

2



Fault Indicator Relays
Timer
Interface Modules

**ZANDER
AACHEN**

it works





Fault Indicator Relay

Fault Indicator System ENQ41-5
Modular fault indicator system with 4 inputs



Timer / Control Relays

Multifunction Timer DMC2-1
Provides all common functions and time ranges in one device

Multifunction Timer DVC2-3
2 times - provides all common functions and time ranges in one device

Star-Delta Timer DDC2-5
DDC triggers a star-delta contactor to control the run-up of three-phase current motors

Time Remote Potentiometer DFP2-6
To use in connection with the timers DMC, DVC

Multifunction Timer DSCM2-7
Pluggable on 11-pin standard relay socket

Programmable Digital Timer ENS202-9
Provides all common functions and time ranges in one device, protection IP65, 48x48mm

Programmable Digital Timer ENS902-11
Provides all common functions and time ranges in one device, protection IP65, 72x72mm

Liquid Level Control DSFC2-13
DSFC regulates the level of liquid in combination with a connected pump engine

Electronic Amplifier Relay DSTC2-15
Sensor circuit amplifier and contact protective relay

Thermistor Motor Protection Relay DHC2-17
Temperature control relay in combination with PTC resistors



Power Supply

Compact Power Supply with Relay DNEZ52-19
DC 24V/100mA power supply with relay contacts for proximity switches, light barriers...

Compact Power Supply NTX2-20
DC24V/160mA for small automation components

Compact Power Supply NTC5/NTC12-21
22.5mm housing, wide input voltage range AC85-264V, output DC24V/450mA stabilised

Compact Power Supply NTSR2-23
22.5mm housing, DC24V/70mA for small automation components

Interface

Performance Interface Module DSC-System2-25
Relay and power optocoupler interface, 22.5mm DIN-rail housing

4-fold Interface Module DSC-System2-27
Relay and power optocoupler interface, 22.5mm DIN-rail housing

Relais Interface DSR2-29
Very small relay module 6.2mm





We offer problem solutions optimized for your application such as timers, fault indicator relays, level control relays...

Simple installation and operation are just as natural as extensive accessories, from the cable connection to the PC software. Use our over 50-years experience, lower your costs!

Our automation components work daily in the hard industrial applications, e.g. machine tool manufacture, packaging machines, conveying technique, food industry.....

ZANDER supplies a multiplicity of customized variants and special solutions apart from the standard components - ask us!



Safety Warnings

It is intended for qualified personnel familiar with the installation, commissioning or maintenance of the machine equipped with ZANDER control devices.

The user manuals do not substitute the machine's operating instructions. This must provide separate coverage of the controller functions used in the particular application and explain the effect these have on the machine.

Particular attention must be paid to the safety concept underlying the overall project. Supplementary safety precautions ensuring defined, safe operating statuses irrespective of the control and operating equipment must be taken in all areas where, in conjunction with automation components, faults are able to cause material damage or personal injury.

Pertinent accident prevention regulations must be observed. Emergency stop circuits to EN 60204 (VDE0133) must remain in effect in all operating modes and must not result in any undefined restart when released.

Reliable electrical isolation in the form of a transformer to VDE0551 must be provided when using 24VDC EPC control devices.

Apart from the measures described in the installation sheets, no action must be carried out inside the device.



The electronic fault indicator system ENQ4 offers in a compact form a complete control – and disturbance monitoring-system to stop the operating conditions, when unacceptable conditions arise on compressors, automatic-machines, vehicles, heating installations and air conditioning systems etc.



- Simplify maintenance
- Report faults
- Avoid damages
- Monitor equipment
- Reduce service costs
- Raise operational readiness

Installation

There are 4 fault-detection-inputs and a control input, which operates directly to the output relays of the unit.

Each fault will be indicated by a red LED at the front panel, the fault free operation is shown by a green LED.

ENQ4 has a plastic front panel IP54 with identification panel for the fault messages. A paperstrip for inscriptions is enclosed at each item. This strip can easily be pushed into the considered side pocket.

All electronic components are integrated in a switchboard mounting housing 48x48mm. The device is facially splash and dust proof.

In addition to each fault report display, space for text for customer specific formatting of the reports is provided. We will supply the devices with the appropriate text as per your text documentation for mass production requirements.

Several fault annunciators can be arranged next to each other in the form of a board.

The report is made through external break contacts so that separate cable monitoring is assured.

Various operating/reporting voltages up to AC 230V can be used.

Function

During fault free operation (all external transmitting relays closed) the central transmitting relay A1-14 is closed. A report coming through the fault reporting input S1-S4 (opening of the transmitting relay) causes the central transmitting relay A1-14 to be switched off in addition to activating the appropriate LED display.

As a result of this, for example, the machine/equipment being monitored is switched off. Each report channel has a report memory so that faults occurring even sporadically are recognised. The acknowledgment takes place with the interruption of the mains current of the fault annunciator system or the entire machine.

The condition „ready to service“ is shown by a green LED, which will deactivate in case of a fault message.

Special function test operation (input S5)

The closing of the input relay S5 activates the opening of the transmitting relay A1-14. The A1-14 relays will close with the opening of S5 provided that the input S1-S4 do not have a fault report.

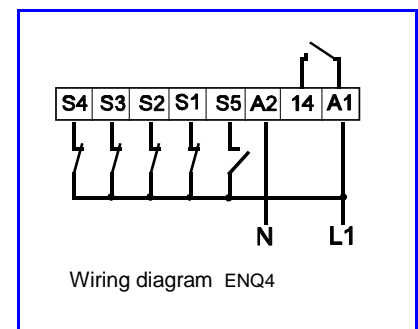
Hints for installation

Extensive technical switching measures guarantee the highest degree of operational safety. Every fault reporting input is galvanically separated from the processing electronics via an optocoupler.

Additionally each input is equipped with a signal delay of about 200ms for the purpose of filtering out any possible current interruptions occurring momentarily.

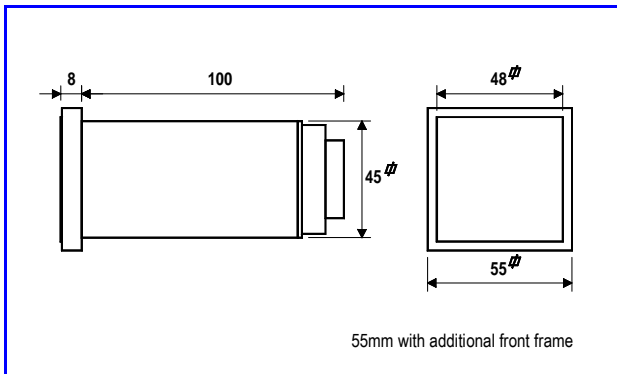
The central transmitting relay is also equipped with such a time delay. In this way, the switching on of the entire plant and the simultaneous closing of the transmitting relays do not lead to a fault report.

These measures permit the use of the equipment with unshielded input cable up to 100m in length.





Fault Indicator System ENQ4



Accessories

A plastic front frame with external dimensions of 55x55mm is available as an accessory.

If desired each ENQ4 is available without front foil and mounting material for back side installation in existing operator tableaus.

Specifications	
Operating voltage	AC 230V, 50-60Hz AC 115V, 50-60Hz DC 24V
Voltage tolerance	85..110% von U_N
Residual ripple (type DC)	5%
Power consumption	AC 1,5VA; DC 2W
Inputs	4 fault report inputs, reporting on opening, 1 additional function
Function	S1, S2, S3, S4 switching, reporting, storing S5 inverted switching without storing in memory
Report input voltage	as same as operating voltage
Reporting input current	< 10mA
Signal delay	approx. 200ms for each reporting input and additional 200ms for relay contact
Acknowledgement/reset	by interruption of mains supply
Protection	front IP54
Switching capacity	1 N/C, max. AC 250V, max. 8A
Contact life	mechanical 2×10^7 operations
Temperature range	0° - + 50°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Temperature range	approx. 180g
Installation position	Any, as required

Order-No	Type
583000	ENQ4 AC230V
583001	ENQ4 AC115V
583002	ENQ4 DC24V
583010	Front frame ENQ4

DMC - the microcontroller-controlled multi-function timer provides all common functions and time ranges in one device:

16 functions:

On-delay, signal off-delay, signal on- and off-delay, one shot actuation during starting, one shot actuation during stopping, wipe contact during starting and stopping, flicker, one shot actuation, pulse shaping, each in some cases inverted too, electronic sensor.

16 time ranges:

0.1-1s; 0.3-3s; 1-10s; 3-30s; 6-60s; 10-100s; 0.3-3min; 1-10min; 3-30min; 6-60min; 0.3-3h; 0.6-6h; 1.2-12h; 2.4-24h; 7.2-72h; 16.8-168h

2 operating voltages:

AC 230V (or AC 115V) and DC 12-30V

1 or 2 contacts

Design with 1 or 2 change-over contacts, 2nd change-over contact optionally as instantaneous or 2nd time closing contact.

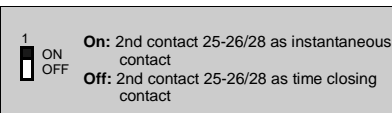


Installation

Time ranges and functions are set at a 9-position DIL switch on the side of the device. A1-A2 are operating voltage connections for AC 230V (or AC 115V), B1-B2 for DC 12-30V.

Functions and time ranges cannot be altered once the operating voltage has been applied.

The devices are available with one or two change-over contacts. In the design with two change-over contacts the second contact can be optionally switched as a time closing or instantaneous contact (switch 1):



The functions "signal off-delay", "signal on- and off-delay", "wipe contact during stopping", "one shot actuation during starting and stopping", "pulse shaping" are controlled via a potential-free contact at Y1-Y2. Every change of state at Y1-Y2 directly affects the connected time function irrespective of whether a preceding reset time has elapsed or not. All other time functions start when the operating voltage is applied.

Electronic sensor

With the "electronic sensor" function the relay picks up when the value of an electrical resistance connected to terminals Z1-Z2 drops below a certain level. The DMC can be used as a contact protection relay, sensor switching amplifier,

temperature probe (with external PTC/NTC resistor) or twilight switch (with external LDR resistor) in this mode of operation.

Remote potentiometer

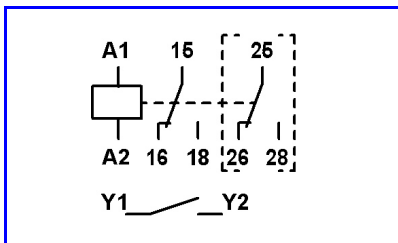
If a remote potentiometer is connected the bridge between terminals Z1-Z2 must be removed and the potentiometer on the front set to maximum.

Time ranges

The desired time range is determined according to the following table using the selector switch 6-9. The time at the end position of the potentiometer t is given.

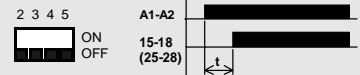
1s	60s	30min	12h
3s	100s	60min	24h
10s	3min	3h	72h
30s	10min	6h	168h

Contact configuration



On-delay

Contact 15-16 (25-26) switches after operating voltage is applied to A1-A2 (or B1-B2) and time lapse to 15-18 (25-28).



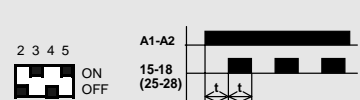
One shot actuation (starting)

Contact 15-16 (25-26) switches after operating voltage is applied to A1-A2 (or B1-B2) for the duration of the set time to 15-18 (25-28)



Flicker

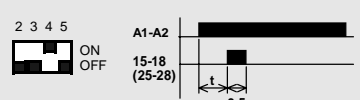
When voltage is applied to A1-A2 (B1-B2) the timed contact turns on and off repeatedly, starting with the pause time



The function can be inverted with switch 2 = ON (start with working time).

One shot actuation

Contact 15-16 (25-26) switches after operating voltage is applied to A1-A2 (or B1-B2) and time lapse t for 0.5 sec. to 15-18 (25-28).



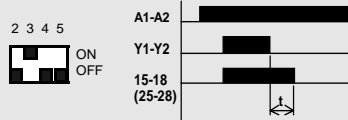
The function can be inverted with switch 2 = ON.



Multi-Function Timer/ Sensor Relay DMC

Signal off-delay

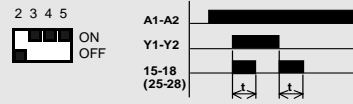
Contact 15-16 (25-26) switches after the potential-free contact closes at Y1-Y2 to 15-18 (25-28). When Y1-Y2 opens the off-delay time t starts, after which the contact switches back to 15-16 (25-26)..



The function can be inverted with switch 2 = ON.

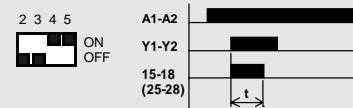
One shot actuation during starting and stopping

Contact 15-16 (25-26) switches to 15-18 (25-28) for the time t after the potential-free contact closes at Y1-Y2. Once Y1-Y2 opens the contact 15-16 (25-26) switches to 15-18 (25-28) for the duration t .



Pulse shaping

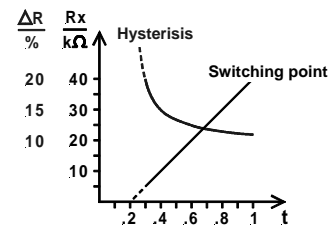
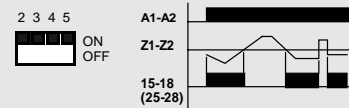
Contact 15-16 (25-26) switches to 15-18 (25-28) for the duration t when the potential-free contact closes at Y1-Y2 irrespective of whether the potential-free contact is opened before or after expiry of the time t .



The function can be inverted with switch 2 = ON.

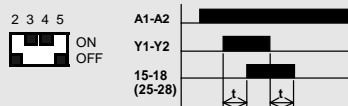
Electronic sensor

Contact 15-16 (25-26) switches to 15-18 (25-28) if an electrical resistance between terminals Z1-Z2 falls below a certain value. The switching threshold can be set on the front potentiometer t . The hysteresis depends on the resistance value used.



Signal on- and off-delay

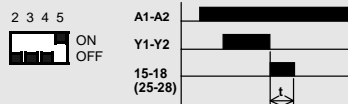
If Y1-Y2 is connected via a potential-free contact, contact 15-16 (25-26) switches on expiry of t to 15-18 (25-28). When Y1-Y2 opens the time lapse t starts the off-delay, after which the contact switches back to 15-16 (25-26).



The function can be inverted with switch 2 = ON.

One shot actuation (stopping)

If the closed potential-free contact at Y1-Y2 is opened, contact 15-16 (25-26) switches to 15-18 (25-28) for the duration t .



The function can be inverted with switch 2 = ON.

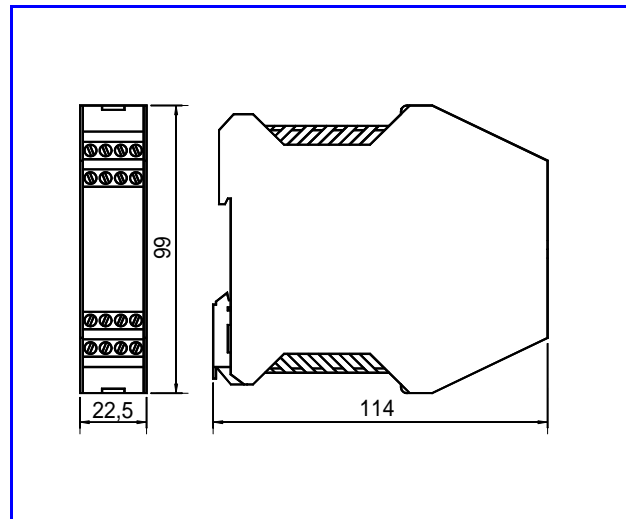
Accessories/optional extras

Remote potentiometer DFP 100kOhm including rotary knob, scale and installation kit (see data sheet DFP) on request.
Semi-conductor relay outputs AC 1A/250V other functions/time ranges

Order-No	Type
415000	DMC AC230V/DC12-30V, 1 contact
415010	DMC AC115V/DC12-30V, 1 contact
415100	DMC AC230V/DC12-30V, 2 contacts
415110	DMC AC115V/DC12-30V, 2 contacts
445091	Remote potentiometer DFP 100k

Specifications

Operating voltage U_N	AC 230V, 50-60Hz und DC 12-30V, AC 115V, 50-60Hz und DC 12-30V
Voltage tolerance	90..110% of U_N
Power consumption	AC 3,5VA bei 230V, DC <3W
LED's	yellow: stand by green: relay contact 15-18 (25-28) switched
Protection	IP20
Time ranges	0.1s - 168h
Input resistance sensor relay	5-40kOhm
Repeat accuracy	+/- 0.5%
Reclose readiness	< 60ms
Switching capacity	AC 250V: max. 8A, max. 2000VA DC: 2A bei 24VDC
Contact life	mechanical 2×10^7 operations
Temperature dependence	0.1% /°C
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight: approx	approx. 200g
Installation position	any, DIN-rail mounting



DVC - the microcontroller-controlled multi-function timer provides all common functions and time ranges in one device:

16 functions:

On-delay, signal off-delay, signal on- and off-delay, one shot actuation during starting, one shot actuation during stopping, one shot actuation during starting and stopping, flicker, one shot actuation, pulse shaping, each in some cases also inverted, electronic sensor.

2 times - t1 and t2 - available , 4 time ranges:

0.3-3s; 1-10s; 0.1-1min; 1-10min;

The time range t1 and t2 are independent of each other.

2 operating voltages:

AC 230V (or AC 115V) and DC 12-30V

1 or 2 contacts

Design with 1 or 2 change-over contacts, 2nd change-over contact optionally as instantaneous or 2nd time closing contact.



Installation

Time ranges and functions are set at a 9-position DIL switch on the side of the device. A1-A2 are operating voltage connections for AC 230V (or AC 115V), B1-B2 for DC 12-30V.

Functions and time ranges cannot be altered once the operating voltage has been applied.

The devices are available with one or two change-over contacts. In the design with two change-over contacts the second contact can be optionally switched as a time closing or instantaneous contact (switch 1):



The functions "signal off-delay", "signal on- and off-delay", "one shot actuation during stopping", "one shot actuation during starting and stopping", "pulse shaping" are controlled via a potential-free contact at Y1-Y2. Every change of state at Y1-Y2 directly affects the connected time function irrespective of whether a preceding reset time has elapsed or not. All other time functions start when the operating voltage is applied.

Electronic sensor

With the "electronic sensor" function the relay picks up when the value of an electrical resistance connected to terminals Z1-Z2 drops below a certain level. The DVC can be used as a contact pro-

tection relay, sensor switching amplifier, temperature probe (with external PTC/NTC resistor) or twilight switch (with external LDR resistor) in this mode of operation.

Remote potentiometer

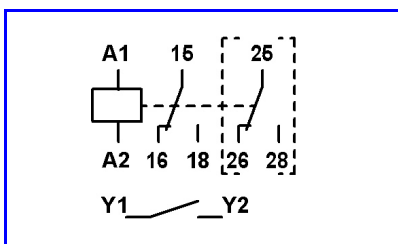
If a remote potentiometer is connected the bridge between terminals Z11-Z12 (or Z21-Z22) must be removed and the approx. potentiometer on the front set to maximum.

Time ranges

The desired time range is determined according to the following table using the selector switch 6,7 or 8,9. The time at the end position of the potentiometer t1 or t2 is given.

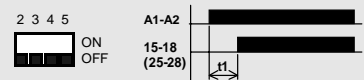
t1	t2
3s <input type="checkbox"/> 6,7	3s <input type="checkbox"/> 8,9 ON/OFF
10s <input type="checkbox"/>	10s <input type="checkbox"/>
1min <input type="checkbox"/>	1min <input type="checkbox"/>
10min <input type="checkbox"/>	10min <input type="checkbox"/>

Contact Configuration



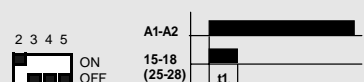
On-delay

Contact 15-16 (25-26) switches after operating voltage is applied to A1-A2 (or B1-B2) and time lapse (t1) to 15-18 (25-28).



One shot actuation (starting)

Contact 15-16 (25-26) switches after operating voltage is applied to A1-A2 (or B1-B2) for the duration of the set time t1 to 15-18 (25-28)



Flicker

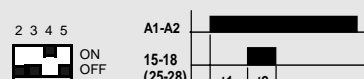
When voltage is applied to A1-A2 (B1-B2) the relay alternately switches on at time t2 and switches off at time t1, starting with the pause time t1.



The function can be inverted with switch 2 = ON (start with working time).

One shot actuation

Contact 15-16 (25-26) switches after operating voltage is applied to A1-A2 (or B1-B2) and time lapse t1 for the time of t2 to 15-18 (25-28).



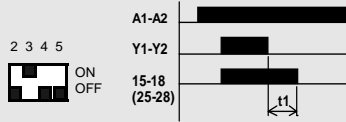
The function can be inverted with switch 2 = ON.



Multi-Function Timer / Sensor Relay DVC

Signal off-delay

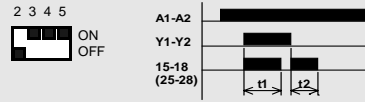
Contact 15-16 (25-26) switches after the potential-free contact closes at Y1-Y2 to 15-18 (25-28). When Y1-Y2 opens the off-delay time t_1 starts, after which the contact switches back to 15-16 (25-26).



The function can be inverted with switch 2 = ON.

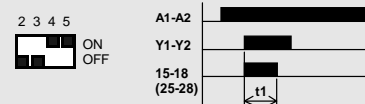
One shot actuation during starting and stopping

Contact 15-16 (25-26) switches to 15-18 (25-28) for the time t_1 after the potential-free contact closes at Y1-Y2. Once Y1-Y2 opens the contact 15-16 (25-26) switches to 15-18 (25-28) for the duration t_2 .



Pulse shaping

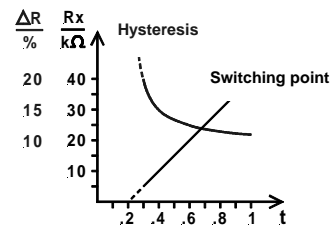
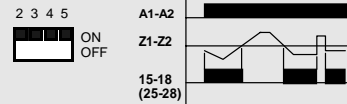
Contact 15-16 (25-26) switches to 15-18 (25-28) for the duration t_1 when the potential-free contact closes at Y1-Y2 irrespective of whether the potential-free contact is opened before or after expiry of the time t .



The function can be inverted with switch 2 = ON.

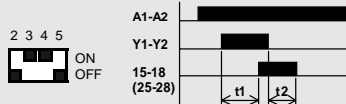
Electronic sensor

Contact 15-16 (25-26) switches to 15-18 (25-28) if an electrical resistance between terminals Z11-Z12 falls below a certain value. The switching threshold can be set on the front potentiometer t_1 . The hysteresis depends on the resistance value used.



Signal on- and off-delay

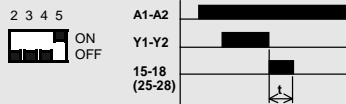
If Y1-Y2 is connected via a potential-free contact, contact 15-16 (25-26) switches on expiry of t_1 to 15-18 (25-28). When Y1-Y2 opens the time lapse t_2 starts the off-delay, after which the contact switches back to 15-16 (25-26).



The function can be inverted with switch 2 = ON.

One shot actuation (stopping)

If the closed potential-free contact at Y1-Y2 is opened, contact 15-16 (25-26) switches to 15-18 (25-28) for the duration t_1 .



The function can be inverted with switch 2 = ON.

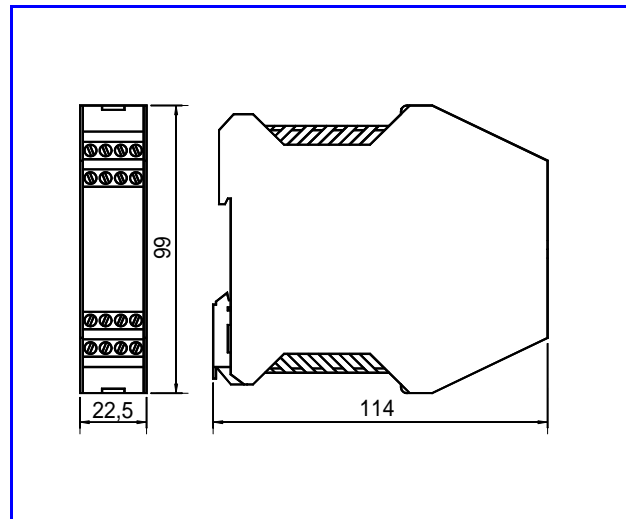
Accessories/optional extras

Remote potentiometer DFP 100kOhm including rotary knob, scale and installation kit (see data sheet DFP) on request.
Semi-conductor relay outputs AC 1A/250V other functions/time ranges

Order-No	Type
416000	DVC AC230V/DC12-30V, 1 contact
416010	DVC AC115V/DC12-30V, 1 contact
416100	DVC AC230V/DC12-30V, 2 contacts
416110	DVC AC115V/DC12-30V, 2 contacts
445091	Remote potentiometer DFP 100k

Specifications

Operating voltage U_N	AC 230V, 50-60Hz und DC 12-30V, AC 115V, 50-60Hz und DC 12-30V
Voltage tolerance	90..110% of U_N
Power consumption	AC 3,5VA bei 230V, DC <3W
LED's	yellow: stand by green: relay contact 15-18 (25-28) switched
Protection	IP20
Time ranges	0.1s - 10min
Input resistance sensor relay	5-40kOhm
Repeat accuracy	+/- 0.5%
Reclose readiness	< 60ms
Switching capacity	AC 250V: max. 8A, max. 2000VA DC: 2A bei 24VDC
Contact life	mechanical 2×10^7 operations
Temperature dependence	0.1% /°C
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight: approx	approx. 200g
Installation position	any, DIN-rail mounting



The timer DDC triggers a star-delta contactor combination to control the run-up of three-phase current motors.



- Adjustable run-up time for star mode
- Adjustable dwell period
- Compact design
- High breaking capacity
- Internal interlock for delta contact
- 2 operating voltages: AC 230V (AC 115V) and DC 12-30V



Function

When the operating voltage is applied to A1-A2 (B1-B2 for DC 12-30V) the instantaneous contact switches to 17-18 (star-mode) for **t1**. At the end of the transit time **t2** (dwell time) the time lag contact switches permanently to 17-28 (delta mode). The relay remains in this condition as long as the operating voltage is applied to A1-A2 (B1-B2).

Time range for run-up time t1: 3-90s (star-mode)

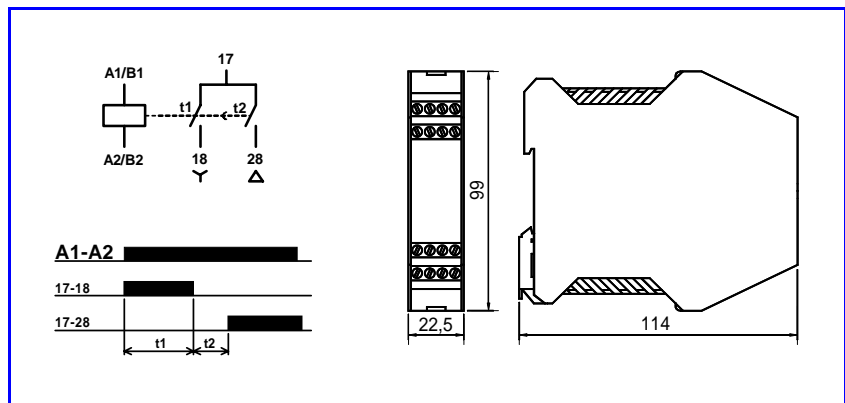
Time range for dwell time t2: 30-75ms

The respective time ranges are set at the two potentiometers on the front. A1-A2 are operating voltage connections for AC 230V (or AC 115V), B1-B2 for DC 12-30V.

Delta contact interlock

The **DDC** has two separate internal relays to trigger the star and delta modes.

The delta contact is hereby run through the normally closed contact of the star relay to that delta operation is only possible after the star contact has been opened safely. If the star contact is welded the delta switch-over is thus prevented in any case.



Specifications	
Operating voltage U_N	AC 230V, 50-60Hz und DC 12-30V, AC 115V, 50-60Hz und DC 12-30V
Voltage tolerance	90..110% of U_N
Power consumption	AC 2VA bei 230V, DC <3W
LED's	yellow: star contact 17-18 switched green: delta contact 17-28 switched
Protection	IP20
Time range star mode	3 - 90s
Dwell time	30 - 75ms
Repeat accuracy	+/- 0.5%
Reclose readiness	< 60ms
Switching capacity	AC 250V: max. 8A, max. 2000VA DC: 2A bei 24VDC
Contact life	mechanical 2x10 ⁷ operations
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight: approx	approx. 160g
Installation position	any, DIN-rail mounting

Order-No	Type
417000	DDC AC230V/DC12-30V
417010	DDC AC115V/DC12-30V



Timer Remote Potentiometer DFP

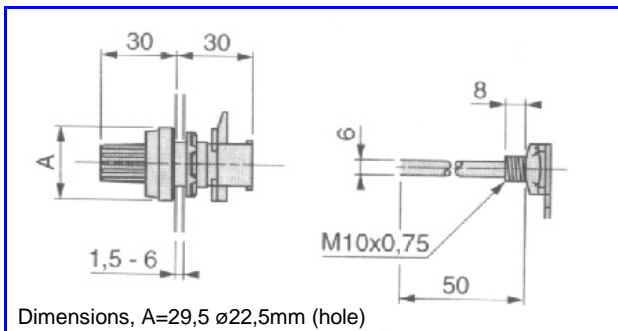
The remote potentiometer DFP can be used in connection with the timers DMC and DVC. DFP is supplied with rotary knob, scale and installation kit.



Installation

If a remote potentiometer is connected, the bridge between terminals Z1-Z2 of DMC/DVC-timer must be removed and the potentiometer on the front set to maximum.

- Dimension \varnothing 22,5mm
- Use a shielded cable, connect on side of the potentiometer at earth (PE) and/or grounded housing.
- max. distance to the timer DMC/DVC: 20m.
- Don't lay cable connections together with high voltage or high frequency power lines .



Order-No	Type
445091	DFP remote potentiometer 100kOhm incl. installation kit

DSCM - the multi-function timer provides all common functions and time ranges in one device:

4 functions:

On-delay, one shot actuation during starting, flicker starting with relay off, flicker starting with relay on

4 time ranges:

1-10s, 4-40s, 0.5-5min, 4-40min

1 or 2 contacts

Large input voltage range AC 110-230V or DC24V

Pluggable on 11-pin standard relay socket



Installation

Time ranges and functions are set at a 4-position DIL switch on the side of the device.

2 and 10 are operating voltage connections.

Functions and time ranges cannot be altered once the operating voltage has been applied.

The devices are available with one or two change-over contacts

The desired time range is determined according to the following table using the selector switch 3 and 4, the function is set using switch 1 and 2.

The timers DSCM are pluggable on 11-pin standard relay socket.

Time ranges

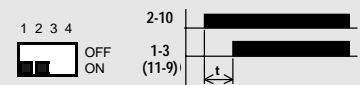
1-10s	
4-40s	
0.5-5min	
4-40min	

Ask for other time ranges

Function

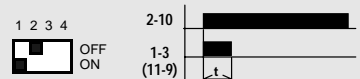
On-delay

Contact 1-4 (11-8) switches to 1-3 (11-9) after operating voltage is applied to 2-10 and time has elapsed.



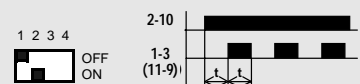
One shot actuation (starting)

Contact 1-4 (11-8) switches to 1-3 (11-9) after operating voltage is applied to 2-10 for the duration of the set time.



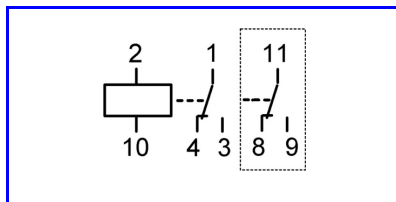
Flicker

When voltage is applied to 2-10 the timed contact turns on and off repeatedly, starting with the pause time.



The function can be inverted with switch 2 = OFF (start with working time).

Contact Configuration

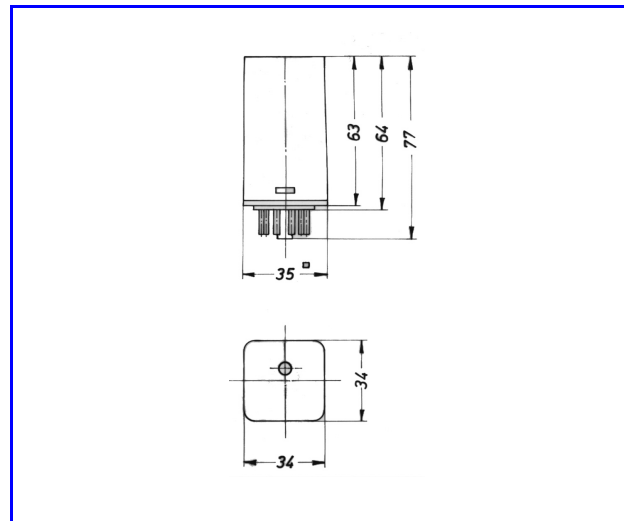


Order-No	Type
434100	DSCM AC110-230V, 1 c/o contact
434120	DSCM DC24V, 1 c/o contact
434200	DSCM AC110-230V, 2 c/o contacts
434220	DSCM DC24V, 2 c/o contacts



Multi-Function Timer DSCM

Specifications	
Operating voltage U_N	AC 110-230V, 50-60Hz or DC 24V (DC21-30V smoothed)
Power consumption	AC 1,5VA at 230V, DC 3W
LED	green: relay contact 1-3 (11-9) switched
Protection	housing IP20, connection IP00
Time ranges	1-10s, 4-40s, 0.5-10s, 4-40min
Repeat accuracy	+/- 1,0%
Reclose readiness	ca. 300ms
Switching capacity	AC 250V: max. 6A, max. 1500VA ohm's load DC: 2A / 24VDC ohm's load
Contact life	mechanical 1×10^7 operations
Temperature dependence	0,1% / °C
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight	approx. 150g
Installation position	any



ENS20 is a compact, in all usual functions and time ranges simply programmable digital timer/counter. By use of a tight-fitting keyboard the front of the equipment is protected against splash-water completely. Therefore ENS20 is suitable ideally for the employment at bakery machines, machine tools, manufacturing automats etc..



- front protection IP65
- simple programming by integrated keyboard
- 7 programmable time ranges 0.01s - 999h
- all usual functions programmable
- quartz-stabilized time base
- only 48x48mm front size
- 1 equipment for all applications
- START/STOP (gate) and RESET inputs

Timing begins either with the programmed time value (preselection) and ends at zero or it begins with zero and ends at the preselected value. Stop, resetting as well as adjusting new parameters during the timing operation are possible.

Keyboard function during timing/counting

The keyboard disabling (LOCK) is activated, if the keys "<" and "R" are pressed while connecting the supply voltage. By this the keyboard can be blocked against inadvertent adjusting in critical applications. Deactivating is effected by renewed actuation "<" and "R" while switching on the supply voltage.

Reset functions

- Reset on zero or to the preselected value
- Announcement of the preselected value; timing continues in the background with all switching functions
- Programming mode; depending on function attitudes only possible if no starting signal is activated
- With power on activate the simultaneous pressing of these keys the LOCK function (keyboard disabling)

By operation of the backspace key "R" or the RESET-input (1-2) the ENS20 is set to the programmed preselected value in each operating condition. The RESET signal (1-2) and "R" - key have priority in relation to the START signal.

ENS20 can be used in numerous modes of operation as timer or as counter.

The different functions are now described in detail.

ENS20 as timer (2-0 to 2-6, see function 2)

Timing begins with turning on the starting signal (1-3) and can be interrupted by this input as desired. The START input 1-3 can be closed by a cable link. In this case timing begins directly with switching on the mains voltage. RESET and START input have an internal noise pulse suppression. They may be activated by contacts or electronic initiators.

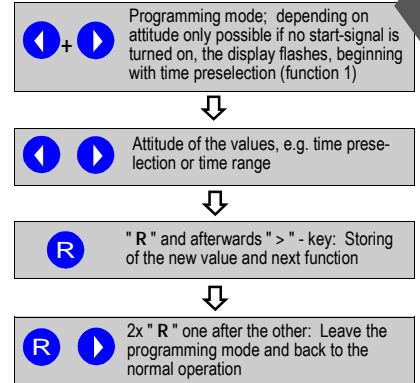
ENS20 as counter (2-7, see function 2)

All functions 3 to 8 also apply to the counter mode. The clock input is provided at the terminals 3 (+12..24V) and 1 (0V). Counting is done by closing an external counting contact. Also 2- or 3-wire semiconductor outputs of initiators can be used. The falling edge is counted.

Programming

The programming mode is activated by simultaneously pressing of "<" and ">" keys. **Note:** The LOCK function must be deactivated. There are 8 functions (1..8), which are working on in sequence. The display flashes in the programming mode.

Programming



Display	Function 1: Timer/counter preselection
last programmed value, e.g. 472	Select the time/count-preselection with the keys "<" and ">". Single and continuous pressure are possible. Storing and next function with "R". The display shows "r->": Next function with key ">", return to the operating mode with "R" - key.

Display	Function 2 Timing ranges
2-0	0.01 - 9.99s
2-1	0.1 - 99.9s
2-2	1 - 999s
2-3	0.1 - 99.9min
2-4	1 - 999min
2-5	0.1 - 99.9h
2-6	1 - 999h
2-7	Counter mode

2



Programmable Digital Timer/Counter ENS20

The following function settings are valid depending on the value of the function 2 for **timer mode (2-0 to 2-6)** or **counter mode (2-7)**.

Display	Function 3: Timing functions
3-0	On-delay. Timing begins with applying of the mains voltage and closing of the START-contact. After timing the contacts switch from 15-16 to 15-18 until the arrival of a resetting signal, at least however for 100ms.
3-1	Impulse-limiting. As On-delay, however the contacts are switched on with application of the mains voltage immediately (15-18) and back to 15-16 after timing.
3-2	Flashing (T1=T2). The ENS20 works after applying of the mains voltage and closing of the START contact as symmetrical cycling timer. The cycle starts with output off (relay switched off). On and off time are equal.
3-3	Flashing (T2=100ms). In this operating condition the output relay switches periodically for 100ms. The total cycle time is determined by the preselected current value.
3-4	Signal off-delay. The control is made by the START contact. The contacts switch on immediately and after opening the starting contact timing begins. After timing the contacts switch back to 15-16. A stop is not possible here.
3-5...	Free for customized special functions

Display	Function 4: Counting direction
4-0	upward. Timing/counting begins with zero and ends with the preselected value. A RESET signal sets back to zero.
4-1	downward. Timing begins with the preselected value and ends with zero. A RESET signal sets back to the preselected value.

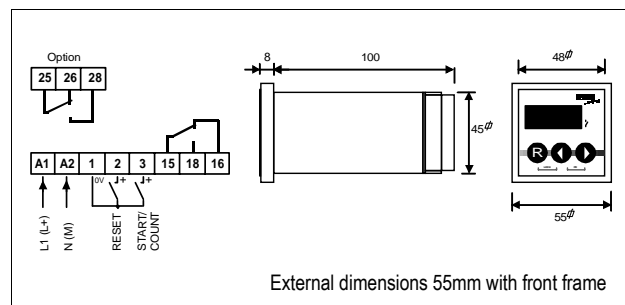
Display	Function 5: Power failure function
5-0	Continuation. Timing is continued after power failure with the value reached last.
5-1	Restart. Timing begins after power failure with zero or with the preselected value (RESET after power failure).

Display	Function 6: Enable/disable programming
6-0	Programming enabled during timing. Programming during timing (i.e. the START signal is turned on) is enabled. Timing is stopped and continued after the recent time preselection with the new values.
6-1	Programming disabled during timing. The programming mode by "<" and ">" - keys is not possible during timing (i.e. the START signal is turned on). Programming only, if the START input is turned off.

Display	Function 7: Aux. contact, only version 52311x
7-0	Auxiliary contact is immediate contact. Timer mode: The 2nd contact switches with applying the START signal. Counter mode: The 2nd contact switches on with the first counting pulse.
7-1	Auxiliary contact is programmable pre-contact The display shows next "Pxx". xx is the timer/counter value of the 2nd contact. Set the value with <, > e.g. "P52". Through this the 2nd contact switches on 52 clocks before reaching the timer/counter preselection (1st contact). With the value "P00" the 2nd contact switches at the same time as the 1st contact with reaching the preselection value.

Display	Function 8: Input frequency
8-0	Input frequency at start/count 50Hz.
8-1	Input frequency at start/count 500Hz.

Specifications	
Operating voltage	DC24V, AC230V/AC115V, 50-60Hz
Voltage tolerance	90..110% of U _N
Power consumption	< 2VA
LED-display	3 digits, 7mm red, time up indication
Protection	IP65 front
Internal data storage time	10 years
Contacts	1 change-over contact, optional 2nd contact
Contact rating	jAC 250V, 8A; DC 24V, 3A
Contact life	mechanically 2x10 ⁷ operations electrical 10 ⁵ operations
Inputs 2, 3	DC10..30V or external contact
Time base	quartz-stabilized, time tolerance: < 0,1%
Min.power-off time	function 5-1:100ms, function 5-0: 200ms
Input frequency / counter	50/500Hz programmable
Trigger	closing of the contact / falling edge
Time ranges	7 between 0.01s and 999h
Temperature range	0° - + 50°C
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight	approx. 200g



Order-No	Type
523100	ENS20 AC230V, 1 contact
523101	ENS20 AC115V, 1 contact
523102	ENS20 ADC24V, 1 contact
523110	ENS20 AC230V, 2 contacts
523111	ENS20 AC115V, 2 contacts
523112	ENS20 ADC24V, 2 contacts
523010	Plug-on front frame 55x55mm (option)

The electronic digital timer ENS90 combines modern industrial electronics with robust mechanical construction. By use of a tight-fitting keyboard the front of the equipment is protected against splash-water completely. Therefore ENS90 is suitable ideally for the employment at bakery machines, machine tools, manufacturing automats etc..



- front protection IP65
- simple programming by integrated keyboard
- 6 programmable time ranges 0.01s - 99,9h
- all usual functions programmable
- quartz-stabilised time base
- 13mm LED display
- Integrated 12VDC power supply for external initiators
- START/STOP (gate) and RESET inputs

Timing begins with the programmed time value (preselection) and ends at zero (time up). Stop, resetting as well as adjusting new parameters during the timing operation are possible.

Time setting

By pressing the „fast upward“ or „slow downwards“ keys the required timing period can be set. During the time preselection the upper LED „programming“ flashes. Single and continuous pressure are possible. The new preselect value is stored by pressing the „memory“ key, "Reset " cancels without memory.

	Fast upward, time setting
	Slow downward, time setting
	Memory, storing of the new value
	Reset, cancel without storing

Keyboard function during timing

	Announcement of the preselected value; timing continues in the background with all switching functions
	Reset to zero or to the preselected value

Operating instructions

By operation of the backspace key "R" or the RESET-input (2-3) the ENS90 is set to the programmed preselected value in each operating condition. The RESET signal (2-3) and "R" - key have priority in relation to the START signal.

Timing begins with turning on of the starting signal (1-3) and can be interrupted by this input as desired. The START (gate) input 1-3 can be closed by a cable link. In this case timing begins directly with switching on of the mains voltage. RESET and START input have an internal noise pulse suppression. They may be activated by contacts or electronic initiators. The 2nd contact (immediate contact) switches with applying of the START signal.

A stabilised voltage of DC12V / 60mA is available on the terminals 3, 4 for the supply of external initiators.

A closed relay contact 15-18 is indicated by the lower LED „time up indication“

Programming

On the back of the equipment are eight selector switches. The following modes of operation can be adjusted in arbitrary combination:

Counting direction (switch 1)

Timing begins with the programmed time value and ends at zero.

Switch 1	Counting direction
ON	upward
OFF	downward

Timing ranges (switches 2,3,4)

2	3	4	Timing range
OFF	OFF	OFF	0,01 - 9,99s
OFF	OFF	ON	0,01 - 9,99s
ON	OFF	OFF	0,1 - 99,9s
OFF	ON	OFF	1 - 999s
ON	OFF	ON	0,1 - 99,9min
OFF	ON	ON	1 - 999min
ON	ON	OFF	0,1 - 99,9h
ON	ON	ON	0,1 - 99,9h

Power failure function (switch 5)

Switch 5	Power failure function
ON	Continuation. After power failure timing is continued with the value reached last.
OFF	Restart. After power failure timing begins at zero (RESET after power failure).



Programmable Digital Timer ENS90

Enable/disable programming (switch 6)

Switch 6	Enable/disable function
ON	Programming disabled during timing. The programming mode is not possible during timing (i.e. the START signal is turned on). Programming only, if the START input is turned off.
OFF	Programming enabled during timing. Programming during timing (i.e. the START signal is turned on) is enabled. Timing is stopped and continued after the recent time preselection at the new values.

Timing functions (switches 7,8)

On-delay

Timing begins with applying of the mains voltage and closing of the START-contact. After timing the contacts switch from 15-16 to 15-18 until the arrival of a resetting signal, at least however for 200ms.

Impulse-limiting

As On-delay, however the contacts are switched on with application of the mains voltage immediately (15-18) and back to 15-16 after timing.

Flashing (T1=T2)

The ENS90 works after applying of the mains voltage and closing of the START

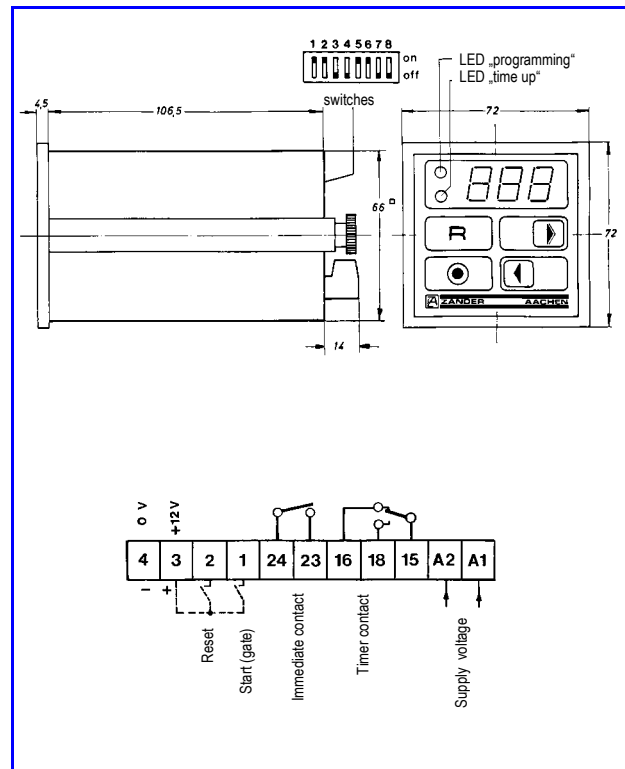
contact as symmetrical cycling timer. The cycle starts with output off (relay switched off). On and off time are equal.

Flashing (T2=100ms)

In this operating condition the output relay switches periodically for 200ms. The total cycle time is determined by the preselected current value.

7	8	Timing functions
OFF	OFF	On-delay
OFF	ON	Impulse limiting
ON	OFF	Flashing (T1=T2)
ON	ON	Flashing (T2=200ms)

Specifications	
Operating voltage	DC24V, AC230V/AC115V, 50-60Hz
Voltage tolerance	90..110% of U _N
Power consumption	< 5VA
LED-display	3 digits, 13mm red, LEDs: time up indication and programming mode
Protection	IP65 front
Internal data storage time	10 years
Contacts	1 change-over contact (timer), 1N/O immediate, switches with Start-signal
Contact rating	AC 250V, 8A; DC 24V, 3A
Contact life	mechanically 2x10 ⁷ operations electrical 10 ⁵ operations
Inputs 2, 3	DC10..30V or external contact
Power supply for ext. initiators	DC12V / 60mA stabilised
Time base	quartz-stabilised, time tolerance: < 0,1%
Min.power-off time	Approx. 200ms
Time ranges	6 between 0.01s and 99,9h
Temperature range	0° - + 50°C
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight	approx. 450g



Order-No	Type
523000	ENS90 AC230V
523001	ENS90 AC115V
523002	ENS90 ADC24V

The relay DSFC regulates the level of liquid in containers/tanks in combination with a connected pump engine. The level of liquid is always held between the electrodes attached in different heights. Over a conductance measurement the equipment recognizes whether the liquid is between the electrodes or not. Sensitivity is adjustable in a wide range.

- Inexpensive all-electronic device
- level regulation and level monitoring possible
- Electrodes DC voltage-free
- No galvanic procedures in the medium
- Adjustable sensitivity and time delay
- Suitable for almost all liquid media
e.g. water, beverages, jam, chocolate etc.
- Very compact design



Fill containers with pump

The pump is switched on by the relay contact 15-18, until the level of liquid reaches the upper electrode 7. The relay switches off the pump (15-16) until the level of liquid falls below the electrode 9 and then the pump is switched on again. Also the contacts 25-28 and/or 25-26 switch in the same manner.

Empty containers with pump

Like above, however the pump is now switched by relay contacts 15-16.

Level monitoring

For just the level monitoring only the connections 7-9 are used. Connection 9 must be attached alternatively to the (electrically leading) housing or to the lower electrode.

Sensitivity and time adjustment

At the upper potentiometer sensitivity can be adjusted depending upon the conductivity of the liquid between 5kOhm and approx. 300kOhm. The adjustment of the sensibility as small as possible is recommendable. Alternatively a variant with a sensitivity between 2kOhm and 10kOhm is available. The lower potentiometer (t) permits the adjustment of a time-delay of the swit-

ching contacts between approx. 0,2s and 2s. Thereby a reaction of the relay to a momentary exceeding/falling below the limit values is suppressed, for example at wave formation of the liquid.

Installation

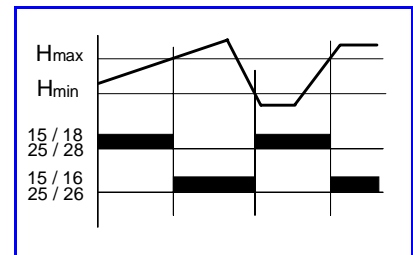
Because all electrodes have a pure alternating voltage, galvanic procedures in the liquid are avoided. This voltage is galvanically separated from the operating voltage of the equipment.

The mechanical construction of the electrodes is freely shapable depending upon conditions. Usually precious metal bars in appropriate lengths are used.

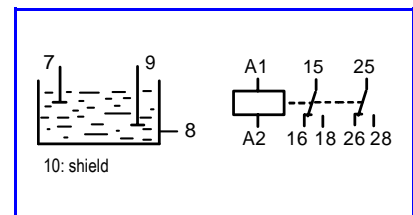
Connection 8 is connected with the electrically leading container or attached to an additional electrode mounted under the level of the electrode 9.

The electrode lines should be shielded, whereby the shield is put at terminal 10.

The devices provide two change-over contacts and are integrated into a standard 35mm DIN rail housing.



Contact configuration

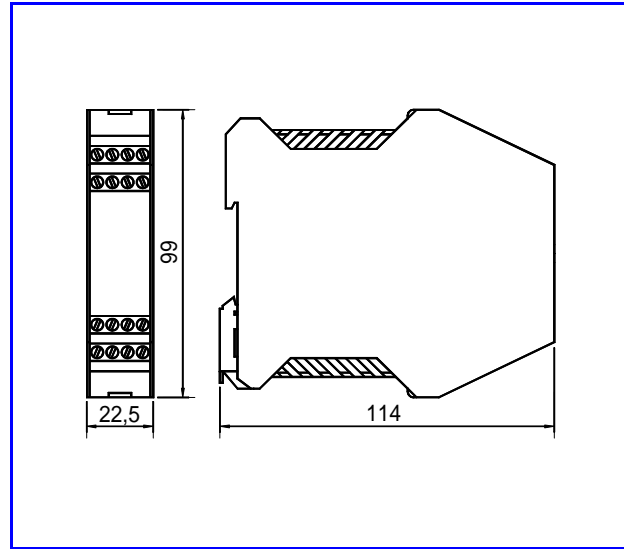


Order-Nr	Type
404801	DSFC AC230V, 5-300kOhm
404803	DSFC AC115V, 5-300kOhm
404805	DSFC AC230V, 2-10kOhm



Liquid Level Control DSFC

Specifications	
Operating voltage U_N	AC 230V, 50-60Hz AC 115V, 50-60Hz
Voltage tolerance	85..110% of U_N
Power consumption	approx. 1VA
LEDs	yellow: stand by green: contacts 15-18 / 25-28 switched
Protection	IP20
Electrode input 7-9	max. AC12V DC voltage-free
Adjusting range	5-300kOhm; 2-10kOhm
Time delay	Approx. 0.2-2s
Repeat accuracy	+/- 1,0%
Switching capacity	AC 250V: max 8A, max 2000VA DC: 2A at DC 24V
Contact life	mechanical 2×10^7 operations
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight	approx. 180g
Installation position	any
Mounting	DIN-rail DIN EN 50022-35



Electronic amplifier relays produce a switching signal with falling below or exceeding a certain electrical resistance value at the signal input terminals. The sensor attached there is only electrically very small loaded, so that these devices are very useful in numerous instrumentation applications:

- Thermostat control with PTC/NTC resistors
- Contact protective relays
- Sensor circuit amplifiers
- Twilight switches with external LDR resistors
- Air humidity measurement



Function / Installation

If the bridge Y1-Y2 is installed, the DSTC switches when falling below an electrical resistance value between the connections 7-9.

The trigger level is adjustable at the front potentiometer within a wide range. If the connections 8-10 are bridged, the relay contacts switch into self-holding when one time falling below of the measured resistance value appears. The holding wire should be shielded, shield connection at terminal 9.

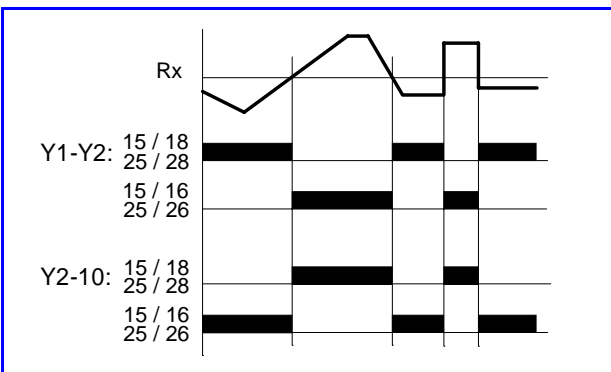
The switching function can be inverted by setting the bridge Y2-10. In this condition the relay switches on with exceeding at an electrical resistance value between the connections 7-9. At bridged

terminals 8-10, self-holding takes place after one time exceeding of the measured resistance value.

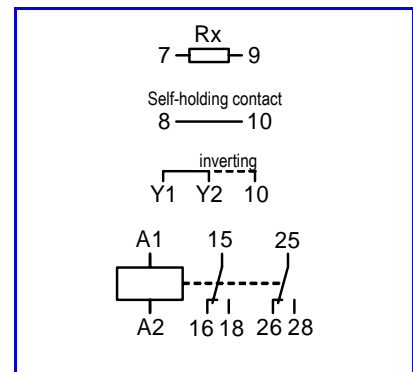
At the devices with AC-voltage supply the measuring circuit is galvanically separated from the operating voltage, but not at the DC24V types.

The devices provide two change-over contacts and are integrated into a standard housing for 35mm mounting rail housing.

Order-No	Type
404200	DSTC AC230V, 100kOhm
404201	DSTC AC230V, 2MOhm
404202	DSTC AC115V, 100kOhm
404203	DSTC AC115V, 2MOhm
404204	DSTC DC24V, 100kOhm
404205	DSTC DC24V, 2MOhm



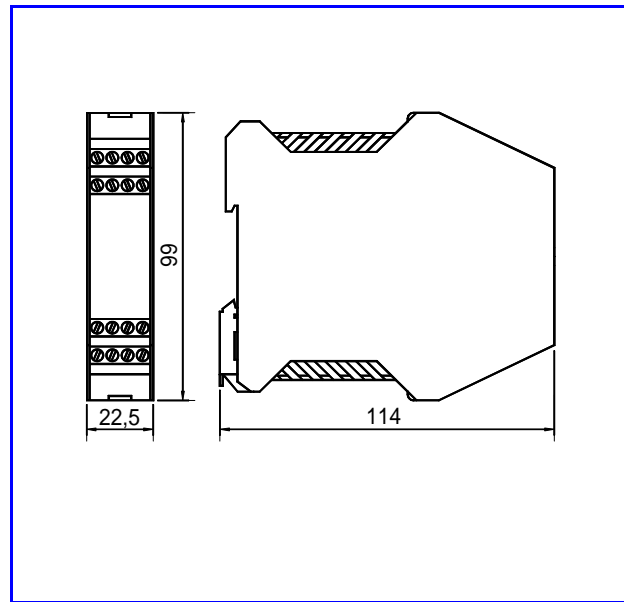
Contact configuration





Electronic Amplifier Relay DSTC

Specifications	
Operating voltage U_N	AC 230V, 50-60Hz AC 115V, 50-60Hz DC 24V
Voltage tolerance	85..110% of U_N
Power consumption	AC approx. 0.5VA / DC approx. 0,7W
LEDs	yellow: stand by green: contacts 15-18 / 25-28 switched
Protection	IP20
Measurement Input 7-9	DC12V: max. 2,5mA at 1kOhm adjusted sensitivity max. 0,1mA at 100kOhm adjusted sensitivity
Hysteresis	approx. 10%
Adjusting range	1,0 - 100kOhm; 20kOhm - 2MOhm
Repeat accuracy	+/- 1.0%
Switching capacity	AC 250V: max 8A, max 2000VA DC: 2A bei 24VDC
Contact life	mechanical 2×10^7 operations
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight	approx. 180g
Installation position	any
Mounting	DIN-rail DIN EN 50022-35



The motor protection relay DHC is a temperature control relay for electric motors with no-voltage protected reconnection-stop, e.g. in case of a mains failure the relay remains to be interlocked at a release.

It is specially distinguished because of:

- Very compact housing
- High security is given by the reconnection-stop and the principle of rest current
- Easy installation of several sensor resistances at one relay
- Maximum of reliability because of the modern CMOS-technology
- Integrated reset key
- Galvanic isolation of the sensor circuit from the voltage supply at the AC-type
- Models with 1 or 2 contacts



Function

At a small sensor resistance (normal temperature) the output contact 13-14 is closed. When the nominal cut-off temperature is reached, the contact 13-14 opens and interrupts the control circuit. Simultaneously, the interlocking of the output relay follows assured by the permanent memory; the red LED shines.

This interlocking could only be canceled after the temperature falls under the nominal cut-off temperature and the reset key is pressed. An interruption of the supply voltage will not lead to electrical reset. A reset and therewith a restart of the motor could only result of a cooled off motor winding and an actuation of the integrated reset key at the front.

Installation

At the terminals T1-T2 the thermally controlled resistors (PTC), which are in the motor winding, are connected. Several temperature sensors can be connected in series; the cumulative cold resistance has to be smaller than 1.65 kΩ. Because of the principle of rest current,

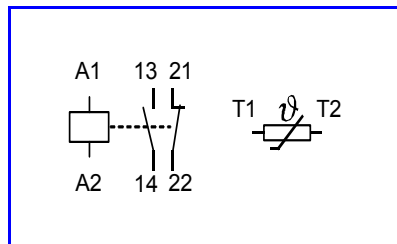
also a wire breakage in the sensor line will be indicated as a fault.

By the DHC with alternating voltage supply (standard type), the measuring circuit is galvanically isolated from the mains.

On application items with DC24V-supply are possible; but for the galvanic isolation of the measuring line it is recommended to connect the DC24V-type to an external transformer.

Order-No	Type
446050	DHC AC230V, 1 N/O
446051	DHC AC115V, 1 N/O
446052	DHC AC24V, 1 N/O
446060	DHC AC230V, 1 N/O / 1 N/C
446061	DHC AC230V, 1 N/O / 1 N/C

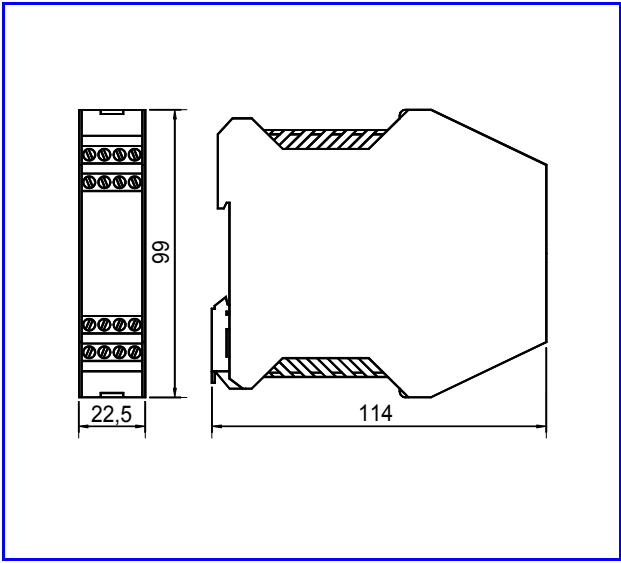
Contact configuration





Thermistor Motor Protection Relay DHC

Specifications	
Operating voltage U_N	AC 230V, 50-60Hz AC 115V, 50-60Hz AC 24V, 50-60Hz
Voltage tolerance	85..110% of U_N
Power consumption	approx. 0.5VA
LED's	stand by (green) overtemperature relay contact (red)
Protection	IP20
Operating range T1-T2	1.65 - 4.0 kOhm
Terminal voltage resistor-input	< 6V
Reset/acknowledgement	Key at the front
Switching capacity	1 N/O 13 -14 (optional add. 1N/C 21-22) max. AC 250V, max. 5A, max.1250VA DC: 2A at DC 24V
Contact life	mechanical 5×10^7 operations
Temperature range	-20° - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight: approx	approx. 200g
Installation position	any
Mounting	DIN-rail mounting



The stabilised compact power supply unit DNEZ5 is excellently qualified to be used as a power supply unit for small components of the control technique, e.g. proximity switches, light barriers or sensors.



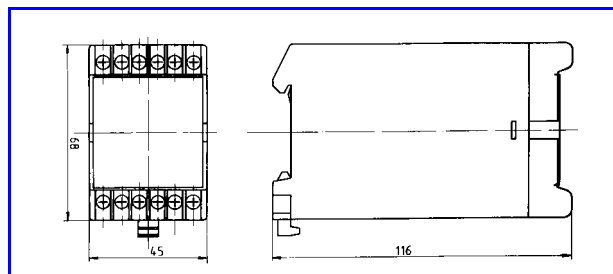
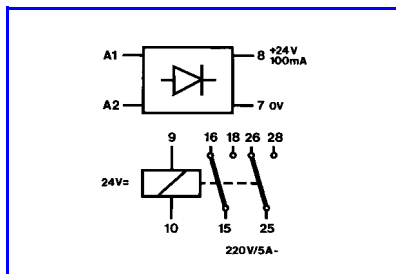
- DC 24V / 100mA stabilized, short-circuit-proof output voltage
- Compact DIN-housing, width just 45mm
- Inclusive switching relay with 2 change-over contacts
- LED-display for secondary voltage and relays
- Qualified alternatively for NPN or PNP-initiators

An integrated switching relay with 2 change-over contacts can be used by the connected sensors as a switching amplifier. The power-on signal and the switching status are shown by LEDs.

The polarity of the relay control 9-10 is random, the power consumption of the relay is approx. 40mA . Because of the protection of this input a controlling via a transistor stage is possible without a problem, there will be also no hazardous of these components. The voltage output 7-8 is permanently short-circuit-proof.

Specifications	
Operating voltage U_N	AC 230V, 50-60Hz AC 115V, 50-60Hz
Voltage tolerance	85..110% of U_N
Power consumption	approx. 3.0VA
LED's	green for supply voltage red: relay contact is switched
Protection	housing IP40, terminal IP10
Voltage output	DC 24V / 100mA stabilized permanent short-circuit-proof; +5% / -10%
Power consumption relay	approx. 40mA at contact 9-10
Switching capacity	2 change-over contacts 250V AC: max. 5A, max. 1000VA DC: 24V, 3A / 60V, 500mA / 110V, 200mA
Contact life	mechanical 2x10 ⁷ operations
Temperature range	-20 ⁰ - + 60°C (dew-free)
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight	approx. 250g
Installation position	any
Mounting	DIN-rail mounting DIN EN 50022-35

Contact configuration



Order-No	Type
408050	DNEZ5 AC230V
408051	DNEZ5 AC115V

The compact power supply unit NTX is excellently qualified to be used as a power supply unit for small automation components, e.g. of the Micro-PLCs SPEEDY/EX16 or the fieldbus-modules ESB. The NTX is also just right as a supply unit in control applications, e.g. proximity switches, light barriers or sensors.



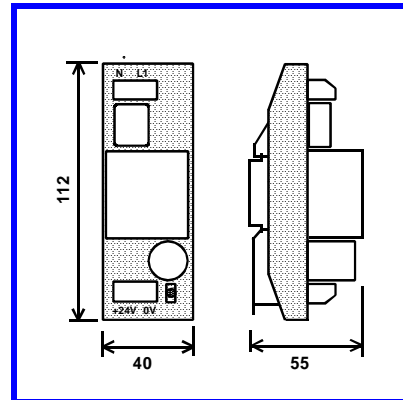
- DC 24V / 160mA smoothed output voltage
- Compact size, DIN-rail mounting
- LED-display for secondary voltage
- Mains filter included
- Permanent short-circuit proof

Installation

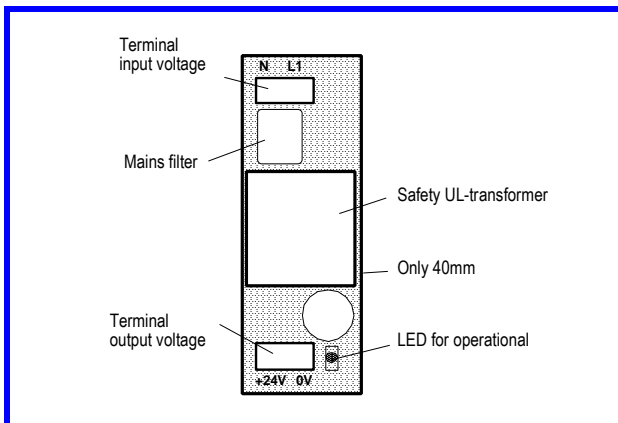
The output terminals are existing twice, so on the secondary side several **NTX** can be connected easily parallel or in series.

Because of the integrated mains filter and the short-circuit proof transformer, processor controls can operate at the **NTX** with noise immunity. The DC 24V-connection should be as short as possible and may not be placed near a high voltage transmission line or a high frequency line.

The supply unit is loadable up to 160mA (200mA peak). This is sufficient in order to supply three Micro-PLCs SPEEDY depending on the quantity of switched relay-outputs.



Order-Nr	Type
471200	NTX AC230V
471201	NTX AC110/115V



Specifications	
Operating voltage	AC 230V, 115V; +/- 10%
Mains frequency	50-60Hz
Power consumption	max. 4,0VA
LED	yellow for operational (secondary voltage)
Output voltage	DC 24V, unstabilized, smoothed
Output current	max. 160mA permanent, 200mA up to 20s
Residual ripple	< 5%
Temperature range	0 .. +50°C
Max. output voltage	DC 30V / without load / 100% input voltage
Min. output voltage	DC 17V / 160mA / 100% input voltage
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Weight / mounting	approx. 280g, DIN rail mounting

The stabilised compact power supply unit NTC5 is excellently qualified to be used as a power supply unit for small components of the control technique, e.g. proximity switches, light barriers or sensors. An integrated switching relay with 2 change-over contacts can be used by the connected sensors as a switching amplifier. The output voltage is durable short-circuit proof.



- Wide input voltage range AC 85-264V, DC 110-260V
- Output DC24V / 450mA stabilised
- Compact DIN-housing, width just 25mm
- Inclusive switching relay with 2 change-over contacts
- LEDs for secondary voltage and relays
- Short-circuit-proof output voltage

Structure and application

The input voltage range of AC85-264V or DC110-264V makes possible the employment of only one variant for all usual AC/DC operation voltages. The max. permanent output current of NTC5 is 550mA at an ambient temperature of 55°C. The stabilised DC24V output voltage is galvanically separate from the input voltage.

Integrated switching relay

An integrated switching relay with 2 change-over contacts can be used by the connected sensors as a switching amplifier. The power-on signal and the switching status are shown by LEDs.

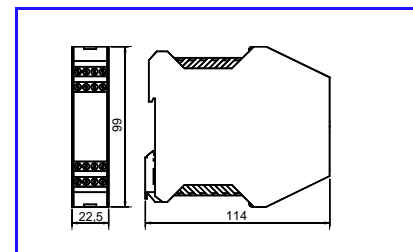
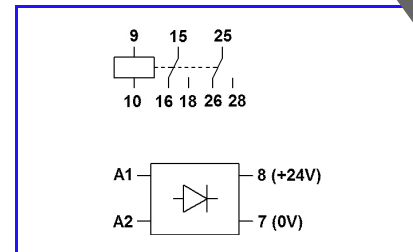
The polarity of the relay control 9-10 is random, the power consumption of the relay is approx. 40mA. Because of the protection of this input, a controlling via a transistor stage is possible without a problem, there will be also no hazardous of these components.

Overload and temperature rise protection

The voltage output 7-8 is permanently short-circuit-proof. In case of overload the output 7-8 switches off and is automatically ready for use again after removal of the overload. Same applies to thermal overloading. Furthermore NTC5 is varistor-protection-wired against overvoltage at the input side. Thus the equipment is almost indestructible with normal installation.

Installation

The PE terminal must be connected with protective ground for EMC reasons. A parallel connection of the output voltages of several NTC5 is not allowed, probably however a series connection. The ventilation slots at the housing's upper and lower surface must be kept free.



Order-No	Type
471260	NTC5 AC 85-264V / DC24V

Specifications	
Standards	EN60950, DIN/VDE0160
Operating voltage (input)	AC 85-264V 47-440Hz, DC 110-264V
Power consumption	approx. 15VA
LEDs	yellow: stand by green: relay contact 15-18 / 25-28 switched
Voltage output	DC24V stabilised permanently short-circuit-proof; 23,0...25,0V
Output current	I _n = 450mA, max. 550mA at T=55°C
Residual ripple	max. 260mV
Power consumption relay	approx. 40mA at contact 9-10
Contacts	2 change-over contacts
Switching capacity	AC250V, max. 8A / AC12, max. 2.5A / AC15 DC 24V, max. 8A / DC12, max. 5A / DC13
Contact life	mechanical 2x10 ⁷ operations
Dielectric strength	Input/Output: AC 3kV, Input/PE: AC 2kV
Protection	IP20
Temperature range	-10°C bis +55°C
Weight	approx. 160g
Mounting	DIN-rail mounting DIN EN 50022-35

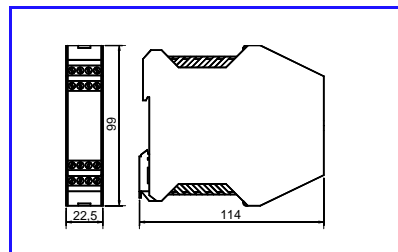
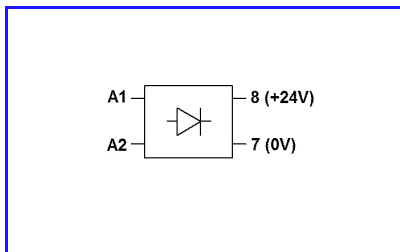
The stabilised compact power supply unit NTC1 is excellently qualified to be used as a power supply unit for small components of the control technique, e.g. proximity switches, light barriers or sensors. The output voltage is durable short-circuit proof.



- Wide input voltage range AC 85-264V, DC 110-260V
- Output DC24V / 450mA stabilised
- Compact DIN-housing, width just 25mm
- LEDs for secondary voltage and relays
- Short-circuit-proof output voltage

Structure and application

The input voltage range of AC85-264V or DC110-264V makes possible the employment of only one variant for all usual AC/DC operation voltages. The max. permanent output current of NTC1 is 550mA of an ambient temperature of 55°C. The stabilised DC24V output voltage is galvanically separate from the input voltage.



Overload and temperature rise protection

The voltage output 7-8 is permanently short-circuit-proof. In case of overload the output 7-8 switches off and is automatically ready for use again after removal of the overload. Same applies to thermal overloading. Furthermore NTC1 is varistor-protection-wired against overvoltage at the input side. Thus the equipment is almost indestructible with normal installation.

Installation

The PE terminal must be connected with protective ground for EMC reasons. A parallel connection of the output voltages of several NTC1 is not allowed, probably however a series connection. The ventilation slots at the housing's upper and lower surface must be kept free.

Specifications	
Standards	EN60950, DIN/VDE0160
Operating voltage (input)	AC 85-264V 47-440Hz, DC 110-264V
Power consumption	approx. 15VA
LEDs	yellow: stand by / output voltage
Voltage output	DC24V stabilized permanently short-circuit-proof; 23,0..25,0V
Output current	$I_n = 450\text{mA}$, max. 550mA at $T = 55^\circ\text{C}$
Residual ripple	max. 260mV
Dielectric strength	Input/Output: AC 3kV, Input/PE: AC 2kV
Protection	IP20
Temperature range	-10°C bis $+55^\circ\text{C}$
Weight	approx. 140g
Mounting	DIN-rail mounting DIN EN 50022-35

Order-No	Type
471250	NTC1 AC 85-264V / DC24V

The compact power supply unit NTSR is excellently qualified to be used as a power supply unit for small components of the safety technology, e.g. of the safety emergency stop relay SR3C or the safety two-hand operation relay S2HC. The NTSR is also just right as a supply unit in control applications, e.g. proximity switches, light barriers or sensors.



- DC 24V / 70mA smoothed output voltage
- Ultra compact size, 22.5mm DIN-housing
- LED-display for secondary voltage
- Mains filter included
- Permanent short-circuit proof

The output terminals are existing twice, so on the secondary side several NTSR can be connected easily parallel or in series. Because of the integrated mains filter and the short-circuit proof transformer, processor controls can operate at the NTSR with noise immunity. The DC 24V-connection should be as short as possible and may not be placed near a high voltage transmission line or a high frequency line.

The supply unit is loadable up to 100mA. This is sufficient, in order to supply

- two emergency-stop-relays SR2C, SRLC, SRTC, SREC
- one emergency-stop-relay SR3C or S2HC.

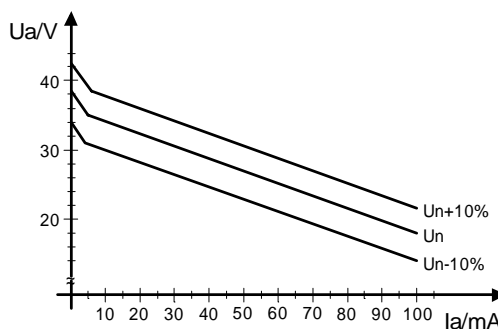


Fig 1: Output voltage in reliance on the output current

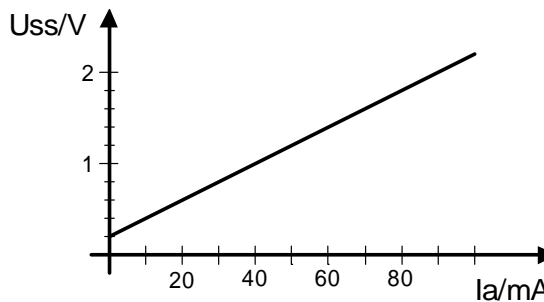
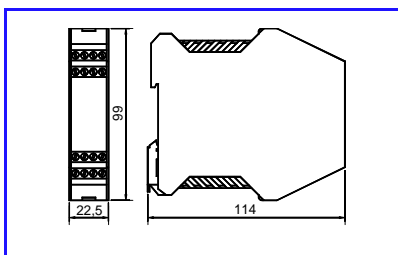


Fig 2: Residual ripple at Un



Order-No	Type
471310	NTSR, AC230V
471311	NTSR, AC115V

Specifications	
Operating Voltage	AC230V, AC115V +/- 10%
Mains frequency	50-60Hz
Power consumption	ca. 3VA
LED	green for operational (secondary voltage)
Output voltage	DC 24V unstabilized, smoothed, (see Fig.1)
Output current	I _n =70mA, max. 100mA
Residual ripple	see Fig. 2
Dielectric strength	4kV DIN VDE 0110-1:1997-04
Protection	IP20
Temperature range	-15°C bis +40°C at 100mA -15°C bis +60°C at 70mA
Weight	approx. 220g
Mounting	DIN rail (DIN EN 50022-35)



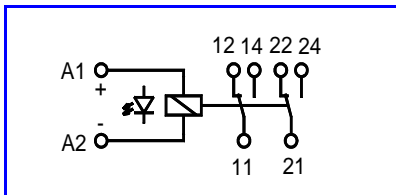
The DSC-system consists of high-quality interface modules for DIN-rail installation. Besides their function as an interface with electrical isolation the units can also be used as fully-electrical circuit-breakers because of their very high output switching capacity.



- Relay interface or short circuit-proof 4A power optocoupler
- Compact housing 22.5mm
- High output switching capacities
- Defined input switching thresholds
- LED display for signal and short circuit
- Noise spike suppression
- All the usual input / output voltages up to AC 230V

Relay interface DSRC1

Relay module with two changeover contacts, including rectifier circuit in the input stage and LED display. The version with AC 230V input has an isolating transformer and therefore minimum power consumption.

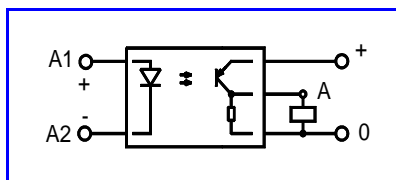


Specifications	
Input voltage	ADC12/24V, AC230V +15/-10%
Input resistance	1 kOhm / 24V, 270 Ohm / 12V
Power consumption	< 1,0 VA (AC230V-Input)
LED	Yellow, closed contact
Protection	IP20
Output	2 changeover contacts AC 250V
Switching capacity	AC: max. 8A, max. 2000VA DC: 24V; 3A / 60V; 0,7A 115V; 0,3A
Contact life	mechanical 2x10 ⁷ operations
Isolation voltage	2,5kV (contact - coil)
Temperature range	0° - + 60°C
Weight	approx. 150g

Order-No	Type
453010	DSRC1 ADC12V Input
453011	DSRC1 ADC24V Input
453014	DSRC1 AC230V Input

Power optocoupler interface DSOC1 (DC/DC)

Short circuit-proof DC/DC optocoupler module with 3-wire SIPMOS transistor switching output. The output stage also has an overtemperature protection facility. Short circuits or overtemperatures cause locked cut-off, which is at the same time indicated by the red LED. Switching back on is performed by eliminating the input or output voltage. The load resistance must be greater than 4 Ohm. The maximum clocking frequency under full load (4A) is 100Hz. Input voltages and input currents have defined levels.

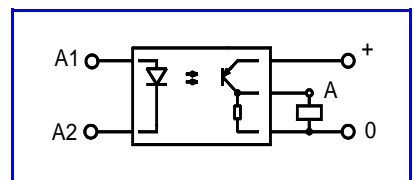


Specifications	
Input voltage	DC10-30V, residual ripple < 5%
Input current	< 15mA
Switching threshold	"H": > 7V "L": < 5V
LED's	Output: yellow Short circuit: red
Protection	IP20
Output	Transistor, short circuit proof
Switching capacity	DC10-30V; 4A
Residual voltage drop	1V
Signal delay	max. 1ms
Isolation voltage	2,5kV (input-output)
Temperature range	0° - + 60°C
Weight	approx. 150g

Order-No	Type
453130	DSOC1 DC10-30V Input

Power optocoupler interface DSOC1 (AC/DC)

Short circuit-proof optocoupler module with 3-wire SIPMOS transistor switching output. The output stage also has an overtemperature protection facility. Short circuits or overtemperatures cause locked cut-off. This is indicated at the same time by the red LED. Switching back on is performed by eliminating the input or output voltage. The load resistance must be greater than 4 Ohm. The maximum clocking frequency under full load (4A) is 100Hz. The input voltage can be between AC 110 and 230V.



Specifications	
Input voltage	AC110-230V, 50-60Hz
Input current	< 10mA
Switching threshold	"H": > 50V "L": < 25V
LED's	Output: yellow Short circuit: red
Protection	IP20
Output	Transistor, short circuit proof
Switching capacity	DC10-30V; 4A
Residual voltage drop	1V
Signal delay	max. 20ms
Isolation voltage	2,5kV (input-output)
Temperature range	0° - + 60°C
Weight	approx. 150g

Order-No	Type
453131	DSOC1 AC110-230V Input

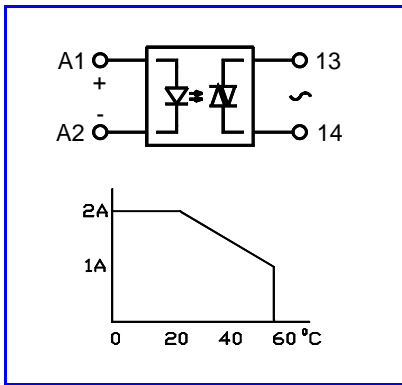
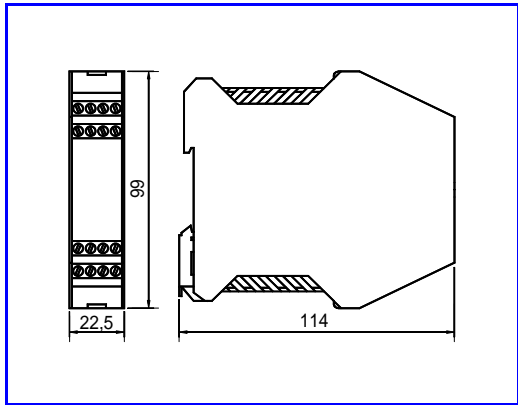
2



Performance Interface Module DSC-System

Power optocoupler interface DSHC1 (DC/AC)

Optocoupler module with high-performance output stage for AC 24-240V / 2A continuous load at 25°C. The output is suppressed with a RC element and varistor and is therefore also suitable for controlling inductive loads. The load is switched on in zero crossing of the secondary voltage. Switching off occurs with current zero crossing. Note the reduction in the possible switching capacity as the ambient temperature increases. The load is connected in series with output of the **DSHC1**. The output is not short circuit-proof.



Specifications	
Input voltage	DC10-30V, Residual ripple < 5%
Input current	20mA at DC24V
Switching threshold	"H": > 8V "L": < 56
LED	Output: yellow
Protection	IP20
Output	Triac, AC24-240V, 50-60Hz
Switching capacity	2A at 25°C, 1A at 50°C Surge current: max.10A for 10ms
Minim. load current	50mA
Signal delay	max. 10ms
Isolation voltage	2,5kV (input/output)
Temperature range	0° - + 50°C See derating diagram
Weight	approx. 150g

Order-No	Type
453151	DSHC1 DC10-30V Input

The modules of the DSC-systems each contain four complete interfaces independent of each other. Compared with the individual components of the DS/DSV system, this reduces even further the amount of space required – four interfaces require only 22.5mm, i.e. 5.6mm per interface.

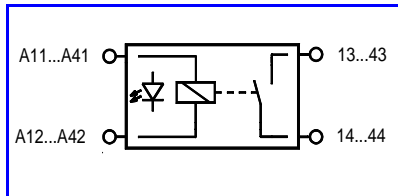
The modules are snapped on 35mm DIN-rails. Self-opening screw connection terminals and a guide for automatic screwdrivers simplify installation.



- 4 interfaces in one housing
- Only 5.6mm / interface
- Relay interface or short circuit-proof optocoupler
- LED display for each channel

4-fold relay interface DSRC4

The relay module **DSRC4** has four mutually independent relay interfaces with LED displays.

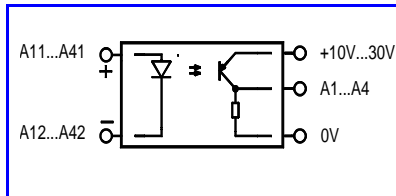


Specifications	
Input voltage	DC12 / 24V, +15/-10%
Input resistance	1500 Ohm / 24V, 450 Ohm / 12V
LED's	4xyellow, closed contact
Protection	IP20
Output	4 N/O AC 250V
Switching capacity	AC: max. 8A / 250V / 2000VA DC: max. 3,5A / 24V / 80W
Isolation voltage	4kV (contact-coil)
Temperature range	0° - + 60°C
Weight	approx. 150g

Order-No	Type
459030	DSRC4 DC12V Input
459031	DSRC4 DC24V Input

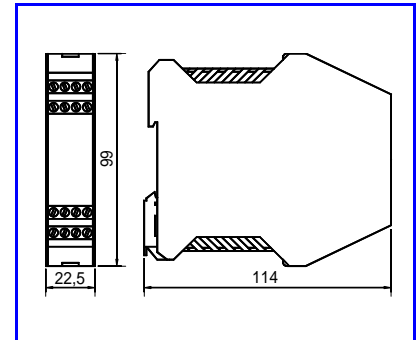
4-fold optocoupler interface DSOC4

Type **DSOC4** contains four mutually independent optocouplers with short circuit-resistant transistor switching output. Input voltage and input currents have a defined level.



Specifications	
Input voltage	DC 5 / 12 / 24V, +15/-10%
Input current	< 12mA
Switching threshold "H"	appr. 70% of the input voltage
Switching threshold "L"	appr. 50% of the input voltage
LED's	4x yellow
Protection	IP20
Output	Transistor, short circuit-proof
Switching capacity	DC10-30V; 0,5A
Residual voltage drop	ca. 2,0V
Signal delay	max. 1ms
Temperature range	0° - + 60°C
Weight	approx. 150g

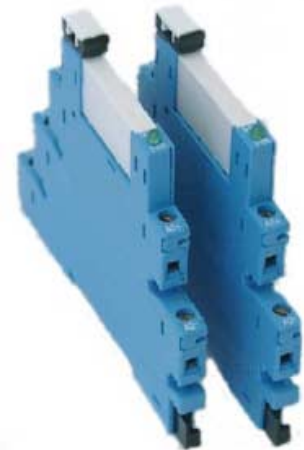
Order-No	Type
459131	DSOC4 DC12V Input
459132	DSOC4 DC24V Input





Extreme small relay module (6,2mm) with replaceable relay. The A1/ A2-connections of several modules arranged next to each other can be simply connected by a bridge. The supply includes the designation sign.

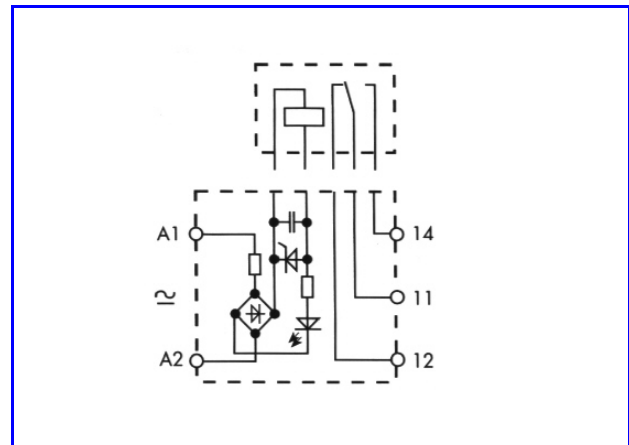
- 6.2mm-housing
- Plug-in relay AC 250V/6A
- LED indication
- Polarity and overvoltage protection
- ADC 12, 24 and AC 230V-types available
- 35mm DIN rail mounting



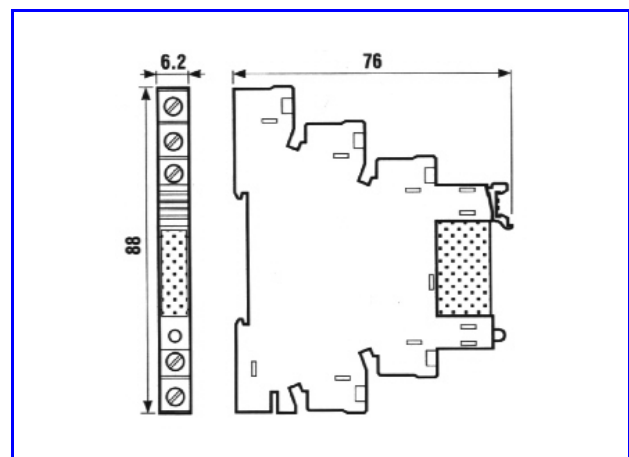
Coil-data at 20°C

Rated voltage Un	Rpm	Rpm max	Rated current In
ADC 12V	9.1V	16.8V	15.2mA
ADC 24V	18.2V	33.6V	9.4mA
AC 230V	175V	255V	3.1mA

Specifications	
Input voltage	ADC12/24V, AC230V
LED	green
Output	1 changeover contact AC 250V
Contact life	mechanical 2x10 ⁶ operations
Switching capacity	AC1: max. 6A/250V max. 1500VA AC15: 300VA at 230V DC1: max. 5A / 30V
Temperature range	0° - + 70°C
Isolation voltage	4kV (contact - coil)
On-/off-delay	7/11ms
Weight	approx. 150g



Order-No	Type
463000	DSR ADC12V Input
463001	DSR ADC24V Input
463002	DSR AC230V Input
463020	Bridge with 20 modules, max. 36A
463030	spare relay for 463000, VPE 10pc
463031	spare relay for 463001, VPE 10pc
463032	spare relay for 463002, VPE 10pc





Safety & Automation

Fault Indicator Systems



Timers, Control Relays



Position Switches, Microswitches



Safety Relays, Safety Switches



Micro-PLC, Cam-Controller



to Fax-Hotline: +49 (0)241 154029

from

Name

Company

Address

eMail

Send information about:

H. ZANDER GmbH & Co. KG

Am Gut Wolf 15
D52070 Aachen - Germany

Telefon: +49 (0)241 910501-0
Telefax: +49 (0)241 154029
eMail: info@zander-aachen.de

www.zander-aachen.de

 **ZANDER
AACHEN**

it works

**QUALITÄTS-
MANAGEMENT**
Wir sind zertifiziert
Regelmäßige freiwillige
Überwachung nach ISO 9001:2000

