

D.C. Open Frame Solenoid

Rectifier for A.C. supply
Range up to 20 mm and 150 Ncm

1

Product group

Type **G FC**

- According to VDE 0580 and ISO 9001
(conform with article 10 of directions 73/23/EEC –
according to CENELEC memorandum no. 3 of March 1987).
- Linear force characteristic (fig. 3)
- Small dimensions – Six sizes
- Push and pull operation – Conical spring return available
- High endurance, maintenance free PTFE armature and
push rod bearings
- Coil with insulation to class F for voltages up to 250 volts
- Protection classification – DIN VDE 0470/EN 60529
Spade connectors – IP 00 (A 6,3 x 0,8 DIN 46244)
Flying leads – IP 00
- Special versions with terminal block or plug connector
available
- Suitable for mounting in any attitude
- All sizes available with linear shotbolt/spring return for
energize to lock or unlock operation
- Right angle shotbolt assembly provided for size 040
energize to lock or unlock with optional interlock/
indication switches
- Fork ends are available (list Z GA)
- Modifications and special designs on request
- General-purpose open frame solenoid for arduous
service on:
Machine tools Office machines
Automation Remote control
Packaging and coin equipment
Textile machinery

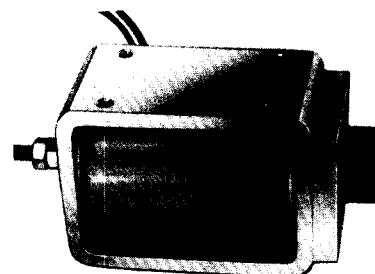


Fig. 1
Type G FC X 060 X 00 E 04

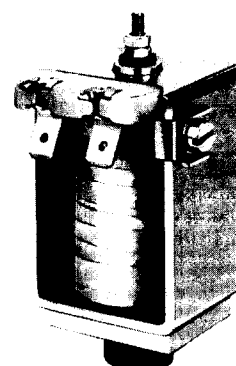


Fig. 2
Type G FC X 040 X 00 B 12

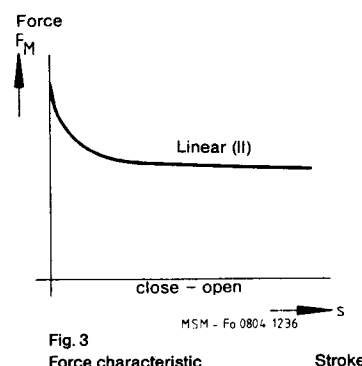


Fig. 3
Force characteristic

G FC	025					030					035				
Duty rating ED (%)	100	40	25	15	5	100	40	25	15	5	100	40	25	15	5
Stroke s rated (max. stk.) ¹⁾ (mm)	4 (8 max.)					5 (9 max.)					7 (11 max.)				
Holding force (N)	7,0	10,4	12	13,9	20,7	11	17	20	25	32	16,7	23,4	27,5	34,4	52
Force rating F_M at rated stk. (N)	2,7	5,0	6,3	7,6	11,1	4,3	8,3	9,9	12,7	17,5	7,7	13,2	15,5	19,1	30
Force rating F_M at max. stk. (N)	0,4	0,9	1,35	2,0	5,0	0,9	2,0	2,8	4,7	9,2	2,1	4,5	5,9	9,4	18
Work rating A_N (Ncm)	1,08	2,0	2,52	3,04	4,44	2,15	4,15	4,95	6,35	8,75	5,4	9,3	10,8	13,4	21
Power consumption P_{20} (W)	6,3	12	18	25	58	7	15	20	36	83	10	23	32	55	125
Freq. of operation (S_h max.) ($1/h$)	30000	21000	15000	9000	3000	22000	15000	9000	5500	1900	16000	13000	9000	5500	2200
Closing time t_1 (ms)	50	50	45	45	45	70	70	70	70	70	100	80	75	70	60
Opening time t_2 (ms)	33	30	28	25	21	50	45	40	35	32	60	50	50	50	45
Armature weight m_A (kg)	0,02					0,03					0,04				
Solenoid weight m_M (kg)	0,1					0,16					0,27				

G FC	040					050					060				
Duty rating ED (%)	100	40	25	15	5	100	40	25	15	5	100	40	25	15	5
Stroke s rated (max. stk.) ¹⁾ (mm)	8 (12 max.)					10 (15 max.)					12 (20 max.)				
Holding force (N)	41	56	63	74	95	71	100	120	135	190	90	120	133	170	252
Force rating F_M at rated stk. (N)	12,2	19	22,6	26,4	38	21	37	47	55	78	33	57	65	85	125
Force rating F_M at max. stk. (N)	3,1	6,8	9,0	13,5	26	6,5	14,8	24,7	33,7	64	7,0	17,5	22	40	86
Work rating A_N (Ncm)	9,8	15,2	18,1	21,1	30,4	21	37	47	55	78	39,6	68,4	78	102	150
Power consumption P_{20} (W)	14	31	44	62	134	20	50	76	117	284	26	60	66	128	320
Freq. of operating (S_h max.) ($1/h$)	13000	9000	6500	4500	1600	10000	7000	5000	3000	1300	8000	4500	3000	2600	1000
Closing time t_1 (ms)	120	120	100	90	80	180	150	135	130	100	230	230	200	150	125
Opening time t_2 (ms)	85	70	60	60	55	85	70	65	60	60	100	85	80	75	65
Armature weight m_A (kg)	0,08					0,15					0,24				
Solenoid weight m_M (kg)	0,45					0,85					1,3				

1) 0 mm is completion of energized stroke.

PERFORMANCE TABLE

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 Pull arrangement
Tolerance $\pm 10\%$ (inherent & manufacture).

MAGNETIC FORCE (F_M)

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

POWER CONSUMPTION (P_{20})

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.

OPERATING TIMES (t_1/t_2)

are listed per cycle of operation in HOT condition at rated voltage with weight load of 70 % of Force (F_M) at and over rated stroke.

SUPPLY VOLTAGE:

Standard D.C.: 24 V, 97 V, 205 V (max. 250) (for A.C. 50/60 Hz rectified, 110 V, 230 V).

A separate external rectifier can be provided for A.C. supply.

PROTECTION

Special finishes available – Paint (tropical) – Plating (special tropical protection).

SPECIAL

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

INSTALLATION

Installation details are provided in Technical Bulletin G XX.

OVER VOLTAGE

Force and/or speed of stroke may be increased by application of over-voltage: – DC pulse width modulator Type OVDC.

ADAPTATIONS

Long stroke, shotbolt, spring return and fork end adaptations are available – see page 4.

Conversion Factors

1 N = 0,102 kp $\approx$ 0,1 kg
1 kg = 2,2 lb
1 mm = 0,039 in
1 Ncm = 0,086 in lb

Spade connectors

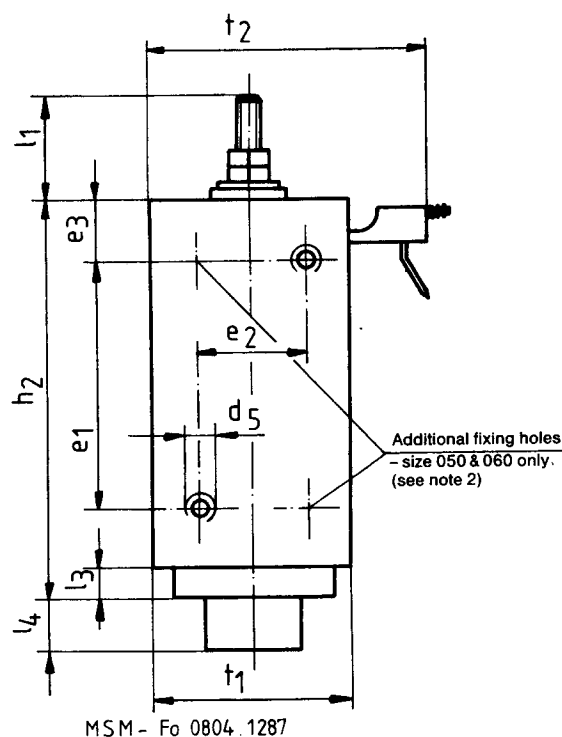
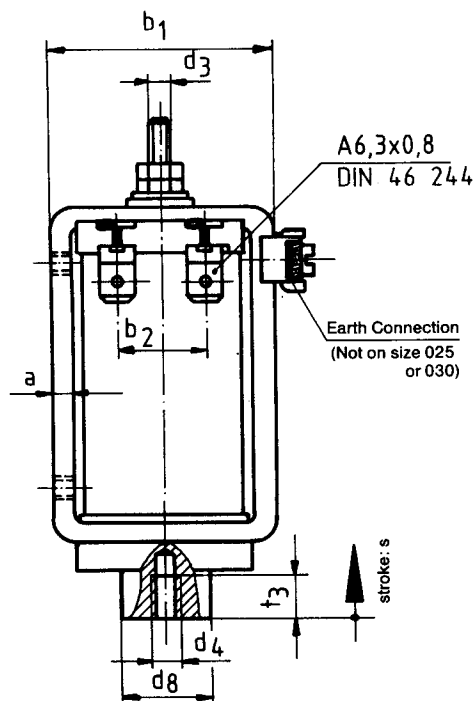


Fig. 4 Spade connectors
Type G FC X 025 to
060 X 00 B 12

Free leads

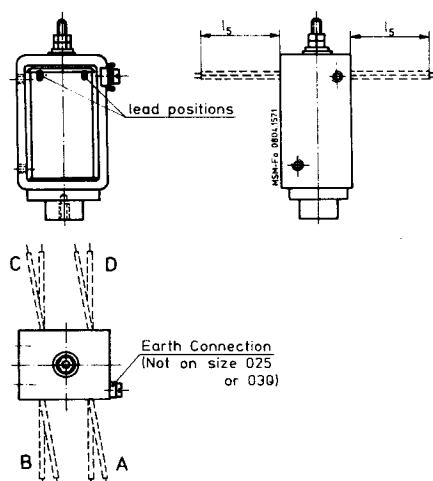


Fig. 5 Free leads
G FC X 025 to 060 X 00 E... (see table)
See Fig. 4 for other dimensions

Type	G FC						
Size	025	030	035	040	050	060	
Lead Position (Standard)	A	B	A	A	C	A	C
Type code GFCX...X00...	E 01	E 01	E 01	E 04	E 10	E 05	E 03

Highly flexible and other special leads also available.

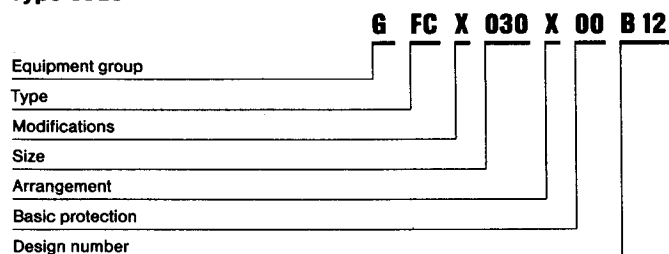
Type	G FC					
Size	025	030	035	040	050	060
Dim.	Dimension (mm)					
a ³⁾	2	2,5	2	4	4	4
b ₁	25	30	35	40	50	60
b ₂	16	16	16	16	16	16
d ₃	M3	M3	M3	M4	M5	M6
d ₄	M3	M4	M4	M5	M5	M6
d ₅ ²⁾	M3	M3	M3	M4	M4	M5
d ₈	10	12	14	16	20	24
e ₁	20	25	30	40	45	50
e ₂	12	14	18	18	28	32
e ₃	7,5	7,5	10	10	12,5	15
h ₂	39	45	55	65	76	88
l ₁	12	12	12	16	18	22
l ₃	4	5	5	5	6	8
l ₄	5	6	8	9	11	13
l ₅	150	150	200	200	200	250
t ₁	20	24	30	32	41	50
t ₂	31,5	36	42	45	54	63
t ₃	6	6	7	8	8	10
s*	4	5	7	8	10	12
Fork end Z GA	030	030 040	030 040	040 050	050	060

2) Sizes 050 - 060 - 4 fixing holes

* See note 1), page 2

3) Do not use overlength screws

Type code



Order Example

I. Equipment group

Type

Modification

Size

Arrangement

Protection

Connections

Free leads

See table, page 3

Spade connectors

Voltage (V) – standards – page 2

Duty rating (ED %) – from tables
(5, 15, 25, 40, 100)

Additional requirements – specify

1. Special protection
tropical or special tropical

2. Spring return

3. Fork end Z GA

4. Shotbolt/lock assembly

– D.C. classification

– Standard

– Select from tables

– Standard

– Standard

– (E 01 – E 10)

– B 12

– G

– FC

– X

– 030

– X

– 00

– B 12

– 24 V

– 100 %

Adaptations available

Long Stroke / Shotbolt / Spring Return / Fork End

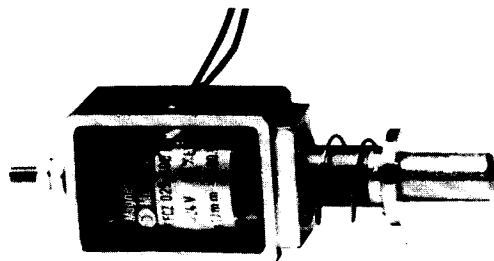


Fig. 6
Type G FC Z 025 X 00 E 01 long stroke
adaptation with bolt end and spring return

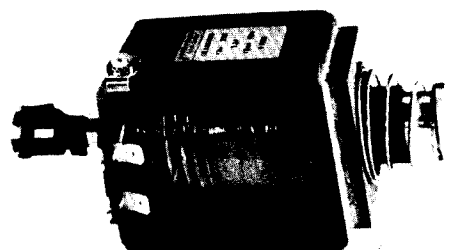


Fig. 7
Type G FC X 060 X 00 B 12 with
spring return and fork end