

## P/N: 73513-0102

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### Document identity

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Commit: 81008

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### Website

<http://www.flir.com>

### Customer support

<http://support.flir.com>

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General description	
<p>The FLIR A65 has features and functions that make it the natural choice for anyone who uses PC software to solve problems and for whom 640 × 512 pixel resolution is sufficient.</p> <p>Among its main features are GigE Vision and GenICam compliance, which makes it plug-and-play when used with software packages such as IMAQ Vision and Halcon.</p>	
Key features:	
<ul style="list-style-type: none"> <li>• Very affordable.</li> <li>• Compact (40 mm × 43 mm × 106 mm).</li> <li>• GigE Vision and GenICam compliant.</li> <li>• GigE Vision lockable connector.</li> <li>• PoE (power over Ethernet).</li> <li>• 8-bit 640 × 512 pixel images streamed at 7.5 Hz, signal linear</li> <li>• 14-bit 640 × 512 pixel images streamed at 7.5 Hz, signal and temperature linear</li> <li>• Synchronization between cameras possible.</li> <li>• 1x+1x GPIO.</li> <li>• Compliant with any software that supports GenICam, including National Instruments IMAQ Vision, Stemmers Common Vision Blox, and COGNEX Vision Pro.</li> </ul>	
Typical applications:	
<ul style="list-style-type: none"> <li>• Automation and thermal machine vision.</li> <li>• Entry level "high-speed" R&amp;D.</li> </ul>	
Imaging and optical data	
IR resolution	640 × 512 pixels
Thermal sensitivity/NETD	< 0.05°C @ +30°C (+86°F) / 50 mK
Field of view (FOV)	45° × 37°
Minimum focus distance	7.6 cm (3.0 in.)
Focal length	13 mm (0.5 in.)
Spatial resolution (IFOV)	1.31 mrad
F-number	1.25
Image frequency	7.5 Hz
Focus	Fixed
Detector data	
Detector type	Focal plane array (FPA), uncooled VOX microbolometer
Spectral range	7.5–13 μm
Detector pitch	17 μm
Detector time constant	Typical 12 ms



# FLIR A65 f=13 mm with SC kit (7.5 Hz)

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Measurement	
Object temperature range	<ul style="list-style-type: none"> <li>-25 to +135°C (-13 to 275°F)</li> <li>-40 to +550°C (-40 to +1022°F)</li> </ul>
Accuracy	±5°C (±9°F) or ±5% of reading

Measurement analysis	
Atmospheric transmission correction	Automatic, based on inputs for distance, atmospheric temperature and relative humidity
Optics transmission correction	Automatic, based on signals from internal sensors
Emissivity correction	Variable from 0.5 to 1.0
Reflected apparent temperature correction	Automatic, based on input of reflected temperature
External optics/windows correction	Automatic, based on input of optics/window transmission and temperature
Measurement corrections	Global object parameters

Ethernet	
Ethernet	Control and image
Ethernet, type	Gigabit Ethernet
Ethernet, standard	IEEE 802.3
Ethernet, connector type	RJ-45
Ethernet, communication	GigE Vision ver. 1.2 Client API GenICam compliant
Ethernet, image streaming	8-bit monochrome @ 7.5 Hz <ul style="list-style-type: none"> <li>Signal linear/ DDE</li> <li>Automatic/ Manual</li> <li>Flip H&amp;V</li> </ul> 14-bit 640 × 512 pixels @ 7.5 Hz <ul style="list-style-type: none"> <li>Signal linear/ DDE</li> <li>Temperature linear</li> </ul> GigE Vision and GenICam compatible
Ethernet, power	Power over Ethernet, PoE IEEE 802.3af class 0 Power
Ethernet, protocols	TCP, UDP, ICMP, IGMP, DHCP, GigEVision

Digital input/output	
Digital input, purpose	General purpose
Digital input	1× opto-isolated, "0" <1.2 VDC, "1" = 2–25 VDC.
Digital output, purpose	General purpose output to ext. device (programmatically set)
Digital output	1× opto-isolated, 2–40 VDC, max. 185 mA
Digital I/O, isolation voltage	500 VRMS
Digital I/O, supply voltage	2–40 VDC, max. 200 mA
Digital I/O, connector type	12-pole M12 connector (shared with Digital synchronization and External power)
Synchronization in, purpose	Frame synchronization in to control camera
Synchronization in	1×, non-isolated
Synchronization in, type	LVC Buffer @3.3V, "0" <0.8 V, "1">2.0 V.
Synchronization out, purpose	Frame synchronization out to control another FLIR Ax5 camera



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Digital input/output	
Synchronization out	1x, non-isolated
Synchronization out, type	LVC Buffer @ 3.3V, "0"=24 MA max, "1"= -24 mA max.
Digital synchronization, connector type	12-pole M12 connector (shared with Digital I/O and External power)

Power system	
External power operation	12/24 VDC, < 3.5 W nominal < 6.0 W absolute max.
External power, connector type	12-pole M12 connector (shared with Digital I/O and Digital Synchronization )
Voltage	Allowed range 10–30 VDC

Environmental data	
Operating temperature range	-15°C to +50°C (+5°F to +122°F) <div style="border: 1px solid black; padding: 5px;"><p> <b>NOTE</b></p><p>The operating temperature range assumes that the camera is mounted on the base support (included in the package) or a similar type of heatsink.</p></div>
Storage temperature range	-40°C to +70°C (-40°F to +158°F)
Humidity (operating and storage)	IEC 60068-2-30/24 h 95% relative humidity +25° C to +40°C (+77°F to +104°F)
EMC	<ul style="list-style-type: none"><li>• EN 61000-6-2 (Immunity)</li><li>• EN 61000-6-3 (Emission)</li><li>• FCC 47 CFR Part 15 Class B (Emission)</li></ul>
Encapsulation	IP 40 (IEC 60529) with base support mounted
Shock	25 g (IEC 60068-2-27)
Vibration	2 g (IEC 60068-2-6)
Declaration of conformity	See: <a href="https://support.flir.com/resources/DoC">https://support.flir.com/resources/DoC</a>

Physical data	
Weight	0.200 kg (0.44 lb.)
Camera size (L × W × H)	106 × 40 × 43 mm (4.2 × 1.6 × 1.7 in.)
Tripod mounting	1 × UNC ¼"-20 (with Base support accessory, included in the delivery box)
Base mounting	4 × M3 thread mounting holes (bottom)
Housing material	Magnesium and aluminum



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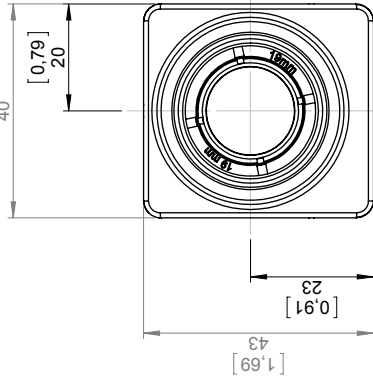
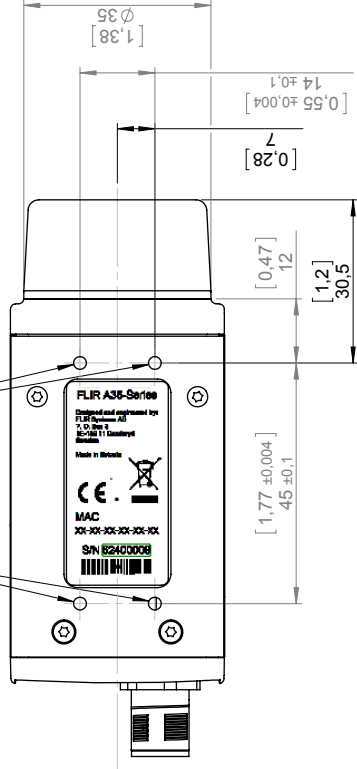
Shipping information	
Packaging, type	Cardboard box
List of contents	<ul style="list-style-type: none"><li>• Hard transport case</li><li>• Infrared camera with lens</li><li>• Base support</li><li>• Cable tie (2 ea.)</li><li>• Ethernet cable CAT-6, 2m/6.6 ft (2 ea.)</li><li>• FLIR Research Studio 1-Year Subscription (license only)</li><li>• Focus adjustment tool</li><li>• Gooseneck</li><li>• Mains cable kit (UK,EU,US)</li><li>• PoE Injector (power over Ethernet)</li><li>• Printed documentation</li><li>• Table stand</li></ul>
Packaging, weight	5.3 kg (11.7 lb.)
Packaging, size	370 × 180 × 320 mm (14.6 × 7.1 × 12.6 in.)
EAN-13	7332558010624
UPC-12	845188011291
Country of origin	Sweden

### Supplies & accessories:

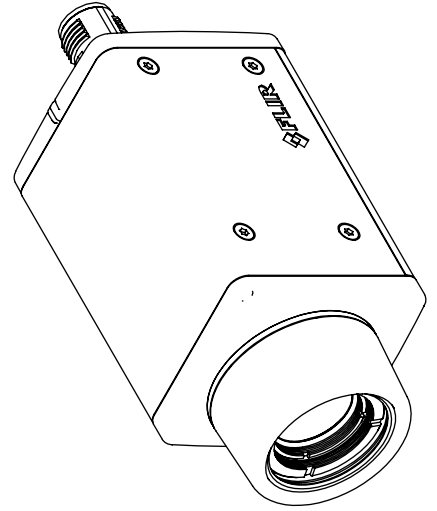
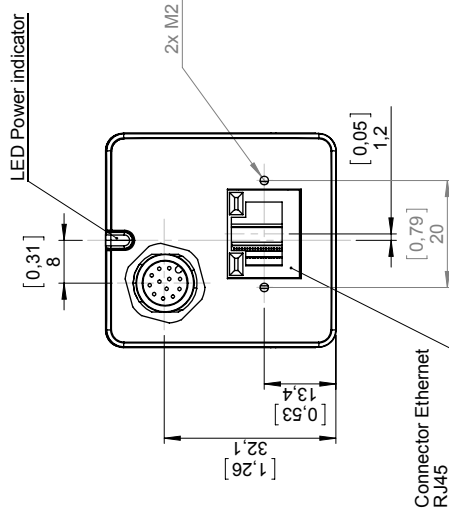
- T951004ACC; Ethernet cable CAT6, 2 m/6.6 ft.
- T198349; Base support
- T198348; Cable kit Mains (UK,EU,US)
- T127605ACC; Cable M12 Pigtail
- T127606ACC; Cable M12 Sync
- T199698; Environmental housing for Ax5
- T199356; FLIR Ax5 accessory starter kit
- T911183; Gigabit PoE injector 16 W, with multi-plugs
- T198392; Table stand kit
- T198594ACC; Transport case Ax5
- T300243; FLIR Thermal Studio Pro, 1 Year Subscription
- T300083; FLIR Thermal Studio Pro, Perpetual license
- T300341; FLIR Thermal Studio Standard, 1 Year Subscription
- T300258; FLIR Thermal Studio Standard, Perpetual license
- T198584; FLIR Tools
- T199233; FLIR Atlas SDK for .NET
- 4232535; FLIR Research Studio, Professional Edition - 1 Year Subscription (online activation)
- 4232556; FLIR Research Studio, Professional Edition - Perpetual License (online activation)
- 4232590; FLIR Research Studio, Professional Edition - Perpetual License (USB dongle)
- 4220499; FLIR Research Studio, Standard Edition - 1 Year Subscription (online activation)
- 4220500; FLIR Research Studio, Standard Edition - Perpetual License (online activation)
- 4220646; FLIR Research Studio, Standard Edition - Perpetual License (USB dongle)
- 4232591; FLIR ResearchIR to Research Studio, Professional Edition - 1 Year License Upgrade

Basic dimensions  
for cameras with  
focal length:  
f= 7,5 mm  
f= 9 mm  
f=13 mm  
f=19 mm

4x M3  
Depth max 4 mm



Connector GP I/O  
M12 12-pin



<b>FLIR</b>		Material	
Konstr/Drawn <b>P. MARCUS</b>		-	
Datum/Date <b>2014-01-29</b>		Kontr/Check <b>MABR</b>	
Ändrad av/Modified by <b>P. MARCUS</b>		Ytbehandling/Roughness Ra $\mu\text{m}$	
Där ej annat anges/Unless otherwise stated Gen tol ISO 2768-mK		Benämning/Denomination <b>Basic dimensions Ax5 f=7.5 mm to f=100 mm</b>	
Utdrag ur/except from ISO 2768-m		Ytbehandling/Surface treatment	
0.5-6 ±0.1 Hållisradier		1:1 Skala/Scale	
(6)-30 ±0.2 Fillet radii		1:17 BlockSheet	
(120)-400 ±0.5 Kanter brutna		A3 Size	
(400)-1000 ±0.8 Edges broken		Rev A	
		Rit nr/Drawing No <b>T128116</b>	

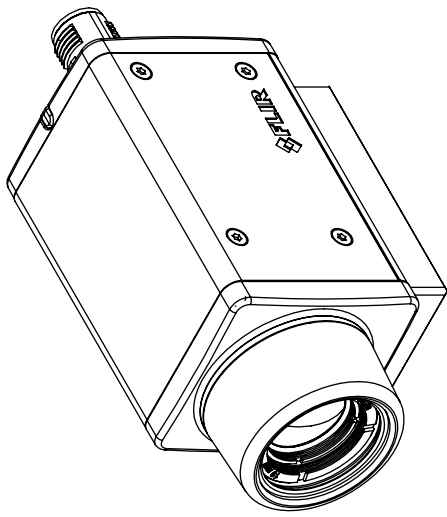
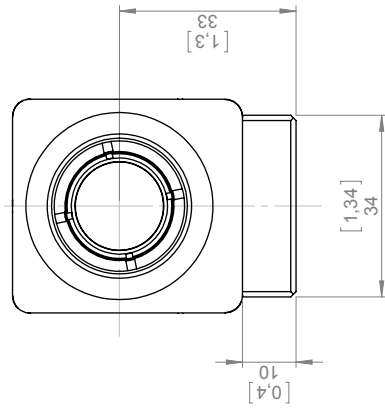
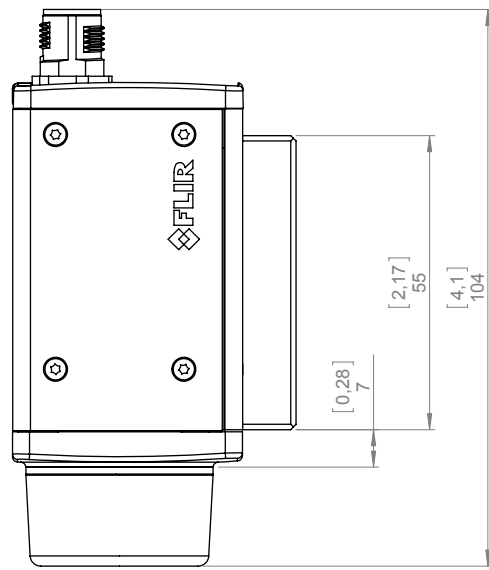
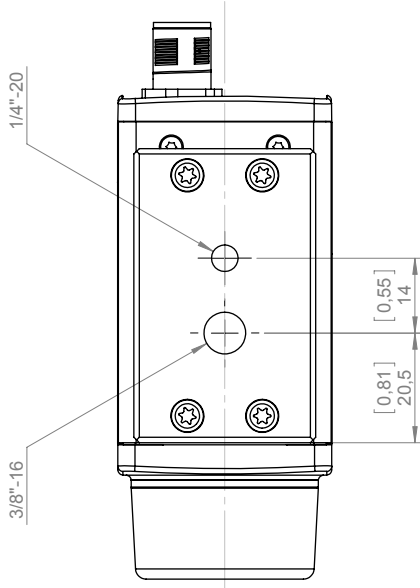
1 2 3 4 5 6 7 8 9 10

A B C D E F G

1 2 3 4 5

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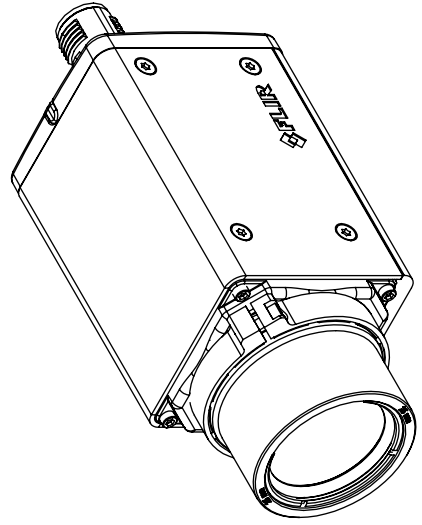
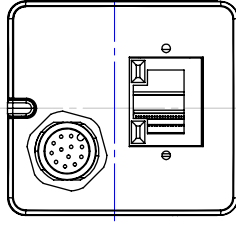
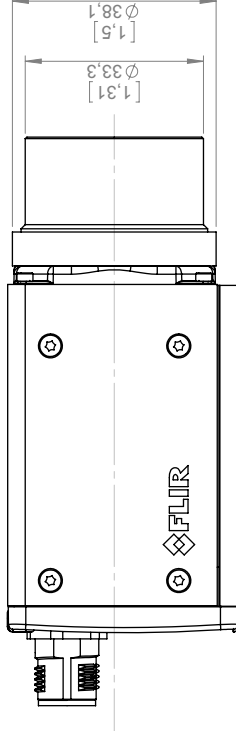
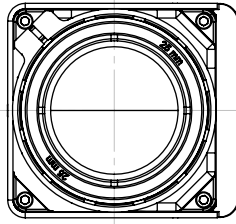
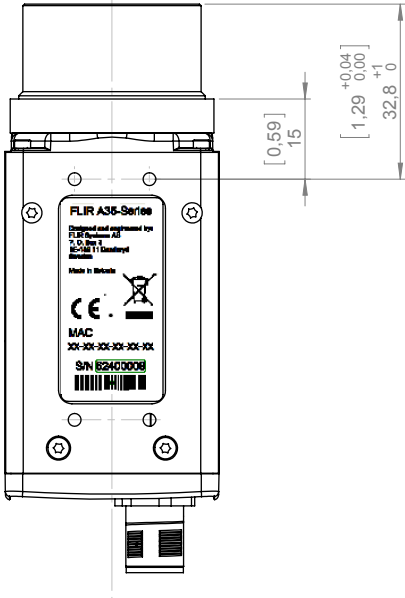
Basic dimensions for  
add-on base support



Konstr/Drawn	P. MARCUS	Datum/Date	2014-01-29	Kontr/Check	MABR	Material	-
Ändrad av/Modified by	P. MARCUS	Ändrad/Modified	2014-02-11	Ytjämnhet/Roughness	Ra	Ytbehandling/Surface treatment	
Övrigt uttryck/Except from ISO 2768-m	0,5-6 ±0,1 ±0,2 ±0,3 ±0,5 ±0,8	Benämning/Denomination					
Gen till ISO 2768-mK	±0,1 ±0,2 ±0,3 ±0,5 ±0,8						
Utdrag ur/except from ISO 2768-m	Höjlsradier Fileradii Kantler brutna Edgess broken						
Basic dimensions Ax5		Scale/Scale	1:1	Blad/Sheet		2(7)	Rev
f=7,5 mm to f=100 mm		ArtNo.	T128116	Siv		A3	Rev
		Ritning/Drawing No.	T128116				A



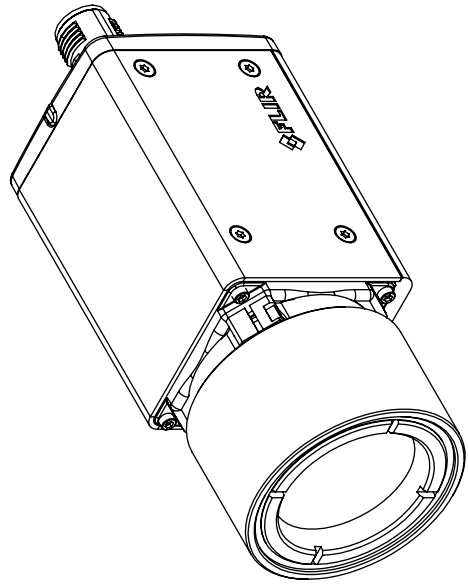
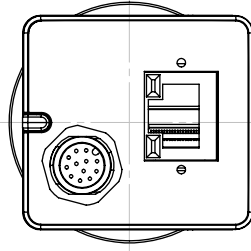
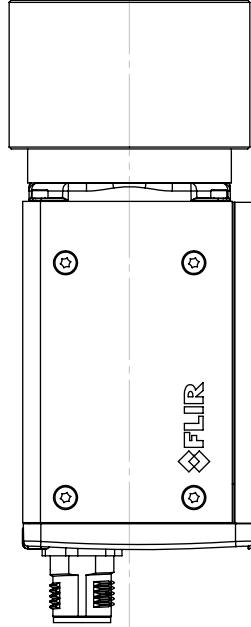
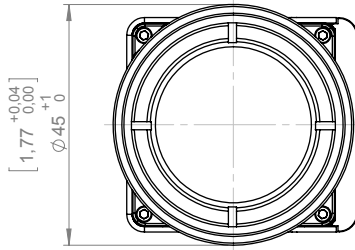
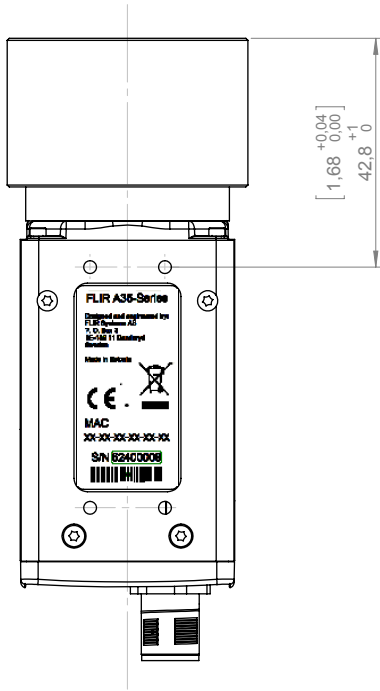
Basic dimensions:  
 Camera with focal length  
 f=25 mm IR lens.  
 Only dimensions valid for  
 this IR lens.  
 For all other dimensions see pages  
 1 and 2.



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Konstr/Drawn <b>P. MARCUS</b>		Datum/Date <b>2014-01-29</b>	Kontr/Check <b>MABR</b>	Material -
Ändrad av/Modified by <b>P. MARCUS</b>		Ändrad/Modified <b>2014-02-11</b>	Ytjämnhet/Roughness Ra	Ytbehandling/Surface treatment µm
Gen tel ISO 2768-mK 0.5-6 ±0.1 Hållarsradier (0.5-6) ±0.2 Filtr radii (120-400) ±0.5 Kanter brutna (400)-1000 ±0.8 Edges broken		Benämning/Denomination <b>Basic dimensions Ax5 f=7.5 mm to f=100 mm</b>		
FLIR		Skala/Scale 1:1	Blad/Sheet 3(7)	Rev A3
		ÄRNO.	Ritning/Drawing No. <b>T128116</b>	A

Basic dimensions:  
 Camera with focal length  
 f=35 mm IR lens.  
 Only dimensions valid for  
 this IR lens.  
 For all other dimensions see pages  
 1 and 2.

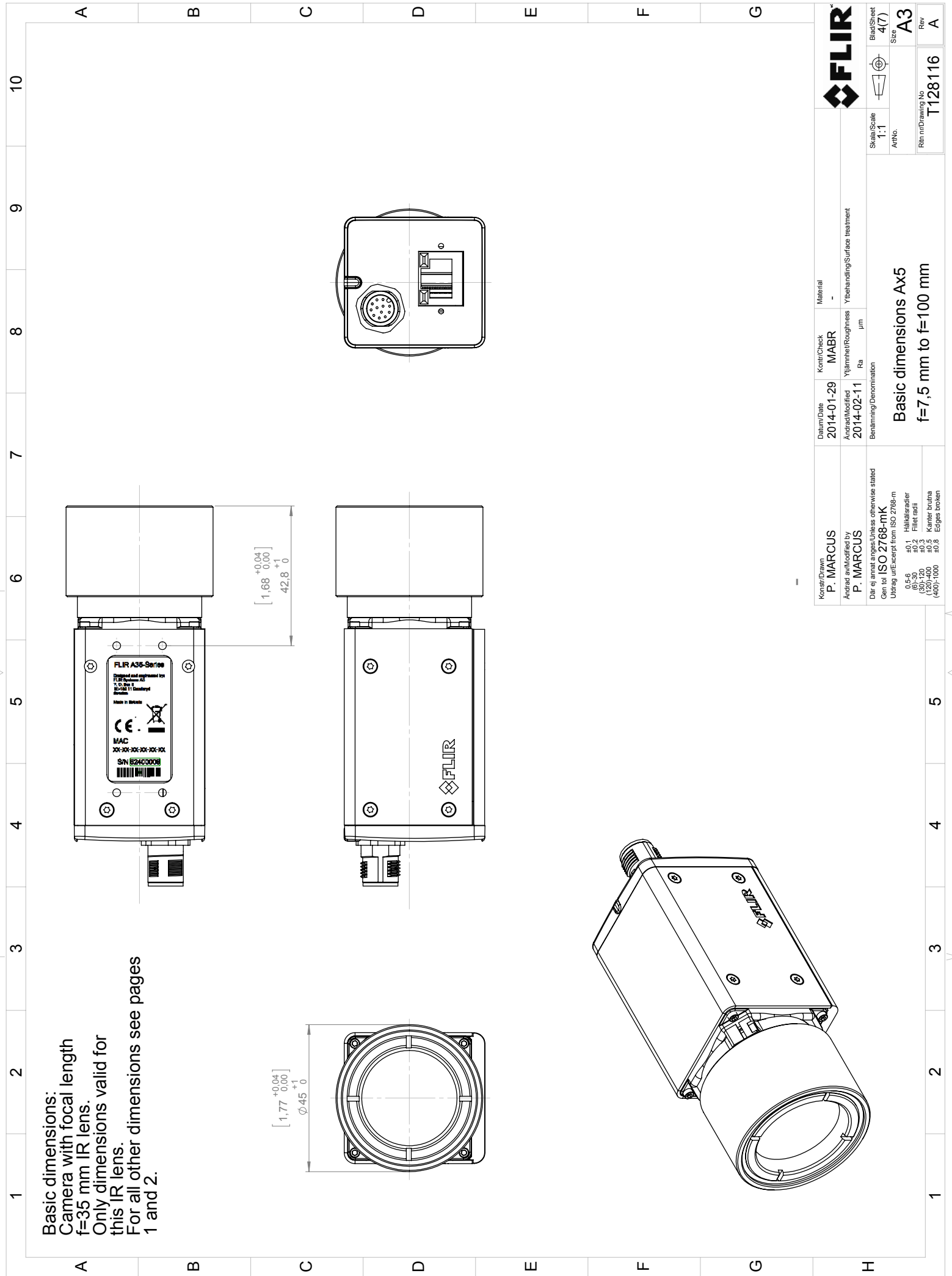


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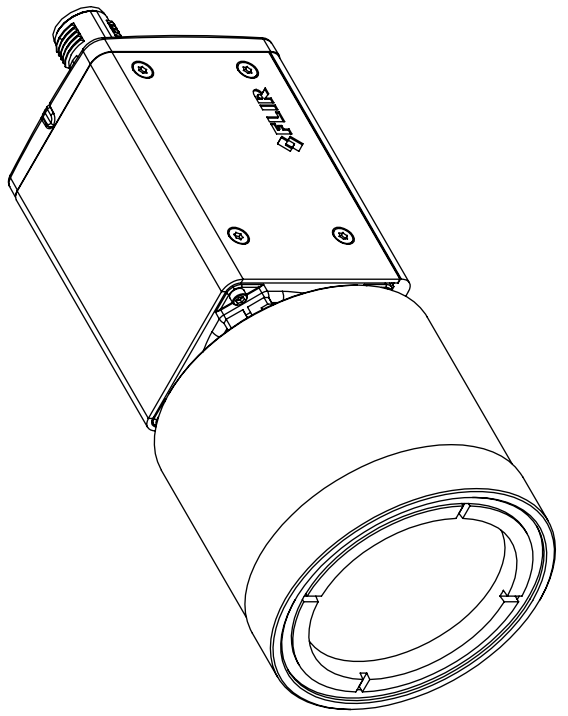
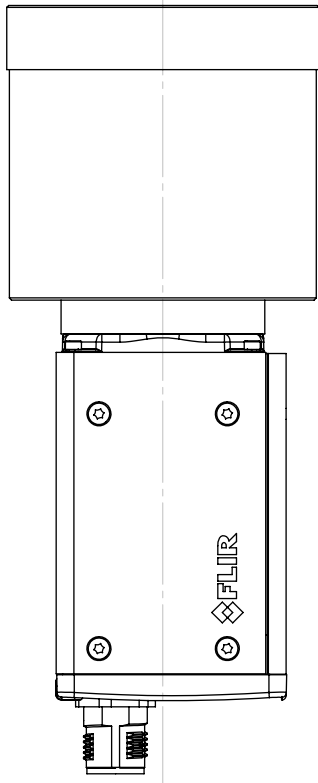
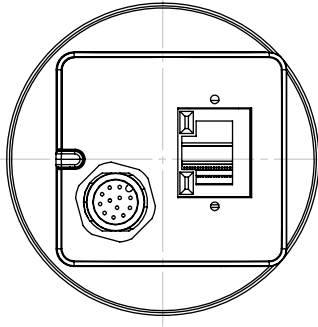
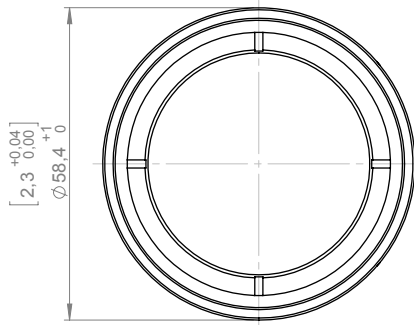
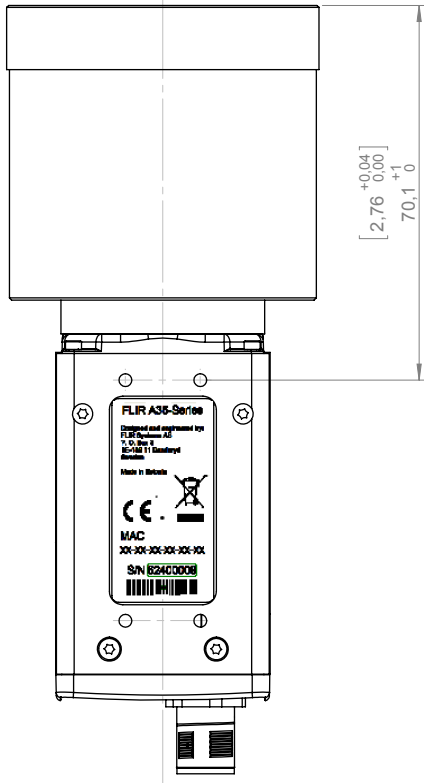
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Konstr/Drawn <b>P. MARCUS</b>		Datum/Date <b>2014-01-29</b>	Kontr/Check <b>MABR</b>	Material <b>-</b>
Ändrad av/Modified by <b>P. MARCUS</b>		Ändrad/Modified <b>2014-02-11</b>	Ytjämnhet/Roughness <b>Ra</b>	Ytbehandling/Surface treatment <b>µm</b>
Övrigt utöver ISO 2768-mK 0.5-6 ±0.1 Hållradier (6)-30 ±0.2 Fillet radii (120)-400 ±0.5 Kanter brutna (400)-1000 ±0.8 Edgese broken		Benämning/Denomination <b>Basic dimensions Ax5 f=7.5 mm to f=100 mm</b>		
Stapel/Scale <b>1:1</b>		Blad/Sheet <b>4(7)</b>		Rev <b>A3</b>
Ritning/Drawing No. <b>T128116</b>		Artno.		





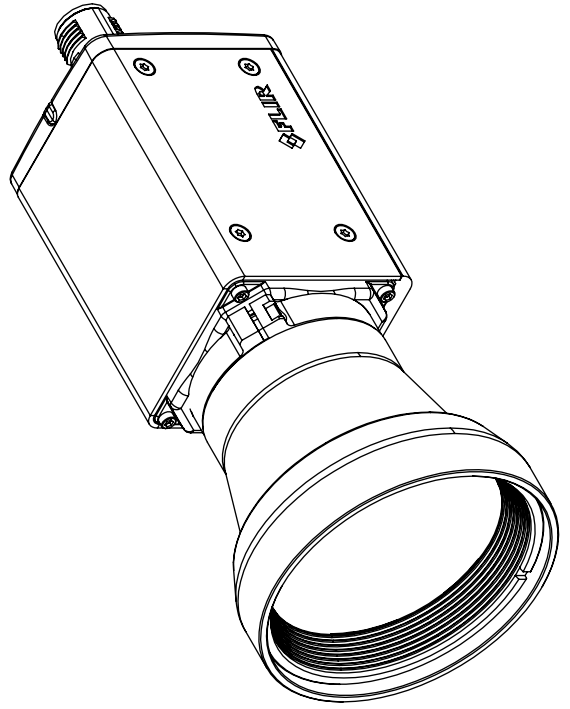
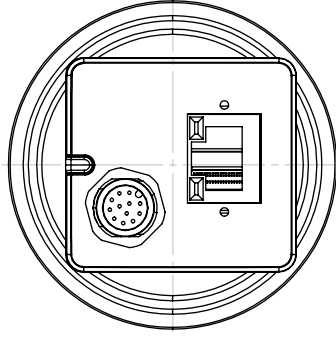
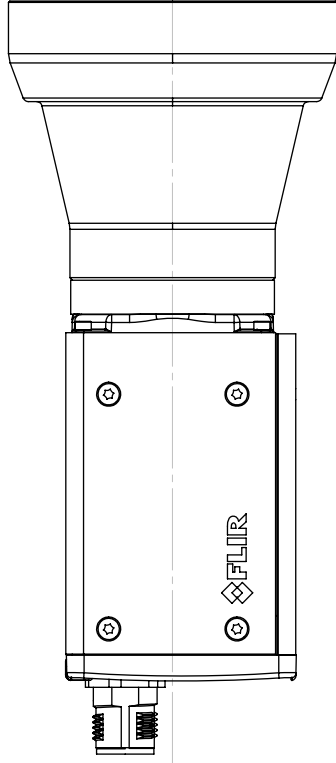
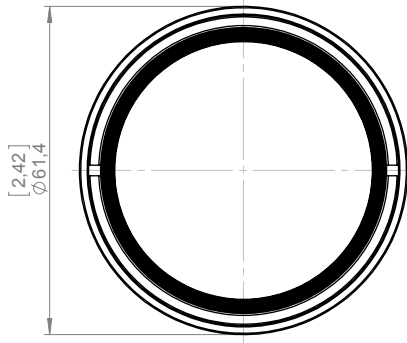
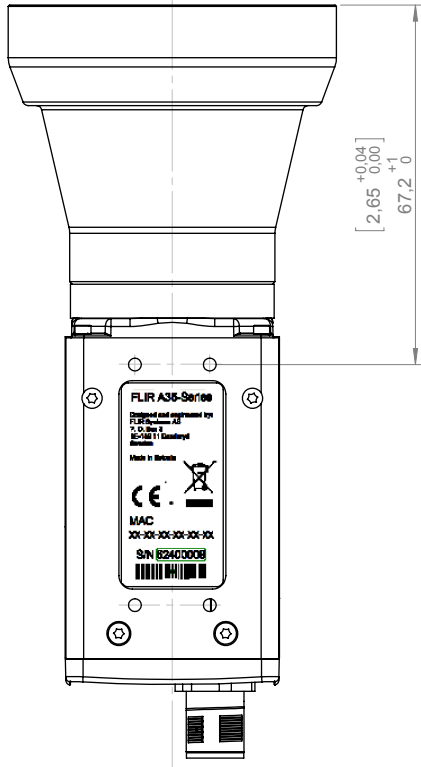
Basic dimensions:  
 Camera with focal length  
 $f=50$  mm IR lens.  
 Only dimensions valid for  
 this IR lens.  
 For all other dimensions see pages  
 1 and 2.



Konstr/Drawn <b>P. MARCUS</b>		Datum/Date <b>2014-01-29</b>	Kontr/Check <b>MABR</b>	Material -
Ändrad av/Modified by <b>P. MARCUS</b>		Ändrad/Modified <b>2014-02-11</b>	Ytjämnhet/Roughness Ra	Ytbehandling/Surface treatment µm
Ön till ISO 2768-mK Utdrag ur/except from ISO 2768-m		Benämning/Denomination <b>Basic dimensions Ax5</b> <b>f=7,5 mm to f=100 mm</b>		
0,5-6 0,7-30 0,1-20 120-400 400-1000		+0,1 Hållradier +0,2 Fillet radii +0,5 Kanter brutna +0,8 Edgcs broken		
Stapel/Scale 1:1		Blad/Sheet 5(7)		Rev <b>A3</b>
Artno.		Ritning/Drawing No. <b>T128116</b>		<b>A</b>



Basic dimensions:  
 Camera with focal length  
 f=60 mm IR lens.  
 Only dimensions valid for  
 this IR lens.  
 For all other dimensions see pages  
 1 and 2.



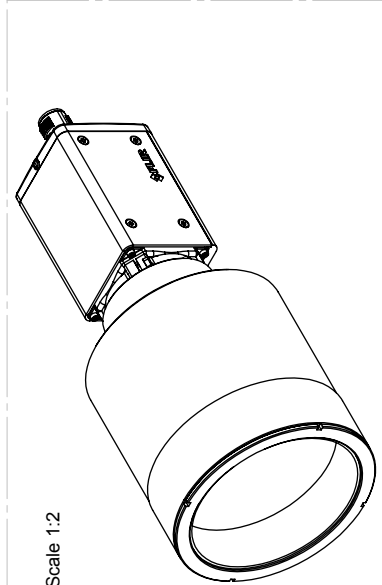
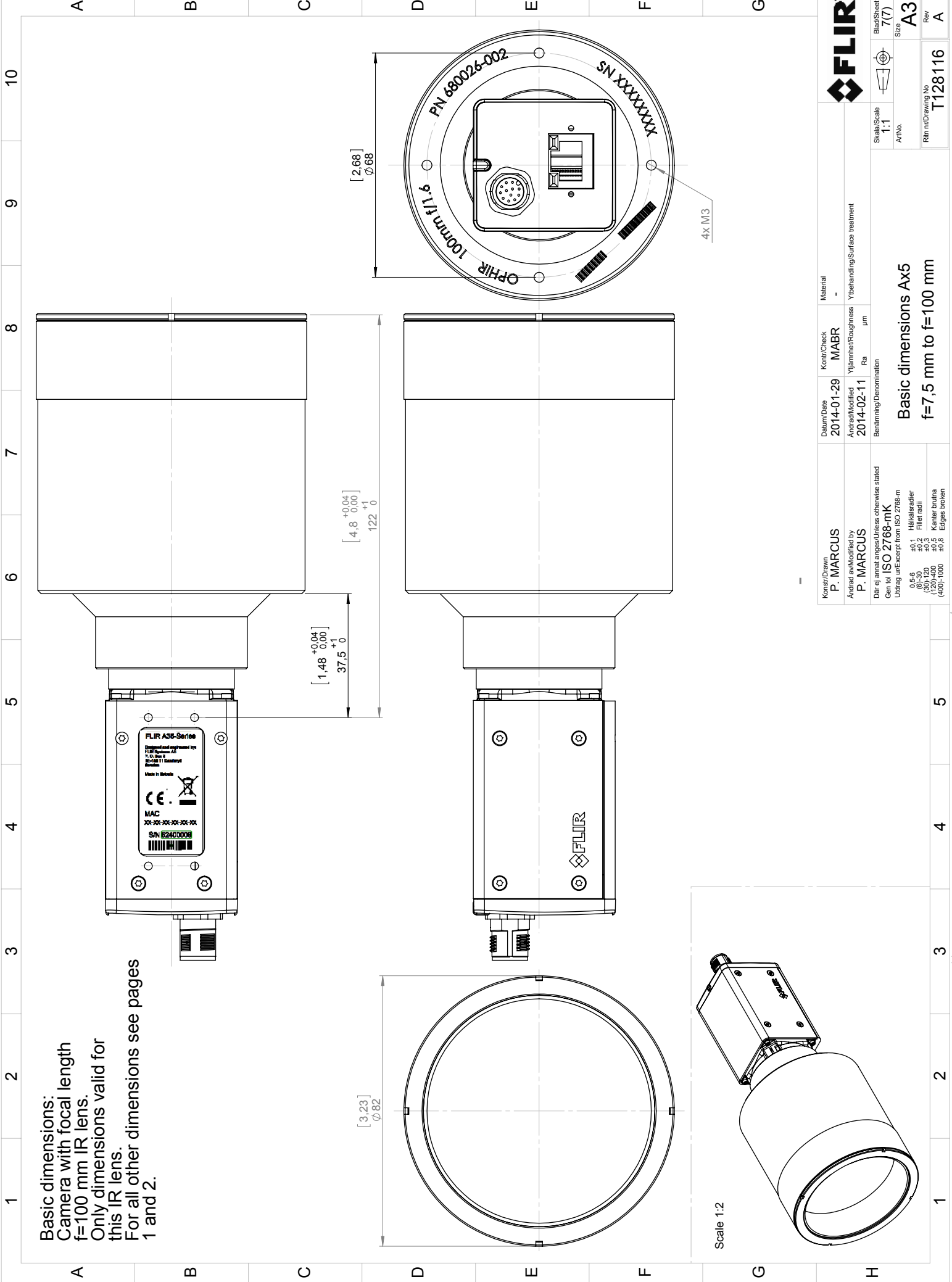
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Konstr/Drawn <b>P. MARCUS</b>	Datum/Date <b>2014-01-29</b>	Kontr/Check <b>MABR</b>	Material -
Ändrad av/Modified by <b>P. MARCUS</b>	Ändrad/Modified <b>2014-02-11</b>	Ytjämnhet/Roughness Ra	Ytbehandling/Surface treatment µm
Ön till ISO 2768-mK Utdrag ur/except from ISO 2768-m	Där ej annat anges/Unless otherwise stated		
0.5-6	+0.1	Höklärsradier	
(0)-30	+0.2	Fileradii	
(120)-400	+0.5	Kantler brutna	
(400)-1000	+0.8	Edgese broken	
Scale/Scale 1:1 AINo. 6(7) Blad/Sheet A3 Rev A Rinn nr/Drawing No. T128116			
<b>Basic dimensions Ax5          f=7.5 mm to f=100 mm</b>			



Basic dimensions:  
 Camera with focal length  
 f=100 mm IR lens.  
 Only dimensions valid for  
 this IR lens.  
 For all other dimensions see pages  
 1 and 2.



<b>FLIR</b>		Blad/Sheet 7(7)		Siz <b>A3</b>		Rev <b>A</b>	
Scale/Scale 1:1		Artno. T128116		Rin nr/Drawing No. T128116			
Konstr/Drawn <b>P. MARCUS</b>	Datum/Date 2014-01-29	Kontr/Check <b>MABR</b>	Material -	Basic dimensions Ax5 f=7.5 mm to f=100 mm			
Ändrad av/Modified by <b>P. MARCUS</b>	Ändrad/Modified 2014-02-11	Ytjämnhet/Roughness Ra	Ytbehandling/Surface treatment µm				
Där ej annat anges/Unless otherwise stated Utdrag ur/Excerpt from ISO 2768-m							
0.5-6		+0.1		Höjlsradier			
(0.5-6)		+0.2		Fileradii			
(120-400)		±0.5		Kantler brutna			
(400-1000)		±0.8		Edgar broten			