

# OPTIM HYB

## Automatic hybrid switching capacitor banks



### Description

The **OPTIM HYB** automatic capacitor banks with hybrid switching are units designed for automatic compensation of reactive energy in networks in which the load levels fluctuate, with power variation rates of seconds and also independently of the level of unbalance in the installation. The compensation system is based on the combination of switching by three-phase step contact breakers and single-phase step semiconductors (thyristors), controlled by a smart regulator that uses the electrical parameters provided via communications by a power analyzer of the **CVM-MINI** range for its calculations.

### Application

The **OPTIM HYB** series is ideal for achieving very accurate reactive power compensation in any installation, and especially those that present a certain degree of unbalance, since the compensation between phase and neutral adds to the fast reply provided by the static switching of the thyristor. It is therefore possible to guarantee a significant reduction in the chance of penalties in comparison with conventional capacitor banks.

### Technical features

<b>Electrical features</b>	Operating voltage	3 x 400 V P-P / 1 x 230 V P-N	
	Support voltage	3 x 440 V P-P / 1 x 254 V P-N	
	Frequency	50 Hz	
	Capacity tolerance	-5% / +10%	
	Contacting switching voltage	230 Vac	
	Semiconductor activation controller board power supply voltage	12 Vdc	
	Single-phase capacitor switching	Solid state semiconductor Including aluminium heatsink for heat dissipation	
	Three-phase capacitor switching	Three-pole contact breakers suitable for capacitive currents, equipped with a preinserted resistor block	
	<b>Capacitors</b>	Cylindrical capacitor, aluminium housing, <b>CLZ-FP</b> type	
	<b>Overload protection</b>	Single or three-pole circuit breaker protection on each single or three-phase step	
<b>Reactive energy regulator</b>	<b>Computer HYB</b> communicated via RS-485 with a <b>CVM-MINI</b> power analyzer		
<b>Main switch</b>	Tetra-polar manual switch included as standard		
<b>Add-ons (optional)</b>	Tetra-polar circuit breaker on capacitor bank header		
	Tetrapolar circuit breaker + earth leakage protection on capacitor bank header		
	Polycarbonate plate for protection against direct contacts		
	400/230 V autotransformer		
<b>Residual discharge voltage</b>	75 V / 3 minutes		
<b>Capacitor losses</b>	< 0.5 W / kvar		
<b>Permissible overload</b>	1.3 times the nominal hold current		
<b>Overvoltage</b>	10%, 8 over 24 hours	20%, up to 5 minutes over 24 hours	
	15%, up to 15 minutes over 24 hours	30%, up to 1 minute over 24 hours	
<b>Temperature</b>	Maximum: +45°C, minimum: -25°C		
<b>Environmental conditions</b>	Humidity	80% without condensation	
	Altitude	<2,000 m above sea level.	
	<b>Mechanical features</b>	Enclosure material	Steel plate
<b>Assembly conditions</b>	Protection Degree	IP 21	
	Colour	RAL 7035 Grey	
	Wall-mounting in <b>OPTIM HYB1</b> models	Free standing assembly in <b>OPTIM HYB2</b> and <b>OPTIM HYB3</b>	
	Positioning the unit	Vertical	
<b>Standards</b>	Ventilation	Natural	
	IEC 61921, IEC 61642, IEC 60831		

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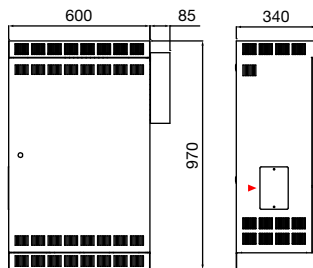
### References

kvar									
440 V	400 V	Composition	Manual switch	Cable cross-section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code	
90	75	(3 x 2 x 5) kvar / 230 V + (3 x 15) kvar / 400 V / 50 Hz	Included	1 x 95	67	685 x 970 x 340	OPTIM HYB1-90-440	R4E103	
110	90	(3 x 2 x 5) kvar / 230 V + (4 x 15) kvar / 400 V / 50 Hz	Included	1 x 95	71	685 x 970 x 340	OPTIM HYB1-110-440	R4E104	
165	135	(3 x 3 x 5) kvar / 230 V + (3 x 30) kvar / 400 V / 50 Hz	Included	1 x 120	146	800 x 1840 x 640	OPTIM HYB2-165-440	R4E105	
200	165	(3 x 3 x 5) kvar / 230 V + (4 x 30) kvar / 400 V / 50 Hz	Included	1 x 185	152	800 x 1840 x 640	OPTIM HYB2-200-440	R4E106	
270	225	(3 x 3 x 5) kvar / 230 V + (6 x 30) kvar / 400 V / 50 Hz	Included	1 x 240	163	800 x 1840 x 640	OPTIM HYB2-270-440	R4E108	
325	270	(3 x 3 x 10) kvar / 230 V + (3 x 60) kvar / 400 V / 50 Hz	Included	2 x 150	229	800 x 1840 x 640	OPTIM HYB2-325-440	R4E113	
400	330	(3 x 3 x 10) kvar / 230 V + (4 x 60) kvar / 400 V / 50 Hz	Included	2 x 240	304	1000 x 1840 x 640	OPTIM HYB3-400-440	R4E114	
470	390	(3 x 3 x 10) kvar / 230 V + (5 x 60) kvar / 400 V / 50 Hz	Included	2 x 240	325	1000 x 1840 x 640	OPTIM HYB3-470-440	R4E115	
540	450	(3 x 3 x 10) kvar / 230 V + (6 x 60) kvar / 400 V / 50 Hz	Included	2 x 240	336	1000 x 1840 x 640	OPTIM HYB3-540-440	R4E116	

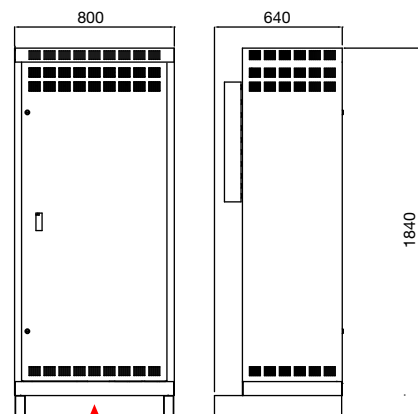
Switch and cable cross-section recommended for installations with  $U_n = 400$  V. Installers must confirm that this meets everything established in the Low Voltage Directive according to the special characteristics of each installation and cable type, completely relieving CIRCUTOR S.A. of all breaches of the pertinent regulations as a result of an incorrect choice of the type and cross-section of the cabling.

### Dimensions

#### OPTIM HYB 1



#### OPTIM HYB 2



#### OPTIM HYB 3

