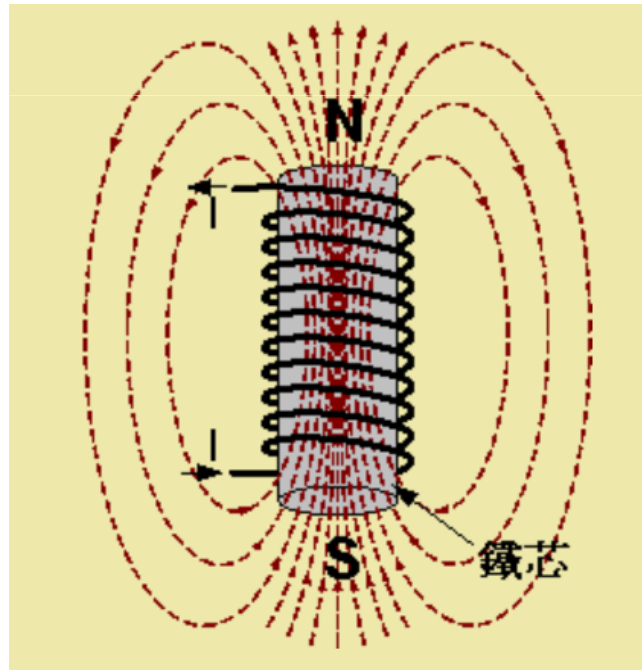


油壓及空壓電磁閥用線圈面面觀

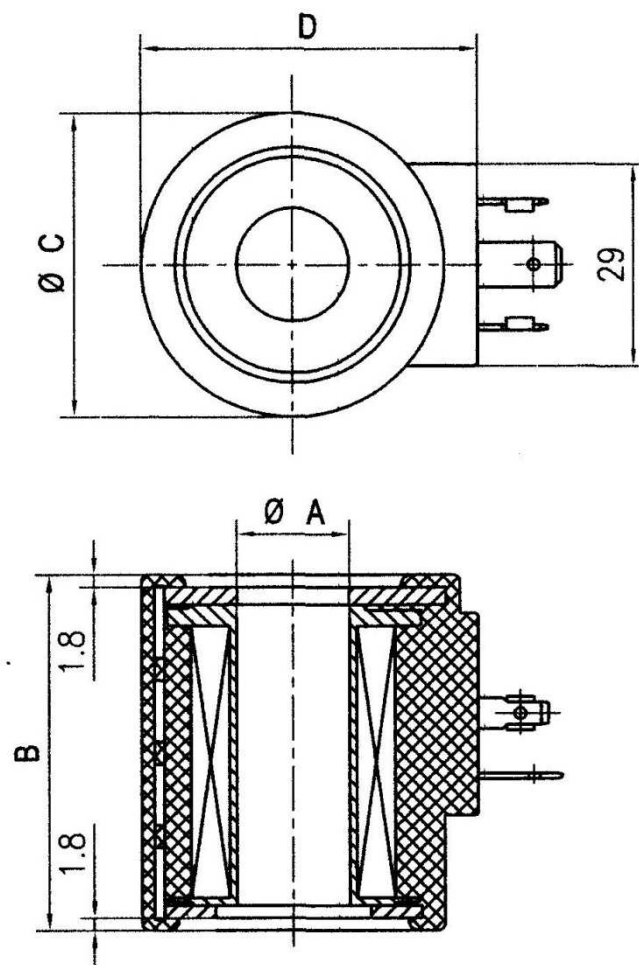
2014/8/29

一.線圈之說明

- 作用:把電能變為磁力.
- 線圈形式有很多種,電磁閥用線圈為最簡單一種.



1.1尺寸: 孔、高、寬



1.2 功率

- 歐姆定律
- $A \text{ (電流)} = V \text{ (電壓)} / R \text{ (電阻)}$
- 功率
- $W = V \text{ (電壓)} * A \text{ (電流)} = V * V / R$
-
- 假定有一線圈 電阻是 24 OHM
- 在直流電壓 DC24時 $A = 24 / 24 = 1A$
 $W = 24 * 1 = 24 \text{ 瓦}$
- 在直流電壓 DC12時 $A = 12 / 24 = 0.5A$
 $W = 12 * 0.5 = 6 \text{ 瓦}$

1.4耐溫等級

- UL
- 保護等級IP per standard EN60529
- ED (DUTY) %

2.線圈性能,材料,成本,結構,形狀

- 2.1漆包線
- 線徑
- 絕緣漆
- UEW、EIW

2.2鐵殼(架)

- 作用:把磁力線集中
- 形狀



鐵架材料

影响發熱

Steel grade	EN 10130	Steel grade no.	BS 1449/1	NF A 36/401	UNI 5866	JIS G 3141
DC01	St 12 (FeP01)	1.0330	CR 4	C	FeP01	SPCC
DC03	St 13 (FeP03)	1.0347	CR 3	E	FeP03	SPCD
DC04	St 14 (FeP04)	1.0338	CR 1	ES	FeP04	SPCEN
DC05	St 15 (FeP05)	1.0312	-	-	-	-
DC06	IF 18 (FeP06*)	1.0873	-	-	-	-

純鐵

2.3包塑、及骨架

**COIL BOBBIN
MATERIALS**

ISO 9001 Certified

Property (dry as molded)	ASTM Method	Unfilled nylon 6/6	Glass filled nylon 6/6	Glass filled PBT ^(a)	Glass filled PET ^(b)	Glass filled PPS ^(c)	Liquid crystal polymer	Thermo-setting polyester	Phenolic	Glass filled DAP ^(d)
Notched izod impact, 73°F, ft-lbs/in.	D-256	1.0/2.1 ^(e)	2.2/2.5 ^(e)	1.3	1.6	1.6	2.4	4.3	.5	.8
Tensile strength, 73°F, psi x 10 ³	D-638	12.0/11.2 ^(e)	27/18 ^(e)	19.5	22	22.5	23	6.2	9	12
Elongation, 73°F, %	D-638	60/300+ ^(e)	3/4 ^(e)	1.5	2.3	.9	1.7	-	-	-
Flexural strength, 73°F, psi x 10 ³	D-790	-	38	28	32	29.4	31	13	14	19
Compressive strength, psi x 10 ³	D-695	4.9	42	18	25	26	18	29.9	40	22
Heat distortion, °F, 264 psi	D-648	194	480	406	435	>500	469	>500	400	400
Heat distortion, °F, 66 psi	D-648	455	500	442	475	>500	543	-	-	-
Thermal expansion, in/in/°C x 10 ⁻⁵	D-696	8.1	2.3	1.4	2.5	2/4 ^(l)	.6	3.5	1.9	1.9
Volume resistivity, ohm-cm	D-257	1015/1013 ^(e)	1015/109 ^(e)	1015	1015	1016	1015	1014	1013	1015
Dielectric constant, 100 Hz	D-150	4/8 ^(e)	4.5/25 ^{(e)(f)}	3.9	3.6 ^(f)	3.9 ^(f)	4.1 ^(f)	6.3	4.1	4.2/3.5 ^(k)
Dielectric strength, v/mil. 1/8" thick.	D-149	385/773 ^{(e)(h)}	530	490	430/1040 ^(g)	450	1110 ⁽ⁱ⁾	436	380	450/726 ^(g)
Oxygen index	D-2873	28/31 ^(e)	24	30	33	47	37	-	-	39
Arc resistance, seconds	D-495	60-120	135	123	117	34	137	>180	>180	130
Water absorption, %, 24 hrs.	D-570	1.2	.7	.07	.05	<.05	.02	.19	.1	.25
Flammability rating	UL-94	V2	HB	V0	V0	V0	V0	HB	V0	V0
Specific gravity	D-792	1.14	1.38	1.66	1.67	1.65	1.61	1.98	1.80	1.87
Hot wire ignition, seconds	UL-746	15	9	73	>300	12/300 ⁽ⁱ⁾	<30	-	-	-
Comparative tracking index, seconds	-	>599	400-599	250-399	250-399	100-174	175-259	400-599	175-259	>599
Thermoplastic (P), Thermosetting (S)	-	P	P	P	P	P	P	S	S	S

^(a) polybutylene terephthalate


^(g) (.125 inch thick molded) / (.032 inch thick molded)

^(h) polybutylene terephthalate

⁽ⁱ⁾ (125 mil thick molded) / (32 mil thick molded)

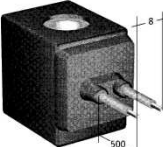
2.4 連接

DIN 43650 A
versione - version 259



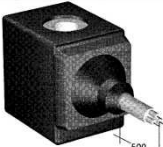
Cod.	Ø A	Ø B	Ø C	Ø D
mm				
259000	9.8	16.7	13.2	16.8
259001	13.2	16.7	13.2	16.8
259002	9.8	13.7	13.2	16.8
259003	9.8	16.7	13.2	20.5

Flying leads
versione - version 268



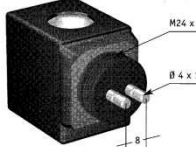
Cod.	Ø A	Ø B	Ø C	Ø D
mm				
268000	9.8	16.7	13.2	16.8
268001	13.2	16.7	13.2	16.8
268002	9.8	13.7	13.2	16.8
268003	9.8	16.7	13.2	20.5

Tripolar cable
versione - version 279



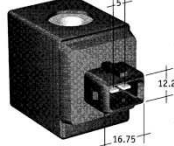
Cod.	Ø A	Ø B	Ø C	Ø D
mm				
279000	9.8	16.7	13.2	16.8
279001	13.2	16.7	13.2	16.8
279002	9.8	13.7	13.2	16.8
279003	9.8	16.7	13.2	20.5

Kostal M.24x1
versione - version 312



Cod.	Ø A	Ø B	Ø C	Ø D
mm				
312000	9.8	16.7	13.2	16.8
312001	13.2	16.7	13.2	16.8
312002	9.8	13.7	13.2	16.8
312003	9.8	16.7	13.2	20.5

AMP Junior
versione - version 342



Cod.	Ø A	Ø B	Ø C	Ø D
mm				
342000	9.8	16.7	13.2	16.8
342001	13.2	16.7	13.2	16.8
342002	9.8	13.7	13.2	16.8
342003	9.8	16.7	13.2	20.5

• Norme di riferimento EN 60204-1 - VDE 0580 (ed. 1994) - Direttiva 73/23 CEE • Reference rules EN 60204-1 - VDE 0580 (ed. 1994) - Directive 73/23 EEC
 I dati tecnici contenuti nella presente scheda, sono suscettibili di modifiche per motivi tecnici o commerciali; di conseguenza il Produttore si riserva il diritto di modificarli senza preavviso.
 All technical data reported on the present data sheet would be modified in function of technical or commercial reasons; therefore the manufacturer reserve its right to modify them without notice.

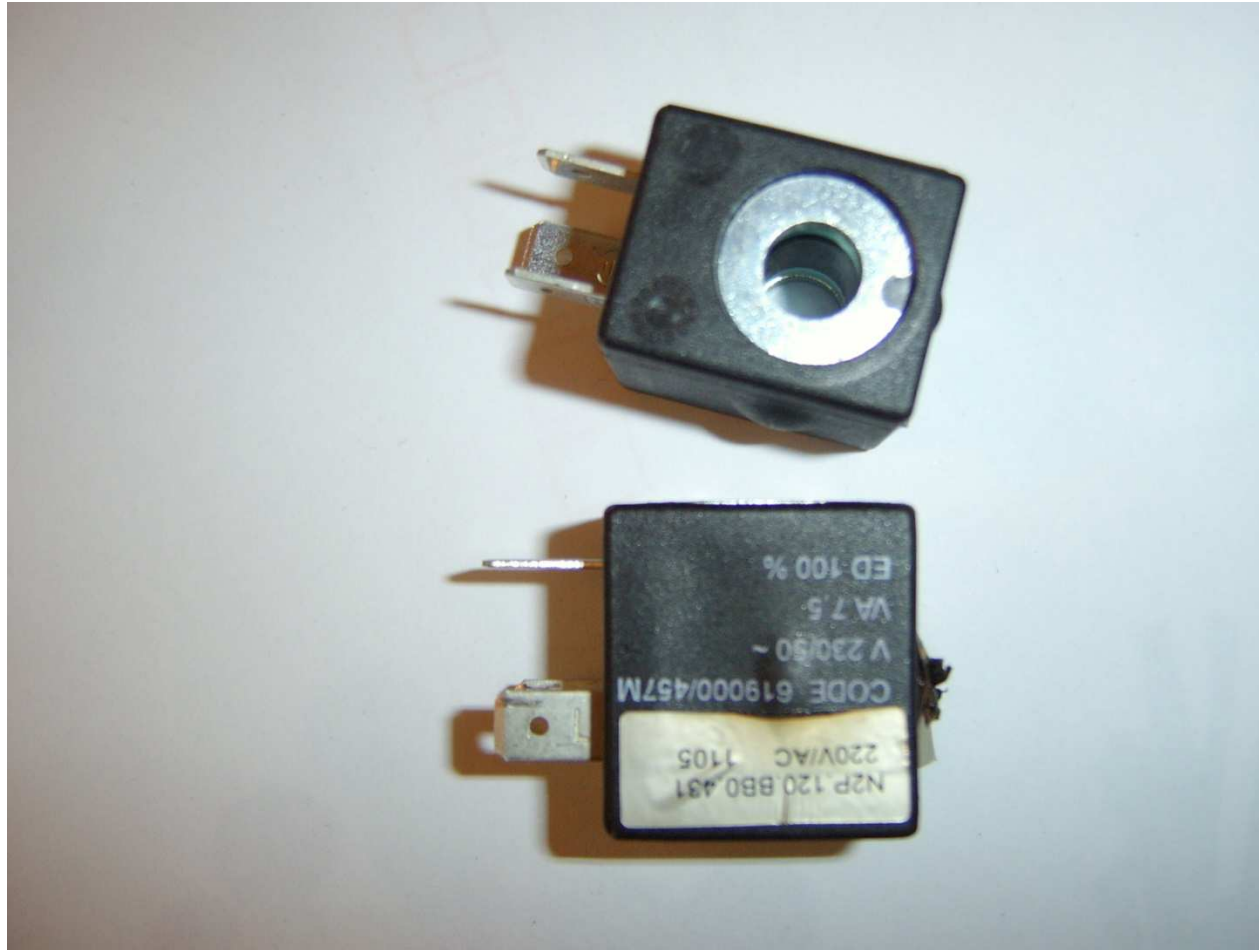
2.5 測試

- 生產線一般測試
 - 電阻
 - 高壓絕緣
 - 匝間衝擊耐壓測試 (脈沖線圈測試
impulse winding test)
- 特別測試
 - 溫度循環試驗
 - 請參閱hydraforce 的 e-coil web

3.不良之原因

- 3.1 Winding stress

3.2 steam



3.2 heat 熱

- 熱讓塑膠絕緣漆老化,

謝謝大家

cc.hha@msa.hinet.net