



Innovative grid technologies



2023
PRODUCT CATALOGUE

Index

PRC Series Reactive Power Control Relays	4
PTCR Series Inductive Load Drivers	7
PTSC Series Thyristor Switches	10
PAD Series Digital Energy Analyzers	14
PMA Series Digital Multimeters	17
PMD Series Digital Multimeters	21
PVM Series Voltmeters	23
PAM Series Ammeters	26
PVAM Series Voltammeters	29
PFM Series Frequency meters	32
PICS-G Series Gateways	35
PCC Series Capacitor Contactors	38
PSC & PTC Series Capacitors	40
PRMS & PRTS Series Shunt Reactors	45
PRMH & PRTH Series Harmonic Filter Reactors	47



Developing technology, the rapid growth of the world population, changing demands made energy efficiency and the need for energy a priority in the industry of our country and the world. For this reason, as PROVAR, we have started out with the aim of guiding the efficiency, quality, analysis and proper use of energy by examining the demands in the sector in detail . We aim to transfer our knowledge and experience of 15 years to the world starting from our country by creating innovative solutions in line with the determined needs.

A new brand is born in the field of Energy Power Quality and Industrial Electronics. We invite you to use the products of PROVAR Electronics and become a solution partner.

PROVAR;

- has the potential of 100% local capital and manufacturing, design and software.
- manufactures innovative, functional and high-quality products with its strong R&D and manufacturing teams.
- adopts compliance with Production and Quality Standards accepted in our country and the world as a principle.

Our mission is to transform our knowledge and experience into a company that lives and sustains reliability, loyalty, continuity and respectability, which we believe are essential.

Our vision is, with our business partners and valuable employees, to achieve unconditional customer satisfaction, and to be an exemplary manufacturing company in our country and the world by manufacturing within the principle of continuous innovation and the framework of international quality standards.

OUR FIELDS OF OPERATION

- Measurement and Control of Energy
- Quality and Efficiency of Energy
- Compensation Solutions
- Remote Control and Automation Solutions
- Communication Units



PRC Series

Reactive Power Control Relays

- ▶ PRC-15
- ▶ PRC-15H+TCR
- ▶ PRC-18H+TCR
- ▶ PRC-18TH+TCR



PRC Series Reactive Power Control Relays are innovative devices designed as classical, SVC supported, thyristor triggered with the hard work of our expert R&D team in power quality and compensation applications. It is designed and manufactured to minimize the reactive power generated in the facilities in accordance with the compensation regulation for 3-phase electrical systems, to obtain maximum efficiency with the minimum number of steps in the compensation of unbalanced loads that occur with SVC support, to measure the electrical parameter values in the facilities, and to protect the system with alarm options.

It offers design and efficiency together with its 100-265V AC/DC wide supply range, ergonomic design in 144x144x68 mm dimensions, SVC support and product variety with advanced features.

- **128x64 Graphic LCD Display**
- **Easy to Use with Turkish and English Menu Options**
- **RS-485 Communication (Modbus RTU)**
- **TCR (SVC) Output**
- **RTC**
- **Event and Log Records**
- **Discrete Harmonics (2-31. HD-I ve HD-V)**
- **V, A, P, Q, S, PF, Cos ϕ , ΣP , ΣQ , ΣS , THD-I, THD-V (Monitoring Parameters)**
- **Import and Export Energies**
- **Can Compensate Inductive and Capacitive Systems**
- **Generator Input, Generator Energy Record and Compensation (Cos2)**
- **A Single Phase, Two Phase or Three Phase Capacitor / Shunt Reactor Support**
- **Step Value Can Be Entered Manually**
- **Monthly, Weekly, Daily, Hourly and Total Compensation Rates Can Be Monitored**
- **1 Adjustable Alarm Output for Electrical and Compensation Parameters**
- **Built-in Buzzer**
- **Step On, Off, Discharge and Transition Times Can Be Adjusted**
- **Step Advice and Step Co-Aging**
- **Cosine and Energy Values of Each Phase Can Be Monitored**

Product Code	Product Description	Dimensions (mm)	Steps	Graphic LCD Display (128x64)	3 Phase Intervention	Single-Two-Three Phase Capacitor	Single-Two-Three Phase Shunt Reactor	TCR(SVC)	TSC	Generator	Generator Mode (Cos2)	Cos ϕ	Power Factor (PF)	RS-485 Communication	Step Advice	Panel Temperature Control	Alarm Output (x1)	Panel Fan Output (x1)	2-31. Harmonics (V-I)	Built-in Buzzer	THD-I, THD-V
PRC-15	15 Steps Reactive Power Control Relay	144x144	15	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PRC-15H+TCR	15 Steps SVC Reactive Power Control Relay	144x144	15 + SVC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PRC-18TH+TCR	18 Steps Thyristor Triggered SVC Reactive Power Control Relay	144x144	18 + SVC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PRC-18H+TCR	18 Steps SVC Reactive Power Control Relay	144x144	18 + SVC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

General Specifications Table

Technical Information	PRC-15	PRC-15H+TCR	PRC-18H+TCR	PRC-18TH+TCR
Steps	15	15+TCR	18+TCR	18+TCR
Operating Voltage	100 - 265 Vac	100 - 265 Vac	100 - 265 Vac	100 - 265 Vac
Operating Frequency	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Current Measurement Range	1mA - 5,5 A	1mA - 5,5 A	1mA - 5,5 A	1mA - 5,5 A
Voltage Measurement Range	5 - 300 V AC (L-N) 10 - 520 V AC (L-L)	5 - 300 V AC (L-N) 10 - 520 V AC (L-L)	5 - 300 V AC (L-N) 10 - 520 V AC (L-L)	5 - 300 V AC (L-N) 10 - 520 V AC (L-L)
Frequency	√	√	√	√
Cosφ	√	√	√	√
Power Factor	√	√	√	√
%THD-V / %THD-I	√	√	√	√
Active Power	√	√	√	√
Reactive Power	√	√	√	√
Apparent Power	√	√	√	√
Active Energy	√	√	√	√
Reactive Energy	√	√	√	√
Apparent Energy	√	√	√	√
LV / MV	AG	AG	AG	AG
Shunt Reactor	√	√	√	√
TCR	-	√	√	√
TSC	-	-	-	√
Monophase Capacitor	√	√	√	√
Three-phase Capacitor	√	√	√	√
Over Voltage Protection	√	√	√	√
Under Voltage Protection	√	√	√	√
Over Temperature Protection	-	√	√	√
Under Temperature Protection	-	-	√	√
Temperature Control	-	-	√	√
Generator	√	√	√	√
Cosφ2 (Generator)	√	√	√	√
Generator Energy Record	√	√	√	√
Advanced Energy Analysis	-	-	-	√
Event Log	-	-	-	√
Scheduled Energy	-	-	-	√
RTC	-	-	-	√
Graphic LCD	128x64	128x64	128x64	128x64
Discrete Harmonics	31	31	31	31
RS-485 Communication	-	√	√	√
MODBUS Baud Rate	-	1200 - 19200	1200 - 19200	1200 - 19200
Alarm Output	√	√	√	√
Offset Adjust (3 Phase)	√	√	√	√
Cosφ Adjust	√	√	√	√
Step On Time	1 - 60 sec	1 - 60 sec	1 - 60 sec	100 ms - 60 sec
Step Off Time	1 - 60 sec	1 - 60 sec	1 - 60 sec	100 ms - 60 sec
Discharge Time	1 - 60 sec	1 - 60 sec	1 - 60 sec	100 ms - 60 sec
Reaction Time	100 ms - 5 sec	100 ms - 5 sec	100 ms - 5 sec	100 ms - 5 sec
Relay Output	5A / 250Vac Cosφ1	5A / 250Vac Cosφ1	5A / 250Vac Cosφ1	5A / 250Vac Cosφ1
Protection Class	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)
Dimensions (mm)	144 x 144	144 x 144	144 x 144	144 x 144
Buzzer	√	√	√	√
Advice	√	√	√	√

Technical Specifications Table

Operating Voltage	100V – 265 V AC
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 11 VA
Measuring Inputs Power Consumption	< 0,5 VA
Current Measurement Range	1 mAAC – 5,5 AAC
Voltage Measurement Range	5 – 300 VAC (L-N) 10 – 520 VAC (L-L)
Current Transformer Ratio	8000 / 5
Measurement Accuracy	
Voltage	%0,50
Current	%0,50
Frequency	%0,10
Cosφ	%0,20
Active Energy	%1
Reactive Energy	%2
Relay Output	NO Max 5 AAC 250 VAC Cosφ=1
Communication	Modbus RTU Optical Isolated, Programmable
Baudrate (bps)	1200, 2400, 4800, 9600, 14400, 19200
Address (ID)	1 – 247
Harmonics	2 – 31
Protection Class	IP54 (Front Panel) IP20 (Body)
Device Protection Class	Double Insulated
Operating Temperature	-25°C+70°C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
Connection Type	3P4W (Star)
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm ²
Voltage Terminal Cable Cross Section	Max 2,5 mm ²
Current Terminal Cable Cross Section	Max 2,5 mm ²
RS485 Terminal Cable Cross Section	Max 2,5 mm ²
Weight	570 gr
Dimensions	144 x 144 x 68 mm
Panel Mounting Dimensions	137x137 mm

- ▶ PTCR-5H
- ▶ PTCR-10H
- ▶ PTCR-20H
- ▶ PTCR-30H



Inductive Load Drivers are also called TCR (Thyristor Controlled Reactor). It is designed to drive single-phase reactors with maximum VAR power, which the driver can drive per phase in three-phase systems, by creating a phase difference with voltage values.

Thanks to its trigger structure even at low power levels, it provides maximum power quality with less steps in compensation. 20 ms for compensation of fast loads. It is extremely effective thanks to its trigger structure. It requires minimal maintenance with its powerful electronic design.

Usage Areas

- School
- Hospital
- Shopping Centre
- Office
- Hotel
- Bank Branches
- Public Buildings

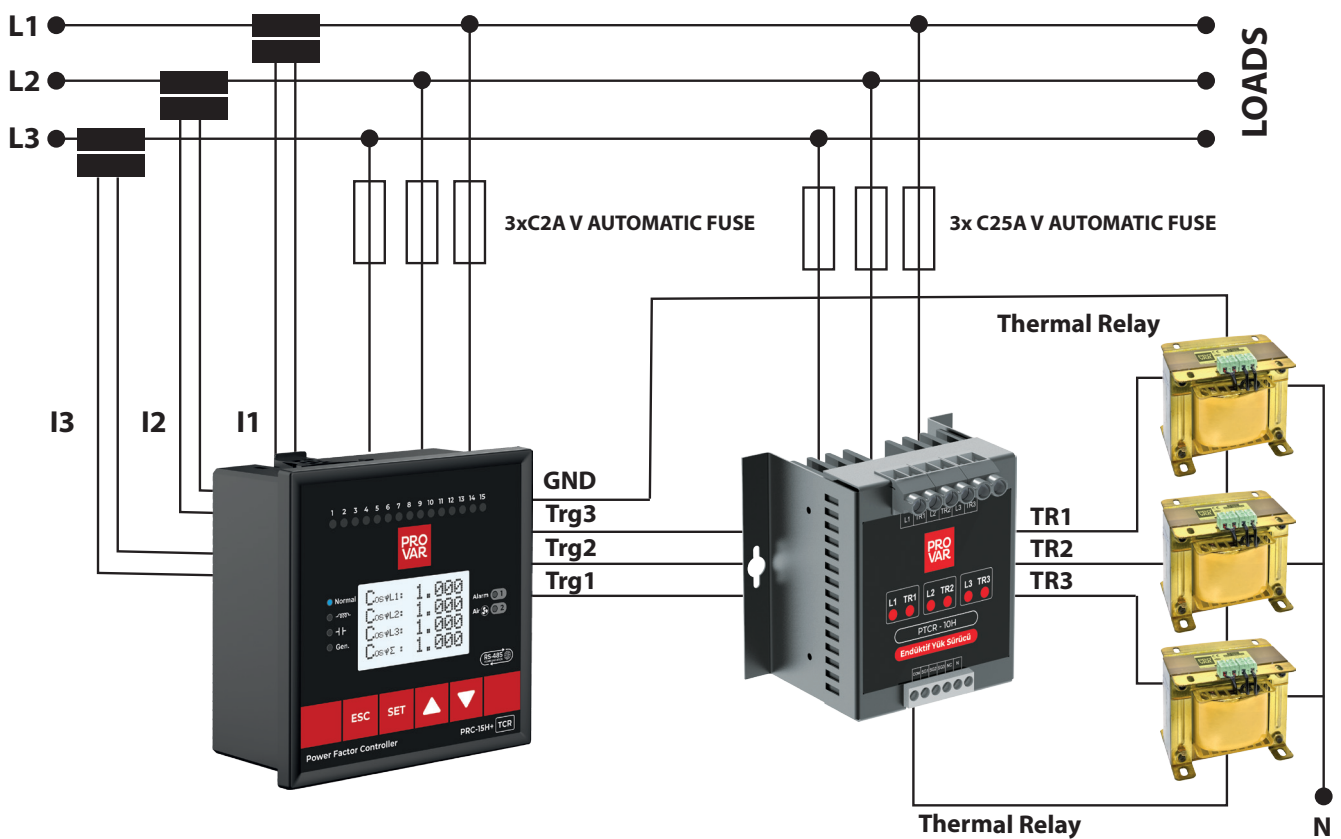


Product Code	Product Description	Dimensions (mm) (Wid.-Dep.-Height)	Maximum Connectable Shunt Reactor Power (kVAr)	Voltage	Cable Cross Section	Fuse Current to be Used
PTCR-5H	5 kVAr Inductive Load Driver	110x106x77	3 x 1,66 kVAr(230V)	230V	2,5 mm ²	16 A
PTCR-10H	10 kVAr Inductive Load Driver	120x106x88	3 x 3,33 kVAr(230V)	230V	4 mm ²	25 A
PTCR-20H	20 kVAr Inductive Load Driver	164x167x153	3 x 6,67 kVAr(230V)	230V	10 mm ²	63 A
PTCR-30H	30 kVAr Inductive Load Driver	164x167x153	3 x 10 kVAr(230V)	230V	16 mm ²	100 A

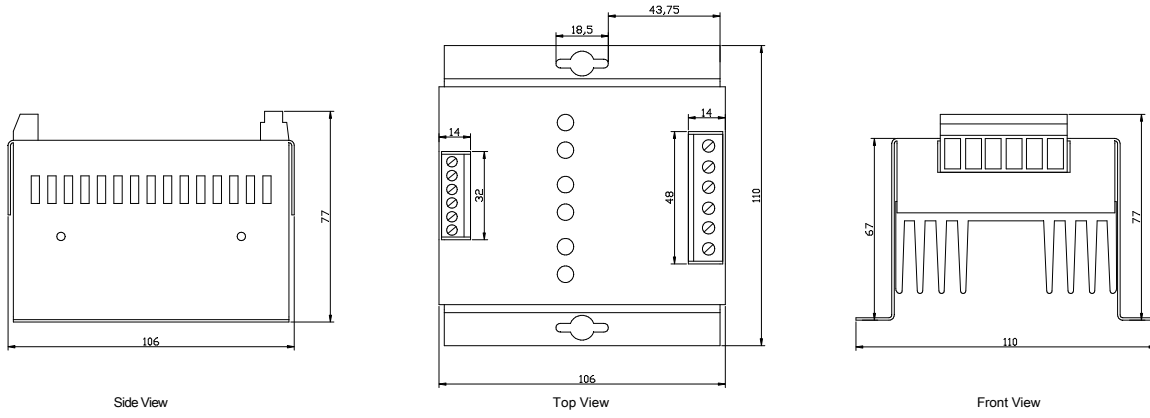
Technical Specifications Table

Operating Voltage	400 VAC
Operating Frequency	50 Hz
Power	5 kVAr-10 kVAr-20 kVAr-30 kVAr
Reaction Time	20 ms
Trigger Voltage	12V DC
Operating Altitude	<2000 m
Protection Class	IP20
Protection (Electrical)	Fan protection against overheating (PTCR-20H & PTCR-30H)
Humidity	Maximum %90
Operating Voltage	-25°C+70°C

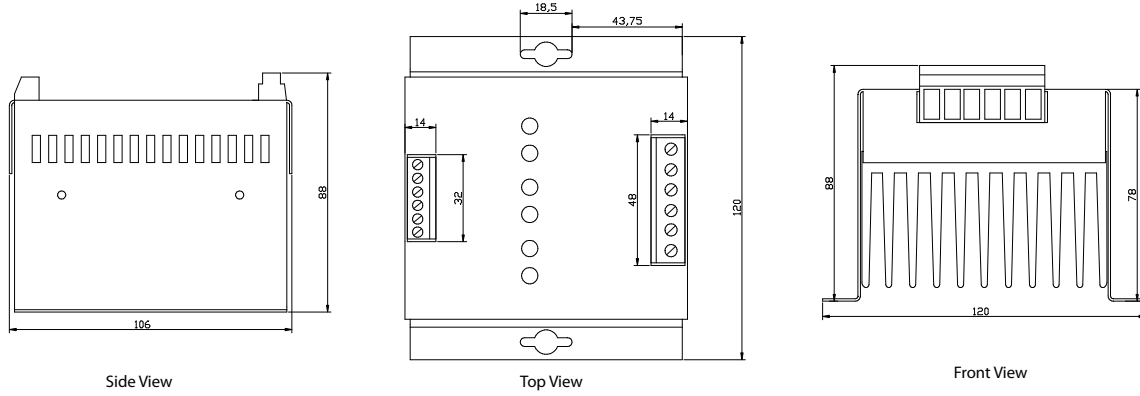
Connection Diagram



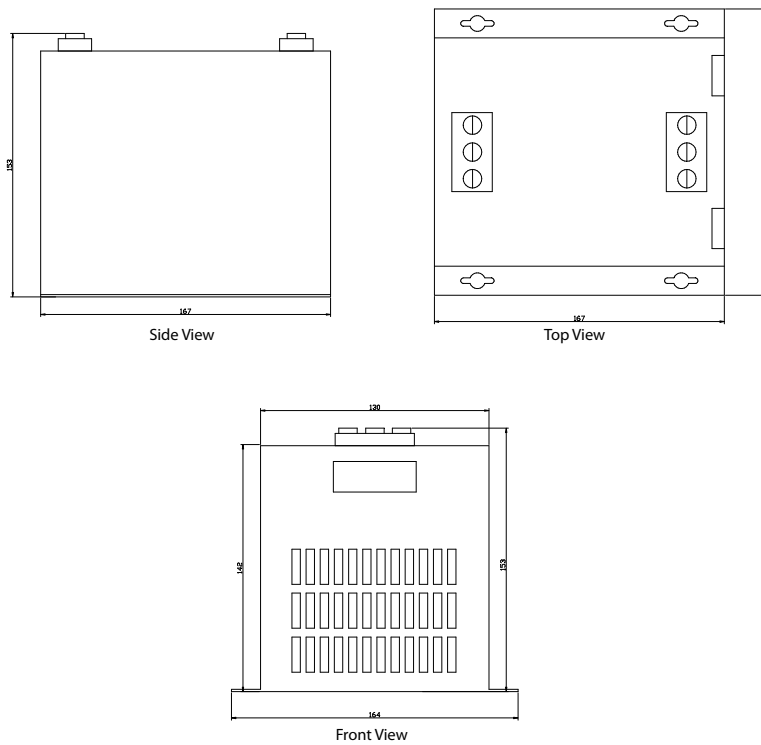
PTCR-5H



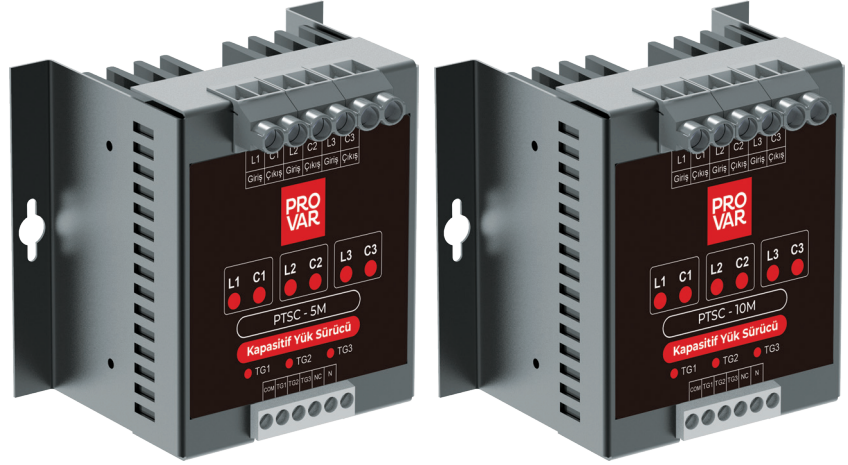
PTCR-10H



PTCR-20 & 30H



- ▶ PTSC-5M
- ▶ PTSC-10M
- ▶ PTSC-5
- ▶ PTSC-12,5
- ▶ PTSC-25
- ▶ PTSC-50



Provar PTSC series thyristor switches are designed for use in businesses with fast and variable loads. Elevator, crane, spot welding etc. fast load change occurs in businesses with loads. Normal compensation panels are insufficient in such enterprises. For this reason, thyristor switches are preferred for safe opening and closing.

Thyristor switches must be used with harmonic filters, and fast type fuses must be selected when choosing a fuse. In addition, the capacitors to be used in thyristor switches should be chosen as a minimum of 525 Volts. PTSC series modules can make 20 ms fast switching.

Usage Areas

- School
- Hospital
- Shopping Centre
- Office
- Hotel
- Bank Branches
- Public Buildings



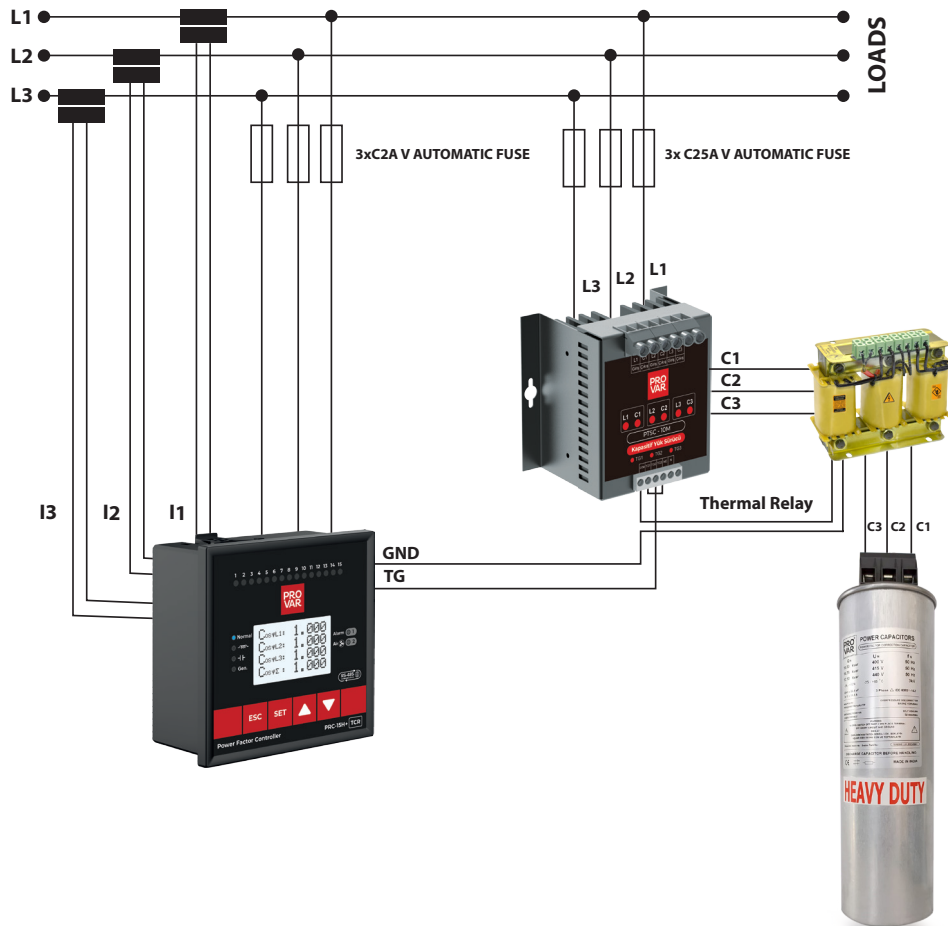
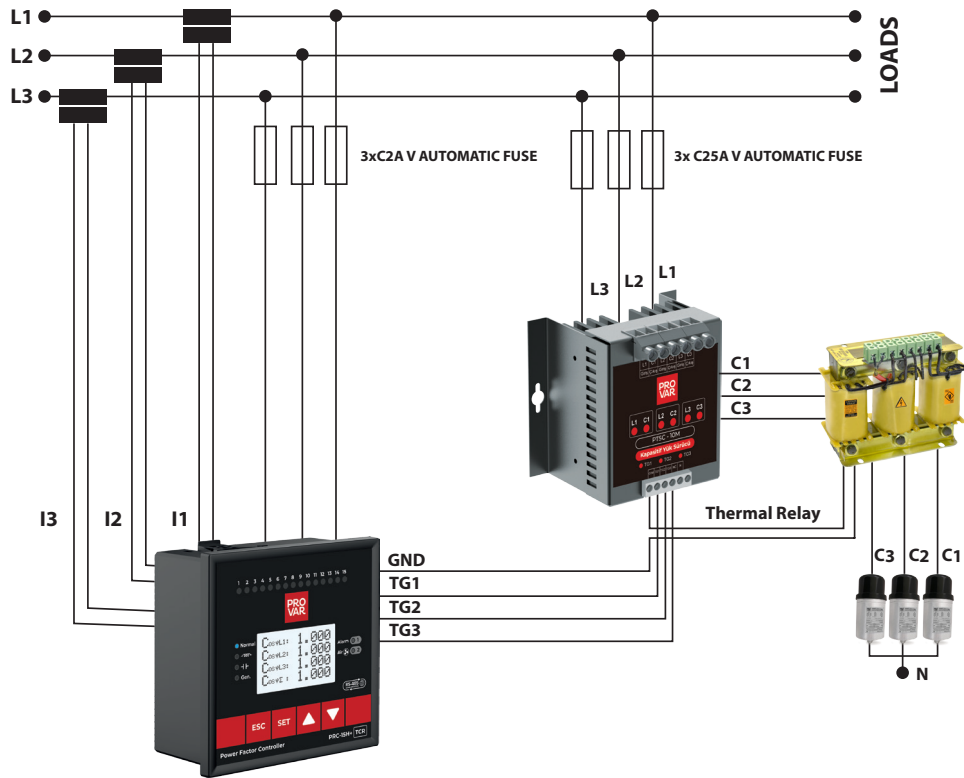
General Specifications Table

Product Code	Product Description	Dimensions (mm) (Wid.-Dep.-Height)	Number of Thyristor Modules	Maximum Connectable Capacitor Power (kVAr)	Voltage	Max. Voltage	Discharge Resistance	Thermal Protection Limit	Status LED	Cable Cross Section	Fuse Current to be Used
PTSC-5M	5 kVAr Thyristor Switches	119x83x104	3	3 x 1,6 kVAr	400 VAC	480 VAC	●	+85°C	●	2,5 mm ²	16 A
PTSC-10M	10 kVAr Thyristor Switches	119x83x104	3	3 x 3,3 kVAr	400 VAC	480 VAC	●	+85°C	●	4 mm ²	25 A
PTSC-5	5 kVAr Thyristor Switches	119x83x104	2	5 kVAr	400 VAC	480 VAC	●	+85°C	●	2,5 mm ²	16 A
PTSC-12,5	12,5 kVAr Thyristor Switches	119x83x104	2	12,5 kVAr	400 VAC	480 VAC	●	+85°C	●	10 mm ²	40 A
PTSC-25	25 kVAr Thyristor Switches	164x145x166	2	25 kVAr	400 VAC	480 VAC	●	+85°C	●	16 mm ²	63 A
PTSC-50	50 kVAr Thyristor Switches	164x145x166	2	50 kVAr	400 VAC	480 VAC	●	+85°C	●	25 mm ²	125 A

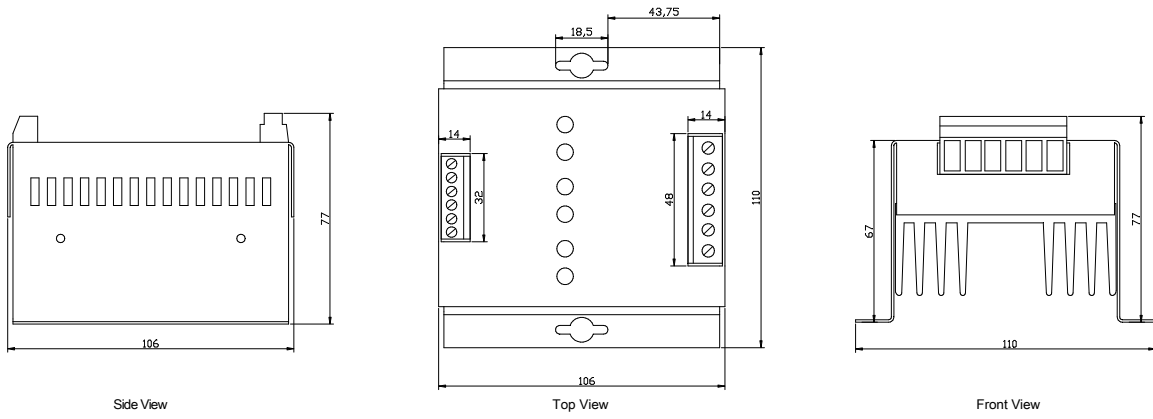
Technical Specifications Table

Operating Voltage	400 VAC
Operating Frequency	50/60 Hz
Power	
PTSC-5M	3x1,6 kVAr
PTSC-10M	3x3,3 kVAr
PTSC-5	5 kVAr
PTSC-12,5	12,5 kVAr
PTSC-25	25 kVAr
PTSC-50	50 kVAr
Reaction Time	20 ms (50 Hz) / 16,66 ms (60 Hz)
Trigger Signal Voltage	10 - 30 VDC
Operating Altitude	<2000 m
Protection Class	IP20
Protection (Electrical)	Fan protection against overheating (PTSC-25 & PTSC-50)

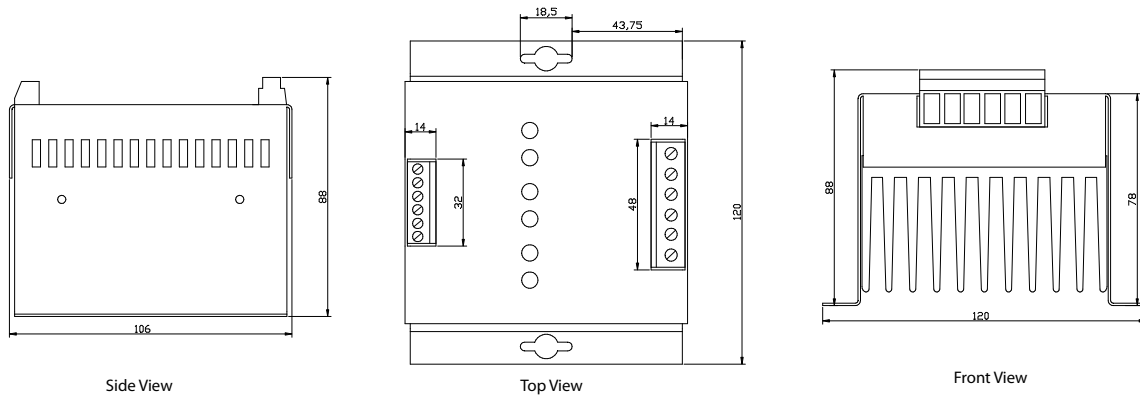
Connection Diagram



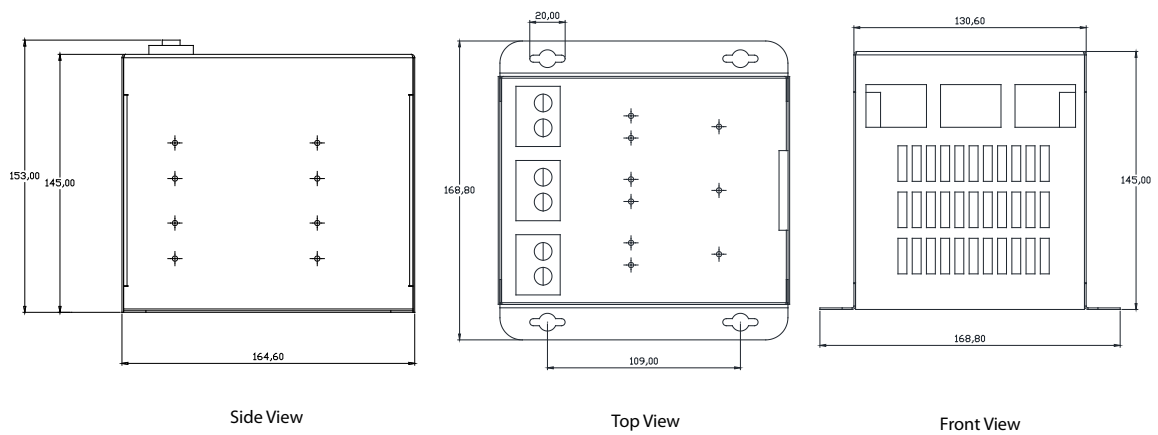
PTSC-5M



PTSC-10M



PTSC-25 & 50



- ▶ PAD-01
- ▶ PAD-02
- ▶ PAD-03
- ▶ PAD-03-DI
- ▶ PAD-03-DO



Our PAD Series Energy Analyzers are designed to measure all parameters of the electrical network, to calculate the consumed energies, to protect and control the system with alarm options, and to display all measured parameters, with the intensive work of our expert R&D team in the field of Power Quality.

It offers design and efficiency together with its 45-265V AC/DC wide supply range, ergonomic design of 96x96x51 mm dimensions and RS-485 communication (Modbus RTU) feature, which is standard in all our energy analyzer series.

- 128x64 Wide Graphic LCD Display
- Easy to Use with Turkish and English Menu Options
- RS-485 Communication (Modbus RTU)
- Adjustable Relay Outputs
- Adjustable Digital Inputs and Outputs
- RTC
- Event and Log Records
- Sag/Swell Measurement
- Discrete Harmonics (31. HD-I & HD-V), (51. HD-I & HD-V)
- V, A, P, Q, S, PF, Cos ϕ , Σ P, Σ Q, Σ S, THD-I, THD-V (Monitoring Parameters)
- Import and Export Energies
- Min, Max and Demands

Product Code	Product Description	Dimensions (mm)	Basic Parameters	Graphic LCD Display (128x64)	3 x Cos ϕ	Power Factor (PF1,PF2,PF3)	Demand - Max. Demand	Max-Min Values	Neutral Current	Current / Voltage Unbalance	Sag /Swell	THD-I, THD-V	2-31. Harmonics (V-I)	2-51. Harmonics (V-I)	RS-485 Modbus Communication	Digital Input (x2)	Digital Output (x2)	Event Records	Log Records	Relay Outputs (x2)	Alarm State Modes	Date/Time	45-265 V AC/DC Supply	
PAD-01	Base Model Communication Energy Analyzer	96x96	•	•	•	•	•	•	•	•	•	•	•	•	•								•	
PAD-02	Advanced Model Communication Energy Analyzer	96x96	•	•	•	•	•	•	•	•	•	•	•	•	•						•	•	•	•
PAD-03	Advanced Model Communication Energy Analyzer	96x96	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•
PAD-03-DI	Advanced Model Communication Energy Analyzer	96x96	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•
PAD-03-DO	Advanced Model Communication Energy Analyzer	96x96	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•

General Specifications Table

Product Code	PAD-01	PAD-02	PAD-03	PAD-03-DI	PAD-03-DO
Operating Voltage	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC
Operating Frequency	30 - 100 Hz	30 - 100 Hz	30 - 100 Hz	30 - 100 Hz	30 - 100 Hz
Current Measurement Range	1mA - 5,5 A	1mA - 5,5 A	1mA - 5,5 A	1mA - 5,5 A	1mA - 5,5 A
Voltage Measurement Range	5-300VAC(L-N) 10 - 520 V AC (L-L)	5-300VAC(L-N) 10 - 520 V AC (L-L)	5 - 300 V AC (L-N) 10 - 520 V AC (L-L)	5-300VAC(L-N) 10 - 520 V AC (L-L)	5-300VAC(L-N) 10 - 520 V AC (L-L)
Frequency	√	√	√	√	√
Cosφ	√	√	√	√	√
Power Factor	R,S,T, Σ PF	R,S,T, Σ PF	R,S,T, Σ PF	R,S,T, Σ PF	R,S,T, Σ PF
Neutral Current Transformer Input	-	-	-	-	-
Ground-Neutral Voltage Measurement	-	-	-	-	-
Neutral Current	√	√	√	√	√
Max-Min Voltage	√	√	√	√	√
Demand-Max Demand	√	√	√	√	√
Active Energy Class 0.5	-	-	√	√	√
Active Energy Class 1	√	√	-	-	-
Reactive Energy Class 1	-	-	√	√	√
Reactive Energy Class 2	√	√	-	-	-
4-Quadrant Energy	√	√	√	√	√
Active Power	P1, P2, P3, ΣP	P1, P2, P3, ΣP	P1, P2, P3, ΣP	P1, P2, P3, ΣP	P1, P2, P3, ΣP
Reactive Power	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ
Apparent Power	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS
Over / Under Voltage Protection	-	√	√	√	√
Over / Under Current Protection	-	√	√	√	√
Over / Under Frequency Protection	-	√	√	√	√
Over Neutral Current Protection	-	√	√	√	√
Voltage Unbalance Protection	-	√	√	√	√
Current Unbalance Protection	-	√	√	√	√
Phase Seq. / Absence Protection	-	√	√	√	√
% THD-V	√	√	√	√	√
% THD-I	√	√	√	√	√
Sag / Swell	-	√	√	√	√
Discrete Harmonics (HD-V / HD-I)	-	31	51	51	51
Digital Input X2	-	-	-	√	-
Digital Output X2	-	-	-	-	√
RTC	-	√	√	√	√
Sampling Rate	128	128	128	128	128
Event Records	-	-	√	√	√
Log Records	-	-	√	√	√
RS-485 Communication	√	√	√	√	√
Connection Type	3P3W / 3P4W	3P3W / 3P4W	3P3W / 3P4W	3P3W / 3P4W	3P3W / 3P4W
Protection Class	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)
Relay Output X2	-	Max5A250 Vac Cosφ=1	Max5A250 Vac Cosφ=1	Max5A250 Vac Cosφ=1	Max5A250 Vac Cosφ=1
Indicator	LCD (128x64)	LCD (128x64)	LCD (128x64)	LCD (128x64)	LCD (128x64)
Operating Voltage	-25°C.....70°C	-25°C.....70°C	-25°C.....70°C	-25°C.....70°C	-25°C.....70°C

Technical Specifications Table

Operating Voltage	45 – 265 VAC / DC \pm %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	30 – 100 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Current Measurement Range	1 mAAC – 5,5 AAC
Voltage Measurement Range	5 – 300 VAC (L-N) 10 – 520 VAC (L-L)
Current Transformer Ratio	1 – 2000 (10000/5)
Voltage Transformer Ratio	1.0 – 4000.0
Optional	
Digital Input Active Level	6 – 30 VDC
Digital Output Active Level	6 – 30 VDC
Measurement Accuracy	
Voltage	%0,5
Current	%0,5
Frequency	%0,1
Cosϕ	%0,2
Active Energy	%1 (PAD-01, PAD-02), %0,5 (PAD-03, PAD-03-DI, PAD-03-DO)
Reactive Energy	%2 (PAD-01, PAD-02), %1 (PAD-03, PAD-03-DI, PAD-03-DO)
Relay Output	2 SPDT Relay NO Max 5A AC 250 VAC Cos ϕ =1
Communication	Modbus RTU Optical Isolated, Programmable
Baudrate (bps)	1200, 2400, 4800, 9600, 14400, 19200
Stop Bits	(1), (1,5), (2)
Parity	None (Fixed)
Address (ID)	1 – 247
Harmonics	2 – 31 (PAD-02) 2 – 51 (PAD-03, PAD-03-DI, PAD-03-DO)
Protection Class	IP54 (Front Panel) IP20 (Body)
Device Protection Class	Double Insulated
Operating Temperature	-25°C+70°C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
Connection Type	3P3W (Delta), 3P4W (Star)
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm ²
Voltage Terminal Cable Cross Section	Max 2,5 mm ²
Current Terminal Cable Cross Section	Max 2,5 mm ²
Cable Cross Section for RS485, DI, DO	Max 1,5 mm ²
Weight	238 gr
Dimensions	96 x 96 x 51 mm
Panel Mounting Dimensions	92 x 92 mm
Standards	EN 61000-4-2 EN 61000-4-5 EN 61000-4-6 EN 61000-4-3 EN 61000-4-4 EN 61000-3-3 EN 61000-4-11 EN 61000-4-8 EN 61010-1 EN 55011
EU Directives	2014 / 35 / EU (LVD) Directive 2014 / 30 / EU (EMC)



PMA Series Digital Multimeters

- ▶ PMA-01
- ▶ PMA-120D
- ▶ PMA-02
- ▶ PMA-03



Our PMA Series Multimeters are able to calculate Current, Voltage, Frequency, Apparent Power, Minimum and Maximum Voltage, Current Demand, Maximum Current Demand values of 3-phase electrical systems, with the hard work of our expert R&D team in the field of Power Quality and Energy solutions. It is designed and manufactured to measure and protect the system with alarm options.

It offers design and efficiency together with its 45-265V AC/DC wide supply range, ergonomic design in 96x96x51 mm dimensions and product range with advanced features.

- 4 x 4 Digit 14 mm Digital LED Display
- Easy-to-Use Menu
- Voltage, Current and Frequency Protection
- Phase-Phase or Phase-Neutral Protection
- Phase Sequence Error Information and Protection
- Three-phase L-N and L-L Voltage Information
- Three-phase Current and Frequency Information
- Adjustable Relay Outputs
- V, A, S, ve $\sum S$ (Monitoring Parameters)
- RS-485 Communication (Modbus RTU)
- Min, Max and Demands
- Connection Type (Δ , Δ)

Product Code	Product Description	Dimensions (mm)	Basic Parameters (Current-Voltage-Frequency)	7 Segment LED Display (14 mm)	Apparent Power (S1,S2,S3, $\sum S$)	Demand - Max. Demand	Max-Min Values	Voltage / Current Unbalance	Over-Under Voltage Protection	Over-Under Current Protection	Over-Under Frequency Protection	Phase Seq. / Absence Protection	Inrush Current Protection	X/5	CT-120	RS-485 Modbus Communication	Total Hours of Operation	Relay Output (x2)	Alarm State Modes	45-265 V AC/DC Supply
PMA-01	Multimeter	96x96	•	•	•	•	•							•						•
PMA-120D	Direct Multimeter (120A)	96x96	•	•	•	•	•								•					•
PMA-02	Adjustable Multimeter	96x96	•	•	•	•	•	•	•	•	•	•		•				•	•	•
PMA-03	Communication, Adjustable Multimeter	96x96	•	•	•	•	•	•	•	•	•	•		•		•		•	•	•

General Specifications Table

Product Code	PMA-01	PMA-120D	PMA-02	PMA-03
Operating Voltage	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC
Operating Frequency	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Current Transformer Ratio Range	1 ... 2000	CT-30 (120A)	1 ... 2000	1 ... 2000
Voltage Transformer Ratio Range	0,1 ... 4000,0	0,1 ... 4000,0	0,1 ... 4000,0	0,1 ... 4000,0
Current Measurement Range	0,05 - 5,5 AAC	1 - 120 AAC	0,05 - 5,5 AAC	0,05 - 5,5 AAC
Voltage Measurement Range	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)
Frequency	√	√	√	√
Cosφ	-	-	-	-
Neutral Current	-	-	-	-
Max-Min Voltage	√	√	√	√
Demand-Max Demand	√	√	√	√
Active Power	-	-	-	-
Reactive Power	-	-	-	-
Apparent Power	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS
Over / Under Voltage Protection	-	-	√	√
Over / Under Current Protection	-	-	√	√
Over / Under Frequency Protection	-	-	√	√
Over Neutral Current Protection	-	-	-	-
Voltage Unbalance Protection	-	-	√	√
Current Unbalance Protection	-	-	√	√
Phase Seq. / Absence Protection	-	-	√	√
Sudden Tripping (Current / Voltage)	-	-	-	-
Resetable Total Hours of Operation	-	-	-	-
RS-485 Communication	-	-	-	√
Protection Class	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)
Output Relay X2	-	-	Max 5A 250 Vac Cosφ=1	Max 5A 250 Vac Cosφ=1
Indicator	4x4 14 mm LED Display	4x4 14 mm LED Display	4x4 14 mm LED Display	4x4 14 mm LED Display
Operating Temperature	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C
Dimensions (mm)	96x96	96x96	96x96	96x96

Technical Specifications Table

Operating Voltage	45 – 265 VAC / DC %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Current Measurement Range	50 mA AC – 5,5 A AC
Voltage Measurement Range	10 – 300 V AC (L-N) 20 – 500 V AC (L-L)
Current Transformer Ratio	1 – 2000 (10000/5) (PMA-120D hariç)
Voltage Transformer Ratio	1.0 – 4000.0
Measurement Accuracy	
Voltage	%1
Current	%1
Frequency	%1
Apparent Power	%1
Relay Output	2 SPDT Relay NO Max 5A AC 250 VAC Cosφ=1
Protection Class	IP54 (Front Panel) IP20 (Body)
Device Protection Class	Double Insulated
Operating Temperature Range	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
Connection Type	3P3W (Δ), 3P4W (▲)
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Voltage Terminal Cable Cross Section	Max 2,5 mm
Current Terminal Cable Cross Section	Max 2,5 mm
Weight	238 gr
Dimensions	96 x 96 x 51 mm
Panel Mounting Dimensions	92 x 92 mm

- ▶ PMD-01
- ▶ PMD-02
- ▶ PMD-02R
- ▶ PMD-03
- ▶ PMD-03R
- ▶ PMD-04



Our PMD Series Multimeters are able to calculate Current, Voltage, Frequency, $\text{Cos}\phi$, Active Power, Apparent Power, Reactive Power, Minimum and Maximum Voltage, Current Demand, Maximum Current Demand values of 3-phase electrical systems, with the hard work of our expert R&D team in the field of Power Quality and Energy solutions. It is designed and manufactured to measure and protect the system with alarm options.

It offers design and efficiency together with its 45-265V AC/DC wide supply range, ergonomic design in 96x96x51 mm dimensions and product range with advanced features.

- **128x64 Wide Graphic LCD Display**
- **Easy to Use with Turkish and English Menu Options**
- **Voltage, Current and Frequency Protection**
- **Phase-Phase or Phase-Neutral Protection**
- **Phase Sequence Error Information and Protection**
- **Event Logs**
- **Three-phase L-N and L-L Voltage Information**
- **Three-phase Current and Frequency Information**
- **Adjustable Relay Outputs**
- **V, A, P, Q, S, $\text{Cos}\phi$, ΣP , ΣQ , ΣS (Monitoring Parameters)**
- **RS-485 Communication (Modbus RTU)**
- **Min, Max and Demands**
- **Connection Type (Δ , Δ)**

Product Code	Product Description	Dimensions(mm)	Basic Parameters (Current-Voltage-Frequency)	Graphic LCD Display (128*64)	$\text{Cos}\phi$	Active Power (P1,P2,P3, ΣP)	Reactive Power (Q1,Q2,Q3, ΣQ)	Apparent Power (S1,S2,S3, ΣS)	Demand - Max. Demand	Max-Min Values	Current-Voltage Unbalance	Over-Under Voltage Protection	Over-Under Current Protection	Over-Under Frequency Protection	Phase Seq. / Absence Protection	Inrush Current Protection	X/5	RS-485 Communication	Total Hours of Operation	Output Relay X2	Alarm State Modes	45-265 V AC/DC Supply
PMD-01	Multimeter	96x96	•	•				•	•	•							•					•
PMD-02	Adj. Multimeter	96x96	•	•				•	•	•	•	•	•	•	•	•	•			•	•	•
PMD-03	Adj. Multimeter with Communication	96x96	•	•				•	•	•	•	•	•	•	•	•	•	•		•	•	•
PMD-04	Adj. Multimeter with Communication	96x96	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

General Specifications Table

Product Code	PMD-01	PMD-02	PMD-02R	PMD-03	PMD-03R	PMD-04
Operating Voltage	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC
Operating Frequency	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Current Transformer Ratio Range	1 ... 2000	1 ... 2000	1 ... 2000	1 ... 2000	1 ... 2000	1 ... 2000
Voltage Transformer Ratio Range	0,1 ... 4000,0	0,1 ... 4000,0	0,1 ... 4000,0	0,1 ... 4000,0	0,1 ... 4000,0	0,1 ... 4000,0
Current Measurement Range	0,05 - 5,5 AAC	0,05 - 5,5 AAC	0,05 - 5,5 AAC	0,05 - 5,5 AAC	0,05 - 5,5 AAC	0,05 - 5,5 AAC
Voltage Measurement Range	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)
Frequency	√	√	√	√	√	√
Cosφ	-	-	-	-	-	√
Neutral Current	-	-	-	-	-	√
Max-Min Voltage	√	√	√	√	√	√
Demand-Max Demand	√	√	√	√	√	√
Active Power	-	-	-	-	-	P1, P2, P3, ΣP
Reactive Power	-	-	-	-	-	Q1, Q2, Q3, ΣQ
Apparent Power	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS
Event Log	-	-	√	-	√	√
Over / Under Voltage Protection	-	√	√	√	√	√
Over / Under Current Protection	-	√	√	√	√	√
Over / Under Frequency Protection	-	√	√	√	√	√
Over Neutral Current Protection	-	-	-	-	-	√
Voltage Unbalance Protection	-	√	√	√	√	√
Current Unbalance Protection	-	√	√	√	√	√
Phase Seq. / Absence Protection	-	√	√	√	√	√
Sudden Tripping (Current / Voltage)	-	-	-	-	-	√
Inrush Current Protection	-	-	√	-	√	√
Resetable Total Hours of Operation	-	-	-	-	-	√
RS-485 Communication	-	-	-	√	√	√
Protection Class	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)	IP54 (Front Panel) IP20 (Body)
Output Relay X2	-	Max 5A 250 Vac Cosφ=1	Max 5A 250 Vac Cosφ=1	Max 5A 250 Vac Cosφ=1	Max 5A 250 Vac Cosφ=1	Max 5A 250 Vac Cosφ=1
Indicator	LCD (128x64)	LCD (128x64)	LCD (128x64)	LCD (128x64)	LCD (128x64)	LCD (128x64)
Operating Temperature	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C
Dimensions (mm)	96x96	96x96	96x96	96x96	96x96	96x96

Technical Specifications Table

Operating Voltage	45 – 265 VAC / DC %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Current Measurement Range	50 mA AC – 5,5 A AC
Voltage Measurement Range	10 – 300 V AC (L-N) 20 – 520 V AC (L-L)
Current Transformer Ratio	1 – 2000 (10000/5)
Voltage Transformer Ratio	1.0 – 4000.0
Measurement Accuracy	
Voltage	1%
Current	1%
Frequency	1%
Active Power	1%
Reactive Power	1%
Apparent Power	1%
Relay Output	2 SPDT Relay NO Max 5A AC 250 VAC Cosφ=1
Protection Class	IP54 (Front Panel) IP20 (Body)
Device Protection Class	Double Insulated
Operating Temperature Range	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
Connection Type	3P3W (Δ), 3P4W (▲)
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Voltage Terminal Cable Cross Section	Max 2,5 mm
Current Terminal Cable Cross Section	Max 2,5 mm
Weight	238 gr

PRO VAR® PVM Series
Voltmeters

- ▶ PVM-01-96
- ▶ PVM-02-96
- ▶ PVM-01-72
- ▶ PVM-02-72



Our PVM Series Voltmeters offer design and efficiency together with 36-265V AC/DC wide supply range, ergonomic design options suitable for 96x96 mm and 72x72 mm panels.

- Wide 7 Segment LED Display
- Over / Under Voltage Protection
- Ability to Monitor and Reset Min and Max Voltage Values
- Adjustable Relay Modes
- 36-265V AC/DC Supply Range

Product Code	Product Description	Dimensions (mm)	7 Segment LED Display	Max-Min Values	Over / Under Voltage Protection	Sudden Tripping Protection	Relay Output	Alarm State Modes	36-265 V AC/DC %10 Supply ³
PVM-01-96	96x96 Panel Voltmeter	96x96	•	•					•
PVM-02-96	96x96 Panel Adj. Voltmeter	96x96	•	•	•	•	•	•	•
PVM-01-72	72x72 Panel Voltmeter	72x72	•	•					•
PVM-02-72	72x72 Panel Adj. Voltmeter	72x72	•	•	•	•	•	•	•

General Specifications Table

Product Code	PVM-01-96	PVM-02-96	PVM-01-72	PVM-02-72
Operating Voltage	36 - 265 V AC/DC	36 - 265 V AC/DC	36 - 265 V AC/DC	36 - 265 V AC/DC
Operating Frequency	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Voltage Measurement Range	10 - 720 VAC	10 - 720 VAC	10 - 720 VAC	10 - 720 VAC
Over / Under Voltage Protection	-	√	-	√
Sudden Tripping (Voltage)	-	√	-	√
Resetable Max & Min	√	√	√	√
Protecton Class	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)
Relay Output	-	Max 5A 250 Vac Cosφ=1	-	Max 5A 250 Vac Cosφ=1
Indicator	LED 7 Segment	LED 7 Segment	LED 7 Segment	LED 7 Segment
Operating Voltage	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C
Dimensions (mm)	96x96	96x96	72x72	72x72

Technical Specifications Table

Operating Voltage	36 – 265 VAC / DC %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Voltage Measurement Range	10 – 720 V AC
Measurement Accuracy	
Voltage	%1
Relay Output	1 SPDT Relay NO Max 5AAC 250 VAC Cosφ=1
Protection Class	IP54 (Front Panel)
	IP20 (Body)
Device Protection Class	Double Insulated
Operating Temperature	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Voltage Terminal Cable Cross Section	Max 2,5 mm
Weight	
96x96 Models	176 gr
72x72 Models	134 gr
Dimensions	
96x96 Models	96 x 96 x 51 mm
72x72 Models	72 x 72 x 50 mm
Panel Mounting Dimensions	
96x96 Models	92 x 92 mm
72x72 Models	69 x 69 mm

PRO VAR® PAM Series Ammeters

- ▶ PAM-01-96
- ▶ PAM-02-96
- ▶ PAM-01-72
- ▶ PAM-02-72



Our PAM Series Ammeters offer design and efficiency together with 36-265V AC/DC wide supply range, ergonomic design options suitable for 96x96 mm and 72x72 mm panels.

- **Wide 7 Segment LED Display**
- **Over / Under Current Protection**
- **Ability to Monitor and Reset Demand Values**
- **Adjustable Relay Modes**
- **36-265V AC/DC Supply Range**

Product Code	Product Description	Dimensions (mm)	7 Segment LED Display	X5	Demand Values	Over / Under Current Protection	Sudden Tripping Protection	Relay Output	Alarm State Modes	36-265 V AC/DC %10 Supply
PAM-01-96	96x96 Panel Ammeter	96x96	•	•	•					•
PAM-02-96	96x96 Panel Adj. Ammeter	96x96	•	•	•	•	•	•	•	•
PAM-01-72	72x72 Panel Ammeter	72x72	•	•	•					•
PAM-02-72	72x72 Panel Adj. Ammeter	72x72	•	•	•	•	•	•	•	•

General Specifications Table

Product Code	PAM-01-96	PAM-02-96	PAM-01-72	PAM-02-72
Operating Voltage	36 - 265 V AC/DC	36 - 265 V AC/DC	36 - 265 V AC/DC	36 - 265 V AC/DC
Operating Frequency	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Current Measurement Range	30 - 5500 mAAC	30 - 5500 mAAC	30 - 5500 mAAC	30 - 5500 mAAC
Over / Under Current Protection	-	√	-	√
Sudden Tripping (Current)	-	√	-	√
Resettable Demand	√	√	√	√
Current Transformer Ratio	1 - 2000	1 - 2000	1 - 2000	1 - 2000
Protection Class	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)
Relay Output	-	Max 5A 250 Vac Cosφ=1	-	Max 5A 250 Vac Cosφ=1
Indicator	LED 7 Segment	LED 7 Segment	LED 7 Segment	LED 7 Segment
Operating Voltage	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C
Dimensions (mm)	96x96	96x96	72x72	72x72

Technical Specifications Table

Operating Voltage	36 – 265 VAC / DC %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Current Measurement Range	30 - 5500 mA AC
Measurement Accuracy	
Current	%1
Relay Output	1 SPDT Relay NO Max 5A AC 250 VAC Cosφ=1
Protection Class	IP54 (Front Panel)
	IP20 (Body)
Device Protection Class	Double Insulated
Operating Temperature	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Current Terminal Cable Cross Section	Max 2,5 mm
Weight	
96x96 Models	176 gr
72x72 Models	134 gr
Dimensions	
96x96 Models	96 x 96 x 51 mm
72x72 Models	72 x 72 x 50 mm
Panel Mounting Dimensions	
96x96 Models	92 x 92 mm
72x72 Models	69 x 69 mm

PRO VAR® PVAM Series
Voltammeters

▶ PVAM-01-96

▶ PVAM-01-72



Our PVAM Series Voltammeters offer design and efficiency together with 36-265V AC/DC wide supply range, ergonomic design options suitable for 96x96 mm and 72x72 mm panels.

- **Wide 7 Segment LED Display**
- **Ability to Monitor and Reset Min and Max Voltage Values**
- **Ability to Monitor and Reset Demand Values**
- **36-265V AC/DC Supply Range**

Product Code	Product Description	Dimension (mm)	7 Segment LED Display	X5	Demand Values	Min-Max Voltage Values	36-265 V AC/DC %10 Supply
PVAM-01-96	96x96 Panel Voltampermetre	96x96	•	•	•	•	•
PVAM-01-72	72x72 Panel Voltampermetre	72x72	•	•	•	•	•

General Specifications Table

Product Code	PVAM-01-96	PVAM-01-72
Operating Voltage	36 - 265 V AC/DC	36 - 265 V AC/DC
Operating Frequency	45 - 65 Hz	45 - 65 Hz
Voltage Measurement Range	10 - 720 VAC	10 - 720 VAC
Current Measurement Range	30 - 5500 mAAC	30 - 5500 mAAC
Resettable Demand	√	√
Resettable Max & Min Voltages	√	√
Current Transformer Ratio	1 - 2000	1 - 2000
Protection Class	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)
Indicator	LED 7 Segment	LED 7 Segment
Operating Voltage	-25°C....70°C	-25°C....70°C
Dimensions (mm)	96x96	72x72

Technical Specifications Table

Operating Voltage	36 – 265 VAC / DC %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Voltage Measurement Range	10 – 720 V AC
Current Measurement Range	30 – 5500 mA AC
Measurement Accuracy	
Voltage	%1
Current	%1
Protection Class	IP54 (Front Panel) IP20 (Body)
Device Protection Class	Double Insulation
Operating Temperature	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Current and Voltage Terminal Cable Cross Section	Max 2,5 mm
Weight	
96x96 Models	176 gr
72x72 Models	134 gr
Dimensions	
96x96 Models	96 x 96 x 51 mm
72x72 Models	72 x 72 x 50 mm
Panel Mounting Dimensions	
96x96 Models	92 x 92 mm
72x72 Models	69 x 69 mm

PRO VAR® PFM Series
Frequencymeters

- ▶ PFM-01-96
- ▶ PFM-02-96
- ▶ PFM-01-72
- ▶ PFM-02-72



Our PFM Series Frequencymeters offer design and efficiency together with 36-265V AC/DC wide supply range, ergonomic design options suitable for 96x96 mm and 72x72 mm panels.

- **Wide 7 Segment LED Display**
- **Over / Under Frequency Protection**
- **Ability to Monitor and Reset Min and Max Frequency Values**
- **Adjustable Relay Modes**
- **36-265V AC/DC Supply Range**

Product Code	Product Description	Dimensions (mm)	7 Segment LED Display	Max-Min Values	Over / Under Voltage Protection	Relay Output	Alarm State Modes	36-265 V AC/DC %10 Supply
PFM-01-96	96x96 Panel Frequencymeter	96x96	•	•				•
PFM-02-96	96x96 Panel Adj. Frequencymeter	96x96	•	•	•	•	•	•
PFM-01-72	72x72 Panel Frequencymeter	72x72	•	•				•
PFM-02-72	72x72 Panel Adj. Frequencymeter	72x72	•	•	•	•	•	•

General Specifications Table

Product Code	PFM-01-96	PFM-02-96	PFM-01-72	PFM-02-72
Operating Voltage	36 - 265 V AC/DC	36 - 265 V AC/DC	36 - 265 V AC/DC	36 - 265 V AC/DC
Operating Frequency	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Frequency Measurement Range	20 - 500 Hz	20 - 500 Hz	20 - 500 Hz	20 - 500 Hz
Measuring Input Voltage Range	20 - 550 VAC	20 - 550 VAC	20 - 550 VAC	20 - 550 VAC
Over / Under Frequency Protection	-	√	-	√
Resetable Max & Min	-	√	-	√
Protection Class	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)	IP54 (Front panel) IP20 (Body)
Relay Output	-	Max 5A 250 Vac Cosφ=1	-	Max 5A 250 Vac Cosφ=1
Indicator	LED 7 Segment	LED 7 Segment	LED 7 Segment	LED 7 Segment
Operating Voltage	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C
Dimensions (mm)	96x96	96x96	72x72	72x72

Technical Specifications Table

Operating Voltage	36 – 265 VAC / DC %10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 6 VA
Measuring Inputs Power Consumption	< 0,5 VA
Frequency Measurement Range	20 - 500 Hz
Measuring Input Voltage Range	20 - 550 VAC
Measurement Accuracy	
Frequency	%1
Relay Output	1 SPDT Relay NO Max 5A AC 250 VAC Cosφ=1
Protection Class	IP54 (Front Panel) IP20 (Body)
Device Protection Class	Front
Operating Temperature	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Front
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Measurement Terminal Cable Cross Section	Max 2,5 mm
Weight	
96x96 Models	176 gr
72x72 Models	134 gr
Dimensions	
96x96 Models	96 x 96 x 51 mm
72x72 Models	72 x 72 x 50 mm
Panel Mounting Dimensions	
96x96 Models	92 x 92 mm
72x72 Models	69 x 69 mm



PICS-G Series Gateways

- ▶ **PMGW Series**
- ▶ **PGGW Series**
- ▶ **PEGW Series**



Provar Industrial Communication Systems subgroup Gateway products; inverters, PLC, energy analyzers, electricity meters, etc. they are gateway devices designed to quickly and reliably connect devices with RS485 serial ports over a wired or cellular network.

- **45-265 VAC/DC Wide Supply Range**
- **45-65 Hz Operating Frequency Range**
- **4 kV Isolation Voltage**
- **GSM 4 Band Operability (850/900/1800/1900 Mhz)**
- **Ability to Work in TCP Server/Client Mode**
- **Ability to Operate as TCP/RS485 Transparent**
- **Remote Connection with Modbus TCP or Modbus RTU/ASCII Over TCP**
- **Working Between 300-921600 bps**
- **Modbus RTU/ASCII Protocol Support**
- **2 x 3.75 kV Protected Digital Inputs**
- **2 x 5A 250VAC/28VDC Relay Output**
- **IEC62056-21 Protocol Support for Meters Communicating over RS485**

Product Code	Product Description	Dimensions (mm)	GSM	Ethernet	RS-485	Digital Input	Relay Output	IEC62056-21 Support	45-265 V AC Supply
PMGW-01	Multi Gateway	70x90x80	●	●	●				●
PMGW-02	Multi Gateway	70x90x80	●	●	●	●	●		●
PMGW-03	Multi Gateway	70x90x80	●	●	●	●	●	●	●
PGGW-01	GSM Gateway	70x90x80	●		●				●
PGGW-02	GSM Gateway	70x90x80	●		●	●	●		●
PGGW-03	GSM Gateway	70x90x80	●		●	●	●	●	●
PEGW-01	Ethernet Gateway	70x90x80		●	●				●
PEGW-02	Ethernet Gateway	70x90x80		●	●	●	●		●
PEGW-03	Ethernet Gateway	70x90x80		●	●	●	●	●	●

General Specifications Table

Product Code	PMGW-01	PMGW-02	PMGW-03	PGGW-01	PGGW-02	PGGW-03	PEGW-01	PEGW-02	PEGW-03
Operating Voltage	45 - 265 VAC								
Operating Frequency	45 - 65 Hz								
GSM Band	850/900/1800/1900 Mhz						-	-	-
Ethernet	√	√	√	-	-	-	√	√	√
Digital Inputs	-	7-30 VDC		-	7-30 VDC		-	7-30 VDC	
Modbus RTU/ASCII Protocol Support	√	√	√	√	√	√	√	√	√
IEC62056-21 Protocol Support	-	-	√	-	-	√	-	-	√
Digital Input Insulation Voltage	-	3.75 kV		-	3.75 kV		-	3.75 kV	
Insulation Voltage	4 kV								
Protection Class	IP20								
Relay Output	-	2 x Max 5A 250 Vac Cosφ=1		-	2 x Max 5A 250 Vac Cosφ=1		-	2 x Max 5A 250 Vac Cosφ=1	
Operating Temperature	-25°C.....70°C								
Dimensions (mm)	70 x 90 x 80 mm								

Technical Specifications Table

Operating Voltage	45 – 265 VAC
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz
Power Consumption	3 – 6 VA
Insulation Voltage	4 kV
Digital Input	
Quantity / Input Voltage	2 x 7-30 VDC
Insulation Voltage	3.75 kV
Relay Output	2 SPDT Relay NO Max 5A AC 250 VAC Cosφ=1
Device Protection Class	IP20
Operating Temperature	-25 °C+70 °C
Humidity	Maximum %90
Operating Altitude	<2000 m
Panel Connection Type	Rail Type
IK Code	IK06
Supply Terminal Cable Cross Section	Max 2,5 mm
Communication Terminal Cable Cross Section	Max 2,5 mm
Weight	215 gr
Dimensions	70 x 90 x 80 mm



PCC Series Capacitor Contactors

► PCC Series



Provar Compensation Contactors have a double-stage structure specially designed to prevent high inrush currents, are equipped with contact set and current limiting resistors and are protected against direct contact. These contactors, which cannot be operated manually, provide facility safety as well as life safety. When the contactor coil is energized, first the transition block contacts are closed and shortly after the first inrush current passes over these contacts, the contacts open, and the rated current of the capacitors starts to pass through the main contacts. Capacitors can cause high frequency between 1 and 15 kHz at the time of first commissioning and very short-term high currents, which can be up to 150 times the rated current. Since the process of adding pre-resistance to all three phases to which the capacitor is connected is difficult and time-consuming under normal conditions, only compensation contactors designed for this purpose are used.

Usage Areas

- School
- Hospital
- Shopping Centre
- Office
- Hotel
- Bank Branches
- Public Buildings

Main Features

- Auxiliary Contact Block
- Three-phase Connection
- Possibility to connect capacitors up to 75 kVAr
- Coil Voltage: 230 VAC %10, 50/60 Hz
- IEC-60947 Compatible
- Long Electrical Life
- Operating Voltage Range: 400/440-660/690



General Specifications Table

Product Code	Operating Power 400V - 440V VAC, 50Hz Qn (kVAr)	Operating Power 600V - 690V VAC, 50Hz Qn (kVAr)	Current (A) (400V, 50Hz)	Operating Temperature(°C)	NO	NC	Electrical Life
PCC-2,5-400	2,5	3,2	3,0	-25 ...+60	1	0	200.000
PCC-5,0-400	5,0	6,5	7,0	-25 ...+60	1	0	200.000
PCC-10,0-400	10,0	12,5	14,0	-25 ...+60	1	1	200.000
PCC-12,5-400	12,5	18,0	18,0	-25 ...+60	1	1	200.000
PCC-16,7-400	16,7	24,0	24,0	-25 ...+60	1	1	200.000
PCC-20,0-400	20,0	30,0	29,0	-25 ...+60	1	1	200.000
PCC-25,0-400	25,0	36,0	36,0	-25 ...+60	1	1	200.000
PCC-33,3-400	33,3	48,0	48,0	-25 ...+60	1	2	150.000
PCC-40,0-400	40,0	58,0	58,0	-25 ...+60	1	2	100.000
PCC-50,0-400	50,0	74,0	74,0	-25 ...+60	1	2	100.000
PCC-60,0-400	60,0	92,0	92,0	-25 ...+60	1	2	100.000
PCC-75,0-400	75,0	120,0	108,0	-25 ...+60	1	2	100.000



PSC & PTC Series Capacitors

- ▶ PSC Monophase
- ▶ PTC Three-phase



Provar PSC (Monophase) and PTC (Three-phase) series capacitors are designed in accordance with harsh conditions and adverse conditions that will shorten the life they will be exposed to in compensation. Provar PSC and PTC series capacitors have protection methods that prevent the capacitor from exploding at the end of its life or in electrical thermal overloads, with a circuit disconnector system under extreme pressure.

Provar PSC and PTC series capacitors are manufactured using metallized polypropylene film with self-healing feature. It has superior durability with its ability to work in harsh conditions and a lifespan of 65°C 130,000 / 55°C 180,000 hours.

Usage Areas

- School
- Hospital
- Shopping Centre
- Office
- Hotel
- Bank Branches
- Public Buildings



Main Features

- Compact Cylindrical Body
- Easy Setup
- PCB Free
- Eco-Friendly
- High Temperature Resistance
- Shockproof Terminal
- Long Life
- IEC 60831 1&2 . IS:13340 Compliance with Standards

Design and Construction

- Mkp Film, Cylindrical Structure, Aluminum Case
- High Power Density Resistant Body
- Low Loss, Zinc Fragments
- Self-healing Film Design
- Long Lasting and Reliable

Explosion Protection

Capacitors tend to explode when exposed to overvoltage for a long time. Provar PSC and PTC series capacitors can prevent explosions with their ability to expand under increasing pressure and internal pressure settings.

General Specifications Table

230V CYLINDER TYPE CAPACITOR (MONOPHASE)							
Product Code	230 VAC,50Hz Qn (kVAr)	400 VAC,50Hz Qn (kVAr)	Current (A) (230V,50Hz)	Operating Temperature(°C)	Capaticance (uF)	"Dimensions DxH (mm)"	Package Quantity
PSC-0,25-230	0,25	0,75	1,08	-25 ...+65	15	63,5x87	16
PSC-0,5-230	0,50	1,50	2,17	-25 ...+65	30	63,5x87	16
PSC-1-230	1,00	3,00	4,35	-25 ...+65	60	63,5x87	16
PSC-1,5-230	1,50	4,50	6,52	-25 ...+65	90	63,5x145	16
PSC-2,5-230	2,50	7,50	10,87	-25 ...+65	150	63,5x145	16
PSC-3-230	3,00	9,00	13,05	-25 ...+65	180	63,5x145	16
PSC-5-230	5,00	15,00	21,75	-25 ...+65	300	76x210	16

400V / 415V / 440V HEAVY DUTY CYLINDER TYPE CAPACITOR (THREE-PHASE)								
Product Code	400 VAC,50Hz Qn (kVAr)	415 VAC,50Hz Qn (kVAr)	440 VAC,50Hz Qn (kVAr)	Current (A) (400V,50Hz)	Operating Temperature(°C)	Capaticance (uF)	"Dimensions DxH (mm)"	Package Quantity
PTC-0,5-400	0,50	0,54	0,61	0,72	-25 ...+65	3x3,32	63,5x87	16
PTC-1-400	1,00	1,08	1,21	1,44	-25 ...+65	3x6,64	63,5x87	16
PTC-1,5-400	1,50	1,61	1,81	2,16	-25 ...+65	3x9,96	63,5x87	16
PTC-2,5-400	2,50	2,69	3,03	3,60	-25 ...+65	3x16,6	63,5x87	16
PTC-5-400	5,00	5,38	6,05	7,20	-25 ...+65	3x33,2	76x175	16
PTC-7,5-400	7,50	8,07	9,08	10,80	-25 ...+65	3x49,8	76x210	16
PTC-10-400	10,00	10,76	12,10	14,40	-25 ...+65	3x66,4	76x247	16
PTC-12,5-400	12,50	13,46	15,13	18,00	-25 ...+65	3x83	85x247	9
PTC-15-400	15,00	16,15	18,16	21,60	-25 ...+65	3x99,6	85x278	9
PTC-20-400	20,00	21,53	24,20	28,80	-25 ...+65	3x133	95x278	9
PTC-25-400	25,00	26,97	30,25	36,00	-25 ...+65	3x166	95x278	9
PTC-30-400	30,00	32,30	36,30	43,20	-25 ...+65	3x199,2	116x278	4
PTC-40-400	40,00	43,06	48,40	57,60	-25 ...+65	3x265,6	136x247	4
PTC-50-400	50,00	53,82	60,50	72,00	-25 ...+65	3x332	136x278	4

General Specifications Table

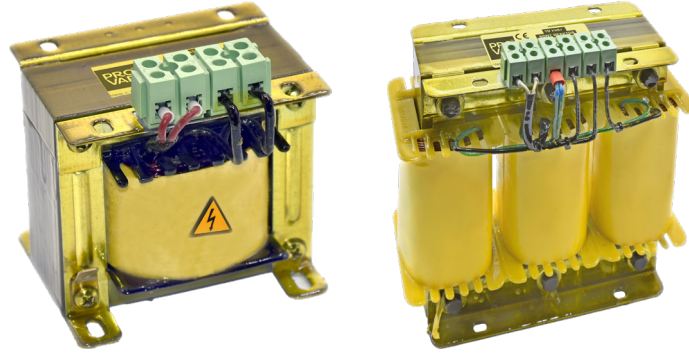
480V / 525V HEAVY DUTY CYLINDER TYPE CAPACITOR (THREE-PHASE)								
Product Code	480 VAC Qn (kVAr)	525 VAC Qn (kVAr)	440 VAC Qn (kVAr)	Current (A) (480V,50Hz)	Operating Temperature(°C)	Capaticance (uF)	"Dimensions DxH (mm)"	Package Quantity
PTC-5-480	5,00	5,98	4,20	6,00	-25 ...+65	3x23,05	76x210	16
PTC-7,5-480	7,50	8,97	6,30	9,00	-25 ...+65	3x34,6	76x210	16
PTC-10-480	10,00	11,96	8,40	12,00	-25 ...+65	3x46,1	76x210	16
PTC-12,5-480	12,50	14,95	10,50	15,00	-25 ...+65	3x57,7	85x210	12
PTC-15-480	15,00	17,94	12,60	18,00	-25 ...+65	3x69,15	95x210	9
PTC-16,7-480	16,70	14,00	11,80	18,40	-25 ...+65	3x64,3	95x247	9
PTC-20-480	20,00	23,93	16,80	24,00	-25 ...+65	3x92,2	95x247	9
PTC-25-480	25,00	29,91	21,00	30,00	-25 ...+65	3x115	116x247	4
PTC-30-480	30,00	35,89	25,20	36,00	-25 ...+65	3x138,3	116x247	4
PTC-33,3-480	33,30	39,83	28,10	39,90	-25 ...+65	3x153,5	136x247	4

525V SUPER HEAVY DUTY CYLINDER TYPE CAPACITOR (THREE-PHASE)								
Product Code	525 VAC Qn (kVAr)	480 VAC Qn (kVAr)	440 VAC Qn (kVAr)	Current (A) (525V,50Hz)	Operating Temperature(°C)	Capaticance (uF)	"Dimensions DxH (mm)"	Package Quantity
PTC-5-525	5,00	4,20	3,50	5,50	-25 ...+65	3x19,3	76x175	16
PTC-7,5-525	7,50	6,30	5,30	8,30	-25 ...+65	3x28,9	76x210	16
PTC-10-525	10,00	8,40	7,00	11,00	-25 ...+65	3x38,5	85x210	12
PTC-12,5-525	12,50	10,50	8,80	13,80	-25 ...+65	3x48,3	85x210	12
PTC-15-525	15,00	12,50	10,60	16,50	-25 ...+65	3x57,8	95x210	9
PTC-20-525	20,00	16,80	14,00	22,00	-25 ...+65	3x77	116x210	6
PTC-25-525	25,00	20,90	17,60	27,50	-25 ...+65	3x96,3	116x247	4
PTC-30-525	30,00	25,00	21,00	33,00	-25 ...+65	3x115,5	116x247	4
PTC-40-525	40,00	33,50	28,10	44,00	-25 ...+65	3x154	136x247	4

General Specifications Table

690V SUPER HEAVY DUTY CYLINDER TYPE CAPACITOR (THREE-PHASE)								
Product Code	690 VAC Qn (kVAr)	660 VAC Qn (kVAr)	600 VAC Qn (kVAr)	Current (A) (690V,50Hz)	Operating Temperature(°C)	Capaticance (uF)	"Dimensions DxH (mm)"	Package Quantity
PTC-20-690	20,00	18,50	15,20	16,80	-25 ...+65	3x44,6	95x247	6
PTC-25-690	25,00	23,00	19,00	21,00	-25 ...+65	3x55,8	116x210	6
PTC-30-690	30,00	27,50	22,70	25,20	-25 ...+65	3x67	116x247	4

830V SUPER HEAVY DUTY CYLINDER TYPE CAPACITOR (THREE-PHASE)								
Product Code	830 VAC Qn (kVAr)	740 VAC Qn (kVAr)	690 VAC Qn (kVAr)	Current (A) (830V,50Hz)	Operating Temperature(°C)	Capaticance (uF)	"Dimensions DxH (mm)"	Package Quantity
PTC-20-830	20,00	15,90	13,80	14,00	-25 ...+65	3x30,8	95x247	6
PTC-30-830	30,00	23,80	20,80	21,00	-25 ...+65	3x46,2	116x247	4
PTC-40-830	40,00	31,80	27,70	28,00	-25 ...+65	3x61,6	136x247	4



Shunt reactors are devices that create an inductive effect. For this reason, they are also called 'Inductive Load Reactor' and are used for balancing (compensation) in systems with high capacitive-reactive energy.

Main reasons for capacitive-reactive effect in energy systems:

- In systems fed with very long energy cables such as TV-radio transmitters and radio base stations installed outside the city centers, the capacitive effect of the supply cables due to the low load capacity causes the system to overcompensate.
- A similar capacitive effect occurs in energy transmission lines and general energy distribution systems.
- Capacitive-reactive energy increases in the system as a result of excessive use of capacitor-containing electronic devices such as UPS and similar or excessive compensation in the facility.

Main problems caused by capacitive-reactive energy in energy systems

- Reactive energy causes fines to be paid,
- It reduces the efficiency and life of the energy system, equipment and machinery connected to the system,
- Causes less active energy power flow to the system
- It causes unwanted maintenance and repair costs in the energy system.

In order to eliminate these problems, it is necessary to connect a shunt reactor parallel to the system. Shunt reactors dampen the undesired capacitive effect by creating an inductive load, thus eliminating the above-mentioned problems.

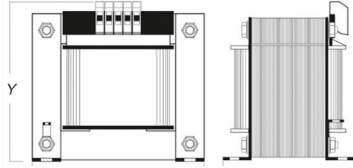
Shunt reactors are also used as an inductive load in electrical test systems and laboratories, in addition to compensation systems. We produce shunt reactors, which we produce at standard values, in different voltage and power values for the needs of the facility to be compensated. In order to establish a high quality compensation system for industrial facilities with high harmonic distortions, a harmonic analysis report and reactive load values of each phase must be reported.

ROUTINE TESTS (All or some of the following test types)

Routine product tests of our shunt reactors are carried out during the production phase as specified in the EN 61558 2-20 standard. Type product tests are carried out and delivered depending on customer demand.

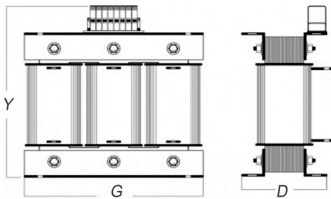
- Inductance Test
- Current Test
- Resistance Test
- Impact Resistance Test
- Insulation Strength Test
- Short Circuit Withstand Test
- Temperature Rise Test

Monophase Shunt Reactors (Un: 230V AC, Fn: 50 Hz)



Product Code	Product Description	Power (kVAr)	Voltage	A (In)	Ln (mH)	Thermal	Dimensions (mm)	Connection	Weight (kg)
PRMS-1	1 kVAr Monophase Shunt Reactor	1	230V	4,35	169	●	120x115x120	Terminal	5,2
PRMS-1,5	1,5 kVAr Monophase Shunt Reactor	1,5	230V	6,52	113	●	150x130x145	Terminal	8
PRMS-1,66	1,66 kVAr Monophase Shunt Reactor	1,66	230V	6,82	103	●	150x130x150	Terminal	8,3
PRMS-2,5	2,5 kVAr Monophase Shunt Reactor	2,5	230V	10,87	67,6	●	190x130x190	Terminal	12,6
PRMS-3	3 kVAr Monophase Shunt Reactor	3	230V	13,04	56,3	●	190x150x190	Terminal	15,6
PRMS-3,3	3,3 kVAr Monophase Shunt Reactor	3,3	230V	14,4	50,5	●	190x150x190	Terminal	15,7
PRMS-5	5 kVAr Monophase Shunt Reactor	5	230V	21,74	33,8	●	190x200x185	Lug	26,8
PRMS-6,67	6,67 kVAr Monophase Shunt Reactor	6,67	230V	30	28,5	●	235x140x310	Lug	27
PRMS-7,5	7,5 kVAr Monophase Shunt Reactor	7,5	230V	32,61	22,5	●	235x140x310	Lug	27,7
PRMS-10	10 kVAr Monophase Shunt Reactor	10	230V	43,48	16,9	●	235x140x310	Lug	30

Three Phase Shunt Reactors (Un: 400V AC, Fn: 50 Hz)



Product Code	Product Description	Power (kVAr)	Voltage	A (In)	Ln (mH)	Thermal Protection	Dimensions (mm)	Connection	Weight (kg)
PRTS-1	1 kVAr Three Phase Shunt Reactor	1	400V	1,45	505	●	175x75x140	Terminal	5,38
PRTS-1,5	1,5 kVAr Three Phase Shunt Reactor	1,5	400V	2,17	337	●	185x100x175	Terminal	7,36
PRTS-2,5	2,5 kVAr Three Phase Shunt Reactor	2,5	400V	3,61	203	●	240x100x230	Terminal	11,48
PRTS-3	3 kVAr Three Phase Shunt Reactor	3	400V	4,33	168	●	280x125x255	Terminal	14,74
PRTS-5	5 kVAr Three Phase Shunt Reactor	5	400V	7,22	101	●	300x125x310	Terminal	22,4
PRTS-7,5	7,5 kVAr Three Phase Shunt Reactor	7,5	400V	10,9	67,3	●	300x150x320	Terminal	29,46
PRTS-10	10 kVAr Three Phase Shunt Reactor	10	400V	14,4	50,5	●	360x160x320	Lug	37,38
PRTS-15	15 kVAr Three Phase Shunt Reactor	15	400V	21,7	33,7	●	360x170x320	Lug	53
PRTS-20	20 kVAr Three Phase Shunt Reactor	20	400V	28,9	25,3	●	415x170x370	Lug	70,5
PRTS-30	30 kVAr Three Phase Shunt Reactor	30	400V	43,3	16,8	●	480x235x420	Lug	104,3

General Specifications Table

Production Standards	EN 61558-1, EN 61558 2-20, EN 60289 and EN60076-6 CE Certificated
Rated Powers	Single phase 0,10 - 10 kVAr or three phase 0,5 - 100 kVAr production
Rated Voltage	230 VAC 1000 VAC
Rated Frequency	50 Hz (60 Hz Optional)
Reactor Factor	p= % 100
Inductivity Tolerance	5%
Magnetic Circuit	High magnetic permeability 0.35 mm silica lamination
Windings	Electrolytic copper or aluminum coil wire - foil
Design	Air gap design
Connection	Transformer terminal, Rail terminal, SKP lug, Copper busbar
Protection (Electrical)	Thermal protection against overheating
Protection Class	IP00 (Installation in a cabinet suitable for the desired protection class upon request)
Insulation Class	Class 1, optionally F 155 °C or H 180 °C
Preservation	Varnish under vacuum, class f or h, upon request
Relative Humidity	%90 Non-condensing (DIN 40040)
Operating Altitude	0 - 2000 m
Operating Environment Temperature	-10 °C +40 °C
Storage Temperature	-10 °C +70 °C
Production Suitable for Needs	Design according to the voltage and power rating of your energy system



Harmonic distortions caused by non-linear loads in energy systems cause serious problems in industrial facilities. The causes of harmonic distortions and the problems that are frequently encountered due to these distortions are summarized below;

CAUSES OF HARMONIC DISORDERS

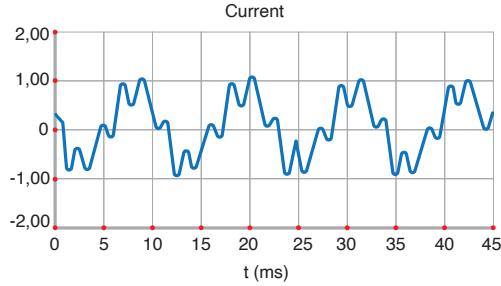
The source of harmonic distortions occurring in THD, that is, voltage and current, are non-linear loads;

- Uninterruptible power supplies
- Motor starters
- Motor drivers
- Speed controllers
- Computer and electronic lighting
- Welding machines
- Power electronics converters
- Rectifiers

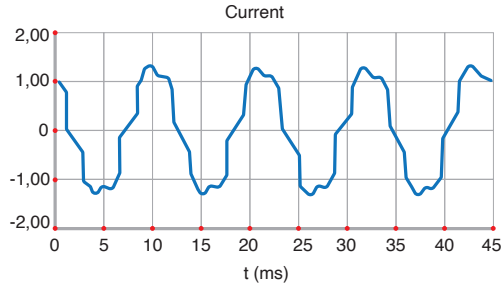
MAIN FAULTS CAUSED BY HARMONIC DISORDERS;

- Heating in electromechanical devices and cables
- Mechanical vibrations (vibration) in machines
- Abnormal operation of ignition circuits
- Voltage spikes
- Punctures in cables and other electromechanical devices due to high voltage
- Malfunctions in electronic cards, devices and computers
- Power losses, ruptures and explosions in power capacitors
- Trips in compensation fuses
- Unexplained trips in breakers and switches
- Distortion and abnormal operation of relay signals
- Energy losses

Current harmonics in compensation system without harmonic filter



Harmonic changes in compensation system with harmonic filter



The minimum information you need to convey to our company so that we can respond to your harmonic filter requests;

- Mains voltage
- Resonant frequency (134, 189, 210 Hz)
- Capacitor powers and voltage values.

ROUTINE TESTS

All routine tests specified in the standards are performed and offered to customers. Type tests are carried out upon customer request.

- Inductance Test
- Current Test
- Resistance Test
- Impact Resistance Test
- Insulation Strength Test
- Short Circuit Withstand Test
- Temperature Rise Test

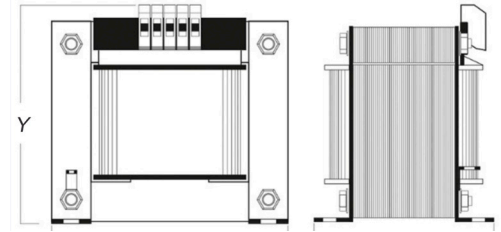
Particular attention should be paid to the selection of filters and capacitors in the filter compensation systems to be installed in order to correct harmonic distortions. The design of harmonic filters is made according to factors such as resonance frequency (mostly 134, 189, 210 Hz), capacitor power and capacitor voltage.

A higher voltage is output from the harmonic filters compared to the mains voltage. Considering that the voltage value is higher than normal especially in organized industrial zones during the night, pay attention to the high voltage values of the capacitors to be installed in the system.

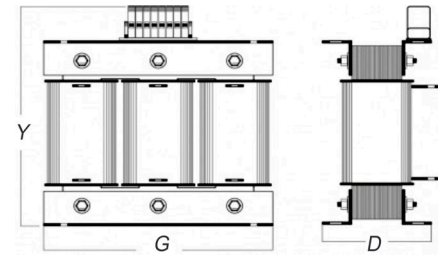
Do not forget that the resonance frequency of the system will shift and the performance will decrease when capacitors with different values of voltage and power are connected to the harmonic filters. For this reason, take care to use filters designed according to the power and voltage values of the capacitors.

Harmonic filters cause an increase in temperature inside the panel. For this reason, make sure that the panels are made in such a way as to provide sufficient air flow. In harmonic filter compensation systems, the final power will be different from the sum of the capacitor power values. For this reason, do not forget to take into account harmonic filters while calculating power in order not to make incomplete compensation.

Production Standards	EN 61558-1, EN 61558 2-20, EN 60289 and EN60076-6 CE Certificated
Design	Air gap design
Rated Powers	Single-phase 0.10 - 10 kVAr or three-phase 0.5 - 100 kVAr generation
Rated Voltage	230 VAC 1000 VAC
Rated Frequency	50 Hz (60 Hz Optional)
Resonant Frequency	134 Hz p= %14 189 Hz p= % 7 210 Hz p=%5,67
Inductive Tolerance	± % 3
Linearity	1,6 In 2,2 In
Magnetic Circuit	High magnetic permeability 0.35 mm silica lamination
Windings	Electrolytic copper or aluminum coil wire - foil
Connection	Transformer terminal, Rail terminal, SKP lug, Copper busbar
Protection (Electrical)	90 °C 1 NK contact thermistor
Protection Class	IP00
Insulation Test Voltage	3000 VAC (Between the windings and the sheet core)
Insulation Class	Class 1, optionally F 155 °C or H 180 °C
Thermal Class	Ta 55 °C / F or Ta 60 °C / H
Preservation	Varnish under vacuum, class f or h, upon request
Cooling	Natural
Relative Humidity	%95 Non-condensing (DIN 40040)
Operating Altitude	0 - 2000 m
Operating Environment Temperature	-10 °C +40 °C
Storage Temperature	-10 °C +70 °C
Production Suitable for Needs	Design according to the voltage and power rating of your energy system


Monophase Harmonic Filter P:%7 189 Hz

Product Code	Product Description	Power (kVAr)	Voltage	A (In)	Ln (mH)	Thermal Protection	Resonant Frequency	P Factor	Dimensions (mm)	Connection	Weight (kg)
PRMH-0,55-07	0,55 kVAr Single Phase Harmonic Filter	0,55	230V	2,53	25,3	●	189 Hz	%7	80x70x85	Terminal	0,9
PRMH-0,83-07	0,83 kVAr Single Phase Harmonic Filter	0,83	230V	3,69	17,4	●	189 Hz	%7	85x85x85	Terminal	1,3
PRMH-1-07	1 kVAr Single Phase Harmonic Filter	1	230V	4,61	13,9	●	189 Hz	%7	85x85x90	Terminal	1,52
PRMH-1,5-07	1,5 kVAr Single Phase Harmonic Filter	1,5	230V	6,91	9,28	●	189 Hz	%7	85x90x90	Terminal	1,82
PRMH-2,5-07	2,5 kVAr Single Phase Harmonic Filter	2,5	230V	11,52	5,57	●	189 Hz	%7	95x95x100	Terminal	2,46
PRMH-3-07	3 kVAr Single Phase Harmonic Filter	3	230V	13,83	4,64	●	189 Hz	%7	100x100x100	Terminal	4
PRMH-5-07	5 kVAr Single Phase Harmonic Filter	5	230V	23,04	2,78	●	189 Hz	%7	120x120x120	Terminal	5,18
PRMH-7,5-07	7,5 kVAr Single Phase Harmonic Filter	7,5	230V	34,57	1,85	●	189 Hz	%7	145x120x130	Terminal	8
PRMH-10-07	10 kVAr Single Phase Harmonic Filter	10	230V	46,09	1,39	●	189 Hz	%7	150x120x140	Lug	9,34


Three-Phase Harmonic Filter P:%7 189 Hz

Product Code	Product Description	Power (kVAr)	Voltage	A (In)	Ln (mH)	Thermal Protection	Resonant Frequency	P Factor	Dimensions (mm)	Connection	Weight (kg)
PRTH-1-07	1 kVAr Three Phase Harmonic Filter	1	400V	1,53	38,35	●	189 Hz	%7	120x65x125	Terminal	1,46
PRTH-1,5-07	1,5 kVAr Three Phase Harmonic Filter	1,5	400V	2,38	25,6	●	189 Hz	%7	120x70x125	Terminal	1,56
PRTH-2,5-07	2,5 kVAr Three Phase Harmonic Filter	2,5	400V	3,83	15,84	●	189 Hz	%7	120x75x125	Terminal	2,1
PRTH-4-07	4 kVAr Three Phase Harmonic Filter	4	400V	6,12	9,59	●	189 Hz	%7	175x85x150	Terminal	3,6
PRTH-5-07	5 kVAr Three Phase Harmonic Filter	5	400V	7,65	7,67	●	189 Hz	%7	175x85x150	Terminal	3,76
PRTH-6,25-07	6,25 kVAr Three Phase Harmonic Filter	6,25	400V	9,56	6,14	●	189 Hz	%7	175x85x150	Terminal	4,6
PRTH-7,5-07	7,5 kVAr Three Phase Harmonic Filter	7,5	400V	11,48	5,11	●	189 Hz	%7	175x85x150	Terminal	4,8
PRTH-10-07	10 kVAr Three Phase Harmonic Filter	10	400V	15,3	3,83	●	189 Hz	%7	190x100x200	Busbar	5,26
PRTH-12,5-07	12,5 kVAr Three Phase Harmonic Filter	12,5	400V	19,13	3,07	●	189 Hz	%7	180x110x200	Busbar	6,62
PRTH-15-07	15 kVAr Three Phase Harmonic Filter	15	400V	22,95	2,56	●	189 Hz	%7	185x110x200	Busbar	6,82
PRTH-20-07	20 kVAr Three Phase Harmonic Filter	20	400V	30,6	1,92	●	189 Hz	%7	185x120x200	Busbar	8,34
PRTH-25-07	25 kVAr Three Phase Harmonic Filter	25	400V	38,25	1,53	●	189 Hz	%7	240x120x210	Busbar	11,86
PRTH-30-07	30 kVAr Three Phase Harmonic Filter	30	400V	45,9	1,28	●	189 Hz	%7	240x120x210	Busbar	12,46
PRTH-40-07	40 kVAr Three Phase Harmonic Filter	40	400V	61,2	0,96	●	189 Hz	%7	280x150x240	Busbar	18,2
PRTH-50-07	50 kVAr Three Phase Harmonic Filter	50	400V	76,5	0,77	●	189 Hz	%7	280x170x240	Busbar	21,2
PRTH-60-07	60 kVAr Three Phase Harmonic Filter	60	400V	91,8	0,64	●	189 Hz	%7	300x130x250	Busbar	23,5
PRTH-75-07	75 kVAr Three Phase Harmonic Filter	75	400V	119	0,51	●	189 Hz	%7	200x150x250	Busbar	29,5
PRTH-100-07	100 kVAr Three Phase Harmonic Filter	100	400V	153	0,38	●	189 Hz	%7	360x160x300	Busbar	39,6



Halkapınar Mah. 1203/11. Sk. Megapol Çarşı Kule

No:5-7 Daire:96 35170 Konak/İzmir

Tel: 0232 683 24 44

www.provar.com.tr



Innovative grid technologies

27012023.REV.2