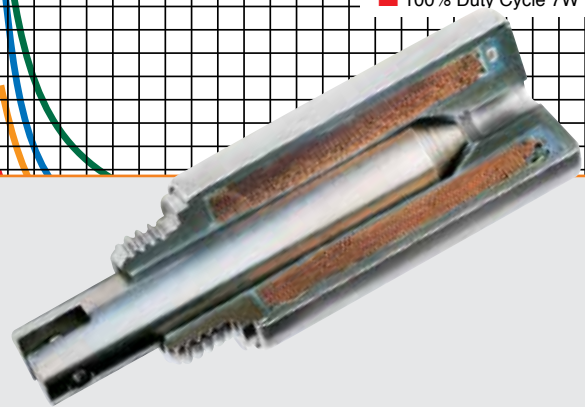
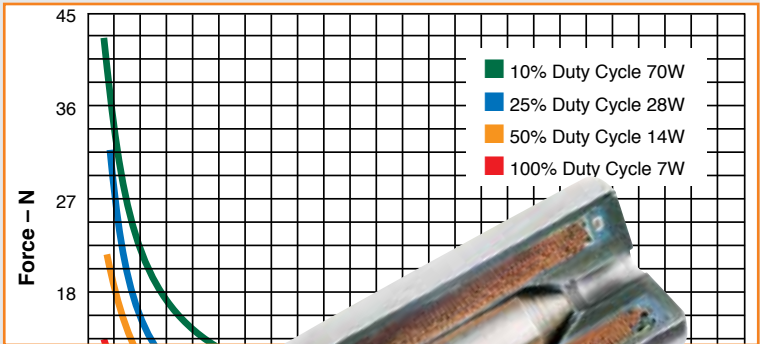


Ledex[®] Tubular Linear Solenoids



Ledex® Tubular Solenoids

LINEAR Tubular

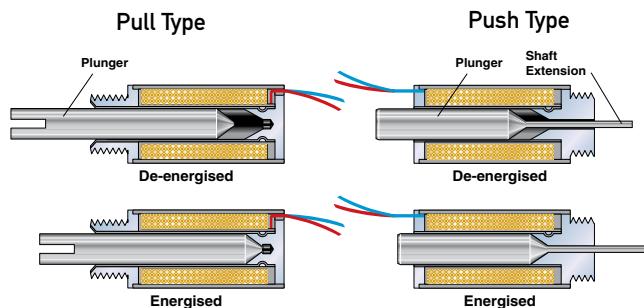


The Ledex® STA Series of tubular solenoids is available in three sizes of 13, 20 and 26 mm diameter. Both push and pull types are available. Additionally, each size and type is available with a choice of two plunger configurations: flat face and 60°, as well as with or without an anti-rotation flat on the mounting bushing. These options offer maximum force for a wide range of applications. The new design also improves performance and provides longer life than previous tubular designs. They offer quiet operation and improved reliability for demanding applications

Magnetic latching versions are available for some models, and many models are well suited for battery operation.

Pull versus Push Type

In Pull type solenoids, the plunger is pulled into the solenoid coil when the coil is energised. In Push type solenoids, the same is true, however, the plunger has a shaft extension which then pushes out through a hole in the end of the solenoid case. Please note, however, that the magnetic field cannot be reversed to cause the opposite action to occur.



- STA® Series has enhanced design features and improved performance
- Strokes up to 64 mm
- Life rating of 25 million actuations for STA designs
- Push and pull models



All catalogue products manufactured after April 1, 2006 are RoHS Compliant

Performance Curves

The performance curves in this section serve as guides to determine the solenoid size needed to produce a desired force at a given stroke, duty cycle, and power source. All curves were developed under the following standard test conditions: ambient temperature of 20°C, 65% relative humidity.

Starting Force

When determining an application's force requirement, apply a 1.5 safety factor. For example: a load requiring 1.0 N of force should utilise a solenoid providing 1.0 N x 1.5 or 1.5 N of force.

Duty Cycle

Duty cycle is determined by: ON time/(ON + OFF time).

For example: a solenoid is actuated for 30 seconds, then off for 90 seconds. $30 \text{ sec ON} / (30 \text{ Sec ON} + 90 \text{ sec OFF}) = 30/120 = 1/4$ or 25% duty cycle.

Ledex tubular solenoids are rated for various duty cycles ranging from continuous to 10% duty.

Note that maximum ON time for a particular application can be a factor which overrides the duty cycle rating. For example, at 25% duty cycle, the maximum ON time for a given Ledex solenoid is 36 seconds. If, however, the solenoid is operated at a cycle rate which enables the unit to return to ambient temperature between ON cycles, then the maximum ON time is extended somewhat. In the above example, this extended ON time is 44 seconds. Maximum ON time ratings are listed on the individual model specification pages.

Ledex® Tubular Solenoids

Life

When selecting a tubular solenoid, as with any other solenoid style, it is important to consider the effects of heat on life. When used with a constant voltage supply, an increase in coil temperature reduces the work output and the life of the unit. Standard life is 25,000,000 actuations for STA designs.

Power Requirements

Voltage applied to the solenoid must be matched to the coil wire size for proper operation. Solenoids are catalogued in coil awgs ranging from #23 up to #37 to accommodate your input power.

Refer to the individual model specification pages for coil wire awg recommendations. Many other coil awg sizes are available. Please feel free to contact our application engineering department for availability.

Tubular Applications

The STA Series is particularly ideal for applications where field service is prohibitive. Its long life and high reliability are definite advantages in applications involving:

- Computer peripherals
- Industrial sewing machines
- Automated teller machines
- Blood analyzers
- Gate mechanisms
- Packaging machinery
- Door interlocks
- Sorting machines
- Glue dispensers
- Laboratory equipment
- Business machines

STA Construction

The STA is constructed with a low friction nylon bobbin which insures a 25 million actuations life rating on all models.

The problems associated with powdered metal flaking in typical tubular designs is eliminated with the metal-to-plastic bearing surface. In addition, the new design's case is rolled over both ends of the unit for greater shock and vibration integrity, allowing the STA to withstand severe applications in which typical solenoids may come apart.

Both push and pull models offer a built-in combination air gap spacer and plunger stop. This feature eliminates the need for external E-rings and impact washers which typically fail prematurely, as well as get in the way of your attached mechanisms.

All units are provided with 250 mm PVC lead wires as standard, and are rated for a maximum coil temperature of 150°C. UL-approved materials are used in the construction. For higher temperature applications up to 180°C, please consult the factory for alternate materials which are available in some models. Mechanical and electrical ratings may also be affected. Other options include: special plunger configurations, springs, special mounting features, and anti-rotation flats on mounting bushings. Please consult the factory with details about your application as tooling may apply to some features.

STA Plunger Configurations

With two standard plunger configurations to choose from, the new STA Series offers stroke lengths up to 18 mm and up to 107 N of force.

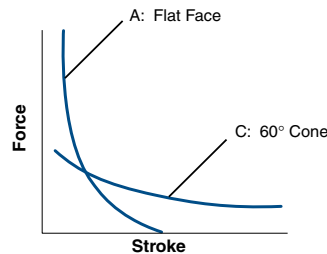
A. Flat Face

For strokes typically less than 1.5 mm, the flat face plunger is recommended with a pull or push force three to five times greater than 60° plungers.



B. 60° Angle

For longer strokes up to 19 mm, the 60° plunger offers the greatest advantage over the flat face plunger.



Size 125M, 150M, 175M Standard Tubular Models for Large Loads

Ledex Size 125M, 150M, and 175M standard tubular models are offered for heavy duty applications requiring larger forces. These standard models are all pull type and offered with 60° plungers. These models feature heavy duty welded mounting brackets, and heavy duty plunger stops to limit plunger travel, provide positive stopping, and keep pole faces from slamming together at the end of stroke.

An impact cushion made of resilient non-magnetic material absorbs energy at the end of the stroke. This cushion also helps eliminate residual magnetism.

Size 125M, 150M, and 175M models are available with other plunger configurations, in push type models, and with other mountings. Please consult the factory as tooling may apply.

Ledex® Tubular Solenoids Selection

Tubular solenoids are available in seven sizes. The four STA Series sizes are available in both push and pull types.

Use the selection overview chart to determine which size offers the desired performance and mechanical specifications.

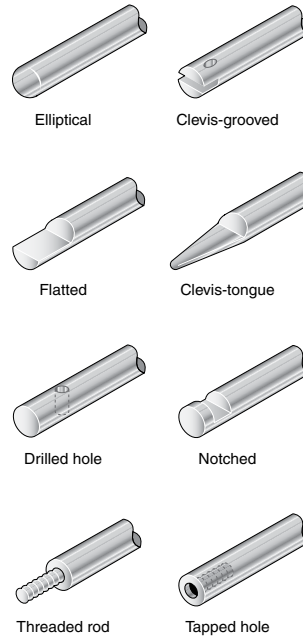
Refer to the individual size specification pages for complete performance and mechanical data.

Options and Modified Designs

Even though many solenoid designs are in stock and available via distribution, our customers often require a product with unique features or performance capabilities. In fact, almost 80% of all solenoids that we make are either modified or custom built to meet our customers' exact application requirements.

So, if you don't find what you're looking for in the catalogue, give us a call to discuss your needs with one of our application engineers.

Typical Examples of Custom Features



How to Use Tubular Performance Charts

- Select one of the four columns which provides the appropriate duty cycle. (For example 50%.)
- Reading down this column provides a variety of performance and electrical data including maximum on time, watts, and amp turns.
- Following down the column further into the VDC ratings, select the voltage which most closely matches your supply voltage. (For example, 11.5 for a 12 VDC power supply.)
- Read across (to the left) to select the awg suffix. (In this example, 32 awg is required, thus to order, specify: 195223-232.
Note that the digit preceding the awg refers to the plunger configuration and anti-rotation flat selected. Review the STA plunger section on the previous page and on the individual specification page to select the appropriate plunger configuration.

Note: The size 125, 150 and 175 standard models do not use this plunger configuration and anti-rotation flat suffix system.

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously	∞	50	5	2
Maximum ON Time (sec) for single pulse	∞	140	30	8
Watts (@ 20°C)	4	8	16	40
Ampere Turns (@ 20°C)	497	704	994	1573

Coil Data						
awg (0XX)	Resistance (@20°C)	# Turns	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
27	1.43	306	2.4	3.4	4.8	7.6
28	1.95	342	2.8	3.9	5.6	8.8
29	3.84	508	3.9	5.5	7.8	12.4
30	5.29	572	4.6	6.5	9.2	14.5
31	9.56	795	6.2	8.8	12.4	19.6
32	16.54	1068	8.1	11.5	16.3	25.7
33	22.60	1194	9.5	13.4	19.0	30.0
34	37.41	1547	12.2	17.3	24.0	39.0
35	60.71	1976	15.6	22.0	31.0	49.0
36	96.19	2475	19.6	28.0	39.0	62.0
37	149.93	3060	24.5	35.0	49.0	77.0

Ledex® Tubular Solenoids Design Modifications

Size	Solenoid Type	Package Dimension (mm)		Max Stroke (mm)	Nominal Stroke (mm)	Force (N) @ Nominal Stroke and Specified Duty Cycle			
		Dia.	Length			100%	50%	25%	10%
STA-Mini 9.5 x 17 ●◆★◆	Pull	9.7	16.5	6.4	3.2	0.27	5.92	0.85	1.96
STA-Mini 13 x 14 ●◆★◆	Pull	13.2	13.9	2.5	1.3	0.80	1.33	2.22	4.45
STA -Mini 13 x 16 ●★◆◆	Pull - Latching	13.2	15.7	3.8	1.9	–	1.11	2.14	3.34
STA-Mini 13 x 14 ●◆★◆	Push	13.2	13.9	2.5	1.3	0.36	0.80	1.11	2.67
STA 13 x 27 ●◆★◆	Pull	13.2	26.7	12.5	2.5	0.84	1.38	2.49	4.45
STA 13 x 27 ●◆★◆	Push	13.2	26.7	12.5	2.5	0.58	1.11	2.14	4.18
STA 13 x 52 ●★◆	Pull	13.2	52.1	20.0	7.5	0.27	0.53	1.02	1.82
STA 20 x 40 ●◆★	Pull	19.6	39.4	17.5	5.1	2.22	4.45	7.25	11.97
STA 20 x 40 ●◆★	Push	19.6	39.4	17.5	5.1	1.69	3.56	6.68	12.24
STA-Q 20 x 41 ●◆★◆	Pull	19.6	40.6	30.0	5.1	2.23	4.23	6.68	10.68
STA-D 20 x 41 ●◆★◆	Pull	19.6	40.6	17.5	5.1	1.96	3.69	6.14	10.68
STA-D 20 x 41 ●◆★◆	Push	19.6	40.6	17.5	5.1	1.69	3.25	5.56	11.13
STA 26 x 30 ◆★	Pull	25.9	29.8	12.5	2.5	7.80	12.9	21.36	36.49
STA 26 x 52 ◆★	Pull	25.9	52.1	17.5	7.6	4.00	7.79	13.35	23.14
STA 26 x 52 ◆★	Push	25.9	52.1	17.5	7.6	3.34	8.37	12.90	23.14
Size 125 1-1/4" x 2-1/4"	Pull	31.8	57.2	18.0	10.2	4.45	8.90	17.80	28.92
Size 150 1-1/2" x 2-1/2"	Pull	38.1	63.5	20.0	10.2	4.45	11.12	23.14	43.61
Size 175 1-3/4" x 4-3/4"	Pull	44.4	119.7	63.5	25.4	5.56	11.12	16.69	28.92

All data is at 20°C coil temperature. Force outputs degrade with elevated temperatures.

