KIT (US CONV)	1	
	2107-9021	CLEVIS MOUNT KIT (METRIC)		1
55.	1107-1075	CLEVIS	1	
	2107-1075	CLEVIS		1
58.	1076-1032	JAM NUT	1	
	2124-1019	JAM NUT		1
59.	1107-1073	THREADED ROD END	1	
	2107-1073	THREADED ROD END		1
ALIGNMENT COUPLER (ALC) NOTE: ALIGNMENT COUPLER IS INTERNALLY THREADED, IF EXTERNAL THREAD IS DESIRED ORDER MET ALSO				
	1124-9022	BACK FLANGE KIT (US CONV)	1	
	2124-9032	BACK FLANGE KIT (METRIC)		1
57	1107-1076	ALIGNMENT COUPLER	1	N\A
SPHERICAL ROD EYE (SRE)				
	1107-9020	SPHERICAL ROD EYE KIT (US CONV)	1	
	2107-9020	SPHERICAL ROD EYE KIT (METRIC)		1
56.	1107-1074	ROD END BEARING	1	
	2107-1074	ROD END BEARING		1
58.	1076-1032	JAM NUT	1	
	2124-1019	JAM NUT		1
59.	1107-1073	THREADED ROD END	1	
	2107-1073	THREADED ROD END		1
THREADED ROD END (MET)				
59.	1107-1073	THREADED ROD END	1	
	2107-1073	THREADED ROD END		1
FRONT FLANGE (FFG)				
	1107-9013	FRONT FLANGE KIT (US CONV)	1	
	2107-9013	FRONT FLANGE KIT (METRIC)		1
60.	1150-1005	SOCKET HEAD CAP SCREW	4	
	2212-1090	SOCKET HEAD CAP SCREW		4
61.	2107-1067	FLANGE PLATE	1	1
TRUNNION MOUNT (TRN)				
62.	1107-1066	TRUNNION PIVOT PIN	2	
	2107-1066	TRUNNION PIVOT PIN		2

ITEM	PART NO.	DESCRIPTION	QTY US CONV (SK)	QTY METRIC (SM)
EYE MOUNT (PCS)				
	1107-9016	EYE MOUNT KIT (US CONV)	1	
	2107-9016	EYE MOUNT KIT (METRIC)		1
63.	1107-1070	EYE BRACKET	1	
	2107-1070	EYE BRACKET		1
64.	1150-1005	SOCKET HEAD CAP SCREW	4	
	0602-3012	SOCKET HEAD CAP SCREW		4
CLEVIS MOUNT (PCD)				
	1107-9017	CLEVIS MOUNT KIT (US CONV)	1	
	2107-9017	CLEVIS MOUNT KIT (METRIC)		1
65.	1150-1005	SOCKET HEAD CAP SCREW	4	
	2212-1090	SOCKET HEAD CAP SCREW		4
66.	1107-1071	CLEVIS	1	
	2107-1071	CLEVIS		1
67.	1107-1072	CLEVIS PIN	1	
	2107-1072	CLEVIS PIN		1
REAR FLANGE (BFG)				
	1107-9014	REAR FLANGE MOUNT KIT (US CONV)	1	
	2107-9014	REAR FLANGE MOUNT KIT (METRIC)		1
68.	1150-1005	SOCKET HEAD CAP SCREW	4	
	2212-1090	SOCKET HEAD CAP SCREW		4
69.	2107-1068	FLANGE PATE	1	1
FOOT MOUNT (FM2)				
	1107-9010	FOOT MOUNT KIT (US CONV)	1	
	2107-9009	FOOT MOUNT KIT (METRIC)		1
70.	1150-1005	SOCKET HEAD CAP SCREW	2	
	2212-1090	SOCKET HEAD CAP SCREW		2
71.	2107-1064	FOOT MOUNT BRACKET	2	2
MOUNTING PLATE (MP2)				
	1107-9015	MOUNTING PLATE KIT (US CONV) -17 FRAME	1	
	2107-9015	MOUNTING PLATE KIT (METRIC)-17 FRAME		1
72.	3410-1464	SOCKET HEAD CAP SCREW-17 FRAME	4	
	2212-1093	SOCKET HEAD CAP SCREW-17 FRAME		4
73.	2107-1069	TUBE SUPPORT BRACKET-17 FRAME	2	2
	1112-9014	MOUNTING PLATE KIT (US CONV) -23 FRAME, YMH	1	
	2112-9014	MOUNTING PLATE KIT (METRIC)-23 FRAME, YMH		1
72.	2309-1025	SOCKET HEAD CAP SCREW-23 FRAME, YMH	4	
	0602-1027	SOCKET HEAD CAP SCREW-23 FRAME, YMH		4
73.	2112-1054	TUBE SUPPORT BRACKET-23 FRAME, YMH	2	2



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

EXAMPLE: SWRSA12KK3

KIT	ACTUATOR	SIZE	SWITCH CODE	QUANTITY
SW	RSA	12	KK	3

The example is for 3 Solid State NPN, Normally Open Switches with Quick-disconnect couplers. 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 RSA.

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-disconnec

Enclosure classification IEC 529 IP67 (NEMA 6)

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

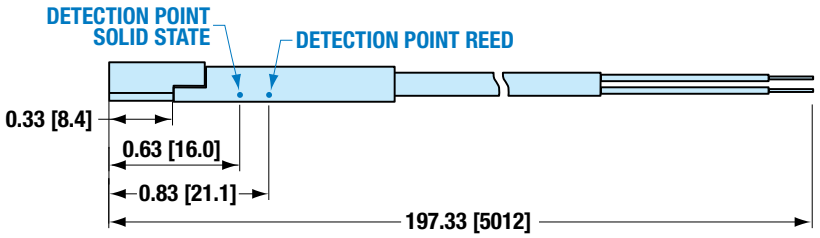
**WARNING: Do not exceed power rating (Watt = Voltage x Amperage). Permanent damage to sensor will occur.

Switch installation

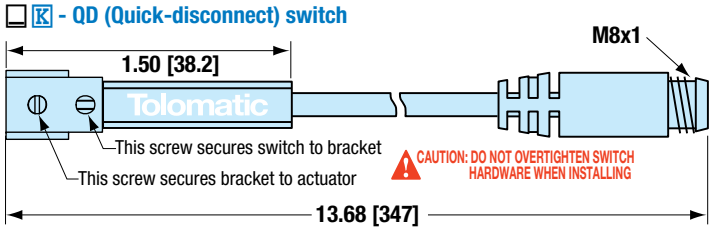
Place switch bracket into one of the four slots that run the length of the extruded tube. Note that there is a cutout on the actuator head (RSA) or tube (GSA) to allow insertion of the bracket. Insert the switch with the word "Tolomatic" facing up and slide it under the bracket. Position the bracket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

SWITCH DIMENSIONS

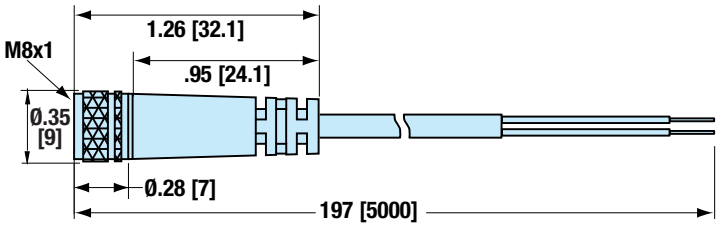
☐ Y - direct connect



☐ K - QD (Quick-disconnect) switch

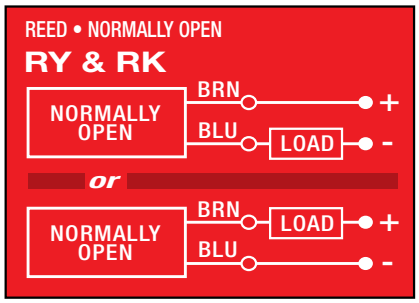


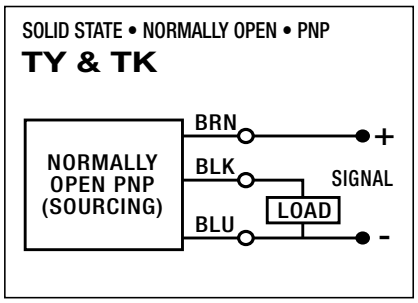
- QD Cable

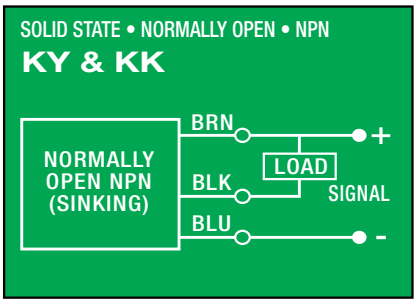


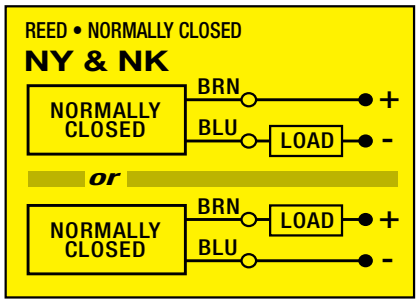
Dimensions in inches [brackets indicate dimensions in millimeters]

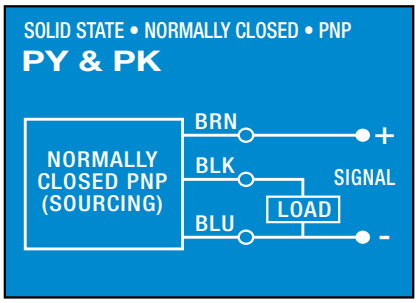
SWITCH WIRING DIAGRAMS AND LABEL COLOR CODING (CE and RoHS Compliant)

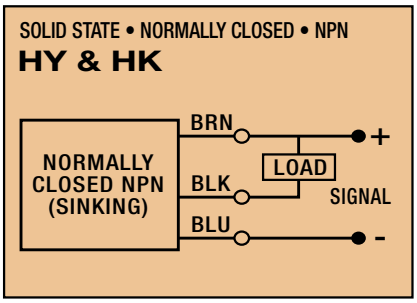


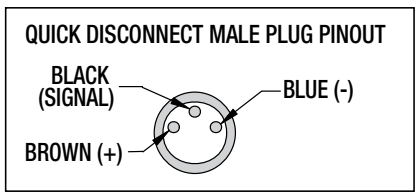


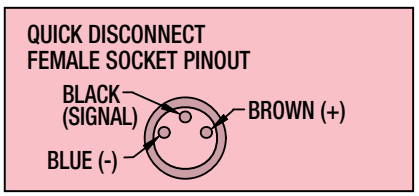












Switches:
- Include retained mounting hardware
- In slot, sit below extrusion profile
- Same for all sizes

NOTE: For actuators manufactured before 5-1-2010

CONFIG. CODE ORDERING Mounting Hardware & FE conn. included	
CODE	**DESCRIPTION**
BT	SWITCH ONLY, REED, FORM C, 5M
BM	SWITCH ONLY, REED, FORM C, MALE CONN.
RT	SWITCH ONLY, REED, FORM A, 5M
RM	SWITCH ONLY, REED, FORM A, MALE CONN.
CT	SWITCH ONLY, TRIAC, 5M
CM	SWITCH ONLY, TRIAC, MALE CONN.
KT	SWITCH ONLY, HALL-EFFECT, SINKING, 5M
KM	SWITCH ONLY, HALL-EFFECT, SINKING, MALE CONN.
TT	SWITCH ONLY, HALL-EFFECT, SOURCING, 5M
TM	SWITCH ONLY, HALL-EFFECT, SOURCING, MALE CONN.

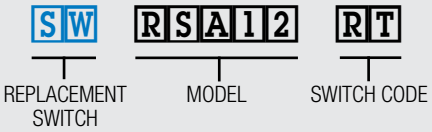
NOTE: When ordered by Config. Code Female connector & all mounting hardware is included

REED SWITCHES

NOTE: Form A Reed Switches should not be used in TTL logic circuits. A voltage drop caused by the L.E.D. indicator will result.For applications where TTL circuits are used, please contact Tolomatic.

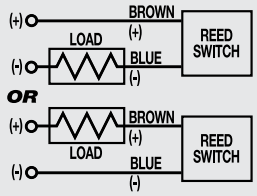
WARNING: An ohmmeter is recommended for testing Reed Switches. NEVER use an incandescent light bulb as a high current rush may damage the switch. Reed and TRIAC switches are only recommended for signalling position, not directly powering soleniods. For shifting a solenoid, a relay or resistor is recommended between it and the switch. Switch ratings must not be exceeded at any time

TO ORDER RETROFIT KITS: SW then the model number and base size, and code for type of switch needed: **EXAMPLE:**

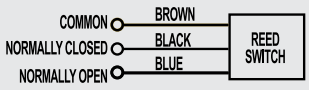


All Switch Kits come with 1 switch and mounting hardware.

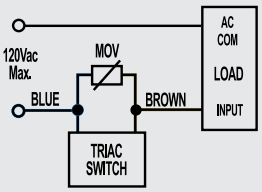
Universal Switch Wiring Diagrams and Label Color Coding



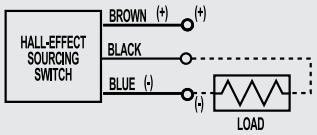
REED SWITCH FORM A
LABEL COLOR: RED
10VA MAX.
200 Vdc
500mA Max. Current



REED SWITCH FORM C
LABEL COLOR: YELLOW
120 Vdc/120 Vac MAX.
250mA Max. Current

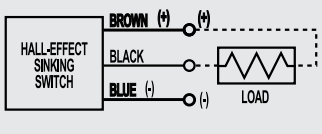


TRIAC SWITCH
LABEL COLOR: BLUE
Max. 1Amp. Cont. Current @ 86°F
Max. .5Amp. Cont. Current @ 140°F
Peak surge current 10 Amp.



HALL-EFFECT SWITCH
(SOURCING)

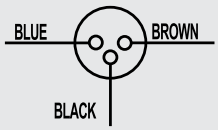
LABEL COLOR: WHITE
Input Voltage:5-25 VDC only
Output Current: 200 mA Max.



HALL-EFFECT SWITCH
(SINKING)

LABEL COLOR: GREEN
Input Voltage:5-25 VDC only
Output Current: 200 mA Max.

QUICK-DISCONNECT (Applies to all switch types)



An Important Note Regarding Field Retrofit of Quick-Disconnect Couplers:

If replacing a Quick-Disconnect switch manufactured before 7-1-97 it will also be necessary to replace or rewire the female-end coupler with the in-line splice

Female Connector 5M

NOTE: The side of the switch with the groove indicates the sensing surface. This must face toward the magnet.

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