

DC Holding Magnet

With or without optional armature

Type G MH G ZZ

Benefit from more than 100 years of experience. Use our unmatched end-to-end service: from off-the-shelf products to tailor-made designs - prototyped, tested and manufactured to your exact requirements.

Get free advice, a detailed quote or buy now

Email us at sales@magnetschultz.co.uk or call +44(0)1483 794700

Function

- high holding force
- increasing force vs. stroke characteristic
- gimbal mounted armature

Construction

- 7 sizes - Ø 025mm to 100mm
- metallic faces zinc-plated for corrosion protection
- electrical connection via flexible flying leads, terminal block, or plug connector
- protection class according to DIN VDE/DIN EN 60529 when correctly installed:
 - flexible flying leads: IP 00
 - terminal block: IP 20
 - plug connector: IP 40
- coil insulation: thermal Class F
- fastening via threaded holes on the rear side

Application examples

- robotics, fixture holding, conveyors, door holding systems
- interlocking of all sorts
- use as control solenoid for short strokes

Options

- protection class IP 65/68 on request

Standards

- designed and tested to DIN VDE 0580
- manufactured to ISO 9001



Fig. 1: Holding magnet without armature
Type G MH X 050 X20 A11

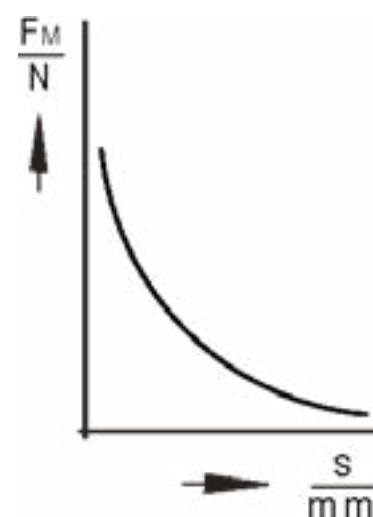


Fig. 2: force vs. stroke characteristic

Technical data

G MH X		025	030	040	050	065	080	100
Operating mode		S1 100%	S1 100%	S1 100%	S1 100%	S1 100%	S1 100%	S1 100%
Rated power P_{20}	(W)	3,2	4	5,6	6,5	9,8	12,4	17
Solenoid weight m_M	(kg)	0,07	0,1	0,22	0,38	0,75	1,3	2,2
Armature weight m_A	(kg)	0,012	0,029	0,05	0,1	0,21	0,4	0,74
Armature thickness	(mm)	3	5	5	6	8	10	12
Armature diameter \varnothing	(mm)	25	30	40	50	65	80	100
Stroke s	(mm)	Magnetic force F_M (N) (with test armature)						
Holding force ¹⁾	0 ¹⁾	135	250	470	720	1330	2050	3330
	0,1	36,3	70	275	569	1128	1942	3140
	0,16	18,2	38	157	373	883	1600	2747
	0,25	9,8	20	80	216	618	1256	2354
	0,4	3,5	10	30	93	294	657	1520
	0,6	1,8	5	14	41	132	314	804
	1,0	0,9	2	6,2	18	61	128	324
	1,6	—	—	2,6	7	18	45	137
	2,5	—	—	1,3	2,2	10	18	58
	4	—	—	0,5	0,8	3,2	9,8	26
6	—	—	—	0,4	2,6	4,9	11	
Magnetic force $F_M^{2)}$ at 0mm with armature G ZZ E		115	210	380	630	1080	1660	2700

Table 1: G MH technical data

- 1) For corrosion protection, the electromagnets are zinc-plated. Increased holding forces of approximately 10% can be achieved with plain (unplated) pole faces - availability on request.
- 2) The armatures are protected against corrosion by nickel plating. Due to this insulating nickel layer, an artificial air gaps exists, which is taken into account in the force figures in the above table.

Notes on the tables

The force values indicated in the tables refer to 90 % of the rated voltage, ($U_N = \text{---} 24 \text{ V}$, deviations of the magnetic force may occur for other voltages) and the normal operating temperature.

Due to natural dispersion the magnetic force values may deviate by approx. $\pm 10 \%$ from the table values.

The normal operating temperature is based on:

- a) Rated voltage $\text{---} 24 \text{ V}$
- b) Operating mode S1 100%
- c) Ambient reference temperature 35° C
- d) Mounting on heat-insulating base

Rated voltage

Rated voltage is $\text{---} 24 \text{ V}$. Adaptation of the coil winding to rated voltages less than $\text{---} 120 \text{ V}$ is possible on request.

Standard values for voltage and operating mode: 24 V , S1 (100%).

The devices correspond to protection class III. Electrical equipment of protection class III may be only connected to low voltage systems (PELV, SELV)(IEC 60364-4-41). The design limit of the equipment is a rated voltage not higher than 120 V (EN 61140:2002) with DC. On request we are pleased to check to what extent the delivery of higher rated voltages is possible as special solutions by agreement.

In the interest of a low surface temperature, the temperature rise of the devices is $\Delta_{v,32} = 60 \text{ K}$.

The magnetic force values are measured using blank armature made of 9 S Mn 28 with plane ground surface and a surface roughness of $15 \mu\text{m}$ max. On request an increase of the magnetic force is possible by a special adjustment of the winding. If the armature thickness is small, the magnetic force is reduced. The use of materials with other permeability or bad surface quality may cause higher deviations of the rated force.

After switching off the supply voltage, a retention force of about 5% of the magnetic force may remain. Degaussing units are also available to mitigate this - see page 4. This retention force decreases by using an armature with surface coating.

Dimension tables

Solenoid without armature

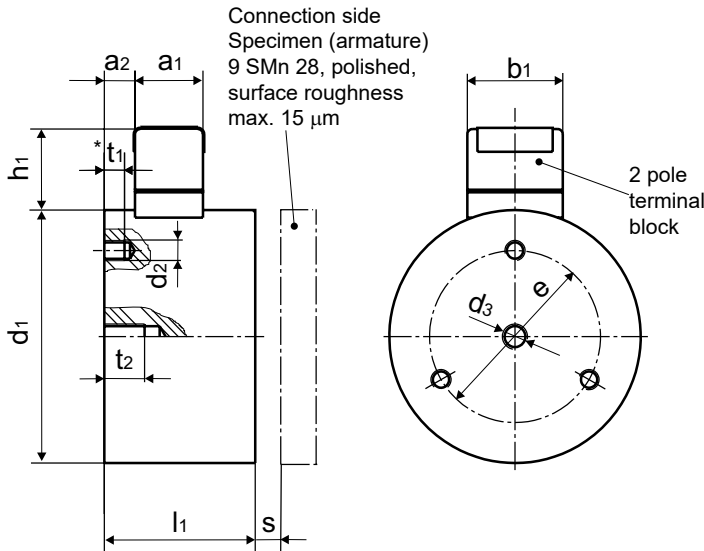


Fig. 3: Type G MH X 025 X 20 A11 to G MH X 100 X 20 A11 - Terminal block design

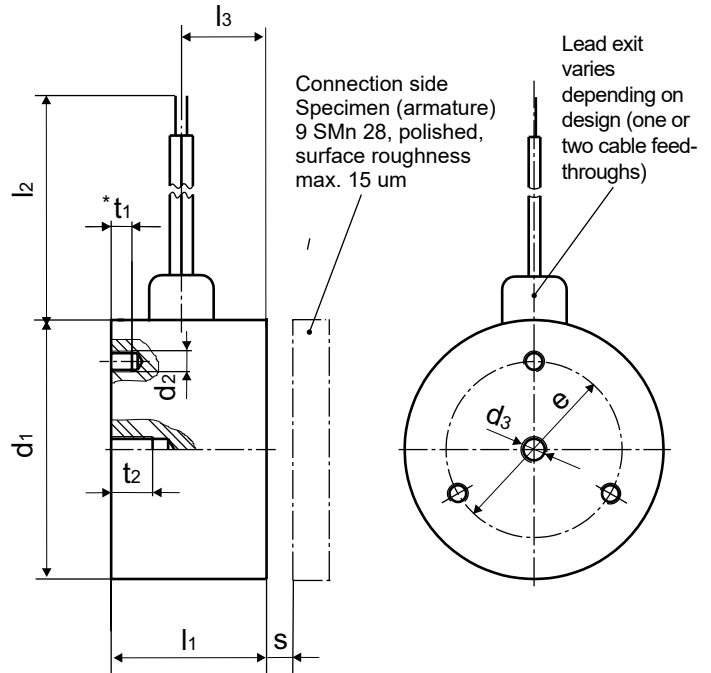


Fig. 4: Type G MH X 025 X 00 A11 to G MH X 100 X 00 A11 - Flying lead design

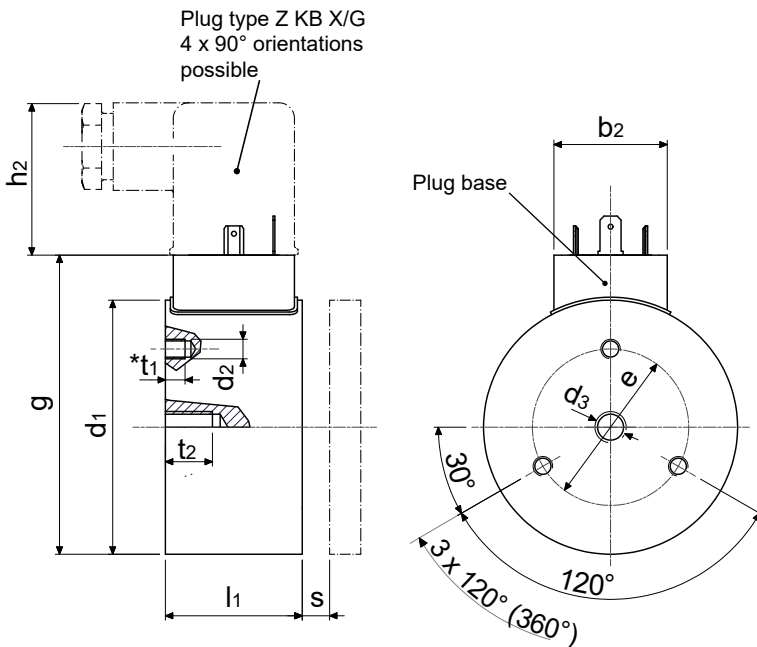


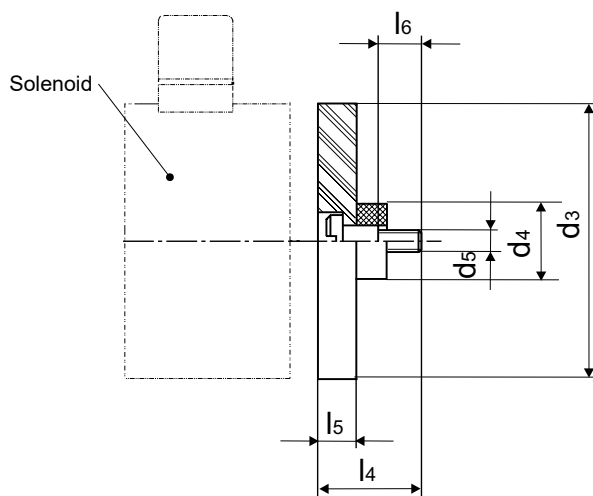
Fig. 5: Type G MH X 050 X 20 D0'X' to G MH X 100 X 20 D0'X' - Plug base design - see table 4 for full type codes
For plug connectors see [Z KB X for DC supply](#)
[Z KB G for AC supply](#)

G MH X							
Size	025	030	040	050	065	080	100
Dim.	Dimensions in mm						
a ₁	13,5	13,5	13,5	13,5	13,5	13,5	13,5
a ₂	4,5	5,6	6	6	7	8,5	11
b ₁	19	19	19	19	19	19	19
b ₂	—	—	—	29	29	30	30
d ₁	25	30	40	50	65	80	100
d ₂	M3	M3	M4	M4	M5	M6	M6
d ₃	M4	M5	M5	M5	M8	M8	M10
e	15	18	26	34	40	50	75
g	—	—	—	61,5	76,5	100	120
h ₁	16	16	16	16	16	16	16
h ₂	—	—	—	39	39	39	39
l ₁	20	24	27	30	35	38	43
l ₂	150	150	150	150	150	150	150
l ₃	11,4	15	17,4	20,4	24,4	25,8	28,3
*t ₁	3	4	4	4	5	7	7
t ₂	6	5	8	8	12	12	15

Table 2: G MH X dimensions

* Do not use over-length screws longer than thread depth 't₁', as this could damage the coil

Armature for solenoids



G Z Z E							
Size	025	030	040	050	065	080	100
Dim.	Dimensions in mm						
d ₃	25	30	40	50	65	80	100
d ₄	8	10,5	10,5	10,5	13,5	16	21,5
d ₅	M3	M4	M4	M4	M5	M6	M8
l ₄	9,5	14	14	15	19	23	26
l ₅	3	5	5	6	8	10	12
l ₆	4,5	6	6	6	7	9	11

Table 3: G Z Z E dimensions

Fig. 6: Type G Z Z E 025 X 00 A01
to G Z Z E 100 X 00 A01
(size 030: ... D01)

Related products

Electro-permanent magnets

Type GMP



Monobloc magnets

Type GMH/GMP
- IP68 protection



Boxed electromagnets

BM EH/ER



Industrial load release

Type EH, ER



Spring loaded armature

Type GZZE



Degaussing unit

- reduces/eliminates residual magnetism/remanence



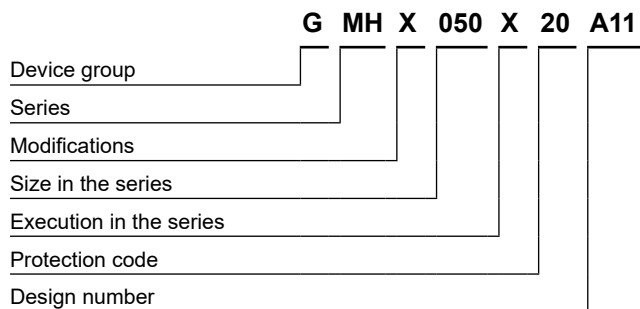
Type code table

Type	Size (diameter) (mm)	Execution and protection	Design number		Voltage, admissible duty cycle for rated voltage 24V
			Terminal/ Flying Lead	Plug	
G MH X	025	X00 (flying lead)	A11	OR	*
	030				*
	040				*
	050	OR			D07
	065	X20 (terminal block/ plug connector)			D03
	080				D02
	100				D09
					24V DC (max. 120V) Protection class III

Table 4: Type codes

* Plug connector only available in sizes 050-100

Type code details



Order example

Holding magnet

Type: G MH X 050 X20 A11
 Voltage: == 24 V DC
 Operating mode: S1 (100 %)

Armature

Type: G ZZ E 050 X00 A01

Information and remarks concerning European directives can be taken from the corresponding information sheet which is available on the [magnetschultz.co.uk website](http://magnetschultz.co.uk).

Note on the RoHS Directive

According to our current state of knowledge, the devices shown in this document do not contain concentrations of hazardous substances which would result in them, or subsequent assemblies in which they are utilised, not complying with RoHS.

Please make sure that the described devices are suitable for your application. Our offers for these devices are based on the assumption of maximal 8 in an FMEA severity table, i. e. in case of malfunction of the device model as offered, there is, amongst others, no jeopardy of life or limb. Supplementary information concerning its proper usage and installation can be found in our [Technical Explanations \(GXX\)](#) document, as well as [DIN VDE0580](#) and other relevant specifications. Further information regarding device selection can be found in our [Solenoid Selection Guide](#).

This datasheet 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 explicitly confirmed.

Please do not hesitate to ask us for application-oriented solutions. In order to find a reliable solution we require details about your specific application and installation conditions. The details should be specified as precisely as possible in accordance with the relevant [Technical Explanations \(GXX\)](#) document.

Need more information or advice?

Email one of our technical experts at sales@magnetschultz.co.uk or call +44(0)1483 794700 now