

Correct Use

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..

Features

- front protection IP65
- simple programming by integrated keyboard
- 7 programmable time ranges 0.01 s - 999 h
- all usual functions programmable
- only 48 x 48 mm front size



Function

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

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.

	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)

Safety Precautions



- The installation and operation must be carried out by qualified personnel only,
- who is familiar with the professional handling of machine equipment,
- who is familiar with the valid rules of industrial safety and accident prevention,
- who read and understood the operating instructions.
- The safe function of the device during machine operation cannot be guaranteed in case of wrong connection or improper operation. This may lead to fatal injuries.
- Pay attention to country specific regulations.
- The electrical installation must be performed after disconnecting the device and the machine from the mains supply.

- The wiring must be carried out according to the instructions of this operating manual.
- The person who programs the device must be protected against electrostatic discharge (ESD protection).
- Opening the device, any manipulation of the device and the avoidance of the safety facilities are not permitted.
- All relevant safety regulations and standards must be attended to.
- Non-observance of the safety regulations may cause death, severe injuries or substantial damage to property.
- Before use, please, read the operating instructions and keep it in a safe place. Make sure that the operating instructions are always available for installation, initial operation and maintenance.

Non-observance of the instructions above will cause the loss of warranty.

Installation

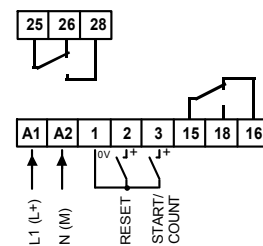
ENS20 is a panel-mounting device for 45 x 45 mm cutout. The front of the device is water and dust proof.

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

Electrical connection

- A1-A2 are operating voltage connections for AC 230 V, AC 115 V for DC 24 V.
- If the DC 24 V version is used, a control transformer according to EN 61558-2-6 or a power supply unit with electrical isolation from the mains must be connected.
- External fusing of the contacts (6 A slow-blow or 8 A quick-action) must be provided.
- The line cross section must not exceed 2.5 mm²
- If the device does not function after commissioning, it must be returned to the manufacturer unopened. Opening the device will void the warranty.

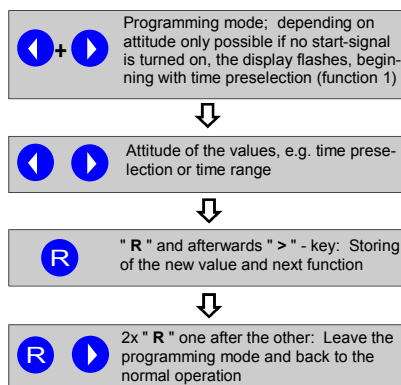
A1: Power supply (+24 V at DC-version)
A2: Power supply (0 V at DC-version)
1: 0 V for ext. connections
2: Reset input
3: Start input
15-16-18: Contact 1
25-26-28: Contact 2



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.



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.

Programming

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...24 V) and 1 (0 V). 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.

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

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 100 ms.
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 50 Hz.
8 – 1	Input frequency at start/count 500 Hz.

Maintenance

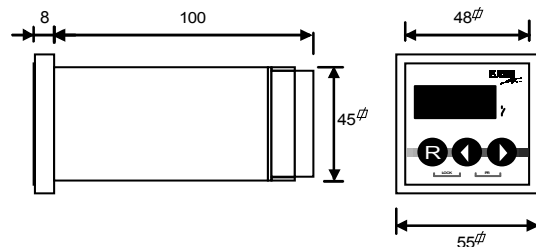
The device must be checked once per month for proper function and for signs of tampering.

The device is otherwise maintenance free, provided that it was installed properly.

Techn. Data

Operating voltage	DC 24 V, AC 230V / AC 115 V, 50-60 Hz
Residual ripple	+ / - 10%
Power consumption	< 2 VA
LED's	3 digits, 7 mm red, time up indication
Protection	IP65 front
Internal data storage time	10 years
Contacts	2 changeover contacts
Switching capacity	AC 250 V, 8 A; DC 24 V, 3 A
Contact life	mechanical 2×10^7 operations electrical 10^5 operations
Inputs 2, 3	DC10...30 V or external contact
Time base	quartz-stabilized, time tolerance: < 0.1%
Min. power-off time	function 5-1: 100 ms, function 5-0: 200 ms
Input frequency / counter	50 / 500 Hz programmable
Trigger	closing of the contact / falling edge
Time ranges	7 between 0.01 s and 999 h
Temperature range	0° - + 50 °C
Dielectric strength	4 kV DIN VDE 0110-1:1997-04
Weight	approx. 200 g

Dimensions



48 mm without front frame
55 mm with front frame



Variants

Order-No. 523110	ENS20 AC230 V, 2 changeover contacts
Order-No. 523111	ENS20 AC115 V, 2 changeover contacts
Order-No. 523112	ENS20 ADC24 V, 2 changeover contacts
Order-No. 583010	Plastic front frame 55 x 55 mm (option)