Product Highlights

Monitoring and controlling for your safety

Tele Haase was founded in 1963 and is Austria's market leader in developing state-of-the-art monitoring, control and automation technology. We are known for operational excellence in the development and production of control and monitoring components for automation applications in industry and building automation.

TELE PRODUCTS are installed globally in various control cabinets or control installations. Thanks to the simple integration into new or existing systems, the reliable function and monitoring of electrical values has proven itself even in critical energy and facility management applications.

TELE DEVELOPMENTS meet international quality standards, contribute to the environmental friendly generation of renewable energies using water, wind and sun and have long been what is known as green or clean.

AT TELE HAASE, we see ourselves as a "company of the future" with the aim of actively shaping social change towards sustainability in the long term. We develop technologies that help industries to become safer, more efficient and sustainable.

All over the world

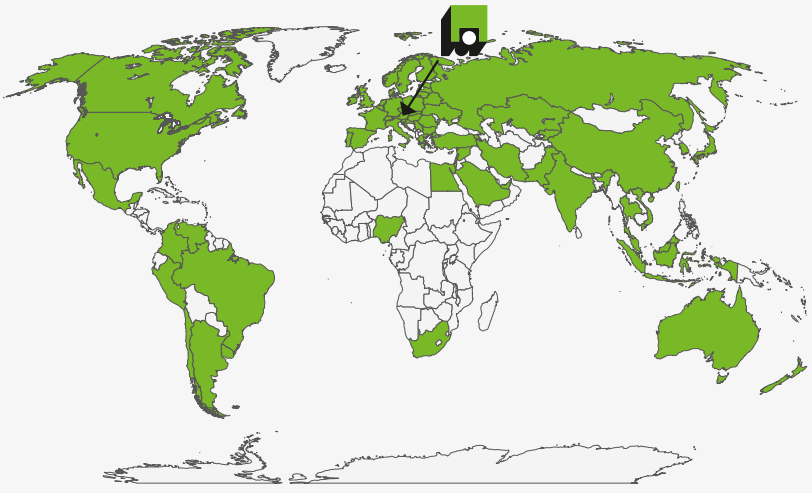
We are the Austrian market leader for timing and monitoring relays. Our relays might be small but they master a huge variety of applications.

TELE at a glance

- Monitoring devices for physical values such as current, voltage, temperature, frequency, level, power factor, active power ...
- Provider of high-quality industrial switching relays and power electronics
- Grid and system protection for renewable energies
- Extensive technical expertise thanks to 60 years of experience
- Global sales network
- Electronic manufacturing services at crisis-proof location in Vienna, Austria

Made in Austria

Over 80 highly qualified employees meet the high demands and wishes of our customers every day. TELE Haase produces one hundred percent of its products in Austria. Our core areas of expertise are development and production – including EMS – at our head office in Vienna. The TELE sales team and more than 60 international trade partners make up our global sales network and stand by for your support.



Who we are

We have nearly 60 years of experience in the development and production of control and monitoring components and we are happy to share this know-how with our customers.

At the Vienna location

we are committed to the highest quality, sustainability and outstanding customer service, both in the production of our own products and in EMS production. In the professional implementation of innovative ideas from customers we score with flexibility and reliability.

How do you benefit from this?

- Short development and realization times
- Proven modular components
- Ability to integrate into the customer's system
- Scalable in price and performance
- In-house development and production with optimized batch sizes

Our business areas

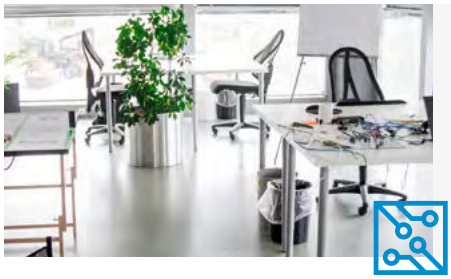
With solid engineering know-how, TELE develops and produces smart technology for a better world. We try out ideas and break new ground on our way to “the company of the future”.

Automation components

According to our customers’ needs, we develop and produce technical solutions for a wide variety of controlling and monitoring tasks, such as timing and monitoring relays, grid and system protection, power electronics and industrial IoT. TELE products are being used all over the world in control cabinets, plant and machinery, renewable energy sector or facility management.

EMS

At TELE Haase you will find our conveniently located Electronic Manufacturing Services (EMS), which can flexibly adapt to your requirements with a personal touch and Austrian quality. We support you in ideation, electronic development, prototyping to serial production and delivery.



Factory Hub Vienna

With the Factory Hub we offer space for new ideas and concepts of young founders and support startups with our extensive production know-how in the implementation of prototypes and small series.

Organisation Playground

TELE implemented a new organization structure in 2012 and invites people to join our experiences. Based on the idea of “New Work” we operate without traditional hierarchies and make democratic decisions. This promotes individual responsibility andagility, and puts us in a position to offer operational excellence at all levels in the future.

Product categories

Our product range consists of the following high quality products:

Timing relays

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can make system and machine operation even more efficient. They check the time for you. For example, they switch off wind turbines after a preset time or fertilize grapevines for a defined timespan. Your production is never thrown off its rhythm, which saves money.

Monitoring relays

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measure and monitor current, voltage, temperature, frequency, level, power factor and active power. A variety of different enclosures for control technology, industrial systems, machinery and building installations allow for flexible use of relays. The rugged design offers excellent usability and installability.

Power monitors

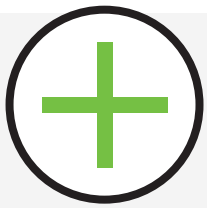
[page 38]

measure variables such as the power factor of a motor or the true power of a pump or fan. These measurements provide indications and important information about the state and functioning of machinery and installations, which reduces maintenance costs, service works and downtime.

Grid and system protection

[page 46]

devices monitor the feed-in of energy to the 230/400V grid. In case of a power failure or disruption by the energy supplier it is vital for small power plants to be disconnected within a few milliseconds to avoid any danger to people and equipment.



Complementary products

[page 48]

- Coupling units
- Switching relays and sockets
- Current transformers
- Thyristor control units
- Hour meters and timers
- Switching power supplies

Product series

Our large and small quartet:
ENYA, VEO, GAMMA and KAPPA – play it safe!

ENYA VEO GAMMA KAPPA

	ENYA	VEO	GAMMA	KAPPA
PRODUCT CATEGORY	**TIMING & MONITORING RELAYS, COUPLING UNITS**	**TIMING & MONITORING RELAYS**	**TIMING & MONITORING RELAYS, POWER MONITORS**	**TIMING & MONITORING RELAYS**
Dimensions (W×H×D)	17.5 / 35×87×65 mm	22.5 / 45×67×76 mm	22.5 / 45×90×108 mm	38×51×80 mm
Design	installation design	compact industrial design	industrial design	installation design
Labelling area	-	freely positionable or fixed	fixed	-
Product standards	EN 61812-1 EN 60947	EN 61812-1 EN 60947	EN 61812-1 EN 50178 EN 60947	EN 61812-1 EN 50178
Energy consumption	0.8 – 1.3 W	extra low: 0.35 – 0.6 W	1 – 1.5 W	0.8 – 2 W
Electrical connection	screw terminal	push-in terminal or screw terminal	screw terminal	plug-in housing mounted on screw terminal socket
Overvoltage category / Rated impulse withstanding voltage	III / 4 kV	III / 4/6 kV (protective separation)	III / 4/6 kV	III / 4 kV
Application field	building	industrial automation	industrial automation	building
Base accuracy	≤ 5 %	≤ 2.5 %	≤ 3 %	≤ 5 %

FOR THE ENTIRE PRODUCT RANGE PLEASE VISIT www.tele-online.com/en

Product features

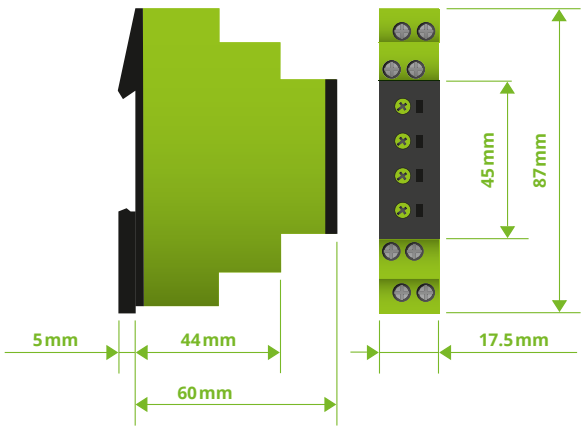
Each of our products is characterized by special features:

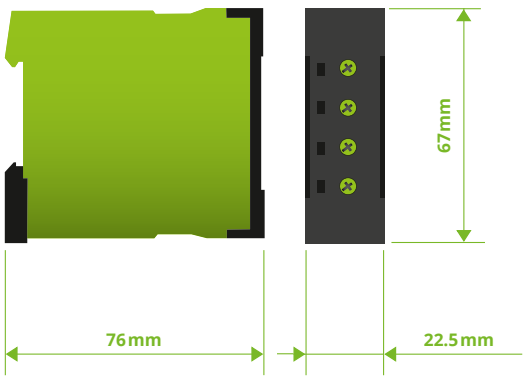
ENYA

- Installation design (45 mm standard front dimension)
- Timing and monitoring relays, single and multifunction
- Width 17.5 mm and 35 mm, 1 or 2 changeover contacts (CO)
- UL listed, CE conformity marking
- Temperature range -25 to +55 °C
- Recessed potentiometer buttons, analog indication by means of LED
- 12 to 240 V AC/DC, powered by measuring circuit
- Compact industrial design

VEO

- Timing and monitoring relays, single and multifunction
- Width 22.5 mm and 45 mm, 1 or 2 changeover contacts (CO)
- Low profile
- UL listed, CE conformity marking
- Temperature range -25 to +60 °C
- Recessed potentiometer buttons, analog indication by means of LED
- 12 to 240 V AC/DC, powered by measuring circuit



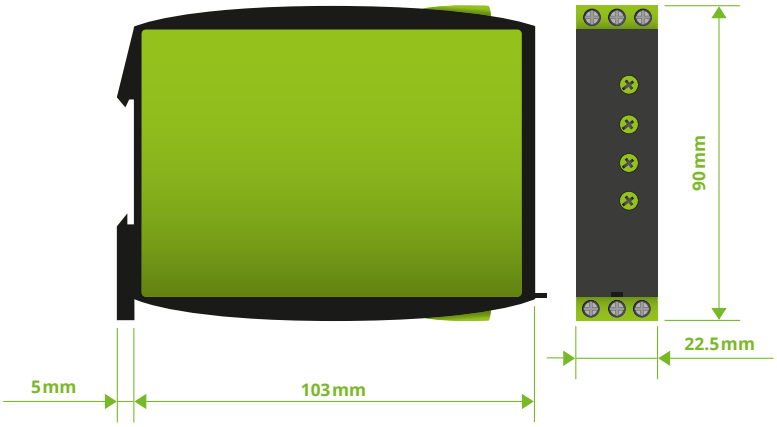


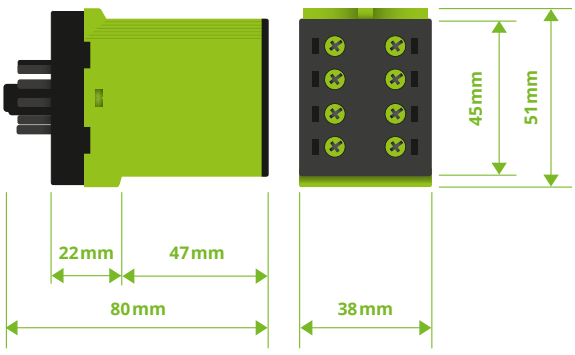
GAMMA

- Industrial design
- Timing and monitoring relays, single and multifunction
- Width 22.5 mm and 45 mm, 1 or 2 changeover contacts (CO)
- UL listed, CE conformity marking
- Temperature range -25 to +55 °C
- Recessed potentiometer buttons, analog indication by means of LED, digital indication by means of LCD-Display
- 12 to 240 V AC/DC, powermodules 24 to 500 V AC or 24 V DC, powered by measuring circuit

KAPPA

- Industrial design (45 mm standard front dimension)
- Timing and monitoring relays, single and multifunction
- Width 35 mm, 2 changeover contacts (2CO) or 1 changeover and 1 normally open contact (1CO + 1NO)
- CE conformity marking
- Temperature range -25 to +55 °C
- Recessed potentiometer buttons, analog indication by means of LED
- 12 to 240 V AC/DC, powered by measuring circuit





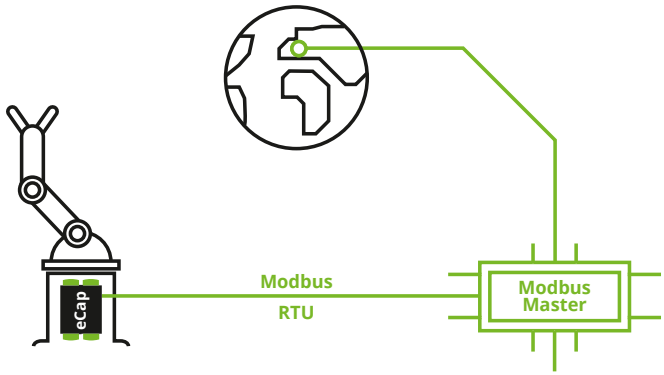
Measure, Connect and Protect

The TELE eCap supports you in your central goal of using energy wisely and reducing operational expenses.

Through the precise measurement of analog electrical values read out from your machines by means of eCap, you easily obtain a reliable database that can be digitally processed, prepared for analysis, and visualized using some Modbus master. The TELE eCap is available in two different variants:

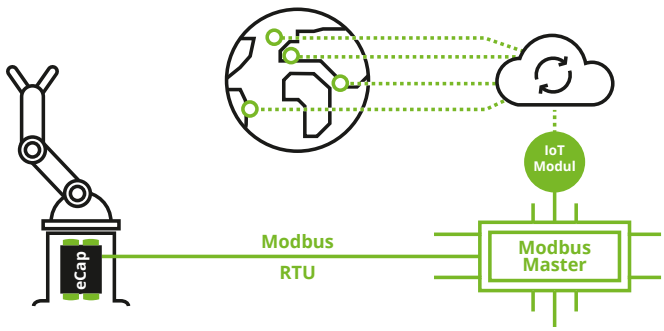
WITH PROGRAMMABLE LOGIC CONTROLLER:

Analog electrical data is read from your machine, motor or power supply, converted into digital values and transmitted via Modbus RTU to a Mdbus master With the obtained data your PLC or HMI can react to the trigger events of your machine in order to protect, prevent, act and alarm. This variant allows you to access the digital data directly on site.



WITH IOT MODULE:

With the addition of an IoT module, the data collected from your machine is transferred to the cloud via internet connection. This way, you can access digital data with various devices from anywhere in the world.



Benefits

High performance

- Excellent sampling resolution: 24 bit.
- Very high sensitivity: 1/100,000 full measurement range.
- High sampling rate: 9,800 samples/second.
- Very high accuracy: up to 0.01 %.

Additional monitoring and switching functions

- Digital input for local integration of additional controls or interfaces.
- Digital output for local activation of the device, e.g. a drive or protective relay.

Super easy setup

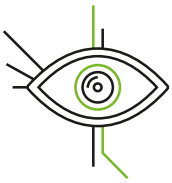
- Setup of Modbus parameters via adjustment dials and screwdriver. Optionally via free configuration software.
- Currentless parametrization possible (unpack › front setting › connect › ready).
- Parameterization can be read from the front even in the de-energized state.
- Fits perfectly into the installation sequence of the TELE Gamma series.

Customization

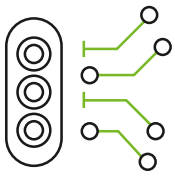
- Possibility to implement customized functions.
- Takes into account values, trends and customer requirements to communicate an accurate digital representation of the analog world.
- Firmware update via Modbus RTU.

Compact size & ease of use

- Mounting width: 45 mm/1.8 in.
- All terminals accessible even when device is mounted.



Predictive maintenance
Monitoring machines during operation to detect any malfunctions or irregularities early on can prevent significant consequential damage to your system. The eCap provides you with accurate digital data for this purpose, enabling you to react quickly



Retrofitting analog technologies
Retrofitting your analog machines is an excellent substitute for costly new purchases and offers you a wide range of new optimization and control options through newly acquired electrical data.

Increasing energy efficiency The optimized use of energy is constantly gaining importance, and this also applies to industrial manufacturing for example. Minimizing energy consumption and adapting the energy required to operate your facilities to the actual workload required can be achieved through clever control using the data from the Performance Sensor eCap.

Process monitoring
Progressive automation in the area of product manufacturing leads to an increase in process monitoring. With the eCap, this can be done automatically to ensure quality and safety. The digitally measured electrical values can be used to decide whether and how to intervene or optimize loads in manufacturing.

MODEL: G4SR480V5A02CAA

TECHNICAL DATA

Accuracy	0.01 % (f); 0.5 % (U); 0.25 % (I); 0.5 % (P,S,Q)
Sensitivity	FMR / 100,000
Current inputs	5 Amp
Digital input	1
Resolution	measures voltage and current with very high resolution (24 bits, 9,800 samples/s) and calculates many other values – power, power factor, frequency, consumed energy etc. that describe the condition of the electrical equipment very well.
Modbus RTU (RS485) interface settings	(9.6; 19.2 or 115.2 kBit/s)
Voltage inputs	0-480 V DC
Power supply	12-48 V DC
Digital outputs	2
Dimensions (W×H×D)	45×90×103 mm
Certificates	CE

Timing Relays
Function Overview

Our timing relays have a variety of functions – here they are in detail:

U	Supply voltage
LED	LED status indication
LED U	LED status indication supply voltage
LED R	Led status indication relay output

LED U/t	LED status indication for supply voltage and timing of function
R	Relay output
T	Thyristor output

S	Control/Trigger input
Y	Star/Wye time
Δ	Delta time
t	Set time

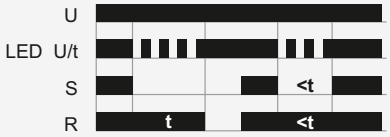
E ON DELAY

When the supply voltage U is applied, the set interval t begins. After the interval t has expired the output relay R switches into on-position. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the set interval, the interval t already expired is erased and is restarted when the supply voltage is next applied.

A OFF DELAY WITHOUT AUXILIARY VOLTAGE

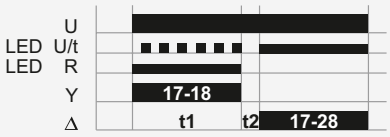
When the supply voltage U is supplied, the output relay R swiches into on-position. If the supply voltage is interrupted, the set interval t begins. After the set interval t has expired the output relay R switches into off-position. If the supply voltage is reconnected before the interval t has expired the interval already is erased and is restarted with the next cycle.

R OFF DELAY



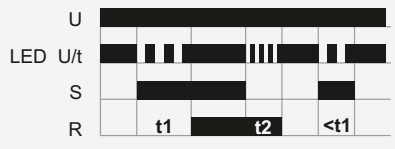
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the output relay R switches into on-position. If the control contact is opened, the set interval t begins. After the interval t has expired the output relay switches into off-position. If the control contact is closed again before the set interval has expired, the interval already expired is erased and is restarted.

S STAR-DELTA START-UP



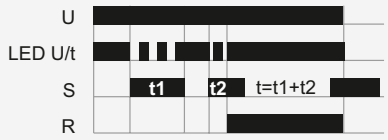
When the supply voltage U is applied, the star-contact switches into on-position and the set star-time t1 begins. After the interval t1 has expired the star-contact switches into off-position and the set transit-time t2 begins. After the interval t2 has expired the delta-contact switches into on-position. To restart the function the supply voltage must be interrupted and reapplied.

ER ON DELAY AND OFF DELAY WITH CONTROL CONTACT



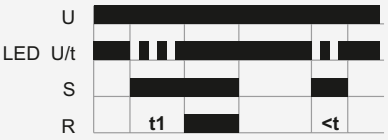
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position. If the control contact is opened, the set interval t2 begins. After the interval t2 has expired, the output relay Switches into off-position. If the control contact is opened before the interval t1 has expired, the interval already expired is erased and is restarted with the next cycle.

Ec ADDITIVE ON DELAY



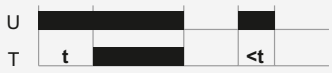
When the supply voltage U is applied, the release for the interval starts. When the control contact S is closed, the set interval t begins. If the control contact S is opened during the set interval t, the interval stops, and the already expired interval is stored. During the lapse of time the control contact can be opened or closed as often as required. If the sum of the periods, in which the control contact S is closed reaches the set interval t the output relay R switches into on-position. The interval is stopped and a further activation of the control contact S remains without effect. By interrupting the supply voltage, the device will be reset. A possibly expired time t is deleted.

Es ON DELAY WITH CONTROL INPUT



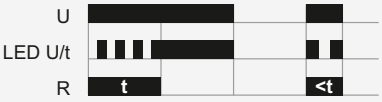
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the set interval t begins. After the interval t has expired the output relay R switches into on-position. This status remains until the control contact is opened again. If the control contact is opened before the interval t has expired, the interval already expired is erased and is restarted with the next cycle.

ET ON DELAY TWO WIRE CONNECTED



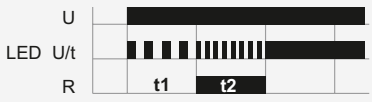
When the supply voltage U is applied, the set interval t begins. After the interval has expired the thyristor switches on. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval, the interval already expired is erased and is restarted when the supply voltage is next applied.

Wu SINGLE SHOT LEADING EDGE VOLTAGE CONTROLLED



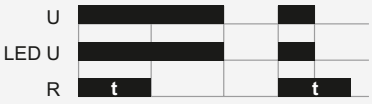
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval t has expired, the output relay switches into off-position. The interval already is erased and is restarted when the supply voltage is next applied.

EWu ON DELAY SINGLE SHOT LEADING EDGE WITH CONTROL CONTACT



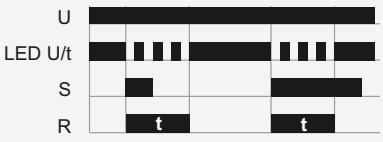
When the supply voltage U is applied, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into off-position. If the supply voltage is interrupted before the interval t1+t2 has expired, the interval already expired is erased and is restarted when the supply voltage is next applied.

nWu MAINTAINED SINGLE SHOT LEADING EDGE



When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is reconnected before the interval t has expired, the unit continues to perform the actual single shot.

Ws SINGLE SHOT LEADING EDGE WITH CONTROL INPUT

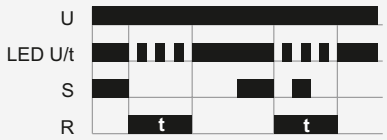


The supply voltage U must be constantly applied to the device. When the control contact S is closed, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

EWs ON DELAY SINGLE SHOT LEADING EDGE WITH CONTROL CONTACT

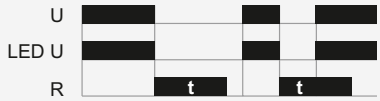
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into offposition. During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

Wa SINGLE SHOT TRAILING EDGE WITH CONTROL INPUT



The supply voltage U must be constantly applied to the device. Closing the control contact S has no influence on the condition of the output R. When the control contact is opened, the output relay switches into on-position and the set interval t begins. After the set interval has expired, the ouput relay switches into off-position. During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

nWa MAINTAINED SINGLE SHOT TRAILING EDGE

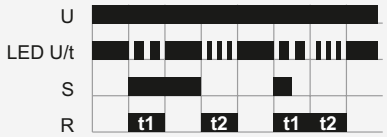


When the supply voltage U is supplied, the output relay R remains into off-position. As soon as the supply voltage is interrupted the output relay switches into on-position and the set interval t begins. After the set interval t has expired the output relay switches into off-position. When the supply voltage is reconnected before the interval t has expired, the unit continues to perform the actual single shot.

nWuWa MAINTAINED SINGLE SHOT LEADING AND TRAILING EDGE

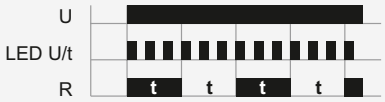
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. As soon as the supply voltage is interrupted the output relay switches into on-position again and the set interval t begins. After the set interval t has expired the output relay switches into off-position. If the supply voltage is interrupted (nWu) or reconnected (nWa) before the interval t has expired the unit continues to perform the actual single shot

WsWa SINGLE SHOT LEADING AND SINGLE SHOT TRAILING EDGE WITH CONTROL CONTACT



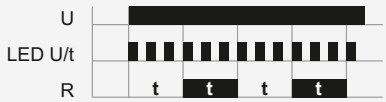
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the output relay R switches into on-position and the set interval t1 begins. After the interval t1 has expired, the output relay R switches into off-position. If the control contact is opened, the output relay again switches into on-position and the set interval t2 begins. After the interval t2 has expired the output relay switches into off-position. During the interval, the control contact can be operated any number of times.

Bi FLASHER PULSE FIRST



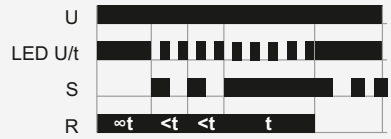
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired, the output relay R switches into off-position and the set interval t begins again. The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

Bp FLASHER PAUSE FIRST



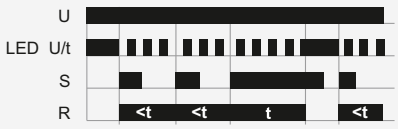
When the supply voltage U is applied, the set interval t begins. After the interval t has expired, the output relay R switches into on-position and the set interval t begins again. After the interval t has expired, the output relay switches into off-position. The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

Wt PULSE DETECTION



When the supply voltage U is applied, the set interval t1 begins and the output relay R switches into on-position. After the interval t1 has expired, the set interval t2 begins. So that the output relay R remains in on-position, the control contact S must be closed and opened again within the set interval t2. If this does not happen, the output relay R switches into off-position and all further pulses at the control contact are ignored. To restart the function the supply voltage must be interrupted and reapplied.

Wtf PULSE SEQUENCE MONITORING EDGE TRIGGERED

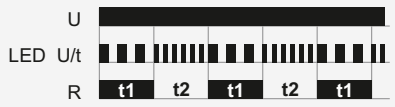


When the supply voltage U is applied the green LED U/t illuminated. When the control contact S is closed (rising edge) the output relay R switches into on- position (yellow LED illuminated) and the set interval t begins (green LED U/t flashes). So that the output relay R remains in on-position, the control contact S must be opened and closed again within the set interval t. if this does not happen, the output relay R switches into off-position. If a new positive edge on the control input is detected, the interval t begins (green LED U/t flashes) and the outputs relay R switches into on-position (yellow Led illuminated).

Wto PULSE SEQUENCE MONITORING EDGE TRIGGERED WITH ON STATE

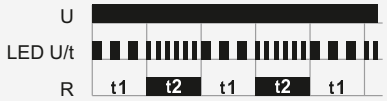
When the supply voltage U is applied the green LED U/t illuminated and if the control input S is on at the same time the set interval t begins (green LED U/t flashes) and the output relay R switches into on position (yellow Led illuminated). If there is no rising edge detected on the control input S, then the Relay R switches into off state. When the control contact S is closed (rising edge) again the output relay R switches into on- position (yellow Led illuminated) and the set interval t begins (green LED U/taagain within the set interval t. if this doed not happen, the output relay R switches into off-position. If a new positive edge on the control input is detected, the interval t begins (green LED U/t flashes) and the output relay R switches into on-position (yellow Led illuminated).

Ii ASYMMETRIC FLASHER PULSE FIRST



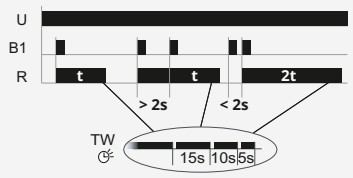
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t1 begins. After the interval t1 has expired, the output relay switches into off-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into on-position. The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.

Ip ASYMMETRIC FLASHER PAUSE FIRST



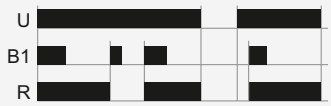
When the supply voltage U is applied, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into off-position. The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.

TW FUNCTION AUTOMATIC TIMER WITH (TW) OR WITHOUT (T) SWITCH-OFF WARNING



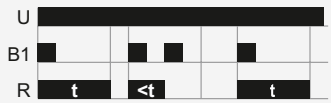
After the pushbutton (control input) has been pressed, the output relay R closes and the set interval t begins. If the pushbutton is pressed again before the interval has expired, the interval begins again (restart function complies with EN 60669-2-3). Rapid, multiple pressing of the pushbutton (pumping) adds 2, 3 or more time intervals to extend the time up to 60 min. Prolonged pressure on the button (>2 s) aborts the interval running and switches the relay off (energy saving function). In the TW mode the device provides a switch-off warning (in accordance with DIN 180-158-2) by generating short pulses (flashing) at 30s, 15s and 5s prior to switch-off.

P IMPULSE SWITCH MODE



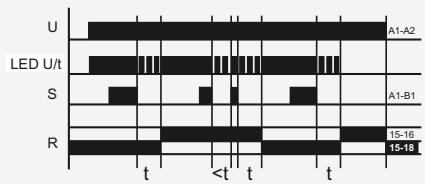
In this mode, every keypress of the pushbutton (control input) toggles the output relay R (flip-flop). In function P, the output relay remains in off-position, whenever the supply voltage is applied. In function PN, the output relay switches into on-position after applying the supply voltage U, if the output relay was in on-position last before power failure. In both functions the output relay switches into on-position, if a short voltage impulse (<2s) is applied to the additional control input (central ON). A longer voltage impulse (>2s) opens the output relay (central OFF).

P (R) IMPULSE SWITCH MODE WITH OFF DELAY



In this mode, every keypress toggles the output relay R (flip-flop). After the pushbutton (control input) has been pressed, the output relay closes and the set interval t begins. After the interval has expired the output relay switches into off-position. If the pushbutton is pressed again before the interval has expired, the interval will be canceled and the output relay switches into off-position.

LA LOAD ALTERNATOR – PUMP CHANGER



In this mode, every falling edge toggles the output relay R (flip-flop) from L1 to L2 or L2 to L1 whatever position is defined by the previous status. On Power-Up the relay R stays in off condition until the first falling edge is detected on S Terminal B1. To ensure a safe and optimal function, please turn both timing controllers on the front to the most left position (CCW), which equals 50 msec. In this operation mode, a minimum delay/de-bump time of 50 msec is applied from the falling edge of the control input until relay R is changing its state. Is a longer delay time as 50 msec is set, a short pulse on the „S“ input resets the times. The timer is restarted with the next falling edge signal on „S“ input again. If you wish to apply longer delay times, set the according time selectors to the required values or contact your application engineer.

E1ZMLA10

Our 3in1 pump alternating relay offers the highest performance in the industry's most compact and space-saving DIN-Rail enclosure style.

TELE'S DUPLEXER CONTROLS TWO loads simultaneously and upgrades the regular alternating function by an integrated ON and OFF delay feature. The selector switch allows the user to lock in one sequence while the relay works with a wide range control voltage of 24 – 240V AC/DC.

OUR E1ZMLA is often used in special applications where optimization of load usage is required by balancing the runtime of two loads. Identical loads are used for the same task – one or more standby units are available in case the first load fails. However, an idle load might deteriorate due to lack of use and thereby lose its safety margin. Alternating relays prevent this by assuring that multiple loads get equal run time. In addition, there are situations where a need arises to have multiple loads on at the same time for additional capacity if one load cannot keep up with demand.

This alternating functionality "LA" is initiated by a control switch, such as a float switch, manual switch, timing relay, pressure switch or other isolated contact. Each time the initiating switch is opened, the output relay contacts will change state, thus alternating the two loads. Two LED indicators show the status of the output relay, control voltage and timing function.

Advantages

- 3in1 Duplex control of two loads
- Integrated OFF and ON delay
- Load alternator w/ selector switch to lock loads manually
- Control voltage 24 – 240V AC/DC
- 8A@250VAC SPDT output
- Low profile selector switch
- 2 LEDs for relay status, timing & operating voltage indication
- cULus, CE, EAC, RoHs
- Rugged design for industrial applications
- Improved inventory maintenance

TYPE DESIGNATION	FUNCTIONALITY	DIMENSIONS (W × H × D)	ART.NO.
E1ZMLA10 24-240V AC/DC	load alternator (LA), ON (E) and OFF (R) delay	17.5×87×65mm	110218

MODEL	E1ZM10	E1ZMQ10	E1ZMWT10	E1ZMW10	E1ZMLA10
ORDER INFORMATION					
PART NO single package	110100 (12 – 240 V) 110200 (24 – 240 V)	110202	110217	-	110218
PART NO packaging unit (10 pcs)	110100 A (12 – 240 V) 110200 A (24 – 240 V)	110202 A	-	110206 A	-
FUNCTIONALITY	multifunction	multifunction	multifunction	multifunction	multifunction
E ON delay	●	●	●	●	●
R OFF delay	●	●	●	●	●
Es ON delay with control contact	●				
Wu Single shot leading edge, voltage-controlled	●	●		●	
Ws Single shot leading edge with control contact	●		●	●	
Wa Single shot trailing edge with control contact	●		●	●	
Bp Flasher pause first	●	●			
Wt Pulse repetition analysis			●	●	
Wtf Pulse sequence monitoring edge triggered			●		
Wto Pulse sequence monitoring edge triggered with on state			●		
WsWa Single shot leading and trailing edge with control contact				●	
La Load alternator – pump changer					●
POWER SUPPLY CIRCUIT					
Supply voltage	12 – 240 V AC/DC 24 – 240 V AC/DC	24 – 240 V AC/DC	24 – 240 V AC/DC	24 – 240 V AC/DC	24 – 240 V AC/DC
Setting range	48 – 63 Hz				
TIME CIRCUITS					
Time ranges	7				
Setting range	0.05 s – 100 h				
INPUT CIRCUIT					
Control signal	●	●	●	●	●
OUTPUT CIRCUIT					
Number of switching contacts	1 CO contact	1 CO contact	1 CO contact	1 CO contact	1 CO contact
Max. switching capacity	2000 VA (8 A / 250 V AC)				
DESIGN					
Dimensions (W×H×D)	17.5×87×65 mm 35×87×65 mm				
Certificates	CE, cULus, EAC	CE, cULus, EAC	CE, EAC	CE, cULus, EAC	CE, cULus, EAC

MODEL	E3ZI20	E1ZI10	E1ZTP	E1ZNT	E1ZWI
ORDER INFORMATION					
PART NO single package	111101	110101	110301	110500	110310
FUNCTIONALITY	multifunction	2-time multifunction	automatic staircase lighting	emergency light tester	impulse switch
ER ON delay and OFF delay with control contact	•				
EWu ON delay single shot leading edge, voltage-controlled	•				
Ws Single shot leading edge with testkey				•	
EWs ON delay single shot leading edge with control contact	•				
Ip Asymmetric flasher pause first		•			
Ii Asymmetric flasher pulse first		•			
Wt Pulse repetition analysis	•				
WsWa Single shot leading and trailing edge with control contact	•				
FUNCTIONALITY STAIRCASE LIGHTING TIMER					
T Automatic timer without switch-off warning			•		
TW Automatic timer with switch-off warning			•		
1 Steady light (ON)			•		
0 Switch-off			•		
P Impulse switch mode without time function (only types with option P)			•		
PN Impulse switch mode power fail latch (only types with option PN)					•
POWER SUPPLY CIRCUIT					
Supply voltage	12 – 240 V AC/DC	12 – 240 V AC/DC	230 V AC	230 V AC	230 V AC
Frequency range			48 – 63 Hz		
TIME CIRCUITS					
Time ranges	7	7	1	1	1
Setting range	1 s – 100 h	1 s – 100 h	0,5 – 12 min	10 min – 3 h	6 – 60 min
INPUT CIRCUIT					
Control signal	•	•	•	integrated test key	•
OUTPUT CIRCUIT					
Number of switching contacts	2 CO contact	1 CO contact	1 CO contact	1 CO contact	1 CO contact
Max. switching capacity	2000 VA (8 A / 250 V AC)	2000 VA (8 A / 250 V AC)	4000 VA (16 A / 250 V AC)	4000 VA (16 A / 250 V AC)	4000 VA (16 A / 250 V AC)
DESIGN					
Dimensions (W×H×D)	35×87×65 mm	17,5×87×65 mm			
Certificates	CE, cULus, EAC	CE, cULus, EAC	CE, EAC	CE, EAC	CE, EAC

MODEL	V2ZM10	V2ZQ10	V2ZI10	V2ZS20	V2ZA10 3MIN	V2ZET
ORDER INFORMATION						
PART NO Screw terminal	125100	125150	125200	125300	125500	125130 (12-240 V AC/DC)
PART NO Push-in terminal	125600					-
PART NO packaging unit (10 pcs)	125100A	125150A	-	-	-	-
FUNCTIONALITY	multifunction		2-time multifunction	star-delta	multifunction	ON delay 2 wire
E ON delay	●	●			●	
ET ON delay 2 wire connected						●
A OFF delay without auxiliary voltage					●	
R OFF delay	●	●				
Ec Additive ON delay	●					
Es ON delay with control input	●					
Wu Single shot leading edge voltage controlled	●	●				
nWu Maintained single shot leading edge					■	
Ws Single shot leading edge with control input	●					
Wa Single shot trailing edge with control input	●					
nWa Maintained single shot trailing edge					●	
nWuWa Maintained single shot leading and trailing edge					●	
Bi Flasher pulse first	●					
Bp Flasher pause first	●	●				
Wt Pulse sequence monitoring	●					
Ip Asymmetric flasher pause first			●			
Ii Asymmetric flasher pulse first			●			
S Star-delta start-up				●		
SUPPLY CIRCUIT						
Supply voltage	12 – 240 V AC/DC	24 – 240 V AC/DC	12 – 240 V AC/DC	12 – 240 V AC/DC	24 – 240 V AC/DC	12 – 240 V AC/DC
Frequency range	48 – 63 Hz or DC					
TIME CIRCUITS						
Time ranges	10		10	4	4	5 (125130)
Setting range	0,05 s – 100 h		0,05 s – 100 h	0,05 s – 3 min	0,1 s – 3 min	0,05 s – 1 h (125130)
INPUT CIRCUIT						
Control signal	●		●	–	–	–
OUTPUT CIRCUIT						
Number of switching contacts	1 CO contact		1 CO contact	2 NO contact	1 CO contact	1 thyristor
Max. switching capacity	2000 VA (8 A / 250 V AC)		2000 VA (8 A / 250 V AC)	750 VA (3 A / 250 V AC)	2000 VA (8 A / 250 V AC)	125 VA / 250 V AC
DESIGN						
Dimensions (W×H×D)	22,5×67×76 mm					
Certificates	CE, cULus, EAC (devices with push-in terminal are not cULus listed)					

MODEL	G2ZM20	G2ZMF11	G2ZI20	G2ZIF20	G2ZA20
ORDER INFORMATION					
PART NO Screw terminal	-	120100	-	120200	120601
PART NO Push-in terminal	120401	120103	120501	120201	120600
FUNCTIONALITY	multifunction	multifunction	multifunction	multifunction	multifunction
E ON delay	●	●			●
A OFF delay without auxiliary voltage					●
R OFF delay	●	●			
ER ON delay and OFF delay with control contact			●	●	
Es ON delay with control input	●	●			
Wu Single shot leading edge voltage controlled	●	●			
EWu ON delay single shot leading edge with control contact			●	●	
nWu Maintained single shot leading edge					●
Ws Single shot leading edge with control input	●	●			
EWs ON delay single shot leading edge with control contact			●	●	
Wa Single shot trailing edge with control input	●	●			
nWa Maintained single shot trailing edge					●
nWuWa Maintained single shot leading and trailing edge					●
WsWa Single shot leading and single shot trailing edge with control contact			●	●	
Bi Flasher pulse first	●	●			
Bp Flasher pause first	●	●			
Ip Asymmetric flasher pause first			●	●	
Ii Asymmetric flasher pulse first			●	●	
POWER SUPPLY CIRCUIT					
Supply voltage	12 – 240 V AC/DC	24 – 240 V or freely selectable via power module TR2, SNT2	12 – 240 V AC/DC	24 – 240 V or freely selectable via power module TR2, SNT2	24 – 240 V or freely selectable via power module TR2, SNT2
Frequency range	48 – 63 Hz				
TIME CIRCUITS					
Time ranges	7	16	7	10	4
Setting range	0,05 s – 100 h	0,05 s – 30 d	0.05 s – 100 h	0,05 s – 10 h	1 s – 10 min
INPUT CIRCUIT					
Control signal	●	●	●	●	-
Remote potentiometer	-	●	-	●	-
OUTPUT CIRCUIT					
Number of switching contacts	2 CO contact	1 delayed / 1 instantaneous CO contact	2 CO contact	2 CO contact	2 CO contact
Max. switching capacity	1250 VA (5 A / 250 V AC)				
DESIGN					
Dimensions (W×H×D)	22.5×108×90 mm				
Certificates	CE, cULus, EAC (devices with push-in terminal are not cULus listed)				

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MODEL	K3ZM20	K3ZM20P	K3ZA20 3MIN	K3ZI20	K3ZS20
ORDER INFORMATION					
PART NO	135100	135200	135400	135101	135300
FUNCTIONALITY	multifunction	multifunction	multifunction	2-times multifunction	star-delta
E ON delay	●	●	●		
A OFF delay without auxiliary voltage			●		
R OFF delay	●	●			
ER ON delay and OFF delay with control contact				●	
Es ON delay with control input	●	●			
Wu Single shot leading edge voltage controlled	●	●			
EWu ON delay single shot leading edge with control contact				●	
nWu Maintained single shot leading edge			●		
Ws Single shot leading edge with control input	●	●			
EWs ON delay single shot leading edge with control contact				●	
Wa Single shot trailing edge with control input	●	●			
nWa Maintained single shot trailing edge			●		
nWuWa Maintained single shot leading and trailing edge			●		
WsWa Single shot leading and single shot trailing edge with control contact				●	
Bp Flasher pause first	●	●			
Ip Asymmetric flasher pause first				●	
Ii Asymmetric flasher pulse first				●	
Wt Pulse sequence monitoring				●	
S Star-delta start-up					●
SUPPLY CIRCUIT					
Supply voltage	12 – 240 V AC/DC	12 – 240 V AC/DC	24 – 240 V AC/DC	12 – 240 V AC/DC	12 – 240 V AC/DC
Frequency range	48 – 63 Hz				
TIME CIRCUITS					
Time ranges	7	7	4	7	4
Setting range	0,05 s – 100 h	0,05 s – 100 h	0,1 s – 3 min	0,05 s – 100 h	0,05 s – 3 min
INPUT CIRCUIT					
Control signal	●	● (isolated)	-	●	-
OUTPUT CIRCUIT					
Number of switching contacts	2 CO contacts				
Max. switching capacity	2000 VA (8 A / 250 V AC)				
DESIGN					
Dimensions (W×H×D)	38×51×80 mm				
Certificates	CE, EAC				





MODEL	K3ZM11	K3ZMF20	K3ZIF20	PF-113BE (R11X)	PF-113BE/M (ES12)
ORDER INFORMATION				**ACCESSORIES FOR KAPPA RELAYS**	
PART NO	135500	135600	135700	180155	180136
FUNCTIONALITY	multifunction	multifunction	2-times multifunction	sockets	
E ON delay	●	●		11-pole socket for mounting KAPPA relays on DIN-Rail TS 35	
R OFF delay	●	●			
ER ON delay and OFF delay with control contact			●		
Es ON delay with control contact	●	●			
Wu Single shot leading edge, voltage-controlled	●	●			
EWu ON delay single shot leading edge, voltage-controlled			●		
Ws Single shot leading edge with control input		●			
EWs ON delay single shot leading edge with control contact			●		
Wa Single shot trailing edge with control input	●	●			
WsWa Single shot leading and trailing edge with control contact			●		
Bp Flasher pause first	●	●			
Ip Asymmetric flasher pause first			●		
Ii Asymmetric flasher pulse first			●		
Wt Pulse sequence monitoring			●		
SUPPLY CIRCUIT					
Supply voltage DC	24V			depends on selected KAPPA relays	
Supply voltage AV	24V, 110 – 240V			depends on selected KAPPA relays	
Frequency range	48 – 63Hz			depends on selected KAPPA relays	
TIME CIRCUITS				**PACKAGING UNIT**	
Time ranges	16	7	7	1 or 10 pcs	10 pcs
Setting range	0,05s – 30d	0,05s – 100h	0,05s – 100h		
INPUT CIRCUIT					
Control signal	●	●	●		
Remote potentiometer		●	●		
OUTPUT CIRCUIT					
Number of switching contacts	2 CO contacts	1 CO + 1 NO contact	1 NC + 1 NO contact	depends on selected KAPPA relays	
Max. switching capacity	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	depends on selected KAPPA relays	
DESIGN					
Dimensions (W×H×D)	38×51×80 mm			38×61,5×26 mm	38×75×26 mm
Certificates	CE, EAC			CE, cULus, CSA	CE, cULus, CSA

Remote potentiometer can be found on page 49.

Timing relays for various applications

Safe switch-off

E1ZM10 24-240 To prevent fire hazard, the stove in a dormitory shared kitchen must switch off safely after a defined period of time. The switch needs to perform even if the central pushbutton has been illegally blocked.

Fluid level monitoring

V2ZQ10 In pools of a wastewater treatment plant the use of the timing relay with Function E (switch-on delay) delays reading of the switch contact until the next usable measurement, and thereby prevents “flutter switching”.

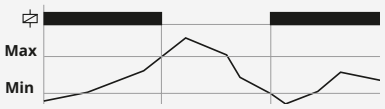
Monitoring of a cold store door

G2ZMF11 As soon as the control contact (Y1-Y2) is interrupted by opening the cold store door the cooling is switched off directly and the set time t starts to run. If the cold store door remains open for longer than the selected time, the delayed contact deactivates and an acoustic signal is triggered. This prevents the door from remaining open for too long or being improperly closed.

please scan QR code to see more timing relay applications

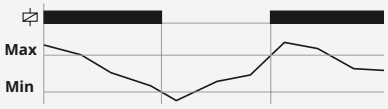
Monitoring Relays
Function Overview

O OVER



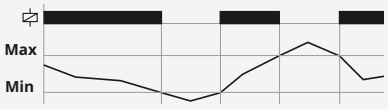
If the measured value exceeds the adjusted MAX threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value falls below the adjusted MIN threshold.

U UNDER



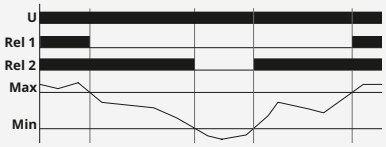
If the measured value falls below the adjusted MIN threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value exceeds the adjusted MAX threshold.

W WINDOW



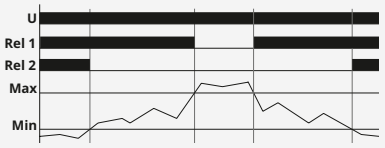
If the measured value falls below the adjusted MIN threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value exceeds the adjusted MIN threshold. If the measured value exceeds the adjusted MAX threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value falls below the adjusted MAX threshold

2MIN MINIMUM MONITORING



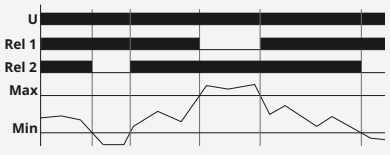
If the measured value falls below the adjusted MAX threshold, the output relay Rel1 switches into off-position. If the measured value falls below the adjusted MIN threshold, the output relay Rel2 switches into off-position. The output relays Rel1 and Rel2 switch into on-position again, as soon as the measured value exceeds the according adjusted threshold (MAX or MIN).

2MAX MAXIMUM MONITORING



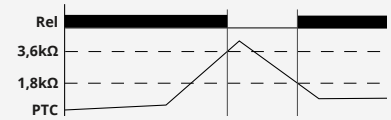
If the measured value exceeds the adjusted MIN threshold, the output relay Rel2 switches into off-position. If the measured value exceeds the adjusted MAX threshold, the output relay Rel1 switches into off-position. The output relays Rel1 and Rel2 switch into on-position again, as soon as the measured value falls below the according adjusted threshold (MAX or MIN).

MM MINIMUM AND MAXIMUM MONITORING (MIN/MAX)



If the measured value falls below the adjusted MIN threshold, the output relay Rel2 switches into off-position. The output relay Rel2 switches into on-position again, as soon as the measured value exceeds the adjusted MIN threshold. If the measured value exceeds the adjusted MAX threshold, the output relay Rel1 switches into off-position. The output relay Rel1 switches into on-position again, as soon as the measured value exceeds the adjusted MIN threshold.

TEMP TEMPERATURE MONITORING



If the supply voltage U is applied and the cumulative resistance of the PTC-circuit is less than 3.6kΩ (standard temperature of the motor), the output relay R switches into on-position. When the cumulative resistance of the PTC-circuit exceeds 3.6kΩ, the output relay switches into off-position. The output relay switches into on-position again after the cumulative resistance falls below 1.6kΩ.

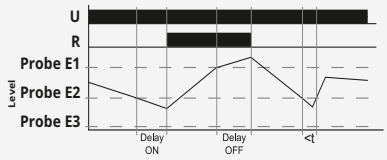
SEQ PHASE SEQUENCE MONITORING

When all phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay switches into on-position (yellow LED illuminated). When the phase sequence changes, the output relay switches into off-position (yellow LED not illuminated). It is recommended to connect the neutral wire of the monitoring relay once loads in the system use neutral connection.

PHASE FAILURE MONITORING

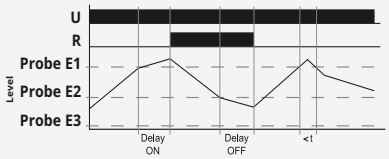
As soon as one of the three phases fails, the output relay R switches into off-position (yellow LED not illuminated). For reliable phase loss detection, the asymmetric function should be enabled. It is recommended to connect the neutral wire of the monitoring relay once loads in the system use neutral connection.

PUMP UP



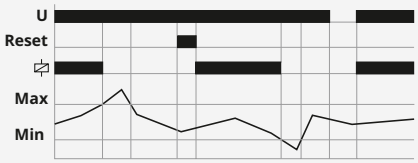
Connection of the probe rods E1, E2 and E3. When the air-fluid level falls below the minimum probe E2 the set interval of tripping delay begins. After the expiration of the interval, the output relay R switches into on-position. When the air-fluid level again rises above the maximum probe E1, the set interval of turn-off delay begins. After the expiration of the interval the output relay switches into off-position.

PUMP DOWN



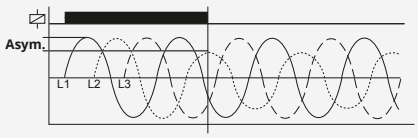
Connection of the probe rods E1, E2 and E3. When the maximum probe E1 gets moistened the set interval of tripping delay begins. After the expiration of the interval the output relay R switches into on-position. When the airfluid level falls below the minimum probe E2, the set interval of turn-off delay begins. After the expiration of the interval, the output relay switches into off-position.

LATCH (ERROR MEMORY)



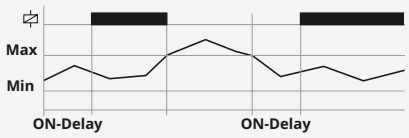
If the device detects a fault, the output relay only switches on again when the fault latch has been reset. The fault latch can be reset by means of an internal or external reset button or by interrupting the supply voltage.

ASYM ASYMMETRY MONITORING



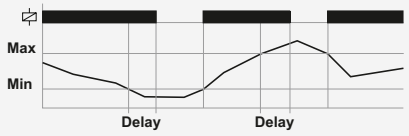
If the asymmetry of the phase-to-phase voltages exceeds the value set at the ASYM-regulator, the output relay switches into off-position. If the neutral wire is connected to the device, the asymmetry of the phase voltages referred to the neutral wire (Y-voltage) is monitored also. In that case both values of the asymmetry are evaluated and if one of the values exceeds the value set at the ASYM-regulator, the output relay switches into off-position.

ON DELAY



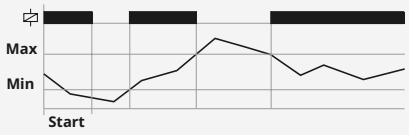
The output relay switches on if the monitored value is within the selected range during the defined time period.

DELAY



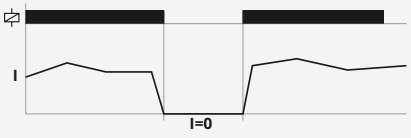
If the monitored value leaves the selected range, the output relay only switches into off-position following expiry of the trip delay.

START START-UP SUPPRESSION



The output relay switches on when the supply voltage is applied. Changes to measured variables have no impact on the setting of the output relay during start up suppression.

I = 0 RECOGNITION OF DISCONNECTED CONSUMERS



When the current flow between i and k is interrupted the output relay switches into off-position. When the current flow is restored, the measuring cycle is restarted with the set interval of the start-up supression.

VEO-V4LM4S30

TELE's new V4LM4S30 24-240V AC/DC electrode relay for level monitoring in conductive fluids combines 10 different functions in one very compact device. It monitors the level of a fluid via probes, which are directly immersed.

Depending on the function selected, the V4LM controls the pumping in and pumping out as well as the running dry and overflow alarm. The device is utilized wherever observing a defined fill level represents an important criterion for the function, efficiency and safety. It protects machines and systems from leakage damage, fluid loss as well as running dry or overflow.

FUNCTION

Unlike float switches, the TELE V4LM has no moving parts and thus has a long durability. In contrast to ultrasonic and radar measurements, the device is resistant to contamination, dust, foam and mist in the containers. With extremely low probe voltage, small measuring currents and a large sensitivity window from 0.25 to 500 kOhm, the fill level measurement is suitable for feed applications and does not endanger animals. The selected measuring frequency of 18.3 Hz enables an extremely robust measurement without interference (no harmonics to mains frequency 50 or 60 Hz). In addition, the alternating current measurement prevents the build-up of oxyhydrogen gas as well as electrolytic disintegration of the probes, which can occur with comparable devices with direct current measurement.

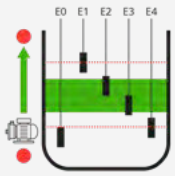
Advantages

- No moving parts (compared to a float switch)
- Robust against soil, dust, foam, mist in the containers (contrary to ultrasound and radar measurements)
- Extremely low probe voltage and measuring currents, therefore also suitable for animal feeding application
- Large sensitivity window (0.25 to 500 kOhm)
- Robust measurement without interference by selecting the measuring frequency of 18.3 Hz (no harmonic to mains frequency 50 or 60 Hz), AC measurement also avoids oxyhydrogen gas formation and electrolytic decomposition of the probe.

FUNCTION 1

PUMP UP WITH MIN-/MAX- ALARM

(2uA) 1 container, 4 probes, 1 pump

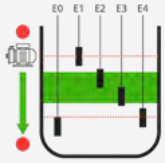


Level control between probes E2 and E3 by pumping up. The probes E1 and E4 serve as overflow – respectively as dry running alarm and may be used to control alarm devices, valves or additional pumps.

FUNCTION 2

PUMP DOWN WITH MIN-/MAX- ALARM

(2dA) 1 container, 4 probes, 1 pump

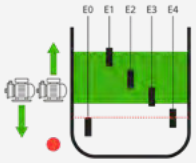


Level control between probes E2 and E3 by pumping down. The probes E1 and E4 serve as overflow – respectively as dry running alarm and may be used to control alarm devices, valves or additional pumps.

FUNCTION 3

PUMP UP AND DOWN (bidirectional) WITH MINIMUM ALARM (3b-)

1 container, 4 probes, 2 pumps

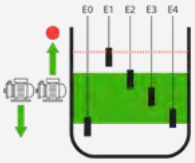


The level is controlled by pumping in and out around the level of probe E3. One example of the minimum alarm via probe E4 is used in dry-running warnings.

FUNCTION 4

PUMP UP AND DOWN (bidirectional) WITH MAXIMUM ALARM (3b+)

1 container, 4 probes, 2 pumps

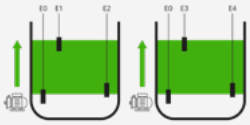


The level is maintained by pumping in and out around the level of probe E2. A maximum alarm via probe E1 warns of liquid overflow. Functions 3 and 4 can be changed during full operation.

FUNCTION 5

TWO INDEPENDENT CONTAINERS – PUMP UP (2u2)

1-2 container, 1-2 probes each, 1 pump each

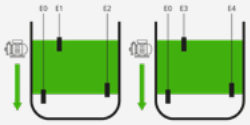


Pump up between probes E1-E2 respectively E3-E4 (alternatively control by one probe at a time). This feature allows level control in two separate containers with only one device. It is also possible to control cascades.

FUNCTION 6

TWO INDEPENDENT CONTAINERS – PUMP DOWN (2d2)

1-2 container, 1-2 probes each, 1pump each

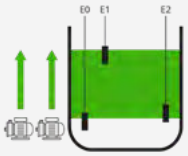


Pump down between probes E1-E2 respectively E3-E4 (alternatively control by one probe at a time). This feature allows level control in two separate containers with only one device. It is also possible to control cascades.

FUNCTION 7

PUMP UP WITH INTEGRATED PUMP CHANGE

(2uc) 1 container, 2 probes, 2 pumps

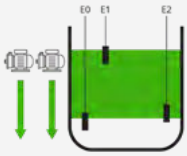


Pump up between control probes E1 and E2. The V4LM acts as an intelligent pump changer (for even use) with pump monitoring (feedback inputs E3 & E4). If a pump fails, the remaining pump is permanently prioritized and an alarm is issued, for maximum availability and uninterrupted operation through full redundancy.

FUNCTION 8

PUMP DOWN WITH INTEGRATED PUMP CHANGE

(2dc) 1 container, 2 probes, 2 pumps

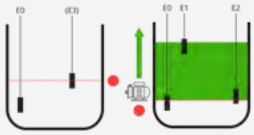


Pump down between control probes E1 and E2. The V4LM acts as an intelligent pump changer (for even use) with pump monitoring (feedback inputs E3 & E4). If a pump fails, the remaining pump is permanently prioritized and an alarm is issued, for maximum availability and uninterrupted operation through full redundancy.

FUNCTION 9

WELL CONTROL (3w-) WITH WELL AND DRY ALARM

1 well, 1 high tank, 3 probes, 1 pump

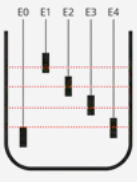


The function serves to ensure the water supply by means of a high tank and a well (pump up into the high tank from the well). Alarm functions: well alarm and dry alarm (high tank and well without water). The pump is protected against dry running in case liquid levels of a well (or feeding container) fall below a minimum value.

FUNCTION 10

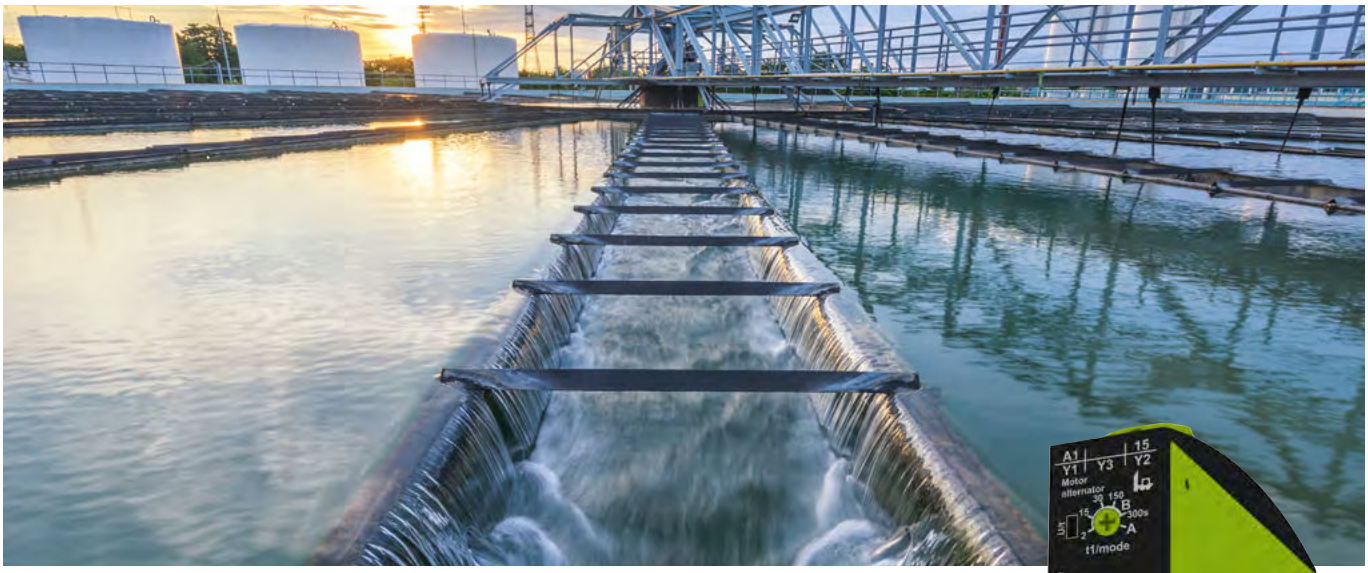
CODE OUTPUT FOR PLC CONNECTION

(4ce) 1 container, 4 probes



The 3 output relays are used to output the probe states by means of coding. Up to 4 level levels can be evaluated for one container. By connecting to an external controller, individual application conditions can be taken into account. Simple connection without external control unit can also protect up to four containers, with one probe each against overflow or dry running, and trigger a collective alarm.

FOR TECHNICAL SPECIFICATIONS please refer to page 33



Operate pumps fail-safe

TELE pump alternators save life cycle costs and prevent production downtime.

Pump systems cause around a quarter of the world's electricity consumption. For this reason, consequent analysis of operating data and long-term optimization of the pump design offer enormous energy-saving potential. In addition, malfunctions that are not recognized in time cause around 70 percent of a pump's life cycle costs, often leading to production downtimes and resulting in high costs.

PUMP MONITORING

This risk can be eliminated by appropriate monitoring, by measuring performance drops at an early stage and triggering an alarm or control measures. TELE has a whole series of devices, such as E1ZMLA, G2ASMA20 or V4LMS30 for this application. The devices recognize all unfavorable operating conditions of a pump, such as wear, but also blockage, wrong running, filter contamination, hot running, cavitation, temperature and dry running. In addition, some devices feature an integrated temperature monitor, which detects increased motor temperature, for example due to phase failure, frequent start-ups or blockages. Error states are reported immediately and thanks to timely maintenance, consequential damage to the system and thus expensive production downtimes can be avoided.

Advantages

- Improve system reliability
- Increase pump efficiency
- Optimize maintenance cycles
- Prevent failure and reduction of downtimes
- Optimized utilization in parallel operation

PUMP CONTROL FOR PARALLEL OPERATION

For direct pump control, soft starters for pump start/stop as well as pump changers for alternately controlling pumps are used. In conveyor systems, pumps are usually designed to be redundant in order to maintain the system function in the event of machine damage and to cover short-term delivery peaks through parallel operation. Here the TELE pump alternator G2ASMA20 guarantees the alternating operation of both pumps, so that the reserve pump remains functional and does not fail in case of need.

MODEL	E1IM10 AACL10 230 V AC	E3IM10 AL20 230 V AC	E3IF500MAAC20	E3YF400 VE20 0.85	E3YF400 VT02 0.85
ORDER INFORMATION					
PART NO single package	1340200	1341200	1341201	1341404	1341402
FUNCTIONALITY	1-phase ac current monitoring	1--phase AC/DC current monitoring	1-phase AC current monitoring	3-phase AC voltage monitoring	3-phase AC voltage monitoring
O ... Over	●	●			
U ... Under	●	●	●	●	●
W ... Window	●	●			
Test function					●
SWITCHING THRESHOLD					
Maximum	10 – 100% of I_N	10 – 100% of I_N	-	-	-
Minimum	5 – 95% of I_N	5 – 95% of I_N	50 – 500mA	fixed, 195.5V (0.85)	fixed, 195.5V (0.85)
Asymmetry	-	-	-	-	-
MEASURING CIRCUIT					
Measuring variable	current AC sinus	current AC/DC AC sinus	current AC sinus	3(N)~ AC sinus	3(N)~ AC sinus
Measuring input	10A AC	100mA / 1A / 10A AC/DC	500mA AC*	U_N= 400/230V AC	U_N= 400/230V AC
SUPPLY CIRCUIT					
Supply voltage	230V AC -15% to +15%	230V AC	230V AC	= measuring voltage 3(N)~ 400/230V AC -30% to +30%	= measuring voltage 3(N)~ 400/230V AC -30% to +30%
Frequency range	48 – 63Hz				
TIME CIRCUITS					
Start-up surpression time (START)	-	0 – 10s	0 – 20min	-	-
Tripping delay (DELAY)	0,1 – 10s	0,1 – 10s	0 – 20min	-	fixed, approx. 200ms
ON delay	-	-	-	fixed, 1min	-
OUTPUT CIRCUIT					
Number of switching contacts	1 CO contact	2 CO contact	2 CO contact	2 CO contact	2 CO contact
Max. switching capacity	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)
DESIGN					
Dimensions (W×H×D)	35×87×65 mm				
Certificates	CE, cULus, EAC	CE, EAC	CE, EAC	CE, cULus, EAC	

* For currents greater than 5A, matching current transformers are available as accessories and can be found on page 51.

MODEL	E1PF400 VSY01	E1PF480Y/277VSY10	E1PF480Y/277 VSY01	E1YF400 V01 0.85	E3YF400 V02 0.85
ORDER INFORMATION					
PART NO single package	1340300	1340305	1340306	1340402 (0.85)	1341401
PART NO packaging unit (10 pcs)	1340300A		-	1340402A (0.85)	-
FUNCTIONALITY	3-phase AC voltage monitoring				
U ... Under				●	●
W ... Window					
SEQ ... Phase sequence	●	●	●		
Phase failure	●	●	●		
ASYM ... Asymmetry	●	●	●		
SWITCHING THRESHOLD					
Minimum	-	-	-	fixed, 195.5V (0.85)	fixed, 195.5V (0.85)
Asymmetry	5 – 25%, OFF	5 – 25%, OFF	5 – 25%, OFF	-	-
MEASURING CIRCUIT					
Measuring variable	3(N)~ AC sinus	3(N)~ AC sinus	3~ AC sinus	3(N)~ AC sinus	3(N)~ AC sinus
Measuring input	U_N= 400/230V AC	U_N= 208/120V to 480/277V AC	U_N= 208/120V to 480/277V AC	U_N= 400/230V AC	U_N= 400/230V AC
SUPPLY CIRCUIT					
Supply voltage	= measuring voltage 3(N)~ 400/230V AC -30% to +30%	= measuring voltage 3~ 400/230V AC -10% to +10%	= measuring voltage 3~ 480/277V AC -10% to +10%	= measuring voltage 3(N)~ 400/230V AC -30% to +10%	= measuring voltage 3(N)~ 400/230V AC -30% to +30%
Frequency range	48 – 63Hz				
TIME CIRCUITS					
Tripping delay (delay)	fixed, approx. 100ms	0.1 – 20s	fixed, approx. 100ms	fixed, approx. 200ms	fixed, approx. 200ms
OUTPUT CIRCUIT					
Number of switch contacts	1 CO contact	1 CO contact	1 CO contact	1 CO contact	2 CO contacts
Max. switching capacity	1250VA (5A / 250V AC)				
DESIGN					
Dimensions (W×H×D)	17.5×87×65mm	17.5×87×65mm	17.5×87×65mm	17.5×87×65mm	35×87×65mm
Certificates	CE, EAC	CE, EAC	CE, cULus, EAC	CE, EAC	CE, cULus, EAC

MODEL	E1YM400 VS10	E1YM480/277 VS10	E3YM230 VS20	E1UM230 V01	E3LM10 230 VAC
ORDER INFORMATION					
PART NO single package	1340405	1340409	1341406	1340101	1341500
FUNCTIONALITY	3- and 1-phase AC voltage monitoring	3-phase AC voltage monitoring	3- and 1-phase AC voltage monitoring	1-phase AC/DC voltage monitoring	level monitoring of conductive liquids
U ... Under	●	●	●	●	
W ... Window	●	●	●	●	
SEQ ... Phase sequence	●	●	●		
Phase failure			●		
Pump up					●
Pump down					●
SWITCHING THRESHOLD					
Maximum	80 – 130% of U_N	75 – 110% of U_N	80 – 130% of U_N	80 – 120% of U_N	-
Minimum	70 – 120% of U_N	65 – 100% of U_N	70 – 120% of U_N	75 – 115% of U_N	-
Asymmetry	5 – 25%, OFF	-	-	-	-
MEASURING CIRCUIT					
Measuring variable	3(N)~ AC sinus	3~ AC sinus	3(N)~ AC sinus	voltage AC/DC AC sinus	liquid level via conductive probes
Measuring input	U_N= 400/230 V AC	U_N= 480/277 V AC	U_N=230/132 V AC	24 V AC/DC; 230 V AC	0.25 – 100 kΩ
SUPPLY CIRCUIT					
Supply voltage	= measuring voltage 3(N)~ 400/230 V AC -30% to +30%	= measuring voltage 3~ 480/277 V AC -35% to +10%	= measuring voltage 3(N)~ 400/230 V AC -30% to +30%	= measuring voltage 24 V AC/DC; 230 V AC -25% to +20%	230 V AC -15% to +10%
Frequency range	48 – 63 Hz	48 – 63 Hz	48 – 63 Hz	48 – 63 Hz or DC	48 – 63 Hz
TIME CIRCUITS					
Tripping delay (delay)	0.1 – 10 s	0.1 – 10 s	0 – 30 s	-	0.5 – 10 s
OFF delay	-	-	-	-	0.5 – 10 s
OUTPUT CIRCUIT					
Number of switch contacts	1 CO contact	1 CO contact	2 CO contacts	1 CO contact	1 CO contact
Max. switching capacity			1250 VA (5 A / 250 V AC)		
DESIGN					
Dimensions (W x H x D)	17.5×87×65 mm	17.5×87×65 mm	35×87×65 mm	17.5×87×65 mm	35×87×65 mm
Certificates	CE, EAC	CE, cULus, EAC	CE, EAC	CE, cULus, EAC	CE, cULus, EAC





MODEL	V2PF480Y/277 VSY01	V2PM400Y/230 VS10	V2UM230 V10	V2UF230 V10	V4P-F480Y/277 VSYTK02
ORDER INFORMATION					
PART NO screw terminal	2100000	2100500	2100300	2100600	2104200
FUNCTIONALITY	3-phase AC voltage monitoring	3-phase AC voltage monitoring	1-phase AC/DC voltage monitoring	1-phase voltage drop detector	3-phase AC voltage monitoring
U ... Under		●	●	●	
W ... Window		●	●		
SEQ ... Phase sequence	●	●			●
Phase failure	●	●			●
ASYM ... Asymmetry	●				●
Voltage interruptions (fast detection)				●	
Temperature monitoring (PTC)					●
SWITCHING THRESHOLD					
Maximum	-	75 – 130 % of U_N	80 – 115 % of U_N	-	-
Minimum	-	70 – 125 % of U_N	75 – 110 % of U_N	165 V AC	-
Asymmetry	5 – 25 %, OFF	-	-	-	5 – 25 %, OFF
MEASURING CIRCUIT					
Measuring variable	3~ AC sinus	3~ AC sinus	voltage AC/DC AC sinus	voltage AC	temperature, voltage 3~ AC sinus
Measuring input	U_N = 208/120 V to 480/277 V AC	U_N = 400/230 V AC	24 V AC/DC; 230 V AC	U_N = 180 – 230 V AC	U_N = 208/120 V to 480/277 V AC
SUPPLY CIRCUIT					
Supply voltage	= measuring voltage 3~ 208/120 V to 480/277 V AC -10 % to +10 %	= measuring voltage 3(N)~ 400/230 V AC -35 % to +35 %	= measuring voltage 24 V AC/DC; 230 V AC 24 V: -30 % to +30 % 230 V: -30 % to +20 %	= measuring voltage 230 V AC	= measuring voltage 3~ 208/120 V to 480/277 V AC -10 % to +10 %
Frequency range	48 – 63 Hz	16.6 – 400 Hz	16.6 – 400 Hz or DC	48 – 63 Hz	48 – 63 Hz
TIME CIRCUITS					
ON delay	approx. 400 ms	approx. 200 ms	approx. 300 ms	0.5 – 10 s	approx. 500 ms
Tripping delay (delay)	< 250 ms	0.1 – 10 s	0.1 – 10 s	-	approx. 250 ms
Response time short voltage interruptions	-	-	-	10 – 40 ms	-
OUTPUT CIRCUIT					
Number of switch contacts	1 CO contact	1 CO contact	1 CO contact	1 CO contact	2 CO contacts
Max. switching capacity			2000 VA (8 A / 250 V AC)		
DESIGN					
Dimensions (W×H×D)	22.5×67×76 mm	22.5×67×76 mm	22.5×67×76 mm	22.5×67×76 mm	45×67×76 mm
Certificates	CE, cULus, EAC	CE, cULus, EAC	CE, cULus, EAC	CE, EAC	CE, cULus, EAC





MODEL	V2TF01	V2IM10 AL10	V4IM100 AL20 V4IM35 AL20	V4IA100 A	V4LM4S30
ORDER INFORMATION					
PART NO screw terminal	2100100	2100400	2104400 (100 A) 2104402 (35 A)	2104420	2104500
FUNCTIONALITY					
O ... Over		●	●		10 functions selectable via rotary switch – for function overview pls. refer to page 27
U ... Under		●	●		
W ... Window		●	●		
2MAX ...2 Maximum			●		
MM ... Min. and max.			●		
+LATCH ... Error memory			●		
Temperature monitoring (PTC)	●				
Short circuit monitoring (PTC)	●				
SWITCHING THRESHOLD					
Maximum	≥ 3.6kΩ (switch-off resistance)	10 – 100% of I_N	10 – 100% of I_N	-	sensitivity: 10kΩ – 500kΩ Vsense: 20, 40, 60, 80, 100%
Minimum	≤ 1.6kΩ (switch-on resistance)	5 – 95% of I_N	5 – 95% of I_N	-	sensitivity: 250Ω – 12.5kΩ Vsense: 20, 40, 60, 80, 100%
Zero...Zero point	-	-	-	0%, 25%, 50% and 75% of nominal value	-
Zero Fine...Fine setting zero point	-	-	-	0 – 25% of nominal value	-
Span...Measuring span	-	-	-	25%, 50%, 75% and 100% of nominal value	-
MEASURING CIRCUIT					
Measuring variable	temperature	current AC/DC AC sinus	current AC/DC AC sinus	current AC/DC AC sinus	liquid level with conductive probes (type SK1, SK5)
Measuring input	-	10A AC/DC	V4IM100AL20: 100A AC/DC built-in current transformer V4IM35AL20: 35A AC/DC built-in current transformer	100A AC/DC built-in current transformer	low (L): 250Ω – 12.5kΩ high (H): 10kΩ – 500kΩ
SUPPLY CIRCUIT					
Supply voltage	24 – 240V AC/DC -15% to +10%	AC: 110 – 240V DC: 24 – 240V AC: -15% to +15% DC: -30% to +30%	24 – 240V AC/DC AC: -15% to +10% DC: -30% to +30%	AC: 48-240V DC: 24-240V AC: -10% to +10% DC: -15% to +20%	24-240V AC/DC AC: -10% to +10% DC: -25% to +25%
Frequency range	16.6 – 400Ω or DC				
TIME CIRCUITS					
ON delay	approx. 50ms	approx. 300ms	approx. 300ms	-	-
Start-up surpression time (start)	-	-	0–10s	-	-
Tripping delay (delay)	-	0.1–10s	0.1–10s	-	-
Delay (measuring filter)	-	-	-	-	1–10s
OUTPUT CIRCUIT					
Analog output	-	-	-	0 ... 20 mA / 4 ... 20 mA 10 mA ±10 mA / 12 mA ±8 mA (burden: max. 300Ω) 0 ... 10 V 5 V ±5 V (burden: max. 1,5kΩ)	-
Number of switch contacts	1 NO contact	1 CO contact	-	-	3 NO contacts
Max. switching capacity	2000VA (8 A/ 250V AC)			-	1250VA (5A / 250V AC)
DESIGN					
Dimensions (W×H×D)	22.5×67×76mm	22.5×67×76mm	45×67×76mm	45×67×76mm	45×67×76mm
Certificates	CE, cULus, EAC			CE, EAC	CE, cULus, EAC

MODEL	G2PF400 VS02	G2PM400 VSY20	G2TF02	G2TFKN02	G2LM20
ORDER INFORMATION					
PART NO 2 CO contacts	2390000	2390504 2390505 (24-240 V AC/DC)	2390100 2390104 (230 V AC) 2390111 (24-240 V AC/DC)	2390101 2390110 (24-240 V AC/DC)	2390201 (24 V AC) 2390202 (110 V AC) 2390200 (230 V AC)
FUNCTIONALITY	3-phase AC voltage monitoring	3-phase AC voltage monitoring	temperature monitoring (PTC)	temperature monitoring (PTC)	level monitoring of conductive liquids
U ... Under		●			
W ... Window		●			
SEQ ... Phase sequence		●			
Phase failure	●	●			
ASYM ... Asymmetry	●	●			
Temperature monitoring (PTC)			●	●	
Short circuit monitoring (PTC)				●	
Zero-voltage latch (PTC)				●	
Test function (PTC)			●	●	
Pump up					●
Pump down					●
SWITCHING THRESHOLD					
Maximum	-	-20 to +30 % of U_N	≥ 3.6 kΩ (switch-off resistance)	≥ 3.6 kΩ (switch-off resistance)	-
Minimum	-	-30 to +20 % of U_N	≤ 1.6 kΩ (switch-on resistance)	≤ 1.6 kΩ (switch-on resistance)	-
Asymmetry	fixed, typ. 30 %	5 – 25 %, OFF	-	-	-
MEASURING CIRCUIT					
Measuring variable	3(N)~ AC sinus	3(N)~ AC sinus	temperature	temperature	liquid level via conductive probes
Measuring input	U_N = 400/230 V AC	3(N)~ 400/230 V	-	-	0.25 – 100 kΩ
SUPPLY CIRCUIT					
Supply voltage	= measuring voltage 3(N)~ 342 – 457 V AC	24 – 240 V AC/DC or selectable via power modules TR2, SNT2*	24 – 240 V AC/DC; 230 V fixed or selectable via power modules TR2, SNT2*	24 – 240 V AC/DC or selectable via power modules TR2, SNT2*	24 V AC fixed 110 V AC fixed 230 V AC fixed
TIME CIRCUITS					
Start-up surpression time (START)	fixed, max. 500 ms	-	-	-	-
Tripping delay (delay)	fixed, max. 350 ms	0.1 – 10 s	-	-	0.5 – 10 s
OFF delay	-	-	-	-	0.5 – 10 s
OUTPUT CIRCUIT					
Number of switch contacts	2 CO contacts	1 or 2 CO contacts	1 or 2 CO contacts	2 CO contacts	2 CO contacts
Max. switching capacity	1250 VA (5 A / 250 V AC)				
DESIGN					
Dimensions (W×H×D)	22.5×90×108 mm				
Certificates	CE, cULus, EAC				

* Please refer to the chapter accessories on page 48 for detailed information and ordering data of power modules TR2 and SNT2.

MODEL	G2PU690 VS20	G2UM300 VL20	G2IM5 AL20	G2IM10 AL20	G2FW400 VL20
ORDER INFORMATION					
PART NO 2 CO contacts	2390507	2390303 2390304 (24-240V AC/DC)	2390405 2390411 (24-240V AC/DC)	2390406 2390410 (24-240V AC/DC)	2390900 (24-240V AC/DC)
FUNCTIONALITY	3-phase voltage monitoring	1-phase AC/DC voltage monitoring	1-phase AC/DC current monitoring	1-phase AC/DC current monitoring	frequency monitoring
O ... Over		●	●	●	
U ... Under	●	●	●	●	
W ... Window		●	●	●	●
SEQ ... Phase sequence	●				
Phase failure	●				
ASYM ... Asymmetry	●				
+LATCH ... Error memory		●	●	●	●
SWITCHING THRESHOLD					
Maximum	-	10 – 100% of U_N	10 – 100% of I_N	10 – 100% of I_N	F_N = 50Ω: 49 – 60Ω F_N = 60Ω: 59 – 70Ω
Minimum	180 – 690V	5 – 95% of U_N	5 – 95% of I_N	5 – 95% of I_N	F_N = 50Ω: 40 – 51Hz F_N = 60Ω: 50 – 61Hz
Asymmetry	fixed, 25%	-	-	-	-
MEASURING CIRCUIT					
Measuring variable	3~ AC sinus	voltage AC/DC AC sinus	current AC/DC AC sinus	current AC/DC AC sinus	frequency 1-phase
Measuring input	U_N= 208 – 690V	30 / 60 / 300V AC/DC	20mA / 1A / 5A AC/DC*	100mA / 1A / 10A AC/DC*	110 – 400V AC
SUPPLY CIRCUIT					
Supply voltage	= measuring voltage 3~ 177V to 794V	24 – 240V AC/DC or selectable via power modules TR2, SNT2**	24 – 240V AC/DC or selectable via power modules TR2, SNT2**	24 – 240V AC/DC or selectable via power modules TR2, SNT2**	24 – 240V AC/DC
TIME CIRCUITS					
ON delay	-	-	-	-	0 – 10s
Start-up surpression time (start)	-	0 – 10s	0 – 10s	0 – 10s	-
Tripping delay (delay)	0.1 – 10s	0.1 – 10s	0.1 – 10s	0.1 – 10s	0.1 – 10s
OUTPUT CIRCUIT					
Number of switch contacts	2 CO contacts	2 CO contacts	1 or 2 CO contacts	1 or 2 CO contacts	2 CO contacts
Max. switching capacity	1250VA (5A / 250V AC)				
DESIGN					
Dimensions (W×H×D)	22.5×90×108mm				
Certificates	CE, cULus, EAC	CE, cULus, EAC	CE, cULus, EAC	CE, cULus, EAC	CE, EAC

* For currents greater than 5A, matching current transformers are available as accessories and can be found on page 51.
** For power modules TR2 and SNT2 pls. s. page 48.





MODEL	K3PF400 VSY02	K3YM400 VSY20	K3IM1 AACL20 K3IM5 AACL20	K3UM230 VAC02	K3UM24 VDC02
ORDER INFORMATION					
PART NO	1380301	1380402	1380203 (1 A) 1380202 (5 A)	1380107	1380106
FUNCTIONALITY	3-phase AC voltage monitoring	3- and 1-phase AC voltage monitoring	1-phase AC current monitoring	1-phase AC voltage monitoring	1-phase AC voltage monitoring
O ... Over			●		
U ... Under		●	●	●	●
W ... Window		●	●	●	●
SEQ ... Phase sequence	●	●			
Phase failure	●				
ASYM ... Asymmetry	●	●			
+LATCH ... Error memory			●		
SWITCHING THRESHOLD					
Maximum	-	80 – 130 % of U_N	10 – 100 % of I_N	80 – 120 % of U_N	80 – 130 % of U_N
Minimum	-	70 – 120 % of U_N	5 – 95 % of I_N	70 – 110 % of U_N	75 – 125 % of U_N
Asymmetry	5 – 30 %, OFF	5 – 30 %, OFF	-	-	-
MEASURING CIRCUIT					
Measuring variable	3(N)~ AC sinus	3(N)~ AC sinus	current AC sinus	voltage AC AC sinus	voltage AC
Measuring input	U_N = 400/230 V AC	U_N = 400/230 V AC	1 A AC or 5 A AC*	U_N = 230 V AC	U_N = 24 V DC
SUPPLY CIRCUIT					
Supply voltage	= measuring voltage 3(N)~ 400/230 V AC -30 % to +30 %	= measuring voltage 3(N)~ 400/230 V AC -30 % to +30 %	230 V AC -15 % to +10 %	= measuring voltage 3(N)~ 400/230 V AC -30 % to +20 %	= measuring voltage 24 V DC -25 % to +30 %
Frequency range	48 – 63 Hz	48 – 63 Hz	48 – 63 Hz	48 – 63 Hz	-
TIME CIRCUITS					
Start-up surpression time (start)	-	-	0 – 10 s	-	-
Tripping delay (delay)	fixed, approx. 100 ms	0.1 – 10 s	0.1 – 10 s	-	-
OUTPUT CIRCUIT					
Number of switching contacts	2 CO contacts				
Max. switching capacity	1250 VA (5 A / 250 V AC)				
DESIGN					
Dimensions (W×H×D)	38×51×80 mm				
Certificates	CE, EAC				

* For currents greater than 5A, matching current transformers are available as accessories and can be found on page 51.

Monitoring relays have a wide range of uses

Fountain fill level

WITH THE TELE E3LM10, the fill level of the fountain is monitored with three sensors. With the water level too low, the current flow between the sensors is interrupted and the monitoring relay activates the pump. To prevent overflowing, the pump switches off when the third sensor comes into contact with the water.

No flooding in the underground car park

TELE LEVEL MONITOR V4LM continuously controls a potential increase of the water level in the garage facilities. Once the connected sensors come into contact with ingressing water, the relay immediately activates pumps to drain the liquid and sends acoustic and optical warning signals.

V-belt monitoring

THE POWER FACTOR METER G2FW quickly recognizes whether a V-belt has broken or if it has become loose. A tripping delay ensures that no fault messages or acoustic or optical warning signals are sent to the control system in the event of small deviations.

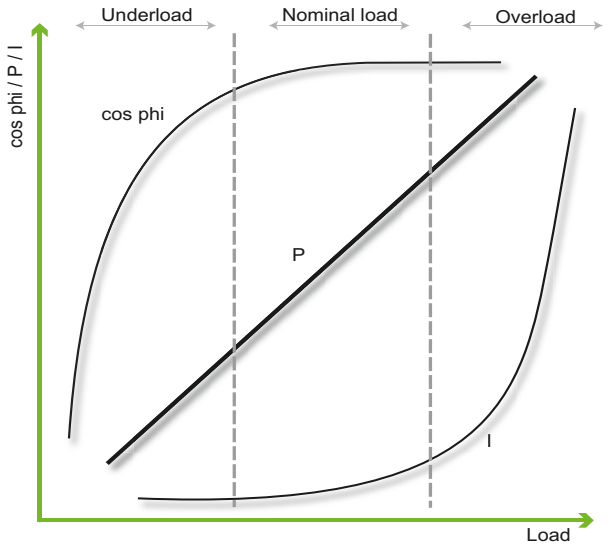
please scan QR code to see more monitoring relay applications

Power Monitors

TELE power monitoring systems offer significant advantages, particularly in situations in which monitoring tasks are usually carried out by sensors:

Benefits at a glance

- No problems due to contamination or measurement value drift of the sensors
- No maintenance and cleaning costs
- Easy to use, even in charged air or aggressive media
- Savings in terms of cabling
- No use of explosion-proof barriers necessary
- Reduction of error source
- Easy retrofitting



CURRENT MONITORING RELAYS

Pure current measurements in the supply to motors can only be used in an extremely restricted capacity to monitor loads. This is due to three essential factors:

01 In alternating current circuits, the measured current is apparent current. This total current comprises the sum of reactive and active current components. However, only the active current is relevant for the generation of mechanical power. The reactive current merely causes losses and does not contribute to the shaft power delivered.

02 In an underload range the current does not reduce in a linear manner with the load but instead remains relatively high due to the necessary magnetisation current. Therefore, no relevant correlation exists between current and load.

03 The current is dependent on the supply voltage. An undervoltage condition with a constant load can result in an increased current draw. To prevent such cases monitoring of the pure active current is insufficient.

This means that pure current monitoring is applicable only for extreme operating conditions, such as a drive blockage, because the current rises dramatically in such cases.

POWER MONITORING SYSTEMS WITH POWER FACTOR MEASUREMENT (COS φ)

The power factor cos φ is the cosine of the phase shift angle between the current drawn and the voltage applied. For electrical motors this is dependent on the loading and theoretically equals 1 in an ideal case. In reality, the power factor at nominal load is practically in a range between 0.85 and 0.95.

In an underload range, the cos φ monitor is extremely significant because the proportion of losses increases sharply at lower loads and results in a cos φ of up to <0.5 in an idle state. This is not applicable around the zero point and in an overload range because load changes cause only small changes of the phase shift angle φ.

POWER MONITORING SYSTEMS WITH EFFECTIVE POWER MEASUREMENTS

The effective power measurement facilitates obtaining the most precise feedback regarding the state of an electrical motor because the effective power is proportional to the shaft power. A direct correlation exists between the effective power supplied and the motor loading (torque at constant rotational speed) across the entire working range.

Examples for power monitor applications

- Waste compactors
- Crusher
- Agitators
- Conveyor belts
- Ventilation systems
- Machinery tools
- Bridge and portal cranes
- Centrifugal and piston pumps

MODEL	G2CU400V10AL20	G2BA480 V12 A 4-20MA G2BA480 V12 A 0-10 V
ORDER INFORMATION		
PART NO	2390602	2390705 / 4 – 20 mA 2390708 / 0 – 10 V
FUNCTIONALITY	cos φ power factor in 1- or 3-phase mains	active power transducer in 1- or 3-phase mains
O ... Overload monitoring	●	
U ... Underload monitoring	●	
W ... Window monitoring	●	
2MIN ... Minimum monitoring		
2MAX ... Maximum monitoring		
MIN/MAX ... Minimum- and maximum monitoring		
+LATCH ... Error memory	●	
I = 0 DETECTION ... Recognition of disconnected load		
Temp ... Temperature monitoring of the motor		
SWITCHING THRESHOLD		
Zero ... Zero point	-	0 %, 25 %, 50 % and 75 % of nominal value
Zero Fine ... Fine setting zero point	-	0 – 25 % of nominal value
Span ... Measuring span	-	100 %, 75 %, 50 % and 25 % of nominal value
Threshold P / P1	cos φ Max: 0.2 – 1.0	-
Threshold P2	cos φ Min: 0.1 – 0.99	-
MEASURING CIRCUIT		
Measuring variable	power factor (cos φ), 1- or 3-phase loads AC sinus	true power, 1- or 3-phase loads AC sinus
Measuring range	0.1 – 1	0.75 kW • 1.5 kW • 3 kW • 6 kW
Measuring input voltage	40 – 415 V AC (single-phase) 40/23 to 415/240 V (3 ~)	0 – 480 V AC (single-phase) 0 to 480/277 V (3 ~)
Overload capacity voltage	500 V AC (single-phase) 500/289 V (3 ~)	550 V AC (single-phase) 550/318 V (3 ~)
Measuring input current *	0.5 – 10 A	0 – 6 A (0.6 and 1.2 kW) 0 – 12 A (2.4 and 4.8 kW)
Overload capacity current	11 A permanent	12 A permanent
SUPPLY CIRCUIT		
Supply voltage	selectable via power module TR2 or SNT2	24 – 240 V DC; 48 – 240 V AC
TIME CIRCUITS		
Start-up surpression time (start)	1 – 100 s	-
Tripping delay (delay)	0.1 – 40 s	-
INPUT CIRCUIT		
Control input	-	-
OUTPUT CIRCUIT		
Analog output	-	4 – 20 mA (Burden: max. 500 Ω) 0-10 V (Burden: min. 3 kΩ)
Number of switch contacts	2 CO contacts	-
Max. switching capacity	1250 VA (5 A / 250 V AC)	-
DESIGN		
Dimensions (W × H × D)	22.5 × 90 × 108 mm	22.5 × 90 × 108 mm
Certificates	CE, cULus, EAC	CE, EAC

* For higher currents, the corresponding current transformers can be used as accessories, whereby the smaller measuring range must always be used for the device.
For current transformers please see page 51.
Power modules TR2, TR3 and SNT2 can be found on page 48.

G2BM400 V12 AL10
G2BM400 V12 AFL10

G4CM690 V16 ATL20

G4BM480 V12 ADTL20

2390700 2390702	2394600	2394706 (24-240 V AC/DC) 2394700
true power monitoring in 1- or 3-phase mains	cos φ power factor in 1- or 3-phase mains	true power monitoring in 1- or 3-phase mains
●		●
●		●
		●
	●	●
	●	●
	●	●
●	●	●
●	●	●
	●	●
-	-	-
-	-	-
-	-	-
5 – 120 % of P_N	cos φ 1: 0,3 – 1 (inductive) 1 – 0,3 (capacitive)	2.5 kW: 120 – 2490 W 10 kW: 480 – 9960 W
-	cos φ 1: 0,3 – 1 (inductive) 1 – 0,3 (capacitive)	-
true power, 1- or 3-phase loads AC sinus	power factor (cos φ), 1- or 3-phase loads AC sinus	true power, 1- or 3-phase loads AC sinus
0.5 kW • 1 kW • 2 kW • 4 kW	0.3 – 1	2.5 kW • 10 kW
0 – 230 V AC (single-phase) 0 – 415/240 V (3 ~)	85 – 690 V AC (single-phase) 85 – 690/400 V (3 ~)	0 – 480 V AC (single-phase) 0 – 480/277 V (3 ~)
300 V AC (single-phase) 500/289 V (3 ~)	796 V AC (single-phase) 796/460 V (3 ~)	550 V AC (single-phase) 550/318 V (3 ~)
0 – 6 A (0.5 and 1 kW) 0 – 12 A (2 and 4 kW)	1 – 8 A 1 – 16 A	0.15 – 6 A (2.5 kW) 0.3 – 12 A (10 kW)
12 A permanent	20 A permanent	12 A permanent
selectable via power module TR2 or SNT	selectable via power module TR3	24 – 240 V AC/DC or selectable via power module TR3
1 – 100 s (AL10) 0.1 – 2 s (AFL10)	3 – 180 s	0 – 100 s
0.1 – 50 s (AL10) 0.1 – 2 s (AFL10)	1 – 50 s	0.1 – 50 s
Y1-Y2 (Latch)	Y1-Y2 (Latch)	Y1-Y2 (Latch)
-	-	-
1 CO contact	2 CO contacts	2 CO contacts
1250 VA (5 A / 250 V AC)	1250 VA (5 A / 250 V AC)	1250 VA (5 A / 250 V AC)
22.5 × 90 × 108 mm	45 × 90 × 108 mm	45 × 90 × 125 mm
CE, cULus, EAC	CE, cULus, EAC	CE, cULus, EAC

TELE SensAct

The new, compact, monitoring modules with ModBus RTU interface, for highly accurate and reliable measurement generate many measured values for a PLC or other master devices.

TELE introduces a new range of communication-capable monitoring devices with ModBus RTU interface with the focus on electric energy applications and monitoring of key electrical values in industrial plants. The modules reliably measure current / voltage / power / energy and various other electrical values in single or three phase networks and supply the data via ModBus RTU to a PLC or other data logger. The fast measurement cycle and fast responding data transmission gives the operator a clear overview of the condition of his system. These accurate process data enable process specialists to adapt maintenance intervals accordingly and help to avoid costly unscheduled downtimes.

3-PHASE POWER METER WITH MODBUS RTU

The 3-phase power meter with ModBus RTU is a complete three phase power meter housed in a 17.5 mm wide module and supports the connection of most common current transformers (1 or 5 A, 333 mV, Rogowski probes). It measures the power (active / reactive / apparent power, bidirectional energy, RMS values, frequency, power factor) in three-phase supply networks. The device is available in three different versions for various applications from standard measurement to power quality requirements.

1-PHASE POWER METER AC/DC WITH MODBUS RTU

The 1-phase power meter AC/DC with ModBus RTU measures DC current up to 50 A/300 A and DC voltage up to 1000 V. With the same device you can measure both current and voltage for different applications in the fields of renewable energy, building automation or mobility. Thanks to the build-in interface converter RS485 Modbus RTU, data is available directly at the datalogger without any other hardware or software.

3-phase power meter with ModBus RTU

Installation design

Up to 500V P-P and universal CT input with ModBus RTU / RS485 interface and programmable digital switch in one module size (17,5mm). Version S1XMmHM also includes harmonic analysis up to 63rd, THD, I/ V peak. Advanced software and energy counter.

1-phase power meter AC/DC with ModBus RTU

Converter design

AC up to 50A or up to 300A and DC up to 50A or up to 400A with ModBus RTU / RS485 interface, DIN rail mounting, frequency range DC or 1 to 400Ω; measurements: Irms, Vrms, Watt, VAr, VA, Vpk, Ipk, frequency, Cos φ, energy bidirectional, THD voltage versions: 800V AC / 1000V DC or 80V AC / 100VDC

1-phase universal current/voltage converter with ModBus RTU

Installation design

Universal sensor input, analog output and RS485 ModBus RTU, RMS, AC and DC measurement, min/ max and average measurement, frequency and crest factor measurement, temperature and resistance measurement (PT100 or NTC) and internal temperature measurement.

1-phase AC/DC current transformer with ModBus RTU & analog interface

Converter design

TRMS measurement up to 50A or up to 300A, frequency range DC or 20...2000Hz, bipolar, analog 0-10V and serial output ModBus RTU/ RS485, adjustable range by dip switch or RS485, DIN rail mounting horizontal or vertical.

Serial converter USB-RS485 (isolated up to 5kV)

USB

The S-USB485 is a serial converter isolated up to 5 kV, with software functions based on a USB FTDI chip. Windows validated drivers download automatically when your PC is online. This device connects safely to any ModBus device on RS485.





MODEL	S1MMMA500 VM	S1MMMA500 VLM	S1MMMA500 VHM	S6XM50 A1000 VM	S6XM50 A100 VM
ORDER INFORMATION					
PART NO	2800300	2800310	2800320	2800200	2800210
INTERFACE					
ModBus RTU	•	•	•	•	•
ModBus RTU on T-Bus	•	•	•		
Analog 4-20mA					
Analog 0-10V					
Digital out	•	•	•		
FUNCTIONALITY	3-ph power meter	3-ph power meter	3-ph power meter	1-ph power meter	1-ph power meter
MEASUREMENT RANGE					
Current AC	ext.CT/Hall/Rogowski	ext.CT/Hall/Rogowski	ext.CT/Hall/Rogowski	50A	50A
Current DC	333mV	333mV	333mV	50A	50A
Voltage AC	500V P-P	500V P-P	500V P-P	800V	80V
Voltage DC	-	-	-	1000V	100V
MEASUREMENT VALUES					
Irms	•	•	•	•	•
Idc				•	•
Iac					
Ah on Irms					
Ah on Idc					
Ah on Iac					
Vrms	•	•	•	•	•
Vdc				•	•
Power/ reactive power/ apparent power	•	•	•	•	•
Cos φ	•	•	•	•	•
Distorted power factor		•	•		
Tan φ		•	•		
Active energy bidirectional	•	•	•	•	•
Reactive/ Apparent energy bidirectional	•	•	•		
Ipeak / Vpeak	•	•	•	•	•
Frequency	•	•	•		
Crest factor	•	•	•		
Temperature (PT100 / NTC)					
Resistance (of PT100 / NTC)					
Internal temperature		•	•		
Min, Max values		•	•	•	•
Average values		•	•		
THD		•	•	•	•
TDD		•	•		
Phase sequence monitoring		•	•		
Time above threshold for power		•	•		
Inverter input (PWM modulated)			•		
Harmonic analysis up to 63rd			•		
Interharmonics			•		
Sag			•		
Swell			•		
Interruption			•		
Waveform display			•		
1-ph device efficiency measurement			•		
Certificates	CE			CE, cULus	CE

S9XM300 A1000 VM

S9XM300 A100 VM

S1XMMM

S1XMMHM

S6IA50 A / S6IA50 AM

S9IA300 A / S9IA300 A

2800220	2800230	2800100	2800110	2800000 / 2800010	2800020 / 2800030
•	•	•	•	• (2800010)	• (2800030)
		•	•		
		•	•	• (2800000)	• (2800020)
		•	•		
		•	•		
1-ph power meter	1-ph power meter	1-ph analyzer	1-ph analyzer	1-ph current transformer (CT)	1-ph current transformer (CT)
300A	300A	external CT	external CT	50A	300A
400A	400A	external Hall sensor	external Hall sensor	50A	300A
800V	80V	(external VT)	(external VT)	-	-
1000V	100V	(external VT)	(external VT)	-	-
•	•	• (alt. voltage)	• (alt. voltage)	•	•
•	•	• (alt. voltage)	• (alt. voltage)		
		• (alt. voltage)	• (alt. voltage)		
		• (alt. voltage)	• (alt. voltage)	• (2800010)	• (2800030)
		• (alt. voltage)	• (alt. voltage)		
		• (alt. voltage)	• (alt. voltage)		
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			•		
CE, cULus	CE				CE, cULus (Art.2800030)

Grid and system protection

Autonomously working disconnecting unit for small power plants

WHY? In the event of a network shutdown or network disruption, small power plants must be disconnected from the grid immediately to avoid any danger to people andmachinery.

FUNCTION An automatic disconnection device monitors the feed-in of energy to the 230/400V grid. In case of a power failure or disruption by the energy supplier it is vital for small power plants to be disconnected within a few milliseconds. Voltage- and frequency monitoring as well as island operation detection are the main requirements for an automatic disconnection device.

REQUIREMENT Converting renewable energy into electricity is a key element in stabilizing the global climate. In the context of small and micro power plants we mainly see photovoltaic installations, small wind power generators, cogeneration plants or small hydropower plants being used. The energy obtained is used to cover own consumption or increasingly fed into the public low-voltage grid at a profit. To ensure network safety, an automatic interface monitors the transfer between small power plants and the grid of the energy supplier (ES). Large power plants are managed and monitored directly by the ES using telecontrol technology. Yet, this method is too expensive and therefore uneconomical for many small electricity producers.

In the event of a power cut or a disruption in the grid of the energy supplier, small power plants have to be disconnected immediately from the public grid to prevent unwanted feed-in, and to protect maintenance personnel and consumers from risk of improper voltages and frequencies. Monitoring and automatic

disconnection are carried out by an automated interface. Small power plants must be equipped with an automatic isolation unit that is checked and permitted by an accredited authority. Country-specific norms define in-depth how the interface must be constructed and certified. To meet requirements of the energy supply companies' standards the market offers solutions as individual components, multinational components as well as integrated solutions. If required by the network operator, the thresholds can be adjusted even outside of standard values. Functionally safe devices also fulfil the monitoring function in the event of faults, detect these faults and ensure safe operating conditions.

TELE's NA003-M64 offers an optimal solution for each country and any requirement.

✔ Multifunctional device

✔ Open setup, fully configurable without any limitations

✔ One device for low and medium voltage grid

Wind power plant | Hydro power plant | Combined heat and power plant | Biomass power plant | Photovoltaics | Battery storage

MODEL: NA003-M64

FUNCTIONALITY

Implemented standards	Complies with new and previous standards which makes replacement of existing installations fast and easy. Predefined parameter settings for several countries. **Check all available standards and settings by scanning the QR Code:**	
Measuring variable	phase to phase voltage, phase to neutral voltage, 10 minutes voltage average, frequency, frequency change (RoCoF), phase shift (PShift)	
Measuring range	phase to phase voltage: 0 ... 560 VAC, phase to neutral voltage: 0 ... 325 VAC frequency: 40 ... 60 Hz, RoCoF 100 mHz/s ... 2.000 mHz/s, Pshift 1 ... 15°	
Monitoring functions	. 2 × phase to neutral overvoltage 2 × phase to neutral undervoltage; . 2 × phase to phase overvoltage 2 × phase to phase undervoltage;	. 1 × 10 minutes voltage average (over) . 4 × overfrequency, 4 × underfrequency, 1 × random overfrequency . 1 × RoCoF (over), 1 × PShift (over)
Features	. each turn-off threshold is associated with its own turn off time . fixed turn-on time, random turn-on time . configurable feedback contact evaluation . enable / disable functions via digital inputs . enable / disable functions via selectable mode	. 4 different connection and measuring modes: 2 wire (single phase L1, N); 3 wire (3 phase without N); 4 wire (3 phase LL only); 4 wire (3 phase LL + LN) . configurable nominal voltage . functional safety . password protection and sealing capability . error memory with time stamp (entries)
Supply voltage	24 V DC ± 10 %, 110 ... 240 V AC ± 30 %,	
Rated frequency	50/60 Hz or DC	
Tolerance of rated frequency	48...63 Hz	
Output circuit	3 CO contacts 5 A, 250 V AC (1250 VA)	
Digital inputs	5 inputs for potential free contacts (24 V / 5 mA)	

DESIGN

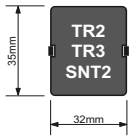
Dimensions (W × H × D)	106.3 × 90.5 × 62 mm
Certificates	CE, EAC

Accessories

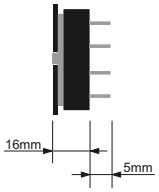
For our timing- and monitoring relays, power monitors and grid- and system protection we offer the following accessories.

Timing relays | Monitoring relays | Power monitors | Grid and system protection

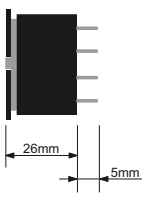
TR2, TR3, SNT Series power modules for transforming the supply voltage to the internal operating voltage of GAMMA relays



Design A
(TR2, SNT2) for Gamma **G2**



Design B
(TR3) for Gamma G4



MODEL	PART NO	SUPPLY VOLTAGE	TOLERANCE	POWER INPUT P_{IN}	POWER OUTPUT P_{OUT}	DESIGN
SNT2 – 24V DC	282050	24V DC	20.4 – 26.4V	2VA	0.5VA	A
TR2 – 24V AC	282110	24V AC	20.2 – 26.4V	2VA	0.5VA	A
TR2 – 110V AC	282113	110V AC	94 – 121V	2VA	0.5VA	A
TR2 – 127V AC	282114	127V AC	108 – 140V	2VA	0.5VA	A
TR2 – 230V AC	282120	230V AC	195 – 264V	2VA	0.5VA	A
TR2 – 400V AC	282117	400V AC	340 – 456V	2VA	0.5VA	A
TR2 – 440V AC	282119	400V AC	374 – 484V	2VA	0.5VA	A
TR3 – 24V AC	285010	24V AC	20.4 – 26.4V	4VA	1.5VA	B
TR3 – 110V AC	285013	110V AC	94 – 121V	4VA	1.5VA	B
TR3 – 230V AC	285025	230V AC	184 – 264V	4VA	1.5VA	B
TR3 – 400V AC	285017	400V AC	323 – 456V	4VA	1.5VA	B
TR3 – 440V AC	285019	440V AC	374 – 484V	4VA	1.5VA	B
TR3 – 500V AC	285026	500V AC*	425 – 550V	4VA	1.5VA	B

* May only be used with types G4PM and G4BM!

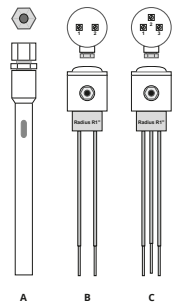
Remote Potentiometer RONDO Series frontpanel mounting adjusting values of intended timers and thyristor control units remotely.

R2

MODEL	PART NO	SCALE	DIMENSIONS (W × H × D)	CONNECTIONS
R2 1MΩ	282130	0,1 – 1	Ø 28 (Ø 22*)×53 mm	1 = First 2 = Wiper 3 = Finish
R20 10KΩ	282131	0 – 10		

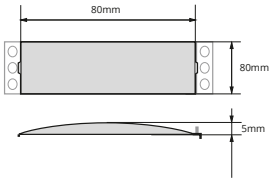
* diameter front panel mounting

Probes – SK Series for monitoring level of conductive liquids



MODEL	PART NO	TYPE	MEASURING VOLTAGE	MAX. TEMP.	NUMBER OF ELECTRODES	LENGTH	DESIGN
SK1	190107	immersion probe	max. 24V AC	60°C	1	140mm	A
SK2-500	190108	rod probe		90°C	2	500mm	B
SK3-500	190109			90°C	3	500mm	C
SK3-1000	190110			90°C	3	1000mm	C

Front Cover FA-G2 for GAMMA monitoring relays (width 22.5mm)
(for the G4 variants two FA-G2 Front Covers are required)



MODEL	PART NO	Ø DRILL HOLES	DIMENSIONS (W × H × D)
FA-G2	070160	Sealable front cover for protecting GAMMA devices against unintended or unauthorized changes in setup parameters.	22.5×80×5mm

Complementary products

In addition to our product range we offer the following complementary products:

Current transformers

Coupling units

Switching relays
Sets
Accessoires

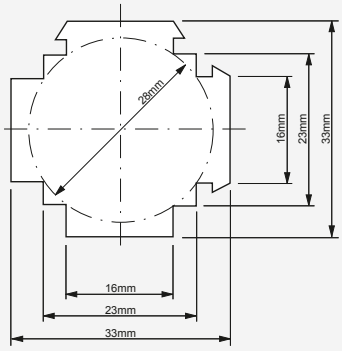
Hour meters
Digital time switches
Countdown timer

DC power supplies

MODEL	PART NO	RATED POWER	RATED PRIMARY CURRENT	SECONDARY CURRENT	DIMENSIONS (W × H × D)	CLASS
WSW 60 1 A/5 A 2,5 VA	498060	2,5 VA	1 A	5 A	80×60×30 mm	1
WSW 60 5 A/5 A 2,5 VA	498062	2,5 VA	5 A		80×60×30 mm	
WSW 60 10 A/5 A 2,5 VA	498063	2,5 VA	10 A		80×60×30 mm	
WSW 60 15 A/5 A 2,5 VA	498064	2,5 VA	15 A		80×60×30 mm	
WSW 60 20 A/5 A 2,5 VA	498065	2,5 VA	20 A		80×60×30 mm	
WSW 60 25 A/5 A 2,5 VA	498066	2,5 VA	25 A		80×60×30 mm	
WSW 60 30 A/5 A 2,5 VA	498067	2,5 VA	30 A		80×60×30 mm	
WSW 60 40 A/5 A 2,5 VA	498068	2,5 VA	40 A		80×60×30 mm	
DSW 60 50 A/5 A 1,25 VA	498069	1 VA	50 A		80×60×30 mm	3
DSW 60 75 A/5 A 2,5 VA	498071	1,5 VA	75 A		80×60×30 mm	
DSW 60 100 A/5 A 2,5 VA	498073	2,5 VA	100 A		80×60×30 mm	1
DSW 60 150 A/5 A 3,75 VA	498075	3,75 VA	150 A		80×60×30 mm	
DSW 60 200 A/5 A 5 VA	498076	5 VA	200 A		80×60×30 mm	
DSW 60 250 A/5 A 5 VA	498077	5 VA	250 A		80×60×30 mm	

ACCESSORIES	PART NO	DESCRIPTION
MC-SW (2 pcs)	498100	Mounting clip required for mounting the current transformer on DIN-Rail TS 35

Bar-type current transformer DSW 60 with dimensions

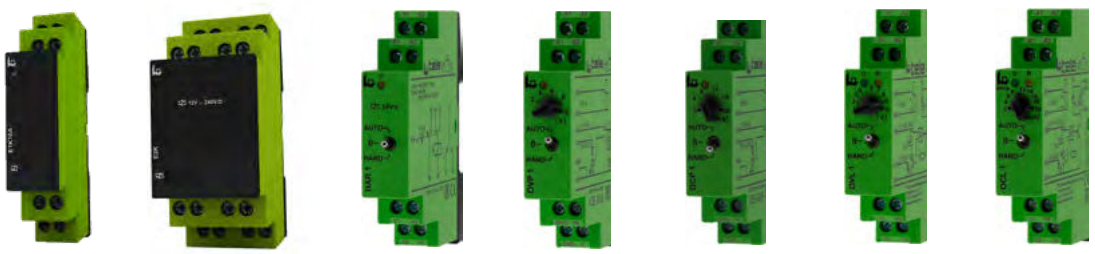


Baffle-type current transformer WSW 60

Mounting clips for DSW and WSW

COMPLEMENTARY PRODUCTS

ENYA Series coupling units / **OCTO Series** coupling units



MODEL	E1K16A	E1K E3K	HAR1	OVP1	OCP1	OVL1	OCL1
ORDER INFORMATION							
PART NO	110701	110700 (E1K) 111700 (E3K)	170010	170012	170018	170015	170017
FUNCTIONALITY	coupling relays	coupling relays	automatic manual off relay	analog data encoder	analog data encoder	level switch	level switch
Coupling unit	•	•					
AUTO ... Automatic			•	•	•	•	•
0 ... OFF			•	•	•	•	•
HAND ... Manual			•	•	•	•	•
SUPPLY CIRCUIT							
Supply voltage	24 – 240 V AC/DC	24 – 240 V AC/DC (E1K) 12 – 240 V AC/DC (E3K)	24 V AC/DC	24 V AC/DC	24 V AC/DC	24 V AC/DC	24 V AC/DC
Rated frequency	48 – 63 Hz						
INPUT CIRCUIT							
Control voltage	-	-	24 V AC/DC	-	-	-	-
Analog input DC	-	-	-	0 – 10 V	0 – 20 mA	0 – 10 V	0 – 20 mA
Trigger level DC	-	-	-	0 – 10 V	0 – 20 mA	1 – 10 V	2 – 20 mA
CHECKBACK							
Number of checkback contacts	-	-	1 NO contact	1 NO contact	1 NO contact	1 NO contact	1 NO contact
Min. switching capacity	-	-	5 mVA (1 mA / 5 V)	5 mVA (1 mA / 5 V)	5 mVA (1 mA / 5 V)	5 mVA (1 mA / 5 V)	5 mVA (1 mA / 5 V)
Max. switching capacity	-	-	24 VA (500 mA / 48 V)	56 VA (2 A / 28 V)	56 VA (2 A / 28 V)	56 VA (2 A / 28 V)	56 VA (2 A / 28 V)
OUTPUT CIRCUIT							
Number of switching contacts	1 NO contact	1 CO contacts (E1K) 2 CO contacts (E3K)	1 CO contact	-	-	1 CO contact	1 CO contact
Max. switching capacity AC	4000 VA (16 A / 250 V)	2000 VA (8 A / 250 V)	2000 VA (8 A / 250 V)	-	-	2000 VA (8 A / 250 V)	2000 VA (8 A / 250 V)
Analog output	-	-	-	0 – 10 V DC	0 – 20 mA	-	-
DESIGN							
Dimensions (W x H x D)	17.5 × 87 × 65 mm	17,5 × 87 × 65 mm (E1K) 35 × 87 × 65 mm (E3K)	17.5 × 87 × 70 mm	17.5 × 87 × 70 mm	17.5 × 87 × 70 mm	17.5 × 87 × 70 mm	17.5 × 87 × 70 mm
Certificates	CE, EAC						

SKR, STKR Series and Accessories PLC coupling relays

STKR

MODEL	PART NO	FUNCTION	RATED VOLTAGE		RELAY VOLTAGE	NUMBER OF SWITCHING CONTACTS	PACKAGING UNIT
SKR 524	180501	PLC coupling relay unit	24V	AC/DC		1 CO contact	10
SKR 024	180500		24V	DC			
SKR 730	180502		230V	AC			
STKR 524	180504	PLC coupling relay modular	24V	AC/DC	24V DC		
STKR 024	180503		24V	DC	24V DC		
STKR 615	180506		115V	AC/DC	60V DC		
STKR 730	180505		230V	AC	60V DC		

ACCESSORIES		FUNCTION	COLOR	NUMBER OF POLES	
PB-B	180535	jumper link	blue	20	10
PB-R	180536		red		

RA, RM Series miniature relays / **RP Series** PCB relays

RA

RM

RP

MODEL	PART NO	RATED VOLTAGE		LED	NUMBER OF SWITCHING CONTACTS	PACKAGING UNIT
RA 524L-N	100623LD-N	24V	AC	•	2 CO contacts	10
RA 615L-N	100621LD-N	115V		•		
RA 730L-N	100624LD-N	230V		•		
RA 024L-N	100622LD-N	24V	DC	•		
RM 512L-N	100612LD-N	12V	AC	•	4 CO contacts	
RM 524L-N	100613LD-N	24V		•		
RM 615L-N	100618LD-N	115V		•		
RM 730L-N	100619LD-N	230V		•		
RM 012L-N	100601LD-N	12V	DC	•		
RM 024L-N	100603LD-N	24V		•		
RM 048L-N	100602LD-N	48V		•		
RM 220L-N	100620LD-N	220V		•		
RP 524-1	100431	24V	AC		1 CO contacts	20
RP 730-1	100432	230V				
RP 024-1	100430	24V	DC			
RP 524-2	100417	24V	AC		2 CO contacts	
RP 730-2	100418	230V				
RP 012-2	100420	12V	DC			
RP 024-2	100416	24V				

COMPLEMENTARY PRODUCTS

RT Series industrial relays

MODEL	PART NO	RATED VOLTAGE		LED	RECOVERY DIODE	GOLD-PLATED CONTACTS	NUMBER OF SWITCHING CONTACTS	PIN CONFIG.	PACKAGING UNIT
RT 1.2.012L	100508LD	12V	AC	•			2 CO contacts, 8 pin	8-pin	10
RT 1.2.024L	100507LD	24V		•				8-pin	
RT 1.2.110L	100505LD	110V		•				8-pin	
RT 1.2.230L	100502LD	230V		•				8-pin	
RT 2.2.012L	100517LD	12V	DC	•				8-pin	
RT 2.2.024L	100516LD	24V		•				8-pin	
RT 1.3.024L	100526LD	24V	AC	•			3 CO contacts, 11 pin	11-pin	
RT 1.3.048L	100524LD	48V		•				11-pin	
RT 1.3.110L	100522LD	110V		•				11-pin	
RT 1.3.230L	100521LD	230V		•				11-pin	
RT 1.3.230.02L	100521H	230V		•		•		11-pin	
RT 2.3.012L	100536LD	12V	DC	•				11-pin	
RT 2.3.024L	100535LD	24V		•				11-pin	
RT 2.3.024LD	100535FD	24V		•	•			11-pin	
RT 2.3.024.02LD	100535H	24V		•		•		11-pin	
RT 2.3.048L	100533LD	48V		•				11-pin	

COMBI Series multifunction timing module for industrial relays with socket type ES9 and PF113BEM (ES12)

MODEL	PART NO	FUNCTIONS	TIME RANGES	SUPPLY VOLTAGE	NUMBER OF SWITCHING CONTACTS	DIMENSIONS (W × H × D)	CERTIFICATES	PACKAGING UNIT
COM3T	237010	8 E, R, Ws, Wa, Wu, Es, Bp, Bi	8 (0.05 s – 10 d)	24 – 240V AC/DC	2 or 3 CO contacts (according to selected industrial relay)	35×12×47 mm	CE, cULus	20

RT

\+

COM3T

\+

Socket

→

RT + COM3T + Socket

Sockets for switching relays

MODEL	PART NO	MODULES USABLE	TYPE OF CONNECTION	FOR RELAYS	RATED VOLTAGE		PACKAGING UNIT
PYF14BE (ES 15/4N)	180134	yes (pls. s. table below)	screw terminal	RA, RM	300V	AC	10
PYF14BE3 (ES 15/4S)	180145						
PYF14BE3CC (ES 15/4G)	180148		push-in terminal				
CST-B14F2-L (ES 15/4B)	180146		screw terminal				
RSS214	180050			RM			
PI50BE/3R (ES 50/3)	180150			RP			20
PI50BE/3CC (ES 50/3G)	180149		push-in terminal				
PI50BE (ES 50)	180137		screw terminal				
PSS8/3	180056						10
PF083BE (ES8)	180139	no		RT 8-pin			
ES 9	180041	yes (pls. s. table below)					
PF113BEM (ES12)	180136			RT 11-pin			
PF113BE (R11X)	180155	no					1 or 10*

* For KAPPA series also available as single packaging unit.

COM3T + ES9 + RT1.2.012L

Socket PYF14BE (ES 15/4N)

Socket PSS8

Socket PYF14BE3CC (ES 15/4G)

Socket PF113BE (R11X)

Modules and Accessories for switching relays

MODEL	PART NO	TYPE DESCRIPTION	FOR SOCKETS SERIES	FOR SWITCHING RELAYS SERIES	RATED VOLTAGE	PACKAGING UNIT
M21N	180261	diode	PYF, CST, PI	RA, RM, RP	6 – 230V DC (+A1)	20
M41R	180263	LED (red) + diode	PYF, CST, PI	RA, RM, RP	6 – 24V DC (+A1)	
EM 12	180309	LED (green) + diode	RSS214, PSS8	RA, RM, RP	6 – 24V DC (+A1)	10
EM 03	180300	RC-link	RSS214, PSS8	RA, RM, RP	110 – 230V AC	
TYPE41 (TVL1)	180232	LED + diode	PF113BEM, ES9	RT	6 – 24V DC (+A1)	20
TYPE21 (TVD1)	180230	retaining clip (metal)	PF113BEM, ES9	RT	6 – 230V DC (+A1)	
HB/RM-RA	180032	retaining clip (plastic)	PYF, CST, RSS214	RA, RM		25
HB/ES15	180153	retaining clip (metal)	PYF, CST	RA, RM		10
HB/RT	180043	retaining clip(plastic)	PF, ES9	RT		
HB/RP 16	180029	retaining clip (plastic)	PI50	RP		20
HB/PSS	180060	retaining clip (plastic)	PSS8/3	RP		10
BS/PSS	180057	front cover (label field)	PSS8/3	RP		

COMPLEMENTARY PRODUCTS

TSC Series Digital Time Switches daily-, weekly- or yearly program, DIN-rail mounting

TSC18.10EASY

MODEL	PART NO	SUPPLY VOLTAGE	CHAN-NELS	NUMBER OF SWITCHING CONTACTS		SWITCHING CAPACITY	RATED CONSUMPTION	DIMENSIONS
				CO	NO			
TSC18.10EASY*	711149	230V AC	1		1	4000VA	1.5VA	35.8×90×58mm

* EASY ... programmable via smartphone (NFC)

TTC Series Digital Time Switches countdown timer, front panel mounting

TTC24.21

MODEL	PART NO	SUPPLY VOLTAGE	TIME RANGE	NUMBER OF SWITCHING CONTACTS	DIMENSIONS
TTC24.21	711450	230V AC	99 h 59 min 59 s	1 CO contact	48×48×41 mm

TBG Series analog hour meters, DC voltage

TBG/TBW30

MODEL	PART NO	SUPPLY VOLTAGE	COUNTING CAPACITY	ACCURACY OF READING	DIMENSIONS
TBG30.18	711056	12 – 48V DC	999 999 h	0.1 h	53.2×28.2×63mm
TBG40.17	711025				48×48×38mm
TBG70.18	711435		99 999 h		17.5×85×61.5mm
TBG70.29	711408				35×90×60mm

TBW Series analog hour meters, AC voltage

TBG/TBW40

MODEL	PART NO	SUPPLY VOLTAGE	RATED FREQUENCY	COUNTING CAPACITY	ACCURACY OF READING	DIMENSIONS
TBW40.18	711045	24V AC	50Hz	99 999 h	0.01 h	48×48×38 mm
TBW40.18	711042	115V AC				48×48×38 mm
TBW70.18	711434	115V AC				17.5×85×61.5 mm
TBW30.18	711050	230V AC				53.2×28.2×63 mm
TBW40.18	711040	230V AC				48×48×38 mm
TBW70.18	711430	230V AC				17.5×85×61.5 mm
TBW70.29	711355	24V AC	50/60Hz		0.1 h	35×90×60 mm
TBW70.89	711140	115V AC				35×105×60 mm
TBW70.89	711141	230V AC				35×105×60 mm
TBW70.29	711350	230V AC				35×90×60 mm
TBW70.89	711139	48V AC				35×105×60 mm

TBG/TBW70.18
TBG/TBW70.29

ACCESSORIES TBG, TBW		DESCRIPTION
SB-TBX30	711809	tension bracket for TBG/TBW30
B55-TBX40	711800	shutter for TBG/TBW40 (55×55mm)
ME72-TBX40	711801	screen for TBG/TBW40 (72×72mm)
SB-TBX40	711807	retaining clip for TBG/TBW40
DR-TBW40	711813	sealing ring for TBW40 (IP54)
KA-TBX70.29	711812	terminal cover for TBG/TBW70.29 (sealable)

Industrial Housing for switch cabinet and plant construction

MODEL	PART NO	OUTPUT VOLTAGE	OUTPUT POWER	OUTPUT CURRENT
NDR-75-24	491630	24V DC	75W	3.2A
NDR-120-24	491601	24V DC	120W	5.0A
NDR-240-24	491610	24V DC	240W	10A
NDR-480-24	491619	24V DC	480W	20A

- **Output voltage 24V DC**
- **Output power 75 – 480W**
- **Overload and short circuit protection**

Installation Housing for building and plant engineering

MODEL	PART NO	OUTPUT VOLTAGE	OUTPUT POWER	OUTPUT CURRENT
HDR-30-12	491712	12V DC	24W	2A
HDR-15-24	491701	24V DC	15W	0.63A
HDR-30-24	491702	24V DC	36W	1.5A
HDR-60-24	491703	24V DC	60W	2.5A
HDR-100-24	491704	24V DC	92W	3.83A

- **Output voltage 24V DC**
- **Output power 15 – 92W**
- **Overload and short circuit protection**

PRODUCT CODES

PRODUCT SERIES		HOUSING		MEASUREMENT PARAMETER		FUNCTION		ADDITIONAL FUNCTION		OUTPUT	TERMINAL	SUPPLY VOLTAGE
E	ENYA	**1**	17.5mm	**Z**	Timer	**M**	multifunction	**F**	Remote potentiometer	delayed	**P**ush-in terminal (VEO)	230 V AC
V	VEO	**2**	22.5mm			**Q**	quattro (4 funct.)			**10** 1 contact	**P**otential free contact (KAPPA)	24V DC
G	GAMMA	**3**	35.0mm			**E**	ON delay			**20** 2 contacts		24–240 V AC/DC
K	KAPPA	**4**	45.0mm			**R**	OFF delay			instantaneous		etc.
						I	flasher			**01** 1 contact		
						S	star-delta (wye-delta)			**02** 2 contacts		
						A	OFF delay without auxiliary voltage			delayed and instantaneous		
						NT	emergency light tester			**11** 1 delayed contact 1 instantane-ous contact		
						TP	staircase timer					
						WI	impulse switch mode					
						ET	ON delay 2-wire connected					

E	1	Z	M	20	24–240 V AC/DC

Example product code time delay relay

E	1	Z	M	20	24–240 V AC/DC

E1ZM2024-240 VAC/DC

ENYA series, in a 17.5 mm wide housing, multifunctional timer with a SPDT relay output and a supply voltage of 12-240 V AC/DC.

PRODUCT SERIES		HOUSING		MEASUREMENT PARAMETER		FUNCTION		MEASURE-MENT RANGE	ADDITIONAL FUNCTION		OUTPUT	TERMINAL	SUPPLY VOLTAGE
E	ENYA	**1**	17.5mm	**U**	voltage 1~	**U**	under	230V	**L**	latch	delayed	**P**ush-in terminal	230 V AC
V	VEO	**2**	22.5mm	**P**	voltage 3~Δ	**O**	over	10A	**D**	digital	**10** 1 contact		24V DC
G	GAMMA	**3**	35.0mm	**Y**	voltage 3~Y	**W**	window	400V12A	**T**	thermistor	**20** 2 contacts		24–240 V AC/DC
K	KAPPA	**4**	45.0mm	**I**	current 1~	**F**	error	PT100	**Y**	asymmetry	instantaneous		etc.
				J	current 3~	**M**	multi-function	etc.	**S**	phase sequence	**01** 1 contact		
				F	frequency	**A**	analog output		**F**	quick action release	**02** 2 contacts		
				T	temperature				**T**	test function			
				L	level				**K**	short circuit monitoring			
				B	effective power				**N**	zero voltage safe			
				C	cos φ								

V	4	I	M	100A	L	20	P	24–240 V AC/DC

Example product code monitoring relays

V	4	I	M	100A	L	20	P	24–240 V AC/DC

V4IM100AL20P24-240 VAC/DC

VEO series, in a 45.0 mm wide housing, multifunctional current monitoring with two contacts and a supply voltage of 24-240 V AC/DC.

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