POLTECHNIK

ELEKTROTECHNIKA PRZEMYSŁOWA

Klemsan®

AUTOMATION
CATALOGUE

KLEMSAN Automation

Klemsan Automation, supported by an experienced sales and technical team and an easy-to use software, is the adaptable alternative for any automation solution.
Klemsan Automation is the perfect solution for any customized or demanding need.
These products are specifically suited for integration in a wide range of applications such as waste and water treatment, access control, renewable energies, building equipment, industrial machines and transportation.

Made in **Turkey**

We build the best automation products on the market right here in the Turkey and we stand behind them. We will outlast and outperform anyone on the market, and support to improve your system.

100%
Customer
Satisfaction

Save your time and energy with fast response

Logistics and After Sales Service

Maximum dependability

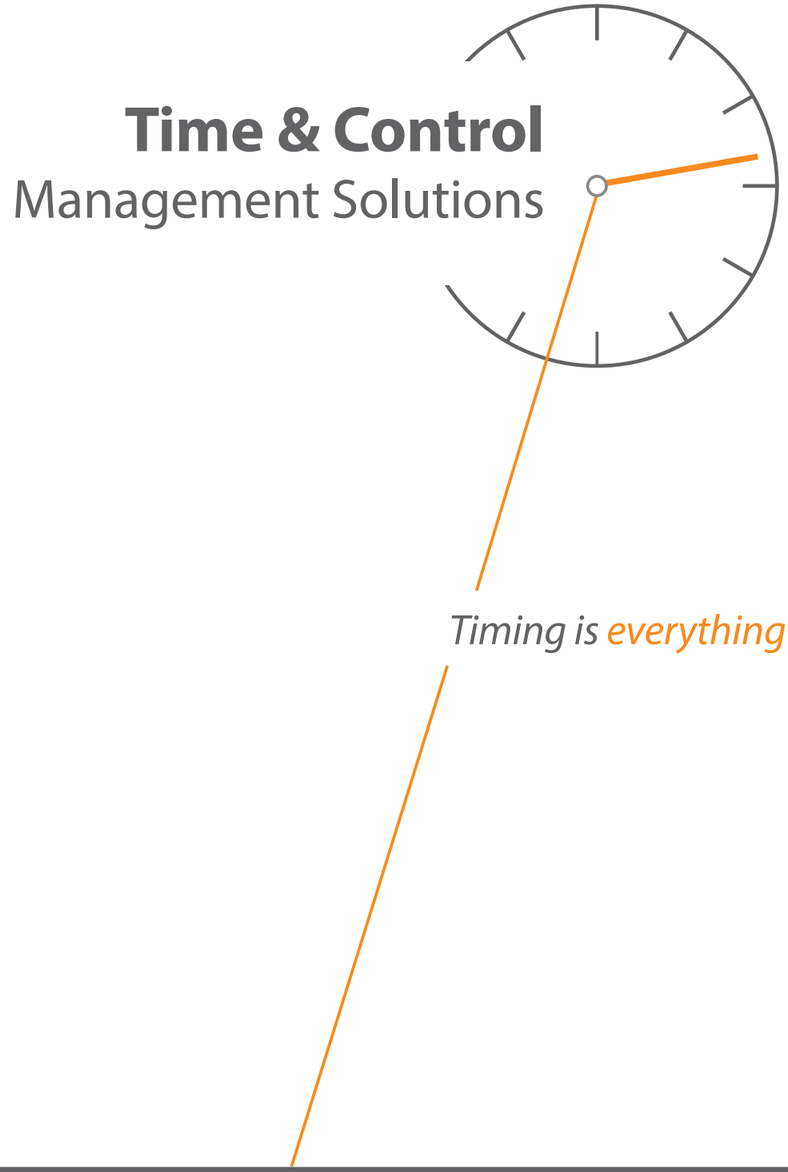
Simple and effective functions suitable for your application

Analysis of customer requirements

Behind every project technologies and expertise

OHSAS 18001-2007
ISO 9001
ISO 50001
ISO 14001

contents


Time & Control
Management Solutions
Timing is everything

Defining a timer in simple terms

A timer is an automation device that either keeps track of how much time has been spent doing something or that counts down a specified duration of time. After a predefined time has elapsed, the timer closes or opens its contact.

Which actions are executed?

Starting
Stopping
Delaying
Triggering

A timer can be used to start an action according to a predefined time or stop an action over a period of time. It can also add delay an action. It allows to control applications with its trigger input as well.

Which markets are they used frequently?

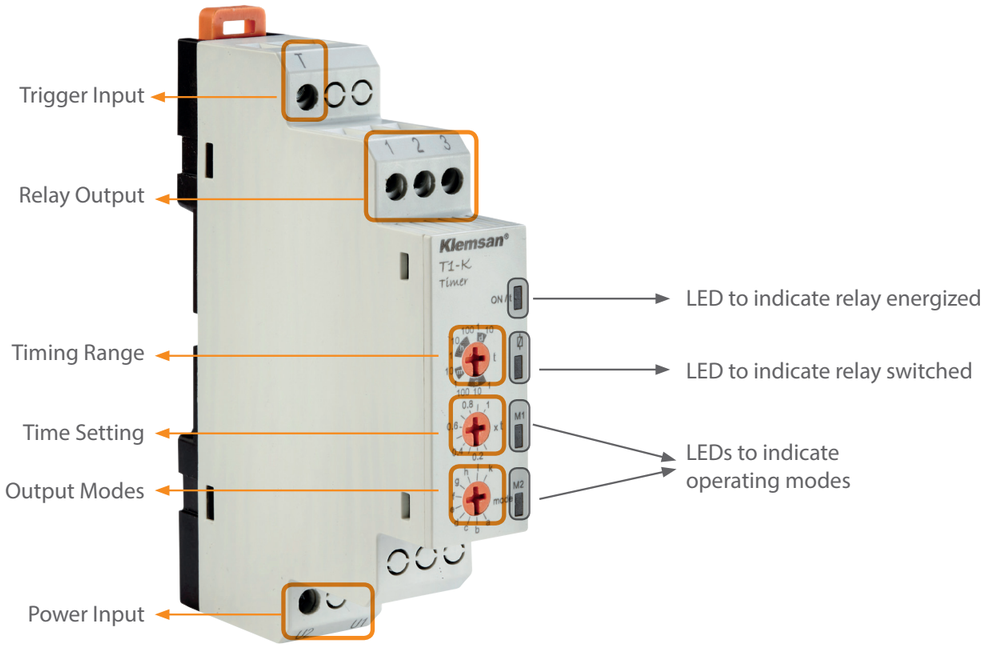
- Industrial Machines
- Illuminating
- Construction industry
- HVAC systems
- Food and agriculture industry

Benefits and Advantages

- High accuracy and switching reliability
- Sensitive timing range from 0.1sec to 10days
- High mechanical endurance
- Multifunctional operating modes
- Trigger input
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- A widely range of power supply from (24 to 300VAC/DC)
- Sleek 17.5mm wide housing and compact design saves panel space.
- Perfect to fit in Modular Enclosure
- Protection against over voltage and reverse polarity
- Self-Extinguishing plastic housing

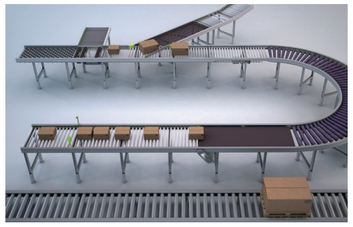
Layout & Mounting

Klemsan electronic timers are suitable for snap mounting onto 35 mm standards DIN rails.



T1-K Multifunctional Timer

Conveyor Control



Managing the operation of a conveyor belt based on the time interval between products on the belt.

Timer
T1 series

Smart Lighting

Controlling flashing on lighted signs.

Timer
T1-Flash, T1-M4, T1-M5

Remote Machinery Control

Managing maintenance of the power supply in the event of a mains power failure, switching on an external backup power source for a given time.

Timer
T1 series

Vending Machines

Automatic management of vending machines.

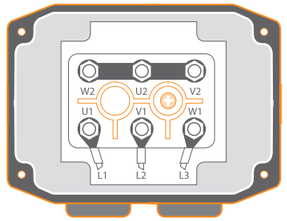
Timer
T1-K

Direction Control of Industrial Motor

Controls the direction of the motor's rotation.

TIMER
T1-LR

Star-Delta Starter



Succesfull run-up for industrial motors with star-delta relay.

Motor Starter Relay
SD1

Controlling Liquid Level in a Tank

It can be used to control the liquid level in a tank. Sensitivity resistance can be adjusted thus there is no need to change models to match different liquid types and concentrations.

Liquid Level Controller
LC3

Billboard and Street Lighting

Controlling billboards and street lights with the accurate and precise time thanks to photocell relay.

Photocell Relay
PH1-20L

Packing Machine / System

Controlling heat sealing times on blister packs, packaging bags, etc.

Timer
T1-K, T1-M5, T1-M4

Meastro astronomical relay

MEASTRO is an astonomic time relay which calculates sunrise and sunset times for the given coordinates or city selections and turns the relay contacts on and off to control connected systems without any need of photocells or external sensors. Meastro can be used as digital time relay as well.

Which actions are executed?

Thanks to the MAESTRO infrared port and remote control, the program, time, location and prayer information prepared by the computer is transferred within seconds.

MAESTRO controls devices connected to relay outputs according to user -programmed hours, sunrise and sunset times.

Street lighting, mosque lighting and air conditioning by controlling the astronomical time clock provides energy savings.

Infrared
energy savings
100 programming memories
user interface software prayer times

It has a total of 100 programming memories for 2 contactst

With the user interface software you can program your program
much faster. You can also double your speed with the control that provides infrared data transfer from the device to the controller or from the controller to the device bidirectionally.

It calculates prayer times according to the province-district or coordinate information you have set.

Which markets are they used frequently?

- Street lighting
- Site lighting
- University and college
- Mosquie lighting and conditioning systems.
- Parks, gardens and farm irrigation
- ATM's, shop windows, advertising boards, lighting

Benefits and Advantages

- Fast programming with user interface program and infrared control
- 7 year battery reserve time
- 100 programming memories
- High electromagnetic compatibility (EMC) and maximum resistance to electromagnetic noise
- User-friendly menu structure
- Perfect fit with the modular panel
- High mechanical strength
- Self-extinguishing plastic outer structure

Layout & Mounting

Klemsan astronomic timers are suitable for snap mounting onto 35 mm standards DIN rails.

MEASTRO 321

Street Lighting

In open areas such as streets, streets, parks and gardens, in closed areas such as universities, schools and buildings where lighting elements need to be turned on and off in certain periods, v astronomical time relay is used independent of human power. Meastro, which calculates the change of the sunrise and sunset time over the next 100 years, saves energy. In addition, different programs according to the days of the week, the lighting system provides periodic control.

Astronomical Timer
MEASTRO 221
MEASTRO 321

ATM, Store Showcase, Billboards Lighting

ATMs, showcase, billboards and many more areas are used MEASTRO with the aim of saving energy.

Astronomical Timer
MEASTRO 221
MEASTRO 321

Park, Garden and Field Irrigation

The control of the water pumps to be operated in agricultural areas, park or garden irrigation systems before one or more times a day is determined easily by the programming of the MEASTRO 110 astronomical time relay.

Astronomical Timer
MEASTRO 110
MEASTRO 120
MEASTRO 121
MEASTRO 221
MEASTRO 321

Mosque, Site Lighting and Air Conditioning

Control panels must be monitored carefully otherwise the effects of a power outage or voltage drop can be highly harmful for equipments.

Astronomical Timer
MEASTRO 321

Digital Timer

MAESTRO also has models that are independent of the astronomical time, and can only be used as digital time relays on the days and times set by the user.

Digital Timer
MEASTRO 110
MEASTRO 210

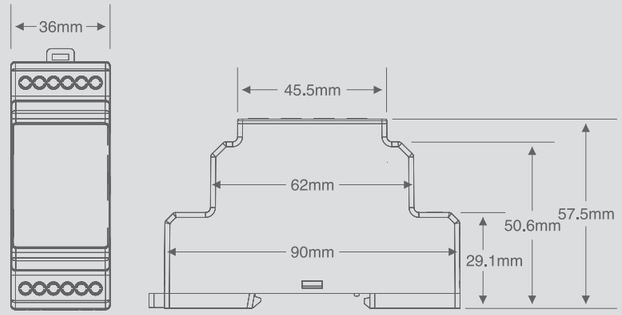
MEASTRO-R
Infrared Controller

Order Number: 270 720



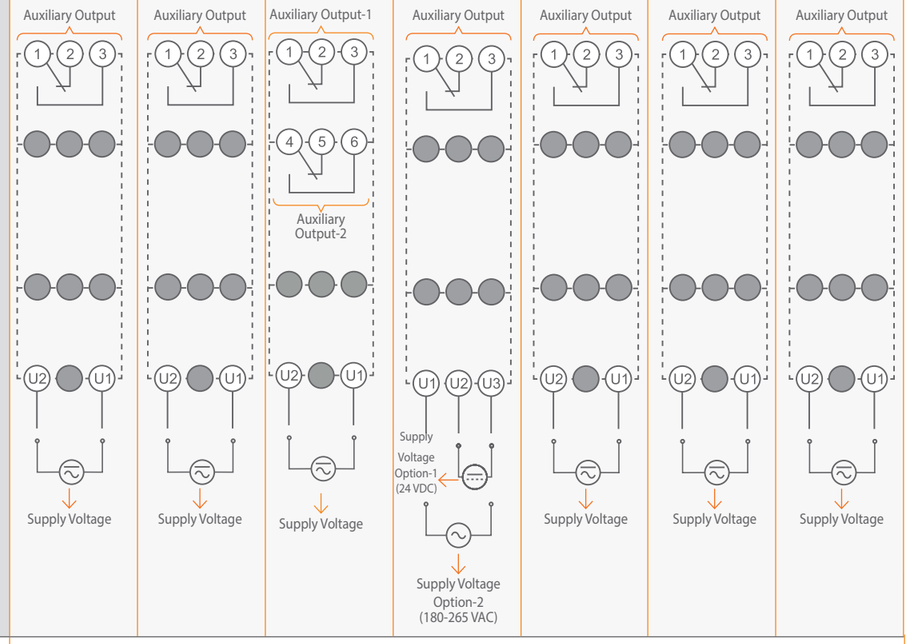
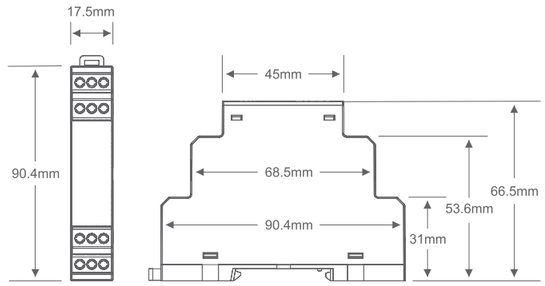


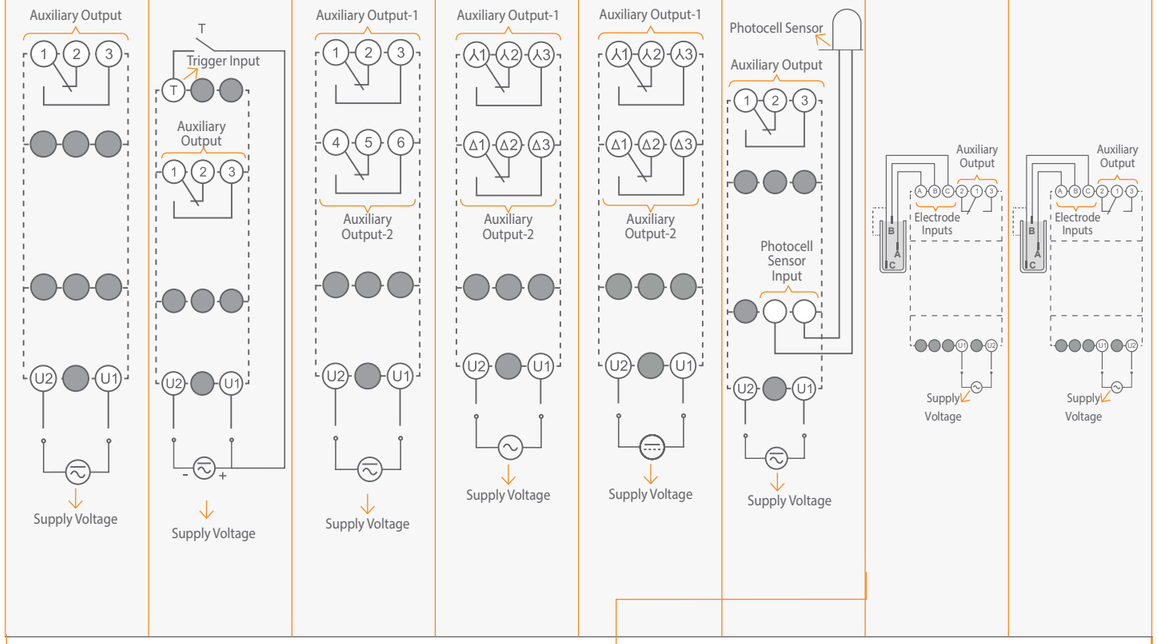
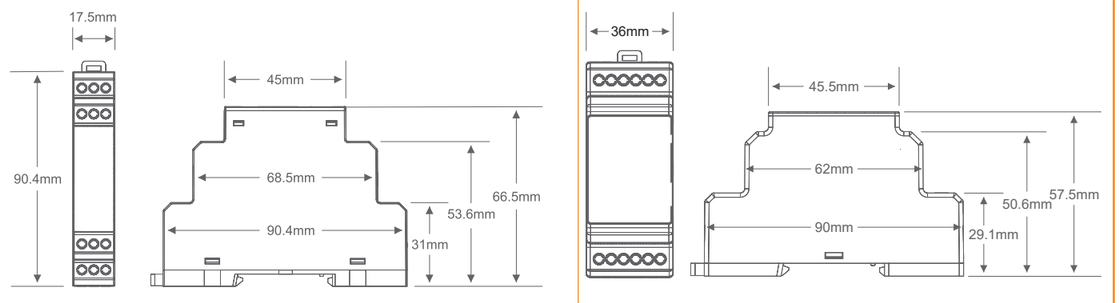
Type		MEASTRO110	MEASTRO120	MEASTRO121	MEASTRO221	MEASTRO321
Definition		Digital Timer	Digital Timer	Astronomical Timer	Astronomical Timer	Astronomical Timer
Order Number		270 700	270 701	270 702	270 703	270 704
Casing Width(mm)		36mm	36mm	36mm	36mm	36mm
Connections		Screw Terminal	Screw Terminal	Screw Terminal	Screw Terminal	Screw Terminal
Mounting		Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount
Functions	Digital time clock	√	√	√	√	√
	Astronomical time clock	-	-	-	√	√
	Prayer program	-	-	-	-	√
	Infrared	-	-	√	√	√
	Programming with controller	-	-	√	√	√
Display	Type	LCD	LCD	LCD	LCD	LCD
	Dimensions	1.5	1.5	1.5	1.5	1.5
	Renewal time	0.5sec	0.5sec	0.5sec	0.5sec	0.5sec
Number of Program		100	100	100	100	100
Infrared Distance		550 mm	550 mm	550 mm	550 mm	550 mm
Accuracy		±1sec/day	±1sec/day	±1sec/day	±1sec/day	±1sec/day
Battery Life		7 years	7 years	7 years	7 years	7 years
Type of Output		Relay	Relay	Relay	Relay	Relay
Relay Outputs	Number of Contacts	1	2	2	2	2
	Type	1 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)
	Max. Ratings -AC	16A / 250VAC	16A / 250VAC	16A / 250VAC	16A / 250VAC	16A / 250VAC
	Max. Switching Power	1250VA	1250VA	1250VA	1250VA	1250VA
	Mechanical Life Time	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7
	Electrical Life Time	5x10^4	5x10^4	5x10^4	5x10^4	5x10^4
Supply Voltage	Supply Voltage DC	-	-	-	-	-
	Supply Voltage AC	165…265 V AC	165…265 V AC	165…265 V AC	165…265 V AC	165…265 V AC
	Supply Frequency	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Permissible Ambient Temperature	During Operation	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C
	During Storage	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Operating Frequency		35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Degree of Protection		IP20	IP20	IP20	IP20	IP20
Power Consumption	DC	-	-	-	-	-
	AC	<11VA	<11VA	<11VA	<11VA	<11VA

Type	MEASTRO110	MEASTRO120	MEASTRO121	MEASTRO221	MEASTRO321
Schematics					
Dimensional Drawings					

Type		T1-30S	T1-60S	T1-60S2	T1-100S	T1-XS	T1-FLASH	T1-M4
Timing Function		Single-functional	Single-functional	Single-functional	Single-functional	Single-functional	Single-functional	Multifunctional
Definiton		On delay timer	On delay timer	2C/O On delay timer	On delay timer	On delay timer	Off flasher timer	Multimode timer
Order Number		270 363	270350	270 352	270359	270357	270351	270355
Casing Width(mm)		17,5	17.5	17,5	17.5	17.5	17.5	17.5
Connections		Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Functions		ND	ND	ND	ND	XS	Foff	ND, FD, Fon, Foff
Type of Output		Relay	Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary contacts	Type	1 C/O (SPDT)	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
	Max ratings-AC (for NO side)	10A/250V; 1250 VA	5A/250V; 1250 VA	10A/250V; 1250 VA	5A/250V; 1250 VA	5A/250V; 1250 VA	5A/250V; 1250 VA	5A/250V; 1250 VA
	Max ratings-DC (for NO side)	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
	Mechanical life time	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
	Electrical life time operations (for NO side)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)
Adjustment of Timing-1 & Timing-2		-	-	-	-	-	independent	independent
Time Range	Timing-1	1sec=>30sec	1sec =>60sec	1sec=>60sec	1sec =>100sec	1sec =>2559sec	0.1sec =>10days	1sec =>10days
	Timing-2	-	-	-	-	-	0.1sec =>10days	1sec =>10days
Lux adjustment range			-		-	-	-	-
Sensitivity adjustment range			-		-	-	-	-
Supply Voltage	DC	24-300 VDC	24-300 VDC	24-300 VDC	24VDC	24-300 VDC	24-300 VDC	24-300 VDC
	AC	24-300 VAC	24-300 VAC	24-300 VAC	24VAC or 180-265 VAC	24-300 VAC	24-300 VAC	24-300 VAC
Supply Frequency		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
Trigger Input Voltage		-	-	-	-	-	-	-
Permissible ambient temperature	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation
Recovery time		Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20	IP20

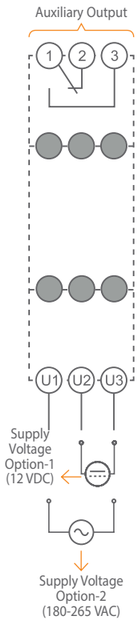
T1-M5	T1-K	T1-LR	SD1	SD1-24	PH1-20L	LC3	LC3-T
Multifunctional	Multifunctional	Single-functional	Single-functional	Single-functional	Single-functional	Single-functional	Single-functional
Multimode timer	Multimode timer with trigger input	Left-right timer	Star-delta timer	Star-delta timer	Photocell relay with an external photocell sensor	Liquid level controller	Liquid level controller
270353	270354	270356	270358	270362	270050	270001	270 002
17.5	17.5	17.5	17.5	17.5	17.5	36	36
Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
ND, FD, NFD, Fon, Foff	a, b, c, d, e, f, g, h, i, k	LR	SD	SD	PHL	LC	LC
Relay	Relay	Two Relays	Two Relays	Relay	Relay	Relay	Relay
1 C/O (SPDT)	1 C/O (SPDT)	2 x C/O	2 x C/O	2 x C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
5A/250V; 1250 VA	5A/250V; 1250 VA	5A/250V; 1250 VA	5A/250V; 1250 VA	10A/250V; 1250 VA	5A/250V; 1250 VA	5A/250V; 1250 VA	10A/250V; 1250 VA
5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^4(5A@30VDC)
dependent	-	independent	independent	independent	independent	-	-
0.1sec =>10days	0.1sec =>10days	0.1sec =>10days	1sec =>30sec	1sec =>30sec	1sec =>45sec	0.1sec =>1sec	-
0.1sec =>10days	-	0.1sec =>10days	20msec=>500msec	20msec=>500msec	20msec1sec=>45sec	-	-
-	-	-	-	-	1-20Lux	-	-
-	-	-	-	-	-	5-100kΩ	2.5 .. 50KΩ
24-300 VDC	24-300 VDC	24-300 VDC	-	24-300 VDC	24-300 VDC	-	-
24-300 VAC	24-300 VAC	24-300 VAC	150-500 VAC	24-300 VAC	24-300 VAC	150-500 VAC	185 .. 265V AC
35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	50-60Hz
-	24-300 VAC/DC	-	-	-	-	-	-
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation	Max. 95% no condensation
Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec
IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20

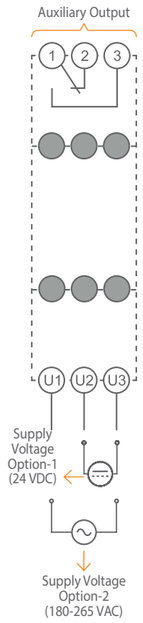
Type			T1-30S	T1-60S	T1-60S2	T1-100S	T1-XS	T1-FLASH	T1-M4
Power consumption	DC		<2W	<1.25W	<2W	<1W	<1.25W	<1.25W	<1.25W
	AC		<3,5VA	<2.5VA	<3,5VA	<13VA	<2.5VA	<2.5VA	<2.5VA
Weight(gr)			66	57	66	57	62	60	60
Permissible mounting position			any	any	any	any	any	any	any
Accessories		Definiton	-	-	-	-	-	-	-
		Order Number	-	-	-	-	-	-	-
		Packaging unit	-	-	-	-	-	-	-
Schematics									
Dimensional Drawings									

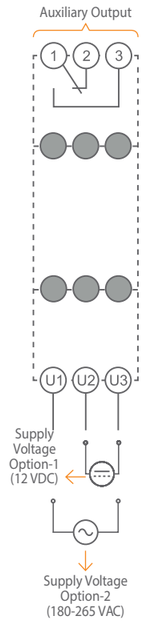
T1-M5	T1-K	T1-LR	SD1	SD1-24	PH1-20L	LC3	LC3-T
<1.25W	<1.25W	<1.25W	<1.25W	<1.25W	<1.25W	-	-
<2.5VA	<2.5VA	<2.5VA	<2.5VA	<2.5VA	<2.5VA	<7VA	<7VA
60	66	70	70	70	63	82	82
any	any	any	any	any	any	any	any
-	-	-	-	-	-	Liquid Level probe for LC3	Liquid Level probe for LC3
-	-	-	-	-	-	280610	280610
-	-	-	-	-	-	1 pc.	1 pc.
							
							

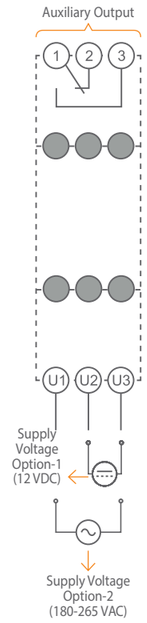
					
Type		**Z1-60S**	**Z1-100S**	**Z1-XS**	**Z1-FLASH**
Timing Function		Single-functional	Single-functional	Single-functional	Single-functional
Def initon		On delay timer	On delay timer	On delay timer	Off flasher timer
Order Number		270 370	270 379	270 377	270 371
Casing Width(mm)		17,5	17,5	17,5	17,5
Connections		Screw terminal	Screw terminal	Screw terminal	Screw terminal
Functions		ND	ND	XS	Foff
Type of Output		Relay	Relay	Relay	Relay
Auxiliary contacts	Type	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
	Max ratings-AC	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
	Max ratings-DC	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
	Mechanical life	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7
	Electrical life	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)
Adjustment of Timing-1 & Timing-2		-	-	-	independent
Time Range	Timing-1	1sec=>60sec	1sec=>100sec	1sec =>2559sec	0.1sec =>10days
	Timing-2	-	-	-	0.1sec =>10days
Lux adjustment range		-	-	-	-
Sensitivity adjustment range		-	-	-	-
Supply Voltage	DC	12VDC	24VDC	12VDC	12VDC
	AC	12VAC or 180..265V AC	24VAC or 180..265V AC	12VAC or 180..265V AC	12VAC or 180..265V AC
Supply Frequency		50-60Hz	50-60Hz	50-60Hz	50-60Hz
Trigger Input Voltage		-	-	-	-
Permissible Ambient Temperature	During Operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During Storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Recovery time		Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec
Degree of protection		IP20	IP20	IP20	IP20
Power consumption	DC	<1.25W	<1.25W	<1.25W	<1.25W
	AC	<2.5VA	<2.5VA	<2.5VA	<2.5VA
Weight(gr)		60	60	60	60

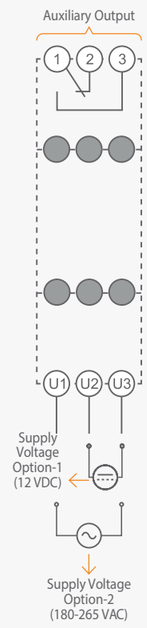
				
Z1-M4	**Z1-M5**	**Z1-K**	**Z1-LR**	**ZD1**
Multifunctional	Multifunctional	Multifunctional	Multifunctional	Single-functional
Multimode timer	Multimode timer	Multimode timer with trigger input	Left-right timer	Star-delta timer
270 375	270 373	270 374	270 376	270 378
17,5	17,5	17,5	17,5	17,5
Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
ND,FD,Fon,Foff	ND,FD,NFD,Fon,Foff	a,b,c,d,e,f,g,h,i,k	LR	SD
Relay	Relay	Relay	Relay	Relay
1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	2 x C/O (SPDT)	2 x C/O (SPDT)
10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7
5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)
independent	independent	independent	independent	independent
0.1sec =>10days	0.1sec =>10days	0.1sec =>10days	0.1sec =>10days	1sec =>30sec
0.1sec =>10days	0.1sec =>10days	-	0.1sec =>10days	20msec=>500msec
-	-	-	-	-
-	-	-	-	-
12VDC	12VDC	12VDC	12VDC	12VDC
12VAC or 180..265V AC	12VAC or 180..265V AC	12VAC or 180..265V AC	12VAC or 180..265V AC	12VAC or 180..265V AC
50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz
-	-	12VAC/DC veya 180..265V AC	-	-
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec	Max. 100msec
IP20	IP20	IP20	IP20	IP20
<1.25W	<1.25W	<1.25W	<1.25W	<1.25W
<2.5VA	<2.5VA	<2.5VA	<2.5VA	<2.5VA
60	60	60	60	60

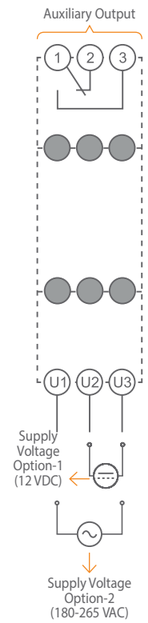


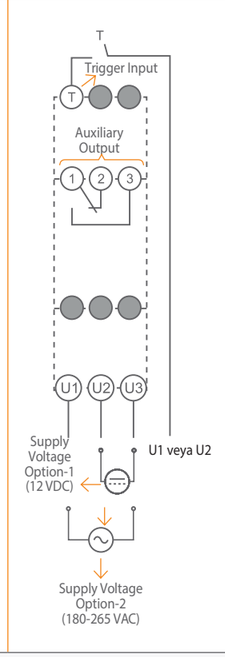


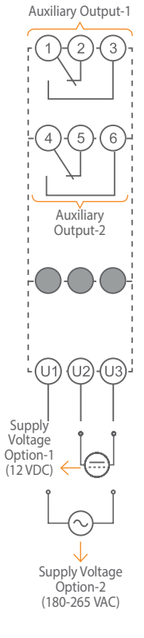


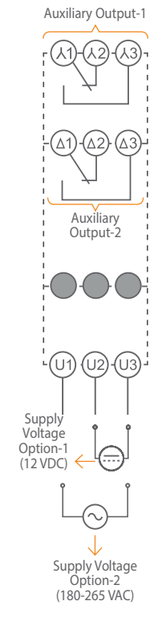


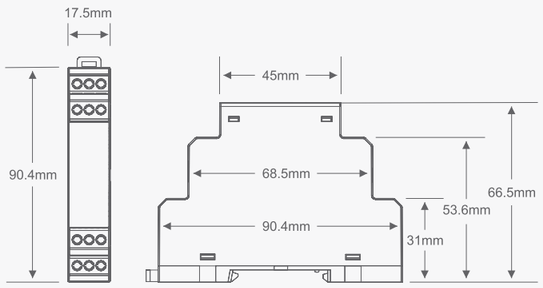


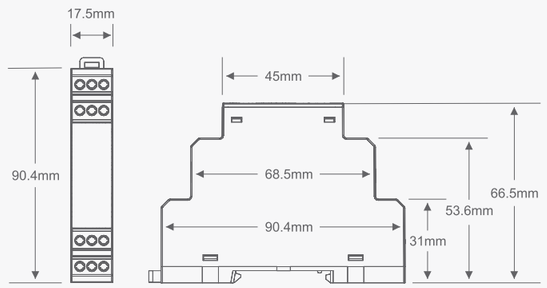


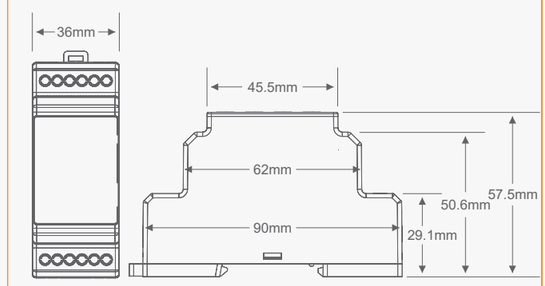










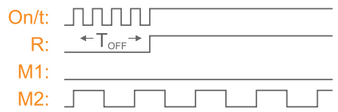


Type	Z1-60S	Z1-100S	Z1-XS	Z1-FLASH
Permissible mounting position	any	any	any	any
Schematics				
Dimensional Drawings				

Z1-M4	Z1-M5	Z1-K	Z1-LR	ZD1
any	any	any	any	any

a & ND functions / On delay operation

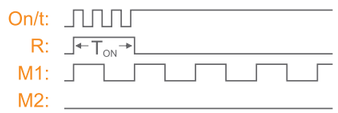
Figure and LED Indication



The output relay is initially de-energized and energized after an adjustable time delay, t_{off} .

b & FD functions / Off delay operation

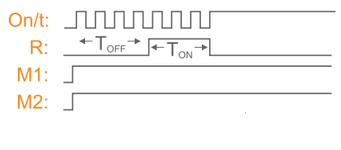
Figure and LED Indication



The output relay is initially energized and de-energized after an adjustable time delay, t_{on} .

NFD function / On-Off delay operation

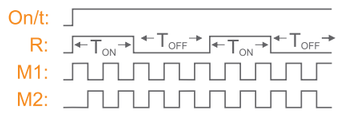
Figure and LED Indication



The output relay is initially de-energized and energized after an adjustable time delay, t_{off} and stays energized for an adjustable period, t_{on} and then de-energized.

Fon function / On flasher operation

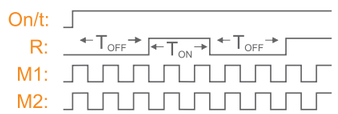
Figure and LED Indication



The output relay is initially energized and de-energized after an adjustable time delay, t_{on} and stays de-energized for an adjustable period, t_{off} and then energized. This loop is repeated until the device is powered off. "On/t" led flashes at Fon and Foff mode for "T1-M4" product.

g and Foff functions / Off flasher operation

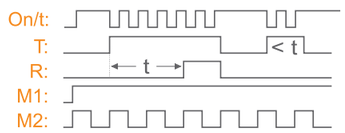
Figure and LED Indication



The output relay is initially de-energized and energized after an adjustable time delay, t_{off} and stays energized for an adjustable period, t_{on} and then de-energized. This loop is repeated until the device is powered off. "On/t" led flashes at Fon and Foff mode for "T1-M4" product.

c function / On delay with control input

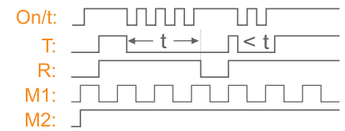
Figure and LED Indication



The output relay is initially de-energized. A contact closure on T contact triggers an adjustable time delay, t, which energizes the output relay when expired. The output relay stays energized as long as the T contact is active. Delay time, t, is cleared when the contact on T contact opens.

d function / Off delay with control input

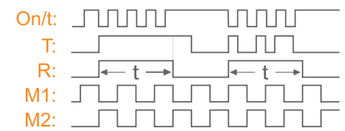
Figure and LED Indication



The output relay is initially de-energized and energized when a contact closure on T contact is detected. A contact triggers an adjustable time delay, t, which de-energizes the output relay when expired. Reclosure of the contact on T contact before the time delay is expired restarts time delay, t, and keeps the output relay energized.

e function / Rising edge triggered off delay

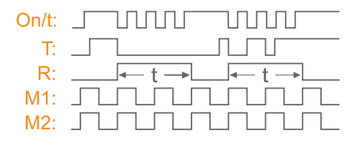
Figure and LED Indication



The output relay is initially de-energized. A contact closure on T contact both energizes the output relay and triggers an adjustable time delay, t, which de-energizes the output relay when expired. During the time delay, T contact is instensitive to state changes and becomes sensitive when time delay, t, expired.

f function / Falling edge triggered off delay

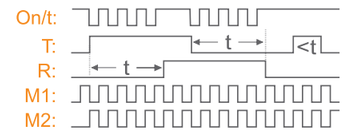
Figure and LED Indication



The output relay is initially de-energized. A state change of the T contact from closed to open both energizes the output relay and triggers an adjustable time delay, t, which de-energizes the output relay when expired. During the time delay, T contact is insensitive to state changes and becomes sensitive when time delay, t, expired.

h function / On and off delay with control input

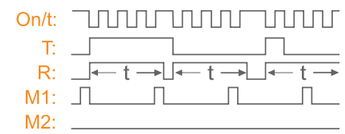
Figure and LED Indication



The output relay is initially de-energized. A contact closure on T contact triggers an adjustable time delay, t, which energizes the output relay when expired. Similarly contact release of T contact triggers the time delay, t, which de-energizes the output relay when expired. Delay time, t, is cleared when the contact state of T contact changes.

i function / Adjustable pulse output with control input

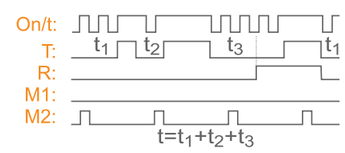
Figure and LED Indication



The output relay is initially de-energized. A state change on T contact both energizes the output relay and triggers an adjustable time delay, t, which de-energizes the output relay when expired. During the time delay, T contact is insensitive to state changes and becomes sensitive when time delay, t, expired.

k function / On delay with memory

Figure and LED Indication



The output relay is initially de-energized. If T contact is open, adjustable time delay, t, counts down and output relay energizes when t is expired. Any contact closure on T contact pauses the count down process and the process continues when the contact release on T contact occurs. A contact release is needed to restart the cycle, after the output relay is energized.

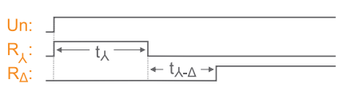
XS function / On delay adjustment for each second

Figure and LED Indication

T1-XS is an ON delay timer thet allows a sensitive time setting from 1 to 2559 seconds with 1 second increments. The output relay is initially de-energized and energized after the time delay t is expired.

SD function / Star-Delta operation

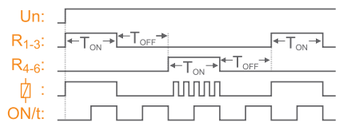
Figure and LED Indication



When the energy applied to device, star relay is energized until the end of the adjustable t_{λ} time. At the end of the adjusted delay time $t_{\lambda-\Delta}$, delta relay is energized until the device is powered off.

LR function / Left-Right operation

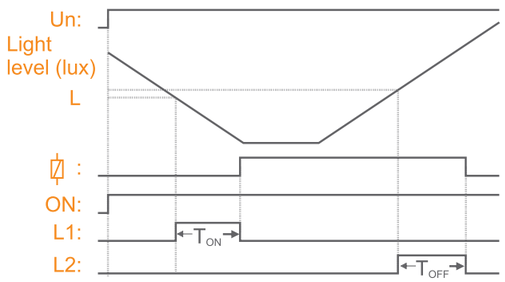
Figure and LED Indication



Initially first relay is energized. After the adjustable time delay t_{on}, relay is de-energized. Both relays are de-energized during the adjustable time delay t_{off}. At the end of t_{off}, second relay energizes. Second relay stays in this position during t_{on}. When t_{on} finished both relays are de-energized. This cycle is repeated continuously.

PHL function / Photocell operation

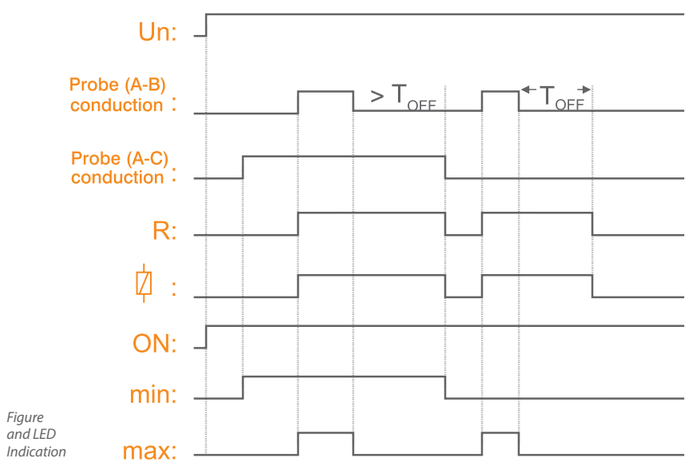
Figure and LED Indication

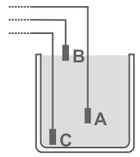


PH1-20L photocell relay measures the luminous intensity by means of a photocell sensor. On-off thereshold value is adjusted in the range of 1-20 lux, via the front adjustment dial. The output relay is energized when the ambient light level is below the adjusted limit. On and off delays are adjustable between 1 and 45 seconds, via the front panel knobs. On delay is adjusted by t_{on} knob, and off delay is adjusted by t_{off} knob.

LC function / Liquid Level Operation

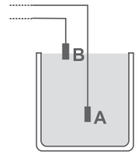
Figure and LED Indication





3 electrodes mode:

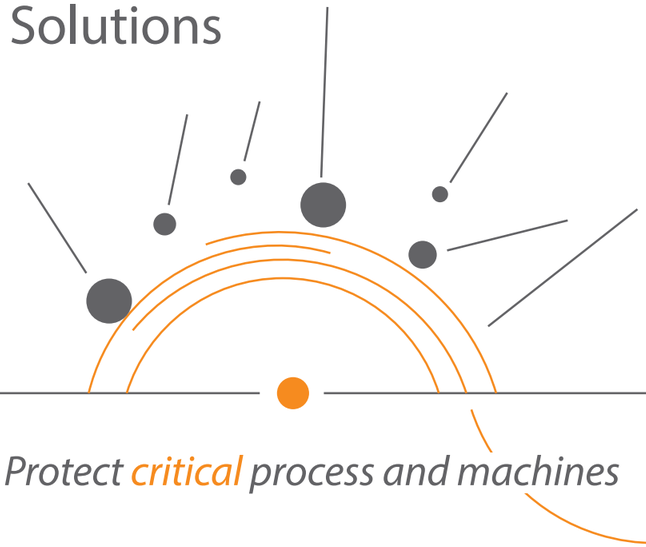
When the level of liquid in the tank reaches to electrode B, the output relay is activated and stays in this position even if the level drops below the electrode B level. The output relay is deactivated when the liquid level drops below the electrode A level. Re-activation occurs when the level reaches to the electrode B level.



2 electrodes mode:

For 2 electrodes mode of operation, A and B electrodes are used. When level of liquid in the tank reaches to electrode B, output relay is activated. When the liquid level drops below electrode B and continually stays there for the adjustable time delay (adjusted on the front panel knob); output relay will be de-energized.

Protection
Management Solutions



Protect critical process and machines

Defining a protection relay in simple terms

A protection relay is an automation device that measures electrical values and detects electrical faults.

Which actions are executed?

Sensing **Detection**
Delaying
Protection

A protection relay measures electrical values such as current, voltage, frequency etc. in order to protect your machines.

It can stop your engine from overheating with external PTC sensor.

Electrical network which is connected to your machines is examined continuously. if a fault is detected, the machine is stoped immediately or with time delay by output contacts. After that, any malfunctions can be fixed. This avoids expensive breakdowns, synonymous with production delays and loss of profitability.

Which markets are they used frequently?

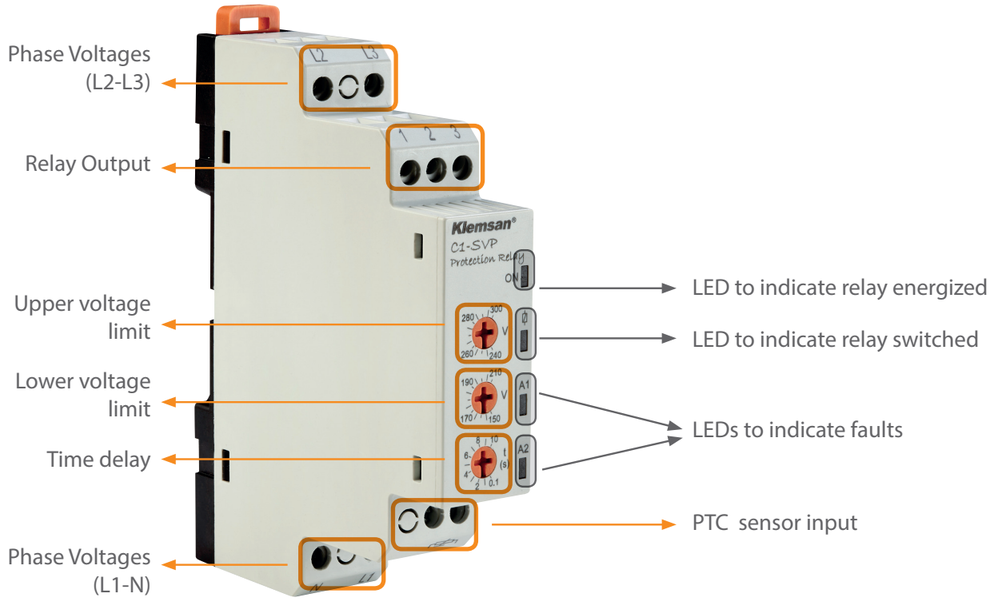
- Industrial machines
- Construction industry
- Stone pits
- Food and agriculture industry
- Water treatment system
- Moving stairs & elevators

Benefits and Advantages

- First Class quality to fulfill all your monitoring needs
- Quick view of status with leds
- Easy configuration with knobs
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Sleek 17.5mm wide housing and compact design saves panel space.
- Perfect to fit in modular enclosure
- Self-Extinguishing plastic housing
- No auxiliary supply needed
- Preventing overheating thanks to PTC input
- High mechanical endurance
- High accuracy and switching reliability

Layout & Mounting

Klemsan protection relays are suitable for snap mounting onto 35mm standards DIN rails.



C1-SVP Protection Relay

Overcurrent Protection with Smart MCB

Detect a fault condition and interrupt current flow with adjustable time delay. After the fault is gone, unlike a circuit breaker, smart MCB turns its normal position automaticlly.

CURRENT PROTECTION
CPR-16

Control Panel

Control panels must be monitored carefully otherwise the effects of a power outage or voltage drop can be highly harmful for equipments.

VOLTAGE PROTECTION
V1-S, C1-SVP, ...
G1-SA, G1-SAP, G1-A,
DPR3

Escalators

Detection of unbalanced voltage on motors.

MOTOR PROTECTION
C1D-SA, P1-SA, ...
D-SA, G1D-SAL
M1-SA, M1D-SA, DPR3

Temperature Control of Motors

Preventing overheating with external PTC sensor.

OVERHEAT PROTECTION
C1D-SVP, P1-SAP...
M1-SAP, DPR3

Conveyor Application

Detection of overcurrent when conveyor is jamed.

CURRENT PROTECTION
CPR-16

Generators

Frequency control for generators.

FREQUENCY PROTECTION
F1, DPR3

Machine Line

Providing phase loss, phase sequence and asymmetry protection for 3 phase aplications.

MOTOR PROTECTION
P1D-SA, C1-SA ...
M1D-S , M1D-SA, DPR3

Cranes

Adjustments of over and under voltage limit in order for cranes to operate correctly.

VOLTAGE PROTECTION
V1, V1D, C1-SVP,
G1-SA...
G1D-SA, DPR3

Compressors

Detection of phase-loss and sequence in order compressors to work correctly.

MOTOR PROTECTION
P1-S, C1-SA, ...
DPR3

DPR3 Digital Protection Relay

DPR31xx series is a digital protection and monitoring relay designed for three-phase systems measure voltage, frequency and monitors these parameters below:

- Over voltage
- Under voltage
- Over Frequency
- Under Frequency
- Asymmetry
- Sequence
- Phase loss
- PTC error

DPR31xx has many features;

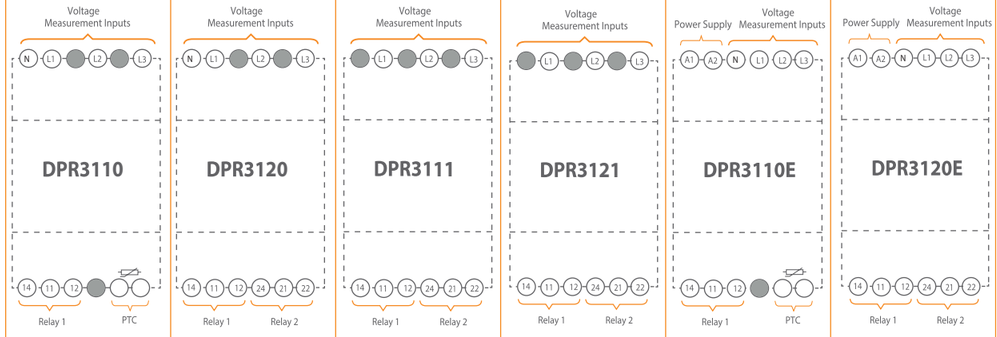
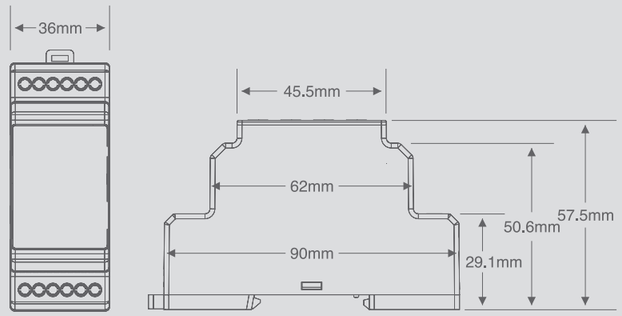
- Undervoltage, overvoltage and frequency monitoring in three-phase AC systems 0...500 V
- Asymmetry, phase sequence, and phase loss monitoring
- Powered by external supply voltage
- Various alarms may be individually enabled/ disabled and assigned to sepa- rate output contacts
- Start-up delay, response delay, delay on release
- Adjustable switching hysteresis
- RMS measurement (AC)
- Digital LCD display with real-time rea-dings and onboard menu
- Automatic preset function available when first connecting device
- Memory stores last 4 alarm value
- Non-volatile memory for settings
- Continuous self monitoring
- Internal test/reset button
- Two separate SPDT alarm relays
- Normally energized or normally de-ener-gized operation
- Latching or non-latching operation
- Password protection for device setting
- Sealable transparent cover
- Two-module enclosure (36 mm)

Layout & Mounting

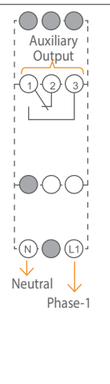
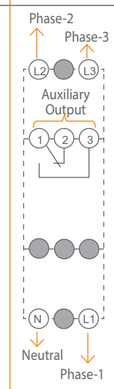
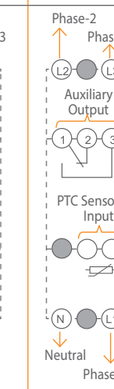
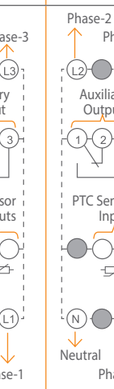
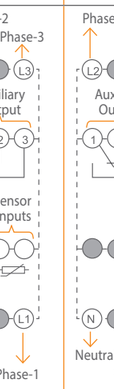
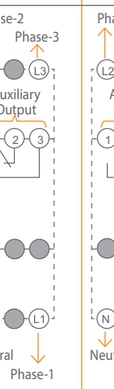
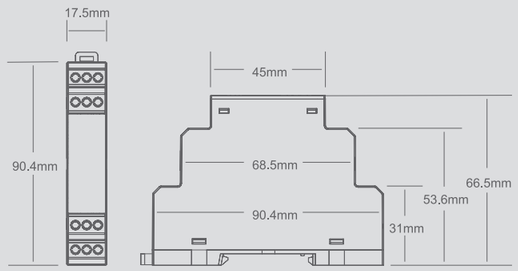
Klemsan digital protection relays are suitable for snap mounting onto 35 mmstandards DIN rails.

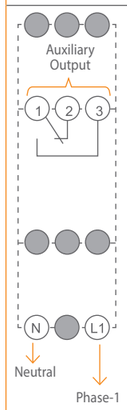
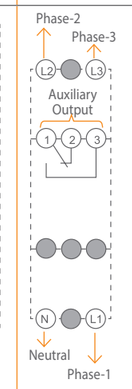
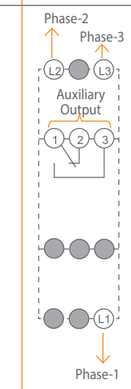
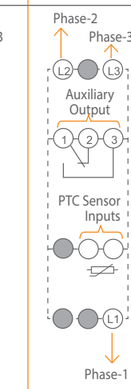
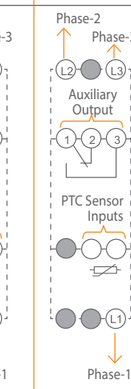
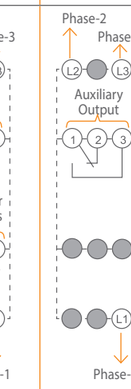
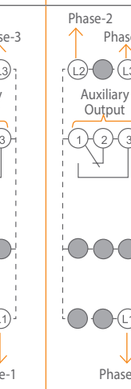
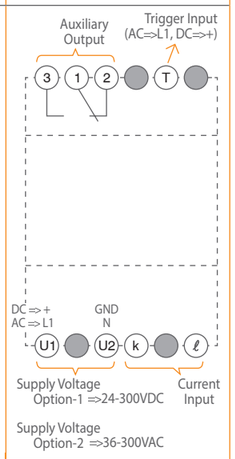
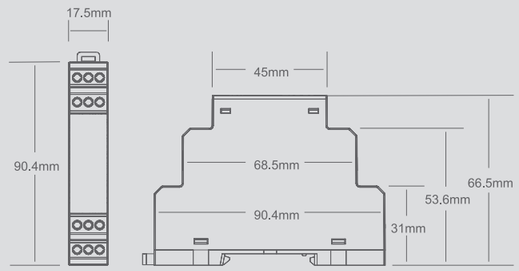
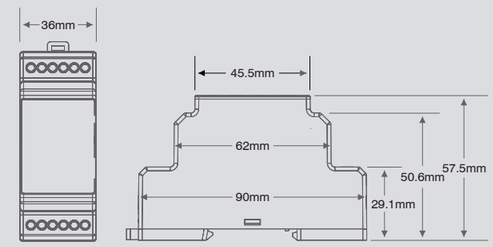
DPR3111

Type			DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
Definition			Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay
Order Number			270 600	270 601	270 602	270 603	270 604	270 605
Casing Width(mm)			36mm	36mm	36mm	36mm	36mm	36mm
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			3Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral
Monitoring Functions	Phase Failure	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Phase Sequuence	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Adjustable Unbalanced Protection	Range	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%
		Hysteresis	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%
		Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Adjustable Voltage Protection	Range	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
		Hysteresis	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
		Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Adjustable Frequency Protection	Range	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
		Hysteresis	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
		Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	PTC Protection	Threshold	1100Ω	-	1100Ω	-	1100Ω	-
		Delay Time	0 - 999 sec	-	0 - 999 sec	-	0 - 999 sec	-
Type of Output			Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary Contacts		Number of Contacts	1	2	1	2	1	2
		Type	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)	2 C/O (SPDT)
		Max Ratings-AC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC
		Max. Switching Power	1250VA	1250VA	1250VA	1250VA	1250VA	1250VA
		Mechanical Life Time	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7
		Electrical Life Time	5x10^4	5x10^4	5x10^4	5x10^4	5x10^4	5x10^4
Supply Voltage	External Supply		-	-	-	-	Available	Available
	Supply Voltage	DC	-	-	-	-	-	-
		AC	85..300 V AC	85..300 V AC	85..300 V AC	85..300 V AC	85..300 V AC	85..300 V AC
	Supply Frequency		35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Permissible Ambient Temperature		During Operation	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C
		During Storage	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Operating Frequency			35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Degree of Protection			IP20	IP20	IP20	IP20	IP20	IP20
Power Consumption		DC	-	-	-	-	-	-
		AC	<4VA	<4VA	<4VA	<4VA	<4VA	<4VA

Type	DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
Schematics						
Dimensional Drawings						

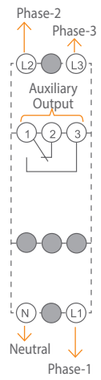
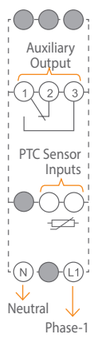
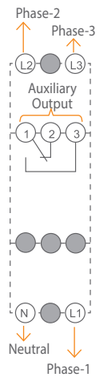
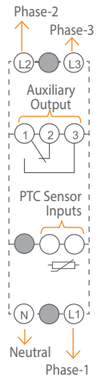
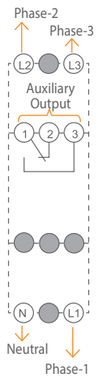
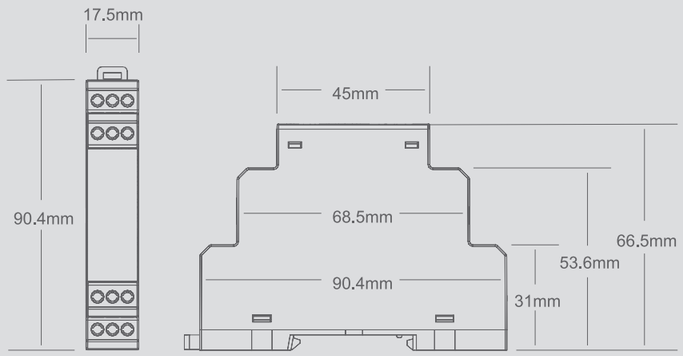
															
Type			**F1**	**C1-SA**	**C1-SAP**	**C1-SVP**	**V1**	**V1-S**	**V1-M**	**V1-T**	**C1D-SA**	**C1D-SAP**	**C1D-SVP**	**V1D**	**V1D-S**	**CPR-16**
Definiton			Frequency monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	VoltaTge monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Current monitoring relay
Order Number			270161	270156	270157	270158	270159	270160	270170	270162	270256	270257	270258	270259	270260	270270
Casing Width(mm)			17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	36
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			-	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	1Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	-
Monitoring Functions	Phase Failure	Fixed delay time	-	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	-
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	-	500msec	-	-	500msec	500msec	500msec	-	500msec	-
	Adjustable Unbalanced Protection	Range	-	± (5% => 20%)	± (5% => 20%)	-	-	-	-	-	± (5% => 20%)	± (5% => 20%)	-	-	-	-
		Hysteresis	-	6,9VAC	6,9VAC	-	-	-	-	-	12 VAC	12 VAC	-	-	-	-
		Delay time	-	0.1=>10sec	0.1=>10sec	-	-	-	-	-	0.1=>10sec	0.1=>10sec	-	-	-	-
	Adjustable Voltage Protection	Upper limit	-	-	-	240=>300VAC (L-N)	240=>300VAC (L-N)	240=>300VAC (L-N)	240=>300VAC (L-N)	240=>300VAC (L-N)	-	-	270=>370VAC (L-L)	270=>370VAC (L-L)	270=>370VAC (L-L)	-
		Lower limit	-	-	-	150=>210VAC (L-N)	150=>210VAC (L-N)	150=>210VAC (L-N)	150=>210VAC (L-N)	150=>210VAC (L-N)	-	-	400=>500VAC (L-L)	400=>500VAC (L-L)	400=>500VAC (L-L)	-
		Hysteresis	-	-	-	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	-	-	6 VAC	6 VAC	6 VAC	-
		Delay time	-	-	-	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for on delay operation & 0.1=>10sec for off delay operation	-	-	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	-
	Adjustable Current Protection	Upper limit	-	-	-	-	-	-	-	-	-	-	-	-	-	1=>16AAC
		Lower limit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hysteresis	-	-	-	-	-	-	-	-	-	-	-	-	-	5=>20% x Upper limit
		Delay time	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1=>10sec
	Adjustable Frequency Protection	Upper limit	42.5 => 65Hz	-	-	-	-	-	-	-	-	-	-	-	-	-
		Lower limit	40 => 62.5Hz	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hysteresis	0.4Hz	-	-	-	-	-	-	-	-	-	-	-	-	-
		Delay time	1=>10sec	-	-	-	-	-	-	-	-	-	-	-	-	-
	Extremely High-Low Voltage Protection	Upper limit	-	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	510 VAC (L-L)	510 VAC (L-L)	510 VAC (L-L)	510 VAC (L-L)	510 VAC (L-L)	-
		Lower limit	-	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	240 VAC (L-L)	240 VAC (L-L)	240 VAC (L-L)	240 VAC (L-L)	240 VAC (L-L)	-
		Hysteresis	-	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	-
		Delay time	-	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	-
	PTC Protection	Fixed delay time	-	-	2000msec	2000msec	-	-	-	-	-	2000msec	2000msec	-	-	-
		Threshold	-	-	1100Ω	1100Ω	-	-	-	-	-	1100Ω	1100Ω	-	-	-
Response time for monitoring any function			Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 100msec
Type of Output			Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary contacts		Type	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
		Max ratings-AC (for NO side)	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	16A/250V; 4000VA
		Max ratings-DC (for NO side)	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	-
		Mechanical life time	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations

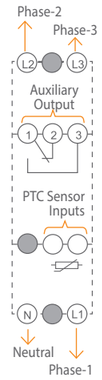
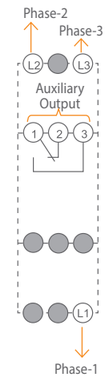
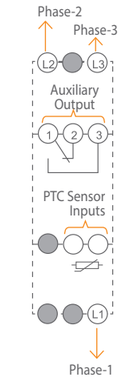
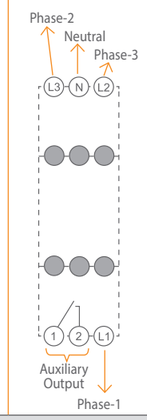
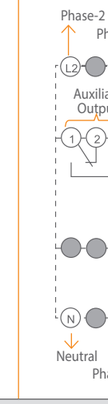
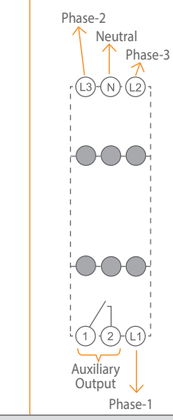
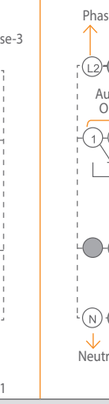
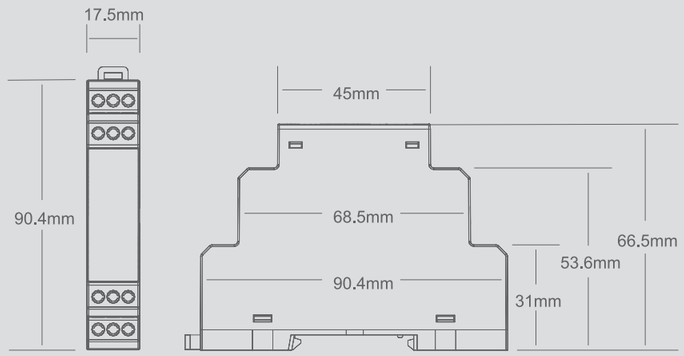
Type		F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S
Auxiliary contacts	Electrical life time operations (for NO side)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)
Supply Voltage	DC	-	-	-	-	-	-
	AC	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N
Supply Frequency		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
Control Input Voltage Range		-	-	-	-	-	-
Permissible ambient temperature	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Operating frequency		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-	-	-
	AC	<3VA	<3VA	<3VA	<3VA	<3VA	<3VA
Weight(gr)		62	66	70	71	66	66
Permissible mounting position		any	any	any	any	any	any
Schematics							
Dimensional Drawings							

V1-M	V1-T	C1D-SA	C1D-SAP	C1D-SVP	V1D	V1D-S	CPR-16
5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	1x10⁵
-	-	-	-	-	-	-	24-300 VDC
85-320VAC from L1-N	85-320VAC from L1-N	150-500VAC from L2-L3	150-500VAC from L2-L3	150-500VAC from L2-L3	150-500VAC from L2-L3	150-500VAC from L2-L3	36 -300VAC
35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
-	-	-	-	-	-	-	Same with supply voltage
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-	-	<1W
<3VA	<3VA	<4VA	<4VA	<4VA	<4VA	<4VA	<3VA
62	66	70	75	75	70	70	95
any	any	any	any	any	any	any	any
							
							

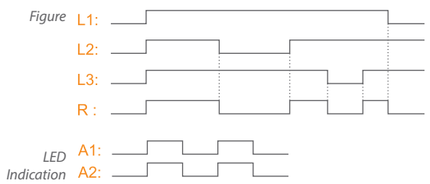
Type			P1-A	P1-P	P1-S	P1-SP	P1-SA
Definiton			Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay
Order Number			270150	270151	270152	270153	270154
Casing Width(mm)			17.5	17.5	17.5	17.5	17.5
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			3Ø with neutral	1Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral
Monitoring Functions	Phase Failure	Fixed delay time	500msec	-	500msec	500msec	500msec
	Phase Sequence	Fixed delay time	-	-	500msec	500msec	-
	Fixed Unbalanced Protection	Limit	± 20%	-	-	-	± 20%
		Hysteresis	3% x Un ≈ 6,9VAC	-	-	-	3% x Un ≈ 6,9VAC
		Delay time	500msec	-	-	-	500msec
	Extremely High-Low Voltage Protection	Upper limit	310 VAC (L-N)	-	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)
		Lower limit	140 VAC (L-N)	-	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)
		Hysteresis	6 VAC	-	6 VAC	6 VAC	6 VAC
		Delay time	100msec	-	100msec	100msec	100msec
	PTC Protection	Fixed delay time	-	2000msec	-	2000msec	-
		Threshold	-	1100Ω	-	1100Ω	-
Response time for monitoring any function			Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec
Type of Output			Relay	Relay	Relay	Relay	Relay
Auxiliary contacts	Type		1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
	Max ratings-AC (for NO side)		10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
	Max ratings-DC (for NO side)		5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
	Mechanical life time		≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
	Electrical life time operations (for NO side)		5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)
Supply Voltage			85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N
Supply Frequency			35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
Permissible ambient temperature	During operation		-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage		-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity			Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)
Operating frequency			35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz

P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay
270155	270254	270255	270400	270401	270402	270403
17.5	17.5	17.5	17.5	17.5	17.5	17.5
Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral
500msec	500msec	500msec	<1sec	<1sec	<1sec	<1sec
500msec	-	500msec	<1sec	<1sec	<1sec	<1sec
± 20%	± 20%	± 20%	-40%	-40%	-40%	-40%
3% x Un ≈ 6,9VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC
500msec	500msec	500msec	<1sec	<1sec	<1sec	<1sec
310 VAC (L-N)	510 VAC (L-L)	510 VAC (L-L)	-	-	-	-
140 VAC (L-N)	240 VAC (L-L)	240 VAC (L-L)	-	-	-	-
6 VAC	6 VAC	6 VAC	-	-	-	-
100msec	100msec	100msec	-	-	-	-
2000msec	-	2000msec	-	-	-	-
1100Ω	-	1100Ω	-	-	-	-
Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec
Relay	Relay	Relay	Relay	Relay	Relay	Relay
1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 NO (SPST)	1 C/O (SPDT)	1 NO (SPST)	1 C/O (SPDT)
10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)
85-320VAC from L1-N	150-500VAC from L2-L3	150-500VAC from L2-L3	180-265VAC from L3-N	180-265VAC from L3-N	90-150VAC from L3-N	90-150VAC from L3-N
35-70 Hz	35-70 Hz	35-70 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)
35-70 Hz	35-70 Hz	35-70 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz

Type		P1-A	P1-P	P1-S	P1-SP	P1-SA
Degree of protection		IP20	IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-	-
	AC	<3VA	<3VA	<3VA	<3VA	<3VA
Permissible mounting position		any	any	any	any	any
Weight(gr)		66	65	65	69	65
Schematics						
Dimensional Drawings						

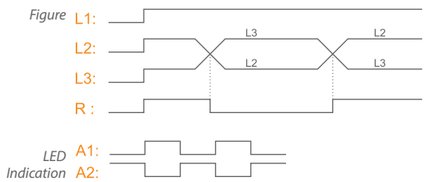
P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
IP20	IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-	-
<3VA	<4VA	<4VA	<13VA	<13VA	<4.5VA	<4.5VA
any	any	any	any	any	any	any
69	70	74	59	59	59	59
						
						

Phase Failure / Off delay operation



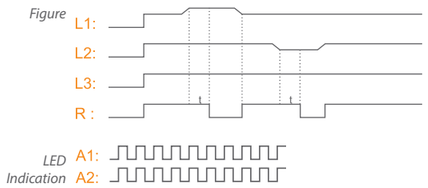
if a phase failure occurs the output relay de-energizes in 500msec.
The fault is indicated by flashing LED A1 and LED A2 simultaneously. The output relay re-energizes automatically as soon as the voltage returns to the tolerance range.

Phase Sequence Error / Off delay operation



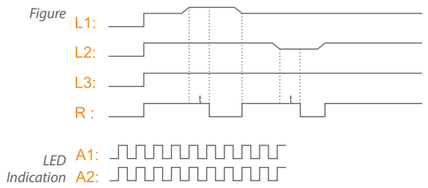
If a phase sequence error occurs the output relay de-energizes in 500msec.
The fault is displayed by alternated flashing of the LEDs A1 and A2. The output relay re-energizes automatically as soon as the phase sequence is correct again.

Adjustable Unbalance Protection / Off delay operation



If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage(%5=>%20), the output relay de-energizes after time delay(0.1-10s). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously.
As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

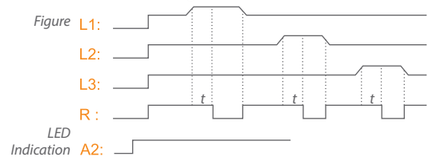
Fixed Unbalance Protection / Off delay operation



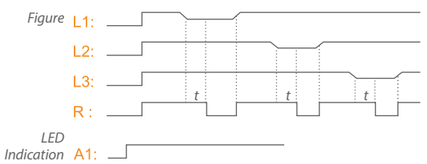
If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage (%20), the output relay de-energizes after time delay(2sec). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously.
As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

Adjustable Voltage Protection / Off delay operation

Over Voltage



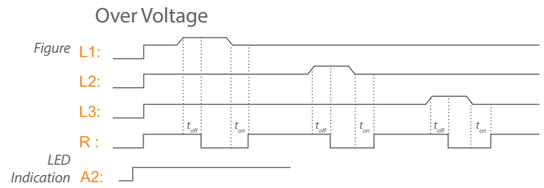
Under Voltage



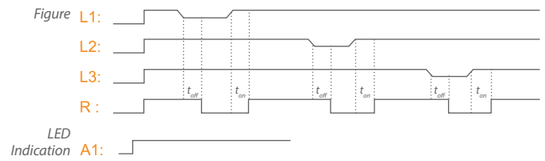
If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after time delay(0.1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay re-energizes automatically.

Adjustable Voltage Protection / On-Off delay operation (Available only for V1-T)

Over Voltage



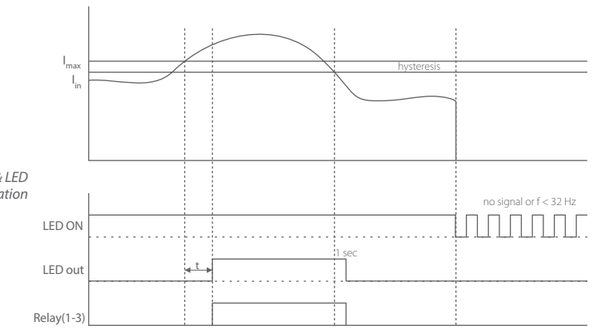
Under Voltage



If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after t_{off} time delay(0.1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay re-energizes after t_{on} time delay(0.1-10s).

Adjustable Current Protection / On delay operation

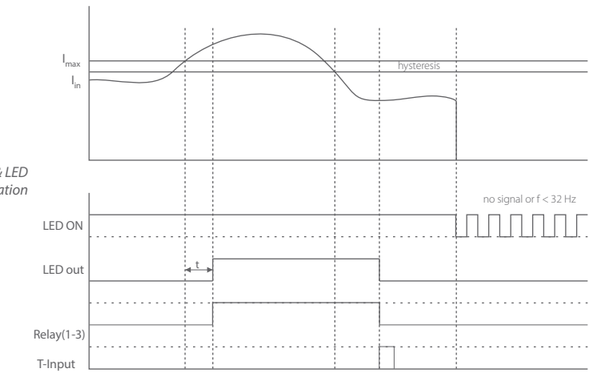
Figure & LED Indication



AUTOMATIC MODE

If the current to be monitored exceeds adjusted high limit value, the output relay de-energizes after time delay(0.1-10s). As soon as the current returns to the tolerance range, taking into account adjusted hysteresis (5-20%) and 1 second safety time, the output relay re-energizes automatically.

Figure & LED Indication



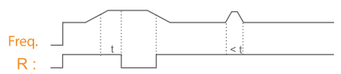
MANUAL MODE

If the current to be monitored exceeds adjusted high limit value, the output relay de-energizes after time delay(0.1-10s). After the current returns to the tolerance range, taking into account adjusted hysteresis (5-20%) and 1 second safety time, the output relay waits till trigger input is applied. After that it re-energizes automaticlly.

Adjustable Frequency Protection / Off delay operation

Over Frequency

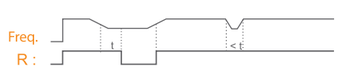
Figure



LED Indication

Under Frequency

Figure



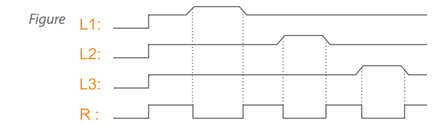
LED Indication

If the frequency to be monitored exceeds or falls below adjusted high limit or low limit value, the output relays de-energizes after time delay(1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the frequency returns to the tolerance range, taking into account a fixed hysteresis of 0.4kHz, the output relay re-energizes automatically.

Extremely High-Low Voltage Protection / Off delay operation

Over Over Voltage

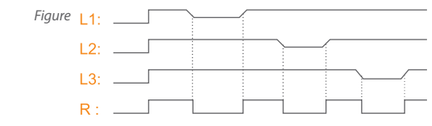
Figure



LED Indication

Under Under Voltage

Figure



LED Indication

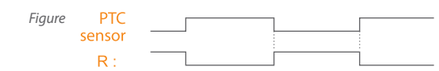
If the voltage to be monitored exceeds 310VAC for star connection device or 510VAC for delta connection device, output relay de-energizes immediately.

If the voltage to be monitored falls below 140VAC for star connection device or 240VAC for delta connection device, output relay de-energizes immediately.

The fault type is indicated by LEDs A1 or A2 with blinking. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay re-energizes automatically.

PTC Protection / Off delay operation

Figure

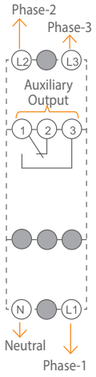
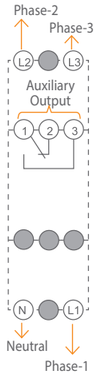
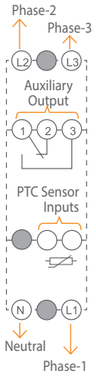
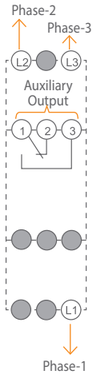
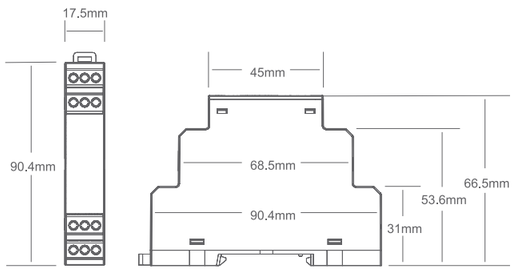


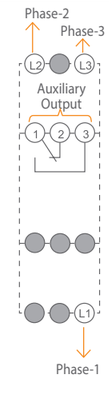
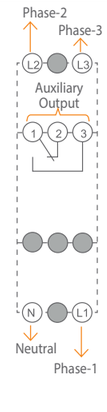
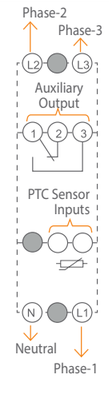
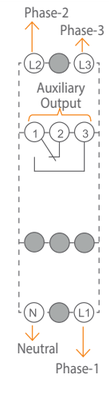
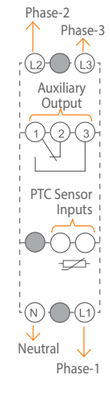
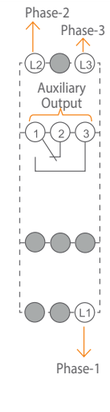
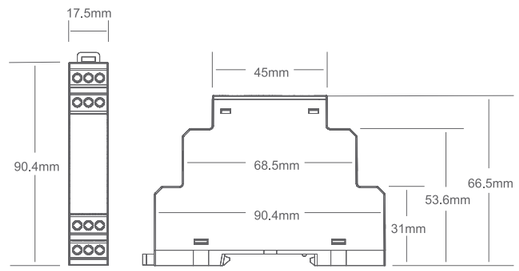
LED Indication

In order to use this fuction, PTC temperature sensors must be connected to the relay's PTC input. Under normal operating conditions the PTC resistance is below the response threshold. If the motor heats up excessively, it means resistance value is increased, the output relay de-energizes after 2 seconds delay.

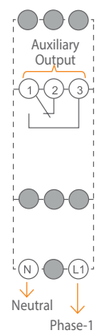
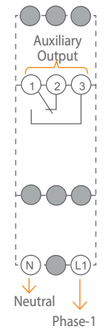
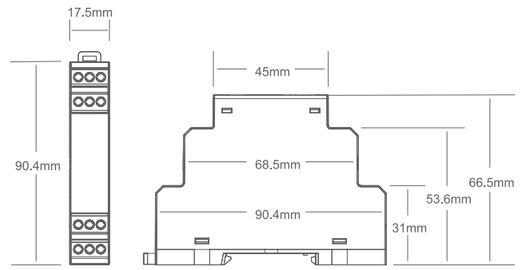
The output relay re-energizes automatically as soon as the motor heat turns back to its normal operating conditions.

												
Type			**G1-A**	**G1-SA**	**G1-SAP**	**G1D-SA**	**G1D-SA-L**	**G1-TU**	**G1-SV**	**G1-SAT**	**G1-SVP**	**G1D-SV**
Definiton			Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay
Order Number			270136	270130	270131	270140	270141	270138	270139	270137	270180	270145
Casing Width(mm)			17.5	17.5	17.5	17.5	17.5	17,5	17,5	17,5	17,5	17,5
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø without neutral
Monitoring Functions	Phase Failure	Fixed delay time	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	500msec	-	500msecec	500msec	500msec	500msec
	Adjustable Unbalanced Protection	Range	± (5% => 20%)/ OFF	± (5% => 20%)/ OFF	± (5% => 20%)/ OFF	± (5% => 20%)/ OFF	± (5% => 20%)/ OFF	-	-	± (5% => 20%)/ OFF	-	-
		Hysteresis	3% x Un ≈ 6,9VAC	3% x Un ≈ 6,9VAC	3% x Un ≈ 6,9VAC	3% x Un ≈ 12 VAC	3% x Un ≈ 6,9VAC	-	-	3% x Un ≈ 6,9VAC	-	-
		Delay time	0.1=>10sec	0.1=>10sec	0.1=>10sec	0.1=>10sec	0.1=>10sec	-	-	ton: 1=>15min, toff: 0.1=>10sec	-	-
		Upper limit	+ (5% => 20%)/OFF	+ (5% => 20%)/OFF	+ (5% => 20%)/OFF	+ (5% => 20%)/OFF	+ (5% => 20%)/OFF	-	240V..300V	+ (5% => 20%)/OFF	240V..300V	400V..500V
		Lower limit	-(5% => 20%)/OFF	-(5% => 20%)/OFF	-(5% => 20%)/OFF	-(5% => 20%)/OFF	-(5% => 20%)/OFF	< Un X 0,75	150V..210V	- (5% => 20%)/OFF	150V..210V	270V..370V
		Hysteresis	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC
		Delay time	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	ton: 1=>15min, toff=0.5sec	toff: 0.1=>10sec	ton: 1=>15min, toff: 0.1=>10sec	toff: 0.1=>10sec	toff: 0.1=>10sec
	PTC Protection	Fixed delay time	-	-	2000msec	-	-	-	-	-	2000msec	-
		Threshold	-	-	1100Ω	-	-	-	-	-	1100Ω	-
Response time for monitoring any function			Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec
Type of Output			Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary contacts		Number of relay						1	1	1	1	1
		Type	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
		Max. Ratings -AC	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
		Max. Switching Power	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
		Mechanical Life Time	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
		Electrical Life Time	$5x10^4$(5A@250VAC) $1x10^5$(5A@30VDC)	$5x10^4$(5A@250VAC) $1x10^5$(5A@30VDC)	$5x10^4$(5A@250VAC) $1x10^5$(5A@30VDC)	$5x10^4$(5A@250VAC) $1x10^5$(5A@30VDC)	$5x10^4$(5A@250VAC) $1x10^5$(5A@30VDC)	5x10^4(5A@250VAC) 1x10^4(5A@30VDC)	5x10^4(5A@250VAC) 1x10^5(5A@30VDC)	5x10^4(5A@250VAC) 1x10^5(5A@30VDC)	5x10^4(5A@250VAC) 1x10^5(5A@30VDC)	5x10^4(5A@250VAC) 1x10^4(5A@30VDC)

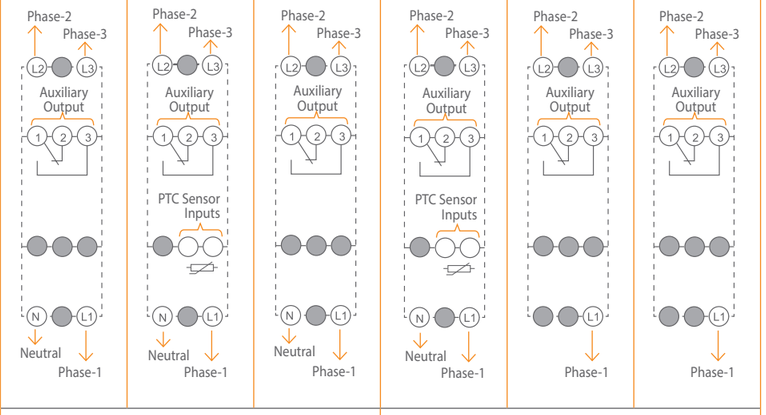
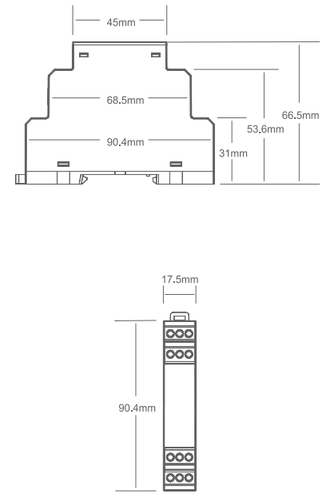
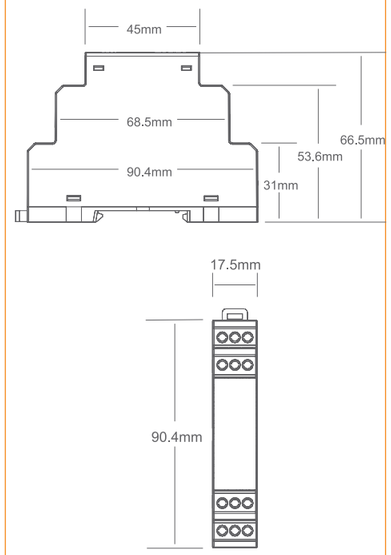
Type		G1-A	G1-SA	G1-SAP	G1D-SA
Supply Voltage	DC	-	-	-	-
	AC	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	380-480VAC ±25% from L1-L3
Supply Frequency		50-60Hz	50-60Hz	50-60Hz	50-60Hz
Control Input Voltage Range		-	-	-	-
Permissible ambient temperature	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Operating frequency		50-60Hz	50-60Hz	50-60Hz	50-60Hz
Degree of protection		IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-
	AC	<3VA	<3VA	<3VA	<4VA
Weight(gr)		66	66	70	70
Permissible mounting position		any	any	any	any
Schematics					
Dimensional Drawings					

G1D-SA-L	G1-TU	G1-SV	G1-SAT	G1-SVP	G1D-SV
-	-	-	-	-	-
190-230VAC ±25% from L1-L3	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	380 .. 480V AC, ±%25
50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz
-	-	-	-	-	-
-20 to +60 °C	-20 to +60 °C	-20°C..+70°C	-20 to +60 °C	-20°C..+70°C	-20°C..+70°C
-40 to +75 °C	-40 to +75 °C	-30°C..+80°C	-40 to +75 °C	-30°C..+80°C	-30°C..+80°C
Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz
IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-
<4VA	<3VA	<3VA	<3VA	<3VA	<4VA
75	66	66	66	70	66
any	any	any	any	any	any
					
					

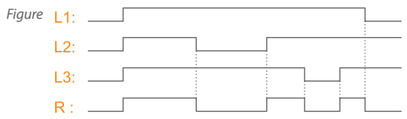
Type			G1-VM	G1-TUM
Definiton			Voltage monitoring relay	Voltage monitoring relay
Order Number			270 146	270 147
Casing Width(mm)			17,5	17,5
Connections			Screw terminal	Screw terminal
Network			1Ø with neutral	1Ø with neutral
Monitoring Functions	Phase Failure	Fixed delay time	500msec	500msec
	Phase Sequence	Fixed delay time	-	-
	Adjustable Unbalanced Protection	Range	-	-
		Hysteresis	-	-
		Delay time	-	-
	Adjustable Voltage Protection	Upper limit	240V..300V	-
		Lower limit	150V..210V	Umeasured < 0.75xUn
		Hysteresis	6 VAC	6 VAC
		Delay time	toff: 0. ec	ton: 1=>15min, toff=0.5sec
	PTC Protection	Fixed delay time	-	-
		Threshold	-	-
Response time for monitoring any function			Max. 250msec	Max. 250msec
Type of Output			Relay	Relay
Auxiliary contacts		Number of relay	1	1
		Type	1 C/O (SPDT)	1 C/O (SPDT)
		Max. Ratings -AC	10A/250V; 1250 VA	10A/250V; 1250 VA
		Max. Switching Power	5A/30VDC; 150W	5A/30VDC; 150W
		Mechanical Life Time	≥ 10^7	≥ 10^7
		Electrical Life Time	5×10^4(5A@250VAC) 1×10^4(5A@30VDC)	5×10^4(5A@250VAC) 1×10^4(5A@30VDC)

Type		G1-VM	G1-TUM
Supply Voltage	DC	-	-
	AC	230V AC, ±%25	230V AC, ±%25
Supply Frequency		50-60Hz	50-60Hz
Control Input Voltage Range		-	-
Permissible ambient temperature	During operation	-20°C..+70°C	-20°C..+70°C
	During storage	-30°C..+80°C	-30°C..+80°C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)
Operating frequency		50-60Hz	50-60Hz
Degree of protection		IP20	IP20
Power consumption	DC	-	-
	AC	<4VA	<4VA
Weight(gr)		66	66
Permissible mounting position		any	any
Schematics			
Dimensional Drawings			

Type			M1-A	M1-SP	M1-SA	M1-SAP	M1D-SA	M1D-S
Definiton			Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay
Order Number			270134	270135	270132	270133	270144	270142
Casing Width(mm)			17.5	17.5	17.5	17.5	17.5	17.5
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral
Monitoring Functions	Phase Failure	Fixed delay time	500msec	500msec	500msec	500msec	500msec	500msec
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	500msec	500msec
	Fixed Unbalanced Protection	Limit	± 20%	-	± 20%	± 20%	± 20%	-
		Hysteresis	3% x Un ≈ 6,9VAC	-	3% x Un ≈ 6,9VAC	3% x Un ≈ 6,9VAC	3% x Un ≈ 12VAC	-
		Delay time	2000msec	-	2000msec	2000msec	2000msec	-
	PTC Protection	Fixed delay time	-	2000msec	-	2000msec	-	-
		Threshold	-	≈1100Ω	-	≈1100Ω	-	-
Response time for monitoring any function			Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec
Type of Output			Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary contacts		Number of relay	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
		Type	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
		Max. Ratings -AC	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
		Max. Switching Power	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
		Mechanical Life Time	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)
Supply Voltage			230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	380-480±25% from L3-N	380-480±25% from L3-N
Supply Frequency			50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
Permissible ambient temperature		During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
		During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity			Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)
Operating frequency			50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz

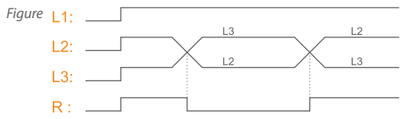
Type		M1-A	M1-SP	M1-SA	M1-SAP	M1D-SA	M1D-S
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-	-	-
	AC	<3VA	<3VA	<3VA	<3VA	<4VA	<4VA
Permissible mounting position		any	any	any	any	any	any
Weight(gr)		66	69	65	69	70	74
Schematics							
Dimensional Drawings							

Phase Failure / Off delay operation



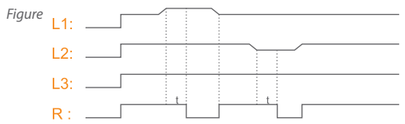
if a phase failure occurs the output relay de-energizes in 500msec.
The output relay re-energizes automatically as soon as the voltage returns to the tolerance range.

Phase Sequence Error / Off delay operation



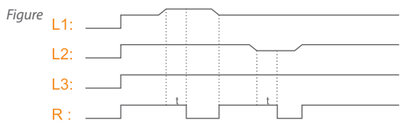
If a phase sequence error occurs the output relay de- energizes in 500msec.
The output relay re-energizes automatically as soon as the phase sequence is correct again.

Adjustable Unbalance Protection / Off delay operation



If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage(%5--%20), the output relay de-energizes after time delay(0.1-10s). As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

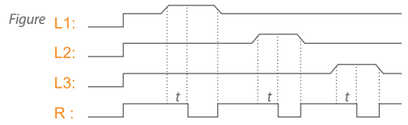
Fixed Unbalance Protection / Off delay operation



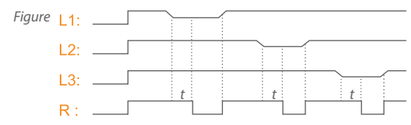
If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage (%20), the output relay de-energizes after time delay(2sec). As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

Adjustable Voltage Protection / Off delay operation

Over Voltage



Under Voltage



If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after time delay (0.1=>10sec). As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay re-energizes automatically.

PTC Protection / Off delay operation

In order to use this fuction, PTC temperature sensors must be connected to the relay's PTC input. Under normal operating conditions the PTC resistance is below the response threshold. If the motor heats up excessively, it means resistance value is increased, the output relay de-energizes after 2 seconds delay.
The output relay re-energizes automatically as soon as the motor heat turns back to its normal operating conditions.

Alarm
Management Solutions

Defining an alarm annunciator in simple terms

An alarm annunciator is an automation device that provides immediate fault recognition, fault identification, visual and audible alarm for an abnormal process situation.

Which actions are executed?

Monitoring
Controlling
Communication
Data Logging **Visualizing**

An alarm annunciator monitors input parameters continuosly.

When a faulty condition occurs, it visualizes alarm status immediately or with adjustable time delay.

It provides to control your process through relay outputs and modbus communication.

Data logging with real time gives you opportunity to analyze your system.

Which markets are they used frequently?

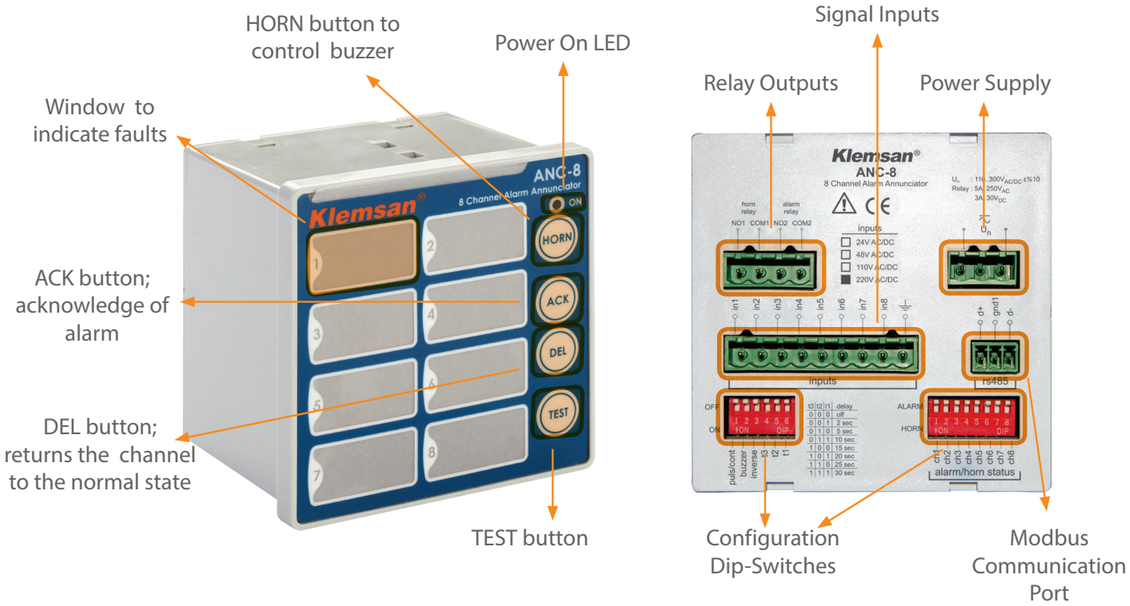
- Medium voltage modular cabinets
- Electric power plants and substations
- Industrial plants and processes
- Technical installations in buildings
- Water treatment plants, etc.

Benefits and Advantages

- Adjustable 2 color options
- Four integrated push buttons for buzzer, alarm accept, alarm clear and led test.
- Three flashing rates indicate different types of faults
- Easy configuration with dip-switches
- DC or AC supply/input voltage.
- Super bright LEDs for long distance visibility
- Various sizes & fonts for window inscription.
- Highly compact and light weight
- Modbus communication
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Self-Extinguishing plastic housing.

Layout & Mounting

Klemsan alarm annunciators are suitable for panel mounting for 96x96mm or 144x144m standarts.



ANC-8 Alarm Annunciator

Alarm Monitoring for Steel Plants

Alarm points for various parameters such as pressures, flow temperatures, speeds for different turbines.

ALARM MANAGEMENT
ANC series

Alarm Status of Battery-Backup System

Backup batteries power can be checked automaticlly with their internal alarm system. When their alarm status wants to be monitored over PC, ANC series present best solution thanks to its modbus communication.

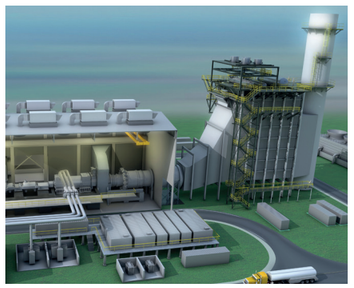
ALARM MONITORING over MODBUS
ANC series

Facility Monitoring

When power, UPS, generator, temperature/humidity, Fire/ Smoke, MVAC, Leak Detection etc. problems are existed, they all can be monitored over PC with modbus communication.

SIGNAL MONITORING over PC
ANC series

Natural Gas Power Stations



Faults of gas turbine, steam turbine, cooling water supply, power lines, generator etc. can be monitored instantaneously with signal inputs.

SIGNAL MONITORING
LSK Series

Pumping Stations

Monitoring pump position and controlling by means of output relays

CONTROLLING PUMP POSITION
ALRC-6

Electrical Control Room

Providing an immediate fault recognition, fault identification and a visual/audible alarm in order to call attention to an abnormal process condition.

CONTROL MANAGEMENT
ANC series

Panel Indicator Lights

Instead of using separate alarm indicator lights, using signal modules gives you opportunity to save space and installation time with monitoring all signals in same window.

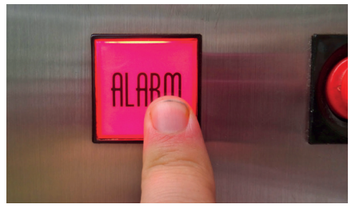
SIGNAL MONITORING
LSK Series

Level Monitoring with Level Switches

Immediately monitoring over PC when certain levels are reached with using liquid level switches.

MONITORING and CONTROLLING
ALRC-6

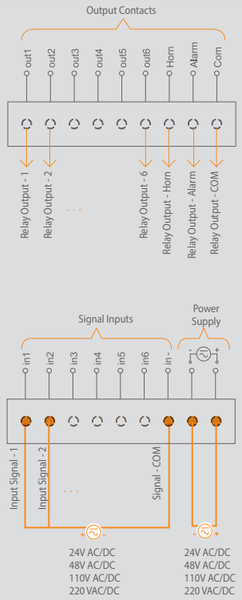
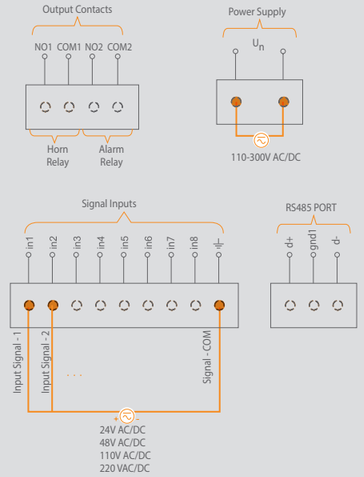
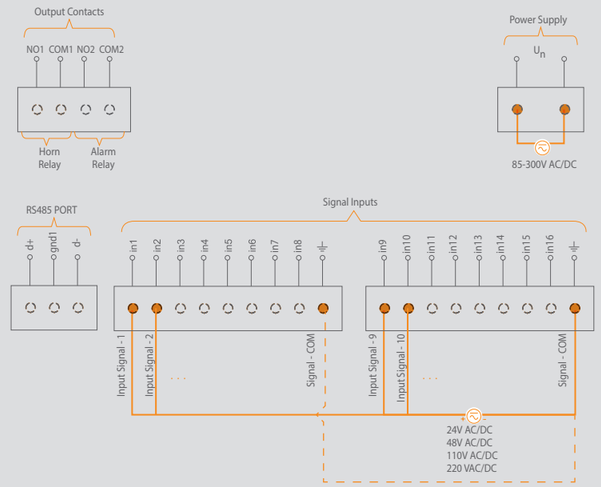
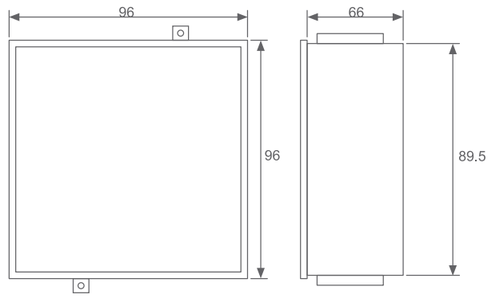
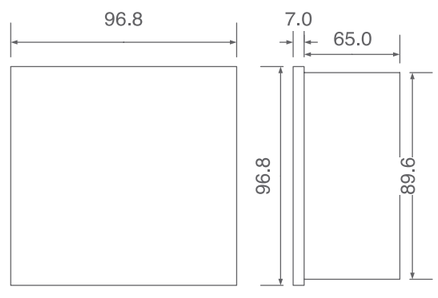
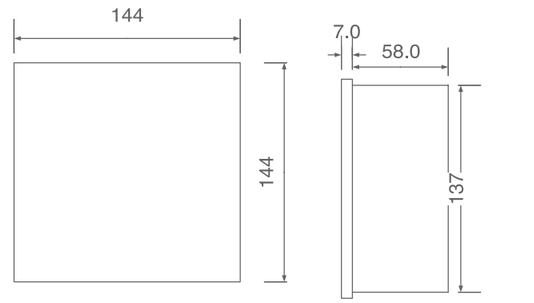
Fault Detection



Monitoring process faults with alarm relay controller provides you to stop them rapidly in order to prevent much worse condition thanks to alarm relay outputs.

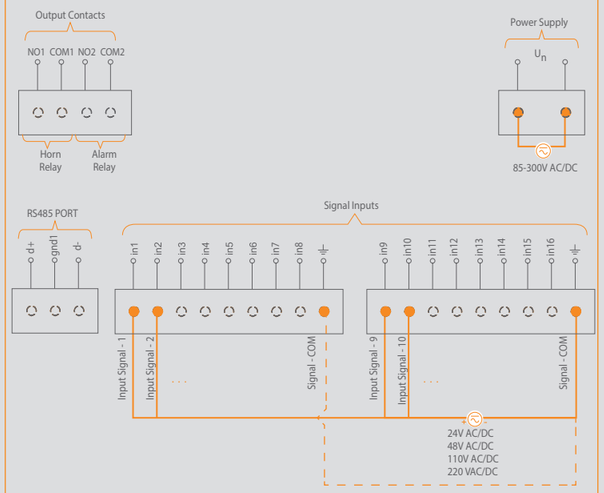
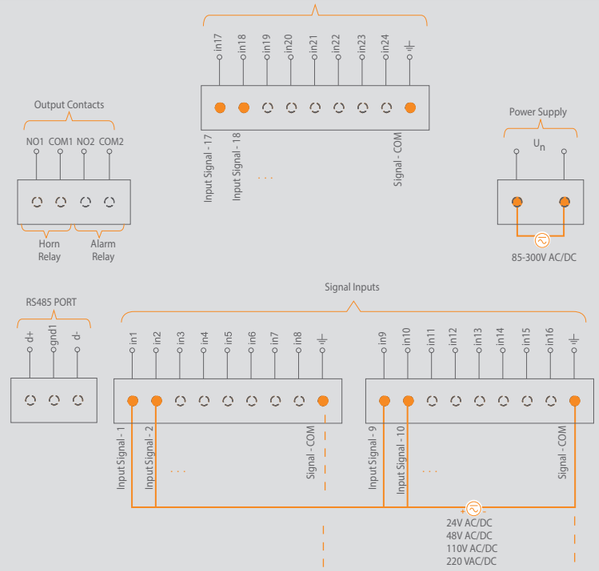
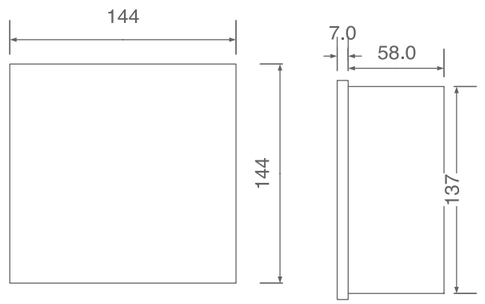
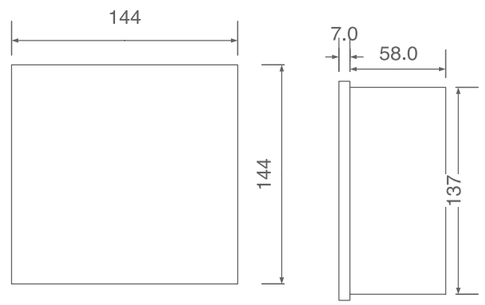
ALARM MANAGEMENT
ALRC-6

Type			ALRC-6 (24VAC/DC)	ALRC-6 (48VAC/DC)	ALRC-6 (110VAC/DC)	ALRC-6 (220VAC/DC)	ANC-8 (24VAC/DC)	ANC-8 (48VAC/DC)	ANC-8 (110VAC/DC)	ANC-8 (220VAC/DC)	ANC-16 (24VAC/DC)	ANC-16 (48VAC/DC)	ANC-16 (110VAC/DC)	ANC-16 (220VAC/DC)
Definiton			Alarm relay controller	Alarm relay controller	Alarm relay controller	Alarm relay controller	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator
Order Number			604610	604611	604612	604613	604620	604621	604622	604623	604630	604631	604632	604633
Input Signal	Voltage	AC	24V	48V	110V	220V	24V	48V	110V	220V	24V	48V	110V	220V
		DC	24V	48V	110V	220V	24V	48V	110V	220V	24V	48V	110V	220V
	Frequency		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
	Numbers		6	6	6	6	8	8	8	8	16	16	16	16
	Response Time		25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec
Output Contacts	Type of Output		Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay
	Number of contacts		8	8	8	8	2	2	2	2	2	2	2	2
	Type		1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)
	Max ratings-AC		5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA
	Max ratings-DC		5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
	Mechanical Life Time		≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations
	Electrical Life Time Operations (for NO side)		1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)
Window	Numbers		6	6	6	6	8	8	8	8	16	16	16	16
	Colours		Red	Red	Red	Red	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable
	Sizes(mm)		30.5x21.6	30.5x21.6	30.5x21.6	30.5x21.6	30.5x15.5	30.5x15.5	30.5x15.5	30.5x15.5	44,8x11,9	44,8x11,9	44,8x11,9	44,8x11,9
	İluminating for Each Window		With 4 pcs. red leds	With 4 pcs. red leds	With 4 pcs. red leds	With 4 pcs. red leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds	With 4 pcs. red leds or 4 pcs. green leds
	Flash rate	Slow	-	-	-	-	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min
		Fast	90 Flash/Min	90 Flash/Min	90 Flash/Min	90 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min
	Legends		Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.
Mod	ANC		-	-	-	-	Available	Available	Available	Available	Available	Available	Available	Available
	LSK		-	-	-	-	-	-	-	-	-	-	-	-
Time Range(sec)			-	-	-	-	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable
Inbuilt Push Buttons			3 nos.(Horn, Delete, Test)	3 nos.(Horn, Delete, Test)	3 nos.(Horn, Delete, Test)	3 nos.(Horn, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)
Buzzer			-	-	-	-	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable
Communication	Protocol		-	-	-	-	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU
	Baud Rate		-	-	-	-	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600
	Isolation		-	-	-	-	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms
Real Time Event Recording			-	-	-	-	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs
Battery Life			-	-	-	-	> 5years	> 5years	> 5years	> 5years	> 5years	> 5years	> 5years	> 5years
Supply	Voltage	AC	24V ±%30	48V ±%30	110V ±%30	220V ±%30	110-300V ±%10	110-300V ±%10	110-300V ±%10	110-300V ±%10	85-300V	85-300V	85-300V	85-300V
		DC	24V ±%30	48V ±%30	110V ±%30	220V ±%30	85-300V	110-300V ±%10	110-300V ±%10	110-300V ±%10	85-300V	85-300V	85-300V	85-300V
	Frequency		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
Power consumption	DC		<3W	<3W	<1W	<5.5W	<3W	<3W	<3W	<3W	<5W	<5W	<5W	<5W
	AC		<10VA	<10VA	<4.3VA	<7.2VA	<5VA	<5VA	<5VA	<5VA	<7.5VA	<7.5VA	<7.5VA	<7.5VA

Type			ALRC-6 (24VAC/DC)	ALRC-6 (48VAC/DC)	ALRC-6 (110VAC/DC)	ALRC-6 (220VAC/DC)	ANC-8 (24VAC/DC)	ANC-8 (48VAC/DC)	ANC-8 (110VAC/DC)	ANC-8 (220VAC/DC)	ANC-16 (24VAC/DC)	ANC-16 (48VAC/DC)	ANC-16 (110VAC/DC)	ANC-16 (220VAC/DC)
Permissible ambient temperature	During operation		-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
	During storage		-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)	Max.90% (no condensation)
Degree of protection			IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Dimensions (mm)	Bezel/Overall	Height(mm)	96	96	96	96	96.8	96.8	96.8	96.8	144	144	144	144
		Width(mm)	96	96	96	96	96.8	96.8	96.8	96.8	144	144	144	144
	Panel Cutout	Height(mm)	89.6	89.6	89.6	89.6	89.6	89.6	89.6	89.6	137	137	137	137
		Width(mm)	89.6	89.6	89.6	89.6	89.6	89.6	89.6	89.6	137	137	137	137
		Depth(mm)	66	66	66	66	65	65	65	65	58	58	58	58
Weight(gr)			274	274	274	274	280	280	280	280	517	517	517	517
Schematics														
Dimensional Drawings														

Type			ANC-16 (24VAC/DC)	ANC-16 (48VAC/DC)	ANC-16 (110VAC/DC)	ANC-16 (220VAC/DC)	ANC-24 (24V AC/DC, 85-300V AC/DC p.s.)
Definiton			Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator
Order Number			604650	604651	604652	604653	604660
Input Signal	Voltage	AC	24V	48V	110V	220V	24V
		DC	24V	48V	110V	220V	24V
	Frequency		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
	Numbers		16	16	16	16	24
	Response Time		25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec
Output Contacts	Type of Output		Relay	Relay	Relay	Relay	Relay
	Number of contacts		2	2	2	2	2
	Type		1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)
	Max ratings-AC		5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA
	Max ratings-DC		5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
	Mechanical Life Time		≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations
	Electrical Life Time Operations (for NO side)		1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)
Window	Numbers		16	16	16	16	24
	Colours		Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable
	Sizes(mm)		44,8x11,9	44,8x11,9	44,8x11,9	44,8x11,9	24,4x11,9
	İluminating for Each Window		With 4 pcs. leds or 4 pcs. green led	With 4 pcs. leds or 4 pcs. green led	With 4 pcs. leds or 4 pcs. green led	With 4 pcs. leds or 4 pcs. green led	With 2pcs. leds or 2 pcs. green led
	Flash rate	Slow	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min
		Fast	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min
	Legends		Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.
Mod	ANC		Available	Available	Available	Available	Available
	LSK		Available	Available	Available	Available	Available
Time Range(sec)			0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable
Inbuilt Push Buttons			4 nos.(Horn, Ack, Delete, Test)	5 nos.(Horn, Ack, Delete, Test)	6 nos.(Horn, Ack, Delete, Test)	7 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)
Buzzer			Available	Available	Available	Available	Available
Communication	Protocol		Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU
	Baud Rate		1200-57600	1200-57600	1200-57600	1200-57600	1200-57600
	Isolation		2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms
Real Time Event Recording			6080 logs	6081 logs	6082 logs	6083 logs	6080 logs
Battery Life			> 5 years	> 5 years	> 5 years	> 5 years	>5 years
Supply	Voltage	AC	24-50V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10	85-300V ±%10
		DC	24-50V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10	85-300V ±%10
	Frequency		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
Power consumption	AC		< 10VA	< 10VA	< 10VA	< 10VA	< 10VA
	DC		<5W	<5W	<5W	<5W	< 5W

ANC-24 (48V AC/DC, 85-300V AC/DC p.s.)	ANC-24 (110V AC/DC, 85-300V AC/DC p.s.)	ANC-24 (220V AC/DC, 85-300V AC/DC p.s.)	ANC-24 (24V AC/DC, 24-50VAC/DC p.s.)	ANC-24 (48V AC/DC, 24-50VAC/DC p.s.)	ANC-24 (110V AC/DC, 24-50VAC/DC p.s.)	ANC-24 (220V AC/DC, 24-50VAC/DC p.s.)
Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator
604661	604662	604663	604665	604666	604667	604668
48V	110V	220V	24V	48V	110V	220V
48V	110V	220V	24V	48V	110V	220V
45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
24	24	24	24	24	24	24
25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec
Relay	Relay	Relay	Relay	Relay	Relay	Relay
2	2	2	2	2	2	2
1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)
5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA
5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations
1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)
24	24	24	24	24	24	24
Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable
24,4x11,9	24,4x11,9	24,4x11,9	24,4x11,9	24,4x11,9	24,4x11,9	24,4x11,9
With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led
60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min
180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min
Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.
Available	Available	Available	Available	Available	Available	Available
Available	Available	Available	Available	Available	Available	Available
0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable
4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)
Available	Available	Available	Available	Available	Available	Available
Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU
1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600
2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms
6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs
>5 years	>5 years	>5 years	>5 years	>5 years	>5 years	>5 years
85-300V ±%10	85-300V ±%10	85-300V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10
85-300V ±%10	85-300V ±%10	85-300V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10
45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA
< 5W	< 5W	< 5W	< 5W	< 5W	< 5W	< 5W

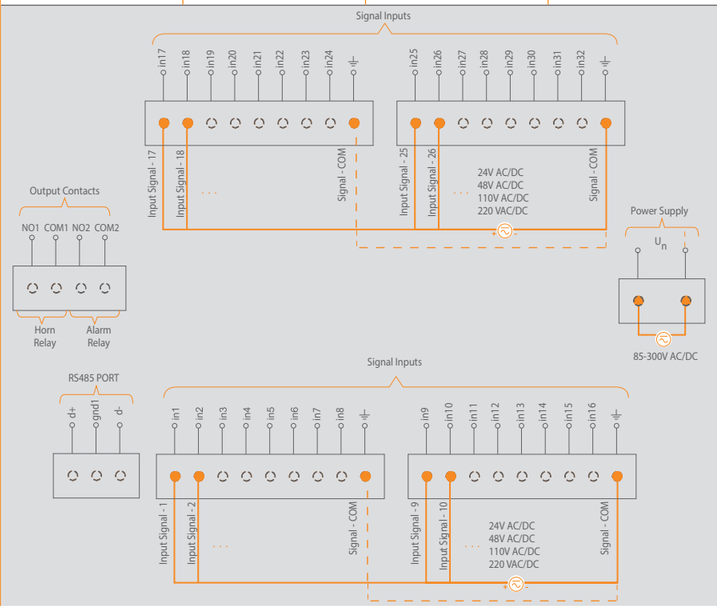
Type			ANC-16 (24VAC/DC)	ANC-16 (48VAC/DC)	ANC-16 (110VAC/DC)	ANC-16 (220VAC/DC)	ANC-24 (24V AC/DC, 85-300V AC/DC p.s.)	ANC-24 (48V AC/DC, 85-300V AC/ DC p.s.)	ANC-24 (110V AC/DC, 85-300V AC/ DC p.s.)	ANC-24 (220V AC/DC, 85-300V AC/ DC p.s.)	ANC-24 (24V AC/DC, 24-50VAC/DC p.s.)	ANC-24 (48V AC/DC, 24-50VAC/DC p.s.)	ANC-24 (110V AC/DC, 24-50VAC/DC p.s.)	ANC-24 (220V AC/DC, 24-50VAC/DC p.s.)
Permissible ambient temperature	During operation		-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage		-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of protection			IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Dimensions (mm)	Bezel/Overall	Height(mm)	144	144	144	144	144	144	144	144	144	144	144	144
		Width(mm)	144	144	144	144	144	144	144	144	144	144	144	144
	Panel Cutout	Height(mm)	137	137	137	137	137	137	137	137	137	137	137	137
		Width(mm)	137	137	137	137	137	137	137	137	137	137	137	137
		Depth(mm)	58	58	58	58	58	58	58	58	58	58	58	58
Weight(gr)			540	540	540	540	540	540	540	540	540	540	540	540
Schematics														
Dimensional Drawings														

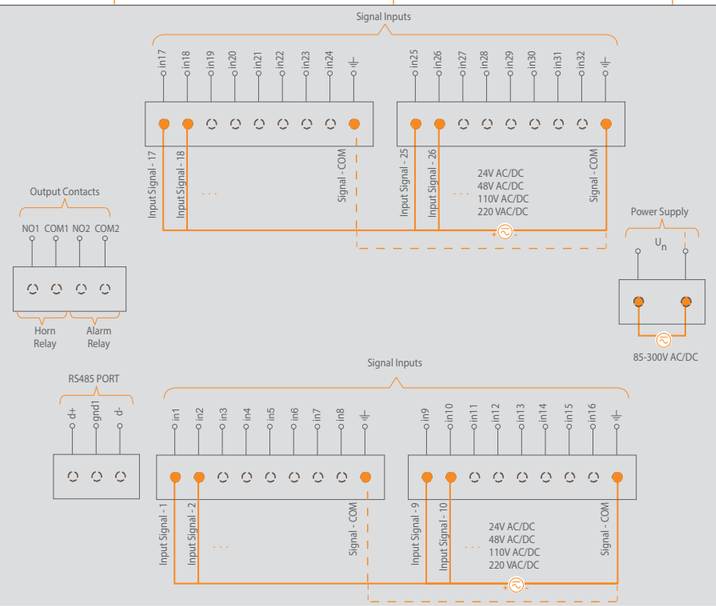
Type			ANC-32 (24V AC/DC, 85-300V AC/DC p.s.)	ANC-32 (48V AC/DC, 85-300V AC/ DC p.s.)	ANC-32 (110V AC/DC, 85-300V AC/ DC p.s.)	ANC-32 (220V AC/DC, 85-300V AC/ DC p.s.)	ANC-32 (24V AC/DC, 24-50VAC/DC p.s.)	ANC-32 (48V AC/DC, 24-50VAC/DC p.s.)	ANC-32 (110V AC/DC, 24-50VAC/DC p.s.)	ANC-32 (220V AC/DC, 24-50VAC/DC p.s.)
Definiton			Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator	Alarm annunciator
Order Number			604670	604671	604672	604673	604675	604676	604677	604678
Input Signal	Voltage	AC	24V	48V	110V	220V	24V	48V	110V	220V
		DC	24V	48V	110V	220V	24V	48V	110V	220V
	Frequency		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
	Numbers		32	32	32	32	32	32	32	32
	Response Time		25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec	25 ± 10 msec
Output Contacts	Type of Output		Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay
	Number of contacts		2	2	2	2	2	2	2	2
	Type		1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)	1 NO (SPST)
	Max ratings-AC		5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA	5A/277V; 1385 VA
	Max ratings-DC		5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
	Mechanical Life Time		≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations	≥ 10^8 operations
	Electrical Life Time Operations (for NO side)		1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)	1×10^5(5A@250VAC)
Window	Numbers		32	32	32	32	32	32	32	32
	Colours		Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable	Red/Green selectable
	Sizes(mm)		15,3x11,9	15,3x11,9	15,3x11,9	15,3x11,9	15,3x11,9	15,3x11,9	15,3x11,9	15,3x11,9
	İluminating for Each Window		With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led	With 2pcs. leds or 2 pcs. green led
	Flash rate	Slow	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min	60 Flash/Min
		Fast	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min	180 Flash/Min
	Legends		Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.
Mod	ANC		Available	Available	Available	Available	Available	Available	Available	Available
	LSK		Available	Available	Available	Available	Available	Available	Available	Available
Time Range(sec)			0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable	0, 2, 5, 10, 15, 20, 25, 30 adjustable
Inbuilt Push Buttons			4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)	4 nos.(Horn, Ack, Delete, Test)
Buzzer			Available	Available	Available	Available	Available	Available	Available	Available
Communication	Protocol		Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU	Modbus-RTU
	Baud Rate		1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600	1200-57600
	Isolation		2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms	2500 Vrms
Real Time Event Recording			6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs	6080 logs
Battery Life			> 5 years	> 5 years	> 5 years	> 5 years	> 5 years	> 5 years	> 5 years	> 5 years
Voltage Supply	Voltage	AC	85-300V ±%10	85-300V ±%10	85-300V ±%10	85-300V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10
		DC	85-300V ±%10	85-300V ±%10	85-300V ±%10	85-300V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10	24-50V ±%10
	Frequency		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz

Type			ANC-32 (24V AC/DC, 85-300V AC/DC p.s.)	ANC-32 (48V AC/DC, 85-300V AC/ DC p.s.)	ANC-32 (110V AC/DC, 85-300V AC/ DC p.s.)	ANC-32 (220V AC/DC, 85-300V AC/ DC p.s.)
Power consumption	DC		< 10VA	< 10VA	< 10VA	< 10VA
	AC		<5W	<5W	<5W	<5W
Permissible ambient temperature	During operation		-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage		-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of protection			IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal
Dimensions (mm)	Bezel/Overall	Height(mm)	144	144	144	144
		Width(mm)	144	144	144	144
	Panel Cutout	Height(mm)	137	137	137	137
		Width(mm)	137	137	137	137
		Depth(mm)	58	58	58	58
Weight(gr)			540	540	540	540

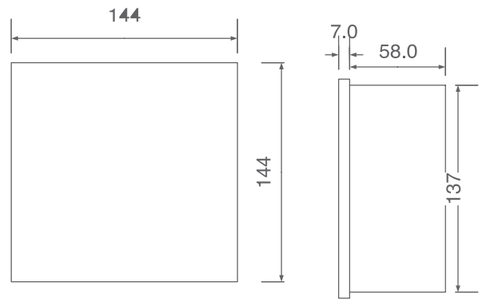
ANC-32 (24V AC/DC, 24-50VAC/ DC p.s.)	ANC-32 (48V AC/DC, 24-50VAC/ DC p.s.)	ANC-32 (110V AC/DC, 24-50VAC/ DC p.s.)	ANC-32 (220V AC/DC, 24-50VAC/ DC p.s.)
< 10VA	< 10VA	< 10VA	< 10VA
<5W	<5W	<5W	<5W
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)
Screw terminal	Screw terminal	Screw terminal	Screw terminal
144	144	144	144
144	144	144	144
137	137	137	137
137	137	137	137
58	58	58	58
540	540	540	540

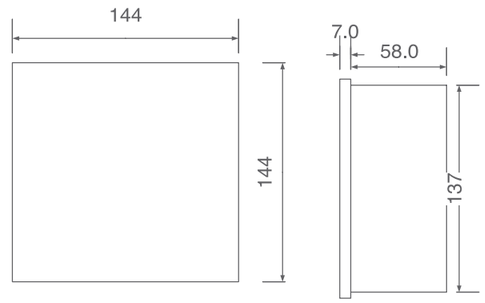
Schematics





Dimensional Drawings





Selection & Ordering Guide

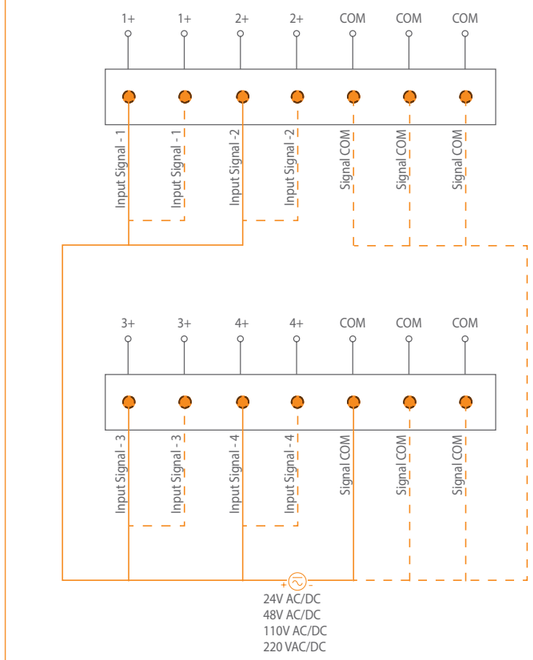
Signal Indicators

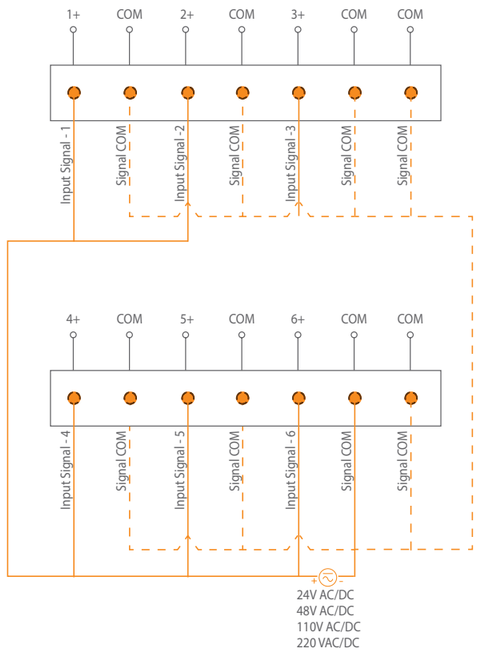
														
Type			**LSK-4 (24VAC/DC)**	**LSK-4 (48VAC/DC)**	**LSK-4 (110VAC/DC)**	**LSK-4 (220VAC/DC)**	**LSK-6 (24VAC/DC)**	**LSK-6 (48VAC/DC)**	**LSK-6 (110VAC/DC)**	**LSK-6 (220VAC/DC)**	**LSK-9 (24VAC/DC)**	**LSK-9 (48VAC/DC)**	**LSK-9 (110VAC/DC)**	**LSK-9 (220VAC/DC)**
Definiton			Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module	Signal Indicator Module
Order Number			583041	583042	583043	583045	583061	583062	583063	583065	583091	583092	583093	583095
Input Signal	Voltage	AC	24V	48V	110V	220V	24V	48V	110V	220V	24V	48V	110V	220V
		DC	24V	48V	110V	220V	24V	48V	110V	220V	24V	48V	110V	220V
	Frequency		Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)	Min. 45Hz (for AC signal input)
	Numbers		4	4	4	4	6	6	6	6	9	9	9	9
	Response Time:		Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms	Max. 10ms
Output Contacts			-	-	-	-	-	-	-	-	-	-	-	-
Window	Numbers		4	4	4	4	6	6	6	6	9	9	9	9
	Colours		Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
	Sizes(mm)		34,85 x 30	34,85 x 30	34,85 x 30	34,85 x 30	34,85 x 18,70	34,85 x 18,70	34,85 x 18,70	34,85 x 18,70	20,9 x 18,7	20,9 x 18,7	20,9 x 18,7	20,9 x 18,7
	Iluminating for each window		With 9 pcs. red leds	With 9 pcs. red leds	With 9 pcs. red leds	With 9 pcs. red leds	With 6 pcs. red leds	With 6 pcs. red leds	With 6 pcs. red leds	With 6 pcs. red leds	With 4 pcs. red leds	With 4 pcs. red leds	With 4 pcs. red leds	With 4 pcs. red leds
	Legends		Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.	Laser printed onto standart tracing paper, using templates provided by Klemsan Inc.
Time Range(sec)			-	-	-	-	-	-	-	-	-	-	-	-
Inbuilt Push Buttons			-	-	-	-	-	-	-	-	-	-	-	-
Buzzer			-	-	-	-	-	-	-	-	-	-	-	-
Communication			-	-	-	-	-	-	-	-	-	-	-	-
Real Time Event Recording			-	-	-	-	-	-	-	-	-	-	-	-
Battery Life			-	-	-	-	-	-	-	-	-	-	-	-
Permissible ambient temperature	During operation		-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
	During storage		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of protection			IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)	IP50(front), IP20(back) (IP66 with accessory)
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal

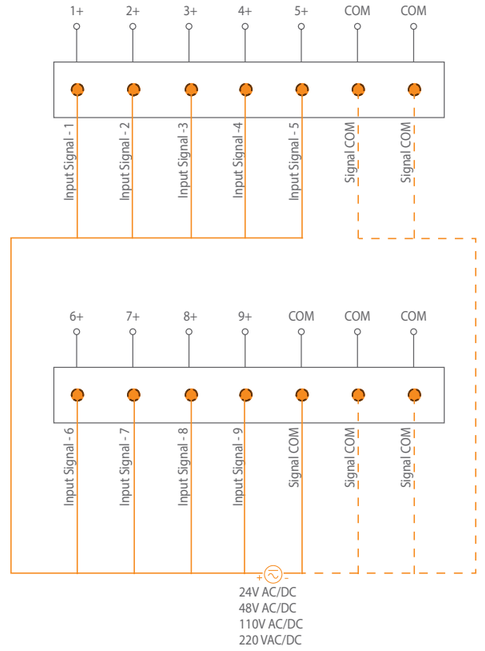
Type			LSK-4 (24VAC/DC)	LSK-4 (48VAC/DC)	LSK-4 (110VAC/DC)	LSK-4 (220VAC/DC)	LSK-6 (24VAC/DC)
Dimensions (mm)	Bezel/Overall	Height(mm)	96	96	96	96	96
		Width(mm)	96	96	96	96	96
	Panel Cutout	Height(mm)	89.5	89.5	89.5	89.5	89.5
		Width(mm)	89.5	89.5	89.5	89.5	89.5
		Depth(mm)	66	66	66	66	66
Weight(gr)			218	218	218	218	220

LSK-6 (48VAC/DC)	LSK-6 (110VAC/DC)	LSK-6 (220VAC/DC)	LSK-9 (24VAC/DC)	LSK-9 (48VAC/DC)	LSK-9 (110VAC/DC)	LSK-9 (220VAC/DC)
96	96	96	96	96	96	96
96	96	96	96	96	96	96
89.5	89.5	89.5	89.5	89.5	89.5	89.5
89.5	89.5	89.5	89.5	89.5	89.5	89.5
66	66	66	66	66	66	66
220	220	220	222	222	222	222

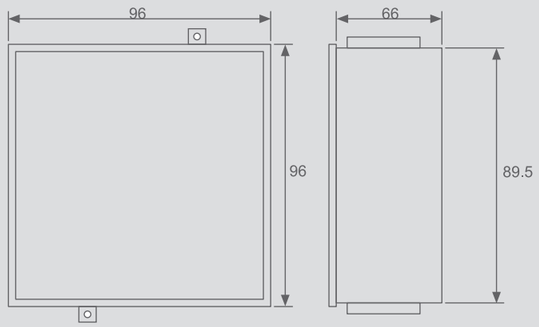
Schematics

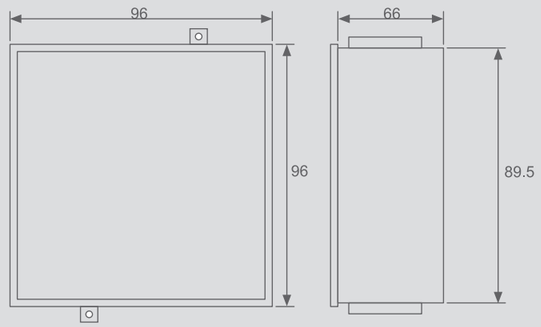






Dimensional Drawings





ANC series / Signal Control

There are 4 kinds of flashing of LED displays; fast blinking, slow blinking, continuously flashing (turn on continuously) and turn off.

For ANC8 the first alarm / for ANC16 the first or the last alarm (depending on setting) display blinks faster than the remaining channel displays which also have an alarm condition.

Assume there is an alarm in the 3rd channel. Third channel's display will blink fast. After a while, assume that there appear alarms in 7th, 8th and 9th channels. Then third channel will blink fast; seventh, eighth and ninth displays will blink slowly.

When the operator presses on the "Ack" button, all the channels (only the 3rd channel other channels already blink slowly) will blink slowly and also the related relay(s) deactivate(s) (horn and/or alarm relay – depending on the setting). After that; if alarm conditions disappeared, slow blinking channels will flash continuously (LEDs turn on continuously). In the above condition, when the operator presses "Del" button; all the continuously flashing displays will turn off.

e.g.

Input-1 is adjusted as horn(green) window and input-2 is adjusted as alarm(red) window in below figure.

when related signal is applied to first input channel, it will blink fastly in green colour in order to indicate first alarm. When related signal is applied to second channel, it blinks slowly in red colour.

If ACK(acknowledge) button is pressed, Horn and Alarm relay are de-activated. After pressing ACK button, if one of input signal is gone; it will blink constantly, otherwise it blinks slowly.

If Horn button is pressed, the buzzer will stop. Functional diagram is shown in below figure.

ALRC-6 series / Signal Control

Whenever any ALRC-6 input is excited, relay of that channel and horn relay are activated. If the related dip-switch (Alarm Relay Enable switch on the rear cover) is adjusted as ON, "alarm relay" will also be activated. If input signal is continued, display of the related channel blinks. If input signal is disconnected, display will be turned on continuously.

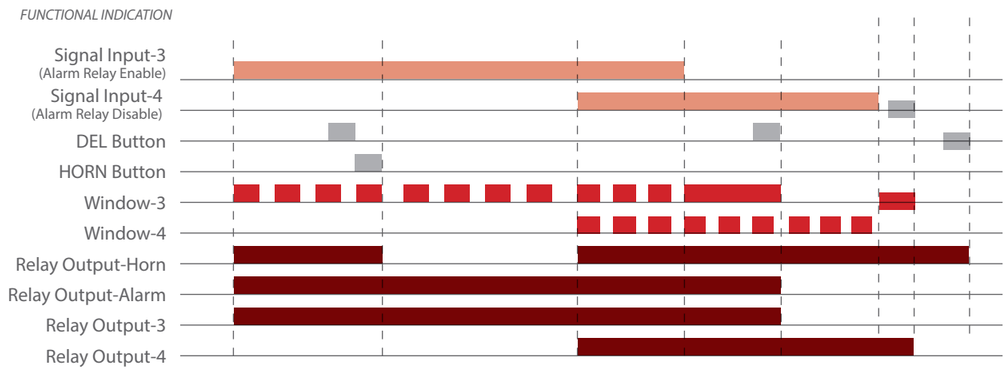
When HORN button is pressed, the HORN relay will be inactive. When a 'new' input signal is applied to any of the inputs, HORN relay will again be active.

When DEL button is pressed, relays of the channels whose input signals are interrupted will be inactive and displays of these channels will turn-off. For the channels whose input signals are continued, displays and relays maintain their initial state, as described above (relay active, display blinking).

When TEST button is pressed, displays of all channels will flash. This button has no effect on channel relays.

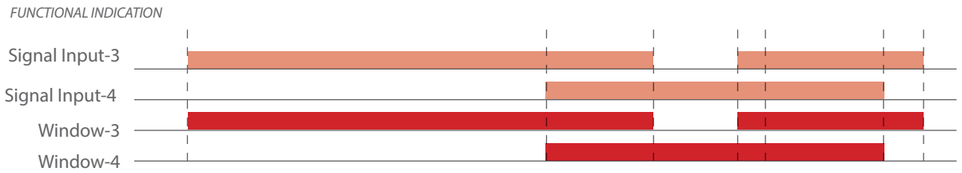
e.g.

Dip switch-3 is adjusted as "ON" and Dip switch-4 is adjusted as "OFF" in below figure.



LSK series/ Signal Visualizing

When input signal is applied to input channel of LSK series, related window is turned on constantly in red colour. When the signal is gone, related window is turned off.



Analog Signal
Management Solutions

Isolation with accurate conversion

Defining a transducer in simple terms

A transducer is an electronic device that changes one form of energy into another.
It provides conversion of main electrical parameters into a voltage or mA output and isolation between inputs and outputs.

Which actions are executed?

Measuring
Converting
Protection
Isolation
Configuration

A transducer measures input parameters and converts them to another signal form continuosly.

Input, output and power supply(optional) are electrically isolated from one another in order to provide protective isolation.

It is possible to configure different input ranges and output types by means of adjustment knobs.

Which markets are they used frequently?

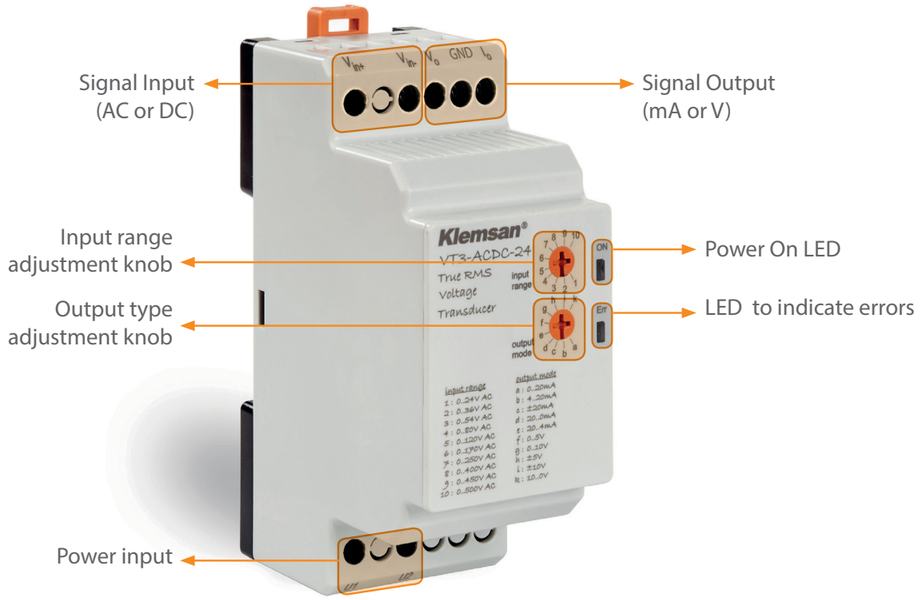
- Renewable Energy
- Medium motors
- Electric power plants and substations
- Telecontrol systems
- Industial Process
- Energy management systems
- Medium voltage modular cabinets
- Control and safety systems
- Telecontrol systems

Benefits and Advantages

- Extended measuring range
- Excellent linearity
- High system safety and reliability
- Electrical isolation with a high test voltage
- No insertion losses
- Low residual noise
- Good overall accuracy
- High quality, long useful life
- Easy configuration with knobs
- Without power suppy option
- Extended temperature input range
- Multiplying analog signal (1 in-2 outs)
- DC and AC supply voltage options
- Highly compact and light weight
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Self-Extinguishing plastic housing.

Layout & Mounting

Klemsan transducers are suitable for snap mounting onto 35mm standards DIN rails.



VT3-ACDC-24 Transducer

Renewable Energies

Measuring current and voltage in order to help the windmills and solar installations to work at their maximum efficiency.

SIGNAL CONVERTING

VT3-ACDC-24

Petrochemical processing

The measurement of temperature is a vital part of instrumentation in petrochemical industries. RTD sensors are often used for their excellent temperature response. They are used in order to combine sensors with PLC/Scada system.

SIGNAL CONVERTING

TT-RTD series

Ascon series

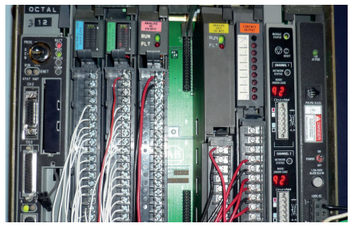
UPS Voltage Control

Inverter output voltage for UPS systems can be monitored by scada system via voltage transducers.

SIGNAL CONVERTING

VT3-ACDC-24

I/O applications



Passive isolators are used for the electrical isolation and converting of analog 0(4) to 20 mA standard current signals to 0-20mA, 4-20mA, 0-5V and 0-10V signals. They provide electrical isolation between the control electronics and process I/O and eleminate measurement errors caused by differences in earth potentials.

SIGNAL ISOLATING

PISO-DC series

Substation Automation

Conversion voltage and current of measurands, integration them with SCADA and RTU system.

SIGNAL CONVERTING

CT3 & VT3 series

Ascon 311

Refrigeration applications

Food products, fresh meats and produce, and stored items require strict environmental conditions for storage. That's why it is required reliable low temperature measurements. Providing down to minus 50 degree provides appropriate scale for any operation.

SIGNAL CONVERTING

TT-RTD series

Ascon321- Ascon 331

Elevators

With higher accuracy and speed, the feedback signal from transducers enables smoother control and energy consumption reduction of many electrical systems.

SIGNAL CONVERTING

CT3 series

On Board Automation for Railways

The electrical power is supplied to the trains via the catenaries. So, depanding on the train type such as subway, trolleybuses, high speed train, heavy traction etc. the locomotives can operate at different voltage levels. In order to monitor them in main panel, voltage transducers are used.

SIGNAL CONVERTING

VT3 series

Ascon 311

Scada System

The rms value of the input AC voltage or current can be converted to a DC output which is connected to analog input of PLC module. So it is possible to monitored them by Scada System.

SIGNAL CONVERTING

CT3 & VT3 series

Ascon series

Air conditioning and liquid temperature measurement

RTDs provide wide temperature input range from -50°C to +300°C in order to keep an industrial process in desired degree with accuracy and stability.

SIGNAL CONVERTING

TT-RTD series

Air Conditioning System

Monitoring of lower voltage levels and heavy load control with PLC modules.

PROTECTION

CT3 & VT3 series

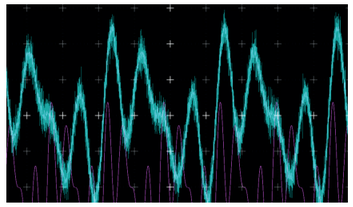
Motor Traction Control

Traction is provided by electric motors driven by inverters that are relying on transducers to measure, optimize and adjust the current and voltage that are sent to the motors, improving both performance and reliability.

PROTECTION

CT3 & VT3 series

Space-critical multi-channel applications



Providing two signal outputs for different control units thanks to 1-in 2-out converting feature. No auxiliary power supply is required for PISO series therefore cost savings are made.

SIGNAL MULTIPLYING

PISO-DC-DUO series

Tele-Control System

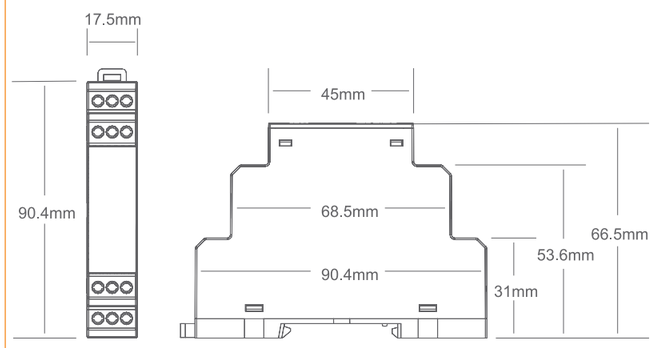
Providing an intelligent analog output module for the direct measurement of alternating variables for the use in station control applications.

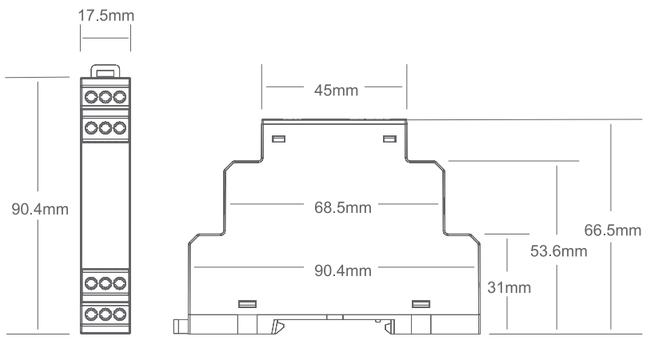
SIGNAL CONVERTING

CT3 & VT3 series

				
Type			**ASCON 311**	**ASCON 321**
Definiton			Configurable Signal Converter	Configurable PT100 Converter
Order Number			602300	602310
Casing Width(mm)			17,5	17,5
Connections			Screw terminal	Screw terminal
Input	Sensor Type		DC Current and Voltage(mV,V,mA)	PT100 (2,3,4 wire)
	PT100 connection Type		-	2, 3 or 4 wire
	Measuring Range		0…60mV -6…60mV 0…5mA 0…100mV -100…100mV 0…10mA 0…250mV -250…250mV 0…20mA 0…500mV -500…500mV -5…5mA 0…1V -1…1V -10…10mA 0…2V -2…2V -20…20mA 0…2,5V -2,5…2,5V 4…20mA 0…5V -5…5V 0…24mA 0…10v -10…10V 4…24mA 0…20V -20…20V 0…12mA	-150°C…800 °C Configurable
	Sensor excitation current		-	<0.5mA
	Maximum input signal		30V DC or 50mA DC	-
Output	Output Signal		0…5V 0…20mA 5…0V 20…0mA 0…10V 4…20mA 10…0V 20…4mA -5…5V -20…20mA	0…5V 0…20mA 5…0V 20…0mA 0…10V 4…20mA 10…0V 20…4mA -5…5V 20…20mA
	Measurement Error		< %0.2 Full scale	< %0.2 Full scale
	Max. Load		≤ 600Ω(Current Output) ≥10kΩ (Voltage Output)	≤ 600Ω(Current Output) ≥10kΩ (Voltage Output)
	Max. Output Signal		12V (Voltage Output) 24mV (Current Output)	12V (Voltage Output) 24mV (Current output)
Supply	Voltage	DC	11-30V DC	11-30V DC
Isolation			3 way-1,5kV RMS	3 way-1,5kV RMS
Power Consumptionr			≤ 25mA @ 24V (ILOAD =0mA, I =0mA)	≤ 25mA @ 24V (ILOAD =0mA, I =0mA)
Temperature coefficient			≤ %0.004/°C	≤ %0.02/°C

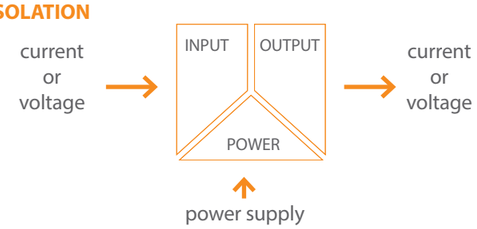
		
ASCON 331	**ASCON 341**	**ASCON 352**
Configurable Thermocouple Converter	Configurable Frequency Converter	Signal-Temperature Converter with RS485
602320	602 330	602400
17,5	17,5	17,5
Screw terminal	Screw terminal	Screw terminal
Thermocouple(J,K,E,R,S)	2-3 wire PNP/NPN, Namur, Push-Pull, Dry contact	mV,V,mA PT100(2,3,4wire) Thermocouple(J,K,E,R,S)
-	-	2,, 3 or 4 wire
J: - 200°C . . . 1200°C configurable K: -200°C . . . 1350°C configurable E: -200°C . . . 950°C configurable R: -50°C . . . 1750°C configurable S: -50°C . . . 1750°C configurable	0 .. 100 kHz configurable via knobs 0...150 kHz can be learned from input signal	**Signal** -30 signal combinations; 4-20mA,0-10V,etc. **PT100** -150°C…800 °C Configurable **Thermocouple** J: - 200°C . . . 1200°C configurable K: -200°C . . . 1350°C configurable E: -200°C . . . 950°C configurable R: -50°C . . . 1750°C configurable S: -50°C . . . 1750°C configurable
-	-	<0.5mA
-	Namur: 1.7 mA NPN: 6.5 V PNP: 6,7 V	30V DC or 50mA DC
0…5V 0…20mA 5…0V 20…0mA 0…10V 4…20mA 10…0V 20…4mA -5…5V -20…20mA	0 .. 5V, 0 .. 10V, -10 .. 10V, 0 .. 20mA, 4 .. 20mA, -20 .. 20mA	RS485
3.6mA .. 23.6mA	< %0.2 Full scale	3.6mA .. 23.6mA
< %0.2 Full scale	≤ 600Ω(Current Output) ≥10kΩ (Voltage Output)	< %0.1 Full scale
≤ 600Ω(Current Output) ≥10kΩ (Voltage Output)	12V (Voltage output), 24mA (Current output)	-
11-30V DC	18 .. 30V DC	11-30V DC
3 way-1,5kV RMS	1,5kVRMS	3 way-1,5kV RMS
≤ 25mA @ 24V (ILOAD =0mA, I =0mA)	≤ 30mA @ 24V (I LOAD AUX =0mA, I =0mA)	≤ 15mA @ 24V (ILOAD =0mA)
≤ %0.004/°C	≤ %0.004/°C	≤ %0.02/°C

Type		ASCON 311	ASCON 321
Response Time		< 150ms	< 150ms
Sensor failure indication		Failure Status: The situation of input signal is at least 10 % different than adjusted value / LED Indication: Err:	Failure Status: The situation of input signal is at least 10 % different than adjusted value / LED Indication: Err:
Protection		Over voltage and reverse polarity protection	Over voltage and reverse polarity protection
Connections	Power Input	DC+,DC-	DC+,DC-
	Input Connection	mV Input : 2(+), 3(-) V Input : 4(+), 1(-) mA Input : 3(+), 1(-)	P1+ and P1- (2 wire connection) P1+ and P1-,P2- (3 wire connection) P1+,P2- and P1+,P2- (4 wire conncetion)
	Output Connection	V,Gnd (Voltage Output) I,Gnd (Current Output)	V,Gnd (Voltage Output) I,Gnd (Current Output)
Communication	Protocol	-	-
	Serial Connection	-	-
	Baud Rate	-	-
	Parity	-	-
Permissible ambient temperature	During Operation	-20 to +60 °C	-20 to +60 °C
	During Storage	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)
Degree of protection		IP20	IP20
Weight(gr)		42	42
Mounting Type		Rail mounted	Rail mounted
Permissible mounting position		any	any
Dimensional Drawings			

ASCON 331	ASCON 341	ASCON 352
< 150ms	0 - 20 Hz: < 1050 msec 20 - 100 Hz: < 550 msec 100 Hz: < 300msec	<10ms
Failure Status: The situation of input signal is at least 10 % different than adjusted value / LED Indication: Err:	M1 M2 leds indication combinations	Failure Status: Voltage output mode: short circuit / LED Indication: Err:
Over voltage and reverse polarity protection	Over voltage and reverse polarity protection	Over voltage and reverse polarity protection
DC+,DC-	DC+,DC-	DC+,DC-
TC1+ and TC1-	**PNP :** 4(+), 2(-), Sensor Supply : 1 or external **NPN :** 3(+), 2(-), Sensor Supply : 1 or external **Namur :** 3(+), 2(-) **Push Pull :** 4(+), 2(-) **Dry Contact :** 4(+), Sensor Supply : 1	**Signal** mV Input : 2(+), 3(-) mA Input : 3(+), 1(-) V Input : 4(+), 1(-) **PT100** 4 and 3 (2 wire connection) 4 and 2,3(3wire connection) 1,4and2,3(4wireconncetion) **Thermocouple** TC connection: 4,5
V,Gnd (Voltage Output) I,Gnd (Current Output)	V,Gnd (Voltage Output) I,Gnd (Current Output)	D+, Gnd, D-
-	-	MODBUS RTU
-	-	RS485
-	-	1200 9600 57600 2400 19200 4800 38400(Default)
-	-	None(Default) Even Odd
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
IP20	IP20	IP20
42	42	42
Rail mounted	Rail Mounted	Rail mounted
any	any	any
		

ASCON 311 / Converting

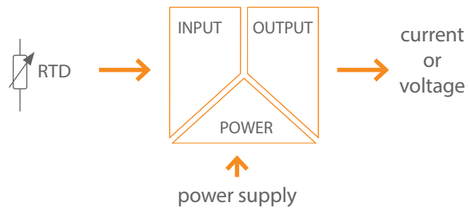
ISOLATION



ASCON 311 measure AC Current/ Voltage and converts it to an industry standard output signal which is directly proportional to the measured input. These transducers provide an output which is load independent and isolated from the input. Input range and output type must be adjusted before use them.

ASCON 321 / Converting

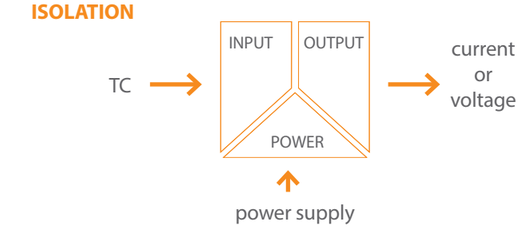
ISOLATION



RTD's provide wide temperature input range from -150°C to +800°C when accuracy and stability are a requirement of the customer's specification in an industrial process in order to keep it in desired degree.

ASCON 331 / Converting

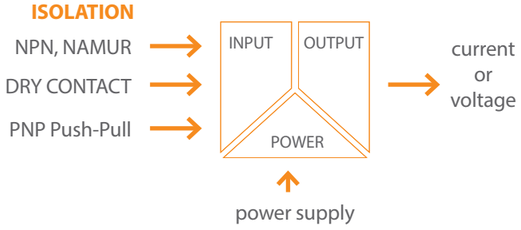
ISOLATION



Measurement of temperature is a vital part of instrumentation in petrochemical industries, heating systems, refrigerating applications etc. Termocouple sensors are often used for their excellent temperature response. ASCON 331 presents best solution with combining TC sensors with PLC/ Scada system.

ASCON 341 / Converting

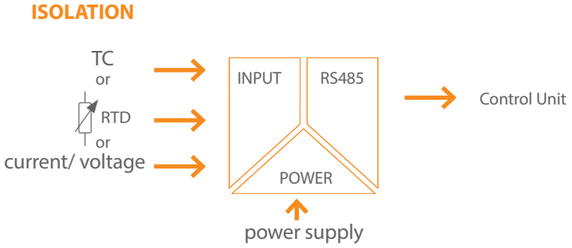
ISOLATION



Frequency converters convert frequency into analogue standard signals. The configurable frequency transducer is suitable for the connection of NAMUR proximity sensors as well as for sensors with NPN, PNP and Push-Pull outputs, Dry Contact as well. Configurable via adjustment knobs and teach-in knob. ASCON 341 has screw connection and standard configuration.

ASCON 352 / Signal-Temperature Converting / RS485 Communication

ISOLATION



ASCON 352 involves all input ranges which are indicated on above ASCON types. Measured values can be transmitted to a PC through serial communication so that real time analog signal monitoring without PLC analog card is possible.

Modbus RTU Descriptions

Modbus Table

Input value	40001	RO	32 bit float	03H
Ambient temprature	40003	RO	32 bit float	03H
Input type	40005	R/W	32 bit integer	03H / 10H
Input type - option 1	40007	R/W	32 bit integer	03H / 10H
Input type - option 2	40009	R/W	32 bit integer	03H / 10H
Input type - option 3	40011	R/W	32 bit integer	03H / 10H
Baudrate	40013	R/W	32 bit integer	03H / 10H
Parity	40015	R/W	32 bit integer	03H / 10H
MODBUS slave ID	40017	R/W	32 bit integer	03H / 10H
Record value	40019	R/W	32 bit integer	03H / 10H

If Input type is "Voltage / Current"

		Input type - option 1		
		0, 1, 2	3, 4, 5, 6	7, 8, 9
Input Type option 2	0	0.. 60mV	-60.. 60mV	0.. 5mA
	1	0.. 100mV	-100.. 100mV	0.. 10mA
	2	0.. 250mV	-250.. 250mV	0.. 20mA
	3	0.. 500mV	-500.. 500mV	-5.. 5mA
	4	0.. 1V	-1.. 1V	-10.. 10mA
	5	0.. 2V	-2.. 2V	-20.. 20mA
	6	0.. 2.5V	-2.5.. 2.5V	4.. 20mA
	7	0.. 5V	-5.. 5V	0.. 24mA
	8	0.. 10V	-10.. 10V	4.. 24mA
	9	0.. 20V	-20.. 20V	0.. 12mA

"Input type -option 3" value must be a 9.

If Input type is "PT100"

Input type - option 1		
0, 1, 2	3, 4, 5, 6	7, 8, 9
PT100-2W	PT100-3W	PT100-4W

"Input type -option 2" value must be a 9.
"Input type -option 3" value must be a 9.

If Input type is "TC"

Input type - option 1				
0, 1	2, 3	4, 5,	6,7	8, 9
J type TC	K type TC	E type TC	R type TC	S type TC

"Input type -option 2" value must be a 9.
"Input type -option 3" value must be a 9.

Baudrate						
0	1	2	3	4	5	6
1200	2400	4800	9600	19200	38400	57600

Parity		
0	1	2
None	Even	Odd

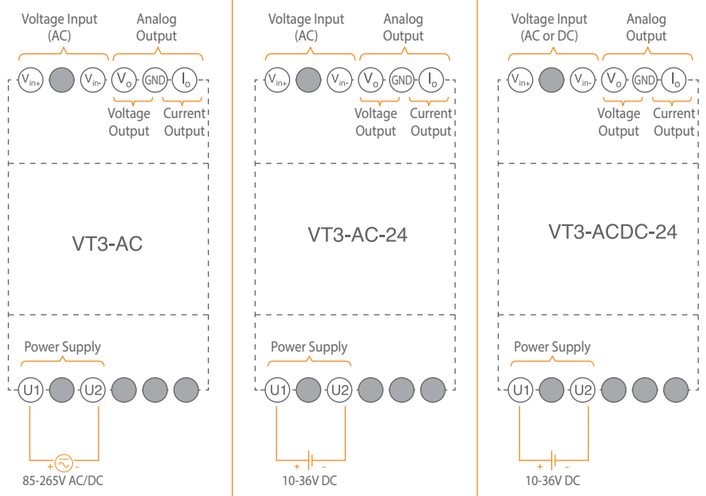
Slave ID _____ 1 .. 247

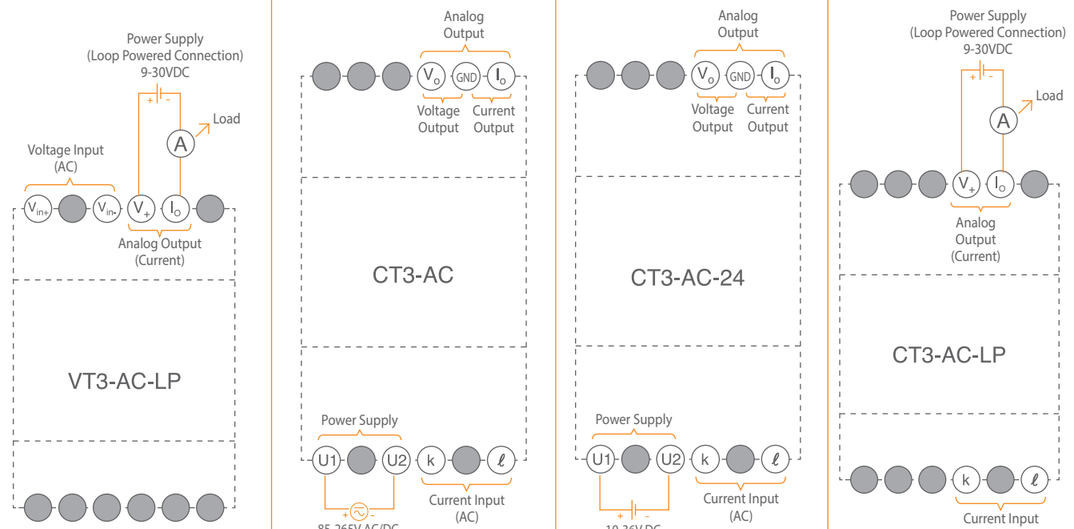
NOTE: Record value _ Enter "100" to save the changes

									
Type			**VT3-AC**	**VT3-AC-24**	**VT3-ACDC-24**	**VT3-AC-LP**	**CT3-AC**	**CT3-AC-24**	**CT3-AC-LP**
Definiton			True RMS Voltage Transducer	True RMS Voltage Transducer	True RMS Voltage Transducer	True RMS Voltage Transducer	True RMS Current Transducer	True RMS Current Transducer	True RMS Current Transducer
Order Number			600101	600103	600106	600105	600100	600102	600104
Casing Width(mm)			36	36	36	36	36	36	36
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Input Signal	Configurable Voltage range	0-24 VAC	Avaliable	Avaliable	Avaliable	Avaliable	-	-	-
		0-36 VAC	Avaliable	Avaliable	-	Avaliable	-	-	-
		0-54 VAC	Avaliable	Avaliable	Avaliable	Avaliable	-	-	-
		0-80 VAC	Avaliable	Avaliable	-	Avaliable	-	-	-
		0-120 VAC	Avaliable	Avaliable	Avaliable	Avaliable	-	-	-
		0-170 VAC	Avaliable	Avaliable	-	Avaliable	-	-	-
		0-250 VAC	Avaliable	Avaliable	Avaliable	Avaliable	-	-	-
		0-400 VAC	Avaliable	Avaliable	-	Avaliable	-	-	-
		0-450 VAC	Avaliable	Avaliable	Avaliable	Avaliable	-	-	-
		0-500 VAC	Avaliable	Avaliable	-	Avaliable	-	-	-
		0-24 VDC	-	-	Avaliable	-	-	-	-
		0-54 VDC	-	-	Avaliable	-	-	-	-
		0-120 VDC	-	-	Avaliable	-	-	-	-
		0-250 VDC	-	-	Avaliable	-	-	-	-
		0-450 VDC	-	-	Avaliable	-	-	-	-
	Configurable Current Range	0-1 AAC	-	-	-	-	Avaliable	Avaliable	Avaliable
		0-2 AAC	-	-	-	-	Avaliable	Avaliable	Avaliable
		0-3 AAC	-	-	-	-	Avaliable	Avaliable	Avaliable
		0-4 AAC	-	-	-	-	Avaliable	Avaliable	Avaliable
		0-5 AAC	-	-	-	-	Avaliable	Avaliable	Avaliable
	Frequency		40-70 Hz	40-70 Hz	40-70 Hz	40-70 Hz	40-70 Hz	40-70 Hz	40-70 Hz
	Surge overload		< 2 x Uinput max. range (5 pulses 1s)	< 2 x Uinput max. range (5 pulses 1s)	< 2 x Uinput max. range (5 pulses 1s)	< 2 x Uinput max. range (5 pulses 1s)	20xin(100A) for 1 Sec.	20xin(100A) for 1 Sec.	20xin(100A) for 1 Sec.
	Constant overload		Max. 600 V	Max. 600 V	Max. 600 V	Max. 600 V	10A(2x Rated IN)	10A(2x Rated IN)	10A(2x Rated IN)
	Input impedances		240 kΩ	240 kΩ	240 kΩ	240 kΩ	49.9 Ω (burden resistor)	49.9 Ω (burden resistor)	49.9 Ω (burden resistor)
Output	Type	0-20 mA	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		4-20 mA	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable	Avaliable
		±20 mA	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		20-0 mA	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		20-4 mA	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		0-5 V	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		0-10 V	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		±5 V	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		± 10 V	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
		10-0 V	Avaliable	Avaliable	Avaliable	-	Avaliable	Avaliable	-
	Analog Output	Max. Current	24 mA	24 mA	24 mA	24 mA	24 mA	24 mA	24 mA
		Max. Voltage	12 V	12 V	12 V	-	12 V	12 V	-
		Max. Load	10kΩ(for voltage) / 600Ω(for current)	10kΩ(for voltage) / 600Ω(for current)	10kΩ(for voltage) / 600Ω(for current)	10kΩ(for voltage) / 600Ω(for current)	10kΩ(for voltage) / 600Ω(for current)	10kΩ(for voltage) / 600Ω(for current)	10kΩ(for voltage) / 600Ω(for current)

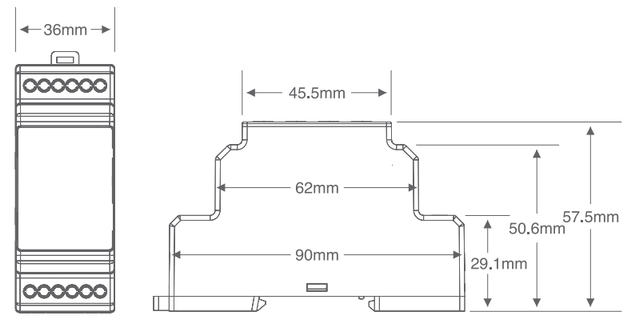
Type			VT3-AC	VT3-AC-24	VT3-ACDC-24	VT3-AC-LP	CT3-AC	CT3-AC-24	CT3-AC-LP
Supply	Voltage	AC	85-265V	-	-	-	85-265V	-	-
		DC	85-265V	10-36V	10-36V	9-30V	85-265V	10-36V	9-30V
	Frequency		40-70 Hz	-	-	-	40-70 Hz	-	-
Power consumption	DC		<1.5W	<1.5W	<1.5W	<1.5W	<1.5W	<1.5W	<1.5W
	AC		<4VA	<4VA	<4VA	<4VA	<4VA	<4VA	<4VA
Isolation			1.5 kVrms, 3-way	1.5 kVrms, 3-way	1.5 kVrms, 3-way	1.5 kVrms, 2-way	1.5 kVrms, 3-way	1.5 kVrms, 3-way	1.5 kVrms, 2-way
Test Voltage between input-output			4kV during 1 min	4kV during 1 min	4kV during 1 min	4kV during 1 min	4kV during 1 min	4kV during 1 min	4kV during 1 min
Linearity			<0.2%	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%
Response Time			350 ms	350 ms	350 ms	350 ms	350 ms	350 ms	350 ms
Ripple			<80mV	<80mV	<80mV	<80mV	<80mV	<80mV	<80mV
Accuracy			< %0.2 (full scale, 25°C)	< %0.2 (full scale, °C)	< %0.2 (full scale, °C)	< %0.2 (full scale, °C)	< %0.2 (full scale, °C)	< %0.2 (full scale, °C)	< %0.2 (full scale, °C)
Temperature coefficient			150 ppm/°C	150 ppm/°C	150 ppm/°C	150 ppm/°C	150 ppm/°C	150 ppm/°C	150 ppm/°C
Permissible ambient temperature		During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
		During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of protection			IP20	IP20	IP20	IP20	IP20	IP20	IP20
Weight(gr)			84	76	70	68	87	81	71
Permissible mounting position			any	any	any	any	any	any	any

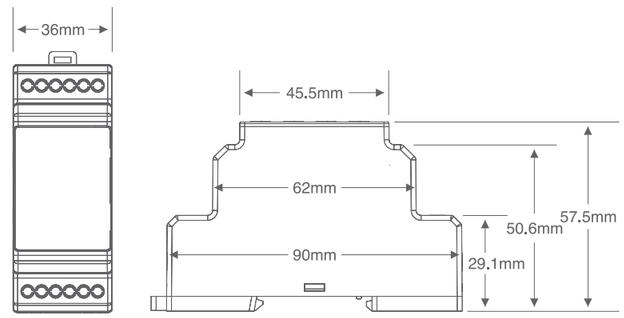
Schematics





Dimensional Drawings



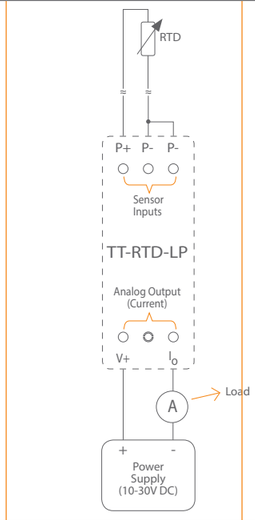
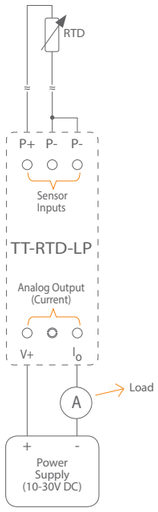
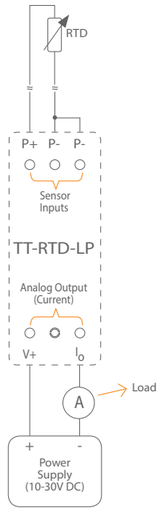
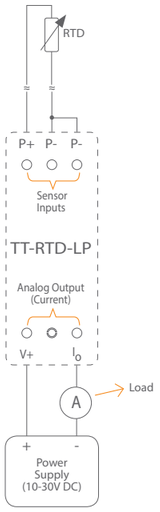
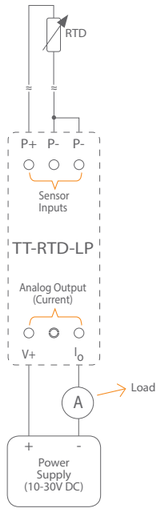
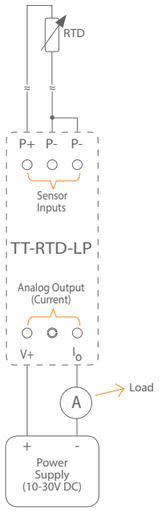
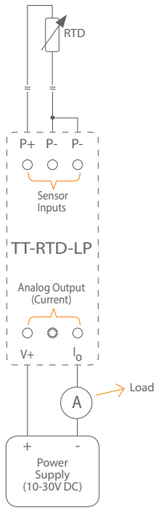
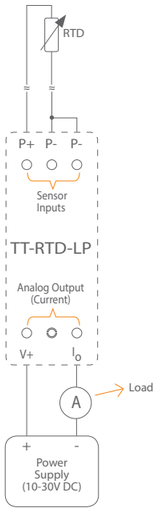
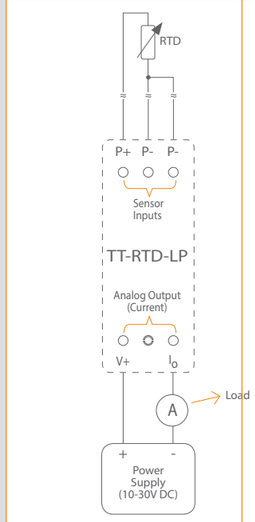
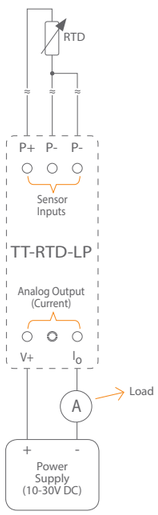
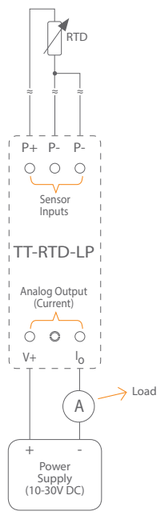
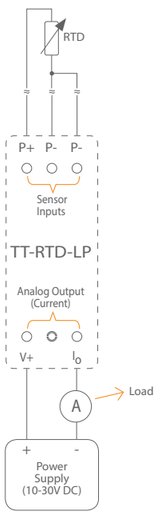
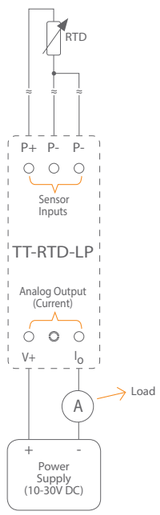
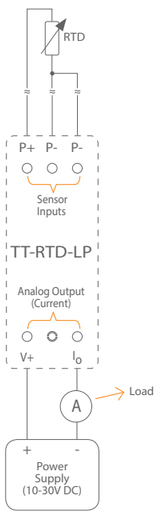
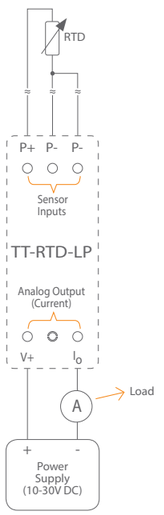
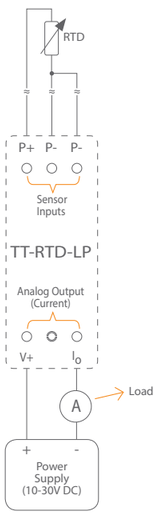
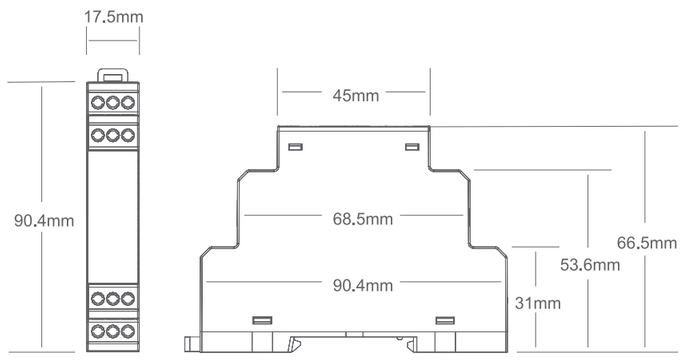
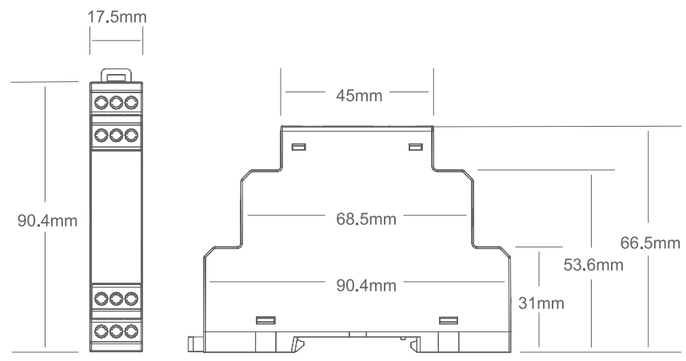




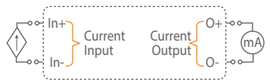
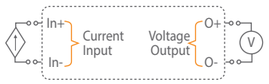
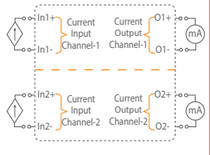
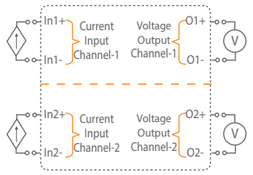
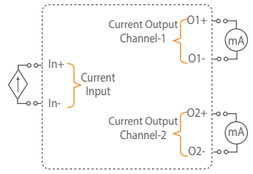
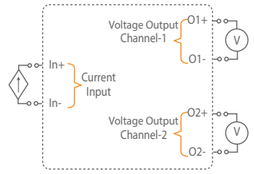
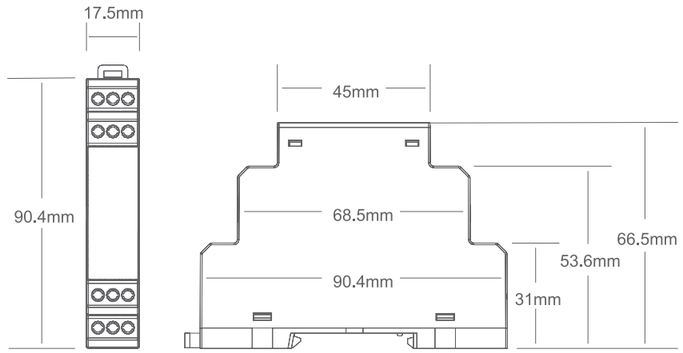
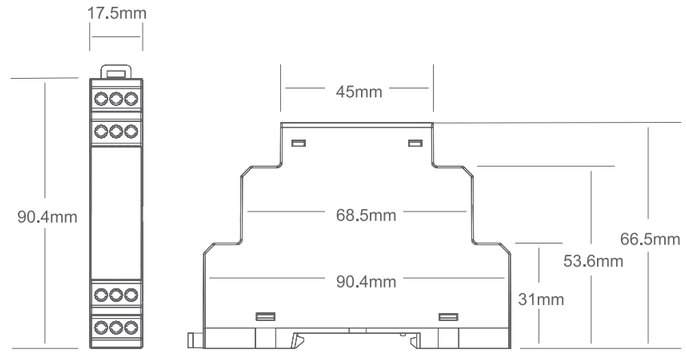





Type			TT-RTD-LP (-50 .. 100)	TT-RTD-LP (0 .. 100)	TT-RTD-LP (0 .. 150)	TT-RTD-LP (0 .. 200)	TT-RTD-LP (0 .. 300)	TT-RTD-LP (-50 .. 150)	TT-RTD-LP (-50 .. 200)	TT-RTD-LP (0 .. 500)
Definiton			Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer	Non-Isolated PT100 Transducer
Order Number			603860	603861	603862	603863	603864	603865	603866	603867
Casing Width(mm)			17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Input	Sensor Type		PT100	PT100	PT100	PT100	PT100	PT100	PT100	PT100
	Connection Method		2 wire or 3 wire	2 wire or 3 wire	2 wire or 3 wire	2 wire or 3 wire	2 wire or 3 wire	2 wire or 3 wire	2 wire or 3 wire	2 wire or 3 wire
	Temperature Measuring Range		-50°C .. 100°C	0°C .. 100 °C	0°C .. 150 °C	0°C .. 200 °C	0°C .. 300 °C	-50°C .. 150°C	-50°C .. 200°C	0°C .. 500°C
	Sensor excitation current		<0.6mA	<0.6mA	<0.6mA	<0.6mA	<0.6mA	<0.6mA	<0.6mA	<0.6mA
Output	Output Signal		4-20mA	4-20mA	4-20mA	4-20mA	4-20mA	4-20mA	4-20mA	4-20mA
	Linear output range		3.6mA .. 23.6mA	3.6mA .. 23.6mA	3.6mA .. 23.6mA	3.6mA .. 23.6mA	3.6mA .. 23.6mA	3.6mA .. 23.6mA	3.6mA .. 23.6mA	3.6mA .. 23.6mA
	Max. Load		≤ 750Ω	≤ 750Ω	≤ 750Ω	≤ 750Ω	≤ 750Ω	≤ 750Ω	≤ 750Ω	≤ 750Ω
	Ripple		< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)	< 20 mVPP (at 750 Ω)
Supply	Voltage	AC	-	-	-	-	-	-	-	-
		DC	10-30V	10-30V	10-30V	10-30V	10-30V	10-30V	10-30V	10-30V
Isolation			-	-	-	-	-	-	-	-
Measurement error			< %0.1 Full scale	< %0.1 Full scale	< %0.1 Full scale	< %0.1 Full scale	< %0.1 Full scale	< %0.1 Full scale	< %0.1 Full scale	< %0.1 Full scale
Temperature coefficient			≤ %0.02/°C	≤ %0.02/°C	≤ %0.02/°C	≤ %0.02/°C	≤ %0.02/°C	≤ %0.02/°C	≤ %0.02/°C	≤ %0.02/°C
Response Time			< 20ms	< 20ms	< 20ms	< 20ms	< 20ms	< 20ms	< 20ms	< 20ms
Sensor failure indication			3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)	3.1mA (1 wire is broken), 24.6mA (at least 2 wire is broken)
Permissible ambient temperature		During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
		During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of protection			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Weight(gr)			42	42	42	42	42	42	42	42
Permissible mounting position			any	any	any	any	any	any	any	any

Type		TT-RTD-LP (-50 .. 100)	TT-RTD-LP (0 .. 100)	TT-RTD-LP (0 .. 150)	TT-RTD-LP (0 .. 200)	TT-RTD-LP (0 .. 300)	TT-RTD-LP (-50 .. 150)	TT-RTD-LP (-50 .. 200)	TT-RTD-LP (0 .. 500)
Schematics	2 wire connection								
	3 wire connection								
Dimensional Drawings									

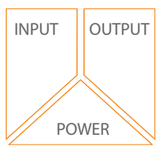
													
Type		**PISO-DC-1 (0-20mA/0-20mA)**	**PISO-DC-1 (4-20mA/4-20mA)**	**PISO-DC-1 (0-20mA/0-10V)**	**PISO-DC-1 (0-20mA/0-5V)**	**PISO-DC-2 (0-20mA/0-20mA)**	**PISO-DC-2 (4-20mA/4-20mA)**	**PISO-DC-2 (0-20mA/0-10V)**	**PISO-DC-2 (0-20mA/0-5V)**	**PISO-DC-DUO (0-20mA/0-20mA, 0-20mA)**	**PISO-DC-DUO (4-20mA/4-20mA, 4-20mA)**	**PISO-DC-DUO (0-20mA/0-10V,0-10V)**	**PISO-DC-DUO (0-20mA/0-5V,0-5V)**
Definiton		Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator	Passive DC Signal Isolator
Order Number		602800	602801	602802	602803	602850	602851	602852	602853	602700	602701	602702	602703
Casing Width(mm)		17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5
Connections		Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Input	Number of Channels	1 pc.	1 pc.	1 pc.	1 pc.	2 pc.	2 pc.	2 pc.	2 pc.	1 pc.	1 pc.	1 pc.	1 pc.
	Signal type	0-20mA	4-20mA	0-20mA	0-20mA	0-20mA	4-20mA	0-20mA	0-20mA	0-20mA	4-20mA	0-20mA	0-20mA
	Maximum input signal	50mA	50mA	50mA	50mA	50mA	50mA	50mA	50mA	50mA	50mA	50mA	50mA
Output	Number of Channels	1 pc.	1 pc.	1 pc.	1 pc.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.
	Signal Type	0-20 mA	4-20 mA	0-10 V	0-5 V	0-20 mA	4-20 mA	0-10 V	0-5 V	0-20 mA	4-20 mA	0-10 V	0-5 V
	Max. Current	24 mA	24 mA	-	-	24 mA	24 mA	-	-	24 mA	24 mA	-	-
	Max. Voltage	-	-	12 V	12 V	-	-	12 V	12 V	-	-	12 V	12 V
	Ripple	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)	< 20 mV (full scale)
	Load Resistance	≤ 250Ω	≤ 250Ω	≥ 5MΩ	≥ 5MΩ	≤ 250Ω	≤ 250Ω	≥ 5MΩ	≥ 5MΩ	≤ 250Ω	≤ 250Ω	≥ 5MΩ	≥ 5MΩ
Isolation		1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms	1.5 kVrms
Measurement error(Full Scale)		< %0.1	< %0.1	< %0.2	< %0.2	< %0.1	< %0.1	< %0.2	< %0.2	< %0.1	< %0.1	< %0.2	< %0.2
Response Time		20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms
Temperature coefficient		<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K	<50 ppm/K
Permissible ambient temperature	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
	During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)

Type	PISO-DC-1 (0-20mA/0-20mA)	PISO-DC-1 (4-20mA/4-20mA)	PISO-DC-1 (0-20mA/0-10V)	PISO-DC-1 (0-20mA/0-5V)	PISO-DC-2 (0-20mA/0-20mA)	PISO-DC-2 (4-20mA/4-20mA)	PISO-DC-2 (0-20mA/0-10V)	PISO-DC-2 (0-20mA/0-5V)	PISO-DC-DUO (0-20mA/0-20mA, 0-20mA)	PISO-DC-DUO (4-20mA/4-20mA, 4-20mA)	PISO-DC-DUO (0-20mA/0-10V, 0-10V)	PISO-DC-DUO (0-20mA/0-5V,0-5V)
Degree of protection	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Permissible mounting position	any	any	any	any	any	any	any	any	any	any	any	any
Schematics					 **NOTE:** Channel-1 and Channel-2 are totally isolated from each other.		 **NOTE:** Channel-1 and Channel-2 are totally isolated from each other.		 **NOTE:** If only one output channel is used, the other channel (which is not used) must be short-circuited.		
Dimensional Drawings											

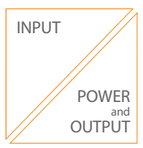
CT3 series / Converting

ISOLATION

CT3-AC, CT3-AC-24



CT3-AC-LP



CT3 series transducers measure AC Current and converts it to an industry standard output signal which is directly proportional to the measured input. These transducers provide an output which is load independent and isolated from the input. Input range and output type must be adjusted before use them.

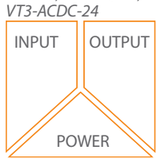
LED INDICATION

Failure Status	LED Indication
Voltage Output Mode: Short Circuit	Err:
Current Output Mode: Open Circuit	Err:
No Signal	ON:

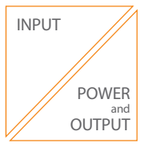
VT3 series / Converting

ISOLATION

VT3-AC, VT3-AC-24, VT3-ACDC-24



VT3-AC-LP



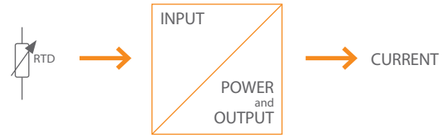
VT3 series transducers measure AC or DC(optional) voltage and converts it to an industry standard output signal which is directly proportional to the measured input. These transducers provide an output which is load independent and isolated from the input. Input range and output type must be adjusted before use them.

LED INDICATION

Failure Status	LED Indication
Voltage Output Mode: Short Circuit	Err:
Current Output Mode: Open Circuit	Err:
No Signal	ON:

TT-RTD series / Converting

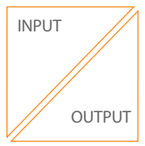
NO ISOLATION



TT-RTD series transducers convert temperature signals from PT100 sensors to an industry standard output signal (4-20mA) which is directly proportional to the measured input.

Passive Isolator series / Isolating

ISOLATION



Passive signal isolator series serve to electrically isolate the analog DC signal in the range from 0-20 or 4-20mA which depending on version, then converted it to 0-20 mA, 4-20mA, 0-5V, 0-10V. It does not require an external power supply. These transducers provide an output which is load independent and isolated from the input.

Switching
Management Solutions

Industrial
switching
with wide range

Defining an interface relay in simple terms

An interface relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current.

Which actions are executed?

Switching
Protection
Controlling
Filtering **Isolation**

An interface relay is an electrically operated switch that is used where it is necesarry to control a circuit by a low-power signal.

It provides complete electrical protective isolation between control and controlled circuits.

Filtering AC power input signals in order to prevent leakage current.

Saving money and increasing efficiency for PLC outputs.

Reduced PLC outputs to meet energy consumption goals.

Which markets are they used frequently?

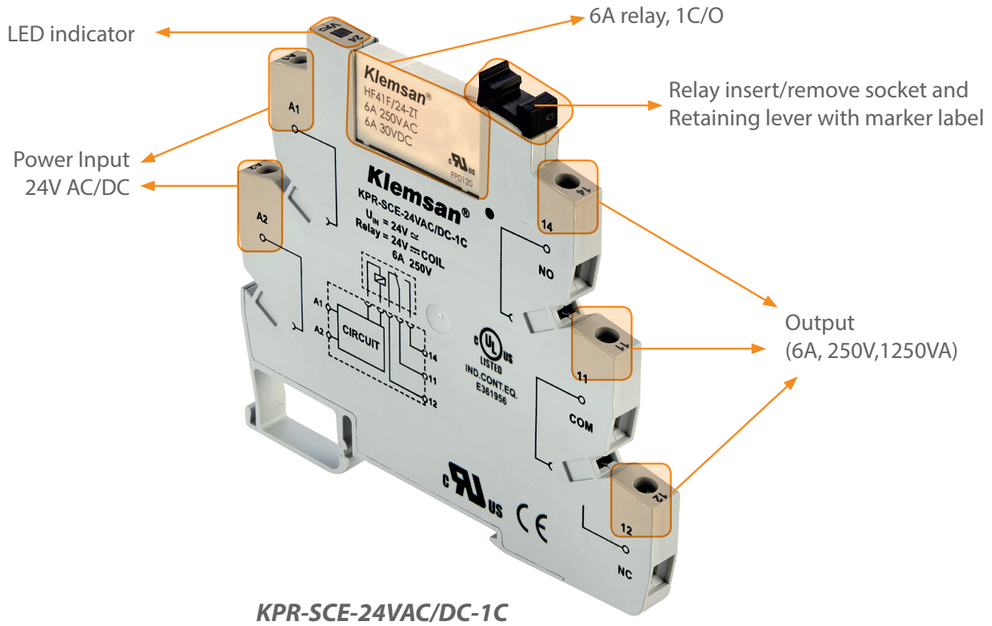
- PLC automation systems
- Electric power plants
- Energy management systems
- Medium Voltage Panels
- Industrial Machines

Benefits and Advantages

- A widely range of power input from 6V to 230V
- DC and AC supply voltage options
- Integrated RCZ filter option
- Saving wiring time with plug-in bridges
- High quality, long useful life
- Saving space with 6.2mm design
- LED status indicator in order to see actual movement of the contacts
- Labeling with terminal block marking materials
- Highly compact and light weight
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Self-Extinguishing plastic housing
- UL certificate

Layout & Mounting

Klemsan interface relays are suitable for snap mounting onto 35 mm standards DIN rails.



KPR-SCE-24VAC/DC-1C

Automation System

Reduced PLC outputs to meet energy consumption goals

I/O CONTROL
All models

Machine Control and Safety

Provides isolation between control and controlled circuits .

ISOLATION
All models

Scada System

Lenghten PLC outputs lifes by using interface relay to turn many devices on and off simultaneously.

I/O CONTROL
All models

Control Panels

It provides to control more than one load with extrarnal pluggable bridges.

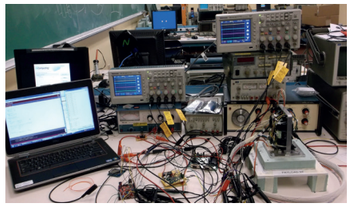
I/O CONTROL
All models

Chemical Industry

Safe isolation between inputs and outputs for pumps, compressors and air conditioning applications.

CONTROLLING
All models

Electrical Test Systems

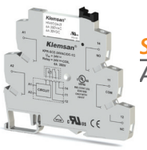


The interface between test equipment and systemI/O devices with a high switching capacity.

CONTROLLING
All models

Pneumatic Control

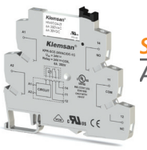
Switching currents or voltage too high for PLC outputs to handle.



SWITCHING
All models

Tight Cabinets

Only 6.2 mm wide, thus saving considerable space in your enclosures.

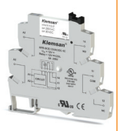
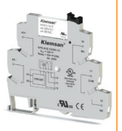
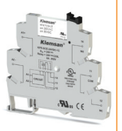
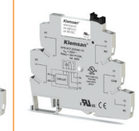


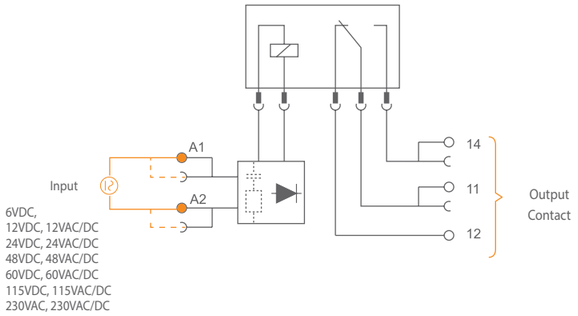
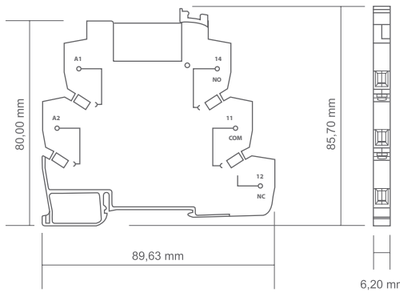
SPACE SAVING
All models

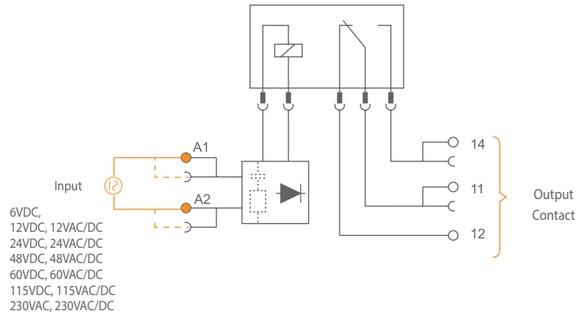
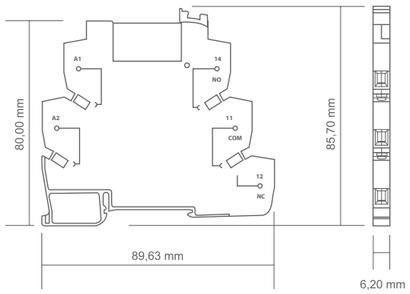
Leakage Current Applications

Preventing to stuck in “ON” state while the relay is switched as “OFF” which is caused by leakage current.

SWITCHING
KPR-SCF series

																		
Pre-assembled module (relay + socket)		**Type**	**KPR-SCE-6VDC-1C**	**KPR-SCE-12VAC/DC-1C**	**KPR-SCE-12VDC-1C**	**KPR-SCE-24VAC/DC-1C**	**KPR-SCE-24VDC-1C**	**KPR-SCE-48VAC/DC-1C**	**KPR-SCE-48VDC-1C**	**KPR-SCE-60VAC/DC-1C**	**KPR-SCE-60VDC-1C**	**KPR-SCE-115VAC/DC-1C**	**KPR-SCE-115VDC-1C**	**KPR-SCF-115VAC/DC-1C**	**KPR-SCE-230VAC/DC-1C**	**KPR-SCE-230VAC-1C**	**KPR-SCF-230VAC/DC-1C**	**KPR-SCF-230VAC-1C**
		Definiton	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module with filter	Interface relay module	Interface relay module	Interface relay module with filter	Interface relay module with filter
		Order Number	270794	270800	270804	270810	270814	270820	270824	270830	270834	270840	270844	270846	270850	270852	270856	270858
Casing Width(mm)			6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2	6,2
Connection			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Packaging unit			10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
Input	Nominal Voltage(Un)		6VDC	12VAC/DC	12VDC	24VAC/DC	24VDC	48VAC/DC	48VDC	60VAC/DC	60VDC	115VAC/DC	115VDC	115VAC/DC	230VAC/DC	230VAC	230VAC/DC	230VAC
	Operating voltage range		(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un	(0,8 – 1,15) x Un
	Release voltage		0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un
	Integrated RCZ filter		-	-	-	-	-	-	-	-	-	-	-	OK	-	-	OK	OK
	Power Consumption	AC	-	<0.35VA	-	<0.2VA	-	<0.6VA	-	<0.4VA	-	<0.7VA	-	<1.1VA	<1.3VA	-	<2.3VA	-
		DC	<0.35W	<0.35W	<0.35W	<0.2W	<0.2W	<0.6W	<0.6W	<0.3W	<0.3W	<0.6W	<0.6W	<0.6W	<1.2W	-	<1.2W	-
Contact Characteristic	Type		1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
	Material		AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2
	Coil voltage		5VDC	12VDC	12VDC	24VDC	24VDC	24VDC	24VDC	60VDC	60VDC	60VDC	60VDC	60VDC	60VDC	24VDC	60VDC	24VDC
	Coil empedance		147x(1± 10%) Ω	212x(1± 10%) Ω	212x(1± 10%) Ω	3390x(1± 15%) Ω	3390x(1± 15%) Ω	3390x(1± 15%) Ω	3390x(1± 15%) Ω	16600x(1± 15%) Ω	16600x(1± 15%) Ω	16600x(1± 15%) Ω	16600x(1± 15%) Ω	16600x(1± 15%) Ω	16600x(1± 15%) Ω	3390x(1± 15%) Ω	16600x(1± 15%) Ω	3390x(1± 15%) Ω
	Coil consumption		170mW	170mW	170mW	170mW	170mW	170mW	170mW	210mW	210mW	210mW	210mW	210mW	210mW	170mW	210mW	170mW
	Operate time		10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.
	Release time		5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.
	Max. ratings (AC)		6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA
	Max. ratings (DC)		6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W
	Mechanical life time		10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations
	Electrical life time operations (UL approvel, 85°C)	NO	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations	3×10^4 operations
		NC	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations	1×10^4 operations
Isolation resistance			1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)
Dielectric Strength	Between relay coil and contacts		4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.
	Between contacts		1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.
Permissible ambient temperature		During operation	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
		During storage	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
Relative Humidity			5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)
Degree of protection			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Weight(gr)			32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Max. cable cross-section			2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2
Max. torque			0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm
Permissible mounting position			any	any	any	any	any	any	any	any	any	any	any	any	any	any	any	any
Accessories and Components	APP/KPR 	Type	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR
		Definiton	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate
		Order Number	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247
		Packaging unit	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	Socket	Type	KPR-SCE-6VDC-1C (RELAY SOCKET)	KPR-SCE-12VAC/DC-1C (RELAY SOCKET)	KPR-SCE-12VDC-1C (RELAY SOCKET)	KPR-SCE-24VAC/DC-1C (RELAY SOCKET)	KPR-SCE-24VDC-1C (RELAY SOCKET)	KPR-SCE-48VAC/DC-1C (RELAY SOCKET)	KPR-SCE-48VDC-1C (RELAY SOCKET)	KPR-SCE-60VAC/DC-1C (RELAY SOCKET)	KPR-SCE-60VDC-1C (RELAY SOCKET)	KPR-SCE-115VAC/DC-1C (RELAY SOCKET)	KPR-SCE-115VDC-1C (RELAY SOCKET)	KPR-SCF-115VAC/DC-1C (RELAY SOCKET)	KPR-SCE-230VAC/DC-1C (RELAY SOCKET)	KPR-SCE-230VAC-1C (RELAY SOCKET)	KPR-SCF-230VAC/DC-1C (RELAY SOCKET)	KPR-SCF-230VAC-1C (RELAY SOCKET)
		Definiton	Interface relay socket (6VDC)	Interface relay socket (12VAC/DC)	Interface relay socket (12VDC)	Interface relay socket (24VAC/DC)	Interface relay socket (24VDC)	Interface relay socket (48VAC/DC)	Interface relay socket (48VDC)	Interface relay socket (60VAC/DC)	Interface relay socket (60VDC)	Interface relay socket (115VAC/DC)	Interface relay socket (115VDC)	Interface relay socket with RCZ filter (115VAC/DC)	Interface relay socket (230VAC/DC)	Interface relay socket (230VAC)	Interface relay socket with RCZ filter (230VAC/DC)	Interface relay socket eith RCZ filter (230VAC)
		Order Number	270795	270801	270805	270811	270815	270821	270825	270831	270835	270841	270845	270847	270851	270853	270857	270859
		Packaging unit	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.

Type			KPR-SCE-6VDC-1C	KPR-SCE-12VAC/DC-1C	KPR-SCE-12VDC-1C	KPR-SCE-24VAC/DC-1C	KPR-SCE-24VDC-1C	KPR-SCE-48VAC/DC-1C	KPR-SCE-48VDC-1C
Accessories and Components	Relay	Type	Slim type 5VDC relay	Slim type 12VDC relay	Slim type 12VDC relay	Slim type 24VDC relay	Slim type 24VDC relay	Slim type 24VDC relay	Slim type 24VDC relay
		Definiton	Relay for 270794 and 270795	Relay for 270800 and 270801	Relay for 270804 and 270805	Relay for 270810 and 270811	Relay for 270814 and 270815	Relay for 270820 and 270821	Relay for 270824 and 270825
		Order Number	095043	095042	095042	095041	095041	095041	095041
		Packaging unit	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
	Plug-in bridge-16	Type	TK-KPR-S (KPR-SCE BRIDGE/16)						
		Definiton	Plug-in bridge for 16 hole						
		Order Number	476605						
		Packaging unit	25 pcs.						
	Plug-in bridge-8	Type	TK-KPR-S (KPR-SCE BRIDGE/8)						
		Definiton	Plug-in bridge for 8 hole						
		Order Number	476606						
		Packaging unit	50 pcs.						
	Dekafix	Type	DG 10/6 T						
		Definiton	Terminal Labels for interface relays						
		Order Number	505390						
		Packaging unit	360 pcs.						
Schematics									
Dimensional Drawings									

KPR-SCE-60VAC/DC-1C	KPR-SCE-60VDC-1C	KPR-SCE-115VAC/DC-1C	KPR-SCE-115VDC-1C	KPR-SCF-115VAC/DC-1C	KPR-SCE-230VAC/DC-1C	KPR-SCE-230VAC-1C	KPR-SCF-230VAC/DC-1C	KPR-SCF-230VAC-1C
Slim type 60VDC relay	Slim type 60VDC relay	Slim type 60VDC relay	Slim type 60VDC relay	Slim type 60VDC relay	Slim type 60VDC relay	Slim type 24VDC relay	Slim type 60VDC relay	Slim type 24VDC relay
Relay for 270830 and 270831	Relay for 270834 and 270835	Relay for 270840 and 270841	Relay for 270844 and 270845	Relay for 270846 and 270847	Relay for 270850 and 270851	Relay for 270852 and 270853	Relay for 270856 and 270857	Relay for 270858 and 270859
095040	095040	095040	095040	095040	095040	095041	095040	095041
10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
TK-KPR-S (KPR-SCE BRIDGE/16)								
Plug-in bridge for 16 hole								
476605								
25 pcs.								
TK-KPR-S (KPR-SCE BRIDGE/8)								
Plug-in bridge for 8 hole								
476606								
50 pcs.								
DG 10/6 T								
Terminal Labels for interface relays								
505390								
360 pcs.								
								
								

2C PLC Relays

Defining an interface relay in simple terms

An interface relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current.

Which actions are executed?

Switching
Protection
Controlling
Filtering **Isolation**

An interface relay is an electrically operated switch that is used where it is necesarry to control a circuit by a low-power signal.

It provides complete electrical protective isolation between control and controlled circuits.

Filtering AC power input signals in order to prevent leakage current.

Saving money and increasing efficiency for PLC outputs.

Reduced PLC outputs to meet energy consumption goals.

Which markets are they used frequently?

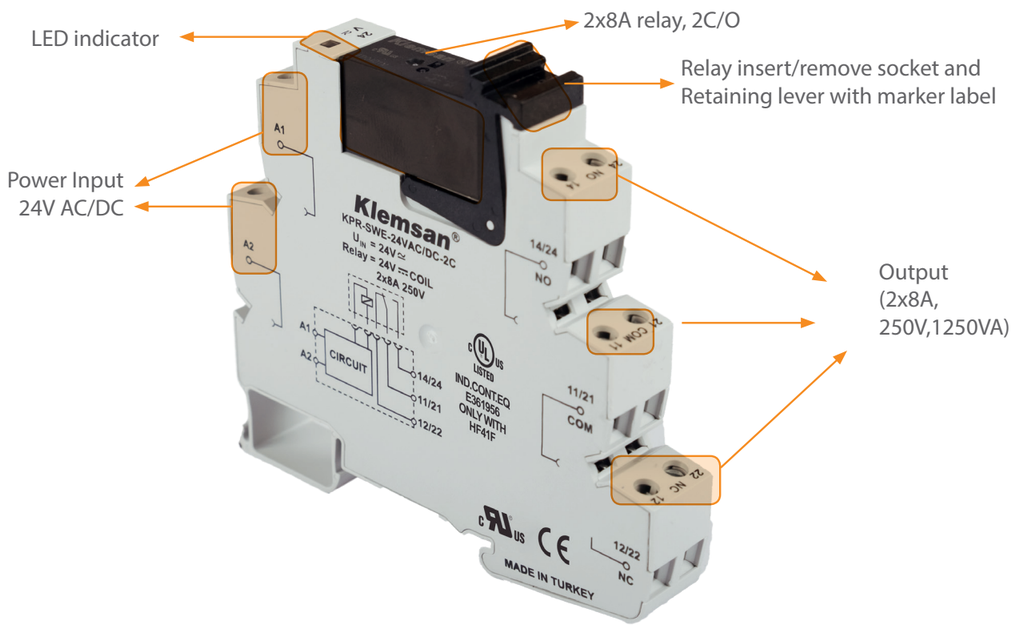
- PLC automation systems
- Electric power plants
- Energy management systems
- Medium Voltage Panels
- Industrial Machines

Benefits and Advantages

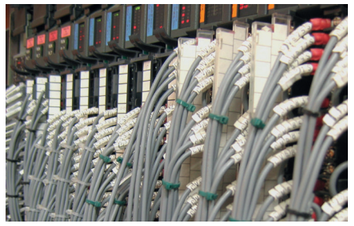
- A widely range of power input from 6V to 230V
- DC and AC supply voltage options
- Integrated RCZ filter option
- Saving wiring time with plug-in bridges
- High quality, long useful life
- Saving space with 14mm design
- LED status indicator in order to see actual movement of the contacts
- Labeling with terminal block marking materials
- Highly compact and light weight
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Self-Extinguishing plastic housing
- UL certificate

Layout & Mounting

Klemsan interface relays are suitable for snap mounting onto 35 mm standards DIN rails.



Automation System



Reduced PLC outputs to meet energy consumption goals

I/O CONTROL
All models

Machine Control and Safety

Provides isolation between control and controlled circuits .

ISOLATION
All models

Scada System

Lenghten PLC outputs lifes by using interface relay to turn many devices on and off simultaneously.

I/O CONTROL
All models

Control Panels

It provides to control more than one load with extrarnal pluggable bridges.

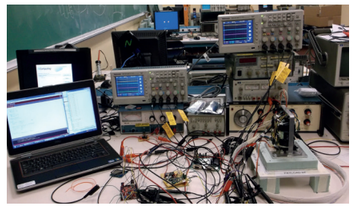
I/O CONTROL
All models

Chemical Industry

Safe isolation between inputs and outputs for pumps, compressors and air conditioning applications.

CONTROLLING
All models

Electrical Test Systems



The interface between test equipment and systemI/O devices with a high switching capacity.

CONTROLLING
All models

Pneumatic Control

Switching currents or voltage too high for PLC outputs to handle.

SWITCHING
All models

Tight Cabinets

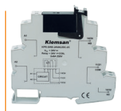
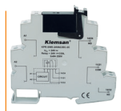
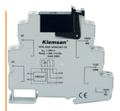
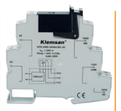
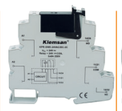
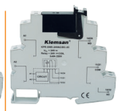
Only 6.2 mm wide, thus saving considerable space in your enclosures.

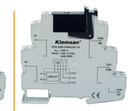
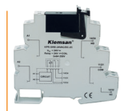
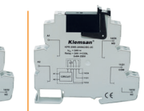
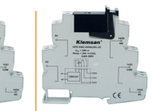
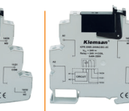
SPACE SAVING
All models

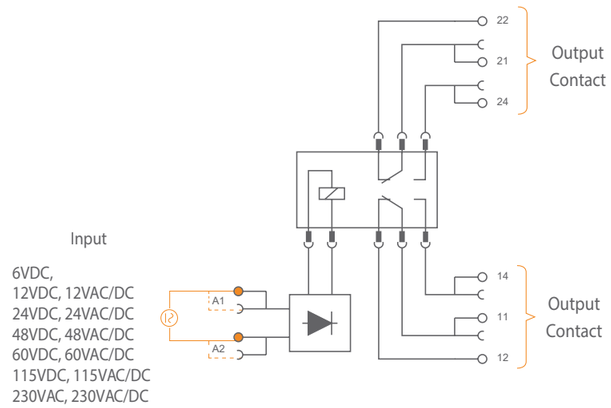
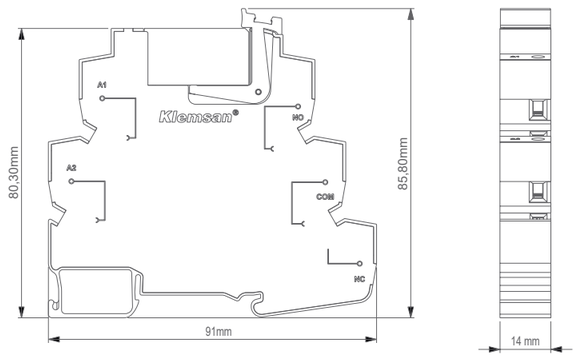
Leakage Current Applications

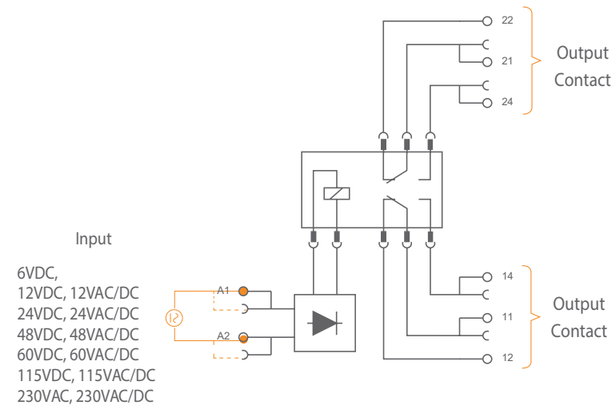
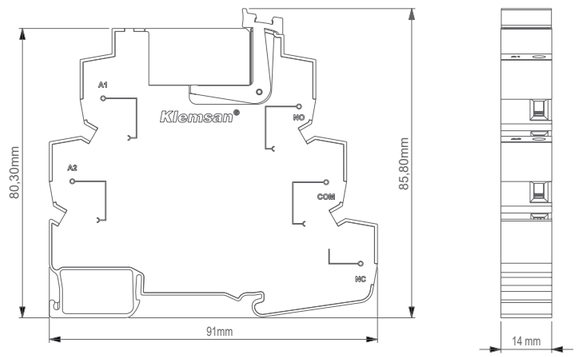
Preventing to stuck in “ON” state while the relay is switched as “OFF” which is caused by leakage current.

SWITCHING
KPR-SCF series

									
Pre-assembled module (relay + socket)	**Type**		**KPR-SWE-6VDC-2C**	**KPR-SWE-12VAC/DC-2C**	**KPR-SWE-12VDC-2C**	**KPR-SWE-24VAC/DC-2C**	**KPR-SWE-24VDC-2C**	**KPR-SWE-48VAC/DC-2C**	**KPR-SWE-48VDC-2C**
	Definiton		Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module
	Order Number		272 504	272 520	272 524	272 540	272 544	272 560	272 564
Casing Width(mm)			14	14	14	14	14	14	14
Connection			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Packaging unit			10	10	10	10	10	10	10
Input	Nominal Voltage(Un)		6VDC	12VAC/DC	12VDC	24VAC/DC	24VDC	48VAC/DC	48VDC
	Operating voltage range		> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN
	Release voltage		< %40 x UN	< %40 x UN	< %40 x UN	< %40 x UN	< %40 x UN	< %30 x UN	< %30 x UN
	Integrated RCZ filter		-	-	-	-	-	-	-
	Power Consumption	AC	-	<1VA	-	<1VA	-	<1VA	-
		DC	<1W	<1W	<1W	<1W	<1W	<1W	<1W
Contact Characteristic	Type		2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)
	Material		AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2
	Coil voltage		5VDC	12VDC	12VDC	24VDC	24VDC	48VDC	48VDC
	Coil empedance		62 x (1 ±10%) Ω	360 x (1 ±10%)	360 x (1 ±10%)	1440 x (1 ±10%)	1440 x (1 ±10%)	5760 x (1 ±10%)	5760 x (1 ±10%)
	Coil consumption		400mW	400mW	400mW	400mW	400mW	400mW	400mW
	Operate time		15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.
	Release time		8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.
	Max. ratings (AC)		8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA
	Max. ratings (DC)		8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W
	Mechanical life time		10^7	10^7	10^7	10^7	10^7	10^7	10^7
	Electrical life time	NO	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4
		NC	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4
Isolation resistance			1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)
Dielectric Strength	Between relay coil and contacts		4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.
	Between contacts		1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.
Permissible ambient temperature	During operation		-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C
	During storage		-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C
Relative Humidity			5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)
Degree of protection			IP20	IP20	IP20	IP20	IP20	IP20	IP20
Weight(gr)			56	56	56	56	56	56	56
Max. cable cross-section			2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2
Max. Torque			0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm
Permissible mounting position			any	any	any	any	any	any	any
Accessories and Components	APP/KPR 	Type	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR
		Definiton	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate
		Order Number	463 247	463 247	463 247	463 247	463 247	463 247	463 247
		Packaging unit	25	25	25	25	25	25	25
	Socket 	Type	KPR-SWE-6VDC-2C (RELAY SOCKET)	KPR-SWE-12VAC/DC-2C (RELAY SOCKET)	KPR-SWE-12VDC-2C (RELAY SOCKET)	KPR-SWE-24VAC/DC-2C (RELAY SOCKET)	KPR-SWE-24VDC-2C (RELAY SOCKET)	KPR-SWE-48VAC/DC-2C (RELAY SOCKET)	KPR-SWE-48VDC-2C (RELAY SOCKET)
		Definiton	Interface relay socket (6VDC)	Interface relay socket (12VAC/DC)	Interface relay socket (12VDC)	Interface relay socket (24VAC/DC)	Interface relay socket (24VDC)	Interface relay socket (48VAC/DC)	Interface relay socket (48VDC)
		Order Number	272 505	272 521	272 525	272 541	272 545	272 561	272 565
		Packaging unit	10	10	10	10	10	10	10
	Relay 	Type	2 C/O 5VDC Relay	2 C/O 12VDC Relay	2 C/O 12VDC Relay	2 C/O 24VDC Relay	2 C/O 24VDC Relay	2 C/O 48VDC Relay	2 C/O 48VDC Relay
		Definiton	Relay for 272 504 and 272 505	Relay for 272 520 and 272 521	Relay for 272 524 and 272 525	Relay for 272 540 and 272 541	Relay for 272 544 and 272 545	Relay for 272 560 and 272 561	Relay for 272 564 and 272 565
		Order Number	095 054	095 053	095 053	095 052	095 052	095 051	095 051
		Packaging unit	50	50	50	50	50	50	50
	Plug-in bridge-8 	Type	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)
		Definiton	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole
		Order Number	476 900	476 900	476 900	476 900	476 900	476 900	476 900
		Packaging unit	25	25	25	25	25	25	25
	Dekafix 	Type	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T
		Definiton	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays
		Order Number	505 390	505 390	505 390	505 390	505 390	505 390	505 390
		Packaging unit	360	360	360	360	360	360	360

											
			KPR-SWE-60VAC/DC-2C	**KPR-SWE-60VDC-2C**	**KPR-SWE-115VAC/DC-2C**	**KPR-SWE-115VDC-2C**	**KPR-SWF-115VAC/DC-2C**	**KPR-SWE-230VAC/DC-2C**	**KPR-SWE-230VAC-2C**	**KPR-SWF-230VAC/VDC-2C**	**KPR-SWF-230VAC-2C**
			Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module	Interface relay module
			272 580	272 584	272 600	272 604	272 606	272 620	272 622	272 626	272 628
			14	14	14	14	14	14	14	14	14
			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
			10	10	10	10	10	10	10	10	10
			60VAC/DC	60VDC	115VAC/DC	115VDC	115VAC/DC	230VAC/DC	230VAC	230VAC/DC	230VAC
			> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN	> %80 x UN
			< %30 x UN	< %30 x UN	< %30 x UN	< %30 x UN	< %30 x UN	< %30 x UN	< %30 x UN	< %30 x UN	< %30 x UN
			-	-	-	-	Available	-	-	Available	Available
			<1VA	-	<1VA	-	<1VA	<2VA	<2VA	<2VA	<2VA
			<1W	<1W	<1W	<1W	<1W	<1W	-	<2W	-
			2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)	2 C/O (SPDT)
			AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2
			60VDC	60VDC	115VDC	115VDC	115VDC	115VDC	115VDC	115VDC	115VDC
			5760 x (1 ±10%)	5760 x (1 ±10%)	25200 x (1 ±10%)	25200 x (1 ±10%)	25200 x (1 ±10%)	25200 x (1 ±10%)	25200 x (1 ±10%)	25200 x (1 ±10%)	25200 x (1 ±10%)
			400mW	400mW	400mW	400mW	400mW	400mW	400mW	400mW	400mW
			15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.	15ms Max.
			8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.	8ms Max.
			8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A/250VAC; 2000VA	8A/250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA	8A / 250VAC; 2000VA
			8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W	8A/30VDC; 240W
			10^7	10^7	10^7	10^7	10^7	10^7	10^7	10^7	10^7
			3x10^4	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4	3x10^4
			1x10^4	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4	1x10^4
			1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)
			4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.	4000VAC 1 min.
			1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.	1000VAC 1 min.
			-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C
			-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C	-40°C .. +85°C
			5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)
			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
			56	56	56	56	56	56	56	56	56
			2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2	2.5mm2
			0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm
			any	any	any	any	any	any	any	any	any
			APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR	APP/KPR
			Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate	Separator plate
			463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247	463 247
			25	25	25	25	25	25	25	25	25
			KPR-SWE-60VAC/DC-2C (RELAY SOCKET)	KPR-SWE-60VDC-2C (RELAY SOCKET)	KPR-SWE-115VAC/DC-2C (RELAY SOCKET)	KPR-SWE-115VDC-2C (RELAY SOCKET)	KPR-SWF-115VDC-2C (RELAY SOCKET)	KPR-SWE-230VAC/DC-2C (RELAY SOCKET)	KPR-SWE-230VAC-2C (RELAY SOCKET)	KPR-SWF-230VAC/DC-2C (RELAY SOCKET)	KPR-SWF-230VAC-2C (RELAY SOCKET)
			Interface relay socket (60VAC/DC)	Interface relay socket (60VDC)	Interface relay socket (115VAC/DC)	Interface relay socket (115VDC)	Interface relay socket with RCZ filter (115VAC/DC)	Interface relay socket (230VAC/DC)	Interface relay socket (230VAC)	Interface relay socket with RCZ filter (230VAC/DC)	Interface relay socket with RCZ filter (230VAC)
			272 581	272 585	272 601	272 605	272 607	272 621	272 623	272 627	272 629
			10	10	10	10	10	10	10	10	10
			2 C/O 48VDC Relay	2 C/O 48VDC Relay	2 C/O 115VDC Relay	2 C/O 115VDC Relay	2 C/O 115VDC Relay	2 C/O 115VDC Relay	2 C/O 115VDC Relay	2 C/O 115VDC Relay	2 C/O 115VDC Relay
			Relay for 272 580 and 272 581	Relay for 272 584 and 272 585	Relay for 272 600 and 272 601	Relay for 272 604 and 272 605	Relay for 272 606 and 272 607	Relay for 272 620 and 272 621	Relay for 272 622 and 272 623	Relay for 272 626 and 272 627	Relay for 272 628 and 272 629
			095 051	095 051	095 050	095 050	095 050	095 050	095 050	095 050	095 050
			50	50	50	50	50	50	50	50	50
			TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)	TK-KPR-S (KPR-SCE BRIDGE/8)
			Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole	Plug-in bridge for 8 hole
			476 900	476 900	476 900	476 900	476 900	476 900	476 900	476 900	476 900
			25	25	25	25	25	25	25	25	25
			DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T	DG 10/6T
			Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays	Terminal Labels for interface relays
			505 390	505 390	505 390	505 390	505 390	505 390	505 390	505 390	505 390
			360	360	360	360	360	360	360	360	360

Type	KPR-SWE-6VDC-2C	KPR-SWE-12VAC/DC-2C	KPR-SWE-12VDC-2C	KPR-SWE-24VAC/DC-2C	KPR-SWE-24VDC-2C	KPR-SWE-48VAC/DC-2C	KPR-SWE-48VDC-2C
Schematics							
Dimensional Drawings							

KPR-SWE-60VAC/DC-2C	KPR-SWE-60VDC-2C	KPR-SWE-115VAC/DC-2C	KPR-SWE-115VDC-2C	KPR-SWF-115VAC/DC-2C	KPR-SWE-230VAC/DC-2C	KPR-SWE-230VAC-2C	KPR-SWF-230VAC/VDC-2C	KPR-SWF-230VAC-2C
								
								

Defining Interface Relays in simple terms

An interface relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current. An interface relay is an electrically operated switch that is used where it is necesarry to control a circuit by a low-power signal. It provides complete electrical protective isolation between control and controlled circuits. Filtering AC power input signals in order to prevent leakage current.

Which actions are executed?

Switching
Controlling
Filtering Isolation

An interface relay is an electrically operated switch that is used where it is necesarry to control a circuit by a low-power signal. It provides complete electrical protective isolation between control and controlled circuits. Filtering AC power input signals in order to prevent leakage current.

Which markets are they used frequently?

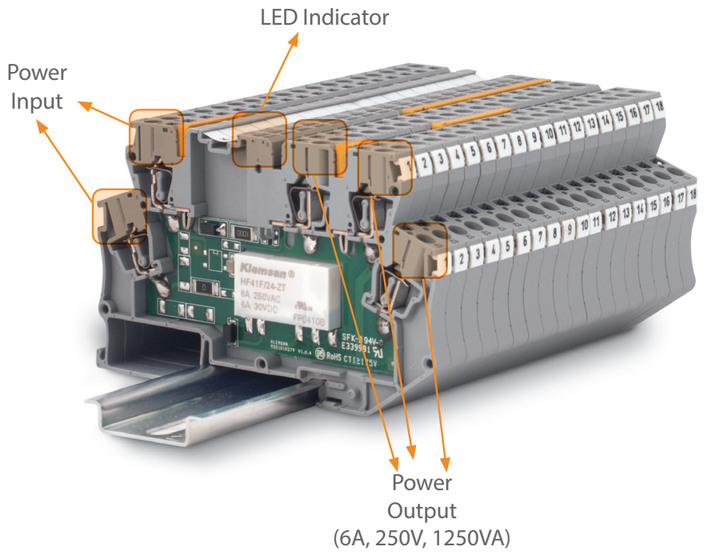
- PLC automation systems
- Industrial Machines
- Control and protection systems
- Energy management systems
- Electric power plants
- Medium voltage modular systems

Benefits and Advantages

- Wide range of power input from 6 V to 230 V
- AC, DC and AC/DC input voltage options
- Spring clamp connection
- Integrated RCZ filter option
- Saving time with plug-in bridged
- High quality, long usage life
- Space-saving 6.2 mm design
- LED status indicator to see actual movements of the contacts
- Labelling with terminal block marking equipments
- Highly compact and lightweight
- High level of electromagnetic compability (EMC)
- Maximum immunity to interfrences
- Self-extinguishing plastic housing

Layout & Mounting

Klemsan interface relays are suitable for snap mounting onto 35 mm standards DIN rails.

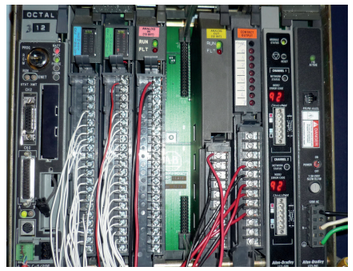


SCADA System

Lenghten PLC outputs lifes by using interface relay to turn many devices on and off simultaneously.

I/O CONTROL
All models

Tight Cabinets



Only 6.2 mm wide, thus saving considerable space in your enclosures. Especially suitable for use in switchgear cabinets to use the space in the most efficient way, equipment and machine modification and extend the lifetime.

SPACE SAVING
All models

Under Vibration

Balances the bad effects of vibration and keep switching with its spring clamp connection. Provides unintended operation for all systems.

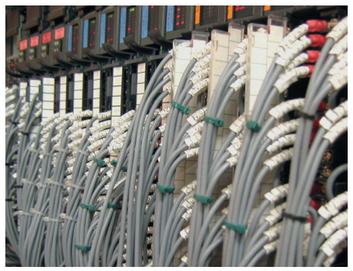
SWITCHING
All models

Pneumatic Control

Switching currents or voltage too high for PLC outputs to handle.

AMPLIFICATION
All models

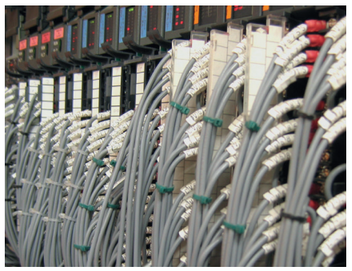
Current Leakage Applications



Preventing to stuck in "ON" state while the relay is switched as "OFF" which is caused by leakage current.

FILTERING
All models

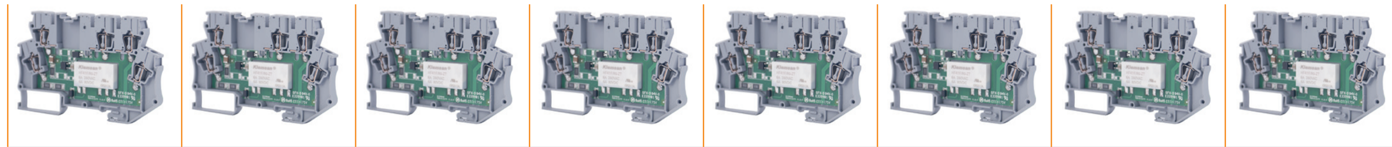
Machine Control and Safety



Prevents isolations between input and control circuits

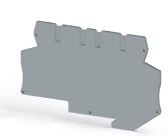
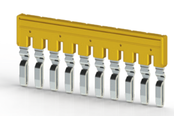
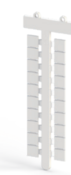
ISOLATION
All models

			KPR-CIE-6VDC-1C	KPR-CIE-12VAC/DC-1C	KPR-CIE-12VDC-1C	KPR-CIE-24VAC/DC-1C	KPR-CIE-24VDC-1C	KPR-CIE-48VAC/DC-1C
Module	Type		KPR-CIE-6VDC-1C	KPR-CIE-12VAC/DC-1C	KPR-CIE-12VDC-1C	KPR-CIE-24VAC/DC-1C	KPR-CIE-24VDC-1C	KPR-CIE-48VAC/DC-1C
	Definiton		Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module
	Order Number		271504	271510	271514	271520	271524	271530
Casing Width(mm)			6.2	6.2	6.2	6.2	6.2	6.2
Connection			Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp
Packaging unit			10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
Input	Nominal Voltage(Un)		6VDC	12VAC/DC	12VDC	24VAC/DC	24VDC	48VAC/DC
	Operating voltage range		0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un
	Release voltage		0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un
	Power Consumption	AC		<0.35VA	<0.35VA	<0.35VA	<0.35VA	<0.35VA
		DC	<0.35W	<0.35W	<0.35W	<0.35W	<0.35W	<0.35W
Contact Characteristic	Type		1 C/O	1 C/O	1 C/O	1 C/O	1 C/O	1 C/O
	Material		AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2
	Coil voltage		5VDC	12VDC	12VDC	24VDC	24VDC	24VDC
	Coil empedance		147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω
	Coil consumption		170mW	170mW	170mW	170mW	170mW	170mW
	Operate time		10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.
	Release time		5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.
	Max. ratings (AC)		6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA
	Max. ratings (DC)		6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W
	Mechanical life time		10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations
	Electrical life time operations (UL approvel, 85℃)	NO	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations
		NC	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations
Isolation resistance			1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)
Dielectric Strength	Between relay coil and contacts		4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min
	Between contacts		1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min
Permissible ambient temperature	During operation		-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
	During storage		-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
Relative Humidity			5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)
Degree of protection			IP20	IP20	IP20	IP20	IP20	IP20
Weight(gr)			26gr	26gr	26gr	26gr	26gr	26gr
Max. cable cross-section			2.5mm2	2.5mm3	2.5mm3	2.5mm3	2.5mm3	2.5mm3
Max. torque			0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm
Permissible mounting position			any	any	any	any	any	any
Integrated RCZ Filter			x	x	x	x	x	x



			KPR-CIE-48VDC-1C	KPR-CIE-60VAC/DC-1C	KPR-CIE-60VDC-1C	KPR-CIE-115VAC/DC-1C	KPR-CIE-115VDC-1C	KPR-CIF-115VAC/DC-1C	KPR-CIE-230VAC/DC-1C	KPR-CIE-230VAC/DC-1C
Module	Definiton		Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module	Integrated Interface relay module
	Order Number		271534	271540	271544	271550	271554	271556	271560	271562
Casing Width(mm)			6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Connection			Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp	Cage Clamp
Packaging unit			10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
Input	Nominal Voltage(Un)		48VDC	60VAC/DC	60VDC	115VAC/DC	115VDC	115VAC/DC	230VAC/DC	230VAC/DC
	Operating voltage range		0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un	0,8 x Un
	Release voltage		0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un	0,2 x Un
	Power Consumption	AC	<0.35VA	<0.35VA	<0.35VA	<0.35VA	<0.35VA	<0.35VA	<0.35VA	<0.35VA
		DC	<0.35W	<0.35W	<0.35W	<0.35W	<0.35W	<0.35W	<0.35W	<0.35W
Contact Characteristic	Type		1 C/O	1 C/O	1 C/O	1 C/O	1 C/O	1 C/O	1 C/O	1 C/O
	Material		AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2	AgSnO2
	Coil voltage		24VDC	60VDC	60VDC	60VDC	60VDC	60VDC	60VDC	60VDC
	Coil empedance		147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω	147x(1± 10%) Ω
	Coil consumption		170mW	170mW	170mW	170mW	170mW	170mW	170mW	170mW
	Operate time		10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.	10 ms max.
	Release time		5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.	5 ms max.
	Max. ratings (AC)		6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA	6A/250VAC; 1500VA
	Max. ratings (DC)		6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W	6A/30VDC; 180W
	Mechanical life time		10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations	10^7 operations
	Electrical life time operations (UL approvel, 85℃)	NO	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations	3 x 10^4 operations
		NC	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations	1 x 10^4 operations
Isolation resistance			1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)	1000MΩ (500VDC)
Dielectric Strength	Between relay coil and contacts		4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min	4000VAC 1 min
	Between contacts		1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min	1000VAC 1 min
Permissible ambient temperature	During operation		-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
	During storage		-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
Relative Humidity			5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)	5% .. 85% (no condensation)
Degree of protection			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Weight(gr)			26gr	26gr	26gr	26gr	26gr	26gr	26gr	26gr
Max. cable cross-section			2.5mm3	2.5mm3	2.5mm3	2.5mm3	2.5mm3	2.5mm3	2.5mm3	2.5mm3
Max. torque			0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm	0.4Nm
Permissible mounting position			any	any	any	any	any	any	any	any
Integrated RCZ Filter			x	x	x	x	x	Available	x	Available

Accessories and Components

									
Definition	End Plate	Plug in bridge for 2 hole	Plug in bridge for 3 hole	Plug in bridge for 4 hole	Plug in bridge for 5 hole	Plug in bridge for 10 hole	DG 6/5 - Label	DB 5 – Label	11.2 Strip label
Order Number	450389	470112	470113	470114	470115	470119	505330	505850	1020100 — **NOTE:** This product is only compatible with below items: -112710N -112720N -112730N
Package Unit	10 pcs.	25 pcs.	20 pcs.	15 pcs.	10 pcs.	5 pcs.	440 pcs.	500 pcs.	1 pc.

Defining OPK-EKI modules in simple terms

OPK-EKI is an optocoupler module that uses a short optical transmission path to transfer an electrical signal between circuits or elements of a circuit, while keeping them electrically isolated from each other. They can be used to switch loads like mechanical relays but they are much more than simply switching…

Which actions are executed?

Switching
prevents inrush current
Controlling
Driving **Isolation**

OPK-EKI module is an electrically operated switch that is used where it is necesarry to control a circuit by a low-power signal.

The main purpose of an optocoupler is to prevent rapidly changing voltages or high voltages on one side of a circuit from distorting transmissions or damaging components on the other side of the circuit. It uses light waves to provide complete electrical isolation between control and controlled circuits while transferring an electrical signal.

Zero volt switching circuit prevents inrush current so loads can be switched more stable.

High side and low side switching option allows driving a load in two different ways.

Which markets are they used frequently?

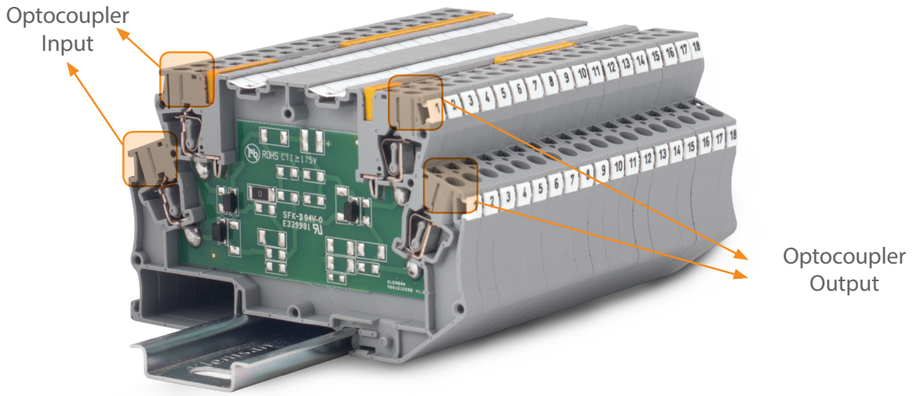
- PLC automation systems
- Industrial Machines
- Control and safety systems
- Energy management systems
- Electric power plants
- Medium voltage modular cabinets

Benefits and Advantages

- A widely range of voltage input from 5V to 220V
- Providing high switching frequency due to short switch-on and switch-off times
- Long service life
- Quite working
- No contact arching
- Resistant to vibration and shock
- Preventing inrush current
- High side and low side switching options
- AC and DC load switching options
- Cage clamp connection
- Saving space with 6.2mm design
- Saving wiring time with plug-in bridges
- LED status indicator in order to see actual movement of the contacts
- Self-Extinguishing plastic housing
- Labeling with terminal block marking materials

Layout & Mounting

Klemsan interface relays are suitable for snap mounting onto 35 mm standards DIN rails.



Industrial Applications

Optocoupler modules are used in industrial environments where high voltages, magnetic fields and noise are commonly present, reliability is critical to avoid downtime and ensure data accuracy. In this environment circuit designers use optocouplers to insulate high voltages and isolate unwanted signals.
Klemsan presents OPK-EKI modules that are designed to meet the stringent requirements of industrial applications.

ISOLATION and AMPLIFICATION
All models

Solid State Relay Applications

OPK-EKI modules can be used instead of solid state relays due to high switching frequency, short switch-on and switch-off times, no contact bouncing, noisless switching, long operation

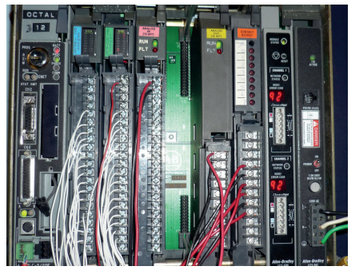
I/O CONTROL
All models

Under Vibration

Klemsan OPK-EKI modules compensate the bad effects of vibration and shock and continue to switch current and voltage thanks to their cage clamp connection and having no moving parts like electromechanical relays.
They ensure continuous and uninterrupted operation for any system.

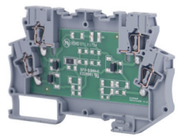
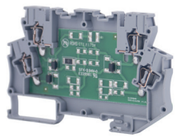
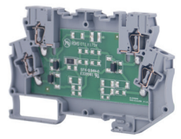
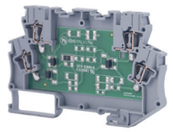
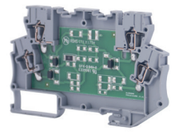
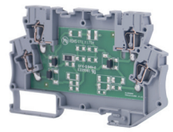
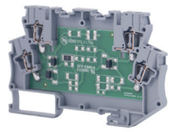
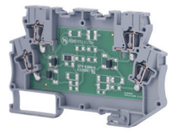
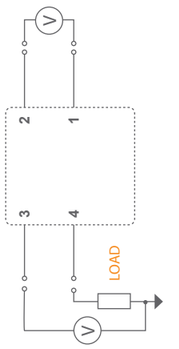
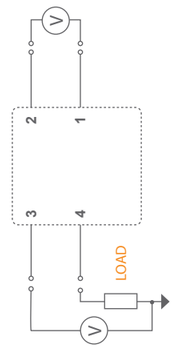
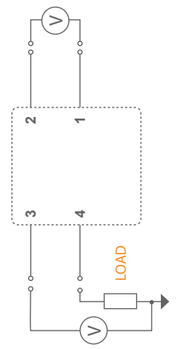
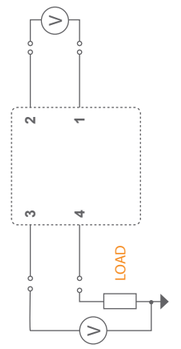
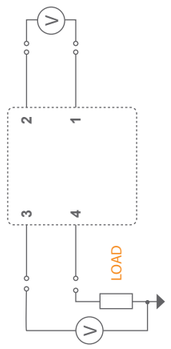
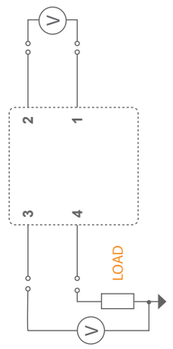
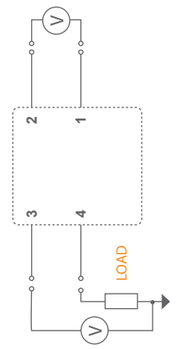
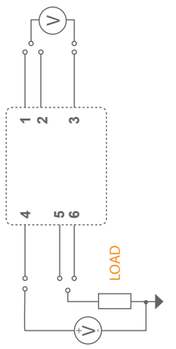
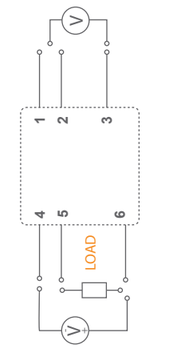
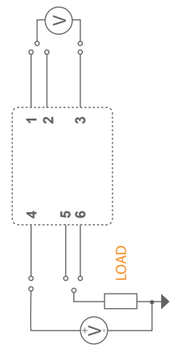
SWITCHING
All models

Narrow Cabinets



Only 6.2 mm wide, thus saving considerable space in your enclosures. OPK-EKI modules are particularly suitable for the modification and extension of equipment and machinery, where it helps to make optimum use of the limited space available in switchgear cabinets.

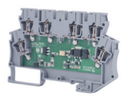
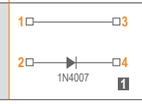
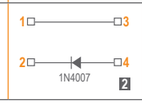
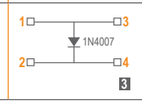
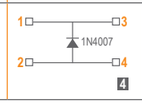
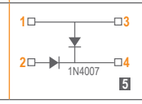
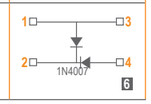
SPACE SAVING
All models

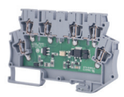
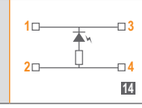
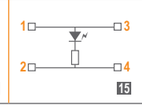
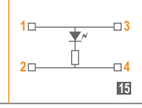
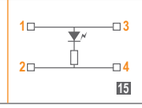
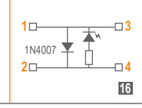
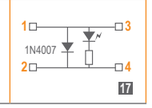
											
Pre-assembled module (relay + socket)	**Type**	**OPK - EKI 5 VAC/DC**	**OPK - EKI 12 VAC/DC**	**OPK - EKI 24 VAC/DC**	**OPK - EKI 48 VAC/DC**	**OPK - EKI 60 VAC/DC**	**OPK - EKI 110 VAC/DC**	**OPK - EKI 220 VAC/DC**	**OPK - EKI 9-72 VDC**	**OPK - EKI 9-72 VDC**	**OPK - EKI 9-72 VDC**
	Definiton	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module	Optocoupler module
	Order Number	112010N	112110N	112220N	112320N	112420N	112520N	112620N	112710N	112720N	112730N
Width/Depth/ Height (mm)		6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9	6.2/56/81.9
Connection		Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp
Packaging unit		1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.
Mounting		Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount	Rail Mount
Input	Input Voltage	5V AC/DC	12V AC/DC	24V AC/DC	48V AC/DC	60V AC/DC	110V AC/DC	220V AC/DC	9-72V DC	9-72V DC	9-72V DC
Output	Switching Voltage Range	5-48V DC	5-48V DC	5-48V DC	5-48V DC	5-48V DC	5-48V DC	5-48V DC	3-30V DC	3-30V DC	24-260V AC
	Maximum Switcing Current	0.65A DC	0.65A DC	0.65A DC	0.65A DC	0.65A DC	0.65A DC	0.65A DC	5A DC	5A DC	0.5A AC
Switching Type		High Side	High Side	High Side	High Side	High Side	High Side	High Side	High Side	Low Side	High Side
Zero volt switching circuit		-	-	-	-	-	-	-	-	-	available
Response time		<10msec	<10msec	<10msec	<10msec	<10msec	<10msec	<10msec	<500µsec	<500µsec	<500µsec
Schematics											

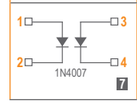
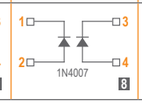
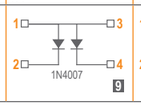
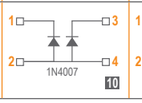
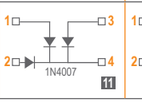
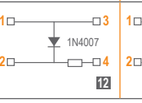
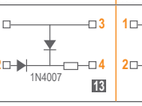
Accessories and Components

				
Definition	End Plate	Plug in bridge for 2 hole	Plug in bridge for 3 hole	Plug in bridge for 4 hole
Order Number	450389	470112	470113	470114
Package Unit	10 pcs.	25 pcs.	20 pcs.	15 pcs.

					
Plug in bridge for 5 hole	Plug in bridge for 10 hole	DG 6/5 - Label	DB 5 – Label	11.2 Strip label	
470115	470119	505330	505850	1020100	**NOTE:** This product is only compatible with below items: -112710N -112720N -112730N
10 pcs.	5 pcs.	440 pcs.	500 pcs.	1 pc.	

							
Module	**Type**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**
	Definiton	Reverse Current Protection	Reverse Current Protection	Reverse Current Protection	Reverse Current Protection	Lamp / Test Circuit	Lamp / Test Circuit
	Order Number	110010N	110020N	110030N	110040N	110050N	110060N
Casing Width (mm)		6.2	6.2	6.2	6.2	6.2	6.2
Connection		Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp
Packing Unit		10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
Nominal Voltage		x	x	x	x	x	x
Diode Coltage		1000V	1000V	1000V	1000V	1000V	1000V
Diode Voltage Drop		0,7V	0,7V	0,7V	0,7V	0,7V	0,7V
Degree of Protection		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Weight		19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr
Diode Current		1A	1A	1A	1A	1A	1A
Circuit Diagram							

							
Module	**Type**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**
	Definiton	Voltage Indicator	Voltage Indicator	Voltage Indicator	Voltage Indicator	Voltage Indicator + Flyback Diode	Voltage Indicator + Flyback Diode
	Order Number	110160N	110170N	110180N	110190N	110200N	110210N
Casing Width (mm)		6.2	6.2	6.2	6.2	6.2	6.2
Connection		Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp
Packing Unit		10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.
Nominal Voltage		220VDC	24VDC	110VDC	220VDC	24VDC	24VDC
Diode Coltage		1000V	1000V	1000V	1000V	1000V	1000V
Diode Voltage Drop		0,7V	0,7V	0,7V	0,7V	0,7V	0,7V
Degree of Protection		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Weight		19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr
Diode Current		1A	1A	1A	1A	1A	1A
Circuit Diagram							

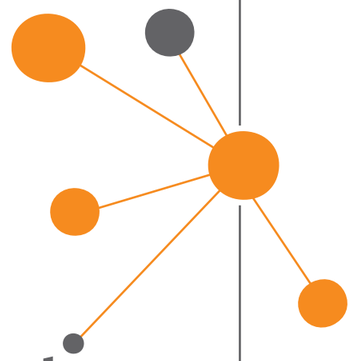
										
WG-EKI		**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**
Reverse Current Protection		Reverse Current Protection	Lamp / Test Circuit	Lamp / Test Circuit	Lamp / Test Circuit	Lamp / Test Circuit	Lamp / Test Circuit	Voltage Indicator	Voltage Indicator	
110070N		110080N	110090N	110100N	110110N	110120N	110130N	110140N	110150N	
6.2		6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	
Cage clamp		Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	
10 pcs.		10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	
x		x	x	x	x	24VAC/DC	24VAC/DC	24VDC	110VDC	
1000V		1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	
0,7V		0,7V	0,7V	0,7V	0,7V	0,7V	0,7V	0,7V	0,7V	
IP 20		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	
19.8gr		19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	
1A		1A	1A	1A	1A	1A	1A	1A	1A	
										

WG-EKI		**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**	**WG-EKI**
Voltage Indicator		Voltage Indicator	Voltage Indicator	Voltage Indicator	Voltage Indicator + Rectifier	Voltage Indicator + Rectifier	Voltage Indicator + Rectifier	Terminal with Cross Connection	Voltage Divider	
110270N		110280N	110290N	110300N	110310N	110320N	110330N	110380N	110410N	
6.2		6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	
Cage clamp		Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	Cage clamp	
10 pcs.		10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	
24VAC/DC		48VAC/DC	110VAC/DC	220VAC/DC	24VAC/DC	110VAC/DC	220VAC/DC	X	24VAC/DC	
1000V		1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	
0,7V		0,7V	0,7V	0,7V	0,7V	0,7V	0,7V	0,7V	0,7V	
IP 20		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	
19.8gr		19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	19.8gr	
1A		1A	1A	1A	1A	1A	1A	1A	1A	

Accessories and Components

Definition	End Plate	Plug in bridge for 2 hole	Plug in bridge for 3 hole	Plug in bridge for 4 hole
Order Number	450389	470112	470113	470114
Package Unit	10 pcs.	25 pcs.	20 pcs.	15 pcs.

Plug in bridge for 5 hole	Plug in bridge for 10 hole	DG 6/5 - Label	DB 5 – Label	11.2 Strip label	
470115	470119	505330	505850	1020100	**NOTE:** This product is only compatible with below items: -112710N -112720N -112730N
10 pcs.	5 pcs.	440 pcs.	500 pcs.	1 pc.	



Communication
Management Solutions

Made to communicate

Defining an ethernet gateway in simple terms

An ethernet gateway is an automation device which converts between serial to ethernet, GPRS or WI - FI protocols in order to monitor and control serial devices. over internet network or ethernet based devices over serial network

Which actions are executed?

Converting the data
Fast data transmission
Querying simultaneously
Bidirectional working
Protective Isolation
Dual-mode conf iguration
Ping blocking
Auto-learning IP address

An ethernet gateway coverts the data between different protocols and supports system integrators by ensuring a consistent flow of information throughout the entire facility. Etor,Wtor and Gtor gateway provides fast data transmission for serial devices up to 115Kbps. Simultaneous queries that belong to 6 different users can be replied by 64 slave devices over one Etor-4, Gtor and Wtor gateway. It is possible to control serial devices over internet network(server mode) or ethernet based devices over serial interface(client mode) thanks to bidirectional working feature. The integrated galvanic isolation between ethernet, modbus and supply parts provides line protection against over voltage and the anti-noise circuit eliminates the effects of EMI. It has ability to be conf igured over USB or Web server thanks to dual-mode conf iguration. Ping queries from unauthorized people can be prevented thus your network can be secured, thanks to ping blocking feature. Auto-learning IP address feature allows you to adopt ethernet gateway ETOR to your system more easily.

Which markets are they used frequently?

- Electrical power plants and substations
- PLC-Scada applications
- Submetering station
- Building automation
- Food and agriculture industry
- Railway automation
- Machine tool industry
- IT centres
- Alarm station
- Production line management

Benefits and Advantages

- First Class quality to fulf ill all your communication needs
- Quick view of status with leds
- Line protection by galvanic isolation
- Isolates noise on Remote I/O cable for improved communications
- Bidirectional protocol converting; client and server mode
- Ethernet-RS485 and Ethernet-RS232 options
- Supports 6 simultaneous TCP masters with up to 64 simultaneous serial slave devices
- Multi-Slave gateway solutions for large data transfers
- Converting between Modbus TCP and Modbus RTU/ASCII
- Easy conf iguration over USB or Web Server
- User friendly conf iguration software
- 300-115200 bps baudrate adjustment
- Dual supply option: 18-50VAC/DC or can be powered up through a mini USB cable
- Automatic or manual IP addressing
- Ping blocking
- High mechanical endurance
- Sleek 17.5mm wide housing and compact design saves panel space.
- Perfect to f it in modular enclosure
- Self-Extinguishing plastic housing
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.

Layout & Mounting

Klemsan interface relays are suitable for snap mounting onto 35 mm standards DIN rails.

ETOR-4 Ethernet Gateway - WTOR WI - FI Gateway - GTOR GPRS Gateway

Data Center Management

ETHERNET GATEWAY
ETOR-4, ETOR-2, GTOR, WTOR

Efficiency of IT infrastructure depends on accessing, monitoring, and managing IT equipment remotely. Although some equipments may be installed in data center, need of support remote offices, factory floors or other unattended locations, is also important. Many devices have a serial port for making configuration changes or uploading new firmware. However, visiting remote equipment cabinets with a serial cable and laptop is a time-consuming and expensive task. KLEMSAN gateways bridge the distance between remote IT equipment and data center. Costs and cut downtime can be reduced by allowing remote access.

Wastewater Treatment Plants

ETHERNET GATEWAY
ETOR-4, GTOR, WTOR

Because of the dynamic nature of many water treatment systems and the worldwide need for improved reliability and quality, a higher degree of precision is required in the monitoring and control of water treatment programs than that obtained through manual monitoring. To achieve the degree of precision needed, continuous on-line monitoring with automatic instrumentation is required. Most of engineers use radio modems to collect RTU system data in Modbus RTU format. However, since most SCADA monitors use Modbus TCP for remote monitoring, a gateway is used to connect the two protocols.

Factory Automation

ETHERNET GATEWAY
ETOR-4, ETOR-2, WTOR, GTOR

TCP/IP is widely used in many electrical systems for remote monitoring to ensure reliable performance and energy control. Although systems and equipments can often be managed from the network itself, such access may not always be possible. The problem comes when such equipment doesn't support TCP/IP protocol. It is an option to modify these devices with TCP/IP versions but it may be too expensive and sometimes not possible. Fortunately, most of electrical devices, computers, equipments provide a serial port for local access. Users are able to have access from anywhere, just as if they were connected locally through a serial connection. So that's why gateways have become a popular way to achieve TCP/IP requirements.

Power Generation System

ETHERNET GATEWAY
ETOR-4, ETOR-2, WTOR

Generally, power plants have their own generation system in order to provide uninterrupted power supply. It is highly important to get data continuously from power RTUs, smart electronic devices, energy measuring devices which support serial communication and transmit them to TCP network which is required to reach those information from anywhere in the world. At this point, Etor gateways present best solution between serial devices and TCP network.

Industrial Motors

ETHERNET GATEWAY
ETOR-4, ETOR-2, GTOR, WTOR

The consumption of industrial motors should be monitored carefully by energy meters that are located throughout the facility because they use a significant amount of energy, with many factories spending 70% of their total production budget on this expense. Generally meters support Modbus RTU protocol so the data from the meters is transmitted via an industrial gateway to a Modbus TCP network and monitored any place in the world.

Energy Metering Applications

ETHERNET GATEWAY
ETOR-4, ETOR-2, GTOR, WTOR

These days most of energy meters support RS232 or RS485 communication protocols. Human efforts and wasted time that are spend for meter readings can be reduced by using remote monitoring system and Etor gateway.

Multi-User & Multi-Device Applications

ETHERNET GATEWAY
ETOR-4, WTOR

Ethernet is a general purpose communication protocol that is very fast, can be used any purpose and can be found anywhere in the world. 6 users located from different places can connect to one gateway simultaneously and communicate up to 64 serial devices over one gateway. So ethernet gateway presents cost-effective solution for IP-based systems which are growing at a exponential rate nowadays.

Wind & Solar Power Plants

ETHERNET GATEWAY
ETOR-4, GTOR, WTOR

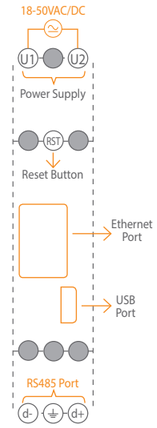
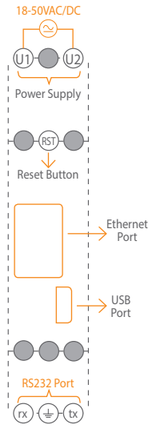
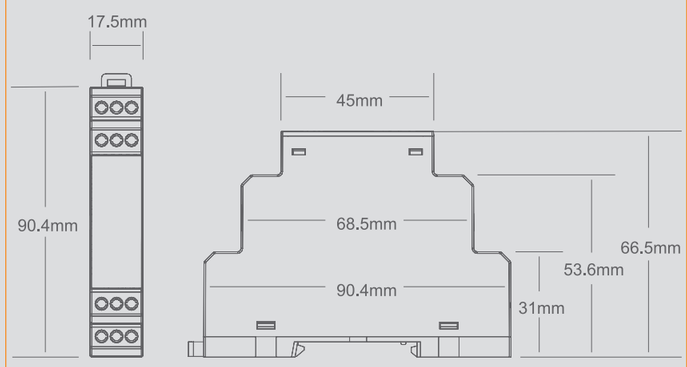
Renewable energy power plants are required to be monitored in long distance because of their locations. In order not transmission distance to become a problem, data should have transmitted through the ethernet gateways over TCP/IP protocol which provides safe, reliable and fast communication all over the world.

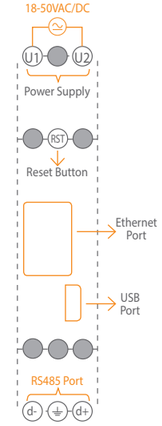
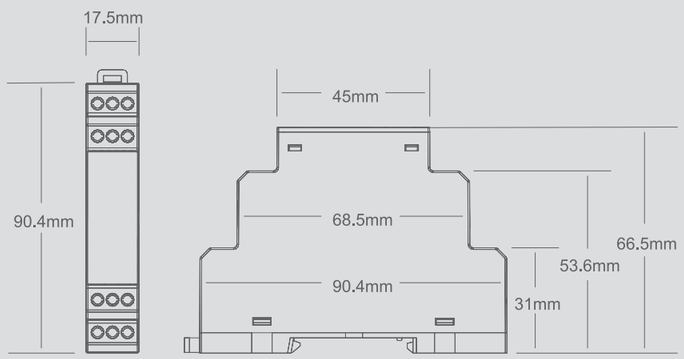
Oil and Gas Automation

ETHERNET GATEWAY
ETOR-4, ETOR-2, GTOR, WTOR

For most oil and gas industries, the need for accurate, real-time information obtained through a SCADA system is a must. These industrial facilities are looking to improve efficiencies in data communication by connecting serial devices which support RS485 or RS232 protocols. KLEMSAN gateways can be used to optimize efficiency, productivity, reliability, and safety at any stage of oil and gas production.

Type			ETOR-4	ETOR-2	ETOR-4 (with external power supply)	ETOR-2 (with external power supply)
Definiton			Ethernet gateway (TCP/IP - RS485)	Ethernet gateway (TCP/IP - RS232)	Ethernet gateway (TCP/IP - RS485)	Ethernet gateway (TCP/IP - RS232)
Order Number			601400	601401	601402	601403
Casing Width(mm)			17.5	17.5	17.5	17.5
Connections			Screw terminal (for supply and serial interface)	Screw terminal (for supply and serial interface)	Screw terminal (for supply and serial interface)	Screw terminal (for supply and serial interface)
General Information	Working Mode		Server or Client selectable (Bidirectional)	Server or Client selectable (Bidirectional)	Server or Client selectable (Bidirectional)	Server or Client selectable (Bidirectional)
	Configuration		Mini USB port or WEB interface	Mini USB port or WEB interface	Mini USB port or WEB interface	Mini USB port or WEB interface
	DHCP (Automatic IP Receive)		Available	Available	Available	Available
	ARP		Available	Available	Available	Available
	Ping blocking		Available	Available	Available	Available
	LED indicators		Available	Available	Available	Available
	Reset Function		Available	Available	Available	Available
	ESD protection		Available	Available	Available	Available
	Driver Supported		Windows® XP/Vista/7/8/8.1	Windows® XP/Vista/7/8/8.1	Windows® XP/Vista/7/8/8.1	Windows® XP/Vista/7/8/8.1
Ethernet Interface	Number of Ports		1	1	1	1
	Operation Modes		Modbus TCP, Modbus RTU over TCP, Modbus ASCII over TCP	Modbus TCP, Modbus RTU over TCP, Modbus ASCII over TCP	Modbus TCP, Modbus RTU over TCP, Modbus ASCII over TCP	Modbus TCP, Modbus RTU over TCP, Modbus ASCII over TCP
	Number of Remote Connections	Server mode	6	6	6	6
		Client mode	1	1	1	1
	Connector		RJ45	RJ45	RJ45	RJ45
	Data Transmission Rate		10/100 Base-TX	10/100 Base-TX	10/100 Base-TX	10/100 Base-TX
Serial Interface	Number of Ports		1	1	1	1
	Operation Modes		MODBUS RTU, MODBUS ASCII	MODBUS RTU, MODBUS ASCII	MODBUS RTU, MODBUS ASCII	MODBUS RTU, MODBUS ASCII
	Serial Standart		RS485	RS232	RS485	RS232
	Number of Serial Devices	Server mode	64	1	64	1
		Client mode	1	1	1	1
	Serial Communication Parameters	Baud Rate	300 to 115200 bps	300 to 115200 bps	300 to 115200 bps	300 to 115200 bps
		Data Bit	8	8	8	8
		Stop Bits	1 or 2	1 or 2	1 or 2	1 or 2
		Parity	None, Even, Odd	None, Even, Odd	None, Even, Odd	None, Even, Odd
Supply	Voltage	AC	18-50V	18-50V	18-50V	18-50V
		DC	18-50V	18-50V	18-50V	18-50V
	Consumption	AC	< 2.2VA	< 2.2VA	< 2.2VA	< 2.2VA
		DC	< 1.2W	< 1.2W	< 1.2W	< 1.2W
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz
Galvanic Isolation	Supply- Ethernet port		1500VRMS, 2250VDC	1500VRMS, 2250VDC	1500VRMS, 2250VDC	1500VRMS, 2250VDC
	Supply- Serial port		1500VRMS, 2250VDC	1500VRMS, 2250VDC	1500VRMS, 2250VDC	1500VRMS, 2250VDC
	Serial port-Ethernet port		2500VRMS	2500VRMS	2500VRMS	2500VRMS
Mechanical Properties	Weight(g)		58	58	58	58
	Protection Class		IP20	IP20	IP20	IP20
	Assembly Type		Rail Mount	Rail Mount	Rail Mount	Rail Mount
	Permissible mounting position		Any	Any	Any	Any
Ambient Conditions	Operating Temperature		-10 to +60 °C	-10 to +60 °C	-10 to +60 °C	-10 to +60 °C
	Storage Temperature		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C
	Relative Humidity (no condensation)		Max.95%	Max.95%	Max.95%	Max.95%

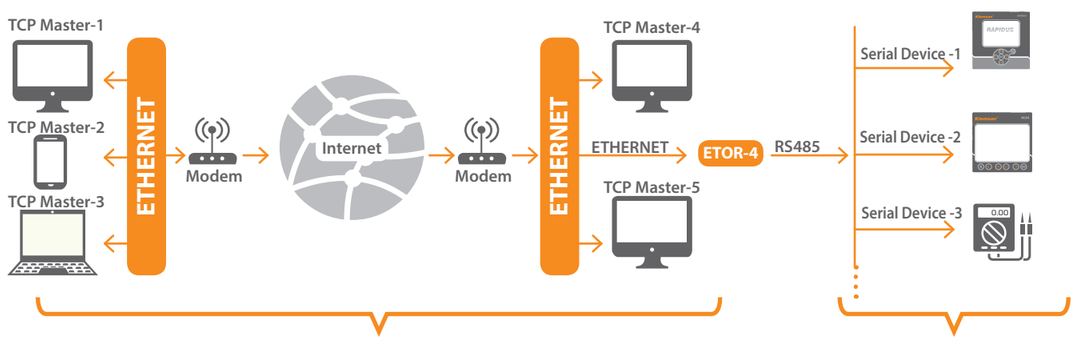
Type		ETOR-4	ETOR-2
Accesorries	Mini USB Cable 	Available	Available
	External Power Supply (220/110VAC to 24VDC) 	-	-
Schematics			
Dimensional Drawings			

ETOR-4 (with external power supply)	ETOR-2 (with external power supply)
Available	Available
Available	Available
	
	

ETOR-4 / Ethernet-RS485 Bidirectional Converting

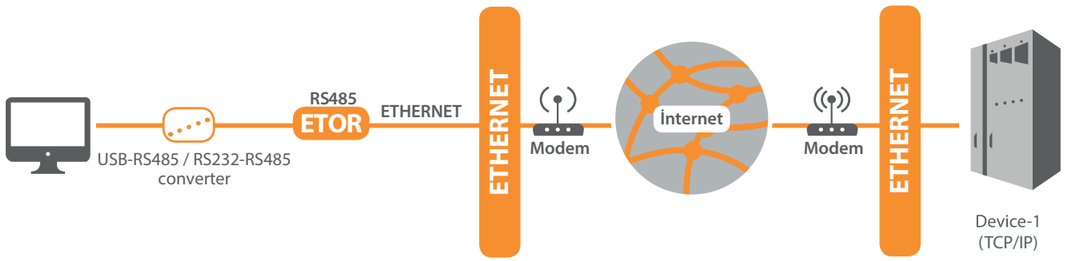
Server Mode

When running in the server mode; ETOR-4 converts the MODBUS TCP, MODBUS RTU over TCP and MODBUS ASCII over TCP queries to MODBUS RTU and MODBUS ASCII queries and transmits these queries to the serial devices. After that, it converts the responses which are received by slave devices, then transmits them to master devices. 6 TCP masters and 64 serial devices can be communicated simultaneously over one Etor-4 gateway in server mode.



Client Mode

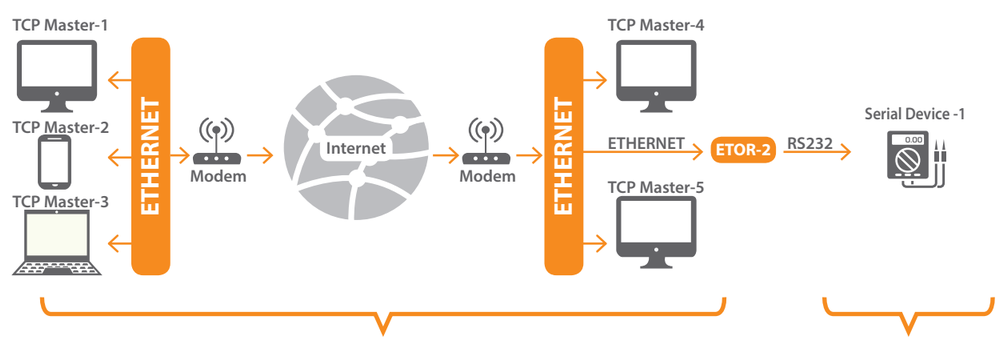
When running in the client mode; ETOR-4 converts the MODBUS RTU and MODBUS ASCII queries to MODBUS TCP, MODBUS RTU over TCP and MODBUS ASCII over TCP queries and transmits these queries to the remote device which is connected to the internet or the local network. After that, it converts the responses which are received by slave devices, then transmits them to master devices. 1 TCP master and 1 serial device can be communicated simultaneously over one Etor-4 gateway in client mode.



ETOR-2 / Ethernet-RS232 Bidirectional Converting

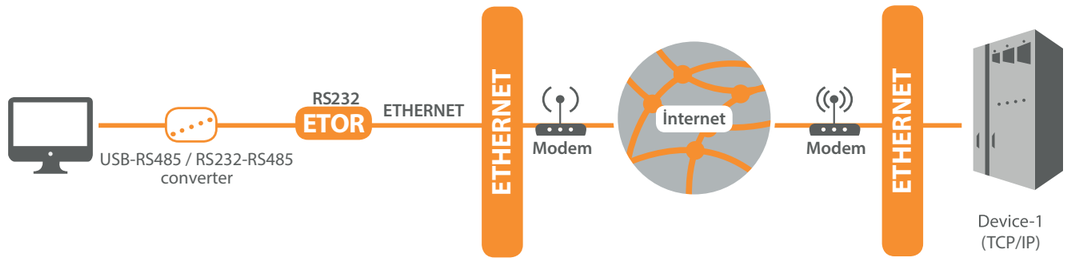
Server Mode

When running in the server mode; ETOR-2 converts the MODBUS TCP, MODBUS RTU over TCP and MODBUS ASCII over TCP queries to MODBUS RTU and MODBUS ASCII queries and transmits these queries to the serial device. After that, it converts the responses which are received by slave device, then transmits them to master devices. 6 TCP masters and 1 serial device can be communicated simultaneously over one Etor-2 gateway in server mode.



Client Mode

When running in the client mode; ETOR-2 converts the MODBUS RTU and MODBUS ASCII queries to MODBUS TCP, MODBUS RTU over TCP and MODBUS ASCII over TCP queries and transmits these queries to the remote device which is connected to the internet or the local network. After that, it converts the responses which are received by slave device, then transmits them to master device. 1 TCP master and 1 serial device can be communicated simultaneously over one Etor-2 gateway in client mode.

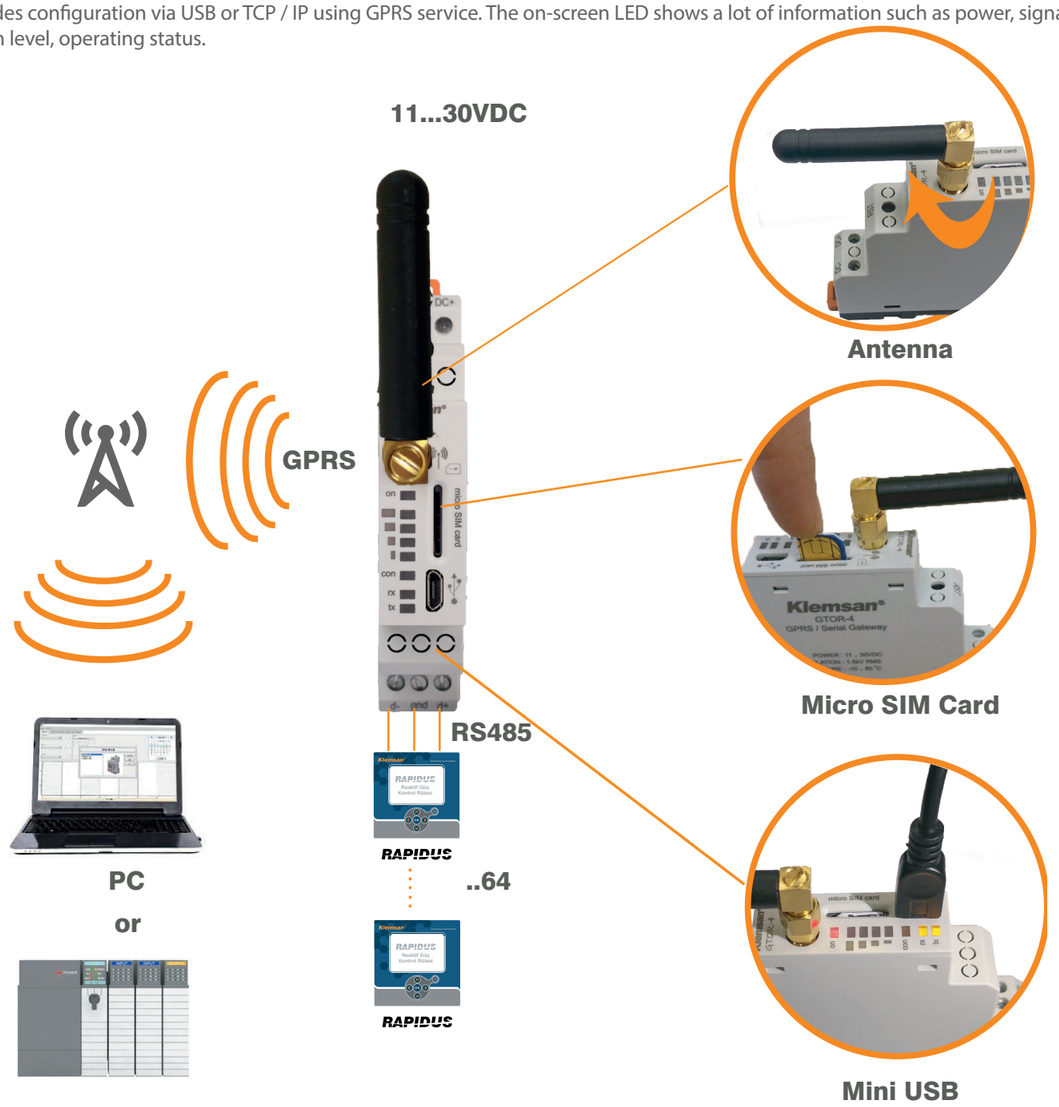


GTOR-4 / GPRS to RS485 Gateway

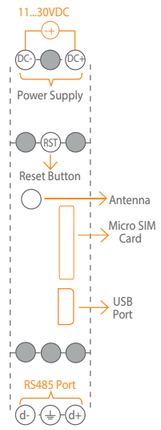
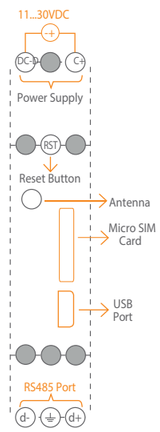
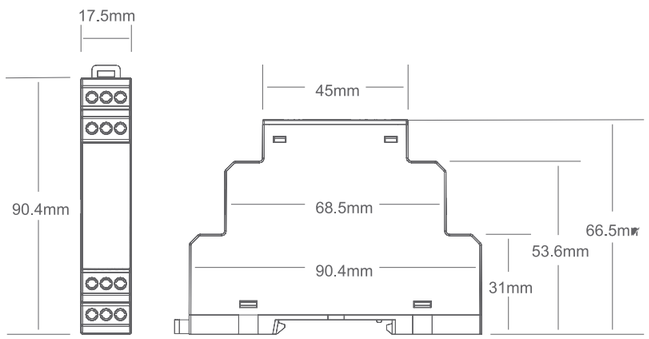
GTOR series products connect to serial MODBUS devices with TCP / IP based systems via GPRS service. In this way, it is possible to remotely control and monitor serial devices connected to MODBUS network via GPRS service. GTOR can be easily integrated into existing MODBUS networks thanks to their wide range of configuration options.GTOR series products works as a TCP / IP server. GTOR is user friendly with easy to configure and free interface program.

- Micro SIM Card
- Free user interface program
- RS485 interface
- 17,5mm width
- 8 LED indicators
- APN configuration with Mini USB
- Supports all operators
- Supports up to 64 devices

It provides configuration via USB or TCP / IP using GPRS service. The on-screen LED shows a lot of information such as power, signal strength level, operating status.



Type			GTOR	GTOR(with power supply)
Definition			GPRS Gateway	GPRS Gateway
Order Number			601 440	601 441
Casing Width(mm)			17,5mm	17,5mm
Connections			Screw Terminal	Screw Terminal
Mounting			Rail Mount	Rail Mount
General Information	Configuration		Configurable via USB Micro USB Connection Interface	Configurable via USB Micro USB Connection Interface
	IP Based Security		√	√
	LED Indicators		√	√
	Reset Function		√	√
	ESD Protection		√	√
	Supported Drivers		WindowsXP/Vista/7/8/10	WindowsXP/Vista/7/8/10
GPRS Interface	SIM/USIM		3V/1.8V	3V/1.8V
	Quad Band		850/900/1800/1900MHz	850/900/1800/1900MHz
	GPRS Multi Slot Class	Downlink	Class 12 85.6kbps	Class 12 85.6kbps
		Uplink	Class 12 85.6kbps	Class 12 85.6kbps
	GPRS Mobile Station		Class B	Class B
	Compliant to GSM Phase 2/2+		Class 4 (2W @850/900MHz) Class 1 (1W @1800/1900MHz)	Class 4 (2W @850/900MHz) Class 1 (1W @1800/1900MHz)
Serial Interface	Number of Port		1	1
	Serial Connection Standard		RS485	RS485
	Number of Serial Connection Devices	Server Mode	32	32
		Client Mode	1	1
	Serial Connection Parameters	Baud Rate	Between 600 - 57600 bps	Between 600 - 57600 bps
		Data Bit	8	8
		Stop Bit	1 or 2	1 or 2
		Parity	None, even, odd	None, even, odd
Supported Protocols			MODBUS TCP; MODBUS RTU via TCP; MODBUS ACII via TCP	MODBUS TCP; MODBUS RTU via TCP; MODBUS ACII via TCP
Voltage Supply	Voltage	DC	11-30VDC	11-30VDC
		AC	-	-
	Frequency		45-65Hz	45-65Hz
Isolation			1.5kV RMS	1.5kV RMS
Permissible Ambient Temperature	During Operation		-10°C..+60°C	-10°C..+60°C
	During Storage		-30°C..+80°C	-30°C..+80°C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)
Operating Frequency			45-65Hz	45-65Hz
Degree of Protection			IP20	IP20
Power Consumption	DC		1.2W	1.2W
	AC		-	-

Tip		GTOR	GTOR (with power supply)
Accessories	Mini USB Cable 	Available	Available
	Antenna 	Available	Available
	High gain antenna 	Available	Available
	External Power Supply (220/110VAC to 24VDC) 	-	Available
Schematics			
Dimensional Drawings			

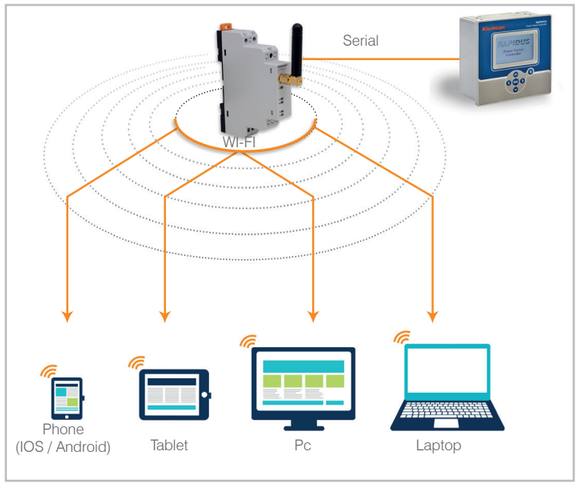
WTOR-4 / WI - FI to RS485 Gateway

WTOR series products connect to serial MODBUS devices with TCP / IP based systems via WI-FI service. In this way, it is possible to remotely control and monitor serial devices connected to MODBUS network via WI-FI service. WTOR can be easily integrated into existing MODBUS networks thanks to their wide range of configuration options. WTOR series products works as a TCP / IP server.

- Operating with Access
- Point or Station mode
- Configurating via web interface
- RS485
- 4 pcs. led indication
- Supports up to 64 devices
- 17,5mm wide

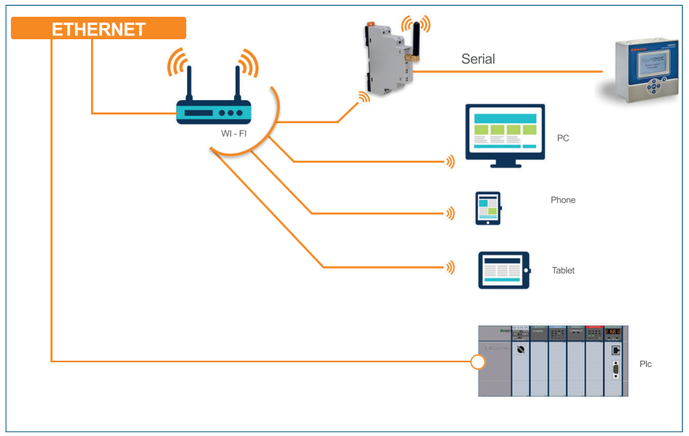
It provides configuration via web interface.The on-screen LED shows a lot of information such as power, mode information, operating status.

AP(Access Point) Mode



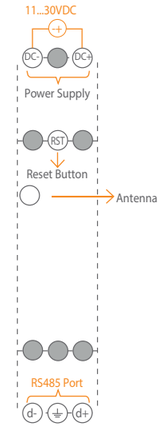
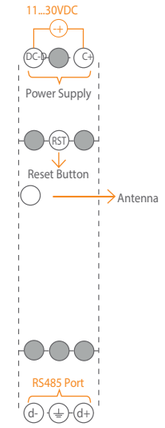
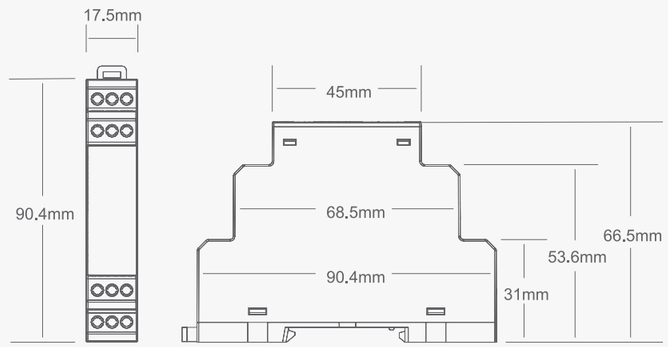
Where there is no established Wi-Fi network, the WTOR may create a Wi-Fi network. A single device can join the Wi-Fi network created by WTOR. Serial devices can be controlled and monitored in this way.

STA Mode:



Joins an external Wi-Fi router to connect serial devices to the existing Wi-Fi network. This way the serial devices can be controlled and monitored. The configuration page can be accessed by entering the IP address set for WTOR in the WEB browser of a computer joined to the same network, and the desired configuration settings can be made.

				
Type			**WTOR**	**WTOR(with power supply)**
Definition			WI-FI Gateway	WI-FI Gateway
Order Number			601 450	601 451
Casing Width(mm)			17,5mm	17,5mm
Connections			Screw Terminal	Screw Terminal
Mounting			Rail Mount	Rail Mount
General Information		Configuration	Web Interface	Web Interface
		DHCP	√	√
		Ping Blocking	√	√
		LED Indicators	√	√
		Reset Fonction	√	√
		ESD Protection	√	√
		Supported Drivers	WindowsXP/Vista/7/8/10	WindowsXP/Vista/7/8/10
WIFI Interface	Standard		802.11b/g/n	802.11b/g/n
	Operating Modes			AP(Access Point)/ STA (Station) Mode
	Number of Remote Connections	Server Mode	7	7
		Client Mode	1	1
	Security Type		WPA2	WPA2
Serial Interface	Number of Port		1	1
	Serial Connection Standard			RS485
	Number of Serial Connection Devices	Server Mode	64	64
		Client Mode	1	1
	Serial Connection Parameters	Baud Rate	Between 600 - 57600 bps	Between 600 - 57600 bps
		Data Bit	8	8
		Stop Bit	1 or 2	1 veya 2
		Parity	None, Even, Odd	None, Even, Odd
Supported Protocols			MODBUS TCP; MODBUS RTU via TCP; MODBUS ACII via TCP	MODBUS TCP; MODBUS RTU via TCP; MODBUS ACII via TCP
Voltage Supply	Voltage	DC	11-30VDC	11-30VDC
		AC	-	-
	Frequency		45-65Hz	45-65Hz
Isolation			1.5kV RMS	1.5kV RMS
Permissible Ambient Temperature	During Operation		-10°C..+60°C	-10°C..+60°C
	During Storage		-30°C..+80°C	-30°C..+80°C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)
Operating Frequency			45-65Hz	45-65Hz
Degree of Protection				IP20
Power Consumption	DC		1.2W	1.2W
	AC		-	-

Tip		WTOR	WTOR (with power supply)
	Antenna 	Available	Available
	High gain antenna 	Available	Available
	External Power Supply (220/110VAC to 24VDC) 	-	Available
Schematics			
Dimensional Drawings			

UTOR / USB to RS485,RS232 and TTL Converter

UTOR series products,

- USB to RS485
- USB to RS232
- Provides TTL conversion from USB.
- UTOR is powered from the USB port without the need for an external power supply. Unlike most converters, UTOR has an isolation barrier that provides electrical isolation between your computer and serial devices. This creates an ideal environment where equipment and data are critical.

						
Type			UTOR-4i	UTOR-2i	UTOR-T5i	UTORT3i
Definition			Isolated RS485 to USB Converter	Isolated RS232 to USB Converter	Isolated TTL(5V) to USB Converter	Isolated TTL(3V) to USB Converter
Order Number			601 430	601 431	601 432	601 433
Interface	USB	Compatibility	USB 1.1 and USB 2.0	USB 1.1 and USB 2.1	USB 1.1 and USB 2.2	USB 1.1 and USB 2.3
		Connector	USB Type A	USB Type A	USB Type A	USB Type A
	Serial	Port Number	1	1	1	1
		Standart	RS485	RS232	TTL(5V)	TTL(3.3V)
		Connector	Removable terminal block with screw connection	Removable terminal block with screw connection	Removable terminal block with screw connection	Removable terminal block with screw connection
		Isolation	2500Vrms	2500Vrms	2500Vrms	2500Vrms
		Baudrate	300 .. 115200 bps	300 .. 115200 bps	300 .. 115200 bps	300 .. 115200 bps
		Stop Bits	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2
		Data Bits	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8
		Parity	None, Even, Odd	None, Even, Odd	None, Even, Odd	None, Even, Odd
		Terminals	D+,D-	Tx, Rx	Tx, Rx	Tx, Rx
Voltage Supply			via USB port	via USB port	via USB port	via USB port
Permissible Ambient Temperature		During Operation	-20°C..+60°C	-20°C..+60°C	-20°C..+60°C	-20°C..+60°C
		During Storage	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of Protection			IP20	IP20	IP20	IP20
Accesorries 			Available	Available	Available	Available

Energy Monitoring
Solutions

More efficiency
than you expected

Defining an energy analyzer in simple terms

An energy analzer is an automation device which offers 3-phase energy monitoring, analyzing and controlling the network comprehensively. It enables advanced applications such as energy metering, data logging, DIO applications, transducer applications etc.

Which actions are executed?

An energy analyzer provides highly accurate measuring for main electrical parameters and expanded energy metering solutions for your electrical network.

All the data which are being measured or kept in its memory can be transmitted to remote monitoring system thanks to modbus communication.

It offers 3-phase energy and power measurement with data logging such as min/max/avg values, energy values, demand values etc. with date and time.

Digital inputs can be used for equipment status/position monitoring, activation second tariff which is used by generators or as a counter.

Digital outputs can be used to take an impulse which is synchronized with internal energy meters.

It provides conversion of main electrical parameters into DC voltage or DC mA outputs thanks to analogue outputs which can be easily programmed by the users.

Low/high limit thresholds for all electrical paramaters can be defined so load management in a network is possible by means of alarm relay outputs.

In dept-analysis of individual current and voltage harmonics in order to increase network quality.

Displaying signal waveforms for current and voltage phases to detect signal deviations which are observed in real time.

Detailed analyze of phase relationships between current and voltage lines thanks to phasor diagram feature.

Specifying run hours, on hours and power interruptions in order for your machines to be used more effectively.

Measuring
Metering
Communicating
Alarming
Harmonic monitoring
Counting
Waveform displaying
Taking impulse
Converting
Data logging
Phasor analyzing
Specifying hour meters

Which markets are they used frequently?

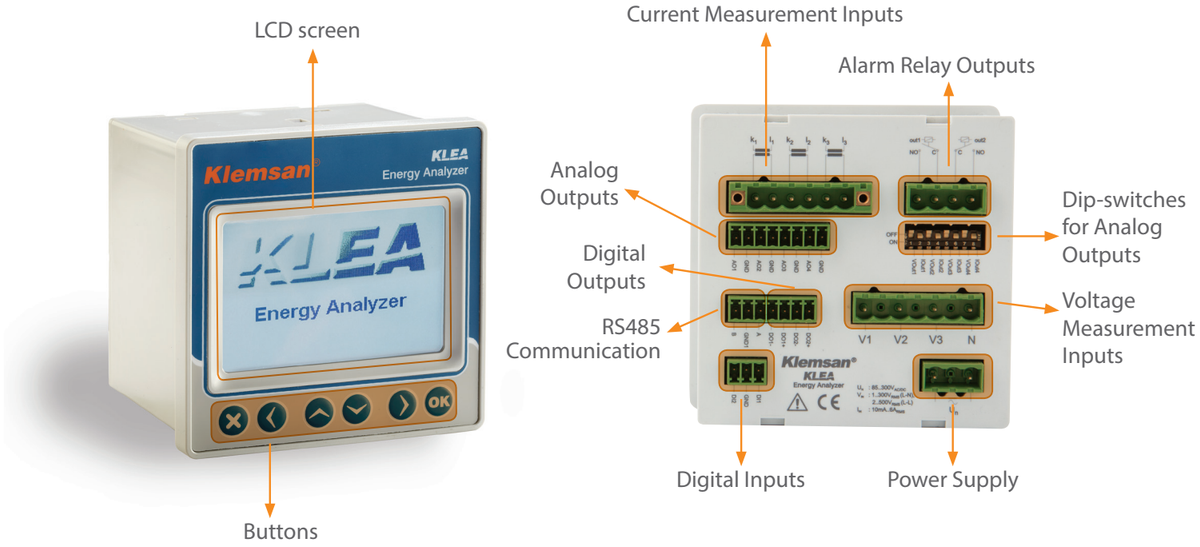
- Medium voltage modular cabinets
- Submetering station
- PLC-Scada applications
- Electrical power plants and substations
- Electric utilities
- Enery meter applications
- Infrastructure
- Alarm station
- IT centres
- High-rise buildings

Benefits and Advantages

- Current inputs can withstand surges up to 100 A for 1 second
- State of the art technology; moduler design, no connector cables, no fixing screws inside
- Panel or rail mount options
- 3 phase and 1 phase options
- Adjustable multi-tariff energy meter
- 4 quadrant measurement
- Harmonic measurement up to 51st
- Programmable analog outputs
- Programmable digital inputs and outputs
- Prgrammable alarm output
- Modbus communication
- Long distance visibility with super bright seven segment displays
- AC/DC power supply
- Real time clock
- Connection to current transformer x/1 A or x/5 A
- High measurement accuracy according to IEC standarts
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences
- Self-Extinguishing plastic housing.

Layout & Mounting

Klemsan measuring devices are suitable for panel mounting for 96x96mm standarts or for snap mounting onto 35 mm standards DIN rails.



KLEA 324P Energy Analyzer

Dual Source Energy Measurement

Recording and displaying the consumption of the energy from two different sources; network and generator. Users can set Tariff 2 to measure genset usage as a power supply so exact cost of the energy for network and genset can be identified more easily.

ENERGY ANALYZER
KLEA and POWYS series

Equipment Maintenance

Monitoring elapsed hours for equipment warranty, recording actual running hours for equipment resale, tracking running time for equipment service thanks to Run hour, On hour and Power interruption counter features.

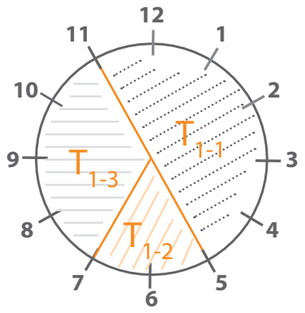
ENERGY ANALYZER
KLEA 110P
KLEA 220P
POWYS 3121 …

Buildings and Infrastructure

The main consumers can be identified by measuring the energy consumption of the various sub-assemblies in your buildings. So energy costs that belong to the departments can be managed and distributed between the various users thanks to submetering function. By correctly detecting peak demands in consumption gives you opportunity to reduce your electricity bills.

ANALYZER / MULTIMETER
KLEA, ECRAS and POWYS Series

Sub-metering Station



User can use these sub-tariffs in order to measure energy consumption for different shifts in a facility. In addition to Tariff 2, Tariff 1 is splitted into three pieces with adjustable start & end times for each sub-tariff.

ENERGY ANALYZER
KLEA 3xxx Series

PLC-Scada Applications

Conversion of measured electrical parameters such as voltage, current, active power, reactive power, frequency etc. can be converted to a DC output which is connected to analog input of PLC module by means of power transducer. So it is possible to integrate network measurands with a scada system.

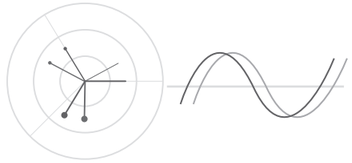
POWER TRANSDUCER
DNPT

Cost Management

Industry faces a never ending challenge to keep down its operating costs. One of the prerequisites for achieving this goal is to identify where costs occur. Energy analyzers present best solution to detect, analyze and prevent them thanks to their advanced multi-tariff meters and real time demand logs.

ENERGY ANALYZER
KLEA 3xxx Series

Signal Analyzing



Advanced monitoring of current and voltage waveforms, monitoring signal disturbances, detailed analyze of phase relationships.

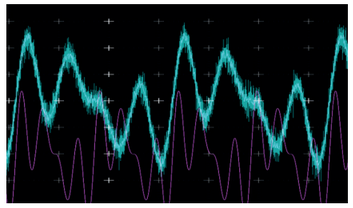
ENERGY ANALYZER
KLEA 3xxx Series

Remote Monitoring

All measured parameters are transmitted to a PC through RS485 so that keep you informed of system performance 24 hours per day. Parameters can be changed remotely and a variety of measured values can be monitored, analyzed and downloaded via a Web browser with using an energy management softwares and ethernet gateway from anywhere in the world.

ANALYZER / MULTIMETER
KLEA, ECRAS and POWYS Series

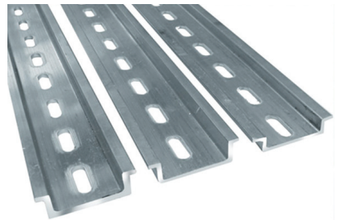
Pulse Concentration Applications



Klemsan energy analyzers offer several meters which are suitable all type of electrical networks. The pulse output function enables the kWh/kVArh consumption to be exported to a concentrator so that they can be analyzed for energy saving and billing purpuses.

ENERGY ANALYZER
KLEA and POWYS Series

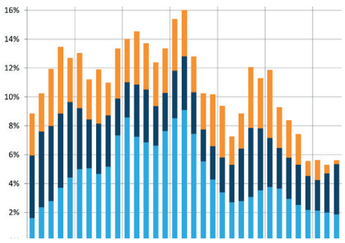
Din-Rail Applications



Installation costs are significantly decreased by the installation of measurement devices on a standart 35mm din-rail instead of mount them in a panel. This means that panel cut-out is no longer necesarry so time and energy can be saved.

ANALZER/ POWER TRANSDCUER
POWYS and DNPT Series

Demand Management



Measuring demand values for active power with date and time helps identifying time periods when energy use is very high so that unnecessary and unexpected costs can be detected and reduced.

ENERGY ANALYZER
KLEA 3xxx Series

Load Management by means of Alarm Outputs

Fully programmable alarm function for any electrical parameter which is measured by the product, gives you opportunity to define pickup setpoint, dropout setpoint and time delay in order to detect a fault condition and prevent it with activating alarm outputs before it's too late.

ANALYZER / MULTIMETER
KLEA, ECRAS and POWYS Series

Facility Management

DNPT series transducers provide all requirements of entire facility such as monitoring and conversion of mono/three phase electrical parameters, remote communication, 2 relay output, 2 DIO, 4 analog output, advanced multi-tariff energy meters. Briefly all power management needs are provided by only one product.

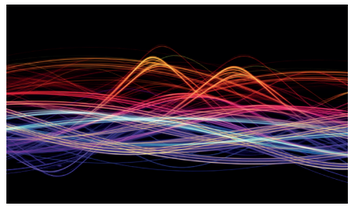
POWER TRANSDUCER
DNPT

Counting Quantities

Production quantity can be collected by a limit switch or a dry contact coming from a proximity sensor thanks to digital input feature.

ENERGY ANALYZER
KLEA and POWYS Series

Harmonic Management



Harmonics cause many problems for all sorts of equipment connected to the low voltage network. Before take the cost and and consequences of poor power quality, harmonics must be measured instantaneously and isolated from the source when it is necessary.

ENERGY ANALYZER
KLEA and POWYS Series

Fan Control

Assigning temperature value as an alarm paramater allows you to control temperature in a cabinet and prevents equipments from overheating thanks to integrated temperature sensor.

ENERGY ANALYZER
KLEA 3xxx Series

Data and Event Logging

Minimum, maximum and average values of measurements and consumption data are stored in non-volatile memory as hourly, daily and monthly. Plus, 50 alarm logs with time stamp allows you to analyze the malfunctions which were occured in the past.

ENERGY ANALYZER
KLEA 3xxx Series

Equipment Status Management

The status of a circuit breaker or a disconnector in an electrical power distrubution center can be monitored by means of digital inputs. According to digital input status(open or short circuit), simple Logic-0 or Logic-1 signal is sent to the PC through the modbus communication instantaneously.

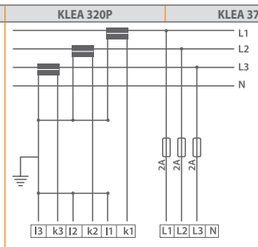
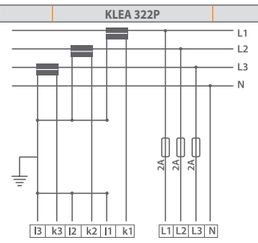
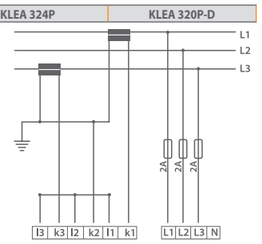
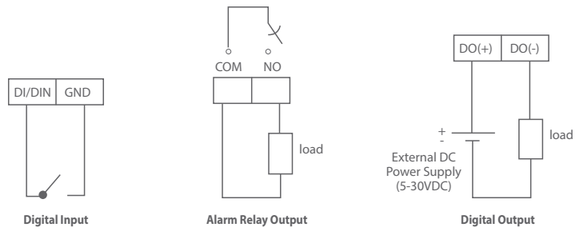
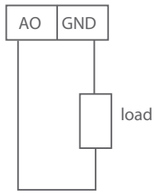
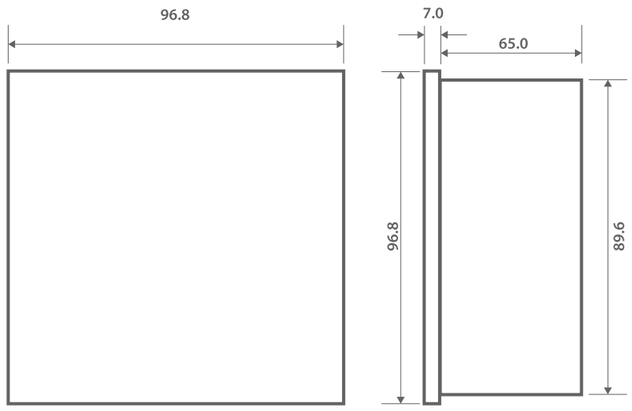
ANALYZER / MULTIMETER
KLEA and POWYS Series

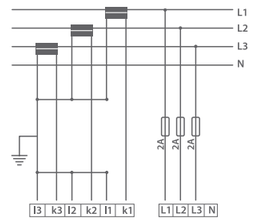
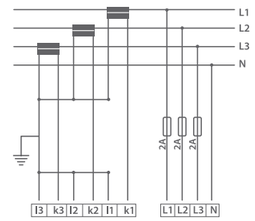
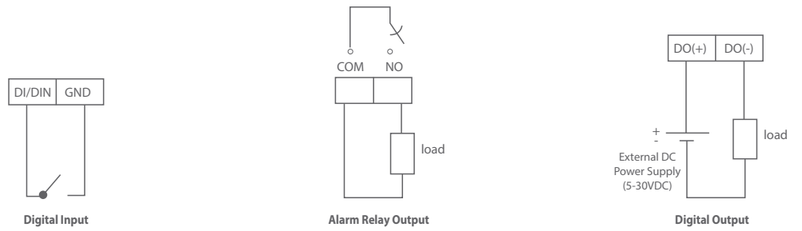
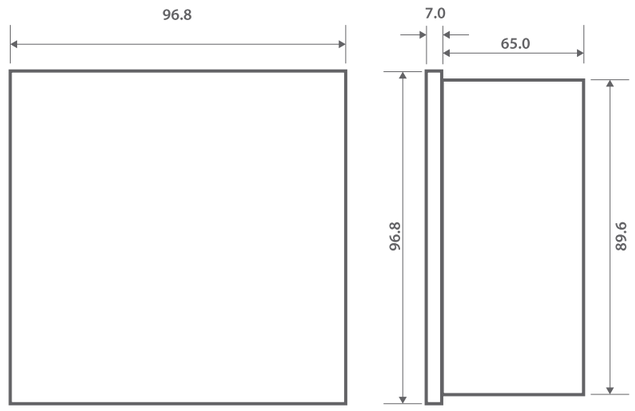
								
Type			**KLEA 320P**	**KLEA 370P**	**KLEA 322P**	**KLEA 324P**	**KLEA 320P-D**	
Definiton			3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	
Order Number			606100	606101	606102	606103	606130	
General	Seven Segment Display		-	-	-	-	-	
	LCD		Available	Available	Available	Available	Available	
	Language Support		Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	
	Battery		Available	Available	Available	Available	Available	
	Real Time Clock		Available	Available	Available	Available	Available	
	Password Protection		Available	Available	Available	Available	Available	
	Current Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	
	Voltage Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	
	Demand Period		1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	
	Connection Type		3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	
	Measurement in Quadrants		4	4	4	4	4	
	Number of Measurement in a period		512	512	512	512	512	
	LCD/Display Refresh Period		1 sec	1 sec	1 sec	1 sec	1 sec	
	Networks		TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	
	Phasor Diagram		Available	Available	Available	Available	Available	
	Signal Waveforms		Available	Available	Available	Available	Available	
	Min/Max/Demand Values		Available	Available	Available	Available	Available	
Energy Measurement	Number of Tariffs		2	2	2	2	2	
	Multi Sub-Tariffs(Peak, Day and Off-Peak)		Available	Available	Available	Available	Available	
	1Ø Phase Energy Meters		Available	Available	Available	Available	Available	
	3Ø Phase Energy Meters		Available	Available	Available	Available	Available	
	4-Quadrant Reactive Energy Meters		-	-	-	-	Available	
Current Measurement Input	Measurement Range		10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	
	Overvoltage Category		300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	
	Measurement Surge Voltage		2 kV	2 kV	2 kV	2 kV	2 kV	
	Power Consumption		<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	
	intermittent overload		100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	
	Sampling Freq.between 45-65 Hz		25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	
Voltage Measurement Input	Overvoltage Category		300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	
	Measured Range L-N		1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	
	Measured Range L-L		2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	
	Measured Frequency Range		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	
	Power Consumption		<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	
	Sampling Freq.between 45-65 Hz		25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	
Power Quality Measurements	Harmonics for current and voltage phases		Upto 51st	Upto 51st	Upto 51st	Upto 51st	Upto 51st	
	THD-Voltage in %		Available	Available	Available	Available	Available	
	THD-Current in %		Available	Available	Available	Available	Available	
Other Measurements	Run Hour (Operating time for load in hours)		Available	Available	Available	Available	Available	
	On Hour (Operating time for meter in hours)		Available	Available	Available	Available	Available	
	Int Counter (Number of power interruptions)		Available	Available	Available	Available	Available	
Measurement Accuracy	According to IEC 61557-12	Total Active Power	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Total Reactive Power	Class 1	Class 1	Class 1	Class 1	Class 1	
		Total Apparent Power	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Total Active Energy	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	
		Frequency	Class 0.05	Class 0.05	Class 0.05	Class 0.05	Class 0.05	
		Current	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Neutral Current (calculated)	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Voltage	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Power factor	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		THDV, THDI	Class 1	Class 1	Class 1	Class 1	Class 1	
	According to IEC 62053-22	Total Active Energy	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.2S	
	Accoding to IEC 62053-23	Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	
Inputs and Outputs	Alarm Relay Outputs	Number of outputs	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	
		Max. Switching Current	10 A	10 A	10 A	10 A	10 A	
		Max. Switching Voltage	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	
		Max. Switching Power	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	

								
KLEA 370P-D			**KLEA 220P**	**KLEA 110P**	**KLEA-370P-VSM**	**KLEA-320P-DC**	**KLEA-220P-DC**	
3Ø Energy Analyzer			3Ø Energy Analyzer	3Ø Energy Analyzer		3Ø Energy Analyzer	3Ø Energy Analyzer	
606131			606160	606180	606121	606150	606190	
-			-	Available	-	-	-	
Available			Available	-	Available	Available	Available	
Turkish, English, Russian			-	-	Turkish, English, Russian	Turkish, English, Russian	-	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			Available	Available	Available	Available	Available	
1-5000			1-5000	1-5000	1 - 5.000	1 - 5.000	1 - 5.000	
1-5000			1-5000	1-5000	1 - 5.000	1 - 5.000	1 - 5.000	
1-60 minutes adjustable			1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	
3P4W, 3P3W, Aron			3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W	
4			4	4	4	4	4	
512			256	256	512	512	256	
1 sec			1 sec	1 sec	1 sec	1 sec	1 sec	
TT, TN, IT			TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			Available	Available	Available	Available	Available	
2			2	2	2 + 7 different energy meters	2	2	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			Available	Available	Available	Available	Available	
Available			-	-	-	-	-	
10mA-6A AC			10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	
300 V Cat II			300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	
2 kV			2 kV	2 kV	2 kV	2 kV	2 kV	
<0.2 VA			<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	
100A for 1 sec			100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	
25,6 kHz			12,8 kHz	12,8 kHz	25,6 kHz	25,6 kHz	12,8 kHz	
300 V Cat III			300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	
1-300 Vrms			1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	
2-500 Vrms			2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	
45-65 Hz			45-65 Hz	45-65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	
<0.1 VA			<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	
25,6 kHz			12,8 kHz	12,8 kHz	25,6 kHz	25,6 kHz	12,8 kHz	
Upto 51st			Upto 31st	Upto 31st	Upto 51st	Upto 51st	Upto 31st	
Available			Available	Available	Available	Available	Available	
Available			Available	Available	Available	Available	Available	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Class 0.2			Class 0.5	Class 0.5	Class 0.2	Class 0.2	Class 0.5	
Class 1			Class 1	Class 1	Class 1	Class 1	Class 1	
Class 0.2			Class 0.5	Class 0.5	Class 0.2	Class 0.2	Class 0.5	
Class 0.5			Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
Class 2			Class 2	Class 2	Class 2	Class 2	Class 2	
Class 0.05			Class 0.1	Class 0.1	Class 0.05	Class 0.05	Class 0.1	
Class 0.2			Class 0.5	Class 0.5	Class 0.2	Class 0.2	Class 0.5	
Class 0.5			Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
Class 0.2			Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
Class 0.5			Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
Class 1			Class 1	Class 1	Class 1	Class 1	Class 1	
Class 0.2S			Class 0.5S	Class 0.5S	Class 0.2S	Class 0.2S	Class 0.5S	
Class 2			Class 2	Class 2	Class 2	Class 2	Class 2	
2 pcs.			2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	
NO (SPST)			NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	
10 A			10 A	10 A	10 A	10 A	10 A	
250 VAC			250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	
1250 VA			1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	

Type			KLEA 320P	KLEA 370P	KLEA 322P	KLEA 324P	KLEA 320P-D
Inputs and Outputs	Digital Inputs	Number of inputs	2 pcs.	7 pcs.	2 pcs.	2 pcs.	2 pcs.
		Frequency	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms
		Input Present or Not	Dry Contact	Dry Contact	Dry Contact	Dry Contact	Dry Contact
		Isolation Level	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms
	Digital Outputs	Number of outputs	2 pcs.	7 pcs.	2 pcs.	2 pcs.	2 pcs.
		Switching Voltage Range	Transistor	Transistor	Transistor	Transistor	Transistor
		Frequency	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC
		Isolation Level	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms
		Number of outputs	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms
	Analog Outputs	Range of Outputs 0-5 V, 0-10 V, -5-5 V, -10-10V, 0-20 mA, 4-20 mA	-	-	2	4	-
		Isolation	-	-	Available	Available	-
Supply	Voltage	AC	85-300V	85-300V	85-300V	85-300V	85-300V
		DC	85-300V	85-300V	85-300V	85-300V	85-300V
	Consumption	AC	< 3VA	< 3VA	< 3VA	< 3VA	< 3VA
		DC	<2.5W	<2.5W	<2.5W	<2.5W	<2.5W
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
Data Logging with timestamp	Min/max/avg Values	Hourly records	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters
		Daily records	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters
		Monthly records	36 months x 68 different parameters	36 months x 68 different parameters	36 months x 68 different parameters	36 months x 68 different parameters	36 months x 68 different parameters
	Demand		4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters
	Alarm records		50	50	50	50	50
Communication	Protocol		Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU
	Baud rate		2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable
	Parity number		None	None	None	None	None
	Stop bit		1	1	1	1	1
	Address		1-247	1-247	1-247	1-247	1-247
	Isolation		2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS
Mechanical Properties	Weight(g)		404	428	428	428	404
	Protection Class		Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
	Assembly Type		Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
Cable Cross Sections	Supply, Voltage, Current, Relay Outputs	Stranded	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG
		Solid	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG
	Digital I/O, RS 485, Analog Output	Stranded	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG
		Solid	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG
Ambient Conditions	Operating Temperature		-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
	Storage Temperature		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C
	Relative Humidity (no condensation)		Max.95%	Max.95%	Max.95%	Max.95%	Max.95%

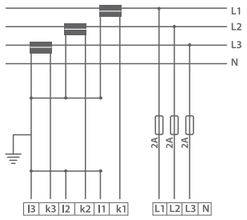
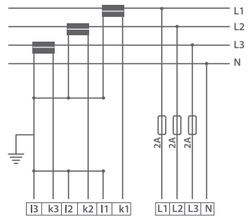
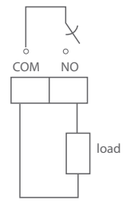
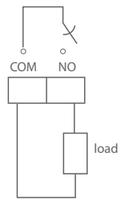
KLEA 370P-D	KLEA 220P	KLEA 110P	KLEA-370P-VSM	KLEA-320P-DC	KLEA-220P-DC
2 pcs.	2 pcs.	1 pc.	7 pcs.	2 pcs.	2 pcs.
100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms
Dry Contact	Dry Contact	Dry Contact	Dry Contact	Dry Contact	Dry Contact
5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms
2 pcs.	2 pcs.	2 pcs.	7 pcs.	2 pcs.	2 pcs.
Transistor	Transistor	Transistor	Transistor	Transistor	Transistor
5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC
20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	5000 Vrms	5000 Vrms	5000 Vrms
5000 Vrms	5000 Vrms	5000 Vrms	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
85-300V	85-300V	85-300V	85-300V	-	-
85-300V	85-300V	85-300V	85-300V	18-60VDC	18-60VDC
< 3VA	<4.5VA	<6VA	< 3VA	-	-
<2.5W	<2W	<3W	<2.5W	<2.5W	<2.2W
45-65Hz	45-65Hz	45-65Hz	45-65Hz	-	-
1920 hours x 68 different paramaters	-	-	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	-
240 days x 68 different paramaters	-	-	240 days x 68 different paramaters	240 days x 68 different paramaters	-
36 months x 68 different parameters	-	-	36 months x 68 different parameters	36 months x 68 different parameters	-
4 months x 16 different parameters	-	-	4 months x 16 different parameters	4 months x 16 different parameters	-
50	-	-	50	50	-
Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU
2400-115200 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	1200-57600 bps adjustable
None	Odd, Even, None	Odd, Even, None	Odd,Even,None	Odd,Even,None	Odd,Even,None
1	1	1	1	1	1
1-247	1-247	1-247	1-247	1-247	1-247
2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS
428	378	323	428	428	378
Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2.5mm^2 - 14AWG	2.5mm^2 - 14AWG	2.5mm^2 - 14AWG
4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm^2 - 12AWG, 2x1.5mm^2 - 2x16AWG	4mm^2 - 12AWG, 2x1.5mm^2 - 2x16AWG	4mm^2 - 12AWG, 2x1.5mm^2 - 2x16AWG
1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG
1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG
-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30°C +80°C	-30°C +80°C	-30°C +80°C
Max.95%	Max.95%	Max.95%	Maks. 95%	Maks. 95%	Maks. 95%

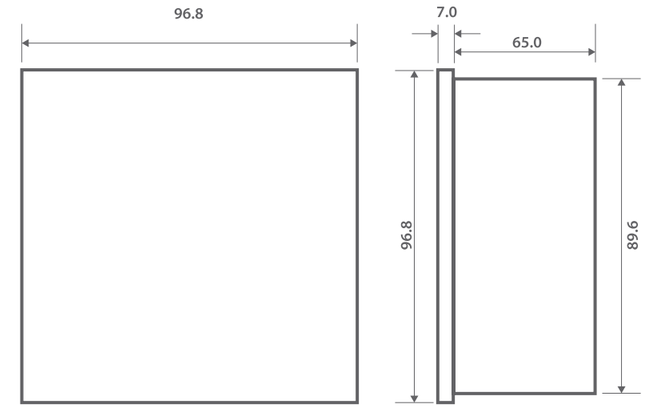
Type		KLEA 320P	KLEA 370P	KLEA 322P	KLEA 324P	KLEA 320P-D
Schematics	Network Connections	 **3 wires with 3 CTs**	 **4 wires with 3 CTs**		 **3 wires with 2 CTs**	
		NOTE : CTs can be connected any phase for 3 wires with 2 CTs connection. They are connected to phase 1 and phase 3 in above figure.				
	Digital I/O And Alarm Output Connections	 **Digital Input** **Alarm Relay Output** **Digital Output**				
	Analog Output Connection	-				-
Dimensional Drawings						

KLEA 370P-D	KLEA 220P	KLEA 110P	KLEA-370P-VSM	KLEA-320P-DC	KLEA-220P-DC
	 **3 wires with 3 CTs**		 **4 wires with 3 CTs**		
 **Digital Input** **Alarm Relay Output** **Digital Output**					
-					
					

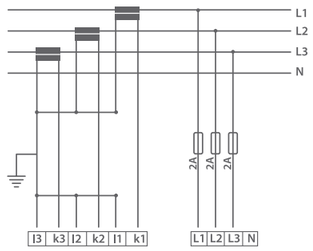
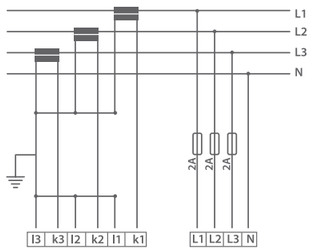
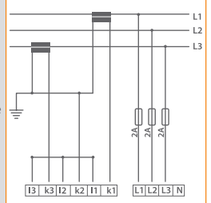
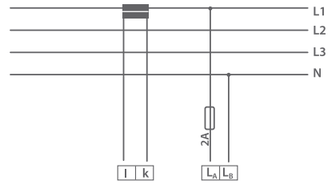
							
Type			**ECRAS 100**	**ECRAS 120**	**ECRAS 200**	**ECRAS 220**	**ECRAS 100 VCF**
Definiton			3Ø Multimeter	3Ø Multimeter	3Ø Multimeter	3Ø Multimeter	3Ø Multimeter
Order Number			606210	606211	606212	606213	606218
General	Seven Segment Display		Available	Available	Available	Available	Available
	LCD		-	-	-	-	-
	Language Support		-	-	-	-	-
	Battery		-	-	-	-	-
	Real Time Clock		-	-	-	-	-
	Password Protection		Available	Available	Available	Available	Available
	Current Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1 - 5.000
	Voltage Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1 - 5.000
	Demand Period		1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	-
	Connection Type		3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W
	Measurement in Quadrants		4	4	4	4	-
	Number of Measurement in a period		256	256	256	256	256
	LCD/Display Refresh Period		1 sec	1 sec	1 sec	1 sec	1 sec.
	Networks		TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT
	Phasor Diagram		-	-	-	-	-
	Signal Waveforms		-	-	-	-	-
	Min/Max/Demand Values		Available	Available	Available	Available	-
Energy Measurement	Number of Tariffs		1	1	1	1	-
	Multi Sub-Tariffs(Peak, Day and Off-Peak)		-	-	-	-	-
	1Ø Phase Energy Meters		Available	Available	Available	Available	-
	3Ø Phase Energy Meters		Available	Available	Available	Available	Available
	4-Quadrant Reactive Energy Meters		-	-	-	-	-
Current Measurement Input	Measurement Range		10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC
	Overvoltage Category		300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II
	Measurement Surge Voltage		2 kV	2 kV	2 kV	2 kV	2 kV
	Power Consumption		<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA
	intermittent overload		100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec
	Sampling Freq.between 45-65 Hz		12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz
Voltage Measurement Input	Overvoltage Category		300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III
	Measured Range L-N		1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms
	Measured Range L-L		2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms
	Measured Frequency Range		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz
	Power Consumption		<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA
	Sampling Freq.between 45-65 Hz		12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz
Power Quality Measurements	Harmonics for current and voltage phases		Upto 31st	Upto 31st	Upto 31st	Upto 31st	-
	THD-Voltage in %		Available	Available	Available	Available	-
	THD-Current in %		Available	Available	Available	Available	-
Other Measurements	Run Hour (Operating time for load in hours)		Available	Available	Available	Available	-
	On Hour (Operating time for meter in hours)		Available	Available	Available	Available	-
	Int Counter (Number of power interruptions)		Available	Available	Available	Available	-
Measurement Accuracy	According to IEC 61557-12	Total Active Power	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Reactive Power	Class 1	Class 1	Class 1	Class 1	Class 1
		Total Apparent Power	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Active Energy	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2
		Frequency	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1
		Current	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Neutral Current (calculated)	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Voltage	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2
		Power factor	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		THDV, THDI	Class 1	Class 1	Class 1	Class 1	Class 1
	According to IEC 62053-22	Total Active Energy	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S
	Accoding to IEC 62053-23	Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2
Inputs and Outputs	Alarm Relay Outputs	Number of outputs	-	2 pcs.	-	2 pcs.	-
		Type		NO (SPST)		NO (SPST)	-
		Max. Switching Current	-	10 A	-	10 A	-
		Max. Switching Voltage	-	250 VAC	-	250 VAC	-
		Max. Switching Power	-	1250 VA	-	1250 VA	-

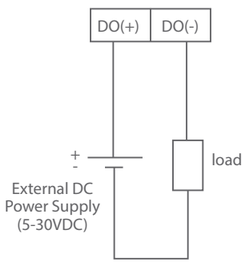
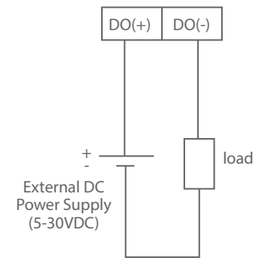
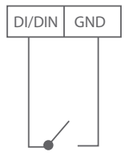
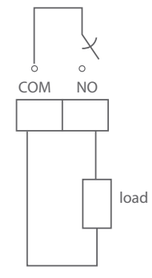
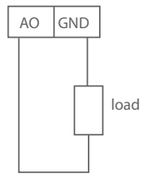
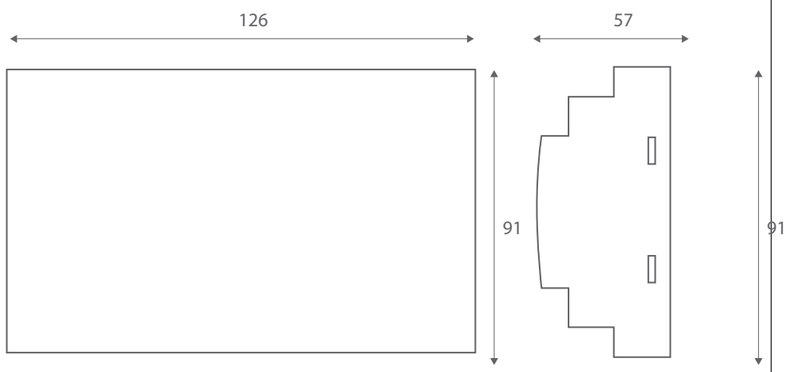
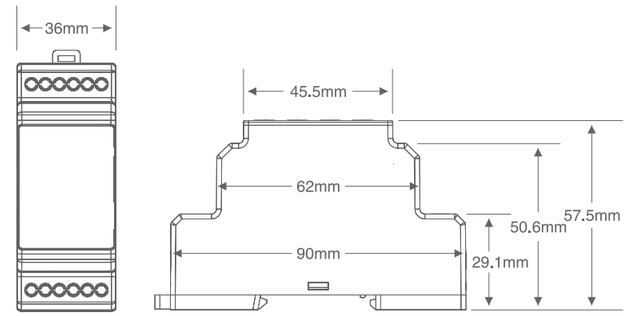
Type			**ECRAS 100**	**ECRAS 120**	**ECRAS 200**	**ECRAS 220**	**ECRAS 100 VCF**
Inputs and Outputs	Digital Inputs	Number of inputs	-	-	-	-	-
		Minimum Counting Frequency	-	-	-	-	-
		Input Present or Not	-	-	-	-	-
		Isolation Level	-	-	-	-	-
	Digital Outputs	Number of outputs	-	-	-	-	-
		Type	-	-	-	-	-
		Switching Voltage Range	-	-	-	-	-
		Minimum Switching Frequency	-	-	-	-	-
		Isolation Level	-	-	-	-	-
	Analog Outputs	Number of outputs	-	-	-	-	-
		Range of Outputs 0-5 V, 0-10 V, -5-5 V, -10-10V, 0-20 mA, 4-20 mA	-	-	-	-	-
		Isolation	-	-	-	-	85-300V
Supply	Voltage	AC	85-300V	85-300V	85-300V	85-300V	85-300V
		DC	85-300V	85-300V	85-300V	85-300V	85-300V
	Consumption	AC	<6VA	<6VA	<6VA	<6VA	<6VA
		DC	<3W	<3W	<3W	<3W	<3W
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
Data Logging with timestamp	Min/max/avg Values	Hourly records	-	-	-	-	-
		Daily records	-	-	-	-	-
		Monthly records	-	-	-	-	-
	Demand		-	-	-	-	-
	Alarm records		-	-	-	-	-
Communication	Protocol		-	-	Modbus RTU	Modbus RTU	-
	Baud rate		-	-	1200-57600 bps adjustable	1200-57600 bps adjustable	-
	Parity number		-	-	Odd, Even, None	Odd, Even, None	-
	Stop bit		-	-	1	1	-
	Address		-	-	1-247	1-247	-
	Isolation		-	-	2750V RMS	2750V RMS	-
Mechanical Properties	Weight(g)		272	290	296	316	221
	Protection Class		Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
	Assembly Type		Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
Cable Cross Sections	Supply, Voltage, Current, Relay Outputs	Stranded:	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2.5mm² - 14AWG
		Solid:	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG
	Digital I/O, RS 485, Analog Output	Stranded:	-	-	1,5 mm2-16AWG	1,5 mm2-16AWG	-
		Solid:	-	-	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	-
Ambient Conditions	Operating Temperature		-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
	Storage Temperature		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30°C +80°C
	Relative Humidity (no condensation)		Max.95%	Max.95%	Max.95%	Max.95%	Maks. 95%

Type		ECRAS 100	ECRAS 120	ECRAS 200	ECRAS 220	ECRAS 100 VCF
Schematics	Network Connections	 **3 wires with 3 CTs**			 **4 wires with 3 CTs**	
	Digital I/O And Alarm Output Connections	-	 **Alarm Relay Output**	-	 **Alarm Relay Output**	-
	Analog Output Connection	-				-

Type	ECRAS 100	ECRAS 120	ECRAS 200	ECRAS 220	ECRAS 100 VCF
Dimensional Drawings					

												
Type			**DNPT**	**POWYS 3121**	**POWYS 3111**	**POWYS 3101**	**POWYS 3100**	**POWYS 1110**	**POWYS 1120**	**POWYS 1012**	**POWYS 1022**	
Definiton			3Ø Power Transducer	3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	1Ø Energy Analyzer	1Ø Energy Analyzer	1Ø Energy Analyzer	1Ø Energy Analyzer	
Order Number			606400	606305	606304	606303	606300	606351	606352	606354	606355	
General	Seven Segment Display		-	-	Available	-	-	Available	-	Available	-	
	LCD		-	Available	-	-	-	-	Available	-	Available	
	Language Support		-	-	-	-	-	-	-	-	-	
	Battery		Available	-	-	-	-	-	-	-	-	
	Real Time Clock		Available	-	-	-	-	-	-	-	-	
	Password Protection		-	Available	Available	Available	Available	Available	Available	Available	Available	
	Current Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	
	Voltage Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	1-5000	
	Demand Period		1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	
	Measurement in Quadrants		4	4	4	4	4	4	4	4	4	
	Number of Measurement in a period		512	256	256	256	256	256	256	256	256	
	LCD/Display Refresh Period		-	1 sec	1 sec	-	-	1 sec	1 sec	1 sec	1 sec	
	Network		TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	
	Wiring		3P4W, 3P3W, Aron	3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W	Single-phase with neutral and 1 CT	Single-phase with neutral and 1 CT	Single-phase with neutral and 1 CT	Single-phase with neutral and 1 CT	
	Phasor Diagram		-	-	-	-	-	-	-	-	-	
	Signal Waveforms		-	-	-	-	-	-	-	-	-	
	Min/Max/Demand Values		Available	Available	Available	Available	Available	Available	Available	Available	Available	
Energy Measurement	Number of Tariffs		2	2	2	2	1	1	1	1	1	
	Multi Sub-Tariffs(Peak, Day and Off-Peak)		Available	-	-	-	-	-	-	-	-	
	1Ø Phase Energy Meters		-	Available	Available	Available	Available	Available	Available	Available	Available	
	3Ø Phase Energy Meters		Available	Available	Available	Available	Available	-	-	-	-	
	4 Quadrant Reactive Energy Meters		-	-	-	-	-	-	-	-	-	
Current Measurement Input	Measurement Range		10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	
	Overvoltage Category		300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	
	Measurement Surge Voltage		2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	
	Power Consumption		<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	
	intermittent overload		100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	
	Sampling Freq.between 45-65 Hz		25.6 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	
Voltage Measurement Input	Overvoltage Category		300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	
	Measured Range L-N		1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	10-500 Vrms	10-500 Vrms	10-500 Vrms	10-500 Vrms	
	Measured Range L-L		2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	-	-	-	-	
	Measured Frequency Range		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	
	Power Consumption		<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	
	Sampling Freq.between 45-65 Hz		25.6 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	
Power Quality Measurements	Harmonics for current and voltage phases		Upto 51st	Upto 31st	Upto 31st	Upto 31st	Upto 31st	Upto 31st	Upto 31st	Upto 31st	Upto 31st	
	THD-Voltage in %		Available	Available	Available	Available	Available	Available	Available	Available	Available	
	THD-Current in %		Available	Available	Available	Available	Available	Available	Available	Available	Available	
Other Measurements	Run Hour (Operating time for load in hours)		-	Available	Available	Available	Available	Available	Available	Available	Available	
	On Hour (Operating time for meter in hours)		-	Available	Available	Available	Available	Available	Available	Available	Available	
	Int Counter (Number of power interruptions)		-	Available	Available	Available	Available	Available	Available	Available	Available	
Measurement Accuracy	According to IEC 61557-12	Total Active Power	Class 0.2	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Total Reactive Power	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	
		Total Apparent Power	Class 0.2	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Total Active Energy	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	
		Frequency	Class 0.05	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1	
		Current	Class 0.2	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Neutral Current	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Voltage	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Power factor	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		THDV, THDI	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	
	According to IEC 62053-22	Total Active Energy	Class 0.2S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	
	Accoding to IEC 62053-23	Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	
Inputs and Outputs	Alarm Relay Outputs	Number of outputs	2 pcs.	2 pcs.	2 pcs.	2 pcs.	-	-	-	-	-	
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)						
		Max. Switching Current	10 A	10 A	10 A	10 A	-	-	-	-	-	
		Max. Switching Voltage	250 VAC	250 VAC	250 VAC	250 VAC	-	-	-	-	-	
		Max. Switching Power	1250 VA	1250 VA	1250 VA	1250 VA	-	-	-	-	-	
	Digital Inputs	Number of inputs	2 pcs.	2 pcs.	2 pcs.	2 pcs.	-	-	-	-	-	
		Minimum Counting Frequency	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	-	-	-	-	-	
		Input Present or Not	Dry Contact	Dry Contact	Dry Contact	Dry Contact	-	-	-	-	-	
		Isolation Level	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	-	-	-	-	-	
	Digital Outputs	Number of outputs	2 pcs.	2 pcs.	2 pcs.	2 pcs.	-	-	-	2 pcs.	2 pcs.	
		Type	Transistor	Transistor	Transistor	Transistor	-	-	-	Transistor	Transistor	
		Switching Voltage Range	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	-	-	-	5-30 VDC	5-30 VDC	
		Minimum Switching Frequency	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	-	-	-	20 Hz, 50 ms	20 Hz, 50 ms	
		Isolation Level	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	-	-	-	5000 Vrms	5000 Vrms	
	Analog Outputs	Number of outputs	4	-	-	-	-	-	-	-	-	
		Range of Outputs 0-5 V, 0-10 V, -5-5 V, -10-10V, 0-20 mA, 4-20 mA	Available	-	-	-	-	-	-	-	-	
		Isolation	isolated	-	-	-	-	-	-	-	-	

Type			DNPT	POWYS 3121	POWYS 3111	POWYS 3101	POWYS 3100	POWYS 1110	POWYS 1120	POWYS 1012	POWYS 1022
Supply	Voltage	AC	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V
		DC	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V	85-300V
	Consumption	AC	< 3VA	<4.5VA	<6VA	<6VA	<6VA	<4VA	<4VA	<4VA	<4VA
		DC	<2.5W	<2W	<3W	<3W	<3W				
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
Data Logging with timestamp	Min/max/avg Values	Hourly records	1920 hours x 68 different paramaters	-	-	-	-	-	-	-	-
		Daily records	240 days x 68 different paramaters	-	-	-	-	-	-	-	-
		Monthly records	36 months x 68 different parameters	-	-	-	-	-	-	-	-
	Demand		4 months x 16 different parameters	-	-	-	-	-	-	-	-
	Alarm records		50	-	-	-	-	-	-	-	-
Communication	Protocol		Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	-	-
	Baud rate		2400-115200 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	-	-
	Parity number		None	Odd, Even, None	Odd, Even, None	Odd, Even, None	Odd, Even, None	Odd, Even, None	Odd, Even, None	-	-
	Stop bit		1	1	1	1	1	1	1	-	-
	Address		1-247	1-247	1-247	1-247	1-247	1-247	1-247	-	-
	Isolation		2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS	-	-
Mechanical Properties	Weight(g)		335	340	330	278	259	135	135	135	135
	Protection Class		IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
	Assembly Type		Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
Cable Cross Sections	Supply, Voltage, Current, Relay Outputs	Stranded:	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG
		Solid:	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG
	Digital I/O, RS 485, Analog Output	Stranded:	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG
		Solid:	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG
Ambient Conditions	Operating Temperature		-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
	Storage Temperature		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C
	Relative Humidity (no condensation)		Max.95%	Max.95%	Max.95%	Max.95%	Max.95%	Max.95%	Max.95%	Max.95%	Max.95%
Schematics	3 wires with 3 CTs						-				
	4 wires with 3 CTs						-				
	3 wires with 2 CTs NOTE: CTs can be connected any phase. They are connected to phase 1 and phase 3 in this figure.			-			-				
	Single Phase with 1 CT NOTE: CT and VT can be connected any phase. They are connected to phase-1 in this figure		-				-				

Type		DNPT	POWYS 3121	POWYS 3111	POWYS 3101	POWYS 3100	POWYS 1110	POWYS 1120	POWYS 1012	POWYS 1022
Schematics	Digital Output Connection					-				
	Digital Input Connection					-				
	Alarm Output Connection					-				
	Analog Output Connection		-			-				
Dimensional Drawings										

Reactive
Power
Management
Solutions

Electrical way of saving

Defining a power factor controller in simple terms

A power factor controller is an automation device which allows power distrubution system to operate at its maximum efficiency with reducing reactive power. This control process reduces the load requirement on the energy generation and transmission supply system.

Which actions are executed?

Switching capacitors and shunt reactors in order to compensate your system.

Learning voltage-current connections and correcting them when wrong connecting is detected.

Estimating exact step powers thanks to dynamic step monitoring feature.

Displaying switching cycles and connection times for capacitors and shunt reactors.

Activating target-2 cosØ, which is required by generators to work their maximum efficiency thanks to generator input.

Provides highly accurate measuring for main electrical parameters and energy metering solutions for your electrical network.

Measuring
Phasor analyzing
Metering
Communicating
Alarming
Harmonic monitoring
Compensation
Data logging
Dynamic capacitor monitoring
Learning
Displaying Switching Cycles
Activating target-2 cosØ

All the data which are being measured or kept in its memory, can be transmitted to remote monitoring system thanks to modbus communication.

It offers 3-phase energy and power measurement with data logging such as min/max/avg values, energy values, demand values etc. with date and time.

Low/high limit thresholds for all paramaters can be defined so load management is possible by means of alarm relay outputs.

In dept-analysis of individual current and voltage harmonics in order to increase network quality.

Detailed analyze of phase relationships between current and voltage lines thanks to phasor diagram feature.

Which markets are they used frequently?

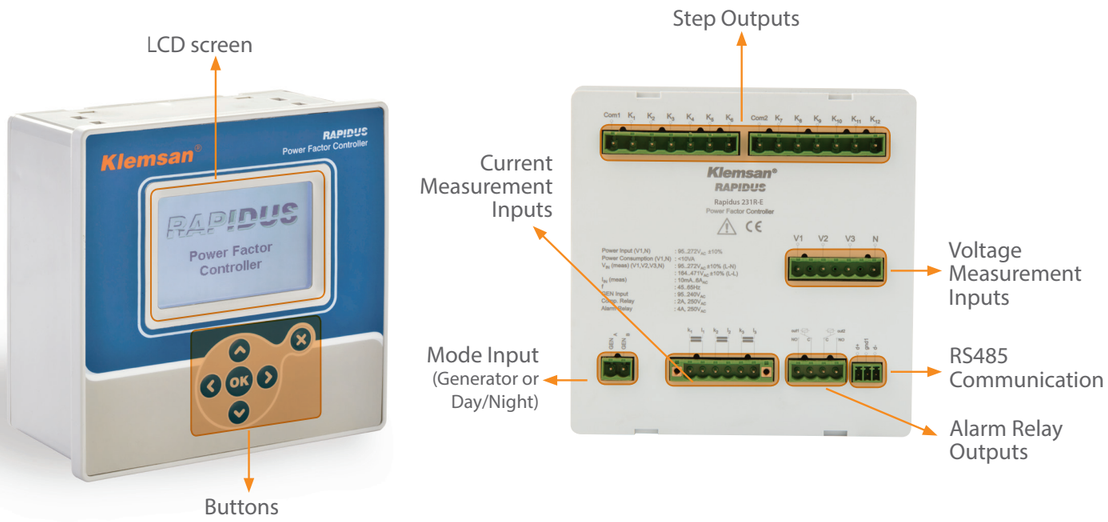
- Medium voltage modular cabinets
- Submetering station
- PLC-Scada applications
- Electric power plants and substations
- Electric utilities
- Enery meter applications
- Infrastructure
- Alarm station
- IT centres
- High-rise buildings

Benefits and Advantages

- Current inputs can withstand surges up to 100 A for 1 second
- State of the art technology; moduler design, no connector cables, no fixing screws inside
- Multiple compensation modes
- Capacitors and shunt reactors can be connected to each step
- Mono phase and 3 phase compensation
- Dynamic capacitor monitoring
- Learning connections and step powers
- Display of switching cycle for each step
- Display of connection time for each step
- Multi-language support
- Adjustable phase difference angle
- Energy meters
- Harmonic measurement up to 51st
- Programmable alarm output
- Modbus communication
- Real time clock
- Connection to current transformer x/1 A or x/5 A
- High measurement accuracy according to IEC standarts
- Easy configuration with integrated push buttons
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences
- Self-Extinguishing plastic housing

Layout & Mounting

Klemsan power factor devices are suitable for panel mounting for 96x96mm or 144x144mm standarts.



RAPIDUS 231R-E Power Factor Controller

Data Centers, UPS system

Rapidus reactive controller provides two way compensation with controlling capacitors and shunt reactors. Thus, it presents perfect solution for the places where the load is capacitive, such as data centers, mining areas, UPS system, energy transmission lines etc.

Dynamic Capacitor Monitoring(DCM)

DCM is a supreme function in Rapidus which enables the user to make pro-active maintenance for compensation cabinets. DCM tracks the real time KVAR values of each step and uses the measured KVAR value in compensation calculations.

Reducing Energy Loses

Limiting energy losses by Joule effect, increasing available active power to use better kW/KVA ratio, reducing level of system noises.

Reduction of the Electricity Bill

Depending on the different electrical tariffs in different countries, the cost of electricity can be reduced by balancing reactive energy or elemination of reactive penalty payments.

POWER FACTOR CONTROLLER
RAPIDUS Series

POWER FACTOR CONTROLLER
RAPIDUS Series

POWER FACTOR CONTROLLER
RAPIDUS Series

POWER FACTOR CONTROLLER
RAPIDUS Series

Energy Metering Applications

In standart compensation cabinets, there are always a multimeter or an analyzer to be associated with a power factor controller. Rapidus, as a two-in-one device meets both requirements of the industry. Users can reduce analyzer, wiring and labor costs by not using an external energy analyzer.

POWER FACTOR CONTROLLER
RAPIDUS Series

Steel Process Plants

Disconnection of capacitors can be provided by using alarm relay outputs of Rapidus. So undesired voltage levels in compensation panels and subsequent switchgear damages can be prevented before it is too late.

POWER FACTOR CONTROLLER
RAPIDUS Series

Industrial Plants

Low power factor problems which are occured in industrial facilities such as overloaded cables and transformers, reduced voltage level, poor quality motor performance, utility penalty payments etc. can be eliminated with proper analysis by a power factor contoller.

POWER FACTOR CONTROLLER
RAPIDUS Series

Contactor, Capacitor and Shunt Reactor Maintenance

Monitoring switching cycles and operation times for capacitors and shunt reactors helps you to understand how long they are used and how many times they are switched. Plus, DCM feature calculates exact step powers. So it is easy to define maintenance schedules for your compensation panels.

POWER FACTOR CONTROLLER
RAPIDUS Series

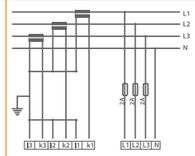
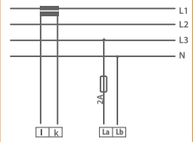
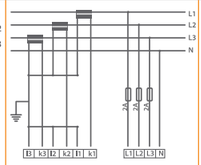
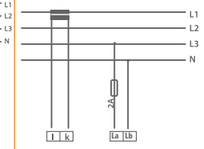
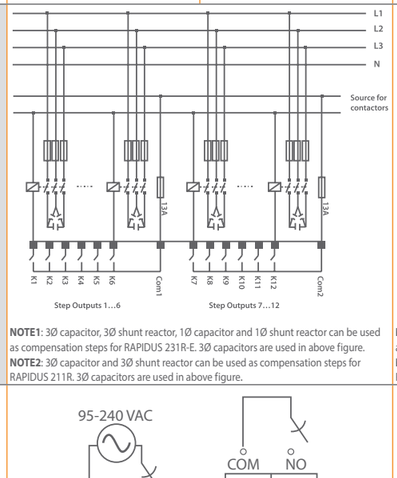
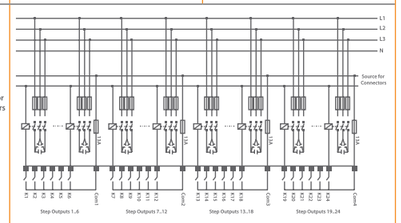
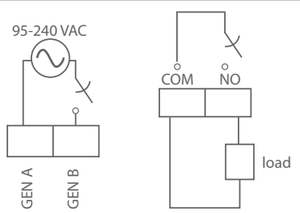
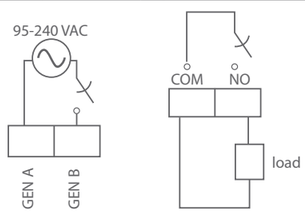
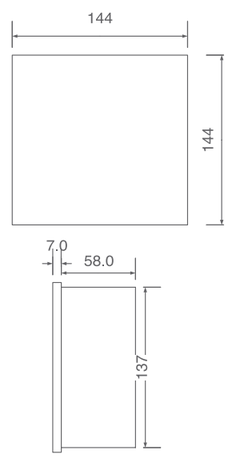
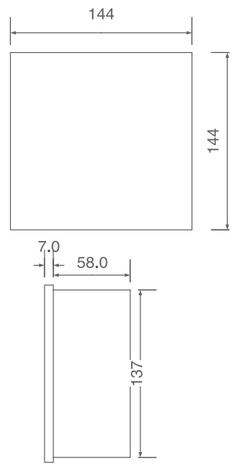
Alarm Control Applications

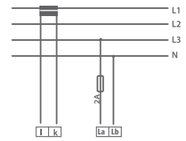
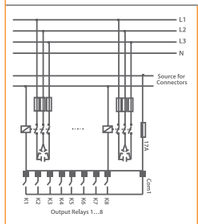
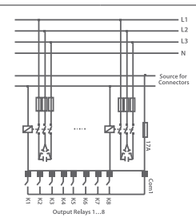
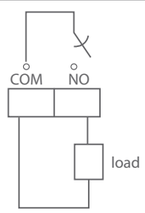
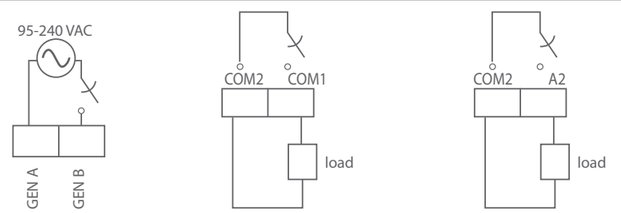
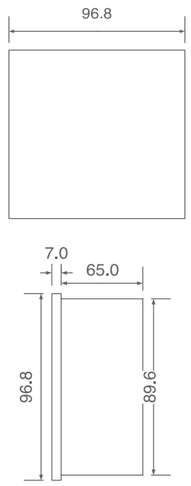
All necessary parameters such as voltage, current, frequency, temperature, step powers, Q/P ratios, harmonics etc. can be assigned to an alarm relay in order to provide system reliability and durability.

POWER FACTOR CONTROLLER
RAPIDUS Series

												
Type			**RAPIDUS 231R-E**	**RAPIDUS 211R**	**RAPIDUS 232R-E**	**RAPIDUS 212R**	**RAPIDUS 218R**	**RAPIDUS 114**	**RAPIDUS 114R**	**RAPIDUS 116**	**RAPIDUS 116R**	**RAPIDUS 118**
Definiton			Power Factor Controller (3Ø-12steps)	Power Factor Controller (1Ø-12steps)	Power Factor Controller (3Ø-24steps)	Power Factor Controller (1Ø-24steps)	Power Factor Controller (1Ø-8steps)	Power Factor Controller (1Ø-4steps)	Power Factor Controller (1Ø-4steps)	Power Factor Controller (1Ø-6steps)	Power Factor Controller (1Ø-6steps)	Power Factor Controller (1Ø-8steps)
Order Number			606005	606011	606007	606014	606021	606060	606061	606062	606063	606064
General	Measuring system		3Ø	1Ø	3Ø	1Ø	1Ø	1Ø	1Ø	1Ø	1Ø	1Ø
	LCD Sreen		Available	Available	Available	Available	Available	Custom LCD	Custom LCD	Custom LCD	Custom LCD	Custom LCD
	Language Support		Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English	Turkish, English	Turkish, English	Turkish, English	Turkish, English
	Battery		Available	Available	Available	Available	Available	-	-	-	-	-
	Real Time Clock		Available	Available	Available	Available	Available	-	-	-	-	-
	Password Protection		Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
	Current Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	1 - 5.000	1 - 5.000	1 - 5.000	1 - 5.000	1 - 5.000
	Voltage Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	1 - 999.9	1 - 999.9	1 - 999.9	1 - 999.9	1 - 999.9
	Demand Period		1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	-	-	-	-	-
	Connection Type		3P4W	Single phase(L-L or L-N) voltage connection with 1 CT	3P4W	Single phase(L-L or L-N) voltage connection with 1 CT	Single phase(L-L or L-N) voltage connection with 1 CT	L-L/L-N	L-L/L-N	L-L/L-N	L-L/L-N	L-L/L-N
	Measurement in Quadrants		4	4	4	4	4	-	-	-	-	-
	Number of Measurement in a period		512	512	512	512	512	512	512	512	512	512
	LCD/Display Refresh Period		1 sec	1 sec	1 sec	1 sec	1 sec	<0.5 sec.	<0.5 sec.	<0.5 sec.	<0.5 sec.	<0.5 sec.
	Networks		TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN	TT, TN	TT, TN	TT, TN	TT, TN
	Phasor Diagram		Available	Available	Available	Available	Available	-	-	-	-	-
	Signal Waveforms		-	-	-	-	-	-	-	-	-	-
	Min/Max/Demand Values		Available	Available	Available	Available	Available	-	-	-	-	-
Control Operations and Functions	Compensation Modes	Rapidus (Intelligent control mode)	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
		Sequential	Available	Available	Available	Available	Available	-	-	-	-	-
		Linear	Available	Available	Available	Available	Available	-	-	-	-	-
		Circular	Available	Available	Available	Available	Available	-	-	-	-	-
		Manual	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
	Step Configurations	Manually Assign	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
		Predefined	1-1-1-1, 1-1-2-2, 1-2-2-4, 1-2-3-3, 1-2-4-4, 1-1-2-4, 1-2-3-4, 1-2-4-8, 1-1-2-3	1-1-1-1, 1-1-2-2, 1-2-2-4, 1-2-3-3, 1-2-4-4, 1-1-2-4, 1-2-3-4, 1-2-4-8, 1-1-2-3	1-1-1-1, 1-1-2-2, 1-2-2-4, 1-2-3-3, 1-2-4-4, 1-1-2-4, 1-2-3-4, 1-2-4-8, 1-1-2-3	1-1-1-1, 1-1-2-2, 1-2-2-4, 1-2-3-3, 1-2-4-4, 1-1-2-4, 1-2-3-4, 1-2-4-8, 1-1-2-3	1-1-1-1, 1-1-2-2, 1-2-2-4, 1-2-3-3, 1-2-4-4, 1-1-2-4, 1-2-3-4, 1-2-4-8, 1-1-2-3	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4
		DCM	Available	Available	-	-	Available	-	-	-	-	-
		Fixed Step Assigment	Available	Available	Available	Available	Available	-	-	-	-	-
		Power(kVAr)	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable
		Type	3Ø capacitor,3Ø shunt reactor,1Ø capacitor or 1Ø shunt reactor adjustable	3Ø capacitor, 3Ø shunt reactor adjustable	3Ø capacitor,3Ø shunt reactor,1Ø capacitor or 1Ø shunt reactor adjustable	3Ø capacitor, 3Ø shunt reactor adjustable	3Ø capacitor, 3Ø shunt reactor adjustable	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor
	Power factor settings	Target 1 cosØ	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable
		Target 2 cosØ	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable
	Learning Step Powers and Connections		Available	Available	Available	Available	Available	-	-	-	-	-
	Dual cosØ target		Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
	4 Quadrant operation for generators		Available	Available	Available	Available	Available	-	-	-	-	-
	Time delays	Step activation time	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable
		Step deactivation time	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable
		Step discharge time	3-1000 sec adjustable	3-1000 sec adjustable	3-1000 sec adjustable	3-1000 sec adjustable	3-1000 sec adjustable	3-600 sec adjustable	3-600 sec adjustable	3-600 sec adjustable	3-600 sec adjustable	3-600 sec adjustable
	Phase shift angle		±45 degree adjustable	±45 degree adjustable	±45 degree adjustable	±45 degree a adjustable	±45 degree adjustable	-	-	-	-	-
	Averaging time		Off, 5sec, 10sec, 20sec, 30sec, 40sec, 50sec, 60sec adjustable	Off, 5sec, 10sec, 20sec, 30sec, 40sec, 50sec, 60sec adjustable	Off, 5sec, 10sec, 20sec, 30sec, 40sec, 50sec, 60sec adjustable	Off, 5sec, 10sec, 20sec, 30sec, 40sec, 50sec, 60sec adjustable	Off, 5sec, 10sec, 20sec, 30sec, 40sec, 50sec, 60sec adjustable	-	-	-	-	-
Energy Meters	Number of Tariffs		1	1	1	1	1	1	1	1	1	1
	Multi Sub-Tariffs(Peak, Day and Off-Peak)		-	-	-	-	-	-	-	-	-	-
	1Ø Phase Energy Meter		-	-	-	-	-	Available	Available	Available	Available	Available
	3Ø Phase Energy Meters		Available	Available	Available	Available	Available	-	-	-	-	-
	4 Quadrant Reactive Energy Meters		-	-	-	-	-	-	-	-	-	-
Current Measurement Input	Measurement Range		10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC
	Overvoltage Category		300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	510V CAT II	510V CAT II	510V CAT II	510V CAT II	510V CAT II
	Measurement Surge Voltage		2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV
	Power Consumption		<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.3 VA	<0.3 VA	<0.3 VA	<0.3 VA	<0.3 VA
	intermittent overload		100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec
	Sampling Freq.between 45-65 Hz		25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz
Voltage Measurement Input	Overvoltage Category		300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	510V CAT III	510V CAT III	510V CAT III	510V CAT III	510V CAT III
	Measured Range L-N		95-272 VAC ±10%	95-410VAC ±10%	95-272 VAC ±10%	95-410VAC ±10%	95-410VAC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%
	Measured Range L-L		164-471 VAC ±10%	95-410VAC ±10%	164-471 VAC ±10%	95-410VAC ±10%	95-410VAC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%
	Measured Frequency Range		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
	Power Consumption		<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA
	Sampling Freq.between 45-65 Hz		25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz
Power Quality Measurements	Harmonics / current and voltage		Upto 51st	Upto 51st	Upto 51st	Upto 51st	Upto 51st	-	-	-	-	-
	THD-Voltage in %		Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
	THD-Current in %		Available	Available	Available	Available	Available	Available	Available	Available	Available	Available

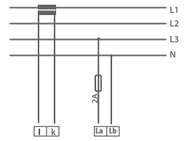
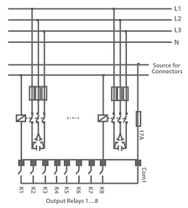
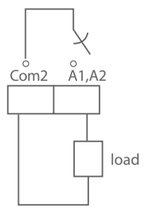
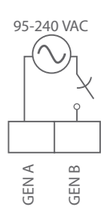
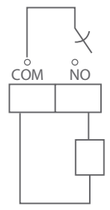
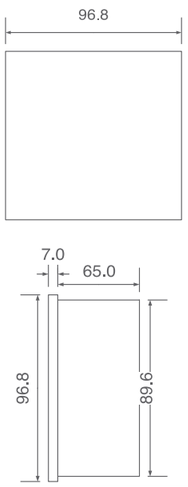
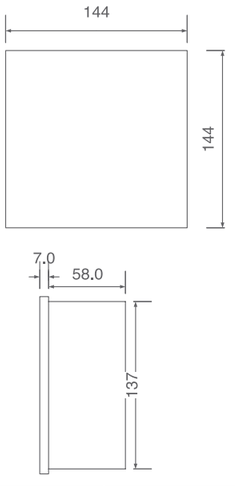
Type			RAPIDUS 231R-E	RAPIDUS 211R	RAPIDUS 232R-E	RAPIDUS 212R	RAPIDUS 218R	RAPIDUS 114	RAPIDUS 114R	RAPIDUS 116	RAPIDUS 116R	RAPIDUS 118
Measurement Accuracy	According to IEC 61557-12	Total Active Power	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Reactive Power	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1
		Total Apparent Power	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Active Energy	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2
		Frequency	Class 0.05	Class 0.05	Class 0.05	Class 0.05	Class 0.05	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1
		Current	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Neutral Current	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Voltage	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2
		Power factor	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		THDV, THDI	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1
	According to IEC 62053-22	Total Active Energy	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S
	Accoding to IEC 62053-23	Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2
Input and Outputs	Compensation Relay Outputs	Number of outputs	12 pcs.	12 pcs.	24 pcs.	24 pcs.	8+2(If alarm relay outputs are used for compensation) pcs.	4	4	6	6	8
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)
		Max. Switching Current	2 A	2 A	2 A	2 A	2 A	2A	2A	2A	2A	2A
		Max. Switching Voltage	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	250VAC	250VAC	250VAC	250VAC	250VAC
		Max. Switching Power	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	1250VA	1250VA	1250VA	1250VA	1250VA
		Mechanical life time	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations
		Electrical life time operations (for NO side)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)
	Alarm Relay Outputs	Number of outputs	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2	2	2	2	2
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)
		Max. Switching Current	4 A	4 A	4 A	4 A	4 A	4A	4A	4A	4A	4A
		Max. Switching Voltage	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC
		Max. Switching Power	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA
		Mechanical life time	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations
		Electrical life time operations (for NO side)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)
	Generator/ Day-Night Input	Number of inputs	1 pc.	1 pc.	1 pc.	1 pc.	1 pc.	1	1	1	1	1
		Frequency	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
		Input Present or Not	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC
	Digital Outputs		-	-	-	-	-	-	-	-	-	-
	Analog Outputs		-	-	-	-	-	-	-	-	-	-
Supply	Auxilary supply input		No	No	No	No	No	-	-	-	-	-
	Voltage		95-272VAC ±10% from L1-N	95-410VAC ±10% from La-Lb	95-272VAC ±10% from L1-N	95-410VAC ±10% from La-Lb	95-410VAC ±10% from La-Lb	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
	Consumption	AC	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA
		DC	-	-	-	-	-	-	-	-	-	-
Data Logging with timestamp	Min/max/avg Values	Hourly records	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	-	-	-	-	-
		Daily records	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	-	-	-	-	-
		Monthly records	36 hours x 68 different paramaters	36 hours x 68 different paramaters	36 hours x 68 different paramaters	36 hours x 68 different paramaters	36 hours x 68 different paramaters	-	-	-	-	-
	Demand		4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	-	-	-	-	-
	Alarm records		50	50	50	50	50	-	-	-	-	-
Communication	Protocol		Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	-	Modbus RTU	-	Modbus RTU	-
	Baud rate		2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	-	1200-38400 bps adjustable	-	1200-38400 bps adjustable	-
	Parity number		None	None	None	None	None	-	Odd, Even, None	-	Odd, Even, None	-
	Stop bit		1	1	1	1	1	-	1	-	1	-
	Address		1-247 adjustable	1-247 adjustable	1-247	1-247	1-247	-	1-247	-	1-247	-
	Isolation		2000V RMS	2000V RMS	2000V RMS	2000V RMS	2000V RMS	-	2000V RMS	-	2000V RMS	-
Mechanical Properties	Weight(g)		670	663	765	750	415	309	314	319	324	329
	Protection Class		Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
	Assembly Type		Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
Cable Cross Sections	Voltage, Current, All Relay Outputs, Gen Input	Stranded:	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5mm² - 14AWG	2.5mm² - 14AWG	2.5mm² - 14AWG	2.5mm² - 14AWG	2.5mm² - 14AWG
		Solid:	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG
	RS 485	Stranded:	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	-	1.5mm² - 16AWG	-	1.5mm² - 16AWG	-
		Solid:	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	-	1.5mm² - 16AWG, 2x0.75mm² - 2x18AWG	-	1.5mm² - 16AWG, 2x0.75mm² - 2x18AWG	-
Ambient Conditions	Operating Temperature	-20 to +55 °C	-20 to +55 °C	-20 to +55 °C	-20 to +55 °C	-20 to +55 °C	-20 to +55 °C	-20 to +55 °C	-20°C +55°C	-20°C +55°C	-20°C +55°C	-20°C +55°C	-20°C +55°C
	Storage Temperature	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30°C +80°C	-30°C +80°C	-30°C +80°C	-30°C +80°C	-30°C +80°C
	Relative Humidity (no condensation)	Max.95%	Max.95%	Max.95%	Max.95%	Max.95%	Max.95%	Maks. 95%	Maks. 95%	Maks. 95%	Maks. 95%	Maks. 95%	Maks. 95%

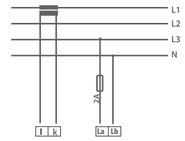
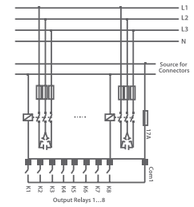
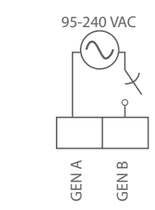
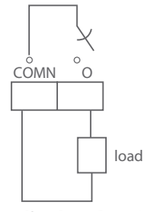
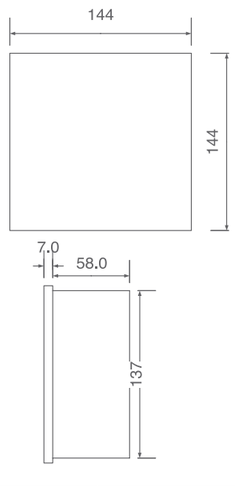
Type		RAPIDUS 231R-E	RAPIDUS 211R	RAPIDUS 232R-E	RAPIDUS 212R
Schematics	Network Connections	 **4 wires with 3 CTs**	 **Single phase system with 1 CT** **NOTE 1:** L1, L2 or L3 can be used as current measurement input. L1 is used in this figure. **NOTE 2:** L1-N, L2-N, L3-N, L1-L2, L1-L3 or L2-L3 can be used as voltage measurement input. L3-N is used in this figure.	 **4 wires with 3 CTs**	 **Single phase system with 1 CT** **NOTE 1:** L1, L2 or L3 can be used as current measurement input. L1 is used in this figure. **NOTE 2:** L1-N, L2-N, L3-N, L1-L2, L1-L3 or L2-L3 can be used as voltage measurement input. L3-N is used in this figure.
	Step Output Connection	 **NOTE1**: 3Ø capacitor, 3Ø shunt reactor, 1Ø capacitor and 1Ø shunt reactor can be used as compensation steps for RAPIDUS 231R-E. 3Ø capacitors are used in above figure. **NOTE2**: 3Ø capacitor and 3Ø shunt reactor can be used as compensation steps for RAPIDUS 211R. 3Ø capacitors are used in above figure.		 **NOTE1:** 3Ø capacitor, 3Ø shunt reactor, 1Ø capacitor and 1Ø shunt reactor can be used as compensation steps for RAPIDUS 232R-E. 3Ø capacitors are used in above figure. **NOTE2:** 3Ø capacitor and 3Ø shunt reactor can be used as compensation steps for RAPIDUS 212R. 3Ø capacitors are used in above figure.	
	Gen Input and Alarm Output Connections	 **Generator/Day-Night Input Connection** **Alarm Output Connection**		 **Generator/Day-Night Input Connection** **Alarm Output Connection**	
Dimensional Drawings					

RAPIDUS 218R	RAPIDUS 114	RAPIDUS 114R	RAPIDUS 218R	RAPIDUS 116R	RAPIDUS 118
		 **Single phase system with 1 CT** **NOTE 1:** L1, L2 or L3 can be used as current measurement input. L1 is used in this figure. **NOTE 2:** L1-N, L2-N, L3-N, L1-L2, L1-L3 or L2-L3 can be used as voltage measurement input. L3-N is used in this figure.			
 **NOTE1:** 3Ø capacitor and 3Ø shunt reactor can be used for compensation. 3Ø capacitors are used in this f igure. **NOTE2:** Alarm ouputs can be used for compensation as well. So totally 10 pcs.(8+2) step outputs can be used for compensation		 **NOTE1:** 3Ø capacitor and 3Ø shunt reactor can be used for compensation. 3Ø capacitors are used in this figure.			
 **Alarm Output Connection**		 **Generator/Day-Night Input Connection** **Alarm Output Connection** **Alarm Output Connection**			
					

								
Type			**RAPIDUS 118R**	**RAPIDUS 110**	**RAPIDUS 110R**	**RAPIDUS 111**	**RAPIDUS 111R**	
Definiton			Power Factor Controller (1Ø-8steps)	Power Factor Controller (1Ø-10steps)	Power Factor Controller (1Ø-10steps)	Power Factor Controller (1Ø-12steps)	Power Factor Controller (1Ø-12steps)	
Order Number			606065	606070	606071	606072	606073	
General	Measuring system		1Ø	1Ø	1Ø	1Ø	1Ø	
	LCD Sreen		Custom LCD	Custom LCD	Custom LCD	Custom LCD	Custom LCD	
	Language Support		Turkish, English	Turkish, English	Turkish, English	Turkish, English	Turkish, English	
	Battery		-	-	-	-	-	
	Real Time Clock		-	-	-	-	-	
	Password Protection		Available	Available	Available	Available	Available	
	Current Transformer Ratio		1 - 5.000	1 - 5.000	1 - 5.000	1 - 5.000	1 - 5.000	
	Voltage Transformer Ratio		1 - 999.9	1 - 999.9	1 - 999.9	1 - 999.9	1 - 999.9	
	Demand Period		-	-	-	-	-	
	Connection Type		L-L/L-N	L-L/L-N	L-L/L-N	L-L/L-N	L-L/L-N	
	Measurement in Quadrants		-	-	-	-	-	
	Number of Measurement in a period		256	256	256	512	512	
	LCD/Display Refresh Period		<0.5 sec.	<0.5 sec.	<0.5 sec.	<0.5 sec.	<0.5 sec.	
	Networks		TT, TN	TT, TN	TT, TN	TT, TN	TT, TN	
	Phasor Diagram		-	-	-	-	-	
	Signal Waveforms		-	-	-	-	-	
	Min/Max/Demand Values		-	-	-	-	-	
Control Operations and Functions	Compensation Modes	Rapidus (Intelligent control mode)	Available	Available	Available	Available	Available	
		Sequential	-	-	-	-	-	
		Linear	-	-	-	-	-	
		Circular	-	-	-	-	-	
		Manual	Available	Available	Available	Available	Available	
	Step Configurations	Manually Assign	Available	Available	Available	Available	Available	
		Predefined	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	1-1-1-1, 1-2-2-2, 1-2-4-4	
		DCM	-	-	-	-	-	
		Fixed Step Assigment	-	-	-	-	-	
		Power(kVAr)	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	0.00-1000 adjustable	
	Power factor settings	Type	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	3Ø capacitor or 1Ø capacitor	
		Target 1 cosØ	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	
		Target 2 cosØ	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	0.8cap. to 0.8ind. Adjustable	
	Learning Step Powers and Connections		-	-	-	-	-	
	Dual cosØ target		Available	Available	Available	Available	Available	
	4 Quadrant operation for generators		-	-	-	-	-	
	Time delays	Step activation time	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	
		Step deactivation time	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	1-600 sec adjustable	
		Step discharge time	3-600 sec adjustable	3-600 sec adjustable	3-600 sec adjustable	3-600 sec adjustable	3-600 sec adjustable	
	Phase shift angle		-	-	-	-	-	
	Averaging time		-	-	-	-	-	
Energy Meters	Number of Tariffs		1	1	1	1	1	
	Multi Sub-Tariffs(Peak, Day and Off-Peak)		-	-	-	-	-	
	1Ø Phase Energy Meter		Available	Available	Available	Available	Available	
	3Ø Phase Energy Meters		-	-	-	-	-	
	4 Quadrant Reactive Energy Meters		-	-	-	-	-	
Current Measurement Input	Measurement Range		10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	
	Overvoltage Category		510V CAT II	510V CAT II	510V CAT II	510V CAT II	510V CAT II	
	Measurement Surge Voltage		2 kV	2 kV	2 kV	2 kV	2 kV	
	Power Consumption		<0.3 VA	<0.3 VA	<0.3 VA	<0.3 VA	<0.3 VA	
	intermittent overload		100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	
	Sampling Freq.between 45-65 Hz		12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	
Voltage Measurement Input	Overvoltage Category		510V CAT III	510V CAT III	510V CAT III	510V CAT III	510V CAT III	
	Measured Range L-N		120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	
	Measured Range L-L		120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	120-510V AC ±10%	
	Measured Frequency Range		45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	
	Power Consumption		<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	
	Sampling Freq.between 45-65 Hz		12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	12,8 kHz	
Power Quality Measurements	Harmonics / current and voltage		-	-	-	-	-	
	THD-Voltage in %		Available	Available	Available	Available	Available	
	THD-Current in %		Available	Available	Available	Available	Available	

Type			RAPIDUS 118R	RAPIDUS 110	RAPIDUS 110R	RAPIDUS 111	RAPIDUS 111R
Measurement Accuracy	According to IEC 61557-12	Total Active Power	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Reactive Power	Class 1	Class 1	Class 1	Class 1	Class 1
		Total Apparent Power	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Active Energy	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2
		Frequency	Class 0.1	Class 0.1	Class 0.1	Class 0.1	Class 0.1
		Current	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Neutral Current	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		Voltage	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2
		Power factor	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5
		THDV, THDI	Class 1	Class 1	Class 1	Class 1	Class 1
	According to IEC 62053-22	Total Active Energy	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S
	Accoding to IEC 62053-23	Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2
Input and Outputs	Compensation Relay Outputs	Number of outputs	8	10	10	12	12
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)
		Max. Switching Current	2A	2A	2A	2A	2A
		Max. Switching Voltage	250VAC	250VAC	250VAC	250VAC	250VAC
		Max. Switching Power	1250VA	1250VA	1250VA	1250VA	1250VA
		Mechanical life time	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations
		Electrical life time operations (for NO side)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)
	Alarm Relay Outputs	Number of outputs	2	2	2	2	2
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)
		Max. Switching Current	4A	4A	4A	4A	4A
		Max. Switching Voltage	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC
		Max. Switching Power	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA
		Mechanical life time	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations	≥ 10.0000000 operations
		Electrical life time operations (for NO side)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)	5×104(5A@250VAC) 1×105(5A@30VDC)
	Generator/ Day-Night Input	Number of inputs	1	1	1	1	1
		Frequency	45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
		Input Present or Not	95-240VAC	95-240VAC	95-240VAC	95-240VAC	95-240VAC
	Digital Outputs		-	-	-	-	-
	Analog Outputs		-	-	-	-	-
Supply	Auxilary supply input		-	-	-	-	-
	Voltage		120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N	120...510V AC ±10% from L1-N
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
	Consumption	AC	< 10VA	< 10VA	< 10VA	< 10VA	< 10VA
		DC	-	-	-	-	-
Data Logging with timestamp	Min/max/avg Values	Hourly records	-	-	-	-	-
		Daily records	-	-	-	-	-
		Monthly records	-	-	-	-	-
	Demand		-	-	-	-	-
	Alarm records		-	-	-	-	-
Communication	Protocol		Modbus RTU	-	Modbus RTU	-	Modbus RTU
	Baud rate		1200-38400 bps adjustable	-	1200-38400 bps adjustable	-	1200-38400 bps adjustable
	Parity number		Odd, Even, None	-	Odd, Even, None	-	Odd, Even, None
	Stop bit		1	-	1	-	1
	Address		1-247	-	1-247	-	1-247
	Isolation		2000V RMS	-	2000V RMS	-	2000V RMS
Mechanical Properties	Weight(g)		334	365	369	374	379
	Protection Class		Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
	Assembly Type		Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
Cable Cross Sections	Voltage, Current, All Relay Outputs, Gen Input	Stranded:	2.5mm² - 14AWG	2.5mm² - 14AWG	2.5mm² - 14AWG	2.5mm² - 14AWG	2.5mm² - 14AWG
		Solid:	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG	4mm² - 12AWG, 2x1.5mm² - 2x16AWG
	RS 485	Stranded:	1.5mm² - 16AWG	-	1.5mm² - 16AWG	-	1.5mm² - 16AWG
		Solid:	1.5mm² - 16AWG, 2x0.75mm² - 2x18AWG	-	1.5mm² - 16AWG, 2x0.75mm² - 2x18AWG	-	1.5mm² - 16AWG, 2x0.75mm² - 2x18AWG
Ambient Conditions	Operating Temperature	-20 to +55 °C	-20°C +55°C	-20°C +55°C	-20°C +55°C	-20°C +55°C	-20°C +55°C
	Storage Temperature	-30 to +80 °C	-30°C +80°C	-30°C +80°C	-30°C +80°C	-30°C +80°C	-30°C +80°C
	Relative Humidity (no condensation)	Max.95%	Maks. 95%	Maks. 95%	Maks. 95%	Maks. 95%	Maks. 95%

Type		RAPIDUS 118R	RAPIDUS 110	RAPIDUS 110R
Schematics	Network Connections		 **Single phase system with 1 CT** **NOTE 1:** L1, L2 or L3 can be used as current measurement input. L1 is used in this figure. **NOTE 2:** L1-N, L2-N, L3-N, L1-L2, L1-L3 or L2-L3 can be used as voltage measurement input. L3-N is used in this figure.	
	Step Output Connection		 **NOTE:** 3Ø capacitor or 1Ø capacitor can be used for compensation. 3Ø capacitors are used in this f igure.	
	Gen Input and Alarm Output Connections	 **Alarm Output Connection**	 **Generator/Day-Night Input Connection**	 **Alarm Output Connection**
Dimensional Drawings				

RAPIDUS 111	RAPIDUS 111R
 **Single phase system with 1 CT** **NOTE 1:** L1, L2 or L3 can be used as current measurement input. L1 is used in this figure. **NOTE 2:** L1-N, L2-N, L3-N, L1-L2, L1-L3 or L2-L3 can be used as voltage measurement input. L3-N is used in this figure.	
 **NOTE:** 3Ø capacitor or 1Ø capacitor can be used for compensation. 3Ø capacitors are used in this f igure.	
 **Generator/Day-Night Input Connection**	 **Alarm Output Connection**
	

Product Description	Product Code	LVD						
		EN 61984-1	EN 61984-1	CSA C22.2 NO14-13	UL 508	CSA C22.2 NO14-13	UL 508	EN 50581
KPR-SCE-12VAC/DC-1C interface relay	270800			✓	✓			✓
KPR-SCE-24VAC/DC-1C interface relay	270810			✓	✓			✓
KPR-SCE-48VAC/DC-1C interface relay	270820			✓	✓			✓
KPR-SCE-60VAC/DC-1C interface relay	270830			✓	✓			✓
KPR-SCE-115VAC/DC-1C interface relay	270840			✓	✓			✓
KPR-SCE-230VAC/DC-1C interface relay	270850			✓	✓			✓
KPR-SCE-12VAC/DC-1C relay socket	270801	✓	✓			✓	✓	✓
KPR-SCE-24VAC/DC-1C relay socket	270811	✓	✓			✓	✓	✓
KPR-SCE-48VAC/DC-1C relay socket	270821	✓	✓			✓	✓	✓
KPR-SCE-60VAC/DC-1C relay socket	270831	✓	✓			✓	✓	✓
KPR-SCE-115VAC/DC-1C relay socket	270841	✓	✓			✓	✓	✓
KPR-SCE-230VAC/DC-1C relay socket	270851	✓	✓			✓	✓	✓
KPR-SCE-6VDC-1C interface relay	270794			✓	✓			✓
KPR-SCE-12VDC-1C interface relay	270804			✓	✓			✓
KPR-SCE-24VDC-1C interface relay	270814			✓	✓			✓
KPR-SCE-48VDC-1C interface relay	270824			✓	✓			✓
KPR-SCE-60VDC-1C interface relay	270834			✓	✓			✓
KPR-SCE-115VDC-1C interface relay	270844			✓	✓			✓
KPR-SCE-6VDC-1C relay socket	270795	✓				✓	✓	✓
KPR-SCE-12VDC-1C relay socket	270805	✓				✓	✓	✓
KPR-SCE-24VDC-1C relay socket	270815	✓				✓	✓	✓
KPR-SCE-48VDC-1C relay socket	270825	✓				✓	✓	✓
KPR-SCE-60VDC-1C relay socket	270835	✓				✓	✓	✓
KPR-SCE-115VDC-1C relay socket	270845	✓				✓	✓	✓
KPR-SCF-115VAC/DC-1C interface relay with filter	270846			✓	✓			✓
KPR-SCF-230VAC/DC-1C interface relay with filter	270856			✓	✓			✓
KPR-SCF-230VAC-1C interface relay with filter	270858			✓	✓			✓
KPR-SCF-115VAC/DC-1C relay socket with filter	270847	✓				✓	✓	✓
KPR-SCF-230VAC/DC-1C relay socket with filter	270857	✓				✓	✓	✓
KPR-SCF-230VAC-1C relay socket with filter	270859	✓				✓	✓	✓
KPR-SWE-6VDC-1C inreface relay	272004			✓	✓			✓
KPR-SWE-12VDC-1C interface relay	272024			✓	✓			✓
KPR-SWE-24VDC-1C interface relay	272044			✓	✓			✓
KPR-SWE-48VDC-1C interface relay	272064			✓	✓			✓
KPR-SWE-60VDC-1C interface relay	272084			✓	✓			✓
KPR-SWE-115VDC-1C interface relay	272104			✓	✓			✓
KPR-SWE-6VDC-1C relay socket	272005	✓				✓	✓	✓
KPR-SWE-12VDC-1C relay socket	272025	✓				✓	✓	✓
KPR-SWE-24VDC-1C relay socket	272045	✓				✓	✓	✓
KPR-SWE-48VDC-1C relay socket	272065	✓				✓	✓	✓
KPR-SWE-60VDC-1C relay socket	272085	✓				✓	✓	✓
KPR-SWE-115VDC-1C relay socket	272105	✓				✓	✓	✓
KPR-SWE-12VAC/DC-1C interface relay	272020	✓		✓	✓	✓	✓	✓
KPR-SWE-24VAC/DC-1C interface relay	272040	✓		✓	✓	✓	✓	✓
KPR-SWE-48VAC/DC-1C interface relay	272060	✓		✓	✓	✓	✓	✓
KPR-SWE-60VAC/DC-1C interface relay	272080	✓		✓	✓	✓	✓	✓

Product Description	Product Code	LVD		EMC²											
		EN 60664-1	EN 61984-1	EN 61000-4-2	EN 61000-4-3	EN 61000-4-4	EN 61000-4-5	EN 61000-4-6	EN 61000-4-8	EN 61000-4-11	EN 61000-6-1	EN 61000-6-3	EN 55011	CSA C22.2 NO14-13	UL 508	CSA C22.2 NO14-13	UL 508	EN 50581
KPR-SWE-115VAC/DC-1C interface relay	272100		✓											✓	✓	✓	✓	✓
KPR-SWE-230VAC/DC-1C interface relay	272120		✓											✓	✓	✓	✓	✓
KPR-SWE-12VAC/DC-1C relay socket	272021		✓													✓	✓	✓
KPR-SWE-24VAC/DC-1C relay socket	272041		✓													✓	✓	✓
KPR-SWE-48VAC/DC-1C relay socket	272061		✓													✓	✓	✓
KPR-SWE-60VAC/DC-1C relay socket	272081		✓													✓	✓	✓
KPR-SWE-115VAC/DC-1C relay socket	272101		✓													✓	✓	✓
KPR-SWE-230VAC/DC-1C relay socket	272121		✓													✓	✓	✓
KPR-SWE-230VAC-1C interface relay	272122		✓											✓	✓	✓	✓	✓
KPR-SWE-230VAC-1C relay socket	272123		✓													✓	✓	✓
KPR-SWF-115VAC/DC-1C interface relay with filter	272106		✓											✓	✓	✓	✓	✓
KPR-SWF-230VAC/DC-1C interface relay with filter	272126		✓											✓	✓	✓	✓	✓
KPR-SWF-230VAC-1C interface relay with filter	272128		✓											✓	✓	✓	✓	✓
KPR-SWF-115VAC/DC-1C relay socket with filter	272107		✓													✓	✓	✓
KPR-SWF-230VAC/DC-1C relay socket with filter	272127		✓													✓	✓	✓
KPR-SWF-230VAC-1C relay socket with filter	272129		✓													✓	✓	✓
C1-SA Protection relay	270156			✓	✓	✓		✓	✓		✓	✓	✓					✓
C1-SAP Protection relay	270157			✓	✓	✓		✓	✓		✓	✓	✓					✓
C1-SVP Protection relay	270158			✓	✓	✓		✓	✓		✓	✓	✓					✓
C1D-SA Protection relay	270256			✓	✓	✓		✓	✓		✓	✓	✓					✓
C1D-SAP Protection relay	270257			✓	✓	✓		✓	✓		✓	✓	✓					✓
C1D-SVP Protection relay	270258			✓	✓	✓		✓	✓		✓	✓	✓					✓
V1 Protection relay	270159			✓	✓	✓		✓	✓		✓	✓	✓					✓
V1-S Protection relay	270160			✓	✓	✓		✓	✓		✓	✓	✓					✓
V1-T Protection relay	270162			✓	✓	✓		✓	✓		✓	✓	✓					✓
V1-D Protection relay	270259			✓	✓	✓		✓	✓		✓	✓	✓					✓
V1-DS Protection relay	270260			✓	✓	✓		✓	✓		✓	✓	✓					✓
F1 Protection relay	270161			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-A Protection relay	270150			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-p Protection relay	270151			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-S Protection relay	270152			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SP Protection relay	270153			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SA Protection relay	270154			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SAP Protection relay	270155			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1D-SA Protection relay	270254			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1D-SAP Protection relay	270255			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SU Protection relay (115 V AC - FORM A)	270402			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SU Protection relay (115 V AC - FORM C)	270403			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SU Protection relay (230 V AC - FORM A)	270400			✓	✓	✓		✓	✓		✓	✓	✓					✓
P1-SU Protection relay (230 V AC - FORM C)	270401			✓	✓	✓		✓	✓		✓	✓	✓					✓
CPR 16 Protection relay	270270	✓		✓	✓	✓	✓	✓		✓	✓							✓
T1-K Time relay	270354			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
T1-LR Time relay (left-right)	270356			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
T1-XS Time relay	270357			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓

Product Description	Product Code	LVD							EMC²										c UL us LISTED		RoHS
		EN 61010-1	EN 61010-2-30	EN 61557-12	EN 61010-1	EN 61326-1	EN 61000-3-2	EN 61000-3-3	EN 61000-4-2	EN 61000-4-3	EN 61000-4-4	EN 61000-4-5	EN 61000-4-6	EN 61000-4-8	EN 61000-4-11	EN 61000-6-1	EN 61000-6-3	EN 55011	CSA C22.2 NO14-13	UL 508	EN 50581
PH1-20L Time relay (photocell)	270050								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SD1 Time relay (star delta)	270358								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
T1-60S Time relay	270350								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
T1-FLASH Time relay	270351								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
T1-M5 Time relay	270353								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
T1-M4 Time relay	270355								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
T1-100S Time relay	270359								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ECRAS 100 Energy analyser	606210	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓			✓			✓
ECRAS 120 Energy analyser	606211	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓			✓
ECRAS 200 Energy analyser	606212	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓			✓
ECRAS 220 Energy analyser	606213	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓			✓
ECRAS ALARM Energy analyser	606201	✓	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓			✓			✓
ECRAS -VCF	606218	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓			✓
KLEA 110 P Energy analyser	606180	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓			✓
KLEA 220 P Energy analyser	606160	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
KLEA 320 P Energy analyser	606100	✓	✓	✓	✓	✓											✓	✓			✓
KLEA 322 P Energy analyser	606102	✓	✓	✓	✓	✓											✓	✓			✓
KLEA 324 P Energy analyser	606103	✓	✓	✓	✓	✓											✓	✓			✓
KLEA 370 P Energy analyser	606101	✓	✓	✓	✓	✓											✓	✓			✓
KLEA 370P-VSM	606121	✓	✓	✓	✓	✓											✓	✓			✓
G1D-SA	270140	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1D-SA-L	270141	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1D-SV	270145	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
M1D-S	270142	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
M1D-SA	270144	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-SAP	270131	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-SA	270130	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-A	270136	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-SAT	270137	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-TU	270138	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-SV	270139	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-SVP	270180	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-VM	270146	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
G1-TUM	270147	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
M1-A	270134	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
M1-SA	270132	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
M1-SP	270135	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
M1-SAP	270133	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
Z1-M4	270374	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
Z1-XS	270377	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
Z1-LR	270376	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
Z1-K	270374	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
Z1-60S	270370	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓
Z1-FLASH	270371	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓

Product Description	Product Code	LVD			EMC²													RoHS
		EN 61010-1	EN 61010-2-30	EN 61557-12	EN 61326-1	EN 61000-3-2	EN 61000-3-3	EN 61000-4-2	EN 61000-4-3	EN 61000-4-4	EN 61000-4-5	EN 61000-4-6	EN 61000-4-8	EN 61000-4-11	EN 55011	CISPR 11/R.E	CISPR 11/C.E	EN 50581
Z1-M5	270373	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
ZD-1	270378	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Z1-100S	270379	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 1022	606355	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 1012	606354	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 1023	606356	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 1110	606351	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 1120	606352	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 3121	606305	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 3122 (TÜRKÇE)	606308			✓														
POWYS 3122 (ENGLISH)	606307			✓														
POWYS 3111	606304	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 3101	606303	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
POWYS 3100	606300	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
PISO-DC-DUO (0…20 - 0…20)	602700				✓			✓	✓				✓		✓	✓		
PISO-DC-1 (0…20 - 0…20)	602800				✓			✓	✓				✓		✓	✓		
PISO-DC-1 (4…20 - 4…20)	602801				✓			✓	✓				✓		✓	✓		
PISO-DC-1 (0…20 - 0…10)	602802				✓			✓	✓				✓		✓	✓		
PISO-DC-1 (0…20 - 0…5)	602803				✓			✓	✓				✓		✓	✓		
PISO-DC-2 (0…20 - 0…20)	602850				✓			✓	✓				✓		✓	✓		
PISO-DC-2 (4…20 - 4…20)	602851				✓			✓	✓				✓		✓	✓		
PISO-DC-2 (0…20 - 0…10)	602852				✓			✓	✓				✓		✓	✓		
PISO-DC-2 (0…20 - 0…5)	602853				✓			✓	✓				✓		✓	✓		
PISO-DC-DUO (4…20 - 4…20)	602701				✓			✓	✓				✓		✓	✓		
PISO-DC-DUO (0…20 - 0…10)	602702				✓			✓	✓				✓		✓	✓		
PISO-DC-DUO (0…20 - 0…5)	602703				✓			✓	✓				✓		✓	✓		
ASCON 311	602300	✓			✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	
ASCON 321	602310	✓			✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	
ASCON 331	602320	✓			✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	
ASCON 341	602330	✓																
ASCON 352	602400	✓			✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	
RAPIDUS 111 R Reactive Power Factor Controller	606073	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 111 Reactive Power Factor Controller	606072	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 110 R Reactive Power Factor Controller	606071	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 110 Reactive Power Factor Controller	606070	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 118 R Reactive Power Factor Controller	606065	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 118 Reactive Power Factor Controller	606064	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 116 R Reactive Power Factor Controller	606063	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 116 Reactive Power Factor Controller	606062	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 114 R Reactive Power Factor Controller	606061	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 114 Reactive Power Factor Controller	606060	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAPIDUS 211 R Reactive Power Factor Controller	606011	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Product Description	Product Code	LVD				TSE	EMC²														RoHS
		EN 61010-1	EN 61010-2-30	EN 60688	EN 61557-12	EN 61010-1	EN 61326-1	EN 61000-3-2	EN 61000-3-3	EN 61000-4-2	EN 61000-4-3	EN 61000-4-4	EN 61000-4-5	EN 61000-4-6	EN 61000-4-8	EN 61000-4-11	EN 61000-6-2	EN 61000-6-4	EN 55011	CISPR 11/R.E	CISPR 11/C.E	EN 50581
RAPIDUS 211 T Reactive Power Factor Controller	606012	✓			✓		✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
RAPIDUS 212 R Reactive Power Factor Controller	606014	✓			✓		✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
RAPIDUS 218 R Reactive Power Factor Controller	606021				✓																	✓
RAPIDUS 231 R Reactive Power Factor Controller	606001	✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
RAPIDUS 231 RE Reactive Power Factor Controller	606005	✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
RAPIDUS 232 R Reactive Power Factor Controller	606002	✓	✓		✓		✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
RAPIDUS 232 RE Reactive Power Factor Controller	606007	✓	✓		✓		✓			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
CT3-AC Transducer	600100	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CT3-AC-24 Transducer	600102	✓		✓			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CT3-AC-LP Transducer	600104	✓		✓			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VT3-AC Transducer	600101	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VT3-AC-24 Transducer	600103	✓		✓			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VT3-AC-LP Transducer	600105	✓		✓			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VT3-ACDC-24 Transducer	600106	✓		✓			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ANC 8 (24 V AC/DC) Annunciator	604620									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 8 (48 V AC/DC) Annunciator	604621									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 8 (110 V AC/DC) Annunciator	604622									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 8 (220 V AC/DC) Annunciator	604623									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (220V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604653									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (110V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604652									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (48V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604651									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (24V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604650									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (220V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604668									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (110V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604667									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (48V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604666									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (24V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604665									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 32 (110V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604677									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 32 (48V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604676									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 32 (24V AC/DC, 24-50 VAC/DC p.s.) Annunciator	604675									✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (220V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604633	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (110V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604632	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (48V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604631	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 16 (24V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604630	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (220V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604663	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (110V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604662	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (48V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604661	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 24 (24V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604660	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 32 (110V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604672	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 32 (48V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604671	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
ANC 32 (24V AC/DC, 85-300 VAC/DC p.s.) Annunciator	604670	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓				✓

Product Description	Product Code	LVD	EMC²														R&TTE		RoHS
		EN 61010-1	EN 61326-1	EN 61000-3-2	EN 61000-3-3	EN 61000-4-2	EN 61000-4-3	EN 61000-4-4	EN 61000-4-5	EN 61000-4-6	EN 61000-4-8	EN 61000-4-11	EN 55011	EN 55022	EN 55024	CISPR 11/R.E	CISPR 11/C.E	EN 301489-1	EN 301489-17	EN 50581
ETOR 2 Ethernet gateway	601401													✓	✓					✓
ETOR 4 Ethernet gateway	601400													✓	✓					✓
GTOR-4	601440		✓			✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
GTOR-4 (with PS)	601441		✓			✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
WTOR-4	601450		✓			✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
WTOR-4 (with UPS)	601451		✓			✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
DWT-3T	270501	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
DWT-3	270500	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
DPR 3120 E	270605	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
DPR 3110 E	270604	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
DPR 3120	270601	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓	✓			✓
DPR 3121	270603	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓	✓			✓
DPR 3111	270602	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓	✓			✓
DPR 3110	270600	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓	✓			✓
MEASTRO 321	270704	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
MEASTRO 221	270703	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
MEASTRO 121	270702	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
MEASTRO 120	270701	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓
MEASTRO 110	270700	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			✓

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