Advanced technology
Outstanding Performance

KONDAS®

VArPOWER
Power Quality System

VArKON
Power Factor Correction

Products and Systems Catalogue

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ABOUT US

Kondaş has been established in 1973 as the first capacitor manufacturer of Turkey. Since the date of its establishment, Kondaş has continiously been improving its technology and widening its product range, thus conserving the rank for being the largest producer of capacitors throughout Turkey. The Kondaş team consists of more than 100 practised engineers and high-skilled workers, that aims to produce the best quality products at the most rational price level. Along with the distribution line that can reach everywhere on a domestic basis and the pleasant after sales operations, our company's ultimate objective is to provide customer satisfaction at its best

Adopting and applying the methodologies of Total Quality Management and Environmental Management as a corporate culture at all costs, Kondaş complies with ISO 9001 systems standards. In addition, our company complies with the ISO / IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories standards. Such accreditation supports the technical sufficiency and reliability of Kondaş both on domestic and
international grounds.

VArKON Power Factor Correction

VArPOWER Power Quality System

KONDAS®

VArKON
Power Factor Correction

VArPOWER
Power Quality System
KONDAŞ

Low Voltage Capacitors and Power Factor Correction Components

ZnPS

Cylindrical Type Low Voltage Power Capacitors

Technical Specifications

Rated Temperature:	- 25/D (-25/+55°C)
Capacity Tolerance:	% -5 +10
Rated Voltage:	230 - 690 V
Working Frequency:	50 - 60 Hz.
Internal Connection:	Delta or Single Phase
Permitted Over Voltages:	As Shown Table 2
Permitted Over Current:	1,3 In
Inrush Current:	> 100 In
Tan δ (Total Losses):	0,5 W/kVAr
Dielectric Loss :	<0,2 W/kVAr
Terminals:	Screw Terminals
Terminals Torque:	Max. 0,3 Kg.m.
Safety Device Protection Class:	Internal overpressure disconnector
Altitude:	IP20
Fixing Stud and Max. Torque:	2000 m. a.s.l
Test Voltage Between Terminals:	M12 - 1 kg.m
Test Voltage Between Terminal and Case:	2,15 Un, 2 sn.
Discharge Resistor:	3 kV AC, 10 sn.
Reference standards:	External; 50 V - 60 sec.
	TS EN 60831 - 1 / 2, IEC 60831 - 1/2
	*optional

Long Life

In case of a short circuit between the electrodes of a capacitor element, the metal layers around the short circuit vaporize and cease a possible breakdown; therefore allowing the capacitor to self-heal itself and continue its operation. Also, Kondaş applies "torture tests" to all of its prototypes before launching, thus ensuring top quality.

Purpose and Area of Usage

ZnPS capacitors are used in industrial and commercial facilities for serving the purpose of power factor correction. The product fixes the power factor (cos Q) and allows the user to consume less reactive power from the grid circuit. In return, the costs of elecric usage fall and the energy quality enhances.

Ergonomy

ZnPS capacitors provide ergonomy advantage through its compact dimensions and design which allows the product to fit almost anywhere.

Components of ZnPS Capacitors

ZnPS type capacitors consist of; metallized self-healing polypropylene film, winding cores, separators, paper and resine, mechanic fuses for disconnection, aluminum can, terminal blocks and discharge resistors.

Production Process of ZnPS Capacitors

The production commences with the winding of metallized PP film with low dielectric loss in a clean room under high vacuum. This forms the capacitor element. On the next step, both cylindrical sides of the element are sprayed with %99.95 pure zinc, and the conductive materials are soldered between the terminals and elements. The processed single-phase elements are then dehydrated under vacuum and impregnated with highly purified gas. In order to avoid any connection with air and to provide an excellent insulation, the processed elements are put into plastic tubes and filled with natural polyurethane resin. Depending on the product type, the wires of elements inside plastic tubes are either left as single-phase or connected in a delta position to provide a three-phase output and mounted into aluminum cans, forming the final product.

Environment-Friendly Products

All materials used in Kondaş Capacitors' production line are non-toxic and environment-friendly.

TEMP. CATEGORIES		AMBIENT TEMPERATURE			PERMITED OVER VOLTAGE	
SYMBOL	MEANING	MAX.	HIGHEST MEAN OVER ANY PERIOD OF (°C)		MAX. DURATION	Voltage Factor x Un
			24 Hours	1 Year	CONTINUOUS	1,0 Un
-25/A	- 25 / + 40 °C	40	30	20	8 hours / day	1,1 Un
-25/B	- 25 / + 45 °C	45	35	25	30 min. / day	1,15 Un
-25/C	- 25 / + 50 °C	50	40	30	5 min. / 200 times	1,2 Un
-25/D	- 25 / +55°C	55	45	35	1min. / 200 times	1,3 Un

Table - 1

KONDAS

ZnPS

Cylindrical Type Low Voltage Power Capacitors

ZnPS CYLINDRICAL TYPE 1-2 (SINGLE PHASE/TWO PHASE) LOW VOLTAGE POWER CAPACITORS

STANDARD RATINGS							DIMENSION		WEIGHT	PACKAGES		
VOLTAGE	PRODUCT CODE	POWER kVAr 230 V	POWER kVAr 400 V		CAPACITANCE µF	CURRENT A	DIAM. mm	HEIGHT mm(*)	KG	PCS/PACK	WEIGHT kg	PACK DIM. mm
230 V. 50 Hz. POWER / kVAr	Y412M01A0	0,25	0,75		1*15,1	1,9	55	90	0,4	12	0,4	235*310*180
	Y412M01B0	0,5	1,5		1*30,1	2,2	55	90	0,4	12	0,4	235*310*180
	Y412M01D0	1	3		1*60,2	4,4	55	145	0,4	12	0,4	235*310*180
	Y412M01G0	1,5	4,5		1*90,3	6,5	70	125	0,7	12	0,7	235*310*180
	Y412M01K0	2,5	7,5		1*150,5	10,9	70	180	0,7	12	0,7	235*310*180
	Y412M01S0	5	15		1*301	21,7	75	247	0,9	6	0,9	180*265*310
	Y412M01X0	10	30 (*)		1*600	43,4	100	285	2,4	4	10	215*215*350

(*) - This unit is used for filter application only as 400V/30kVAr/1ph

ZnPS CYLINDRICAL TYPE 3 PHASE LOW VOLTAGE POWER CAPACITORS

STANDARD RATINGS							DIMENSION		WEIGHT	PACKAGES		
VOLTAGE	PRODUCT CODE	POWER kVAr 400 V	POWER kVAr 415 V		CAPACITANCE µF	CURRENT A	DIAM. mm	HEIGHT mm(*)	KG	PCS/PACK	WEIGHT kg	PACK DIM. mm
400 V . 50 Hz. POWER / kVAr	YG12D01B0	0,5	0,53		3*3,32	0,7	55	90	0,4	12	6,5	235*310*180
	YG12D01D0	1	1,1		3*6,7	1,4	55	160	0,4	12	6,5	235*310*240
	YG12D01G0	1,5	1,6		3*10	2,2	55	160	0,4	12	6,5	235*310*240
	YG12D01K0	2,5	2,7		3*16,7	3,6	55	160	0,7	12	9,5	235*310*240
	YG12D01S0	5	5,4		3,33,3	7,2	65	172	0,7	12	9,5	235*310*240
	YG12D01V0	7,5	8,1		3*50	10,8	65	210	0,9	6	6,5	170*250*280
	YG12D01X0	10	10,8		3*66,7	14,4	75	210	0,9	6	6,5	170*250*280
	YG12D01Y0	12,5	13,5		3*83,3	18	75	247	1	6	7	180*265*280
	YG12D0160	15	16,1		3*100	21,6	85	247	1,6	6	11	180*265*310
	YG12D0180	20	21,5		3*133,3	28,9	90	247	1,8	6	11,3	180*265*310
	YG12D0190	25	26,9		3*166,7	36,1	100	247	2	4	9	215*215*310
	YG12D0A00	30	32,3		3*200	43,3	100	285	2,2	4	9,3	215*215*350

STANDARD RATINGS							DIMENSION		WEIGHT	PACKAGES		
VOLTAGE	PRODUCT CODE	POWER kVAr 440 V	POWER kVAr 415 V	POWER kVAr 400 V	CAPACITANCE µF	CURRENT A	DIAM. mm	HEIGHT mm(*)	KG	PCS/PACK	WEIGHT kg	PACK DIM. mm
440 V . 50 Hz . POWER / kVAr	YJ12D01B0	0,5	0,4	0,4	3*2,74	0,7	55	90	0,4	12	6,5	235*310*180
	YJ12D01D0	1	0,9	0,8	3*5,5	1,3	55	160	0,4	12	6,5	235*310*240
	YJ12D01G0	1,5	1,3	1,2	3*8,3	2	55	160	0,4	12	6,5	235*310*240
	YJ12D01K0	2,5	2,2	2,1	3*13,7	3,3	55	160	0,7	12	9,5	235*310*240
	YJ12D01S0	5	4,4	4,1	3*27,5	6,6	65	172	0,7	12	9,5	235*310*240
	YJ12D01V0	7,5	6,7	6,2	3*41,2	9,84	65	210	0,9	6	6,5	170*250*280
	YJ12D01X0	10	8,9	8,3	3*54,9	13,1	70	210	0,9	6	6,5	170*250*280
	YJ12D01Y0	12,5	11,1	10	3*68,6	16,4	70	247	1	6	7	180*265*280
	YJ12D0160	15	13,3	12,5	3*82,3	19,7	75	247	1,6	6	11	180*265*310
	YJ12D0180	20	17,8	16,5	3*110	26,3	85	247	1,8	6	11,3	180*265*310
	YJ12D0190	25	22,2	20	3*137,1	32,8	100	247	2	4	9	215*215*310
	YJ12D0A00	30	26,7	25	3*164,5	39,4	100	285	2,2	4	9,3	215*215*310

STANDARD RATINGS							DIMENSION		WEIGHT	PACKAGES		
VOLTAGE	PRODUCT CODE	POWER kVAr 480 V	POWER kVAr 440 V		CAPACITANCE µF	CURRENT A	DIAM. mm	HEIGHT mm(*)	KG	PCS/PACK	WEIGHT kg	PACK DIM. mm
480V.50Hz. POW./Kvar	YY12D0170	16,6	14,1		3*76,4	20	85	247	1,7	6	11	180*265*310
	YY12D0H00	33,3	28,2		3*153,4	40	100	285	2,2	4	9,3	215*215*310

STANDARD RATINGS							DIMENSION		WEIGHT	PACKAGES		
VOLTAGE	PRODUCT CODE	POWER kVAr 525 V	POWER kVAr 480 V	POWER kVAr 440 V	CAPACITANCE µF	CURRENT A	DIAM. mm	HEIGHT mm(*)	KG	PCS/PACK	WEIGHT kg	PACK DIM. mm
525 V. 50 Hz. POWER / kVAr	YO12D01K0	2,5	2,1	1,8	3*9,7	2,8	55	160	0,7	12	9,5	235*310*240
	YO12D01S0	5	4,2	3,5	3*19,3	5,5	65	172	0,7	12	9,5	235*310*240
	YO12D01V0	7,5	6,2	5,3	3*28,9	8,3	65	210	0,9	6	6,5	170*250*280
	YO12D01X0	10	8,3	7	3*38,6	11	70	210	0,9	6	6,5	170*250*280
	YO12D01Y0	12,5	10,4	8,8	3*48,2	13,8	70	247	1	6	7	180*265*310
	YO12D0160	15	12,5	10,5	3*57,8	16,5	75	247	1,6	6	11	180*265*310
	YO12D0180	20	16,6	14,1	3*77,1	22	85	247	1,8	6	11,3	180*265*310
	YO12D0190	25	20,8	17,5	3*96,3	27,5	100	247	2	4	9	215*215*310
	YO12D01A00	30	25	21,1	3*116	33	100	247	2,2	4	9,2	215*215*310
	YO12D01P00	40	33,3	28,2	3*154,1	44	116	285	3,1	4	12,7	215*215*350
	YO12D01R00	50	41,7	35	3*192,5	55	120	285	3,1	4	12,7	215*215*350

ZNPP

Box Type Low Voltage Power Capacitors

Technical Specifications

Rated Temperature:	- 25/D (-25/+55°C)
Capacity Tolerance:	% -5 +10
Rated Voltage:	400 - 690 V
Internal Connection:	Delta or Single Phase
Permitted Over Voltages:	As Shown Table 2
Permitted Over Current:	1,3 In
Inrush Current:	> 100 In
Tan δ (Total Losses)	0,5 W/kVAr
Dielectric Loss :	<0,2 W/kVAr
Terminals:	M8 Nuts Of Terminals
Terminals Torque:	Max. 0,5 Kg.m.
Protection Class:	IP20
Altitude:	2000 m. a.s.l
Test Voltage Between Terminals:	2,15 Un, 2 sn.
Test Voltage Between Terminal and Case:	3 kV AC, 10 sn.
Discharge Resistor:	Internal; 50 V - 60 sec.
Reference standards:	TS EN 60831 - 1/2, IEC 60831 - 1/2
	*optional

Long Life

In case of a short circuit between the electrodes of a capacitor element, the metal layers around the short circuit vaporize and cease a possible breakdown; therefore allowing the capacitor to self-heal itself and continue its operation. Also, Kondaş applies "torture tests" to all of its prototypes before launching, thus ensuring top quality.

Purpose and Area of Usage

ZnPP capacitors are used in industrial and commercial facilities for serving the purpose of power factor correction. The product fixes the power factor (cos Q) and allows the user to consume less reactive power from the grid circuit. In return, the costs of elecric usage fall and the energy quality enhances.

Flexibility

Equipped with M8 terminals, ZnPP capacitors provide mounting advantage and in case of an additional power need, allows a convenient connection with another capacitor by using only a busbar.

Components of ZnPP Capacitors

ZnPP type capacitors consist of; metallized self-healing polypropylene film, winding cores, separators, paper and resine, mechanic fuses for disconnection, steel box, plastic terminal cover and discharge resistors.

Production Process of ZnPP Capacitors

The production commences with the winding of metallized PP film with low dielectric loss in a clean room under high vacuum. This forms the capacitor element. On the next step, both cylindrical sides of the element are sprayed with %99.95 pure zinc, and the conductive materials are soldered between the terminals and elements. The processed single-phase elements are then dehydrated under vacuum and impregnated with highly purified gas. In order to avoid any connection with air and to provide an excellent insulation, the processed elements are put into plastic tubes and filled with natural polyurethane resin. Depending on the product type, the wires of elements inside plastic tubes are either left as single-phase or connected in a delta position to provide a three-phase output and mounted into steel boxes, forming the final product.

Environment-Friendly Products

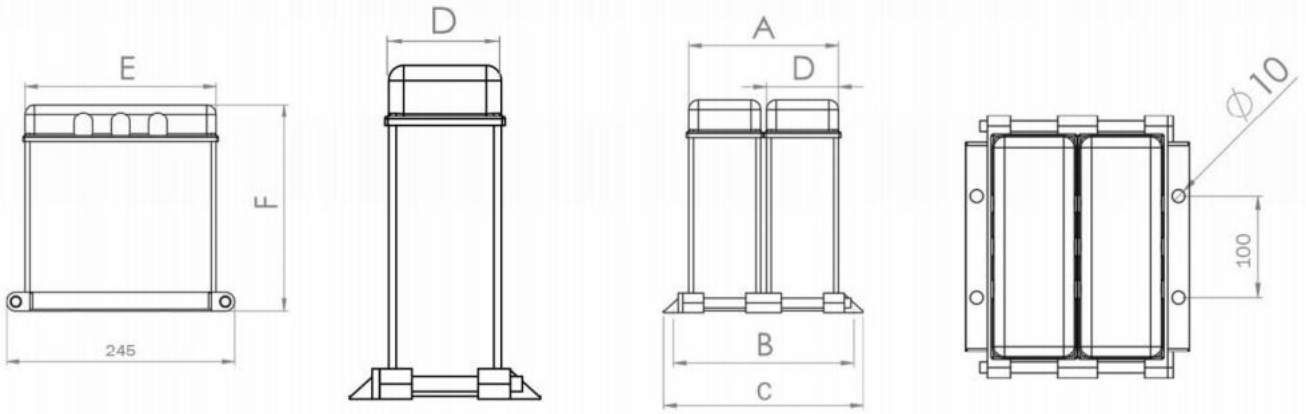
All materials used in Kondaş Capacitors' production line are non-toxic and environment-friendly.

TEMP. CATEGORIES		AMBIENT AIR			PERMITED OVER VOLTAGE	
SYMBOL	MEANING	MAX.	HIGHEST MEAN OVER ANY PERIOD OF (ºC)		MAX. DURATION	Voltage Factor x Un
			24 Hours	1 Years	CONTINUOUS	1,0 Un
-25/A	- 25 / + 40 °C	40	30	20	8 hours / day	1,1 Un
-25/B	- 25 / + 45 °C	45	35	25	30 min. / day	1,15 Un
-25/C	- 25 / + 50 °C	50	40	30	5 min. / 200 times	1,2 Un
-25/D	- 25 / + 55 °C	55	45	35	1min. / 200 times	1,3 Un

Table - 2

ZNPP

Box Type Low Voltage Power Capacitors



ZnPP STANDARD TYPE 1-2 (SINGLE PHASE/TWO PHASE) LOW VOLTAGE POWER CAPACITORS

STANDARD RATINGS							DIMENSION mm						WEIGHT	PACKAGES	
VOLTAGE	PRODUCT KODU	POWER kVAr 230 V	POWER kVAr 400 V		CAPACITANCE µF	CURRENT A	A	B	C	D	E	F	kg	PCS/PACK	kg
230 V. 50 Hz. POWER/kVAr	Z412M01A0	0,25	0,75		1*15,1	1,1				70	130	150	0,6	12	7,2
	Z412M01B0	0,5	1,5		1*30,1	2,2				70	130	150	0,7	12	8,6
	Z412M01D0	1	3		1*60,2	4,3				70	130	150	0,8	12	9,8
	Z412M01G0	1,5	4,5		1*90,3	6,5				70	130	150	0,9	12	11
	Z412M01K0	2,5	7,5		1*150,5	10,9				70	210	215	1,2	6	7,4
	Z412M01S0	5	15		1*301	21,8				75	210	265	2,3	6	14,1
	Z412M01X0	10	30 (*)		1*600	43,5				75	210	265	2,8	6	17,1

(*) - This unit is used for filter application only as 400V/30kVAr/1ph

ZnPP STANDARD TYPE 3 PHASE LOW VOLTAGE POWER CAPACITORS

STANDARD RATINGS							DIMENSION mm						WEIGHT	PACKAGES	
VOLTAGE	PRODUCT KODU	POWER kVAr 400 V	POWER kVAr 415 V		CAPACITANCE µF	CURRENT A	A	B	C	D	E	F	kg	PCS/PACK	kg
400 V. 50 Hz. POWER / kVAr	ZG12D01B0	0,5	0,53		3*3,4	0,7				70	130	150	0,6	12	7,2
	ZG12D01D0	1	1,1		3*6,7	1,4				70	130	150	0,6	12	7,2
	ZG12D01G0	1,5	1,6		3*10	2,2				70	130	150	0,7	12	8
	ZG12D01K0	2,5	2,7		3*16,7	3,6				70	130	150	0,8	12	9,2
	ZG12D01S0	5	5,4		3*33,3	7,2				70	130	215	1,1	12	9,8
	ZG12D01V0	7,5	8,1		3*50	10,8		95	115	75	210	220	1,6	6	9,8
	ZG12D01X0	10	10,8		3*66,7	14,4		95	115	75	210	220	1,9	6	11,7
	ZG12D01Y0	12,5	13,5		3*83,3	18		95	115	75	210	220	2	6	12,2
	ZG12D0160	15	16,1		3*100	21,6		95	115	75	210	265	2	6	12,4
	ZG12D0180	20	21,5		3*133,3	28,9		95	115	75	210	265	2,9	6	17,7
	ZG12D0190	25	26,9		3*166,7	36		95	115	75	210	265	3,1	6	18,9
	ZG12D0A00	30	32,3		3*200	43,3		95	115	75	210	265	3,3	6	19,8
	ZG12D0280	40	43		2*(3*133,3)	57,7	155	175	195	75	210	265	5,8	3	19,8
	ZG12D0290	50	53,8		2*(3*166,7)	72,2	155	175	195	75	210	265	6,2	3	19,8
	ZG12D0380	60	64,6		2*(3*200)	86,6	155	175	195	75	210	265	6,5	3	19,8

ZNPP

Box Type Low Voltage Power Capacitors

STANDARD RATINGS							DIMENSION mm						WEIGHT	PACKAGES	
VOLTAGE	PRODUCT KODU	POWER kVAr 440 V	415 V	400 V	CAPACITANCE µF	CURRENT A	A	B	C	D	E	F	kg	PCS/PACK	kg
440 V. 50 Hz. POWER / kVAr	ZJ12D01B0	0,5	0,4	0,4	3*2,8	0,7				70	130	150	0,6	12	7,2
	ZJ12D01D0	1	0,9	0,8	3*5,5	1,3				70	130	150	0,6	12	7,2
	ZJ12D01G0	1,5	1,3	1,2	3*8,3	2				70	130	150	0,7	12	8
	ZJ12D01K0	2,5	2,2	2,1	3*13,7	3,3				70	130	150	0,8	12	9,2
	ZJ12D01S0	5	4,4	4,1	3*27,4	6,6				70	130	215	1,1	12	9,8
	ZJ12D01V0	7,5	6,7	6,2	3*41,1	9,84		95	115	75	210	220	1,6	6	9,8
	ZJ12D01X0	10	8,9	8,3	3*54,9	13,1		95	115	75	210	220	1,9	6	11,7
	ZJ12D01Y0	12,5	11,1	10	3*68,6	16,4		95	115	75	210	220	2	6	12,2
	ZJ12D0160	15	13,3	12,5	3*82,3	19,7		95	115	75	210	265	2	6	12,4
	ZJ12D0180	20	17,8	16,5	3*109,7	26,3		95	115	75	210	265	2,9	6	17,7
	ZJ12D0190	25	22,2	20	3*137,1	32,8		95	115	75	210	265	3,1	6	18,9
	ZJ12D0A00	30	26,7	25	3*164,5	39,4		95	115	75	210	265	3,3	6	19,8
	ZJ12D0280	40	35,6	33	2*(3*109,7)	52,6	155	175	195	75	210	265	5,8	3	19,8
	ZJ12D0290	50	44,4	40	2*(3*137,1)	65,6	155	175	195	75	210	265	6,2	3	19,8
	ZJ12D0380	60	53,7	50	2*(3*164,5)	78,8	155	175	195	75	210	265	6,5	3	19,8

STANDARD RATINGS							DIMENSION mm						WEIGHT	PACKAGES	
VOLTAGE	PRODUCT KODU	POWER kVAr 525 V	480 V	440 V	CAPACITANCE µF	CURRENT A	A	B	C	D	E	F	kg	PCS/PACK	kg
525 V. 50 Hz. POWER / kVAr	ZO12D01K0	2,5	2,1	1,8	3*9,6	2,8				70	130	150	0,8	12	9,2
	ZO12D01S0	5	4,2	3,5	3*19,3	5,5				70	130	215	1,1	12	9,8
	ZO12D01V0	7,5	6,2	5,3	3*28,9	8,3		95	115	75	210	220	1,6	6	9,8
	ZO12D01X0	10	8,3	7	3*38,5	11		95	115	75	210	220	1,9	6	11,7
	ZO12D01Y0	12,5	10,4	8,8	3*48,2	13,8		95	115	75	210	220	2	6	12,2
	ZO12D0160	15	12,5	10,5	3*57,8	16,5		95	115	75	210	265	2	6	12,4
	ZO12D0180	20	16,6	14,1	3*77	22		95	115	75	210	265	2,9	6	17,7
	ZO12D0190	25	20,8	17,5	3*96,3	27,5		95	115	75	210	265	3,1	6	18,9
	ZO12D0A00	30	25	21,1	3*115,6	33		95	115	75	210	265	3,3	6	19,8
	ZO12D0280	40	33,3	28,2	2*(3*77)	44	155	175	195	75	210	265	5,8	3	19,8
	ZO12D0290	50	41,7	35	2*(3*96,3)	55	155	175	195	75	210	265	6,2	3	19,8
	ZO12D0380	60	50	42,2	2*(115,6)	66	155	175	195	75	210	265	6,5	3	19,8

STANDARD RATINGS							DIMENSION mm						WEIGHT	PACKAGES	
VOLTAGE	PRODUCT KODU	POWER kVAr 690 V			CAPACITANCE µF	CURRENT A	A	B	C	D	E	F	kg	PCS/PACK	kg
690V. 50 Hz. POWER/kVAr	ZX12S01X0	10			3*66,9	8,4		95	115	75	210	220	1,9	6	11,7
	ZX12S01Y0	12,5			3*30,5	10,5		95	115	75	210	220	2	6	12,2
	ZX12S0180	20			3*133,8	16,8		95	115	75	210	265	2,9	6	17,7
	ZX12S0190	25			3*167,3	21		95	115	75	210	265	3,1	6	18,9

ZnPP 3*.....kVAr 3 SINGLE-PHASE + NEUTRAL TERMINALS, STAR CONNECTION INSIDE LOW VOLTAGE POWER CAPACITORS

STANDARD RATINGS							DIMENSION mm						WEIGHT	PACKAGES	
VOLTAGE	PRODUCT KODU	POWER kVAr 230 V			CAPACITANCE µF	CURRENT A	A	B	C	D	E	F	kg	PCS/PACK	kg
230 V. 50 Hz. POWER / kVAr	Z412O0K00	3*0,13			3*6	3*0,5		95	115	75	210	220	1	6	6,3
	Z412O0L00	3*0,26			3*16,3	3*1,2		95	115	75	210	220	1	6	6,3
	Z412O0M00	3*0,55			3*33	3*2,4		95	115	75	210	220	1,3	6	8,1
	Z412O0N00	3*1,1			3*66,2	3*4,8		95	115	75	210	220	1,6	6	9,9
	Z412O0O00	3*2,2			3*132,4	3*9,6		95	115	75	210	265	2,9	6	17,7
	Z412O1N1O	3*3,3			3*198,7	3*14,3		95	115	75	210	265	2,9	6	17,7

ZnPAS / ZnPAS-M

Heavy Duty Dry Type Low Voltage Power Capacitors

Technical Specifications

Rated Temperature:	- 25 / D (-25/+ 55ºC)
Capacity Tolerance:	% -5 +10
Rated Voltage:	415 - 900 V
Working Frequency:	50 - 60 Hz.
Internal Connection:	Delta or Single Phase*
Permitted Over Voltages:	As Shown Table 3
Permitted Over Current:	1,3 In
Inrush Current:	> 100 In
Tan δ (Total Losses):	0,5 W/kVAr
Dielectric Loss :	<0,2 W/kVAr
Terminals:	M6, M8, M10 Cable Lug Connection
Terminals Torque:	15 N.m.
Protection Class:	IP54
Altitude:	2000 m. a.s.l
Test Voltage Between Terminals:	2,15 Un, 2 sn.
Test Voltage Between Terminal and Case:	3 kV AC, 10 sn.
Filling Materials:	Vermiculite (Anti-Toxic)
Stainless Steel Body:	Internal (External Type Optional)
Discharge Resistor:	Internal; 50 V - 60 sec.
Reference standards:	TS EN 60831 - 1 / 2, IEC 60831 - 1/2
	*optional

Long Life

In case of a short circuit between the electrodes of a capacitor element, the metal layers around the short circuit vaporize and cease a possible breakdown; therefore allowing the capacitor to self-heal itself and continue its operation. Also, Kondaş applies "torture tests" to all of its prototypes before launching, thus ensuring top quality.

Purpose and Area of Usage

ZnPAS / ZnPAS-M capacitors are used in industrial and commercial facilities for serving the purpose of power factor correction. The product fixes the power factor (cos Q) and allows the user to consume less reactive power from the grid circuit. In return, the costs of elecric usage fall and the energy quality enhances. These types of capacitors have been designed both for indoor and outdoor usage such as overhead lines and pole transformer compensation.

Safety

Holding a rating of IP 54 Protection Class, ZnPAS / ZnPAS-M capacitors reduce the risk of fire to the lowest level possible due to its vermiculite filling.

Components of ZnPAS / ZnPAS-M Capacitors

ZnPAS / ZnPAS-M type capacitors consist of; metallized self-healing polypropylene film, winding cores, separators, paper and resine, plastic tubes mechanic fuses for disconnection, steel box and discharge resistors.

Production Process of ZnPAS / ZnPAS-M Capacitors

The production commences with the winding of metallized PP film with low dielectric loss in a clean room under high vacuum. This forms the capacitor element. On the next step, both cylindrical sides of the element are sprayed with %99.95 pure zinc, and the conductive materials are soldered between the terminals and elements. The processed single-phase elements are then dehydrated under vacuum and impregnated with highly purified gas. In order to avoid any connection with air and to provide an excellent insulation, the processed elements are put into plastic tubes and filled with natural polyurethane resin. The wires of elements inside plastic tubes are connected in a delta position to provide a three-phase output and mounted into steel sheet cases filled with vermiculite granules, forming the final product.
Environment-Friendly Products.

Environment-Friendly Products

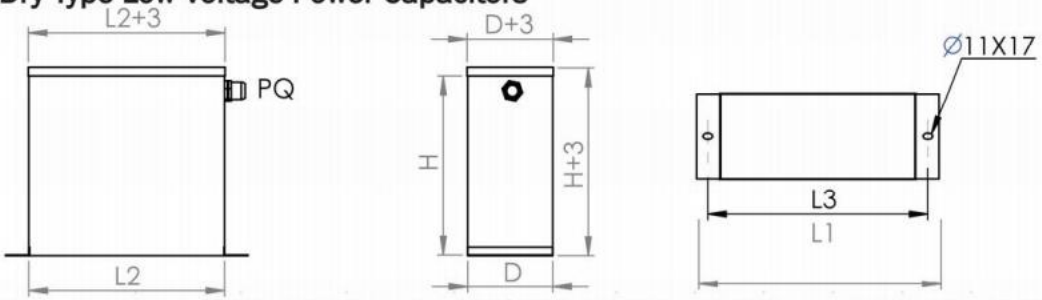
All materials used in Kondaş Capacitors' production line are non-toxic and environment-friendly.

TEMP. CATEGORIES		AMBIENT AIR			PERMITED OVER VOLTAGE	
SYMBOL	MEANING	MAX.	HIGHEST MEAN OVER ANY PERIOD OF (ºC)		MAX. DURATION	Voltage Factor x Un
			24 Hrs	1 Year	CONTINUOUS	1,0 Un
					8 hours / day	1,1 Un
					30 min. / day	1,15 Un
					5 min. / 200 times	1,2 Un
-40 / D	-40 / +55°C	55	45	35	1 min. / 200 times	1,3 Un

Table - 3

ZnPAS / ZnPAS-M

Heavy Duty Dry Type Low Voltage Power Capacitors



ZnPAS for HEAVY DUTY APPLICATION DRY TYPE (ANTI TOXIC VERMICULITE INSIDE SS BODY IP42)

	STANDARD RATINGS					DIMENSION						PACKAGES
VOLTAGE	PRODUCT CODE	POWER kVAr 415 V	POWER kVAr 457 V		CAPACITANCE µF	D mm	L1 mm	L2 mm	L3 mm	H mm	CABLE GLAND	PCS/PACK
415 V. 50 Hz. POWER / kVAr	X41A12D0300H0	5	6,1		3*30,8	75	301	215	261	265	30	1
	X41A12D0300N0	10	12,1		3*61,6	75	301	215	261	265	30	1
	X41A12D0300R0	12,5	15,2		3*77	75	301	215	261	265	30	1
	X41A12D03S000	15	18,2		3*92,5	75	301	215	261	265	30	1
	X41A12D06N000	20	24,2		3*123,3	152	266	180	226	285	PG21	1
	X41A12D060410	25	30,3		3*154,1	152	266	180	226	285	PG21	1
	X41A12D06S000	30	36,4		3*184,9	152	266	180	226	285	PG21	1
	X41A12D090440	40	48,5		3*246,6	152	436	350	396	335	PG29	1
	X41A12D090550	50	60,6		3*308,2	152	436	350	396	335	PG29	1
	X41A12D12S000	60	72,7		3*369,8	152	436	350	396	390	PG36	1
	X41A12D150530	80	97		3*493,1	152	436	350	396	460	PG36	1
	X41A12D15T000	90	109,1		3*554,7	152	436	350	396	500	PG42	1
	X41A12D180550	100	121,2		3*616,4	152	436	350	396	500	PG42	1
	X41A12D24S000	120	145,4		3*739,7	152	436	350	396	590	PG42	1

	STANDARD RATINGS					DIMENSION						PACKAGES
VOLTAGE	PRODUCT CODE	POWER kVAr 525 V	POWER kVAr 480 V		CAPACITANCE µF	D mm	L1 mm	L2 mm	L3 mm	H mm	CABLE GLAND	PCS/PACK
525 V. 50 Hz. POWER / kVAr	X52A12D0300S0	5	4,2		3*19,3	75	301	215	261	265	30	1
	X52A12D0300N0	10	8,4		3*38,5	75	301	215	261	265	30	1
	X52A12D0300R0	12,5	10		3*48,1	75	301	215	261	265	30	1
	X52A12D03S000	15	12,5		3*57,8	75	301	215	261	265	30	1
	X52A12D03U000	20	16,6		3*77	152	266	180	226	285	PG21	1
	X52A12D030W00	25	21		3*96,3	152	266	180	226	285	PG21	1
	X52A12D03X000	30	25		3*115,5	152	266	180	226	285	PG21	1
	X52A12D06U000	40	33,3		3*154,1	152	436	350	396	335	PG29	1
	X52A12D090550	50	42		3*192,6	152	436	350	396	335	PG29	1
	X52A12D09U000	60	50		3*231,1	152	436	350	396	390	PG36	1
	X52A12D120580	70	60		3*296,6	152	436	350	396	460	PG36	1
	X52A12D12U000	80	67		3*308,1	152	436	350	396	460	PG36	1
	X52A12D15U000	100	83		3*385,2	152	436	350	396	500	PG42	1
	X52A12D184000	120	100		3*462,2	152	436	350	396	590	PG42	1

ZnPAS-M MODULAR For HEAVY DUTY APPLICATION DRY TYPE (SS BODY IP42)

	STANDARD RATINGS					DIMENSION						PACKAGES
VOLTAGE	PRODUCT CODE	POWER kVAr 525 V	POWER kVAr 457 V		CAPACITANCE µF	D mm	L1 mm	L2 mm	L3 mm	H mm	CABLE GLAND	PCS/PACK
525 V.50 Hz. POW./kVAr	X45712D030030	18,6	14,1		3*71,6		70	340	220	240		3
	X45712D062820	37,2	28,2		3*143,2		70	340	220	240		3

Asvartör

Heavy Duty Non-Dry Type Low Voltage Power Capacitors

Technical Specifications

Rated Temperature:	- 25 / D (-25/+ 55ºC)*
Capacity Tolerance:	% -5 +10
Rated Voltage:	400 - 690 V
Working Frequency:	50 - 60 Hz.
Imprengnating Fluid:	Non PCB
Use Type:	Horizontal or Vertical
Permitted Over Voltages:	As Shown Table 4
Permitted Over Current:	1,4 In
Switching Over Voltages (max: 10 m/s):	2x √ 2 Un
Dielectric Loss :	<0,15 W/kVAr
Terminals Torque:	M10 - M14 max. 10 N.m
Altitude:	2000 m. a.s.l
Test Voltage Between Terminals:	2,15 Un, 2 sn.
Test Voltage Between Terminal and Case	3 kV AC, 10 sn.
Fuses:	Internal
Insulator Bushing:	Wet Proses Porcelain
Discharge Resistor:	75 V - 3 min.
Reference standards:	TS EN 60931 - 1 / 2, IEC 60931 - 1/2

Long Life

Produced with an "All-Film Technology", AsVartör capacitors are manufactured with extremely low dielectric loss material and can absorb high stress.

Purpose and Area of Usage

AsVartör capacitors are used in industrial and commercial facilities for serving the purpose of power factor correction. The product fixes the power factor (cos Q) and allows the user to consume less reactive power from the grid circuit. In return, the costs of elecric usage fall and the energy quality enhances. AsVartör capacitors are designed for electrical networks that operate under low voltage, and can function in a highly efficient way at industrial plants that work under heavy conditions.

Endurance

Due to its tough hardware material and "All-Film Technology", AsVartör capacitors are build-to-last.

Components of AsVartör Capacitors

AsVartör type capacitors consist of; hazy polypropylene film, aluminum foil, copper, wires, fuses, paper, steel container, dielectric non-PCB oil, insulators and top case.

Production Process of AsVartör Capacitors

The production commences with the winding of low dielectric loss hazy PP film in a clean room under high vacuum. The film is wound along with aluminum foil in order to provide the necessary electrode level, and their combination creates the AsVartör capacitor element. After the winding, the terminals are connected to the element with tin plated copper and wires, and their safety is backed up with fuses. The elements can be considered as capacitors with low power and voltage, and when connected in a parallel way to build up series, they form a strong power capacitor. The connected elements are then insulated with paper wrapping to be mounted into steel containers. Following the assembly of the capacitor box, the products are put in an autoclave under very high vacuum in order to provide the ultimate dehydration. On the final step of production, vacuumed capacitors are impregnated with non-PCB oil, forming the final product upon impregnation.

Environment-Friendly Products

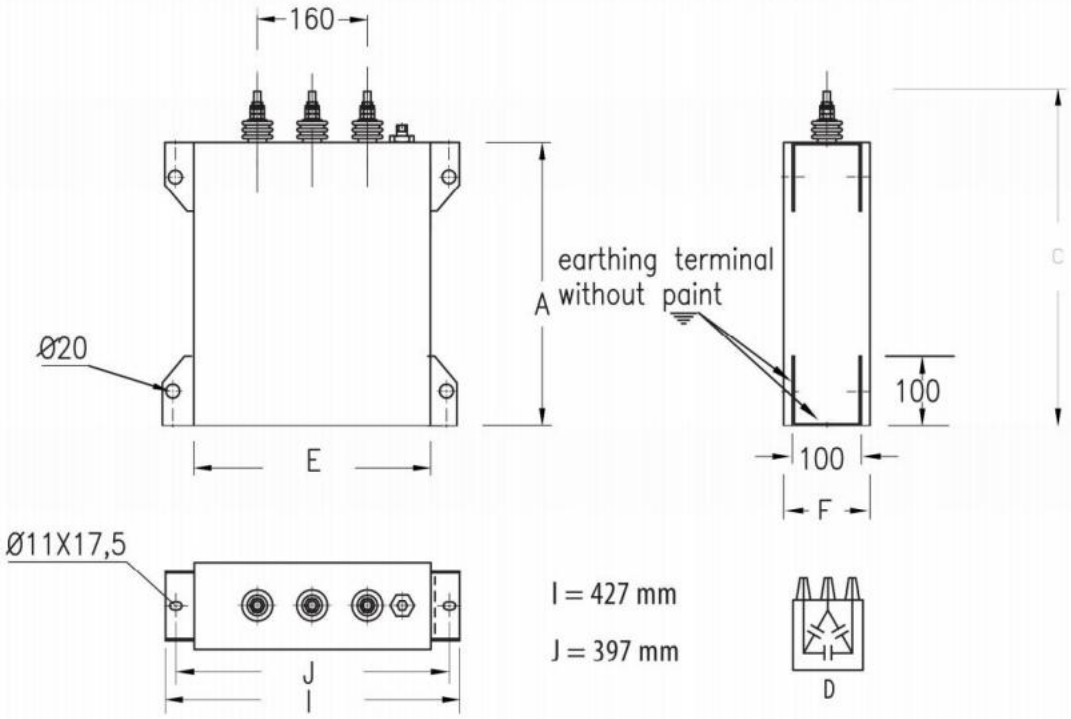
All materials used in Kondaş Capacitors' production line are non-toxic and environment-friendly. Especially the oil used for impregnation consists of carbon, hydrogen and oxygen; therefore can biodegrade quickly in nature without any issues.

TEMP. CATEGORIES		AMBIENT AIR			PERMITED OVER VOLTAGE	
SYMBOL	MEANING	MAX.	HIGHEST MEAN OVER ANY PERIOD OF (°C)		MAX. DURATION	Voltage Factor x Un
			24 Hours	1 Year	PERMANENT OVER VOLTAGE	1,2 Un
					8 hours / day	1,25 Un
					30 min. / day	1,30 Un
					5 min./ 200 times	1,35 Un
-25 / D	-25 / +55ºC	55	45	35	1 min. / 200 times	1,40 Un

Table - 4

AsVartör

Heavy Duty Non-Dry Type Low Voltage Power Capacitors



AS VArTÖR HEAVY DUTY APPLICATION TYPE WITH OIL (SS BODY IP42, INTERNAL FUSED WITH PRESSURE SWITCH)

STANDARD RATINGS						DIMENSION						PACKAGES
VOLTAGE	PRODUCT CODE	POWER kVAr 400 V			CAPACITANCE µF	A mm	E mm	F mm	C mm		kg	PCS/PACK
400 V. 50 Hz. GÜÇ / kVAr	3C00D1A50	25			500	430	343	100	530		25	1
	3C00D1B01	30			600	490	343	100	590		29	1
	3C00D1C01	40			800	530	343	114	630		36	1
	3C00D1D01	50			1000	620	343	114	720		42	1
	3C00D1E01	60			1200	680	343	125	780		49	1
	3C00D1G1K	80			1600	710	343	152	810		65	1
	3C00D1I01	100			2000	730	343	185	830		81	1

Harmonic Filter Reactors – Low Voltage

Technical Specifications

Standards:	EN6158-2-20, EN60289
CE Conformity:	Yes
Rated Voltage:	230 V - 1000 V
Rated Power:	0,9 kVAr - 150 kVAr
Rated Frequency:	50 Hz.
Phase:	3
Standard Reactor Factors:	% 5,67 - % 7 - % 14
Inductance Tolerance:	% 3
Protection Class:	IP00
Insulation (Vinding-Iron Case):	3 kV
Thermistor:	120 °C, 1NK Contact
Insulation Class:	F Class 55°C
Varnish:	Impregnation With Epoxy Varnish in Vacuum
Cooling:	Natural Cooling By Air
Ambient Temperature (max.):	40 °C
Humidty:	% 95
Altitude:	1000 m.
Design Specialities:	Three Phase, Low Loss Iron Care
Winding Materials:	Copper or Aluminium
Terminals:	Copper, Which are Suitable For Clamps and Cable

Purpose and Area of Usage

Used in filtered power factor compensation systems that reduce the effects of the harmonics. The filter prevents overvoltage and overcurrent that occur following a resonance between the capacitance and inductance. Through the usage of Harmonic Filter Reactors; the lifespan of capacitors increase impressively, the possibility of a resonance is completely avoided and harmonic current flow is prevented.

Strength

Nearly with no-loss at all, Harmonic Filter Reactors can work at the limit of the upper current due to its strong material selection which are pure copper or aluminum.

DEFINITIONS AND SELECTION CRITERIA FOR HARMONIC FILTER REACTORS:

1) Nominal Inductance: When the reactor works on it's nominal current, it should have a nominal inductance in miliHenry. That value is evaluated when it is designed.

2) Nominal Voltage: When the reactor works with the capacitor in series connection, reactor should have AC rms voltage on the terminals.

3) Capacitor Voltage: When the reactor works with the capacitor in series connection, the capacitor terminals have a voltage higher than the system voltage.

$$Uc = \frac{Un}{1 - P}$$

U_n= System voltage

U_c= Voltage at the capacitor terminal higher than the system voltage.

U_n=400 V

p=%7

U_c= 430 V (capacitor's nominal voltage should be higher than this calculated voltage as much as safe)

4) Reactor Factor: That factor is equal to inductive reactance of the reactor devided by capacitive reactance of the capacitor.

$$P = 100 \cdot \frac{XL}{XC}$$

5) Series Resonance Frequency: Look the below table which shows; Standard reactor factor, resonance frequency and capacitor terminal voltage are shown in the below table. Capacitor unit nominal voltages should always be selected above the given values.

REACTOR FACTOR	DETUNED FREQUENCY (For 50 Hz.)	VOLTAGE AT THE CAPACITOR TERMİNAL
5,67%	210	424 V
7%	189	430 V
14%	134	465 V

Harmonic Filter Reactors

Nominal Power:
Is the total power of the L-C circuit at nominal voltage and frequency.
Nominal Current:
Rms current of the circuit at nominal voltage and frequency transient effects are excluded.
Maximum current value and inductance stability:
The reactor should have the same reactance when it works continously on it's upper limit of the current.
Working Conditions:
If the reactor has temperature class T40, it means that can work between -5 / +40°C ambient temperatures but it should be run <35°C for 24 hours according IEC439-1 and DIN EN60934 standards. T40 class is our recommendation for you.
Thermistor:
The reactor has already a thermistor inside of the middle winding. The thermistor has been set to 120° for safety reasons. This for safe reason. The temperature shouldn't be increased up to 120°C.
Impregnation:
Reactor is impregnated with epoxy varnish in vacuum conditions and left in furnace. That process gives some specialities like higher insulation and working without vibration.
Insulation:
Reactor has F class insulation which means it should stand against 155°C for safety reasons. Raector should be run way below that temperature normally.

3 PHASE HARMONIC FILTER REACTORS 5,67 % (210 Hz.) - 7 % (189 Hz.)

TYPE	VOLTAGE	WILL BE USED THE CAPACITOR UNIT (ZnPS)			PRODUCT	CURRENT	INDUCTANCE	DIMENSION mm			PACK
	400 V.	440 V	480 V	525 V	CODE	A	mH	WIDTH	HEIGHT	DEPTH	
% 5,67 (210 Hz.) - % 7 (189 Hz.) POWER / kVAr	0,9	1			1RE000287D	1,3	43	150	150	85	1
	1,5			2,5	1RE000161D	2,2	24,88	130	150	80	1
	2,2	2,5			1RE000032D	3,2	17,3	150	150	100	1
	3,1			5	1RE000092D	5,5	12,4	150	150	100	1
	4,4	5			1RE000100D	6,6	8,45	180	180	95	1
	6,2	7,5		10	1RE000070D	9	6,22	180	180	80	1
	7,8			12,5	1RE000182D	11	4,92	180	180	80	1
	8,8	10		15	1RE000034D	13	4,3	180	180	110	1
	12,5	14,1	16,6	20	1RE000069D	18	3,07	180	210	100	1
	15			25	1RE000183D	22	2,46	240	210	140	1
	23	25		3*12,5	1RE000162D	33,5	1,66	260	175	180	1
	25	28,2	33,3	40	1RE000090D	36	1,53	240	210	145	1
	31			50	1RE000184D	45	1,23	270	210	185	1
	46	2*25		3*25	1RE000163D	67	0,83	300	230	190	1
	50	2*28,2	2*33,3	2*40	1RE000091D	72	0,77	300	260	180	1
	62			2*50	1RE000185D	90	0,62	300	260	190	1
	71	4*20			1RE000164D	103	0,54	360	285	195	1
	75	3*28,2	3*33,3	3*40	1RE000093D	108	0,51	300	270	210	1
	92	4*25		3*50	1RE000276D	135	0,41	360	285	205	1
	100	4*28,2	4*33,3	4*40	1RE000198D	145	0,385	360	320	220	1
	150	6*28,2	6*33,3	6*40	1RE000290D	217	0,257	420	360	186	1

3 PHASE HARMONIC FILTER REACTORS % 14 (134 Hz.)

TYPE	VOLTAGE	WILL BE USED THE CAPACITOR UNIT (ZnPS)			PRODUCT	CURRENT	INDUCTANCE	DIMENSION mm			PACK
	400 V.	440 V	480 V	525 V	CODE	A	mH	WIDTH	HEIGHT	DEPTH	
% 14 (134 Hz.) POWER / kVAr	5			7,5	1RE000318D	7,3	16,23	240	205	110	1
	10			15	1RE000319D	14,4	8,3	240	205	120	1
	20			30	1RE000320D	29,3	4,06	250	205	165	1
	27			40	1RE000321D	39	3,06	330	240	205	1
	34			50	1RE000322D	49	2,45	300	260	205	1
	40			2*30	1RE000323D	58	2	340	275	210	1
	54			2*40	1RE000324D	78	1,53	350	275	210	1
	68			2*50	1RE000325D	97,2	1,23	360	320	220	1
	80			3*40	1RE000326D	115,5	1,04	360	310	186	1
	100			3*50	1RE000327D	145	0,83	360	310	206	1

1 PHASE HARMONIC FILTER REACTORS % 5,67 (210 Hz.) - % 7 (189 Hz.)

TYPE	VOLTAGE	WILL BE USED THE CAPACITOR UNIT (ZnPS)			PRODUCT	CURRENT	INDUCTANCE	DIMENSION mm			PACK
	230 V	230 V	400 V		CODE	A	mH	WIDTH	HEIGHT	DEPTH	
% 5,67 (210 Hz.) - % 7 (189 Hz.) POWER /kVAr	0,5		1,5		1RE000165D	2,4	23	96	110	90	1
	1		3		1RE000142D	4,6	11,9	96	110	90	1
	1,5		4,5		1RE000212D	6,95	7,93	120	125	195	1
	2,5		7,5		1RE000286D	12	4,73	120	130	100	1
	5		15		1RE000033D	23,2	2,38	120	130	115	1
	10		30		1RE000337D	46,7	1,18	150	140	105	1

1 PHASE HARMONIC FILTER REACTORS % 14 (134 Hz.)

TYPE	VOLTAGE	WILL BE USED THE CAPACITOR UNIT (ZnPS)			PRODUCT	CURRENT	INDUCTANCE	DIMENSION mm			PACK
	230 V	230 V	400 V		CODE	A	mH	WIDTH	HEIGHT	DEPTH	
% 14 (134 Hz.) POWER /kVAr	0,5		1,5		1RE000328D	2,51	47,3	120	125	80	1
	1		3		1RE000329D	5	23,6	120	125	100	1
	1,5		4,5		1RE000330D	7,6	15,64	120	125	110	1
	2,5		7,5		1RE000331D	12,5	9,46	120	130	115	1
	5		15		1RE000332D	25,1	4,73	150	140	105	1
	10		30		1RE000333D	50,1	2,39	171	160	160	1

Shunt Reactors – Low Voltage

Technical Specifications

Standards:	EN6158-2-20, EN60289
CE Conformity:	Yes
Rated Voltage:	230 V - 1000 V
Rated Power:	0,5 kVAr - 100 kVAr
Rated Frequency:	50 Hz.
Phase:	3
Standard Reactor Factors:	% 100
Inductance Tolerance:	% 5
Protection Class:	IP00
Insulation (Vinding-Iron Case):	3 kV
Thermistor:	120 °C, 1NK Contact
Insulation Class:	F Class 55°C
Varnish:	Impregnation With Epoxy Varnish in Vacuum
Cooling:	Natural Cooling By Air
Ambient Temperature (max.)	40 °C
Humidty:	% 95
Altitude:	1000 m.
Design Specialities:	Three Phase, Low Loss Iron Care
Winding Materials:	Copper or Aluminium
Terminals:	Copper, Which are Suitable For Clamps and Cable

Purpose and Area of Usage

Shunt Reactors are used in applications that are consistently under capacitive and inductive load, caused by cables with large diameters. In such situation, Shunt Reactors can provide balance.

3 PHASE SHUNT REACTORS (INDUCTIVE LOAD)

TYPE	VOLTAGE	PRODUCT	CURRENT	INDUCTANCE	DIMENSION mm			PACK
	400 V.	CODE	A	mH	WIDTH	HEIGHT	DEPTH	
400 V. 50 Hz. POWER / kVAr	0,5	1RE000127D	0,73	1000	120	130	110	1
	1	1RE000040D	1,45	500	240	185	120	1
	1,5	1RE000235D	2,17	339	240	190	120	1
	2,5	1RE000118D	3,61	203	240	235	130	1
	5	1RE000028D	7,23	101	300	235	180	1
	10	1RE000226D	14,45	50,9	420	395	230	1
	15	1RE000285D	21,7	34	420	395	250	1
	20	1RE000334D	29	25,4	420	395	250	1
	25	1RE000049D	36,2	20	460	435	280	1
	30	1RE000335D	43,3	16,8	480	415	220	1
	40	1RE000336D	57,7	12,6	480	415	240	1
	50	1RE000172D	73	10	620	555	300	1
	100	1RE000255D	145	5,1	770	695	320	1

1 PHASE SHUNT REACTORS (INDUCTIVE LOAD)

TYPE	VOLTAGE	PRODUCT	CURRENT	INDUCTANCE	DIMENSION mm			PACK
	230 V	CODE	A	mH	WIDTH	HEIGHT	DEPTH	
230 V. 50 Hz. POWER / kVAr	0,5	1RE000116D	2,2	336	120	125	110	1
	1	1RE000117D	4,35	168,4	130	160	110	1
	1,5	1RE000031D	6,52	112,3	160	235	130	1
	2,5	1RE000134D	12,5	70	160	265	140	1
	3	1RE000181D	13	56,2	160	265	140	1
	3,5	1RE000218D	15,2	48,2	200	280	130	1
	5	1RE000119D	21,7	33,7	200	315	200	1
	7	1RE000225D	30,4	24,1	240	345	210	1
	10	1RE000154D	43,5	16,8	240	380	230	1
	15	1RE000253D	65	11,23	360	410	245	1

KONDAS®

VArKON
Power Factor Correction

VArPOWER
Power Quality System
KONDAS

Medium & High Voltage Capacitors and Power Factor Correction Components

OG Vartör

Medium Voltage Power Capacitors

Technical Specifications

Standard Powers:	As shown table 6
Rated Temperature:	- 25/C (- 25 + 50°C)*
Capacity Tolerance:	- 5 /+ 10 %
Rated Voltage:	1 kV to 34,5 kV
Rated Frequency:	50 Hz. (Other frequency avaible)
Impregnating Fluid:	Non PCB
Capacitor Mounting Configuration:	Vertical or Horizontal
Maximum Allowed Voltage:	As shown table 5
Maximum Allowed Current:	1,3 Un
Overvoltage During Switching (max:10 ms):	≤2x√2 Un
Maximum Peak Value of Transient Current:	100 . In
Maximum Transient Period	1/2 periods
Max. Torque of M10, M14 Terminals:	15 N.m
Dielectric Loss :	<0,15W/kVAr
Test Voltage Between Terminals:	2 Un AC, 10 sn
Test Voltage Between Terminals-Case:	bkz. IEC 871-1
Fuses:	Internal and External Fuses
Bushings:	Porcelain
Altitude:	max. 2000 m. (a.s.l.)
Discharge Resistor:	Internal 50 V After 5 min. or 75 V 10 min.
Reference standards:	IEC 60871-1-/2; TS EN 60871/1-2

Long Life

Produced with an “All-Film Technology”, OG Vartör capacitors are manufactured with extremely low dielectric loss material. Also, Kondaş ensures that OG Vartör capacitors undertake several tough tests such as: oil leakage test, initial capacitor test, terminal to terminal over potential test, terminal to case insulation test, discharge test and sonic corona test.

Flexibility of Production Range

As long as the figures of rated voltage, frequency, capacity and operating temperature is indicated with an enquiry, Kondaş is extremely flexible of tailoring solutions upon request.

Purpose and Area of Usage

OG Vartör capacitors are used in industrial and energy supply facilities that operate under medium and high voltage for serving the purpose of power factor correction. The product fixes the power factor (cos Q) and allows the user to consume less reactive power from the grid circuit. In return, costs of electric usage fall and the energy quality enhance.
OG Vartör capacitors can be implemented on their own, or mounted on banks through series connection.

Components of OG Vartör Capacitors:

OG Vartör type capacitors consist of; hazy polypropylene film, aluminum foil, copper, wires, fuses, paper, steel container, dielectric non-PCB oil, and porcelain bushings.

Production Process of OG Vartör Capacitors:

The production commences with the winding of low dielectric loss hazy PP film in a clean room under high vacuum. The film is wound along with aluminum foil in order to provide the necessary electrode level, and their combination creates the OG Vartör capacitor element. After the winding, the terminals are connected to the element with tin plated copper and wires, and their safety is backed up with fuses. The elements can be considered as capacitors with low power and voltage, and when connected in a parallel way to build up series, they form a strong power capacitor. The connected elements are then insulated with paper wrapping to be mounted into steel containers. Following the assembly of the capacitor box, the products are put in an autoclave under very high vacuum in order to provide the ultimate dehydration. On the final step of production, vacuumed capacitors are impregnated with non-PCB oil, forming the final product upon impregnation.

Environment-Friendly Products:

All materials used in Kondaş Capacitors’ production line are non-toxic and environment-friendly. Especially the oil used for impregnation consists of carbon, hydrogen and oxygen; therefore can biodegrade quickly in nature without any issues.

OG Vartör

Medium Voltage Power Capacitors

CAPACITOR VOLTAGE CATAGORIES (kV)			
SINGLE-PHASE MV UNITS CODE NO:	THREE-PHASE MV UNITS CODE NO:	WORKING VOLTAGE (kV)	
		SINGLE-PHASE	THREE-PHASE
5K64	5K00	6,3/√3=3,64	3,0
5N06	5K30	10,5/√3=6,06	3,3
5Q12	5N30	15,8/√3=9,12	6,3
5R15	5K60	20/√3=11,55	6,6
5R82	5O20	31,5/√3=18,19	7,2
5R90	5R50	33/√3=19,05	10,5
5R99		34,5/√3=19,92	

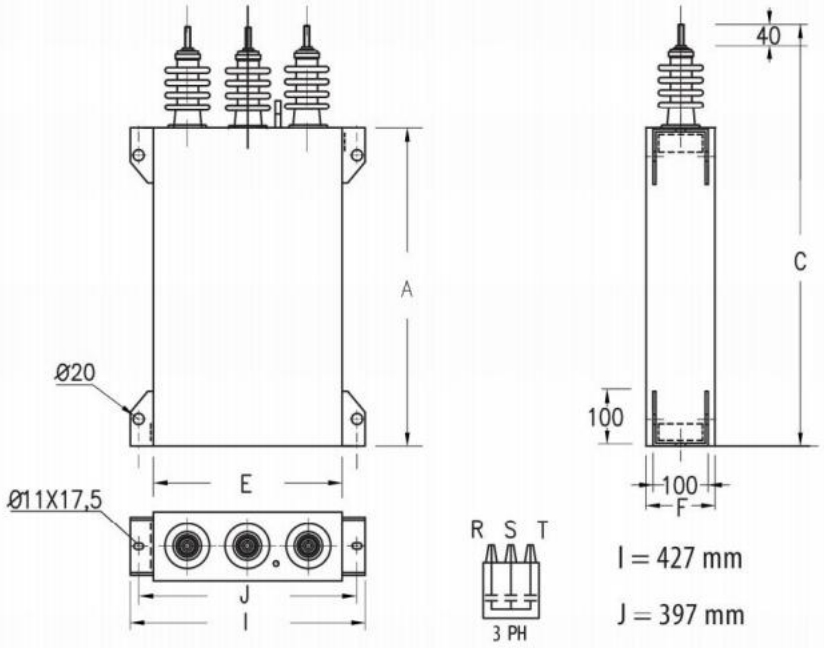
PERMITTED OVER VOLTAGE	
CONDITION	WORKING VOLTAGE (kV)
12 Hours/day	1,10 Un
30 min./day	1,15 Un
5 min./200 times	1,20 Un
1 min./200 times	1,30 Un

BUSHING HEIGHTS			
SINGLE PHASE BIL kV	THREE PHASE BIL kV	SINGLE PHASE K (mm)	THREE PHASE K(mm)
60	60	152	152
75	75	190	190
95	95	265	265
125		265	
150		275	
170		360	

TEMP. CATAGORIES		AMBIENT AIR TEMP.		
SYMBOL	MEANING	MAX.	HIGHEST MEAN OVER ANY PERIOD OF	
			24 HOUR	1 YEAR
-25 / C	-25 / 50 °C	50 °C	40 °C	30 °C

Table - 5

OG Vartör
Three-Phase

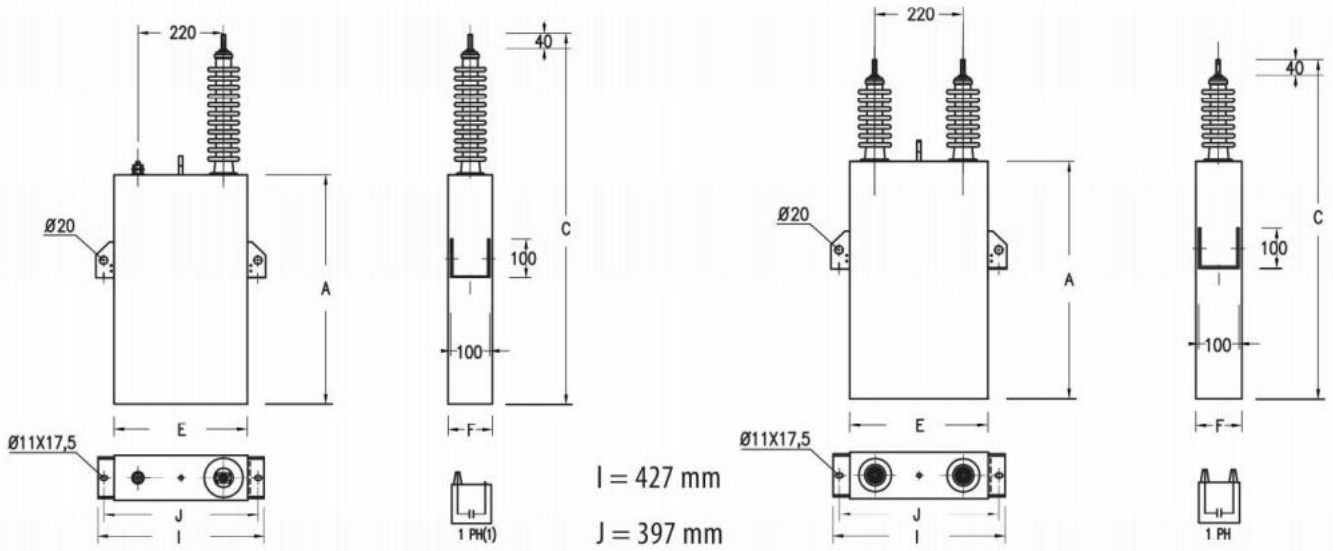


MEDIUM VOLTAGE POWER CAPACITORS - THREE PHASE										
Medium Voltage System				3,3 kV		6,3 kV		7,2 kV		10,5 kV	
kVAR	A mm	E mm	F mm	C mm	Weight kg.	C mm	Weight kg.	C mm	Weight kg.	C mm	Weight kg.
50	270	343	114	460	18	460	18	460	18	460	18
67	280	343	114	470	19	470	19	470	19	470	19
75	310	343	114	500	20	500	20	500	20	500	20
83	340	343	114	530	22	530	22	530	22	530	22
100	360	343	114	550	23	550	23	550	23	550	23
125	430	343	114	620	27	620	27	620	27	620	27
150	490	343	114	680	30	680	30	680	30	680	30
175	550	343	114	740	34	740	34	740	34	740	34
200	620	343	114	810	38	810	38	810	38	810	38
225	680	343	114	870	41	870	41	870	41	870	41
250	740	343	114	930	44	930	44	930	44	930	44
300	790	343	125	980	51	980	51	980	51	980	51
350	800	343	152	990	62	990	62	990	62	990	62
400	810	343	152	1000	63	1000	63	1000	63	1000	63
450	810	343	175	1000	72	1000	72	1000	72	1000	72
500	820	343	185	1010	77	1010	77	1010	77	1010	77
550	830	343	185	1020	78	1020	78	1020	78	1020	78
600	960	343	185	1150	90	1150	90	1150	90	1150	90
650	960	343	210	1150	101	1150	101	1150	101	1150	101

Table 6 :Dimensions, weights and voltage range.

Capacitors that can bear up to 42/√3 kV and 880 kVAr can be produced upon request. Please contact our sales department.

OG Vartör
Single-Phase



MEDIUM VOLTAGE POWER CAPACITORS - SINGLE PHASE											
Medium Voltage System				6,3/√3=3,64kV		10,5/√3=6,06kV		15,8/√3=9,12kV		34,5/√3=19,92kV	
kVAR	A mm	E mm	F mm	C mm	Weight kg.	C mm	Weight kg.	C mm	Weight kg.	C mm	Weight kg.
50	270	343	114	460	18	460	18	535	19	630	19
67	280	343	114	470	19	470	19	545	20	640	20
75	290	343	114	480	19	480	19	555	20	650	20
83	310	343	114	500	20	500	20	575	21	670	21
100	360	343	114	550	23	550	23	625	24	720	24
125	420	343	114	610	26	610	26	685	27	780	27
133	440	343	114	630	28	630	28	705	29	800	29
150	470	343	114	660	29	660	29	735	30	830	30
167	500	343	114	690	31	690	31	765	32	860	32
200	590	343	114	780	34	780	34	855	35	950	35
250	590	343	140	780	43	780	43	855	44	950	44
267	590	343	150	780	46	780	46	855	47	950	47
300	590	343	150	780	53	780	53	855	54	950	54
333	590	343	175	780	56	780	56	855	57	950	57
350	590	343	185	780	64	780	64	855	65	950	65
400	590	343	210	780	64	780	64	855	65	950	65
417	590	343	210	780	64	780	64	855	65	950	65
500	720	343	210	910	77						
600	850	343	210	1040	90						
700	980	343	210	1170	104						
800	1090	343	210	1280	115						

Table : Dimensions, weights and voltage range.

Capacitors that can bear up to 42/√3 kV and 880 kVAr can be produced upon request. Please contact our sales department.

Water Cooled Capacitors

Capacitors for Induction Heating

WATER COOLED CAPACITORS FOR INDUCTION HEATING

Standard Powers:	Up to 7000 kVAr
Rated Temperature:	Outlet Water Temperature +45 °C
Capacity Tolerance:	-10 +10 %
Rated Voltage:	Any Voltages up to 3000 V
Rated Frequency:	50 to 15000 Hz.
Impregnating Fluid:	Non PCB
Capacitor Mounting Configuration	Vertical or horizontal
Maximum Allowed Voltage:	1,05 Un; 24h/1h
Maximum Allowed Current:	1,65 Un (including harmonics)
Switching Over Voltages	≤2x √ 2 Un
M10, M14 Most Crimping Force terminals:	10 N.m
Dielectric Loss :	<0,15W/kVAr
Test Voltage Between Terminals:	2,15 Un AC, 2 sn
Fuses:	Not fitted. Avaible upon request
Isolates Bushings:	Steatite or wet process Porcelain
Altitude:	max. 2000 m. (a.s.l.)
Discharge Resistor:	Not fitted. Avaible upon request
Reference standards:	IEC 60110-1/2; VDE0560-9(*);TS 3558
	(*)- Approval pending

Long Life

Produced with an "All-Film Technology", Water Cooled Capacitors are manufactured with extremely low dielectric loss material.

Purpose and Area of Usage

Water Cooled Capacitors are used in induction heating, melting, forging and heating treatment facilities.
Water Cooled Capacitors can be implemented on their own, or mounted on banks.

Components of Water Cooled Capacitors:

Water Cooled Capacitors consist of; hazy polypropylene film, aluminum foil, copper, wires, fuses, paper, aluminum or steel container, dielectric non-PCB oil, copper pipes and porcelain bushings.

Production Process of Water Cooled Capacitors:

The production commences with the winding of low dielectric loss hazy PP film in a clean room under high vacuum. The film is wound along with aluminum foil in order to provide the necessary electrode level, and their combination creates the Water Cooled Capacitor element. After the winding, the terminals are connected to the element with tin plated copper and wires, and their safety is backed up with fuses. The elements can be considered as capacitors with low power and voltage, and when connected in a parallel way to build up series, they form a strong power capacitor. The connected elements are then insulated with paper wrapping to be mounted into steel containers. Following the assembly of the capacitor box, the products are put in an autoclave under very high vacuum in order to provide the ultimate dehydration. On the final step of production, vacuumed capacitors are impregnated with non-PCB oil, forming the final product upon impregnation.

Environment-Friendly Products:

All materials used in Kondaş Capacitors' production line are non-toxic and environment-friendly. Especially the oil used for impregnation consists of carbon, hydrogen and oxygen; therefore can biodegrade quickly in nature without any issues.

When Placing an Enquiry Please Indicate the Following

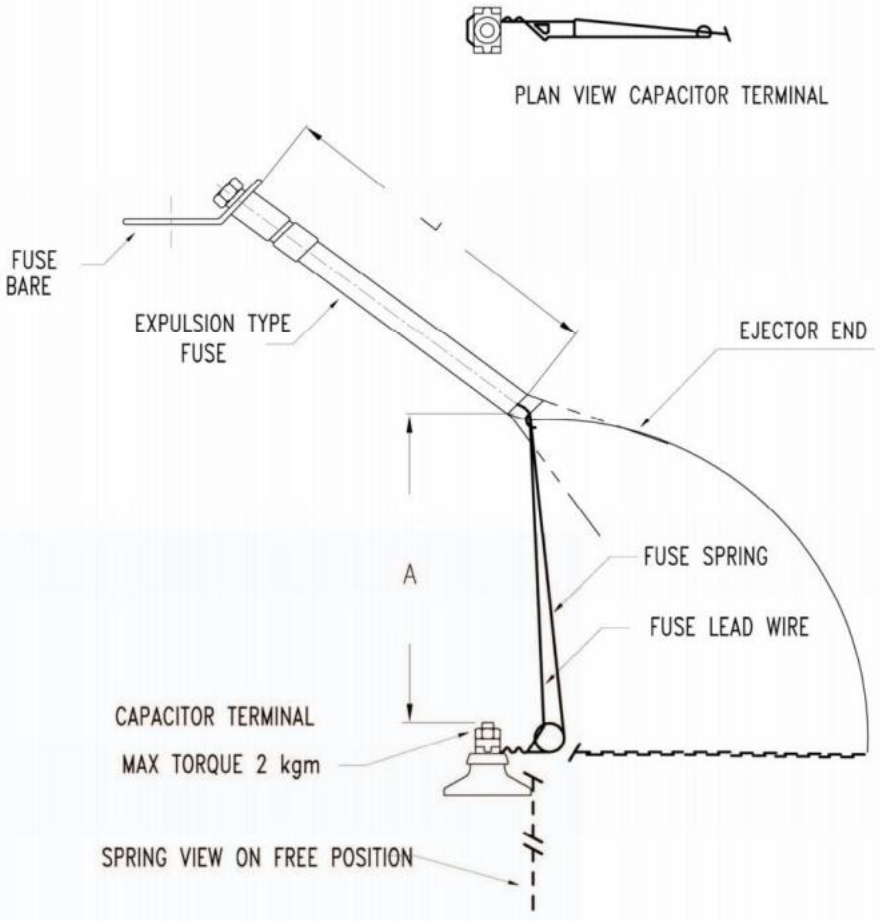
Power (kVAr)
Tap Quantity
Water/Air Cooled
Frequency (Hz)
Capacitance (µF)
Pressure Switch
Voltage (V)
Dead or Live Case
Required Dimensions

ETF Expulsion Type Fuses

Outdoor capacitor units that are mounted onto banks usually do not contain internal fuses; therefore a bank system manufactured by Kondaş Capacitors is protected by ETF Expulsion Type Fuses. The “horn fiber” fiberglass filament material of the tube provides a more efficient expulsion.

Fuses that serve all voltage ranges can be manufactured.

EXPULSION FUSE TYPES	MAX. VOLTAGE (kV)	A (mm)	L (mm)
ETF 1	25	127	380
ETF 2	16	102	273
ETF 3	8	77	211



Current Limiting (Inrush) Reactors

CURRENT LIMIT REACTOR GENERAL AND TECHNICAL DATA

Capacitor banks attract a very high level of starting current; therefore an installation of Current Limiting Reactors in series connection with each phase can reduce switching transient current to a safer level. As a result, the lifespan of the components of the capacitor bank increases impressively.

Standard:	EN 60289
Design Type:	With Air Core, Dry, Out-door
Protection Class:	IP00
Voltage (Un):	3,3 kV - 36 kV
Current (In):	30 A - 1000 A
Frequency:	50 Hz.
Insulation Class:	*F Class 155 °C, Vacuum*
Cooling:	Natural
Ambient Temperature:	40 *°C*
Phase Number:	Single-Phase (You can install 3 single phase units side by side or on top of each other)
Inductance Tolerance:	± 20%
Winding Material:	Aluminum or Copper
Terminal:	Aluminum or Copper

Standard:	EN 60289
Design Type:	With Air Core, Dry, In-door
Protection Class:	IP00
Voltage (Un):	3,3 kV - 36 kV
Current (In):	30 A - 1000 A
Frequency:	50 Hz.
Insulation Class:	*F Class 155 °C, Vacuum*
Cooling:	Natural
Ambient Temperature:	40 *°C*
Phase Number:	Single-Phase (You can install 3 single phase units side by side or on top of each other)
Inductance Tolerance:	± 20%
Winding Material:	Aluminum or Copper
Terminal:	Aluminum or Copper

Power Factor Correction Systems & Applications

KONDAS®

VArPOWER
Power Quality System

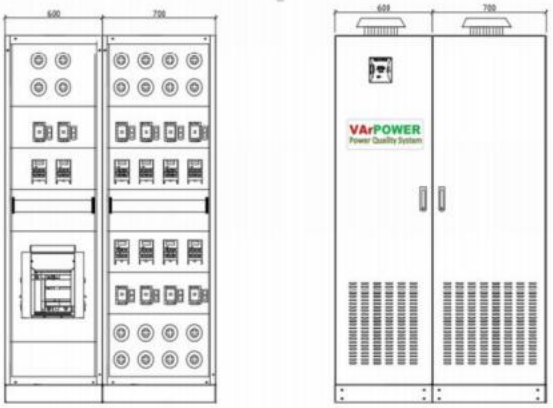
VArKON
Power Factor Correction

VARPOWER LOW VOLTAGE PFC SYSTEMS

VARPOWER Contactor Switching PFC Systems

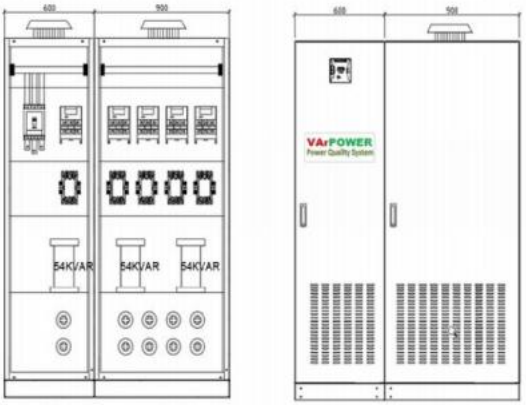
Contactor Switching PFC Systems

Produced with an “All-Film Technology”, OG Vartör capacitors are manufactured with extremely low dielectric loss material. Also, Kondaş ensures that OG Vartör capacitors undertake several tough tests such as: oil leakage test, initial capacitor test, terminal to terminal over potential test, terminal to case insulation test, discharge test and sonic corona test.



Contactor Switching PFC Systems (with an option of HFR installation)

It is the most cost-efficient and widespread amongst Low Voltage PFC systems, and can be designed both for indoor and outdoor purposes. Usually preferred in facilities where the total voltage & current harmonic distortions (THDv & THDi) are relatively low and the intended compensation load is balanced. We strongly advise the application of systems that contain anti-resonance harmonic filter reactors with the following reactor factor values; %5,67 (210 Hz.), %7 (189 Hz.) & %14 (134 Hz.), in order to protect capacitors from grid resonance and overcurrent. VArPower offers quick solutions between a voltage interval of 230V-1000V and up to 3000 kVAr reactive power, however our team is always eager to help in case if there is a higher voltage and power level need.

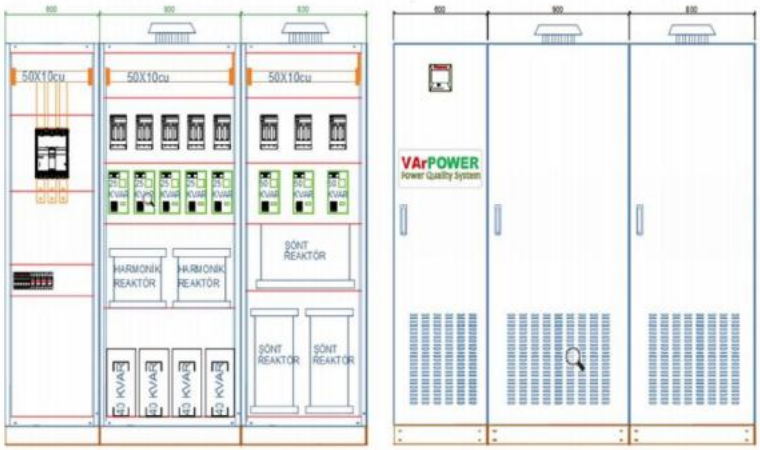


VARPOWER LOW VOLTAGE PFC SYSTEMS

Thrystor Switching PFC Systems

Thrystor Switching

Known as another efficient method of low voltage PFC. It can be designed both for indoor and outdoor purposes. Usually preferred in facilities where the total voltage & current harmonic distortions (THDv & THDi) are relatively low and the intended compensation load is unbalanced and inconsistent. We strongly advise the application of systems that contain anti-resonance harmonic filter reactors with the following reactor factor values; %5,67 (210 Hz.), %7 (189 Hz.) & %14 (134 Hz.), in order to protect capacitors from grid resonance and overcurrent. This system can compensate even the most complex and variable loads through the help of its TCR/SVC relays and thrystor switching modules. VArPower offers quick solutions between a voltage interval of 230V-1000V and up to 3000 kVAr reactive power, however our team is always eager to help in case if there is a higher voltage and power level need.



Several Other Systems That Can Be Applied by VArPower

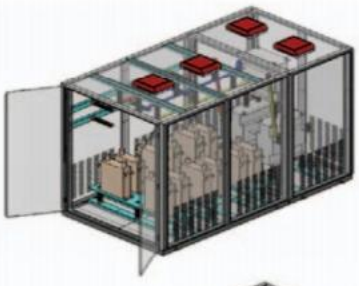
VArPower can also offer solutions between 400 V – 3000 V for Induction Heating Systems, Solar Energy Plants, Wind Energy Plants, Hydroelectric Energy Plants, long XLPE cable systems, and inductive load compensation systems. Please contact our team for further detailed information.

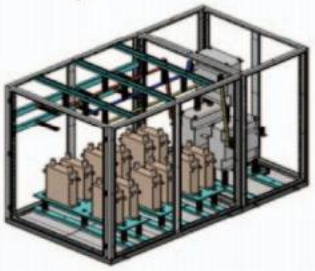
VARPOWER MEDIUM AND HIGH VOLTAGE PFC SYSTEMS

Varpower Indoor Bank Systems

36 kV Industrial and Transmission Line Fixed Bank System

These banks are used up to 36 kV voltage of grid circuit. The power of PFC is calculated over the total rated power of a facility.
Connected with a double-star design, these banks can accommodate 6, 9, 12 or 24 capacitors. A possible internal defect of the bank is protected with an unbalance anticipation system.





Bank Material List

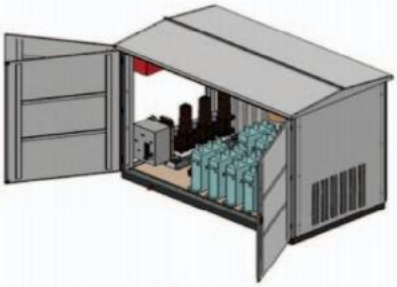
- Aluminum or steel construction, IP23 Protection Class panels
- 6, 9, 12 or 24 pieces of capacitors
- Current Limiting Reactors for 3 phases
- HRC type fuses for 3 phases
- Unbalance Current Transformer

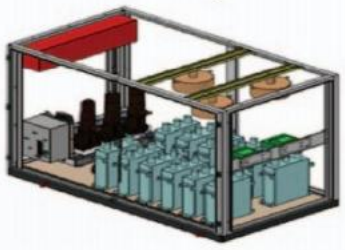
Opsiyon

- Harmonic Filter Reactors for avoiding resonance frequency up to 36 kV
- 2 sets of quick discharge reactors
- Unbalance protection relay (for capacitor protection)
- Earthing circuit breaker
- Lock option for panel doors

36 kV Industrial and Transmission Line Automatic Bank System

These banks are used up to 36 kV voltage of grid circuit. The total steps of the bank is determined in relation to the fluctuations of the load level.
Banks are double-star connected and a possible internal defect of the bank is protected with an unbalance anticipation system. The system is controlled automatically with a reactive power controller relay upon the completion of banks with steps.





Bank Material List

- Aluminum or steel construction, IP23 Protection Class panels
- 6, 9, 12 or 24 pieces of capacitors
- Current Limiting Reactors for 3 phases
- HRC type fuses for 3 phases
- Vacuum contactor for step switching
- Unbalance Current Transformer

Option

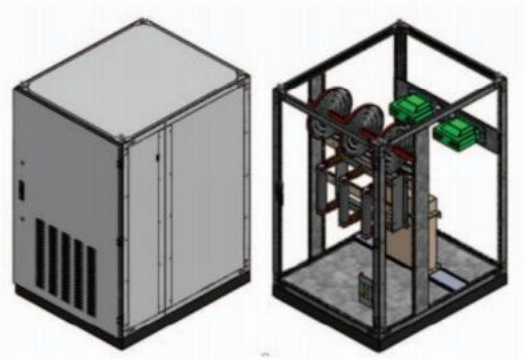
- Harmonic Filter Reactors for avoiding resonance frequency up to 36 kV
- 2 sets of quick discharge reactors
- Unbalance protection relay (for capacitor protection)
- Current Transformer
- Voltage Transformer
- Earthing Circuit Breaker
- Lock option for panel doors

VARPOWER MEDIUM AND HIGH VOLTAGE PFC SYSTEMS

Varpower Indoor Bank Systems

12 kV Fixed Bank for Motor Compensation

These banks are used up to 12 kV voltage of grid circuit and are suitable for use in motor compensation systems. Capacitors that are mounted on this system are usually delta-connected with three phases. The system is mounted into panels. Also, the system is equipped with HRC type fuses in order to protect the system from defects due to the inconsistent voltages flowing from the grid circuit.



Bank Material List

- Aluminum or steel construction, IP23 Protection Class panels
- 3 Phase - 3 Bushing Capacitors
- Curent Limiting Reactors for 3 phases
- HRC type fuses for 3 phases

Optional

- Harmonic Filter Reactors for avoiding resonance frequency up to 12 kV
- Quick Discharge Reactors on 7,2 kV or 12 kV of voltages
- Lock option for panel doors

12 kV Industrial Automatic PFC System

These banks are used up to 12 kV voltage of grid circuit. The power of PFC is calculated over the total rated power of a facility. The total steps of the bank is determined in relation to the fluctuations of the load level. For the self-compensation of medium voltage motors, each is equipped with one step.

The pictured banks can be formed with delta, star or double-star connections. On delta connected systems, the bank is protected with a HRC type fuse. On double-star connected systems, capacitors with internally fuses are implemented for protecting the system from unbalance and their maximum power can reach up to 900 kVAr, therefore allowing the bank system to reach up to 4500 kVAr in total. The automatic compensation starts its operation with a reactive power control relay.

Bank Material List

- Aluminum or steel construction, IP23 Protection Class panels
- 3 Phase – 3 Bushing or 1 Phase – 2 Bushing Capacitors depending on the connection type of bank
- Current Limiting Reactors for 3 phases
- HRC type fuses for 3 phases
- Vacuum contactor for step switching

Option

- Harmonic Filter Reactors for avoiding resonance frequency up to 12 kV
- Quick Discharge Reactors on 7,2 kV or 12 kV of voltages
- Automatic / Manual step
- Earthing circuit breaker
- Lock option for panel doors
- Pressure Switch protection for capacitors

VARPOWER MEDIUM AND HIGH VOLTAGE PFC SYSTEMS

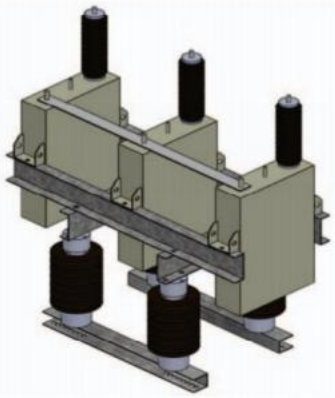
Varpower Outdoor Bank Systems

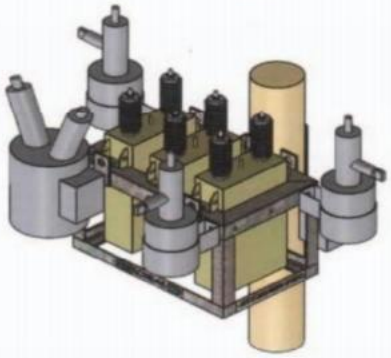
Pole and Console Type Shunt Capacitor Banks

Pole Type Shunt Capacitor Bank: Mounted onto poles and connected to the energy transmission line through a fused and earthed separator

Console Type Shunt Capacitor Bank: Mounted onto buildings externally and connected to the medium voltage busbar through metal protected switching

POLE & CONSOLE TYPE OUTDOOR BANK
7,2 - 12 - 17,5 - 24 - 36 kV Operating Voltage
Can accommodate 3 or more capacitors
75 – 900 kVAr of rated power
ETF Expulsion Type Fuses
Compatible with Current Limiting Reactors
Galvanized Steel

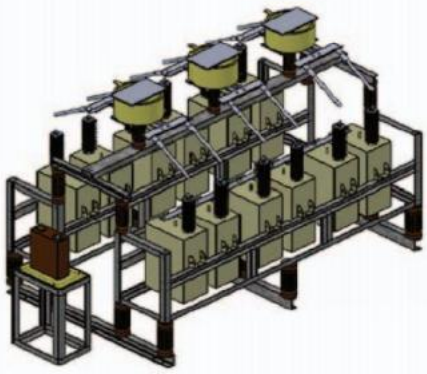


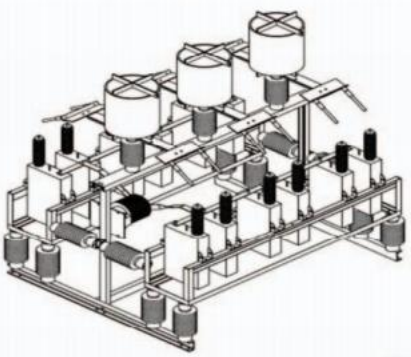


Indoor & Outdoor Schalt Type Shunt Capacitor Bank

These banks are mounted onto a medium voltage schalt inside a fence and connected to the medium voltage busbar through metal protected switching

Indoor & Outdoor Schalt Type Shunt Capacitor Bank
7,2 - 12 - 17,5 - 24 - 36 kV of operating voltage
Can accommodate between 6 – 12 capacitors
1200 – 5000 kVAr of rated power
ETF Expulsion Type Fuses
Compatible with Unbalance Current Transformer
Compatible with Current Limiting Reactors
Galvanized Steel





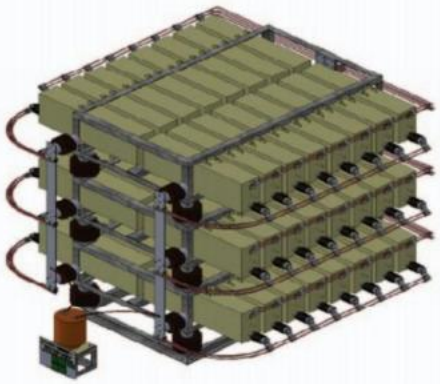
VARPOWER MEDIUM AND HIGH VOLTAGE PFC SYSTEMS

Varpower Outdoor Bank Systems

PFC Bank System for Transmission Lines

These banks can operate up to 36 kV voltage of grid circuit and are generally used in large industrial and energy transmission lines that work under high rated power.

Allowing an accommodation of up to 48 capacitors, the bank is equipped with unbalance current transformer in order to prevent a possibe internal defect. For designs that include Harmonic Filter Reactors, please contact our sales department.



Electrical Characteristics

- 50 Hz of Operation Frequency
- Can work up to 36 kV of rated voltage
- Reactive power ranges between 5,4 - 30 MVAr through the mounting of 48 capacitors max.
- For more powerful banks please contact our sales department

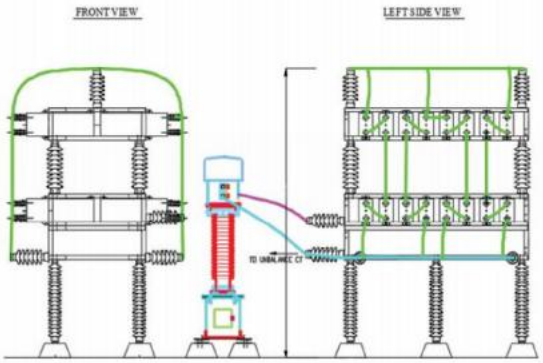
Option

- Current Limiting Reactors for every phase
- Harmonic Filter Reactors for every phase

PFC Bank System for Transmission and Distribution Lines

These capacitor banks can be designed upon request and can operate up to 245 kV of rated voltage, and are generally used at high voltage grids for enhancing transmission capacity, increasing voltage declines & reducing voltage fluctuations.

Mentioned systems are extremely strong and reliable due to their mounting on aluminum or galvanized steel frames. The banks are series and parallel connected in relation to the rated voltage and power.



Electrical Characteristics

- 50 Hz of Operation Frequency
- Can work up to 245 kV of rated voltage
- Reactive power starts from 100 MVAr
- For more powerful banks please contact our sales department

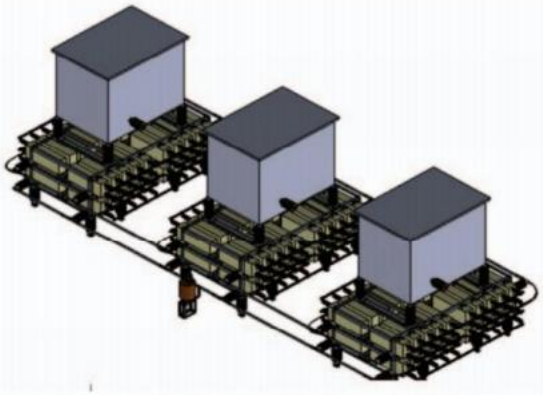
Static VAR PFC Systems (SVC)

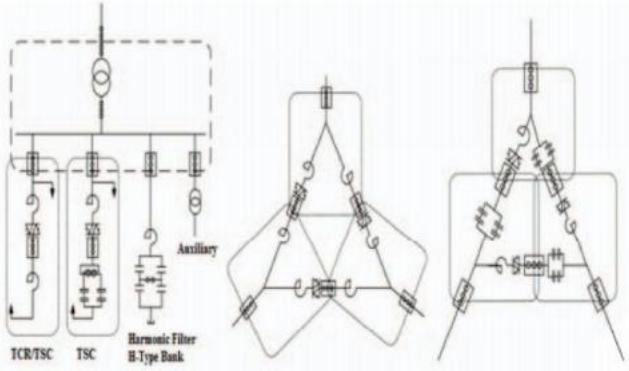
SVC systems are designed with thrystor switching control elements; such as thrystor switching shunt reactors (TCR), thrystor switching capacitor banks (TCR) and fixed connection capacitor bank (FC).

The capacitor banks used in SVC systems are equipped with filter reactors which are selected upon an analysis of 2nd, 3rd and 4th harmonic frequency. The selected reactors are series connected to the bank.

While responding to the reactive power compensation needs, Static VAR Compensation Systems also avoid overvoltages of power frequency, enhances the voltage stability and reduces the harmonics on the load side to an acceptable level.

These solutions are very suitable for facilities that contain arc, melting and induction furnaces. As the system avoids heat loss and reduces the unnecessary consumption of electrodes, it covers up the investment costs in just a few years.





VARPOWER OUTDOOR BANK SYSTEMS

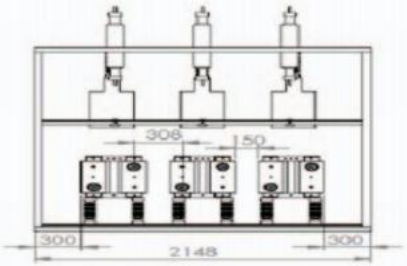
Varpower Outdoor Bank Systems

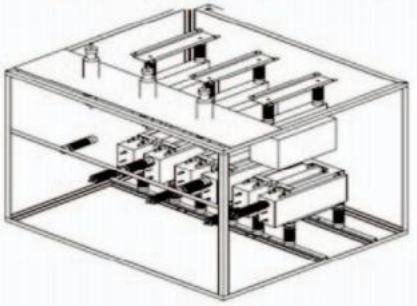
RC Filter Systems (Snubber Circuits)

Overvoltage protection capacitor loads a temporary capacitance that alters the slope of the overvoltage, thus reducing the ΔV / Δt value. As a result, the system protects the machinery winding of motors, generators and transformers that are sensitive to high ΔV / Δt values.
Overvoltage surge arresters can alter the peak points of temporary overvoltages to appropriate levels that are compatible with RC filters.
There are two types of overvoltage protection capacitors:

- With one insulated and one earthed terminal
- With two insulated terminals

Every single capacitor contains and internal discharge resistor that forces the excess DC voltage left on capacitor decline below 75V after 10 minutes.





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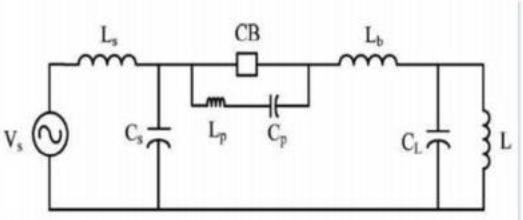
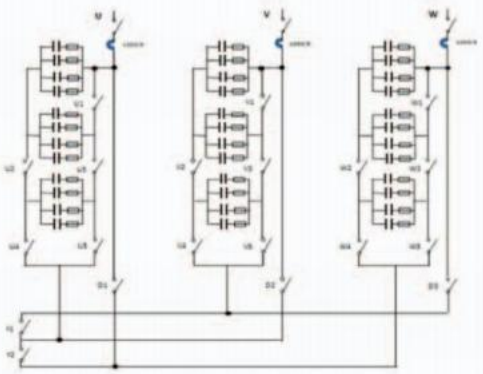
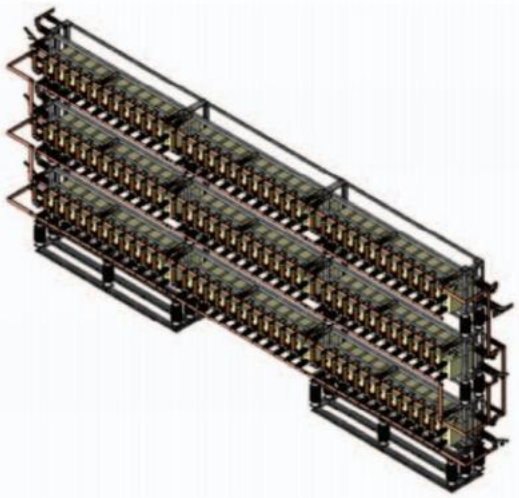


Transformer and Shunt Reactor Testing Laboratory Systems

Pictured capacitor banks are custom designed for the PFC of test laboratories of facilities that are concerned with the production of transformers and shunt reactors. This system allows numerous configurations as well, and VArPower offers turn-key systems that can operate up to a rated voltage and reactive power of 145 kV and 350 MVAr respectively.





Advanced Technology, High Performance

41th Anniversary

VArKON Relay Group

KONDAS®

VArKON
Power Factor Correction

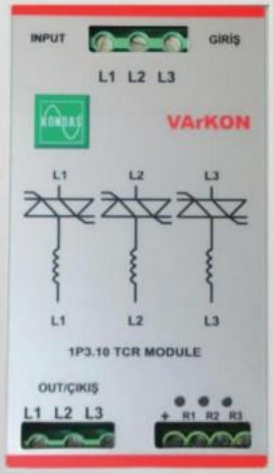
VArKON 18K, VArKON 18KS, VArKON 18TSC, VArKON 18H,VArKON 8HV
VarKON SERIES REACTIVE POWER CONTROLERS

The easiest user experience. Stable & safe operation.

Staible for many facilities and sufficiant solutions.

- → Buildings
- → Factory plants
- → Petrol stations
- → Markets
- → Banks
- → Schools
- → Mechanic shop panels
- → Housing estate
- → Official plants
- → Hotels
- → Welding shop panels
- → Mechanical shops for press
- → Elevators

VArKON-15TCR
(TCR/SVC) Thyristor control reactor / Static VAr Compensator



3.4" wide Graphic LCD	Easy use, detailed analyzing	Min. measurement 5mA
Harmonic measurement to 63rd ord/U/I	For capacitor and/or reactor using	Advising for steps requirements
Event records with real time	Suitable for different rates as mounthly, weekly, daily etc.	Correcting any correction faults
Ability to detect the steps quickly and reliably	Smart intervention	Ability to enter different targets

www.kondas.net
www.varkon.com.tr

VArKON POWER CONTROL SERIES

REACTIVE POWER CONTROL RELAY, POWER ANALYZERS, THYRISTOR DRIVE MODULES, MODEM AND COMMUNICATION SOLUTIONS

With VArKON series, any specific suitable solutions are provided for all types of facilities/systems. Final and stable solutions are produced for different problems at different facilities with maximum types of relays developed with years of experience.

- ✓ Maximum numbers of relay models. (A suitable solution is absolutely available for each type of facility in
- ✓ VArKON series.)
- ✓ Maximum thyristor interlocked drive model, FAST series not waiting for discharge.
- ✓ Optimum any most cost-effective solutions.
- ✓ Most user friendly, easy-to-use smart relays.
- ✓ With modem and communication solutions, online monitoring software of one unlimited device.
- ✓ A software quality, which works stably, without blocking, without forgetting to adjust and trouble free.
- ✓ Maximum contribution to integrity of system/facility.
- ✓ Maximum easiness in starting the system/facility, running automatic connection and step detection.

Precise and high accurate measurements.

M→Single-phase; G→Graphic display

VArKON SERIES CONTROLLER SELECTION TABLE

Model	**Standard measuring parameters** Phase currents IL1, IL2, IL3 Neutral current IMP Voltages ph.- neutr. UL1, UL2, UL3 Voltages, ph. - ph. UL12, UL21, UL31 Active power PL1, PL2, PL3 Reactive power QL1, QL2, QL3 Apparent power SL1, SL2, SL3 Power factor PFL1, PFL2, PFL3 cosφ's cosφL1-L2-L3 Frequency Fr Total active power ΣP Total reactive pow. ΣQ Total app. pow. ΣS Minimum and maximum values (current, voltage and power) 0.2% accuracy	**Energies** Import kWh L1-L2-L3-Σ Export kWh L1-L2-L3-Σ Capacitive kVArh L1-L2-L3-Σ Inductive kVArh L1-L2-L3-Σ Apparent kVAh L1-L2-L3-Σ Tariff Energies (day,night,puant T1,T2,T3) Generator Energies (when generator starts) Harmonics Current harmonics L1-L2-L3 Current harmonics Voltage harmonics L1-L2-L3 THD, 3-63 odd harmonics 2-62 even harmonics Displays shown power rates Displays shown bar graphic **Energy Rates (react.pwr/act.pwr)** tanφ Instantaneous, hourly, daily, weekly, monthly, Can be set on invoice date	LCD Display	Harmonic from 2nd to 63rd ; voltage and/or current in THD	Measures min. 5mA	Checking the connections	Polarity correction	Learning the steps and following	Recognation capacitor or reactor	Same aging for the steps	Switching and duration counters	Suggestions	Smart application and timing	Setting target in 3 ways	Measuring speed 20ms	Password protection	Setting the language (EN, TR)	Measuring the temperature, temp. alarm	Digital input (Target for generator))	Outputs alarm/fan	RTC and records of events	Modbus RTU	Steps switching by contactor	Steps switching by thyristor
VArKON 18K	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	18	-
VArKON 18KS	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	18	-
VArKON 18TSC	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	18
VArKON 18H	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12	6
VArKON 8HV	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8	-
VArKON 12M	M	M	G	M	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	-	-	12	-
VArKON 12MS	M	M	G	M	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	-	✓	12	-
VArKON 15TCR	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12	3
VArKON 15K	✓ (1%)	✓ (limited)	G	3 1	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	-	-	15	-

On simple phase models have harmonics management up to 31st harmonic

VArKON-15TCR

(TCR/SVC) Thyristor control reactor / Static VAr Compensator

What is VArKON-15TCR?

In VArKON relay series, it is a compensator relay developed and called as SVC or TCR system for most complicated and quickest facilities. Compared to SVC relays, it has superior operation characteristics, analyzer and intervention characteristics. For SVC function, it provides a unique experience not with one mode, but 6 modes.

It makes an effective compensation by dividing into about ten thousand steps as if there are thousands of compensators and reactors. It has a contact output up to 12 steps and 3 semi-conductive trigger outputs as one reactor connected to each reactor. It may be used only as a classic relay or as TCR/SVC relays with 1 reactor drive and 3 reactors.

What are VArKON-15TCR's advantages?

It provides balanced-unbalanced, fast and slow load changing, low power-high power, cost-effective, durable and smart intervention modes.

1. Even at most problematic plants, it provides a final compensation achievement.
2. Only with 3 reactors, it meets thousands of single-phase capacitor and reactor requirements. It reduces costs.
3. Semi-conductors are fast, quiet and durable. It also reduces long-term maintenance costs.
4. It meets the unbalanced loads perfectly and accurately.
5. It compensates fast load changes quickly at the system frequency (at a speed of 20ms up to 50 times per second).
6. It also provides a perfect achievement both in highly small loads and large loads.
7. Both capacitor and reactor may be connected to regular steps.
8. With 6 different TCR modes, it provides various problems with solutions.
9. With manual test, it enables to test each step of TCR's individually.
10. The main display a bar graph showing TCR steps actuated and a power status info showing number of kVAr rectors actuated.
11. TCR steps are also detected by the relay.

What are TCR/SVC function modes of VArKON-15TCR relay?

It enables to adjust under which condition and how TCR intervention shall be conducted.

TCR system has 2 disadvantages. It causes a small amount of active power consumption and harmonic currents. VArKON relay has measures and settings to protect against these disadvantages and to enable to conduct TCR intervention only when necessary. With these features only available in VArKON relay, you use most appropriate solution for your system so that it may affect power quality of the system at a minimum level.

VArKON
Power Factor Correction

VArKON-18K, VArKON-18KS, VArKON-18TSC, VArKON-18H
3-PHASE, 18-STEPS (contact, thyristor, hybrid) REACTIVE POWER CONTROL RELAY

FEATURES

- **Advantages**
  - Measurement starting from 5mA.
  - Connection accuracy test and ability to correct any connection fault automatically.
  - Ability to connect single-phase or tree-phase capacitor and **reactor** up to 18 steps (there must be a three-phase capacitor at first step.)
  - In thyristor type models, ability to connect a model up to 18 steps.
  - In hybrid models, ability to connect a contact type module up to 12 steps and a thyristor type model up to 6 steps.
  - Ability to detect capacitors and reactors and continuous monitoring.
  - **Smart timing and smart intervention algorithms.**
  - With event record, retroactive analysis.
  - **Ability to see any system requirements on recommendations menu.**
  - Ability to monitor Equivalent Steps, equal aging, step switching and run times.
  - Ability to enter 2 different compensation targets and a separate target mode varying with digital input for generator.
  - Ability to enter power rate, power factor or substation as compensation target in an inductive or capacitive zone.
  - Detailed power analysis and ability to monitor monthly, weekly, daily and instantaneous power rates.
  - Separate analysis displays for total, per phase, scheduled and generator powers.
  - Alarms and separate alarm or fan output contact.
  - Measurements and intervention at a speed of 20ms. (In contact type models, these speeds are used only for reliably running of internal algorithms for life of the systems.)
  - General
  - 240x160, 3.4'' wide graphic display and 18-step LED.
  - User friendly and easy menus and measurement displays.
  - Password protection, English or Turkish language option.
  - Advanced analyzer features, harmonic bar pages.
  - Advanced settings for compensation.
  - Measurements
  - 0.2% accuracy, True RMS, 256 samples per period.
  - Measurement starting from **5mA** and successful measurement in low power.
  - Temperature measurement and neutral current measurement.
  - Separate power measurement at 4 zones and per phase (including VAh).
  - Measures odd and even harmonics up to 63rd order Harmonics.
  - Minimum and maximum values.
  - Step Detection (capacitors and reactors).
  - Fast, verifiable and reliable step detection.
  - Automatic and continuous step monitoring.
  - More sound with automatic step testing at an adjusted time.
  - Connection Detection.
  - Ability to correct connection faults automatically and internally.
  - Fast and reliable connection testing by a three-phase capacitor to first phase.
  - Event record
  - Record of important events in the system with a real-time timer.
  - Recommendations
  - Ability to monitor the system continuous and to recommend necessary capacitors and reactors.
  - Communication
  - Ability to read and write all network parameters and device settings via Modbus-RTU on RS-485 port (optional).

VArKON three-phase reactive power control relay series is designed to meet all requirements in the compensation systems. Contact type model of VArKON 18K series, thyristor model of VArKON 18TSC and VArKON 18H are hybrid models as 12 steps are contact type and 6 steps are thyristor type. VArKON 8HV middle voltage compensation, VArKON 15TCR is a new generation TCR/SVC relay.

VArKON series reactive power control relay power control relays are relays which may be connected to single-phase and three-phase capacitors and reactors; apply smart investment algorithms to the system with smart receipt and removal times; conduct best compensation; may enter capacitive or inductive targets; and have advanced properties. It provides any privileges such as rich analyzer property, minimum measurement current starting from 5mA, correcting any connection faults together with parameters, etc. It monitors any system requirements, recommends capacitors and reactors, and provides any advantages such detecting and monitoring steps quickly and reliably.

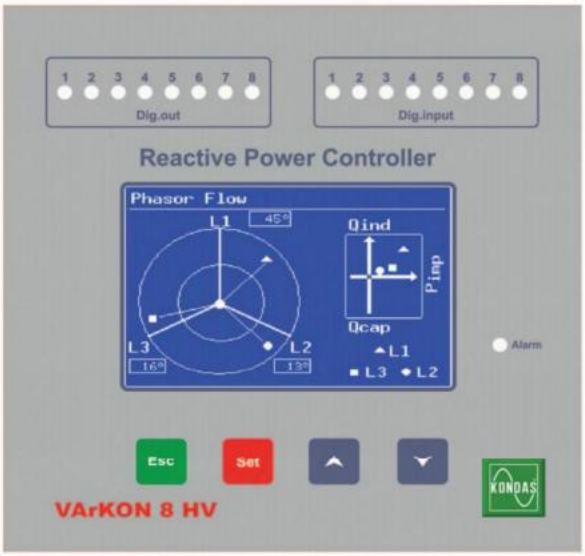
VArKON series reactive power control relays provide a unique use comfort with wide graphic display, carefully prepared, user friendly menus and measurement displays. They have open and collective menus without requiring any user manuals. It has optional Modbus-RTU communication. All parameters, settings, system analysis and command of the relay may be made via communication on a PC.

APPLICATION AREAS

All 3-phase facilities	Substations	Power Boards
Industry	Schools	Housing Estates
Oil Stations	Markets	Governmental departments
Smart buildings	Banks	Hotels

VArKON-8HV, VArKON-8HVX

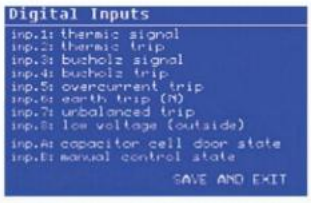
HIGH VOLTAGE AND MIDDLE VOLTAGE, SPECIFIC 3-PHASE, 8-OUTPUT, 10-INPUT REACTIVE POWER CONTROL RELAY



VArKON-8HV relay model is a special model developed for VArKON series middle voltage (OG) High voltage (YG). In this model, communication is standard. It is configurable, and has an annunciator property, blocking property, and digital outputs and LEDs having an ability to generate alarms.

Through digital input-outputs and LEDs, it makes maximum contribution to integrity of facility/system.

Most important property of VArKON-8HV relay is that it contributes to the system security and generates ground switch permission and cell gate permission. It generates permission and makes extra contribution to the facility security. These permissions are used to prevent improper shutdowns and incorrect interventions.



- ✓ 144X144 panel type, 58mm wide, Wide Graphic LCD.
- ✓ Multi-functional, measurement of more than parameters.
- ✓ Special design for high voltage.
- ✓ Very easy and practice startup, user friendly.
- ✓ 8 programmable digital contact outputs.
- ✓ 8 programmable LEDs.
- ✓ 8 programmable digital inputs.
- ✓ 2 extra special-purpose digital inputs.
- ✓ Each of contact outputs may be assigned to duties such as step, ground blade, cell gate, alarm, etc.
- ✓ Each of digital inputs may be assigned to duties such as fault trip, annunciator, etc.
- ✓ Ability to collect and assign the digital inputs to digital outputs and LEDs by logics.
- ✓ Ability to use special-purpose digital inputs for purposes such as manual use and panel gate status, etc.
- ✓ Programmable advanced alarms.
- ✓ Ability to adjust activation-deactivation-discharge times between 1 minute and 99 minutes.
- ✓ Ability to make capacitor setting manually and automatically.
- ✓ Slow switching to protect capacitor and step lifetimes. 110VDC, 24VDC, 230VAC supply options
- ✓ Current and voltage harmonics up to 63rd order.
- ✓ In-built timer.
- ✓ Advanced alarms.
- ✓ Communication (Modbus RTU).
- ✓ Demande values.
- ✓ Minimum and maximum values.
- ✓ 5mA secondary current measurement.
- ✓ High accurate measurements, 0.2% accuracy.
- ✓ Ability to recommend capacitor requirements.
- ✓ Ability to record alarms and events by date and hour.
- ✓ Smart intervention algorithms.
- ✓ Power measurement in 4 zones.
- ✓ Day-night peak power measurements.
- ✓ Step equal aging.
- ✓ Step switching counters.
- ✓ Step switching on process counters.

VArKON-15K
3-PHASE, 15-CONTACT RGKR
Practical and Cost-Effective Model

VArKON-15K is most cost-effective and practical model for classic type facilities of VArKON series. With useful properties and distinguishing privileges, it is a stable model with very good price/performance.

Most of applications have an unbalanced load, but require a small number of steps and have not very fast changing loads. Operators, who conduct compensation works at such facilities, prefer a cost-effective relay complete with practical and strong properties.

VArKON-15K model is developed to meet requirements of the operators, who conduct compensation works, completely.

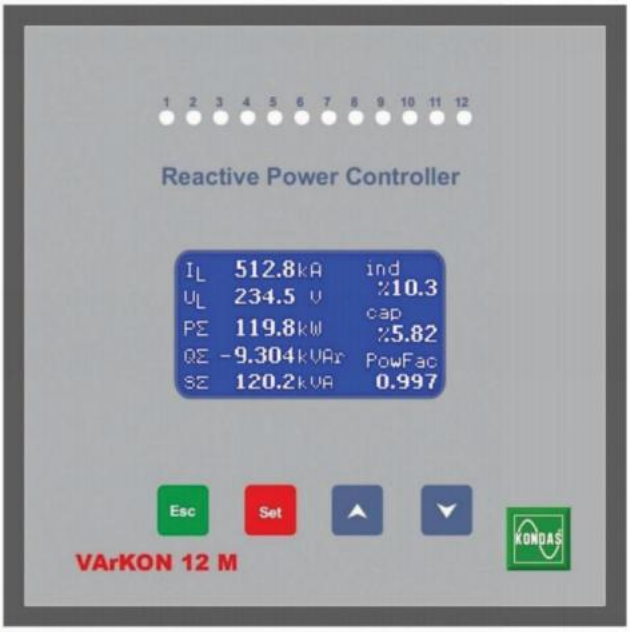
Operator has connection testing and connection faults to conduct and correct automatically by the relay. Operator introduces steps highly fast and reliably to the relay. Operator sees the steps required by the facility on the recommendations menu of the relay automatically.

Despite all of them, with VArKON-15K, it finds any solutions with easy and strong properties for a facility having a limited budget.

- ✓ Ability to conduct and correct connection test and connection faults automatically.
- ✓ Ability to connect single-phase or tree-phase capacitor and reactor up to 15 steps. (There must be a three-phase capacitor at first step.)
- ✓ Ability to detect capacitors and reactors and permanent monitoring.
- ✓ **Smart timing and smart intervention algorithms.**
- ✓ **Ability to see any system requirements on recommendations menu.**
- ✓ Ability to monitor Equivalent Steps, equal aging, step switching and run times.
- ✓ Ability to enter compensation targets.
- ✓ Ability to enter power rate, power factor or substation as compensation target in an inductive or capacitive zone.
- ✓ Analysis of power rates.
- ✓ Alarms and separate alarm or fan output contact.
- ✓ Measurements and intervention at a speed of 20ms. (In contact type models, these speeds are used only for reliably running of internal algorithms for life of the systems.)
- ✓ 20mA minimum secondary measurement current.
- ✓ 128x64 graphic display and 15-step LED.
- ✓ User friendly and easy menus and measurement displays.
- ✓ Password protection, English or Turkish language option.
- ✓ Advanced analyzer features, harmonic bar pages.
- ✓ Advanced settings for compensation.
- ✓ 1% accuracy, True RMS, 128 samples per period.
- ✓ Neutral current measurement.
- ✓ Separate power measurement at 4 zones and per phase (including VAh).
- ✓ Measures odd and even harmonics up to 31st Harmonics.
- ✓ Automatic step testing in an adjusted period.
- ✓ Ability to monitor the system continuously and to recommend necessary capacitors and reactors.
- ✓ Knowledge about which and how much recommendation shall reduce power rates.
- ✓ Hourly and daily recommendations.

VArKON-12M

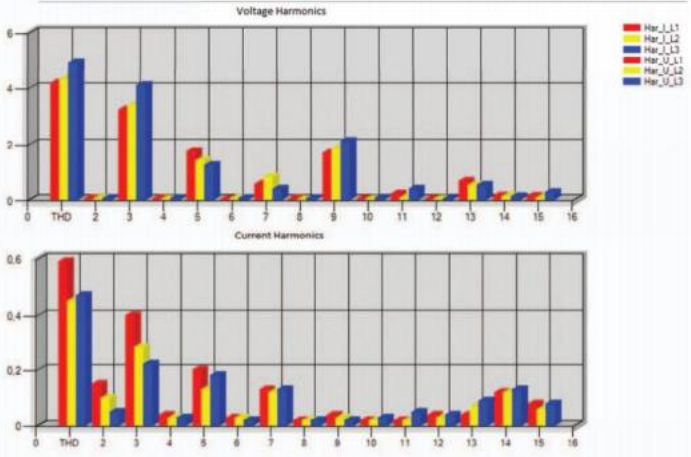
FOR BALANCED, 3-PHASE FACILITIES
Compensation Relay With a Single Current Transformer (CT)



VArKON-12M model is a special one developed by VArKON for any balanced facilities. It is very easy to operate and very practical to start up. It endeavors to get any voltage reading at a single current substation and at one phase. It accepts all phases in a balanced way and conducts compensation. It calculates total power ratings by multiplying network parameters received at one phase by three.

Smart easy-to-use, practical for balanced systems.
Having one voltage measurement input with a single current transformer.
User friendly menus on Graphic LCD display.
144X144 panel type, 56mm depth.
Connection fault testing.
Ability to connect single-phase or tree-phase capacitor and reactor up to 12 steps.
A LED showing 12 step statuses.
Fast, verifiable and reliable step detection.
Automatic step testing in an adjusted period.
Smart timing and smart intervention algorithms.
Ability to see any system requirements on recommendations menu.
Ability to monitor Equivalent Steps, equal aging, step switching and run times.
Ability to enter compensation targets.
Ability to enter power rate, power factor or transformer reactive power as compensation target in an inductive or capacitive zone.
Analysis of power rates.
Ability to assign 12th step as an alarm contact.
20mA minimum secondary measurement current.
Password protection, English or Turkish language option.
Advanced settings for compensation.
1% accuracy, True RMS, 128 samples per period.
Separate power measurement at 4 zones and per phase (including VAh).
Measures single and double harmonics up to 31st order odd and even number Harmonics.

VArKON-EA01, VArKON-EA02, VArKON-EA03, VArKON-EA04
NETWORK POWER ANALYZERS HARMONIC CURRENT AND VOLTAGE SCREEN



VArKON-EA01, VArKON-EA02, VArKON-EA03, VArKON-EA04
NETWORK POWER ANALYZERS

FEATERS

- ✓ General
- ✓ Graphic display, more than 50 measurement displays.
- ✓ User friendly and easy menus
- ✓ Password protection
- ✓ English or Turkish language option.
- ✓ Measures all network parameters in chart in 3-phase systems.
- ✓ Settings and current and voltage ratings.
- ✓ Demand, minimum, maximum values.
- ✓ Harmonic Measurement
- ✓ Measures odd and even harmonics up to 63rd Harmonics.
- ✓ Measures total harmonic measurements (THD) more accurately with 63 components.
- ✓ Measures and shows current, line voltage and phase voltage harmonics individually in text and bar graph.
- ✓ Accurate Measurement
- ✓ All measurements count with 256 samples per period.
- ✓ Makes True RMS measurements at an accuracy of 0.2%.
- ✓ Measurement starting from 5mA and successful measurement in low power.
- ✓ Neutral current measurement.
- ✓ Power measurement in 4 zones (in VAh apparent power).
- ✓ Power measurement per phase in 4 separate zones.
- ✓ Communication
- ✓ Ability to read and write all network parameters and device settings via Modbus-RTU on RS-485 port.
- ✓ Contact Outputs and Advanced alarms
- ✓ 2 different contacts which may react in 20 milliseconds and have different settings.
- ✓ Ability to assign over, low or window range alarm (or protection) for each parameter.
- ✓ Hysteresis, Ton and Toff settings (starting from 20ms).
- ✓ Manuel and remote control ability.
- ✓ Data record
- ✓ Recording the parameters in internal memory with a real-time timer.

GENERAL:

VArKON EA series network analyzers are designed to measure, monitor and record any parameters required in electric networks. Furthermore, VArKON EA series network analyzers also provide any options such as communication, contacts with advanced alarms, pulse outputs, real-time data records, etc.

In standard, all models of the series:
Receive 256 samples per period; makes high quality measurements at an accuracy of 0.2%; and measures current and power reliably starting from 5mA.

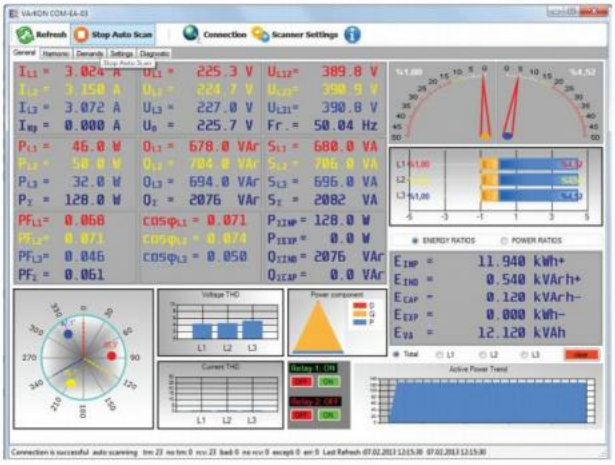
Furthermore, a property to measure current, voltage and phase voltage harmonics (odd, even, total) up to 63rd order harmonic is standard in all models of the series.

APPLICATION AREAS

All 3-phase facilities	Substations	Power Boards
Industry	Schools	Housing Estates
Oil Stations	Markets	Governmental departments
Smart buildings	Banks	Hotels

USE PURPOSES

- ➢ Analysis of electric network parameters.
- ➢ Over, low and window alarm for parameters.
- ➢ All systems with power indexes received.
- ➢ Systems requiring a harmonic measurement.
- ➢ Analysis in the compensation systems.
- ➢ Have a purpose to keep network statistics.
- ➢ Communication type network systems

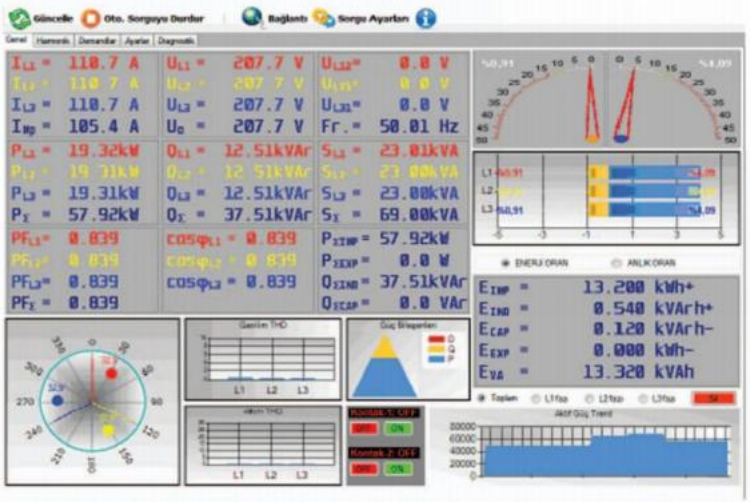


All parameters may be monitored on same page in the communication software. Settings and control of the device may be made remotely. Data record is kept in computer, and analyzed in an Excel spreadsheet.

VArKON SERIES NETWORK ANALYSER AND MULTIMETER SELECTION TABLE

Model	Accuracy	Standard measuring parameters Phase currents I_{L1}, I_{L2}, I_{L3} Neutral current I_{MP} Voltages ph.- neutr. U_{L1}, U_{L2}, U_{L3} Voltages, ph. - ph. U_{L12}, U_{L21}, U_{L31} Active power P_{L1}, P_{L2}, P_{L3} Reactive power Q_{L1}, Q_{L2}, Q_{L3} Apparent power S_{L1}, S_{L2}, S_{L3} Power factor PF_{L1}, PF_{L2}, PF_{L3} cosφ's $\cos\varphi_{L1\text{-}L2\text{-}L3}$ Frequency Fr Total active power ΣP Total reactive pow. ΣQ Total app. pow. ΣS Minimum and maximum values (current, voltage and power)	Energies Import kWh L1-L2-L3-Σ Export kWh L1-L2-L3-Σ Capacitive kVArh L1-L2-L3-Σ Inductive kVArh L1-L2-L3-Σ Apparent kVAh L1-L2-L3-Σ Harmonics Current harmonics L1-L2-L3 Voltage harmonics L1-L2-L3 Phase to phase Voltage Harmonicd L12-L23-L31 THD, 3-63 even harmonics 2-62 even harmonics Displays shown power rates Displays shown bar graphic Energy Rates (react.pwr/act.pwr) tanφ Instantaneous rates Collected rates	LCD Display	Harmonics from 2 to 63;voltage and/or current in THD	Over voltage, over current protections and under alarms	Over harmonic level protections	Neutral current	Measures min. 5mA	Minimum, maximum demand	Same aging for the steps	Energy display per phase	Setting the language (EN, TR)	Password protection	Two contacts	Advanced alarms	Measuring speed and reaction in 20ms	Modbus RTU	Energy pulse outputs	RTC and memory
DM-01	%1	✓	-	D	-	-	-	✓	-	✓	-	-	✓	-	-	-	-	-	-	-	-
DM-02	%1	✓	-	D	-	✓	-	✓	-	✓	-	-	✓	-	✓	✓	✓	-	-	-	-
EA-01	%0.2	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-
EA-02	%0.2	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
EA-03	%0.2	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
EA-04	%0.2	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

VArKON-NET, VArKON-COM COMMUNICATION SOFTWARE
FOR MONITORING AND VIA INTERNET AND SERIAL BUS



You must operate VArKON-PC software to monitor more devices.

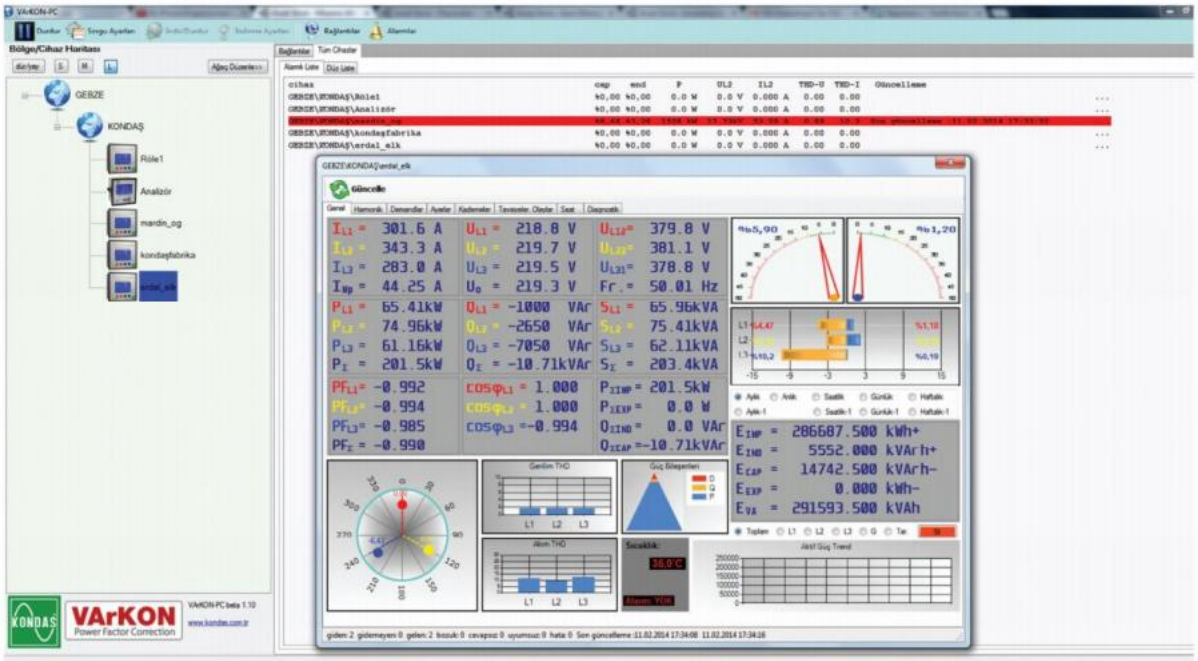
But, VArKON-NET and VArKON-COM Windows-based monitoring and control software programs are most practical and free to monitor only one device and only one facility.

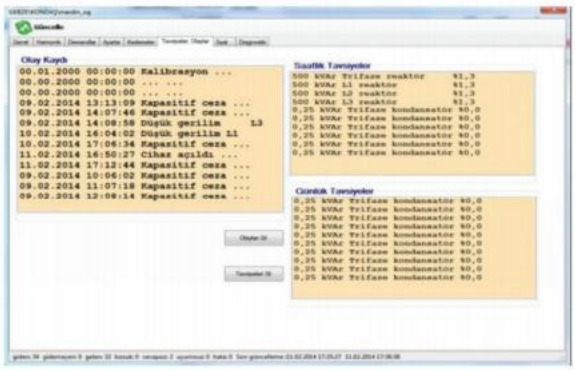
VArKON-NET software enables to monitor and control the facility online via VArKON model devices and VArKON model GPRS modem.

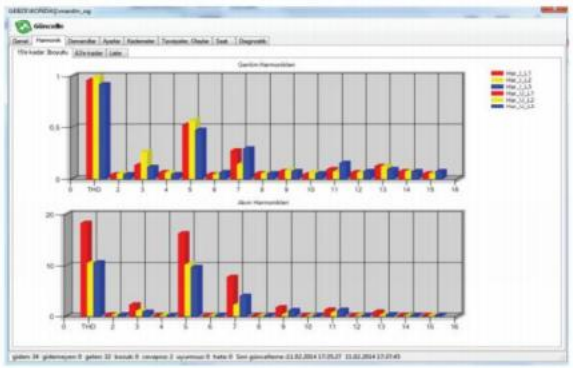
VArKON-COM software enables to monitor and control the facility via a serial bus.

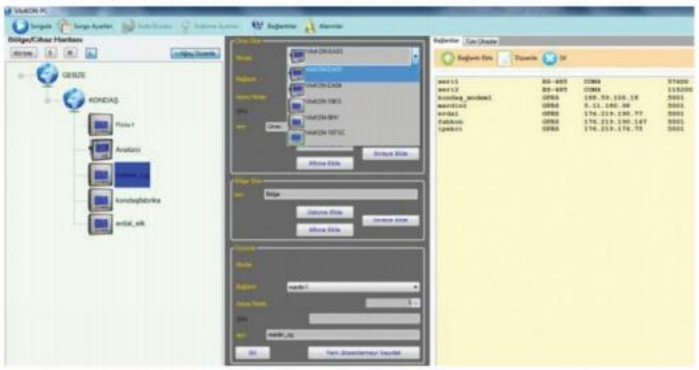
VArKON-PC
MULTIDEVICE, GENERAL PURPOSE MONITORING AND CONTROL SOFTWARE

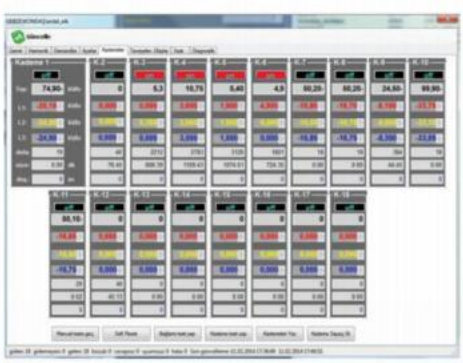
VArKON-PC SOFTWARE enables to monitor the relays and analyzers communicated to all VArKON brand and other brand devices (optional) via internet or a serial network. It never requires a server fee. It has a feature to record data on a PC, an automatic research feature, a feature divide into zones and monitor and control more devices as required in one package program.











TSC Drive Modules

VArKON-FAST.10, VArKON-FAST.25, VArKON-FAST.50
VArKON-FAST.10S, VArKON-FAST.25S, VArKON-FAST.50S
VArKON-FAST.4M, VArKON-FAST.9M, VArKON-FAST.17M

VArKON-FAST drive series enables switching at a speed faster than 10ms and repetition at a speed faster than 40ms without discharge time and without using discharge resistance and discharge coil. Thus, your thyristor type systems run stably at a real speed. This means that the systems obtains the achievement, which is obtained by slow modules at 18 steps, through fast modules at 5 to 10 steps more economically depending on speed of the system charges. Both VArKON-18TSC relay and VArKON-FAST drive modules of VArKON series provide real thyristor switching experience at a repetition rate of 40ms.

FAST SERIES TSC Drive Modules

All FAST series modules have a sturdy drive and stability through a microcontroller type control circuit in them.

DELTA CONNECTION TYPE, DELTA SERIES:

VArKON-FAST.10, VArKON-FAST.25, VArKON-FAST.50

It is a mostly required and mostly used series. Delta series is used for switching three-phase capacitors and reactors. It has one starting input. Starting is conducted under a low DC voltage (5-24V). Module contains a microprocessor type control circuit and two sets of strong thyristor module. As long as starting voltage runs, capacitors/reactors with Delta connections are started in each alternans of the network. With specific design and exclusive property of VArKON-FAST series, a sturdy switching is conducted by a microprocessor type control circuit through thyristor starting conducted by considering zero current passes without affecting energy quality and consuming lifetime of capacitors.

STAR CONNECTION TYPE, STAR SERIES:

VArKON-FAST.10S, VArKON-FAST.25S, VArKON-FAST.50S

Unlike Delta series, it is used with three-phase capacitors/reactors requiring a star connection at facilities requiring a single-phase step. With VArKON-FAST.S module having one star connection, three phases may be connected in random to a single-phase capacitor or reactor. One VArKON-FAST.S module meets requirements of three single-phase step switches. There are three self-contained inputs. Starting is conducted under a low DC voltage (5-24V). Module contains a microprocessor type control circuit and two sets of strong thyristor module. As long as starting voltage runs, capacitors/reactors with Star connections are started in each alternans of the network. With specific design and exclusive property of VArKON-FAST series, a sturdy switching is conducted by a microprocessor type control circuit through thyristor starting conducted by considering zero current passes without affecting energy quality and consuming lifetime of capacitors

SINGLE-PHASE CONNECTION TYPE, SINGLE-PHASE SERIES:

VArKON-FAST.4M, VArKON-FAST.9M, VArKON-FAST.17M

Single-phase series has one input and one output. Only one single-phase capacitor or reactor may be connected. It has one starting input. Starting is conducted under a low DC voltage (5-24V). Module contains a microprocessor type control circuit and two sets of strong thyristor module. As long as starting voltage runs, connected capacitors/reactors are started in each alternans of the network. With specific design and exclusive property of VArKON-FAST series, a sturdy switching is conducted by a microprocessor type control circuit through thyristor starting conducted by considering zero current passes without affecting energy quality and consuming lifetime of capacitors.

VArKON-TCR.10 VE VArKON-TCR.50
Thyristor type Drive Modules

In VArKON series, thyristor drive modules, which have a strong power and run perfectly in conformity with VArKON-15TCR, are available. In VArKON series, a compensation procedure is conducted by the drive modules up to 50kVAr in about ten thousand steps at a network frequency.

We recommend that these modules must be operated together with VArKON-15TCR relays for durable, trouble-free facilities complete with their design, high quality material and workmanship, which comply with the EMC standards.

A different module up to 10kVAr power and a large module with a fan up to 50kVAr power. Please contact VArKON for special requirements in different power ratings.

VArKON-100
GPRS modem (RS-485-TCP/IP Converter)

It is developed to monitor VArKON series communication devices and all other types of devices (optional) via internet. VArKON series has two types of communication solution. For facilities intended to be restrict access by third parties and other, who never want to pay a server fee, it is very easy to manage and monitor tens of devices by VArKON-PC specific software and VArKON-100 modem. With its user friendly simple menus and data entry, you may provide any necessary solution by consulting VArKON agents.

Accreditations and Quality Certificates

Notes

Notes

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