



GUARDIAN
GUARDIAN ELECTRIC MANUFACTURING CO.

SOLENOIDS



AC Frame
AC Laminated
DC Frame
DC Tubular
Custom Designs

GUARDIAN-ELECTRIC.COM

Why Choose Guardian For Your Solenoid Needs?

For over 80 years, Guardian Electric has designed and built electro-mechanical components for a wide variety of industries and applications. We put that experience to work everyday to continue to serve our customers' ever changing needs.

- All of our solenoids are UL recognized components
- All of our solenoids are RoHS Compliant
- We are ISO9100:2009 Certified
- All of our solenoids are 100% Made in the USA

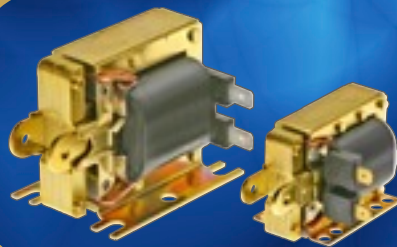
To maintain the highest level of quality we manufacture the key components of every solenoid. We mold our own coil bobbins and wind or coils in house. We also have state of the art machining capabilities for manufacturing all custom components.

All of our employees are trained in, and utilize **Lean Tools** for **Continuous Improvement** in our factory to keep our lead times, product quality and prices competitive with any solenoid on the market today.

Guardian Solenoid Types



AC & DC Frame Solenoids



AC Laminated Solenoids



DC Tubular Solenoids



Long Life Tubular Solenoids

Options To Meet Your Specific Application Needs

Put the Guardian Electric engineering team to work for you. We can create application specific solenoid designs with:

We also specialize in custom winding and insulation of our coils to meet **your requirements** for:

- Custom plungers
- Spring returns
- Custom mounting
- Custom terminations

- Operational force
- Duty cycle
- Life expectancy

We offer our solenoids in **pull or push types**. We also offer **magnetic latching** designs. Our expertise also includes the design and assembly of **value-added** packages to ease the integration into the end application.

You won't have to deal with the hassle of trying to use an "off the shelf" solenoid solution when you trust your design to the solenoid experts at Guardian Electric. We will partner with you from the initial concept to prototypes to final production.

Your success is our mission.

Value Added Solutions



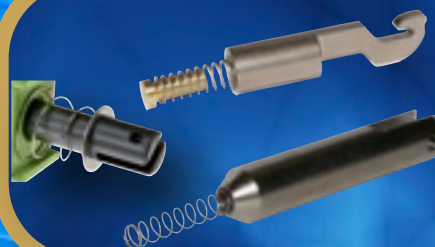
Custom Plungers



Explosion-Proof Packaging



Plunger Retention Features



Spring Returns

FRAME SOLENOID	SERIES	BODY SIZE (Inches)	AC FORCE		AC HOLDING FORCE		CO
			CONT.	INT.	CONT.	INT.	
120 & 240 VAC 12 & 24 VDC. Continuous or Intermittent	2	1.54	6 - 20	15 - 54	50	80	1
	2HD	1.7	9 - 26	20 - 64	55	70	1
	3HD	1.74	7 - 26	8 - 88	43	88	1
	4	1.98	9 - 13	38 - 46	43	92	1
	4HD	2.17	18 - 24	60 - 75	80	135	5
	11	1.84	4 - 13	8 - 24	12	20	1
	11HD	2	3 - 12	7 - 24	50	85	1
	22	1.13	1 - 7	2 - 8	6	7	1
	24	1.23	1 - 8	2 - 14	20	23	1
	26	1.73	1 - 10	2 - 20	15	27	1
	28	1.13	4 - 11	5 - 18	13	15	1
	28HD	1.23	4 - 12	8 - 24	35	61	1
TUBULAR SOLENOID	SERIES	BODY SIZE (Inches)	PULL DC FORCE		PULL DC HOLDING FORCE		CO
			CONT.	INT.	CONT.	INT.	
12 & 24 VDC. Continuous or Intermittent	T-3.5x9	1.18	.5 - 3	1 - 5	20	21	.5
	T4x7	0.89	.5 - 3	1 - 6	20	24	.5
	T4x12	1.51	1 - 4	1 - 7	22	25	
	T4x16	2.01	1 - 5	2 - 8	23	28	1
	T6x12	1.54	2 - 17	6 - 24	48	53	2
	T8x9	1.17	.5 - 20	2 - 42	96	128	1
	T8x16	2.04	2 - 30	8 - 60	103	125	1
	T12x13	1.68	1 - 80	7 - 140	188	215	1
	T12x19	2.38	8 - 100	20 - 145	179	205	6
LONG LIFE TUBULAR SOLENOID	SERIES	BODY SIZE (Inches)	PULL DC FORCE		PULL DC HOLDING FORCE		CO
			CONT.	INT.	CONT.	INT.	
12 & 24 VDC. Continuous or Intermittent	LT-3.5x9	1.18	1 - 3	1.5 - 6	1.5	1.8	
	LT4x7	0.89	.5 - 3.5	1 - 6	3	9	
	LT4x12	1.51	.5 - 9	1.5 - 16	10	18	
	LT4x16	2.01	.5 - 8	1.5 - 14	13	17	
	LT6x12	1.54	.5 - 30	1 - 45	21	39	
	LT8x9	1.17	.5 - 25	2 - 50	24	60	
	LT8x16	2.04	1 - 45	3 - 80	43	66	
	LT12x13	1.68	1.5 - 90	7 - 160	100	144	
	LT12x19	2.43	3 - 110	10 - 170	139	160	
LAMINATED SOLENOID	SERIES	BODY SIZE (Inches)	PULL AC FORCE		PULL AC HOLDING FORCE		CO
			CONT.	INT.	CONT.	INT.	
120 & 240 VAC. Continuous or Intermittent	12	1.63	5 - 30	8 - 48	25	35	
	14	2.46	75 - 115	108 - 130	160	220	
	16	1.63	8 - 68	8 - 112	70	130	8
	18	2.5	60 - 155	144 - 336	245	430	60

* All Forces are in lbs.

Solenoid Selector

DC FORCE		DC HOLDING FORCE		STROKE (Inches)			
INT.	INT.	CONT.	INT.	AC DISTANCE	DC DISTANCE	PUSH	PULL
95	10 - 125	145	181	0.75	.75 (1.00 Int)		X
100	10 - 135	155	191	0.75	.75 (1.00 Int)		X
115	5 - 165	145	181	1	1		X
100	20 - 140	155	181	1	1		X
125	20 - 165	176	235	1	1		X
35	5 - 62	93	82	0.75	1	X	X
70	5 - 100	168	150	1	1		X
11	1 - 20	39	45	0.5	.375 (.50 Int)		X
15	2 - 33	48	65	0.75	0.5		X
25	2 - 30	58	75	.75 (1.00 Int)	.625 (1.00 Int)		X
25	2 - 32	76	92	0.5	0.5	X	X
30	5 - 65	130	159	0.5	0.5		X
PUSH DC FORCE		PUSH DC HOLDING FORCE		STROKE (Inches)			
INT.	INT.	CONT.	INT.	PULL DISTANCE	PUSH DISTANCE	PUSH	PULL
-3	1 - 5	15	17	0.25	0.25	X	X
-3	1 - 6	16	20	0.25	0.25	X	X
				0.25			X
-4	2 - 6.5	18	22	0.25	0.25	X	X
13	5 - 19	38	43	0.375	0.375	X	X
16	1 - 34	76	123	0.5	0.38	X	X
24	1 - 48	83	100	0.75	0.75	X	X
64	5 - 112	146	168	0.75	0.75	X	X
80	16 - 116	143	163	1	1	X	X
				STROKE (Inches)			
				PULL DISTANCE			PULL
				0.25			X
				0.25			X
				0.375			X
				0.375			X
				0.5			X
				0.5			X
				0.75			X
				0.75			X
				1			X
PUSH AC FORCE		PUSH AC HOLDING FORCE		STROKE (Inches)			
INT.	INT.	CONT.	INT.	PULL DISTANCE	PUSH DISTANCE	PUSH	PULL
				1			X
				1			X
68	8 - 112	70	130	1	1	X	X
155	144 - 336	100	240	1	1	X	X

Weight in Ounces



PROUDLY MADE IN THE USA

How to Specify a Guardian Solenoid

Key considerations for specifying a Guardian solenoid for your application are:

- **Force:** The power the solenoid plunger is able to deliver to the load.
- **Stroke:** Distance the plunger will need to travel.
- **Life Expectancy:** # of cycles the solenoid needs to operate for.
- **Temperature:** Max and min temperature the solenoid will be exposed to.
- **Power:** Amount of electrical energy the solenoid coil will consume.
- **Mounting:** How will the solenoid be mounted in the application.
- **Size:** Space required for the solenoid to operate in.
- **Electrical Connections:** Terminals, lead wires, connector.
- **Duty Cycle:** The ratio of the on-time divided by the total time for one complete cycle (on-time + off-time).
- **Holding Force:** The force required to break the plunger free from the plug (stop) when the coil is energized.

You can use the Solenoid selector in this guide to choose the product type that best fits your needs based on the parameters above and the information below.

Helpful Information

AC Applications: The Plunger MUST seat. Lack of seating results in excessive coil current which could result in failure of the coil.

AC Applications: The force remains more even as the stroke decreases.

DC Applications: The force is non-linear and increases as the stroke decreases.

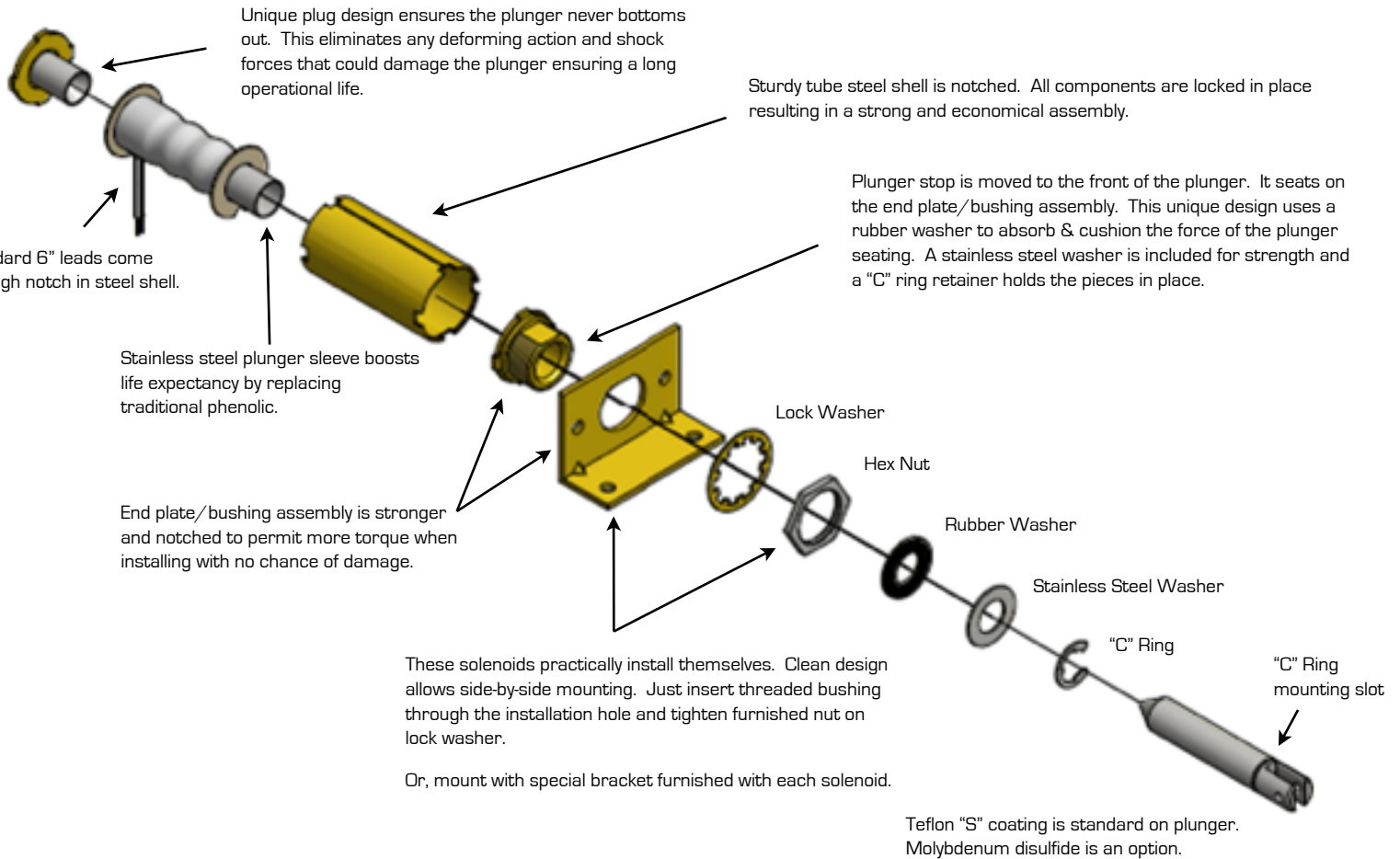
Highly Configurable: Guardian can fabricate custom plungers to interface with almost any application. Coil windings can be modified to accommodate almost any voltage or PWM applications.

Magnetic Latching Solenoids: Include a permanent magnet to hold the plunger in place after it is fully engaged. To release, the polarity to the coil must be reversed.

Long Life Tubular Solenoids: Incorporates an anti-bottoming, Teflon coated plunger, riding in a stainless steel tube to provide high performance and long life in critical applications.

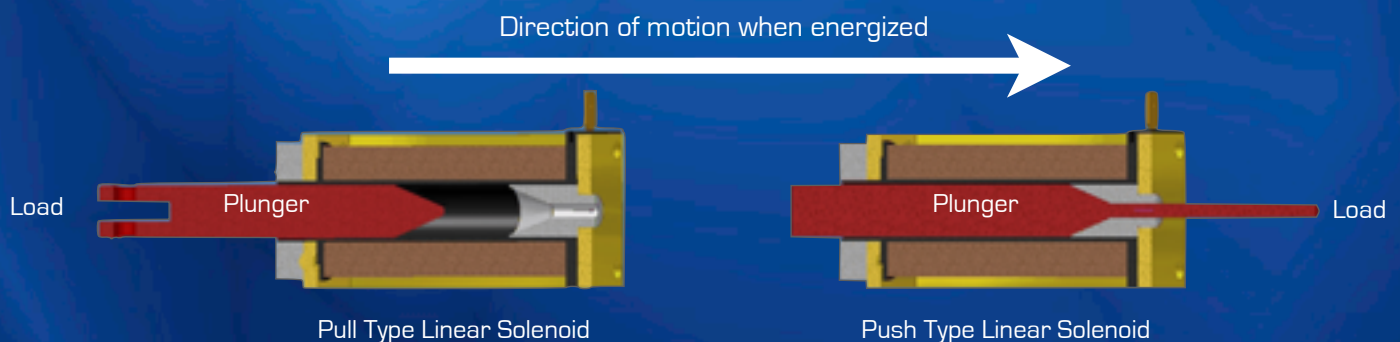
Tight Manufacturing Tolerances and Robust Materials: Yield outstanding performance, high reliability and long life. Guardian solenoids have been tested in excess of 10 million cycles without failure.

Anatomy of the Guardian Long Life Tubular Solenoid



Principle of Operation

A solenoid is an electromechanical device which converts electrical energy into mechanical motion to move an external load a specified distance. For a linear solenoid, when electrical power is applied, the solenoid plunger moves into the solenoid coil until it hits the mechanical stop. For a pull type solenoid the load is pulled towards the coil by the plunger. For a push type, an extension rod pushes the load away from the coil.



Industries and Applications Served

Commercial

- Security / Door Interlocks
- Safety Interlocks
- Vending Machines
- Banking / ATMs
- Gaming Equipment
- Food Processing
- Appliances
- Medical Equipment
- Power Generation
- Office Equipment

Military / Aerospace

- Access Panels
- Landing Gear
- Payload
- Doors / Hatches



DESIGNING FUTURE
TECHNOLOGIES TODAY

1425 Lake Ave
Woodstock, IL 60098
PH: 815-334-3600
Toll Free: 800-762-0369
FX: 815-337-0377



PROUDLY MADE IN THE USA

GUARDIAN-ELECTRIC.COM