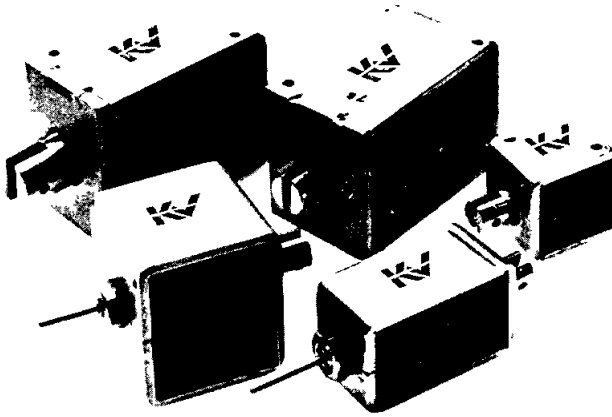


# Solenoids

## type SM

CSA Certified Report LR 15089

103-743/4 AND 103-746



- Class E (120 C) insulation for high temperature working
- Non-jam plunger design
- Coils easily interchangeable
- Suitable for most environments

These are robustly made strip-frame solenoids, with tapped holes on two faces for universal mounting. Types SM1 to SM4 are available in both ac and dc form, type SM5 is dc only. They are available for pull or thrust operation and the design permits considerable application flexibility. All versions will operate up to 200 cycles per minute dependent on conditions of use.

Each type can be easily dismantled, and a variety of coil connections and impregnations are available to suit most environmental conditions. Each plunger moves within a non-magnetic metal tube to avoid the possibility of jamming should the coil overheat and distort, for example due to a circuit fault.

### Standard Coil Voltages

48/50, 110, 230/240V ac Continuous Rating

12, 24, 50, 110V dc Continuous Rating

Greatly increased pull/thrust can be obtained at intermittent ratings.

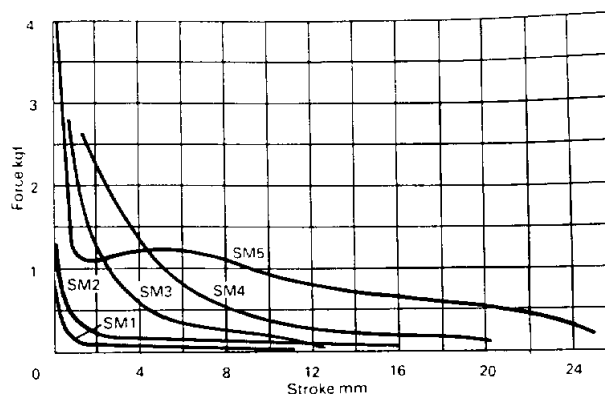
Coils for operation at non-standard voltages are available to special order.

### Weight in grams

| Type | Total | Plunger |
|------|-------|---------|
| SM1  | 135   | 21 3    |
| SM2  | 193   | 28 4    |
| SM3  | 397   | 35 4    |
| SM4  | 610   | 49 5    |
| SM5  | 815   | 120 1   |

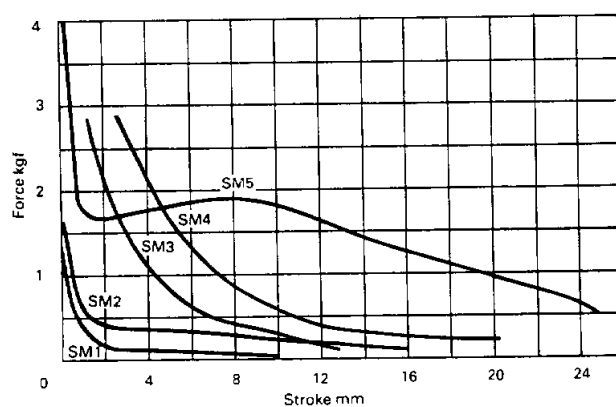
### DC Continuous Rating

| Type | Max Stroke<br>mm | Pull at Max<br>Stroke gf | Approx<br>Watts | Max<br>Volts |
|------|------------------|--------------------------|-----------------|--------------|
| SM1  | 9.5              | 42                       | 4.4             | 100          |
| SM2  | 16.0             | 28                       | 6.0             | 200          |
| SM3  | 14.3             | 28                       | 8.5             | 250          |
| SM4  | 22.0             | 85                       | 10.2            | 250          |
| SM5  | 25.0             | 198                      | 12.8            | 250          |



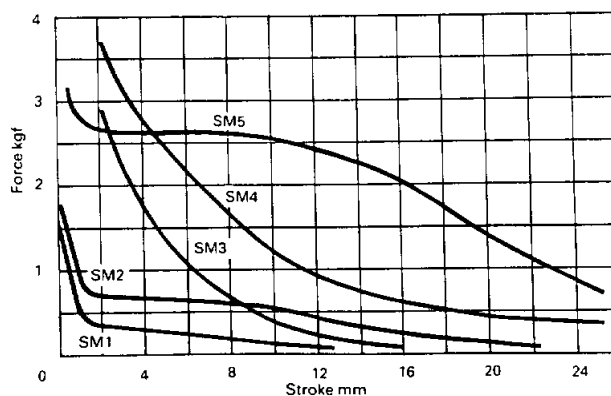
### DC 50% Rating

|     |      |     |      |     |
|-----|------|-----|------|-----|
| SM1 | 9.5  | 99  | 8.8  | 100 |
| SM2 | 16.0 | 127 | 12.0 | 250 |
| SM3 | 14.3 | 142 | 17.0 | 250 |
| SM4 | 22.0 | 226 | 20.4 | 250 |
| SM5 | 25.0 | 538 | 25.6 | 250 |



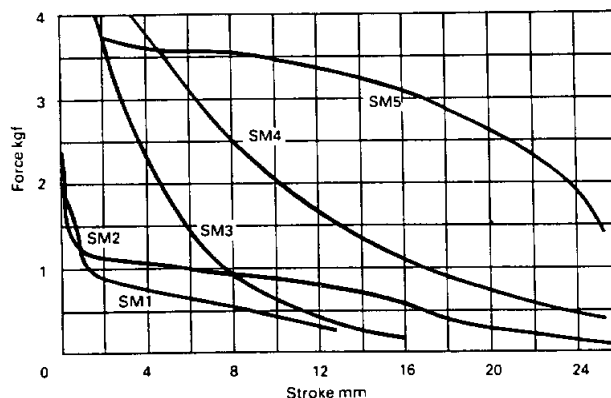
### DC 25% Rating

|     |    |     |    |     |
|-----|----|-----|----|-----|
| SM1 | 12 | 100 | 18 | 250 |
| SM2 | 22 | 100 | 24 | 250 |
| SM3 | 16 | 100 | 34 | 250 |
| SM4 | 25 | 300 | 41 | 250 |
| SM5 | 25 | 700 | 52 | 250 |



### DC 10% Rating

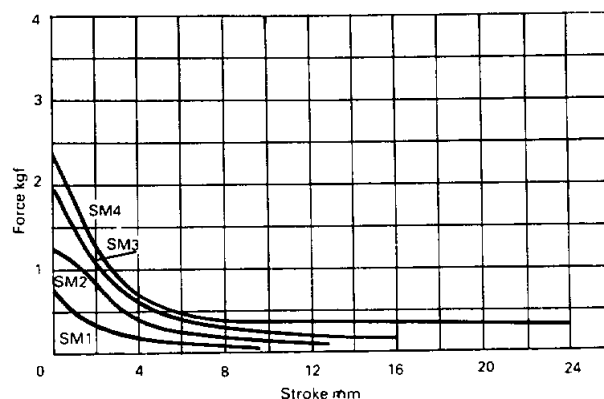
|     |    |      |     |     |
|-----|----|------|-----|-----|
| SM1 | 12 | 300  | 44  | 250 |
| SM2 | 24 | 125  | 60  | 250 |
| SM3 | 16 | 200  | 85  | 440 |
| SM4 | 25 | 400  | 102 | 440 |
| SM5 | 25 | 1500 | 128 | 440 |



Performance figures are for operation at working temperature and for horizontal movement

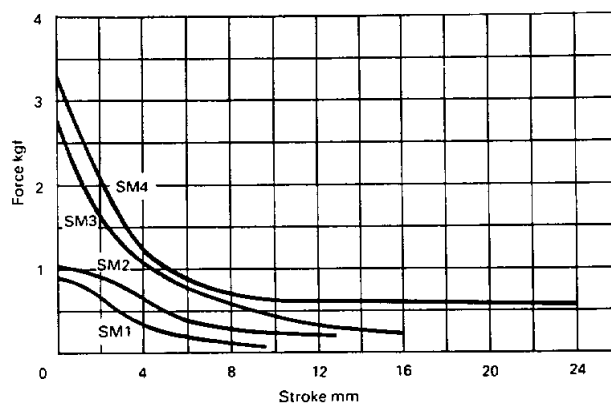
### AC Continuous Rating at 50Hz

| Type | Max Stroke mm | Pull at Max Stroke gf | Approx VA Inrush at Max Stroke | Approx VA Closed | Max Volts |
|------|---------------|-----------------------|--------------------------------|------------------|-----------|
| SM1  | 9.5           | 28                    | 17                             | 6.0              | 250       |
| SM2  | 16.0          | 56                    | 33                             | 10.0             | 250       |
| SM3  | 14.3          | 255                   | 50                             | 12.0             | 250       |
| SM4  | 25.0          | 311                   | 95                             | 18.5             | 440       |



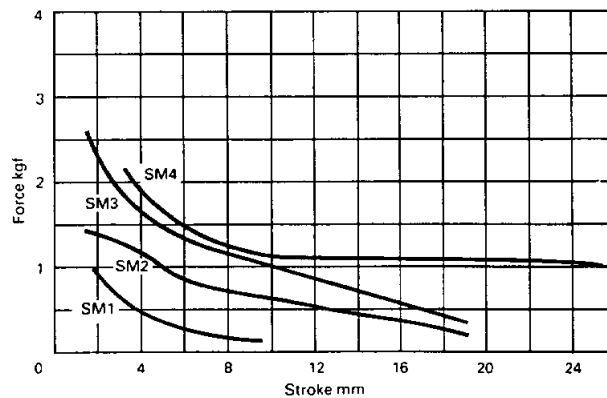
### AC 50% Rating at 50Hz

|     |      |     |     |      |     |
|-----|------|-----|-----|------|-----|
| SM1 | 9.5  | 56  | 30  | 12.0 | 250 |
| SM2 | 16.0 | 113 | 44  | 17.5 | 250 |
| SM3 | 14.3 | 397 | 84  | 24.0 | 440 |
| SM4 | 25.0 | 538 | 168 | 35.0 | 440 |



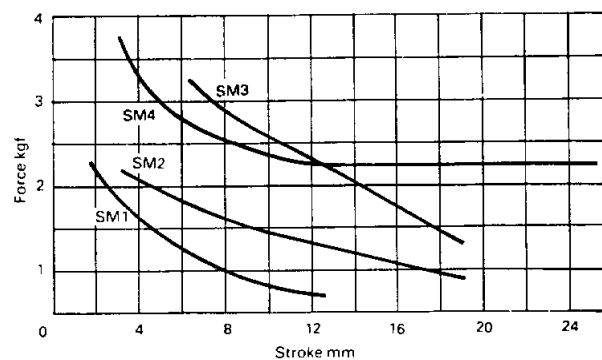
### AC 25% Rating at 50Hz

|     |    |      |     |    |     |
|-----|----|------|-----|----|-----|
| SM1 | 12 | 100  | 58  | 21 | 250 |
| SM2 | 19 | 250  | 75  | 30 | 250 |
| SM3 | 19 | 350  | 148 | 41 | 440 |
| SM4 | 25 | 1000 | 280 | 60 | 440 |



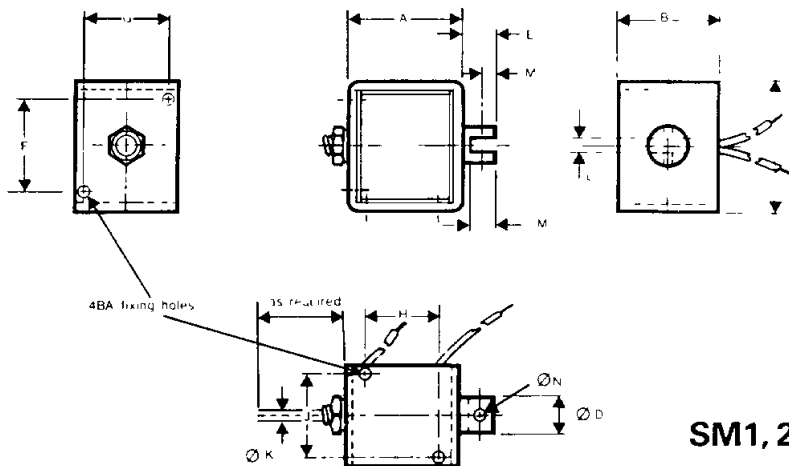
### AC 10% Rating at 50Hz

|     |    |      |     |     |     |
|-----|----|------|-----|-----|-----|
| SM1 | 13 | 150  | 140 | 52  | 250 |
| SM2 | 19 | 400  | 160 | 60  | 250 |
| SM3 | 19 | 800  | 300 | 115 | 440 |
| SM4 | 25 | 1750 | 600 | 200 | 440 |



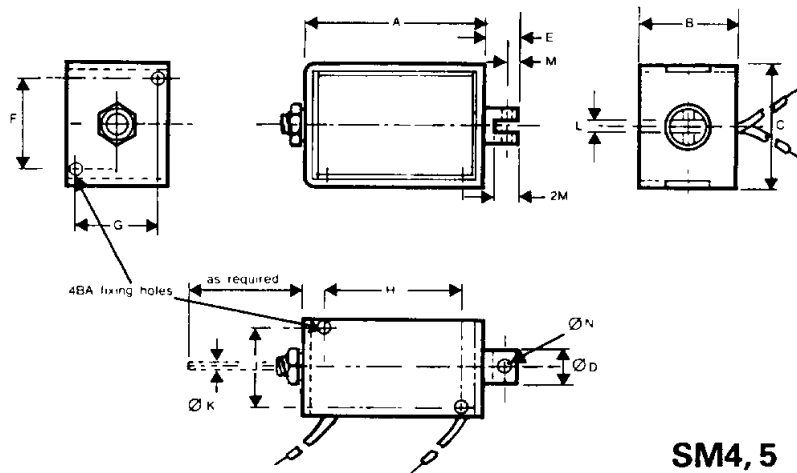
Performance figures are for operation at working temperature and for horizontal movement

All dimensions mm (inch)



SM1, 2, 3

| Type | A              | B              | C              | D              | E              | F              | G              | H              | J              | K             | L             | M             | N             |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|
| SM1  | 33.3<br>(1.31) | 25.4<br>(1.00) | 31.8<br>(1.25) | 11.1<br>(0.44) | 12.7<br>(0.50) | 18.3<br>(0.72) | 17.5<br>(0.69) | 19.1<br>(0.75) | 17.5<br>(0.69) | 2.4<br>(0.09) | 3.6<br>(0.14) | 4.8<br>(0.19) | 2.4<br>(0.09) |
| SM2  | 52.4<br>(2.06) | 25.4<br>(1.00) | 31.8<br>(1.25) | 11.1<br>(0.44) | 12.7<br>(0.50) | 18.3<br>(0.72) | 17.5<br>(0.69) | 38.1<br>(1.50) | 17.5<br>(0.69) | 2.4<br>(0.09) | 3.6<br>(0.14) | 4.8<br>(0.19) | 2.4<br>(0.09) |
| SM3  | 42.9<br>(1.69) | 39.7<br>(1.56) | 49.2<br>(1.94) | 12.7<br>(0.50) | 12.7<br>(0.50) | 34.9<br>(1.38) | 31.8<br>(1.25) | 28.6<br>(1.13) | 31.8<br>(1.25) | 3.2<br>(0.13) | 3.6<br>(0.14) | 4.8<br>(0.19) | 2.4<br>(0.09) |
| SM4  | 68.3<br>(2.69) | 39.7<br>(1.56) | 49.2<br>(1.94) | 12.7<br>(0.50) | 12.7<br>(0.50) | 34.9<br>(1.38) | 31.8<br>(1.25) | 54.0<br>(2.13) | 31.8<br>(1.25) | 3.2<br>(0.13) | 3.6<br>(0.14) | 4.8<br>(0.19) | 2.4<br>(0.09) |
| SM5  | 66.7<br>(2.63) | 39.7<br>(1.56) | 54.0<br>(2.13) | 17.5<br>(0.69) | 20.6<br>(0.81) | 34.9<br>(1.38) | 31.8<br>(1.25) | 47.6<br>(1.88) | 31.8<br>(1.25) | 3.2<br>(0.13) | 4.8<br>(0.19) | 6.4<br>(0.25) | 3.2<br>(0.13) |



SM4, 5

When ordering, please specify the following  
**Type e.g SM3**  
**Pull or Thrust**  
**Special coil treatment**  
**Voltage, dc/ac, frequency**  
**Rating, e.g continuous**  
**Projection required, (thrust type) i.e from frame to end of thrust rod, with plunger closed**

When ordering spare coils state voltage, frequency (if applicable) and rating required

#### Technical Advice

Because the choice of solenoid for a particular application can be a complex process, the Keyswitch Varley Technical Advisory Service is always available to help in providing the most economical solution to your problem. The service is entirely free. Simply complete and mail the Solenoid Questionnaire, or contact us by telephone or telex stating your requirements

December, 1982



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