INFU-Module **INFU**

The GS Testing Module for function tests of infusions pumps

- ☑ for peristaltic or syringe pumps
- ☑ automatic measurement sequences with PC - Software
- ☑ measuring of pressure and bolusvolume
- ☑ integrated nurse call test
- ☑ software-controlled graphical evaluation possible (start up diagram, trumpet curve)
- ☑ measuring of very small volume from 0,1 ml/h is possible

Test and measurement technic for medicine and industry

TÜVRheinland ZERTIFIZIERT Management System ISO 9001:2008 www.tuv.com ID 0910095181

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Technical Data

Measurement range:	0.1 – 0,99 ml/h	± 0,1 ml/h or ± 2.5 % of measurement value[1]
	1 - 1000 ml/h	± 0,1 ml/h or ± 1 % of measurement value[1]
Switch-off pressure measurement:	0 – 2,2 bar	± 0,1 bar or ± 1 % of measurement value
Bolus-volume measurement:	0 – 5,0 ml	
Display of the alert outputs:	contact closed / open / not connected	
Ambient temperature for operation:	5 - 40°C	
Included in the equipment supplied:	Luer-lock tube set / closure plugs / Electrical plug-in jack for nurse´s call	

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

Description of functions:

The GS Testing Module INFU serves for the functional testing of infusion pumps such as syringe pumps, roller (volumetric) pumps, peristalsis (finger) pumps and the like.

The ACTIMED Testing Program can perform single-channel measurements. In such cases, this program carries out fully automatic testing of the measurement parameters, in the sequence set forth of the selected test regulation. The measured values are rated with plus (+) or minus (-), and will be stored as a test record.

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 emtied. From the time required for filling the measuring chamber, the system calcultates the feed rate with a precision of ± 1% within the measuring range of 1...1000 ml/h. The INFU system 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 discontinous pumps (peristalsis pumps and the like).

Switch-off pressure

The INFU Testing Module 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 INFU Testing Module 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 opend. The system measures this volume immediately after the stenosis valve is opened.

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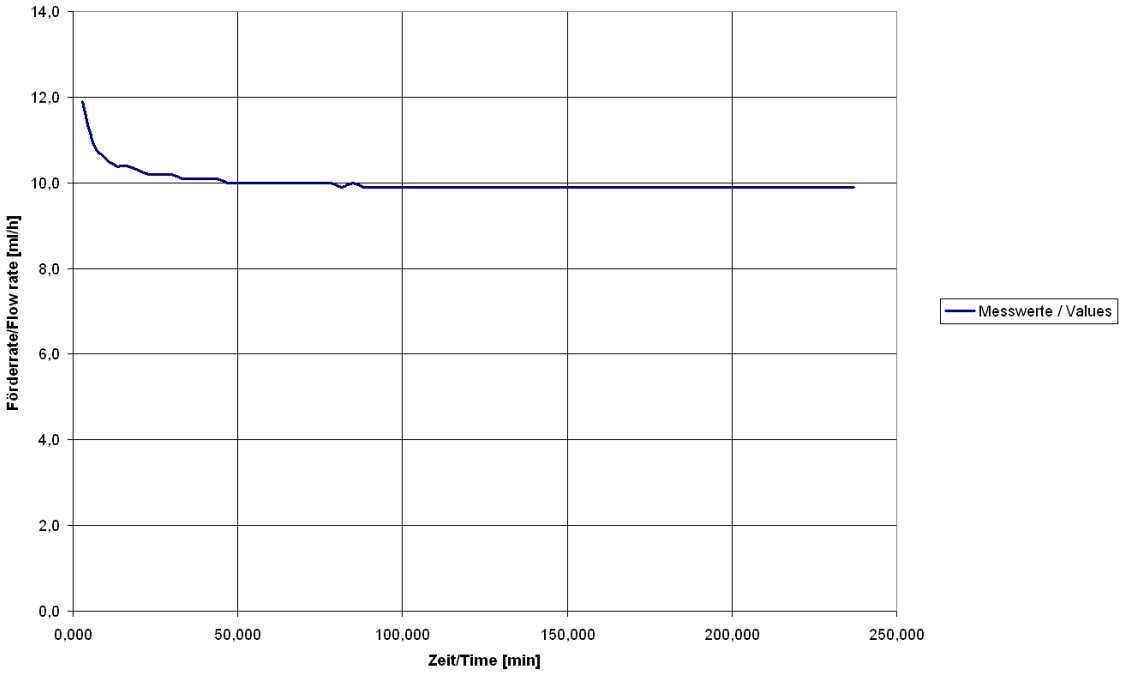
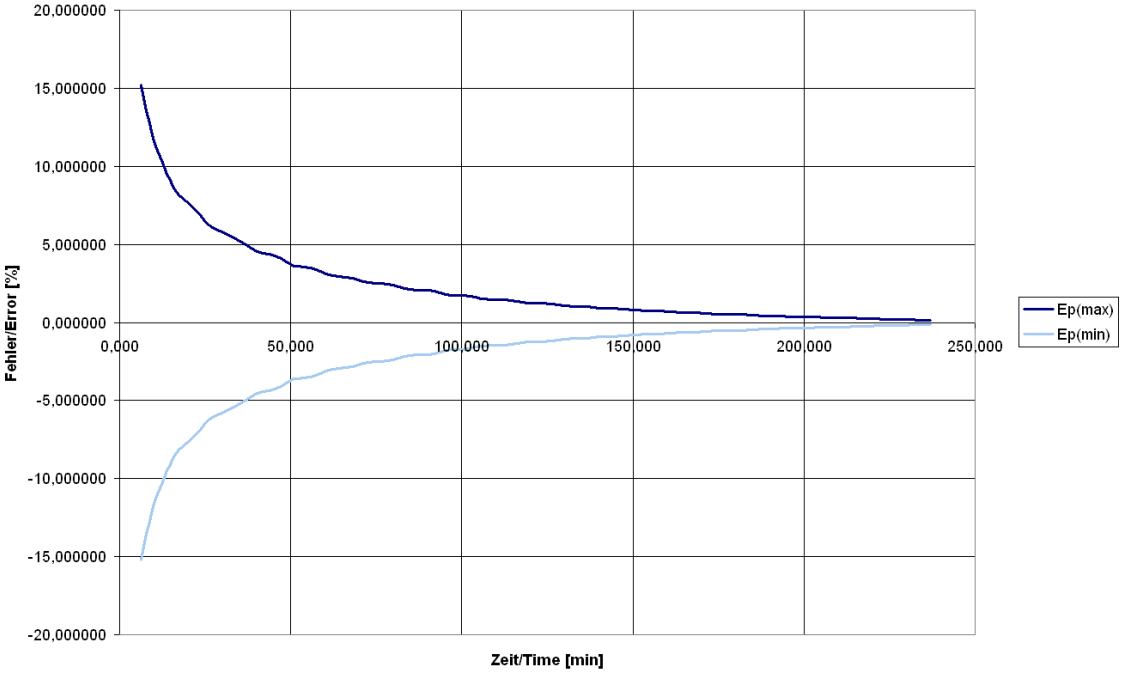
Technical Data



Start diagram at IEC 60601-2-24



Trumpet curve at 60601-2-24

(The specified measuring accuracy refers to the measuring element. Technical modifications and errors reserved. 03/2012)

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