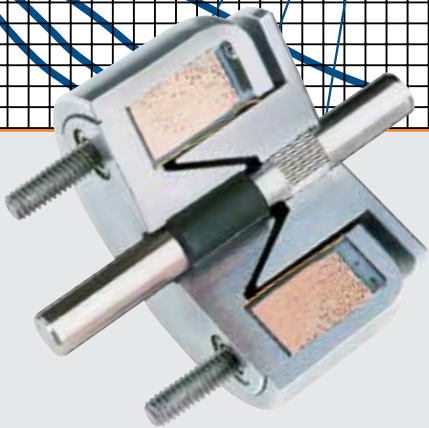
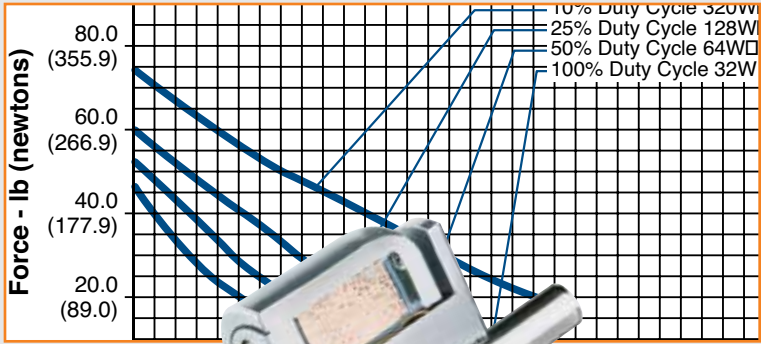


Ledex[®] Low Profile Linear Solenoids



Ledex® Low Profile Solenoids

LINEAR Low Profile



- Linear actuation
- Space-saving, low-profile configuration
- Ideal for high force, short stroke applications
- Forces to 190 lbs.
- Stroke lengths to 0.7 inches



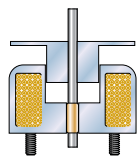
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The low profile shape, besides contributing to smaller size, optimizes the magnetic flux paths for maximum force versus stroke characteristics. The construction of the plunger assembly provides an auxiliary flux path which permits a significant increase in force. The low profile solenoid construction not only provides long life, but also provides a rugged design for both military and commercial applications.

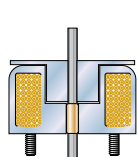
Conical Face vs. Flat Face Plunger Design

Conical-faced designs extend the useful range of a solenoid to provide higher forces for strokes typically over 0.060 inches. The pole surface area is greater and the distance between the tapered cone faces is approximately one-half that of the gap between the land faces (for 30° angles), providing the effect of a closer air gap.

Flat Face: Higher efficiency for shorter strokes

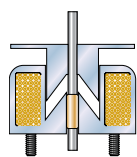


De-Energized

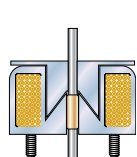


Energized

Conical Face: Higher force for longer strokes



De-Energized



Energized

While some of the force component is lost because the force vector is not parallel with the plunger motion, the shorter gap and higher flux density combine to provide more output force for longer strokes.

For shorter strokes, the magnetic flux density increases and causes the iron to saturate rapidly as the poles move closer, thus reducing the efficiency of the conical-faced design. At this point, the flat-faced plunger is more efficient.

The main advantage of the flat-faced pole over the conical is that the full component of force is usable because the force vector is parallel with the pole motion.

Applications

The reliability and high performance of Low Profile solenoids make them an ideal choice for applications in which consistent, reliable operation is critical.

- Pumps
- Machine tools
- Packaging machines
- Cranes
- Instruments
- Flow controls
- Trucks and buses
- Computer peripherals

Ledex® Low Profile Solenoids

Why Low Profile solenoids provide such high force and rapid response.

A key to the efficiency and compact form factor of the low profile solenoid is our special precision coil-winding process. With maximum copper packed into the allowable space, each solenoid develops tremendous force for its size and power input. The low profile form, in addition to contributing to smaller size, permits maximum pole face surface area for the magnetic flux.

Another factor that contributes to high efficiency is the additional iron surface on the external portion of the plunger; it provides an auxiliary flux path and a significant increase in force.

The force is also affected by other interrelated features, such as the length of the iron path, the magnetic saturation properties of the solenoid case and plunger, and the area and shape of the pole pieces.

The enclosed construction of the solenoid not only provides an iron path with minimum losses at the ring gap, but also provides a rugged design for critical environment applications

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 4.5 lb of force should utilize a solenoid providing 4.5 x 1.5 or 6.75 lb of force.

Duty Cycle

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

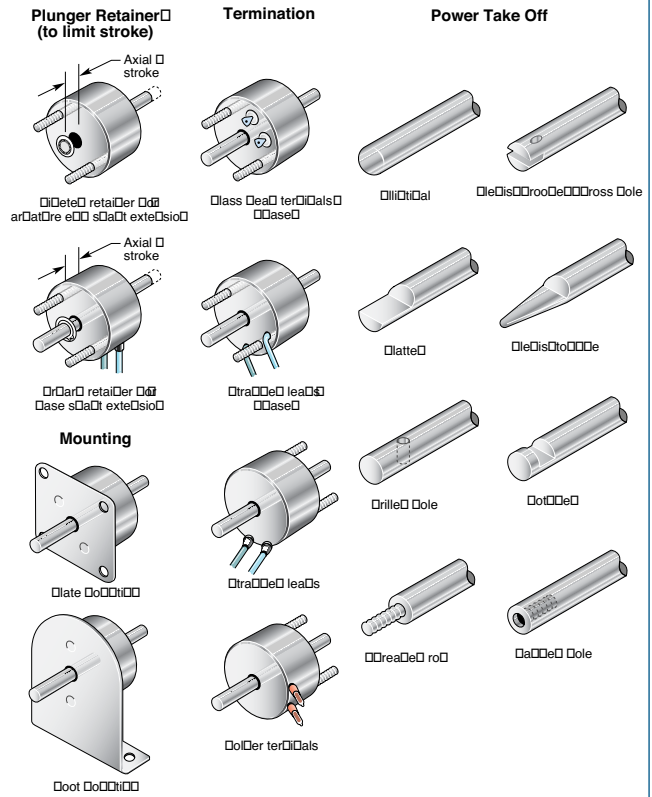
For example: a solenoid is actuated for 30 seconds, then off for 90 seconds.
 $30 \text{ sec ON} / (30 \text{ Sec ON} + 90 \text{ sec OFF}) = 30/120 = 1/4 \text{ or } 25\% \text{ duty cycle.}$

Ledex Low Profile 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.

Typical Examples of Custom Features

Even though many solenoid designs are in stock, our customers often require a product with unique features or performance capabilities. So, if you don't find what you're looking for in the catalog, give us a call to discuss your needs with one of our application engineers.



Life

When selecting a Low Profile solenoid, as with any other solenoid style, it is important to consider factors that will affect the life of the unit. Heat, side-loading, stroke and operating environment all play an important role in determining the life you can expect in your application.

A simple, yet often overlooked method to improve Low Profile solenoid life is to minimize the side load. Maximum life can be achieved by mounting Low Profile solenoids so that the shaft travels along a vertical plane. Keeping the stroke as short as possible will also improve life.

Power Requirements

Voltage applied to the solenoid must be matched to the coil wire size for proper operation. Solenoids are cataloged in coil awgs ranging from #25 up to #38 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.

Ledex® Low Profile Selection

Low Profile solenoids are available in nine sizes. Use the selection 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.

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Low Profile Selection Overview

Size*	Package Dimensions		Max Stroke (in)	Nominal Stroke (in)	Force (lbs) @ Nominal Stroke at Specified Duty Cycle @ 20°C			
	Dia.	Length			100%	50%	25%	10%
0EC ●	0.750	0.500	0.150	0.060	0.19	0.44	0.85	2.06
1EC ●	1.000	0.530	0.240	0.080	0.25	0.50	1.25	3.20
2EF	1.125	0.580	0.075	0.030	2.00	3.50	6.50	13.50
2EC ●	1.125	0.580	0.240	0.100	0.25	1.00	2.00	3.75
3EF	1.312	0.690	0.075	0.040	2.50	5.00	11.00	20.00
3EC	1.312	0.690	0.300	0.120	0.80	2.00	3.80	5.60
4EF	1.562	0.835	0.120	0.060	3.00	6.50	12.00	25.00
4EC	1.562	0.835	0.250	0.150	1.00	2.25	5.50	11.50
5SF	1.875	0.880	0.140	0.080	3.00	9.50	17.00	39.00
5EC	1.875	1.035	0.400	0.200	2.50	5.00	10.00	21.00
6SF	2.250	1.145	0.180	0.080	10.00	20.00	40.00	80.00
6EC	2.250	1.330	0.400	0.200	6.00	13.00	24.00	43.00
7EC	2.750	1.750	0.700	0.300	9.00	18.00	33.00	54.00
8EC	3.375	2.165	0.700	0.300	27.00	52.00	90.00	145.00

● Well-suited for battery operation.



See the "Battery Operated Solenoids" section for complete information.

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

* EC sizes have conical face plungers, EF and SF sizes have flat face plungers.

LINEAR Low Profile

How to Use Low Profile 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, 8.9 for a 9 VDC power supply.)
- Read across (to the left) to select the awg suffix to complete the part number when ordering. (In this example using our 0EC chart, 32 awg is required, thus to order, specify: 174534-032.)

Performance

	100%	50%	25%	10%
Maximum Duty Cycle	∞	100	36	7
Maximum ON Time (sec) when pulsed continuously	∞	162	44	8
Maximum ON Time (sec) for single pulse	4.5	9	18	45
Watts (@ 20°C)	28.5	403	570	901

Coil Data

awg (OXX)	Resistance (@20°C)	# Turns	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
26	0.50	90	1.6	2.3	3.2	5.1
27	0.97	136	2.0	2.8	3.9	6.3
28	1.33	152	2.6	3.7	5.1	8.1
29	2.40	215	3.2	4.4	6.2	9.9
30	3.29	240	4.1	5.7	8.0	12.7
31	5.61	324	5.0	7.1	9.9	15.8
32	9.09	420	6.3	8.9	12.4	19.7
33	14.95	544	8.0	11.3	15.7	25.0
34	24.06	684	10.2	14.4	20.0	32.0
35	37.10	840	12.8	18.1	25.0	40.0
36	58.51	1056	16.1	23.0	32.0	50.0
37	78.70	1109	19.8	28.0	39.0	62.0
38	123.00	1370	25.0	35.0	49.0	78.0

Force values for reference only.

All specifications subject to change without notice.

Ledex® Low Profile Size OEC — Push or Pull

Medium Stroke, Conical Face
Part Number: 174534-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	7
Maximum ON Time (sec) for single pulse ²	∞	162	44	8
Watts (@ 20°C)	4.5	9	18	45
Ampere Turns (@ 20°C)	285	403	570	901

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
26	0.50	90	1.6	2.3	3.2	5.1
27	0.97	136	2.0	2.8	3.9	6.3
28	1.33	152	2.6	3.7	5.1	8.1
29	2.40	215	3.2	4.4	6.2	9.9
30	3.29	240	4.1	5.7	8.0	12.7
31	5.61	324	5.0	7.1	9.9	15.8
32	9.09	420	6.3	8.9	12.4	19.7
33	14.95	544	8.0	11.3	15.7	25.0
34	24.06	684	10.2	14.4	20.0	32.0
35	37.10	840	12.8	18.1	25.0	40.0
36	58.51	1056	16.1	23.0	32.0	50.0
37	78.70	1109	19.8	28.0	39.0	62.0
38	123.00	1370	25.0	35.0	49.0	78.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

Specifications

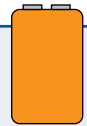
Dielectric Strength	1000 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 2" square by 1/8" thick
Coil Resistance Weight	±10% tolerance on all coil awg sizes 0.875 oz (24.8 gms)
Holding Force Dimensions	1.7 lb (7.6 N) @ 105°C Ø0.750" x 0.500" L (See page G16)

How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 3.2 VDC, specify 174534-026).

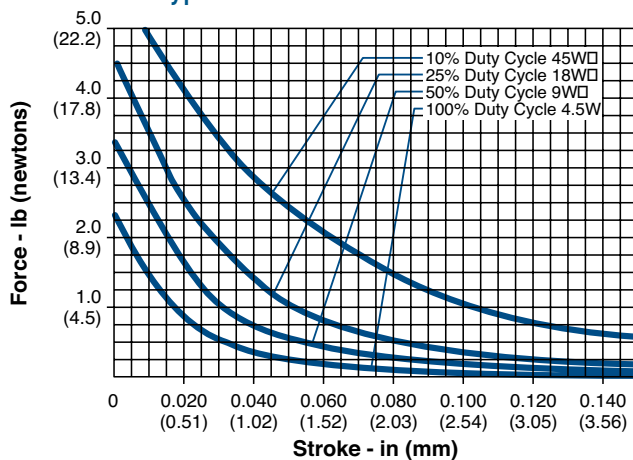
Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

- Well-suited for battery operation. See the "Battery Operated Solenoids" section for complete information.



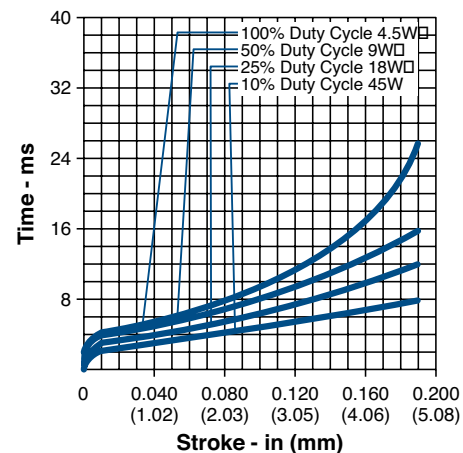
LINEAR Low Profile

Size OEC — Typical Force @ 20°C



Force values for reference only.

Size OEC — Typical Speed @ No Load, 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 1EC — Push or Pull

Size 1EC Medium Stroke, Conical Face
Part Number: 123421-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	7
Maximum ON Time (sec) for single pulse ²	∞	162	44	8
Watts (@ 20°C)	5	10	20	50
Ampere Turns (@ 20°C)	340	480	680	1075

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
25	0.83	140	2.1	2.9	4.1	6.5
26	1.38	186	2.6	3.7	5.2	8.2
27	1.91	210	3.2	4.5	6.3	10.1
28	3.17	273	4.1	5.7	8.1	12.8
29	5.17	352	5.1	7.2	10.2	16.2
30	8.25	441	6.5	9.2	13.0	21.0
31	12.95	550	8.2	11.6	16.4	26.0
32	20.71	682	10.6	14.9	21.0	34.0
33	30.60	828	12.7	18.2	26.0	41.0
34	50.95	1078	16.5	23.0	33.0	52.0
35	83.92	1392	21.0	30.0	42.0	67.0
36	112.00	1500	26.0	37.0	52.0	83.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

Specifications

Dielectric Strength	1000 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 3" square by 1/8" thick
Coil Resistance	25-35 awg, ±5%; 36 awg, ±10%
Weight	1.50 oz (42.5 gms)
Holding Force	5.4 lb (24.0 N) @ 105°C
Dimensions	Ø1.000" x 0.530" L (See page G16)

How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 6.3 VDC, specify 124910-027).

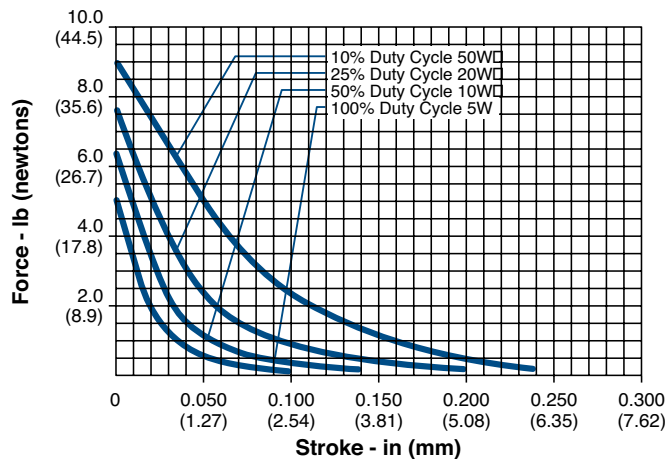
Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

LINEAR Low Profile

- Well-suited for battery operation. See the "Battery Operated Solenoids" section for complete information.

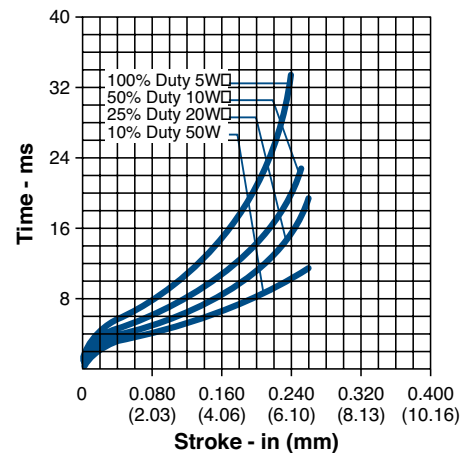


Size 1EC — Typical Force @ 20°C



Force values for reference only.

Size 1EC— Typical Speed @ No Load, 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 2EF/2EC — Push or Pull

Size 2EF Short Stroke, Flat Face

Part Number: 124911-0XX

Size 2EC • Medium Stroke, Conical Face

Part Number: 123422-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	7
Maximum ON Time (sec) for single pulse ²	∞	162	44	8
Watts (@ 20°C)	7	14	28	70
Ampere Turns (@ 20°C)	425	602	849	1350

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
24	0.68	130	2.2	3.2	4.5	7.1
25	1.16	174	2.8	4.0	5.7	9.0
26	1.96	231	3.6	5.1	7.2	11.5
27	3.16	296	4.5	6.4	9.0	14.4
28	5.10	378	5.7	8.1	11.5	18.2
29	6.94	423	7.0	9.9	13.9	22.0
30	11.03	530	8.8	12.5	17.7	28.0
31	16.85	649	11.0	15.6	22.0	35.0
32	28.15	858	13.9	19.8	28.0	44.0
33	42.75	1036	17.5	25.0	35.0	56.0

- Continuously pulsed at stated watts and duty cycle
- Single pulse at stated watts (with coil at ambient room temperature 20°C)
- Other coil awg sizes available — please consult factory
- Reference number of turns

• Well-suited for battery operation. See the "Battery Operated Solenoids" section for complete information.



Specifications

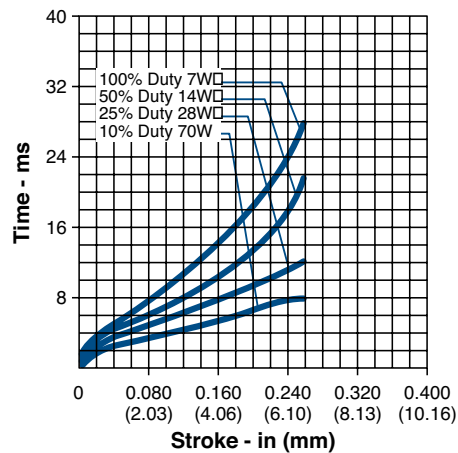
Dielectric Strength	1000 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 3 ³ / ₈ " square by 1 ¹ / ₈ " thick
Coil Resistance	24-33 awg, ±5%
Weight	2.25 oz (63.8 gms)
Holding Force 2EF	12.0 lb (53.4 N) @ 105°C
Holding Force 2EC	5.7 lb (25.4 N) @ 105°C
Dimensions	Ø1.125" x 0.580" L (See page G16)

How to Order

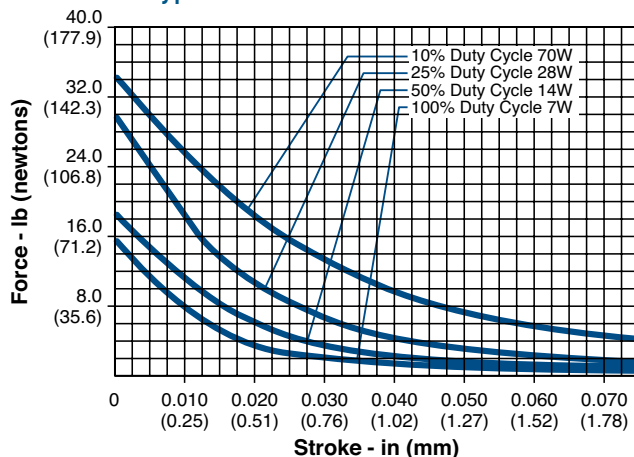
Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 9.0 VDC, specify 124911-027).

Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

Size 2EF and 2EC — Typical Speed @ No Load, 20°C

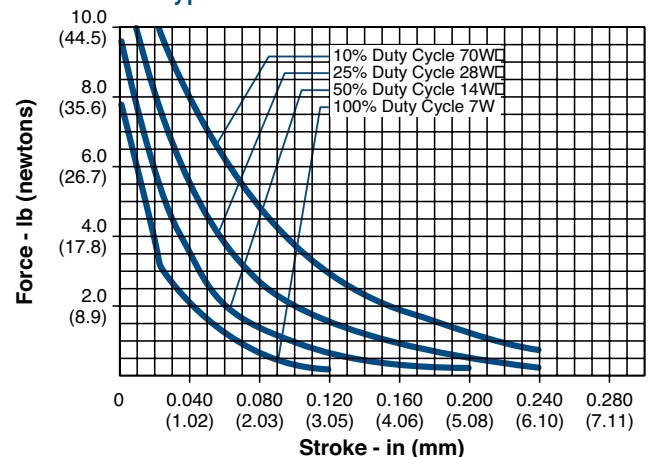


Size 2EF— Typical Force @ 20°C



Force values for reference only.

Size 2EC — Typical Force @ 20°C



All specifications subject to change without notice.

LINEAR Low Profile

Ledex® Low Profile Size 3EF/3EC — Push or Pull

Size 3EF Short Stroke, Flat Face

Part Number: 124912-0XX

Size 3EC Medium Stroke, Conical Face

Part Number: 123423-0XX

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	8
Maximum ON Time (sec) for single pulse ²	∞	162	44	9
Watts (@ 20°C)	9	18	36	90
Ampere Turns (@ 20°C)	535	756	1070	1690

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	0.70	145	2.6	3.7	5.2	8.2
24	1.18	192	3.3	4.6	6.6	10.4
25	1.97	252	4.2	5.9	8.4	13.2
26	3.26	328	5.3	7.5	10.6	16.8
27	5.04	405	6.7	9.4	13.3	21.0
28	8.02	510	8.4	11.9	16.8	27.0
29	12.21	627	10.4	14.7	21.0	33.0
30	19.20	780	13.2	18.6	26.0	42.0
31	31.84	1008	16.9	24.0	34.0	53.0
32	46.97	1215	21.0	29.0	41.0	65.0
33	75.30	1530	26.0	37.0	53.0	83.0

- Continuously pulsed at stated watts and duty cycle
- Single pulse at stated watts (with coil at ambient room temperature 20°C)
- Other coil awg sizes available — please consult factory
- Reference number of turns

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

Specifications

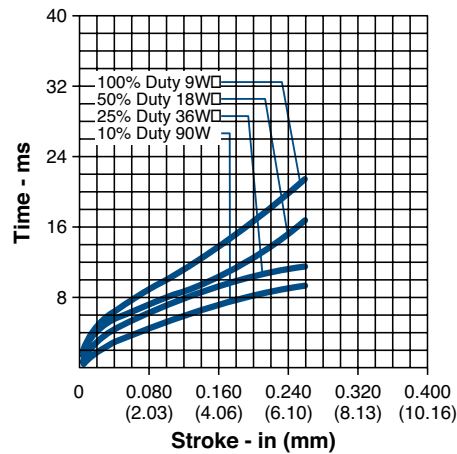
Dielectric Strength	23-27 awg, 1000 VRMS ; 28-33 awg, 1200 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 4 ³ / ₈ " square by 1/ ₈ " thick
Coil Resistance	23-33 awg, ±5%
Weight	3.75 oz (106.3 gms)
Holding Force 3EF	26.0 lb (115.6 N) @ 105°C
Holding Force 3EC	12.0 lb (53.4 N) @ 105°C
Dimensions	Ø1.312" x 0.690" L (See page G16)

How to Order

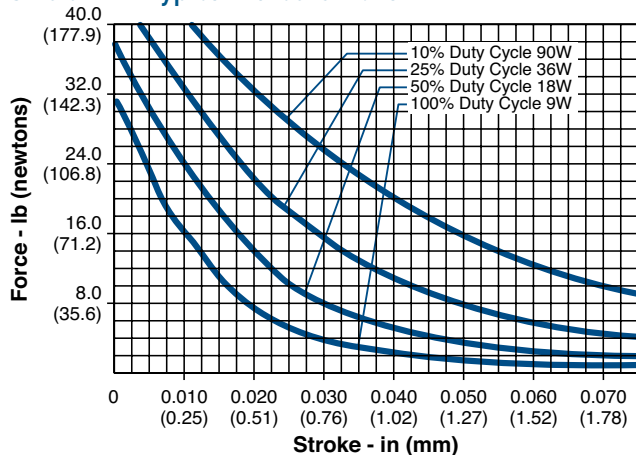
Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 13.3 VDC, specify 124912-027).

Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

Size 3EF and 3EC – Typical Speed @ No Load, 20°C

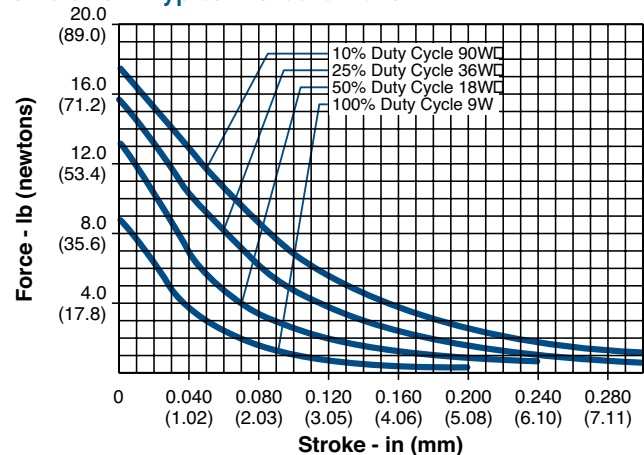


Size 3EF— Typical Force @ 20°C



Force values for reference only.

Size 3EC— Typical Force @ 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 4EF/4EC — Push or Pull

Size 4EF Short Stroke, Flat Face

Part Number: 129440-0XX

Size 4EC Medium Stroke, Conical Face

Part Number: 129409-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	9
Maximum ON Time (sec) for single pulse ²	∞	162	44	10
Watts (@ 20°C)	12.5	25	50	125
Ampere Turns (@ 20°C)	714	1000	1425	2250

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	1.59	266	4.3	6.0	8.5	13.4
24	2.20	301	5.2	7.3	10.4	16.4
25	3.54	384	6.6	9.2	13.1	21.0
26	5.67	486	8.3	11.7	16.6	26.0
27	8.76	600	10.4	14.6	21.0	33.0
28	13.80	748	13.2	18.5	26.0	42.0
29	22.60	975	16.6	23.0	33.0	52.0
30	34.80	1190	21.0	29.0	42.0	66.0
31	56.70	1520	27.0	37.0	53.0	84.0
32	88.30	1908	33.0	46.0	66.0	104.0
33	138.00	2360	42.0	59.0	83.0	132.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

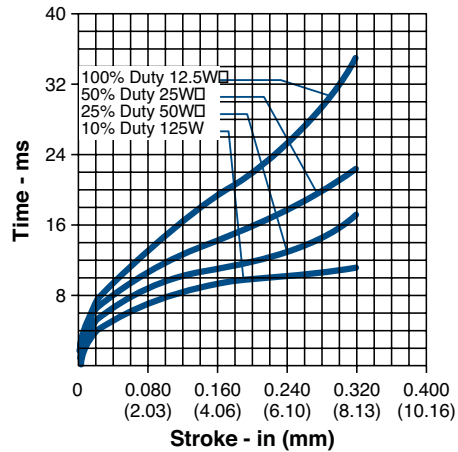
Specifications

Dielectric Strength	23-24 awg, 1000 VRMS ; 25-33 awg, 1200 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 6 1/4" square by 1/8" thick
Coil Resistance	23-33 awg, ±5%
Weight	6.0 oz (170 gms)
Holding Force 4EF	37.0 lb (164.6 N) @ 105°C
Holding Force 4EC	16.0 lb (71.2 N) @ 105°C
Dimensions	Ø1.562" x 0.835" L (See page G17)

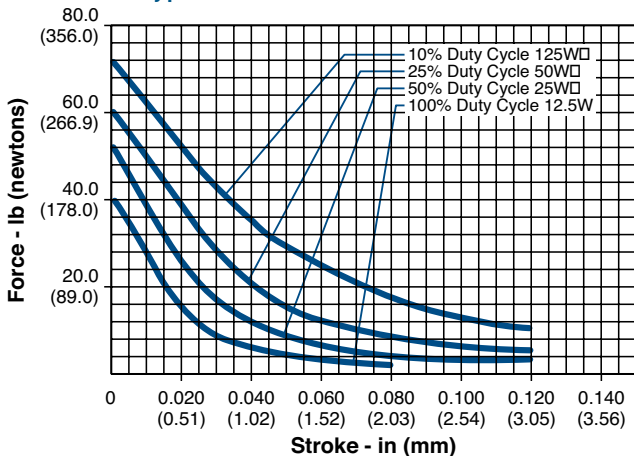
How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 21 VDC, specify 129440-027). Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

Size 4EF and 4EC—Typical Speed @ No Load, 20°C

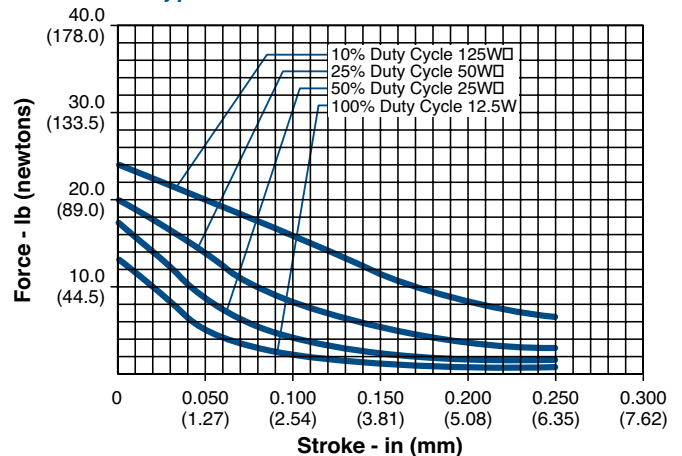


Size 4EF— Typical Force @ 20°C



Force values for reference only.

Size 4EC— Typical Force @ 20°C



All specifications subject to change without notice.

LINEAR Low Profile

Ledex® Low Profile Size 5SF — Push or Pull

Short Stroke, Flat Face
Part Number: 129450-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	10
Maximum ON Time (sec) for single pulse ²	∞	160	44	13
Watts (@ 20°C)	21	42	84	210
Ampere Turns (@ 20°C)	860	1220	1720	2730

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	2.03	288	6.1	8.6	12.1	19.2
24	3.20	360	7.6	10.8	15.3	24.0
25	4.91	440	9.6	13.6	19.2	31.0
26	7.72	550	12.1	17.1	24.0	38.0
27	11.12	636	15.0	21.0	30.0	48.0
28	18.79	840	19.2	27.0	39.0	61.0
29	30.48	1088	24.0	34.0	48.0	77.0
30	44.86	1275	30.0	43.0	61.0	96.0
31	70.90	1596	38.0	54.0	76.0	121.0
32	109.00	1974	47.0	67.0	95.0	150.0
33	175.00	2496	60.0	86.0	121.0	192.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

Specifications

Dielectric Strength	23 awg, 1000 VRMS ; 24-33 awg, 1200 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 7½" square by ⅛" thick
Coil Resistance	23-33 awg, ±5%
Weight	9.0 oz (255 gms)
Holding Force	58.0 lb (258.0 N) @ 105°C
Dimensions	Ø1.875" x 0.880" L (See page G17)

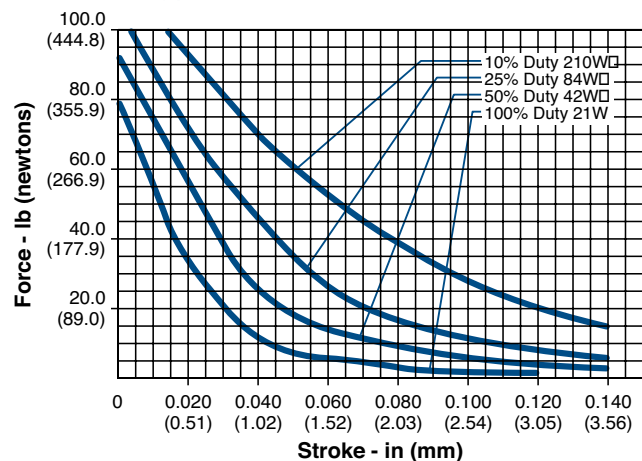
How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 30 VDC, specify 129450-027).

Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

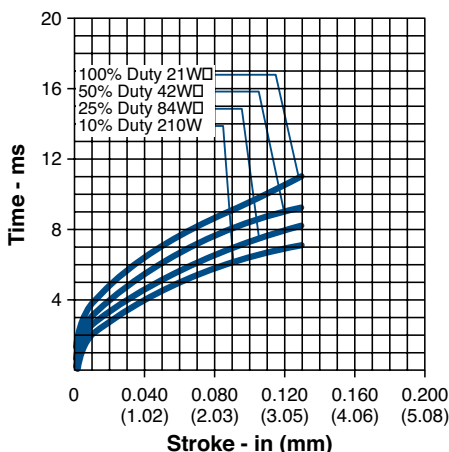
LINEAR Low Profile

Size 5SF— Typical Force @ 20°C



Force values for reference only.

Size 5SF— Typical Speed @ No Load, 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 5EC — Push or Pull

Medium Stroke, Conical Face
Part Number: 129415-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	100	36	10
Maximum ON Time (sec) for single pulse ²	∞	160	44	13
Watts (@ 20°C)	21	42	84	210
Ampere Turns (@ 20°C)	1015	1440	2030	3210

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	2.70	384	7.2	10.1	14.3	23.0
24	4.30	486	9.0	12.7	18.0	28.0
25	6.66	590	11.5	16.2	23.0	36.0
26	10.30	737	14.0	20.0	28.0	44.0
27	15.70	900	17.7	25.0	35.0	56.0
28	26.60	1190	23.0	32.0	45.0	72.0
29	38.00	1380	28.0	40.0	56.0	89.0
30	62.10	1768	36.0	51.0	71.0	113.0
31	96.10	2166	45.0	64.0	90.0	143.0
32	157.00	2816	57.0	80.0	113.0	179.0
33	241.00	3432	71.0	101.0	143.0	226.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

Specifications

Dielectric Strength	23 awg, 1000 VRMS ; 24-33 awg, 1200 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 7½" square by ⅛" thick
Coil Resistance	23-33 awg, ±5%
Weight	11.5 oz (326.0 gms)
Holding Force	27.0 lb (120.1 N) @ 105°C
Dimensions	Ø1.875" x 1.035" L (See page G17)

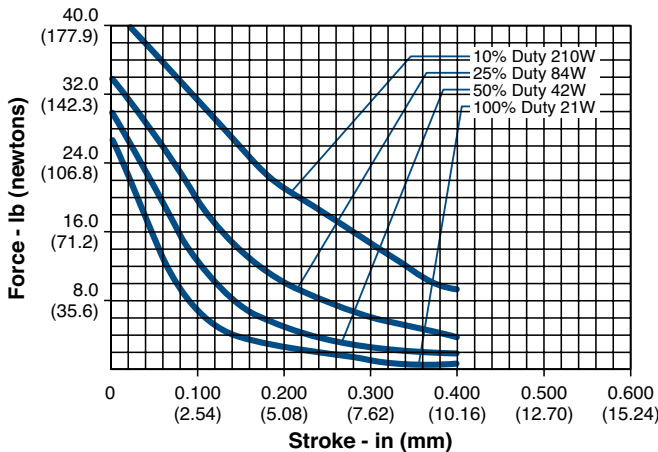
How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 35 VDC, specify 129415-027).

Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

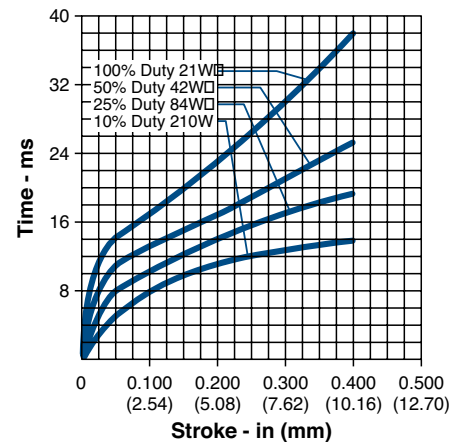
LINEAR Low Profile

Size 5EC— Typical Force @ 20°C



Force values for reference only.

Size 5EC— Typical Speed @ No Load, 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 6SF — Push or Pull

Short Stroke, Flat Face
Part Number: 187789-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	87	36	13
Maximum ON Time (sec) for single pulse ²	∞	140	44	16
Watts (@ 20°C)	32	64	128	320
Ampere Turns (@ 20°C)	1240	1760	2490	3920

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	3.59	432	10.3	14.6	21.0	33.0
24	5.24	500	13.0	18.4	26.0	41.0
25	9.51	708	16.7	24.0	33.0	53.0
26	14.44	858	21.0	30.0	42.0	66.0
27	23.69	1110	27.0	38.0	53.0	84.0
28	38.27	1411	34.0	48.0	68.0	106.0
29	54.62	1638	41.0	59.0	83.0	131.0
30	93.67	2184	53.0	76.0	107.0	168.0
31	143.00	2645	67.0	95.0	134.0	211.0
32	223.00	3328	83.0	118.0	167.0	262.0
33	338.00	4004	105.0	149.0	210.0	331.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

Specifications

Dielectric Strength	23-31 awg, 1200 VRMS ; 32-33 awg, 1500 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 12 ³ / ₈ " square by 1/8" thick
Coil Resistance	23-33 awg, ±5%
Weight	1 lb 2 oz (510.3 gms)
Holding Force	88.0 lb (391.4 N) @ 105°C
Dimensions	Ø2.250" x 1.145" L (See page G18)

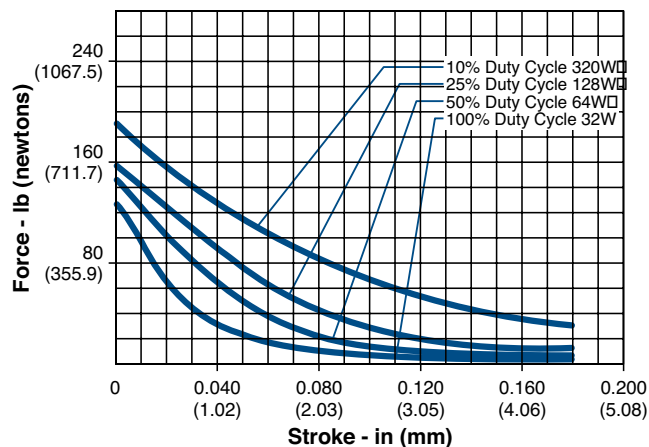
How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 53 VDC, specify 187789-027).

Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

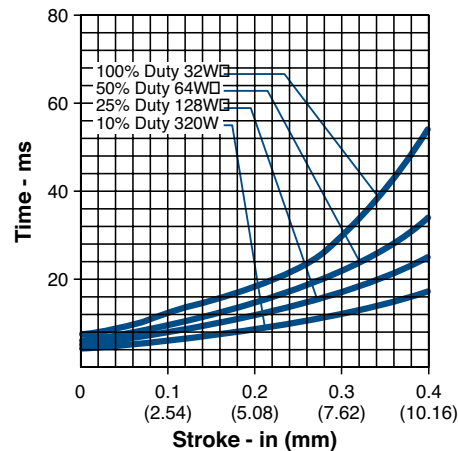
LINEAR Low Profile

Size 6SF— Typical Force @ 20°C



Force values for reference only.

Size 6SF— Typical Speed @ No Load, 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 6EC — Push or Pull

Medium Stroke, Conical Face
Part Number: 173921-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	87	36	13
Maximum ON Time (sec) for single pulse ²	∞	140	44	16
Watts (@ 20°C)	32	64	128	320
Ampere Turns (@ 20°C)	1480	2080	2940	4620

Coil Data						
awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	4.69	567	12.3	17.2	24.0	38.0
24	7.43	710	15.5	22.0	31.0	48.0
25	12.90	960	19.9	28.0	39.0	62.0
26	19.70	1170	25.0	35.0	49.0	78.0
27	32.00	1500	32.0	44.0	63.0	99.0
28	51.60	1904	40.0	56.0	79.0	125.0
29	74.40	2232	49.0	69.0	98.0	154.0
30	126.00	2940	63.0	89.0	126.0	198.0
31	195.00	3611	80.0	112.0	159.0	250.0
32	288.00	4350	98.0	138.0	195.0	306.0
33	427.00	5010	126.0	177.0	251.0	394.0

- ¹ Continuously pulsed at stated watts and duty cycle
- ² Single pulse at stated watts (with coil at ambient room temperature 20°C)
- ³ Other coil awg sizes available — please consult factory
- ⁴ Reference number of turns

Specifications

Dielectric Strength	23-31 awg, 1200 VRMS ; 32-33 awg, 1500 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 12 ³ / ₈ " square by 1/8" thick
Coil Resistance	23-33 awg, ±5%
Weight	1 lb 5.50 oz (609.5 gms)
Holding Force	49.0 lb (218.0 N) @ 105°C
Dimensions	Ø2.250" x 1.330" L (See page G18)

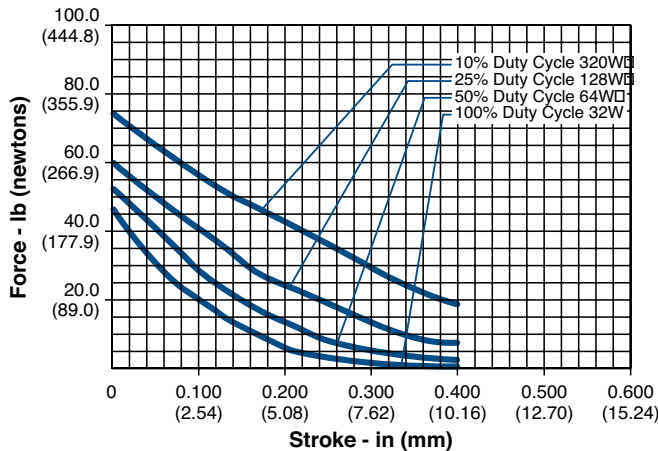
How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 63 VDC, specify 173921-027).

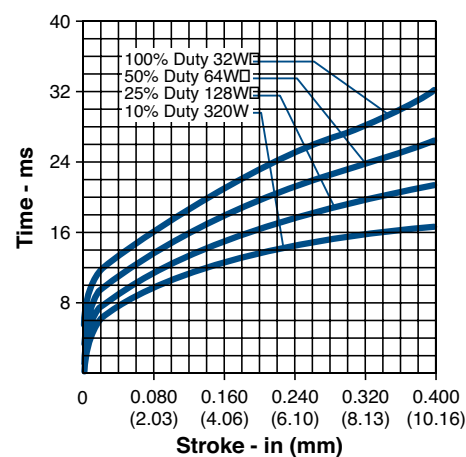
Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

LINEAR Low Profile

Size 6EC— Typical Force at 20°C



Size 6EC— Typical Speed @ No Load, 20°C



Force values for reference only.

All specifications subject to change without notice.

Ledex® Low Profile Size 7EC — Push or Pull

Medium Stroke, Conical Face
Part Number: 191357-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	80	38	16
Maximum ON Time (sec) for single pulse ²	∞	138	50	18
Watts (@ 20°C)	35	70	140	350
Ampere Turns (@ 20°C)	1805	2555	3610	5710

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	10.80	1044	19.0	27.0	39.0	61.0
24	16.50	1274	24.0	34.0	48.0	76.0
25	27.00	1635	31.0	43.0	61.0	97.0
26	43.80	2091	39.0	55.0	78.0	124.0
27	68.40	2603	49.0	69.0	98.0	155.0
28	108.00	3255	61.0	87.0	123.0	194.0
29	162.00	3933	75.0	106.0	151.0	238.0
30	265.00	5044	96.0	136.0	193.0	305.0
31	385.00	5800	116.0	164.0	232.0	367.0
32	583.00	7230	143.0	202.0	286.0	452.0
33	882.00	8400	176.0	248.0	351.0	600.0

- Continuously pulsed at stated watts and duty cycle
- Single pulse at stated watts (with coil at ambient room temperature 20°C)
- Other coil awg sizes available — please consult factory
- Reference number of turns

Specifications

Dielectric Strength	23-29 awg, 1200 VRMS ; 30-33 awg, 1500 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 15 1/8" square by 1/8" thick
Coil Resistance	23-30 awg, ±5%; 31-33 awg, ±10%
Weight	2.5 lb (1.134 kg)
Holding Force	50.0 lb (222.4 N) @ 105°C
Dimensions	Ø2.750" x 1.780" L (See page G18)

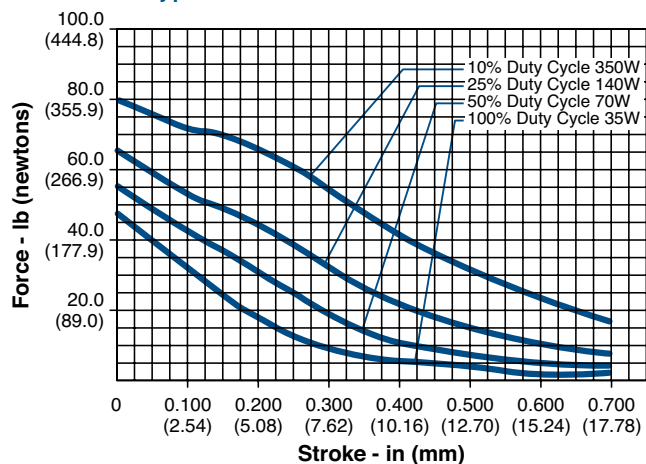
How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 48 VDC, specify 191357-024).

Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

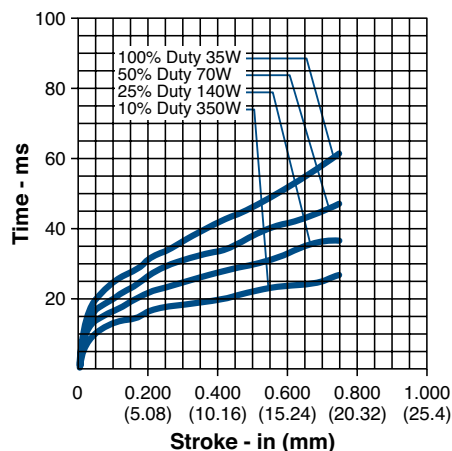
LINEAR Low Profile

Size 7EC— Typical Force @ 20°C



Force values for reference only.

Size 7EC— Typical Speed @ No Load, 20°C



All specifications subject to change without notice.

Ledex® Low Profile Size 8EC — Push or Pull

Medium Stroke, Conical Face
Part Number: 191016-0XX

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

Performance

Maximum Duty Cycle	100%	50%	25%	10%
Maximum ON Time (sec) when pulsed continuously ¹	∞	72	43	20
Maximum ON Time (sec) for single pulse ²	∞	132	56	22
Watts (@ 20°C)	41	82	164	410
Ampere Turns (@ 20°C)	2195	3105	4155	6945

Coil Data

awg (0XX) ³	Resistance (@20°C)	# Turns ⁴	VDC (Nom)	VDC (Nom)	VDC (Nom)	VDC (Nom)
23	19.00	1512	28.0	40.0	56.0	88.0
24	31.20	1952	36.0	51.0	72.0	113.0
25	49.40	2448	45.0	64.0	90.0	142.0
26	78.00	3060	57.0	80.0	113.0	179.0
27	119.00	3740	70.0	99.0	140.0	221.0
28	184.00	4584	87.0	123.0	174.0	275.0
29	301.00	5936	111.0	157.0	222.0	351.0
30	425.00	6750	132.0	187.0	264.0	417.0
31	683.00	8750	167.0	237.0	335.0	529.0
32	1110.00	11000	213.0	302.0	427.0	—
33	1509.00	12050	249.0	352.0	498.0	—

- Continuously pulsed at stated watts and duty cycle
- Single pulse at stated watts (with coil at ambient room temperature 20°C)
- Other coil awg sizes available — please consult factory
- Reference number of turns

Specifications

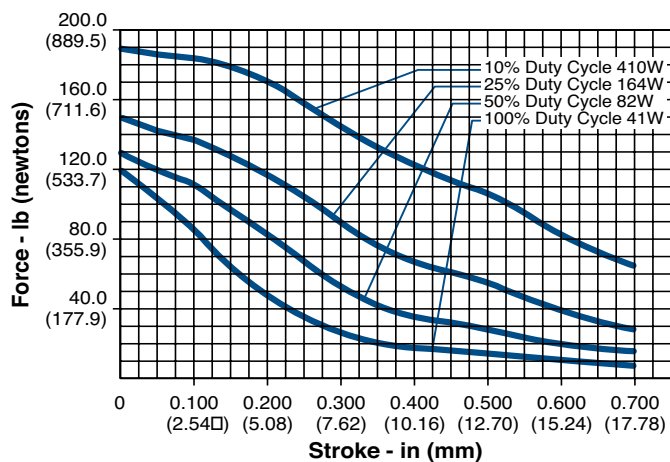
Dielectric Strength	23-27 awg, 1200 VRMS ; 28-33 awg, 1500 VRMS
Recommended Minimum Heat Sink	Maximum watts dissipated by solenoid are based on an unrestricted flow of air at 20°C, with solenoid mounted on the equivalent of an aluminum plate measuring 20 ¹ / ₄ " square by 1 ¹ / ₈ " thick
Coil Resistance	23-30 awg, ±5%; 31-33 awg, ±10%
Weight	4.9 lb (2.2 kg)
Holding Force	120.0 lb (533.7 N) @ 105°C
Dimensions	Ø3.375" x 2.165" L (See page G18)

How to Order

Add the coil awg number (0XX) to the part number (for example: to order a 25% duty cycle unit rated at 90 VDC, specify 191016-025).

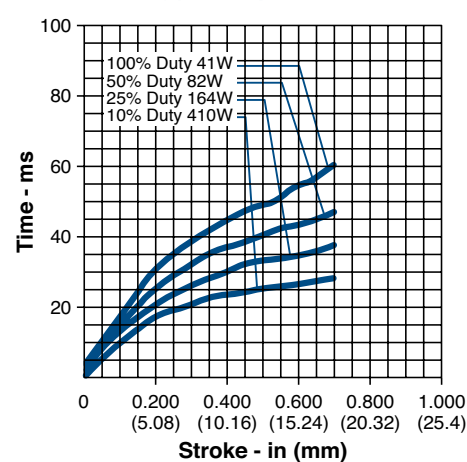
Please see www.ledex.com (click on Stock Products tab) for our list of stock products available through our North American distributors.

Size 8EC— Typical Force at 20°C



Force values for reference only.

Size 8EC— Typical Speed @ No Load, 20°C



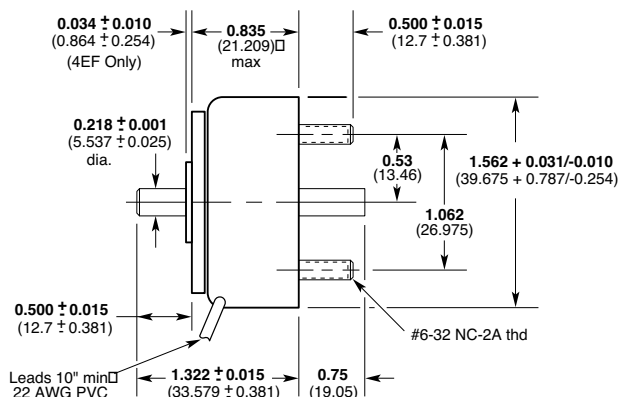
All specifications subject to change without notice.

Ledex® Low Profile Dimensions

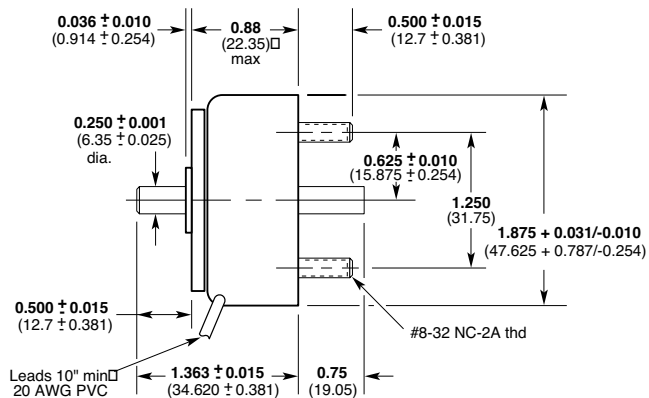
Inches (mm)

All solenoids are illustrated in energized state

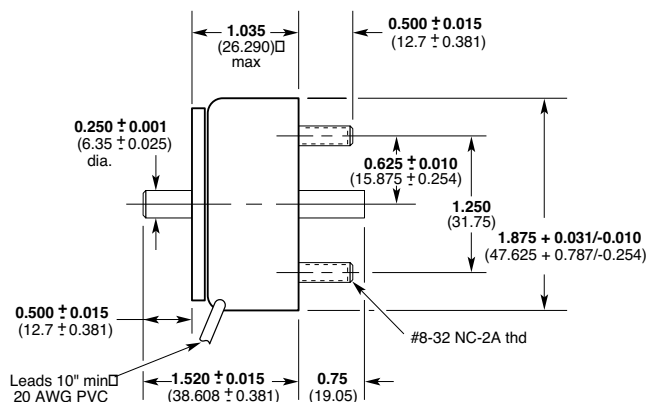
Size 4EF/4EC



Size 5SF



Size 5EC



LINEAR Low Profile

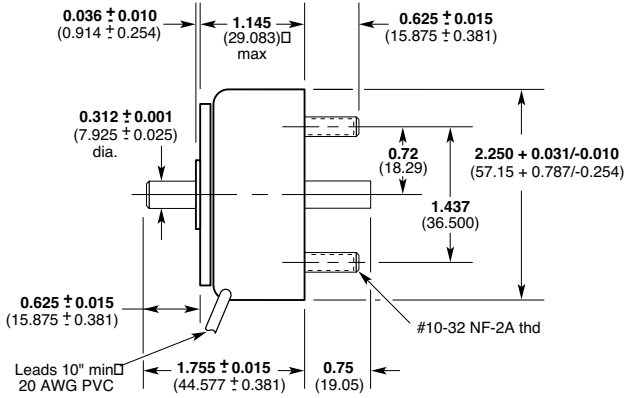
All specifications subject to change without notice.

Ledex® Low Profile Dimensions

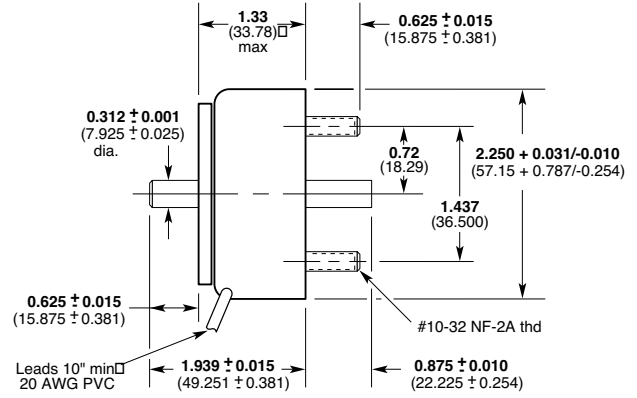
Inches (mm)

All solenoids are illustrated in energized state

Size 6SF

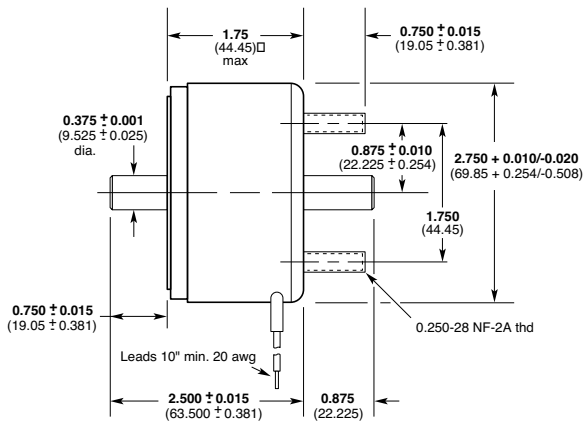


Size 6EC

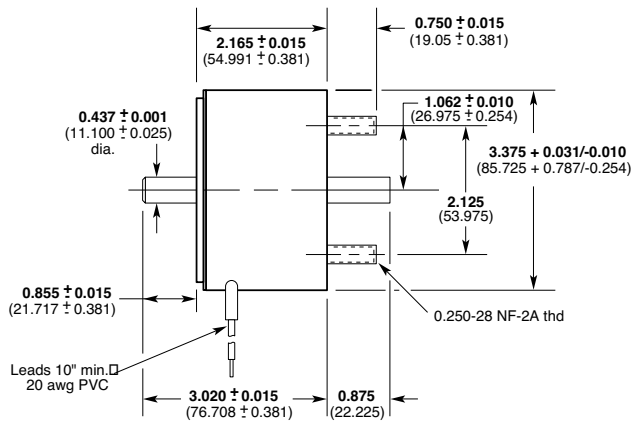


LINEAR Low Profile

Size 7EC



Size 8EC



All specifications subject to change without notice.