

# HA Series

## FEATURES

- Wide temperature, Standard
- Load Life 2000 hours at 105°C
- Suitable for Frequency converters, Professional power supplies and Electric welding machine
- Compliant to the RoHS directive
- 宽温通用品
- 105°C 2000小时
- 适用于变频器、专业电源和电焊机等
- RoHS指令对策品



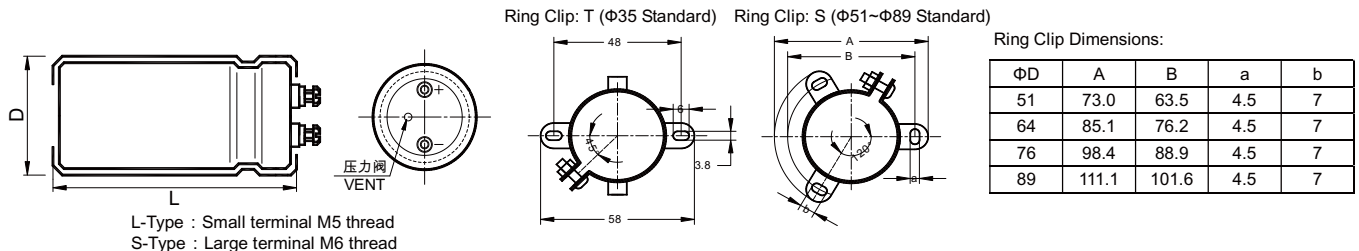
## 规格表 SPECIFICATIONS

项目 Items	特性 Characteristics		
工作温度范围 Operating Temperature Range	- 40 ~ +105°C	- 25 ~ +105°C	
额定工作电压范围 Rated Working Voltage Range	25 ~ 100V	160 ~ 600V	
静电容量范围 Capacitance Range	220 ~ 330000µ F		
静电容量允许偏差 Capacitance Tolerance	±20% (20 °C, 120Hz)		
损耗角正切值 Dissipation Factor ( MAX ) 20°C , 120Hz	U <sub>R</sub> (V)	25-100    160    200    250    350    400    450    500    550    600	
	tanδ	见规格表	0.15
漏电流 Leakage Current ( MAX )	I = 0.01C <sub>R</sub> U <sub>R</sub> 或 5mA 取小者 ( 20°C , 施加额定电压5分钟后 ) I = 0.01C <sub>R</sub> U <sub>R</sub> or 5mA whichever is minimum. ( at 20°C , After 5 minutes application of rated voltage ) I = 漏电流 ( µA )    U <sub>R</sub> = 额定电压 ( V )    C <sub>R</sub> = 静电容量 ( µF ) Leakage Current    Rated Voltage    Rated Capacitance		

	使用寿命 Useful Life	负荷寿命 Load Life	耐久性特性 Endurance Test	高温无负荷特性 Shelf Life
产品寿命 Life Time	4000h	>200000h	2000h	1000h U <sub>R</sub> ≤ 500V    500h U <sub>R</sub> ≥ 550V
漏电流 Leakage Current	≤ 规定值 ≤ Specified value	≤ 规定值 ≤ Specified value	≤ 规定值 ≤ Specified value	≤ 规定值 ≤ Specified value
损耗角正切值变化率 tanδ Change	≤ 规定值的300% ≤ 300% of specified value	≤ 规定值的175% ≤ 175% of specified value	≤ 规定值的130% ≤ 130% of specified value	≤ 规定值的150% ≤ 150% of specified value
静电容量变化率 Capacitance Change	初始值± 30%以内 Within ± 30% of initial value	初始值±15%以内 Within ± 15% of initial value	初始值±10%以内 Within ± 10% of initial value	初始值±15%以内 Within ± 15% of initial value
施加条件 Condition 施加电压 Applied Voltage 施加纹波电流 Applied Ripple Current 环境温度 Applied Temperature 失效等级 Failure Rate Level	U <sub>R</sub> I <sub>R</sub> 105°C ≤ 1% Failure Rate	U <sub>R</sub> 1.2 × I <sub>R</sub> 40°C ≤ 1% Failure Rate	U <sub>R</sub> I <sub>R</sub> 105°C 0%	U <sub>R</sub> I <sub>R</sub> 105°C 0% Back up to 20 °C and placed more than 24 hours. U <sub>R</sub> to be applied for 60 min before measurement.

## 尺寸图 Dimensions

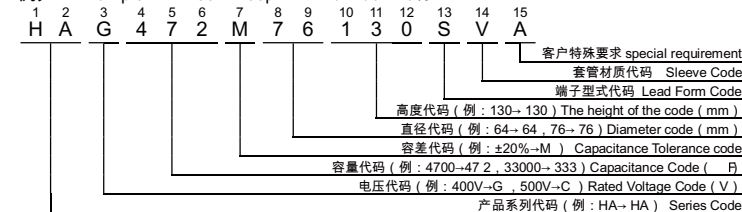
- 常用端子型式代码：Terminal Code



- 记载以外的端子形状，请另行咨询。Please consult to us for the terminal type not displayed in content.

## 产品编码体系 PART NUMBER SYSTEM

● 例如：Example HA 400V4700µF Φ 76×130 ±20%



## 纹波电流修正系数 Rated Ripple Current Multiplies

### 频率修正系数 Frequency coefficient

频率 Frequency ( Hz )	50(60)	100(120)	300	1k	≥10k
系数 Coefficient	0.80	1.00	1.18	1.30	1.40

### 温度修正系数 Temperature coefficient

温度 Temperature ( °C )	+ 40	+ 55	+ 70	+ 85	+ 105
系数 Coefficient	3.30	2.85	2.40	2.00	1.00

# HA Series

◆ 产品一览表 Standard Ratings

WV <sub>DC</sub> (Surge Voltage) (V)	Cap ( $\mu$ F)	Size D x L (mm)	tan $\delta$ 20°C/120Hz	Ripple Current 105°C/120Hz (Arms)	Catalog Part Number
25 (32)	10000	35×60	0.35	3.2	HAU103M35060□VA
	15000	35×80	0.35	4.8	HAU153M35080□VA
	22000	35×80	0.35	5.8	HAU223M35080□VA
	33000	35×100	0.40	7.2	HAU333M35100□VA
	47000	51×80	0.40	9.3	HAU473M51080□VA
	68000	51×115	0.50	11.5	HAU683M51115□VA
	100000	64×95	0.60	13.0	HAU104M64095□VA
	150000	64×115	0.80	17.9	HAU154M64115□VA
	220000	76×115	1.00	21.3	HAU224M76115□VA
330000	89×130	1.00	23.4	HAU334M89130□VA	
35 (44)	6800	35×60	0.30	2.8	HAT682M35060□VA
	10000	35×80	0.30	4.1	HAT103M35080□VA
	15000	35×80	0.30	5.2	HAT153M35080□VA
	22000	35×100	0.35	6.3	HAT223M35100□VA
	33000	51×80	0.40	8.7	HAT333M51080□VA
	47000	51×95	0.45	11.2	HAT473M51095□VA
	68000	51×150	0.50	14.3	HAT683M51150□VA
	100000	64×115	0.60	17.2	HAT104M64115□VA
	150000	76×115	0.70	20.7	HAT154M76115□VA
220000	89×130	0.70	23.4	HAT224M89130□VA	
50 (63)	3300	35×60	0.20	2.5	HAR332M35060□VA
	4700	35×60	0.25	3.7	HAR472M35060□VA
	6800	35×80	0.25	3.9	HAR682M35080□VA
	10000	35×80	0.25	4.7	HAR103M35080□VA
	15000	35×100	0.30	5.7	HAR153M35100□VA
	22000	51×80	0.35	8.1	HAR223M51080□VA
	33000	51×115	0.40	11.1	HAR333M51115□VA
	47000	64×95	0.40	13.9	HAR473M64095□VA
	68000	64×115	0.45	16.6	HAR683M64115□VA
100000	76×115	0.50	19.5	HAR104M76115□VA	
150000	76×115	0.50	23.9	HAR154M76115□VA	
63 (79)	2200	35×60	0.15	2.5	HAQ222M35060□VA
	3300	35×60	0.20	2.7	HAQ332M35060□VA
	4700	35×80	0.20	3.8	HAQ472M35080□VA
	6800	35×80	0.20	4.4	HAQ682M35080□VA
	10000	35×100	0.25	5.3	HAQ103M35100□VA
	15000	51×80	0.25	6.8	HAQ153M51080□VA
	22000	51×95	0.30	9.0	HAQ223M51095□VA
	33000	64×95	0.30	12.0	HAQ333M64095□VA
	47000	64×115	0.35	14.5	HAQ473M64115□VA
68000	76×115	0.40	18.4	HAQ683M76115□VA	
100000	89×130	0.40	20.0	HAQ104M89130□VA	
80 (100)	2200	35×60	0.15	2.8	HAP222M35060□VA
	3300	35×80	0.15	3.6	HAP332M35080□VA
	4700	35×80	0.15	4.3	HAP472M35080□VA
	6800	35×100	0.20	4.9	HAP682M35100□VA
	10000	51×80	0.20	6.4	HAP103M51080□VA
	15000	51×95	0.25	7.4	HAP153M51095□VA
	22000	64×95	0.25	11.0	HAP223M64095□VA
	33000	76×95	0.30	13.9	HAP333M76095□VA
	47000	76×115	0.30	16.5	HAP473M76115□VA
68000	89×130	0.30	19.7	HAP683M89130□VA	
100 (125)	1000	35×60	0.15	1.6	HAO102M35060□VA
	1500	35×60	0.15	2.0	HAO152M35060□VA
	2200	35×80	0.15	3.0	HAO222M35080□VA
	3300	35×80	0.15	4.2	HAO332M35080□VA
	4700	35×100	0.15	5.0	HAO472M35100□VA
	6800	51×80	0.15	5.8	HAO682M51080□VA

WV <sub>DC</sub> (Surge Voltage) (V)	Cap ( $\mu$ F)	Size D x L (mm)	tan $\delta$ 20°C/120Hz	Ripple Current 105°C/120Hz (Arms)	Catalog Part Number
100 (125)	10000	51×95	0.15	7.8	HAO103M51095□VA
	15000	64×95	0.20	10.4	HAO153M64095□VA
	22000	76×95	0.20	12.5	HAO223M76095□VA
	33000	76×130	0.25	15.2	HAO333M76130□VA
	47000	89×130	0.25	19.3	HAO473M89130□VA
160 (200)	470	35×60	0.15	1.2	HAN471M35060□VA
	680	35×60	0.15	1.3	HAN681M35060□VA
	1000	35×80	0.15	1.9	HAN102M35080□VA
	1500	35×80	0.15	2.4	HAN152M35080□VA
	2200	35×100	0.15	3.2	HAN222M35100□VA
	3300	51×80	0.15	4.2	HAN332M51080□VA
	4700	51×95	0.15	5.5	HAN472M51095□VA
	6800	64×95	0.15	7.1	HAN682M64095□VA
	10000	76×95	0.15	9.1	HAN103M76095□VA
15000	76×130	0.15	11.8	HAN153M76130□VA	
22000	89×130	0.15	15.2	HAN223M89130□VA	
200 (250)	330	35×60	0.15	0.9	HAL331M35060□VA
	470	35×60	0.15	1.2	HAL471M35060□VA
	680	35×80	0.15	1.4	HAL681M35080□VA
	1000	35×100	0.15	2.0	HAL102M35100□VA
	1500	35×80	0.15	2.5	HAL152M35080□VA
	2200	51×95	0.15	3.2	HAL222M51095□VA
	3300	51×95	0.15	4.3	HAL332M51095□VA
	4700	64×95	0.15	5.2	HAL472M64095□VA
	6800	64×115	0.15	7.3	HAL682M64115□VA
10000	76×155	0.15	9.3	HAL103M76155□VA	
15000	89×157	0.15	12.5	HAL153M89157□VA	
250 (300)	330	35×60	0.15	0.9	HAJ331M35060□VA
	470	35×60	0.15	1.1	HAJ471M35060□VA
	680	35×80	0.15	1.5	HAJ681M35080□VA
	1000	35×100	0.15	2.1	HAJ102M35100□VA
	1500	51×80	0.15	2.6	HAJ152M51080□VA
	2200	51×95	0.15	3.4	HAJ222M51095□VA
	3300	64×95	0.15	4.6	HAJ332M64095□VA
	4700	64×115	0.15	6.0	HAJ472M64115□VA
	6800	76×115	0.15	7.9	HAJ682M76115□VA
10000	76×155	0.15	10.2	HAJ103M76155□VA	
15000	89×157	0.15	13.5	HAJ153M89157□VA	
350 (400)	470	35×60	0.15	1.4	HAH471M35060□VA
	680	35×80	0.15	1.9	HAH681M35080□VA
	1000	35×120	0.15	2.8	HAH103M35120□VA
	1500	51×80	0.15	3.5	HAH152M51080□VA
	2200	51×115	0.15	4.8	HAH222M51115□VA
	3300	64×95	0.15	6.1	HAH332M64095□VA
	4700	76×115	0.15	8.3	HAH472M76115□VA
	6800	76×155	0.15	11.0	HAH682M76155□VA
	10000	89×157	0.15	14.6	HAH103M89157□VA
15000	89×195	0.15	19.1	HAH153M89195□VA	
400 (450)	1000	51×80	0.15	2.7	HAG102M51080□VA
	1200	51×95	0.15	3.2	HAG122M51095□VA
	1500	51×115	0.15	3.9	HAG152M51115□VA
	1800	51×130	0.15	4.4	HAG182M51130□VA
	2200	64×95	0.15	4.9	HAG222M64095□VA
	2700	64×115	0.15	5.7	HAG272M64115□VA
	3300	64×130	0.15	6.6	HAG332M64130□VA
	3900	76×115	0.15	7.5	HAG392M76115□VA
	4700	76×130	0.15	8.7	HAG472M76130□VA
5600	76×155	0.15	10.3	HAG562M76155□VA	

\*产品编码中□内为产品端子引出型式代码  
\*□ Enter the appropriate terminal code

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◆ 产品一览表 Standard Ratings

WV <sub>DC</sub> (Surge Voltage) (V)	Cap ( $\mu$ F)	Size D x L (mm)	tan $\delta$ 20°C/120Hz	Ripple Current 105°C/120Hz (Arms)	Catalog Part Number
400 (450)	6800	89x157	0.15	12.1	HAG682M89157□VA
	8200	89x157	0.15	13.2	HAG822M89157□VA
	10000	89x195	0.15	15.6	HAG103M89195□VA
	12000	89x195	0.15	17.1	HAG123M89195□VA
	15000	89x235	0.15	20.8	HAG153M89235□VA
450 (500)	220	35x60	0.15	1.1	HAE221M35060□VA
	330	35x100	0.15	1.5	HAE331M35100□VA
	470	51x80	0.15	2.1	HAE471M51080□VA
	680	51x95	0.15	2.7	HAE681M51095□VA
	1000	51x105	0.15	4.2	HAE102M51105□VA
	1500	51x130	0.15	5.7	HAE152M51130□VA
	2200	64x115	0.15	7.3	HAE222M64115□VA
	2700	64x130	0.15	8.3	HAE272M64130□VA
	3300	76x130	0.15	10.1	HAE332M76130□VA
	4700	76x155	0.15	12.6	HAE472M76155□VA
	5600	89x157	0.15	15.8	HAE562M89157□VA
	6800	89x157	0.15	18.0	HAE682M89157□VA
	8200	89x195	0.15	19.8	HAE822M89195□VA
	10000	89x195	0.15	22.0	HAE103M89195□VA
	12000	89x235	0.15	26.0	HAE123M89235□VA
15000	89x250	0.15	29.0	HAE153M89250□VA	
500 (550)	330	51x80	0.15	1.5	HAC331M51080□VA
	470	51x80	0.15	1.8	HAC471M51080□VA
	680	51x105	0.15	2.5	HAC681M51105□VA
	1000	51x115	0.15	3.1	HAC102M51115□VA
	1500	64x115	0.15	4.4	HAC152M64115□VA
	2200	64x130	0.15	5.6	HAC222M64130□VA
	3300	76x155	0.15	8.1	HAC332M76155□VA
	4700	89x157	0.15	10.6	HAC472M89157□VA

WV <sub>DC</sub> (Surge Voltage) (V)	Cap ( $\mu$ F)	Size D x L (mm)	tan $\delta$ 20°C/120Hz	Ripple Current 105°C/120Hz (Arms)	Catalog Part Number	
500 (500)	5600	89x157	0.15	11.6	HAC562M89157□VA	
	6800	89x170	0.15	13.3	HAC682M89170□VA	
	8200	89x235	0.15	16.9	HAC822M89235□VA	
	10000	89x250	0.15	18.1	HAC103M89250□VA	
	550 (600)	820	51x115	0.20	3.2	HAZ821M51115□VA
1000		51x130	0.20	3.7	HAZ102M51130□VA	
1200		64x95	0.20	4.1	HAZ122M64095□VA	
1500		64x115	0.20	4.9	HAZ152M64115□VA	
1800		64x130	0.20	5.7	HAZ182M64130□VA	
2200		76x115	0.20	6.6	HAZ222M76115□VA	
2700		76x130	0.20	7.4	HAZ272M76130□VA	
3300		76x155	0.20	8.6	HAZ332M76155□VA	
3900		76x170	0.20	9.8	HAZ392M76170□VA	
4700		89x157	0.20	11.0	HAZ472M89157□VA	
5600		89x195	0.20	12.9	HAZ562M89195□VA	
6800		89x220	0.20	14.0	HAZ682M89220□VA	
8200		89x250	0.20	14.9	HAZ822M89250□VA	
600 (650)		820	51x130	0.20	3.0	HAB821M51130□VA
		1000	64x95	0.20	3.5	HAB102M64095□VA
	1200	64x115	0.20	4.2	HAB122M64115□VA	
	1500	64x130	0.20	5.0	HAB152M64130□VA	
	1800	76x115	0.20	5.7	HAB182M76115□VA	
	2200	76x130	0.20	6.6	HAB222M76130□VA	
	2700	76x155	0.20	7.6	HAB272M76155□VA	
	3300	76x170	0.20	8.4	HAB332M76170□VA	
	3900	89x157	0.20	9.7	HAB392M89157□VA	
	4700	89x195	0.20	11.4	HAB472M89195□VA	
	5600	89x220	0.20	12.3	HAB562M89220□VA	
	6800	89x250	0.20	14.0	HAB682M89250□VA	

\*产品编码中□内为产品端子引出型式代码

\*□Enter the appropriate terminal code

\*记载之外的体积，请另行咨询。

\*Please ask for advice for other sizes.

\*铝电解电容器由于承受纹波电流而发热，随着温升而发生性能劣化。请在使用中降低产品承受的纹波电流。

\*Aluminum electrolytic capacitor will emit heat when ripple current is applied, the performance will deteriorate when temp. rises. Please reduce the ripple current when using capacitor.

Note: All design and specification are for reference only and is subject to change without prior notice. If any doubt about safety for your application, please contact KNSCHA immediately for technical assistance before for purchase.

备注：以上所提供的的设计及特性参数仅供参考，任何修改不作预先通知。如果在使用上有疑问，请再购买前与科尼盛联系，以便我们提供技术上的服务和协助。