

SOLIDO™ Ceiling pendants for operating theatres



SOLIDO™ pendants can be adapted to suit the needs of the surgeon or anesthetic with all the required electrical and medical components. SOLIDO™ pendants are designed to provide the medical staff with maximum flexibility and reliability. The brake system ensures maximum stability and accuracy and the ease of any movement.

This document provides information on the various options and accessories that may be relevant when choosing right pendant solution for your needs.

Available Solido pendant configurations

SOLIDO™ pendants are available in multiple different configurations, which are always built to order. Please consult your sales for the optimal configuration for your needs. Below different configuration options:



Single arm "A"
with electropneumatic or electromagnetic brake



Double arm "B"
with electropneumatic or electromagnetic brake



Single motorized arm "CM"
Single spring arm "CS"
with electropneumatic or electromagnetic brake



Double motorized arm "DM"
Double spring arm "DS"
with electropneumatic or electromagnetic brake



Reverse double arm "E"
with electropneumatic or electromagnetic brake, for low ceiling application



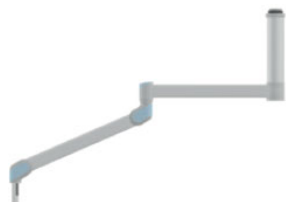
Single motorized arm "FM"
Single spring arm "FS"
with electropneumatic or electromagnetic brake



Double motorized arm "GM"
Double spring arm "GS"
with electropneumatic or electromagnetic brake



Retractable arm "H"



Slim spring arm "L"
only for service head Slim, type 1L



Service head Slim "1"
For Electricity and Gas



Service head Slim "1L"
Electrical components only, for single spring arm "L"



Service head Horizontal 4C



Service head Horizontal 4L



Service head Standard "2"



Service head Large "3"
Available late 2021



Service and control management



Monitor support "6"
(Wide screen)
Monitor not included



Service head Hammer 5C



Service head Hammer 5L

Examples of available configurations

Tandem version



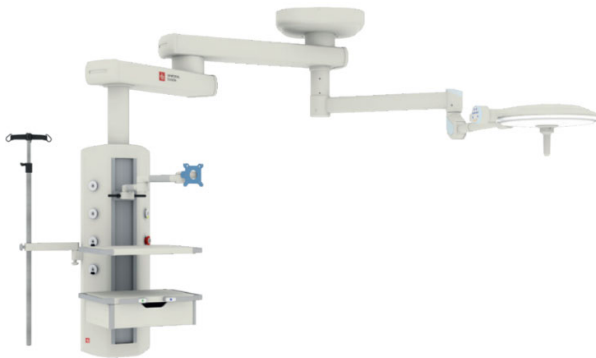
Monitor version

Available also in Tandem version



Examination light version

Available also in Tandem version



Patient lift version

Available also in Tandem version



Media bridge version



Column version



Mobile version



Swiveling arms

Swiveling arms 0-330° are made of extruded aluminum and painted with epoxy coated powder. Arms have minimum thickness of 9mm and section of 118x218mm. Arms are equipped with ABS cover heads with LED brake lights in each arm showing the status of the brake system. Pendants can be equipped with an electropneumatic or electromagnetic brake system.



Rotation of the arms can be limited (upper arm 1° and lower arm 30°) to prevent collision to other devices or fixed structures.

When requested, arms can be equipped with LED strip light on both the arms for indirect light or RGB ambient light. LED spot light is also available to the bottom of the vertical column.



Range and system loads

Length	Load (kg)	Lift (mm)	Weight of the arm system with the maximum admissible load (kg)	Maximum torque exerted by the system (Nm)
Single arm swivelling 0-330° 600mm	400	-	498	2527
Single arm swivelling 0-330° 900mm	270	-	372	2789
Single arm swivelling 0-330° 1200mm	200	-	306	3103
Double arm swivelling 0-330° 600+600mm	220	-	346	3034
Double arm swivelling 0-330° 900+600mm	200	-	330	3689
Double arm swivelling 0-330° 900+900mm	180	-	314	4243
Double arm swivelling 0-330° 1200+900mm	150	-	288	4613
Single arm swivelling 0-330° 800mm with motorized lift	260	420	371	2294
Single arm swivelling 0-330° 1000mm with motorized lift	180	600	314	2423
Single arm swivelling 0-330° 1250mm with motorized lift	145	750	283	2835
Double arm swivelling 0-330° 600+800mm with motorized lift	260	420	399	4076
Double arm swivelling 0-330° 600+1000mm with motorized lift	180	600	342	3905
Double arm swivelling 0-330° 900+800mm with motorized lift	260	420	403	5161
Double arm swivelling 0-330° 900+1000mm with motorized lift	180	600	346	4828
Double arm swivelling 0-330° 1000+1000mm with motorized lift	180	600	348	5148

Net load for the system will always be calculated according to the specific configuration. This value will be visible in the project specific drawing.

Standard vertical service head

Thanks to its 3-piece modular design, the height of the vertical column is determined by the required connections and equipment.

Configuration and variability

We produce detailed drawings based on the specifications provided by the customer. During the design phase, it is possible to modify the location of the interfaces in the console.

All outlets (electricity, data and AV) are based on the same standard box base. This allows easy transfer of access points if user needs changes later. When planning reservations for future needs, the console has good options for changing or growing needs.

Below is the maximum number of connections to each vertical console length.



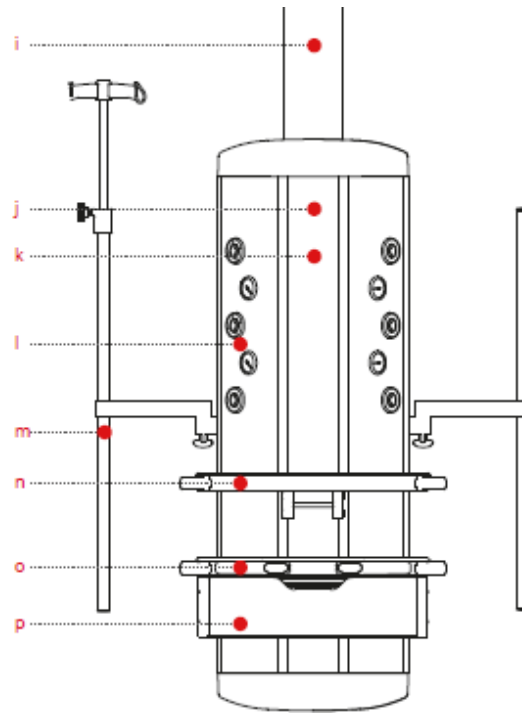
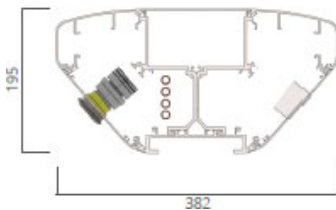
CE standards

Head column height	Max. no. of electrical components	Max. no. of gas outlets	Total max. no of connections
600mm	12pcs	8pcs	29pcs
1000mm	22pcs	14pcs	32pcs
1200mm	28pcs	16pcs	35pcs
1500mm	36pcs	20pcs	43pcs
1700mm	40pcs	22pcs	46pcs

In reference to the standard HTM 02-1 reduce the maximum number of 30%.

Vertical column structure:

- i – drop tube*
- j – rotating junction*
- k – railtrack for accessories*
- l – service compartment; gas, electricity, data*
- m – swiveling arms for mounting accessories*
- n – shelf*
- o – control pads and handles*
- p – drawer*

Profile:


Dimensions (mm):	H600/800/1000/1200/1500/1700 x W382 x D195
Max. no. of connections:	40x electricity, 22x gas - max. 46 connections for H1700mm
Mounting connections:	3 separated sections, 2 in the front and 1 in the back + 2 channels
Fixing accessories to:	<ul style="list-style-type: none"> • Integrated vertical rail track in the frontside for adjustable placement of shelves, drawers, monitor arms, handles and rails. • Vertical swivelling arms / poles fixed on column sides – factory assembly only. • Rails on the sides of shelves/drawers • Circular DIN rail, fixing on the column
Control:	Handles in the front side of a shelf / drawer Double handles in the column (option to above)
Options:	<ul style="list-style-type: none"> • Night light blue LED spot in the bottom part of the column. • Docking station for anaesthesia workstation
Brake systems:	Electropneumatic - 24Vcc - 4 bar min – 6 bar max Electromagnetic - 24 Vcc In an emergency (power failure, magnetic or brake button failure), the pendant can be moved by pushing firmly on the arm or console without damaging the joint.

Horizontal service heads

Allows more free space underneath the console compared to a vertical console.

A commonly used solution as an anesthetic pendant.

Horizontal service head allows also shelves to be mounted below – not available for type hammer head.

Horizontal service head



Hammer Head service head



Dimensions (mm):	L820 x W382 x H195 Length can be modified on request	L800 x W382 x H195 Length can be modified on request
Max. no. of connections:	10x electricity, 6x gas - max. 16 connections	20x electricity, 12x gas - max. 32 connections
Mounting connections:	Tilted sections (2) in the front and rear side for mounting connections.	Sections (3) in the front, rear and lower side for mounting connections. Gases available in all 3 sides.
Fixing accessories to:	<ul style="list-style-type: none"> DIN rails, available in both ends Vertical tubes (H800/1200/1500mm) below the column for fixing shelves, drawers and monitor arms 	<ul style="list-style-type: none"> DIN rails, available in both ends
Control:	<ul style="list-style-type: none"> Handle on the long side Wired hand-control (option) 	<ul style="list-style-type: none"> Handle in the lateral side (option) Wired hand-control (standard)
Options:	N/A	N/A
Brake systems:	Electropneumatic - 24Vcc - 4 bar min – 6 bar max Electromagnetis - 24 Vcc In an emergency (power failure, magnetic or brake button failure), the pendant can be moved by pushing firmly on the arm or console without damaging the joint.	

Available colours

All pendant frames are supplied in standard white, RAL 9010 matt.
Effect color in the columns and ABS coverings is grey RAL 9017 matt.



At customer request, individual profiles can be painted according to the customer's color preference (RAL color chart). Selecting any color that is not commonly used may require a longer delivery time.

We recommend contacting your local sales representative for more information on price, availability and delivery time.



Accessories

Pendants can be fully personalized with a broad range of accessories. Special rail supports or vertical poles are available for installing the needed complementary equipment to monitor the patients vital signs.

Please see SOLIDO Accessories Price List for full list of all available accessories.

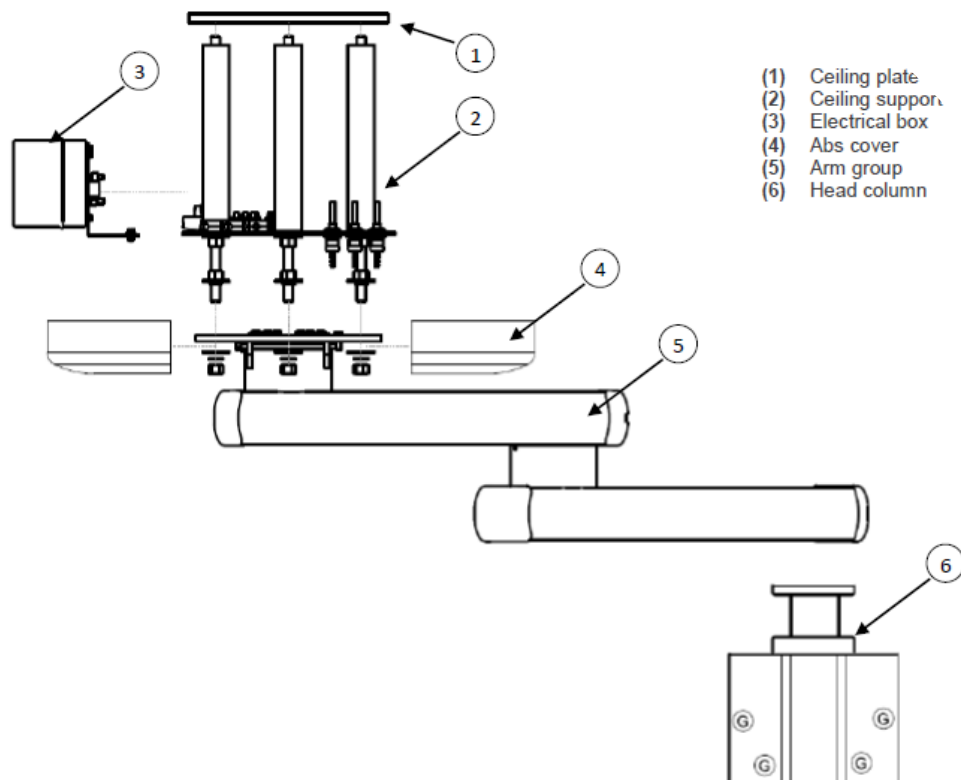
Key dimensional information

All dimensions are visible in the project specific drawing. Project specific drawings will be created latest after receiving the PO for customer approval.

Pendant components

The main pendant components are shown in the picture below. The standard ceiling support set is for false ceiling height max 800mm. Ceiling support sets are available until false ceiling height max 2300mm.

The picture below illustrates pendant components with standard ceiling support set:

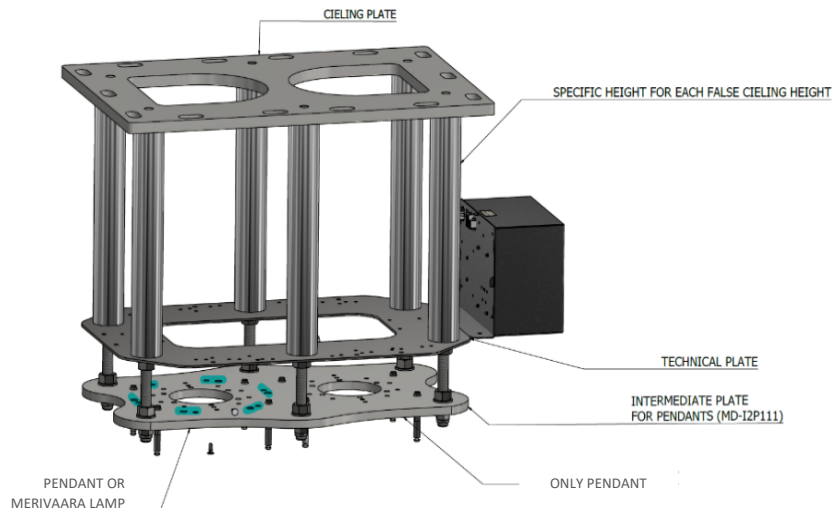


Options – pendants and light systems

There are various ways to combine the arm systems we offer as an alternative to standard solutions.

Ceiling support for two separate arm systems

Two separate arm systems (so called tandem) can be mounted on the same plate. Our 1st fix (tandem) accompanies both pendant and monitor arm or pendant and lamp system. Solido 1st fix system (tandem) is compatible with Merivaara equipment.



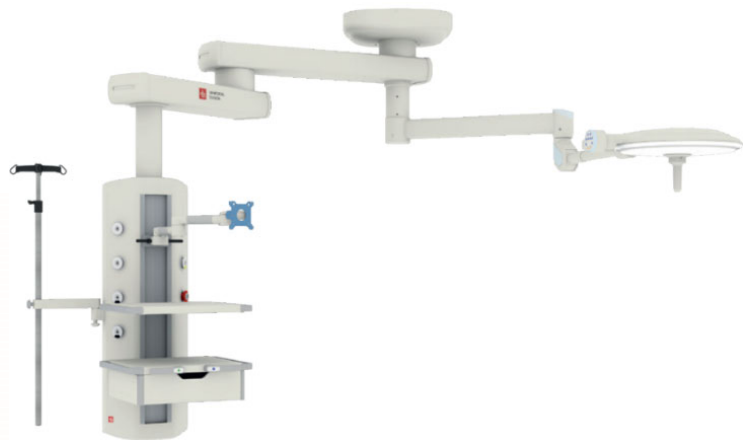
Attaching lamp system to the pendant arm system

Pendant system can also be equipped with an additional arm for a minor light, such as examination light.

The lamp system arm can be mounted on the underside of the fixed extension arm of the pendant system.

The pendant system can also be equipped with a reservation for the additional arm. The reservation does not affect normal operation and the pre-drilled hole is covered with a cover plate. The picture shows a modelling of the installation. Also tandem version is available.

Merivaara has installed a similar solution to the new Karolinska University Hospital in Sweden.



Technical data

Operational temperature range	5°C - 35°C
Relative humidity range	Between 30% and 75%
Atmospheric pressure:	From 700to 1060hPa
Supply voltage	110÷120 220÷230 V 50/60 z
Auxiliary voltage (usually)	24Vdc-24Vac
Power consumption - Lighting - Electrical socket	Max 150W Max 2000W for each socket
Brake system - Electropneumatic Brakes - Electromagnetic Brakes	24 Vcc, min 4Bar – max 6Bar 24 Vcc
Service head	Adjustable friction
Classification according to the degree of protection against penetration of liquids and external agents	IP20
Noise level	Less than 35 dB
Color:	Frame is white (RAL 9010 matt), effect color in the columns and ABS covers is grey (RAL 9017 matt). Other RAL colors available on request.
Testing in production for each single unit	For each unit, the following tests are performed: - grounding impedance protection in accordance with 8.6 of standard CEI EN 60601 1 - standard measurement of leakage current and dielectric strength in accordance with 8.7, 8.8, 16.6 of EN 60601 1 - Tests on medical gas and vacuum distribution in accordance with 12.3, 12.4, 12.5, 12.6 of EN ISO 7396 1 - Testing facilities on evacuation of anaesthetic gases in accordance with 12.2, 12.3, 12.4 of EN ISO 7396 2 Tests carried out on end-of-line product form an integral part of this manual
Electromagnetic interference	The operation of other devices placed near the medical device (as portable equipment or furniture) can cause electromagnetic interference or other interference, always check with qualified personnel
EC certificate 1548/MDD	The devices are made in compliance with Directive 93/42/EEC concerning medical devices Annex II with certification CE0051.
Regulation	The equipment should be considered class IIb according to the Medical Device Directive 93/42 ECC.
Maintenance	The pendant does not require routine standard maintenance but only long term one. Medical gases and electrical components are kept separated: for this reason, no special caution during maintenance service is needed.
Cleaning	The epoxy-polyester paint or the anodic oxidation guarantee the durability of all external surfaces. Cleaning is recommended with soft cloth soaked with non-alcoholic and gentle detergents and disinfectants.
GMDN code	35630

Complete operating room portfolio from a single supplier

Merivaara product portfolio covers whole range of operating room devices

- Operating tables
- Operating and examination lights
- Monitor arms
- Displays mounted on a arm system or wall
- Pendants
- Operating room integration system



Benefits for the customer

- + Uniform product design
- + One contact
- + Scheduling
- + Experienced project partner
- + qualified local resources
- + wide service network
- + support in English and other local languages

We also provide layout plans and 3D presentations for the surgery department. Be in contact:
merivaara@merivaara.com.

“ HEALTH TECHNOLOGY WITH A HUMAN TOUCH ”