

# Vacuum Capacitors

**MEIDEN**  
Quality connecting the next



MADE IN JAPAN  
RoHS compliant

Providing solutions to customer challenges  
with environmental consideration and high quality.

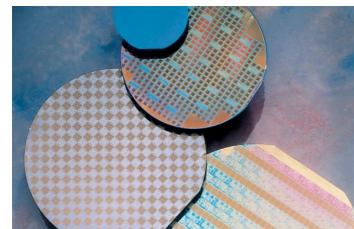
# Reliable Vacuum Technology Since 1968

MEIDEN has been developing and manufacturing highly reliable vacuum capacitors since 1994, utilizing vacuum technology and know-how we have accumulated through the development and manufacture of vacuum circuit breakers for over half a century. There are two methods of manufacturing vacuum devices: constant air exhaustion using a vacuum pump and the vacuum sealing at the manufacturing stage. MEIDEN vacuum capacitors are manufactured using the vacuum sealing method and are designed to maintain the vacuum state for a long period of time.

## Production location

All our vacuum capacitors are manufactured at Numazu Works.

## Main Applications



### Semiconductor Manufacturing Equipment

Vacuum capacitors (VCs) are an integral part of semiconductor manufacturing processes. VCs are used in the impedance matching networks which enable physical vapor deposition (PVD), chemical vapor deposition (CVD) and etching.



### Liquid Crystal Display (LCD) Panel Manufacturing Equipment

VCs are a key component of the impedance matching networks of the radio frequency (RF) generators used to manipulate high-current plasma in order to manufacture LCD panels, such as flat screen TVs.

### Photovoltaic Cell Manufacturing Equipment

LCD technology is used for the manufacture of photovoltaic power generating panels (solar cells). Here too, VCs are incorporated in the impedance matching network of RF generators for plasma generation.

### Broadcasting

VCs are used in communications equipment, transmission systems for short and medium wave broadcasting, aircraft antenna tuners used in harsh environments, and various mobile communications equipment.

### Medical Care and Measuring Devices

VCs are used in chemical composition analysis and magnetic resonance imaging (MRI).

### Research

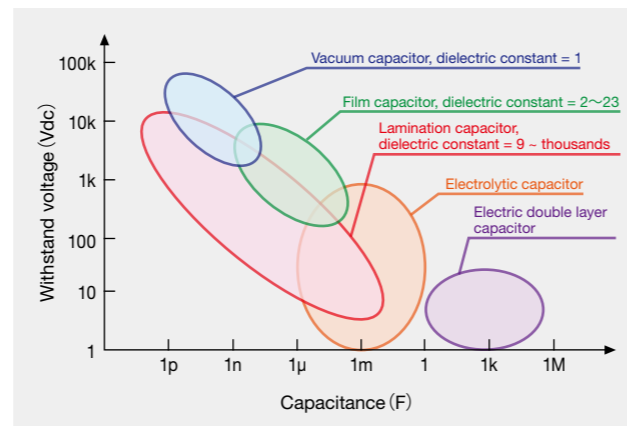
VCs are used in particle accelerators and other fundamental science research facilities.

### Wireless charging

VCs are used in wireless charging research facilities of electric vehicles and plug-in hybrid vehicles.

## Features

Vacuum capacitors (VCs) are small electrical components that, among the various types of capacitors on the market, boast low equivalent series resistance (ESR) for extremely low dielectric loss. This gives them a large allowable current at high frequencies ranging from one to several hundred MHz, along with excellent temperature properties. Because the electrodes are within a vacuum, they remain largely unaffected by temperature changes, humidity and dust. With a dielectric constant of 1, small capacitances ranging from 1 to 6,000 pF, and vacuum-insulated electrodes, they achieve peak withstand voltage ranging from 3 to 55 kVp and are thus well-suited to high-voltage applications.



## Structure

### ● Compact with high withstand voltage and large-current carrying capacity

Ceramic envelope, which is highly resistant to heat generated during energization, is used along with a vacuum-insulation structure with high insulating performance to realize high withstand voltage and large-current carrying in a compact package.

### ● Reliability

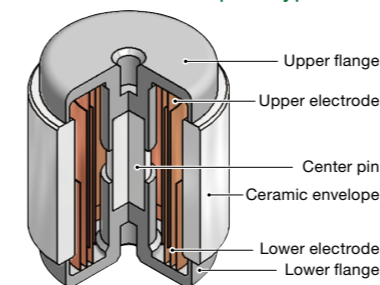
Low equivalent series resistance (ESR) makes for extremely low dielectric loss, resulting in stable temperature properties.

### ● Long product life

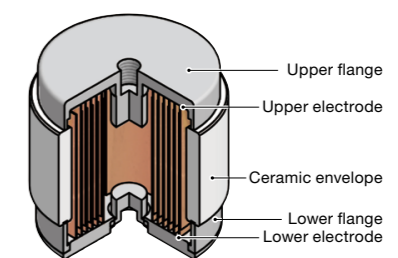
Because the electrodes are within a vacuum, they remain largely unaffected by temperature changes, humidity and dust.

## Fixed Type

### FS • FC Series Compact type

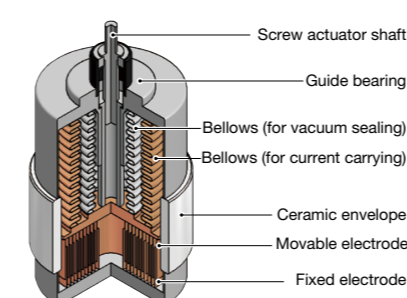


### FH Series Large current type

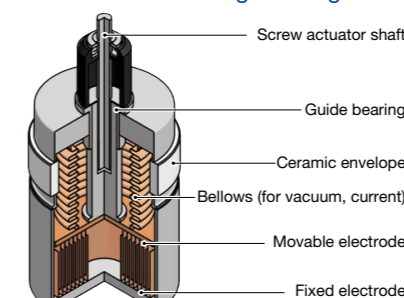


## Variable Type

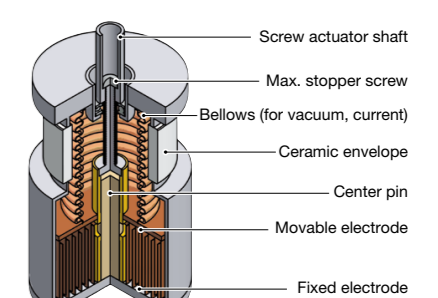
### VP Series Double bellows



### UW Series Low-loss high-strength bellows



### VM Series The first model



# Fixed Vacuum Capacitors

## Trimmable vacuum capacitors

**FS** Series up to 50 Arms ..... P.4

**FC** Series up to 100 Arms ..... P.5

**FH** Series up to 172 Arms ..... P.7

Trimmable vacuum capacitors

**TC** Series up to 76 Arms ..... P.6



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**FS** Series

up to 50 Arms (13.56 MHz)

Designed for low-power applications, in ultra-compact sizes with wide-ranging capacitances

### Features

- Compact design
- Stainless steel electrodes facilitate high voltage tolerance in a compact form.
- Robust internal construction



### Type

Type	Part Number	Capacitance (pF) <sup>※3</sup>	Voltage (kVp) <sup>※1</sup>		Current (Arms)			Total length (mm)	Diameter (mm)	Weight (kg)	Options (Mounting kit)
			RF Working	Peak Test	13.56MHz	40MHz	60MHz				
FS36S	SCF-51S <sup>※2</sup>	100	3	5	18	38	34	30	φ36	~0.1	—
	SCF-51.1S <sup>※2</sup>	110	3	5	19	38	34				
	SCF-51.2S <sup>※2</sup>	120	3	5	21	38	34				
	SCF-51.3S <sup>※2</sup>	130	3	5	23	38	34				
	SCF-51.4S <sup>※2</sup>	140	3	5	25	38	34				
	SCF-51.5S <sup>※2</sup>	150	3	5	27	38	34				
FS36	SCF-52S <sup>※2</sup>	200	3	5	36	38	34	43	φ36	~0.2	—
	SCF-150.1Z <sup>※2</sup>	10	9	15	5	15	23				
	SCF-200.1Z <sup>※2</sup>	10	12	20	7	21	31				
	SCF-150.2Z <sup>※2</sup>	20	9	15	10	31	34				
	SCF-150.25Z <sup>※2</sup>	25	9	15	13	38	34				
	SCF-200.3Z <sup>※2</sup>	30	12	20	21	38	34				
	SCF-150.33Z <sup>※2</sup>	33	9	15	17	38	34				
	SCF-150.4Z <sup>※2</sup>	40	9	15	21	38	34				
	SCF-150.5Z <sup>※2</sup>	50	9	15	27	38	34				
	SCF-150.6Z <sup>※2</sup>	60	9	15	32	38	34				
	SCF-200.6Z <sup>※2</sup>	60	12	20	43	38	34				
	SCF-150.75Z <sup>※2</sup>	75	9	15	40	38	34				
	SCF-150.8Z <sup>※2</sup>	80	9	15	43	38	34				
	SCF-150.84Z <sup>※2</sup>	84	9	15	45	38	34				
	SCF-150.9Z <sup>※2</sup>	90	9	15	48	38	34				
	SCF-151Z <sup>※4</sup>	100	9	15	50	38	34				
	SCF-151.1Z <sup>※4</sup>	110	9	15	50	38	34				
	SCF-151.15Z <sup>※4</sup>	115	9	15	50	38	34				
	SCF-151.2Z <sup>※4</sup>	120	9	15	50	38	34				
	SCF-151.3Z <sup>※4</sup>	130	9	15	50	38	34				
	SCF-151.4Z <sup>※4</sup>	140	9	15	50	38	34				
	SCF-151.5Z <sup>※4</sup>	150	9	15	50	38	34				
	SCF-151.8Z <sup>※4</sup>	180	9	15	50	38	34				
	SCF-152Z <sup>※4</sup>	200	9	15	50	38	34				
SCF-52.5Z <sup>※2</sup>	250	3	5	45	38	34					
SCF-102.5Z <sup>※4</sup>	250	6	10	50	38	34					
SCF-53Z <sup>※4</sup>	300	3	5	50	38	34					
SCF-103Z <sup>※4</sup>	300	6	10	50	38	34					
SCF-53.5Z <sup>※4</sup>	350	3	5	50	38	34					
SCF-103.5Z <sup>※4</sup>	350	6	10	50	38	34					
SCF-54Z <sup>※4</sup>	400	3	5	50	38	34					
SCF-104Z <sup>※4</sup>	400	6	10	50	38	34					
SCF-55Z <sup>※4</sup>	500	3	5	50	38	34					
SCF-105Z <sup>※4</sup>	500	6	10	50	38	34					
FS43	SCF-152.2 <sup>※4</sup>	220	9	15	50	38	34	43	φ43	~0.3	—
	SCF-152.5 <sup>※4</sup>	250	9	15	50	38	34				
	SCF-153 <sup>※4</sup>	300	9	15	50	38	34				
	SCF-173 <sup>※4</sup>	300	10.2	17	50	38	34				
	SCF-56 <sup>※4</sup>	600	3	5	50	38	34				
	SCF-57 <sup>※4</sup>	700	3	5	50	38	34				
SCF-58 <sup>※4</sup>	800	3	5	50	38	34					
SCF-59 <sup>※4</sup>	900	3	5	50	38	34					
SCF-510 <sup>※4</sup>	1000	3	5	50	38	34					

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※2: "Current (Arms)" is specified under natural convection cooling conditions (no forced cooling).

※3: Capacitance tolerance: below 50 pF : ±10 %, above 50 pF : ±5 %

※4: "Current (Arms)" is specified under 50W conduction cooling.

# FC Series

up to 100 Arms (13.56 MHz)

Designed for medium-power applications

## Features

- **Copper electrodes**

The use of copper electrode material enables higher conductive performance than the FS Series.

- **Robust internal construction**



## FC Series Product Types

SCF-□□□□□CA (□)

Fixed Vacuum Capacitors

① ② ③ ④

①: Peak test voltage (kV)

②: Capacitance (x100pF)

③: Symbol (Series)

**C** Standard  
**CA** With centering structure

④: Options

**Blank** Standard  
**(IK-x)** Mounting kit

## Optional

- **Mounting kit**

Screws and washer sets commonly used in installation

Applicable models	FC52, FC62	FC52A
Mounting kit		

## Type

Type	Part Number	Capacitance (pF) <sup>※3</sup>	Voltage (kVp) <sup>※1</sup>		Current (Arms)			Total length (mm)	Diameter (mm)	Weight (kg)	Options (Mounting kit)
			RF Working	Peak Test	13.56MHz	40MHz	60MHz				
FC52	SCF-150.5C <sup>※2</sup>	50	9	15	27	61	55	48	φ52.4	~0.4	IK-0
	SCF-151C <sup>※2</sup>	100	9	15	54	61	55				
	SCF-151.5C <sup>※2</sup>	150	9	15	80	61	55				
	SCF-152C <sup>※2</sup>	200	9	15	80	61	55				
FC52A	SCF-150.5CA <sup>※2</sup>	50	9	15	27	61	55	62	φ52.4	~0.4	IK-2
	SCF-150.8CA <sup>※2</sup>	80	9	15	43	61	55				
	SCF-150.9CA <sup>※2</sup>	90	9	15	48	61	55				
	SCF-151CA <sup>※2</sup>	100	9	15	54	61	55				
	SCF-151.2CA <sup>※2</sup>	120	9	15	65	61	55				
	SCF-151.5CA <sup>※2</sup>	150	9	15	80	61	55				
	SCF-151.8CA <sup>※2</sup>	180	9	15	80	61	55				
	SCF-152.1CA <sup>※2</sup>	210	9	15	80	61	55				
FC62	SCF-200.1C <sup>※2</sup>	9	12	20	6	19	28	50	φ62.4	~0.6	IK-0
	SCF-200.5C <sup>※2</sup>	50	12	20	36	76	68				
	SCF-200.75C <sup>※2</sup>	75	12	20	54	76	68				
	SCF-201C <sup>※2</sup>	100	12	20	72	76	68				
	SCF-201.5C <sup>※4</sup>	150	12	20	100	76	68				
<b>NEW</b> FM85	SCF-2220M85S <sup>※4</sup>	2000	13.2	22	50	38	34	54	φ85	~1.1	—

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※2: "Current (Arms)" is specified under natural convection cooling conditions (no forced cooling).

※3: Capacitance tolerance: below 50 pF : ±10 %, above 50 pF : ±5 %

※4: "Current (Arms)" is specified under 50W conduction cooling.

# TC Series

High voltage and High frequency tolerance

## Features

- **Fine-tuning Option ( Trimmer Capacitors )**

The capacitance can be adjusted by few picofarads

- **Structural design enabling adjustments after circuit completion**

The circuit constant can be adjusted with high precision.



## Optional

- **Mounting kit**

Screws and washer sets commonly used in installation

Applicable models	TC48
Mounting kit	

## Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options (Mounting kit)
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
TC48	SCT-300.2H48C <sup>※4</sup>	7	20	18	30	21	63	68	72	62	φ48	~0.5	IK-9
	SCT-300.3H48C <sup>※4</sup>	25	35	18	30	37	76	68					

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※4: "Current (Arms)" is specified under 50W conduction cooling.

Design for high-power applications with high withstand voltage

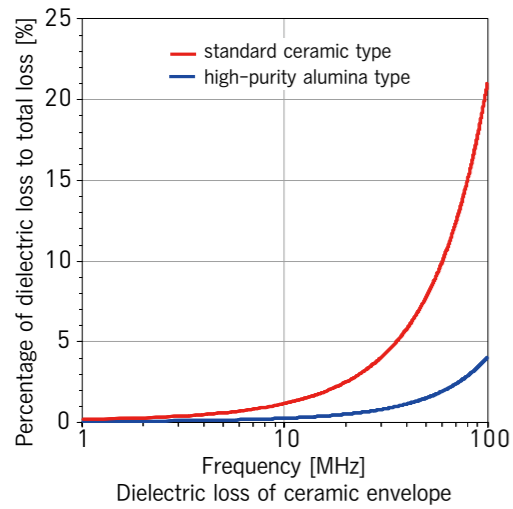
### Features

#### ● High voltage tolerance

We offer a variety of different capacitors covering peak test voltages of 25 kVp, 30 kVp, and 35 kVp



### Low-Loss with High-Purity Alumina Ceramic



#### Dielectric losses of ceramic envelope

Vacuum capacitor has resistance losses and dielectric as heat losses.

High purity alumina ceramics exhibit reduced low dielectric losses and is recommended for applications requiring higher power at frequencies over 40MHz.



Standard Ceramic Type (FH52)



High Purity Alumina Ceramic Type (FHA52)

### FH Series Product Types

SCF-□□□□□H□□WR(□)

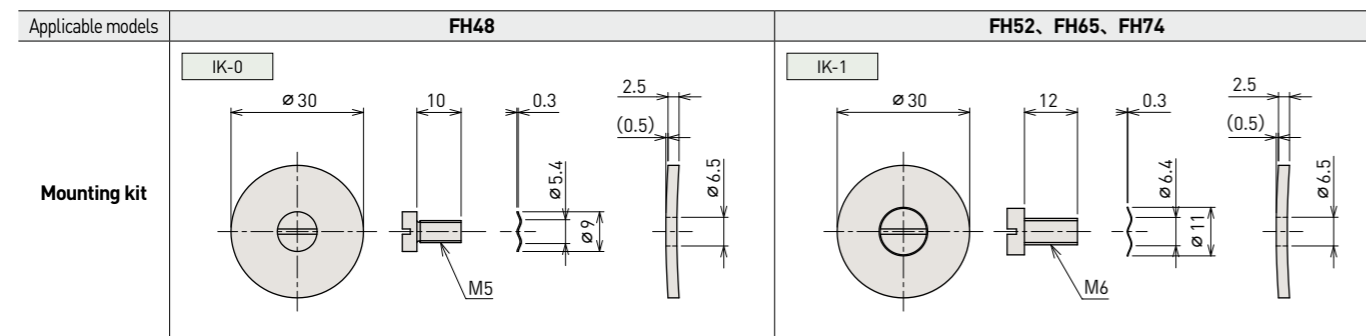
Fixed Vacuum Capacitors

- ①: Peak test voltage (kV)
  - ②: Capacitance (x100pF)
  - ③: Design identification symbol
  - ④: Diameter (mm)
  - ⑤: Symbol (Series)
  - ⑥: Options
- H** Standard  
**HA** High purity alumina ceramics (Apply FH52 only)  
**C** Copper ring electrode  
**WR** Copper spiral electrode  
**Blank** Standard  
**(IK-x)** Mounting kit

### Optional

#### ● Mounting kit

Screws and washer sets commonly used in installation. Installation kits are sold separately.



### Type

Type	Part Number	Capacitance (pF) <sup>※3</sup>	Voltage (kVp) <sup>※1</sup>		Current (Arms)			Total length (mm)	Diameter (mm)	Weight (kg)	Options (Mounting kit)			
			RF Working	Peak Test	13.56MHz	40MHz	60MHz							
FH48	SCF-300.1H48C <sup>※2</sup>	10	18	30	10	31	47	73	φ48	~0.5	IK-0			
	SCF-300.2H48C <sup>※2</sup>	20	18	30	21	63	95							
	SCF-300.25H48C <sup>※2</sup>	25	18	30	27	79	99							
	SCF-300.5H48C <sup>※2</sup>	50	18	30	54	110	99							
	SCF-350.5H48C <sup>※2</sup>	50	21	35	63	110	99							
	SCF-350.75H48C <sup>※2</sup>	75	18	30	81	110	99							
	SCF-350.9H48C <sup>※2</sup>	90	21	35	113	110	99							
	SCF-301H48C <sup>※2</sup>	100	18	30	108	110	99							
	SCF-351H48C <sup>※2</sup>	100	21	35	126	110	99							
	SCF-251.25H48C <sup>※2</sup>	125	15	25	112	110	99							
	SCF-251.5H48C <sup>※2</sup>	150	15	25	135	110	99							
	SCF-301.5H48C <sup>※4</sup>	150	18	30	145	110	99							
	<b>NEW</b> SCF-401.5H48S <sup>※4</sup>	150	24	40	50	38	34					87		
	SCF-251.75H48C <sup>※4</sup>	175	15	25	145	110	99					73		
SCF-252H48C <sup>※4</sup>	200	15	25	145	110	99	52	φ52.4	~0.4	IK-1				
FHA52 SCF-200.56HA52WR <sup>※2</sup>	56	12	20	40	99	89								
SCF-200.62HA52WR <sup>※2</sup>	62	12	20	44	99	89								
SCF-151H52WR <sup>※2</sup>	100	9	15	54	99	89								
SCF-201H52WR <sup>※2</sup>	100	12	20	72	99	89								
SCF-151.5H52WR <sup>※2</sup>	150	9	15	81	99	89								
SCF-152H52WR <sup>※2</sup>	200	9	15	108	99	89								
SCF-202H52WR <sup>※4</sup>	200	12	20	130	99	89								
SCF-152.1H52WR <sup>※2</sup>	210	9	15	113	99	89								
SCF-152.5H52WR <sup>※4</sup>	250	9	15	130	99	89								
SCF-153H52WR <sup>※4</sup>	300	9	15	130	99	89								
SCF-153.5H52WR <sup>※4</sup>	350	9	15	130	99	89								
SCF-153.7H52WR <sup>※4</sup>	370	9	15	130	99	89								
SCF-124H52WR <sup>※4</sup>	400	7.2	12	130	99	89								
SCF-124.5H52WR <sup>※4</sup>	450	7.2	12	130	99	89								
SCF-125H52WR <sup>※4</sup>	500	7.2	12	130	99	89								
FH52 SCF-155H52WR <sup>※4</sup>	500	9	15	130	99	89	52	φ52.4	~0.4	IK-1				
SCF-105.5H52WR <sup>※4</sup>	550	6	10	130	99	89								
SCF-56H52WR <sup>※2</sup>	600	3	5	108	99	89								
SCF-106H52WR <sup>※4</sup>	600	6	10	130	99	89								
SCF-126H52WR <sup>※4</sup>	600	7.2	12	130	99	89								
SCF-106.5H52WR <sup>※4</sup>	650	6	10	130	99	89								
SCF-107H52WR <sup>※4</sup>	700	6	10	130	99	89								
SCF-107.5H52WR <sup>※4</sup>	750	6	10	130	99	89								
SCF-810H52WR <sup>※4</sup>	1000	4.8	8	130	99	89								
SCF-512.5H52WR <sup>※4</sup>	1250	3	5	130	99	89								
SCF-315H52WR <sup>※4</sup>	1500	1.8	3	130	99	89								
SCF-515H52WR <sup>※4</sup>	1500	3	5	130	99	89								
SCF-317.5H52WR <sup>※4</sup>	1750	1.8	3	130	99	89								
SCF-320H52WR <sup>※4</sup>	2000	1.8	3	130	99	89								
SCF-350.25H65C <sup>※2</sup>	25	21	35	31	93	118	87	φ65	~0.9	IK-1				
SCF-350.5H65C <sup>※2</sup>	50	21	35	63	131	118								
SCF-351H65C <sup>※2</sup>	100	21	35	126	131	118								
SCF-351.5H65C <sup>※4</sup>	150	21	35	172	131	118								
FH65 SCF-351.75H65C <sup>※4</sup>	175	21	35	172	131	118								
SCF-352H65C <sup>※4</sup>	200	21	35	172	131	118								
SCF-352.5H65C <sup>※4</sup>	250	21	35	172	131	118								
SCF-253H65C <sup>※4</sup>	300	15	25	172	131	118								
SCF-253.5H65C <sup>※4</sup>	350	15	25	172	131	118								
SCF-205H74WR <sup>※4</sup>	500	12	20	140	106	96					52	φ74	~0.9	IK-1
SCF-157.5H74WR <sup>※4</sup>	750	9	15	140	106	96								
SCF-1010H74WR <sup>※4</sup>	1000	6	10	140	106	96								
FH74 SCF-520H74WR <sup>※4</sup>	2000	3	5	140	106	96								
<b>NEW</b> SCF-525H74WR <sup>※4</sup>	2500	3	5	140	106	96								
SCF-530H74WR <sup>※4</sup>	3000	3	5	140	106	96								
SCF-340H74WR <sup>※4</sup>	4000	1.8	3	140	106	96								
FH82 SCF-1028H82WR <sup>※4</sup>	2800	6	10	140	106	96	52	φ82	~1.0	IK-1				

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".  
 ※2: "Current (Arms)" is specified under natural convection cooling conditions (no forced cooling).  
 ※3: Capacitance tolerance: below 50 pF : ±10 %, above 50 pF : ±5 %  
 ※4: "Current (Arms)" is specified under 50W conduction cooling.

# Variable Vacuum Capacitors

**VC-36LI** Series up to 39 Arms ..... **P.10**

**VD** Series up to 80 Arms ..... **P.10**

**UW** Series up to 94 Arms ..... **P.11**

**VP** Series up to 400 Arms ..... **P.13**

**VC-82HE·VC-85HE** Series up to 190 Arms ..... **P.17**

**VC-82PO** Series up to 130 Arms ..... **P.18**



MADE IN JAPAN RoHS compliant

## VC-36LI Series up to 9 Arms (13.56MHz)

Designed for low-power applications, low-loss

Features

● **Compact design**

Motor Specifications

Item	C36LI
Torque	≤ 0.15Nm (≤ 15Ncm)
Turns	11.1 (±0.5) Turns
Motor axis diameter	φ 5mm

Estimated Service Life<sup>※5</sup>

Item	Operating Range	VC-36LI
Screw	50%	1,080 k cycles
Bellows	75%	40 k cycles
	100%	10 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).



VC-36LI

Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options (Mounting kit)
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VC-36LI	SCV-50.5C36LID <sup>※6</sup>	6	50	3	5	9	26	39	90.6	72.1	φ 36	~0.3	IK-7

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※6: "Current (Arms)" is specified under 30W conduction cooling.

## VD Series up to 80 Arms (13.56MHz)

Designed for low-power applications, low-loss

Features

● **Compact design**

Motor Specifications

Item	VDB45	VD55
Torque	≤ 0.15Nm (≤ 15cNm)	
Turns	10.2 (±0.2) Turns	10.0 (±0.5) Turns
Motor axis diameter	φ 6.35mm	φ 6.35mm

Estimated Service Life<sup>※5</sup>

Item	Operating Range	VDB45	VD55
Screw	50%	2,380 k cycles	1,200 k cycles
Bellows	75%	40 k cycles	40 k cycles
	100%	10 k cycles	10 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).



VDB45



VD55

Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options (Mounting kit)
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VDB45	SCV-56.5DB45WC(S8) <sup>※6</sup>	8	650	3	5	70	53	48	115.3	90.2	φ 44.7	~0.4	IK-6
	SCV-76.5DB45WC(S8) <sup>※6</sup>	8	650	4.2	7	70	53	48					
VD55	SCV-154.5D55WB <sup>※6</sup>	45	450	9	15	80	61	55	115	96.5	φ 55	~0.6	—
	SCV-85D55WB <sup>※6</sup>	35	500	4.8	8	80	61	55					
	SCV-410D55WB <sup>※6</sup>	40	1000	2.4	4	80	61	55					
	SCV-315D55WB <sup>※6</sup>	45	1500	1.8	3	80	61	55					

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※6: "Current (Arms)" is specified under 30W conduction cooling.

Designed for low-power applications, low-loss

Features

- **Low-loss and high-strength bellows**  
Copper-plated stainless steel material is used to achieve low loss and high strength.
- **Wide capacitance range**  
Product capacitances range from 3 to 2,000 pF.
- **High purity alumina ceramics**  
Low-loss ceramics (UWA55 type)
- **High durability screw actuator technology**  
Diamond-like carbon (DLC) coating extends life and reduces friction
- **Ball screw actuators**  
We have adopted ball screws for variable capacitors to overcome overload conditions such as high speed/ high acceleration reverse matching, same range continuous operation, micro-motion and hunting oscillation. They provide vastly superior life expectancy, exhibiting near-zero friction for high-speed and high acceleration / deceleration functions.  
The UW series is available with small ball screw profiles to meet size constraints and extend life.



UW Series Product Types

**SCV-□□□□□H□□UW-□ (□)**

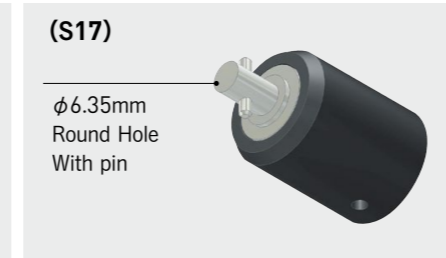
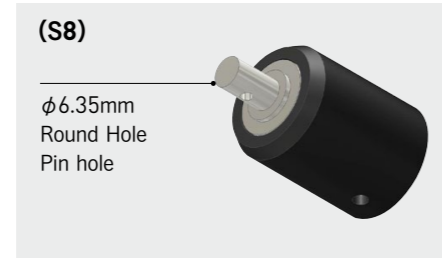
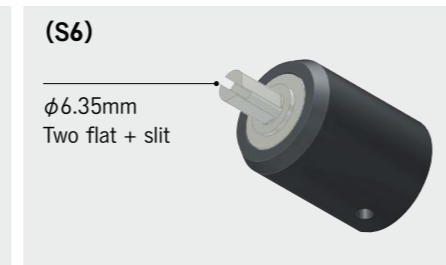
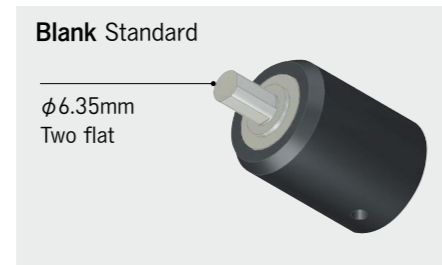
Variable Vacuum Capacitors

- ①: Peak test voltage (kV)
- ②: Capacitance (x100pF)
- ③: Design identification symbol  
H Alumina Al2O3 94~98%  
FH Minimum non-linear region (2 turns)  
HA For high frequencies Alumina Al2O3 98%~ Non-linear region (4 turns)
- ④: Diameter (mm)
- ⑤: Symbol (Series)  
UW Flat mounting surface  
UWD Fixed side 4-point mounting
- ⑥: Types of screw  
-C DLC coating  
-B3 Ball screw
- ⑦: Types of shaft (Options)  
Blank Standard  
(xx) See options

⑥: Types of screw



⑦: Types of shaft (Options)



Motor Specifications

Item	UW-C	UW-B(Ball Screw)
Torque	≤0.18Nm(≤18Ncm)	≤0.15Nm(≤15Ncm)
Turns	10.5(±0.2) Turns	9.5(±0.2) Turns
Motor axis diameter	φ 6.35mm	φ 12.7mm

Estimated Service Life<sup>※5</sup>

Item	Operating Range	UW-C	UW-B(Ball Screw)
Screw	50%	2,380 k cycles	5,260 k cycles
Bellows	75%	60 k cycles	60 k cycles
	100%	20 k cycles	20 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).

Type

Type	Part Number	Capacitance (pF)		Voltage (kV) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
UW55	SCV-150.6HA55UW-C <sup>※6</sup>	3	60	9	15	32	71	64	133.5	90.6	φ55	~0.8	-B3
	SCV-150.75HA55UW-C <sup>※6</sup>	5	75	9	15	40	71	64					
	SCV-151H55UW-C <sup>※6</sup>	10	100	9	15	54	71	64					
	SCV-151.5FH55UW-C <sup>※6</sup>	7	150	9	15	81	71	64					
	SCV-152.5H55UW-C <sup>※6</sup>	25	250	9	15	94	71	64					
	SCV-83.5FH55UW-C <sup>※6</sup>	7	350	4.8	8	94	71	64					
	SCV-55FH55UW-C <sup>※6</sup>	7	500	3	5	90	71	64					
	SCV-85H55UW-C <sup>※6</sup>	35	500	4.8	8	94	71	64					
	SCV-310H55UW-C <sup>※6</sup>	35	1000	1.8	3	94	71	64					
	SCV-510H55UW-C <sup>※6</sup>	35	1000	3	5	94	71	64					
UW65	SCV-415H55UW-C <sup>※6</sup>	150	1500	2.4	4	94	71	64	133.5	90.6	φ65	~1.0	-B3
	SCV-125H65UW-C <sup>※6</sup>	50	500	7.2	12	94	71	64					
	SCV-155H65UW-C <sup>※6</sup>	50	500	9	15	94	71	64					
	SCV-810H65UW-C <sup>※6</sup>	100	1000	4.8	8	94	71	64					
	SCV-1010H65UW-C <sup>※6</sup>	100	1000	6	10	94	71	64					
	SCV-415H65UW-C <sup>※6</sup>	150	1500	2.4	4	94	71	64					
UW82	SCV-515H65UW-C <sup>※6</sup>	150	1500	3	5	94	71	64	133.5	90.6	φ82	~1.3	-B3
	SCV-320H65UW-C <sup>※6</sup>	200	2000	1.8	3	94	71	64					
	SCV-158FH82UW-C <sup>※6</sup>	50	800	9	15	94	71	64					
	SCV-1014H82UW-C <sup>※6</sup>	140	1400	6	10	94	71	64					
	SCV-815H82UW-C <sup>※6</sup>	150	1500	4.8	8	94	71	64					

※1: The unit of "Voltage (kV)" is "0-peak" not "peak-peak".

※6: "Current (Arms)" is specified under 30W conduction cooling.

Design for medium- and high-power applications, with low torque and long product life

Features

- **Double bellows with special copper alloy**  
Designed for high current applications, the dual bellows system provides the highest current capacity and extended durability while exhibiting low actuation torque.
- **Reinforced actuator screw system**  
Coated with long-life diamond-like carbon (DLC)

Optional

- **Ball screw actuators**  
We have adopted ball screws for variable capacitors to overcome overload conditions such as high speed/ high acceleration reverse matching, same range continuous operation, micro-motion and hunting oscillation. They provide vastly superior life expectancy, exhibiting near-zero friction for high-speed and high acceleration / deceleration functions. The VP Series uses a dual-bellows design—vacuum-sealing bellows and current-carrying bellows—to realize low-torque performance. In addition, the VH-B ball-screw variant provides a more compact motor design with greater power savings.

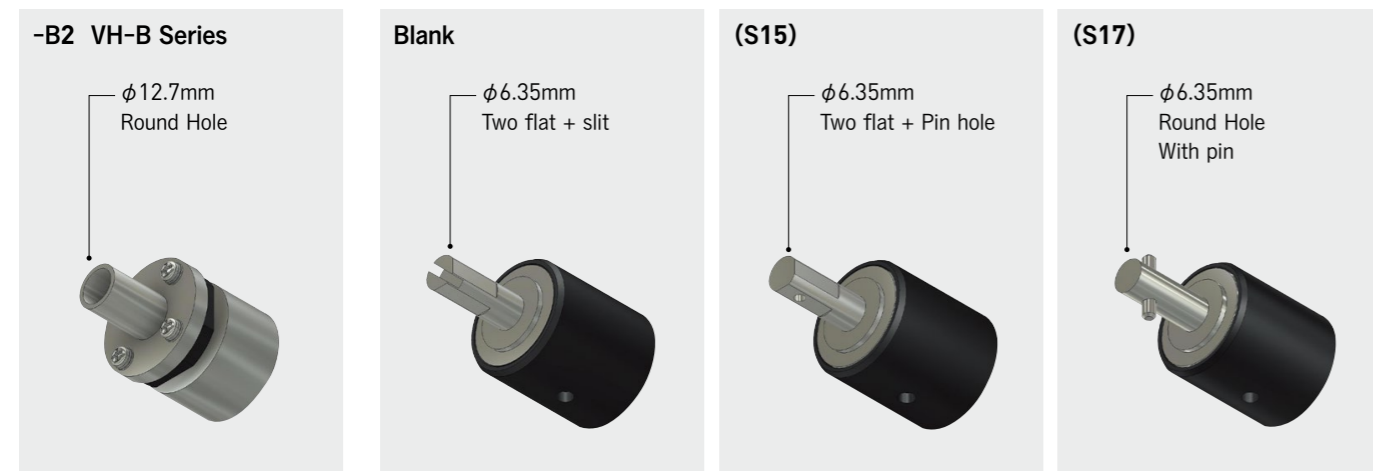


VP Series Product Types

SCV-□□□□□P□□L-□ (□)

Vacuum Variable Capacitors

- ①: Peak test voltage (kV)
- ②: Capacitance (x100pF)
- ③: Symbol (Series)  
P Normal current  
PA Large current
- ④: Diameter (mm)
- ⑤: Design identification symbol  
Blank Concentric electrodes  
L Mounting length 95mm (115 mm for normal specifications)  
W Swirl electrode  
DW Minimum non-linear region (2.8 turns)  
FW Minimum non-linear region (5.5 turns)
- ⑥: Types of screw  
Blank Standard (DLC coating)  
-B2 Ball Screw (VH-B Series)  
-B4 Ball Screw (VP150, VP200 types)
- ⑦: Types of shaft (Options)  
Blank Two flat + slit  
(xx) See options



Motor Specifications

Item	Other than VP82L,VP94L	VP82L·VP94L	Other than VP82L-B,VP94L-B (Ball Screw)	VP82L-B,VP94L-B (Ball Screw)
Torque	≤0.18Nm (≤18cNm)		≤0.12Nm (≤12cNm)	
Turns	14.3±(±0.2) Turns	10.7(±0.2) Turns	14.3(±0.2) Turns	10.7(±0.2) Turns
Motor axis diameter	φ 6.35mm		φ 12.7mm	

Estimated Service Life<sup>※5</sup>

Item	Operating Range	Other than VP82L,VP94L	VP82L·VP94L	Other than VP82L-B,VP94L-B (Ball Screw)	VP82L-B,VP94L-B (Ball Screw)
Screw	50%	2,500 k cycles	3,330 k cycles	5,000 k cycles	6,670 k cycles
	75%	500 k cycles	500 k cycles	500 k cycles	500 k cycles
Bellows	100%	50 k cycles	50 k cycles	50 k cycles	50 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).

Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VP65	SCV-201P65 <sup>※2</sup>	10	100	12	20	72	99	89	154	115	φ 65	~1.3	-B2 AWF-6 AWM-6
	SCV-202P65 <sup>※2</sup>	15	200	12	20	130	99	89					
	SCV-202.5P65 <sup>※2</sup>	15	250	12	20	130	99	89					
	SCV-7.55P65FW <sup>※2</sup>	8	500	4.5	7.5	130	99	89					
	SCV-125P65DW <sup>※2</sup>	10	500	7.2	12	130	99	89					
VP70	SCV-810P65W <sup>※2</sup>	20	1000	4.8	8	130	99	89	154	115	φ 70	~1.4	-B2 AWF-6 AWM-6
	SCV-155P70W <sup>※2</sup>	15	500	9	15	140	106	96					
	SCV-128P70W <sup>※2</sup>	20	800	7.2	12	140	106	96					
VP70L	SCV-515P70W <sup>※2</sup>	35	1500	3	5	140	106	96	125	95	φ 70	~1.2	
	SCV-49.5P70LW <sup>※2</sup>	12	980	2.4	4	141	114	103					
VP82	SCV-85P70LW <sup>※2</sup>	10	580	4.8	8	150	114	103	154	115	φ 82	~1.9	
	SCV-252P82 <sup>※2</sup>	20	200	15	25	140	106	96					
	SCV-205P82W <sup>※2</sup>	20	500	12	20	140	106	96					
VPA82	SCV-1010P82W <sup>※2</sup>	25	1000	6	10	140	106	96	152	112	φ 82	1.8	
	SCV-515P82W <sup>※2</sup>	25	1500	3	5	140	106	96					
	SCV-302PA82 <sup>※2</sup>	22	200	18	30	170	129	117					
VP82L	SCV-200.5P82L <sup>※2</sup>	12	50	12	20	36	106	96	125	95	φ 82	~1.6	-B2 AWM-4 AWM-5
	SCV-250.8P82L <sup>※2</sup>	11	80	15	25	72	106	96					
	SCV-251P82L <sup>※2</sup>	12	100	15	25	90	106	96					
VP85	SCV-202P82L <sup>※2</sup>	12	200	12	20	140	106	96	154	115	φ 85	~1.8	
	SCV-225P85 <sup>※2</sup>	20	500	13.2	22	140	106	96					
	SCV-205P94 <sup>※2</sup>	25	500	12	20	150	114	103					
VP94	SCV-158P94DW <sup>※2</sup>	50	800	9	15	150	114	103	154	115	φ 94	~2.3	
	SCV-815P94 <sup>※2</sup>	30	1500	4.8	8	150	114	103					
	SCV-523P94W <sup>※2</sup>	45	2300	3	5	150	114	103					
VP94L	SCV-251P94L <sup>※2</sup>	14	100	15	25	90	125	113	125	95	φ 94	~1.8	
	SCV-202.2P94L <sup>※2</sup>	14	220	12	20	159	125	113					
	SCV-153.5P94LW <sup>※2</sup>	15	350	9	15	165	125	113					

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※2: "Current (Arms)" is specified under natural convection cooling conditions (no forced cooling).

Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options (Types of screw and water-cooling flanges)
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VP110	SCV-301P110 <sup>※2</sup>	20	100	18	30	108	129	117	154	115	φ110	~2.9	-B2 AWM-4
	SCV-251.5P110C <sup>※2</sup>	11	150	15	25	135	129	117					
	SCV-302P110 <sup>※2</sup>	25	200	18	30	170	129	117					
	SCV-252.5P110C <sup>※2</sup>	13	245	15	25	170	129	117					
	SCV-253.5P110 <sup>※2</sup>	35	350	15	25	170	129	117					
	SCV-255P110 <sup>※2</sup>	40	500	15	25	170	129	117					
	SCV-158P110FW <sup>※2</sup>	15	800	9	15	170	129	117					
	SCV-1510P110W <sup>※2</sup>	40	1000	9	15	170	129	117					
	SCV-2210P110W <sup>※2</sup>	40	1000	13.2	22	170	129	117					
	SCV-1015P110W <sup>※2</sup>	40	1500	6	10	170	129	117					
	SCV-820P110W <sup>※2</sup>	40	2000	4.8	8	170	129	117					
SCV-325P110FW <sup>※2</sup>	15	2500	1.8	3	170	129	117						

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※2: "Current (Arms)" is specified under natural convection cooling conditions (no forced cooling).

Water-cooling flanges for the VP Series

Types	Bottom Side	Top Side (Actuator Side)
VP65 VP70	<p>AWF-6</p> <p>(Water flow rate : 1.0 l/min., Permissible hydraulic pressure : 1.0 MPa) Unit : mm</p>	<p>AWM-6</p> <p>(Water flow rate : 1.0 l/min., Permissible hydraulic pressure : 1.0 MPa) Unit : mm</p>
VP82 VP82L VP94L	<p>AWM-4</p> <p>(Water flow rate : 1.0 l/min., Permissible hydraulic pressure : 1.0 MPa) Unit : mm</p>	<p>AWM-5</p> <p>(Water flow rate : 1.0 l/min., Permissible hydraulic pressure : 1.0 MPa) Unit : mm</p>
VP94 VP110 VP132	<p>AWM-4 (Top and bottom sides in common)</p> <p>(Water flow rate : 1.0 l/min., Permissible hydraulic pressure : 1.0 MPa) Unit : mm</p>	

Designed for high withstand voltage and high current

Features

Double bellows with special copper alloy

Designed for high current applications, the dual bellows system provides the highest current capacity and extended durability while exhibiting low actuation torque.

Reinforced actuator screw system

Coated with long-life diamond-like carbon (DLC)



VPE115

Motor Specifications

Item	SCVW-352.5PE115H
Torque	≤0.18Nm (≤18cNm)
Turns	10.3 (±0.2) Turns
Motor axis diameter	φ6.35mm

Estimated Service Life<sup>※5</sup>

Item	Operating Range	SCVW-352.5PE115H
Screw	50%	3,400 k cycles
	75%	500 k cycles
Bellows	100%	50 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).

Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options
		Min.	Max	RF Working	Peak Test voltage	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VPE115	SCVW-352.5PE115H <sup>※7</sup>	40	250	21	35	280	213	193	154	125	φ115	4.2	—

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※7: The maximum allowable current value is for a 100W thermal cooling conditions. (The body is standard and water-cooling.)

Designed for high-power applications

Features

Makes larger currents possible with a water-cooling structure and large-aperture copper-alloy bellows

Realizes low torque

Reinforced actuator screw system

Coated with long-life diamond-like carbon (DLC)



VP150

VPA150

VP200

Motor Specifications

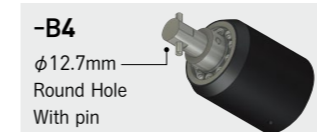
Item	VP150, VPA150, VP200
Torque	≤0.70Nm (≤70cNm)
Turns	16.6 (±0.2) 回転
Motor axis diameter	φ12.7mm

Estimated Service Life<sup>※5</sup>

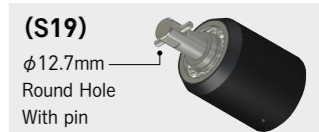
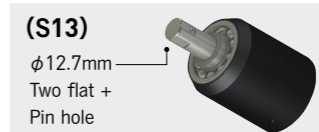
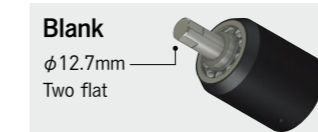
Item	Operating Range	VP150, VPA150, VP200
Screw	50%	2,500 k cycles
	75%	500 k cycles
Bellows	100%	50 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).

Types of screw



Types of shaft (Options)



Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VP150	SCV-403.5P150G <sup>※8</sup>	20	350	24	40	300	228	206	269	165	φ150	~7.0	-B4
	SCV-405P150G <sup>※8</sup>	40	500	24	40	300	228	206					
	SCV-1525P150GW <sup>※8</sup>	40	2500	9	15	300	228	206					
VPA150	SCV-1525PA150GW <sup>※8</sup>	40	2500	9	15	400	305	275	269	165	φ150	7.0	-B4
VP200	SCV-555P200G <sup>※8</sup>	40	500	33	55	400	305	275	269	165	φ200	13.0	-B4

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※8: The maximum allowable current value is for a 700W thermal cooling conditions. (The body is standard and water-cooling.)

# VC-82HE · VC-85HE Series up to 225 Arms (13.56MHz)

Designed for medium-power applications, low torque and long product life

## Features

- **Double bellows with special copper alloy**  
Designed for high current applications, double bellows system provides highest current capacity and extended durability while exhibiting low actuation torque
- **Reinforced actuator screw system**  
Coated with long-life diamond-like carbon (DLC)



VC-82HE

## Motor Specifications

Item	SCV-103.3C82HEW-AADG-J	SCV-202C82HE-AAFG-B	SCV-250.8C82HE-AADG-F	SCW-252.5C85HE
Torque	≤0.18Nm(≤18cNm)	≤0.18Nm(≤18cNm)	≤0.18Nm(≤18cNm)	≤0.18Nm(≤18cNm)
Turns	12(±0.2) Turns	10.5(±0.2) Turns	13.5(±0.2) Turns	10.3(±0.2) Turns
Motor axis diameter	φ12.7mm	φ12.7mm	φ12.7mm	φ6.35mm

## Estimated Service Life<sup>※5</sup>

Item	Operating Range	SCV-103.3C82HEW-AADG-J	SCV-202C82HE-AAFG-B	SCV-250.8C82HE-AADG-F	SCW-252.5C85HE
Screw	50%	2,920 k cycles	3,330 k cycles	2,590 k cycles	3,400 k cycles
Bellows	75%	500 k cycles	500 k cycles	500 k cycles	500 k cycles
	100%	50 k cycles	50 k cycles	50 k cycles	50 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).

## Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VC-82HE	SCV-250.8C82HE-AADG-F <sup>※6</sup>	10	80	15	25	72	106	96	132	101	φ82	~1.5	-B3
	SCV-202C82HE-AAFG-B <sup>※6</sup>	12	200	12	20	140	106	96					
	SCV-103.3C82HEW-AADG-J <sup>※6</sup>	25	330	6	10	119	106	96					
VC-85HE	SCW-252.5C85HE <sup>※9</sup>	12	250	15	25	225	171	155	141	101	φ85	2.5	—

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※6: "Current (Arms)" is specified under 30W conduction cooling.

※9: Max current values assume water cooling. (vacuum capacitor + water-cooled flange.)

# VC-82PO Series up to 130 Arms (13.56MHz)

Designed for medium-power applications, low torque and long product life

## Features

- **Double bellows with special copper alloy**  
Designed for high current applications, double bellows system provides highest current capacity and extended durability while exhibiting low actuation torque
- **Reinforced actuator screw system**  
Coated with long-life diamond-like carbon (DLC)



VC-82PO

## Motor Specifications

Item	SCV-510C82POW	SCV-155C82POW
Torque	≤0.18Nm(≤18cNm)	≤0.18Nm(≤18cNm)
Turns	17.5±(0.3) Turns	21.9(±0.3) Turns
Motor axis diameter	φ6.35mm	φ6.35mm

## Estimated Service Life<sup>※5</sup>

Item	Operating Range	SCV-510C82POW	SCV-155C82POW
Screw	50%	1,400 k cycles	1,400 k cycles
Bellows	75%	200 k cycles	200 k cycles
	100%	20 k cycles	20 k cycles

※5: Product life estimated based on MEIDEN standard operating conditions (rotational speed of 600 rpm, acceleration rate of 4.5 rpm/ms, temperature of 25°C, humidity range of 40-85% RH).

## Type

Type	Part Number	Capacitance (pF)		Voltage (kVp) <sup>※1</sup>		Current (Arms)			Mounting Dimensions (mm)			Weight (kg)	Options
		Min.	Max	RF Working	Peak Test	13.56MHz	40MHz	60MHz	Total Length	Mounting Length	Diameter		
VC-82PO	SCV-155C82POW <sup>※6</sup>	50	500	9	15	130	99	89	141.5	109.5	φ82	1.6	—
	SCV-510C82POW <sup>※6</sup>	100	1000	3	5	130	99	89	129.6	98.1	φ82	1.4	—

※1: The unit of "Voltage (kVp)" is "0-peak" not "peak-peak".

※6: "Current (Arms)" is specified under 30W conduction cooling.

# AutoVC

Motorized Variable Vacuum Capacitors

## Smart Variable Capacitor for Easy and Accurate Setting High-Accuracy Capacitance Control Quick and Easy Installation

Motorized  
Vacuum  
Capacitors



### Product Description

All the control systems necessary for capacitance control of variable vacuum capacitors have been modularized. By connecting to a host PC and performing communication control, control of complex impedance matching circuits can be achieved. This is the optimal product for incorporating into high-frequency plasma matching networks and RF power supply circuits.

### Features

#### ● Easy to introduce

The capacitance of the variable vacuum capacitor can be easily set by connecting to a host PC and performing communication control. Models equipped with an incremental encoder also perform origin seeking automatically. Cumbersome motor control is not required, so development resources can be focused on high-frequency circuit design and matching programming.

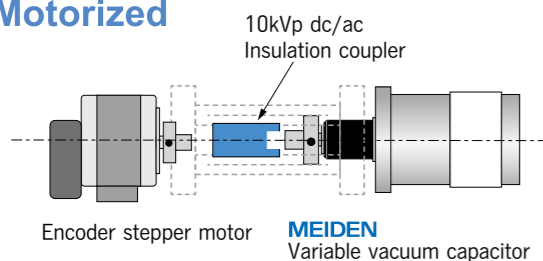
#### ● High reliability

The order to detect accidental motor step-out, a weak point of stepper motors, and automatically restore the motor to accurate capacitance, an optical encoder is employed to constantly monitor the stepper motor operation.

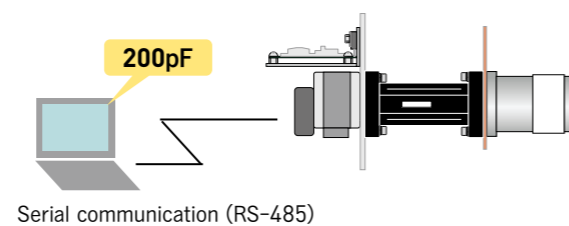
The connection between motor and variable vacuum capacitor has many conditions to be considered, such as structural robustness, high voltage tolerance, alignment accuracy, and heat resistance. That makes it a place where troubles often occur. Therefore, we have developed a strong outer shell (insulation tube) and a flexible insulation coupler to achieve the ideal connection.

For motor operation, the motor drive speed was set to 240 rpm, giving priority to reliability. Minimum capacitance to maximum capacitance can be set to approx. 3 seconds (UW series). During acceleration and deceleration, acceleration is optimally controlled to minimize stress on the vacuum capacitor.

#### +Motorized



#### +Auto variable capacitor

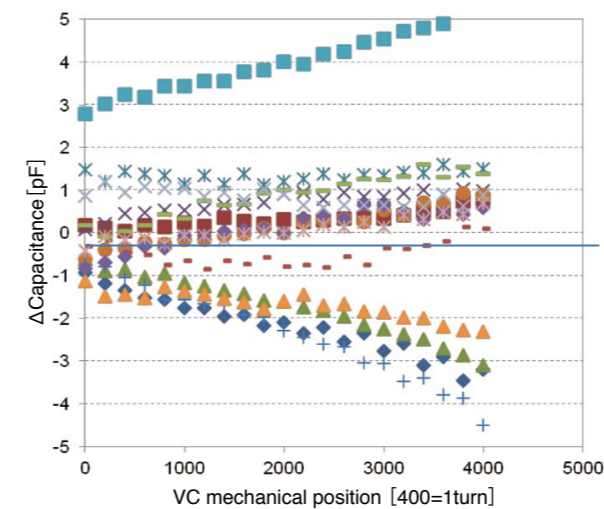


#### ● High accuracy

The capacitance setting accuracy of a typical variable capacitor is about  $\pm 5\%$  (due to the mechanical accuracy of the capacitor). Capacitance is measured for all AutoVC, and the capacitance setting command is calibrated before shipment. Therefore, a capacitance setting accuracy of about  $\pm 0.5\%$  (typical value) can be achieved.

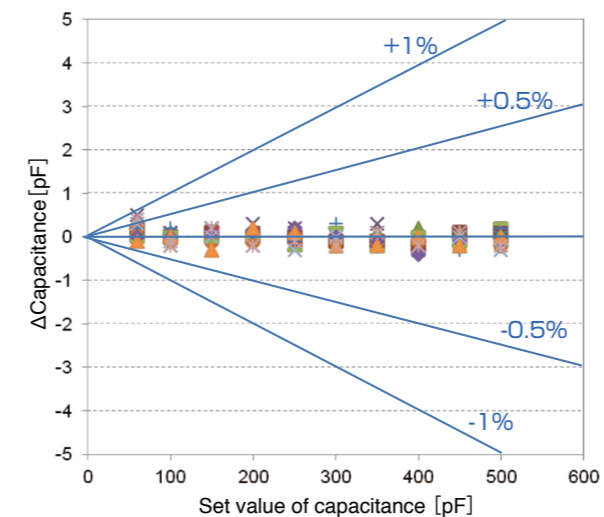
##### (1) Mechanical setting accuracy

Example of measurement of screw-turn position and capacitance error for SCV-125H65UW (Measurement of variation where N=14 units)



##### (2) Auto-tuning

Sample capacitance error measurements when using an auto-tuning vacuum capacitor to set capacitance (using the same measurement sample)

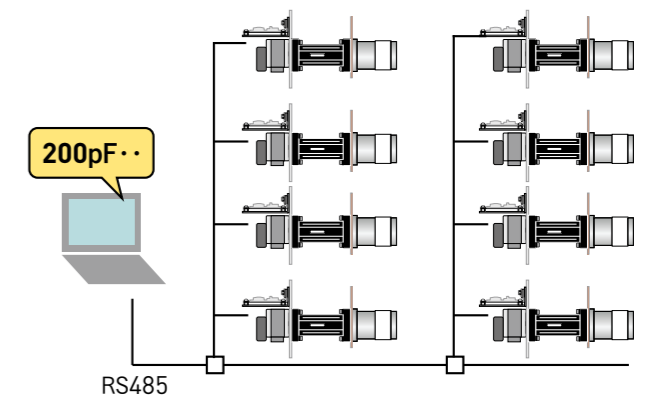


#### ● Network building

You can build a network of AutoVC. The capacitance of each capacitor can be controlled by one serial line from one controller. RS-485 type can connect up to 16 units, and EtherCAT can theoretically connect up to 65,535 units.

#### +Network

Build a network of vacuum capacitors (up to 16 units)



#### ● Fast communication

A high-speed, high-efficiency industrial network system can be built thanks to EtherCAT support.

#### +EtherCAT

Real-time communication

#### ● Common Specifications

The table below presents the standard common specifications for the AutoVC motor unit. For the electrical characteristics and other details of the VC incorporated into the unit, please refer to the specifications of the applicable product.

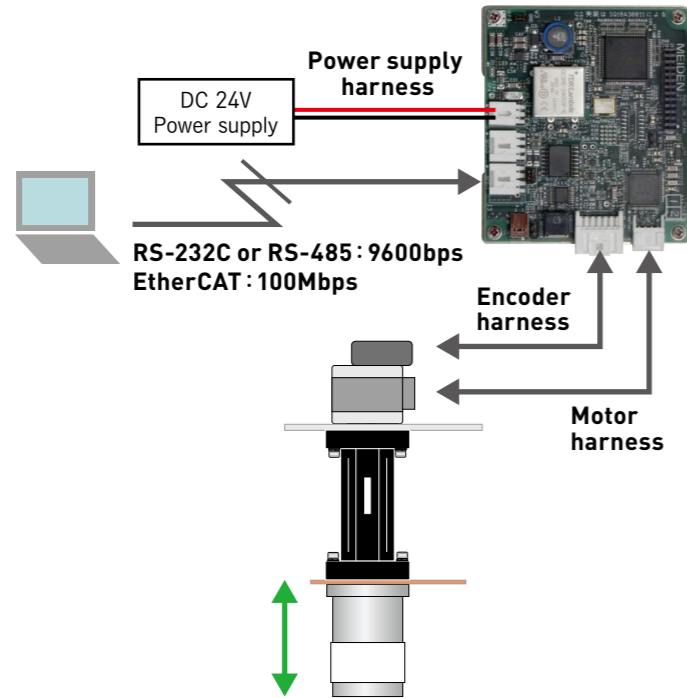
Power supply	DC 24V (1A)
Powered device	Stepper motor
Motor speed	240 rpm (max. 360 rpm)
Motor resolution	400 steps per revolution
Coupler withstand voltage	10kVp (AC)
Capacitance setting accuracy	$\pm 1\%$

● EtherCAT is a licensed-use, patented technology and registered trademark of German company Beckhoff Automation GmbH.

# Specifications

Interface	Communication speed	Control method
EtherCAT	100Mbps	Incremental (with absolute function) <sup>※10</sup>
RS-485	9,600bps	Incremental (with absolute function) <sup>※10</sup>
RS-485	9,600bps	Incremental
RS-232C	9,600bps	Incremental

※10: The absolute function enables reading of absolute position information upon command issuance, thus precluding the need for origin seeking (response time: 5 ms).



# ⚠ Handling Precautions

## Quality assurance

If any defect or failure attributable to MEIDEN is found within one year after delivery of the product, we will replace or repair the returned vacuum capacitor free of charge. The customer shall be responsible for the replacement work. However, in special cases where one of the following applies (for example, when the returned capacitor is working properly), the customer may be billed an analysis and reporting fee, which is not covered by the warranty. In addition, the warranty is limited to the content above and does not cover any other damages (including damage to customer equipment, lost opportunities, lost profits, etc.) resulting from the product. If you wish to return the investigated product, please contact a sales representative in advance. If you fail to contact a sales representative, you will be responsible for payment of all shipping costs, including import duties.

## Vacuum capacitor analysis

If you wish to have your product investigated due to defect or failure, please fill out the Vacuum Capacitor Investigation Request Form at the end of this document and contact a MEIDEN sales representative. If you fail to contact a sales representative, you will be responsible for payment of all shipping costs, including import duties.

The standard investigation period is 10 business days after the receipt of the actual product. A sales representative will inform you of the investigation report submission date. Major investigation items are as follows.

Investigation	Fixed vacuum capacitor	Variable vacuum capacitor
General	<ul style="list-style-type: none"> <li>Exterior investigation</li> <li>Capacitance inspection</li> <li>Withstand voltage test</li> <li>X-ray investigation, etc. (non-destructive)</li> </ul>	<ul style="list-style-type: none"> <li>Exterior investigation</li> <li>Capacitance investigation</li> <li>Torque investigation</li> <li>Withstand voltage test</li> <li>X-ray investigation, etc. (non-destructive)</li> </ul>
Disassembly	<ul style="list-style-type: none"> <li>Electrode check</li> <li>Internal discoloration check</li> </ul>	<ul style="list-style-type: none"> <li>Electrode check</li> <li>Bellows check</li> <li>Internal discoloration check</li> </ul>

You will be responsible for payment of all shipping-related costs at time of return. Also, if the investigated product is not covered under the warranty conditions mentioned above, MEIDEN has right to charge an investigation fee.

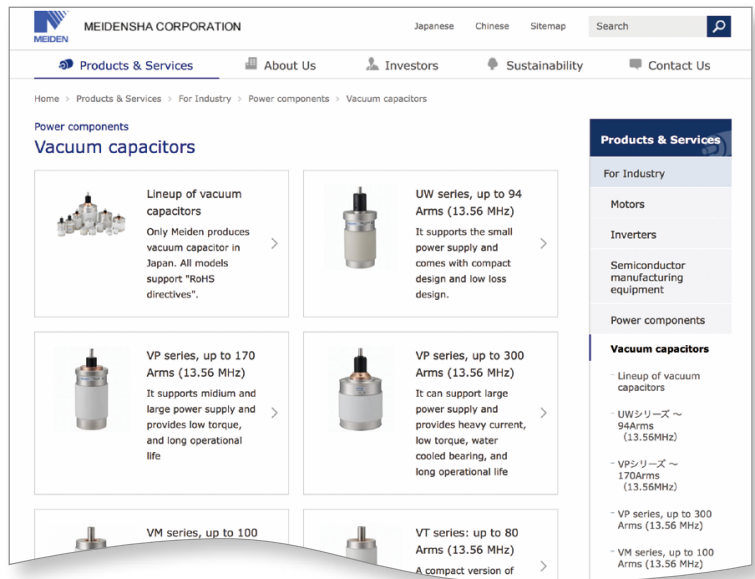
After receipt of the report, please inform us of how you would like us to handle the investigated product. If not informed, we will dispose it after six months of storage.

If any abnormality is found in the packing box or cushioning material when the vacuum capacitor is delivered, please contact a sales representative and submit a Vacuum Capacitor Investigation Request Form. When shipping vacuum capacitors with abnormal packaging or cushioning materials to MEIDEN as investigated products, please ship them in packages that maintain the packaging and cushioning materials in the same condition as when they were delivered.

# Meidensha.com: An Introduction to our Vacuum Capacitors

For more information, please visit our website:

<https://www.meidensha.com/vc>



All product and company names mentioned in the catalog are the trademarks and / or service marks of their respective owners.

See here for vacuum capacitor technical information.

<https://www.meidensha.com/vc-technical-data>



### Technical Information (Operational Precautions and Characteristic Explanations)

- 1. Withstand Voltage**  
 Withstand voltage is determined by the following three factors:  
 (1) Degree of vacuum  
 (2) Distance between electrodes (gap)  
 (3) Electrode conditioning  
 (1) Degree of vacuum  
 Withstand voltage remains constant if degree of vacuum is less than 0.1 Pa (See Figure 1).
- 2. Peak Test Voltage**  
 This refers to a limit value of dielectric breakdown voltage between electrodes (Figure 3. (1)). Before shipment, MEIDEN tests vacuum capacitors to confirm that no dielectric breakdown occurs when the rated voltage is applied for the specified time (one minute).
- 3. RF Working Voltage**  
 This refers to the rated voltage which can be applied continuously. The RF working voltage is set at 60% of the peak test voltage (Figure 3. (2)). An instant discharge can occur even below than RF working voltage.



MEIDENSHA CORPORATION

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[www.meidensha.com](http://www.meidensha.com)

**Safety Precautions**  

 Prior to using our products, please read through the relevant instruction manuals and related materials.  
 In the case of applications in facilities where fatal injuries are anticipated as a result of product failure, malfunction, and/or misoperation, or where the occurrence of serious losses is predicted, it is recommended to take adequate measures separately by installing, for example, proper safety devices.

**Contact Us**  
**Vacuum Capacitors**  
<https://www.meidensha.com/vc>  
 Please click **Contact Us** on the products web page.

In regard to queries about these products, please contact the Industrial Component Business Unit specified below.

● Vacuum Device Sales Section Industrial Component Business Unit : ThinkPark Tower 2-1-1 Osaki, Shinagawa-ku, Tokyo 141-6029 Japan

■ Due to our commitment to continually improving the function and performance of our products, specifications are subject to change without prior notice.  
 ■ The nameplates for marking the product types and logos shown in this catalog may differ from the actual ones.



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