	<b>VascuLuminator</b>	Document	3186-GEN52
	<i>Overview</i>	Version	0.0 By R. Stemerding
		Date	April 17th, 2013

# *VascuLuminator*


## *Vein Imaging system Mk2*

### *Overview*



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## 1 General specifications

Device weight (excl. packaging):	23 kg
Packaging dimensions:	69 x 53 x 102 cm
Device dimensions:	54 x 48 x 170 cm (when assembled)
Field of use:	indoor use only
Storage temperature range	-15 - +40°C
Storage relative humidity	25 – 85%
Operating temperature	+18° to + 30°C
Max. Altitude	+ 2000m above sealevel
Vertical camera adjustment:	0.5 -01.65 m (distance from floor level to camera)
Focus distance:	0.1-0.8 m
Charger:	DKMS bv charger type 330-00
Protection class:	IP 20
IR applicator *	De Koningh Medical Systems type 3186-0320
CE Compliance:	(pending)

\* : These parts can be ordered as a spare part at DKMP bv.

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## 1.1 Operation mode

The VascuLuminator is built for continuous operation. The VascuLuminator can be used for at least 8 hrs based on fully charged batteries at the beginning of use. The batteries need to be recharged for at least 8 hours after this time, by connecting the charger to the mains supply.

The VascuLuminator contains the following interfaces with the user:

- The on / off touch button, positioned on the display. The button carries an indicator that lights green during normal operation, and turns orange when the battery is low.
- Three touch buttons on the display for:
  1. Reflection mode
  2. Transillumination mode for small hands
  3. Transillumination mode for adult hands.
- The focus knob, mounted on the bottom side of the camera. The focus distance can be adjusted by turning this knob manually.

## 1.2 Operator level

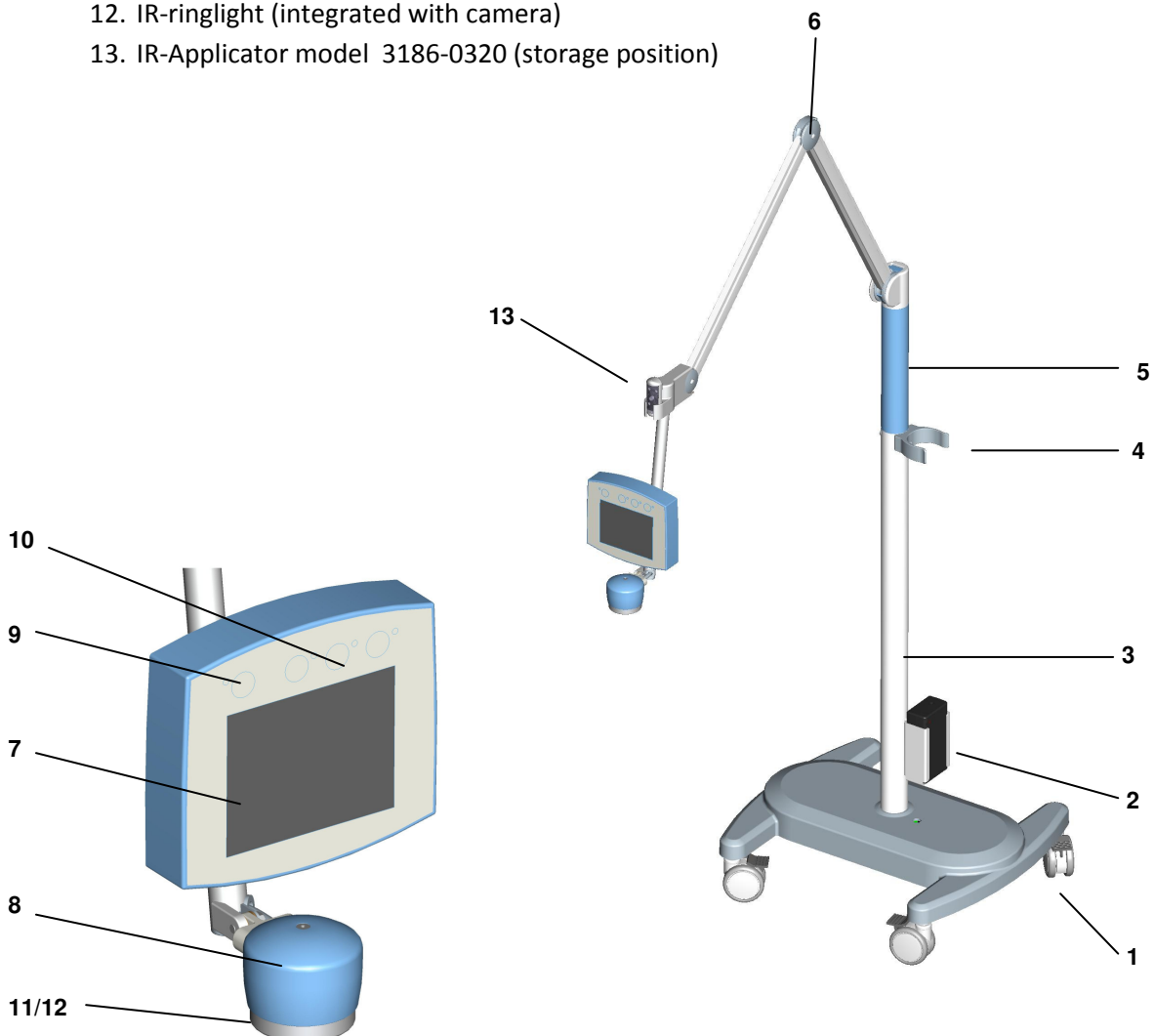
Operator profile for operating the VascuLuminator is: nursing personal at beginner and intermediate level who are used to handling medical equipment, and who have the required skills and certifications to do injections and place drip needles.


## 1.3 System description

System description	An infrared light source held under body part allows camera with infrared filter to detect the position of veins in the body part, as blood is less translucent for infrared light than tissue. A representation of the vein position is shown in greytones on a display. In the reflection mode, an infrared light mounted on the camera illuminates the skin of the patient, showing veins below the skin.
Field of use	Making the position of veins visible in thin body extensions, esp. hand, when required for venipunctures and in forearm or elbow
Patient population	Patients of any age, weight, health and condition
Contraindications	None
Operator level	Medical personnel, skilled and certified for doing injections and placing drip needles
Environment	Indoor use only
Use limitations	<ul style="list-style-type: none"> <li>- limited visibility of smaller veins, and veins that lay deeper in the body</li> <li>- no difference in representation of veins and arteries</li> <li>- direct sunlight and bright light sources may influence the quality of the representation on the screen.</li> </ul>

## 2 System overview

1. ESD safe swivel Wheel with brake (4x)
2. Battery charger model 330-00 with power cord
3. Lower VascuLuminator support
4. Swivel arm support clip
5. Distribution support
6. Swivel arm
7. Monitor
8. Camera
9. On/ Off button
10. Mode buttons
11. Focus ring
12. IR-ringlight (integrated with camera)
13. IR-Applicator model 3186-0320 (storage position)



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## 2.1 Controls

The Vasculuminator contains three operation modes.

### Reflection mode:

in this mode, the infrared ringlight is switched on. Infrared light shines downward from the camera and will reflect on the skin of body parts held under the camera. The hand applicator LEDs are turned off.

### Transillumination Mode 1:

in this mode, the middle infrared LED of the hand applicator is switched on. Very thin body parts such as fingers or children hands can be investigated by transillumination when the hand applicator is held under the body part.

### Transillumination Mode 2:

in this mode, the four outer infrared LEDs of the hand applicator are switched on. Thin body parts such as hands can be investigated by transillumination when the hand applicator is held under the body part.

The buttons are of the touch type. Operating a button is done by slightly touching the button with one finger.

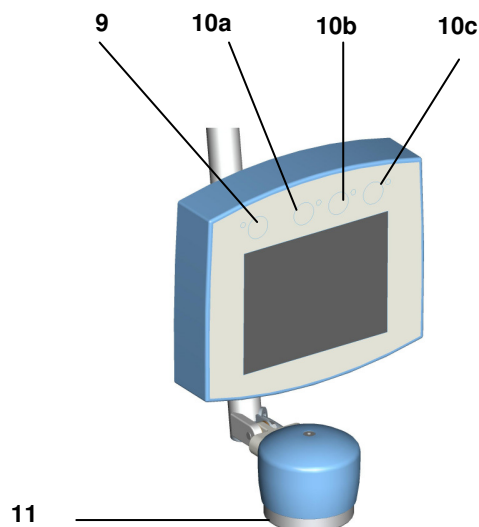
9 = on / off button with indicator;    green continuously = on and batteries are charged,  
yellow blinking = on and batteries are low  
yellow continuously = on and batteries are low


10a = reflection mode

10b = mode 1 (one infrared LED in the hand applicator + ringlight with low intensity)

10c = mode 2 (four infrared LEDs in the hand applicator + ringlight with low intensity)


11 = camera focus ring



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## **2.2 Using the VascuLuminator**

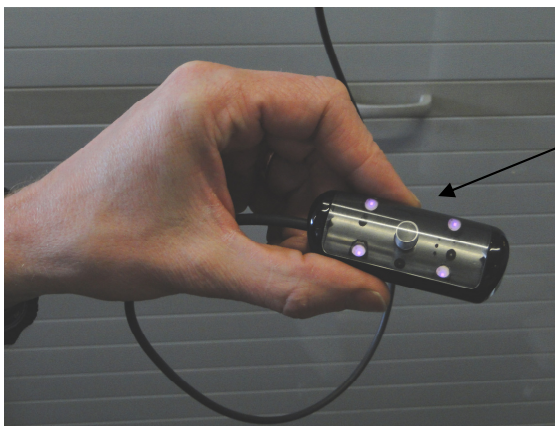
1. Turn the VascuLuminator on by touching the on/off button (9). The button will light up green when switched on. An image will appear on the display after a few seconds.
2. If the button lights up yellow, the batteries need recharging, however the VascuLuminator can still be used for some time. Recharging of the batteries in this case is recommended!
3. Press the button of the mode that is required.
4. After use, switch off the VascuLuminator by touching the on / off button.
5. When the VascuLuminator is switched on again, the mode will appear that was used last time.

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**How to apply the VascuLuminator for imaging, using transillumination mode**

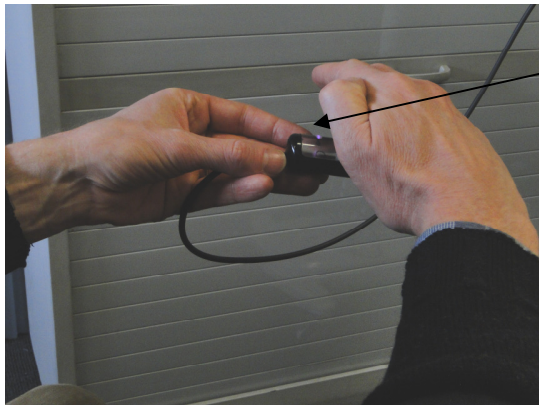
***IR applicator***

- 1 Switch on the Transillumination mode 2 (right button). Align the IR applicator with the transparent side up.




*IR applicator – Transparent side up  
Emission from the infrared source will radiate upwards*

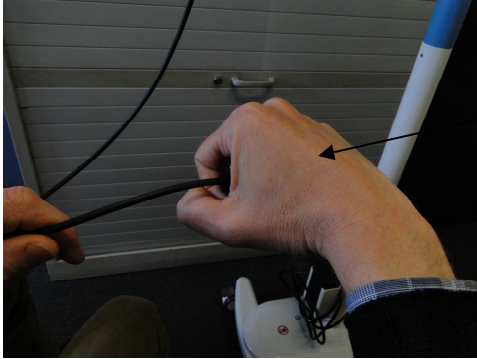
- 2 Place the hand for imaging above the IR applicator.



*The radiant side of the IR applicator will now be facing the imaging hand*

- 3 Press the IR applicator with the transparent side up to the imaging hand by bending the fingers

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*The radiant side of the IR applicator will now be lighting the imaging hand*

*Imaging*

- 4 Align hand to the imaging camera



For thin hands or fingers, use Transillumination mode 2.


Optimise the image by adjusting distance, position and focus

The focus dial displays the following symbol:



The focus can be adjusted to any distance between ~ 0.1 and 0.8 m.



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**Reflection mode**

For non-translucent bodyparts such as the elbow, the reflection mode can be used.

The hand applicator is not needed in this mode and can be stored in the applicator cradle.



Switch on the reflection mode. Place the body extension under the camera as shown below:

