Proportional rotary solenoid

6

Product group

G DR

- **Proportional rotary solenoid**
- According to DIN VDE 0580
- Horizontal torque vs. rotation angle characteristic
- Constant torque in the working area
- Proportional relation between torque and current
- Short correcting times through pre-magnetized system
- Clockwise and anti clockwise by reversing the polarity
- Armature guided in ball bearings
- Exciter coil corresponds to insulation class B
- Electrical connection and protection class with duly executed installation
  - free flexible liead ends

  Protection classs according to DIN VDE 0470-1/ DIN EN 60529 - IP 20
- Fastening with tapped holes on the front sides
- Possibility to flange-mount of a return spring
- **Rotation angle position sensor**
- Flow measuring by means of Hall sensor with integrated electronics
- Limit frequency of the Hall sensor: typically 23 kHz
- Measuring range up to 110°
- Stable sensor housing made of aluminium
- Flange-mounting by centering shoulder and two screws
- Electrical connection and protection class with duly executed installation:
  - Free, flexible lead ends

  Protection class according to DIN VDE 0470-1/ DIN EN 60529 - IP 20
- Design with programmable Hall sensor on request
- Please contact us for modifications and special designs
- **Application examples:**
  Drive for industrial control units, control technology, rotary slides and flap valves in fluid technology.
  The combination proportional solenoid with rotation angle position sensor allows the use of the rotary solenoid for closed loop control system.

Fig. 1: Type G DR X 050 X20 A01
Without rotation position sensor

Fig. 2: Type G DR X 050 X20 A61
With rotation position sensor

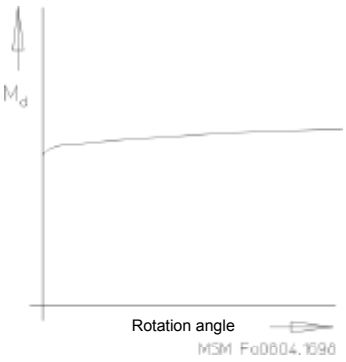


Fig. 3: Torque characteristic

sales@magnetschultz.co.uk
Phone: ++44 (0) 1483 794700

QUALITY SINCE 1912

Technical data proportional rotary solenoids of the series G DR

G DR X		035					050					075				
Rated voltage U_N	(V)	⎓24					⎓24					⎓24				
Operating mode ED		S1	S3	S3	S3	S3	S1	S3	S3	S3	S3	S1	S3	S3	S3	S3
		100 %	40 %	25 %	15 %	5 %	100 %	40 %	25 %	15 %	5 %	100 %	40 %	25 %	15 %	5 %
Rated power P_{20}	(W)	6,6	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 ϑ_{11}	(°C)	35					35					35				
Rotation angle	(°)	110					110					110				
Mass m	(kg)	0,156					0,425					1,42				
Moment of inertia of the armature J	(kgm²)	$1,9 \times 10^{-6}$					$1,1 \times 10^{-5}$					$1,1 \times 10^{-4}$				

Technical date **Rotation angle position sensor** **on proportional rotary solenoids**		**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 consumption	(mA)	<14	
Output voltage	(V)	1,8 ... 3,1	e.g. at U_{Supply} = 5 V
In central position	(V)	2,5±0,25	
Sensitivity	(mV/1°)	typically 11±1	
Linearty tolerance	(%)	±3	
Limit frequency (-3 dB)	(kHz)	typically 23	
Reference temperature range	(°C)	0 ... 50	
Temperature drift	(%/°C)	typically 0,05	
Output resistance	(Ω)	50	

Sensitivity
The sensytivity is the change output signal referring to the measurement path (indicated in mV/1°).

Linearity fault
Lineartiy fault indicates the deviation (in per cent) of the output signal from the ideal straight line

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

Limit frequency
In reference to the Hall sensor

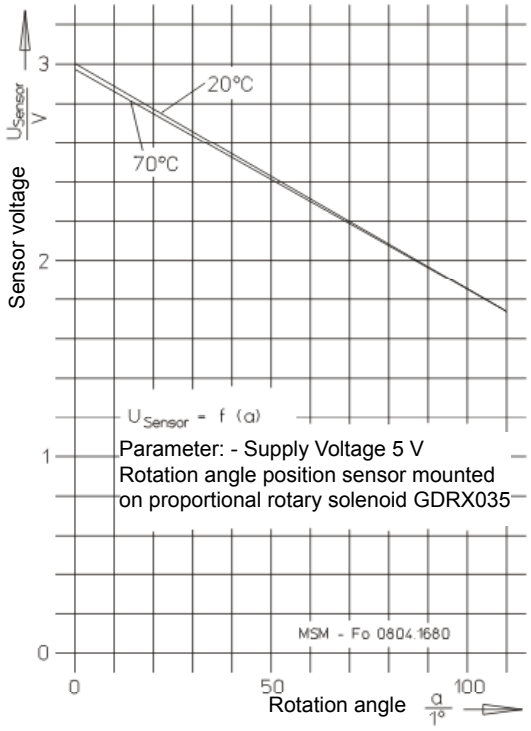


Fig. 4:
Voltage vs. rotation angle characteristic of rotation angle position sensor

Serial values
The torque values indicated in the table refer to 90% of the rated voltage of ⎓24 V and to the normal operating temperature. For other voltages the torque may differ. Due to natural dispersion the torque values may deviate by ±10% from the values indicated in the tables.
Rated voltage ⎓24V, other voltages on request.
The normal operating temperature is based on:
a) Mounting on heat-insulating base
b) Rated voltage ⎓24 V
c) Operating mode S3 5% - S1 according to part list G XX section 4
d) Reference temperature 35°C

It is advisable to do not limit bigger masses connected to the shaft by means of stops inside the solenoid but outside.

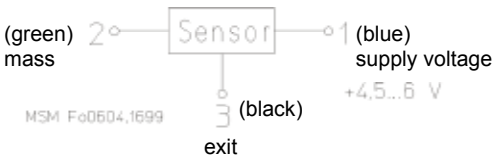


Fig 5:
Block diagram

sales@magnetschultz.co.uk
Phone: ++44 (0) 1483 794700

Type G DR X 035

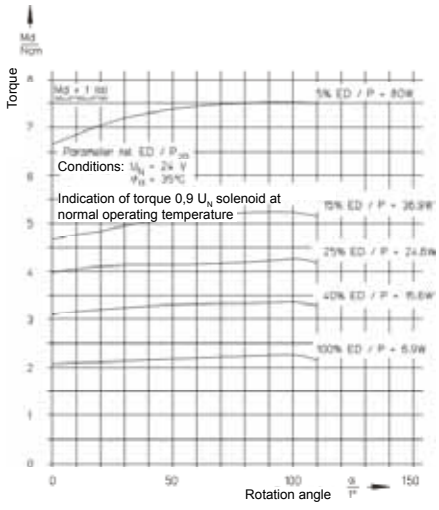


Fig. 6: MSM-Fo 0804.1692
Characteristics Md = f (d)
Type G DR X 035

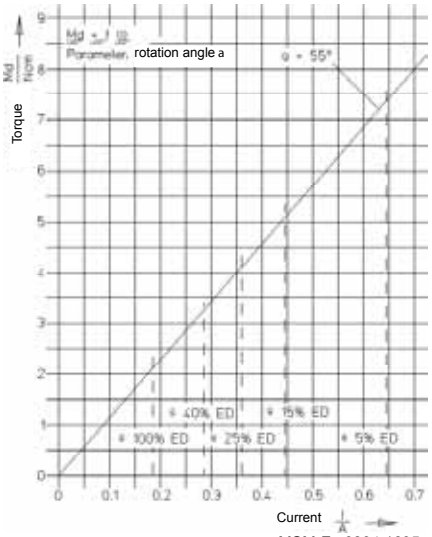


Fig. 7: MSM-Fo 0804.1695
Characteristics Md = f (I)
Type G DR X 035

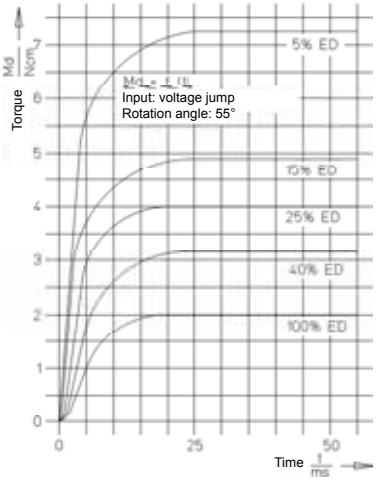


Fig. 8: MSM-Fo 0804.1675
Characteristics Md = f (t)
Typ G DR X 035

Type G DR X 050

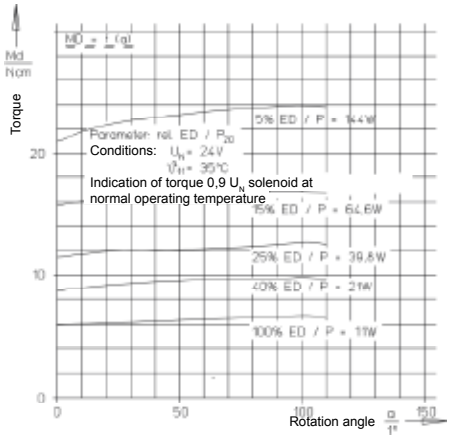


Fig. 9: MSM-Fo 0804.1693
Characteristics Md = f (d)
Type G DR X 050

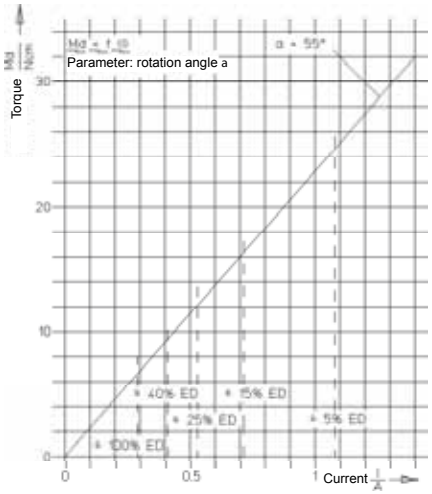


Fig. 10: MSM-Fo 0804.1696
Characteristics Md = f (I)
Type G DR X 050

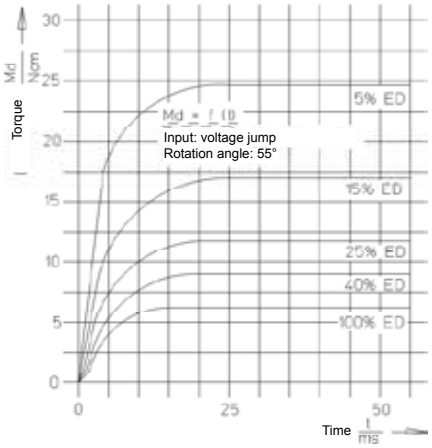


Fig. 11: MSM-Fo 0804.1676
Characteristics Md = f (t)
Type G DR X 050

Type G DR X 075

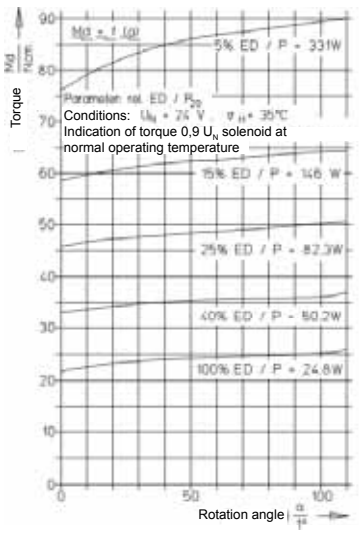


Fig. 12: MSM-Fo 0804.1694
Characteristics Md = f (d)
Type G DR X 075

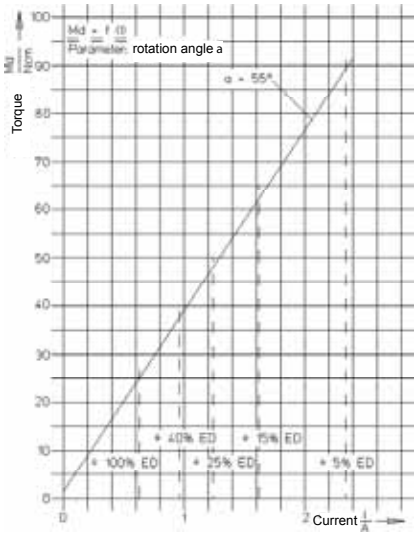


Fig. 13: MSM-Fo 0804.1697
Characteristics Md = f (I)
Type G DR X 075

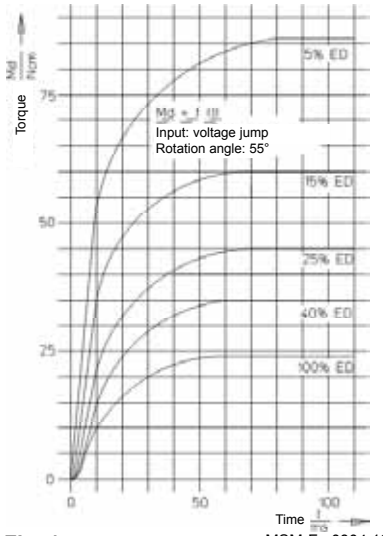
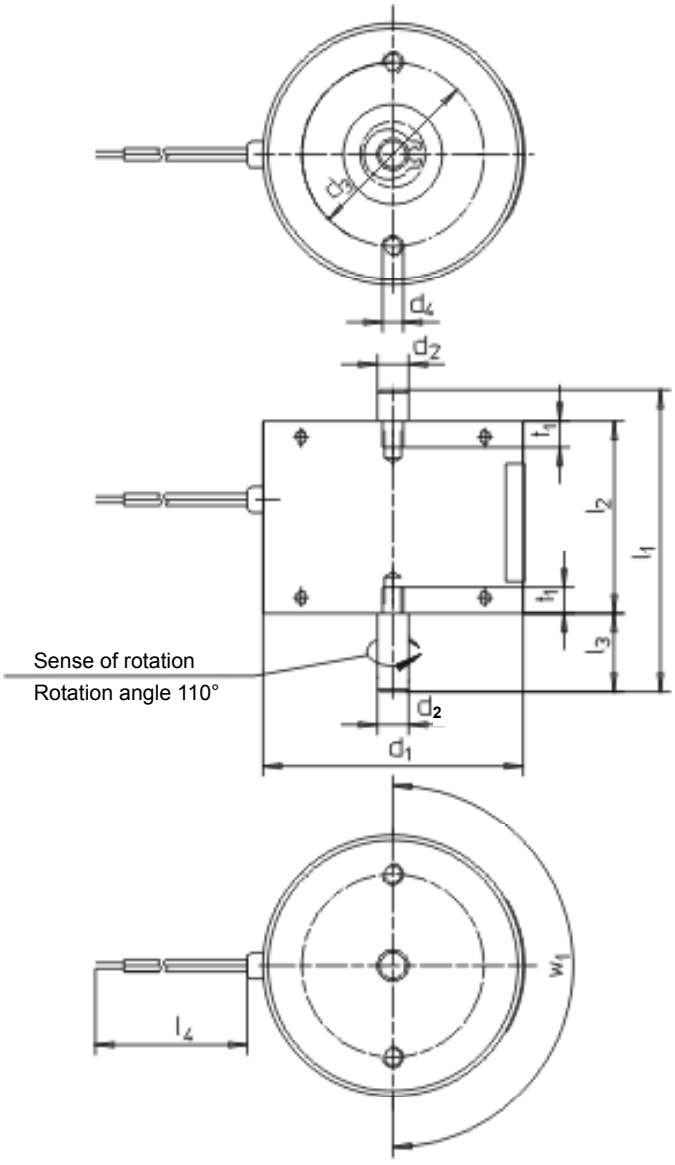


Fig. 14: MSM-Fo 0804.1677
Characteristics Md = f (t)
Type G DR X 075

sales@magnetschultz.co.uk
Phone: ++44 (0) 1483 794700

Dimension tables



MSM-Fo 0804.1710

	G DR ... A01		
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	M3	M4	M5
d_5	35	35	35
l_1	46	58	86
l_2	30	37	56
l_3	10	15	20
l_4	100	150	200
[1)] t_1	3,5	5	8
w_1	2x180°	2x180°	3x120°

[1)] Please do not exceed the thread depth t1 as this may cause a damage of the coil.

Fig. 15:
Dimensions
Type G DR X 035 X 20 A01
to type G DR X 075 X 20 A01

sales@magnetschultz.co.uk
Phone: ++44 (0) 1483 794700

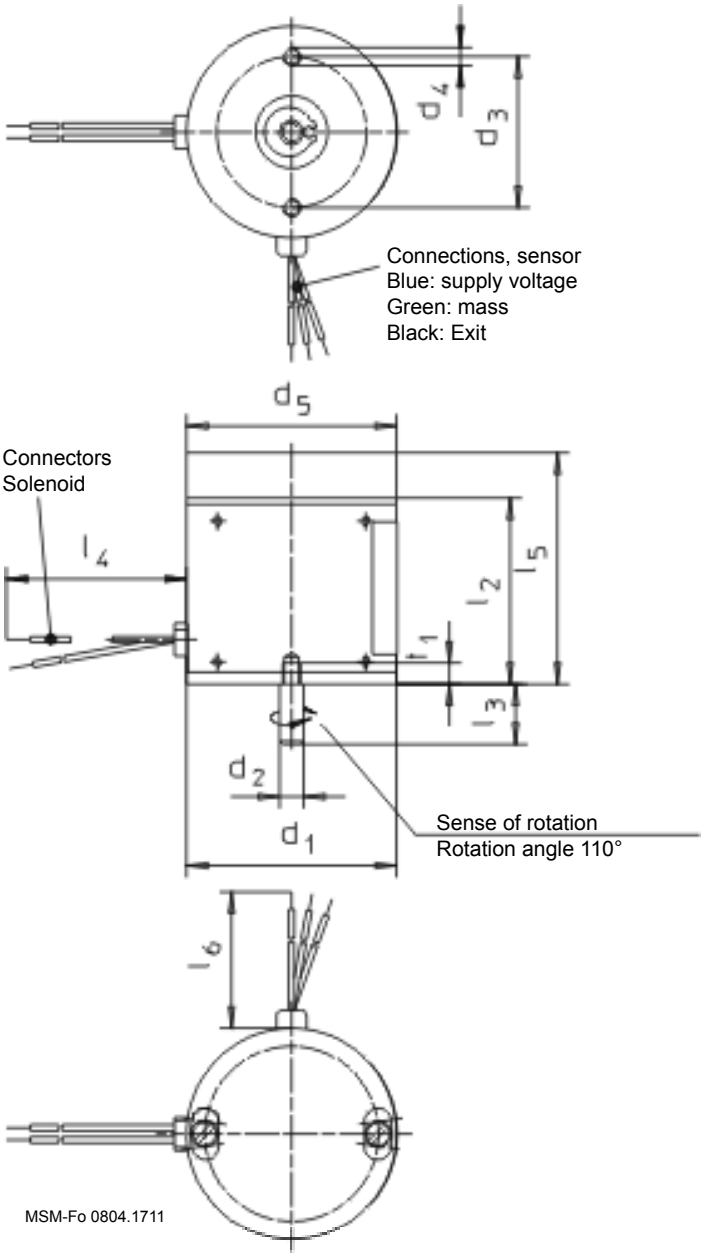


Fig. 16:
Dimensions
Type G DR X 035 X 20 A61
to type G DR X 075 X 20 A61
With rotation angle position sensor

	G DR ... A61		
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	M3	M4	M5
d_5	35	35	35
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
[1)] t_1	3,5	5	8

[1)] Please do not exceed the thread depth t1 as this may cause a damage of the coil.

(missing dimensions see fig. 15)

This part list is a document for technically qualified personnel. This publication is for informational purposes only and must not be considered as mandatory product description, unless this is confirmed expressively.

Please make sure that the described devices are suitable for your application. Please find further information about the duly assembly among others in the -Technical Explanations, the valid DIN VDE0580 as well as in the relevant prescriptions.

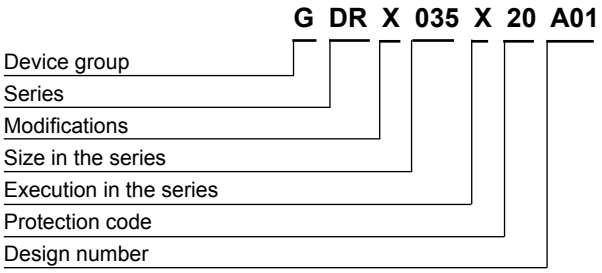
Information and remarks concerning European directives can be taken from the correspondent information sheet which is available under *Produktinfo.Magnet-Schultz.com*.

Note on the RoHS guideline 2002/95/ EC

The devices presented in this document do not fall into the scope of regulation 2002/95/EC („RoHS“) and do not become part of products which fall into the scope according to our state of information. In case of surfaces zinc coating with yellow chromating and zinc iron with black chromating separate agreements are necessary for application according RoHS.

sales@magnetschultz.co.uk
Phone: ++44 (0) 1483 794700

Type code



Order example

Type	G DR X 035 X20 A01
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.