710-8138 to 710-8278

MAGNET-SCHULTZ

SPECIALISTS IN ELECTROMAGNETIC DEVICES

QUALITY SINCE 1912

Proportional Rotary Solenoid

6

Product group

G DR

- **Proportional Rotary Solenoid**
- According to VDE 0580 (conform with article 10 of directions 73/23/EEC-according to CENELEC memorandum no. 3 of March 1987)
- Horizontal torque vs angle of rotation characteristic
- Constant torque in work area
- Proportional relationship between output torque and input current
- Short regulating time through pre-magnetized system
- Clock- and counterclockwise rotation by switching the current polarity
- Armature guided in ball bearings
- Coil with insulation to class B
- Electrical connection and protection classification with proper assembly
  - Connection by free leads protection classification – DIN VDE 0470/EN 60529 – IP 20
- Mounting by threaded holes on the flat surfaces
- Possibility to attach a spring return

- **Rotation Angle Position Sensor**
- Flux measuring by means of a Hall sensor with integrated electronics
- Critical frequency of Hall sensor: Typically 23 kHz
- Measuring range up to 110°
- Stable sensor housing made of aluminium
- Flange mounting via centring pin and two screws
- Electrical connection and protection class with proper assembly:
  - Free, flexible leads
    Protection classification according to DIN VDE 0470/EN 60529 – IP 20

- **Application examples:**
  Drive for industrial control units, control technology, rotary slide valves and flap valves in fluid technology.
  The combination proportional rotary solenoids with rotation angle position sensor allow the use of the rotary solenoid for closed loop position control applications.

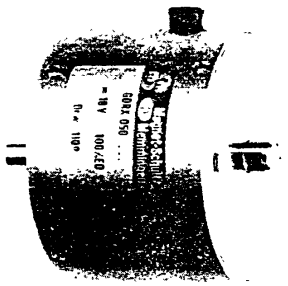

Fig. 1
Type G DR X 050 X 20 A 01
without rotation angle position sensor

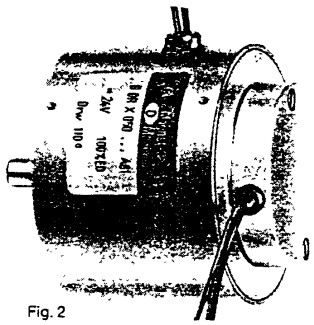

Fig. 2
Type G DR X 050 X 20 A 61
with rotation angle position sensor

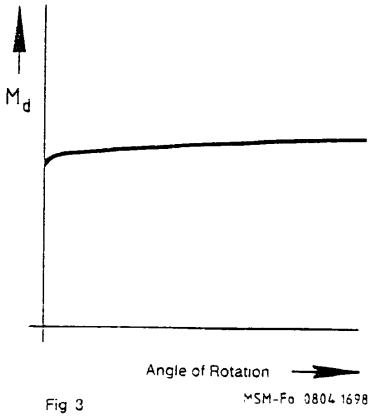

Fig 3
Torque characteristic

MSM-Fo 0804 1698

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EMESSEM SOLENOID CO. LTD
579 LONDON ROAD
ISLEWORTH

Technical Data Proportional Rotary Solenoid Type G DR

G DR X		035					050					075				
Rated voltage U_N	(V)	⎓ 24					⎓ 24					⎓ 24				
Duty rating ED	(%)	100	40	25	15	5	100	40	25	15	5	100	40	25	15	5
Power consumption	(W)	6,9	15,6	24.6	37	80	11	21	40	65	144	25	50	82	146	331
Torque M_d	(Ncm)	2.1	3.3	4,1	5,1	7.2	6	8,6	11.6	16	23	24	35	48	61	85
Reference temperature δ_{11}	(° C)	35					35					35				
Angle of rotation	(°)	110					110					110				
Mass m	(kg)	0,156					0.425					1,42				
Moment of inertia armature J	(kgm^2)	$1{,}9 \cdot 10^{-6}$					$1.1 \cdot 10^{-5}$					$1{,}1 \cdot 10^{-4}$				

Technical Data Rotation Angle Position Sensor

Technical Data Rotation Angle Position Sensor on Proportional Rotary Solenoid		G DR X 035 X 20 A 61 G DR X 050 X 20 A 61 G DR X 075 X 20 A 61	
Measuring range	(≮ °)	± 55	
Supply voltage	(V)	4,5 . . . 6	
Current input	(mA)	< 14	
Output voltage	(V)	1,8 . . 3,1	e g at U_{supply} = 5 V
in middle position	(V)	2,5 ± 0,25	
Sensitivity	(mV/1°)	typical 11 ± 1	
Linearity tolerance	(%)	= 1	
Critical frequency (– 3 dB)	(kHz)	typical 23	
Reference temperature range	(° C)	0 . . . 50	
Temperature drift	(%/°C)	typical 0,05	
Output resistance	(Ω)	50	

Sensitivity
The sensitivity is the output-signal change relating to the distance that is to be measured (indicated in mV/1°).

Linearity Fault
The linearity fault indicates the proportional deviation of the output signal from the ideal line.

Temperature Drift
The temperature drift indicates the proportional deviation of the output signal per degree of temperature change (indicated in %/°C).

Critical Frequency
relating to the Hall sensor

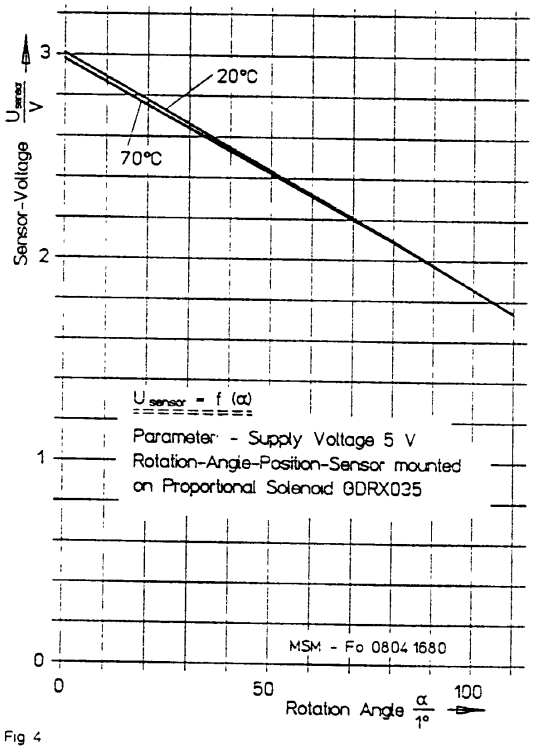


Fig 4
Voltage vs rotation angle diagram of rotation angle position sensor

Listed values
The torques indicated in the table refer to 90 % of the rated voltage ⎓ 24 V and hot condition.
Torque may deviate with other voltages.
The value of torque may deviate of approx.
± 10 % from the table value due to natural dispersion.
Rated voltage ⎓ 24 V, other voltages on request.

The hot condition is based on:

a) mounting on a heat insulating base

b) rated voltage ⎓ 24 V

c) rel. duty rating 5 – 100 % according to technical explanation G XX paragraph 4

d) reference temperature 35° C

Further information see ®-Technical Explanation and VDE 0580.

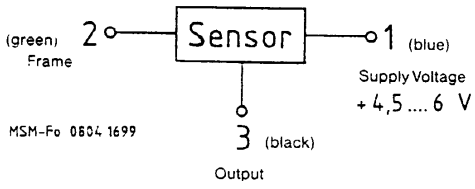


Fig 5
Block diagram

The edition of the present pamphlet cancels the former ones

Type G DR X 035

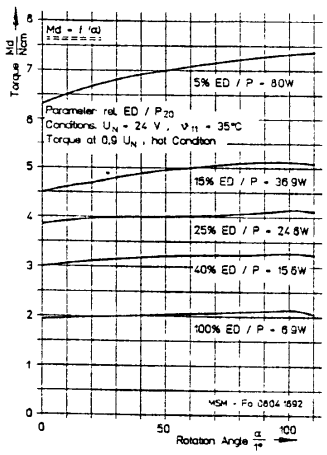


Fig. 6
Characteristics Md = f (α)
Type G DR X 035

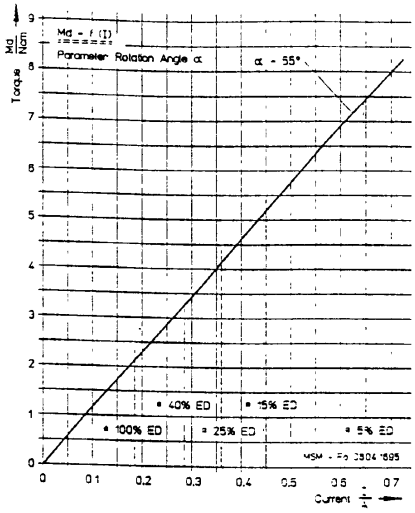


Fig. 7
Characteristics Md = f (I)
Type G DR X 035

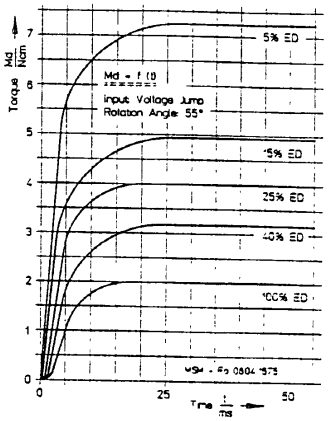


Fig 8
Characteristics Md = f (t)
Type G DR X 035

Type G DR X 050

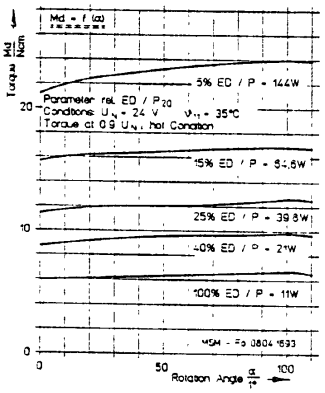


Fig. 9
Characteristics Md = f (α)
Type G DR X 050

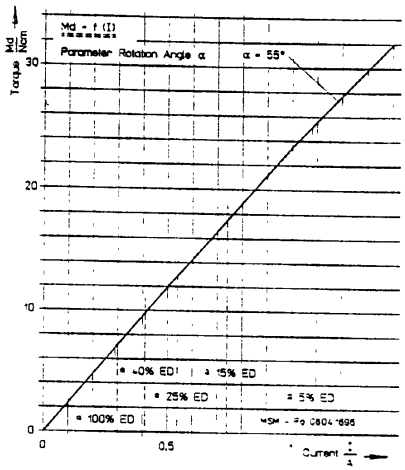


Fig 10
Characteristics Md = f (I)
Type G DR X 050

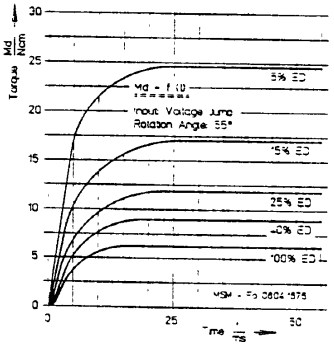


Fig. 11
Characteristics Md = f (t)
Type G DR X 050

Type G DR X 075

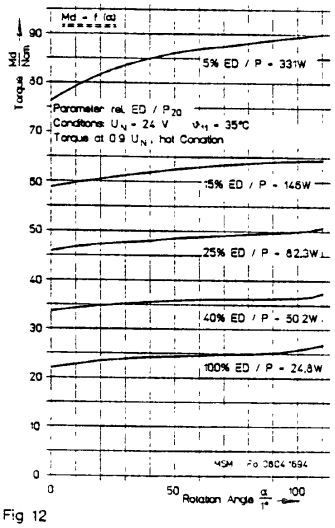


Fig. 12
Characteristics Md = f (α)
Type G DR X 075

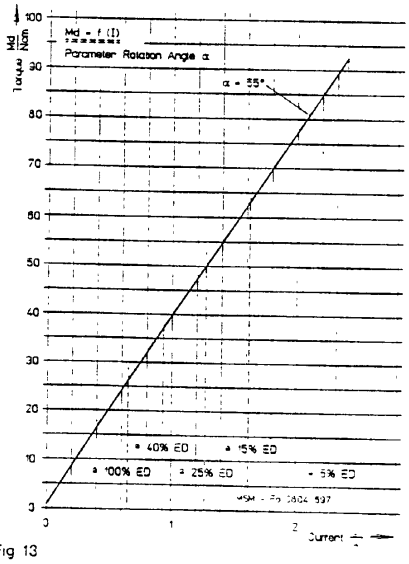


Fig 13
Characteristics Md = f (I)
Type G DR X 075

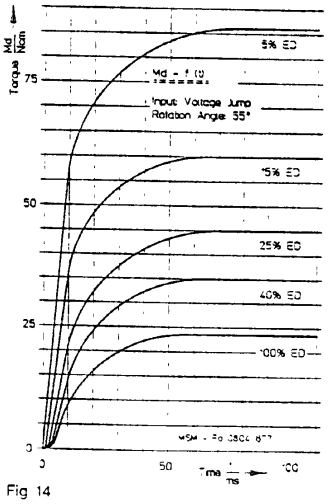


Fig 14
Characteristics Md = f (t)
Type G DR X 075

Dimensions without guarantee – Modifications reserved

Dimension Tables Type G DR

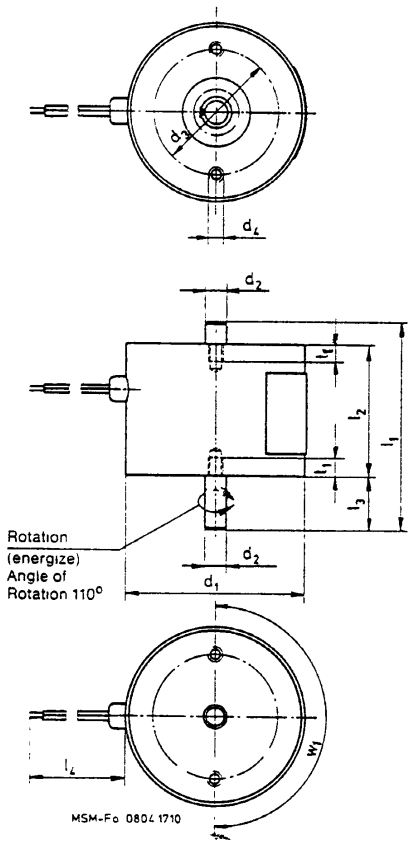


Fig 15
Dimensions
Type G DR X 035 X 20 A 01
to G DR X 075 X 20 A 01

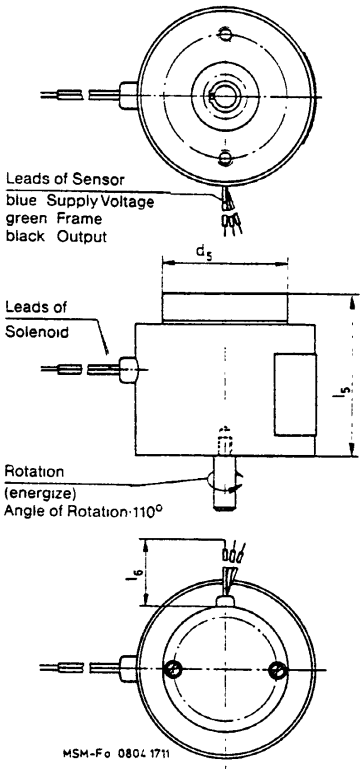
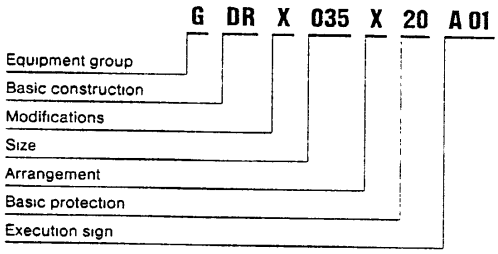


Fig 16
Dimensions
Type G DR X 035 X 20 A 61
to G DR X 075 X 20 A 61
with rotation angle position sensor
(all other details as fig 15)

Size	035	050	075
Dim.	Dimensions in mm		
d_1	35	50	75
d_2	4_{h8}	6_{h8}	10_{h8}
d_3	25	35	50
d_4	M 3	M 4	M 5
d_5	35	35	35
l_1	44	58	86
l_2	28	37	56
l_3	10	15	20
l_4	100	150	200
l_5	36,5	45,5	64,5
l_6	200	200	200
t_1	3,5	5	8
w_1	2 x 180°	2 x 180°	3 x 120°

Type code



Order example

Type	G DR X 035 X 20 A 01
Voltage	⎓ 24 V
Duty rating	100 %

Special designs

Special designs and modifications on request; please then provide exact details of the conditions of application, in accordance with our -Technical Explanations.

Subject to our standard conditions.

emessem
SOLENOID COMPANY LTD
ELECTROMAGNETIC EQUIPMENT

QUALITY SINCE 1912

Optional Return Spring for GDR Rotary Solenoid

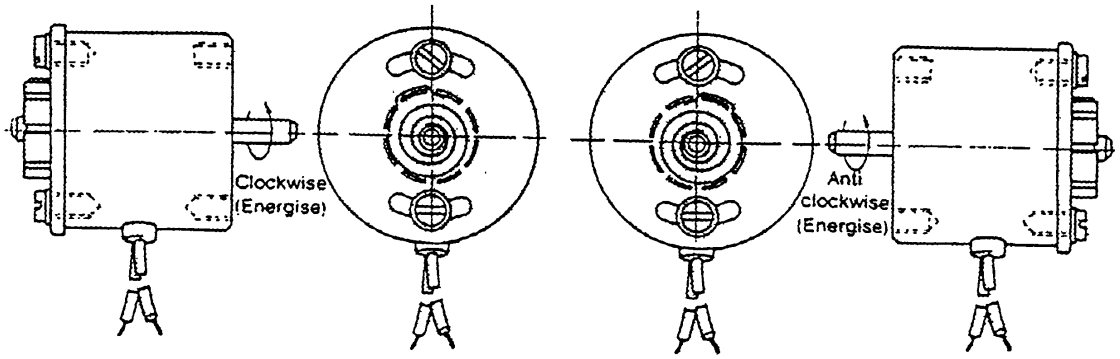
6
Product group

February 1997

Type GDR
Farnell supplement

Fitting of Optional Spring for Fail - Safe Operation

To be read in conjunction with datsheet GDR (Proportional Rotary Solenoid)



Fail - safe anti - clockwise

Fail - safe clockwise

The spring assembly can only be fitted to the shaft which has a machined flat and the direction of the spring spiral controls the fail safe direction (see above)

Slide the spring down into the bore of the plastic cage with the spiral winding in the appropriate direction and engage the outer end of the spring in an adjacent castellation.

Position the spring and cage assembly on the end of the solenoid with the shaft appearing through the middle of the spring. Whilst holding the spring in place in the cage, push the spring down over the shaft end until the inner end engages in the slot in the shaft. Rotate the cage to tension the spring to give the required torque, fit and tighten the screws and washers.

Fine adjustments can be made by slackening the screws and rotating the cage before retightening. Coarse adjustments can be made by lifting the outer end of the spring from the castellation and re-engaging it in an alternative position

WARNING

DO NOT FIT OVERLENGTH SCREWS

DO NOT OVER TENSION SPRING (solenoid will fail to operate)

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emessem

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