



Portable Test Equipment **PZ-1**

- ✓ source of the variable current and voltage
- ✓ time delay measurement for relays, protection relays and other equipments

Application:

Portable Test Equipment PZ-1 is used as a source of the variable current or voltage and for the time delay measurement during the tests and setting up relay, protection relay and other equipments.

Description:

PZ-1 consists of:

- variable auto-transformer
- supply transformer
- timer

The whole apparatus is housed in a metall case with the removable cover of the rear panel. To make the manipulation with the PZ-1 more easier, the top desk is provided with a grip and on the bottom and rear desk there are ribbon legs, which allows to do measurements in the horizontal and vertical position.

Power supply:

Portable Test Equipment PZ-1 has a single-phase connection to the network current by the EURO-cable. PZ-1 is set on by a shinned network switch, that activates variable transformer and timer.

Supply transformer:

The supply transformer is set on by pushbutton ZAP (ON) and set off by pushbutton VYP (OFF). The current transformer primary winding is led to the clips, which are not galvanic separated from the power network. The secondary winding has three side lines 10V, 40V and 160V providing a galvanic separation from the power network.

The set of resistors is connected to the secondary winding to serve to the realisation of the power supply when the load is nonlinear. The following condition for nondistorted current ought to be fulfilled:

R_i (internal source resistance) is much more (e.g. 10x) greater than R_z (load resistance)

Output side lines of the supply transformer are marked with the nominal voltage and current. The voltage is valid for the maximum setting of the variable transformer and loading by the nominal current.

Protection of PZ-1:

PZ-1 design enables the current overloading. The apparatus is protected against the damage on the primary side by the circuit breakers F1, F2 and by the thermal sensor F4, allocated in the supply transformer that switches the transformer off and after cooling automatically returns it to the initial position.

Timer:

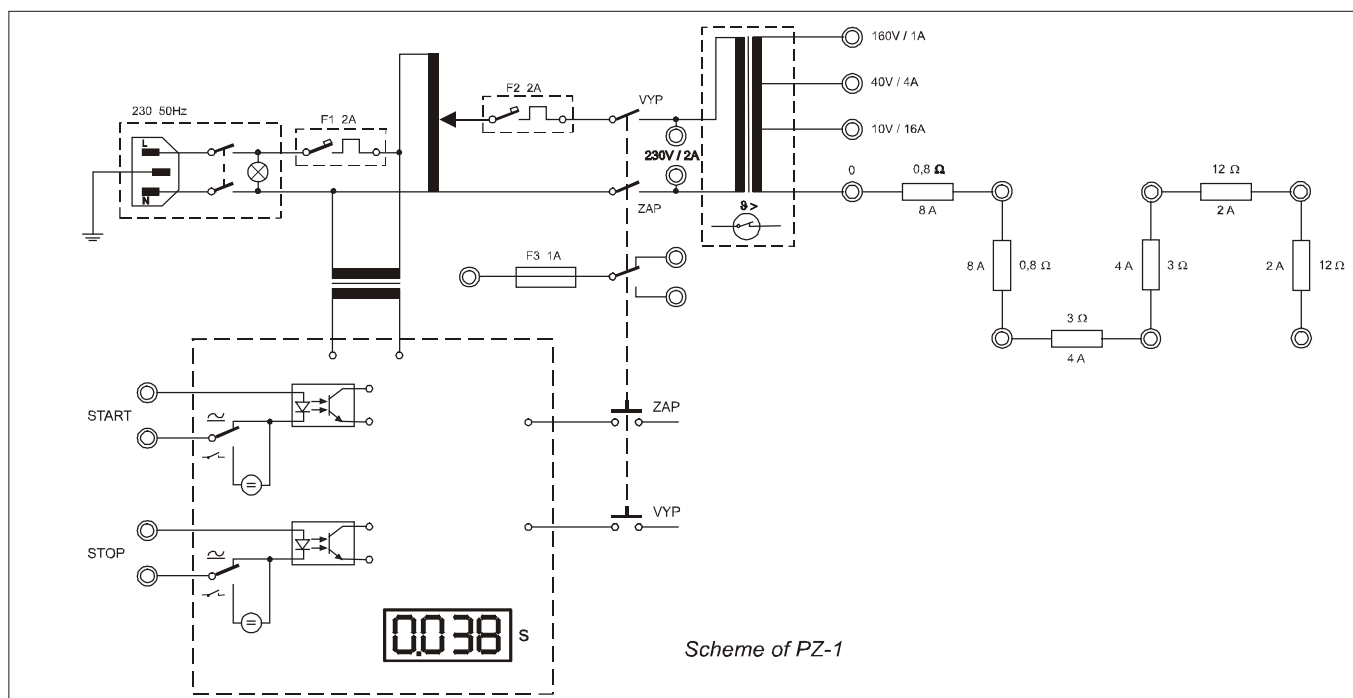
The timer is controlled by inputs START and STOP. The inputs are controlled either by the external DC or AC voltage in the wide scale or by the internal DC voltage controlled by the contact with no voltage.

Regarding the fact that the inputs START and STOP are isolated from the frame and from each other, the contact can be connected even one-side to either of voltage to 250V, even in the mode without the external controlling voltage.

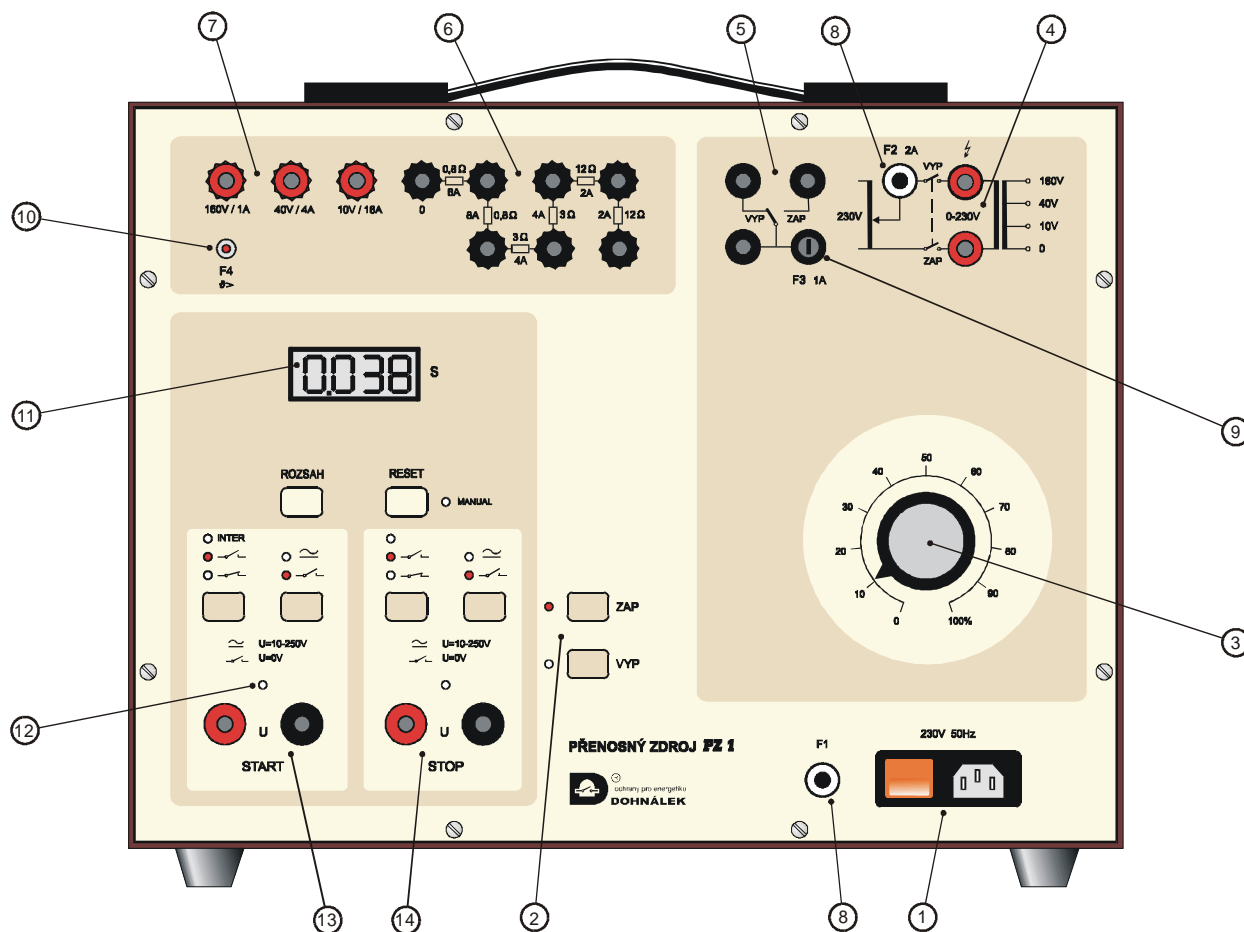
START in mode INTER is controlled by the signal ZAP or VYP of the supply transformer. When START is in mode INTER then signal STOP switches the supply transformer off.

The timer LCD display has 4 digits with the switching of the time range from 0 - 9,999 s to 0 - 9999 s with the pushbutton ROZSAH.

The timer stopping and zero-setting is done by the pushbutton RESET. When longer pressing this button, switching between auto zero-setting and manual zero-setting is done. Mode of manual zero-setting is indicated by the shining pilot lamp MANUAL. In this mode the individual measured times are summed up for an easier calculation of the mean from the more measurements. When the mode auto zero-setting is set up (pilot lamp MANUAL does not shine), the timer is zero-set by every START.











Scheme of PZ-1



1. Power supply by EURO-cable and the main network disconnecter
2. Pushbuttons ZAP (ON) and VYP (OFF)
The supply transformer's switching on and off
3. Variable auto-transformer
4. Primary winding of the supply transformer
5. Auxiliary contact
6. Set of resistors
7. Secondary winding of the supply transformer
8. Circuit breakers F1 a F2 (2A)
9. Fuse F3 (1A)
10. Thermal sensor F4 of the supply transformer
11. Timer LCD display
12. Indikator presenting the start and stop signal
13. Input of the external signal START
14. Input of the external signal STOP

Control of timer:

	Position	Function description
START	INTER	Start derived from the switching on or off by the pushbuttons ZAP or VYP
		Start derived from the contact connecting or from the voltage carried on the input START or from the pushbutton ZAP
		Start derived from the contact disconnecting or from the voltage carried on the input START or from the pushbutton VYP
STOP		Stop derived from the contact connecting or from the carrying voltage on the input STOP
		Stop derived from the contact connecting or from the voltage carried on the input STOP
START, STOP		Voltage carried on the input START or STOP exceeds 5V (10V for accuracy less than 1ms) and no exceeds 250V
		Contact connected on the inputs START and STOP has no external voltage

Notice: Position  or  doesn't assert when START of the timer is in position INTER.

Technical Data:

Input voltage rating	230 V / 50 Hz
Input burden	220 VA
Input burden maximum	2500 VA
Dimensions	310 x 386 x 220 mm
Weight	20,5 kg

Not isolated output:

Voltage U	0 - 230 V_{AC}
Current I _n	2 A

Isolated output:

Range	I _n	3 I _n	U	6 I _n	U	12 I _n	U
0 - 10 V	16 A	50 A	8,9 V	100 A	7,5 V	200 A	4,5 V
0 - 40 V	4 A	12 A	37,5 V	25 A	32 V	50 A	23 V
0 - 160 V	1 A	3 A	142 V	6 A	128 V	12 A	96 V
t _{ON} / t _{OFF}	—	30min / 60min		15s / 5min		2s / 5min	

Insulation against case earth	2000 V / 50 Hz
Insulation against power network	3500 V / 50 Hz

Internal set of resistors:

Serial connection	R	0,8 Ω	0,8 Ω	3 Ω	3 Ω	12 Ω	12 Ω
	I	8 A	8 A	4 A	4 A	2 A	2 A
Parallel connection	R	0,8 Ω // 0,8 Ω		3 Ω // 3 Ω		12 Ω // 12 Ω	
	I	16 A		8 A		4 A	

Timer:

Range	Steps	Accuracy
0 - 9,999 s	1 ms	2 ms
0 - 99,99 s	10 ms	11 ms
0 - 999,9 s	100 ms	101 ms
0 - 9999 s	1 s	1 s

The minimal measurable time interval of two signals **1 ms**
 The minimal measurable time duration of one signal **25 ms**
 (e.g. contact connecting or disconnecting time)

Inputs START, STOP:

External voltage	10 - 250 V_{AC, DC} / 1 - 4 mA
Internal voltage	cca 25 V_{DC}
Insulation against case	2000 V / 50 Hz

Internal start:

derived from ZAP or VYP
 Accuracy between current and signal START **1 ms max.**

Auxiliary contact:

derived from ZAP or VYP
 Accuracy between current and contact **1 ms max.**