DUB81

1-phase True RMS AC/DC over or under voltage monitoring relay



Benefits

- **Multiple measurement ranges in one item**. Thanks to multi-input.
- **Fast installation**. Thanks to the ease of use of push-in terminals.
- **Wiring costs reduction**. Avoiding the need for dedicated tools thanks to push-in terminals.
- **Long-term clamping reliability**. Thanks to push-in terminals.
- **Multiple power sources in one item**. Thanks to the wide range of supply voltage.
- **Compactness of the housing**. To save space inside the cabinet or to fit into the cabinet without having to redesign it.
- **Output and status LED indication**. For quick troubleshooting.

Description

DUB81s are over or under voltage monitoring relays.

Inputs can be connected directly to measured voltage from 0.1 to 500 V AC/DC.

Thanks to the latch function, the alarm position of the relay output can be maintained.

Inhibit function can be used to avoid relay operation when not desired (maintenance, transitions).

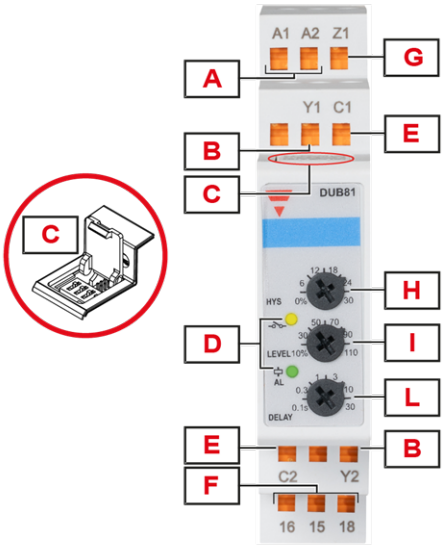
Main features

- Over or under voltage setpoint adjustment.
- Alarm ON delay adjustment.
- Hysteresis adjustment.
- 24 to 240 V AC/DC power supply.
- Push-in or screw terminals.
- 17.5 mm DIN rail housing.

Order code

Mounting	Measuring ranges	Terminals	Component name/part number
DIN-rail	From 0.1 to 500 V AC/DC	Screw	**DUB81CM24500VN**
		Push-in	**DUB81CM24500VP**

Structure



Element	Component	Description
A	Power supply terminals	24 to 240 V AC/DC
B	Voltage input terminals	Input voltage measurement
C	DIP switches	Setting the input range, latch / inhibit function, monitoring function
D	Information LEDs	Bicolour: green for device ON / red for signal alarm status Yellow for relay output status
E	Common input terminal	Reference terminal for voltage input and latch / inhibit input
F	Output terminals	SPDT relay output
G	Latch / inhibit input terminal	To enable or disable the latch or inhibit function
H	Hysteresis dial (HYS)	Hysteresis setpoint adjustment
I	Voltage level dial (LEVEL)	Voltage setpoint adjustment
L	Delay time dial (DELAY)	Alarm ON delay time adjustment

Features

Power supply

Terminals	A1, A2
Overvoltage category	III (EN 61010-1)
Voltage range	24 to 240 V AC/DC ± 15%
Frequency range	50 to 60 Hz ± 10% sinusoidal waveform
Consumption	≤ 0.8 W ≤ 3.2 VA

Inputs

Terminals	Y1, Y2, C1, C2		
Measuring ranges	***Input terminals***	***Selectable by DIP switches***	
	Y1, C1: 0.1 to 10 V AC/DC	0.1 to 1 V AC/DC	Internal resistance: 70 kΩ Max voltage: 350 V Max voltage for 1 s: 1000 V
		0.2 to 2 V AC/DC	
		0.5 to 5 V AC/DC	
		1 to 10 V AC/DC	
	Y2, C2: 2 to 500 V AC/DC	2 to 20 V AC/DC	Internal resistance: 880 kΩ Max voltage: 600 V Max voltage for 1 s: 1000 V
		5 to 50 V AC/DC	
		20 to 200 V AC/DC	
		50 to 500 V AC/DC	
Measurement type	Directly to measured voltage. ***Note**: the input voltage cannot raise over 300 V AC/DC with respect to ground.*		
Measured variables	Voltage level		
Latch / inhibit terminals	Z1, C1 or Z1, C2		

Outputs

Terminals	15, 16, 18
Number of outputs	1
Type	SPDT electromechanical relay with changeover contacts
Logic	Output energised on alarm
Contact rating	**Ith:** 8 A @ 250 V AC **AC15:** 2.5 A @ 250 V AC **DC12:** 5 A @ 24 V DC **DC13:** 2.5 A @ 24 V DC

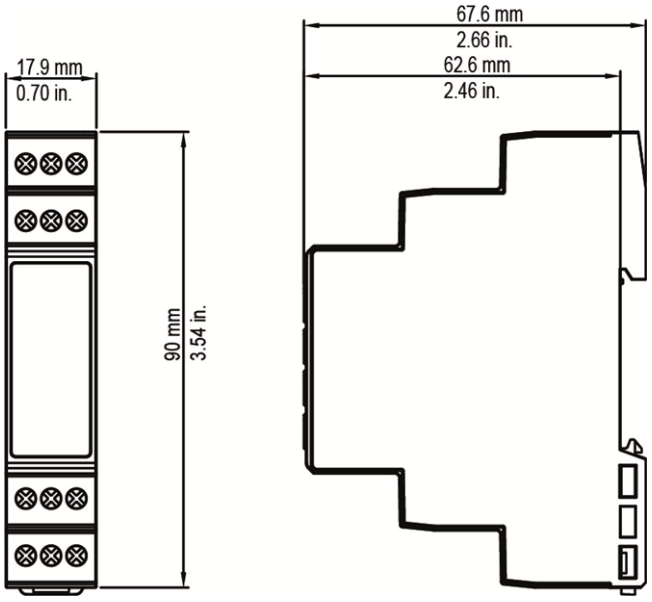
Electrical lifetime	≥ 50 x 10^3 operations (at 8 A, 250 V, cos φ= 1)
Mechanical lifetime	> 30 x 10^6 operations
Assignment	Associated to all alarm types

Insulation

Terminals	**Basic**
Power supply to input	4 kV impulse 1.2/50 µs
Power supply to output	
Input to output	

General

Material	Housing: Polybutylene Terephthalate (PBT) Dials: Polyamide (Nylon PA66)
	Flammability rating: V0 according to UL 94
Colour	RAL7035 (light grey)
Dimensions (W x H x D)	17.9 x 90 x 67.6 mm (0.70 x 3.54 x 2.66 in)
Weight	90 g (3.17 oz)
Terminals	**Screw**: cable size from 0.2 to 2.5 mm^2 (AWG24 to AWG12), stranded or solid **Spring**: cable size from 0.5 to 1.5 mm^2 (AWG30 to AWG16), stranded or solid
Tightening torque	Max. 0.5 Nm (4.425 lbin)
Terminal type	Screw or push-in



Environmental

Operating temperature	-25 to 65 °C (-13 to 149 °F)
Storage temperature	-25 to 80 °C (-13 to 176 °F)
Relative humidity	5 - 95% non condensing
Protection degree	IP40
Pollution degree	2
Operating max altitude	2000 m amsl (6560 ft)
Salinity	Non saline environment
UV resistance	No

Vibration/Shock resistance

Test condition	Test
Tests with unpacked device	Vibration response (EN 60947-5-1)
	Shock (EN 60947-5-1)
Tests with packed device	Vibration random (IEC 60068-2-6) - Class 1
	Shock (IEC 60255-21-2) - Class 1
	Bump (IEC 60255-21-2) - Class 1

Class 1: monitoring devices for normal use in power plants, substations and industrial plants and for normal transportation conditions.

The packaging type is designed and implemented in such manner that the severity class parameters will not be exceeded during transportation.

Compatibility and conformity

Marking	CE RoHS COMPLIANT
Directives	2014/35/EU (LVD - Low voltage) 2014/30/EU (EMC - Electromagnetic compatibility) 2011/65/EU, 2015/863/EU (RoHS)
Standards	EN 60947-5-1 Immunity: EN 61000-6-2 Emission: EN 61000-6-3 RoHS: EN 63000
Approvals	c UL us LISTED 61010

Operating description

Device configuration

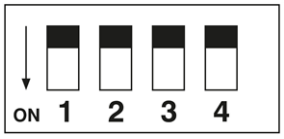
Function	Connection	Description
Latch	Connection between terminals Z1, C1 or Z1, C2	When an alarm condition is triggered and the delay time expires, the relay output energises. When the alarm condition expires, the relay output de-energises as soon as the connection between the common and Z1 terminals or the power supply is interrupted.
Inhibit	Connection between terminals Z1, C1 or Z1, C2	When an alarm condition is triggered, relay output energisation can be avoided when not desired (e.g. maintenance, transients), while the red LED turns steady ON after the delay time expires. The relay output energisation can be restored as soon as the connection between the common and Z1 terminals is interrupted and the alarm is still active.

Hysteresis adjustment dial (HYS)	
Typology	Linear selection from 0 to 30% of set value
Resolution	3% setpoint increase per notch
Function	Adjustable hysteresis on relative scale

Over or under voltage level adjustment dial (LEVEL)	
Typology	Linear selection from 10 to 110% of full scale
Resolution	10% setpoint increase per notch
Function	Adjustable voltage on relative scale

Delay setting dial (DELAY)	
Typology	Logarithmic adjustment from 0.1 to 30 s
Resolution	From 100 ms/notch at 0.1 s to 10 s/notch at 30 s
Function	Adjustable alarm ON delay time on absolute scale

DIP switches	
Typology	4 switches (SW)
Function	Input range (SW1 and SW2) Latch / inhibit function (SW3) Monitoring function (SW4)



SW1	SW2	Y1-C1	Y2-C2
OFF	**OFF**	0.1 to 1 V AC/DC	2 to 20 V AC/DC
OFF	**ON**	0.2 to 2 V AC/DC	5 to 50 V AC/DC
ON	**OFF**	0.5 to 5 V AC/DC	20 to 200 V AC/DC
ON	**ON**	1 to 10 V AC/DC	50 to 500 V AC/DC

SW3	Latch / inhibit function
OFF	Inhibit
ON	Latch

SW4	Monitoring function
OFF	Undervoltage
ON	Overvoltage

Alarms

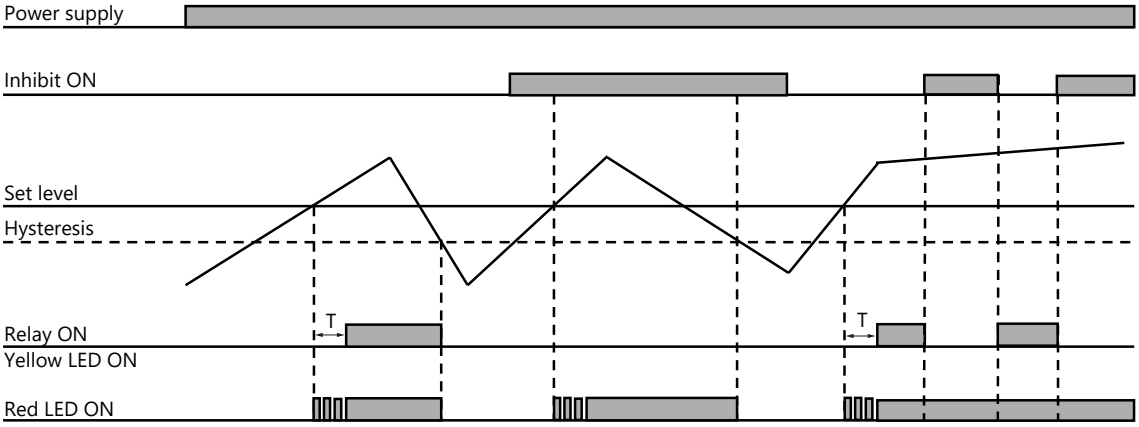
Over or under voltage causes output relay energisation after the delay time has elapsed.

Voltage level alarm	
Reaction time	Alarm ON < 100 ms Alarm OFF < 100 ms
Voltage level setting	From 10 to 110%
Power ON delay	1 s ± 0.5 s
Repeatability	0.5% of the measured value
Alarm ON delay	Adjustable from 0.1 to 30 s

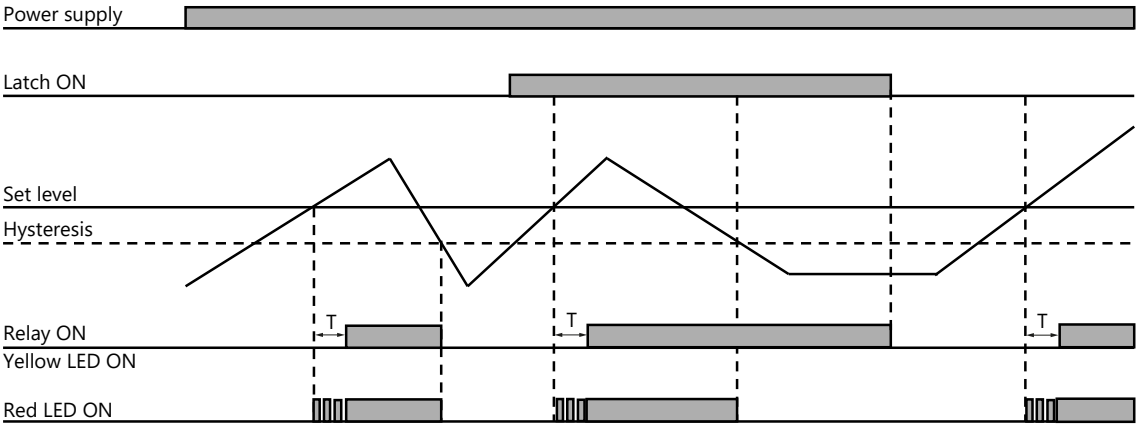
Information LEDs

Colour	Status		Description
Green (⏚) / Red (AL) (bicolour)	Power supply / Alarm	Green ON (steady)	Power supply ON and alarm OFF
		Red ON (steady)	Alarm ON for over or under voltage
		Green / red blinking at 2 Hz	Alarm triggered and delay time elapsing
		Green / red blinking at 5 Hz	Alarm ON for improper use: • more than one measuring input connected at the same time
Yellow (-⊙-)	Relay output	ON	Energised
		OFF	De-energised

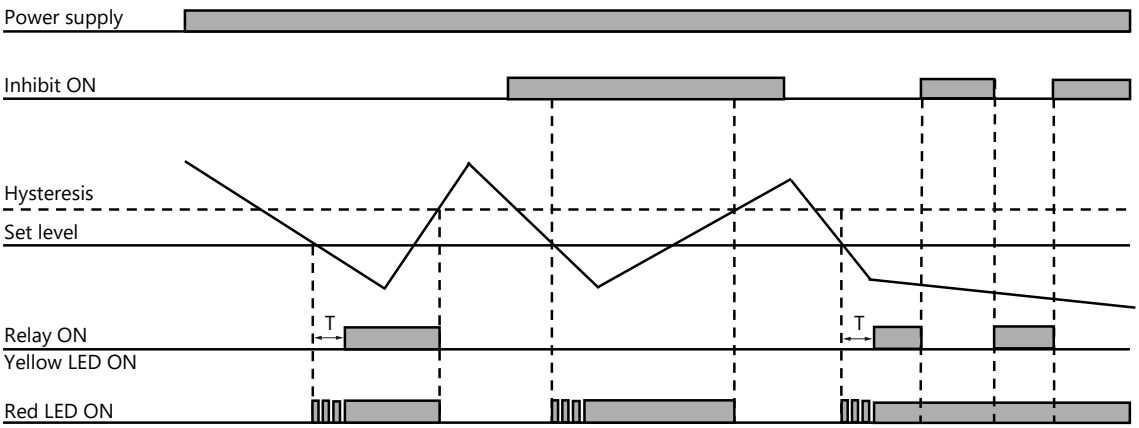
Operating diagram



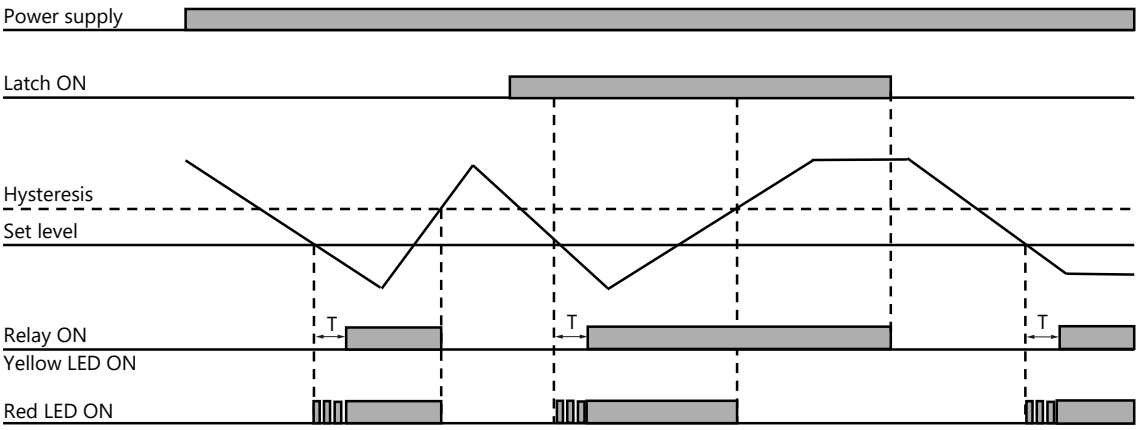
Overvoltage and inhibit function



Overvoltage and latch function

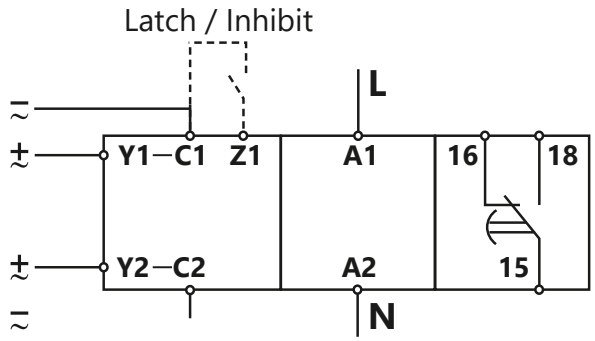


Undervoltage and inhibit function



Undervoltage and latch function

Connection diagram



Terminals	Description
A1, A2	Power supply: 24 to 240 V AC/DC
Y1, C1	Input range 1: 0.1 to 10 V AC/DC
Y2, C2	Input range 2: 2 to 500 V AC/DC
C1, Z1 (C2, Z1)	Latch / inhibit input
15, 16, 18	Relay output

References

Further reading

Information	Where to find it	QR code
Installation manual	https://carlogavazzi-pss.com/manuals/DUB8_IM_html	
PSS selection tool	https://carlogavazzi-pss.com/	

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