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*Information for ordering is included on each series page.*

## Design Features

Eight standard models available. Black paint for corrosion and fungus protection is standard. Stearns solenoid design has been time-tested and proven in Stearns electromagnetic disc brakes.

**Frame and Plunger** are constructed entirely of high grade silicon steel for optimum performance and elimination of residual magnetic effects. The complete stack is riveted under constant pressure to assure uniformity and strength of entire frame.

**Coil** is encapsulated in resilient epoxy for high resistance to moisture, vibration, shock, contaminants, thermal expansion and fungus. Vacuum impregnation prior to encapsulation assures a solid sealed void-free insulating structure.

**Terminals** are solidly imbedded in epoxy insulation. Terminal screws and lock washers provided.

### **Precision Ground Contact Surfaces**

assures positive seating, accuracy of air gap and quiet operation.

**Frame and Plunger** are constructed entirely of high grade silicon steel for optimum performance and elimination of residual magnetic effects. The complete stack is riveted under constant pressure to assure uniformity and strength of entire frame.

**Special Bearing Surfaces** are copper brazed to plunger, providing ample area for connecting linkage...extending wear life.

### **Replaceable Plunger Guides**

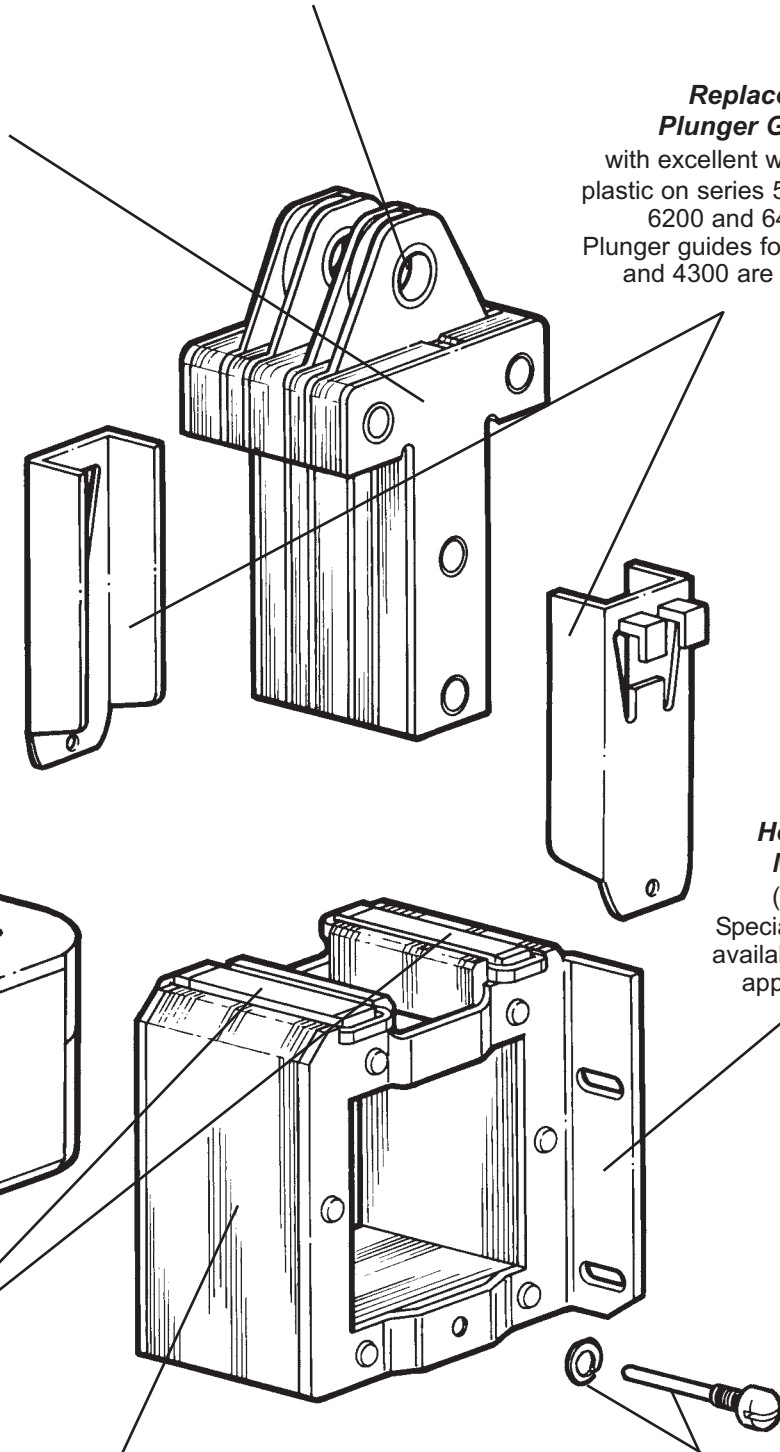
with excellent wear life are plastic on series 5000, 5600, 6200 and 6400. Plunger guides for series 4000 and 4300 are metal.

### **Horizontal Mount** (shown)

Special mounting available for most applications.

### **Ease of Maintenance**

Should a coil failure occur due to a system voltage problem, it can be replaced easily by removing either one or two screws and withdrawing the plunger and plunger guides.



## Selection

The solenoid must be closely sized to load requirements for maximum service life. An undersized solenoid... where load exceeds solenoid force... will fail through burnout of coil. An oversized solenoid... where solenoid force greatly exceeds load... will fail prematurely through hammering of the plunger on the frame.

Stearns engineers are specialists in applying the proper solenoid to a particular application. You can profit from our experience by having a Stearns engineer review your requirements and determine the best possible solenoid for your particular application. Frequently, Stearns engineers are able to offer valuable recommendations which lower your solenoid costs and improve the performance of your products.

The solenoids described in this brochure are commonly used standards. Numerous variations of standard solenoids are available from Stearns. For complete details, contact the factory.

When selecting a standard Stearns solenoid, four basic factors should be considered to obtain optimum performance: A) load characteristics, B) voltage and current limitations, C) ambient temperature and cycling rate, D) push or pull type operation.

Solenoid model number and coil stock number should be specified when ordering Stearns industrial solenoids. The solenoid assembly consists of the solenoid frame, plunger, plunger guides, and plunger guide screw(s). The coil has two side terminals. The terminals have screws and lock washers attached.

## Solenoid Series Selection

Stearns industrial solenoids are available in a wide variety of pull-in forces and stroke lengths. The 100% voltage pull charts on pages 4 and 5 will help you determine the correct solenoid model number to meet your specific performance requirements.

Use the horizontal axis of the chart to locate the stroke length needed. Pounds of pull in force are listed vertically on the left axis. Draw a horizontal line from the stroke length. The 100% voltage pull curves that falls above to where these two lines intersect will indicate which solenoid models to consider. To compensate for voltage fluctuation and possible errors in calculating load, pull values at 85% voltage should normally be used. To obtain 85% voltage pull forces, multiply the 100% voltage pull forces by 0.72. The 85% voltage solenoid pull curve that falls closest above your force-stroke requirement will meet your performance requirements. The 85% voltage pull forces are also listed on the solenoid specification, Pages 6 through 11. As referenced in Figure 1A, the pull required by the load must not be greater than the force exerted by the solenoid at any point on the chart.

Each curve is labeled with a letter. Locate the corresponding letter in the Model Number Chart to determine the solenoid and coil series best suited to your needs. Full electrical and dimensional specifications on these solenoids can be found on Pages 6 through 11.

A solenoid should always be mounted either horizontally or vertically for maximum life. The plunger should be

linked to operating mechanism of machine in such a way to allow free plunger travel. Plunger misalignment accelerates wear on plunger guides.

## Electrical Considerations

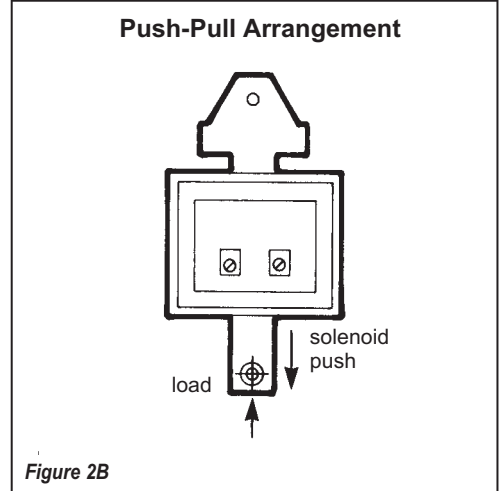
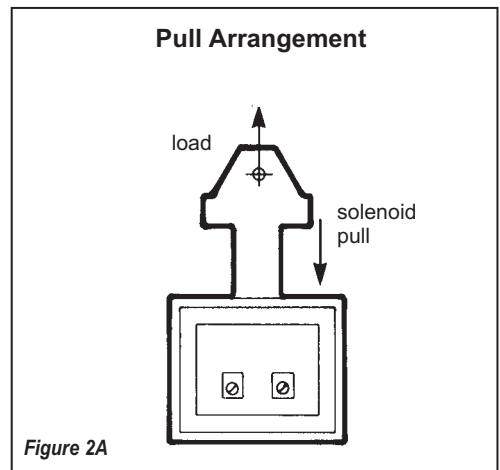
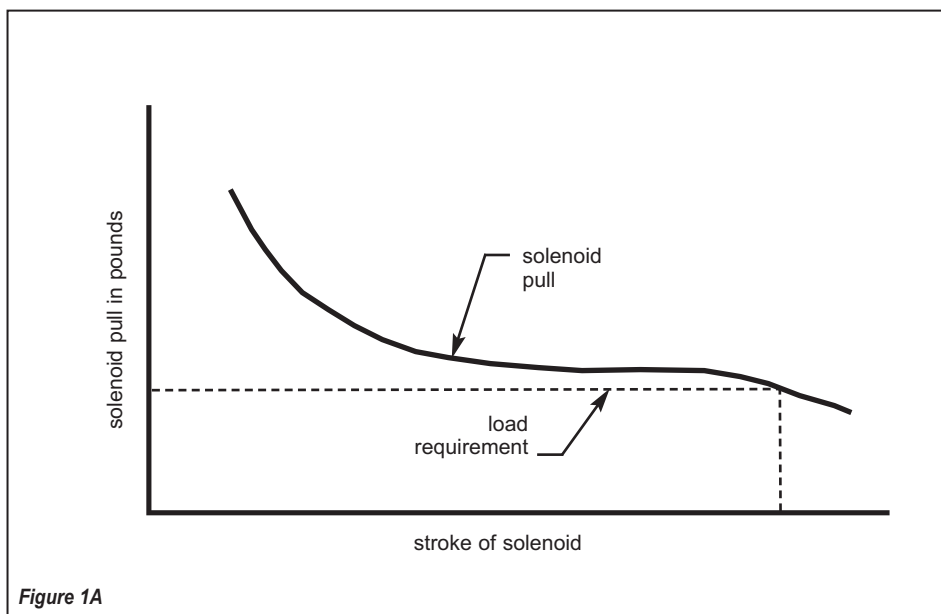
Volt-ampere data is listed for each Stearns solenoid on the following pages. Inrush current at a given stroke is calculated by dividing the volt-ampere value at that stroke by the voltage being used. The holding volt-ampere value is also listed for each solenoid. Coils are available in NEMA standard voltages of 115, 230, 460 and 575 VAC, 60 Hz, with Class A insulation. Coils for other voltages and frequencies are available on special order.

## Ambient Temperature

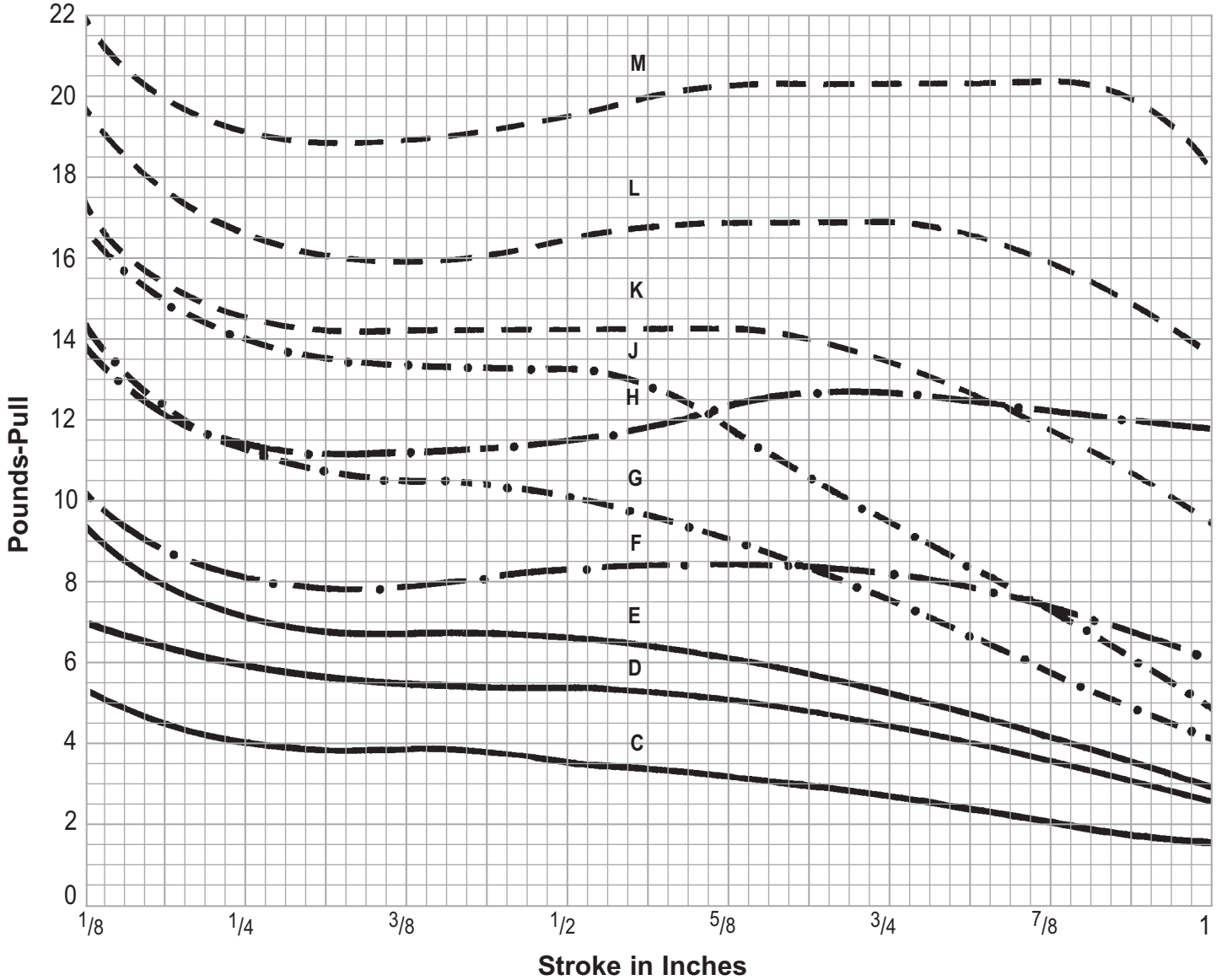
Values listed in solenoid data are for an ambient of 40° C or below. If the ambient is higher than shown or for high cycling applications, consult factory.

## Push or Pull Applications

Stearns solenoids are available in both pull and push-pull arrangements. With pull arrangement, the load is connected as in Figure 2A. With push-pull arrangement, the load is connected as in Figure 2B.



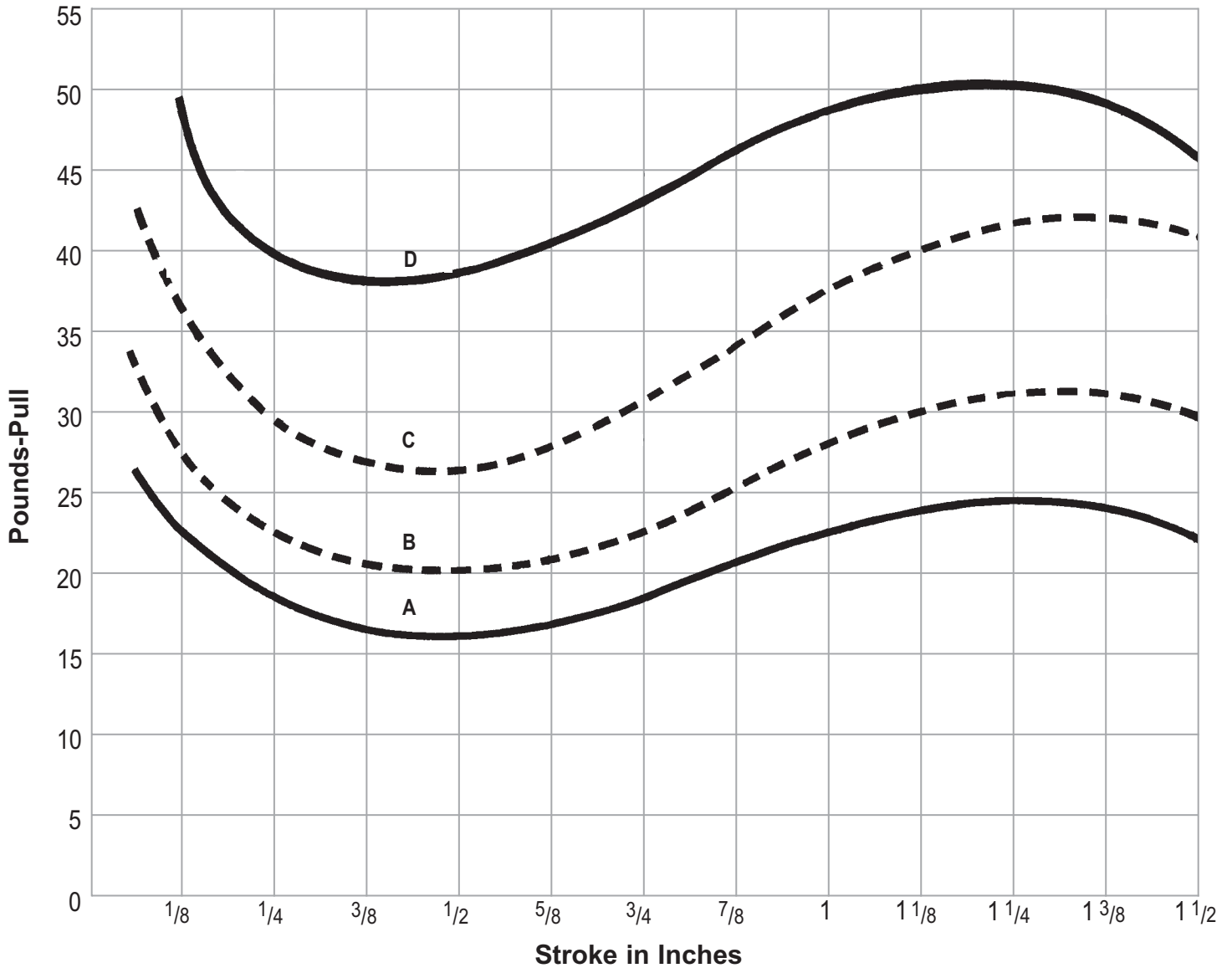
# Stearns Industrial Solenoid Pull Curves - 100% Voltage



- Notes:** 1) Pull characteristics recorded with coil “hot” to insure optimum operating performance.  
 2) Add plunger weight to pull force if plunger is vertical above the solenoid frame.  
 Subtract plunger weight from pull force if plunger is vertical below the solenoid force.

Curve	Solenoid Model Number		Mounting	Coil Series
	Pull	Push-Pull		
C	4-2-04001-00	4-2-04002-00	Wall	43,200
	4-2-04003-00	4-2-04004-00	Universal	43,200
D	4-2-04001-00	4-2-04002-00	Universal	56,100
	4-2-04003-00	4-2-04004-00		
E	4-2-04001-00	4-2-04002-00	Universal	56,200
	4-2-04003-00	4-2-04004-00		
F	4-2-05003-00	4-2-05004-00	Universal	56,300

Curve	Solenoid Model Number		Mounting	Coil Series
	Pull	Push-Pull		
G	4-2-04301-00	4-2-04302-00	Wall	43,100
	4-2-04303-00	4-2-04304-00	Universal	43,100
H	4-2-05003-00	—	Universal	50,200
J	4-2-04301-00	4-2-04302-00	Wall	43,200
	4-2-04303-00	4-2-04304-00	Universal	43,200
K	4-2-05603-00	4-2-05604-00	Universal	56,100
L	4-2-05603-00	4-2-05604-00	Universal	56,200
M	4-2-05603-00	4-2-05604-00	Universal	56,300



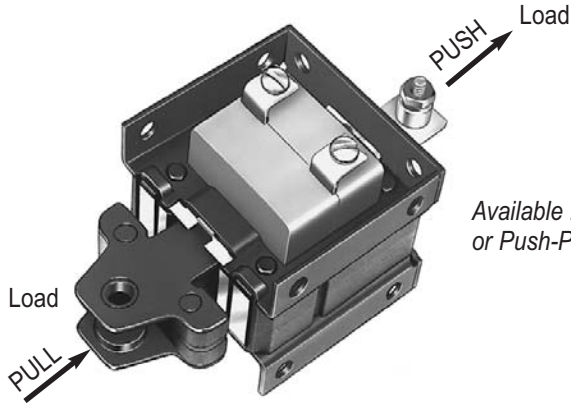
- Notes:** 1) Pull characteristics recorded with coil “hot” to insure optimum operating performance.  
 2) Add plunger weight to pull force if plunger is vertical above the solenoid frame.  
 Subtract plunger weight from pull force if plunger is vertical below the solenoid force.

Curve	Solenoid Model Number		Coil Series
	Push Only	Mounting	
A	4-2-06206-00	Vertical	62,100
	4-2-06201-00	Horizontal	
B	4-2-06206-00	Vertical	62,200
	4-2-06201-00	Horizontal	
C	4-2-06406-00	Vertical	64,100
	4-2-06401-00	Horizontal	
D	4-2-06406-00	Vertical	64,200
	4-2-06401-00	Horizontal	

## Series 4000

### Universal Mount

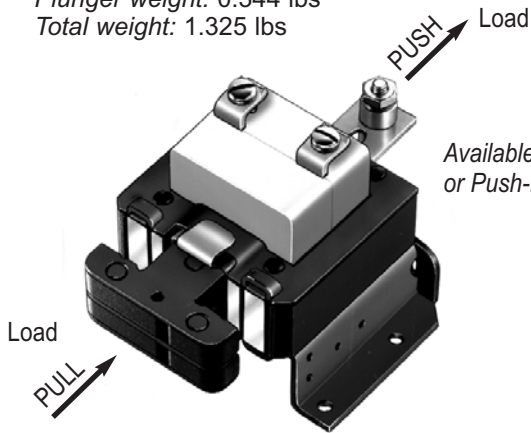
Plunger weight: 0.350 lbs  
Total weight: 1.341 lbs



Available in Pull Only or Push-Pull

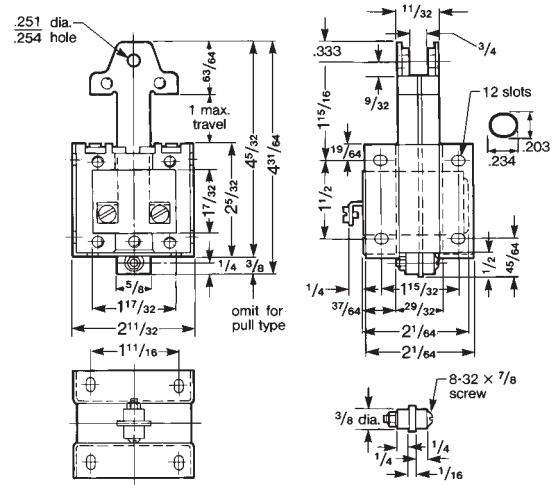
### Wall Mount

Plunger weight: 0.344 lbs  
Total weight: 1.325 lbs

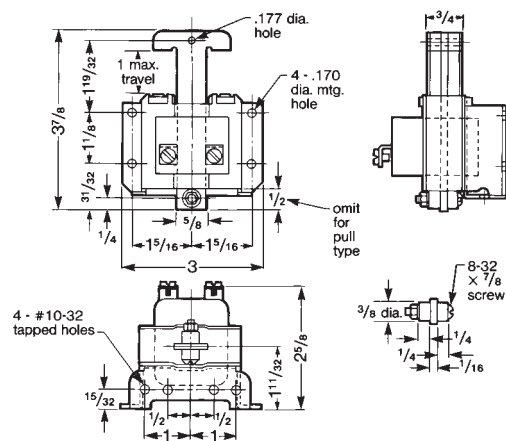


Available in Pull Only or Push-Pull

### Dimensional Information for Universal Mount



### Dimensional Information for Wall Mount



## Electrical Data

	Stroke	Force in Pounds		Volt-Amperes*			Stroke	Force in Pounds		Volt-Amperes*			Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding
Coil Series 40,100	1/8	5.3	3.9	139	30	Coil Series 40,200	1/8	7.1	5.0	161	37	Coil Series 40,300	1/8	9.2	6.5	212	55
	1/4	3.9	2.9	196			1/4	5.6	4.0	231			1/4	7.0	5.1	294	
Line "C" on Pull Curve Chart Page 4	3/8	3.6	2.6	240		Line "D" on Pull Curve Chart Page 4	3/8	5.3	3.8	286		Line "E" on Pull Curve Chart Page 4	3/8	6.5	4.8	366	
	1/2	3.4	2.5	276			1/2	5.2	3.7	337			1/2	6.3	4.5	434	
	5/8	3.0	2.2	307			5/8	4.8	3.5	392			5/8	5.7	4.0	506	
	3/4	2.5	1.8	336			3/4	4.2	3.0	440			3/4	4.8	3.4	561	
	7/8	1.9	1.3	360			7/8	3.5	2.3	473			7/8	3.5	2.5	594	
1	1.2	.9	381	1		2.2	1.6	495	1	2.4		1.7	638				

\*To determine current (amps) divide volt-amperes by coil voltage.

## Ordering information

Specify solenoid model number from Table A and coil stock number from Table B. For special coils, other voltages and frequencies, consult Stearns Division.

Table A

Solenoid Model Number			
Universal Mount		Wall Mount	
Pull:	4-2-04003-00	Pull:	4-2-04001-00
Push-Pull	4-2-04004-00	Push-Pull	4-2-04002-00

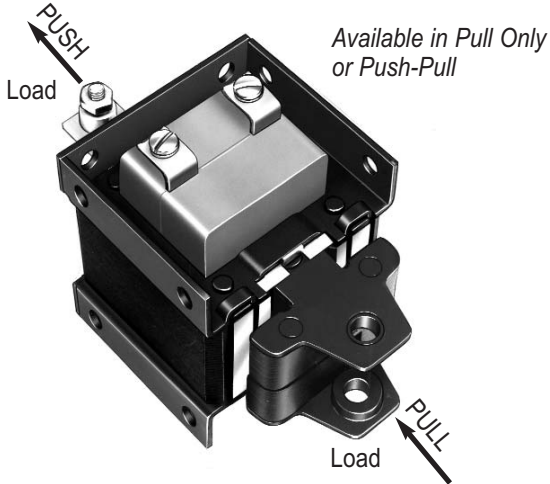
Table B

Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460 V/60 Hz	575 V/60 Hz
40,100	4-2-40101-00	4-2-40102-00	4-2-40104-00	4-2-40105-00
40,200	4-2-40201-00	4-2-40202-00	4-2-40204-00	4-2-40205-00
40,300	4-2-40301-00	4-2-40302-00	4-2-40304-00	4-2-40305-00

## Series 4300

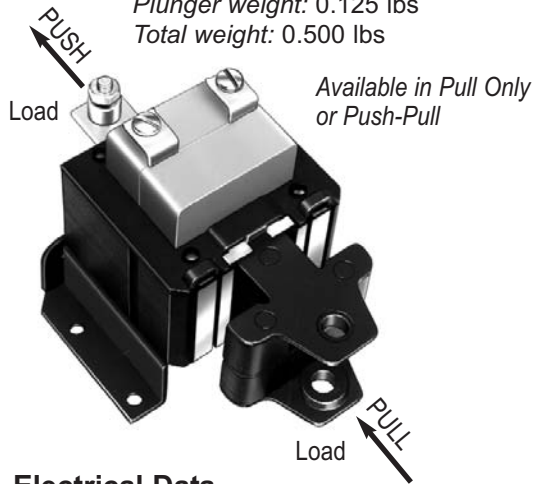
### Universal Mount

Plunger weight: 0.625 lbs  
Total weight: 2.000 lbs

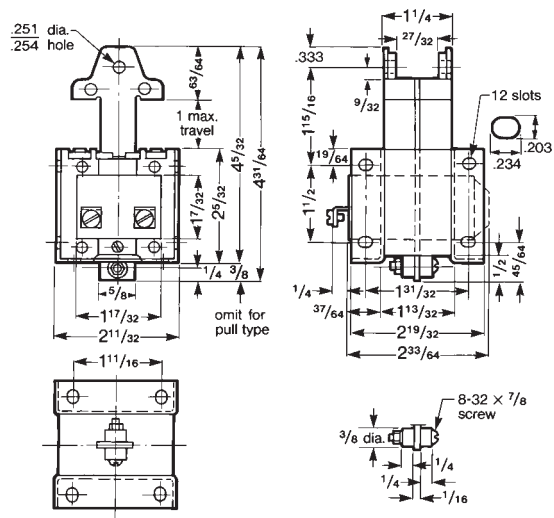


### Wall Mount

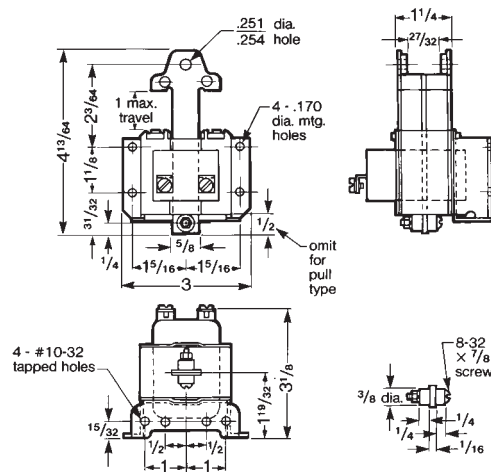
Plunger weight: 0.125 lbs  
Total weight: 0.500 lbs



### Dimensional Information for Universal Mount



### Dimensional Information for Wall Mount



### Electrical Data

Coil Series	Stroke	Force in Pounds		Volt-Amperes*		Coil Series	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding
43,100	1/8	14.1	10.3	300	67	40,100	1/8	16.6	12.1	352	78
	1/4	11.0	7.9	434			1/4	13.8	9.8	495	
Line "G" on Pull Curve Chart Page 4	3/8	10.3	7.3	539		3/8	13.1	9.3	637		
	1/2	9.8	6.9	643		1/2	13.0	9.0	770		
	5/8	8.6	6.3	738		5/8	11.3	8.0	895		
	3/4	7.1	5.1	775		3/4	9.0	6.6	1010		
	7/8	5.3	4.0	825		7/8	6.8	4.8	1110		
1	3.6	2.6	870	1	4.3	3.1	1186				

\*To determine current (amps) divide volt-amperes by coil voltage.

### Ordering information

Specify solenoid model number from Table A and coil stock number from Table B. For special coils, other voltages and frequencies, consult Stearns Division.

Table A

Solenoid Model Number			
Universal Mount		Wall Mount	
Pull:	4-2-04303-00	Pull:	4-2-04301-00
Push-Pull	4-2-04304-00	Push-Pull	4-2-04302-00

Table B

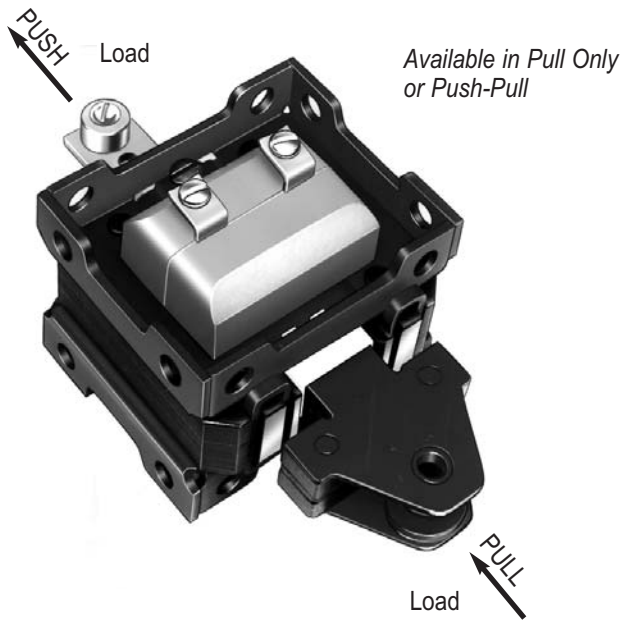
Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460V/60 Hz	575 V/60 Hz
43,100	4-2-431011-00	4-2-43102-00	4-2-43104-00	4-2-43105-00
43,200	4-2-432011-00	4-2-43202-00	4-2-43204-00	4-2-43205-00

## Series 5000

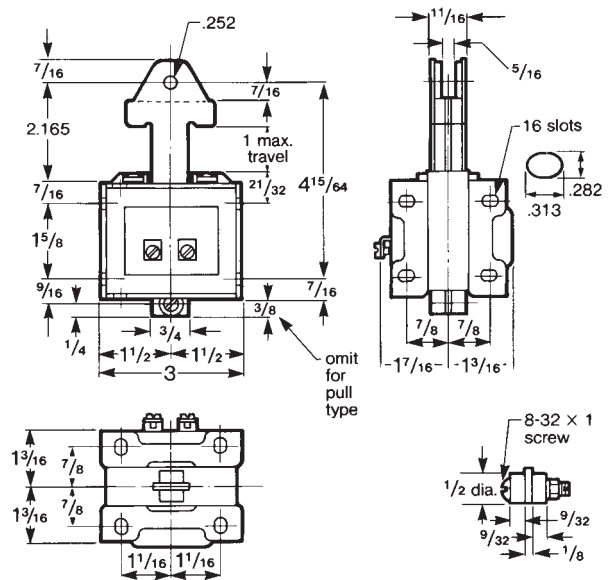
### Universal Mount

Plunger weight: 0.052 lbs

Total weight: 2.42 lbs



### Dimensional Information for Universal Mount



### Electrical Data

Coil Series	Stroke	Force in Pounds		Volt-Amperes*		Coil Series	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding
50,100	1/8	10.0	7.4	207	56	50,200	1/8	13.7	9.8	308	88
	1/4	8.0	5.8	312			1/4	11.2	8.0	447	
	3/8	7.8	5.8	380			3/8	11.1	7.9	568	
Line "F" on Pull Curve Chart Page 4	1/2	8.1	6.0	462		Line "H" on Pull Curve Chart Page 4	1/2	11.4	8.3	694	
	5/8	8.2	6.1	545			5/8	12.3	8.9	836	
	3/4	7.8	5.9	627			3/4	12.4	9.0	968	
	7/8	6.9	5.2	710			7/8	11.9	8.7	1100	
	1	5.6	4.3	788		1	11.4	7.6	1232		

\*To determine current (amps) divide volt-amperes by coil voltage.

### Ordering information

Specify solenoid model number from Table A and coil stock number from Table B. For special coils, other voltages and frequencies, consult Stearns Division.

Table A

Solenoid Model Number	
Pull:	4-2-05003-00
Push-Pull	4-2-05004-00 (The push-pull solenoid is only offered with the 50,100 series coil)

Table B

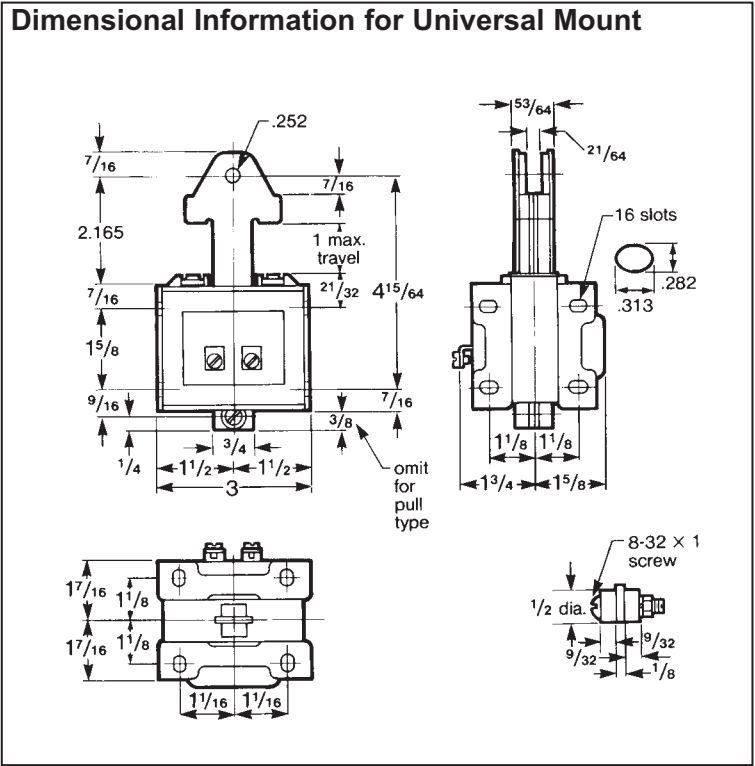
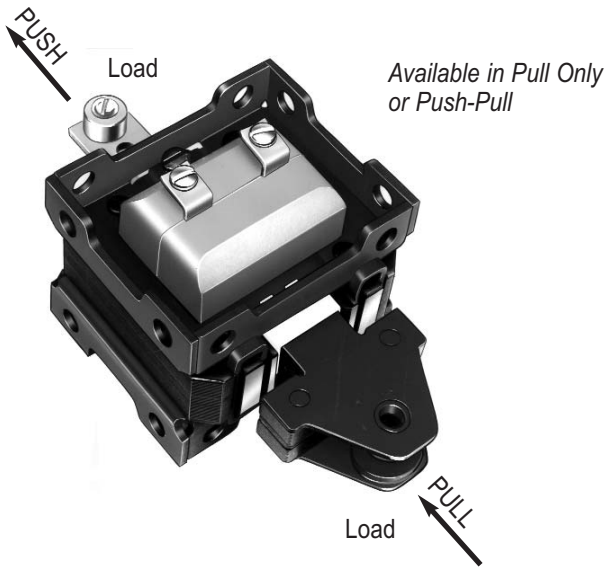
Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460V/60 Hz	575 V/60 Hz
50,100	4-2-50101-00	4-2-50102-00	4-2-50104-00	4-2-50105-00
50,200	4-2-50201-00	4-2-50202-00	4-2-50204-00	4-2-50205-00



# Series 5600

## Universal Mount

Plunger weight: 1.0 lb  
Total weight: 3.37 lbs



## Electrical Data

Coil Series	Stroke	Force in Pounds		Volt-Amperes*		Coil Series	Stroke	Force in Pounds		Volt-Amperes*		Coil Series	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding
56,100	1/8	17.3	13.0	330	76	56,200	1/8	19.6	14.1	411	94	56,300	1/8	21.8	16.0	465	111
	1/4	14.2	10.3	500			1/4	16.4	11.8	605			1/4	18.7	13.2	682	
	3/8	14.0	10.0	643			3/8	15.6	11.5	770			3/8	18.6	13.1	903	
	1/2	14.0	10.0	785			1/2	16.3	11.8	968			1/2	19.2	13.8	1100	
	5/8	14.0	10.0	965			5/8	16.6	12.1	1155			5/8	20.1	14.5	1330	
	3/4	13.0	9.3	1075			3/4	16.5	12.0	1342			3/4	20.1	14.5	1560	
	7/8	11.3	8.0	1245			7/8	15.3	11.0	1495			7/8	20.0	14.2	1770	
	1	8.7	6.4	1365			1	13.0	10.0	1650			1	17.3	12.5	1980	

\*To determine current (amps) divide volt-amperes by coil voltage.

## Ordering information

Specify solenoid model number from Table A and coil stock number from Table B. For special coils, other voltages and frequencies, consult Stearns Division.

Table A

Solenoid Model Number	
Pull:	4-2-05603-00
Push-Pull	4-2-05604-00

Table B

Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460 V/60 Hz	575 V/60 Hz
56,100	4-2-56101-00	4-2-56102-00	4-2-56104-00	4-2-56105-00
56,200	4-2-56201-00	4-2-56202-00	4-2-56204-00	4-2-56205-00
56,300	4-2-56301-00	4-2-56302-00	4-2-56304-00	4-2-56305-00

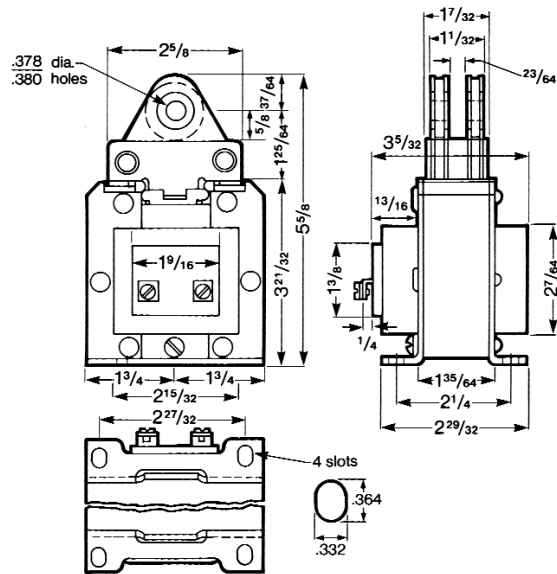
## Series 6200

### Vertical Mount

Plunger weight: 1.9 lbs  
Total weight: 6.5 lbs



### Dimensional Information for Vertical Mount

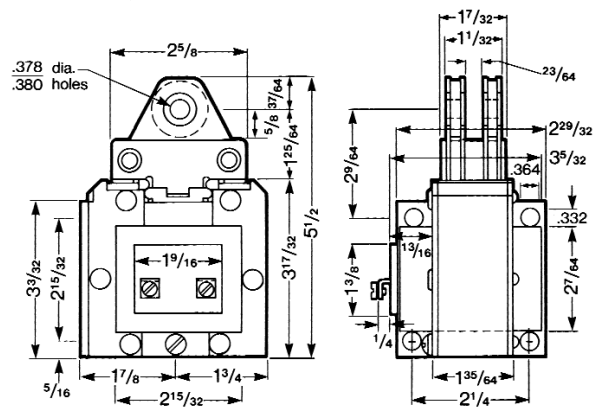


### Horizontal Mount

Plunger weight: 1.9 lbs  
Total weight: 6.5 lbs



### Dimensional Information for Horizontal Mount



## Electrical Data

	Stroke	Force in Pounds		Volt-Amperes*			Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding
Coil Series 62,100 See Page 5 for Pull Curve Chart	1/8	22.5	17.0	445	122	Coil Series 62,200 See Page 5 for Pull Curve Chart	1/8	28.1	20.9	685	180
	1/4	17.7	12.9	700			1/4	21.8	16.8	910	
	3/8	16.4	12.5	815			3/8	21.3	15.7	1200	
	1/2	17.4	12.2	1050			1/2	21.5	16.1	1400	
	5/8	18.1	13.3	1260			5/8	22.3	16.7	1680	
	3/4	20.0	14.6	1450			3/4	23.7	18.0	1940	
	7/8	22.4	16.2	1700			7/8	26.5	19.6	2100	
	1	23.6	17.4	1810			1	28.3	21.5	2530	
	1 1/8	24.5	18.1	2200			1 1/8	31.0	22.6	2780	
	1 1/4	25.0	18.5	2375			1 1/4	32.3	23.5	3190	
1 3/8	24.5	18.1	2700	1 3/8	32.5	23.8	3500				
1 1/2	22.5	16.5	3000	1 1/2	31.5	23.0	3880				

\*To determine current (amps) divide volt-amperes by coil voltage.

## Ordering information

Specify solenoid model number from Table A and coil stock number from Table B. For special coils, other voltages and frequencies, consult Stearns Division.

Table A

Solenoid Model Number
Vertical Mount: 4-2-06206-00 Horizontal Mount: 4-2-06201-00

Table B

Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460V/60 Hz	575 V/60 Hz
62,100	4-2-62101-00	4-2-62102-00	4-2-62104-00	4-2-62105-00
62,200	4-2-62201-00	4-2-62202-00	4-2-62204-00	4-2-62205-00

## Series 6400

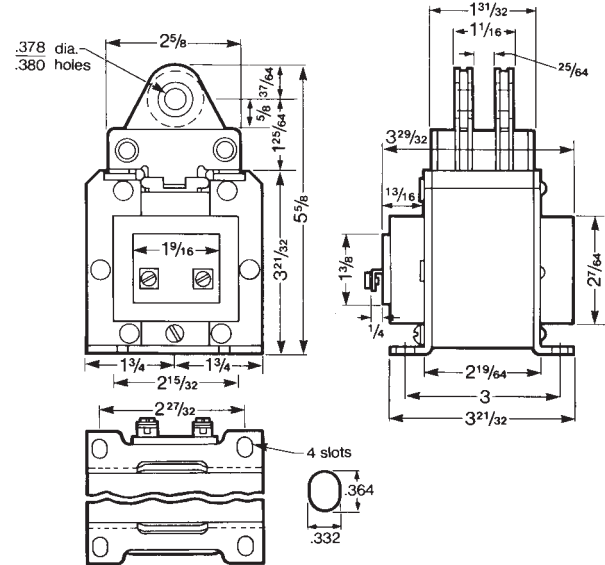
### Vertical Mount

Plunger weight: 2.9 lbs

Total weight: 7.8 lbs



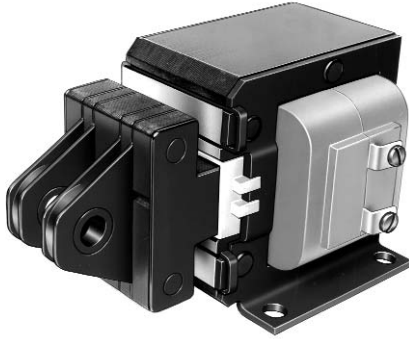
### Dimensional Information for Vertical Mount



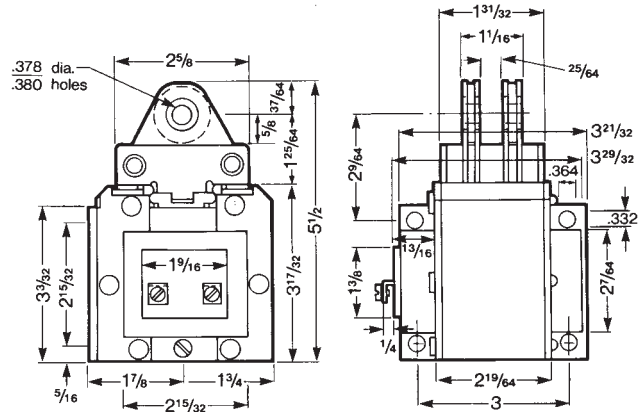
### Horizontal Mount

Plunger weight: 2.9 lbs

Total weight: 7.8 lbs



### Dimensional Information for Horizontal Mount



### Electrical Data

	Stroke	Force in Pounds		Volt-Amperes*			Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding			100% Voltage	85% Voltage	Inrush	Holding
Coil Series 64,100 See Page 5 for Pull Curve Chart	1/8	37.4	27.5	875	200	Coil Series 64,200 See Page 5 for Pull Curve Chart	1/8	50.5	36.0	1005	250
	1/4	30.0	21.3	1240			1/4	40.0	28.5	1500	
	3/8	27.6	19.5	1520			3/8	38.0	26.6	1900	
	1/2	28.0	20.0	1780			1/2	39.0	27.0	2485	
	5/8	30.0	21.2	2240			5/8	40.6	28.9	2760	
	3/4	32.6	23.0	2520			3/4	43.8	31.6	3250	
	7/8	34.3	25.1	2800			7/8	47.5	34.0	3740	
	1	38.3	27.3	3300			1	50.0	36.1	4240	
	1 1/8	41.7	29.3	3760			1 1/8	51.4	37.4	4735	
	1 1/4	43.5	31.2	4200			1 1/4	51.4	38.5	5300	
1 3/8	43.5	31.2	4630	1 3/8	50.5	37.2	5800				
1 1/2	41.9	29.0	5150	1 1/2	47.1	34.0	6275				

\*To determine current (amps) divide volt-amperes by coil voltage.

### Ordering information

Specify solenoid model number from Table A and coil stock number from Table B. For special coils, other voltages and frequencies, consult Stearns Division.

Table A

Solenoid Model Number
Vertical Mount: 4-2-06406-00 Horizontal Mount: 4-2-06401-00

Table B

Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460V/60 Hz	575 V/60 Hz
64,100	4-2-64101-00	4-2-64102-00	4-2-64104-00	4-2-64105-00
64,200	4-2-64201-00	4-2-64202-00	4-2-64204-00	4-2-64205-00