



Leica AF6000 E–AF7000

Leica Microsystems Advanced Widefield Systems

Technical Documentation

Living up to Life

Upgrade Options from Entry-Level to High-End Solutions

	Leica AF6000 E	Leica AF6000	Leica AF6500	Leica AF7000
Main characteristics	Entry-level fluorescence acquisition system, 2D time-lapse, multi-channel overlay	Fluorescence imaging and analysis system, high flexibility (without real-time control)	High-speed fluorescence system, real-time control of camera and one filter wheel	Dedicated live cell system, full real-time control
Applications	Fluorescence imaging and documentation	General fluorescence imaging, 3D time-lapse experiments, multi-positioning, deconvolution	Functionality of AF6000, plus fast 2D time-lapse and fast ratio imaging, peripheral triggering	TIRF, fast 3D time-lapse, Fura2, FRET, deconvolution, peripheral triggering
Includes	AF6000 E SW + PC	AF6000 SW + PC	AF6000 SW + PC + CTR6500 HS	AF6000 SW + PC + CTR7000 HS
Leica DM1000 Ergonomic system microscope	●			
Leica DM2000 Advanced system microscope	●			
Leica DM2500 Advanced system microscope 100 W	●			
Leica DM3000 Advanced system microscope, motorized	●			
Leica DM4000 B Automated upright microscope for biological, laboratory and research applications	●			
Leica DM5000 B Automated upright microscope for demanding research applications	●	●	●	●
Leica DM5500 B Automated upright microscope for high-end research applications with motorized focus	●	●	●	●
Leica DM6000 B Fully automated upright microscope for cutting edge biomedical research	●	●	●	●
Leica DMI3000 B Manual inverted research microscope	●			
Leica DMI4000 B Automated inverted research microscope	●	●	●	●
Leica DMI6000 B Fully automated inverted research microscope	●	●	●	●
Leica M205 FA High-end stereomicroscope	●	●		
Leica MacroFluo High-end macrocope	●	●		



Software

- intuitive and guiding user interface
- context sensitive online help
- multi-dimensional data acquisition
- time-lapse experiments
- Mark and Find feature in combination with motorized stages (not on AF6000 E)
- quantification tools (not on AF6000 E)
- tile scanning (not on AF6000 E)

Software options	
Live Data Mode	interactive data recording allowing job-sequencing and online evaluation
3D visualization	maximum and other projections, simulated fluorescence process, 3D rotation and animations
Colocalization	histogram based colocalization and area measurements
3D Deconvolution	fully integrated deconvolution algorithm using adaptive calculated or supplied PSF
2D Deconvolution	fully integrated 2D deconvolution offering no-neighbour and nearest-neighbour algorithm
FRET SE	powerful wizard for FRET acquisition and analysis
Dye Finder	multi-color restoration, channel unmixing
Well plate acquisition	predefined and user-definable patterns

Hardware Specifications

SuperZ Galvo z-positioner	
travel range	250 μm
step size	61 nm
Piezo z-positioner	
travel range	100 μm
step size	25 nm
Leica EL6000 External light source	
lamp	HXP 120 W 45C VIS (Osram), Metal Halogenide bulb
light intensity	3.5 W (with IR filter, at the end of light guide)
life time	average 2000 h
shutter time	6 ms
Leica External Filter Wheels	
filter positions	5
switching time	27 ms between adjacent positions 36 ms for maximum position distance
Incubator BL/Incubator BL TIRF	
temperature min.	3° C above room temperature
temperature max.	20° C above room temperature
control accuracy	+/- 0.1° C at sensor
step size	0.1° C

Cameras

Leica DFC310 FX Camera

gain	1 to 10
digitization	12 bit
cooling	– 20 K to ambient
imaging array	1392 x 1040 pixel
pixel size	6.45 μm x 6.45 μm
interline progressive scan CCD	color
high speed trigger capability	yes

Leica DFC345 FX Camera

gain	1 to 10
digitization	12 bit
cooling	active Peltier cooling
imaging array	1600 x 1200 pixel
pixel size	4.4 μm x 4.4 μm
interline progressive scan CCD	monochrome
high speed trigger capability	yes

Leica DFC360 FX Camera

gain	1 to 10
digitization	12 bit
cooling	– 20 K to ambient
imaging array	1392 x 1040 pixel
pixel size	6.45 μm x 6.45 μm
interline progressive scan CCD	monochrome
high speed trigger capability	yes

Leica DFC425 C & DFC425 Camera

gain	1 to 10
digitization	12 bit
cooling	– 20 K to ambient (DFC425: no cooling)
imaging array	2592 x 1944 pixel
pixel size	2.78 μm x 2.78 μm
interline frame transfer CCD	color
high speed trigger capability	no

Leica DFC495 Camera

gain	1 to 10
digitization	12 bit
cooling	– 20 K to ambient
imaging array	3264 x 2448 pixel
pixel size	2.7 μm x 2.7 μm
interline frame transfer CCD	color
high speed trigger capability	no

Cameras

Princeton Instruments CoolSnap HQ2 Camera PCI board version

gain	1 or 2
digitization	12 bit
cooling	– 30° C
imaging array	1392 x 1040 pixel
pixel size	6.45 μm x 6.45 μm
interline progressive scan CCD	monochrome
high speed trigger capability	yes

Princeton Instruments Cascade II 512B Camera

gain	on chip multiplication gain
digitization	16 bit
cooling	– 80° C
imaging array	512 x 512 pixel
pixel size	16 μm x 16 μm
frame transfer CCD	monochrome, back thinned
high speed trigger capability	yes

Hamamatsu 9100-02 Camera

gain	on chip multiplication gain
digitization	14 bit
cooling	– 50° C
imaging array	1000 x 1000 pixel
pixel size	8 μm x 8 μm
frame transfer CCD	monochrome
high speed trigger capability	yes

Hamamatsu 9100-13 Camera

gain	on chip multiplication gain
digitization	16 bit
cooling	– 65° C (-80/-90° C water cooled)
imaging array	512 x 512 pixel
pixel size	16 μm x 16 μm
frame transfer CCD	monochrome, back thinned
high speed trigger capability	yes

Hamamatsu Orca R² Camera

gain	1 to 10
digitization	12/16 bit
cooling	– 35° C (-40° C water cooled)
imaging array	1344 x 1024 pixel
pixel size	6.45 μm x 6.45 μm
interline progressive scan CCD	monochrome
high speed trigger capability	yes

Cameras

Andor iXon 897 Camera

gain	on chip multiplication gain
digitization	14 bit
cooling	- 85° C air cooled
imaging array	512 x 512 pixel
pixel size	16 µm x 16 µm
frame transfer CCD	monochrome, back thinned
high speed trigger capability	yes

Andor iXon 885 Camera

gain	on chip multiplication gain
digitization	14 bit
cooling	- 70° C air cooled
imaging array	1004 x 1002 pixel
pixel size	8 µm x 8 µm
frame transfer CCD	monochrome
high speed trigger capability	yes

High-Speed Components for the Leica Advanced Widefield System Line

	Leica AF6000 E	Leica AF6000	Leica AF6500	Leica AF7000
Time-lapse	●	●	●●	●●
Multi-channel overlay	●	●	●●	●●
Camera control	●	●	●●	●●
Z stack	○	●	●	●●
Motorized XY stage	○	●	●	●
Deconvolution	○	●	●	●
External filter wheels	● 1 FW*	● 1 FW*	●● 1 FW	●● 4 FW
Peripheral triggering	○	○	●● 2 In, 1 Out	●● 4 In, 4 Out
SuperZ Galvo fine focus	○	○	○	●●
Pifoc fine focus	○	○	○	●●
TIRF	○	○	○	●●

●● available, high-speed ● available, non high-speed ○ not available *Leica CTR5500, 6000 or 6500 required

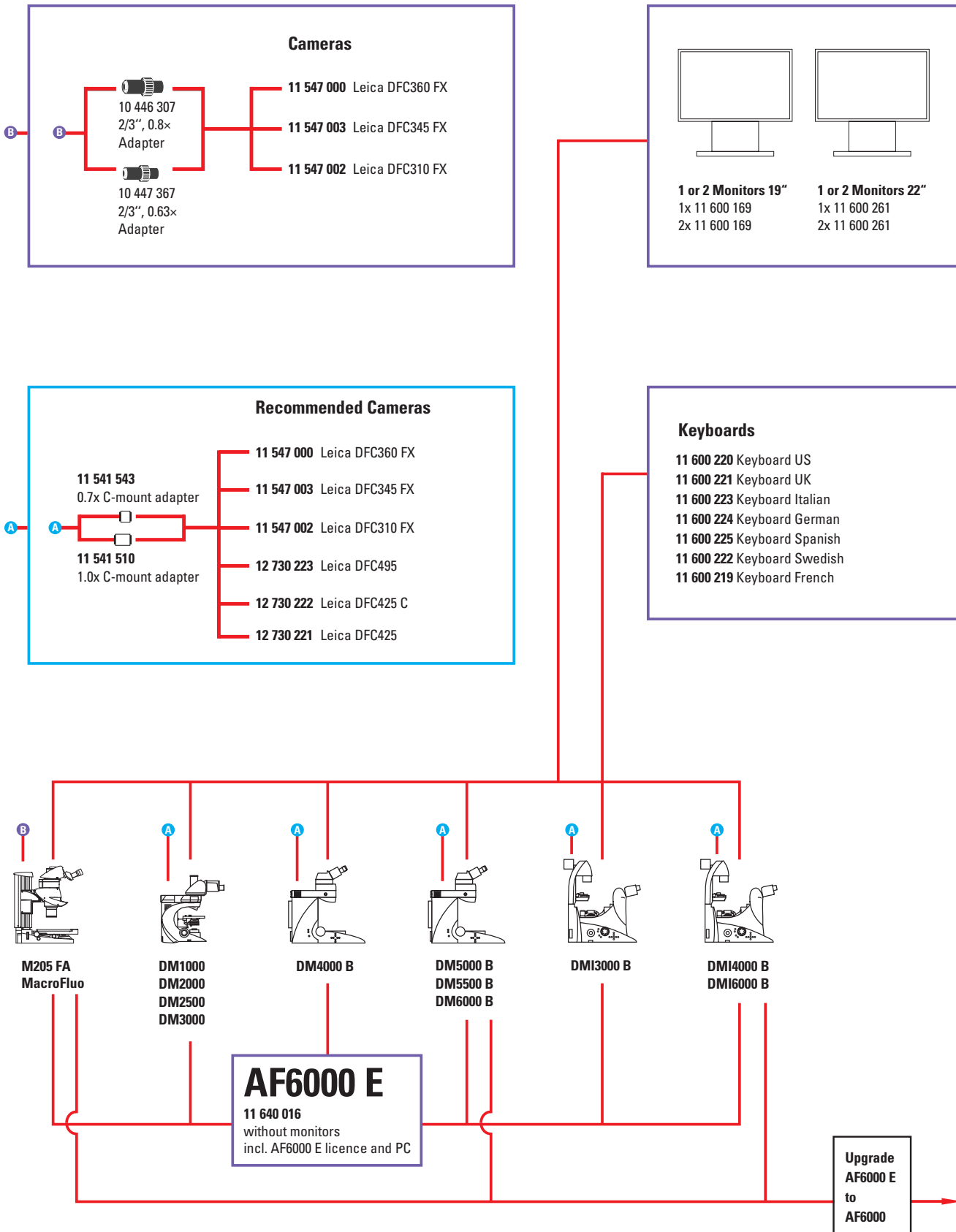


Leica External Fast Filter Wheel for high-speed excitation, attenuation and emission control.



Leica Water Immersion Micro Dispenser supplies water immersion automatically during experiments with living specimens.

System Overview Leica AF6000 E



System Overview

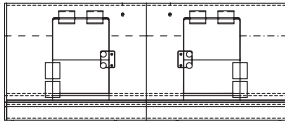
Leica AF6000

Keyboards

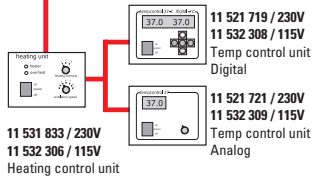
- 11 600 220 Keyboard US
- 11 600 221 Keyboard UK
- 11 600 223 Keyboard Italian
- 11 600 224 Keyboard German
- 11 600 225 Keyboard Spanish
- 11 600 222 Keyboard Swedish
- 11 600 219 Keyboard French

D

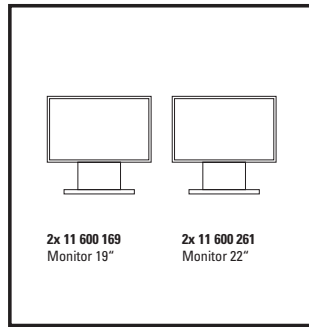
Climate Chamber Upright



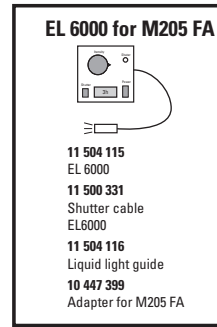
11 532 755
Incubator for DM4000-6000 B



B



D

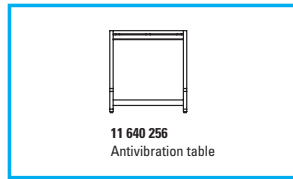


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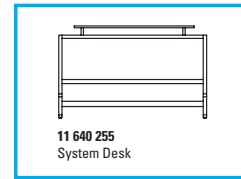
Software Options

- | | | | |
|------------|------------------|------------|---------------------------------------------------------------------------------------------------------|
| 11 640 803 | Live Data Mode | 11 640 808 | Dye Finder |
| 11 640 804 | 3D Visualization | 11 640 811 | FRET Software (not for M205 FA and MacroFluo) |
| 11 640 805 | Colocalization | 11 640 812 | Core Review Software w/o Deconvolution |
| 11 640 806 | 3D Deconvolution | 11 640 814 | Well Plate Acquisition (DMI6000 B with motorized/scanning stage or M205 FA/MacroFluo with Isopro stage) |
| 11 640 807 | 2D Deconvolution | | |

D

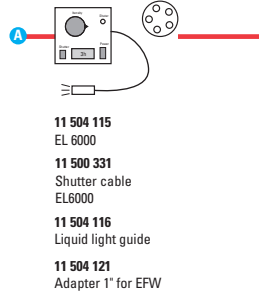


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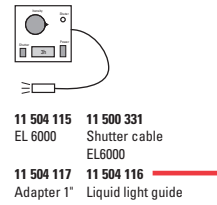


A

EL 6000 + Leica Ext. FW (CTR5500/6000/6500 only)



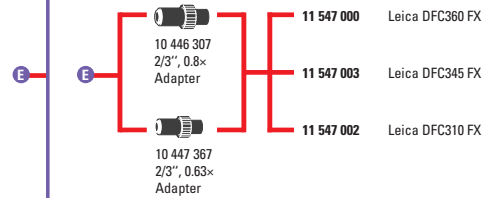
EL 6000



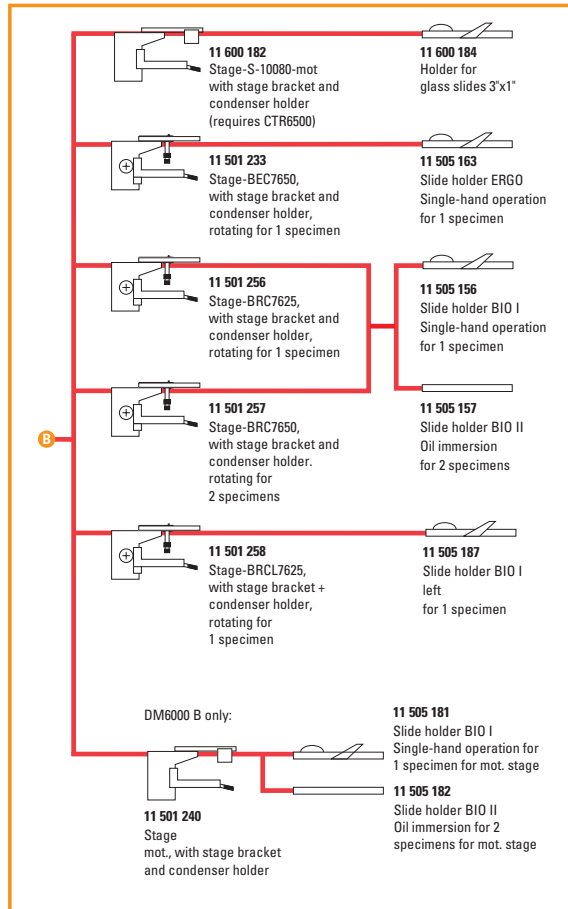
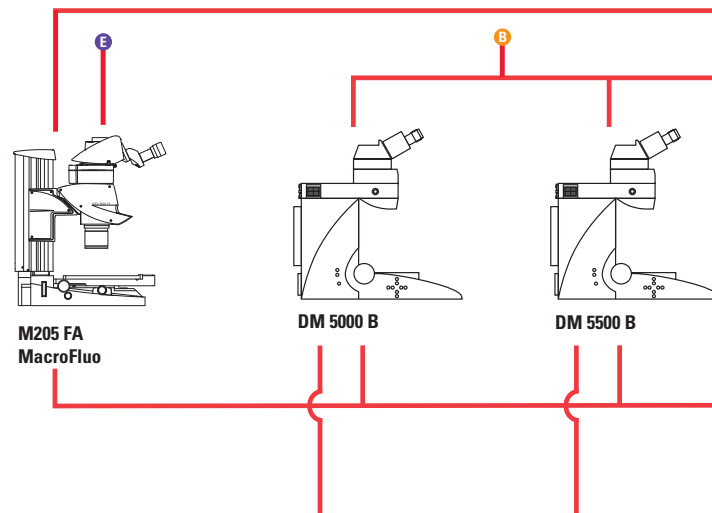
SFL4000/SFL7000

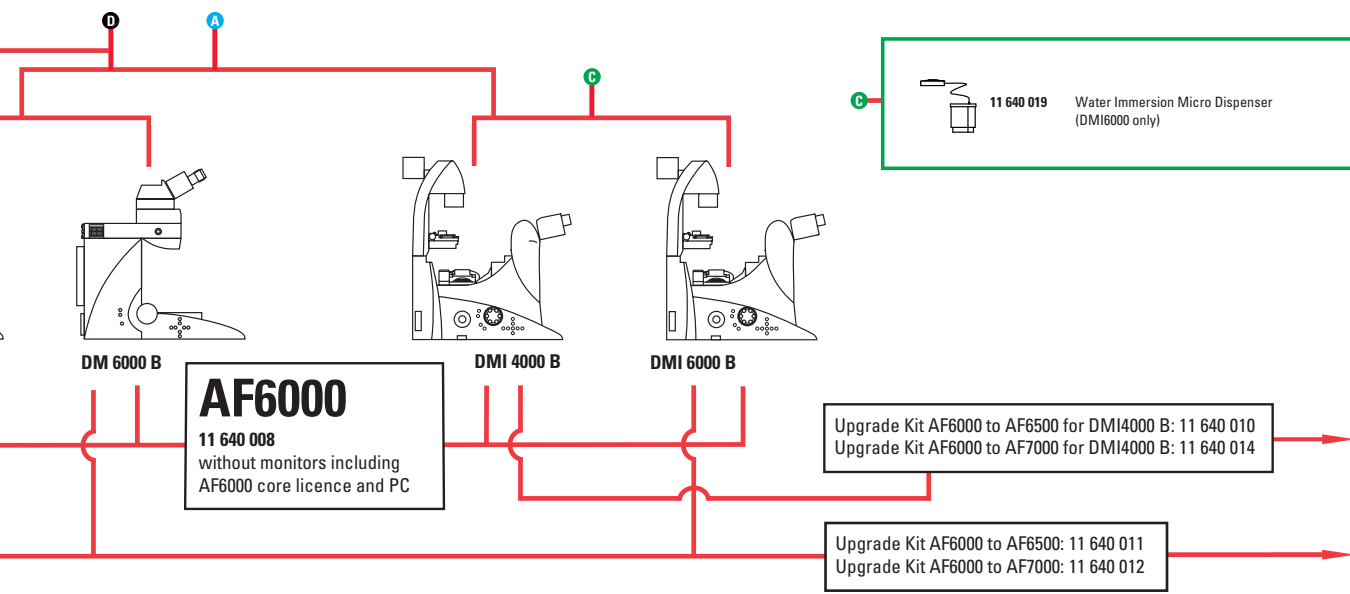
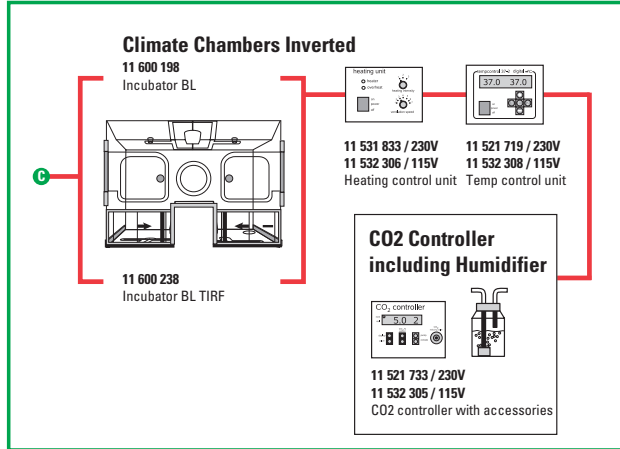
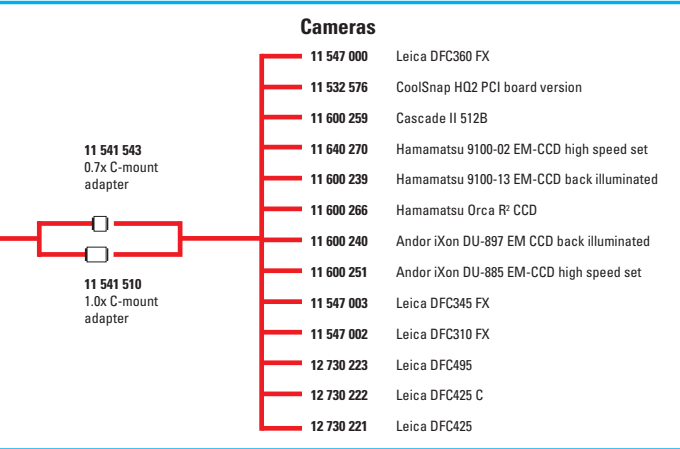
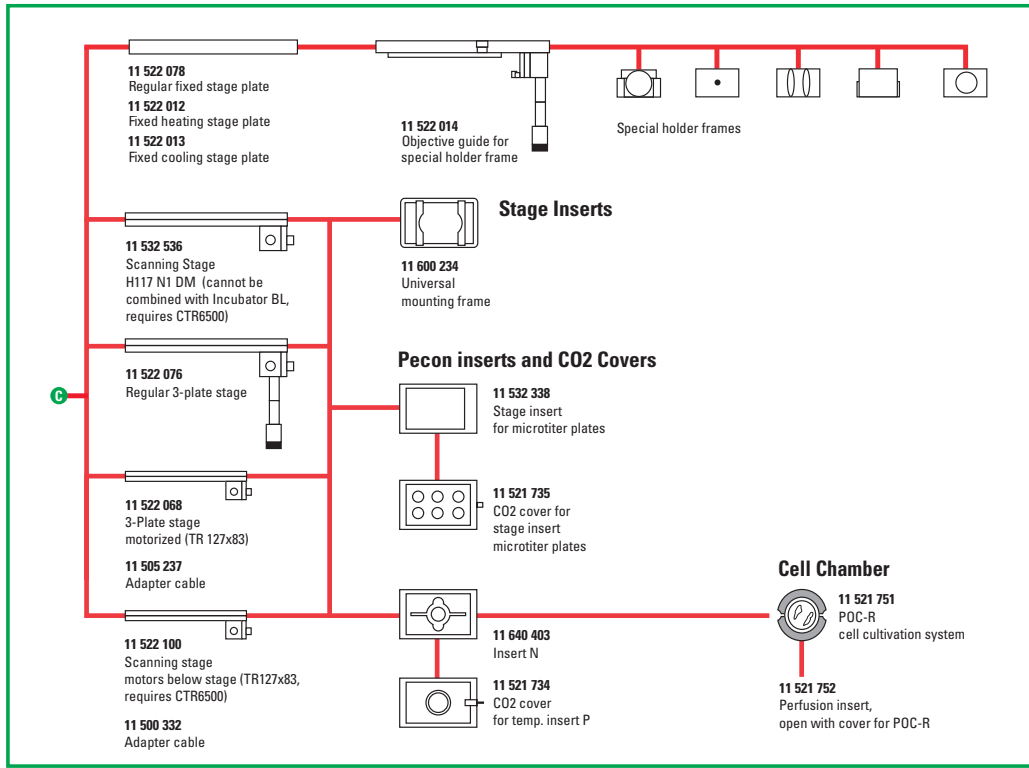
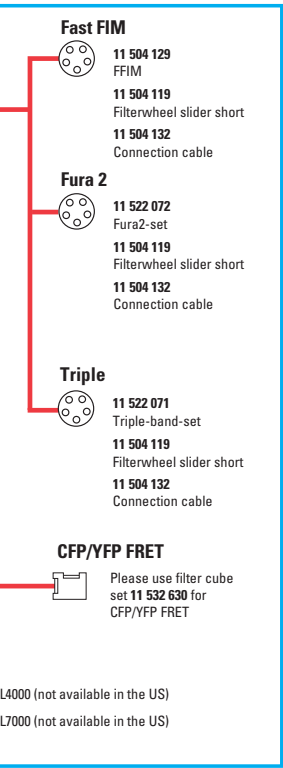


Cameras



Microscope



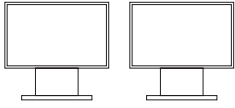


System Overview

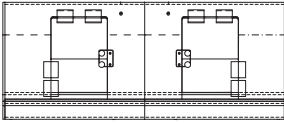
Leica AF6500

Keyboards

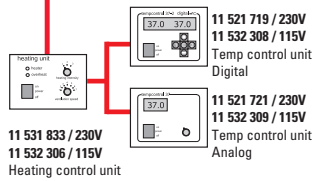
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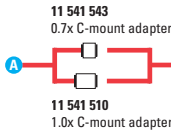
Climate Chamber Upright



- 11 532 755 Incubator for DM4000-6000 B



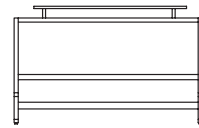
Cameras



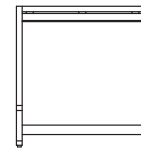
- 11 547 000 Leica DFC360 FX
- 11 600 243 Trigger cable DFC Cameras for CTR7000
- 11 547 003 Leica DFC345 FX
- 11 600 243 Trigger cable DFC Cameras for CTR7000
- 11 547 002 Leica DFC310 FX
- 11 600 243 Trigger cable DFC Cameras for CTR7000
- 11 532 576 CoolSnap HQ2 PCI board version
- 11 600 244 Trigger cable Roper cameras for CTR7000
- 11 600 259 Cascade II 512B
- 11 600 244 Trigger cable Roper cameras for CTR7000
- 11 640 270 Hamamatsu 9100-02 EM-CCD high speed set
- 11 600 246 Trigger cable Hamamatsu cameras for CTR7000
- 11 600 239 Hamamatsu 9100-13 EM-CCD back illuminated
- 11 600 246 Trigger cable Hamamatsu cameras for CTR7000
- 11 600 266 Hamamatsu Orca R² CCD
- 11 600 267 Trigger cable Hamamatsu Orca R² for CTR7000
- 11 600 240 Andor iXon DU-897 EM CCD back illuminated
- 11 600 245 Trigger cable Andor cameras for CTR7000
- 11 600 251 Andor iXon DU-885 EM-CCD high speed set
- 11 600 245 Trigger cable Andor cameras for CTR7000

Software Options

- 11 640 803 Live Data Mode
- 11 640 804 3D Visualization
- 11 640 805 Colocalization
- 11 640 806 3D Deconvolution
- 11 640 807 2D Deconvolution
- 11 640 808 Dye Finder
- 11 640 811 FRET Software
- 11 640 812 Core Review Software w/o Deconvolution
- 11 640 814 Well Plate Acquisition (DMI6000 B only, requires motorized/scanning stage)



- 11 640 255 System Desk

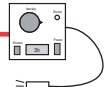


- 11 640 256 Antivibration table

Peripheral triggering

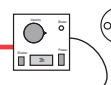
- 2 channel in and 1 out
- 11 640 004 Adapter peripheral triggering

EL 6000



- 11 504 115 EL 6000
- 11 640 265 High Speed shutter cable
- 11 504 116 Liquid light guide
- 11 504 117 Adapter 1"

EL 6000 + Leica External FW

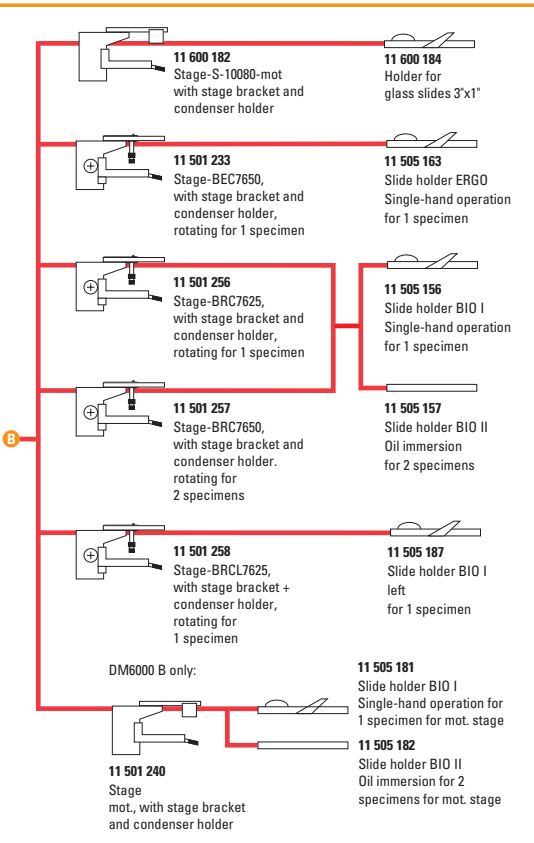


- 11 504 115 EL 6000
- 11 504 117 Adapter 1"
- 11 640 266 Holder for two FW sliders
- 11 640 265 High Speed
- 11 504 116 Liquid light g

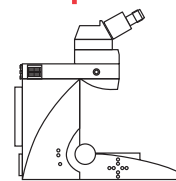
SFL7000



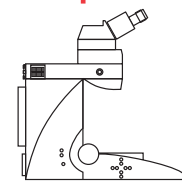
- 11 504 140 L



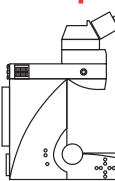
Microscope



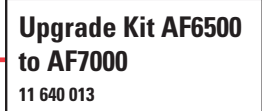
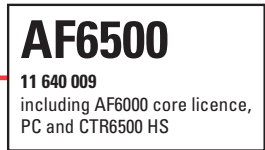
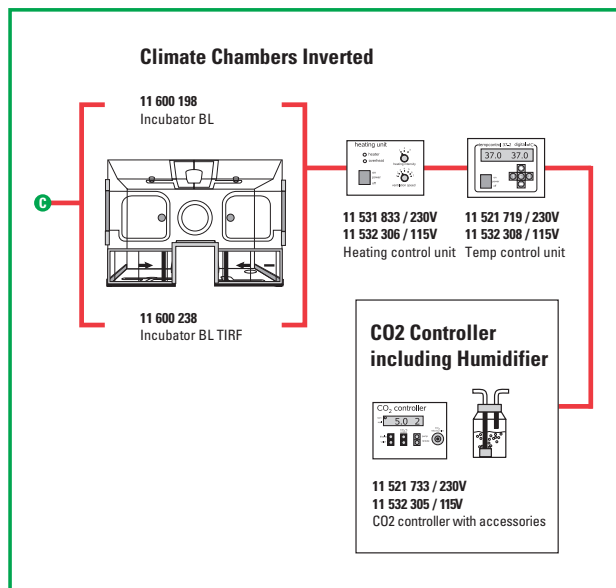
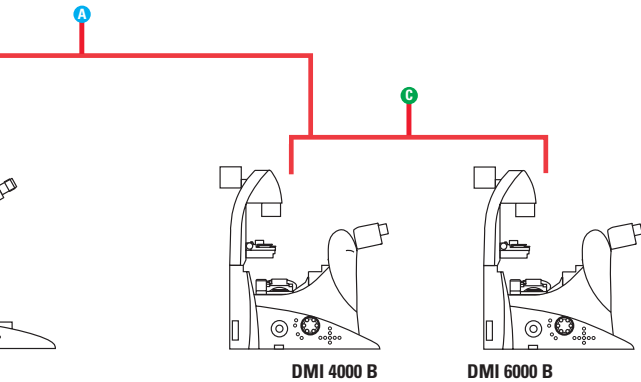
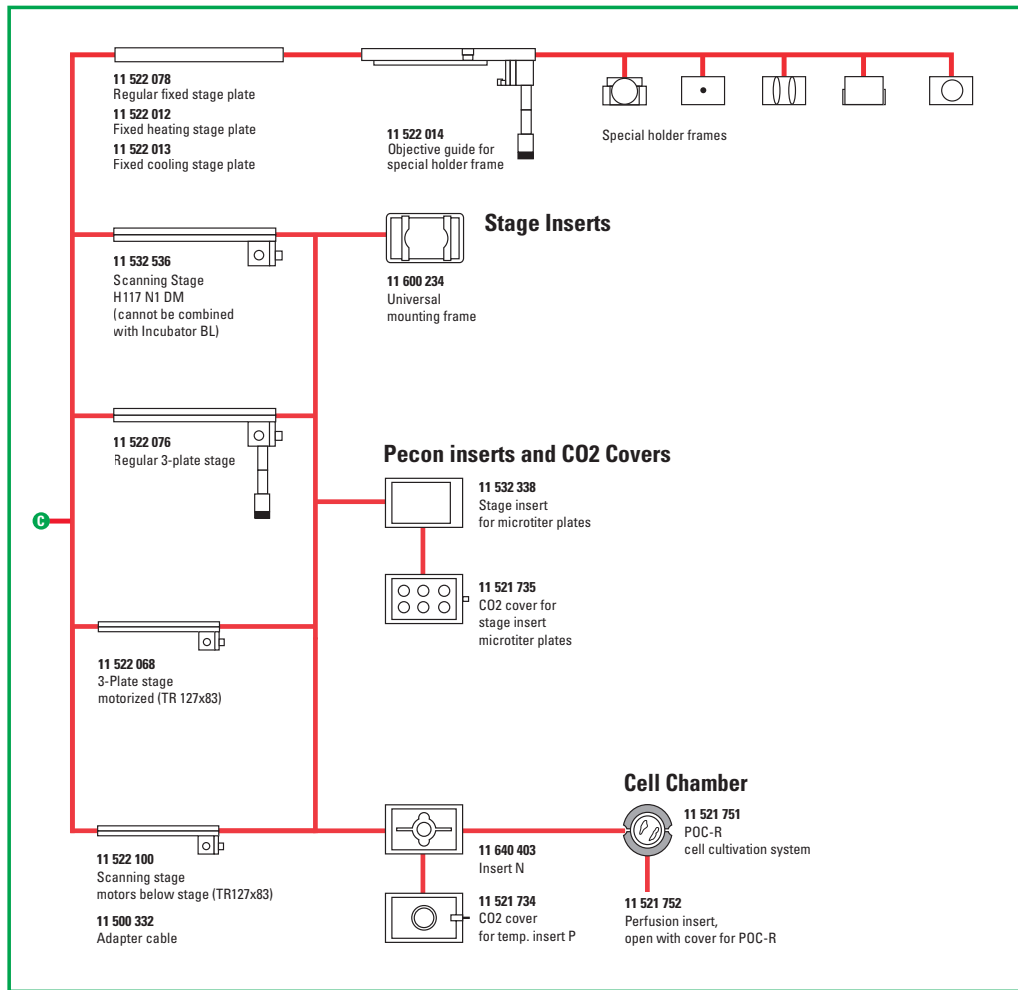
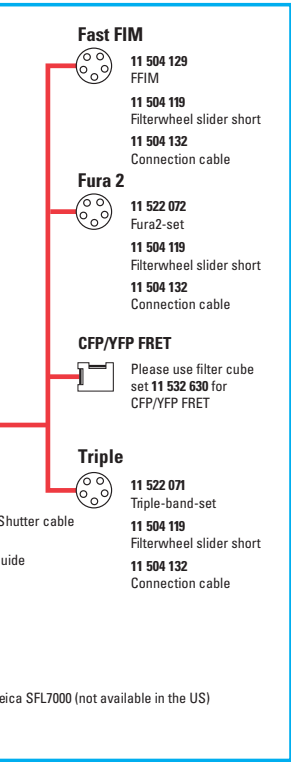
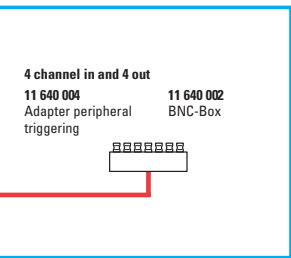
DM 5000 B



DM 5500 B



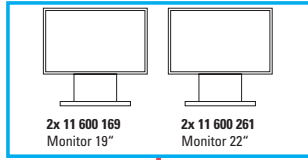
DM 6000 B



System Overview

Leica AF7000

- 11 600 220 Keyboard US
- 11 600 221 Keyboard UK
- 11 600 223 Keyboard Italian
- 11 600 224 Keyboard German
- 11 600 225 Keyboard Spanish
- 11 600 222 Keyboard Swedish
- 11 600 219 Keyboard French



Climate Chamber Upright

11 532 755 Incubator for DM4000-6000 B

11 521 719 / 230V 11 532 308 / 115V Temp control unit Digital	11 521 721 / 230V 11 532 309 / 115V Temp control unit Analog
------------------------------------------------------------------------	-----------------------------------------------------------------------

11 531 833 / 230V
11 532 306 / 115V
Heating control unit

Fast Z-Movement

DM6000 B only:

11 640 017 SuperZ Galvo Focus AF7000 for mot. stage

11 501 240 Stage mot., with stage bracket and condenser holder

11 600 182 Stage-S-10080-mot with stage bracket and condenser holder	11 600 184 Holder for glass slides 3"x1"
11 501 233 Stage-BEC7650, with stage bracket and condenser holder, rotating for 1 specimen	11 505 163 Slide holder ERGO Single-hand operation for 1 specimen
11 501 256 Stage-BRC7625, with stage bracket and condenser holder, rotating for 1 specimen	11 505 156 Slide holder BIO I Single-hand operation for 1 specimen
11 501 257 Stage-BRC7650, with stage bracket and condenser holder, rotating for 2 specimens	11 505 157 Slide holder BIO II Oil immersion for 2 specimens
11 501 258 Stage-BRCL7625, with stage bracket + condenser holder, rotating for 1 specimen	11 505 187 Slide holder BIO I left for 1 specimen

11 505 181 Slide holder BIO I Single-hand operation for 1 specimen for mot. stage

11 505 182 Slide holder BIO II Oil immersion for 2 specimens for mot. stage

Cameras

11 541 543 0.7x C-mount adapter

11 541 510 1.0x C-mount adapter

11 547 000	Leica DFC360 FX
11 600 243	Trigger cable DFC Cameras for CTR7000
11 547 003	Leica DFC345 FX
11 600 243	Trigger cable DFC Cameras for CTR7000
11 547 002	Leica DFC310 FX
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11 532 576	CoolSnap HQ2 PCI board version
11 600 244	Trigger cable Roper cameras for CTR7000
11 600 259	Cascade II 512B
11 600 244	Trigger cable Roper cameras for CTR7000
11 640 270	Hamamatsu 9100-02 EM-CCD high speed set
11 600 246	Trigger cable Hamamatsu cameras for CTR7000
11 600 239	Hamamatsu 9100-13 EM-CCD back illuminated
11 600 246	Trigger cable Hamamatsu cameras for CTR7000
11 600 266	Hamamatsu Orca R ² CCD
11 600 267	Trigger cable Hamamatsu Orca R ² for CTR7000
11 600 240	Andor iXon DU-897 EM CCD back illuminated
11 600 245	Trigger cable Andor cameras for CTR7000
11 600 251	Andor iXon DU-885 EM-CCD high speed set
11 600 245	Trigger cable Andor cameras for CTR7000

Software Options

11 640 803 Live Data Mode	11 640 808 Dye Finder
11 640 804 3D Visualization	11 640 811 FRET Software
11 640 805 Colocalization	11 640 812 Core Review Software w/o Deconvolution
11 640 806 3D Deconvolution	11 640 814 Well Plate Acquisition (DMI6000 B only, requires motorized/scanning stage)
11 640 807 2D Deconvolution	

Peripheral triggering

2 channel in and 1 out

11 640 004 Adapter peripheral triggering

EL 6000

11 504 115 EL 6000

11 640 265 High Speed shutter cable

11 504 116 Liquid light guide

11 504 117 Adapter 1"

EL 6000 + Leica External FW

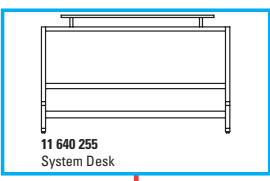
11 504 115 EL 6000

11 504 117 Adapter 1"

11 640 265 High Speed Shutter cable

11 504 116 Liquid light guide

11 640 266 Holder for two FW sliders

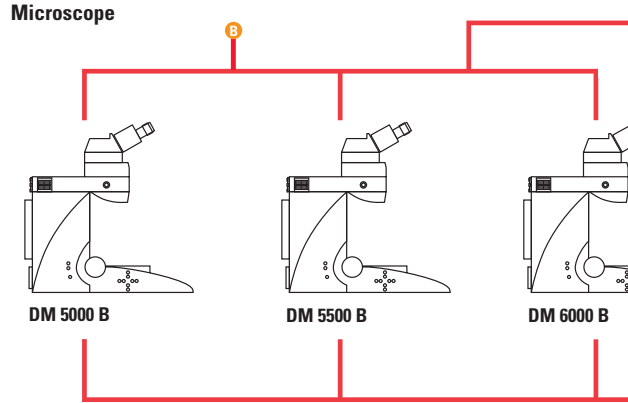


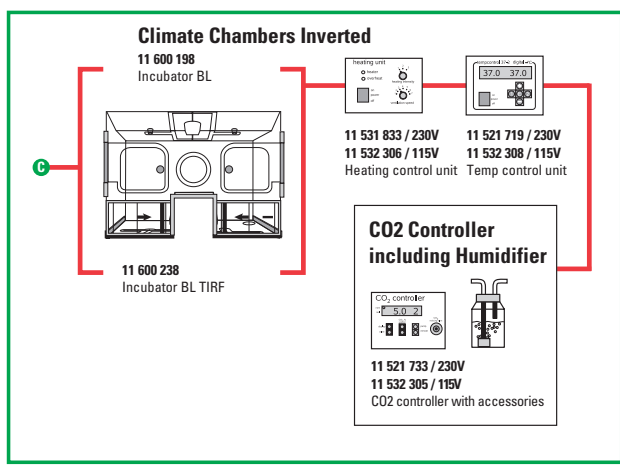
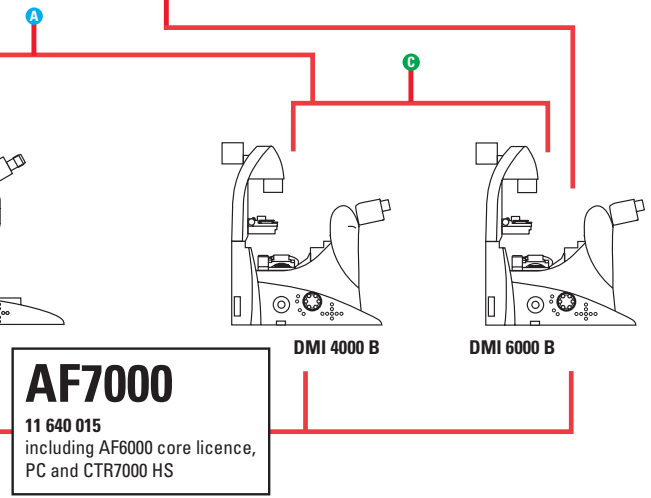
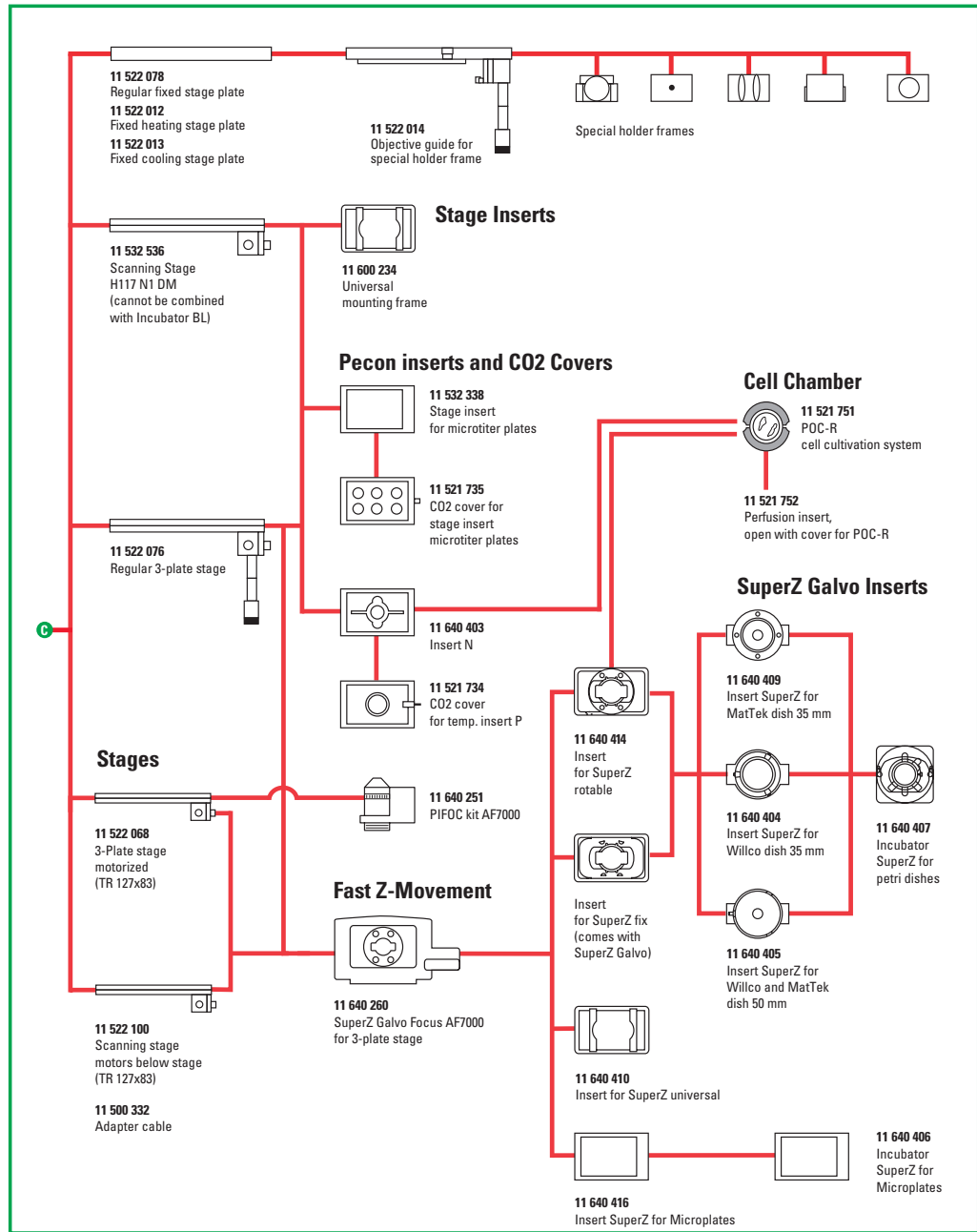
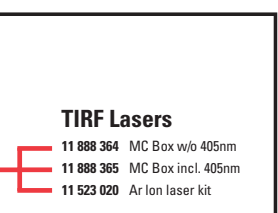
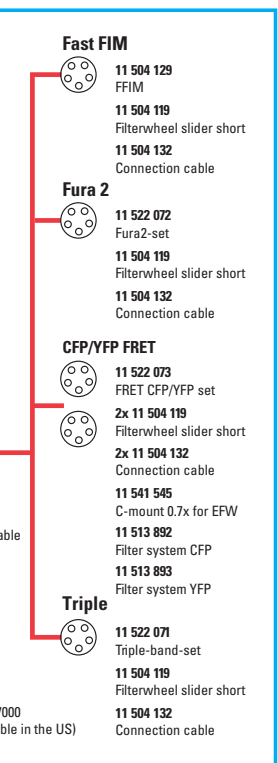
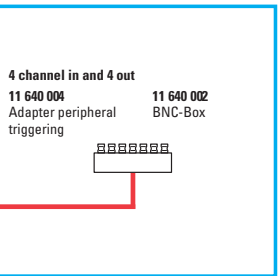
TIRF

11 888 383 TIRF MC Retrofit Kit

11 506 318 Obj. HCX PL APO 100x/1.47 Oil

11 506 319 Obj. HCX PL APO 63x/1.47 Oil





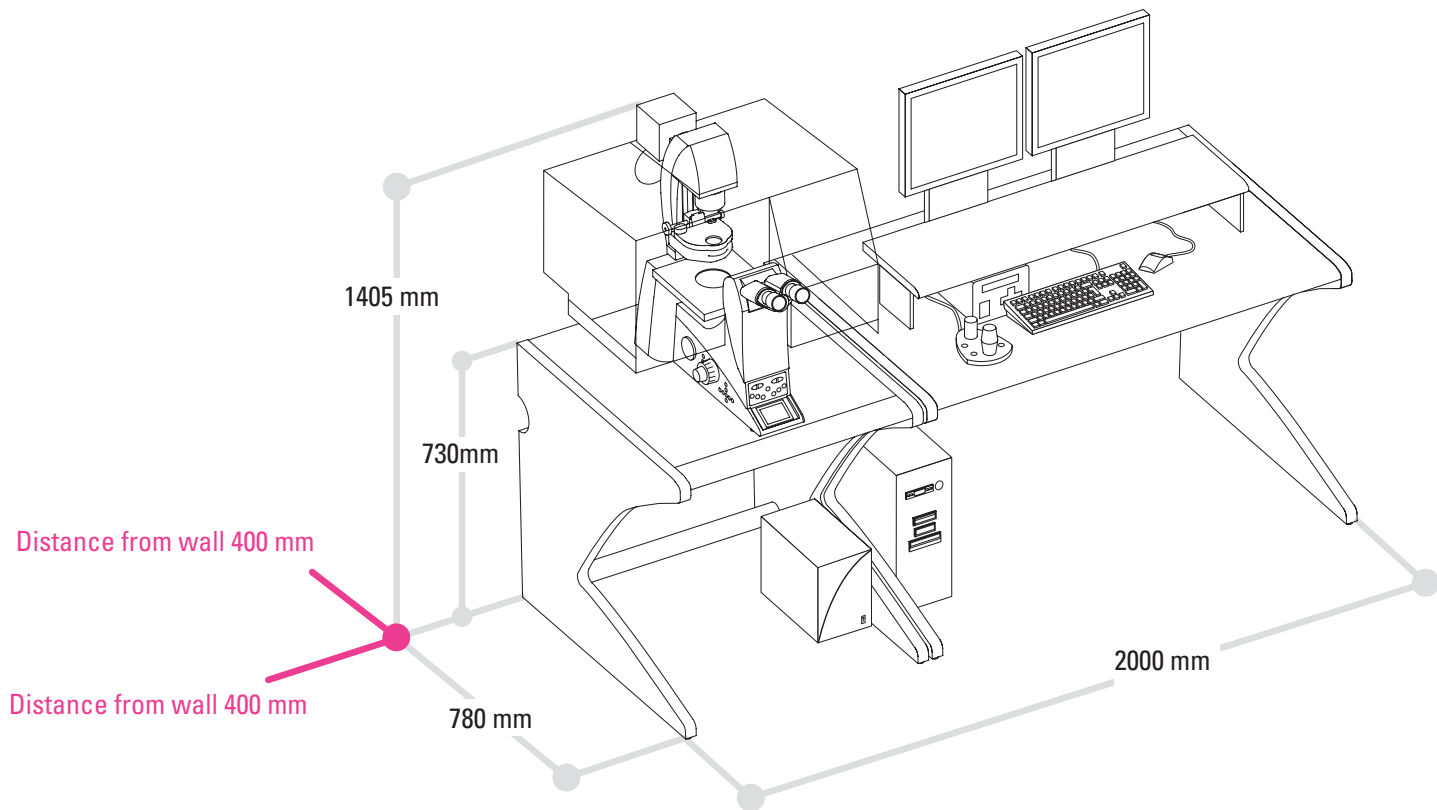
Installation Requirements

Environment	Room temperature: +18 to + 25° C, low fluctuation of temperature Avoid proximity to air conditioning equipment Protect from dust Room darkening recommended Air conditioned room recommended Humidity max 80% (35° C)
Electricity supply*	115 / 230 V AC/ +/- 10%, 60/50 Hz Two separate fused power lines: 1 x 1600 VA for main system 1 x 700 VA for climate controller and monitors
Heat load*	System: approx. 500 – 900 W Climate controller: approx. 300 W (stand-by)
Crating (width, depth and height in mm)*	maximum box size: (1470/1000/1030), max weight: 236 kg (if optional work desk and/or antivibration table is included)
	Pallets for other hardware components

* maximum numbers for the Leica Advanced Widefield System line



Leica AF6000 with Leica M205 FA stereomicroscope and Leica EL6000 external light source



Maximum footprint of the Leica Advanced Widefield System line with antivibration table and system desk.



Leica AF7000 with Leica DMI6000 B inverted microscope, climate chamber, CO₂ controller and SuperZ Galvo focus

Leica Microsystems – the brand for outstanding products

Leica Microsystems operates internationally in four divisions, where we rank with the market leaders.

● Life Science Research Division

Leica Microsystems' Life Science Research Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems' customers at the leading edge of science.

● Industry Division

The Leica Microsystems Industry Division's focus is to support customers' pursuit of the highest quality end result by providing the best and most innovative imaging systems for their needs to see, measure and analyze the microstructures in routine and research industrial applications, in materials science and quality control, in forensic science investigations, and educational applications.

● Biosystems Division

The Biosystems Division of Leica Microsystems brings histopathology labs and researchers the highest-quality, most comprehensive product range. From patient to pathologist, the range includes the ideal product for each histology step and high-productivity workflow solutions for the entire lab. With complete histology systems featuring innovative automation and Novocastra™ reagents, the Biosystems Division creates better patient care through rapid turnaround, diagnostic confidence and close customer collaboration.

● Surgical Division

The Leica Microsystems Surgical Division's focus is to partner with and support micro-surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

Leica Microsystems' mission is to be the world's first-choice provider of innovative solutions to our customers' needs for vision, measurement and analysis of micro-structures.

Leica, the leading brand for microscopes and scientific instruments, developed from five brand names, all with a long tradition: Wild, Leitz, Reichert, Jung and Cambridge Instruments. Yet Leica symbolizes innovation as well as tradition.

Leica Microsystems – an international company with a strong network of customer services

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in more than 100 countries.