

Infusion Pump Tester IN-400



Test device for function tests of infusion pumps in accordance to IEC 60601-2-24

- for peristalsis or syringe pumps
- menu guided cursor operation or PC-operation
- 1- or 2-channel version available
- integrated nurse call test
- robust light metal case
- user specific language setting
- option - suit case

Test and measurement technic
for medicine and industry



S.P.L.
Elektronik

Technical Data

Line voltage:	83 – 264 V ac, 50 / 60 Hz	Interface:	1 x USB for PC-connection 1 x RS-232 for PC-connection 1 x RS-232 for further test appliances
Nominal power:	max. 100 VA		
Protection class:	1		
Environmental temperature:	+5 - +40 °C	Testing device connection:	3 Luer-Lock
Storage temperature:	+5 - +50 °C		
Measurements		Digital display:	4 x 20 char b/w display
Flow rate:	0,1 – 0,99 ml/h, $\pm 0,1$ ml/h or $\pm 2,5$ % of measurement value ¹⁾ 1 - 1000 ml/h, $\pm 0,1$ ml/h or ± 1 % of measurement value ¹⁾	Keyboard:	6 key foil keyboard
Switch-off pressure:	0 – 2,2 bar, $\pm 0,1$ bar or ± 1 % of measurement value	Accessories:	1 x RS-232 interface cable
Bolus volume:	0 – 5,0 ml	Mechanical data:	light weight metal case IP20
Test nurse's call switch:	contact closed / open / not connected	Dimensions:	290 x 340 x 87 mm (D x W x H)
		Weight:	approx. 3,7 kg
		Selectable languages:	german, english, french, polish, spanish italian, portuguese, turkish

¹⁾ at least 5 ml of measurement liquid must be pumped by syringe pumps and at least 25 ml by discontinuous pumps (peristalsis pumps and the like)

Description of functions:

The IN-400 serves for the functional testing of infusion pumps such as syringe pumps, roller (volumetric) pumps, peristalsis (finger) pumps and the like. The IN-400 can make measurements at 2 pumps at the same time.

The measurement parameters:

Feed rate (volumetric)
Switch-off pressure
Bolus Volume
Function of the nurse's call contacts

Measurement principle for feed-rate measurements:

Measurement of the feed-rate is based on a volumetric principle in which a 0.5 ml measuring chamber is cyclically and alternately filled and emptied. From the time required for filling the measuring chamber, the system calculates the feed rate with a precision of ± 1 % within the measuring range of 1...1000 ml/h. The IN-400 displays a new arithmetic mean after each filling of the measuring chamber.

The duration of measurement is in accordance with the stipulations contained in the test step selected by the operator.

In order to achieve the measurement precision of 1% of the measured value given above in the technical data, at least 5 ml of measurement liquid must be pumped by syringe pumps and at least 25 ml by discontinuous pumps (peristalsis pumps and the like).

Switch-off pressure:

The IN-400 determines the switch-off pressure by closing the entry valve, which produces artificial stenosis. When the switch-off pressure is reached, the infusion pump triggers an alarm, and the system stops the feed of infusion liquid. Continuous measurement of the input pressure at the IN-400 enables determining the maximum pressure, which is then recorded as the switch-off pressure of the pump. If the input pressure exceeds 2.2 bar, the system automatically opens the valves and stops the measurement.

Bolus volume:

The bolus volume is defined as the volume of liquid, which leaves the infusion tube after the switch-off pressure is reached and the stenosis valve is opened. The system measures this volume immediately after the stenosis valve is opened.

(The specified measuring accuracy refers to the measuring element. Technical modifications and errors reserved. 04/2016)
