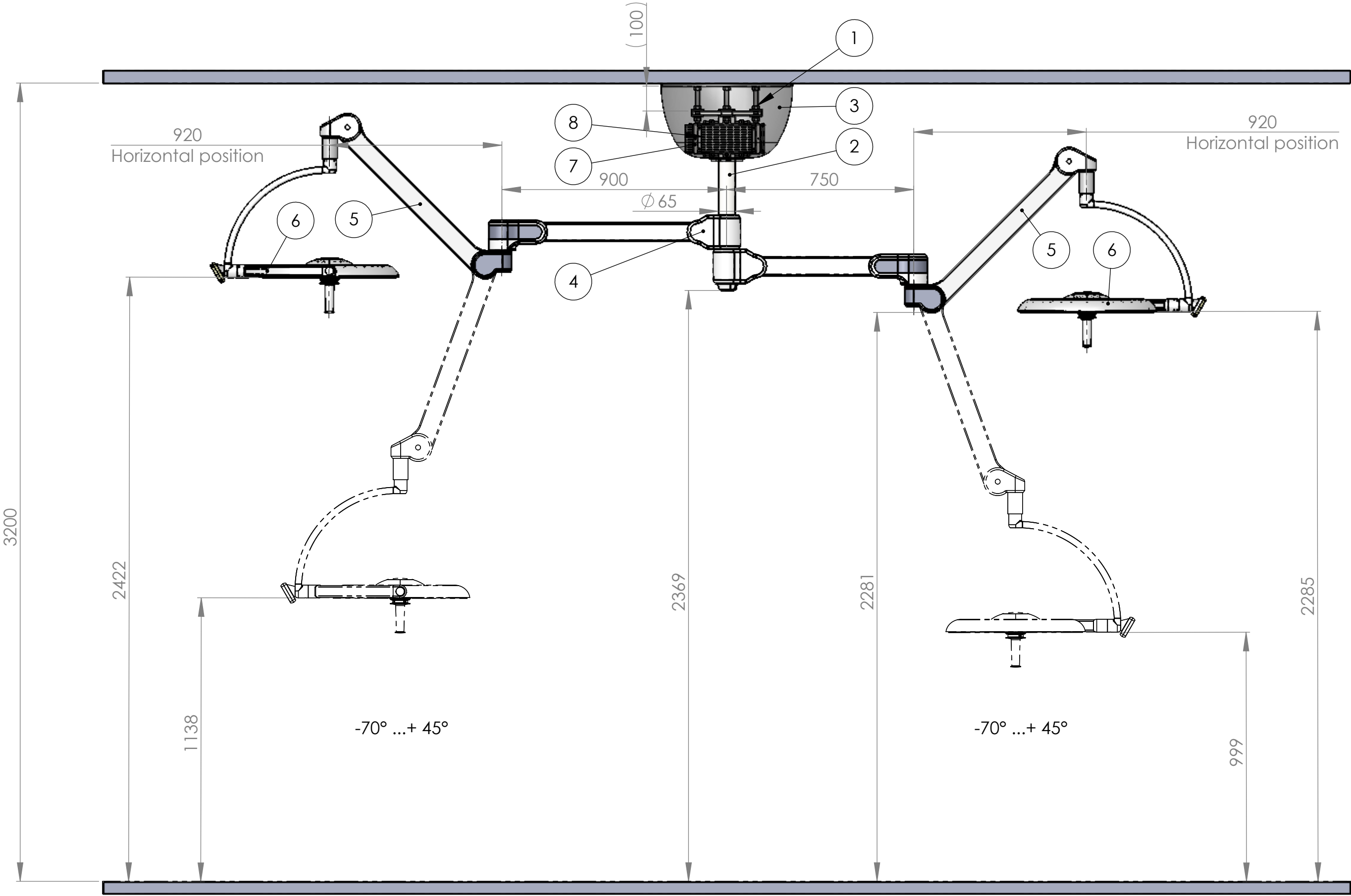


Specificația Tehnică Completă

Model: Q-Flow 6i + Q-Flow 6i; DM000820943 + DM00820922; PN: 520252 + 520222; Producătorul: Merivaara CORP; Țara: Finlanda.

Specificarea tehnică deplină solicitată de către autoritatea contractantă	Specificația tehnică propusă de operatorul economic
Descriere Lampă chirurgicală fără umbre destinată pentru iluminare în investigații chirurgicale majore cu fixare pe tavan cu 2 sateliți Parametru Specificația Fixare pe tavanda Sistem de iluminare bazat pe tehnologia LED (Light Emitting Diodes) DA Numărul de sateliți (cupole) 2 Temperatura culorii reglabilă diapazon min. 3500 - 5000K Nivelul de iluminare la 1 m distanță satelit (cupola) nr.1 $\geq 160\ 000$ lux, satelit (cupola) nr.2 $\geq 160\ 000$ lux Reglarea intensității luminei min. 10 pași Indexul de culoare > 96 Cupole proiectate pentru asigurarea unui flux laminar de aer in sala de operatie da Suprafata de acoperire antibacteriana pentru cupole da Dimensiunea câmpului, cm: - Focusabil da - Diametrul ajustabil diapazon min. 15 - 30 cm - Adâncimea ≥ 80 cm Rotația articulațiilor bratelor min. 330 grade Ajustare pe verticală ≥ 80 cm Alimentarea electrică: Tensiunea de alimentare 220V, 50Hz	Descriere Lampă chirurgicală fără umbre destinată pentru iluminare în investigații chirurgicale majore cu fixare pe tavan cu 2 sateliți DA configurație Q-Flow 6i + Q-Flow 6i (Configuration Q-flow DUO - DM000820922) Parametru Specificația DA Fixare pe tavanda DA Sistem de iluminare bazat pe tehnologia LED (Light Emitting Diodes) număr de LED pe cupola 90 unități DA Numărul de sateliți (cupole) 2 Q-Flow 6 + Q-Flow 6 DA Temperatura culorii reglabilă diapazon 3 regimuri 3700/4400/5100 K pag. 11 din broshura generală DA Nivelul de iluminare la 1 m distanță DA satelit (cupola) nr.1 $\geq 160\ 000$ lux, Q-Flow 6 pag. 11 din broshura generală DA satelit (cupola) nr.2 $\geq 160\ 000$ lux Q-Flow 6 pag. 11 din broshura generală DA Reglarea intensității luminei minm 18 pași pag. 24 din Manual de utilizarea Q-Flow 6 – Control Brightness -de la 10% la 100 % cu pasul de 5 % DA Indexul de culoare 98 pag. 11 din broshura generală DA Cupole proiectate pentru asigurarea unui flux laminar de aer in sala de operatie pag. 11 din broshura generală DA Suprafata de acoperire antibacteriana pentru cupole – suportă si posibilitatea de dezinfectare pag. 6 din Manual de utilizarea Q-Flow 6 - Product cleaning and disinfection can only be done by duly trained personnel according to the best practices in use at the facility, strictly attended with the instructions given in this user manual. It is strongly recommended to disinfect the whole system before use. Dimensiunea câmpului, cm: - DA Focusabil - DA Diametrul ajustabil diapazon 20 - 37 cm pag. 11 din broshura generală - DA Adâncimea de la 1200 mm (120 cm) la 1800 mm (180 cm) pag. 11 din broshura generală DA Rotația articulațiilor bratelor 360 grade pag. 7 din broshura generală DA Ajustare pe verticală 110 cm sint atasate 2 exemple de modele de instalare in care poate fi văzute distanta in dependeta de inlatiema podului. In manualul de instalare :Working distance 700-1800 mm = 1100 mm pag. 47 din Manual de utilizarea Q-Flow 6 Da Alimentarea electrică: Tensiunea de alimentare 220V, 50Hz dar find de tip led este necesar blocuri de

Puterea de consum pentru ambele cupole 50 - 180 W". Durata medie de viață a LED-urilor min. 50000 h Mișcarea capului luminos ≥ 4 grade de libertate Mînere: - detașabile da - sterilizabile da - functionale cu reglarea intensitatii luminii da Panoul de control: - fiecare satelit dotat cu panoul de control da - integrat da - touch screen da Posibilitatea integrării sistemului de telemedicină și a sistemelor de înregistrare video da Înălțimea podului 3-4 m Suportul de fixare pe tavan inclus în ofertă da Instalarea și punerea în exploatare inclusă în ofertă da	conversie din curent alternativ (AC) in direct curect (DC) din acest modiv utilizatorul este necesar sa pregateasca doar conexiune de 220 V AC iar noi vom conecta blocurile de conversie pentru ficare cupola separt de 24 V DC – pagina 49 din Manual de utilizarea Q-Flow 6 DA Puterea de consum pentru ambele cupole 190 W". Pagina 49 din Manual de utilizarea Q-Flow 6 DA Durata medie de viață a LED-urilor > 60 000 h pagina 11 din broshura generală DA Mișcarea capului luminos ≥ 4 grade de libertate pot fi controlate la necesitatea medicului si arcurile de densiunie pentur ridicare si mentiniera a fiecarie cupolei sperat. Mînere: - DA detașabile pagina 11 din broshura generală - DA sterilizabile pagina 11 din broshura generală - DA functionale cu reglarea intensitatii luminii IntueriTM pagina 1 din Q-flow-intelligent-quick-guide Panoul de control: - fiecare satelit dotat cu panoul de control DA - integrat DA - touch screen DA Posibilitatea integrării sistemului de telemedicină și a sistemelor de înregistrare video DA DA Înălțimea podului 3-4 m se va consulta inaltimea reala dup care se va face un proiect pentru instalare conform tuturor dimensiunilor incaperei nu doar a inaltimei Suportul de fixare pe tavan inclus în ofertă DA inclus Instalarea și punerea în exploatare inclusă în ofertă DA inclus
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Approved by Merivaara Corp.	
Signature	
Name	Date
Approved by Customer	
Signature	
Name	Date

NOTE!
The system weight (mass kg) given in the dimensional drawing is inaccurate.

8	5202800	2	POWER SUPPLY UNIT	90-240 VAC / 24VDC	3.8
7	A43404700	1	FIXING BRACKET FOR 1-3 PSU	ASSEMBLY	2.9
6	520241	2	LED LAMP HEAD Q-FLOW 4	140 KLUX, 3 POLES	8.5
5	6001111	2	VALIA L21 SPRINGARM	VA L21 3P 1,5 - 21 KG R9010	5.0
4	6007139	1	VALIA S2 CENTRAL AXIS D65(MV)	VA S2 750 900 3P 3P R9010	12.5
3	A43932500	1	CEILING COVER ASSEMBLY	D530X300 FOR D65 TUBE RAL9010	1.6
2	53010400	1	CEILING TUBE	VA, S, CT65, 400, R9010	9.1
1	A43405900	1	INTERFACE PLATE WITH SCREWS	ONDAL 1868427 + 1930920	19.4
ITEM NO.	ITEM CODE	QTY	ITEM DESCRIPTION 1	ITEM DESCRIPTION 2	MASS / KG
DIMENSIONS WITHOUT TOLERANCE			MATERIAL	SCALE	MASS KG
MACHINING: ISO 2768-mK WELDING: EN ISO 13920-BE SHEET: 1 / 1			SURFACE TREATMENT	1:20	79.93
				CREATED	08.08.2022 PAULBA
				APPROVED	

SITE PREPARATION DRAWING
20220808 / GBG-MLD SRL
Q-FLOW VALIA DUO 4/ 4

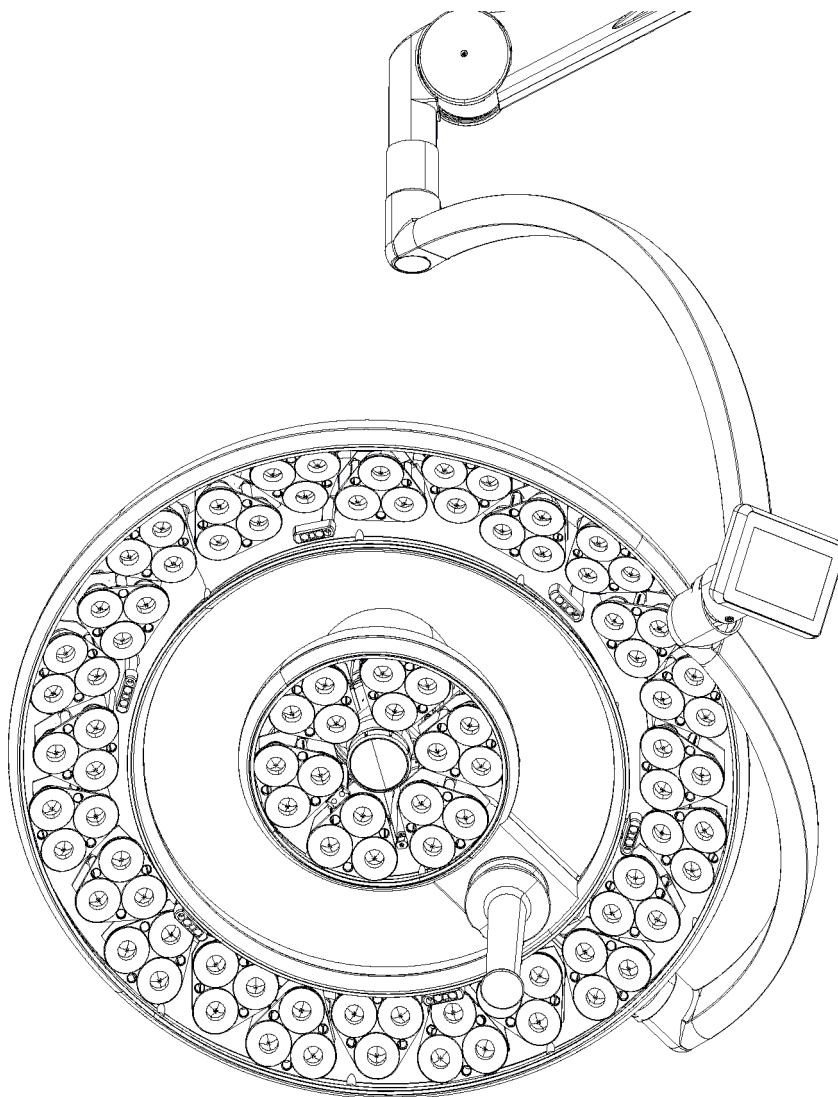


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Q-FLOW™

Surgical lighting system



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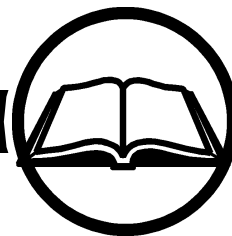
www.merivaara.com

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1. GENERAL



This user manual is designed to provide information on the use of *Merivaara* Q-Flow surgical lighting system. Read this user manual in its entirety before using the equipment to ensure safe and trouble-free operation. The user manual is regarded as part of the product. Keep the user manual for further reference.

When installing additional equipment into the system, supplement these instructions with the user instructions that came with the additional equipment.

The EN 60601-2-41 standard has been applied in the structural design of the Q-Flow system and luminaires. The device is classified as belonging to product category I according to the MDR: EU regulation 2017/745 (MDR), and has a CE marking. This product contains a wireless radio equipment and conforms to Radio Equipment Directive (RED) 2014/53/EU.

1.1 Why choose Merivaara Q-Flow

- Compatibility towards laminar air flow
- Intuitive sterile controls for the surgeon (Intueri™)
- Dynamic obstacle compensation (DOC™)
- Excellent colour rendering properties
- Improved hygienic properties
- Deep stabilized column of light
- Intuitive touch controls

Fluent Usability since 1901

Merivaara offers operating rooms a wide range of high-quality products, solutions, and services. The functionality and ease of use have been at the heart of the design since 1901 when the company was founded. We are proud that the company's values 120 years ago were so ahead of their time that they can still today be fully applied to the development of new and innovative solutions for healthcare professionals. Our user interfaces are developed together with hospital staff so that all our products and systems can be used intuitively. We call this Fluent Usability; operating room staff can focus on patient care, not on managing complex technologies.

Merivaara's medical products are CE-labelled and the company's quality management system complies with EU regulations for medical device. Company is certified by DNV according to ISO 9001 and ISO 13485 standards.

Merivaara's environmental management system is ISO 14001:2004 certified.

Read more about Merivaara's products and solutions at www.merivaara.com.



1.2 Intended use

The Q-Flow surgical lighting system contains modern operating room luminaires for use in hospitals and health care centres. The luminaires are suitable for use during examinations and surgical operations with high illumination requirements. The 4K camera is intended for transferring the image and helping the operation room personnel to follow up surgeries. The camera is not intended for diagnostic use.

1.3 Essential performance

The essential performance of Q-Flow surgical lights and lighting system is the delivery of illumination and the limitation of energy to the operating field. Produced total irradiance and illumination intensity of one luminaire is $<1000 \text{ W/m}^2$ / 160 000 Ec at 1 m distance (lx). Complete technical details presented in section 5.2.4 Luminaire specifications on page 47.

1.4 User identification

Merivaara's Q-Flow system and these operating instructions are intended for use by medical personnel, qualified technicians working in hospitals and surgeons who have acquired working skills by undergoing medical training and who are in possession of necessary authorisation for the aforementioned position. Mandatory personnel training for the use of the Merivaara Q-Flow system must be carried out. Ensure that the training of your personnel complies with the guidelines presented in the document no. T404474.

For your personal safety, read all safety precautions and warnings carefully in chapter 2. PRODUCT USE on page 11

The operations which associate with adjustments necessary during installation must be performed by a qualified technician or authorized operator of the responsible organization in accordance with the safety rules and precautions indicated in this user manual. Also removing and installing the camera can only be performed by a qualified and authorized operator.

In case of re-adjustments for the central axis or of its components, contact technical personnel immediately. Nursing staff or the persons involved in treatment or surgical procedures are not intended to do these kind of procedures (technical personnel only).

Product cleaning and disinfection can only be done by duly trained personnel according to the best practices in use at the facility, strictly attended with the instructions given in this user manual.

It is strongly recommended to disinfect the whole system before use.

1.5 Liability

The contents of this user manual may be amended by *Merivaara*, without prior notice or any further obligations, in order to make changes and improvements. The reproduction, including partial, or translation of any part of this manual is forbidden without the written permission of *Merivaara*.

Merivaara reserves the right to change, cancel or otherwise amend the data contained in this document at any time and for any reason without prior notice in as much as *Merivaara* is constantly seeking new solutions which lead to product evolution. *Merivaara* therefore reserves the right to make changes to the supplied product in terms of shape, fittings, technology and performances.

With regard to translations into languages other than English, reference has always made to the English edition of this operator's and user manual. For the best benefit to understanding the instructions, we suggest to read and look at the corresponding pictures enclosed.

The system is delivered in pre-assembled modules, which must be assemble into the finished product. Check the contents of every package for any shipping damages. The corrugated board packaging is recyclable and the plastics and styrofoam are energy waste.

On-site verification must be done by whoever is responsible for or be holder of an office both at the public and private establishments of the *Merivaara* Q-Flow system.

Merivaara does not take responsibility of consequences if the system contains other suppliers material or components. All system parts must be tested according to EN 60601-1.

This user manual is regarded as a part of the product. It must be kept in close vicinity of the product at all times.

Rights to technical changes reserved. Pictures and technical data in manuals can slightly differ from the current product due to further development of the product.

 **CAUTION!** Disregarding the guidelines presented in this user manual can be interpreted as an user error and can result in loss of the product warranty.

1.6 System description

The Q-Flow system is available on multiple configuration options added with a central axis and extension arms. Please adhere to the system's main configurations from the product table presented in the forthcoming chapters.

For more information on ceiling mounted configurations, refer to following user, installation and maintenance instructions provided by Ondal GmbH:

- 10000198233
- 1566932
- 1563740
- 10000199118

The Q-Flow surgical lighting system is designed for operating rooms in hospitals and health care centres. The system may consist of e.g. 160 klux main surgical luminaires, 140 klux satellite luminaires (max. 4 pcs luminaires), central axis system, cameras, displays, remote and touch controls.

Luminaires are primarily controlled by a touch screen panel or optionally with a Merivaara Merimote™ remote control unit. With the Q-Flow system integrated touch display, it is possible to control all luminaires within the same product family. Both the 160 klux and 140 klux Q-Flow luminaires are “minor operating luminaires” as defined by the IEC 60601-2-41 standard. For more information on the user interface of the Q-Flow system, refer to [2.6 User interface of the Q-Flow luminaire on page 21.](#)

1.6.1 Q-Flow product family

The Q-Flow product family comprises several luminaires optimised to suit specific needs in different lighting environments and conditions. Luminaires are divided in two main categories: Main surgical luminaires and satellite surgical luminaires which are also suitable for examination purposes.

The Q-Flow surgical lighting system can be delivered in the following product modules:

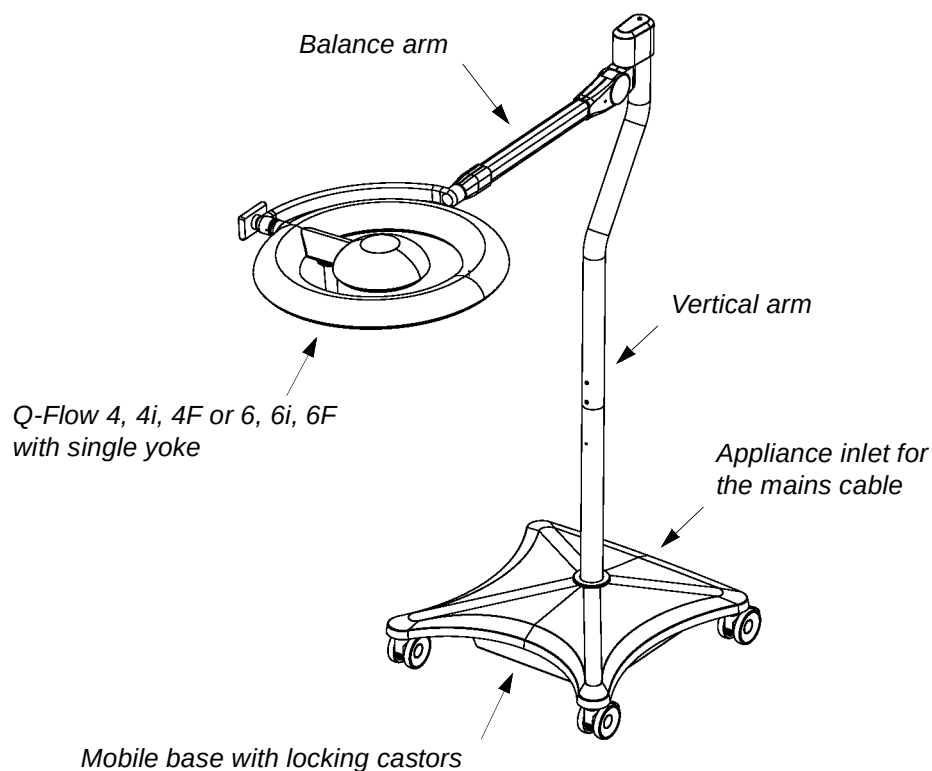
- main luminaire 160 klux (Q-Flow 6i, Q-Flow 6 and Q-Flow 6F models)
- main luminaire 160 klux with a wireless 4K camera, the camera installed inside on either model Q-Flow 6i or Q-Flow 6
- main luminaire 160 klux with a wired 4K camera, the camera installed inside model Q-Flow 6i
- satellite luminaire 140 klux (Q-Flow 4i, Q-Flow 4 and Q-Flow 4F models)
- satellite luminaire 140 klux with a wireless 4K camera, the camera installed inside either the model Q-Flow 4i or Q-Flow 4
- monitor from 19 to 32 in.

Optional configurations can be built by using from one to four product modules of above mentioned devices. System naming follows the quantity of product modules:

- one product module: Q-Flow SOLO
- two product modules: Q-Flow DUO
- three product modules: Q-Flow TRIO
- four product modules: Q-Flow QUAD

If you need more information about the available monitor models, please contact us. More information available also in the Q-Flow product brochure and on the website at www.merivaara.com.

Q-Flow Mobile



Code:	Content of the configuration	Further information
520211	Q-Flow Mobile with one luminaire with single yoke from the selection (4, 4i, 4F or 6, 6i, 6F)	mobile base with castors, base cover, vertical arm tube 2 pcs, balance arm (LCH)

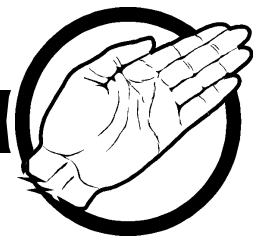
OPTIONAL PRODUCT MODULES

Code:	Contents	Further information
5112844	Q-Flow -battery back-up system	Parallel connection to operate one luminaire, Power supply unit 100–120 VAC / 24 VDC, battery (12 Ah) and charger, with EU plug
5112845	Q-Flow -battery back-up system	Parallel connection to operate one luminaire, Power supply unit 220–240 VAC / 24 VDC, battery (12 Ah) and charger, with EU plug
5112848	Q-Flow -battery back-up system	Parallel connection to operate one luminaire, Power supply unit 220–240 VAC / 24 VDC, battery (12 Ah) and charger, with UK plug

Code:	Contents	Further information
100060970	Merimote controller	Optional (accessory)
5122691	Mounting kit for Merimote, wall model	Optional (accessory)
5202723	4K wireless camera module	Optional (factory installed)
5122855	Video receiver unit	Optional (accessory)
5122850	4K wired camera module	Optional (factory installed)

Table 1. Optional configurations and accessories of the Q-Flow

2. PRODUCT USE



2.1 Warnings

All warnings and items to be noted in this user manual are specified as follows. Read carefully!



WARNING!

Observe to ensure user, maintenance personnel and patient safety.



CAUTION!

Please observe in order to avoid causing damage to the equipment or its parts.



WARNING!

Dangerous voltage! Improper installation or maintenance can cause electric shock.



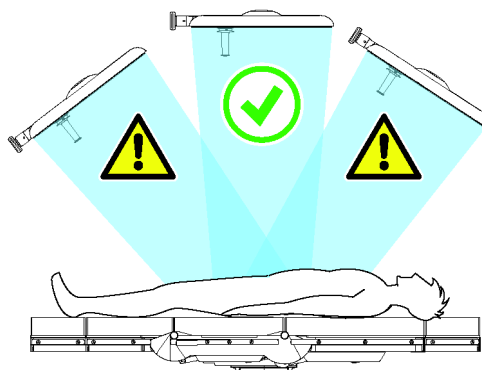
NOTE!

Please observe in order to improve product properties.

2.2 Read before using the system



WARNING! If more than one luminaire is focused on the same illuminance spot, total irradiance and UV-irradiance can increase over the permissible values. ATTENTION: RISK OF PATIENT INJURY.



WARNING! High luminous intensity, can cause dazzling effect. Do not look directly at the light source when operating. It is recommended to use protective eye wear in long term use.



WARNING! For emergency use, the complete system must be isolated from supply mains by using a mains switch. Point at the place where the mains power supply can be safely switched off under circumstances of the system electrical malfunction, malfunction of software (reset), or during a power cut (mandatory user training).



WARNING! If the touch screen panel or the luminaire stops responding, use the main switch of the luminaire to restart and reset the user interface (UI). Switch off the main switch for 10 seconds after the UI turns down before turning the main switch back on. If still not responsive, keep the power turned off for 30 seconds.



WARNING! Do not touch the locking pin or other non-sterile parts of the luminaire when installing the handle. Ensure that the handle remains sterile.



WARNING! Before use make sure that the sterilizable focus handle is installed in place and its functions are working properly. Always keep a spare handle available.



WARNING! Positioning the wireless RF unit and the camera module unfavourably towards each other or moving the luminaire may cause disturbances in the quality of the image (the image may cut in and out).



WARNING! Keep diathermic equipment or electrosurgical knives as far as possible from the luminaire, because they can cause disturbances in the function of the luminaire.



WARNING! When the wireless camera is switched ON, keep it at a minimum distance of twenty (20) centimetres from the living tissue. The RF video transmitter is located inside the camera.



WARNING! No user serviceable parts inside! Hazard of electric shock!



WARNING! Improper installation of the system can cause electric shock and voids the warranty!



WARNING! To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.



WARNING! Q-Flow surgical lighting system must be equipped with a power supply backup system which prevents use interruptions if failure of power supply network occurs. Power supply backup system is not included with the system delivery, it is sold as a separate product module.



WARNING! Modification of this equipment is NOT allowed.



WARNING! Do not use a faulty device. Set the luminaire out of use and contact service personnel.



WARNING! All rated values of illumination intensity are measured as a standard 1 m distance; however, the maximum illumination intensity is higher than rated values and it is measured from 1.3 m distance of the luminaire surface.



LASER RADIATION! DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS, CLASS 2M LASER PRODUCT! Laser UI feature is only in Q-Flow i models!



WARNING! When using the laser UI, keep the laser beam away from the patient's and employee's eyes. Attention, danger of injury! If necessary, use laser safety glasses!



NOTE! Activate the sterilizable focus handle Intueri controls with the laser UI in the settings menu of the luminaire user interface (refer to 2.6.3.1 Setup menu in the Lamp menu on page 25).



NOTE! Energy consumption and extra heating of the medical device can be reduced by switching OFF the device when it is not in use and also by keeping the light the intensity as low as possible when it is in use.



NOTE! To reduce hazardous or any other waste, reduce the need for replacing parts by maintaining the device according to instructions given in the ***Q-Flow Installation and maintenance manual D01144.en***.



NOTE! Expected lifetime of the medical device can be achieved by following carefully the instructions of maintenance and cleaning processes given in Chapter 3. CLEANING on page 36.



CAUTION! If the luminaire hits obstacles, it may get broken. Always handle the luminaire with great care.



CAUTION! Q-Flow surgical lighting system must be always installed with using fixing structures presented in the ***Q-Flow Installation and maintenance manual D01144.en***.

2.2.1 Overview of the key features - all models

- Design optimised for laminar air flow (**Q-OptiFlow™**):
Lowest possible turbulence caused by the luminaire when it is used in vicinity of the laminar air conditioning systems.
- Excellent colour rendering properties:
C.R.I is a measure of the light source's ability to show object colours realistically and naturally compared to a defined reference source which simulates the sunlight colour rendering properties. Carefully selected colour temperature with a high light C.R.I value makes a perfect match.

- Improved hygienic properties:
The sterile handle can be used for illuminance control, switching small or large light field as well as the luminaire position control. Frequently touched surfaces of the luminaire are easy to clean thanks to its shape and design.
- Deep column of light: Depth of illumination has been specified as a distance of L1+L2 in mm. Illumination intensity values on the light column are related to the distance between the light source and the object due to shape, size and orientation. Q-Flow luminaires are designed to provide excellent illumination conditions throughout this defined range, where the most of its illumination is limited to which is a key factor, and because of this it allows a wide working distance and an even light field without compromising.
- The luminaire also features an Ambilight function which creates dim white light in Fluent models and dim green light in other models. A dim lighting mode allows better definition to see images and it makes easier to read texts on monitors.
- Intuitive touch controls with a touch screen panel:
Easy to use thanks to simple and logical user interface design.
- Input voltage monitoring: Protects the system and prolongs usage time when the input voltage is low by reducing light intensity.

2.2.2 Additional features of Q-Flow i model

- Intuitive sterile surgeon controls (Intueri™):
Some of the most useful controls of the UI projected with laser towards the operating area, which allows adjustments without disturbances.
- Dynamic Obstacle Compensation (DOC™):
If an IR object detection system recognizes an object generating a shadow to one or more LED light modules, that group of LEDs will be dimmed and the illumination strength of the other ones will be increased accordingly to compensate illumination.



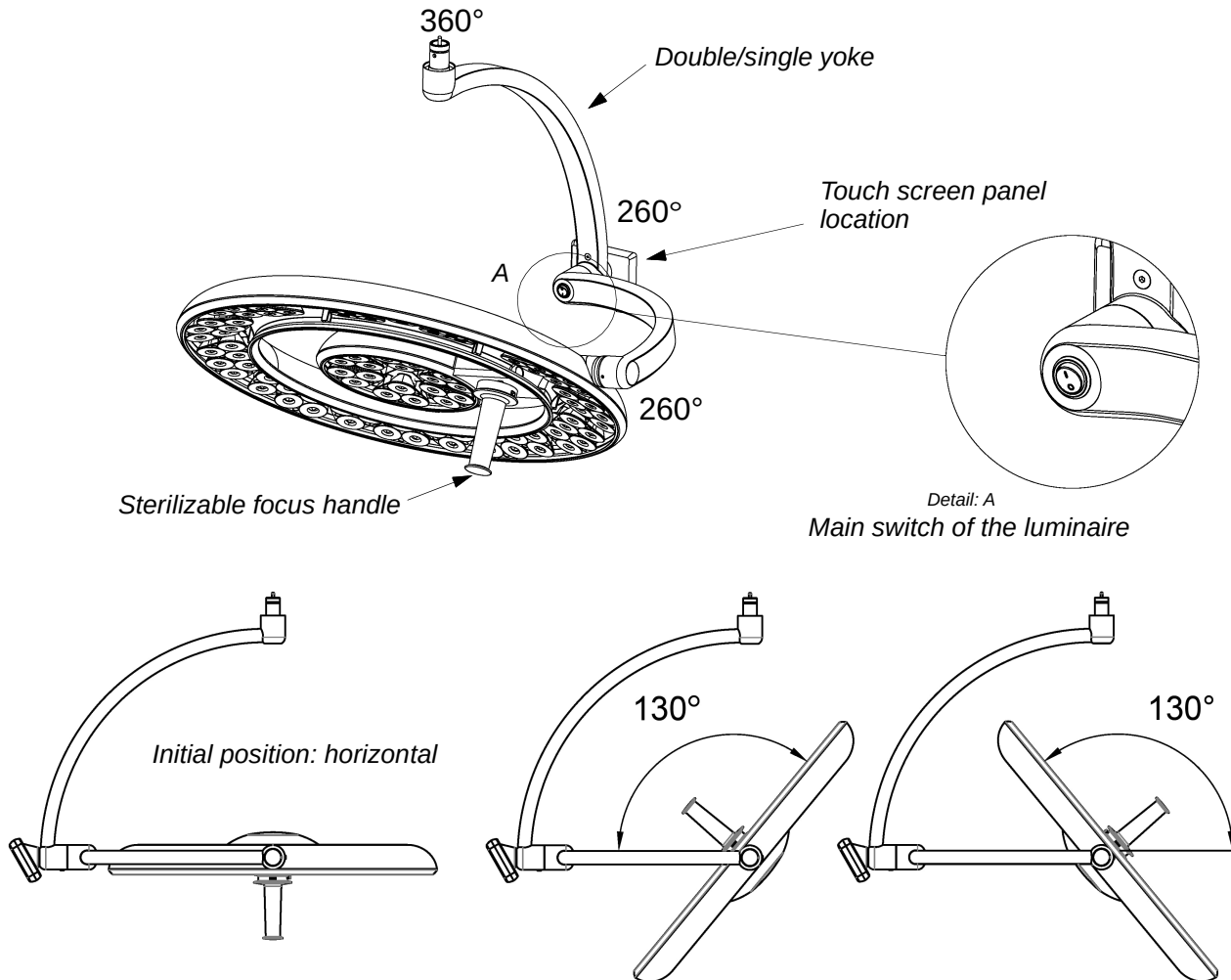
NOTE! Activate the features of Q-Flow i and F models in the **Setup** menu of the luminaires's user interface. For more information, refer to 2.6.3.1 Setup menu in the Lamp menu on page 25.

2.2.3 Specific features of Q-Flow F model

- Fluent sterile surgeon control: Simplified handle control enables adjusting the brightness of the field size of the light with a sterile handle.

2.3.3 Q-Flow luminaire controls

- Sterilizable focus handle controls (additional feature in Q-Flow i and F models)
- Touch screen panel
- Merimote remote control (optional - follow the separate user manual for more details)
- OpenOR compatibility (optional - follow the separate user manual for more details)



Picture 1. Q-Flow luminaire controls and rotational angles



NOTE! To restart the system, switch off the main switch for 10 seconds after the UI turns down before turning the main switch back on. If still not responsive, keep the power turned off for 30 seconds.

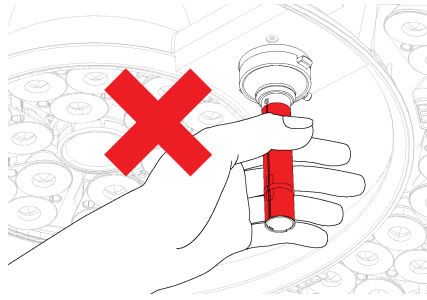
2.3.4 Sterilizable focus handle



WARNING! Before use make sure that the sterilizable focus handle is installed in place and its functions are working properly. Always keep a spare handle available.

Insert the handle into place on the luminaire base with one steady movement aligned with the locking pin. The locking pin or other non-sterile parts of the luminaire must not be touched when installing the handle. Refer to *Picture 2. Sterilizable handle with the touch key functions on page 17.*

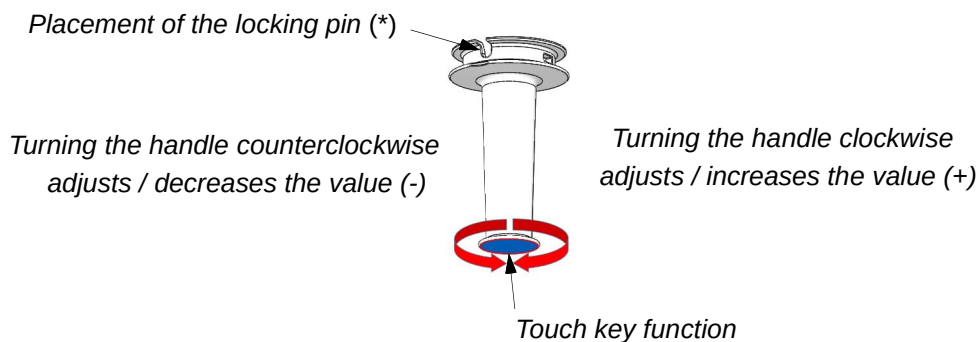
 **WARNING!** Trying to adjust Q-Flow light from red part under sterile handle may result in braking of mechanical and / or electrical components.



 **NOTE!** Check the functioning of the sterilizable focus handle and that it locks when first using the luminaire. All adjustments and handling of the luminaire must be done by using the sterilized focus handle.

2.3.4.1 Intueri - Sterile handle control (i model only)

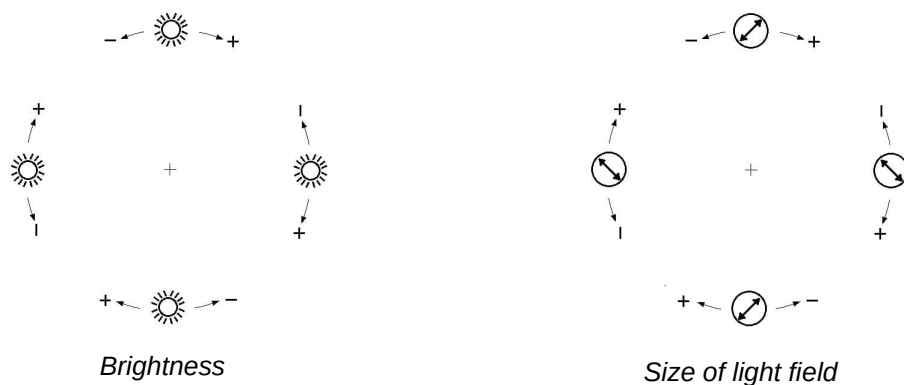
With Intueri, the sterilizable handle of the Q-Flow i models can be used for illuminance control (brightness) and to change between a small or a large light field setting. The touch key is located on the end of the handle and it is used to recognize, hold and release interactions.



Picture 2. Sterilizable handle with the touch key functions

 **NOTE!** When the user holds the sterile handle over two (2) seconds, the Q-Flow automatically recalibrates sterile handle's functionality to match user's hand.

The sterile handle with Intueri controls have a visual UI mode based on a laser and a diffractive film. Turn this feature On/Off in the settings menu (Refer to [2.6.3.1 Setup menu in the Lamp menu on page 25](#)).



Picture 3. Projected views of Intueri user interface

Use of Intueri sterile handle control (i model only)

- Grabbing the handle activates a projected view of the Intueri user interface onto a surface to which the luminaire is directed. The brightness control is a primary function to be illustrated with the corresponding symbol. When the handle is released, there is a two (2) seconds delay before the user interface turns to idle state and the projected view of the current control disappears.
- Tapping the touch key changes the control function of the handle. The touch key is located on the bottom surface of the handle, see [Picture 2. Sterilizable handle with the touch key functions on page 17.](#)
- When you rotate the handle either counterclockwise or clockwise to its full position, the intensity changes at 10% intervals. If you hold the handle in the full position, the intensity changes at 5% intervals until the handle is released.
- Rotate the handle in either direction to adjust the value of these controls.
- The light field size is adjusted with the same manner; first touch the touch key to change the control.
- Details of the adjusted values are also displayed in the Lamp view on the UI. For more information, refer to [2.6.3 Luminaire \(lamp\) menu on page 24.](#)



NOTE! The system includes an acceleration sensor to avoid accidental light controls when the luminaire is moved.



NOTE! Activate the sterilizable focus handle Intueri controls with laser UI from the settings menu of the luminaire user interface. Refer to the menu presented in [Picture 16. Settings menu on page 27.](#)



WARNING! Use only the sterilizable focus handle part no. 5202801. The part number is on the handle base.

2.3.4.2 Fluent sterile surgeon control (F model only)

Q-Flow F-models have simplified control features and functionalities.

The simplified sterile focus handle controls the brightness or light field size. These functions are based on selection in the **Lamp setup**:



Picture 4. Simplified sterile focus handle in F-model

Use of Fluent handle control

- The function for the sterile handle is selected from the touch screen panel in the **Lamp** setup.
- Brightness: When you rotate the handle either counterclockwise or clockwise to its full position, the intensity changes at 10% intervals. If you hold the handle in the full position, the intensity changes at 5% intervals until the handle is released.
- The light field size: Rotating the handle changes between a small or a large light field setting.



NOTE! The system includes an acceleration sensor to avoid accidental light controls when the luminaire is moved.



WARNING! Use only the sterilizable focus handle part no. 485492. The part number is on the handle base.

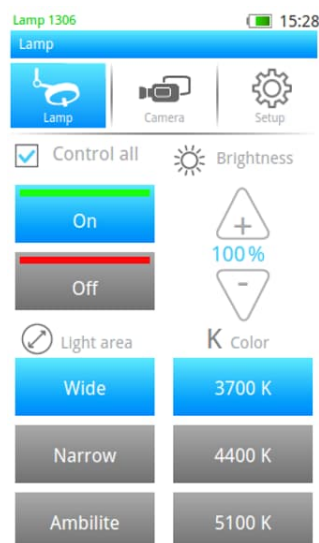
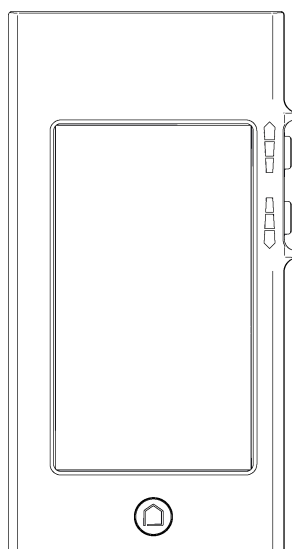
2.4 Merimote remote control (optional)

2.4.1 User Interface and functions



NOTE! Consult *Merimote user instructions DO1130.en* how to use Merimote remote controller.

The Merimote remote controller can be used as additional control panel for Q-Flow lights. It is intended to be used outside the sterile or operation area.



Picture 5. Merimote remote control functions

To synchronize devices, refer to *Merimote's User manual DO1130* for additional settings and chapter [2.6.5.2 Synchronizing/adding a lamp on page 28](#) in this manual.



NOTE! Merimote has also a “Demonstration Mode” which simulates the user interface of target devices. In this mode the user can learn to control the target device with the Merimote without the luminaire. Refer to **Merimote's User manual DO1130** to activate the demonstration mode

2.4.2 Wall-mounted control panel (optional)

The Q-Flow system with a wall-mounted control panel is optional for monitoring and controlling features from the outside of the operating area. Check if your system has this optional product module installed. The panel provides the same functionalities as the Merimote and the control panel on the luminaire yoke.

2.5 Q-Flow luminaire with a camera module (optional)



NOTE! The camera module is not available for Fluent models.



NOTE! The installation of the camera is possible only by a technical service person or during the factory assembly.



WARNING! Some equipment (like an electrosurgical knife or a defibrillator) in the operation room may cause disturbances in the image signal of the camera.

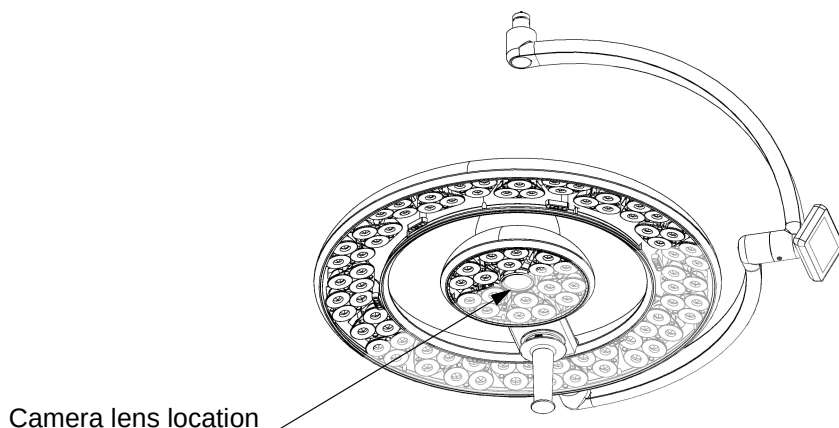


WARNING! The camera is not intended for diagnostic use. The camera is intended to be used as an auxiliary equipment for the operating room personnel.



WARNING! Do not touch the surface of the wireless RF video receiver unit for longer than 10 seconds to avoid excessive exposure to the temperature.

The camera module lens is located inside the centre of the luminaire.



Picture 6. Camera lens location in the Q-Flow luminaire

Use the sterilizable focus handle for normal positioning of the luminaire and for directing the camera. Note that the line-of-sight between the wireless camera module and the RF unit should be as unobstructed as possible. Configure the camera settings by using the user interface instructions. The pairing between the camera module and RF video receiver unit must be done every time, when the camera is moved to another room.

2.5 Q-Flow luminaire with a camera module (optional)



NOTE! The camera module is not available for Fluent models.



NOTE! The installation of the camera is possible only by a technical service person or during the factory assembly.



WARNING! Some equipment (like an electrosurgical knife or a defibrillator) in the operation room may cause disturbances in the image signal of the camera.

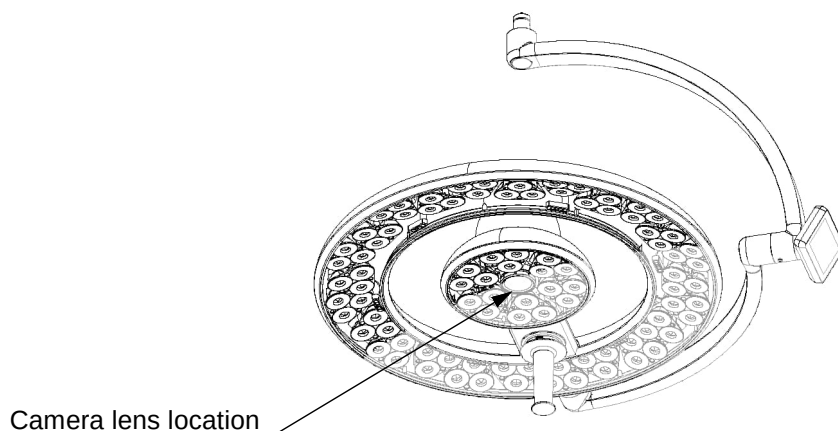


WARNING! The camera is not intended for diagnostic use. The camera is intended to be used as an auxiliary equipment for the operating room personnel.



WARNING! Do not touch the surface of the wireless RF video receiver unit for longer than 10 seconds to avoid excessive exposure to the temperature.

The camera module lens is located inside the centre of the luminaire.



Picture 6. Camera lens location in the Q-Flow luminaire

Use the sterilizable focus handle for normal positioning of the luminaire and for directing the camera. Note that the line-of-sight between the wireless camera module and the RF unit should be as unobstructed as possible. Configure the camera settings by using the user interface instructions. The pairing between the camera module and RF video receiver unit must be done every time, when the camera is moved to another room.

2.6 User interface of the Q-Flow luminaire

2.6.1 Starting the use

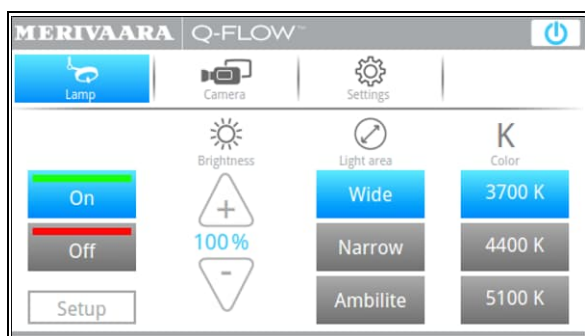
The touch screen panel of the user interface enables easy control of the luminaire functions. The touch screen switches on when the main switch is turned on from the yoke.

Touch the screen to activate the user interface.



Picture 7. Idle screen of the user interface

The User Interface opens in the **Lamp** view:



Picture 8. Main view of the Q-Flow user interface

First, change your UI language in the settings, if necessary (refer to [2.6.3.2 Changing the language in the user interface on page 26](#)). The icons **On/Off** keys are highlighted with green and red colours on the main tab view in the User Interface.

When a function is selected, the corresponding button in the user interface is highlighted in light blue colour.

The Standby key on the upper right corner returns the panel into the idle screen and switches off the light or lights without missing the last settings. The UI laser of the Q-Flow i-series sets off automatically when the luminaire is switched off or on in the standby mode.

The user interface of the Q-Flow luminaire is presented in more detailed in the following chapters. Read instructions carefully and familiarize yourself with the functions and settings of the user interface.

2.6.2 Definitions of user interface icons and keys

	On
	Off
K	Colour temperature
	Brightness
	Light field size
	+ Increase value (%)
	— Decrease value (%)
	Rotate right/left
	Pause (Still image snap shot)
	Icon of luminaire (lamp)
	Icon of camera
	Icon of white balance



Icon of settings



Standby / luminaire power On/Off



Yellow **NOTE!** icon for the action needed by user



Red **WARNING!** icon of critical error (may occur only on OpenOR or Merimote)



Selection tick box



Back to previous menu



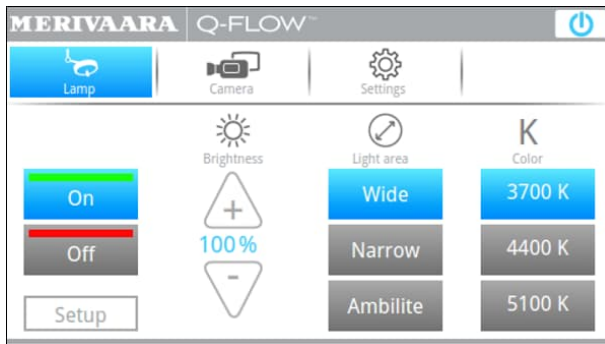
Add device



Remove device

2.6.3 Luminaire (lamp) menu

The user interface opens in the main **Lamp** menu. If a lamp has been switched on before starting the user interface, also the User Interface starts in **ON** mode.



Picture 9. Lamp menu

The Lamp menu contains the following functions and buttons:

On/Off - Switches the lamp ON/OFF.

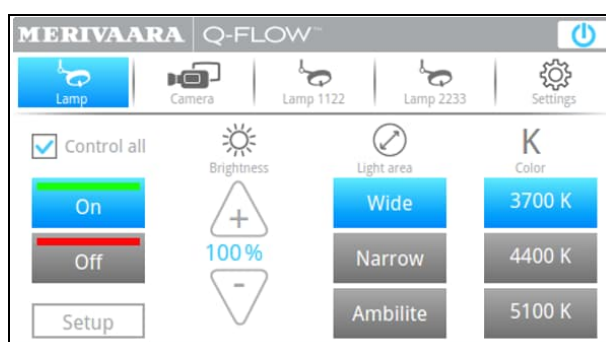
Brightness - The sun icon represents the light intensity. Adjust the light intensity (brightness) by pressing the arrow buttons with +/- symbols. When you press the button, the intensity changes by 10% at a time. When you press the button constantly, the intensity changes by 5% at a time.

Light area - Indicates the size of the light field. Use the **Narrow**, **Wide** and **Ambilite** buttons to reduced or increase the value. The Ambilite function is used when a dim lighting condition is needed.

K - Select the colour temperature (3700 K, 4400 K or 5100 K) by pressing the corresponding button.

Setup - Opens a new menu in which you can change settings for shadow compensation and sterile handle.

If other devices or luminaires have been synchronized to the system, you can control all via one touch screen by selecting **Control all** in the main lamp view (see picture below)

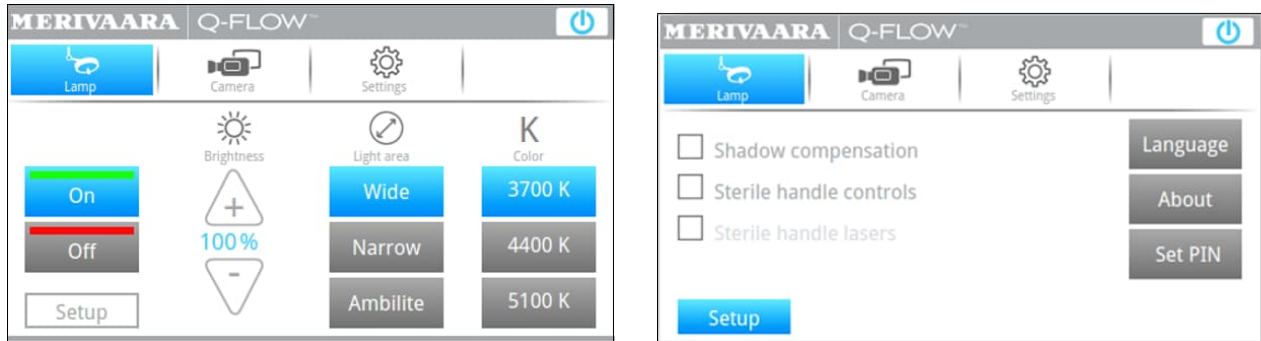


Picture 10. The Lamp view with maximum amount of devices

2.6.3.1 Setup menu in the Lamp menu

In the **Setup** menu you can change settings for shadow compensation and sterile handle.

Click **Setup** in the **Lamp** menu to open the **Setup menu**.



Picture 11. Setup menu in the Lamp view

Shadow compensation - Minimizes shadows within the work field. Detects automatically an object interposed between a particular LED module and the work surface. The power to that LED module is decreased, whereas the power of other LED modules increases.

Sterile handle controls - Enables using the handle for controlling the luminaire.

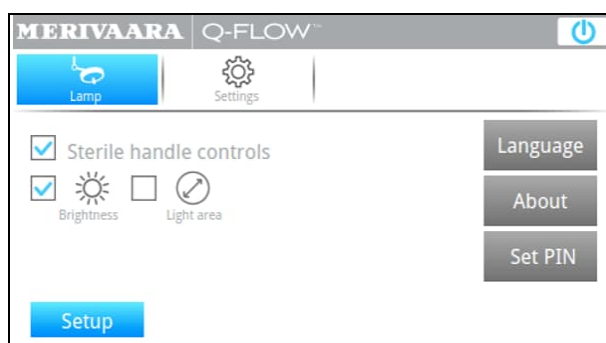
Sterile handle lasers -The function **Sterile handle lasers** is inactivated as default. To enable it, first tick **Sterile handle controls**. After that you can also active the **Sterile handle lasers** function.

Language- Opens a menu for changing the language

About- Shows the product information

Set PIN - Opens a pop up window for changing the PIN

In the Q-Flow F model, the sterile handle controls can be selected from the **Lamp - Setup** Menu.



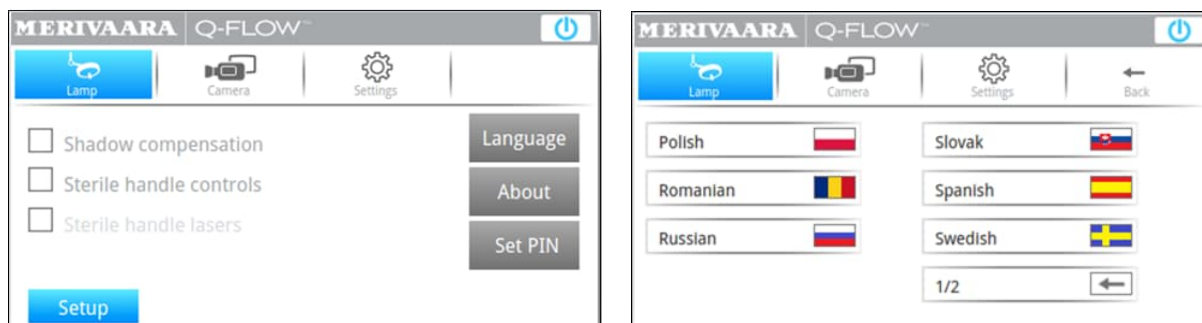
Picture 12. Fluent model-Setup menu in the Lamp view

Brightness -Sterile handle controls adjust the light intensity.

Light area -Sterile handle controls adjust the light field size

2.6.3.2 Changing the language in the user interface

In the **Lamp** view, select **Setup - Language**, and press the desired language to change it.



Picture 13. Language options of the user interface

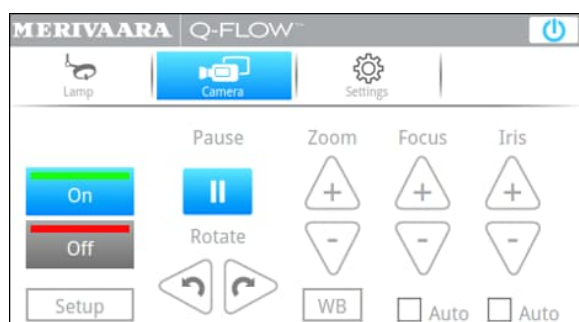


NOTE! The number of language options depend on the installed software release. Consult Merivaara service for possible software updates.

2.6.4 Camera menu



NOTE! The system detects the camera automatically, if it has been installed into the luminaire.



Picture 14. Camera menu

On/Off - Camera switches ON or OFF

Setup - Opens the **Setup** menu in which you can pair the camera with the internet connection. The Setup menu requires a PIN code.

Pause - Still image snap shot



NOTE! Recording is only possible via the *Merivaara* OpenOR system.

Rotate - Arrow buttons for rotating the camera. The rotation of the camera is 350°.

Zoom - Use the +/- buttons to manually zoom in or out the camera.

Focus - Use the +/- buttons to manually focus the camera. Select "Auto", if you want to use automatic focus.

Iris - With the +/- buttons you can control the amount of light coming through the lens. Select "Auto", if you want to use automatic iris control.

WB - Opens a new menu for setting a new white balance value for the camera.

2.6.4.1 Setting a new white balance value

1. Press **WB** in the **Camera** menu.
2. Place a white paper into the centre of the camera view and press **Set**. Zooming in can help focusing the camera on the white paper.

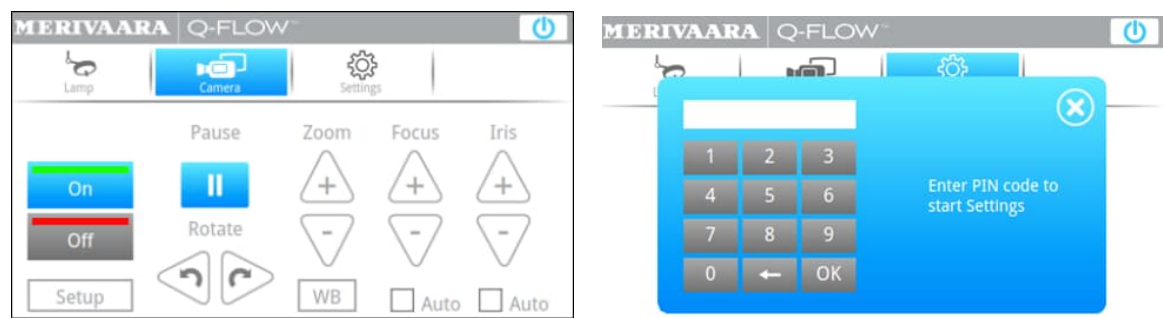


Picture 15. White balance value

2.6.5 Settings menu - for technical personnel only



NOTE! Settings options require a PIN code and they are available for technical personnel only. Refer to *Q-Flow installation and maintenance manual DO1144*.



Picture 16. Settings menu

Input voltage monitoring - When input voltage drops below the threshold level, the system reduces automatically light intensity to prolong the usage time when the device is battery-powered. The system returns automatically to normal functionality when the input voltage rises above the threshold level. Connect to Mains, if possible, when the system notification appears.

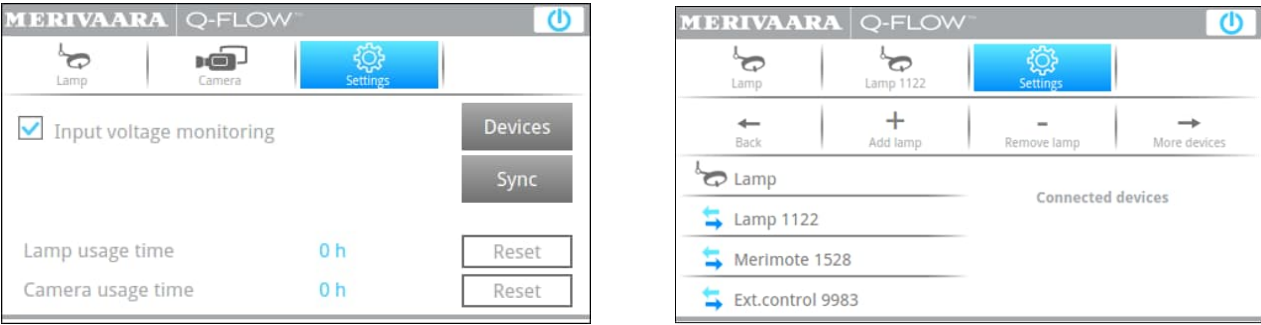
Lamp usage time and **Camera usage time** - Shows the actual time the lamp/camera has been used. Resetting can only be done by Merivaara.

Devices - Opens a menu in which you can add or remove devices and view all devices that are connected with the lamp.

Sync - synchronizes the slave lamp with the master lamp

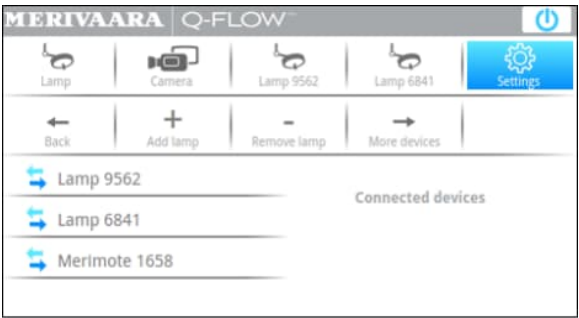
2.6.5.1 Connected devices

Select **Settings - Devices** to add or remove devices and view all devices connected to the lamp.



Picture 17. Devices menu with connected devices

The first device on the list is the light itself. The following devices in the list are devices which are controlled by this light, and devices and lamps that are controlling this light. Optional control devices (such as Merimote) and OpenOR or 3rd party devices that are shown as “Ext.control” are shown last on the list. More devices may be available by selecting “More devices”.



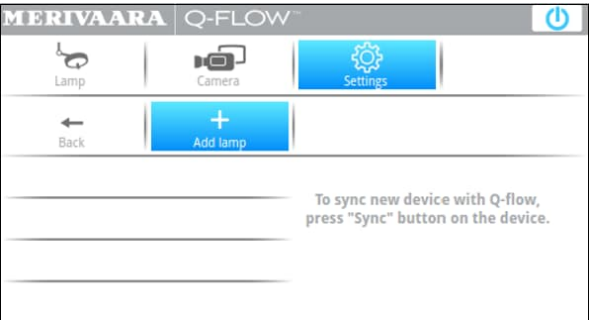
Picture 18. Setup menu with maximum number of connected devices

2.6.5.2 Synchronizing/adding a lamp



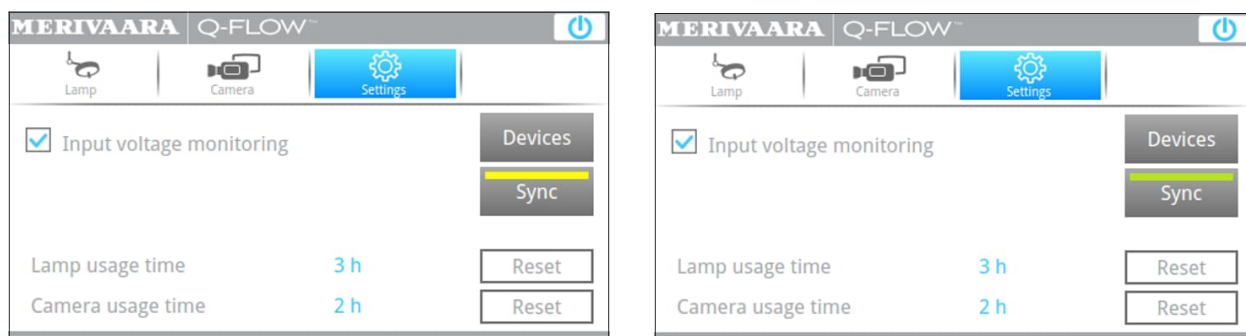
NOTE! **Settings** options require a PIN code and they are available for technical personnel only. Refer to *Q-Flow installation and maintenance manual DO1144* to synchronize other devices with the Q-Flow.

1. Select **Settings – Devices** and press **Add lamp** in the menu of the intended **master** luminaire.



Picture 19. Adding the lamp

2. Press the **Sync** button on the **slave** lamp which you want synchronize with master luminaire or Merimote remote controller (optional).

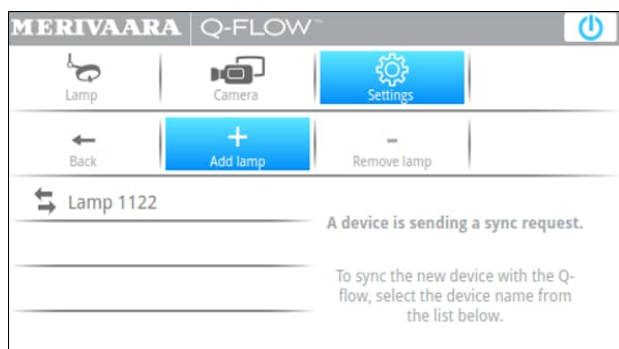


Picture 20. Menu in the slave lamp- Synchronizing ongoing

The yellow light in the **Sync** button indicates that the synchronizing is in process. The light changes to light green, when the synchronizing process has been successfully completed. The red light indicates that the synchronizing process has failed.

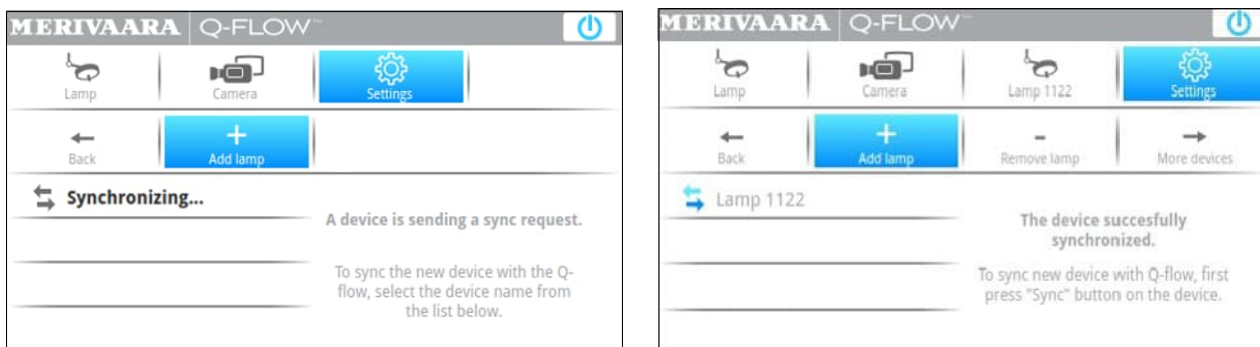
After the **Sync** button has been pressed on the slave luminaire, the lamp is shown on the list of the master luminaire.

3. Click the detected luminaire to complete the synchronization.



Picture 21. The lamp 1122 has been detected in the master luminaire.

After the synchronizing is completed, the text “The device successfully synchronized” is shown on the screen of the main lamp.



Picture 22. The lamp 1122 has been synchronized in the master luminaire



Picture 23. Slave lamp menu in the master lamp

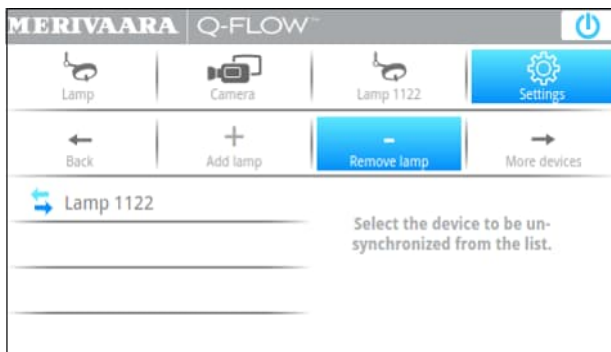
Connected devices can be renamed by pressing the name of the device in the list.

2.6.5.3 Removing a lamp



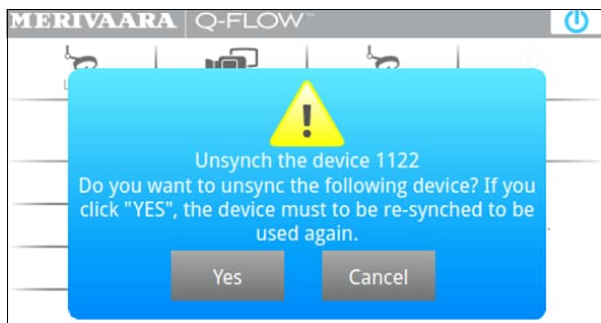
NOTE! Settings options require a PIN code and they are available for technical personnel only. Refer to *Q-Flow installation and maintenance manual DO1144*.

1. Select **Settings- Devices** and press **Remove** lamp.



Picture 24. Removing the lamp

2. Select the lamp from the list.



Picture 25. Removing the lamp- pop up menu

3. Click **Yes** in the pop-up menu.



NOTE! If you remove the lamp, you must re-synchronize it to be able to use it again.

2.7 Use of the Q-Flow Mobile

Mobile version for the Q-Flow luminaires classified as a minor surgical light to provide supplemental light for surgical and medical procedures or when the ceiling mounted model is not an option. It is also suitable to be used as a back-up light in a case of electrical network blackouts because of it is equipped with a battery back-up, primarily operated with mains power. Easy positioning within the operating room, wide working distance and excellent reach towards the operating area. The mobile base castors are manually locking type.

2.7.1 Intended use

- Mobile base is intended to be used within operating room premises plugged into mains. Batteries are for a backup power source during mains power failure.

2.7.2 Implementation

- Check the package for possible transport damages, remove covering plastics and unpack the product.
- Product is assembled according to separate installation instructions in ***Q-Flow installation and maintenance manual DO1144.en*** by a qualified technician.
- Adjustments for the horizontal balance arm must be done during the implementation by a qualified technician.

2.7.3 Use and transportation

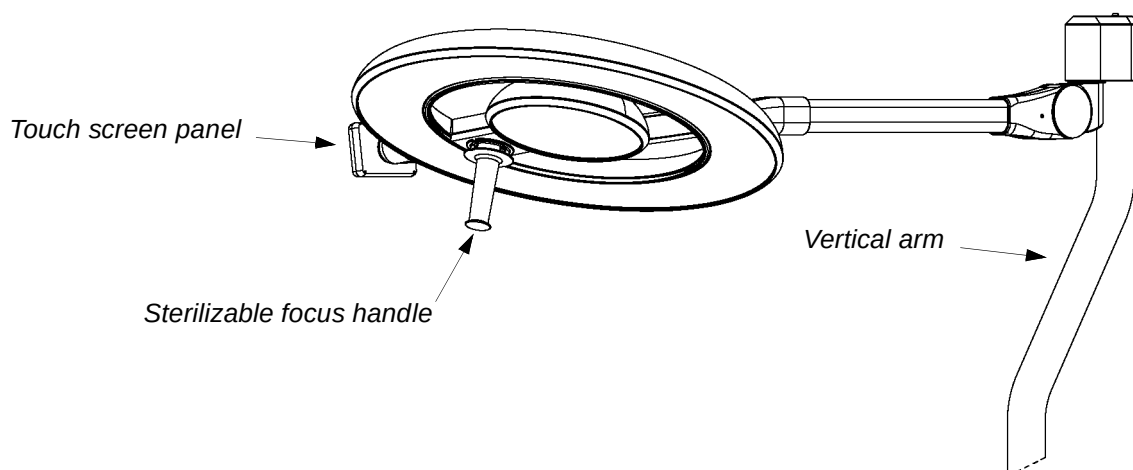


WARNING! Always check that the mains cable is disconnected before transportation.

- Familiarize with the luminaire features and touch screen functions in the user interface. The mobile version adjustment ranges are described in section 2.3.2 Adjusting the system with the luminaires on page 15.



NOTE! The floor clearance of the mobile base is 25 mm, lift up the base over thresholds higher than 10 mm.



Picture 26. Q-Flow mobile

- After the mains cable is connected to the wall, switch the power on from the mains switch located on the luminaire yoke (see Picture 1. Q-Flow luminaire controls on page 16).

- Move The Q-Flow Mobile by grabbing from its vertical arm and with the other hand from the downwards adjusted balance arm frame, then push to the direction of transportation.
- The Q-Flow Mobile structure have been presented in the section [1.6.1 Q-Flow product family on page 8](#). Note the instruction label for transportation which has been attached to the vertical arm.



WARNING! Transport the luminaire carefully. Avoid hitting obstacles, because it may damage the luminaire.



WARNING! Always lock all castors before operations!

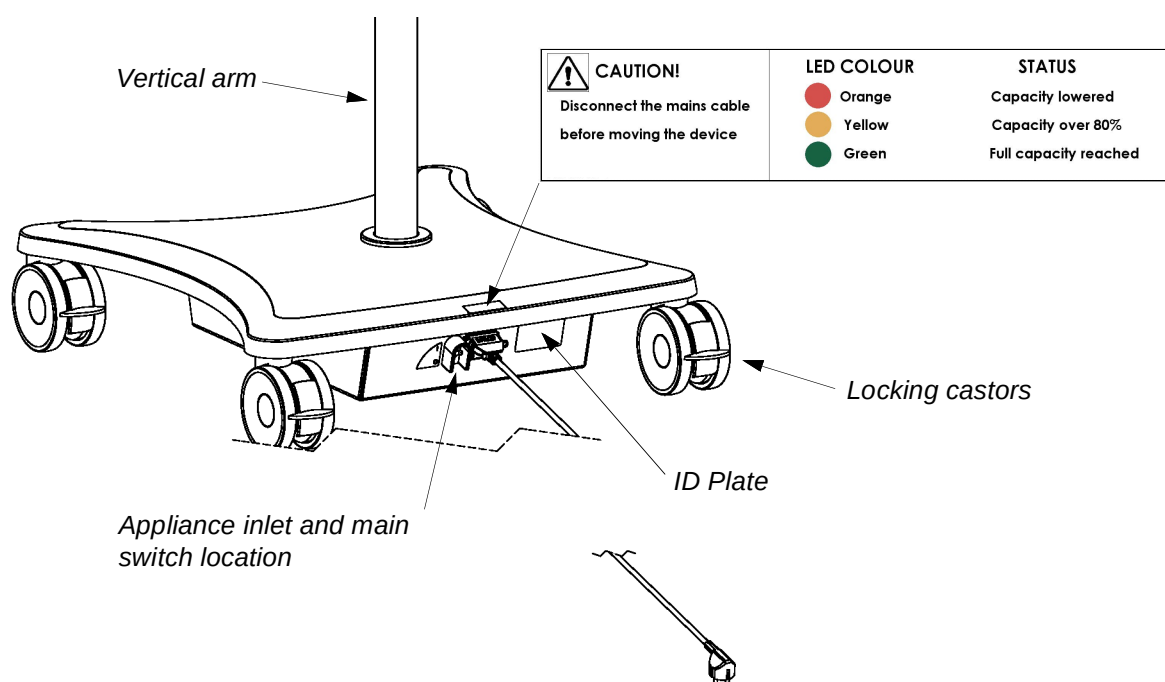
- The battery operating time with full charge is about three (3) hours.
- Handle and position the luminaire from its sterilizable focus handle. Attach the sterilizable focus handle according to the instruction in section [2.3.4 Sterilizable focus handle on page 16](#)



WARNING! Do not position the Q-Flow Mobile base too close to the wall or other objects, because it makes connecting and disconnecting of the mains cable or using the main switch difficult.

2.7.4 Indication lights and mains use

- Mains use: charging starts when the mains cable is connected and the main switch toggle is in ON position. The cable can be plugged constantly to the mobile base to ensure the full capacity of the backup battery. The full capacity of the battery is indicated with a green LED light.



Picture 27. Q-Flow Mobile base

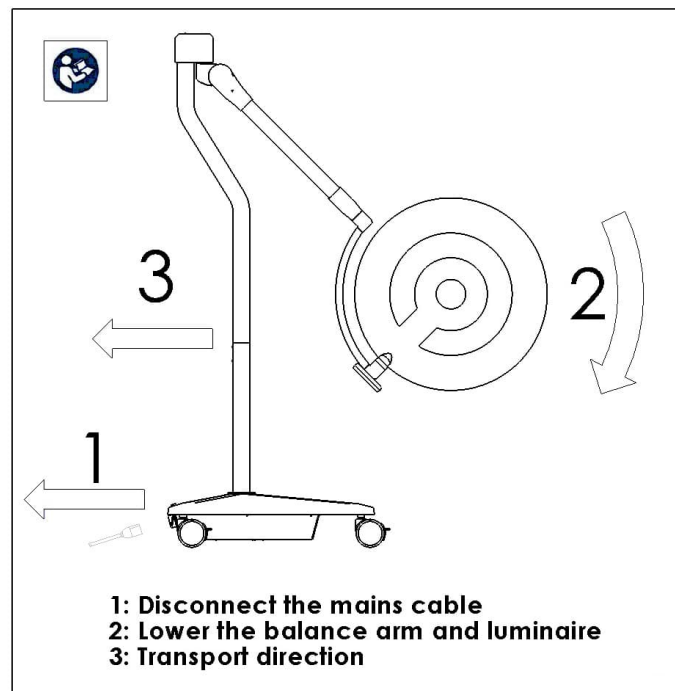


NOTE! The light of the luminaire blinks shortly when the mains cable is connected or disconnected. It is possible that the touch screen panel can restart when the main switch is in ON position.

LED Indications:

- Orange: Capacity lowered
- Yellow: Capacity over 80%
- Green: Full capacity reached

Transportation instructions



Picture 28. Transportation instructions for The Q-Flow Mobile



WARNING! Connect the mains cable only to an earthed power supply. Only use the supplied Q-Flow Mobile mains cable rated 250 V, 10 A, 5 m. Recharge the battery prior to use.



WARNING! Danger of Explosion - A mixture of explosive gases, containing hydrogen, can be produced inside the battery during charging. Avoid naked flames, lit cigarettes, sparks or incandescent materials in the immediate vicinity of the battery. Avoid short circuits between the terminals. Use antistatic materials when cleaning. Do not store the product in sealed container; maintain a fresh, well-ventilated environment protected from direct sunlight and away from heat sources.

2.7.5 Maintenance and storage

- Perform all procedures described in the maintenance section of this manual.
- Storage the Q-Flow Mobile only under specified conditions. Always switch Off the Q-Flow Mobile from the base, if it is not used for a long period of time.

2.7.6 Cleaning

The cleaning instructions for the Q-Flow Mobile are found in section 3. CLEANING on page 36.



CAUTION! Use of pressurized water or intense spray for the Q-Flow Mobile cleaning and disinfecting is not allowed.

2.7.7 Dimensions and technical data

- *Technical data of the luminaire are presented in chapter 5. TECHNICAL DATA on page 42.*

Specifications:

- Fuses: 1 x T6.3 AL 250 V
- Input voltage range 100–240 V / 50–60 Hz
- Weight: 85 kg (mobile base with suspension (balance arm and vertical arm))
- SWL 15 kg



WARNING! The Q-Flow Mobile is intended for Merivaara luminaires, do not install any other devices to the Q-Flow Mobile.



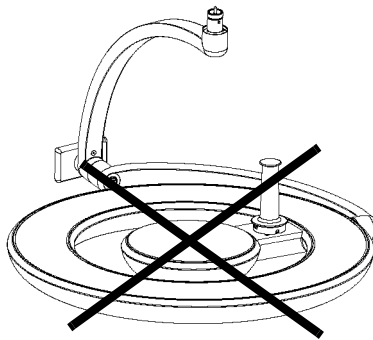
WARNING! Do not touch or insert any objects inside the Q-Flow Mobile base.

2.8 After use

- Move the luminaire away from the operating area.
- Turn off the luminaire using the main switch located on the luminaire yoke.
- Remove the sterilizable focus handle for cleaning/sterilization by pressing in the locking pin (*) at the base of the handle while simultaneously pulling the handle downwards. Refer to Picture 1. Q-Flow luminaire controls on page 16.
- When reinstalling the handle, ensure that the locking button secures the focus handle properly in place.

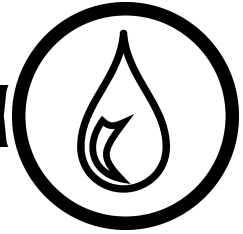


CAUTION! The Q-Flow MUST NOT be used or cleaned UPSIDE DOWN as illustrated below.



Picture 29. Prohibited cleaning position of the Q-Flow

3. CLEANING



 **WARNING!** Always switch Off the luminaire and disconnect the mobile version mains cable from the wall before beginning cleaning procedures.

 **WARNING!** Using mist like substances for disinfection may damage electrical components.

 **WARNING!** Using strong UV light for disinfecting or sterilization may prematurely weaken plastic parts.

 **CAUTION!** Use of excessive amount of liquids may cause fluid access inside the device and cause damage to the equipment. Do not expose the product to liquids more than it is necessary in order to achieve adequate cleaning and disinfection results, follow the given instructions. To prevent spillage and ingress of liquids where necessary by protecting the device with coverage.

 **NOTE!** The responsible organization must also follow the national requirements for hygiene and disinfection.

3.1 Covering front glass of the luminaire

Clean the front glass regularly with a damp cloth by wiping with a mildly alkaline detergent (pH 7-8). Anti-static cleaning agents may be used.

 **CAUTION!** Do not use too much strength when cleaning the glass not to damage it.

 **CAUTION!** Do not use harsh cleaning detergents or detergents containing phenol, alcohol or other corrosive agents with covering front glass, it is made of polycarbonate plastic.

 **NOTE!** The covering front glass should be kept optically clear.

3.2 Luminaire cleaning

- Allow the luminaire head to cool down before cleaning.
- Clean and disinfect with a damp, lint-free cloth and mildly alkaline detergent (pH 7-8).
- After cleaning, remember to dry carefully.

3.3 Disinfecting

- Allow the luminaire to cool down before disinfecting procedures.
- Disinfect only when necessary.
- Wipe down the equipment with the surface disinfectant used at the facility in accordance with manufacturer instructions, unless the surface disinfectant contains phenols and alcohol, which are corrosive and cause embrittlement to the plastic parts.

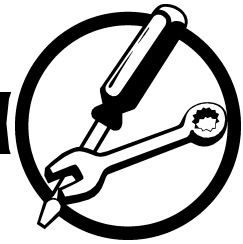
3.4 Sterilization



CAUTION! Recommended focus handle's replacement interval is 1000 sterilization cycles. If the focus handle shows signs of material degradation, replaced immediately.

- The focus handle is removable and separately sterilizable.
- Sterilization of the focus handle can be done in a steam autoclave using the instrument cycle.
- The maximum sterilization temperature for the part in a steam autoclave is 132° C, for three (3) minutes at 2.0 bar. The sterilization time has been calculated by determining when the part being sterilized has reached the sterilization temperature specified above. This does not include the heating and cooling times for the part being sterilized.

4. MAINTENANCE AND SERVICE



NOTE! Any serious incident that has occurred in relation to the device must be reported to the manufacturer and the competent authority of the Member State in which the incident has happened.

4.1 Preventative maintenance



WARNING! Always switch Off the system from the mains power before maintenance procedures.



WARNING! Maintenance allowed only for persons specialized and trained to perform service work on *Merivaara* surgical lights.



WARNING! Software update allowed only for persons from Merivaara service or directly at the factory.

4.1.1 Daily maintenance

- During ordinary cleaning, inspect the system and the luminaire to see that any parts have not come loose or missing, also look for evidence of cracks and surface damage.
- Check conditions of the mobile version base cover seal if the cover is moved vertically.

4.1.2 Annual maintenance

- The sliding surfaces of the extension arm and balance arms joints should be cleaned and greased at three-year (3) intervals.
- Perform all maintenance measures to the system and The Q-Flow luminaires presented in the separate inspection forms (document numbers T404338 and T404339).
- Check all joints between the luminaire's body and central axis. If you find any excessive play or looseness in a joint, inspect and do maintenance also on the attachment mechanisms.

4.2 Troubleshooting

Problem	Cause	Repair
Luminaire moves either up or down on its own.	• The settings of the balance arm spring have changed.	• Contact service personnel to check the adjustments.
The luminaire moves itself.	• The break screws have come loose.	• Contact service personnel to check the adjustments.
The balance arm rotates itself.	• The ceiling tube is not straight. • The break screws are too loose.	• Contact service personnel to check the adjustments. Straightening of the ceiling tube or tightening of the break screws needed.

Table 2. Troubleshooting part 1/3

Problem	Cause	Repair
The balance arm does not move easily.	- The ceiling tube is not straight. - The break screws are too tight. - The sliding surfaces have not been greased or the grease has worn away.	Contact service personnel to check and make the adjustments.
The lights flickers off when the luminaire is moved.	The electrical couplings of the connectors are either not properly attached or are worn.	Contact service personnel.
The luminaire does not respond to the commands of the touch screen panel.	- Malfunction of the software. - Touch screen panel has been defected.	- Start-up the system from the luminaire main switch. - Contact service personnel.
The luminaire does not light up.	- The fuse of the power unit has burned out. - Wiring is poorly attached to main supply. - The cord is damaged or broken. - The Power unit is damaged. - The switching relay of the battery package is damaged.	- Contact service personnel. - Contact service personnel to inspect the power supply connections. - Contact service personnel to make an inspection; inspections related to electrical malfunction only allowed by a licenced electrician. - Inspect the PSU unit/fuses. - Electrician should inspect/change the relay.
Weak illumination	- Settings have changed to defaults. - The LED light unit sector doesn't illuminate bright enough. - Protective front glass is dirty. - Ambilite dimming mode is On.	- After the luminaire is restarted, controls are set to defaults. Adjust the brightness settings using the touch screen panel controls. - Changing of the LED light unit sector might be necessary. - Clean or change the glass. - Change to the normal light mode.
The Merimote remote control unit does not work.	Empty battery	Connect the Merimote remote control unit to the USB charger and check that it has been synchronized with the luminaire.
The camera of the luminaire does not work.	The camera is not configured/ applied to the system correctly.	Contact service personnel.

Table 3. Troubleshooting part 2/3

Problem	Cause	Repair
Video is transferring, but the image is not displayed on the monitor	Incorrect video resolution settings	Change the video resolution settings
Video is displayed in a wrong monitor or not displayed at all (wireless camera)	The connection between the camera module and the RF receiver unit is not working	Repeat camera module's and RF receiver unit's pairing again
Video does not show / full artifacts / flashes on - off (wireless camera)	Incorrect placement between the camera module and receiver unit.	Reposition the luminaire.
The balance arm moves and does not maintain its position after the camera module is removed / added	The adjustments of the spring arm are incorrect.	Adjust the spring arm
Camera module does not turn a full circle	All camera screws are not tightened enough.	Check the three camera screws and tighten them, if necessary.
Blurry image.	The lens of the camera is dirty or damaged.	Clean the camera's lens. Contact Merivaara's Customer Care for a replacement lens.
The camera picture cuts in and out (wireless camera)	The signal between the camera and the RF Unit is not good enough	Change the position of the luminaire.
Input voltage alerts when it is connected to mains	Voltage drop in system's wiring	Turn the voltage monitoring Off. Contact service
Sterile handle controls does not respond to touch	- Sterile handle controls is not activated - User hand's measured value does not matching with the set value	- Activate Sterile handle controls from the Lamp Setup menu (i model only) - Hold the sterile handle over 2 seconds to recalibrate the value
When main switch is turned quickly Off and On, Led modules turn On but the control panel stays turned Off	Control system has not reset itself properly.	- Keep main switch turned Off over 30 sec before turning it back On. - Contact service.

Table 4. Troubleshooting part 3/3

4.3 Contact information

Further information on service and spare parts is available from your local dealer or Merivaara After Sales.

Merivaara Corp	+358 3 3394 611
Email	service@merivaara.com
Internet	www.merivaara.com



Authorized representative:

Optec AG

Guyer-Zeller-Strasse 14
CH-8620 Wetzikon

CHRN Number: CHRN-AR-20001804

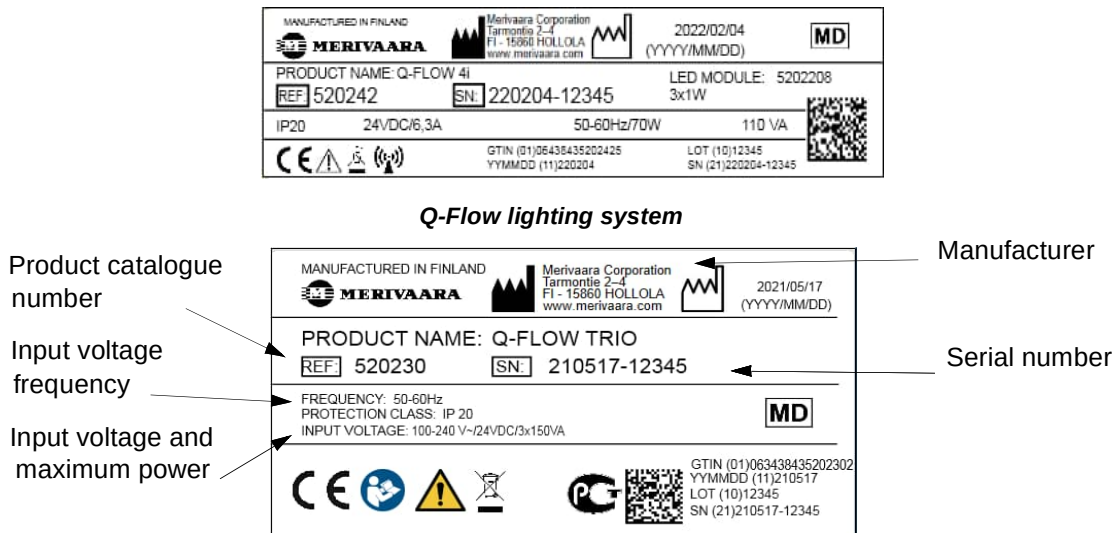
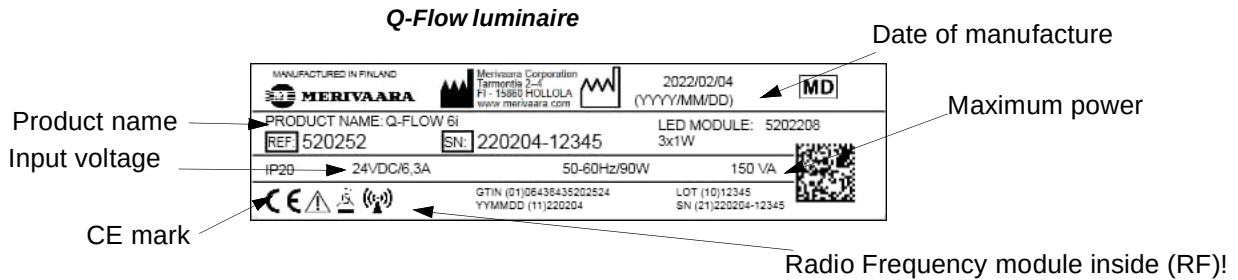
5. TECHNICAL DATA



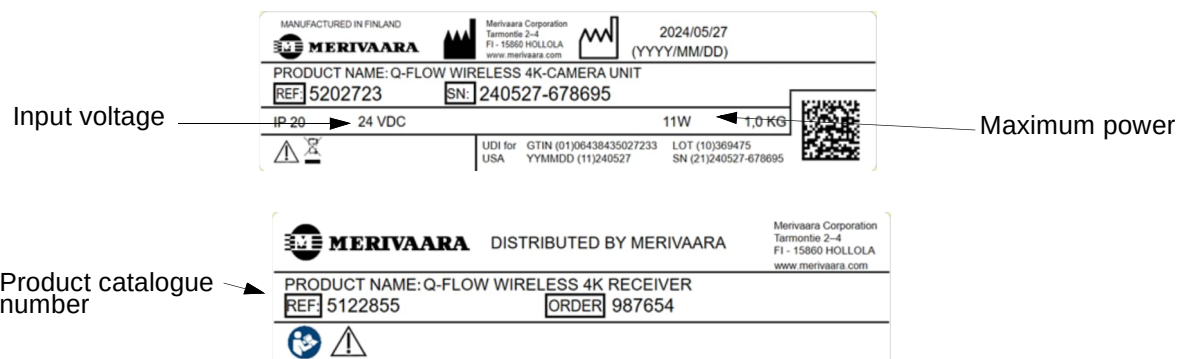
5.1 Identification plate

The identification plate is located:

- **SOLO, DUO, DUO 320 TRIO and QUAD** models: on the attachment arm and on the ceiling flange.



Picture 30. Identification plates of luminaire



Picture 31. Identification plates of 4K camera unit and receiver unit

5.1.1 Labelling and symbols used on the product



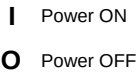
Protective grounding



Equipotential bonding



AC - Alternating current



Main switch of the luminaire



Follow the instructions for use

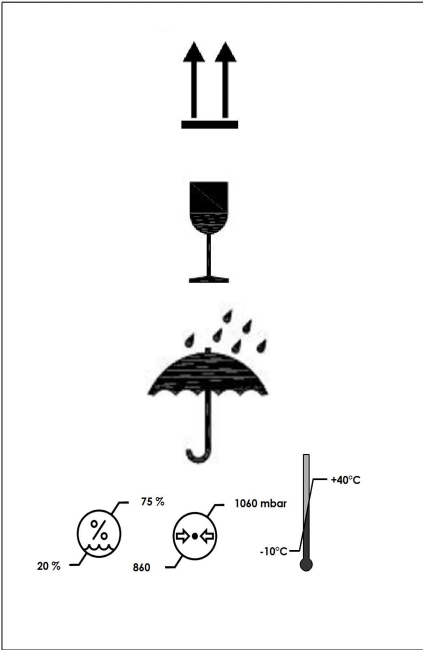


RECYCLING! Product must be recycled separately!



WARNING! Observe to ensure user, maintenance personnel and patient safety.

5.1.2 Packaging labels



- This way-up
- Fragile
- Keep dry
- Humidity limitation, atmospheric pressure limitation, temperature limits have been determined in the next section.

		BE	BG	CZ	DK
		DE	EE	IE	EL
ES	FR	HR	IT	CY	LV
LT	LU	HU	MT	NL	AT
PL	PT	RO	SI	SK	FI
SE	UK				

- Restrictions: Allowed only for indoor use

Picture 32. Packaging labels

5.2 Specifications

5.2.1 Environmental conditions

Ambient temperature	+10 °C, ..., +40 °C
Ambient pressure	860 mbar, ..., 1060 mbar
Relative humidity	20 %, ..., 75 %
Temperature of transport	-10 °C, ..., +40 °C
Temperature of storage	+10 °C, ..., +40 °C

5.2.2 Classification data

Electric shock protection	Class I equipment
Degree of electric protection	B-type
Protection against liquids	IP 20
Input voltage range	100 V,..., 240 V
Alternating Current, AC	~
AC-frequency range	50 Hz, ..., 60 Hz
Fuses:	
- Power supply unit	Primary T2A H/ 250 V, 1 pc Secondary F6.3A L/ 250 V, 2 pcs
-Q-Flow luminaire internal fuses	F6,3A L/ 125 V, 3 pcs

RF-module specifications:

- 802.15.4 compliant RF transceiver with Direct Sequence Spread Spectrum (DSSS) including Offset Quadrature Phase Shift Keying (O-QPSK) with half-sine pulse shaping to modulate the RF carrier.
- frequency band 2.4 GHz
- max radiated power 1 mW

Cleaning and disinfecting Refer to Chapter 3. CLEANING on page 36

Usage type Continuous use

Technical lifetime (from the date of purchase) 10 years

 **WARNING!** Q-Flow luminaires must not be used on premises where flammable/combustible gases are present!

5.2.3 Surface materials of the luminaire

Surface materials
Aluminium casting with powder coating – main body
Aluminium parts with powder coating – covers of body (F models)
Aluminium profiles with powder coating – frames of front glasses and arms of pendant (i models)
Epoxy powder coated steel base – mobile version base and tubes
Steel with powder coating - arms of pendants (F models)
PET+PBT (Polyethylene terephthalate + Polybutylene terephthalate) - plastic covers of body (i models)
PC (Polycarbonate) – front glasses
Silicone rubber – edge trimming of front glasses
PPSU (Polyarylsulphone) – detachable sterilized handle
PC+ABS (Polycarbonate + Acrylonitrile Butadiene Styrene) – touch screen covers and camera modules dome
ABS+PMMA (Acrylonitrile Butadiene Styrene + Poly (Methyl methacrylate coating)) – plastic covers of the Q-Flow Mobile version
PMMA (Polymethyl methacrylate) – lenses
ASA (Acrylonitrile Styrene Acrylate) – covers of balance arms

Table 5. Surface materials

5.2.4 Luminaire specifications

	FLUENT		VISION		INTELLIGENT	
	6F	4F	6	4	6i	4i
Colour rendering index (Ra)*	98	98	98	98	98	98
Red colour rendering index (R9)*	98	98	98	98	98	98
Skin colour rendering index (R13)*	98	98	98	98	98	98
Illumination intensity Ec at 1m distance (lx)	160 000	140 000	160 000	140 000	160 000	140 000
Colour temperature (K)**	3700 /4400 / 5100	3700 /4400 / 5100	3700 /4400 / 5100	3700 /4400 / 5100	3700 /4400 / 5100	3700 /4400 / 5100
Depth of illumination L1-L2 (mm)@60%	1200 mm	690 mm	1200 mm	690 mm	1200 mm	690 mm
Depth of illumination L1-L2 (mm)@20%	1800 mm	1500 mm	1800 mm	1500 mm	1800 mm	1500 mm
Working distance (mm)	700–1800 mm	650–1700 mm	700–1800 mm	650–1700 mm	700–1800 mm	650– 1700 mm
Light field diameter (mm)	200–370 mm	200–320 mm	200–370 mm	200–320 mm	200–370 mm	200–320 mm
Light field diameter, d50 value (mm)	190 mm	150 mm	190 mm	150 mm	190 mm	150 mm
Light field diameter, d10 value (mm)	330 mm	270 mm	330 mm	270 mm	330 mm	270 mm
Integrated dimming (%)	10–100%	10–100%	10–100%	10–100%	10–100%	10–100%
Electrical focus	2 steps	2 steps	2 steps	2 steps	2 steps	2 steps
Turbulence intensity with laminar flow system (%)	<16%	<35%	<16%	<35%	<16%	<35%
Total irradiance (W/ m ²)	510 W/m ²	490 W/m ²	510 W/m ²	490 W/m ²	510 W/m ²	490 W/m ²
UV irradiance	0.00081 W/ m ²	0.00175 W/ m ²	0.00081 W/ m ²	0.00175 W/ m ²	0.00081 W/ m ²	0.00175 W/ m ²
Heat to light ratio (mW/m ² lx)	3.19 mW/ m ² lx	3.5 mW/ m ² lx	3.19 mW/ m ² lx	3.5 mW/ m ² lx	3.19 mW/ m ² lx	3.5 mW/ m ² lx
Dynamic obstacle compensation (DOC)	No	No	No	No	Yes	Yes

Table 6. Luminaire Specifications Part 1/3

	FLUENT		VISION		INTELLIGENT	
	6F	4F	6	4	6i	4i
Remaining illuminance with one mask (klux), (with DOC % / manual%)	100 klux, / manual 65%	105 klux, / manual 75%	100 klux, / manual 65%	105 klux, / manual 75%	100 / 100 klux, 65% / 65%	105 / 105 klux, 75% / 75%
Remaining illuminance with two masks (klux), (with DOC% / manual%)	85 klux, / manual 55%	70 klux, / manual 50%	85 klux, / manual 55%	70 klux, / manual 50%	135 / 85 klux 85% / 55%	115 / 70 klux, 85% / 50%
Remaining illuminance with the tube (klux), (only manual%)	125 klux, manual 80%	130 klux, manual 95%	125 klux, manual 80%	130 klux, manual 95%	125 klux, manual 80%	130 klux, manual 95%
Remaining illuminance with the tube and one mask (klux), (with DOC % / manual %)	75klux, / manual 45%	90 klux, / manual 65%	75 klux, / manual 45%	90 klux, / manual 65%	60 / 60 klux, 45% / 45%	90 / 90 klux, 65% / 65%
Remaining illuminance with the tube and two masks (klux), (with DOC % / manual%)	75 klux/ manual 45%	65 klux, / manual 45%	75 klux, / manual 45%	65 klux, / manual 45%	105 / 75 klux, 70% / 45%	100 / 60 klux, 70% / 45%
Double yoke	Yes	Yes	Yes	Yes	Yes	Yes
Optional Solo yoke (LCH) for Low CM or FM	Yes	Yes	Yes	Yes	Yes	Yes
Sterilizable, detachable focus handle	Yes	Yes	Yes	Yes	Yes	Yes
Intuitive sterile surgeon control (Intueri™) • laser UI • sterile illuminance intensity control • sterile light field diameter control	No	No	No	No	Yes	Yes
Fluent sterile surgeon control • sterile illuminance intensity control • sterile light field diameter control	Yes	Yes	No	No	No	No
Integrated UI touch screen	Yes	Yes	Yes	Yes	Yes	Yes

Table 7. Luminaire Specifications Part 2/3

	FLUENT		VISION		INTELLIGENT	
	6F	4 F	6	4	6i	4i
Bulb rating (W)	1.0 W /LED	1.0 W /LED	1.0 W /LED	1.0 W /LED	1.0 W /LED	1.0 W /LED
Number of LEDs	90	69	90	69	90	69
Nominal operating voltage (V)	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Average lifetime of LED	>60 000 h	>60 000 h	>60 000 h	>60 000 h	>60 000 h	>60 000 h
Colour of case	White /Grey (RAL 9010 / RAL 7012)	White /Grey (RAL 9010 / RAL 7012)	White /Grey (RAL 9010 / RAL 7012)	White /Grey (RAL 9010 / RAL 7012)	White /Grey (RAL 9010 / RAL 7012)	White /Grey (RAL 9010 / RAL 7012)
External diameter dimensions (mm)	700 mm	560 mm	700 mm	560 mm	700 mm	560 mm
Power supply unit	100–240 VAC / 24 VDC	100–240 VAC / 24 VDC	100–240 VAC / 24 VDC	100–240 VAC / 24 VDC	100–240 VAC / 24 VDC	100–240 VAC / 24 VDC
Maximum power consumption (VA)	150	110	150	110	150	110
Maximum power consumption (W)	145	75	145	75	145	75
Nominal power consumption (VA)	100	60	100	60	100	60
Nominal power consumption (W)	95	55	95	55	95	55
Integrated power switch	Yes	Yes	Yes	Yes	Yes	Yes
Battery Back up - Operating time with 27 Ah / 24 VDC battery (h)	Optional-2h	Optional-3h	Optional-2h	Optional-3h	Optional-2h	Optional-3h
Casing protective class	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Merimote remote control	Optional	Optional	Optional	Optional	Optional	Optional
OpenOR compatible	Yes	Yes	Yes	Yes	Yes	Yes
Wireless camera 4K	No	No	Optional	Optional	Optional	Optional
Wired camera 4K	No	No	No	No	Optional	No
Camera control in luminaire	No	No	Optional	Optional	Optional	Optional
Ambilite	Yes	Yes	Yes	Yes	Yes	Yes
Light combinations	SOLO,DUO, TRIO,QUAD	SOLO,DUO, TRIO,QUAD	SOLO,DUO, TRIO,QUAD	SOLO,DUO, TRIO,QUAD	SOLO,DUO, TRIO,QUAD	SOLO,DUO, TRIO,QUAD
Weight of luminaire	15 kg	13 kg	16 kg	13 kg	16 kg	13 kg

Table 8. Luminaire specifications Part 3/3

*) Tolerance ± 3 ,

**) Tolerance ± 300 °K

All values are measured in test laboratory conditions, EN 60601-2-41

5.2.5 Wireless RF unit specifications

	Camera module
RF Antenna	IC: 7680A- AMNPTTX01 and IC:7680A-AMN42012
Frequency Range	5.150 GHz to 5.850 GHz
Bandwidth	20MHz/40MHz
Radiated Power (EIRP)	15 dBm (average)
Transmit Antenna Gain	10 dBi (max)
Antenna type	Dipole

Table 9. Electrical specifications of wireless RF unit

5.2.6 Electrical specifications of 4K camera module (option)

	Camera module
Power Requirements	24 V DC
Power Consumption	11 W
Working distance	750–1700 mm (focus area with max optical zoom)
Dimensions (W x H x D)*2	50.0 x 60.0 x 93.3 mm (2 x 2 3/8 x 3 3/4 in)
Mass	Approx. 1 kg (Approx. 35.3 oz)

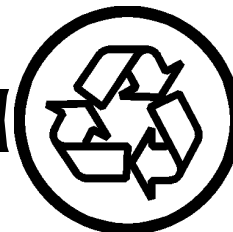
Table 10. Electrical specifications of 4K camera module

5.2.7 Technical specifications of 4K camera

	Camera module
Image Sensor	1/2.5 type Exmor R CMOS
Image Sensor (Number of Effective Pixels)	Approx. 8.51 Mega Pixels (MP)
Signal System QFHD	2160p / 29.97
Resolution	3840 x 2160 pixels
Minimum Illumination (50%, High Sensitivity Mode)	Colour: 0.4 lx (1/30 s)
Minimum Illumination (50%, Normal Mode)	Colour: 1.6 lx (1/30 s)
Recommended Illumination	100 lx to 100,000 lx
S/N Ratio	50 dB (Weight On)
Shutter Speed	1/1 s to 1/10,000 s, 28 steps
Backlight Compensation	Yes
Aperture Control	16 steps
White Balance	Auto
Lens	20x optical zoom, f = 4.4 mm (wide) to 88.0 mm (tele) F2.0 to F3.8
Digital Zoom	12x (240x with optical zoom)
Focusing System	Auto, Manual
Noise Reduction	Yes (6 steps)
Progressive Scan Mode	Yes
Image Stabilization	Yes
Digital Output	Yes
Picture Freeze	Yes
Camera Control Interface	VISCA (CMOS 3.1 V level), Baud rate: 9.6 kbps, 19.2 kbps, 38.4 kbps, 115.2 kbps, Stop bit: 1 bit
Power Requirements	6.0 V to 12.0 V DC
Power Consumption	3.0 W (zoom / focus inactive), 4.0 W (zoom / focus active)
Operating Temperature	-5 °C to +60 °C (23 °F to 140 °F)
Storage Temperature	-20 °C to +60 °C (-4 °F to 140 °F)
Operating Humidity	20% to 80%, Absolute humidity: 36 g/m ³
Storage Humidity	20% to 95%, Absolute humidity: 36 g/m ³
Dimensions (W x H x D)	50.0 x 60.0 x 93.3 mm (2 x 2 3/8 x 3 3/4 in)
Mass	Approx. 275 g (Approx. 10 oz)

Table 11. Technical specifications of 4K camera

6. RECYCLING



NOTE! Except for the mobile base, which contains lead gel batteries, the luminaire does not include any hazardous substances. Possible additional battery backup systems should be disposed to each manufacturer's instructions.

6.1 Metals and plastic

When disposing of a luminaire or replacing any of its parts, check the recyclability of each item (Refer to Table 5. Surface materials on page 46).

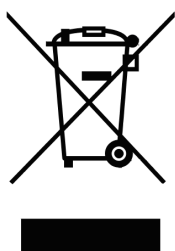
For more information on recycling, contact your local waste management facility or visit related sites on the Internet.

Below are recycling symbols, which are marked on parts made of plastic. Products marked with these symbols can be used as energy waste.



6.1.1 Electronic waste and batteries

Local recycling guidelines are to be adhered to with the disposal of electronic components and equipment.



This symbol is affixed next to the identification plate if the product contains an electrical or electronic device. In such cases, the product must be separately disposed of; it cannot be included with municipal waste.



NOTE! Gel batteries are considered as hazardous waste and must therefore be disposed at a hazardous waste facility or according to local requirements.

7. USER GUIDANCE FOR EMC

7.1 Guidance and manufacturer's declaration - electromagnetic immunity and emissions

The Q-Flow surgical light system has been tested according to IEC/EN 60601-1 to ensure proper electromagnetic compatibility. Portable and mobile RF communications equipment can affect the Q-Flow surgical light system.

Other products used in the vicinity of the Q-Flow surgical light system should also comply with this standard.

This equipment may emit levels of EM energy that cause EMI in other devices in the vicinity, and can potentially cause RF emissions that affect other devices.



WARNING! Extremely strong EM disturbances may cause unintended movement of the surgical light system. Also abnormal operation in indication lights may occur.



WARNING! Use the surgical light only in facilities that are made for medical purposes and that are equipped with an electromagnetic environment specified in this guide. The customer or the user of the surgical light must ensure that the surgical light is used in such an environment.



WARNING! Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment (Merivaara Corp.) can result in:

- increased electromagnetic emissions
- decreased electromagnetic immunity
- improper operation.



WARNING! Portable RF communications equipment (including peripherals such as antenna cables and external antennas) must be used no closer than 30 cm (12 inches) to any part of the Q-Flow surgical lighting system, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment can result.



NOTE! The emissions characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

Guidance and manufacturer's declaration - Electromagnetic emissions		
Emission test	Compliance	Electromagnetic environment - guidance
Conducted and radiated RF emissions CISPR 11	GROUP 1 CLASS A	
Harmonic distortion IEC 61000-3-2	CLASS A	
Voltage fluctuations and flicker Complies with IEC 61000-3-3		

Guidance and manufacturer's declaration - electromagnetic immunity			
The Q-Flow surgical light system is intended for use in the electromagnetic environment specified below. The customer or the user of the Q-Flow surgical light system must ensure that it is used in the following environment:			
Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - guidance
Electrostatic discharge (ESD) IEC/EN 61000-4-2	±8 kV contact ±15kV air	±8 kV contact ±15 kV air	Floors should be made of wood, concrete, ceramic tile or antistatic material. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst immunity test IEC/EN 61000-4-4	±2 kV for power supply lines	±2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge immunity test IEC/EN 61000-4-5	Line(s) to line 1 kV Line to ground 2 kV	Line(s) to line1 kV Line to ground 2 kV	Mains power quality should be that of a typical commercial or hospital environment.
Immunity to conducted disturbances, induced by radio-frequency fields IEC/EN 61000-4-6	0.15-80 MHz 3V 6V in ISM bands	0.15-80 MHz 3V 6V in ISM bands	Portable and mobile RF communications equipment can affect the Q-Flow surgical lighting system and should be used no closer to any part of the Q-Flow surgical light system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Power frequency magnetic field immunity test IEC/EN 61000-4-8	30 A/m	30 A/m	The Q-Flow surgical light system can be used together with medical devices complying IEC/EN 60601-1

Table 12. Electromagnetic immunity part 1

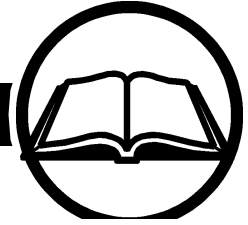
Guidance and manufacturer's declaration - electromagnetic immunity			
The Q-Flow surgical light system is intended for use in the electromagnetic environment specified below. The customer or the user of the Q-Flow surgical light system must ensure that it is used in the following environment.			
Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - guidance
Voltage dips, short interruptions and voltage variations immunity test IEC/EN 61000-4-11	30% 500 ms 100% 10 ms 100% 5000 ms 100% 20 ms	30% 500 ms 100% 10 ms 100% 5000 ms 100% 20 ms	Mains power quality must be that of a typical hospital environment. If the user of the Q-Flow luminaires and the system requires continued operation during power mains interruptions, it is recommended that the Q-Flow luminaires and the system be powered from an uninterruptible power supply or a battery.
Radiated RF EM fields IEC 61000-4-3	3 V/m 80 MHz–2.7GHz 80% AM at 1 kHz	3 V/m 80 MHz–2.7GHz 80% AM at 1 kHz	
Proximity fields from RF wireless communications equipment IEC 61000-4-3	See table <i>Test specification for immunity to RF wireless communications equipment</i> below.	See table <i>Test specification for immunity to RF wireless communications equipment</i> below.	Recommended separation distance: $E = \frac{6}{d} \sqrt{P}$ Where P is the maximum power in W, d is the minimum separation distance in (m), and E is the IMMUNITY TEST LEVEL in V/m.

Table 13. Electromagnetic immunity part 2

Test specification for immunity to RF wireless communications equipment							
Test frequency (MHz)	Band (MHz)	Service	Modulation	Maximum power (W)	Distance (m)	Immunity TEST LEVEL (V/m)	Remarks
385	380 – 390	TETRA 400	Pulse modulation 18 Hz	1.8	0.3	27	
450	430 – 470	GMRS 460, FRS 460	FM $\pm$ 5 kHz deviation 1 kHz sine	2	0.3	28	
710, 745, 780	707–787	LTE Band 13, 17	Pulse modulation 217 Hz	0.2	0.3	9	
810, 870, 930	800–960	GSM 800/ 900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	2	0.3	28	
1720, 1845, 1970	1700–1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1,3,4,25; UMTS	Pulse modulation 217 Hz	2	0.3	28	
2450	2400–2570	Bluetooth, WLAN, 802.11 b/ g/n, RFID 2450, LTE Band 7	Pulse modulation 217 Hz	2	0.3	28	
5240, 5500, 5785	5100–5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	2	0.3	9	

Table 14. Test specification for immunity to RF wireless communications equipment

NOTES

[illegible]





reddot award 2017
winner

FENNIaprize 17
GRAND PRIX

Q-Flow — Award-winning surgical light



MERIVAARA

Member Of Lojer Group

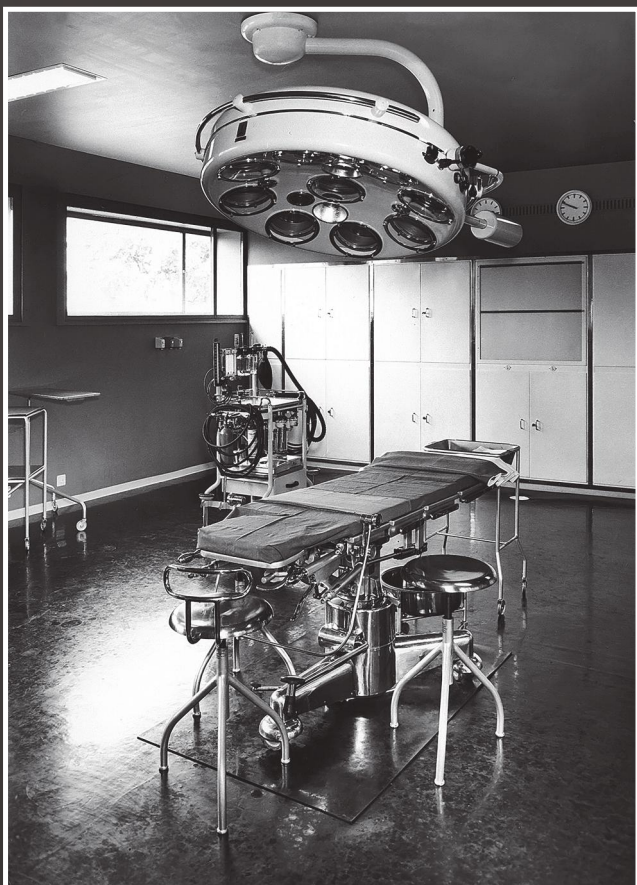
Fluent usability

Since 1901

“In addition to the exquisite quality of work, we have taken the utmost interest in the functionality of the equipment. In this regard, several doctors committed to the cause have contributed their advice, based on their valuable experience.”

Juho Merivaara in 1926, founder of Merivaara





In a modern operating room from the 1950s tables and lights were manually adjusted.



We are proud that the company's values 120 years ago were so ahead of their time that they can still today be fully applied when designing new innovative solutions for healthcare professionals. This is demonstrated by our latest award-winning products, the Q-Flow surgical light and the Smarter Practico operating table with functionality and ease of use at the heart of the design. Our user interfaces are developed together with hospital personnel so that all our products and systems can be used intuitively.

We call this Fluent Usability; operating room teams can focus on patient care, not for the management of complex technologies. Top surgeons appreciate this all over the world.





Solutions

Merivaara Solutions offer operating rooms a wide range of high-quality products, systems and services. Our solutions not only guarantee patient safety, but also provide healthcare operators with the best value for money.

When designing our solutions around the entire surgical team, it is important for us to listen to the customer's needs. This allows us to ensure that the team can implement the procedures safely, quickly and reliably. At the same time, workflow is optimized and the productivity of the entire team will increase.

Merivaara has long experience from leading and implementing projects in operating rooms. For us, keeping projects to schedule and reducing costs is extremely important.



- SURGICAL LIGHTS • EXAMINATION LIGHTS
- OPERATING TABLES • TABLE ACCESSORIES
- INTEGRATION SYSTEMS • MONITORS & MONITOR ARMS
- PENDANTS • PROJECTS • MERIVAARA SERVICES



Design optimized for OR's air flow

Hospital associated infections (HAIs) are a highly recognized challenge in hospitals around the world. HAIs increase morbidity, mortality and length of hospital stay, adding to health care costs. More than 4 million patients in Europe and approximately 1.7 million in the US are affected annually. The prevalence of HAIs in Europe is around 7.1 %.

One cause of contamination is uncontrolled air flow in operating rooms. Q-Flow™ is designed for an optimized air flow that allows ventilation to work properly in an operating room. Traditional surgical light heads cause air to rise in the operating area, resulting in increased particle content and an increased infection burden for the patient. Due to the optimally designed Q-Flow™, with a turbulence intensity of only 15.9 %, there is no additional particle burden created in the operating area. In addition, this also improves the working conditions for the surgical team, as it helps to keep the area clean from harmful smoke and gases.



Benefits of the Q-Flow family



**TURBULENCE
INTENSITY**
15,9%

1. REDUCED RISK OF INFECTION

The design of the Q-Flow light is optimized to improve air flow circulation in the operating area. This will help keep the area clean, improving working conditions for the entire surgical team and increasing patient safety. Turbulence intensity is remarkably low 15.9%, when the industry standard specifies it to be below 37.5 %.



**CRI
Ra
98**

2. PERFECT TISSUE COLOR RENDERING

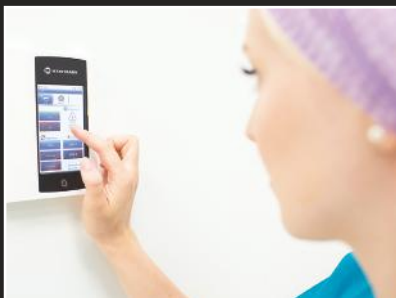
The R9 value (red) of the Q-Flow light is the best in its class 98, making it perfect for the surgeon to separate between different tissue and vascular colors. The R13 value (skin) 98 is also excellent, which is particularly important in plastic surgery and in operations where seeing the skin accurately is important.



3. COMFORTABLE WORKING CONDITIONS

Merivaara's Dynamic Obstacle Compensation (DOC™) decreases the need to adjust the luminaire. Ergonomics and efficiency of the entire surgical team is improved significantly.

- Shadowless light in the surgical area provides optimal light in all circumstances
- Automatic light dimming reduces temperature above surgical team's heads
- Light restores original lighting conditions automatically



4. INTUITIVE TO USE

Merivaara's patented Intueri™ system provides surgeons a possibility to adjust the dimming and the field size of the light field from the sterile area, allowing surgeons to keep their focus on the operating area. The intuitive user interfaces of the Q-Flow touch panel and its auxiliary controllers – multifunctional remote control Merimote™ and integration system OpenOR™ – offer similar, simplified controls for the light and its camera, in multiple languages. This allows users to switch between control devices smoothly as needed.



5. ERGONOMIC CAMERA SOLUTIONS

The in-light camera unit is completely hidden behind the cover glass, leaving no obstacle in the surgeon's peripheral view. Thanks to the central position of the camera unit, the camera can always be centered in the operating range. Wireless technology enables the suspension arms rotate a full 360 degrees, allowing surgeons to focus the camera at optimal viewing angle.



Q-Flow models

Fluent

Main features:

- Excellent optical performance
- Design optimized for air flow
- Fluent usability
- Easy to clean
- MeriMote and OpenOR compatible

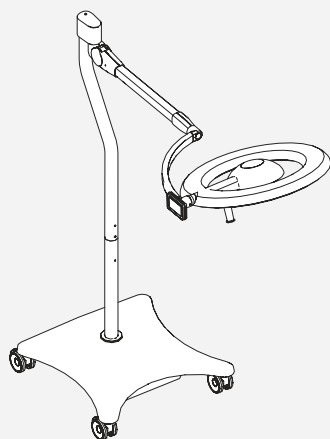
Vision

Additional features:

- Camera option
- Green ambilight
- Lightweight

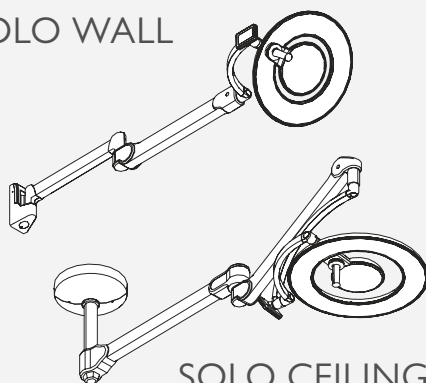
Functional simplicity

Examples of Available Arm Options



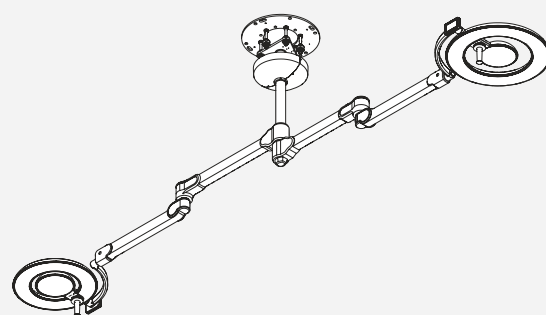
SOLO MOBILE

SOLO WALL



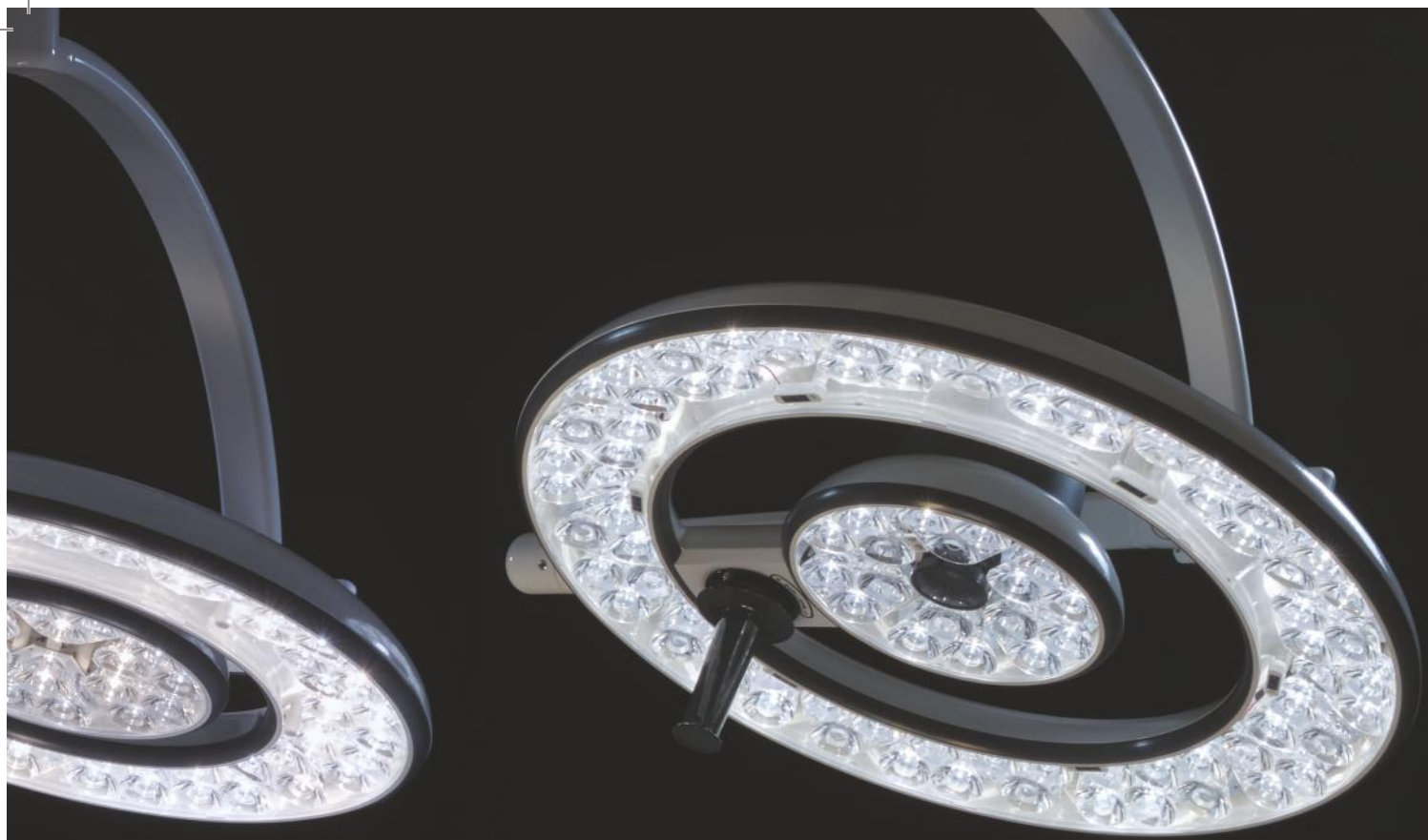
SOLO CEILING

- 50 mm, 65 mm or 110 mm ceiling tube



DUO

- 65 mm or 110 mm ceiling tube



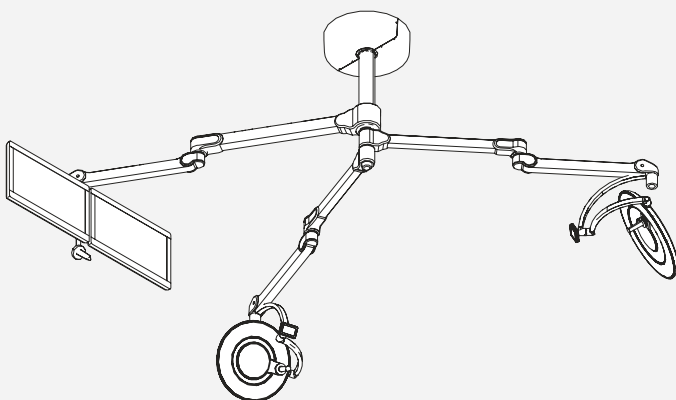
Flexible
viewing
angles

Intelligent

Additional features:

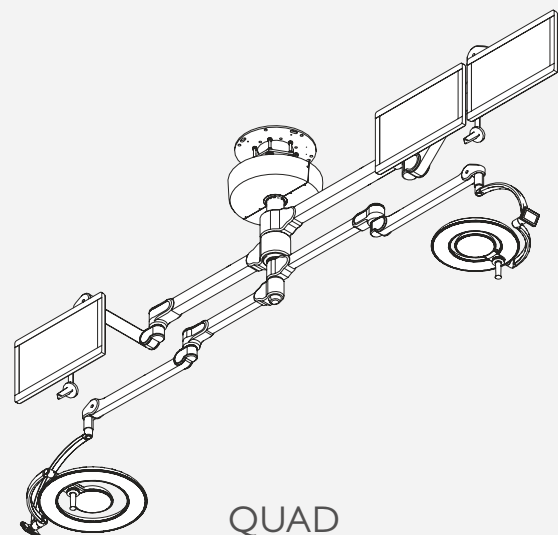
- Intueri™ Sterile user interface
- DOC™ Dynamic Obstacle compensation

Maximum comfort
and ease of use



TRIO

• 110 mm ceiling tube



QUAD

• 110 mm ceiling tube

Our solutions for Q-Flow



OpenOR integration system

OpenOR enables you to connect all video and audio sources, medical devices, and room functions to be displayed on monitors or info screens. OpenOR can also control lights, tables, ventilation and blinds, and it communicates with hospital information systems (HIS) and building management systems (BMS).



Video transfer solutions

We can offer complete solutions for transferring live video stream from the Q-Flow lamp camera to other devices in the hospital.

Monitors & Monitor arms

Merivaara offers customized monitor arms for medical monitor mounting.

Accessories



Disposable sterile light handle cover

A43460601 (Set of 200 units)



Sterilizable Handle

A43280901 Kit for Q-Flow Lamp Head (10 handles)



MERIMOTE

5202691 Remote control unit with wall mounting kit
MULTIFUNCTIONAL REMOTE FOR Q-FLOW SYSTEMS

- 2-way wireless control for all Q-Flow lamp heads
- Full in-light camera control
- Synchronized control of several lamp heads simultaneously



Wireless 4K Camera Set

5202723

SUPERB ULTRA HIGH DEFINITION IMAGE QUALITY WITH OPTIMIZED ERGONOMICS

- Fully recessed camera unit with rotation possibility
- Centralized positioning, always focused on to the surgical site
- Integrated camera control panel on the lamp head



Display protectors

Provides additional impact protection to your valuable arm mounted medical grade monitors. Optically fully transparent surface reduces glare for optimal image visibility and prevents scratches. Can be removed, cleaned and reapplied. Easy to clean and maintain. Installed at our factory prior to shipment.

Technical Specifications

	FLUENT		VISION		INTELLIGENT	
	6F	4F	6	4	6i	4i
Max illumination @ 1.0 m	160 klux	140 klux	160 klux	140 klux	160 klux	140 klux
Color rendering index (Ra)*	98	98	98	98	98	98
Red color rendering index (R9)*	98	98	98	98	98	98
"Skin color" rendering index (R13)*	98	98	98	98	98	98
Turbulence intensity, DIN 1946	15.9 %	<35 %	15.9 %	<35 %	15.9 %	<35 %
Variable color temperatures (K)**	3700 / 4400 / 5100	3700 / 4400 / 5100	3700 / 4400 / 5100	3700 / 4400 / 5100	3700 / 4400 / 5100	3700 / 4400 / 5100
Depth of illumination (L1+L2) @ 60 %	1200 mm	690 mm	1200 mm	690 mm	1200 mm	690 mm
Depth of illumination (L1+L2) @ 20 %	1800 mm	1500 mm	1800 mm	1500 mm	1800 mm	1500 mm
Light field diameter	200–370 mm	200–320 mm	200–370 mm	200–320 mm	200–370 mm	200–320 mm
Integrated dimming	10–100 %	10–100 %	10–100 %	10–100 %	10–100 %	10–100 %
Number of LEDs	90	69	90	69	90	69
Average life time of LED	>60 000 h	>60 000 h	>60 000 h	>60 000 h	>60 000 h	>60 000 h
External dimensions (diameter)	700 mm	560 mm	700 mm	560 mm	700 mm	560 mm
Lamp weight	16 kg	13 kg	16 kg	13 kg	16 kg	13 kg
Ambilite	White	White	Green	Green	Green	Green
Touch panel control	√	√	√	√	√	√
OpenOR™ compatible	√	√	√	√	√	√
MeriMote™ compatible	√	√	√	√	√	√
Extended autonomy	√	√	√	√	√	√
Integrated camera control (touch screen)	-	-	√	√	√	√
Wireless 4K camera	-	-	○	○	○	○
Detachable sterilizable handle	√	√	√	√	√	√
Disposable sterile handle cover	○	○	○	○	○	○
Intuitive Sterile Surgeon Control (Intueri™)	-	-	-	-	√	√
Fluent Sterile Surgeon Control	√	√	-	-	-	-
Shadowless optical system	√	√	√	√	√	√
Dynamic Obstacle Compensation (DOC™)	-	-	-	-	√	√
Manufacturer: Merivaara Corp.						

√ = included
○ = optional

*) Tolerance ±3%
**) Tolerance ±200 °K

All values are measured in test laboratory conditions
EN 60601-2-41





MERIVAARA

Member Of Lojer Group

Health Technology with a Human Touch

Made in Finland with respect
for our unique nature.



MERIVAARA CORP.

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merivaara@merivaara.com www.merivaara.com

MERIVAARA WORLDWIDE

Merivaara's headquarters, with R&D, production, sales, marketing and after-sales service functions, are located in Finland. Merivaara has subsidiary in Sweden (Merivaara AB). Additionally, Merivaara's products are sold in more than 120 countries by a network of distributors.

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