### HITACHI Inspire the Next

### Price List – Capacitors (for Customers)

### Capacitors 3 phase, Dry-type, Internal fused

Туре	kvar at 230V	Price (Baht)	Туре	kvar at 400V	kvar at 415V	Price (Baht)
CLMD 43	8 kvar	12,200	CLMD 43	5 kvar	5.5 kvar	9,800
	16 kvar	19,900		10 kvar	11 kvar	10,600
CLMD 53	24 kvar	30,500		15 kvar	16 kvar	11,000
CLMD 63	32 kvar	37,800		20 kvar	22 kvar	14,000
	40 kvar	46,200		25 kvar	27 kvar	15,200
	48 kvar	54,600	CLMD 53	30 kvar	32 kvar	17,700
	56 kvar	63,000		40 kvar	43 kvar	23,000
	64 kvar	70,800		45 kvar	50 kvar	26,300
Туре	kvar at 480V	Price (Baht)	CLMD 63	50 kvar	54 kvar	26,600
CLMD 43	10 kvar	10,400		60 kvar	65 kvar	34,700
CLMD 53	20 kvar	15,400	$\mathcal{T}$	70 kvar	75 kvar	41,700
	30 kvar	20,700		75 kvar	80 kvar	42,600
	34 kvar	21,300		80 kvar	86 kvar	44,800
	40 kvar	27,200	CLMD 83	100 kvar	110 kvar	56,300
CLMD 63	50 kvar	32,200	Туре	kvar at 500V	kvar at 525V	Price (Baht)
	60 kvar	36,400	CLMD 43	9 kvar	10 kvar	10,400
	68 kvar	38,600	•	18 kvar	20 kvar	13,500
	70 kvar	41,700	CLMD 53	27 kvar	30 kvar	19,000
	80 kvar	51,800		36 kvar	40 kvar	24,700
		$\langle \rangle$	CLMD 63	45 kvar	50 kvar	31,400
				54 kvar	60 kvar	34,200
				63 kvar	70 kvar	40,600
		*		72 kvar	80 kvar	44,300
			CLMD 83	81 kvar	90 kvar	55,700
				90 kvar	100 kvar	60,200

### Remark:

- 1. Effective from 1 July 2023.
- 2. All prices do not include VAT.
- 3. Prices are subjected to change without prior notice.
- 4. Please see Capacitor products brochure for technical specification and application.

© Hitachi Energy 2022. All rights reserved. 2GSB030402-0623

### **@**Hitachi Energy (Thailand) Limited

322 Moo 4 Bangpoo Industrial Estate Soi 6, Praeksa, Muang, Samutprakarn 10280 www.hitachienergy.com

### **Hitachi Energy**

120 kvar

110 kvar

75,300

### Price List – Components (for Customers)

### **Power Factor Controller**

Туре	Output	Price (Baht)
RVC-6	6	39,200
RVC-12	12	49,000
RVT-6	6	52,300
RVT-12	12	64,400
RVT-12-3P	12	69,700
MODBUS adaptor kit	accessory	22,400
Temperature probe for RVT	accessory	20,100
Magnetic Contactor for Capacitor		

### Max.kvar (at 400V) Price (Baht) Type UA 30-30-11 27.5 6,560 UA 50-30-11 33 9,050 UA 63-30-11 45 11,180 UA 75-30-11 50 13,700 UA 95-30-11 17,550 60 UA 110-30-11 70 21,080

### Fuse Base - 3 pole

Туре	Fuse size	Price (Baht)
XLP 00	00 & 000	3,200
XLP 1	1	6,500
OFAZ 00 P3L	00 & 000	4,670
OFAZ 1 P3	1	11,320

### **HRC Blade Fuse Link**

Туре	Rating (A)	Price (Baht)
000	50, 63, 80, 100	620
00	125, 160	760
1	200, 250	1020

### Detuning Reactor 7%

Туре	Price (Baht)
Reactor 7% for capacitor net output 25 kvar at 400V	32,500
Reactor 7% for capacitor net output 50 kvar at 400V	41,000

### Remark:

### 1. Effective from 1 July 2023.

- 2. All prices do not include VAT.
- 3. Prices are subjected to change without prior notice.
- 4. Please see Capacitor products brochure for technical specification and application.

© Hitachi Energy 2023. All rights reserved. 2GSB030401-0623

### Hitachi Energy (Thailand) Limited

322 Moo 4 Bangpoo Industrial Estate Soi 6, Praeksa, Muang, Samutprakarn 10280 www.hitachienergy.com

### **Hitachi Energy**



PRODUCT BROCHURE

### **Capacitors Products** Low Voltage



– Capacitors Products Low Voltage ABB Capacitors Products Low Voltage : Improve your power quality and reduce your energy costs

### **Table of contents**

- 008 **LV Capacitor CLMD**
- 011 **Power Factor Controller RVC**
- 020 **Power Factor Controller RVT**
- 023 **UA Contactor**
- 028 **HRC Fuse Links & Fuse Bases**
- 031 **Detuning Reactor**
- 033 **Selection table**

### **LV Capacitor CLMD** from 200 V to 1000 V



### Features and benefits

### Design

The building block of each CLMD capacitor unit is a capacitor winding. These windings undergo vacuum treatment to ensure consistent electrical characteristics. Each winding is then placed in a plastic case and encapsulated in thermo-setting resin in order to obtain a perfectly sealed element. Elements are combined together to form the capacitor unit.

### **Electrical charateristics**

Dielectric losses are less than 0.2 watt per kvar. Total losses including discharge resistors, are less than 0.5 watt per kvar.

### Avaiable for single and 3-phase systems

The elements are placed inside a box made of sheet steel and connected in such a way as to supply the single or 3-phase power at the required voltage and frequency.

### Safe performance throughout the capacitor's life

- The dry type dielectric makes the CLMD capacitors leakage free, minimizing the impact on the environment.
- The sheet steel box is filled with vermiculite which is an inorganic, inert and fireproof material that can absorb the energy produced or extinguish any flames in case of a possible defect at the end of an element's life.
- In the event of a fault developing in the dielectric of the capacitor, the metallized electrode adjacent to the fault is immediately vaporized, thus insolating the fault. The capacitor then continues normal operation. This is commonly called 'self-healing' principle.
- The capacitor windings are provided with a

sequential disconnector ensuring that each element can be reliably and selectively disconnected from the circuit at the end of its life.

- CLMD capacitors are provided the thermal equalizers to ensure effective heat dissipation.
- The use of robust terminals minimizes the risk of damage during installation and reduce maintenance requirements.
- The capacitors comply with the requirements of IEC 60831-1 & 2.

### High performance in-house metallized film

ABB's completely integrated manufacturing process has resulted in the development of a special high-performance in-house metallized film from which all CLMD capacitors benefit. This film gives high breakdown strength, excellent peak current handling capability, and high capacitance stability and has an optimal self-healing design and a long life.

01 CLMD 43 — 02 CLMD 53

— 03 CLMD 63

04 CLMD 83

### A comprehensive range

### CLMD 43, 53, 63, 83

The CLMD capacitor unit is designed in such a way to give the highest level of reliability, safety, performance and power all in a robust and compact fashion.





02





03

### Technical specifications

Standard	IEC 60831-1&2
Rated voltage	200 V to 1000 V
Connection	3-phase (single-phase on request)
Rated frequency	50 and 60 Hz
Туре	Self-healing, dry
Dielectric	Polypropylene (metallized)
Execution	Indoor (outdoor on request)
Overvoltage	1.1 U <sub>N</sub> at intervals
Overcurrent	1.3 I <sub>N</sub>
Maximum overload	1.35 times of nominal rating (IEEE Std.18-2002)
Maximum inrush current	200 I <sub>N</sub>
Safety protection	Internal fuse within each element
Tolerance on capacitance	-5/+10%
Temperature category	-25/D according to IEC 60831
Losses	Dielectric losses <0.2 w/kvar
	Total <0.5 w/kvar (discharge resistor included)
Degree of protection	IP42 (IP54 on request)
Voltage test	Between terminals 2.15 U <sub>N</sub> for 10 seconds
	Between terminals and earth 3 kV for 10 seconds
Insulation level	3/15 kV
Discharge device	Internal discharge resistors
Discharge time	<50 V in 1 minute
Minimum distance between unit	50 mm
Minimum distance between unit and wall	50 mm
Earth terminal	M8 is included
Important notice	The installation of capacitors on networks disturbed by harmonic may require special precautions
	especially when there is a risk of resonance
	Our offer is valid under normal operating conditions only (according to IEC 60831)
	Minimum time to reconnect capacitors to the supply is 40 seconds
	Torque for terminal: M6 : 3Nm, M8 : 6Nm, M10 : 10Nm, M12 : 15.5Nm

### Dimensions

01 CLMD 43	Туре	H (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	D (mm)
_	CLMD 43	275	176	226	266	180	37
02 CLMD 53	CLMD 53	310	346	396	436	350	37
63 and 83	CLMD 63	485	346	396	436	350	47
	CLMD 83	670	346	396	436	350	47



### Selection table

Туре	Rating (kvar)	Rating (kvar)	Capacitance per phase (uF)	I <sub>N</sub> (A)	I <sub>N</sub> (A)	Terminal	Weight (kg)
	230 V			230 V			
CLMD 43	8		160	20.1		M6	4
	16		321	40.2		M6	5
CLMD 53	24		481	60.2		M8	10
CLMD 63	32		642	80.3		M10	12
	40		802	100.4		M10	14
	48		963	120.5		M12	15.5
	56		1123	140.6		M12	17
	64		1284	160.7		M12	18
	400 V	415 V		400 V	415 V		
CLMD 43	5	5.5	33	7.2	7.7	M6	4.5
	10	11	66	14.4	15.3	M6	4.5
	15	16	99	21.7	22.3	M6	4.5
	20	22	133	28.9	30.6	M6	5.5
	25	27	166	36.1	37.6	M6	5.5
CLMD 53	30	32	199	43.3	44.5	M8	8
	40	43	265	57.7	59.8	M8	10
	45	50	298	65.0	69.6	M8	12
CLMD 63	50	54	332	72.2	75.1	M10	13.5
	60	65	398	86.6	90.4	M10	14.5
	70	75	464	101.0	104.3	M10	15.5
	75	80	497	108.3	111.3	M12	16
	80	86	531	115.5	119.6	M12	17
CLMD 83	100	110	663	144.3	153.0	M12	21
	500 V	525 V		500 V	525 V		
CLMD 43	9	10	38	10.4	11.0	M6	4
	18	20	76	20.8	22.0	M6	6.5
CLMD 53	27	30	115	31.2	33.0	M8	8
	36	40	153	41.6	44.0	M8	12
CLMD 63	45	50	191	52.0	55.0	M10	14
	54	60	229	62.4	66.0	M10	15
	63	70	267	72.7	77.0	M10	17
	72	80	306	83.1	88.0	M10	19
CLMD 83	81	90	344	93.5	99.0	M12	21
	90	100	382	103.9	110.0	M12	22.5
	110	120	467	127.0	132.0	M12	24

### **Power Factor Controller RVC** Accurate control and monitoring of capacitor banks



• Type of switching sequence

• Type of switching sequence

RVC has become synonymous with automatic capacitor bank controller in many markets worldwide thanks to its distinct design, ease of use, reliability and versatile functions.

Thanks to the user interface upgrade with graphical icons, it is possible to commission the RVC without a manual. A slimmer casing requires less space in the capacitor bank panel.

The RVC is an easy-to-install, easy to use, smarter power factor controller and an ideal companion of your automatic capacitor banks.

### **Powerful features**

- $\bullet$  Common range for a broad network voltages from 100 V to 440 V
- Measurement and display of key parameters like voltage, current, power factor, THDV and THDI
- Fully programmable switching sequence
- 1 A or 5 A current input
- Easy commissioning
- Complete auto set-up (starting current-C/k, type of switching sequence, phase shift, special connections)
- Easy to use thanks to a user-friendly interface and ease of access to parameters for manual setting
- Highly efficient switching strategy combining integral, direct and circular switching thereby allowing:
- -to control the cos  $\boldsymbol{\phi}$  in presence of rapidly varying loads
- •to reduce the number of switching
- to avoid unnecessary intermediary switchings
- to increase the lifetime of the capacitors and contactors
- Suitable for hot environments due to maximum ambient temperature rating of 70°C
- Not affected by harmonics
- Overvoltage/undervoltage protection and protections against harmonic distortion (THDV)
- Alarm : an alarm contact is opened when any of these conditions are reached:
- the target  $\cos\phi$  is not reached within 6 minutes after all outputs have been switched on
- •the internal temperature of the RVC rises above  $85^{\circ}C$
- overvoltage/undervoltage limits are reached
- the power supply is out of range
- •the THDV exceeds the limits

### Technical specifications

Measuring system	Micro-processor system for balanced 3-phase or single-phase networks					
Operting voltage	100 V to 440 V					
Voltage tolerance	$\pm 10\%$ on indicated operating voltages					
Frequency range	50 or 60 Hz $\pm$ 5% (automatic adjustment to network frequency)					
Measuring circuit terminals (L2, L3 and k, I)	CAT III rated					
Current input	1 A or 5 A (RMS)					
Current input impedance	<0.1 ohm (recomended CT class 1.0, 10 VA min.)					
Consumption of the controller	8 VA max.					
Output contact rating	Max.continuous current: 1.5 A					
	Max.peak current: 5 A					
	Max.voltage: 440 Vac					
	Terminal A is rated for a continuous current of 16 A					
Alarm contact	Normally open contact Max.continuous current: 5 A					
	Rated/max.breaking voltage: 250 vac/440 vac					
Power factor setting	From 0.7 inductive to 0.7 capacitive					
	0.01 (0 3 A					
Number of outputs	$PVC_{2}$ , programmable up to 2 outputs $PVC_{2}$ , programmable up to 6 outputs					
Number of outputs	PVC-8: programmable up to 8 outputs RVC-0: programmable up to 0 outputs					
	RVC-10: programmable up to 30 outputs RVC-10: programmable up to 10 outputs					
Switching time between steps	Programmable from 1s to 999s (independent of reactive load)					
Switching sequence	User defined					
Mode of switching	The mode of switching for all the programmable switching sequences is integral, direct, circular or linear					
Saving-function	All programmed parameters and modes are saved in a non-volatile memory					
Power outage release	Quick automatic disconnection in less than 20 ms (50 Hz) in case of power outage or voltage drop					
Power outage reset delay time	40s					
Operating temperature	-10°C to 70°C					
Storage temperature	-30°C to 85°C					
Mounting position	Vertical panel mounting					
Dimensions	144 x 144 x 43 mm (HxWxD)					
Cut-out dimensions	138 x 138 mm (HxD)					
Weight	0.4 kg (unpacked)					
Connector	Spring clamp terminal block					
Front plate protection	IP43					
Relative humidity	Maximum 95%, non-condensing					
Article numbers for ordering	RVC-3: 2GCA294983A0050					
	RVC-6: 2GCA294984A0050					
· · ·	RVC-8: 2GCA294985A0050					
	RVC-10: 2GCA294986A0050					
	RVC-12: 2GCA294987A0050					
Other features	Overvoltage and undervoltage protection					
	Auto adaptation to the phase-rotation of the network and the CT-terminals					
	Not affected by harmonics					
	Working with generative and regenerative loads					
	LCD contrast automatically compensated with temperature					
Standards	CE marked					

### **Power Factor Controller RVT** The smart PFC for automatic capacitor bank

— 01 RVT rare view (Base model RVT6/RVT12)

— 02 Temperature measurement

— 03 Voltage and current waveforms





01

Measurements	Values	Units	
Internal T	24.6	°C	1
T1	35.7	°C	100
T2	45.8	°C	
T3	24.9	°C	
T4	50.2	°C	
T5	36.4	°C	1
T6	42.5	°C	
17	29.0	°C	-
T8	43.8	°C	V



02

### **Distinct features**

### Power factor correction for both balanced and unbalanced loads

In nowadays installation, unbalanced loads are becoming ubiquitous, especially in residential or commercial buildings. RVT addresses your power power factor issues from both single phase loads (L-L or L-N) and 3-phase balanced/unbalanced loads. RVT is capable of compensation to each phase individually or compensation to three phases globally. Another distinct feature of RVT is individual phase measurments and energy counting.

### **Complete 3-phase measurements**

- Active power (kW) 3 ph/1 ph
- Apparent power (kVA) 3 ph/1 ph
- Reactive power (kvar) 3 ph/1 ph
- Reactive power (kvar) to reach the target  $\cos\phi$  3 ph/1 ph
- Voltage (V) 3 ph/1 ph
- Current (A) 3 ph/1 ph
- Cos  $\phi$  3 ph/1 ph
- Total Harmonic Distortion on Voltage/Current: THD V/I (%)
- Voltage/Current Harmonics : H2 up to H49 (%-spectrum)

### **Touch Screen**

3.5 inch colorful QVGA touch screen eases your parameter settings.

### **Ethernet connection**

With ABB PQ Link software, you may easily plug an RJ-45 to RVT and communicate with the controller through a 10/100BASE-T interface anywhere in the world.

### **USB** connection

RVT supports USB2.0 connection; which makes it possible to connect to a computer via a widely used USB cable to access all RVT parameters.

### Up to 8 Temperature alarm outputs

RVT can monitor 8 hot spots in your bank through eight daisy-chain connected temperature probes.

### **Real time clock**

RVT real time clock tracks and logs date and moment of each alarm and event.

### Hardware and software lock

Both hardware and software locks are equipped to the RVT for bank setting protections from any unauthorized access.

### Other powerful features

— 01 Bank settings

— 02 System values

### RVT is also a MV and HV bank controller

By connecting a PT to the RVT voltage measurements inputs, and setting the proper (V scaling) according to the PT ratio, the RVT is able to control a MV or HV capacitor bank just like a LV capacitor bank.

### Easy commissioning

The fully automatic set-up of the RVT parameters totally eases the bank commissioning process.

### Menu navigation

The clever organization of menus and sub-menus ensures menu navigation easy and intuitive.

### Guided navigation and programming

Online help information guides you step by step in the menu navigation and RVT programming.

### Communication

RVT has versatile communication interfaces: in addition to Ethernet 10/100BASE-T and USB2.0, the RVT supports RS485 connection as well. All parameters settings and measurements are accessible remotely.

### Fully automatic set-up

C/k (sensitivity), active outputs, switching sequence and phase shift can be automatically set-up.

### Programmable protection thresholds

Programmable thresholds allow you to protect the capacitor bank against over- and undervoltage, over-temperature and excessive harmonic distortions

# Mode Bank settings ? X V nominal V Outputs V V scaling V Outputs V Q step 1Ph Kvar Delays Outputs Q step 3Ph kvar Control Control I

### Network information and capacitor bank monitoring

The RVT computes and displays network and capacitor bank information such as voltage, current, harmonics spectra and much more.

### Multi-language support

The RVT allows you to choose its working language between English, French, German, Spanish and Chinese.

### High ambient temperature rating

The RVT is suitable for harsh ambient environments thanks to its maximum ambient temperature rating of 70°C.

### Multi-voltage and multi-frequency

The RVT may be connected to network voltages in the range 100-460 Vac, 50/60 Hz. RVT's measurement voltage is up to 690 Vac without connecting any additional PT.

### Works with 5A and 1A CT's

Both 5 A and 1 A CT's may be connected to the RVT.

### **Digital inputs**

Two digital inputs can be used for day/night power factor and external alarm respectively.

### Two alarm relay outputs and fan/warning output

RVT has two alarm relay outputs (NO and NC) and a FAN/ Warning relay output.

### On-line help

A click to this button at the right top of the touch screen, it will give you an instant access to a online help system which will guide you through all RVT operation/ commissioning step by step.



### **Touch screen**

Ease your menu navigation

01 RVT Start screen

— 02 RVT screen composition

— 03 Keyboard entry screen

— 04 Harmonics voltage in chart

— 05 Legends for the touch screen icons



**Connection types** Single and 3-phase PFC control types

Con	nection type	RVT 12 - 3P	RVT 6 / RVT 12	Phase shift			Volt	ages				Cu	rrents	5	Co	mpensa	tion type
Name	Schematics	Connection	Connection	adjustment	L12	L23	L31	L1N	L2N	L3N	L1	L2	L3	N	Full C3 <sup>1</sup>	Full C1 <sup>2</sup>	Mixed C3+C1
1Ph-1LL1	L2	L2 ML2 L3 ML3 CT 0 N 0 10 0 10 0 10 0 10 0 10	L2	0° by default (see phase shift table)		M e a s u r e d				- <b>b</b> .	M e s u r e d	•		¢.	-1	yes	
3Ph-1LL1	L1 L2 L3 N	L2 L3 CT	L2	90° by default (see phase shift table)	*	Measured	•	•	÷		M e a s u r e d	×.			yes	÷	*
3Ph-1LN1	L1	мил мил мил мил мил мил мил мил мил мил	L1	0° by default (see phase shift table)	-			M e a s u r e d		(14)	M e s u r e d				yes	).	
3Ph-3LL3	L1 L2 L3 N	L1 ML1 L2 ML2 L3 ML3 CT1 ML3 CT2 ML3 CT2 ML3 CT3 ML3 CT3 ML3 CT4 ML3 CT4 ML3 CT5 ML3 CT5 ML3 CT4 ML3 CT4 ML3 CT5 ML3 CT5 ML3 CT5 ML3 CT6 ML3 CT6 ML3 CT6 ML3 CT7 CT7 ML3 CT7 ML3 CT7 C		0° by default (Adjust - phase rotation - CT redirection )	M e a s u r e d	M e a s u r e d	M e a s u r e d	C a l c u l a t e d	C a I c u I a t e d	C a l c u l a t e d	M e a s u r e d	M e a s u r e d	M e a s u r e d	C a - c u - a t e d	yes	yes	yes
3Ph-3LL2		L1 0 ML1 L2 0 ML2 L3 0 ML3 O ML3	9.fl	0° by default (Adjust - phase rotation - CT redirection )	M e a s u r e d	M e a s u r e d	M e a s u r e d	C a l c u l a t e d	C a l c u l a t e d	C a l c u l a t e d	M e s u r e d	M a s u r e d	C a I c u I a t e d	(3)	yes	yes	yes
3Ph-3LN3	L1 L2 L3 N	L1 ML1 L2 ML2 L3 ML3 N ML3 CT1 K1 CT2 K2 CT3 K3		0° by default (Adjust - phase rotation - CT redirection )	Calculated	C a I c u I a t e d	C a I c u I a t e d	M e s u r e d	M a s u r e d	M e s u r e d	M e a s u r e d	M a s u r e d	M e a s u r e d	Calculated	yes	yes	yes
3Ph-1LL3	L1 L2 L3 N	CT1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	N	0° by default (Adjust - CT redirection )		M e a s u r e d	14			•	M e a s u r e d	M e a s u r e d	M e a s u r e d	C a - c u - a t e d	yes	yes	yes
3Ph-1LN3	L1 L2 L3 N	CT1 CT2 CT3 CT3		0° by default (Adjust - CT redirection )		51 51		M a s u r e d			M e s u r e d	M a s u r e d	M e a s u r e d	Ca Icu Iated	yes	yes	yes

<sup>1</sup>C3: 3-phase capacitor control

<sup>2</sup>C1: single-phase capacitor control

### Accessories

01 RS485 Modbus adapter

02 Temperature probes

— 03 Front plate

### RS485 Modbus adapter

All RVT controllers are Modbus communication enabled. The Modbus adapter is an optional item which allows communication with a monitoring system.

All RVT parameters are available (including harmonic spectrum and tables) through an RS485 Modbus adapter.

All RVT parameters are accessible and locking parameters allows limiting their access through the Modbus communication only.

The RVT RS485 interface (3.3 V power supply) is not compatible with previous RS485 adapter (5 V power supply).

**External probes for temperature measurements** Up to eight temperature probes may be connected to the RVT. The eight temperature probes are connected to a daisy chain network, connection details is shown in the manual.

The RVT will close the fan relay if any of the eight temperature thresholds is exceeded.

Information on temperature may be recorded with the event logging function.

### IP54

The RVT front plate offers an IP43 protection degree in standard version.

The gasket accessory enhances the standard RVT protection degree to IP54.









02

### Wiring diagram

01 RVT wiring diagram (Base model RVT6/RVT12)

02 RVT wiring diagram (3-phase model RVT12-3P)

- PS1-PS2 : power supply
- ML1-3 : voltage measurements
  - : neutral connection
- k1-3, l1-3 : CT connection
- canH, canL : CAN bus

• N

- Earth : grounding
- Temp : temperature probe connection
- RS485 : RS485 adapter interface
- N1-2+/- digital inputs

- A
- 1-12
- NO/NC
- AL
- USB
- RJ45
- LOCK
- : outputs
- : output contacts of alarm relay

: common source for output relay

- : common source for alarm relay
- FAN/Warning 1-2 : FAN output relay
  - : USB connection
  - : Ethernet
  - : hardware lock



01



### Technical specifications

Measuring system	Micro-processor system for balanced 3-phase/single-phase networks and unbalanced
	network individual phase power factor control is available
Supply voltage	From 100 Vac up to 460 Vac
Consumption	15 VA max.
Connection type for measuring	Phase-phase or phase-neutral for balanced and unbalanced network
circuit and power supply	
Voltage tolerance	$\pm$ 10% on indicated supply voltages
Measurement category (acc. to IEC 61010-1)	CAT III
Voltage measurement	Up to 690 Vac or higher with voltage transformer
Accuracy	1% full scale
Frequency range	45 or 65 Hz (automatic adjustment to network frequency)
Current input	1 A or 5 A (RMS) (class 1 C.T.)
Current input impedance	< 0.1 ohm
Power outage release	Automatic disconnection of all capacitors in case of a power outage longer than 20 ms
Number of outputs	RVT6/RVT12 Base model: programmable up to 6 or 12 outputs
	RVT12-3P 3-phase model: programmable up to 12 outputs
Output contact rating	Max.continuous current: 1.5 A (ac) - 0.3 A (110 V dc)
	Max.peak current: 5 A
	Max.voltage: 440 Vac
	Terminal A-A are rated for a continuous current of 18 A (9 A/terminal)
Alarm contact rating	One normally closed contact and one normally open contact
(voltage free contact)	Max.continuous current: 1.5 A (ac)
	Rated votage 250 Vac (max.breaking voltage 440 Vac)
Fan contact rating	Normally open contact
(voltage free contact)	Max.continuous current: 1.5 A (ac)
	Rated votage 250 Vac (max.breaking voltage 440 Vac)
Power factor setting	From 0.7 inductive to 0.7 capacitive
Starting current setting (C/k)	0.01 to 5 A
	Automatic measurment of C/k
Switching sequences	1:1:1:1:1::1 - 1:2:2:2:2::2 - 1:2:4:4:4::4 - 1:2:4:8:8::8 - 1:1:2:2:2::2 - 1:1:2:4:4::4
	1:1:2:4:8::8 - 1:2:3:3:3::3 - 1:2:3:6:6::6 - 1:1:2:3:3::3 - 1:1:2:3:6::6
	and any other customer programmable sequence
Modbus baud rate	300 - 600 - 1200 - 2400 - 4800 - 9600 - 19200 - 38400 - 57600 bps
CAN connection	Support CAN 2.0 B interface (for future use)
USB host connection	For future use
USB device connection	Available
Temperature probe input connection	Only 2 contacts using 1-wire protocol
	<ul> <li>Parasitic supply mode (no need of external power supply)</li> </ul>
	Connection to more nodes in a daisy chain network
	<ul> <li>8 temperature probes connection</li> </ul>
	<ul> <li>8 meters maximum between RVT to temperature probe or between probes</li> </ul>
	• 64 meters maximum length
Step configuration	Automatic, fixed, disabled
Display	QVGA 320 x 240 pixels colorful touch-screen
Adjustable display backlighting	Available
Switching time between steps	Programmable from 1s to 18h
Saving-function	All programmed parameters and modes are saved in a non-volatile memory
Auto adaptation to the connection and phase rotation of the ne	etwork
Auto adaptation to the CT-terminals	
Power factor correction operation is insensitive to the presence	e of harmonics
Working with passive and regenerative loads (four-quadrant op	peration)
Operating temperature	-20°C to 70°C
Storage temperature	-30°C to 85°C
Mounting position	Vertical panel mounting
Dimensions	Front plate: 146 x46 mm (HxW)
	Rear side : 205 x 135 mm
	Overall : 146 x 211 x 67 mm (HxWxD)
Weight	650 g (unpacked)
Connector	Cage clamp type (2.5 mm <sup>2</sup> single core cable)
Front plate protection	IP43 (IP54 on request)
Relative humidity	Maximum 95%, non-condensing
Standards	CE and UL marked

### Dimensions



### Product line-up

Features	RVT6/RVT12	RVT12-3P
Article number	RVT6 : 2GCA291720A0050	2GCA291722A0050
	RVT12 : 2GCA291721A0050	
1/3 phase measurements	1 voltage measurement input	3 voltage measurement inputs
	1 current measurement input	3 current measurement inputs
Real time clock	No	Yes
Energy measurements	No	Yes
Ethernet connection	No	Yes
USB host connection	No	Yes
USB device connection	Yes	Yes
Digital inputs	Yes	Yes
Alarm/fan relays	Yes	Yes
Output relays	6 or 12	12
Lock switch	Yes	Yes
RS485 Modbus connection	Yes	Yes
External temperature probes	Yes	Yes

### **UA Contactor** Exclusive designed for capacitor switching



### **Powerful features**

### High peak current withstanding

UA contactors were specially designed for capacitor switching. They can withstand capacitors short-time peak current during switching up to 100 times of normal capacitors operating current.

### Compact design

The UA capacitors give space saving through its compact design without additional damping resistor or reactor, thus lower heat and losses.

### **Built-in terminal clamps**

Built-in terminal clamps provides ease and speed of wiring without additional termination. This reduce cost and space for the installation.

### Din-rail or screws mounting

Quick fixing on mounting rail according to IEC 715, EN 50022 and EN 50023 standard : 35 x 7.5 mm for UA 30, 35 x 15 mm for UA 30 - UA 75, 75 mm for UA 50 - UA 110. UA contactors also provides holes for screws fixing.

### Three coil terminals

UA contactors have three coil terminals. A1 and A2 on top and A2 at bottom which provide flexibility in coil wiring (UA 30 has only A1 on the top and A2 at bottom).

### Up to ten auxiliary contacts

A large number of auxiliary blocks, up to six front-mounted and four side-mounted auxiliary contacts, can be snapped on UA contactors without extra tools (only five auxiliary contacts can be snapped on the side of UA 30).

### Quick and easy snap-on accessories

All accessories of UA contactors were designed for ease and speed of mounting.

### General

When switching on 3-phase capacitors, a large transient current at high frequency (3 to 15 kHz) occurs. The peak inrush current in the case of multi-stepped bank compensation may reach up to 160 times of Irms which is much larger than one in the case of the single step bank compensation (depending on two main factors i.e. the circuit inductance at the position where the capacitors are installed and the power of the operating capacitors). This duty is therefore particularly severe for the contactor switching of the final step of the bank. In general practice, the contactor should be able to withstand such high peak current or be equipped with additional peak current damping device to prevent contactor arcing.

Furthermore, operating current of a capacitors may be increased over the nominal current for approximately 1.5 times; 1.15 times due to capacitor's tolerance and 1.3 times due to harmonics. This factor has been taken into account in the selection table below so that UA contactor operating current is 1.5 times of capacitors nominal current. In general, Fuse (rated 1.5 to 1.8 IN type gl) are used for short circuit protection. Consult us for different condition of use (higher inrush current, greater rate of harmonics, etc.).

### Technical specifications

Standard	IEC 60947-1/60947-4-1 and EN 60947-1/60947-4-1
Number of main pole	3 pole
Execution	Indoor
Control voltage	220 V to 230 V (other on request)
Rated operational voltage	690 V
Rated frequency	50/60 Hz
Mechanical durability	10 millions operating cycles
Max.electrical switching frequency	240 cycle/h
Electrical durability AC-6b U <sub>e</sub> ≤ 690 V	For max. peak current 100 I $_{ m N}$ of the capacitors 100,000 operating cycles
Peak current	See the selection table
Degree of protection	Main terminals : IP10 (IP20 for UA30)
	Coil terminals : IP20
Approvals	UL, CSA

### Selection table

		Power in kvar (based		Max. permissible peak current (k						
	230-240 V	400-415 V	440 V	500-550 V	690 V	U <sub>e</sub> ≤ 500 V	U <sub>e</sub> > 500 V			
UA 30-30-11	16	27.5	30	34	45	3.5	3.1			
UA 50-30-11	20	33	36	40	55	5	4.5			
UA 63-30-11	25	43	48	50	70	6.5	5.8			
UA 75-30-11	30	50	53	62	75	7.5	6.75			
UA 95-30-11	35	65	65	70	80	9.3	8			
UA 110-30-11	40	70	75	80	90	10.5	9			

### Dimensions

— 01 UA 30

\_\_\_\_\_ 02 UA 50, UA 63, UA 75

— 03 UA 95, UA 110



\_\_\_\_ 02





23

### **HRC Fuse Links & Fuse Bases** Low Voltage

— 01 Inside the fuse



### **Powerful features**

Low loss low voltage high rupturing capacity fuse links type NH are supplied for 500 V.

The main element of the fuse link, the selective fuse elements are directly connected to the knife contacts by spot welding. The ABB HRC fuse link insulators are made of ceramic. Their design matches with the individual load conditions and consequently guarantees faultless and reliable operations.

ABB HRC fuse of standard design are manufactured with flag indicators on the upper end cap. After operation, the red colored leaf spring tucks up and indicates the status of the operation.

ABB Low Voltage HRC fuses are current limiting.

ABB Low Voltage HRC fuses are available for rated voltages 500 V service category gG, and are according to DIN VDE 0636 part 21; IEC 269-1/EN 60269-1; DIN VDE 0636 part 22.

All fuse links according to VDE 0636 for rated voltages 500 V have a minimum breaking capacity of 120 kA.

The geometrical dimensions of the high rupturing capacity fuse links are according to DIN 43620.V



### Fuse Links type NH 500 V

### Dimensions



~ 500 V								
size	А	В	С	D				
000 : 50-100 A	79	52.5	20.8	49.5				
00 125 160 4	70	50 F	20.5	50				

size	Α	В	с	D	E	F	G	н
000 : 50-100 A	79	52.5	20.8	49.5	52	6	35	15
00 : 125-160 A	79	59.5	29.5	50	52.8	6	35	15
1 : 200-250 A	135	66	39.5	68	70.8	6	40	20

### **Technical specifications**



02 Cut-off current characteristics,



### Fuse Bases type OFAX 690 V





### **Technical specifications**

- Protection to IP00
- Ease and speed of installation
  - fixing on rail to CENELEC EN 50023
  - snap-on assembly
  - space saving through 2.5 mm<sup>2</sup> in-built terminal
  - e.g. for measuring or monitoring
- Shock resistant fuse contact, contact spring of stainless steel

Туре	Number Of poles	Term Width (r	ninal mm)	Fuse size	I <sub>N</sub> (A)	Weight (Kg)	Remark
OFAX 00 P3L	3		20	00	160	0.44	Open with phase
OFAX 1 P3	3		25	1	250	1.30	barrier IP00

### Dimensions



Туре	А	В	С	D	E	F	G	н
OFAX 00 P3L	145	109	7.5	25	35	70	95	111
OFAX 1 P3	240	169.5	10.5	25	55	140	109	123

### Fuse Bases type EasyLine XLP

Fuse Switch Disconnector



### Properties of the EasyLine - XLP:

- XLP 00 and XLP 1
- Type tested according to EN IEC 60947-3
- Fullfills BGV A2
- Easy to recycle/EN ISO 14001 standards
- Quick-make operation device
- Integrated IP20 cable termination
- IP30 degree of protection from the front
- Replacement compatible to similar types in the market
- Voltage measuring from the front
- V-0 plastic materials

**3 - pole:** • XLP 00 160 A • XLP 1 250 A

### Technical data

			XLP 00			XLP 1
For NH fuse links acc. to IEC60269-2-1			00			1
Rated operational voltage U <sub>e</sub> AC	(V)	400	500	690	500	690
Rated operational current I <sub>e</sub> AC	(A)	125	160	125	250	200
Thermal current with fuse link I <sub>th</sub>	(A)		160			250
Utilization category		AC23B	AC22B	AC21B	AC22B	AC21B
Rated insulation voltage U <sub>i</sub>	(V)		1000			1000
Rated impulse withstand voltage U <sub>imp</sub>	(kV)		8			8
Rated conditional short circuit current	(kArms)		50			50
Rated frequency	(Hz)		50-60		Ę	50-60
Power loss at I <sub>th</sub> without fuse link per phase	(W)		3.5 W			7.5 W
Max allowed power loss in the fuse per phase	(W)		12 W			23 W
Electrical durability			200			200
Mechanical durability			1400			1400
Degree of protection from the front acc.	Open		IP20			IP20
to IEC60529	Closed		IP30			IP30

### Dimensional drawings

— 01 XLP 00 — 02 XLP 1





01







SECTION A-A

22

### **Detuning Reactor**

## For capacitors up to 690 V system voltage, indoor use



### **Powerful features**

### Description

In harmonics polluted electrical system, installing capacitors for reactive power compensation can cause resonance between capacitors and electrical network which leads to considerable increase of harmonic level. Detuned filter consists of capacitor connected in series with Detuning reactors avoids such resonance and absorbs some of the particular harmonic current from electrical system. ABB Detuning reactors are designed and manufactures for their safety and reliable application in Detuned filter.

### High precision laminated core

High precision punching laminated iron core eliminates inductance's tolerances between three phases and enable accurate reactor tuning. Moreover, sufficient core linearity is obtained to withstand the switching of capacitors steps without causing saturation problems in networks of high harmonic distortion.

### High temperature class

Thermo-setting impregnation resin of temperature class H. maximum operating temperature is 50°C and maximum storage temperature is 75°C.

### Vacuum and over-pressure impregnation

Completed units of reactors are vacuumly impregnated by thermosetting resin then cured in over-pressure. This vacuum over-pressure impregnation ensures that reactor winding and core are securely structured. This leads to outstanding low noise, low vibration and better heat dissipation.

### Computer control design and test equipment

The designing software optimize reactor design to provide customers with a tailor made product, in which their requirements with regard to losses, dimensions and environmental conditions. Database controlled test equipment is used for routinely completed reactor testing at norminal current. For typetesting, a unique 3-phase harmonic generator rated at 0.9 Mvar, enabling to test reactors in a realistic environment, i.e. simultaneous fundamental and harmonic current loading. Thus, heat-run and noise dissipation tests are available, as well as induced overvoltage tests for product reliability testing.

### Technical specifications

Rated voltage	3-phase, up to 690 V
Protection degree	IPOO
Core	Laminated sheet iron
Wiring	Aluminum or copper
Terminal	Copper-Bar
Ground terminal	Fixation holes
Impregnation	Completed unit impregnated under vacuum and overpressure in impregnation thermosetting
	resin temperature class H
Tolerance of inductance	$\pm$ 3% when measured at 20°C ( $\pm$ 5°C) at f $_1$ and I $_N$
Operation	The reactor is designed to operate continually at a network voltage equals to ${\sf U}_{\sf N}$ with a current
	load of $I_{th}$ at $T_{max}$ and maintain sufficient safety margin to hot spot temperatures of its insulation
	while dissipating losses not exceeding P <sub>max</sub>
Insulation test	Between winding and core of 3 kV at 1 minute according to IEC 76
Applicable standard	IEC 60076-6, VDE 0532, IEC 76
Operating temperature	Minimum -25°C, maximum 50°C
Storage temperature	Minimum -40°C, maximum 75°C
Thermal current	$I_{th}$ is defined as the root mean square of ( $I_1$ , $I_3$ , $I_5$ , $I_7$ , $I_{11}$ , $I_{13}$ ) where $I_1$ is calculated from network
	voltage of 1.1 x U <sub>N</sub>
	I <sub>1</sub> , I <sub>3</sub> , I <sub>5</sub> , I <sub>7</sub> , I <sub>11</sub> , I <sub>13</sub> are calculated from network
	Voltage spectrum of maximum
	$U_3/U_1 = 0.5\%$
	$U_5/U_1 = 6.0\%$
	$U_7/U_1 = 5.0\%$
	$U_{11}/U_1 = 3.5\%$
	$U_{13}/U_1 = 3.0\%$
	but not exceeding a total THDU of 8%
Linearity current	$I_{\text{Lin}} = 1.9 I_{\text{N}}$
Rated current	$I_{N}$ = normal fundamental current of one phase of the capacitor-reactor combination in detuned filter
Maximum losses	P <sub>max</sub>
Inductance	L <sub>N</sub> = nominal inductance of one phase of reactor
Net reactive power	$Q_{net}$ = net output reactive power of 3-phase capacitor-reactor combination in detuned filter at U <sub>N</sub>

### **Connection diagram**



### **Reactor data**

U<sub>N</sub> = 400 V / f<sub>1</sub> = 50 Hz

												2					
Р	Q <sub>N</sub>	L <sub>N</sub>	I <sub>N</sub>	l <sub>th</sub>	I <sub>Lin</sub>	P <sub>max</sub>	Weight	Α	В	С	D	E	F	FixØ	Connø	Coil	Class
(%)	(kvar)	(mH)	(A)	(A)	(A)	(W)	(kg)	(mm)	AI/Cu								
7	25	1.533	36.1	42.3	68.6	175	18	228	205	140	150	95	114	11	9	AI	T50/H
7	50	0.767	72.2	84.5	137.1	275	28	264	235	155	150	102	132	11	9	AI	T50/H

### Dimensions





### **Selection table**

### For ABB Capacitors & Components in 3-phase 50 Hz

Sustan		Capacitors Components				Minimum						
Voltage	Туре		Rating (kvar)		I <sub>N</sub> (A)	Terminal	Weight (kg)	Fuse Bases	Fuse Links	Contactor	Contactor	Cu Cable (mm <sup>2</sup> )
			230 V		230 V					230 V		
	CLMD 43		8		20.1	M6	4	XLP 00/OFAX 00 P3L	000/50 A	UA 30-30-11		6
			16		40.2	M6	5	XLP 00/OFAX 00 P3L	000/80 A	UA 30-30-11		10
	CLMD 53		24		60.2	M8	10	XLP 00/OFAX 00 P3L	000/100 A	UA 63-30-11		25
	CLMD 63		32		80.3	M10	12	XLP 00/OFAX 00 P3L	00/160 A	UA 95-30-11		35
			40		100.4	M10	14	XLP 00/OFAX 00 P3L	00/160 A	UA 110-30-11		50
			48		120.5	M12	15.5	XLP 1/OFAX 1 P3	1/200 A	AF 146-30-11*		70
			56		140.6	M12	17	XLP 1/OFAX 1 P3	1/250 A	AF 190-30-11*		70
			64		160.7	M12	18	XLP 1/OFAX 1 P3	1/250 A	AF 205-30-11*		95
400/415 V		400 V	415 V	400 V	415 V					400 V	415 V	
	CLMD 43	5	5.5	7.2	7.7	M6	4.5	XLP 00/OFAX 00 P3L	000/16 A	UA 30-30-11	UA 30-30-11	2.5
		10	11	14.4	15.3	M6	4.5	XLP 00/OFAX 00 P3L	000/25 A	UA 30-30-11	UA 30-30-11	4.0
		15	16	21.7	22.3	M6	4.5	XLP 00/OFAX 00 P3L	000/50 A	UA 30-30-11	UA 30-30-11	6
		20	22	28.9	30.6	M6	5.5	XLP 00/OFAX 00 P3L	000/50 A	UA 30-30-11	UA 30-30-11	10
		25	27	36.1	37.6	M6	5.5	XLP 00/OFAX 00 P3L	000/63 A	UA 30-30-11	UA 30-30-11	10
	CLMD 53	30	32	43.3	44.5	M8	8	XLP 00/OFAX 00 P3L	000/80 A	UA 50-30-11	UA 50-30-11	16
		40	43	57.7	59.8	M8	10	XLP 00/OFAX 00 P3L	000/100 A	UA 63-30-11	UA 63-30-11	25
		45	50	65.0	69.6	M8	12	XLP 00/OFAX 00 P3L	00/125 A	UA 63-30-11	UA 75-30-11	25
	CLMD 63	50	54	72.2	75.1	M10	13.5	XLP 00/OFAX 00 P3L	00/125 A	UA 75-30-11	UA 95-30-11	35
		60	65	86.6	90.4	M10	14.5	XLP 00/OFAX 00 P3L	00/160 A	UA 95-30-11	UA 95-30-11	35
		70	75	101.0	104.3	M10	15.5	XLP 1/OFAX 1 P3	1/200 A	UA 110-30-11	UA 110-30-11	50
		75	80	108.3	111.3	M12	16	XLP 1/OFAX 1 P3	1/200 A	AF 140-30-11*	AF 140-30-11*	50
		80	86	115.5	119.6	M12	17	XLP 1/OFAX 1 P3	1/200 A	AF 140-30-11*	AF 146-30-11*	70
	CLMD 83	100	110	144.3	153.0	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 190-30-11*	AF 190-30-11*	95
480 V			480 V		480 V	415 V				480 V		
	CLMD 43		10		12.0	M6	4.5	XLP 00/OFAX 00 P3L	000/25 A	UA 30-30-11		2.5
	CLMD 53		20		24.1	M8	8	XLP 00/OFAX 00 P3L	000/50 A	UA 30-30-11		6
			27		32.5	M8	8	XLP 00/OFAX 00 P3L	000/63 A	UA 30-30-11		10
			30		36.1	M8	10	XLP 00/OFAX 00 P3L	000/63 A	UA 30-30-11		10
			34		40.9	M8	10	XLP 00/OFAX 00 P3L	000/80 A	UA 30-30-11		16
			40		48.1	M8	12	XLP 00/OFAX 00 P3L	000/80 A	UA 63-30-11		16
	CLMD 63		50		60.1	M10	13.5	XLP 00/OFAX 00 P3L	000/100 A	UA 63-30-11		25
			54		65.0	M10	13.5	XLP 00/OFAX 00 P3L	00/125 A	UA 75-30-11		25
			60		72.2	M10	14.5	XLP 00/OFAX 00 P3L	00/125 A	UA 75-30-11		25
			68		81.8	M10	14.5	XLP 00/OFAX 00 P3L	00/160 A	UA 95-30-11		35
			70		84.2	M10	15.5	XLP 00/OFAX 00 P3L	00/160 A	UA 95-30-11		35
			75		90.2	M10	17	XLP 00/OFAX 00 P3L	00/160 A	UA 110-30-11		35
			80		96.2	M10	17	XLP 00/OFAX 00 P3L	00/160 A	AF 116-30-11*		50
500/525 V		500 V	525 V	500 V	525 V			,		500 V	525 V	
	CLMD 43	9	10	10.4	11.0	M6	4	XLP 00/OFAX 00 P3L	000/25 A	UA 30-30-11	UA 30-30-11	2.5
		18	20	20.8	22.0	M6	6.5	XLP 00/OFAX 00 P3L	000/50 A	UA 30-30-11	UA 30-30-11	6
	CLMD 53	27	30	31.2	33.0	M8	8	XLP 00/OFAX 00 P3L	000/63 A	UA 30-30-11	UA 30-30-11	10
		36	40	41.6	44.0	M8	12	XLP 00/OFAX 00 P3L	000/80 A	UA 50-30-11	UA 30-30-11	16
	CLMD 63	45	50	52.0	55.0	M10	14	XLP 00/OFAX 00 P3L	000/100 A	UA 63-30-11	UA 50-30-11	16
		54	60	62.4	66.0	M10	15	XI P 00/OFAX 00 P3I	00/125 A	UA 75-30-11	UA 63-30-11	25
		63	70	72.7	77.0	M10	17	XLP 00/OFAX 00 P3I	00/125 A	UA 95-30-11	UA 63-30-11	35
		72	80	83.1	88.0	M10	10		00/160 4	UA 110-20-11	UA 95-30-11	
	CI MD 83	۲ <u>د</u> 81	90	93.5	99.0	M12	21		00/160 A	AF 116-30-11*	UA 110-30-11	50
	CLI-D 03	01	100	103.9	110.0	M12	22 5		1/200 4	ΔΕ 140-20-11*	ΔE 146-30-11*	50
		110	120	103.9	122.0	MID	22.3		1/200 A	AF 140-50-11"	AF 100 20 11*	50
		110	120	121.0	132.0	MTS	24	ALP 1/ OFAX 1 P3	1/250 A	AF 140-30-11*	AL 130-20-11.	10

\* For single step, please consult ABB for multi step switching

### For power rating 75, 80 and 100 kvar without reactor

System	Step x Power		c	apacitors				Components		Minimum
Voltage	rating (kvar)	Туре	Rating (kvar)	I <sub>N</sub> (A)	Terminal	Weight (kg)	Fuse Bases	Fuse Links	Contactor	Cu Cable (mm <sup>2</sup> )
400 V	3 x 75	CLMD 63	75	108.3	M10	16	XLP 1/OFAX 1 P3	1/200 A	AF 265	50
	6 x 75	CLMD 63	75	108.3	M10	16	XLP 1/OFAX 1 P3	1/200 A	AF 400	50
	12 x 75	CLMD 63	75	108.3	M10	16	XLP 1/OFAX 1 P3	1/200 A	AF 400	50
	3 x 80	CLMD 63	80	115.5	M10	17	XLP 1/OFAX 1 P3	1/200 A	AF 265	70
	6 x 80	CLMD 63	80	115.5	M10	17	XLP 1/OFAX 1 P3	1/200 A	AF 400	70
	12 x 80	CLMD 63	80	115.5	M10	17	XLP 1/OFAX 1 P3	1/200 A	AF 580	70
	3 x 100	CLMD 83	100	144.3	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 400	95
	6 x 100	CLMD 83	100	144.3	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 580	95
	12 x 100	CLMD 83	100	144.3	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 580	95

### For power rating 75, 80 and 100 kvar with 7% reactor

System Voltage	Step x Power rating (kvar)	Capacitors					Components			Minimum
		Туре	Rating (kvar)	I <sub>N</sub> (A)	Terminal	Weight (kg)	Fuse Bases	Fuse Links	Contactor	Cu Cable (mm <sup>2</sup> )
400 V	3 x 75	CLMD 63	75	108.3	M10	16	XLP 1/OFAX 1 P3	1/200 A	AF 140	50
	6 x 75	CLMD 63	75	108.3	M10	16	XLP 1/OFAX 1 P3	1/200 A	AF 140	50
	12 x 75	CLMD 63	75	108.3	M10	16	XLP 1/OFAX 1 P3	1/200 A	AF 140	50
	3 x 80	CLMD 63	80	115.5	M10	17	XLP 1/OFAX 1 P3	1/200 A	AF 146	70
	6 x 80	CLMD 63	80	115.5	M10	17	XLP 1/OFAX 1 P3	1/200 A	AF 146	70
	12 x 80	CLMD 63	80	115.5	M10	17	XLP 1/OFAX 1 P3	1/200 A	AF 146	70
	3 x 100	CLMD 83	100	144.3	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 190	95
	6 x 100	CLMD 83	100	144.3	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 190	95
	12 x 100	CLMD 83	100	144.3	M12	21	XLP 1/OFAX 1 P3	1/250 A	AF 190	95

### For ABB 7% Detune Bank in 3-phase 50 Hz

System	Target	Reactor Type	Capacitors Type		Minimum			
Voltage	kvar/step			Fuse Bases	Fuse Links	Contactor	Cu cable (mm <sup>2</sup> )	
400 V	25	7% for 25 kvar at 400 V	40 kvar 525 V	XLP 00/OFAX 00 P3L	000/63 A	UA 30-30-11	10	
	50	7% for 50 kvar at 400 V	80 kvar 525 V	XLP 00/OFAX 00 P3L	00/125 A	UA 75-30-11	35	
	100	7% for 100 kvar at 400 V	2x(80 kvar 525 V)	XLP 1/OFAX 1 P3	1/250 A	AF 190-30-11	95	
	100	2x(7% for 50 kvar at 400 V)	2x(80 kvar 525 V)	2x(XLP 00/OFAX 00 P3L)	2x(00/125 A)	2x(UA 75-30-11)	2x35	

Note : For information only. Please refer to application standards, local rules & regulations and technical specifications.

Nete
Note





### ABB LIMITED

322 Moo 4 Bangpoo Industrial Estate Soi 6, Sukhumvit Road, Praeksa, Muang Samutprakarn 10280 THAILAND Phone: +66 2 665 1000 Fax: +66 2 324 0502

www.abb.co.th