



Digital Overcurrent-Time and Overload Protection, Self-Powered DSZW 2

1 Application

This multifunction protection device is mainly used as overcurrent-time protection. It can be applied in every system type as line protection and, together with other protection devices, also as equipment protection (for example transformer, motor, generator).

The DSZW 2 does not need an auxiliary D.C. voltage supply, because the current transformers feed it. An application in non-battery stations as a backup protection is suggestive.

The readout of the LED's for a reasonable time is possible although the protection device is not supplied.

For supplying the release coil of the circuit breaker, a capacitor release KA 4 is separately available. A tripping transformer can be connected if it meets the contact ratings of the DSZW 2 - trip relay.

Some of the additional protective functions indicated below require the use of input signals or external circuits of output relay contacts. The necessary auxiliary voltages for these should be provided (e.g. by employing a KA 4).

2 Functions

The protector integrates the protective and additional functions indicated below. Most of these functions may be switched on or off:

- definite-time phase-selective overcurrent protection (OTP) $I_{L>}$, $t_{L>}$ and $I_{L>>}$, $t_{L>>}$
- definite-time earth-fault current protection $I_{E>}$, $t_{E>}$ and $I_{E>>}$, $t_{E>>}$
- inverse-time phase-selective overcurrent protection, normally, very or extremely inverse for $I_{L>}$, $t_{>}$ and $I_{L>>}$, $t_{>>}$

- inverse-time earth-fault current protection $I_{E>}$, $t_{E>}$ and $I_{E>>}$, $t_{E>>}$, adjustable to very inverse or long time inverse
- earth-fault current stabilisation
- overload protection
- switch-on-to-fault protection
- circuit-breaker failure protection
- reverse interlocking
- two characteristic sets, switchable
- operate value display
- event logging
- disturbance data logging
- TRIP test
- optocoupler check
- measured-value checking
- self-test
- serial Interface RS 232
- readout and setting is menu driven so the use of the PC operator software is not forced.
- short restart time after interruption of auxiliary voltage.
- LED indications without supply for a time

Optional:

- PC-operator routine COMM-3
- representation of disturbance data SDA 2

3 Construction

The DSZW 2 is housed in a sheet-steel enclosure in the following designs:

- panel surface-mounting
- panel flush mounting.

Additionally three different installation positions exist – current terminals

- at the bottom
- right or
- left hand side

For all versions, the low depth of 170 mm allows the installation into medium-voltage switchgear cells. Therefore, be-

hind the relay other devices like terminals may be located.

For panel surface mounting, the terminals can be accessed from the front panel, whereas for panel flush-mounted units they can be accessed from the rear side.

The front operator panels of all versions are equal. They include the membrane keyboard, a four-line LCD display of 20 characters per line, 12 LED's and a 9-pin Sub-D connector for plugging in a PC.

Lettering stripes for LED's, created using e.g. Microsoft Word, are inserted near the LED's.

4 Method of operation

For connecting the DSZW 2, the phase currents I_1 , I_2 , I_3 , and I_E of the system to be monitored may be connected. Single phase and two-phase connections are possible.

A microcontroller with a built-in A/D converter processes all information.

The setting sets are stored in an EEPROM to be preserved if the supply voltage and the back-up battery fail. Due to the back-up battery, recorded events and disturbance data are maintained in case of a voltage failure. The restart time of the protection device is reduced also.

Without auxiliary voltage the status of LED's can be shown for a while.

A real-time clock is provided for time stamping of events.

5 Auxiliary voltage supply

The auxiliary voltage supply is issued out of the system transformers in the current path. The transformer in the I_E path guarantees the supply of the protection even at small I_E 's.



We recommend the additional connection to voltage transformers (U_{LL}) or to a 230 V AC supply that, however, is not mandatory. Some protective functions work at low operating currents that may not yet be sufficient for supplying the protector. Providing this additional voltage supply, setting the protection relay, reading the LCD text information and the LED indications will be possible at any time regardless of the current amount.

The auxiliary voltage supply is designed for a fast stand-by of the protector after connecting the transformer quantities and for the supply, starting at low currents.

6 Protective functions

6.1 Treatment of line-faults

Short circuit can be solved by the three-stage definite-time overcurrent protection ($I_{L>}$, $I_{L>>}$ und $I_{L>>>}$). Current measurement is phase-selective in each phase.

Alternatively the overcurrent-time stage $I_{L>}$ can be used as an inverse-time overcurrent protection. The tripping time is determined using the formulas indicated below (IEC 60255-3 or BS 142).

1. long time inverse:

$$t_{a \max} \geq t_a = \frac{120}{\left(\frac{I}{I_{>}}\right) - 1} \cdot t_{>}$$

2. inverse:

$$t_{a \max} \geq t_a = \frac{0,14}{\left(\frac{I}{I_{>}}\right)^{0,02} - 1} \cdot t_{>}$$

3. very inverse:

$$t_{a \max} \geq t_a = \frac{13,5}{\left(\frac{I}{I_{>}}\right) - 1} \cdot t_{>}$$

4. extremely inverse:

$$t_{a \max} \geq t_a = \frac{80}{\left(\frac{I}{I_{>}}\right)^2 - 1} \cdot t_{>}$$

wherein are:

- t_a : tripping time
- $t_{a \max}$: maximum tripping time (setting value)
- $t_{>}$: time factor
- I : measured current
- $I_{>}$: current setting value

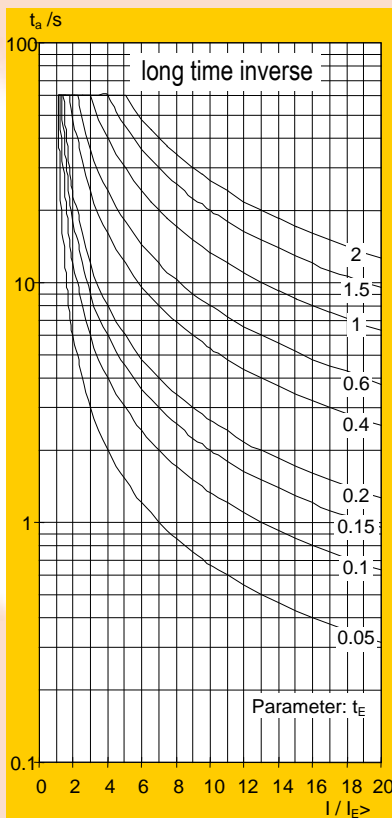


Fig. 4 Characteristics for "long time inverse"

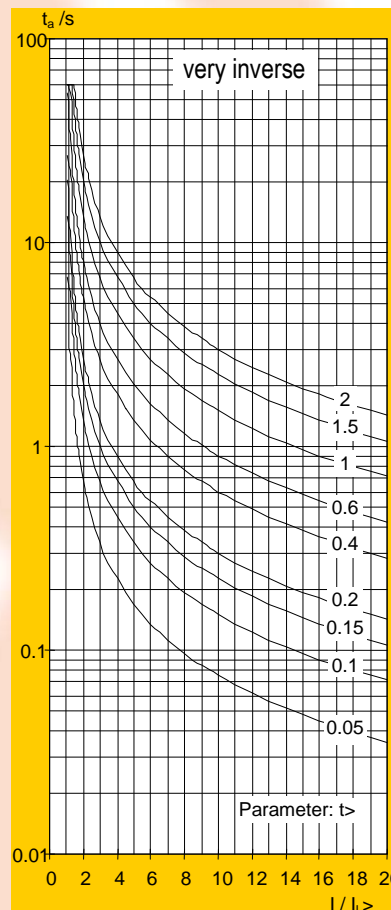


Fig. 2 Characteristics for "very inverse"

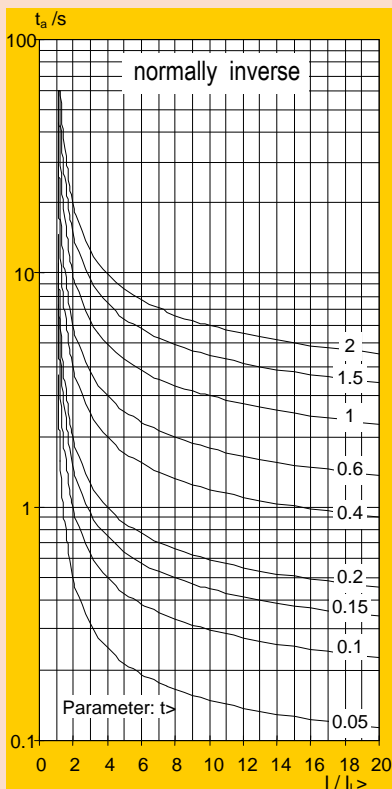


Fig. 1 Characteristics for "inverse"

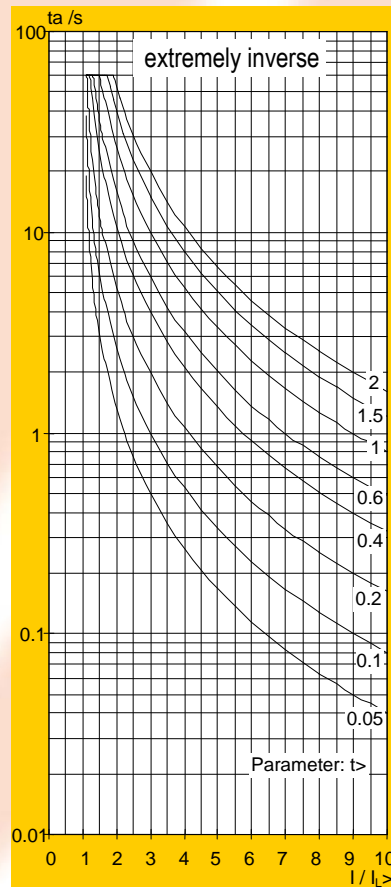


Fig. 3 Characteristics "extremely inverse"



6.2 Treatment of single pole line to earth-faults

This protection function is used mainly in systems having insulated or compensated star points. It serves the treatment of double earth-faults. In this case often the strategy of switching off only one earth-fault root. The rest of the system can have an earth-fault for a longer time. To switch off one root a preferential phase treatment is integrated.

6.3 Treatment of earth-faults

DSZW 2 measures earth current (using a CT) beside line currents. Three setting stages ($I_{E>}$, $I_{E>>}$, $I_{E>>>}$) are available.

To avoid spurious starts of the earth-fault current-time protector $I_{E>}$, for example due to transformer faults if no cable-type CT is used, the operate value is stabilised. Stabilising the earth-fault current serves to rise the operate value of the earth-fault current-time protector depending on the amount of the phase currents which are higher than its setting value. This improved stabilization is most strongly effective for three-pole short circuits.

For $I_{E>}$ - stage the user of the DSZW 2 may choose between definite-time overcurrent protection not depending on the current amount and inverse-time overcurrent protection depending on the current amount. The same characteristics mentioned in chapter 6.1 are available.

6.4 Treatment of intermittent earth faults

Very short earth faults can not always recognized by the "standard" $I_{E>}$ - stage because the timer stops and resets after each end of a short fault. If such short-time earth faults appear repeatedly behind each other, tripping can be meaningful for the feeder.

A special protection function makes the capturing and switching off of intermittent earth faults possible.

6.5 Current annunciation stages

Two warning stages for phase currents and one for earth current annunciate any exceeding of the set level after an adjustable time delay.

6.6 Switch-on protection

The switch-on protection has its own current operate values: This allows detecting short circuits from high inrush currents (not detectable by harmonics).

When switching on to an existing short circuit, this function can produce an undelayed TRIP command. Startings caused by inrush currents can be blocked.

The input-signal "CB manual close" starts the operate time of this function. Short circuits detected during this time are switched off immediately. A possibly switched on auto-reclosing function will be blocked.

6.7 Inrush restraint (IR)

Spurious tripping by magnetising inrush is avoided by valuating the adjustable ratio from the 2nd to the 1st harmonic in the measured currents. Cross blocking is possible.

With higher currents no blocking is issued (limit adjustable).

6.8 Thermal overload protection *)

The integrated overload protection works with a thermal model.

The calculated thermal level will be compared with the set tripping value (when tripping is selected) respectively warning level value. If occasion arises, a response or an alarm is issued.

The influence of the previous load will be regarded. The characteristic meets IEC 60255-8.

$$t_a = \tau \cdot \ln \left[\frac{\left(\frac{I}{I_B}\right)^2 - \left(\frac{I_p}{I_B}\right)^2}{\left(\frac{I}{I_B}\right)^2 - k^2} \right]$$

wherein are:

- t_a tripping time after overload has been started
- τ heating time constant of the equipment
- I actually flowing current
- I_B basic current
- I_p preloading current
- k factor for multiplying the basic current to reach the operating limit.

A reclosing lockout prevents the switching on of the protective object as long as the thermal level is higher than a set value.

6.9 Circuit-breaker failure protection

The DSZW 2 is able to recognise the failure of its own, assigned circuit breaker. With a relay to be configured particularly for this case command to switch-off pre-dominant infeeds can be given.

6.10 Reverse interlock

Using an optocoupler input, the DSZW 2 may be controlled so that it functions as a rapid busbar protection. Protector response must be within a higher grading time than that of the outgoing feeder protectors if a fault occurs on an outgoing feeder. On the other hand, the protector must trip within a shortest possible time if a fault occurs in busbar area.

When during a starting within the action time started simultaneously, no response (start) signal is supplied from a protector in the outgoing feeders the TRIP command is issued. A response signal from an outgoing feeder protector to the input of the DSZW 2 causes tripping in grading time.

6.11 Input signal processing *)

The input signals wanted for the different protective and additional functions are freely programmable; several inputs for one function may be used.

Processing the optocoupler input signals, the logic functions negation (NOT), AND, OR are available. As a result, there are logical input signals for internal processing in the protector.

6.12 Pulse shaper stage

The pulse shaper stages offer the possibility of changing up to two input signals in their time characteristic. So, delays, extensions, shortenings, displacements and storage may be realised. The signal can depend on internal status of the protection relay also. These result signals may be routed to an output signal (input / output coupling).

The pulse shaper stage has two ports functioning independently of each other.

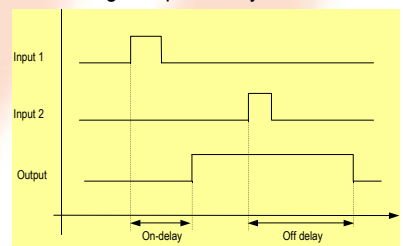


Fig. 6: Example for one effect of the pulse shaper stage

6.13 Change of characteristic sets

Two characteristic sets may be entered. The respectively active set can be selected by an operator action. Changing the configuration allows to switch be-

*) DSZW 2 has to be supplied

*) DSZW 2 has to be supplied



tween the characteristic sets using the optocouplers.

7 Additional functions

7.1 Display of operating values

As long as no trip, alarm or malfunction messages are present, the DSZW 2 display indicates the phase currents and the earth current selectable as

- primary or
- secondary values (referred to rated currents).

When overload protection is enabled, its thermal level is shown alternating.

7.2 Visual display of system faults

For a first short information concerning a system fault or device status, 12 light emitting diodes (LED's) and a four-line display with 20 characters each per line are available.

The LED display as delivered in the standard configuration is shown in Table 1.

LED	steady light	flashing light
green G	Protection available	u
red R	Alarm	l t
yellow 0	TRIP	l t
yellow 1	I1>	I1>>
yellow 2	I2>	I2>>
yellow 3	I3>	I3>>
yellow 4	IE>	IE>>
yellow 5	–	–
yellow 6	–	–
yellow 7	–	–
yellow 8	–	–
yellow 9	–	–

Table 1: LED assignment on delivery for DSZW 2

(abbreviations: u: updating l: latching t: additional indication on LCD)

All LED's can be freely assigned. Except for the upper two, the LED's are yellow. The LED "G" is green while the LED "R" is red. Furthermore, they have three possible states:

- off
- steadily on
- flashing

This provides a large variety of optical signals. As an output command can be derived practically from each sub-

function of the DSZW 2, the LED assignment can be changed within wide limits by changing the configuration.

In case of an alarm, a DSZ 2 malfunction or a trip a short report will be displayed. The four-line LCD text display shown after a "final TRIP" command includes the following information:

- tripping reason,
- period of fault (operating time until TRIP command),
- r.m.s. value of current in the individual phases and earth at the time of the TRIP command output,

It should be considered that this LCD report is only used as first information after a "final TRIP". Information that is more detailed can be found in the event and disturbance data memories of all relays started.

In addition, when the DSZW 2 is not supplied the last LED's state can be called for a while using "Readout"-key.

7.3 Event logging

Event logging is used to make a follow-up analysis of what happened in the protective object and in the protective relays.

To achieve a better survey, the events are divided into the following groups:

- system faults,
- indications,
- operator actions and
- internal malfunctions and alarms.

Moreover, it can be seen whether the events occurred during

- normal, or
- test operation.

The division into

- main and
- subevents

supports the temporal classification.

Main events are numbered and time-stamped. Subevents contain the time in ms relative to the assigned main event. The event memory is a shift memory whose oldest events are overwritten.

The content of the event memory can be selected and displayed on the front panel without using a PC.

The installed back-up battery preserves the event memory content even if the supply voltage fails.

7.4 Disturbance data logging

Disturbance data logging means the storage of the digitised instantaneous values of measured input quantities together with the time marks of some important events (like start trip and opto-

coupler inputs). Logging clock is 1 ms. Logging is activated by:

- system faults located by the protector or
- external logging signals

For logging the power system failures, there are two possibilities:

1. Continuous logging from "coming" to "going" of the general start with a 50ms pre-travel, where the maximum logging duration for a fault is 4s,
2. event controlled logging with 50 ms pre-travel and 150 ms overtravel.

The controlling events are:

- starting comes,
- starting goes,
- starting changes,
- TRIP-command

Several logs with a total of ca. 19 s are possible. The disturbance data logging caused by an input signal is always continuous during the active signal, max. 4 s.

The stored disturbance data can only be visualised on a PC screen using PC operating programs.

When the RAM's back-up battery is intact, the content of the event memory is preserved even if the supply voltage fails.

7.5 Measured-value checking

Measured current values arriving through current transformers are monitored for plausibility during the non-started state when selected.

7.6 Time synchronisation

It is possible to set the time 12:00:00 by an optocoupler input signal. This way several connected protection devices can be set.

8 Tests

8.1 Self-test

Comprehensive monitoring routines of the hardware and for the software are provided to detect and signal malfunctions of the protector. There are cyclic tests and tests during start-up.

Depending on the detected abnormal condition, the protector is taken out of operation or an alarm is issued. Using the green LED to indicate the ready state and the red LED for malfunction and alarm signal is advisable. The pre-configured signal relay "Protection available" signals any malfunction and lack of auxiliary voltage. Alarms may be configured to another signal relay.



8.2 C.B.-Test

A trip test of the circuit breaker may be performed if the device is supplied. Pressing the „Tests“ key on the DSZW 2 activates this function.

8.3 Checking Optocoupler Inputs

Optocoupler-inputs may be monitored by the test-function "Optocoupler test".

8.4 Application of test plug devices

Checking the mounted protection relays periodically many power supply companies apply test plug devices or test selector switches that cause a safe switch over from the measured quantities of the system to the test devices. The TRIP command to the circuit breaker is also involved into the switch over.

Building the "check/test mode", the test plug device respectively the test selector switch has to make a binary signal for one optocoupler input of the protector available. This marks all logged events as "test".

9 Serial interface

The front 9-pole Sub-D connector constitutes the interface S0 for the operator PC.

10 Operation

10.1 Front panel

The following operations can be executed on the front panel:

- Reading and resetting of LED's and display provided automatically by the relay including the following:
 - operating value display during normal operation,
 - LCD report after a TRIP command of the protector,
 - LCD report after switching off the protector and because of an internal malfunction.
 - In case of an alarm, the operating values and the alarms are displayed.
- Setting of the protector
Pressing the password-protected "Setting" key displays an easily comprehensible plain-text menu comprising the following main items:
 - *Equipment adaptation* - data concerning the installation and the system,
 - *Protective functions* – switching the protective and additional functions on or off,
 - *Input configuration* - free assignment and logic combination of op-

tocoupler input signals to device software functions.

- *Output configuration of relays and LED's* - free assignment of the possible output commands to trip relays, signal relays and LED's, this can generate group signals,
- *Characteristic sets* - setting values for the selected protective functions are separately adjustable for two characteristic sets,
- *Device address*,
- *Operator control* - common settings, e.g. protector On/Off, password, date and time, operating mode, etc.
- Display of stored information
After pressing the "Readout" key the stored information may be indicated on the display:
 - logged events (with elapse time),
 - all settings,
 - information on the protector type, e.g. versions.
 - if the DSZW 2 is not powered the last LED's state can be seen for a short time.

As the key is not password-protected and the information selection is shown in a plain-text menu, it is easy to get a local readout.

- Calling of tests
Pressing the "Tests" key accesses a menu used for the above-mentioned tests and the manufacturer's service. The menu is password-protected.

10.2 PC operator routine COMM-3

Although no PC software is necessary for setting and readout of the protection device a PC operator routine COMM-3 and graphic software SDA 2 is available. It is used for preparing and performing the setting of the digital protection relay at the engineer's place of work. In addition to setting the protectors, the routine may also be used for reading out and displaying events and with the additionally graphics software SDA 2 disturbance data can be displayed. Archiving of settings and events is easy to do.

COMM-3 consists of a management program and several device programs (characterised by the "structure" number).

Graphic display and evaluation of disturbance data are by the graphics software featuring the COMTRADE file format (IEEE standard C37.1991). Using this file format data exchange may

be performed between compatible devices such as state of the art test devices.

11 Specifications

The protection relay satisfies the requirements of the product standards EN 60255-6 (IEC 255-6); DIN 57435, part 303; IEC 255-3.

Mechanical construction

- sheet-steel housing for
 - panel surface mounting
 - or panel flush mounting
- dimensions see dimensioned drawings
- weight approx. 9 kg
- degree of protection: housing IP 51
- terminals IP 20
- terminals

transformers solid wire	0.5 ... 16 mm ²
stranded wire	0.5 ... 10 mm ²
others: solid wire	0.2 ... 4 mm ²
stranded wire	0.2 ... 2.5 mm ²

Permissible ambient conditions

- operating temperature -10°C...+55°C
- storage temperature -25°C...+55°C
- transport temperature -25°C...+70°C
- rel. humidity annual mean <75%
- for 30 days 95% at <40°C
- moisture condensation not permitted

Mechanical strength

- resistance to earthquakes (IEC 255-21-3)

nominal frequency range	1...35 Hz
cut-off frequency	8...9 Hz
horizontal	3.5 mm; 10 m/s ²
vertical	1.5 mm; 5 m/s ²
- vibration strain (IEC 255-21-1, IEC 68-2-6)
 - Fc: 10...150 Hz; 0.075 mm; 1g
 - repeated impact strain (IEC 255-21-2, 68-2-27+29)
 - Ea: 11 ms, 15 g; Eb: 16 ms, 10 g

Auxiliary power supply

Instrument transformer power supply

- current transformer 4
 - minimum current for supply when fed through (x=1;2;3 y=2;3;1)

Lx + Ly - transformer	0.5·In
Lx + N - transformer (Lx-transformer only)	0.33·In (1·In)
 - average rated consumption

Lx-transformer	<17 VA
N-transformer	<30 VA
 - load capability

permanent, N transformer	1·In
1 s, N transformer	40·In
limiting dynamic value (10 ms), N transformer	100·In
- voltage transformer 1
 - input voltage, switchable

100/110 V, 50 Hz
or 230 V, 50 Hz
 - average rated consumption <15 VA
 - battery for internal data backup in case of auxiliary power failure
 - 3 V CR ½ AA lithium



Measuring input circuits

- nominal frequency 50 Hz
- rated current (In), design-dependent 1 A or 5 A

load capability (phase CT's)

- permanent 2·In
- 1 s 80·In
- limiting dynamic value (10 ms) 200·In
- load capability (CT "N")
- permanent 1·In
- 1 s 40·In
- limiting dynamic value (10 ms) 100·In

Binary signal inputs (optocoupler) 1

- nominal input voltage (Vi) 24...220 V DC
- power consumption $4 \cdot 10^{-4}$ (Vi)² W
- logic low level <math>< 10</math> V

Output relays

- trip relays (marked S1)
 - switching voltage 300 V DC, 250 V AC
 - limiting making capacity 1250 W (VA)
 - limiting breaking capacity 50...250 W (voltage- and load dependent)
 - 0.3 A at 220 V DC, L/R = 0 ms
 - 0.15 A at 220 V DC, L/R = 40 ms
 - both contacts in series:
 - 0.25 A at 220 V DC, L/R = 40 ms
 - limiting continuous current 1x8 A or 2x5 A /40°C
 - limiting short-time current for 0.5 s 30 A
- signal relays (marked M1, M2)
 - switching voltage 300 V DC, 250 V AC
 - switching current 8 A
 - switching capacity <math>< 2000</math> VA, 50...220 W (voltage-dependent)
 - limiting continuous current 6 A

Serial interface

- PC interface RS 232; 9-pin Sub-D

Displays

- LED's green: 1; red: 1; yellow: 10
- LCD four-line of 20 characters each

Setting values and ranges (selection)

- line-fault overcurrent stages I_L
 - I_{L>}, definite-time 0.20...25·In
 - I_{L>}, inverse-time 0.20...4·In
 - I_{L>>}, definite-time 0.4...30·In
 - I_{L>>>}, definite-time 2...30·In
- earth-fault current stage
 - I_{E>}, definite-time 0.05...12·In
 - I_{E>}, inverse-time 0.05...4·In
 - I_{E>>}, definite-time 0.05...15·In
 - I_{E>>>}, definite-time 0.1...15·In
- resetting ratios 0.20...0.95
- definite-time time stages
 - t_{L>>>} 0...65 s
 - t_{L>>>>} 0...9,99 s
- inverse-time time stages
 - time factor t_>, t_E 0.05...2 s
 - release time, maximum t_{a,max} 10...60 s
- thermal replica (overload protection)
 - basic current I_B 0.2...2·In
 - operate factor k 1.00...1.20

1 On special-wish, differently from the default long-range input voltage optocoupler inputs can be dimensioned for a Low/High switching voltage of about 60 V.

- thermal time constant 1...960 min
- warning levels 40...98%

Routine testing

- dielectric test 2.5 kV, 50 Hz, 1 s
- Each protection relay will be subjected to a 72-hour alternate temperature test while in function.

Type testing

- impulse voltage test 5 kV; 1.2/50 μs; 500 Ω
- dielectric test 2.5 kV, 50 Hz, 60 s
- EMC noise immunity EN 50082-2, severity class 3

- electromagnetic RF field
- magnetic field of power engineering frequency
- discharge of static electricity (ESD)
- fast transients (bursts)
- transients (surges)
- RF interference test (IEC 255-22-1)
- transformer cross voltage 2.5 kV
- EMC emitted interference EN 50081-2 -B

Order data DSZW 2

PI.-No.:	1743	0-3	--0
rated current: 6 th digit		↑	↑↑
1 A		1	
5 A		5	
type of housing: 8 th digit			
panel surface-mounted			
CT terminals down			0
CT terminals right			2
CT terminals left			4
panel flush-mounted			
CT terminals down			1
CT terminals right			3
CT terminals left			5
language: 9 th digit			
German			0
English			1

Design includes:	
binary inputs	2
trip relays	1
pilot relays (1 changeover contact)	2

The desired input-voltage

- 230 V AC or
 - 100/110 V AC
- of the voltage transformer in the supply has to be stated. Without this information the factory adjustment is 230 V AC.

Optocoupler inputs:

On special-wish, differently from the default long-range input voltage optocoupler inputs can be delivered with a Low/High switching voltage of about 60 V. This wish is separated with order to declare.

Accessories

PC-protector interconnecting cable
PI. No.: 1743 900 010

COMM-3 PC operator software

- Management program
- PI.-No.: 1744 990 00-
- Variant: 10th digit ↑
- Full-version 0
- Upgrade from COMM-2 to 3 1
- Update of COMM-3 2
- Demo version 9

• Device programs

- PI.-No.: 1744 991 -- --
- Type of device: 8th and 9th digit ↑↑
- all devices [structure versions] 00
- DM 2 [1004] 10
- DSRZ(W) 2 [2001] 20
- DSZ(W) 2 [3007] 30
- DSZW 4 [3105] 31
- DSZ 4 [3205] 32
- DQ2S 2, DQ3S 2 [4008] 40
- DD 2 [5033] 50
- P9x-DD.. 6 [5601] 56
- DDS(E) 2 [6002] 60
- DSRZE 2 [7000] 70
- P9x-DS.. 6 [7604] 76
- Variant: 10th digit
- current structure version 0
- old structure version 1

When reordering a device program the structure version number of the device is necessary additionally (see label on device). Example for DSZ 2, old structure version 3001: PI.-No. 1744 991 301- 3001

SDA 2 graphics software

PI.-No.: 1744 992 000
On supplied CDROM the user manual exists as a PDF-file.

User manuals printed version

- PI.-No.: 1744 993 0 --
- Language: 9th digit ↑↑
- German 0
- English 1
- Manual: 10th digit
- COMM-3 0
- SDA 2 1

Capacitor release device KA 4

- PI.-No.: 1737 010 --00
- Variant ↑
- a) 230V U_{in} / 300V U_o 0
- b) 100/110V U_{in} / 300V U_o 1
- c) 100/110V U_{in} / 130V U_o 2
- d) 100/110V U_{in}, 50mA I_{in} / 130V U_o 3
- e) 100/110V U_{in} / 130V U_o, 7200μF 4
- with U_{in} input a.c. voltage
- I_{in} input current
- U_o output d.c. voltage

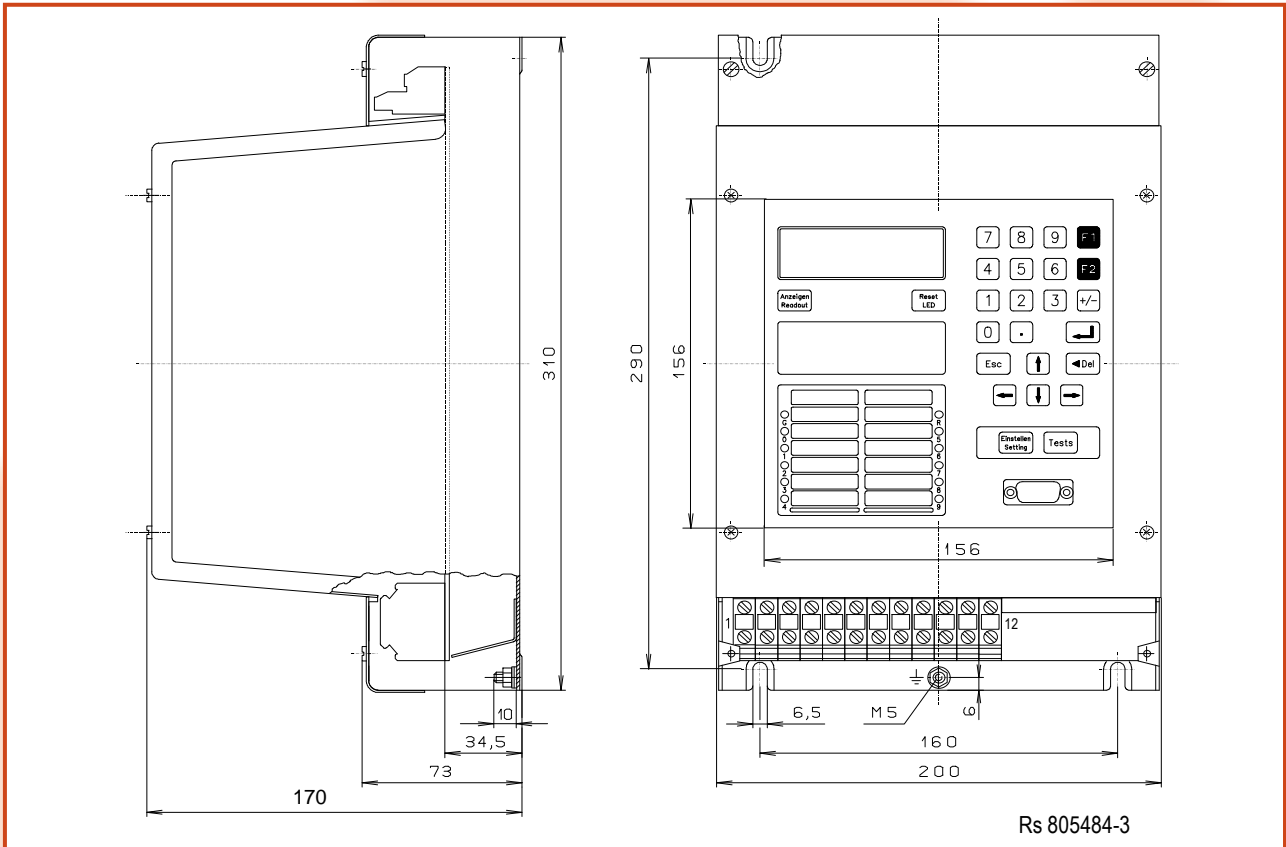


Fig. 6: DSZW 2 housing for panel surface mounting, lower terminal cover not shown in top view.

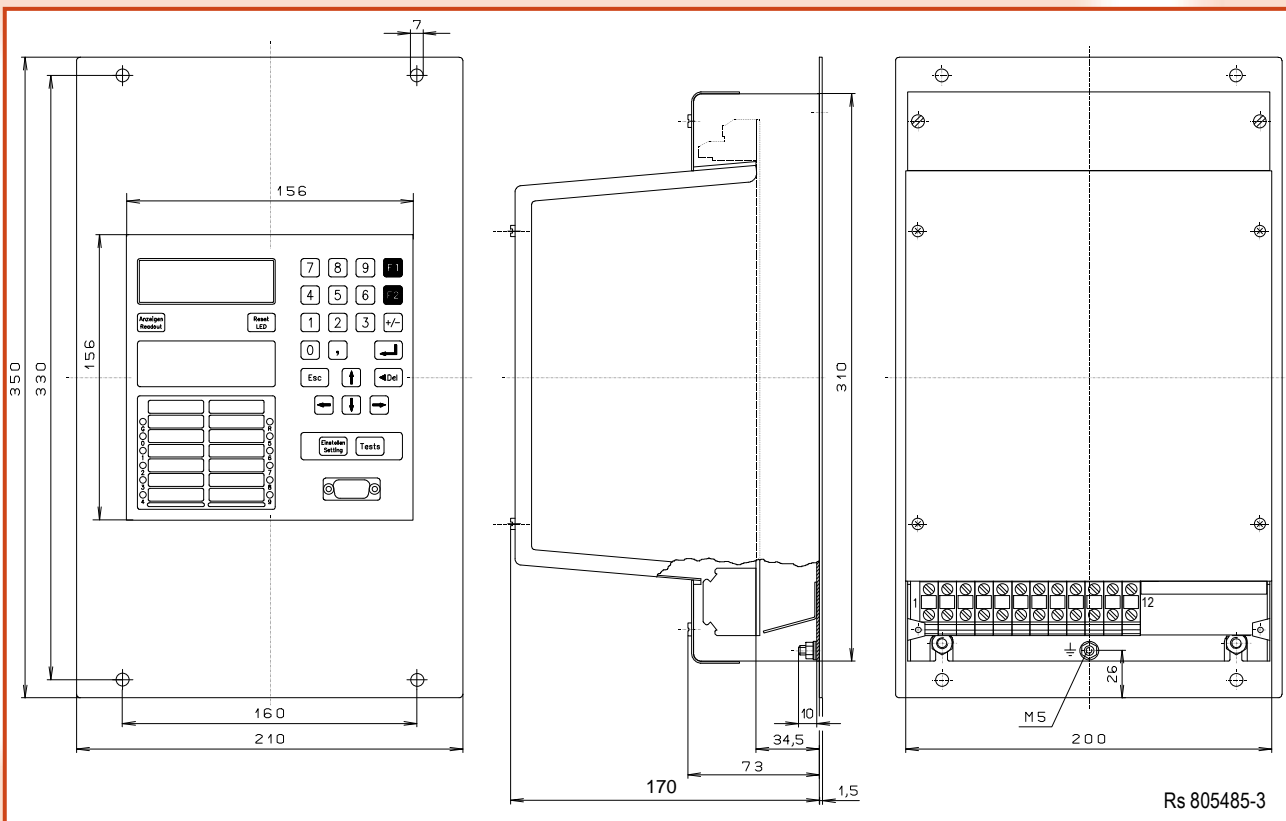


Fig. 7: DSZW 2 housing for panel flush mounting, lower terminal cover not shown in rear view (right-hand side). The panel cut-out should be 202 mm * 312 mm when device will be put through from front side.

