

## D.C. Rotary Solenoid Round Form

Spring Return  
Range up to 95° and 195 Ncm  
Rectifier for A.C. supply

# 6

Product group

Type **G DA**

- According to DIN VDE 0580 and ISO 9001 (conform with article 10 of directions 73/23/EEC - according to CENELEC memorandum no. 3 of March 1987)
- Increasing torque characteristic (fig. 3)  
Proportional, high torque, double acting type - list G DR
- Pure rotary operation, angles up to max. 95° (no axial linear shaft movement, shaft supported in encased ball races)
- With or without adjustable spring return interchangeable for left or right hand operation
- Free leads are standard  
Plug connectors can be provided (list Z KB / Z KC) with built-in rectifier for A.C. supply (list Z KB G)
- Class B coil insulation and protection classification IP 20 - DIN VDE 0470/EN 60529
- Mounting provided by tapped holes in solenoid faces (also used for attaching spring return)
- Round form - 6 sizes (product group G DC for square form type)
- For principle of operation refer to back page
- Ratchet arm for guard door locks, etc.
- Modifications and special designs on request
- General purpose solenoid with high endurance for arduous service in the fields of:

|                                 |                   |
|---------------------------------|-------------------|
| Machine tools                   | Automation        |
| Office machines                 | Remote control    |
| Reject mechanisms               | Optical equipment |
| Hopper flap operation           |                   |
| Packaging and textile machinery |                   |

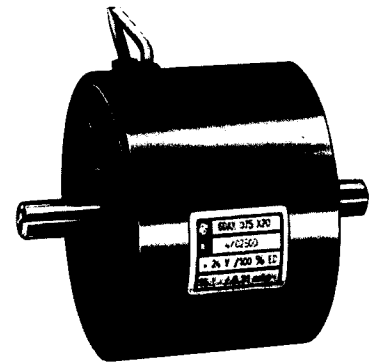


Fig. 1  
Type G DA X 075 X 20 B01 or  
G DA Y 075 X 20 B01  
(without spring return)

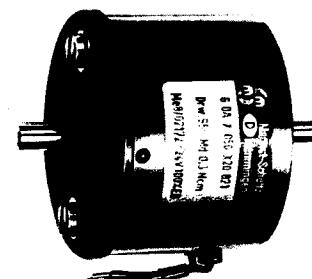


Fig. 2  
Type G DA X 050 X 20 B21 or  
G DA Y 050 X 20 B21  
(with spring return)

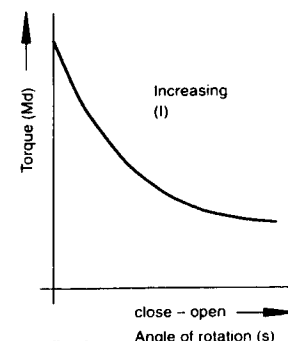


Fig. 3  
Force characteristic



Performance tables for type G DA X 025 to 050 and G DA Y 025 to 050

max. voltage: ~ 220 V

| Type 95°                              |               | GDAX025X20B01            |      |       |      |      | GDAX035X20B01            |      |      |      |      | GDAX050X20B01            |      |      |       |      |      |
|---------------------------------------|---------------|--------------------------|------|-------|------|------|--------------------------|------|------|------|------|--------------------------|------|------|-------|------|------|
| Angle of rotation max. (s) (°)        |               | 95 <sup>+3</sup>         |      |       |      |      | 95 <sup>+3</sup>         |      |      |      |      | 95 <sup>+3</sup>         |      |      |       |      |      |
| Duty rating ED (%)                    |               | 100                      | 40   | 25    | 15   | 5    | 100                      | 40   | 25   | 15   | 5    | 100                      | 40   | 25   | 15    | 5    |      |
| Torque                                | with $\Delta$ | 0°                       | 0.63 | 0.95  | 1.05 | 1.15 | 1.10                     | 1.68 | 2.00 | 2.15 | 2.20 | 2.00                     | 9.00 | 10.0 | 10.20 | 10.0 | 8.4  |
|                                       |               | 30°                      | 0.22 | 0.50  | 0.70 | 0.85 | 1.15                     | 0.73 | 1.45 | 1.75 | 2.00 | 2.45                     | 3.90 | 6.55 | 8.10  | 9.5  | 11.0 |
|                                       |               | 60°                      | 0.10 | 0.25  | 0.40 | 0.55 | 0.85                     | 0.34 | 0.80 | 1.20 | 1.45 | 2.00                     | 1.50 | 3.25 | 4.80  | 6.6  | 8.9  |
|                                       |               | Without spring           | 95°  | 0.065 | 0.17 | 0.27 | 0.40                     | 0.80 | 0.22 | 0.58 | 0.90 | 1.30                     | 2.25 | 0.77 | 1.70  | 2.55 | 4.1  |
| Mass-inertia (kg m <sup>2</sup> )     |               | 0.102 - 10 <sup>-6</sup> |      |       |      |      | 0.314 - 10 <sup>-6</sup> |      |      |      |      | 1.903 - 10 <sup>-6</sup> |      |      |       |      |      |
| Power consumption P <sub>20</sub> (W) |               | 4.2                      | 10.9 | 16.6  | 24.3 | 57.6 | 7.0                      | 16.2 | 24.2 | 38   | 105  | 13.3                     | 27.2 | 41.5 | 75    | 168  |      |
| Inductance time constant (ms)         |               | 6                        |      |       |      |      | 6.5                      |      |      |      |      | 9.2                      |      |      |       |      |      |
| Solenoid weight m <sub>M</sub> (kg)   |               | 0.07                     |      |       |      |      | 0.16                     |      |      |      |      | 0.42                     |      |      |       |      |      |
| Type 65°                              |               | GDAY025X20B01            |      |       |      |      | GDAY035X20B01            |      |      |      |      | GDAY050X20B01            |      |      |       |      |      |
| Angle of rotation max. (s) (°)        |               | 65 <sup>+3</sup>         |      |       |      |      | 65 <sup>+3</sup>         |      |      |      |      | 65 <sup>+3</sup>         |      |      |       |      |      |
| Duty rating ED (%)                    |               | 100                      | 40   | 25    | 15   | 5    | 100                      | 40   | 25   | 15   | 5    | 100                      | 40   | 25   | 15    | 5    |      |
| Torque                                | with $\Delta$ | 0°                       | 0.98 | 1.5   | 1.65 | 1.80 | 1.80                     | 2.40 | 2.90 | 3.0  | 3.00 | 3.00                     | 13.9 | 15.3 | 15.7  | 15.7 | 14.3 |
|                                       |               | 20°                      | 0.46 | 1.0   | 1.30 | 1.55 | 1.85                     | 1.50 | 2.35 | 2.75 | 3.10 | 3.60                     | 8.8  | 12.9 | 14.6  | 15.8 | 17.1 |
|                                       |               | 40°                      | 0.25 | 0.6   | 0.85 | 1.15 | 1.60                     | 0.85 | 1.70 | 2.10 | 2.50 | 3.25                     | 4.3  | 7.9  | 10.5  | 12.9 | 15.6 |
|                                       |               | Without spring           | 65°  | 0.16  | 0.4  | 0.60 | 0.85                     | 1.50 | 0.57 | 1.26 | 1.80 | 2.50                     | 3.60 | 2.4  | 5.0   | 7.2  | 10.0 |
| Mass-inertia (kg m <sup>2</sup> )     |               | 0.115 - 10 <sup>-6</sup> |      |       |      |      | 0.336 - 10 <sup>-6</sup> |      |      |      |      | 2.04 - 10 <sup>-6</sup>  |      |      |       |      |      |
| Power consumption P <sub>20</sub> (W) |               | 4.2                      | 10.9 | 16.6  | 24.3 | 57.6 | 7.0                      | 16.2 | 24.2 | 38   | 105  | 13.3                     | 27.2 | 41.5 | 75    | 168  |      |
| Inductance time constant (ms)         |               | 9                        |      |       |      |      | 8                        |      |      |      |      | 15.5                     |      |      |       |      |      |
| Solenoid weight m <sub>M</sub> (kg)   |               | 0.07                     |      |       |      |      | 0.16                     |      |      |      |      | 0.42                     |      |      |       |      |      |
| Type 35°                              |               | GDAY025X20B03            |      |       |      |      | GDAY035X20B03            |      |      |      |      | GDAY050X20B03            |      |      |       |      |      |
| Angle of rotation max. (s) (°)        |               | 35 <sup>+3</sup>         |      |       |      |      | 35 <sup>+3</sup>         |      |      |      |      | 35 <sup>+3</sup>         |      |      |       |      |      |
| Duty rating ED (%)                    |               | 100                      | 40   | 25    | 15   | 5    | 100                      | 40   | 25   | 15   | 5    | 100                      | 40   | 25   | 15    | 5    |      |
| Torque                                | with $\Delta$ | 0°                       | 1.05 | 1.60  | 1.90 | 2.00 | 2.10                     | 2.50 | 3.30 | 3.60 | 3.90 | 4.30                     | 14.4 | 17.7 | 19.2  | 20.0 | 20.4 |
|                                       |               | 10°                      | 0.84 | 1.55  | 1.90 | 2.15 | 2.55                     | 2.10 | 3.10 | 3.50 | 3.95 | 4.60                     | 12.3 | 16.2 | 18.0  | 19.8 | 21.8 |
|                                       |               | 20°                      | 0.66 | 1.35  | 1.80 | 2.20 | 2.90                     | 1.80 | 2.90 | 3.50 | 4.10 | 5.20                     | 10.0 | 15.4 | 18.0  | 20.7 | 24.3 |
|                                       |               | Without spring           | 35°  | 0.38  | 0.90 | 1.30 | 1.70                     | 2.60 | 1.20 | 2.40 | 3.00 | 3.70                     | 5.10 | 5.9  | 10.6  | 13.6 | 16.9 |
| Mass-inertia (kg m <sup>2</sup> )     |               | 0.140 - 10 <sup>-6</sup> |      |       |      |      | 0.358 - 10 <sup>-6</sup> |      |      |      |      | 2.11 - 10 <sup>-6</sup>  |      |      |       |      |      |
| Power consumption P <sub>20</sub> (W) |               | 4.2                      | 10.9 | 16.6  | 24.3 | 57.6 | 7.0                      | 16.2 | 24.2 | 38   | 105  | 13.3                     | 27.2 | 41.5 | 75    | 168  |      |
| Inductance time constant (ms)         |               | 9                        |      |       |      |      | 12                       |      |      |      |      | 20                       |      |      |       |      |      |
| Solenoid weight m <sub>M</sub> (kg)   |               | 0.07                     |      |       |      |      | 0.16                     |      |      |      |      | 0.42                     |      |      |       |      |      |

Note: - 0° is completion of energized rotation.

**PERFORMANCE TABLES**

Terms are explained in Technical Bulletin G XX & VDE 0580/35.

**TABLE BASIS**

24 V/5 - 100% duty                      Ambient temperature 35° C  
Heat insulated base                      Free air mounted  
Horizontal working                      Tolerance ± 10% (inherent & manufacture).

**MAGNETIC TORQUE**

is listed in HOT condition at 90% of rated voltage (increase approx. 20% at rated voltage).

**POWER CONSUMPTION (P<sub>20</sub>)**

is listed with a 20° C coil temperature (decrease/HOT).

**DUTY RATING (ED %)**

% of energized time per operation cycle:  $\frac{t_{on}}{t_{on} + t_{off}} \times 100$ .

Max. energized time/cycle:

100% continuous: 40% - 120 secs., 25% - 75 secs., 15% - 45 secs., 5% - 15 secs.

**SUPPLY VOLTAGES:**

The standard supply voltages are: 12 V, 24 V, 97 V, 195 V, 205 V, 214 V D.C. (for rectified 110 V, 220 V, 230 V, 240 V, 50/60 Hz A.C.).

Size 025 max. 60 V.

**OVER-VOLTAGE**

Torque and/or speed of stroke may be increased by application of over-voltage: - A.C. rectifier plugs S 114 (2:1), S 106 (7:1) D.C. Pulse width modulator OV/DC-1/2.



**Performance tables for type G DA X 060 to 100 and G DA Y 060 to 100**

max. voltage: === 220 V

| Type 95°                              |               |     | G DA X 060 X 20 B01     |      |      |      |      | G DA X 075 X 20 B01      |      |      |      |      | G DA X 100 X 20 B01     |     |     |     |     |
|---------------------------------------|---------------|-----|-------------------------|------|------|------|------|--------------------------|------|------|------|------|-------------------------|-----|-----|-----|-----|
| Angle of rotation max. (s) (°)        |               |     | 95 <sup>+3</sup>        |      |      |      |      | 95 <sup>+3</sup>         |      |      |      |      | 95 <sup>+3</sup>        |     |     |     |     |
| Duty rating ED (%)                    |               |     | 100                     | 40   | 25   | 15   | 5    | 100                      | 40   | 25   | 15   | 5    | 100                     | 40  | 25  | 15  | 5   |
| Torque                                | with $\Delta$ | 0°  | 19.5                    | 22.3 | 22.6 | 22.3 | 17.9 | 34.0                     | 33.0 | 31.0 | 28.5 | 19.0 | 68                      | 68  | 65  | 59  | 37  |
|                                       |               | 30° | 7.5                     | 14.2 | 17.0 | 19.6 | 23.4 | 19.4                     | 30.0 | 33.5 | 35.5 | 39.0 | 51                      | 66  | 72  | 77  | 83  |
|                                       |               | 60° | 3.0                     | 6.4  | 9.7  | 13.0 | 18.9 | 8.1                      | 17.5 | 22.5 | 27.5 | 33.0 | 28                      | 47  | 57  | 65  | 78  |
|                                       |               | 95° | 1.3                     | 3.4  | 5.0  | 7.6  | 14.0 | 4.4                      | 11.1 | 16.2 | 20.5 | 35.0 | 16                      | 38  | 52  | 66  | 89  |
| Without spring                        |               |     |                         |      |      |      |      |                          |      |      |      |      |                         |     |     |     |     |
| Mass-inertia (kg m <sup>2</sup> )     |               |     | 4.88 · 10 <sup>-6</sup> |      |      |      |      | 14.45 · 10 <sup>-6</sup> |      |      |      |      | 51.2 · 10 <sup>-6</sup> |     |     |     |     |
| Power consumption P <sub>20</sub> (W) |               |     | 16.8                    | 40   | 61   | 96   | 262  | 23.5                     | 55   | 82   | 124  | 303  | 32                      | 78  | 123 | 195 | 514 |
| Inductance time constant (ms)         |               |     | 18                      |      |      |      |      | 25                       |      |      |      |      | 50                      |     |     |     |     |
| Solenoid weight m <sub>M</sub> (kg)   |               |     | 0.74                    |      |      |      |      | 1.48                     |      |      |      |      | 3.4                     |     |     |     |     |
| Type 65°                              |               |     | G DA Y 060 X 20 B01     |      |      |      |      | G DA Y 075 X 20 B01      |      |      |      |      | G DA Y 100 X 20 B01     |     |     |     |     |
| Angle of rotation max. (s) (°)        |               |     | 65 <sup>+3</sup>        |      |      |      |      | 65 <sup>+3</sup>         |      |      |      |      | 65 <sup>+3</sup>        |     |     |     |     |
| Duty rating ED (%)                    |               |     | 100                     | 40   | 25   | 15   | 5    | 100                      | 40   | 25   | 15   | 5    | 100                     | 40  | 25  | 15  | 5   |
| Torque                                | with $\Delta$ | 0°  | 28.5                    | 33.0 | 34.0 | 34.0 | 31.0 | 48                       | 50   | 49   | 47   | 39   | 93                      | 97  | 97  | 91  | 67  |
|                                       |               | 20° | 15.0                    | 25.4 | 29.1 | 31.9 | 35.7 | 37                       | 48   | 53   | 55   | 58   | 82                      | 102 | 109 | 113 | 117 |
|                                       |               | 40° | 7.9                     | 16.8 | 21.6 | 26.0 | 34.6 | 19                       | 37   | 44   | 48   | 57   | 56                      | 86  | 99  | 108 | 119 |
|                                       |               | 65° | 3.9                     | 9.3  | 13.4 | 18.4 | 29.3 | 11                       | 25   | 35   | 42   | 59   | 37                      | 73  | 97  | 113 | 136 |
| Without spring                        |               |     |                         |      |      |      |      |                          |      |      |      |      |                         |     |     |     |     |
| Mass-inertia (kg m <sup>2</sup> )     |               |     | 5.14 · 10 <sup>-6</sup> |      |      |      |      | 15.25 · 10 <sup>-6</sup> |      |      |      |      | 54.6 · 10 <sup>-6</sup> |     |     |     |     |
| Power consumption P <sub>20</sub> (W) |               |     | 16.8                    | 40   | 61   | 96   | 262  | 23.5                     | 55   | 82   | 124  | 303  | 32                      | 78  | 123 | 195 | 514 |
| Inductance time constant (ms)         |               |     | 22.5                    |      |      |      |      | 30                       |      |      |      |      | 75                      |     |     |     |     |
| Solenoid weight m <sub>M</sub> (kg)   |               |     | 0.74                    |      |      |      |      | 1.48                     |      |      |      |      | 3.4                     |     |     |     |     |
| Type 35°                              |               |     | G DA Y 060 X 20 B03     |      |      |      |      | G DA Y 075 X 20 B03      |      |      |      |      | G DA Y 100 X 20 B03     |     |     |     |     |
| Angle of rotation max. (s) (°)        |               |     | 35 <sup>+3</sup>        |      |      |      |      | 35 <sup>+3</sup>         |      |      |      |      | 35 <sup>+3</sup>        |     |     |     |     |
| Duty rating ED (%)                    |               |     | 100                     | 40   | 25   | 15   | 5    | 100                      | 40   | 25   | 15   | 5    | 100                     | 40  | 25  | 15  | 5   |
| Torque                                | with $\Delta$ | 0°  | 31.0                    | 38.0 | 41.0 | 43.0 | 46.0 | 60                       | 67   | 68   | 69   | 64   | 127                     | 136 | 137 | 135 | 121 |
|                                       |               | 10° | 25.0                    | 35.5 | 39.5 | 43.0 | 49.0 | 54                       | 66   | 71   | 73   | 75   | 119                     | 140 | 147 | 150 | 149 |
|                                       |               | 20° | 18.5                    | 32.0 | 38.0 | 43.0 | 53.0 | 47                       | 65   | 73   | 79   | 88   | 118                     | 152 | 165 | 176 | 191 |
|                                       |               | 35° | 10.8                    | 21.5 | 28.0 | 34.5 | 46.0 | 30                       | 51   | 63   | 70   | 87   | 81                      | 136 | 156 | 172 | 195 |
| Without spring                        |               |     |                         |      |      |      |      |                          |      |      |      |      |                         |     |     |     |     |
| Mass-inertia (kg m <sup>2</sup> )     |               |     | 5.39 · 10 <sup>-6</sup> |      |      |      |      | 15.92 · 10 <sup>-6</sup> |      |      |      |      | 57.9 · 10 <sup>-6</sup> |     |     |     |     |
| Power consumption P <sub>20</sub> (W) |               |     | 16.8                    | 40   | 61   | 96   | 262  | 23.5                     | 55   | 82   | 124  | 303  | 32                      | 78  | 123 | 195 | 514 |
| Inductance time constant (ms)         |               |     | 30                      |      |      |      |      | 42.5                     |      |      |      |      | 100                     |     |     |     |     |
| Solenoid weight m <sub>M</sub> (kg)   |               |     | 0.74                    |      |      |      |      | 1.48                     |      |      |      |      | 3.4                     |     |     |     |     |

Note: - 0° is completion of energized rotation.

#### ARRANGEMENT

The range comprises 6 sizes, each with 3 alternative maximum rotation angles: 35°, 65°, 95° (other rotation angles to special order – details on request).

The solenoids may be stalled at any angle without electrical or mechanical harm. External stops are desirable for high inertia applications.

Reduced angle should be used from completion of the energized stroke (0°) to obtain maximum torque.

The standard solenoids are provided with free leads. Alternative arrangements with terminal block or plug are available.

#### SPRING RETURN

The spring return force may be varied by location of the spring in the castellations for coarse setting and rotation of spring housing for fine adjustment.

The spring return performance table details the maximum and minimum torques obtainable by spring adjustment. The spring rate enables intermediate settings to be calculated for relation to requirements and solenoid performance at various duty ratings and with over-voltage.

#### Conversion Factors

1 N = 0.102 kp = 0.1 kg  
 1 Ncm = 0.102 kpcm = 0.1 kpcm  
 1 kp = 1 kg = 2.2 lb  
 1 mm = 0.039 in.  
 1 Ncm = 1.373 oz. in.  
 0.086 lb. in.  
 0.0071 lb. ft.

## Performance tables for spring return type G DA X 025 to 100 and G DA Y 025 to 100

| 95° Type  | Right hand | G DA X 025 X 20 B 21 |                  | G DA X 035 X 20 B 21 |                  | G DA X 050 X 20 B 21 |                  | G DA X 060 X 20 B 21 |                  | G DA X 075 X 20 B 21 |                  | G DA X 100 X 20 B 21 |                  |
|---|------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|
|   | Left hand  | G DA X 025 X 20 B 25 |                  | G DA X 035 X 20 B 25 |                  | G DA X 050 X 20 B 25 |                  | G DA X 060 X 20 B 25 |                  | G DA X 075 X 20 B 25 |                  | G DA X 100 X 20 B 25 |                  |
| Angle of rotation max. (s)  | (°)        | 0                    | 95 <sup>-3</sup> | 0                    | 95 <sup>-3</sup> | 0                    | 95 <sup>-3</sup> | 0                    | 95 <sup>-3</sup> | 0                    | 95 <sup>-3</sup> | 0                    | 95 <sup>-3</sup> |
| Spring Torque (adjustable <sup>1)</sup> )<br>M <sub>R</sub> (Ncm) | min.       | 0.3                  | 0.1              | 0.76                 | 0.14             | 1.8                  | 0.3              | 3.0                  | 0.56             | 5.8                  | 1.1              | 11.5                 | 2                |
|   | max.       | 0.6                  | 0.40             | 1.36                 | 0.74             | 4.5                  | 3.0              | 8.1                  | 5.6              | 15.8                 | 11               | 29.5                 | 20               |
| Spring rate   | (Ncm/°) ≈  | 0.00206              |                  | 0.0065               |                  | 0.016                |                  | 0.026                |                  | 0.05                 |                  | 0.1                  |                  |
| 65° Type  | Right hand | G DA Y 025 X 20 B 21 |                  | G DA Y 035 X 20 B 21 |                  | G DA Y 050 X 20 B 21 |                  | G DA Y 060 X 20 B 21 |                  | G DA Y 075 X 20 B 21 |                  | G DA Y 100 X 20 B 21 |                  |
|   | Left hand  | G DA Y 025 X 20 B 25 |                  | G DA Y 035 X 20 B 25 |                  | G DA Y 050 X 20 B 25 |                  | G DA Y 060 X 20 B 25 |                  | G DA Y 075 X 20 B 25 |                  | G DA Y 100 X 20 B 25 |                  |
| Angle of rotation max. (s)  | (°)        | 0                    | 65 <sup>-3</sup> | 0                    | 65 <sup>-3</sup> | 0                    | 65 <sup>-3</sup> | 0                    | 65 <sup>-3</sup> | 0                    | 65 <sup>-3</sup> | 0                    | 65 <sup>-3</sup> |
| Spring Torque (adjustable <sup>1)</sup> )<br>M <sub>R</sub> (Ncm) | min.       | 0.23                 | 0.1              | 0.56                 | 0.14             | 1.3                  | 0.3              | 2.25                 | 0.56             | 4.35                 | 1.1              | 8.5                  | 2                |
|   | max.       | 0.6                  | 0.47             | 2.0                  | 1.58             | 4.5                  | 3.5              | 8.2                  | 6.5              | 15.8                 | 12.5             | 29                   | 22.5             |
| Spring rate   | (Ncm/°) ≈  | 0.00206              |                  | 0.0065               |                  | 0.016                |                  | 0.026                |                  | 0.05                 |                  | 0.1                  |                  |
| 35° Type  | Right hand | G DA Y 025 X 20 B 23 |                  | G DA Y 035 X 20 B 23 |                  | G DA Y 050 X 20 B 23 |                  | G DA Y 060 X 20 B 23 |                  | G DA Y 075 X 20 B 23 |                  | G DA Y 100 X 20 B 23 |                  |
|   | Left hand  | G DA Y 025 X 20 B 27 |                  | G DA Y 035 X 20 B 27 |                  | G DA Y 050 X 20 B 27 |                  | G DA Y 060 X 20 B 27 |                  | G DA Y 075 X 20 B 27 |                  | G DA Y 100 X 20 B 27 |                  |
| Angle of rotation max. (s)  | (°)        | 0                    | 35 <sup>-3</sup> | 0                    | 35 <sup>-3</sup> | 0                    | 35 <sup>-3</sup> | 0                    | 35 <sup>-3</sup> | 0                    | 35 <sup>-3</sup> | 0                    | 35 <sup>-3</sup> |
| Spring Torque (adjustable <sup>1)</sup> )<br>M <sub>R</sub> (Ncm) | min.       | 0.17                 | 0.1              | 0.37                 | 0.14             | 0.86                 | 0.3              | 1.5                  | 0.56             | 2.85                 | 1.1              | 5.5                  | 2                |
|   | max.       | 0.6                  | 0.53             | 2.0                  | 1.77             | 4.5                  | 4                | 7.9                  | 7                | 15.8                 | 14               | 28.5                 | 25               |
| Spring rate   | (Ncm/°) ≈  | 0.00206              |                  | 0.0065               |                  | 0.016                |                  | 0.026                |                  | 0.05                 |                  | 0.1                  |                  |

Note: - 0° is completion of energized rotation. <sup>1)</sup> The values indicated do not consider the duty rating.

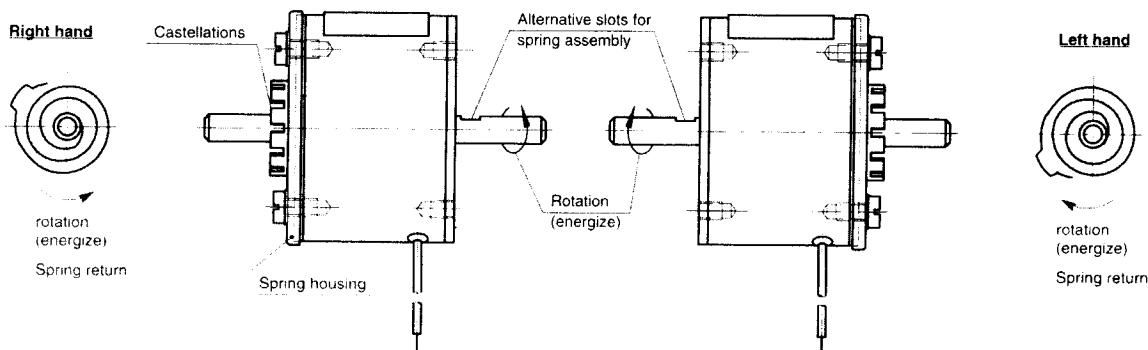


Fig. 4: Type G DA X 025 to 100 and G DA Y 025 to 100 with spring return (B 21, 23, 25, 27)

### SPRING RETURN - ADJUSTMENT AND HANDING

The spring return force may be varied by location of spring in the castellations for coarse setting and rotation of spring housing for fine adjustment. The mechanism is interchangeable to either left or right hand - both shafts are provided with slots for assembly of spring return, which may be changed by:

Removing screws, lifting spring from castellation, removing plastic housing, disengaging spring from shaft flat with knife, sliding spring up and off shaft.

Refitting plastic housing, screws and spring at opposite end reversing spring direction (Fig. 4).

Sliding spring down shaft engaging in shaft flat.

Rotating and engaging spring in castellation for torque required, finally adjusting by screws and slots.

There is no linear movement of the output shafts, which are supported in two enclosed ball-race assemblies.

The load forces should be applied radially and not axially to obtain maximum life of the bearings and protection of the internal components, which are position fitted to the splined shaft for correct torque performance.

Two solenoids may be coupled together to provide a double-acting unit.

Plain stainless steel output shafts are provided. Alternative shaft arrangements including keyways are available to special order (details on request).

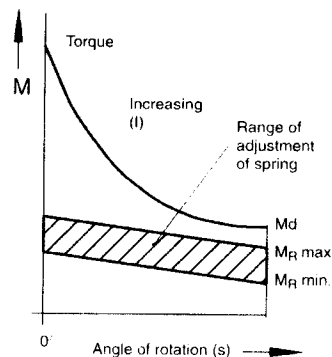


Fig 5  
Rotary solenoid characteristic with spring return mechanism

**Dimension table for type G DA X 025 to 100 and G DA Y 025 to 100**

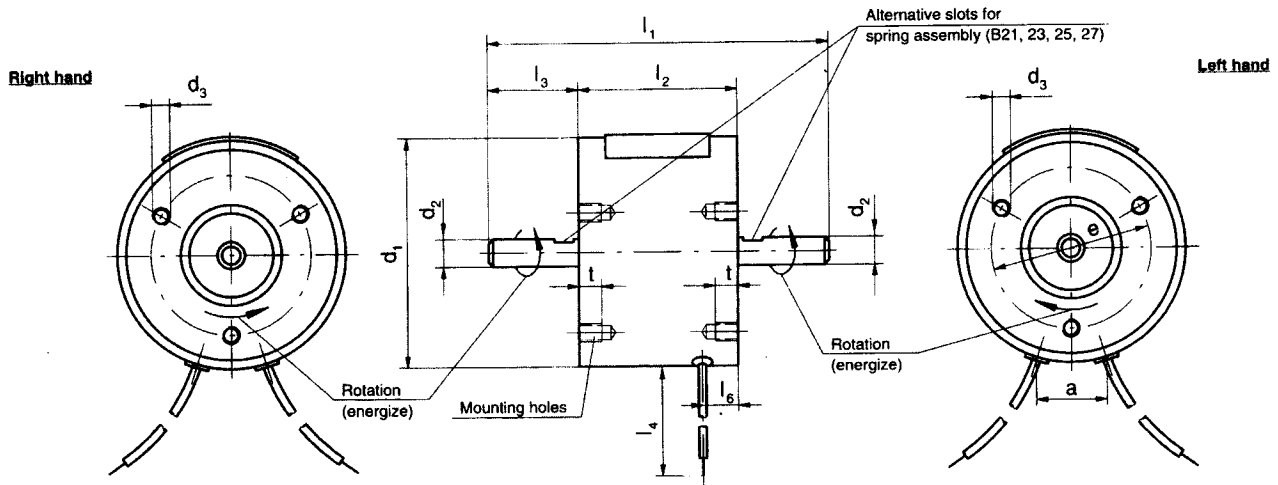


Fig. 6: Type G DA X 060 to 100 and G DA Y 060 to 100

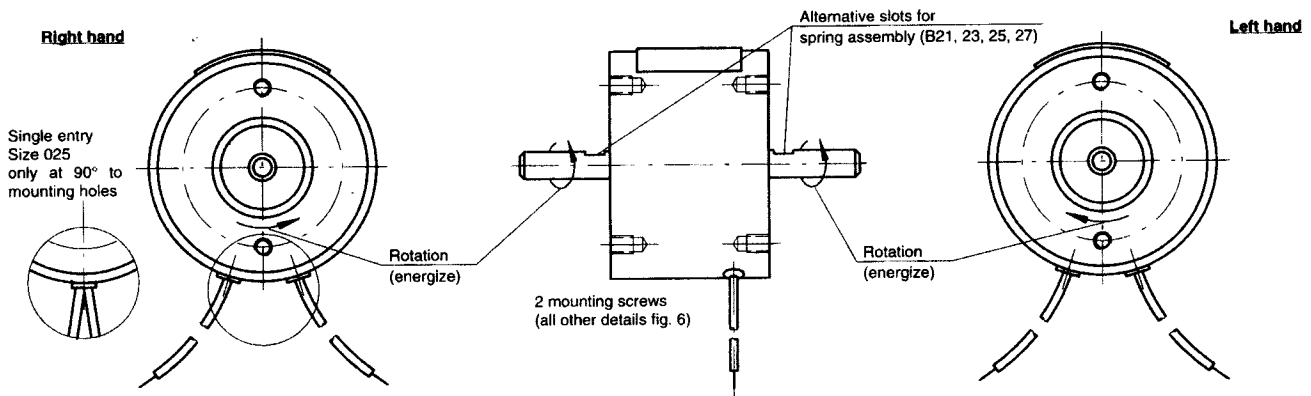


Fig. 7: Type G DA X 025 to 050 and G DA Y 025 to 050

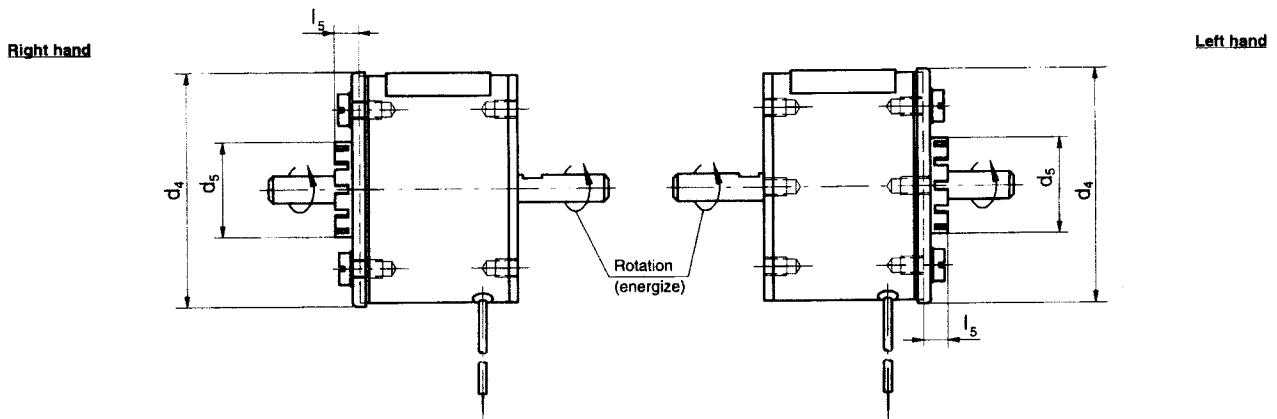


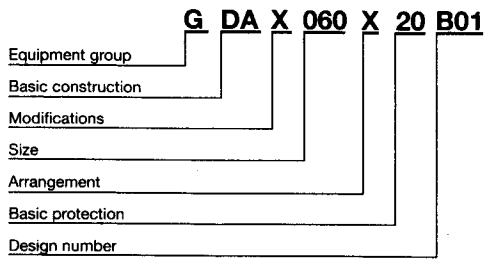
Fig. 8: Type G DA X 025 to 100 and G DA Y 025 to 100 with spring return (B 21, 23, 25, 27) (all other details as fig. 6 and 7)

| Type       | dim. (mm) |                |                |                |                |                |    |                |                |                |                |                |                |     |
|------------|-----------|----------------|----------------|----------------|----------------|----------------|----|----------------|----------------|----------------|----------------|----------------|----------------|-----|
|            | a         | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | d <sub>4</sub> | d <sub>5</sub> | e  | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | l <sub>4</sub> | l <sub>5</sub> | l <sub>6</sub> | t*  |
| G DA . 025 | -         | 25             | 3              | M3             | 26.2           | 11.4           | 18 | 55             | 25             | 15             | 100            | 3.2            | 5.5            | 3   |
| G DA . 035 | 10        | 35             | 4              | M3             | 36.4           | 14.6           | 25 | 47.5           | 27.5           | 10             | 100            | 4.5            | 7              | 3.5 |
| G DA . 050 | 11        | 50             | 6              | M4             | 51.6           | 20.8           | 35 | 65             | 35             | 15             | 150            | 4.7            | 8.5            | 5   |
| G DA . 060 | 11        | 60             | 8              | M4             | 61.6           | 24             | 40 | 78             | 42             | 18             | 150            | 6              | 10             | 6   |
| G DA . 075 | 18        | 75             | 10             | M5             | 76.2           | 29.5           | 50 | 93             | 53             | 20             | 200            | 8.5            | 12.5           | 8   |
| G DA . 100 | 17        | 100            | 12             | M6             | 102            | 32             | 70 | 118            | 68             | 25             | 260            | 10             | 16             | 9   |

\*Do NOT use over-length screws.  
Dimensions with plug connector on request.

# Classification of rotary solenoid type G DA X and G DA Y 025 to 100

## Type code



## Order Example

1. D.C. Classification
  - Basic Construction - GA
  - Standard design: - DA
  - Angle of rotation - 35°, 65° - Y, 95° - X
  - Size - select from tables - X
  - Arrangement - standard X - 060
  - Protection - standard IP 20 - X
  - Protection - standard IP 20 - 20
  
- Execution:
 

|                   |               |               |           |       |
|-------------------|---------------|---------------|-----------|-------|
|                   | Without       | Spring return |           |       |
| angle of rotation | spring return | right hand    | left hand |       |
| - 95° -           | ...B01        | ...B21        | ...B25    | - B01 |
| - 65° -           | ...B01        | ...B21        | ...B25    |       |
| - 35° -           | ...B03        | ...B23        | ...B27    |       |
  
2. State - Voltage (V) - Standards page 3 - 24 V
- Duty rating (ED %) - from tables - 100 %  
(5, 15, 25, 40, 100)
  
- Additional requirements - specify
  - 1) Special protection, if required -Tropical or special tropical
  - 2) Special shaft if required
  - 3) Plug connector (if required)
    - Z KB X 211 - For D.C. supply
    - Z KB G 211 - Built-in Rectifier for A.C. supply
    - S 114 A 01 / S 106 - Over-voltage rectifier.

## FUNCTION PRINCIPLE

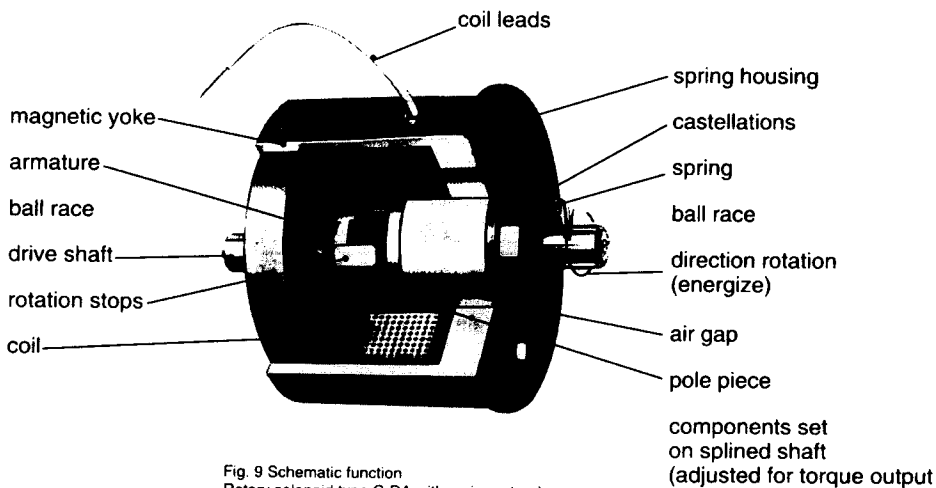


Fig. 9 Schematic function  
Rotary solenoid type G DA with spring return)

The coil's magnetic field attracts, via the fixed magnetic yoke and pole piece, the armature, fixed to the splined shaft, through the air gap formed by their inclined surfaces. This force provides rotary, (without linear) movement on the shaft, within the stop limits.

### Special

Special solenoids are available to meet the requirements of specific applications, such as short duty rating, high ambient temperature, special voltages, double acting etc., for which full operating, application and working conditions as well as environment should be specified in accordance with Technical Bulletin - GXX.

Subject to our Standard Conditions.