Power Factor Correction

(Capacitor,Capacitor Contactor Controller,Reactor)

Himel

About Himel

Himel is a multinational manufacturer and provider of electrical products successfully combining global expertise with local knowledge.

Founded by a Spanish entrepreneur in 1958, the company pioneered in exporting quality electrical enclosures, establishing Himel brand globally. Today, our global footprint and technology enable us to provide the best combination of affordable and reliable offers for Low Voltage Power distribution, Industry Automation and Home Electric to our long-term customers and partners in over 50 countries where we are present.

Himel. Reliable made affordable

Reactive Power Management

In electrical networks, reactive energy results in increased line currents for a given active energy transmitted to loads.

The main consequences are:

- Need for oversizing of transmission and distribution networks by utilities,
- Increased voltage drops and sags along the distribution lines,
- Additional power losses.

This results in increased electricity bills for industrial customers because of:

- Penalties applied by most utilities on reactive energy,
- Increased overall kVA demand,
- Increased energy consumption within the installations.

Reactive energy management aims to optimize your electrical installation by reducing energy consumption, and to improve power availability.

Power Factor Correction

Every electric machine needs active power (kW) and reactive power (kvar) to operate. The power rating of the installation in kVA is the combination of both: $(kVA)^2 = (kW)^2 + (kvar)^2$.

The Power Factor has been defined as the ratio of active power (kW) to apparent power (kVA). Power Factor = (kW) / (kVA).

The objective of Reactive Energy management is improvement of Power Factor, or "Power Factor Correction".

This is typically achieved by producing reactive energy close to the consuming loads, through connection of capacitor banks to the network.

Quality and Reliability

- Advanced impregnation technology ensures the stability of parraffin fill-in: reliable lifecycle.
- 100% testing in manufacturing plant.
- Design and engineering with the highest international standards.

Safety

- Explosion-proof equipment, and quick disconnection from power grid;
- No risk of oil leakage due to the application of microcrystalline wax as impregnation.

Efficiency and Productivity

- Product development including innovation in ergonomics and ease of installation and connection.
- Specially designed components to save time on installation and maintenance.

A Comprehensive Offer

Power Factor Correction capacitor with and without reactor form part of a comprehensive offer of products perfectly coordinated to meet low-voltage power distribution needs.

Reactive Power Management: Why?

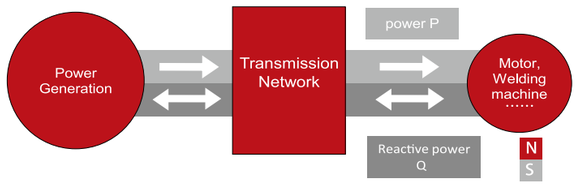
All AC electrical networks consume two types of power: active power (kW) and reactive power (kvar):

Use of these products in the electrical installation will result in:

- Improved continuity of service;
- Reduced power losses;
- Guarantee of scalability;
- efficient monitoring and management.
- The active power P (in kW) is the real power transmitted to loads such as motors, lamps, heaters, computers, etc. The electrical active power is transformed into mechanical power, heat or light.
- The reactive power Q (in kvar) is used only to power the magnetic circuits of machines, motors and transformers.

The apparent power S (in kVA) is the vector combination of active and reactive power.

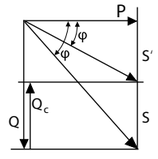
In an electrical circuit, the reactive energy is supplied in addition to the active energy.

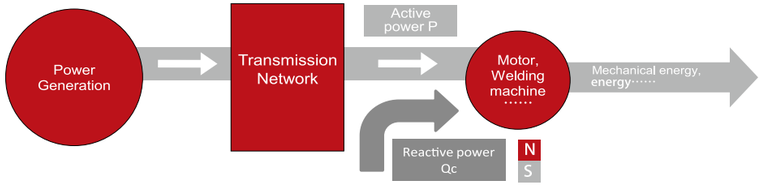


For these reasons, there is a great advantage in generating reactive energy at the load level in order to prevent the unnecessary circulation of current in the network. This is what is known as "power factor correction". This is obtained by the connection of capacitors, which produce reactive energy in opposition to the energy absorbed by loads such as motors.

The result is a reduced apparent power, and an improved power factor P/S' as illustrated in the diagram opposite.

The power generation and transmission networks are partially relieved, reducing power losses and making additional transmission capacity available.





Low-voltage Capacitor

The efficiency of power generation, transmission or conversion is improved when operated at near unity power factor. The least expensive way to achieve the same is by installing Capacitors. Capacitors must be able to withstand high voltage transients and power line variations without breakdown.

Characteristic

- Low loss of medium and temperature with long serving time to save eleltricity bill.
- HIMEL Capacitors are made in accordance with Metallized Polypropelene technology with built-in SELF HEALING properties.
- Full specifications

HDCAP3 Series

Capacity: 1~30kvar
Voltage: 230V, 400V, 450V, 525V
Connection type:Three-phase
Voltage: 230V, 400V, 450V, 525V
Connection type:Three-phase

HBSM Series

Capacity: 0.5~60kvar
Voltage: 230V, 250V, 280V, 400V, 415V, 440V, 450V, 480V, 525V, 660V, 690V, 760V
Connection type: Single-phase, three-phase, three-phase four-wire
Housing type: D, M and Q

Single-phase DType

Three-phase DType

Three-phase Four-wire DType

Three-phase MType

Three-phase Four-wire QType

Three-phase Four-wire MType

Detuned Reactors - Harmonic Blocking

Influence of Harmonics

The growing use of power electronic devices is causing an increasing level of harmonic distortion in the electrical systems, which frequently leads to problems with capacitor installations. This is the reason why energy suppliers and actual conditions require the usage of harmonic blocking reactors.

A detuned capacitor system works out the function of power factor correction while preventing any amplification of harmonic currents and voltages caused by resonance between the capacitor and inductive impedances of the electrical system.

Installation of a Detuned Harmonic Filters is recommended, which can restrain a low-pass resonant circuit (usually below the 5th) harmonics to flow into capacitors.

Application

Capacitors get easily affected and damaged by harmonic current, inrush current, and due to over voltage in the reactive power compensation system. Therefore, to avoid parallel resonance and the issue about amplified harmonic current, it is necessary to be in series reactor along with the capacitors. Reactors are applied to avoid excessive amplification of power grid harmonics and resonance resulting from the connection of capacitor banks to prolong the service time of capacitors.

Features

Reactors adopt three-phase three-column type structure:

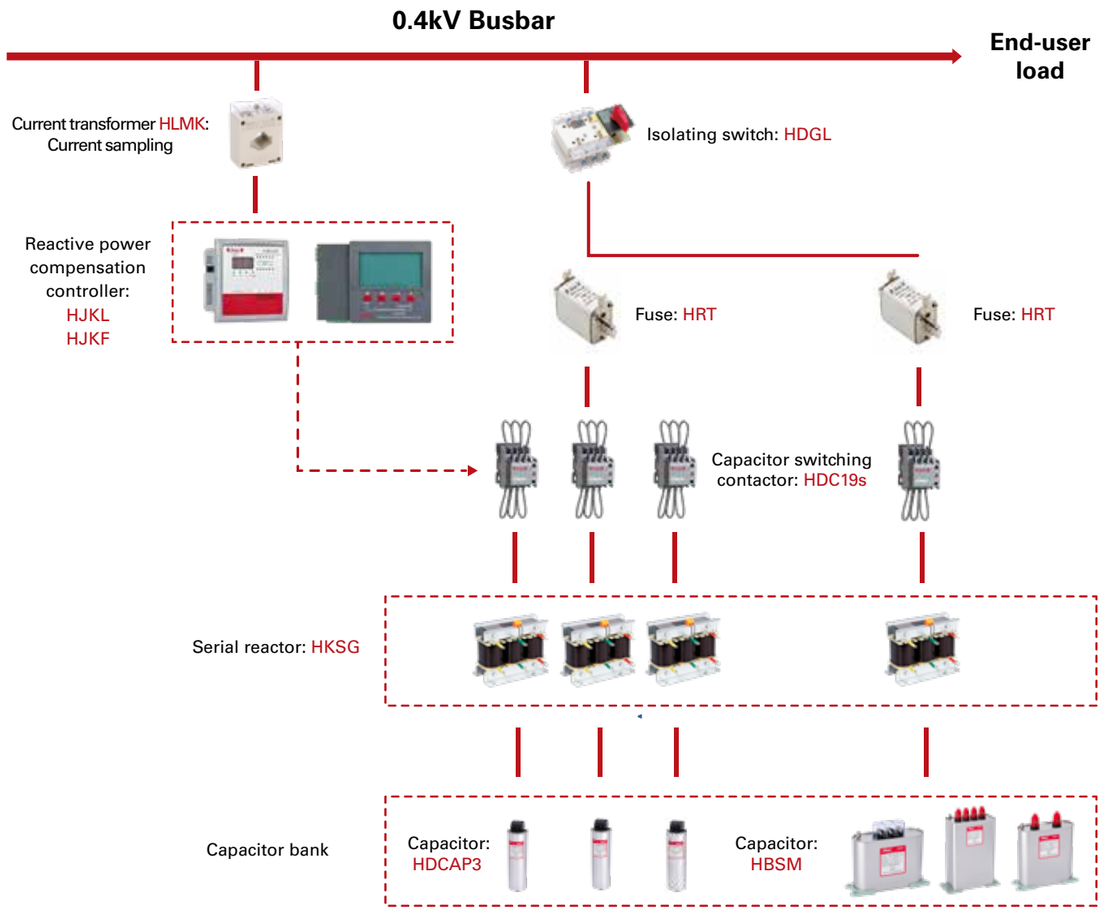
- The gap of the iron core adopts epoxy resin impreged glass cloth laminated sheet as the spacer. High-impact binder is applied (high-temperature tolerance) to ensure that gaps of reactors do not change and there is no noise during the operation.
- Coils are tightly wound with enameled flat wires to ensure that coils of reactors do not vibrate during the operation(foil winding is used when current is more than 100A).
- Advanced low-loss silicon steel sheet is used. Fast punching mode is applied to ensure that products have high efficiency and low loss.

POWER FACTOR CORRECTION

Power Factor Correction Solution

Standard: IEC60947-4-1, IEC60947-5-1

Reactive Power Compensation Solution



System solution for reactive power compensation cabinet.

POWER FACTOR CORRECTION

HDCAP3 Low-voltage Capacitor

NEW

HDCAP3

Rated Operating Voltage: AC 400V, 450V, 525V
Rated Capacity: 1~30kvar
Connection Type: Three-phase
Rated Frequency: 50Hz
Appearance: Cylinder
Inside Dipping Material: Polypropylene Metallized Film
Ambient Temperature: -25°C ~+50°C

01

HBSM Low-voltage Capacitor

HBSM

Rated Operating Voltage: AC 230V,250V,280V,400V,415V, 440V,450V,480V,525V, 660V,690V,750V
Rated Capacity: 0.5~60kvar
Connection Type: Single-phase,three-phase, three-phase four-wire
Rated Frequency: 50/60Hz
Appearance: Box
Inside Dipping Material: Polypropylene Metallized Film
Ambient Temperature: -25°C ~+50°C

02

HJKL Reactive Power Compensation Controllers

HJKL

Sampling voltage: AC 380V/220V±15%
Sampling current: n/5A (Is≤5A)
Output loops: 4, 6, 8, 10, 12 loops

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HJKF Reactive Power Compensation Controller

NEW

HJKF

Rated operating voltage: AC400V (±15%)
Rated current: ≤5A
Output Loops: 12 loops
Four running output modes: circulate switching, coding switching, cut-on first and then cut-off, optimization switching
Frequency:50 / 60Hz

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HKSG Three-phase Serial Reactor

NEW

HKSG

Rated Operating Voltage: AC0.48kV, AC0.525kV
Detuning: 7% and 14%
Connection Type: Three-phase
Rated Frequency: 50Hz

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HDC19s Capacitor Switching Contactor

HDC19s

Rated Operating Voltage: 380/400V
Frame Current: 25A,32A,43A,63A,95A,115A,150A,170A
Poles: 3P
Rated Frequency: 50Hz, 50/60Hz
Coil Voltage: 24V, 36V, 48V, 110V, 127V, 220/230V, 240V, 380/400V, 415V, 440V
Certificate: CE

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POWER FACTOR CORRECTION

HDCAP3 Low-voltage Capacitors

Standard: IEC60831

Range Presentation

Power Factor Correction capacitors with and without reactor form part of a comprehensive offer of products perfectly coordinated to meet low-voltage power distribution needs.

HDCAP3: Cylinder type

Features

- Low loss of medium and temperature with long serving time to save electricity bill.
- Metallized Polypropylene technology with built-in SELF HEALING properties.
- Full specifications:
  - **HDCAP3**
    Capacity: 1-30kvar
    Voltage: 400V, 450V, 525V
    Connection type: Three-phase

Online Content

HDCAP3

Selection Code

HDCAP3 series

Range name	Rated voltage	Rated compensation capacity	Compensation method
HDCAP3	**400**	**5**	**3**
HDCAP3: Cylinder type	**0400:** 400V **0450:** 450V **0525:** 525V	**005:** 5kvar **705:** 7.5kvar **010:** 10kvar **025:** 25kvar **030:** 30kvar	**3:** Three-phase compensation

Technical Parameters	
Low-voltage Capacitor	**HDCAP3**
Rated Voltage(AC)	400V, 450V, 525V
Rated Capacity	1-30kvar
Capacity deviation (μF)	0~+10% of the rated capacity
Loss angle tangent (tan)	At the rated power-frequency voltage, 20°C tan δ≤0.2%
Connection Type	Three-phase
Rated Frequency	50Hz
Ambient Temperature	-25°C~+50°C
AC withstand voltage	Inter-electrode: 2.15Un/10s
	Between shell and phase: 3kV/10s
Allowable over-voltage (Un)	1.10 of rated voltage (not greater than 8h in 24h)
Allowable over-current (In)	1.43 of rated current
Altitude	≤2000m
Relative humidity	≤50% at 40°C ≤90% at 20°C
Appearance	Cylinder
Inside Dipping Material	Polypropylene metallized film
Self discharge characteristic	The residual voltage reduces to 50V or below from √ 2Un after 3 minutes in case of power failure
Standard	IEC60831

POWER FACTOR CORRECTION

HBSM Low-voltage Capacitors

Standard: IEC60831

Range Presentation

Power Factor Correction capacitors with and without reactor form part of a comprehensive offer of products perfectly coordinated to meet low-voltage power distribution needs.

HBSM: Box type

Features

- Low loss of medium and temperature with long serving time to save electricity bill.
- Metallized Polypropylene technology with built-in SELF HEALING properties.
- Full specifications:
  - **HBSM: Capacity:** 0.5~60kvar
    Voltage: 230V, 250V, 280V, 400V, 415V, 440V, 450V, 480V, 525V, 660V, 690V, 760V
    Connection type: Single-phase, three-phase, three-phase four-wire
    Housing type: D, M and Q

Online Content

HBSM

Single-Phase

Range Name	With or without reactor	Rated Voltage	Rated compensation capacity	Compensation method	Housing type
HBSM	**0**	**02500**	**0150**	**1**	**D**
HBSM: Box type	**0:** Without reactor	**02500:** 250V	**0020:** 2kvar **0030:** 3kvar **0040:** 4kvar **0050:** 5kvar **0080:** 8kvar **0100:** 10kvar **0120:** 12kvar **0150:** 15kvar	**1:** Single-phase compensation	**D:** D type
			0200: 20kvar		**M:** M type

*For other voltages(230V, 280V, 400V, 415V, 450V, 480V, 525V), please consult local Himel office.

Three-phase

Range Name	With or without reactor	Rated Voltage	Rated compensation capacity	Compensation method	Housing type
HBSM	**0**	**04500**	**0150**	**3**	**D**
HBSM: Box type	**0:** Without reactor	**04000:** 400V **04150:** 415V **04500:** 450V **05250:** 525V	**0005:** 0.5kvar ... **0200:** 20kvar ... **0320:** 32kvar	**3:** Three-phase compensation	**D:** D type
			0300: 30kvar **0350:** 35kvar **0400:** 40kvar		**M:** M type
			0400: 40kvar **0450:** 45kvar **0500:** 50kvar **0600:** 60kvar		**Q:** Q type

*For other voltages(230V, 250V, 440V, 480V, 690V, 750V), please consult local Himel office.

HBSM Low-voltage Capacitors

Standard: IEC60831

Three-phase four-wire

Range Name	With or without reactor	Rated Voltage	Rated compensation capacity	Compensation method	Housing type
HBSM	**0**	**02503**	**0150**	**4**	**D**
HBSM: Box type	**0:** Without reactor	**02303:** 230√3V **02503:** 250√3V	**0030:** 3kvar ... **0180:** 18kvar	**4:** Three-phase four-wire compensation 3YN	**D:** D type
			0200: 20kvar **0240:** 24kvar		**M:** M type
			0250: 25kvar **0300:** 30kvar **0400:** 40kvar **0450:**45kvar		**Q:** Q type

*For other voltages(280√3V,400√3V),please consult local Himel office.

Technical Parameters		
Low-voltage Capacitor		**HBSM**
Rated Voltage(AC)	Single-phase	230V,250V,280V,400V,415V,450V,480V,525V
	Three-phase	230V,250V,400V,415V,440V,450V,480V,525V
	Three-phase four-wire	400V(230√3V),450V(250√3V),480V(280√3V),690V(400√3V)
Rated Capacity		0.5-60kvar
Capacity deviation (μF)		0~+10% of the rated capacity
Loss angle tangent (tan)		At the rated power-frequency voltage, 20°C tan δ≤0.2%
Connection Type		Single-phase, three-phase, three-phase four-wire
Rated Frequency		50/60Hz
Ambient Temperature		-25°C ~+50°C
AC withstand voltage		Inter-electrode: 2.15Un/10s
		Between shell and phase: 3kV/10s
Allowable over-voltage (Un)		1.10 of rated voltage (not greater than 8h in 24h)
Allowable over-current (In)		1.43 of rated current
Altitude		≤2000m
Relative humidity		≤50% at 40°C ≤90% at 20°C
Appearance		Box
Inside Dipping Material		Polypropylene metallized film
Self discharge characteristic		The residual voltage reduces to 50V or below from √ 2Un after 3 minutes in case of power failure
Standard		IEC60831

selection guide

Standard: IEC60831

HDCAP3 50/60Hz Selection Guide

Commercial Reference	Description	Ue (V)	50Hz			60Hz		
			kvar	Ie (A)	Contact	kvar	Ie (A)	Contact
HDCAP304000053	HDCAP3-400V-5kvar-3phase	400	5	7.2	HDC19s-25	6	8.7	HDC19s-25
HDCAP304007053	HDCAP3-400V-7.5kvar-3phase	400	7.5	10.8	HDC19s-25	9	13	HDC19s-25
HDCAP304000103	HDCAP3-400V-10kvar-3phase	400	10	14.4	HDC19s-25	12	17.3	HDC19s-32
HDCAP304000123	HDCAP3-400V-12kvar-3phase	400	12	17.3	HDC19s-32	14.4	20.8	HDC19s-32
HDCAP304000143	HDCAP3-400V-14kvar-3phase	400	14	20.2	HDC19s-32	16.8	24.2	HDC19s-43
HDCAP304000153	HDCAP3-400V-15kvar-3phase	400	15	21.7	HDC19s-43	18	26	HDC19s-43
HDCAP304000163	HDCAP3-400V-16kvar-3phase	400	16	23.1	HDC19s-43	19.2	27.7	HDC19s-43
HDCAP304000183	HDCAP3-400V-18kvar-3phase	400	18	26	HDC19s-43	21.6	31.2	HDC19s-63
HDCAP304000203	HDCAP3-400V-20kvar-3phase	400	20	28.9	HDC19s-63	24	34.6	HDC19s-63
HDCAP304000253	HDCAP3-400V-25kvar-3phase	400	25	36.1	HDC19s-63	30	43.3	HDC19s-95
HDCAP304000303	HDCAP3-400V-30kvar-3phase	400	30	43.3	HDC19s-95	36	52	HDC19s-95
HDCAP304500053	HDCAP3-450V-5kvar-3phase	450	5	6.4	HDC19s-25	6	7.7	HDC19s-25
HDCAP304507053	HDCAP3-450V-7.5kvar-3phase	450	7.5	9.6	HDC19s-25	9	11.5	HDC19s-25
HDCAP304500103	HDCAP3-450V-10kvar-3phase	450	10	12.8	HDC19s-25	12	15.4	HDC19s-25
HDCAP304500123	HDCAP3-450V-12kvar-3phase	450	12	15.4	HDC19s-25	14.4	18.5	HDC19s-32
HDCAP304500143	HDCAP3-450V-14kvar-3phase	450	14	18	HDC19s-32	16.8	21.6	HDC19s-43
HDCAP304500153	HDCAP3-450V-15kvar-3phase	450	15	19.2	HDC19s-32	18	23.1	HDC19s-43
HDCAP304500163	HDCAP3-450V-16kvar-3phase	450	16	20.5	HDC19s-32	19.2	24.6	HDC19s-43
HDCAP304500183	HDCAP3-450V-18kvar-3phase	450	18	23.1	HDC19s-43	21.6	27.7	HDC19s-43
HDCAP304500203	HDCAP3-450V-20kvar-3phase	450	20	25.7	HDC19s-43	24	30.8	HDC19s-63
HDCAP304500253	HDCAP3-450V-25kvar-3phase	450	25	32.1	HDC19s-63	30	38.5	HDC19s-63
HDCAP304500303	HDCAP3-450V-30kvar-3phase	450	30	38.5	HDC19s-63	36	46.2	HDC19s-95
HDCAP305250053	HDCAP3-525V-5kvar-3phase	525	5	5.5	HDC19s-25	6	6.6	HDC19s-25
HDCAP305257053	HDCAP3-525V-7.5kvar-3phase	525	7.5	8.2	HDC19s-25	9	9.9	HDC19s-25
HDCAP305250103	HDCAP3-525V-10kvar-3phase	525	10	11	HDC19s-25	12	13.2	HDC19s-25
HDCAP305250123	HDCAP3-525V-12kvar-3phase	525	12	13.2	HDC19s-25	14.4	15.8	HDC19s-25
HDCAP305250143	HDCAP3-525V-14kvar-3phase	525	14	15.4	HDC19s-25	16.8	18.5	HDC19s-32
HDCAP305250153	HDCAP3-525V-15kvar-3phase	525	15	16.5	HDC19s-25	18	19.8	HDC19s-32
HDCAP305250163	HDCAP3-525V-16kvar-3phase	525	16	17.6	HDC19s-32	19.2	21.1	HDC19s-32
HDCAP305250183	HDCAP3-525V-18kvar-3phase	525	18	19.8	HDC19s-32	21.6	23.8	HDC19s-43
HDCAP305250203	HDCAP3-525V-20kvar-3phase	525	20	22	HDC19s-43	24	26.4	HDC19s-43
HDCAP305250253	HDCAP3-525V-25kvar-3phase	525	25	27.5	HDC19s-43	30	33	HDC19s-63
HDCAP305250303	HDCAP3-525V-30kvar-3phase	525	30	33	HDC19s-63	36	39.6	HDC19s-63

selection guide

Standard: IEC60831

HBSM 50/60Hz Selection Guide

Single-phase , 250V

Commercial Reference	Description Single-phase △ 250V	50Hz			60Hz		
		kvar	Ie (A)	Contact	kvar	Ie (A)	Contact
HBSM00250000201D	HBSM-0-250V-2kvar-1phase-D	2	8	HDC19s-25	2.4	9.6	HDC19s-25
HBSM00250000251D	HBSM-0-250V-2.5kvar-1phase-D	2.5	10	HDC19s-25	3	12	HDC19s-25
HBSM00250000301D	HBSM-0-250V-3kvar-1phase-D	3	12	HDC19s-25	3.6	14.4	HDC19s-25
HBSM00250000401D	HBSM-0-250V-4kvar-1phase-D	4	16	HDC19s-25	4.8	19.2	HDC19s-32
HBSM00250000501D	HBSM-0-250V-5kvar-1phase-D	5	20	HDC19s-32	6	24	HDC19s-43
HBSM00250000801D	HBSM-0-250V-8kvar-1phase-D	8	32	HDC19s-43	9.6	38.4	HDC19s-63
HBSM00250001001D	HBSM-0-250V-10kvar-1phase-D	10	40	HDC19s-63	12	48	HDC19s-95
HBSM00250001201D	HBSM-0-250V-12kvar-1phase-D	12	48	HDC19s-95	14.4	57.6	HDC19s-95
HBSM00250001501D	HBSM-0-250V-15kvar-1phase-D	15	60	HDC19s-95	18	72	HDC19s-115
HBSM00250002001M	HBSM-0-250V-20kvar-1phase-M	20	80	HDC19s-150	24	96	HDC19s-150

Three-phase, 400V

Commercial Reference	Description Three-phase △ 400V	50Hz			60Hz		
		kvar	Ie (A)	Contact	kvar	Ie (A)	Contact
HBSM00400000103D	HBSM-0-400V-1kvar-3phase-D	1	1.4	HDC19s-25	1.2	1.7	HDC19s-25
HBSM00400000203D	HBSM-0-400V-2kvar-3phase-D	2	2.9	HDC19s-25	2.4	3.5	HDC19s-25
HBSM00400000303D	HBSM-0-400V-3kvar-3phase-D	3	4.3	HDC19s-25	3.6	5.2	HDC19s-25
HBSM00400000403D	HBSM-0-400V-4kvar-3phase-D	4	5.8	HDC19s-25	4.8	7	HDC19s-25
HBSM00400000503D	HBSM-0-400V-5kvar-3phase-D	5	7.2	HDC19s-25	6	8.7	HDC19s-25
HBSM00400000753D	HBSM-0-400V-7.5kvar-3phase-D	7.5	10.8	HDC19s-25	9	13	HDC19s-25
HBSM00400000803D	HBSM-0-400V-8kvar-3phase-D	8	11.5	HDC19s-25	9.6	13.8	HDC19s-25
HBSM00400001003D	HBSM-0-400V-10kvar-3phase-D	10	14.4	HDC19s-25	12	17.3	HDC19s-32
HBSM00400001203D	HBSM-0-400V-12kvar-3phase-D	12	17.3	HDC19s-32	14.4	20.8	HDC19s-32
HBSM00400001403D	HBSM-0-400V-14kvar-3phase-D	14	20.2	HDC19s-32	16.8	24.2	HDC19s-43
HBSM00400001503D	HBSM-0-400V-15kvar-3phase-D	15	21.7	HDC19s-43	18	26	HDC19s-43
HBSM00400001603D	HBSM-0-400V-16kvar-3phase-D	16	23.1	HDC19s-43	19.2	27.7	HDC19s-43
HBSM00400001803D	HBSM-0-400V-18kvar-3phase-D	18	26	HDC19s-43	21.6	31.2	HDC19s-63
HBSM00400002003D	HBSM-0-400V-20kvar-3phase-D	20	28.9	HDC19s-63	24	34.6	HDC19s-63
HBSM00400002403D	HBSM-0-400V-24kvar-3phase-D	24	34.6	HDC19s-63	28.8	41.5	HDC19s-63
HBSM00400002503D	HBSM-0-400V-25kvar-3phase-D	25	36.1	HDC19s-63	30	43.3	HDC19s-95
HBSM00400002803D	HBSM-0-400V-28kvar-3phase-D	28	40.4	HDC19s-63	33.6	48.5	HDC19s-95
HBSM00400003003D	HBSM-0-400V-30kvar-3phase-D	30	43.3	HDC19s-95	36	52	HDC19s-95
HBSM00400003003M	HBSM-0-400V-30kvar-3phase-M	30	43.3	HDC19s-95	36	52	HDC19s-95
HBSM00400003503M	HBSM-0-400V-35kvar-3phase-M	35	50.5	HDC19s-95	42	60.6	HDC19s-95
HBSM00400004003M	HBSM-0-400V-40kvar-3phase-M	40	57.7	HDC19s-95	48	69.3	HDC19s-115
HBSM00400004503Q	HBSM-0-400V-45kvar-3phase-Q	45	65	HDC19s-115	54	78	HDC19s-150
HBSM00400005003Q	HBSM-0-400V-50kvar-3phase-Q	50	72.2	HDC19s-115	60	86.6	HDC19s-150
HBSM00400006003Q	HBSM-0-400V-60kvar-3phase-Q	60	86.6	HDC19s-150	72	103.9	HDC19s-170

selection guide

Standard: IEC60831

Three-phase, 415V

Commercial Reference	Description Three-phase △ 415V	50Hz			60Hz		
		kvar	Ie (A)	Contact	kvar	Ie (A)	Contact
HBSM00415000303D	HBSM-0-415V-3kvar-3phase-D	3	4.2	HDC19s-25	3.6	5	HDC19s-25
HBSM00415000503D	HBSM-0-415V-5kvar-3phase-D	5	7	HDC19s-25	6	8.4	HDC19s-25
HBSM00415000753D	HBSM-0-415V-7.5kvar-3phase-D	7.5	10.4	HDC19s-25	9	12.5	HDC19s-25
HBSM00415000803D	HBSM-0-415V-8kvar-3phase-D	8	11.1	HDC19s-25	9.6	13.3	HDC19s-25
HBSM00415001003D	HBSM-0-415V-10kvar-3phase-D	10	13.9	HDC19s-25	12	16.7	HDC19s-32
HBSM00415001203D	HBSM-0-415V-12kvar-3phase-D	12	16.7	HDC19s-32	14.4	20	HDC19s-32
HBSM00415001403D	HBSM-0-415V-14kvar-3phase-D	14	19.5	HDC19s-32	16.8	23.4	HDC19s-43
HBSM00415001503D	HBSM-0-415V-15kvar-3phase-D	15	20.9	HDC19s-32	18	25.1	HDC19s-43
HBSM00415001603D	HBSM-0-415V-16kvar-3phase-D	16	22.3	HDC19s-43	19.2	26.8	HDC19s-43
HBSM00415002003D	HBSM-0-415V-20kvar-3phase-D	20	27.8	HDC19s-43	24	33.4	HDC19s-63
HBSM00415002503D	HBSM-0-415V-25kvar-3phase-D	25	34.8	HDC19s-63	30	41.7	HDC19s-63
HBSM00415003003D	HBSM-0-415V-30kvar-3phase-D	30	41.7	HDC19s-63	36	50.1	HDC19s-95
HBSM00415003503M	HBSM-0-415V-35kvar-3phase-M	35	48.7	HDC19s-95	42	58.4	HDC19s-95
HBSM00415004003M	HBSM-0-415V-40kvar-3phase-M	40	55.6	HDC19s-95	48	66.8	HDC19s-115
HBSM00415004503Q	HBSM-0-415V-45kvar-3phase-Q	45	62.6	HDC19s-95	54	75.1	HDC19s-115
HBSM00415005003Q	HBSM-0-415V-50kvar-3phase-Q	50	69.6	HDC19s-115	60	83.5	HDC19s-150
HBSM00415006003Q	HBSM-0-415V-60kvar-3phase-Q	60	83.5	HDC19s-150	72	100.2	HDC19s-170

Three-phase, 450V

Commercial Reference	Description Three-phase △ 450V	50Hz			60Hz		
		kvar	Ie (A)	Contact	kvar	Ie (A)	Contact
HBSM00450000103D	HBSM-0-450V-1kvar-3phase-D	1	1.3	HDC19s-25	1.2	1.6	HDC19s-25
HBSM00450000203D	HBSM-0-450V-2kvar-3phase-D	2	2.6	HDC19s-25	2.4	3.1	HDC19s-25
HBSM00450000303D	HBSM-0-450V-3kvar-3phase-D	3	3.8	HDC19s-25	3.6	4.6	HDC19s-25
HBSM00450000403D	HBSM-0-450V-4kvar-3phase-D	4	5.1	HDC19s-25	4.8	6.1	HDC19s-25
HBSM00450000503D	HBSM-0-450V-5kvar-3phase-D	5	6.4	HDC19s-25	6	7.7	HDC19s-25
HBSM00450000753D	HBSM-0-450V-7.5kvar-3phase-D	7.5	9.6	HDC19s-25	9	11.5	HDC19s-25
HBSM00450000803D	HBSM-0-450V-8kvar-3phase-D	8	10.3	HDC19s-25	9.6	12.4	HDC19s-25
HBSM00450001003D	HBSM-0-450V-10kvar-3phase-D	10	12.8	HDC19s-25	12	15.4	HDC19s-25
HBSM00450001203D	HBSM-0-450V-12kvar-3phase-D	12	15.4	HDC19s-25	14.4	18.5	HDC19s-32
HBSM00450001403D	HBSM-0-450V-14kvar-3phase-D	14	18	HDC19s-32	16.8	21.6	HDC19s-43
HBSM00450001503D	HBSM-0-450V-15kvar-3phase-D	15	19.2	HDC19s-32	18	23.1	HDC19s-43
HBSM00450001603D	HBSM-0-450V-16kvar-3phase-D	16	20.5	HDC19s-32	19.2	24.6	HDC19s-43
HBSM00450001803D	HBSM-0-450V-18kvar-3phase-D	18	23.1	HDC19s-43	21.6	27.7	HDC19s-43
HBSM00450002003D	HBSM-0-450V-20kvar-3phase-D	20	25.7	HDC19s-43	24	30.8	HDC19s-63
HBSM00450002203D	HBSM-0-450V-22kvar-3phase-D	22	28.2	HDC19s-43	26.4	33.8	HDC19s-63
HBSM00450002403D	HBSM-0-450V-24kvar-3phase-D	24	30.8	HDC19s-63	28.8	37	HDC19s-63
HBSM00450002503D	HBSM-0-450V-25kvar-3phase-D	25	32.1	HDC19s-63	30	38.5	HDC19s-63
HBSM00450002803D	HBSM-0-450V-28kvar-3phase-D	28	35.9	HDC19s-63	33.6	43.1	HDC19s-95
HBSM00450003003D	HBSM-0-450V-30kvar-3phase-D	30	38.5	HDC19s-63	36	46.2	HDC19s-95
HBSM00450003003M	HBSM-0-450V-30kvar-3phase-M	30	38.5	HDC19s-63	36	46.2	HDC19s-95
HBSM00450003203D	HBSM-0-450V-32kvar-3phase-D	32	41.1	HDC19s-63	38.4	49.3	HDC19s-95
HBSM00450003503M	HBSM-0-450V-35kvar-3phase-M	35	44.9	HDC19s-95	42	53.9	HDC19s-95
HBSM00450004003M	HBSM-0-450V-40kvar-3phase-M	40	51.3	HDC19s-95	48	61.6	HDC19s-95
HBSM00450004503Q	HBSM-0-450V-45kvar-3phase-Q	45	57.7	HDC19s-95	54	69.3	HDC19s-115
HBSM00450005003Q	HBSM-0-450V-50kvar-3phase-Q	50	64.2	HDC19s-115	60	77	HDC19s-150
HBSM00450006003Q	HBSM-0-450V-60kvar-3phase-Q	60	77	HDC19s-150	72	92.4	HDC19s-150

selection guide

Standard: IEC60831

HBSM 50/60Hz Selection Guide

Three-phase, 525V

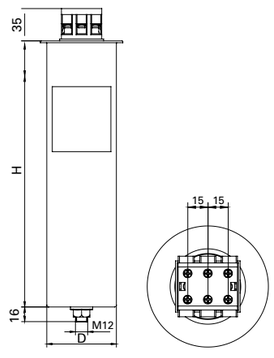
Commercial Reference	Description Three-phase △ 525V	50Hz			60Hz		
		kvar	Ie (A)	Contact	kvar	Ie (A)	Contact
HBSM00525000303D	HBSM-0-525V-3kvar-3phase-D	3	3.3	HDC19s-25	3.6	4	HDC19s-25
HBSM00525000503D	HBSM-0-525V-5kvar-3phase-D	5	5.5	HDC19s-25	6	6.6	HDC19s-25
HBSM00525001003D	HBSM-0-525V-10kvar-3phase-D	10	11	HDC19s-25	12	13.2	HDC19s-25
HBSM00525001203D	HBSM-0-525V-12kvar-3phase-D	12	13.2	HDC19s-25	14.4	15.8	HDC19s-25
HBSM00525001503D	HBSM-0-525V-15kvar-3phase-D	15	16.5	HDC19s-25	18	19.8	HDC19s-32
HBSM00525001603D	HBSM-0-525V-16kvar-3phase-D	16	17.6	HDC19s-32	19.2	21.1	HDC19s-32
HBSM00525001803D	HBSM-0-525V-18kvar-3phase-D	18	19.8	HDC19s-32	21.6	23.8	HDC19s-43
HBSM00525002003D	HBSM-0-525V-20kvar-3phase-D	20	22	HDC19s-43	24	26.4	HDC19s-43
HBSM00525002503D	HBSM-0-525V-25kvar-3phase-D	25	27.5	HDC19s-43	30	33	HDC19s-63
HBSM00525003003M	HBSM-0-525V-30kvar-3phase-M	30	33	HDC19s-63	36	39.6	HDC19s-63
HBSM00525003503M	HBSM-0-525V-35kvar-3phase-M	35	38.5	HDC19s-63	42	46.2	HDC19s-95
HBSM00525004003M	HBSM-0-525V-40kvar-3phase-M	40	44	HDC19s-95	48	52.8	HDC19s-95
HBSM00525004003Q	HBSM-0-525V-40kvar-3phase-Q	40	44	HDC19s-95	48	52.8	HDC19s-95
HBSM00525005003Q	HBSM-0-525V-50kvar-3phase-Q	50	55	HDC19s-95	60	66	HDC19s-115
HBSM00525006003Q	HBSM-0-525V-60kvar-3phase-Q	60	66	HDC19s-115	72	79.2	HDC19s-150

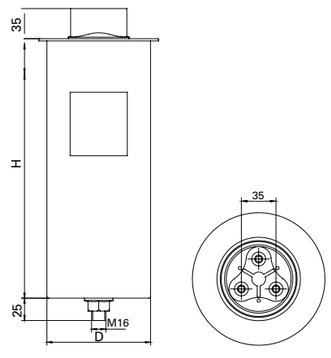
Overall Dimension

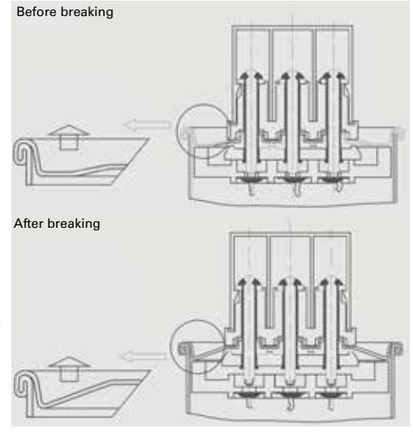
Standard: IEC60831

HDCAP3 Overall Dimension

Model	Overall dimensions D*H(mm)	Mounting dimensions	Capacitance (μF)
HDCAP3-0.4-5-3	76*245	M12×16	99.47
HDCAP3-0.4-7.5-3	76*245	M12×16	149.21
HDCAP3-0.4-10-3	76*245	M12×16	198.95
HDCAP3-0.4-12-3	76*245	M12×16	238.74
HDCAP3-0.4-14-3	86*245	M12×16	278.53
HDCAP3-0.4-15-3	86*245	M12×16	298.42
HDCAP3-0.4-16-3	86*245	M12×16	318.31
HDCAP3-0.4-18-3	86*290	M12×16	358.11
HDCAP3-0.4-20-3	86*290	M12×16	397.9
HDCAP3-0.4-25-3	116*290	M16×25	497.37
HDCAP3-0.4-30-3	116*290	M16×25	596.85
HDCAP3-0.45-5-3	76*245	M12×16	78.6
HDCAP3-0.45-7.5-3	76*245	M12×16	117.9
HDCAP3-0.45-10-3	76*245	M12×16	157.19
HDCAP3-0.45-12-3	76*245	M12×16	188.63
HDCAP3-0.45-14-3	86*245	M12×16	220.07
HDCAP3-0.45-15-3	86*245	M12×16	235.79
HDCAP3-0.45-16-3	86*245	M12×16	251.51
HDCAP3-0.45-18-3	86*290	M12×16	282.95
HDCAP3-0.45-20-3	86*290	M12×16	314.39
HDCAP3-0.45-25-3	116*290	M16×25	392.99
HDCAP3-0.45-30-3	116*290	M16×25	471.58
HDCAP3-0.525-5-3	76*245	M12×16	57.74
HDCAP3-0.525-7.5-3	76*245	M12×16	86.62
HDCAP3-0.525-10-3	76*245	M12×16	115.49
HDCAP3-0.525-12-3	76*245	M12×16	138.59
HDCAP3-0.525-14-3	86*245	M12×16	161.69
HDCAP3-0.525-15-3	86*245	M12×16	173.23
HDCAP3-0.525-16-3	86*245	M12×16	184.78
HDCAP3-0.525-18-3	86*290	M12×16	207.88
HDCAP3-0.525-20-3	86*290	M12×16	230.98
HDCAP3-0.525-25-3	116*290	M16×25	288.72
HDCAP3-0.525-30-3	116*290	M16×25	346.47







Overall Dimension

Standard: IEC60831

HBSM Overall Dimension

• Single-phase dimension（250V）

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00250000201D	D130	101.86
HBSM00250000251D	D130	127.33
HBSM00250000301D	D130	152.79
HBSM00250000401D	D130	203.72
HBSM00250000501D	D130	254.65

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00250000801D	D210	407.44
HBSM00250001001D	D210	509.3
HBSM00250001201D	D210	611.15
HBSM00250001501D	D290	763.94
HBSM00250002001M	M265	1018.59

• Three-phase dimension（400V）

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00400000103D	D130	19.89
HBSM00400000203D	D130	39.79
HBSM00400000303D	D130	59.68
HBSM00400000403D	D130	79.58
HBSM00400000503D	D130	99.47
HBSM00400000753D	D130	149.21
HBSM00400000803D	D130	159.15
HBSM00400001003D	D130	198.95
HBSM00400001203D	D185	238.73
HBSM00400001403D	D185	278.52
HBSM00400001503D	D185	298.42
HBSM00400001603D	D185	318.31

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00400001803D	D210	358.1
HBSM00400002003D	D210	398
HBSM00400002403D	D245	477.46
HBSM00400002503D	D245	497.37
HBSM00400002803D	D290	557.04
HBSM00400003003D	D290	596.85
HBSM00400003003M	M210	596.85
HBSM00400003503M	M265	696.3
HBSM00400004003M	M265	795.77
HBSM00400004503Q	Q210	895.25
HBSM00400005003Q	Q210	994.75
HBSM00400006003Q	Q240	1193.7

•Three-phase dimension（415V）

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00415000303D	D130	55.45
HBSM00415000503D	D130	92.41
HBSM00415000753D	D130	138.62
HBSM00415000803D	D130	147.86
HBSM00415001003D	D130	184.82
HBSM00415001203D	D185	221.79
HBSM00415001403D	D185	258.75
HBSM00415001503D	D185	277.23
HBSM00415001603D	D185	295.72

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00415002003D	D210	369.64
HBSM00415002503D	D245	462.06
HBSM00415003003D	D290	554.47
HBSM00415003503M	M265	646.88
HBSM00415004003M	M265	739.29
HBSM00415004503Q	Q210	831.7
HBSM00415005003Q	Q210	924.11
HBSM00415006003Q	Q210	1108.94

•Three-phase dimension（450V）

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00450000103D	D130	15.72
HBSM00450000203D	D130	31.44
HBSM00450000303D	D130	47.16
HBSM00450000403D	D130	62.88
HBSM00450000503D	D130	78.6
HBSM00450000753D	D130	117.89
HBSM00450000803D	D130	125.75
HBSM00450001003D	D130	157.19
HBSM00450001203D	D185	188.63
HBSM00450001403D	D185	220.07

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00450002803D	D290	440.13
HBSM00450003003D	D290	471.58
HBSM00450003003M	M210	471.58
HBSM00450003203D	D290	503.01
HBSM00450003503M	M265	550.17
HBSM00450004003M	M265	628.78
HBSM00450004503Q	Q210	707.36
HBSM00450005003Q	Q210	785.95
HBSM00450006003Q	Q240	943.14

Overall Dimension

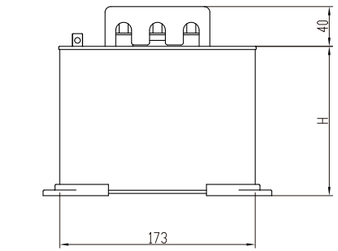
Standard: IEC60831

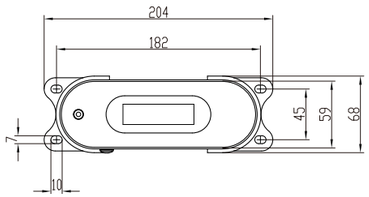
•Three-phase dimension（415V）

Commercial Reference	Shell Code	Capacitance (μF)
HBSM00415000303D	D130	55.45
HBSM00415000503D	D130	92.41
HBSM00415000753D	D130	138.62
HBSM00415000803D	D130	147.86
HBSM00415001003D	D130	184.82
HBSM00415001203D	D185	221.79
HBSM00415001403D	D185	258.75
HBSM00415001503D	D185	277.23
HBSM00415001603D	D185	295.72

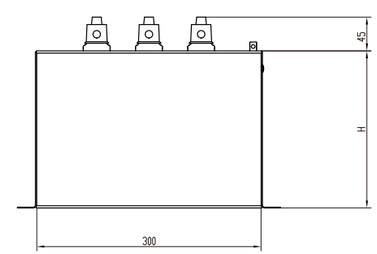
Commercial Reference	Shell Code	Capacitance (μF)
HBSM00415002003D	D210	369.64
HBSM00415002503D	D245	462.06
HBSM00415003003D	D290	554.47
HBSM00415003503M	M265	646.88
HBSM00415004003M	M265	739.29
HBSM00415004503Q	Q210	831.7
HBSM00415005003Q	Q210	924.11
HBSM00415006003Q	Q210	1108.94

HBSM

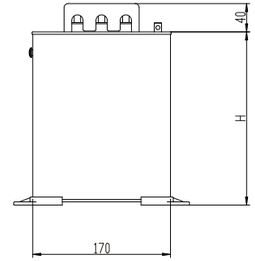


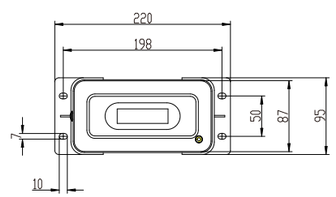


	D Type				Unit: mm
Housing code	D130	D185	D210	D245	D290
Capacitor body height (H)	130	185	210	245	290

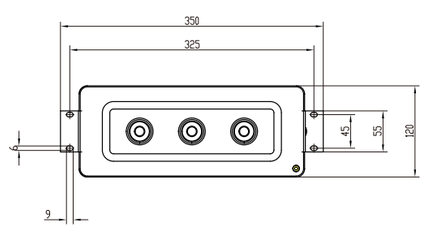


	Q Type	Unit: mm
Housing code	Q210	Q240
Capacitor body height (H)	210	240





	M Type	Unit: mm
Housing code	M210	M265
Capacitor body height (H)	210	265



POWER FACTOR CORRECTION

HJKL Power Factor Correction Controllers

Standard: IEC60831

Range Presentation

HJKL is Himel range of reactive power compensation controllers, matching all kinds of capacitors in low-voltage system. It adopts MCU controlling to compute the phase difference between the fundamentals of current and voltage, enabling precise power factor measurement with quick response.

Features

- New control algorithm designed to reduce the number of switching operations and quickly attain the targeted power factor.
- Quick and simple mounting and wiring.
- Direct viewing of installation electrical information and capacitor condition.
- Direct reading and easy setup
- Alarm indication.

Online Content

HJKL

Selection Code

Range name	Sampling voltage	Output loops	Circuit type	Enclosure material
HJKL	**2CM**	**4**	**DC**	**S**
HJKL	**2CM:** 220V **5CQ:** 380V	**4:** 4 loops **6:** 6 loops **8:** 8 loops **10:** 10 loops **12:** 12 loops	**Default:** AC circuit **DC:** DC 12V	**S:** Molded case

Technical Parameters

Power Factor Correction Controllers	HJKL	
Category	Parameter value	Default Value
Sampling voltage	380V(HJKL5C)/ 220V(HJKL2C)±15%	
Sampling current	n/5A (Is≤5A)	
Frequency	50-60(Hz)	
Sensitivity	50mA	
Input threshold	lag 0.80-lead-0.82 adjustable step 0.01	0.95
Cut-off threshold	lead-0.80-lag0.82 adjustable step 0.01	-0.99
Loop setting	1-12 adjustable step 1	
Time setting	1s~120s adjustable step 1s	30s
Overvoltage setting	400~450V(HJKL5C)adjustable step 5V	430V
	235~260V(HJKL2C)adjustable step 5V	245V
Undervoltage protection	300V(HJKL5C) / 170V(HJKL2C)	
Undercurrent setting	0mA~500mA adjustable step 50mA	200mA (0 is for close)
COSΦdisplay	Lead & Lag (0.00~0.99) resolution 0.01	
Working methods	Continuous working, circular switching	
Output loops	4, 6, 8, 10, 12 loops	
Capacity of output	Each group 5A, 220V resistive / 3A, 380V resistive	
IP grade	IP30 for cover	

POWER FACTOR CORRECTION

HJKF Power Factor Correction Controllers

Standard: IEC60051

Range Presentation

HJKF is Hime range of the reactive power compensation controller. It is a special controller used for three-phase low-voltage power grid. Automatic generation of multiple alarm events, which can remind users through nodes or sounds. Temperature adjustment function is involved in all models, which can save 1 pcs temperature-control regulator in capacitor cabinet. Harmonics detecting and protection functions are included as well. All parameters are protected by password to avoid any unexpected modifications.

Features

- Elegant LCD display with rich contents
- Wiring identification by manual assistance is included for easy wiring
- Current dotted terminal identification is included for easy wiring switch
- Output code can be arbitrary coding, and it can be compatible with various capacity configurations
- Four running output modes: circulate switching, coding switching, cut-on first and then cut-off, optimization switching
- Temperature control node included is easy to adjust ambient temperature of the reactive power compensation cabinet
- Alarm node included is easy for users to temperature control, remote monitoring and fault protection
- Built-in buzzer alarm function, and alarm events can be optional which will be convenient for users on-site to find abnormal cases
- RS485 port is for communication type model which can be arbitrary wiring without differentiating A and B. It's easy for users to do wiring with master computers.

Selection Code

Range Name	Sampling Voltage	Output Loops	Function
HJKF5C	**V**	**12**	**Z**
HJKF5C	**V:** 400V	**12:** 12 loops	**Default:** wiithout communication **Z:** Communication type

Technical Parameters

Rated operating voltage	AC400V (±15%)
Frequency	50 / 60Hz
Rated current	≤5A
Sensitivity	≤50mA
Compensation method	Common three-phase compensation
Power loss	<5VA
Response time	1s~120s
Output capacity	220V/5A
Output loop number	12 loops
Hole size	113*113(mm)
Weight	<0.6kg

Wiring Diagram

Standard: IEC60831

Wiring Diagram

HJKL5C

HJKL5C

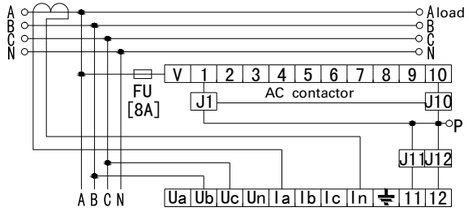
Ub, Uc: input of voltage signal

Ia, In: input of current signal

V: common terminal of control output

e.g. Contactor 380V: point P is connected to phase B or phase C;

e.g. Contactor 220V: point P is connected to phase N



HJKL5C-DC

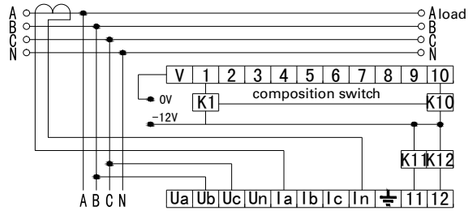
Ub, Uc: input of voltage signal

Ia, In: input of current signal

V, K(1-12): output of DC control signal

V: 0V

K(1-12): output -12V



HJKL2C

HJKL2C

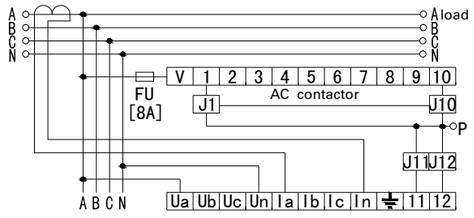
Ub, Uc: input of voltage signal

Ia, In: input of current signal

V: common terminal of control output

e.g. Contactor 380V: point P is connected to phase B or phase C;

e.g. Contactor 220V: point P is connected to phase N



HJKL2C-DC

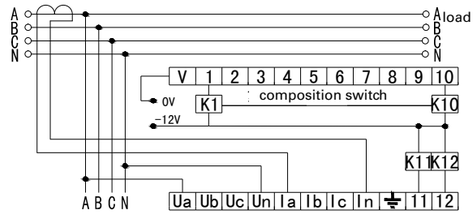
Ub, Uc: input of voltage signal

Ia, In: input of current signal

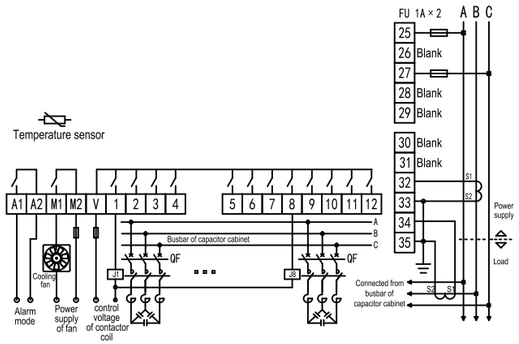
V, K(1-12): output of DC control signal

V: 0V

K(1-12): output -12V



HJKF5C

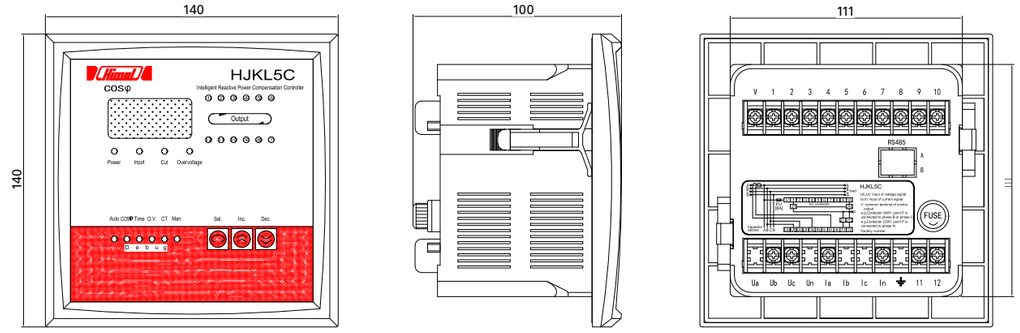


Dimensions

Standard: IEC60051

Dimensions

HJKL5C



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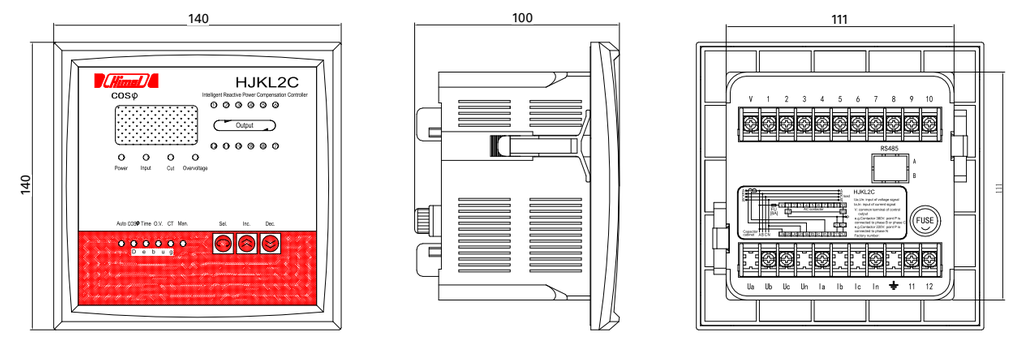
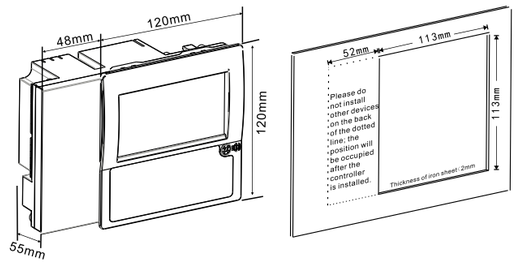


HJKF5C



HKSG Detuned Reactors

Standard: IEC60289

Range Presentation

Capacitors get easily affected and damaged by harmonic current, inrush current, and due to over voltage in the reactive power compensation system. Therefore, to avoid parallel resonance and the issue about amplified harmonic current, reactors need to be added in series along with the capacitors. Reactors are applied to avoid excessive amplification of power grid harmonics and resonance resulting from the connection of capacitor banks to prolong the service time of capacitors.

Features

Reactors adopt three-phase three-column type structure:

- High-impact binder is applied (high-temperature tolerance) and no noise during the operation
- Coils are tightly wound with enameled flat wires to ensure that coils of reactors do not vibrate during the operation(foil winding is used when current is more than 100A).
- High efficiency and low loss

Online Content

HKSG

Selection Code

Model	Winding Material	Rated Capacity of the Reactor	Rated Voltage of the Capacitor	Reactance Ratio
HKSG	**L**	**1P0**	**G048**	**H7**
	Default: Copper windings **L:** Aluminum windings	**P6:** 0.6kvar **P7:** 0.7kvar **1P0:** 1kvar ... **9P8:** 9.8kvar	**G048:** 480V **G052:** 525V	**H7:** 7% **H14:** 14%"

Technical Parameters	
Basic Information	**HKSG Series**
Rated Operating Voltage(AC)	AC0.48kV, AC0.525kV (others can be customized)
Reactance Ratio	7% and 14% (others can be customized)
Phase	Three-phase
Rated Frequency	50Hz
Withstand voltage grade	3000V / min
Overload ability	≤1.35 times
Temperature rise limitation	Coil temperature rise≤85K Winding temperature rise≤95K
Reactor noise	＜ 50dB
Insulation class	＞ F
IP grade	IP00
Altitude	≤ 2000m
Ambient temperature	-25°C~+50°C
Standard	IEC 60289

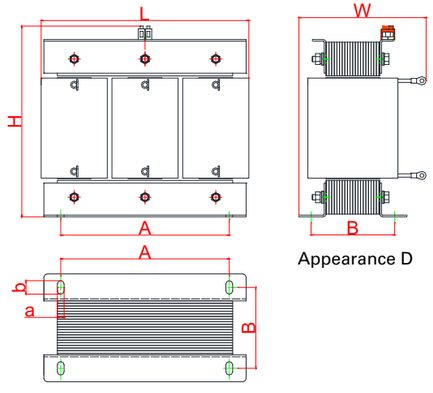
POWER FACTOR CORRECTION

HKSG Detuned Reactors

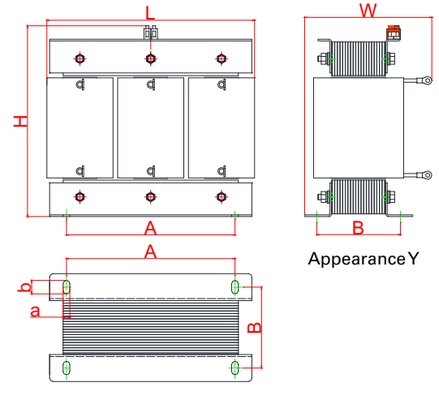
Standard: IEC60289

Dimension

No.	Product Parameter			Aluminum			Product outline	Copper			Product outline
	Reactor Model	Reactor capacity (kvar)	Capacitor capacity (kvar)	Dimension (mm)	Installation dimension (mm)	Hole dimension (mm)		Dimension (mm)	Installation dimension (mm)	Hole dimension (mm)	
				L*W*H	A*B	a*b		L*W*H	A*B	a*b	
1	HKSG-0.35/0.48-7%	0.35	5	160*115*170	130*75	17*φ7	D	160*115*170	130*75	17*φ7	
2	HKSG-0.7/0.48-7%	0.7	10	160*120*170	130*82	17*φ7		200*110*195	170*72	17*φ7	D
3	HKSG-0.84/0.48-7%	0.84	12	200*145*185	170*72	17*φ7	Y	200*115*195	170*77	17*φ7	
4	HKSG-1.05/0.48-7%	1.05	15	200*150*185	170*77	17*φ7		200*155*185	170*82	17*φ7	
5	HKSG-1.4/0.48-7%	1.4	20	200*165*185	170*87	17*φ7		200*165*185	170*92	17*φ7	
6	HKSG-1.75/0.48-7%	1.75	25	200*170*185	200*95	17*φ7		240*180*210	200*95	22*φ10	
7	HKSG-2.1/0.48-7%	2.1	30	240*180*210	200*95	22*φ10		240*185*230	200*100	22*φ10	
8	HKSG-2.45/0.48-7%	2.45	35	240*190*235	200*100	22*φ10		250*190*235	200*105	22*φ10	Y
9	HKSG-2.8/0.48-7%	2.8	40	240*190*235	200*100	22*φ10		250*195*235	200*110	22*φ10	
10	HKSG-3.15/0.48-7%	3.15	45	250*195*235	210*105	22*φ10		250*205*235	210*120	22*φ10	
11	HKSG-3.5/0.48-7%	3.5	50	250*200*235	210*110	22*φ10		250*205*255	210*120	22*φ10	
12	HKSG-4.2/0.48-7%	4.2	60	250*210*255	210*120	22*φ10		310*200*255	250*110	22*φ10	
13	HKSG-0.7/0.525-14%	0.7	5	200*110*190	170*72	17*φ7	D	200*110*190	170*72	17*φ7	
14	HKSG-1.4/0.525-14%	1.4	10	200*125*190	170*87	17*φ7		200*125*190	170*87	17*φ7	D
15	HKSG-1.68/0.525-14%	1.68	12	240*175*210	200*90	22*φ10	Y	240*170*210	200*90	22*φ10	
16	HKSG-2.1/0.525-14%	2.1	15	240*185*210	200*100	22*φ10		240*180*230	200*100	22*φ11	
17	HKSG-2.8/0.525-14%	2.8	20	240*185*230	200*100	22*φ10		240*190*230	200*110	22*φ10	
18	HKSG-3.5/0.525-14%	3.5	25	250*200*235	210*110	22*φ10		250*200*235	210*115	22*φ10	
19	HKSG-4.2/0.525-14%	4.2	30	250*200*255	210*110	22*φ10		250*205*255	210*120	22*φ10	
20	HKSG-4.9/0.525-14%	4.9	35	250*210*255	210*120	22*φ10		310*205*285	210*120	22*φ10	Y
21	HKSG-5.6/0.525-14%	5.6	40	310*200*285	250*110	22*φ10		310*205*285	250*120	22*φ10	
22	HKSG-6.39/0.525-14%	6.3	45	310*200*285	250*110	22*φ10		310*215*285	250*130	22*φ10	
23	HKSG-7.0/0.525-14%	7	50	310*215*285	250*120	22*φ10		310*225*285	250*140	22*φ10	
24	HKSG-8.4/0.525-14%	8.4	60	310*225*285	250*130	22*φ10		310*235*285	250*150	22*φ10	



Appearance D

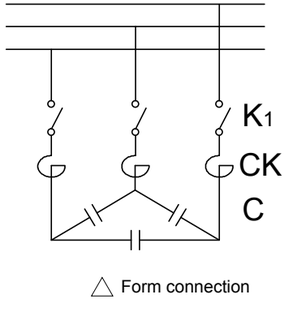


Appearance Y

HKSG Detuned Reactors

Standard: IEC60289

Product Connection Method



△ Form connection

Note:

the standard type of connection is △ type connection (as shown in the figure above).

Other connection methods have to make separate comments when ordering.

Operating Environment and Working Conditions

Ensure the followings:

- No harmful gas, inflammable and explosive materials are around.
- Surrounding is well ventilated. For example: if it is installed in the cabinet, ventilation facilities should be added.
- There is no pollution, corrosive, and explosive medium in the atmosphere, which can seriously affects the insulation of reactors.
- No serious vibration and turbulence at the installation sites.
- The place is free from direct contact of rain and snow.

POWER FACTOR CORRECTION

HKSG Detuned Reactors

Standard: IEC60289

Guideline for Model Selection

With modern electronic technology and developed applications, the number of harmonics generating devices is gradually growing with high harmonic content. All other types of equipment, except the resistance heating devices and filament lamps, generate harmonics with different levels of harmonic content.

Harmonic Generating Devices:

The devices, which can generate harmonics include:

- Magnetic-core equipment (transformer, motor, reactor, electric welder, and inductive heating machine)
- Electric-control transmission equipment (variable frequency speed control, thyristor-type voltage regulation control, elevator or hoister)
- Electronic rectifier, inverter, electric arc furnace, furnace of calcium carbide, switching mode power supply, UPS, electronic office equipment (computers and printers),
- medical electronic equipment
- household appliances and many more.
- Converters, frequency conversion equipment, rolling mills, electric arc furnaces, and electric locomotive and satured transformers with high ratings are the main sources of harmonics.

Sources Generating 3rd Harmonics:

The main sources for generating 3rd harmonics include:

- Electric arc furnace
- Electric locomotive
- Distribution system of shopping mall, business building, and residential building

Sources Generating 5th Harmonics:

The main sources for generating 5th harmonics include:

- Electric locomotive
- Distribution system of shopping mall, business building, and residential building
- Converter and frequency conversion equipment with high ratings

Sources Generating 7th Harmonics:

The main sources for generating 7th harmonics are converters and frequency conversion equipment with high ratings.

Where does our Reactor Fit :

Our reactors are mainly used to filter 3rd and 5th harmonics. Normally, reactance ratio is selected from the below list:

- 3rd harmonics is the main content: 14%
- 5th harmonics is the main content: 7%

Note: If a customer has requirements for other reactance ratio, we can also customize it.

HDC19s Capacitor Switching Contactors

Standard: IEC60947-4-1, IEC60947-5-1

CE

Range Presentation

HDC19s is Himel range of contactors dedicated for switching of capacitors. It is developed based on 3 series contactor with technology to reduce capacitor closing current impact on contactor contacts.

Features

- Current range covers from 25A to 170A
- Various auxiliary contact types can be selected for different applications
- Manufactured on automated production line for better reliability.

Online Content

HDC19s

Selection Code

Range name	Frame current	Auxiliary contact	Coil voltage	Frequency
HDC19s	**25**	**11**	**M**	**5**
HDC19s: Capacitor Switching Contactor	**25:** 25A **32:** 32A **43:** 43A **63:** 63A **95:** 95A **115:** 115A ***150:** 150A ***170:** 170A	**HDC19s-25~43A:** **11:** 1NO+1NC **20:** 2NO+0NC **02:** 0NO+2NC **HDC19s-63~115A:** **12:** 1NO+2NC **21:** 2NO+1NC **HDC19s-150~170A:** **32:** 3NO+2NC	**F:** 110V **S:** 127V **M:** 220/230V **U:** 240V **Q:** 380/400V **L:** 415V **X:** 440V	**5:** 50Hz **7:** 50/60Hz

Note:"*" pruducts are not yet on the market, please consult local Himel office if necessary.

Technical Parameters

Capacitor Switching Contactors			HDC19s-25	HDC19s-32	HDC19s-43	HDC19s-63	HDC19s-95	HDC19s-115	HDC19s-150	HDC19s-170
Standard			IEC60947-4-1, IEC60947-5-1							
Certificate			CE							
Main circuit										
Rated operating voltage (Ue)		V	380/400							
Rated insulation voltage (Ui)		V	690							
Rated current of controlled capacitor	AC-6b 380V	A	17	23	29	43	63	87	115	130
Rated capacity of controlled capacitor (Qn: kvar)	Rated operating voltage of capacitor	AC-6b 220V	6	10	15	18	30	35	46	52
		AC-6b 380V	12	20	25	30	50	60	80	90
Rated conventional thermal current		A	25	32	43	63	95	125	200	200
Controlling capability of inrush current		A	≤35In			≤55In			≤60In	
Mechanical endurance		10000 times	100							
Electrical endurance	AC-6b 380V	10000 times	15			12				
Operating frequency	AC-6b 380V	Times/h	300			120				
Coil										
Coil voltage (Us)		V	24,36,48,110,127,220/230,240,380/400,415,440							
Coil frequency		Hz	AC 50Hz & 50/60Hz							
Operating voltage		V	85%-110%Us							
Drop-out voltage		V	20%-75%Us							
Auxiliary Contact										
Auxiliary contact combination			11,20,02			12,21			32	
Rated conventional thermal current (Ith)		A	10							

Note: Parameters above are considered under three-phase system; for single-phase capacitor, please consult us.

POWER FACTOR CORRECTION

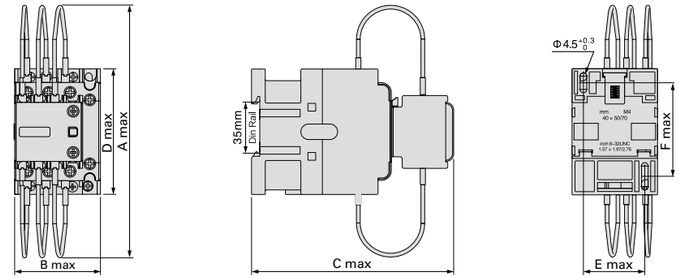
HDC19s Capacitor Switching Contactors

Standard: IEC60947-4-1, IEC60947-5-1

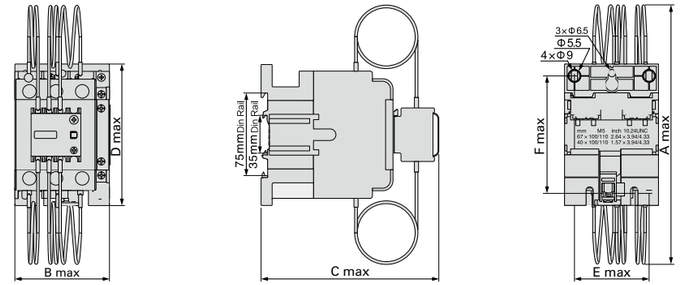
CE

Dimension

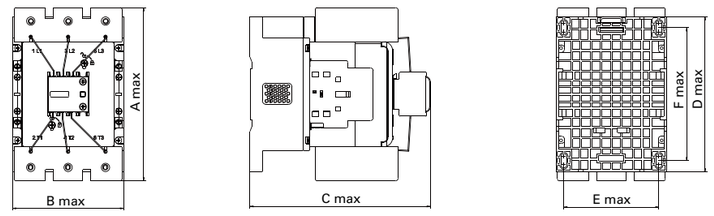
HDC19s-25,32,43



HDC19s-63,95,115



HDC19s-150,170



Overall and Installation Dimensions

Model	104.5Overall size				Installation dimension	
	A max	B max	C max	D max	E max	F max
HDC19s-25	176	45.5	122	74.5	35	50/60
HDC19s-32	180	56.5	132	83	40	50/60
HDC19s-43	180	56.5	132	83	40	50/60
HDC19s-63	190	74.5	154	127.5	59	100/110
HDC19s-95	190	85.5	160	127.5	67	100/110
HDC19s-115	190	85.5	160	127.5	67	100/110
HDC19s-150	188.5	120.5	196	170	104.5	136.5/151.5
HDC19s-170	188.5	120.5	196	170	104.5	136.5/151.5

HDC19s Capacitor Switching Contactors

Standard: IEC60947-4-1, IEC60947-5-1

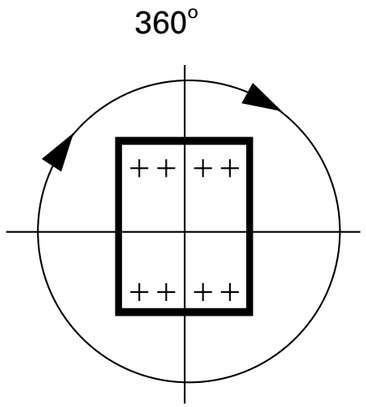
CE

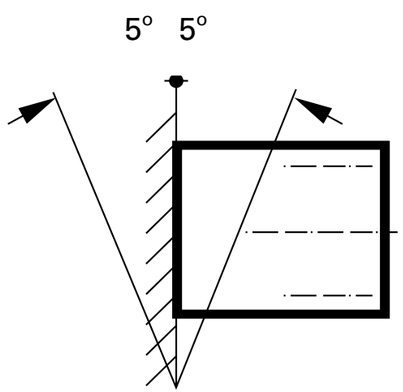
Working Conditions

Ambient temperature:-5°C ~ +40°C, and the daily average temperature: ⩽ 35°C
Altitude: ⩽ 2000 m
The atmospheric relative humidity does not exceed 50% when the highest ambient temperature is +40°C. It is allowed to have a relative higher humidity under lower temperature, e.g. up to 90% at +20°C. For occasional dew due to the temperature change, preventive measures shall be taken.
Pollution Level: 3

Installation Conditions

Installation Type: III
Installation position: should be installed in the absence of a significant shock and vibration point





Notes

Himel
www.himel.com

Oct 2021