

DC rotary solenoid

6

Product group

G DA

- According to DIN VDE 0580
- Increasing torque characteristic (almost linear for small operating modes)
- Design:
 - At both sides shaft ends
 - Clockwise and anti-clockwise operation
 - Rotation angles of 35°, 65° and 95°
 - With or without return spring
 - Return force of the spring fully adjustable
- Armature guided in ball bearings
- Exciter coil corresponds to insulation class B
- Electrical connection and protection class with duly executed installation
 - Free flexible lead ends
Protection class according to DIN VDE 0470 / EN 60529 – IP 20
- Fastening with tapped holes on the front side
 - size 035 and 050: 2 x 180°
 - size 060 to 100: 3 x 120°
- Please contact us for modifications and special designs
- Reverse solenoids and polarized rotary solenoids on request
- Application examples:
Machine tools, office machines, textile machinery, control technology



Fig. 1: Type G DA X 075 X20 B01



Fig. 2: Type G DA X 050 X20 B21 (with return spring)

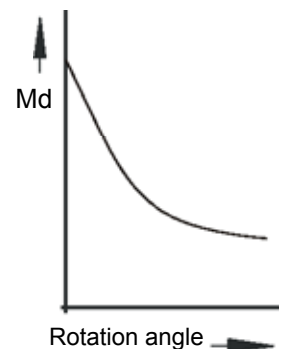


Fig. 3: torque characteristic



Technical data G DA X and G DA Y without spring return

| G DA X ... X20 B01 | | 035 | | | | | 050 | | | | | 060 | | | | |
|---------------------------------------|-----|--------------------------|-----------|-----------|-----------|----------|--------------------------|-----------|-----------|-----------|----------|-------------------------|-----------|-----------|-----------|----------|
| Rotation angle* (°) | | 95 ⁺³ | | | | | 95 ⁺³ | | | | | 95 ⁺³ | | | | |
| Operating mode | | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% |
| Torque M _d (Ncm) at Δ | 0° | 1,68 | 2,00 | 2,15 | 2,20 | 2,00 | 9,00 | 10,00 | 10,20 | 10,00 | 8,40 | 19,5 | 22,3 | 22,6 | 22,3 | 17,9 |
| | 30° | 0,73 | 1,45 | 1,75 | 2,00 | 2,45 | 3,90 | 6,55 | 8,10 | 9,50 | 11,00 | 7,5 | 14,2 | 17,0 | 19,6 | 23,4 |
| | 60° | 0,34 | 0,80 | 1,20 | 1,45 | 2,00 | 1,50 | 3,25 | 4,80 | 6,60 | 8,90 | 3,0 | 6,4 | 9,7 | 13,0 | 18,9 |
| | 95° | 0,22 | 0,58 | 0,90 | 1,30 | 2,25 | 0,77 | 1,70 | 2,55 | 4,10 | 7,40 | 1,3 | 3,4 | 5,0 | 7,6 | 14,0 |
| Rated power P ₂₀ (W) | | 7,0 | 16,2 | 24,2 | 38 | 105 | 13,3 | 27,2 | 41,5 | 75 | 168 | 16,8 | 40 | 61 | 96 | 262 |
| Moment of inertia (kgm ²) | | 0,314 x 10 ⁻⁶ | | | | | 1,903 x 10 ⁻⁶ | | | | | 4,88 x 10 ⁻⁶ | | | | |
| Time constant τ (ms) | | 6,5 | | | | | 9,2 | | | | | 18 | | | | |
| Solenoid weight m _M (kg) | | 0,16 | | | | | 0,42 | | | | | 0,74 | | | | |

| G DA Y ... X20 B01 | | 035 | | | | | 050 | | | | | 060 | | | | |
|---------------------------------------|-----|--------------------------|-----------|-----------|-----------|----------|-------------------------|-----------|-----------|-----------|----------|-------------------------|-----------|-----------|-----------|----------|
| Rotation angle* (°) | | 65 ⁺³ | | | | | 65 ⁺³ | | | | | 65 ⁺³ | | | | |
| Operating mode | | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% |
| Torque M _d (Ncm) at Δ | 0° | 2,40 | 2,90 | 3,00 | 3,00 | 3,00 | 13,9 | 15,3 | 15,7 | 15,7 | 14,3 | 28,5 | 33,0 | 34,0 | 34,0 | 31,0 |
| | 20° | 1,50 | 2,35 | 2,75 | 3,10 | 3,60 | 8,8 | 12,9 | 14,6 | 15,8 | 17,1 | 15,0 | 25,4 | 29,1 | 31,9 | 35,7 |
| | 40° | 0,85 | 1,70 | 2,10 | 2,50 | 3,25 | 4,3 | 7,9 | 10,5 | 12,9 | 15,6 | 7,9 | 16,8 | 21,6 | 26,0 | 34,6 |
| | 65° | 0,57 | 1,26 | 1,80 | 2,50 | 3,60 | 2,4 | 5,0 | 7,2 | 10,0 | 14,4 | 3,9 | 9,3 | 13,4 | 18,4 | 29,3 |
| Rated power P ₂₀ (W) | | 7,0 | 16,2 | 24,2 | 38 | 105 | 13,3 | 27,2 | 41,5 | 75 | 168 | 16,8 | 40 | 61 | 96 | 262 |
| Moment of inertia (kgm ²) | | 0,366 x 10 ⁻⁶ | | | | | 2,04 x 10 ⁻⁶ | | | | | 5,14 x 10 ⁻⁶ | | | | |
| Time constant τ (ms) | | 8,0 | | | | | 15,5 | | | | | 22,5 | | | | |
| Solenoid weight m _M (kg) | | 0,16 | | | | | 0,42 | | | | | 0,74 | | | | |

| G DA Y ... X20 B03 | | 035 | | | | | 050 | | | | | 060 | | | | |
|---------------------------------------|-----|--------------------------|-----------|-----------|-----------|----------|-------------------------|-----------|-----------|-----------|----------|-------------------------|-----------|-----------|-----------|----------|
| Rotation angle* (°) | | 35 ⁺³ | | | | | 35 ⁺³ | | | | | 35 ⁺³ | | | | |
| Operating mode | | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% | S1 100% | S3 40% | S3 25% | S3 15% | S3 5% |
| Torque M _d (Ncm) at Δ | 0° | 2,50 | 3,30 | 3,60 | 3,90 | 4,30 | 14,4 | 17,7 | 19,2 | 20,0 | 20,4 | 31,0 | 38,0 | 41,0 | 43,0 | 46,0 |
| | 10° | 2,10 | 3,10 | 3,50 | 3,95 | 4,60 | 12,3 | 16,2 | 18,0 | 19,8 | 21,8 | 25,0 | 35,5 | 39,5 | 43,0 | 49,0 |
| | 20° | 1,80 | 2,90 | 3,50 | 4,10 | 5,20 | 10,0 | 15,4 | 18,0 | 20,7 | 24,3 | 18,5 | 32,0 | 38,0 | 43,0 | 53,0 |
| | 35° | 1,20 | 2,40 | 3,00 | 3,70 | 5,10 | 5,9 | 10,6 | 13,6 | 16,9 | 21,7 | 10,8 | 21,5 | 28,0 | 34,5 | 46,0 |
| Rated power P ₂₀ (W) | | 7,0 | 16,2 | 24,2 | 38 | 105 | 13,3 | 27,2 | 41,5 | 75 | 168 | 16,8 | 40 | 61 | 96 | 262 |
| Moment of inertia (kgm ²) | | 0,358 x 10 ⁻⁶ | | | | | 2,11 x 10 ⁻⁶ | | | | | 5,39 x 10 ⁻⁶ | | | | |
| Time constant τ (ms) | | 12 | | | | | 20 | | | | | 30 | | | | |
| Solenoid weight m _M (kg) | | 0,16 | | | | | 0,42 | | | | | 0,74 | | | | |

* Other rotation angles on request

M_d = Torque

M_R min. } self-aligning torque of the spring in de-energized condition
M_R max }

The self-aligning torque of the spring can be adjusted within the range of adjustment by choice of gullets and by turning of the spring housing.

The rated voltage is \approx 24 V. An adaptation of the exciter coil to a rated voltage of max. \approx 230 V is possible on request.

A protective earth connection according to DIN VDE 0580 has to be ensured for rated voltages safety extra-low voltage of \approx 42V.

The torque values indicated in the tables refer to 90% of the rated voltage (U_N = \approx 24 V, for other voltages the torque may differ) and to the normal operating temperature.

Due to natural dispersion the torque values may deviate by \pm 10% from the values indicated in the tables.

The normal operating temperature is based on:

- Mounting on heat-insulating base
- Rated voltage \approx 24 V
- Operating mode S1 (100%) – S3 5% according to part list G XX
- Reference temperature 35 °C

Technical data G DA X and G DA Y without return spring

| G DA X ... X20 B01 | 075 | | | | | 100 | | | | | |
|---------------------------------------|--------------------------|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Rotation angle* (°) | 95 ⁺³ | | | | | 95 ⁺³ | | | | | |
| Operating mode | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S3 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S3 5 % | |
| Torque M_d (Ncm) at Δ | 0° 30° 60° 95° | 34,0 19,4 8,1 4,4 | 33,0 30,0 17,5 11,1 | 31,0 33,5 22,5 16,2 | 28,5 35,5 27,5 20,5 | 19,0 39,0 33,0 35,0 | 68,0 51,0 28,0 16,0 | 68,0 66,0 47,0 38,0 | 65,0 72,0 57,0 52,0 | 59,0 77,0 65,0 66,0 | 37,0 83,0 78,0 89,0 |
| Rated power P_{20} (W) | 23,5 | 55,0 | 82,0 | 124,0 | 303,0 | 32,0 | 78,0 | 123,0 | 195,0 | 514,0 | |
| Moment of inertia (kgm ²) | 14,45 x 10 ⁻⁶ | | | | | 51,2 x 10 ⁻⁶ | | | | | |
| Time constant τ (ms) | 25 | | | | | 50 | | | | | |
| Solenoid weight m_M (kg) | 1,48 | | | | | 3,4 | | | | | |

| G DA Y ... X20 B01 | 075 | | | | | 100 | | | | | |
|---------------------------------------|--------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|----------------------|-----------------------|-----------------------|-------------------------|-------------------------|
| Rotation angle* (°) | 65 ⁺³ | | | | | 65 ⁺³ | | | | | |
| Operating mode | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S3 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S3 5 % | |
| Torque M_d (Ncm) at Δ | 0° 20° 40° 65° | 48 37 19 11 | 50 48 37 25 | 49 53 44 35 | 47 55 48 42 | 39 58 57 59 | 93 82 56 37 | 97 102 86 73 | 97 109 99 97 | 91 113 108 113 | 67 117 119 136 |
| Rated power P_{20} (W) | 23,5 | 55 | 82 | 124 | 303 | 32 | 78 | 123 | 195 | 514 | |
| Moment of inertia (kgm ²) | 15,25 x 10 ⁻⁶ | | | | | 54,6 x 10 ⁻⁶ | | | | | |
| Time constant τ (ms) | 30 | | | | | 75 | | | | | |
| Solenoid weight m_M (kg) | 1,48 | | | | | 3,4 | | | | | |

| G DA Y ... X20 B03 | 075 | | | | | 100 | | | | | |
|---------------------------------------|--------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Rotation angle* (°) | 35 ⁺³ | | | | | 35 ⁺³ | | | | | |
| Operating mode | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S3 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S3 5 % | |
| Torque M_d (Ncm) at Δ | 0° 10° 20° 35° | 60 54 47 30 | 67 66 65 51 | 68 71 73 63 | 69 73 79 70 | 64 75 88 87 | 127 119 118 81 | 136 140 152 136 | 137 147 165 156 | 135 150 176 172 | 121 149 191 195 |
| Rated power P_{20} (W) | 23,5 | 55 | 82 | 124 | 303 | 32 | 78 | 123 | 195 | 514 | |
| Moment of inertia (kgm ²) | 15,92 x 10 ⁻⁶ | | | | | 57,9 x 10 ⁻⁶ | | | | | |
| Time constant τ (ms) | 42,5 | | | | | 100 | | | | | |
| Solenoid weight m_M (kg) | 1,48 | | | | | 3,4 | | | | | |

* Other rotation angles on request

Installation guidelines

Rotary solenoids may be used in every mounting position. To ensure a long service life and to maintain their proper function, please make sure that shocks and higher pressure on the rotation axis in axial direction are avoided.

In case of vertical mounting, the support of added masses should be effected outside the solenoid. Furthermore, it is advisable to support bigger masses which are connected to the shaft outside the solenoid and not with the stops inside the solenoid.

For connection via plug connector Z KB X resp. Z KB G, please pay attention to the max. continuous current of the plug.

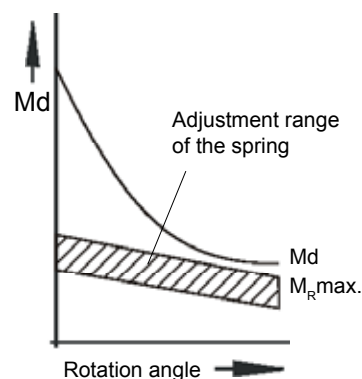


Fig. 4: torque characteristic and return spring characteristic

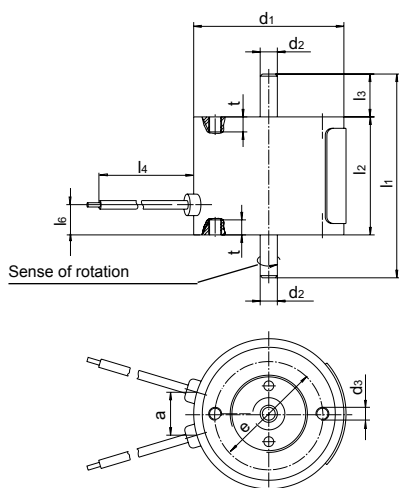


Fig. 5: Type G DA X 035 to 050 and G DA Y 035 to 050
(fastening holes: 2 x 180°)

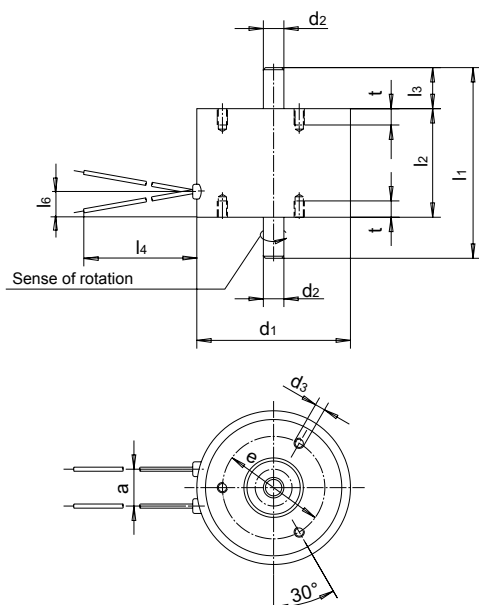


Fig. 6: Type G DA X 060 to 100 and G DA Y 060 to 100
(fastening holes: 3 x 120°)

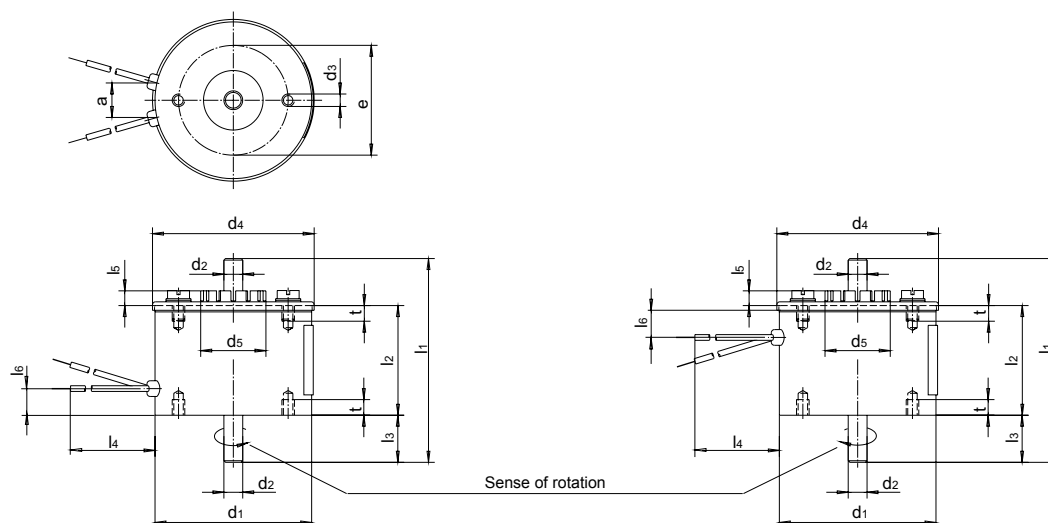


Fig. 7: Type G DA X 035 to 100 and G DA Y 035 to 100
(with return spring)

| G DA X and G DA Y | | | | | |
|-------------------|------------------|------|------|------|-----|
| size | 035 | 050 | 060 | 075 | 100 |
| Dim. | Dimensions in mm | | | | |
| a | 10 | 11 | 11 | 18 | 17 |
| d ₁ | 35 | 50 | 60 | 75 | 100 |
| d ₂ | 4 | 6 | 8 | 10 | 12 |
| d ₃ | M3 | M4 | M4 | M5 | M6 |
| d ₄ | 36,4 | 51,6 | 61,6 | 76,2 | 102 |
| d ₅ | 14,6 | 20,8 | 24 | 29,5 | 32 |
| e | 25 | 35 | 40 | 50 | 70 |
| l ₁ | 47,5 | 65 | 78 | 93 | 118 |
| l ₂ | 27,5 | 35 | 42 | 53 | 68 |
| l ₃ | 10 | 15 | 18 | 20 | 25 |
| l ₄ | 100 | 150 | 150 | 200 | 260 |
| l ₅ | 4,5 | 4,7 | 6 | 8,5 | 10 |
| l ₆ | 7 | 8,5 | 10 | 12,5 | 16 |
| t | 3,5 | 5 | 6 | 8 | 9 |

We ask you to please do not exceed the thread depth t. This may cause a damage of the coil.

The position of the flat portion of the shaft (return spring retainer) in reference to the fastening threads is any desired.

Technical data G DA X and G DA Y with return spring

Please note: Size 035 with operating mode S1 is not available with return spring


| G DA X ... X20 B21 B25 | (clockwise) (anti-clockwise) | 035 | | | | | 050 | | | | |
|--|---------------------------------|---------------------|------------------|--------------|--------------|--------------|-------------|------------------|-------------|------------|------------|
| | | Rotation angle* (°) | 95 ⁺³ | | | | | 95 ⁺³ | | | |
| Operating mode | | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % |
| Self-aligning torque of the spring M _R (Ncm) | min. max. | --- | 0,14 0,18 | 0,14 0,34 | 0,14 0,74 | 0,14 0,74 | 0,3 0,3 | 0,3 0,6 | 0,3 1,25 | 0,3 2,4 | 0,3 3,0 |
| Spring constant | (Ncm/°) | 0,0065 | | | | | 0,016 | | | | |

| G DA Y ... X20 B21 B25 | (clockwise) (anti-clockwise) | 035 | | | | | 050 | | | | |
|--|---------------------------------|---------------------|------------------|-------------|-------------|-------------|-------------|------------------|------------|------------|------------|
| | | Rotation angle* (°) | 65 ⁺³ | | | | | 65 ⁺³ | | | |
| Operating mode | | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % |
| Self-aligning torque of the spring M _R (Ncm) | min. max. | 0,14 0,27 | 0,14 0,72 | 0,14 1,0 | 0,14 1,4 | 0,14 1,6 | 0,3 0,75 | 0,3 2,16 | 0,3 3,4 | 0,3 3,5 | 0,3 3,5 |
| Spring constant | (Ncm/°) | 0,0065 | | | | | 0,016 | | | | |

| G DA Y ... X20 B23 B27 | (clockwise) (anti-clockwise) | 035 | | | | | 050 | | | | |
|--|---------------------------------|---------------------|------------------|-------------|-------------|-------------|-------------|------------------|------------|------------|-----------|
| | | Rotation angle* (°) | 35 ⁺³ | | | | | 35 ⁺³ | | | |
| Operating mode | | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % |
| Self-aligning torque of the spring M _R (Ncm) | min. max. | 0,14 0,68 | 0,14 1,6 | 0,14 1,8 | 0,14 1,8 | 0,14 1,8 | 0,3 2,4 | 0,3 4 | 0,3 4 | 0,3 4 | 0,3 4 |
| Spring constant | (Ncm/°) | 0,0065 | | | | | 0,016 | | | | |

* Other rotation angles on request

This part list is a document for technically qualified personnel. The present publication is for informational purposes only and shall not be construed as mandatory illustration of the products unless otherwise confirmed expressively.

Please make sure that the described devices are suitable for your application. Supplementary information concerning its duly assembly can be found also in -Technical Explanations, in the effective DIN VDE0580 as well as in the relevant specifications.

Information and remarks concerning European directives can be taken from the correspondent information sheet which is available under *Produktinfo.Magnet-Schultz.com*.

Note on the RoHS Directive

The devices presented in this document do not fall into the scope of RoHS Directive and to our knowledge they do not become part of products which fall into this scope. In case of surfaces zinc coating with yellow chromating and zinc iron with black chromating separate agreements are necessary for applications within the scope of RoHS.



Technical data G DA X and G DA Y with spring return

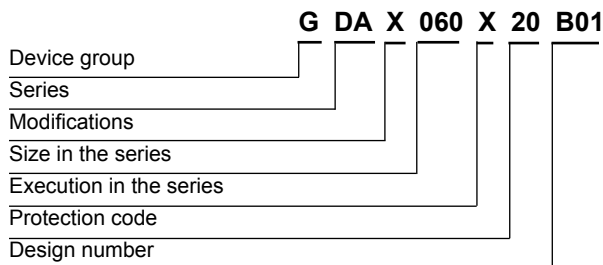
| G DA X ... X20 B21 B25 | (clockwise) | | | | | 060 | | | | | 075 | | | | | 100 | | | | |
|--|------------------|------------|------------|------------|-----------|-------------|------------|------------|------------|-----------|-------------|------------|------------|------------|-----------|-----|--|--|--|--|
| | (anti-clockwise) | | | | | | | | | | | | | | | | | | | |
| Rotation angle* | 95 ⁺³ | | | | | | | | | | | | | | | | | | | |
| Operating mode | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | | | | | |
| Self-aligning torque of the spring M _R (Ncm) | min. 0,56 | 0,56 | 0,56 | 0,56 | 0,56 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 2 | 2 | 2 | 2 | 2 | | | | | |
| | max. 0,6 | 1,0 | 2,0 | 4,0 | 5,6 | 1,8 | 5,0 | 8,4 | 11 | 11 | 12,5 | 20 | 20 | 20 | 20 | | | | | |
| Spring constant (Ncm/°) | 0,026 | | | | | 0,05 | | | | | 0,1 | | | | | | | | | |

| G DA Y ... X20 B21 B25 | (clockwise) | | | | | 060 | | | | | 075 | | | | | 100 | | | | |
|--|------------------|------------|------------|------------|-----------|-------------|------------|------------|------------|-----------|-------------|------------|------------|------------|-----------|-----|--|--|--|--|
| | (anti-clockwise) | | | | | | | | | | | | | | | | | | | |
| Rotation angle* | 65 ⁺³ | | | | | | | | | | | | | | | | | | | |
| Operating mode | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | | | | | |
| Self-aligning torque of the spring M _R (Ncm) | min. 0,56 | 0,56 | 0,56 | 0,56 | 0,56 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 2 | 2 | 2 | 2 | 2 | | | | | |
| | max. 1,5 | 4,0 | 6,2 | 6,5 | 6,5 | 4,65 | 11,7 | 12,5 | 12,5 | 12,5 | 22,5 | 22,5 | 22,5 | 22,5 | 22,5 | | | | | |
| Spring constant (Ncm/°) | 0,026 | | | | | 0,05 | | | | | 0,1 | | | | | | | | | |

| G DA Y ... X20 B23 B27 | (clockwise) | | | | | 060 | | | | | 075 | | | | | 100 | | | | |
|--|------------------|------------|------------|------------|-----------|-------------|------------|------------|------------|-----------|-------------|------------|------------|------------|-----------|-----|--|--|--|--|
| | (anti-clockwise) | | | | | | | | | | | | | | | | | | | |
| Rotation angle* | 35 ⁺³ | | | | | | | | | | | | | | | | | | | |
| Operating mode | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | S1 100 % | S3 40 % | S3 25 % | S3 15 % | S2 5 % | | | | | |
| Self-aligning torque of the spring M _R (Ncm) | min. 0,56 | 0,56 | 0,56 | 0,56 | 0,56 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 2 | 2 | 2 | 2 | 2 | | | | | |
| | max. 4,8 | 7 | 7 | 7 | 7 | 14 | 14 | 14 | 14 | 14 | 25 | 25 | 25 | 25 | 25 | | | | | |
| Spring constant (Ncm/°) | 0,026 | | | | | 0,05 | | | | | 0,1 | | | | | | | | | |

* Other rotation angles on request

Type code



Order example

Type G DA X 060 X20 B01
 Voltage ≡ 24 V DC
 Operating mode S1 (100 %)

Special designs

Please do not hesitate to ask us for application-oriented problem solutions. In order to find rapidly a reliable solution we need complete details about your application conditions. The details should be specified as precisely as possible in accordance with the relevant -Technical Explanations.

If necessary, please request the support of our corresponding technical office.