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Design Features

The Stearns™ solenoid design has been time-tested and proven in our electromagnetic disc brakes. Black paint for corrosion and fungus protection is standard.

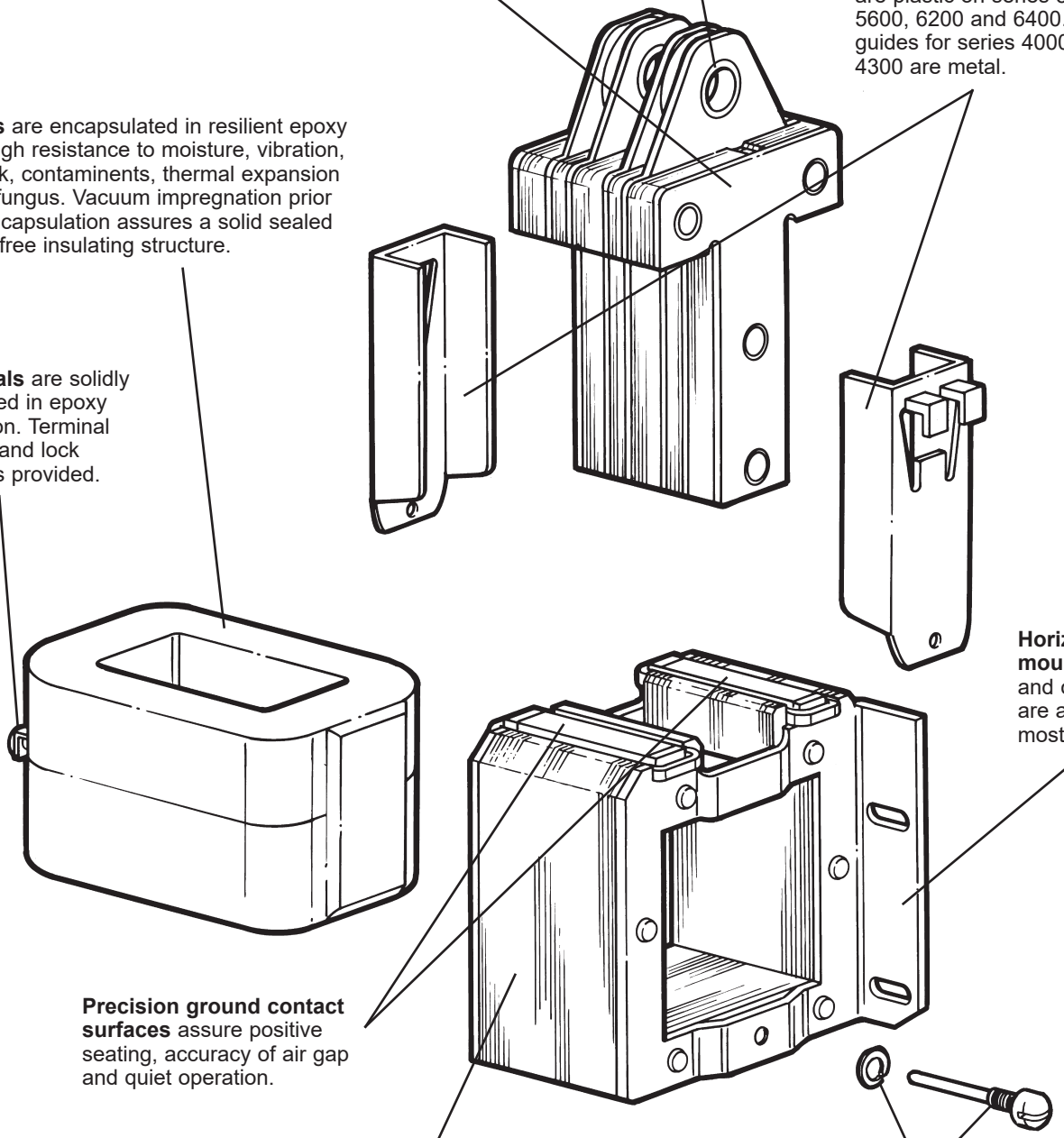
Special bearing surfaces are copper brazed to plunger, providing ample area for connecting linkage and extending wear life.

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.

Replaceable plunger guides are plastic on series 5000, 5600, 6200 and 6400. Plunger guides for series 4000 and 4300 are metal.

Coils are encapsulated in resilient epoxy for high resistance to moisture, vibration, shock, contaminents, 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.



Horizontal mounting (shown) and other options are available for most applications.

Precision ground contact surfaces assure 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.

Easily replaced should a coil failure occur due to a system voltage problem. Simply remove either one or two screws and withdrawing the plunger and plunger guides.

Selection

Stearns™ engineers can help identify the right solenoid for your application, often improving performance while lowering total cost. The following solenoids are commonly used standards. Numerous variations of standard solenoids are available upon request. For complete details, contact the factory.

When selecting a solenoid, it 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.

Four basic factors should be considered to obtain optimum performance:

A) Load characteristics

B) Voltage & current limitations

C) Ambient temperature & cycling rate

D) Push or pull type operation.

Solenoid model number and coil stock number should be specified when ordering. 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

Our industrial solenoids are available in a wide variety of pull-in forces and stroke lengths. The 100% voltage pull charts on the following pages 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 in the solenoid series' electrical data section. 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.

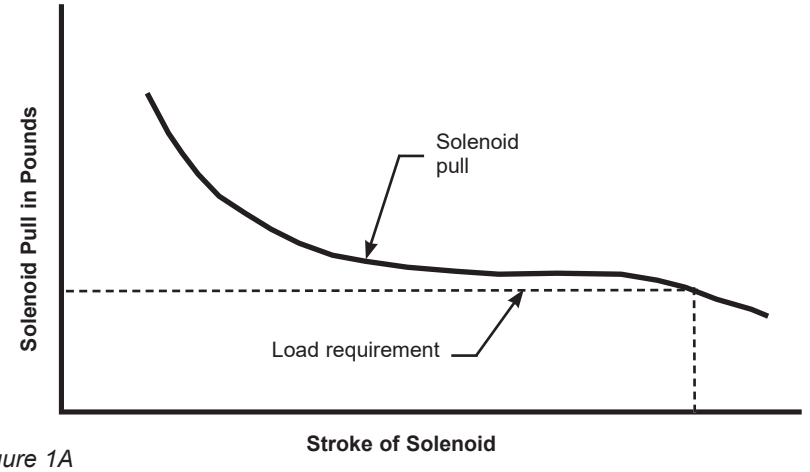


Figure 1A

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 is listed for each solenoid series.

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.

Pull Arrangement

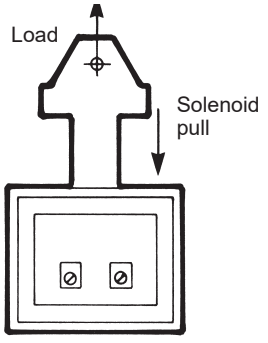


Figure 2A

Push-Pull Arrangement

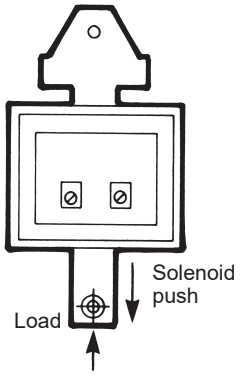
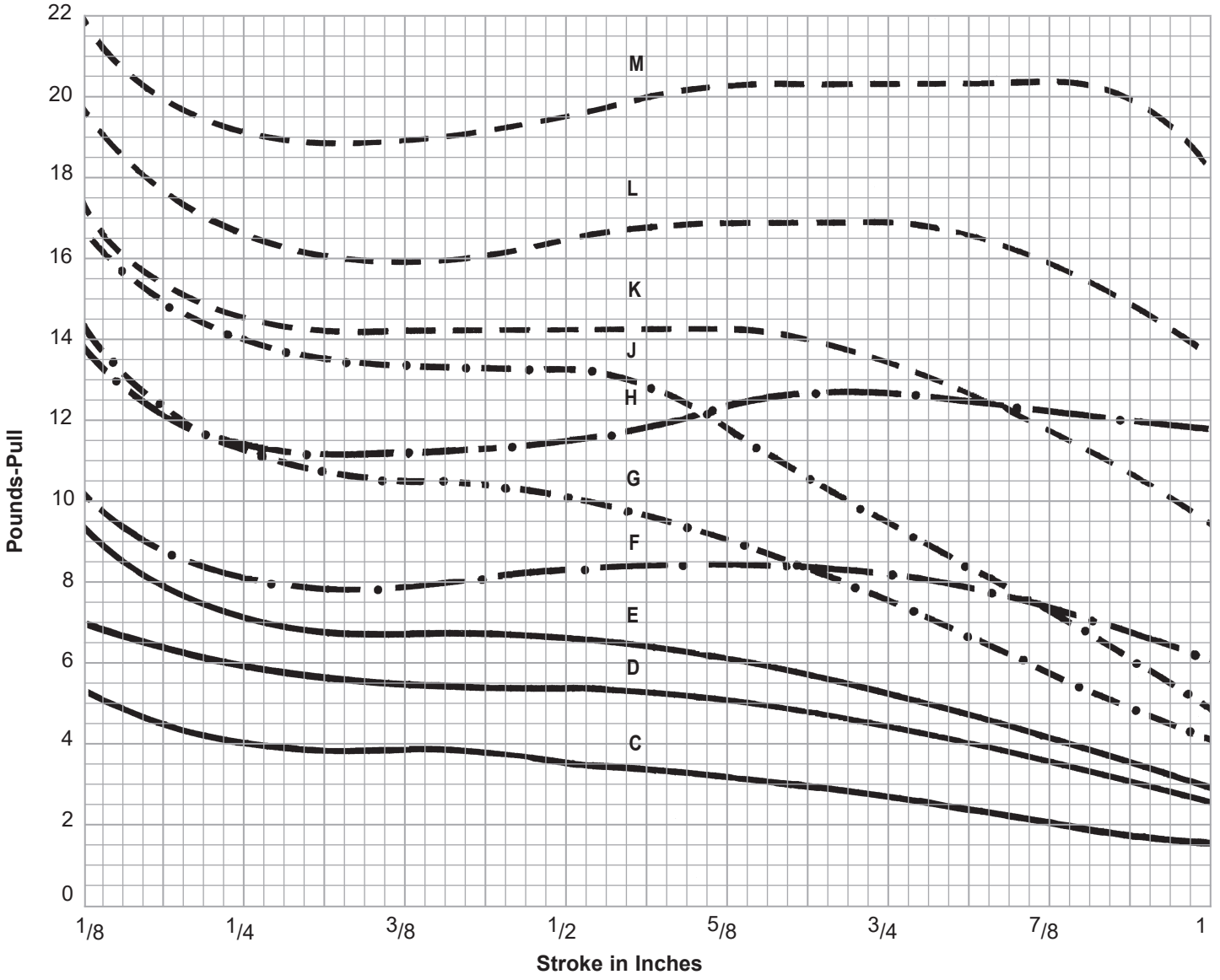


Figure 2B

Pull Curves
100% Voltage



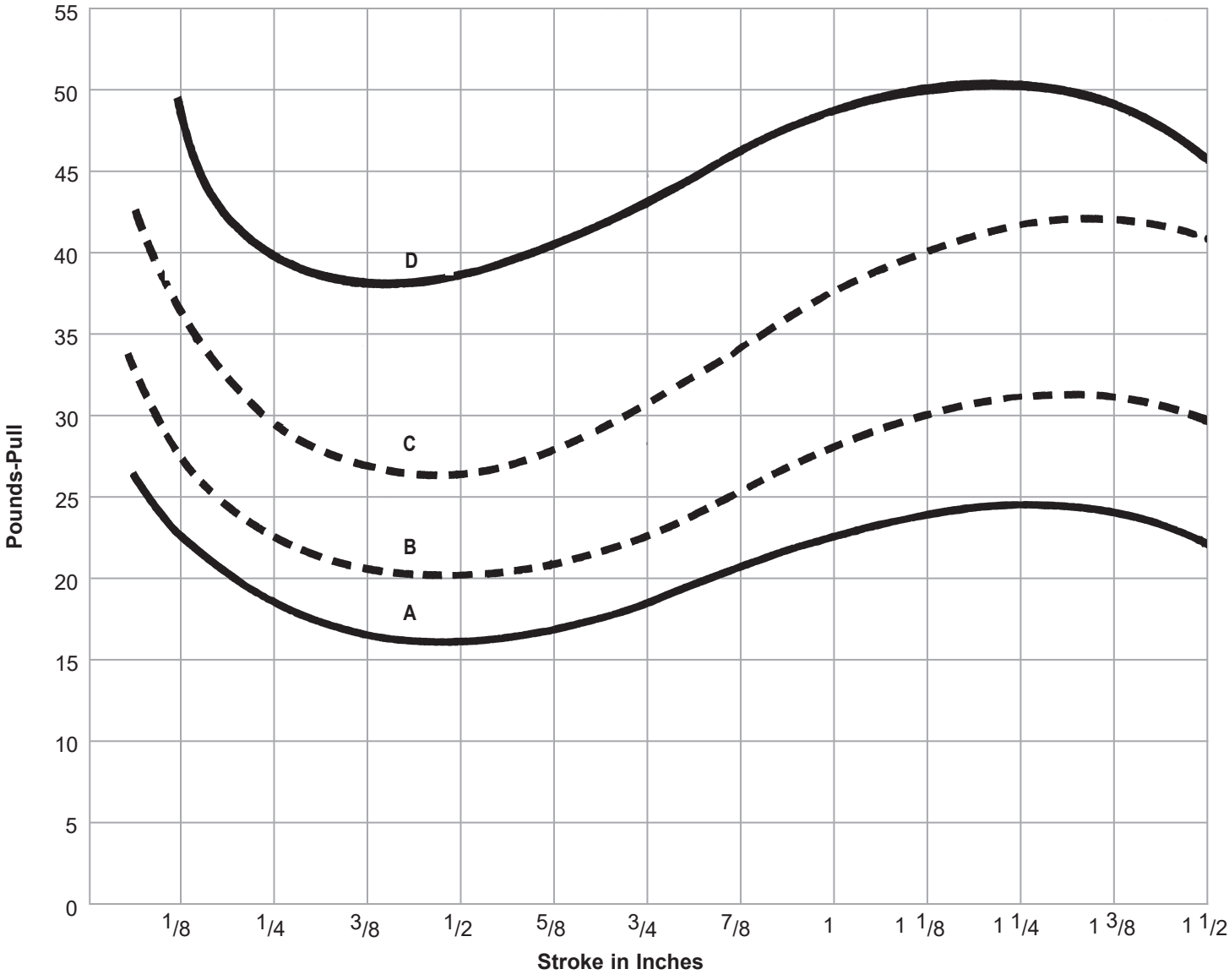
Notes: 1) Pull characteristics recorded with coil "hot" to insure optimum operating performance.

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 4-2-04003-00	4-2-04002-00 4-2-04004-00	Wall Universal	43,200 43,200
D	4-2-04001-00 4-2-04003-00	4-2-04002-00 4-2-04004-00	Universal	56,100
E	4-2-04001-00 4-2-04003-00	4-2-04002-00 4-2-04004-00	Universal	56,200
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 4-2-04303-00	4-2-04302-00 4-2-04304-00	Wall Universal	43,100 43,100
H	4-2-05003-00	—	Universal	50,200
J	4-2-04301-00 4-2-04303-00	4-2-04302-00 4-2-04304-00	Wall Universal	43,200 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

Pull Curves Continued
100% Voltage

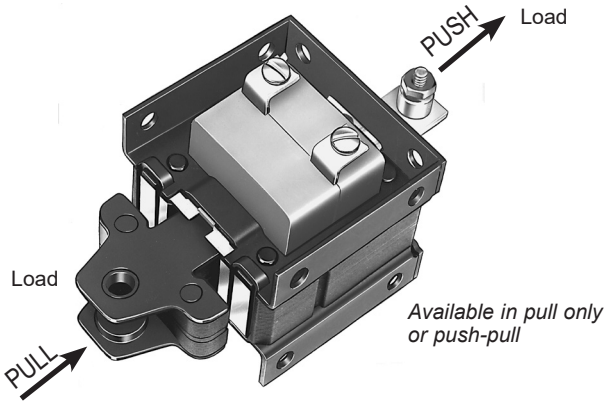


Notes: 1) Pull characteristics recorded with coil "hot" to insure optimum operating performance.

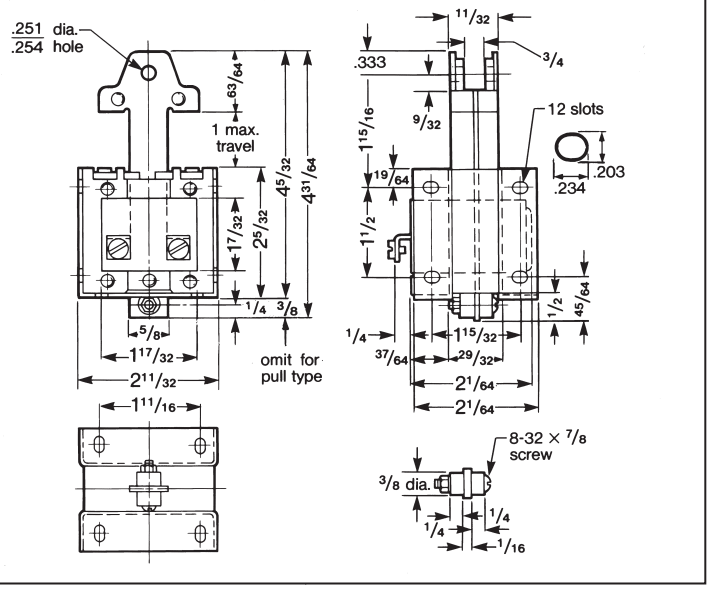
2) Add plunger weight to pull force if plunger is vertical above the solenoid frame. Subtract plunger weight from pull force if plunger is vertical below the solenoid force.

Curve	Solenoid Model Number	Mounting	Coil Series
	Push Only		
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



Dimensional Information for Universal 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	
	3/8	3.6	2.6	240			3/8	5.3	3.8	286			3/8	6.5	4.8	366	
Line "C" on Pull Curve Chart pg 4	1/2	3.4	2.5	276		Line "D" on Pull Curve Chart pg 4	1/2	5.2	3.7	337		Line "E" on Pull Curve Chart pg 4	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	
Pull:	4-2-04003-00
Push-Pull	4-2-04004-00

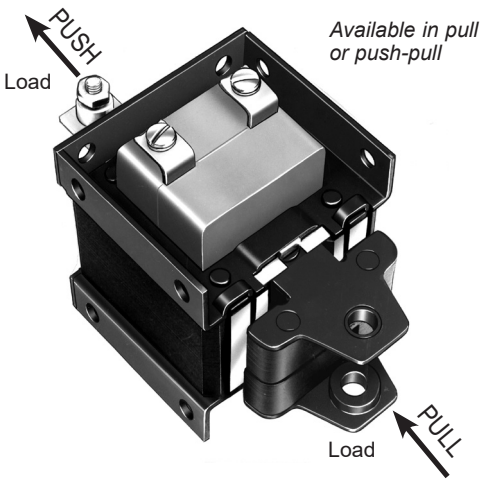
Table B

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

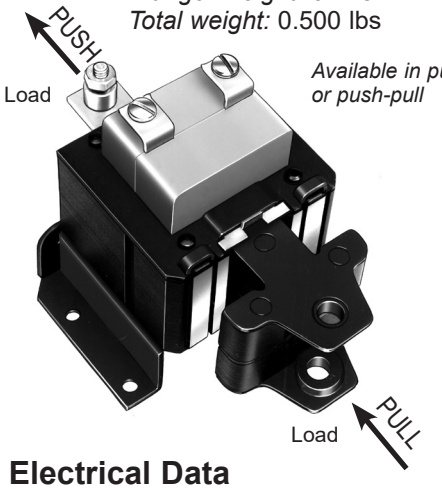
Plunger weight: 0.625 lbs
Total weight: 2.000 lbs



Available in pull only or push-pull

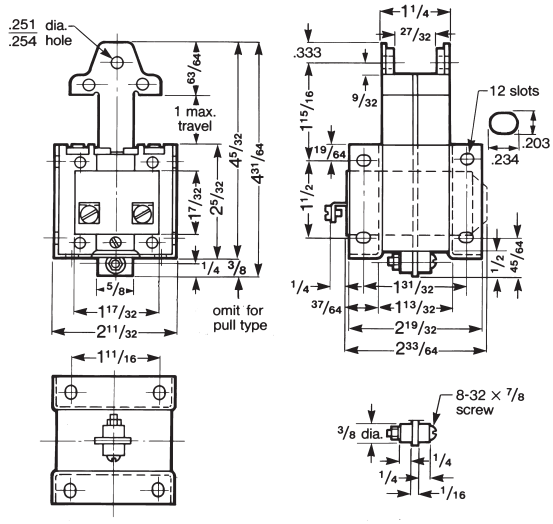
Wall Mount

Plunger weight: 0.125 lbs
Total weight: 0.500 lbs

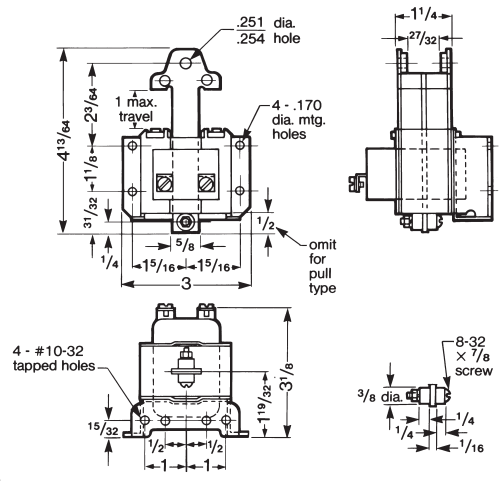


Available in pull only or push-pull

Dimensional Information for Universal Mount



Dimensional Information for Wall Mount



Electrical Data

Coil Series 43,100 Line "G" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding
	1/8	14.1	10.3	300	67
	1/4	11.0	7.9	434	
	3/8	10.3	7.3	539	
	1/2	9.8	6.9	643	
	5/8	8.6	6.3	738	
	3/4	7.1	5.1	775	
	7/8	5.3	4.0	825	
	1	3.6	2.6	870	

Coil Series 40,100 Line "J" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding
	1/8	16.6	12.1	352	78
	1/4	13.8	9.8	495	
	3/8	13.1	9.3	637	
	1/2	13.0	9.0	770	
	5/8	11.3	8.0	895	
	3/4	9.0	6.6	1010	
	7/8	6.8	4.8	1110	
	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.

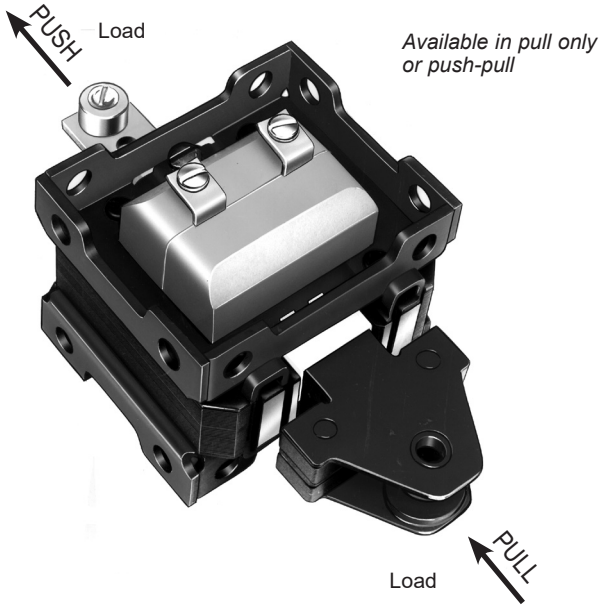
Table A

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

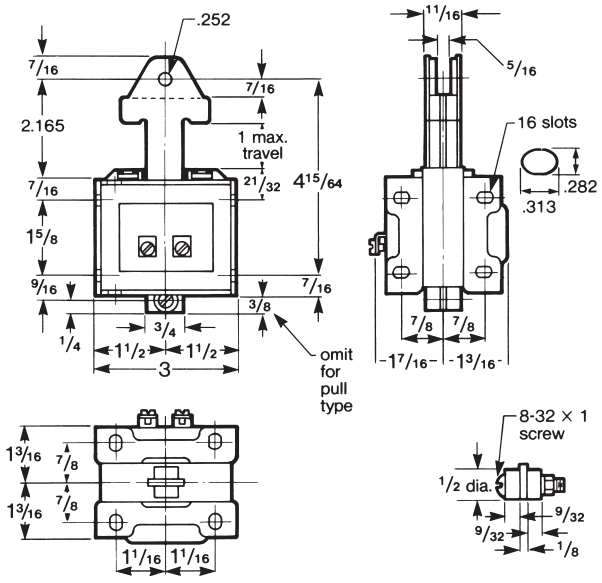
Table B

Coil Series	Coil Stock Number			
	115 V/60 Hz	230 V/60 Hz	460V/60 Hz	575 V/60 Hz
43,100	4-2-43101-00	4-2-43102-00	4-2-43104-00	4-2-43105-00
43,200	4-2-43201-00	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 50,100 Line "F" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85%Voltage	Inrush	Holding
	1/8	10.0	7.4	207	56
	1/4	8.0	5.8	312	
	3/8	7.8	5.8	380	
	1/2	8.1	6.0	462	
	5/8	8.2	6.1	545	
	3/4	7.8	5.9	627	
	7/8	6.9	5.2	710	
	1	5.6	4.3	788	

Coil Series 50,200 Line "H" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85%Voltage	Inrush	Holding
	1/8	13.7	9.8	308	88
	1/4	11.2	8.0	447	
	3/8	11.1	7.9	568	
	1/2	11.4	8.3	694	
	5/8	12.3	8.9	836	
	3/4	12.4	9.0	968	
	7/8	11.9	8.7	1100	
	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)*

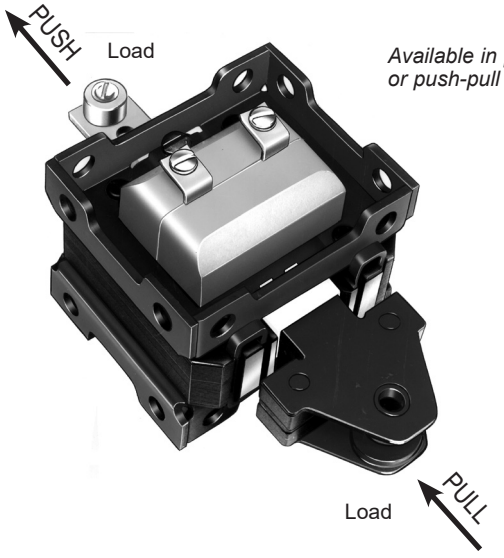
Table B

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

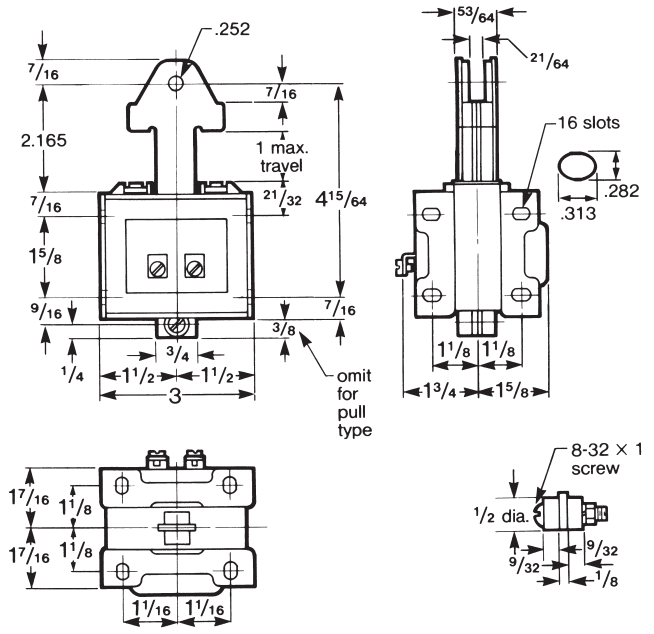
Universal Mount

Plunger weight: 1.0 lb
Total weight: 3.37 lbs



Available in pull only or push-pull

Dimensional Information for Universal Mount



Electrical Data

Coil Series 56,100 Line "K" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding
	1/8	17.3	13.0	330	76
	1/4	14.2	10.3	500	
	3/8	14.0	10.0	643	
	1/2	14.0	10.0	785	
	5/8	14.0	10.0	965	
	3/4	13.0	9.3	1075	
	7/8	11.3	8.0	1245	
	1	8.7	6.4	1365	

Coil Series 56,200 Line "L" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding
	1/8	19.6	14.1	411	94
	1/4	16.4	11.8	605	
	3/8	15.6	11.5	770	
	1/2	16.3	11.8	968	
	5/8	16.6	12.1	1155	
	3/4	16.5	12.0	1342	
	7/8	15.3	11.0	1495	
	1	13.0	10.0	1650	

Coil Series 56,300 Line "M" on Pull Curve Chart pg 4	Stroke	Force in Pounds		Volt-Amperes*	
		100% Voltage	85% Voltage	Inrush	Holding
	1/8	21.8	16.0	465	111
	1/4	18.7	13.2	682	
	3/8	18.6	13.1	903	
	1/2	19.2	13.8	1100	
	5/8	20.1	14.5	1330	
	3/4	20.1	14.5	1560	
	7/8	20.0	14.2	1770	
	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

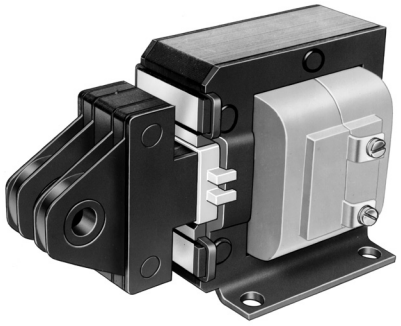
Series 6200

Vertical Mount

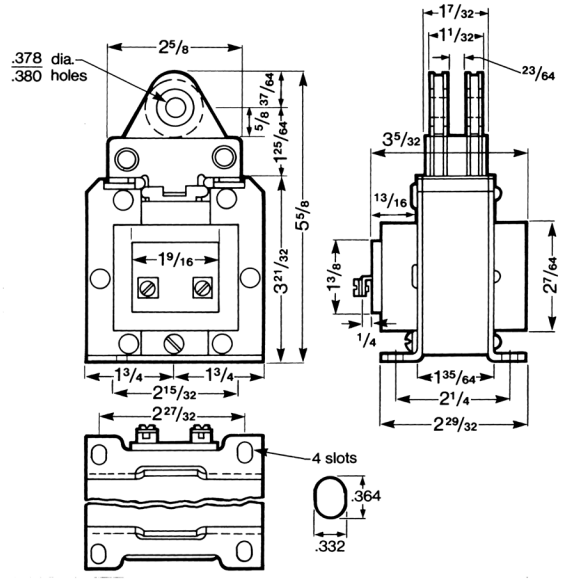
Plunger weight: 1.9 lbs
Total weight: 6.5 lbs

Horizontal Mount

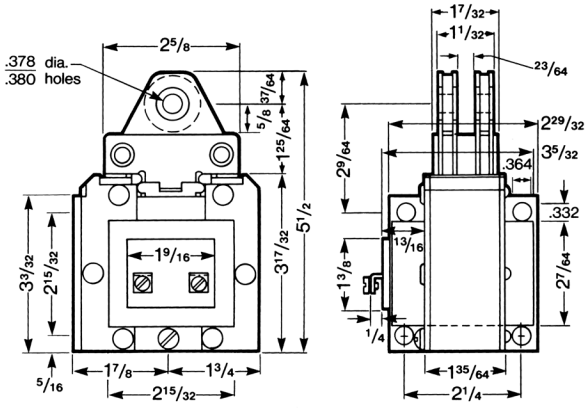
Plunger weight: 1.9 lbs
Total weight: 6.5 lbs



Dimensional Information for Vertical Mount



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 pg 5 for Pull Curve Chart	1/8	22.5	17.0	445	122	Coil Series 62,200 See pg 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

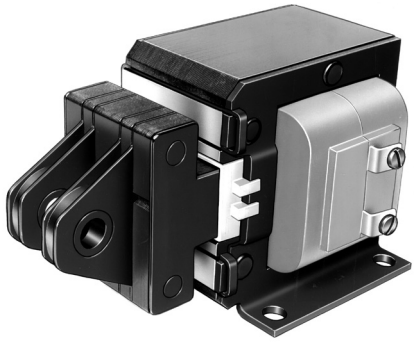
Series 6400

Vertical Mount

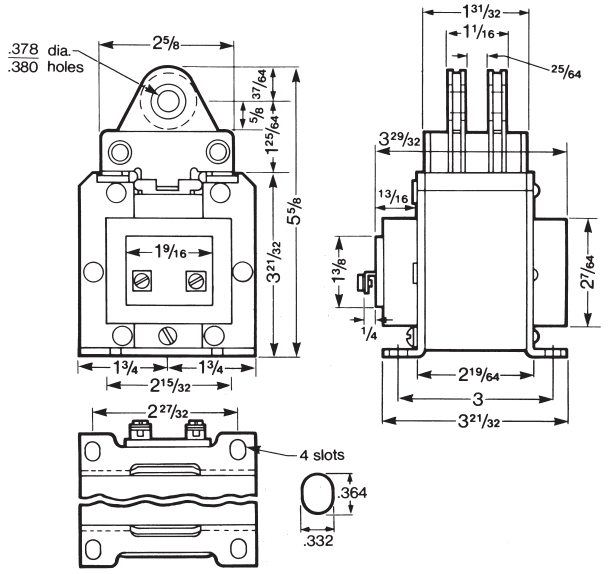
Plunger weight: 2.9 lbs
Total weight: 7.8 lbs

Horizontal Mount

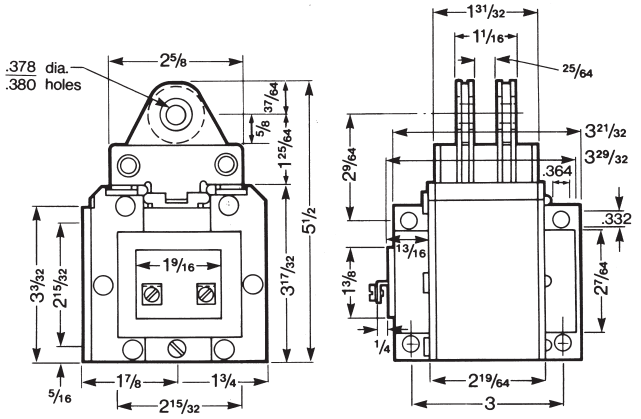
Plunger weight: 2.9 lbs
Total weight: 7.8 lbs



Dimensional Information for Vertical Mount



Dimensional Information for Horizontal 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
64,100 See pg 5 for Pull Curve Chart	1/8	37.4	27.5	875	200	64,200 See pg 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