



## Protection & Monitoring Relays Series

Klemsan protection and monitoring relays in new enclosures under the DIN norm, are designed to protect your system against problems caused by voltage, frequency, and temperature in single-phase and three-phase electrical systems. In addition to fixed protection models that do not require any adjustments, some products allow asymmetry, voltage protection, protection parameter selection, and time setting adjustment over trimpots on the device

- System errors can be monitored thanks to the LED notifications that indicate errors.
- Product design under TS EN 60255 standard,
- 18mm thin product body under DIN standard,
- TRMS measurement,
- Red LED indicators for error notification,
- Orange LED indicator for relay status,
- Adjustable pots for time and limit values,
- 5A SPDT relay output,
- Optionally Asymmetry, Phase Sequence, Absence of Phase, High - Low Voltage, High - Low Frequency, PTC, Neutral break protection,
- Liquid level and light intensity monitoring functions
- Star, delta, and single-phase connection options,
- High precision and high mechanical durability.

## FIXED PROTECTION RELAYS

Product Name	Order No	Definition	3P4W	3P3W	Phase-Loss Protection	Phase Sequence Protection	Asymmetry Protection	PTC Input	1 C/O	1 NO	85-300 VAC (VLN)	180-265 VAC (VLN)	145-520 VAC (VLL)
FP1Y-ASF 230	270271	Motor Protection Relay	√		√	√	20%		√		√		
FP1D-ASF 400	270272	Motor Protection Relay		√	√	√	20%		√			√	
FP1Y-ASF8 230	270273	Motor Protection Relay	√		√	√	40%		√				
FP1Y-ASF8.3 230	270274	Motor Protection Relay	√		√	√	40%			√	√		
FP1Y-AF 230	270275	Motor Protection Relay	√		√		20%		√		√		
FP1Y-SF 230	270276	Motor Protection Relay	√		√	√			√		√		
FP1Y-SFP 230	270284	Motor Protection Relay	√		√	√		√	√		√		
FP1D-SFP 400	270285	Motor Protection Relay		√	√	√		√	√			√	
FP1YA-ASF8 230	270300	Motor Protection Relay	√		√	√	20%		√				√
FP1YA-ASF8.3 230	270301	Motor Protection Relay	√		√	√	20%		√				√
FP1D-SF 400	270302	Motor Protection Relay		√	√	√			√			√	

## ADJUSTABLE PROTECTION RELAYS

Product Name	Order No	Definition	3P4W	3P3W	Phase-Loss Protection	Phase Sequence Protection	Asymmetry Protection	Low Voltage Protection	High Voltage Protection	Low - High Voltage Protection (Same Trimpt)	Neutral Loss Protection	Nominal Voltage (Un)	PTC Input	Adjustable On Delay	Adjustable Off Delay	1 C/O	75-250 VAC (VLN)	85-300 VAC (VLN)	130-430 VAC (VLL)	145-520 VAC (VLL)
P1Y-ASF 230	270277	Motor Protection Relay	√		√	√	±(5-30%/Off)					230V			0.1-10 sec	√		√		
P1D-ASF 400	270278	Motor Protection Relay		√	√	√	±(5-30%/Off)					400V			0.1-10 sec	√				√
P1Y-M1WASFN 170-280	270282	Motor Protection Relay	√		√	√	±(5-30%/Off)			±(5-30%/Off)	√	170-280V			0.1-10 sec	√		√		
P1D-M1WASF 295-480	270283	Motor Protection Relay		√	√	√	±(5-30%/Off)			±(5-30%/Off)		295-480V			0.1-10 sec	√				√
P1Y-M2WSP 170-280	270286	Motor Protection Relay	√		√		-(5-30%/Off)	+(5-30%/Off)				170-280V	√		0.1-10 sec	√		√		
P1D-M2WSP 295-480	270287	Motor Protection Relay		√	√	√	-(5-30%/Off)	+(5-30%/Off)				295-480V	√		0.1-10 sec	√				√
P1Y-M1WASFN 100-200	270288	Motor Protection Relay	√		√	√	±(5-30%/Off)			±(5-30%/Off)	√	100-200V			0.1-10 sec	√	√			
P1D-M1WASF 175-345	270289	Motor Protection Relay		√	√	√	±(5-30%/Off)			±(5-30%/Off)		175-345V			0.1-10 sec	√				√
P1Y-M2WSP 100-200	270290	Motor Protection Relay	√		√	√	-(5-30%/Off)	+(5-30%/Off)				100-200V	√		0.1-10 sec	√	√			
P1D-M2WSP 175-345	270291	Motor Protection Relay		√	√	√	-(5-30%/Off)	+(5-30%/Off)				175-345V	√		0.1-10 sec	√				√

## VOLTAGE MONITORING RELAYS

Product Name	Order No	Definition	1P2W	3P4W	3P3W	Phase-Loss Protection	Phase Sequence Protection	Low Voltage Protection	High Voltage Protection	Low - High Voltage Protection (Same Trimpt)	Neutral Loss Protection	Nominal Voltage (Un)	Adjustable On Delay	Adjustable Off Delay	1 C/O	75-250 VAC (VLN)	85-300 VAC (VLN)	130-430 VAC (VLL)	145-520 VAC (VLL)
V1Y-WFN 230	270279	Voltage Monitoring Relay		√		√		150-210V	240-300V		√	230V	0.1-10 sec	0.1-10 sec	√		√		
V1Y-WS 300	270280	Voltage Monitoring Relay		√		√	√	150-210V	240-300V			230V	0.1-10 sec	0.1-10 sec	√				√
V1D-WS 520	270281	Voltage Monitoring Relay			√	√	√	260-360V	415-520V			400V	0.1-10 sec	0.1-10 sec	√		√		
V1Y-WUN 120-480	270292	Voltage Monitoring Relay		√		√				±(5-30%/Off)	√	120-277V	2 sec	0.1-15 sec	√				√
V1Y-WUN.9 120-480	270293	Voltage Monitoring Relay		√		√				±(5-30%/Off)	√	120-277V	2 sec	0.1-15 mins	√		√		
V1U-M2W 230	270295	Voltage Monitoring Relay	√			√		(90-115%)Un	(80-130%)Un			230V	0.1-10 sec	0.1-10 sec	√				√
V1U-M2W 120	270296	Voltage Monitoring Relay	√			√		(75-115%)Un	(80-130%)Un			120V	0.1-10 sec	0.1-10 sec	√	√			

## SPECIAL FUNCTIONAL MONITORING RELAYS

Product Name	Order No	Definition	PTC Monitoring	Frequency Monitoring Range	Frequency Monitoring Voltage	Light Intensity Monitoring Range	Liquid Level Sensitivity Range	Liquid Level Probe Qty	Adjustable On Delay	Adjustable Off Delay	1 C/O	24-265 VAC/DC (VLN)	115VAC & 230VAC
K1F-WL6 50/60	270294	Frequency Monitoring		45-65Hz	85-300VLN						0.1-10 sec	√	√
FK1T-P 24-265	270297	Temperature Monitoring	√									√	√
K1TW-D7 20K	270298	Light Intensity				1-20 lux					0.1-10 sec	√	√
K2LC-D2 115-230	270299	Liquid Level Monitoring					1-75kohm	6	0.1-10 sec	0.1-10 sec	√		√



- » Product design in accordance with TS EN 60255 standard,
- » 18mm thin product body conforming to DIN Standard,
- » True RMS measurement,
- » Red LED indicators for fault notification,
- » Orange LED indicator for relay status,
- » 5A SPDT relay output,
- » Microprocessor based,
- » Optional Asymmetry, Phase Sequence, Phase Loss and PTC protection,
- » Star and delta connection options,
- » High precision and high mechanical strength.

### Product Guide

Products	Stock Code	Connection Type	Phase Loss	Phase Sequence Protection	Asymmetry Protection	PTC
FP1Y-ASF 230	270271	3P4W	✓	✓	20%	-
FP1D-ASF 400	270272	3P3W	✓	✓	20%	-
FP1Y-ASF8.230	270273	3P4W	✓	✓	40%	-
FP1Y-ASF8.3.230	270274	3P4W	✓	✓	40%	-
FP1YA-ASF8.230	270300	3P4W	✓	✓	40%	-
FP1YA-ASF8.3.230	270301	3P4W	✓	✓	40%	-
FP1Y-AF 230	270275	3P4W	✓	-	20%	-
FP1Y-SF 230	270276	3P4W	✓	✓	-	-
FP1Y-SFP 230	270284	3P4W	✓	✓	-	✓
FP1D-SFP 400	270285	3P3W	✓	✓	-	✓
FP1D-SF 400	270302	3P3W	✓	✓	-	-

### Technical Details

Operating Voltage	85 - 300 V LN ± 20% 145 - 520 V LL ± 20% 180 - 265 V AC ± 10% (FP1YA serie for)	
Operating Frequency	50 / 60 Hz	
Supplying Terminals (Burden)	L2-L3 (3P4W → 4,8 kΩ / 3P3W → 7 kΩ) L3-N (FP1YA-xxx için) NOTE: (any two terminals on product with PTC)	
Voltage Measurement Terminals	L1-L2-L3-N	
PTC Inputs (Burden)	T1-T2 (4,7 MΩ) T1-T3 (6,85 MΩ)	
Rated Voltage	230 V LN 400 V LL	
Energization Delay	< 1 sn	
Phase Loss Threshold Value	Un x 60%	
Asymmetry Threshold Value	± 20% ± 40 (FP1Y-ASF8.230, FP1Y-ASF8.3.230, FP1YA-ASF8.230 and FP1YA-ASF8.3.230 for)	
Histerisis	3%	
PTC Alarm Threshold Value	Short Circuit	20 Ω
	High Value	2,7 kΩ
Output Contact	1 C/0 1 NO (FP1Y-ASF8.3 and FP1YA-ASF8.3 for)	
Max. Switching Voltage / Current / Power	250VAC / 5A / 1250VA - 30VDC / 5A / 150W	
Fault Delay Period	Phase Loss	ton= 2 sn / toff: 500msn
	Phase Sequence	ton= 2 sn / toff: 500msn
	Asymmetry	ton= 2 sn / toff: 500 msn
	PTC	ton= 2 sn / toff: 1 sn
Over Voltage Category (IEC 60664)	CAT III	
Cable Cross Section	2.5mm <sup>2</sup> (Only copper conductor) / 14 AWG Solid / Stranded	
Screw Tightening Torque	0.5 Nm	
Cable Stripping Size (Min/Max)	8 mm / 9 mm	
Power Consumption	< 13 VA	
Operating Temperature Range	-20 / +60 °C	
Protection Degree (IEC 60529)	IP 20	
Activated I/O's at the max temperature	Relay	1
	PTC Input	2

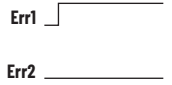
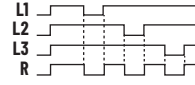
### Fault Types

### Relay Actions

### LED Display

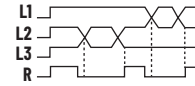
#### Phase Loss:

In case of any of the measuring signals falls below %60 of the rated voltage, phase loss fault occurs. Relay activation and the LED notification are shown in the adjacent figure.



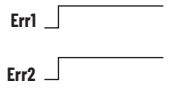
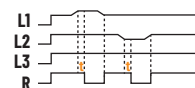
#### Phase Sequence:

When the angles between the signals entering the L1, L2 and L3 inputs are less than 60° and more than 180°, a phase sequence fault occurs in cases where the phases are not connected in sequence. Relay activation and LED notification are shown in the adjacent figure



#### Asymmetry Fault:

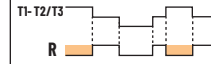
Asymmetry value is calculated by dividing the max. difference between the phase voltage by the nominal voltage. According to this formula, if the asymmetry value is higher than the asymmetry limit, an asymmetry fault occurs. Relay activation and LED notification are shown in the adjacent figure.



#### PTC Fault:

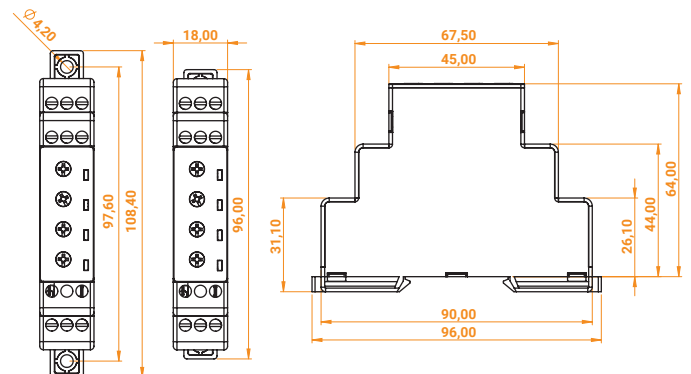
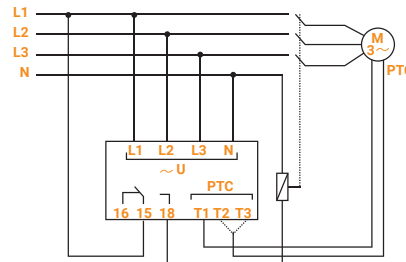
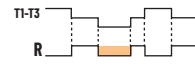
##### a. PTC High Value Fault:

When T1-T2 or T1-T3 detects high value, PTC high value fault occurs. Relay activation and LED notification are shown in the adjacent figure.



##### b. PTC Short Circuit Fault:

If short circuit fault is detected in the device, PTC short circuit fault occurs when there is a short circuit between PTC inputs T1-T3. Relay activation and LED notification are shown in the adjacent figure.



- » Product design in accordance with TS EN 60255 stand
- » 18mm thin product body conforming to DIN Standard
- » TRMS measurement,
- » Red LED indicators for fault notification,
- » Orange LED indicator for relay status
- » Adjustable knobs for time and limit values,
- » 5A SPDT relay output,
- » Microprocessor based,
- » Optional Phase Sequence, Phase Loss, High-Low Voltage, Neutral Break Protection,
- » Star, delta and single phase connection options,
- » High precision and high mechanical strength.

## Product Guide

Products	Stock Code	Connection Type	Phase Loss Protection	Phase Sequence Protection	Low Voltage Only Protection	Neutral Break Protection
V1Y-WFN 230	270279	3P4W	✓		✓	✓
V1Y-WS 300	270280	3P4W	✓	✓	✓	✓
V1D-WS 520	270281	3P3W	✓	✓	✓	
V1Y-WUN 120-480	270292	3P3W & 3P4W	✓		✓	✓
V1Y-WUN.9 120-480	270293	3P3W	✓		Low Voltage Only	✓
V1U-M2W 230	270295	1P2W	✓		✓	✓
V1U-M2W 120	270296	1P2W	✓		✓	✓
V1U-U.9 230	270305	1P2W	✓		✓	✓

## Technical Details

Operating Voltage		85 - 300 V LN ±20% 145 - 520 V LL ±20%	
Operating Frequency		50 - 60 Hz	
Supplying Terminals (Burden)		L2-L3 (3P4W → 4,8 kΩ / 3P3W → 7 kΩ) U1-U2 (V1U-xxx for)	
Voltage Measurement Terminals		L1-L2-L3-N U1-U2 (V1U-xxx for)	
Nominal Voltage		120 V LL (V1U-M2W 120 for) 230 V LN (V1Y-WFN 230, V1Y-WS 300, V1U-M2W 230 and V1U-U.9 230 for) 120 (208) - 277 (480) (V1Y-WUN 120-480 for) 400 V LL (V1D-WS 520 for)	
Voltage Protection Range	V1Y-WFN 230	Low	150 - 210 VAC
		High	240 - 300 VAC
	V1Y-WS 300	Low	150 - 210 VAC
		High	240 - 300 VAC
	V1D-WS 520	Low	260 - 360 VAC
		High	415 - 520 VAC
	V1Y-WUN 120-480	Low & High	± (5 - 30%) Un
		V1Y-WUN.9 120-480	Low
	High		-
	V1U-M2W 230	Low	(75 - 115%) Un
High		(80 - 130%) Un	
V1U-M2W 120	Low	(75 - 115%) Un	
	High	(80 - 130%) Un	
V1U-U.9	Low	(75%) Un	
	High	-	
Energization Delay		< 1 sn	
Phase Loss Threshold Value		Un x 60%	
Histerisis		3%	
Output Contact		1C/0	
Max. Switching Voltage / Current / Power		250VAC / 5A / 1250VA - 30VDC / 5A / 150W	
Fault Delay Period	Phase Loss	ton = 2 sn / toff: 500msn	
	Phase Sequence	ton = 2 sn / toff: 500msn	
	High/ Low Voltage	ton = 0.1 - 10 sn / toff: 0.1 - 10 sn ton = 2 sn / toff: 0.1 - 15 sn (V1Y-WUN 120-480) ton = 2 sn / toff: 5 - 15 dk (V1Y-WUN.9 120-480 and V1U-U.9 230 for)	
	Neutral Break	ton = 2 sn / toff: 500msn	
Over Voltage Category (IEC 60664)		CAT III	
Cable Cross Section		2.5 mm <sup>2</sup> (Only Copper Conductor) / 14 AWG Solid / Stranded	
Screw Tightening Torque		0.5 Nm	
Cable Stripping Size (Min/Max)		8 mm / 9 mm	
Power Consumption		< 13 VA	
Operating Temperature Range		-20 / +60 °C	
Protection Degree (IEC 60529)		IP 20	
Activated I/O's at the max temperature	Relay	1	
	PTC Input	2	

Fault Types	Relay Actions	LED Display
<b>Phase Loss:</b> In case of any of the measuring signals falls below %60 of the rated voltage, phase loss fault occurs. Relay activation and the LED notification are shown in the adjacent figure.		
<b>Neutral Break:</b> In products with neutral connection, if there is a neutral break fault detection feature, in case of a break in the neutral line or if the neutral connection is not made, neutral break fault occurs. Relay activation and the LED notification are shown in the adjacent figure.		
<b>Phase Sequence:</b> When the angles between the signals entering the L1, L2 and L3 inputs are less than 60° and more than 180°, a phase sequence fault occurs in cases where the phases are not connected in sequence. Relay activation and LED notification are shown in the adjacent figure.		
<b>High Voltage Fault:</b> If the signal that applied from the L1, L2 and L3 signals, is higher than the set high voltage limit, a high voltage fault occurs. Relay activation and the LED notification are shown in the adjacent figure.		
<b>Low Voltage Fault:</b> If the signal that applied from the L1, L2 and L3 signals, is lower than the set low voltage limit, a low voltage fault occurs. Relay activation and the LED notification are shown in the adjacent figure.		

