

SOLENOIDI

Si tratta di particolari attuatori elettromagnetici a “corsa corta” che trovano impiego in un’ampia gamma d’applicazioni: macchine per ufficio, dispositivi di sicurezza per elevatori, macchine distributrici, ecc..

Particolarmente insensibili ai disturbi, questi solenoidi offrono un’elevata compattezza e grande versatilità.

Sono disponibili numerose esecuzioni standard. Solenoidi speciali, realizzabili per quantità, possono essere progettati “ex novo” o derivati dai modelli standard con semplici modifiche.

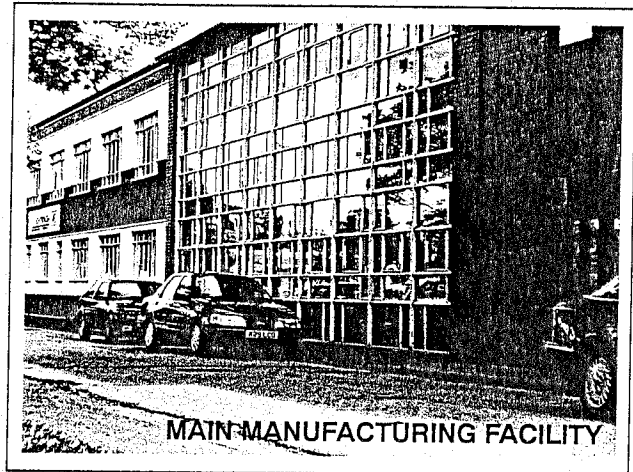


Caratteristiche:

- Forze di spinta fino a 190 N
- Alimentazione CA o CC
- Isolamento classe E.

Company Profile

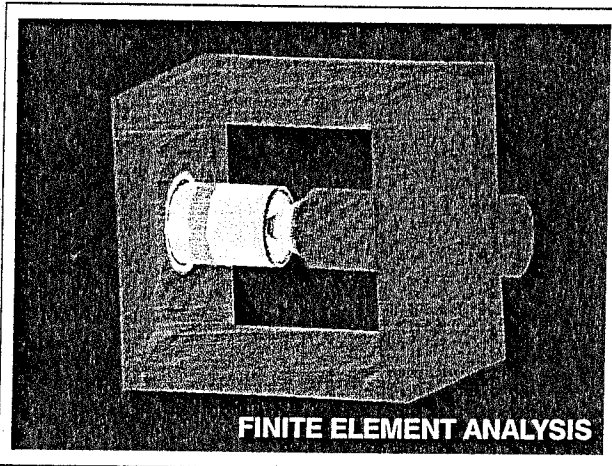
The personnel of MECHETRONICS have been manufacturing solenoids in Bishop Auckland for many years and during this time our reputation has been built on quality, reliability and service. This has created rapid growth making MECHETRONICS one of the industries major manufacturers. Innovation in design and investment in production methods have ensured we remain at the front of technological change, meeting customer demands.



BS EN ISO 9002 : 1994
FM29273



Quality and
MECHETRONICS



Innovation and MECHETRONICS

MECHETRONICS commitment to OEM customer service is one of the most progressive development facilities in the country.

Utilising leading edge technology, in the form of "3d Finite Element Analysis", MECHETRONICS can model and simulate design concepts without the need to "shape metal" to confirm results. This "state of the art" facility makes the process of envisaging and manufacturing product ideas a more expeditious, efficient and rewarding team effort.

Converging technologies and complex system designs demand a new approach to market needs. Quality will be the ultimate arbiter of those needs, and quality is the ultimate reason for MECHETRONICS continued investment in research and product development.

In the past, quality has primarily been associated with defect free manufacturing, but at MECHETRONICS, our definition of quality has evolved into something more comprehensive than that. We equate quality with an individual commitment to doing the job right first time.

As a firm of assessed capability, by the British Standards Institute, solenoids manufactured, in our Bishop Auckland plant in County Durham are made under the stringent quality requirements of BS EN ISO9002 : 1994. Our manufacturing techniques are monitored using Statistical Process Control, this enables potential problems to be identified at the earliest possible moment, allowing any corrective action to be taken immediately, ensuring the highest possible efficiency coupled with minimum defects.

Our emphasis is one of raising quality consciousness company wide, our objectives are to think continuously of meeting our customers unique needs while sharing information that will assist in that process.

Product Profile

The products detailed in the following pages indicate a variety of standard models and sizes developed for general market needs. MECHETRONICS, however, specialise in the design and development of *custom* and *customised solenoids* to fit your specific application so optimising product performance at lower cost. This can mean a simple variation to standard or a full blown custom product at the frontiers of solenoid technology.

AC Solenoids

MECHETRONICS miniature solenoids, U frame and D frame, are available in AC and DC designs. AC solenoids, beyond miniature sizes, require laminated frames.

Our laminated solenoid designs fall into two categories. Industrial "A" range along with Series 600/700 for long life applications, and "TT" solenoids for standard life expectancy and generally designed for applications, where high performance versus low price is critical.

Advantages of AC Solenoids :

- Higher performance/force for size.
- Can be faster in operation.
- Low cost for high force applications.
- Low cost power source.

Disadvantages of AC Solenoids which are eliminated utilising DC Solenoids :

- High inrush currents.
- Noisy if plunger does not fully seat. (Frequency)
- Overheats if plunger does not fully seat.
- Fixed force stroke characteristics.
- Mechanical noise. (Impact)

Application Considerations

AC Solenoids

- Ensure plunger always seats.
- Impact noise generated by seating.
- Supply circuit tailored to accommodate inrush current.
- Response time depends on switching point of AC cycle.
- Limit maximum stroke, ensuring plunger stays in housing.
- When operated at over 120 operations per hour shorten stroke or de-rate the coil.
- Plunger side load will reduce unit life.
- In vertical applications, add (or subtract) plunger weight.

DC Solenoids

MECHETRONICS DC solenoids are available from small units less than 11 mm diameter up to high performance units 115 mm in diameter.

Designs are available including built in AC rectification so as to gain the advantage of DC performance when AC supply is the only available or the more economic to use.

Advantages of DC Solenoids :

- No inrush current.
- Plunger need not seat.
- No frequency noise.
- Can be noise impact dampened.
- Easy to modify performance characteristics.

This catalogue lists a variety of standard models and sizes developed for general market needs.

It is, however, our speciality to design and develop custom solenoids to fit your specific application. This makes it possible to optimise the highest performance against lowest cost.

These custom solenoids, depending on the required quantity, can mean a completely new design, incorporating the latest technology or simple variations to the models shown in this catalogue. Examples are: mounting dimensions, plating etc.

Application Considerations

DC Solenoids

- Plunger need not fully seat.
- Response time is more consistent than AC.
- Limit maximum stroke ensuring plunger stays in housing.
- Plunger side load will reduce unit life.
- In vertical applications, add (or subtract) the plunger weight.

Customised Modifications (for AC or DC)

- Mounting holes.
- Plunger end shape. (DC versions only)
- Thrust rod.
- Terminations, e.g. stripped ends, connectors etc.
- Finish, e.g. plating, blakodizing etc.

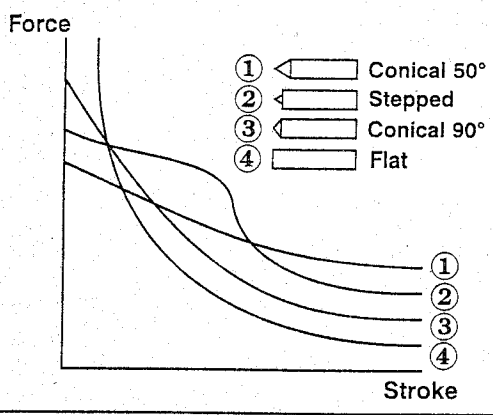
Design
AC Solenoids Design

All MECHETRONICS AC solenoids are fitted with copper shading rings to reduce frequency noise and all have flat face seating.

DC Solenoids Design

The force stroke characteristics of DC solenoids can vary depending on the configuration of the plunger and stop. Therefore within a given frame size, force/stroke characteristics can be varied according to applications and volumes required.

The following are examples of how plunger and stop angles affect performance.

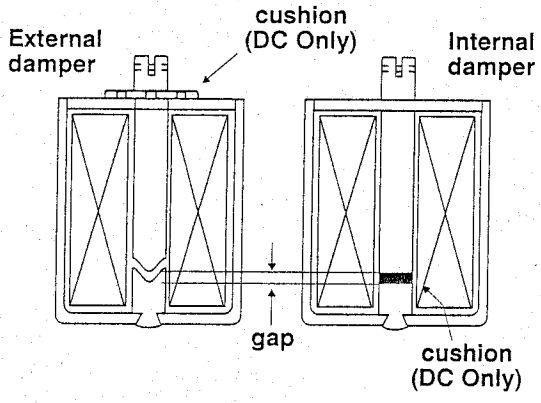


Solenoid Description

To reduce impact noise, a non metallic washer can be fitted internally or externally.

With this cushioning however, a gap between plunger and end stop exists which, depending on the distance of the gap, will proportionally reduce the solenoid force at zero stroke or "holding force".

Note - Only DC solenoids can be provided with this low noise feature since AC solenoids must have full metal to metal seating to ensure no overheating and a quiet "hold on" situation.



Operating Characteristics

The force achievable by a solenoid is largely affected by the amount of electrical energy applied to the coil. This amount of energy is limited by :

- 1 Maximum coil temperature.

Standard MECHETRONICS solenoids utilise Class E (120°C) insulation materials. Higher class insulation is available on request, e.g.

Class F (155°C), Class H (180°C)

Operation duty cycle.

The ratings of standard MECHETRONICS solenoids are based on a total cycle time of 30 seconds and the following formula for the relative duty factor (ED).

Table indicating relationship between cycling, duty cycle and on and off time in accordance with VDE 0580.

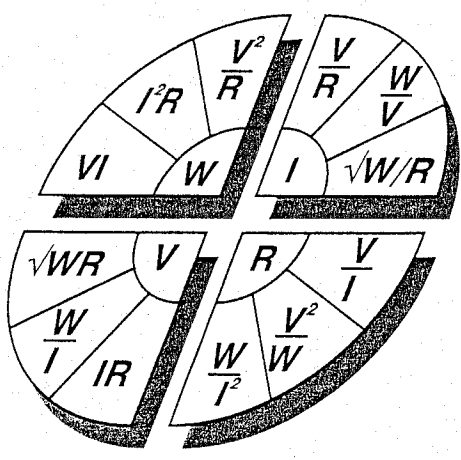
No. Ops/ Hour	On + Off (sec)	25% ED		5% ED	
		On	Off	On	Off
120	30	7.5	22.5	1.5	28.5
300	12	3.0	9.0	0.6	11.4
600	6	1.5	4.5	0.3	5.7
1000	3.6	0.9	2.7	0.18	3.42
1200	3	0.75	2.25	0.15	2.85
1500	2.4	0.6	1.8	0.12	2.28
3000	1.2	0.3	0.9	0.06	1.14

Published data is based on :

- Ambient temperature 35°C.
- Temperature rise 80°C and 90 % of rated

In this catalogue we specify solenoid coil power in Watts at 20°C

For DC versions only, the pie chart shown may help you to calculate the current and resistance.



$$\%ED = \frac{ON\ TIME}{(ON + OFF\ TIME)} * 100$$

DC Quick Selection Chart

Solenoid Type	Size			Factor ED (100%)					Factor ED (25%)					Factor ED (5%)					Page Number
	Width	Height	Length	[mm]					[mm]					[mm]					
	[mm]	[mm]	[mm]	0	2	4	6	10	0	2	4	6	10	0	2	4	6	10	
			Force [N]					Force [N]					Force [N]						
SD181	Ø12	13	26	2.4	0.3	0.2	0.1		2.6	1.1	0.7	0.8		3.3	2.4	2.0	3.3		6
SD214	20	16	26	2.8	0.8	0.5	0.4		5.0	2.3	1.5	1.7	0.5	9.0	7.1	5.4	6.7	2.5	6
SD183	21	19	29	2.3	0.7	0.6	0.6	0.2	9.3	2.6	2.4	3.5	0.8	12.0	7.2	7.0	6.1	3.6	7
SD218	26	20	36	12.1	3.5	1.4	0.8	0.5	18.5	10.0	6.1	3.5	2.1	23.3	16.5	12.5	9.6	6.7	7
SD133(D3)	26	21	39	2.4	1.6	1.1	1.1	0.5	7.2	5.7	4.4	5.0	1.8	16.4	13.1	11.2	13.5	8.1	8
SD216	29	24	40	16.3	3.8	2.0	0.7	0.2	20.9	9.8	7.2	3.6	1.5	26.6	19.1	16.3	13.4	6.9	8
SD206	30	25	44	14.7	2.1	1.1	1.2	0.9	20.6	7.6	5.2	8.0	4.0	31.6	21.3	17.3	27.0	13.7	9
SD166	32	25	38	20.0	3.7	1.8	1.9	1.1	35.0	15.0	10.7	5.7	3.9	46.0	33.0	30.0	17.0	13.8	9
SD134(D4)	30	25	41	4.9	2.6	2.1	2.3	0.7	12.0	8.3	6.8	10.3	4.4	24.0	20.3	18.4	21.9	15.7	10
SD212	30	27	53	16.8	8.1	4.1	3.7	2.4	21.9	16.7	13.1	10.5	9.0	30.4	26.1	23.4	22.3	22.3	10
SD173	32	25	54	27.5	14.0	6.5	2.8	2.3	30.6	20.0	13.0	9.5	7.6	33.5	29.0	25.0	27.5	24.0	11
SD135(D5)	38	32	44	8.3	4.5	3.2	0.7	0.2	20.3	12.9	10.7	3.6	1.5	42.5	33.4	30.0	13.4	6.9	12
SD182	46	32	30	14.7	2.1	1.1	4.0	1.5	20.6	7.6	5.2	13.2	7.2	31.7	21.3	17.3	27.7	19.3	12
SD215	38	30	63	24.9	9.5	6.3	3.8	3.0	37.7	23.5	18.8	15.5	12.0	50.8	36.7	32.8	45.0	39.5	12
SD137(D6)	48	41	43	11.8	6.7	4.5	6.3	2.4	29.5	21.3	17.3	34.3	17.1	69.0	56.0	49.3	75.8	50.8	13
SD158(D7)	48	41	64	50.0	20.5	10.9			82.4	61.3	51.0			105.0	98.0	90.7			13

Solenoid Type	Size			Factor ED (100%)					Factor ED (25%)					Page Number		
	Width	Height	Length	[mm]					[mm]							
	Ø	Ø	[mm]	0	10	20	30	40	50	0	10	20	30		40	50
			Force [N]					Force [N]								
M60	60.3	60.3	129.0	30	18	14	6	11		60	43	41	30	16	9	14
M75	76.2	76.2	159.0	70	43	40	26			120	93	92	85	54	39	14
M75S	76.2	76.2	86.0	259	23	7	2	43	24	471	84	42	15	5		
M90	89.0	89.0	192.0	110	72	68	60	100	80	230	195	168	164	150	105	15
M115	114.0	114.0	243.0	150	125	110	102			400	300	285	280	275	260	15

Available Options

	Pull Type	Thrust Type	Terminals On Coil	Alternative Plating	Flying Leads	Anti-impact Disc (noise)	Position of Fixing Holes	Customised End Stop	Threaded End Stop	Anti-residual Plunger End	Encapsulated Disc	Return Spring
SD181	●	●			●	●	●	●	●	●	●	●
SD214	●	●	●	●	●	●	●	●	●	●	●	●
SD183	●	●	●	●	●	●	●	●	●	●	●	●
SD218	●		●	●	●	●	●	●	●	●	●	●
SD133(D3)	●	●	●	●	●	●	●	●	●	●	●	●
SD216	●	●	●	●	●	●	●	●	●	●	●	●
SD206	●		●	●	●	●	●	●	●	●	●	●
SD166	●	●	●	●	●	●	●	●	●	●	●	●
SD134(D4)	●	●	●	●	●	●	●	●	●	●	●	●
SD212	●		●	●	●	●	●	●	●	●	●	●
SD173	●	●	●	●	●	●	●	●	●	●	●	●
SD135(D5)	●	●	●	●	●	●	●	●	●	●	●	●
SD182	●	●	●	●	●	●	●	●	●	●	●	●
SD215	●		●	●	●	●	●	●	●	●	●	●
SD137(D6)	●	●	●	●	●	●	●	●	●	●	●	●
SD158(D7)	●	●	●	●	●	●	●	●	●	●	●	●
M60	●	●			●	●				●		●
M75	●	●			●					●		
M75S	●									●		
M90	●	●								●		●
M115	●									●		

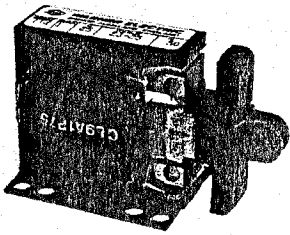
AC Quick Selection Chart

Solenoid Type	Size			Factor ED (100%)					Factor ED (25%)					Factor ED (5%)					Page Number										
	Width	Height	Length	[mm]					[mm]					[mm]															
				0	2	4	6	10	0	2	4	6	10	0	2	4	6	10											
	[mm]			Force [N]					Force [N]					Force [N]															
SD214	20	16	26	12.2	2.7	1.4	0.9	0.3	18.2	4.6	2.3	1.6	0.5	25.1	8.4	5.2	3.6	1.4	17										
SD183	21	19	29	12.7	1.8	0.9	0.6	0.3	18.6	3.0	1.7	1.2	0.5	36.3	7.4	6.1	4.1	2.8	17										
SD218	26	20	36	16.6	4.4	2.3	1.7	1.3	24.0	8.8	6.1	4.8	3.4	28.9	12.7	9.5	7.6	6.4	18										
SD133(D3)	26	21	39	6.0	3.5	2.1	1.7	1.1	10.0	7.5	5.5	4.0	2.6	15.0	14.3	12.8	10.5	8.0	18										
SD216	29	24	40	15.6	4.9	3.2	2.5	2.1	28.8	11.4	7.6	6.3	5.3	50.3	24.9	17.6	14.7	12.2	19										
SD166	32	25	38	17.6	4.8	3.3	2.5	1.3	39.1	22.0	12.9	8.8	4.8	52.3	29.3	16.6	12.3	7.8	19										
SD134(D4)	30	25	41	7.2	4.7	3.3	2.6	2.0	13.2	10.1	8.0	6.7	5.5	19.5	18.7	18.0	17.0	15.2	20										
SD212	30	27	53	14.7	4.0	2.3	1.9	1.8	36.7	18.1	8.9	7.1	6.2	51.4	28.4	18.2	14.8	12.5	20										
SD173	32	25	54	14.6	5.8	3.2	2.6	2.4	38.6	19.0	11.7	8.8	7.3	68.5	38.6	23.9	19.0	15.6	21										
SD135(D5)	38	32	44	10.0	7.5	6.0	4.8	4.0	20.0	17.5	15.0	13.7	12.5	30.0	29.0	28.0	25.7	24.0	21										
SD137(D6)	48	41	43	16.0	13.0	10.5	9.5	8.0	40.0	34.0	29.0	27.0	25.0	70.0	66.0	63.0	60.0	55.0	22										
A141	20	55	50	70.0	25.0	21.0	20.0	20.0	RING FOR DETAILS (0388) 604000 INT + 44-388-604000										23										
A142	25	55	50	83.0	35.0	30.0	29.0	25.0											23										
A143	32	55	50	95.0	40.0	35.0	31.0	29.0											23										
TT2	30	37	41	18.0	10.0	4.0	2.5												24										
TT4	46	53	64	35.0	24.0	16.0	13.0	8.0											24										
TT6	52	53	64	44.0	35.0	22.0	16.0	12.0											25										
TT10	61	75	73	65.0	65.0	60.0	57.0	57.0											25										
600	79	94	97	85.0	50.0	43.0	43.0	43.0											120.0	75.0	63.0	62.0	61.0	145.0	100.0	90.0	90.0	89.0	26
700	119	133	133	270.0	150.0	105.0	90.0	90.0											360.0	225.0	170.0	62.0	140.0	440.0	280.0	210.0	210.0	190.0	26

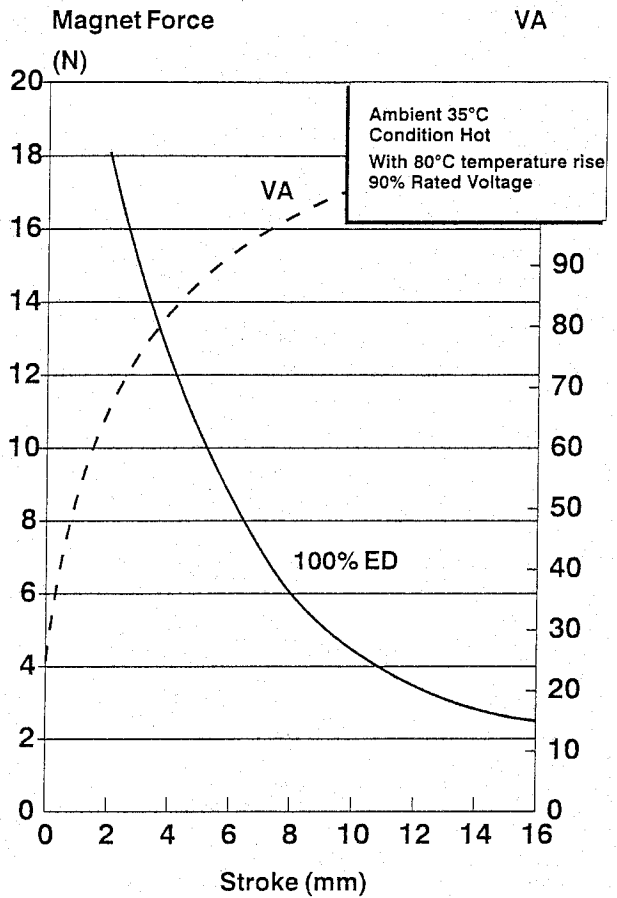
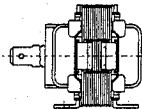
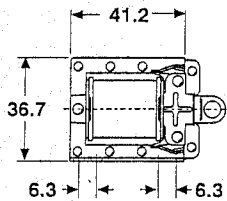
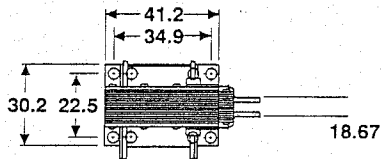
Available Options

	Pull Type	Thrust Type	Terminal On Coil	Alternative Plating	Flying Leads	Anti-impact Disc (noise)	Position of Fixing Holes	Threaded End Stop	Customised Plunger End	Anti-residual Disc	Encapsulated Coil	Return Spring
SD214	●			●	●	●		●		●		●
SD183	●				●	●		●		●		●
SD218	●	●		●	●	●		●	●	●		●
SD133(D3)	●			●	●	●		●		●		●
SD216	●			●	●	●		●	●	●		●
SD166	●	●		●	●	●		●	●	●		●
SD134(D4)	●			●	●	●		●		●		●
SD212	●				●			●		●		●
SD173	●	●		●		●		●	●	●		●
SD135(D5)	●	●		●	●	●		●		●		●
SD137(D6)	●			●	●	●		●		●		●
A141	●			●		●						
A142	●			●								
A143	●			●								
TT2	●			●	●	●						
TT4	●			●	●	●						
TT6	●			●	●	●						
TT10	●	●		●		●						
600	●	●		●								
700	●											

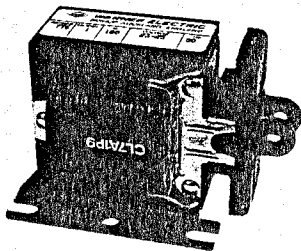
TT 2



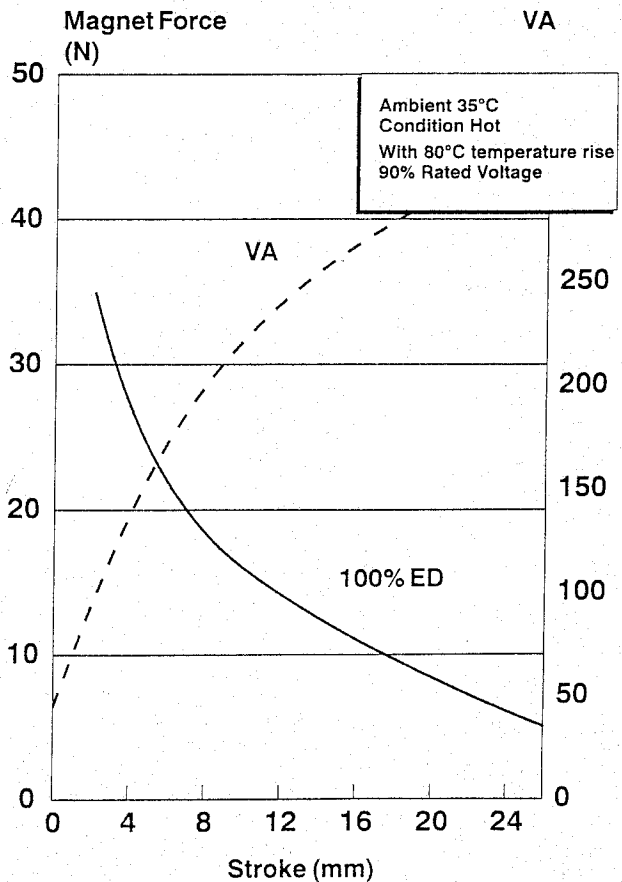
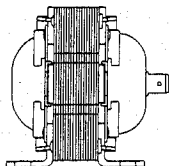
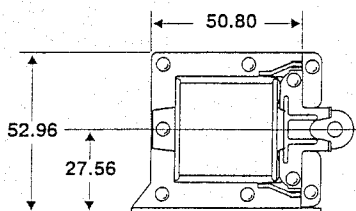
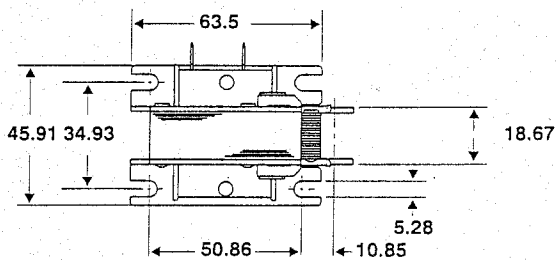
Plunger (kg) 0.003
 Solenoid (kg) 0.019
 Fixing dimensions and plating specifications to customer requirements.
 Voltage and duty cycle to suit your application.



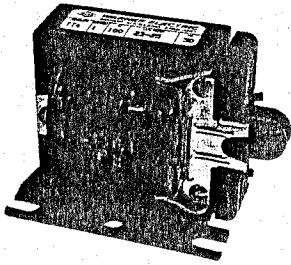
TT 4



Plunger (kg) 0.005
 Solenoid (kg) 0.042
 Fixing dimensions and plating specifications to customer requirements.
 Voltage and duty cycle to suit your application.

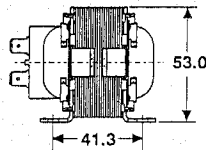
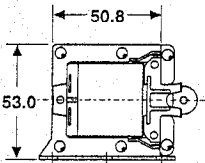
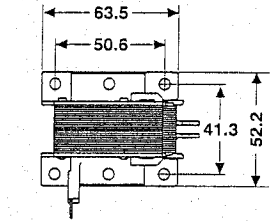


TT 6



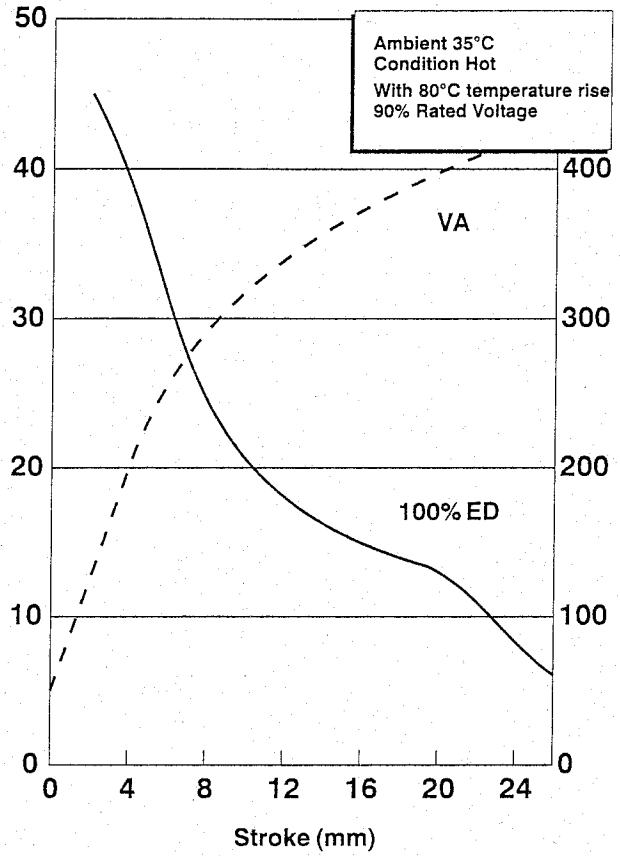
Plunger (kg) 0.173
 Solenoid (kg) 0.570
 Fixing dimensions and plating specifications to customer requirements.

Voltage and duty cycle to suit your application.

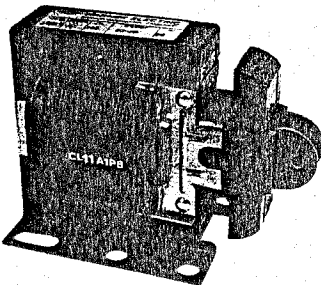


Magnet Force (N)

VA

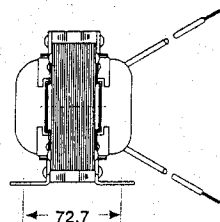
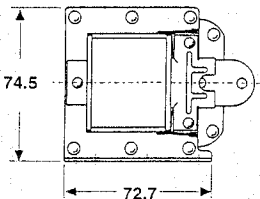
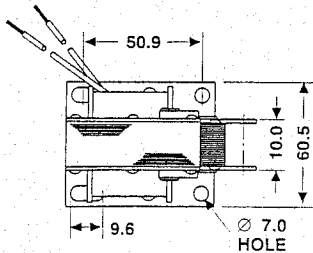


TT 10



Plunger (kg) 0.367
 Solenoid (kg) 1.140
 Fixing dimensions and plating specifications to customer requirements.

Voltage and duty cycle to suit your application.



Magnet Force (N)

VA

