

angēnieux

**ENG lens 19x7.3 HR / HD
ENG lens 26x7.8 HR / HD
and Accessories**

**TECHNICAL MANUAL
MANUEL TECHNIQUE**



THALES

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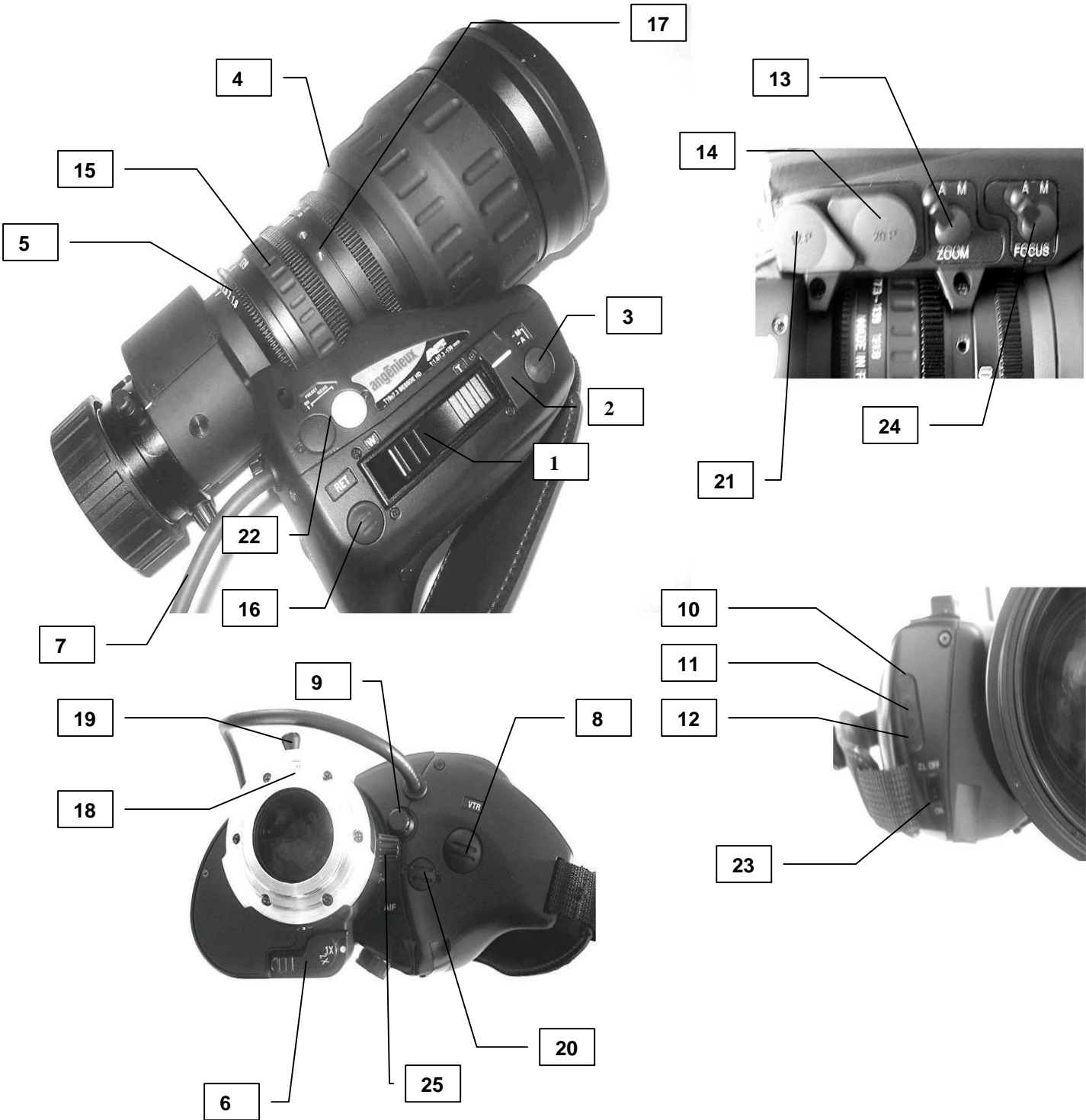
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Design and specifications are subject to change without notice

La conception et les spécifications sont susceptibles d'être modifiées sans préavis

1. Description



Description	
1	Zoom see saw control lever / <i>commande électrique focale</i>
2	Iris mode - switch auto/manu / <i>Fonctionnement iris-switch auto/manu</i>
3	Iris momentary switch / <i>switch iris momentary</i>
4	Focus ring / <i>bague de mise au point</i>
5	Iris ring / <i>bague de commande iris</i>
6	Range extender lever / <i>levier de commande du multiplicateur de focale</i>
7	Lens cable / <i>cable d'alimentation électrique</i>
8	VTR / <i>Bouton VTR</i>
9	Zoom speed control potentiometer / <i>potentiomètre de commande de vitesse focale</i>
10	Iris adjustment – gain / <i>Réglage de l'iris – gain</i>
11	Iris adjustment – open / <i>Réglage de l'iris – ouverture</i>
12	Iris adjustment - close / <i>Réglage de l'iris – fermeture</i>
13	Zoom mode knob / <i>Bouton de choix de commande de la focale - AUTO / MANU</i>
14	Electrical interface for zoom handle / <i>interface électrique pour poignée</i>
15	Zoom ring / <i>bague de commande manuel focale</i>
16	Video return switch / <i>bouton de retour vidéo</i>
17	Mechanical interface for manual focus module / <i>interface mécanique pour module de commande manuelle de la mise au point</i>
18	Lens mount locating pin / <i>pion d'orientation de la monture</i>
19	Macro function / <i>fonction macro</i>
20	AIF switch – Assisted Internal Focus / <i>Switch AIF – Assistance à la mise au point</i>
21	Electrical interface for optical encoders (optional) / <i>Interface électrique pour codeurs optiques (en option)</i>
22	Preset and memo switch for zoom / <i>selectin et memorisation d'un plan focal</i>
23	Zoom limit switch on/off / <i>Activation des limitations de zooming</i>
24	Focus mode knob / <i>Bouton de choix de commande de la mise au point - AUTO / MANU</i>
25	Back focal length lever / <i>réglage de back focus</i>

2. Performances

2.1. Specifications

Versions available							
Designation	Extender 2x	Without extender	HR	HD	SMD	SSD	SSDE
T 19x7.3 BESMD HR / T 26x7.8 BESMD HR	X		X		X		
T 19x7.3 BESSD HR / T 26x7.8 BESSD HR	X		X			X	
T 19x7.3 BESSDE HR / T 26x7.8 BESSDE HR	X		X				X
T 19x7.3 BESMD HD / T 26x7.8 BESMD HD	X			X	X		
T 19x7.3 BESSD HD / T 26x7.8 BESSD HD	X			X		X	
T 19x7.3 BESSDE HD / T 26x7.8 BESSDE HD	X			X			X
T 19x7.3 BSMD HD		X		X	X		
T 19x7.3 BSSD HD		X		X		X	
T 19x7.3 BSSDE HD		X		X			X

SMD : Standard Digital servo control

SSD : version with built in servo focus

SSDE : version with 16 bits serial digital connection for zoom and handle

	BROADCAST SD - Format ratio 4/3		BROADCAST HD - Format ratio 16/9	
	19x7.3	26x7.8	19x7.3	26x7.8
RATIO	19x	26x	19x	26x
MOD	0.6 m	0.9 m	0.6 m	0.9 m
FOCAL LENGTH	7.3-139 mm	7.8-203 mm	7.3-139 mm	7.8-203 mm
RE2x	14.6-278 mm	15.6-406 mm	14.6-278 mm	15.6-406 mm
APERTURE	f/1.8 to 105 mm f/2.4 to 139 mm	f/1.8 to 126 mm f/2.8 to 203 mm	f/1.8 to 105 mm f/2.4 to 139 mm	f/2.2 to 160 mm f/2.8 to 203 mm
RE 2x	f/3.6 to 210 mm f/4.8 to 278 mm	f/3.6 to 252 mm f/5.6 to 406 mm	f/3.6 to 210 mm f/4.8 to 278 mm	f/4.4 to 320 mm f/5.6 to 406 mm
HOR. FIELD ANGLE	62° - 3.6°	59° - 2.5°	66.6° - 4°	6 3.2° - 2.7°
RE 2x	33.5° - 1.8°	31.5° - 1.2°	36.4° - 2°	34.2° - 1.3°
MINIMUM OBJECT DIMENSION (mm)	(660x499) – (36x27)	(896x678) – (37x28)	(717x408) – (40x22)	(971x555) – (41x23)
RE 2x	(330x250) – (18x14)	(457x342) – (19x14)	(358x204) – (20x11)	(499x280) – (21x12)
EXIT PUPIL POSITION	160 mm	290 mm	160 mm	290 mm
BACK FOCUS IN AIR	42.1 mm	42.3 mm	42.1 mm	42.3 mm
WEIGHT	1.84kg – 4 lbs	1.98kg – 4.3 lbs	1.84kg – 4 lbs	1.98kg – 4.3 lbs
OVERALL LENGTH	216 mm	245 mm	216 mm	245 mm
FRONT DIAMETER	87 mm	103 mm	87 mm	103 mm

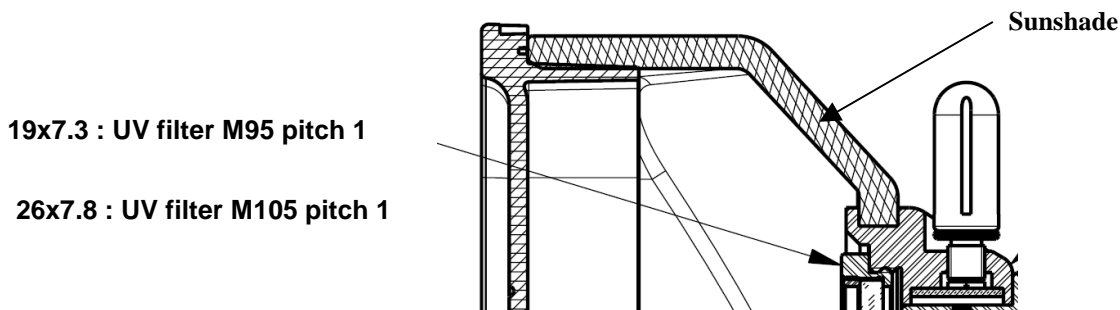
Electrical specifications	
Power requirements	+V = 12 VDC (10 V to 17 V) Consumption maxi – 650 mA
Zoom servo	Time for full range 0.8 sec
Zoom follow	CF: 2V LF: 7V
Focus servo	Time for full range 1.2 sec
Focus follow	MOD 2V ∞ 7V
Iris servo	Time for full range 1 sec
Iris follow	F/16: 3.4V F/2.8: 6.2V
Optical encoders	26000 pitches

2.2. Installation

2.2.1. Mounting the lens on the camera

- Ensure the camera is not powered
- Remove the rear cap
- Install the lens on camera respecting the locating pin on camera mount
- Turn the camera bayonet ring fully clockwise to fix the lens securely
- Connect the lens cable on the camera
- Remove the front cap
- Mount the sunshade

2.2.2. Filters mounting



CAUTION : When the lens is used in hard conditions (cold, humidity), keep sunshade with filter to protect the lens

2.2.3. Camera start-up

- Follow the instructions of the camera manufacturer

2.2.4. Back focus adjutment

- Start with this adjustment on the lens before shoting – see section 2 3 5

2.3. Operating conditions

2.3.1. Focusing

For SMD version, only manual focusing is available

- Focusing is obtained by rotating the focus ring. Turn the ring clockwise for close focus
- Manual focus handle is available (see accessories section)

For SSD or SSDE version, manual or servo operation is selected with focus mode knob

Manual operation “M”

- Focus mode knob in position “M”. Focus is ensured by focus ring

Automatic operation “A”

- Focus mode knob in position “A”. Focus is ensured by electrical focus handle (see accessories section)

2.3.2. Zooming

2.3.2.1 Selection

Manual or servo operation is selected with zoom mode knob

Manual operation “M”

Zoom knob in position “M”. Zooming is ensured by zoom ring or lever

Automatic operation “A”

Zoom mode knob in position “A”. Zooming is ensured by zoom control see saw lever or electrical zoom handle (see accessories section)

- Press T for telephoto
- Press W for wide angle

2.3.2.2 Speed

- Zoom speed can be changed by modifying pressure applied on the zoom see saw control.lever .
- Maximum zoom speed is preset by the zoom speed control potentiometer

Note : Driving the zoom by zoom ring when automatic operation is “ON” can damage the zoom motor

2.3.2.3 AIF function

- Pressure on AIF switch allows to go to the long focal length from all zoom positions to adjust focus by focus ring or focus handle
- Release AIF switch allows to come back to previous zoom position

2.3.3. Range extender

The range extender lever drives the range extender in position ON or OFF

- X1: Re OFF
- X2: Re ON

2.3.4. Macro

- Focus ring on mechanical end stop 0.6 m side
- Pull lever and turn macro ring in the arrow direction to end stop
- According to object distance, correct focus by focus ring

Macro function is not available with range extender in use

19x : MOD at 10 mm for short focal length (7.3 mm) gives field object dimension 78x43 mm

26x : MOD at 10 mm for short focal length (7.8 mm) gives field object dimension 81x45 mm

2.3.5. Back focus adjustment

A reference mark is set by manufacturer

Recommended procedure :

- Iris full opened
- Adjust the lighting to have the correct video level (on the green channel)
- Loosen the back focus length lever
- Set a target at 3 meters

A) Zoom up to telephoto

- Set the zoom ring to maximum telephoto
- Focus on the object by focus ring

B) Zoom back to wide angle

- Set the zoom ring to wide angle
- Focus on the object by back focal length ring
- Repeat steps A and B several times to obtain a correct focus on both telephoto and wide angle positions
- Block the back focal length lever

2.3.6. Iris operation

2.3.6.1 Iris functions

Iris mode switch is used to select the iris mode :

- Mode "A" (Automatic). Iris is controlled by the camera signals (CCU signal or video signal)
- Mode "M" (Manual). Iris is controlled by rotating the iris ring

Note : When the switch "Iris momentary switch" is pressed and if the iris is in manual operation, the iris changes to automatic operation.

2.3.6.2 Iris adjustment

3 potentiometers allow the following adjustments :

- “O” : iris range open side
- “C” : iris range closed side
- “G” : iris gain

Iris is preset by manufacturer. If necessary, adjust as follow :

A) Iris range

Iris mode swicthed on position “A”

1) Open side

- Set the camera iris control on the fully open position
- Adjust the potentiometer marked “O” to obtain “1.8” position on the iris ring

2) Closed side

- Set the camera iris control to the closed position
- Adjust the potentiometer marked “C” to obtain “FC” position on the iris ring

Note : If necessary, repeat steps 1 and 2 to optimize the adjustments

B) Gain adjustments

- Iris mode switch on position “A”
- Select Automatic mode on the camera
- Make the iris ring move from closed to open side (you may move the lens for that)
- Adjust the potentiometer marked “G” to obtain maximum gain without hunting

2.3.7. Other functions – Digital functions

2.3.7.1 Auto cruise zoom fonction

Start zooming with zoom see saw control lever and settle speed, press AIF switch and release see saw control lever , you will keep the same speed for the remaining zooming

Pressing a second time zoom see saw control lever will reset this function .

Same function is available from remote control (zoom handle)

2.3.7.2 Zoom position preset function

Zoom limit switch must be “OFF” to reach this function

This function allows to preset a zoom position.

Memorizing process :

- Set the zoom ring to the desired positions
- Pushing switch “PRESET” then switch “MEMO”

Call back stored positions :

- Call back zoom position by pushing swicth “MEMO”

Focus can be memorized simultaneously if preset is done with digital function

Same function is available from remote control (zoom handle)

2.3.7.3 Zoom limitation function

Zoom limit switch must be “ON” to reach this function

Short focal length limitation :

- Push and maintain “**PRESET**” switch
- Set the focal length with zoom see saw control lever
- Release the button

Long focal length limitation :

- Push and maintain “**MEMO**” switch
- Set the focal length with zoom see saw control lever .
- Release the button

In order to release the zoom limitation mode move the zoom limit switch on OFF position .

Same function is available from remote control (zoom handle)

2.3.7.4 External video

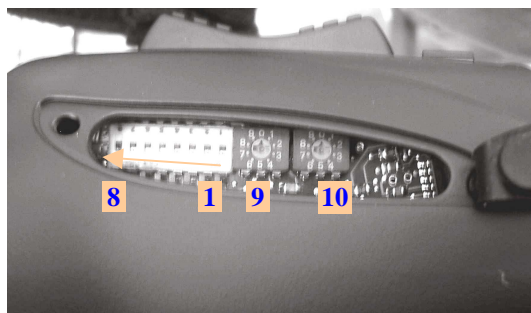
- “**RET**” switch displays the external video on the viewfinder.

2.3.7.5 Record

“**VTR**” switch starts and stops the recorder.

2.3.7.6 Digital functions available

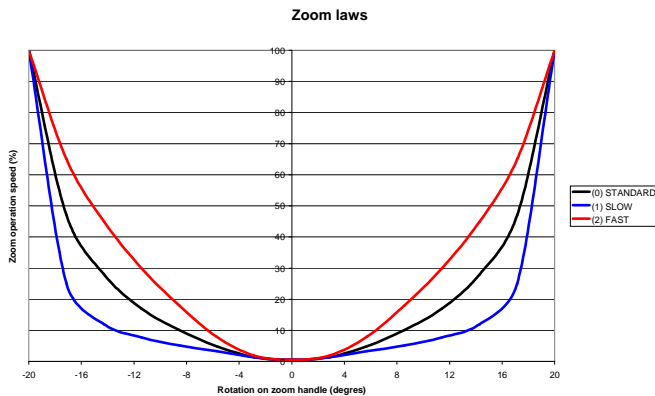
All above digital functions can be preset easily from internal dip switches in rocker switch housing



1	Focus preset function
2	Ramping limitation
3	Anti breathing (also available with manual focus)
4	Iris compensation (According 2x range extender)
5	Iris Auto / Manu or Manu / auto
6	Torque adjustment for iris ring in manual mode
7	VTR / AIF or AIF / VTR
8	RET / AIF or AIF / RET
9	Zoom laws 3 settings available, 6 for customization (Position 0 is standard)
10	Focus laws 5 settings available, 4 for customization (Position 0 is standard)

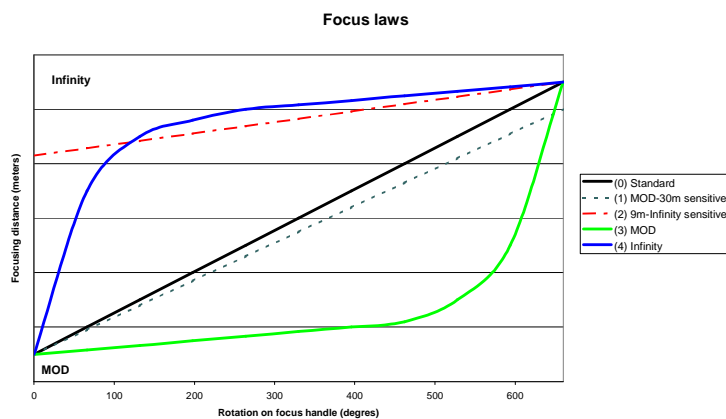
2.3.7.7 Zoom laws

3 different settings are available to get more sensitivity, according to the customers request, on zoom speed adjusted by thumb ring on zoom remote control



2.3.7.8 Focus laws

5 different settings are available to get more sensitivity, according to the customers request, on remote focus control.



2.3.7.9 Breathing

During focusing operation the angle of view change. By synchronisation of zoom movement to the focus movement, it is possible to keep angle of view constant

Function available by switch ON / OFF

2.3.7.10 Ramping

During zooming from wide to télé side with full aperture or near, illumination of the image decreases.

The ramping function prevents the lens to go to zoom position where the image can be underexposed.

Function available by switch ON / OFF

2.3.7.11 Iris compensation

Allow to open automatically the iris when range extender 2X is used

2.3.7.12 Remote controls SS version

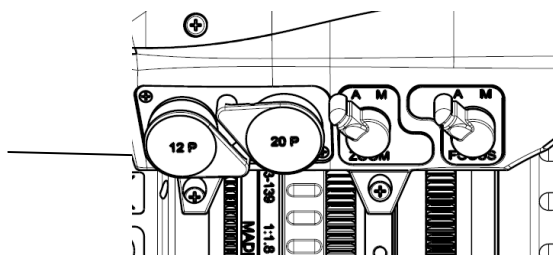
- Remote control mode can be done with focus and zoom handles (see accessories section)
- Digital remote control with serial communication RS 232 or RS 485** is possible via connector for zoom handle (14)

Protocols are available on request.

2.3.7.13 Rotary encoder SSDE version

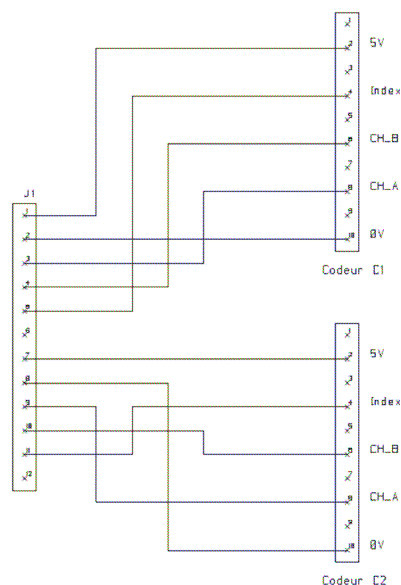
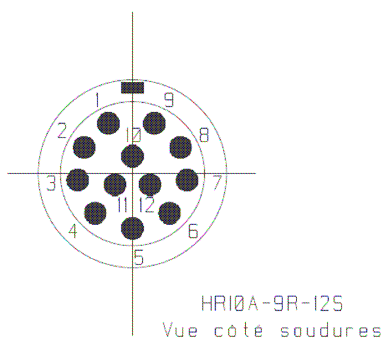
Optical encoders for zoom and focus function are available with the SSDE version. Informations are available through the connector HIROSE 12p (HR10A-10R-12S). It allows to know the position of each element accurately. The encoders used supply 26000 pitches over the entire range of movement.

Rotary encoder connector
HIROSE HR10A-10R-12S



The power is supplied through the connector.

Channels A and B supply signals in quadrature in order to count (TTL level)



Broche	Signal	Function
1	Input : C1 - 5V	Focus encoder
2	Input : C1 - 0V	Focus encoder
3	Output : C1 - chA	Focus encoder
4	Output : C1 - chB	Focus encoder
5	Output : C1 – Index	Focus encoder
6	NC	
7	Input : C2 - 5V	Zoom encoder
8	Input : C2 - 0V	Zoom encoder
9	Output : C2 - chA	Zoom encoder
10	Output : C2 - chB	Zoom encoder
11	Output : C2 – Index	Zoom encoder
12	NC	

2.3.8. Lens care and maintenance

2.3.8.1 Cleaning

It is recommended that the front and back lens are exempt of finger print or dust to assure the maximum of luminosity and contrast

The multi coated lens surfaces are delicate. Dust and particles must first remove with an “optical soft material” then the finger print and other traces must removed with a cotton soaked with a cleaning product available on the market

2.3.8.2 Greasing

The zoom mechanism is factory greased to ensure a long working time trouble free. If the lens has been stored for some time (specially in cold condition), it is recommended to drive all functions several time to recover the normal conditions.

2.3.8.3 Moistness

The zoom lens should remain dry at any time

3. Outline drawings

3.1. Mechanical zoom external view

19X7.3

BESMD	BESSD	BESSDE	see drawing page 21
BSMD	BSSD	BSSDE	see drawing page 22

26X7.8

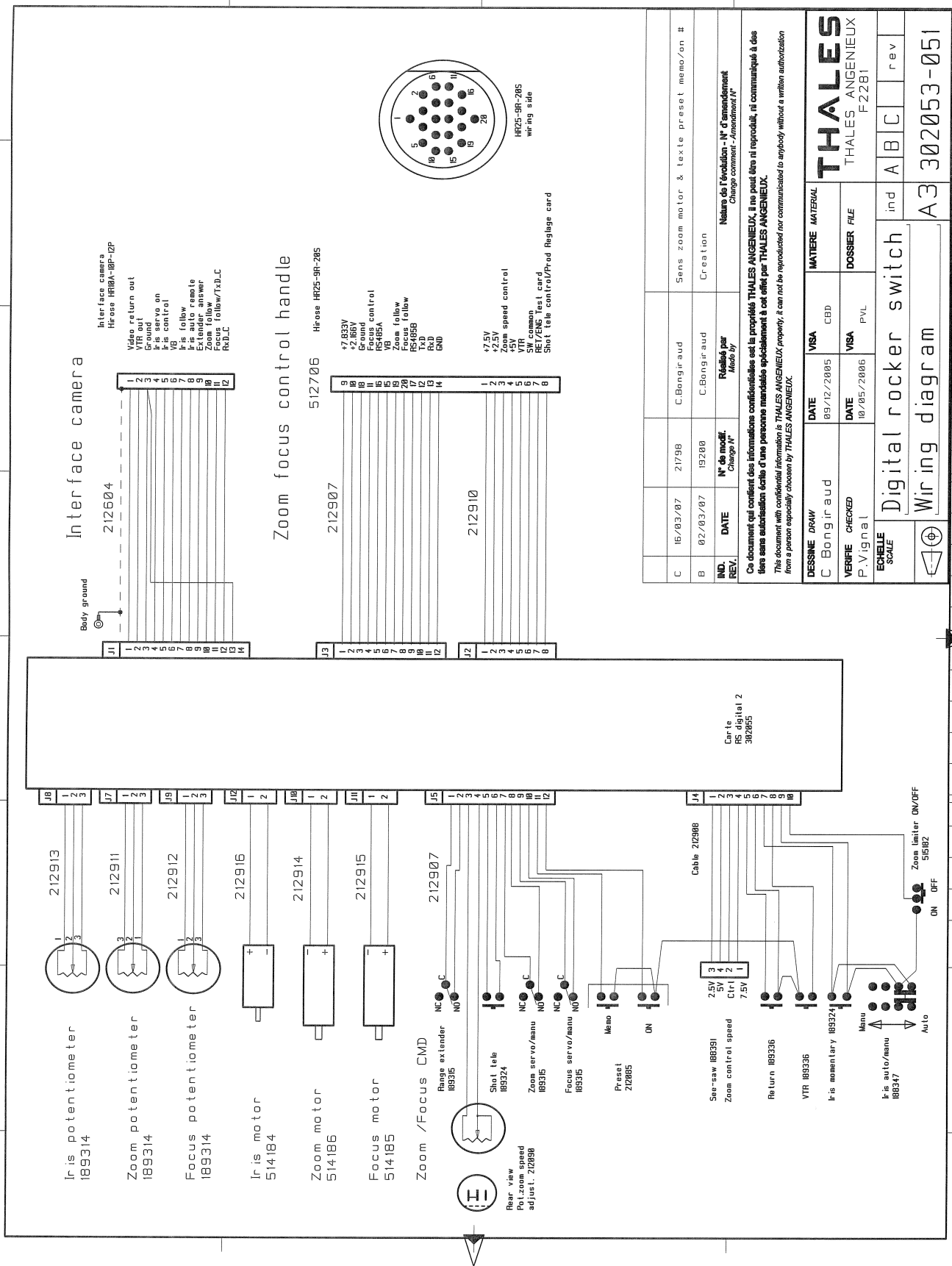
BESMD	BESSD	BESSDE	see drawing page 23
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3.2. Electrical outline

3.2.1. Camera connector interface

Connector pin	Description	
1	Video return switch	ON=0V OFF=OPEN
2	VTR switch	ON=0V OFF=OPEN
3	0V caméra	0V
4	Iris enforced	Servo ON=5V
5	Iris control	F/16=3.4V F/2.8=6.2V
6	+V camera	10V to 17V
7	Iris follow	F/16=3.4V F/2.8=6.2V
8	Iris auto / remote	AUTO=0V REMOTE=5V
9	Range extender answer	ON=0V OFF=OPEN
10	Zoom follow	WIDE=2V TELE=7V
11	Focus follow / TxD_C	MOD=2V INFINITY=7V / Serial link for camera (transmit)
12	RxD_C	Serial link for camera (receive)

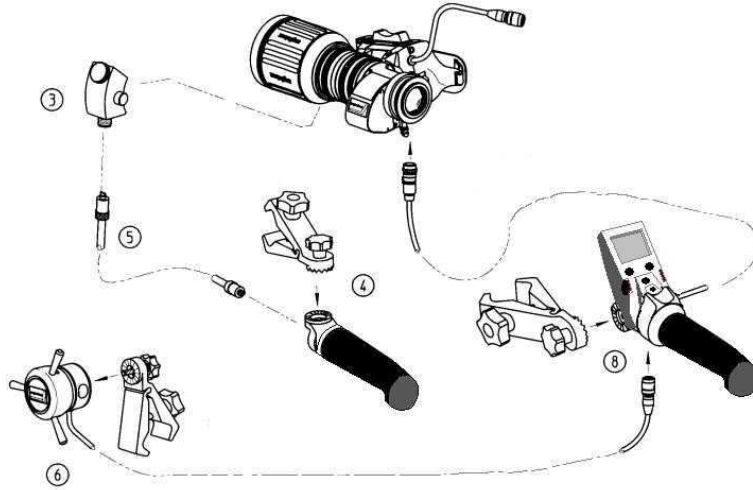
3.2.2. General interconnection diagram



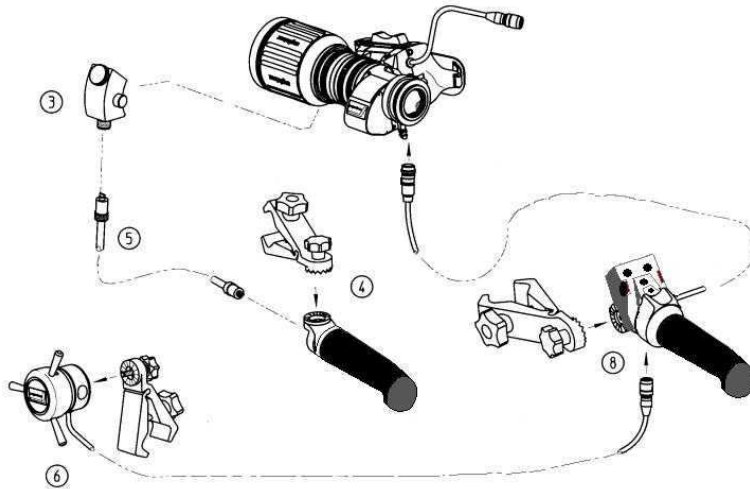
4. Accessories

4 1 Lens system –

PRO Version : Zoom handle with display

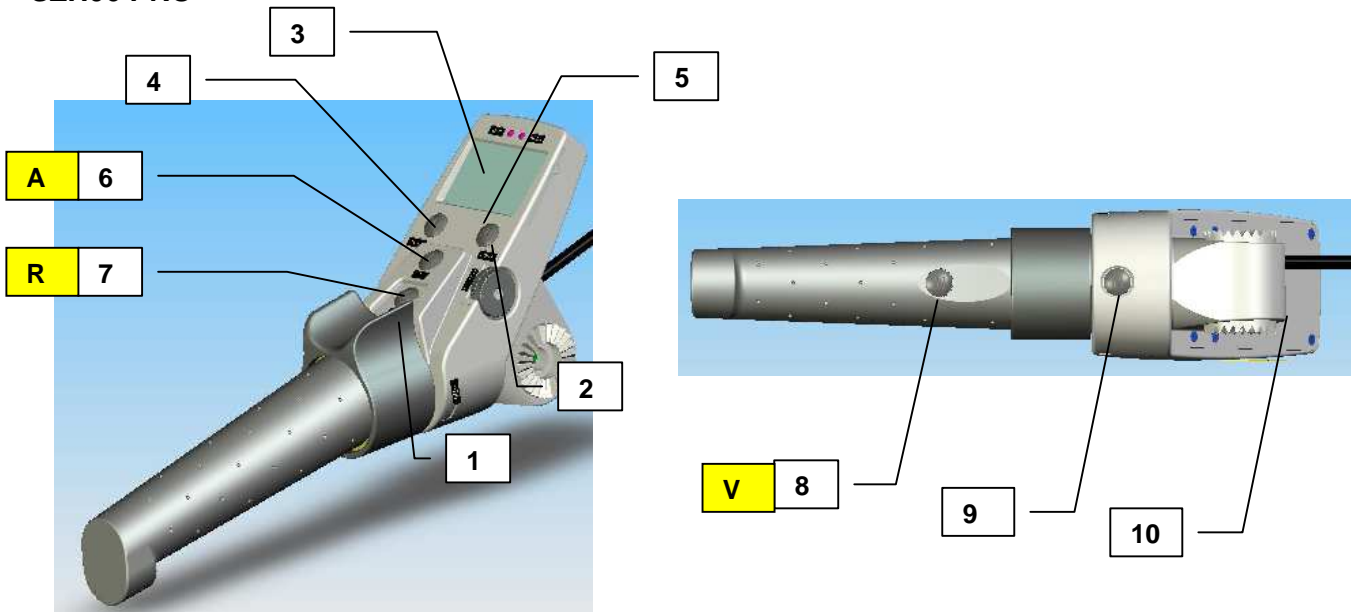


ECO Version: Zoom handle without display



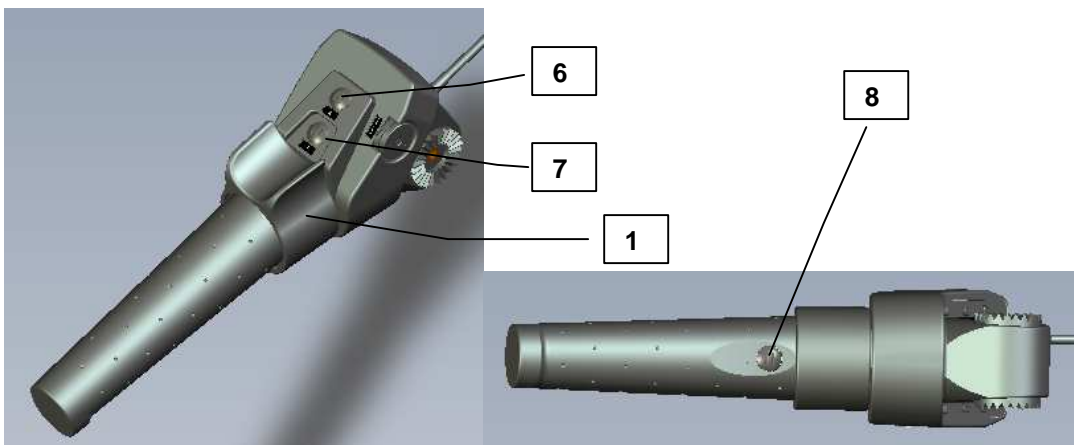
	Description	Identification code	S 19	S 19	SS 19	SM 19	SM 19	SM 19
			PRO	ECO	PRO	ECO	PRO	ECO
			303840	303987	303497	303988	303833	303989
3	Focus outlet	RA06					1	1
4	Manual focus handle	MFH93-ST					1	1
5	42" flexible cable	F84-ST					1	1
6	Servo focus handle	SFH06			1	1		
8	Servo zoom handle with display	SZH06-D	1		1		1	
8	Servo zoom handle without display	SZH06		1		1		1

**4 2 Zoom remote control
SZH06 PRO**



1	SEE SAW HANDLE	
2	ZOOM SPEED	
3	DISPLAY	
4	SWITCH	MENU
5	SWITCH	PRESET
6	SWITCH A	AIF
7	SWITCH R	RETURN
8	SWITCH V	VTR
9	SWITCH	MEMO
10	CONNECTOR FOR FOCUS REMOTE	

SZH06 ECO



4 2 1 Main functions : ECO

- see saw lever (1) allows the choice of the zoom direction (télé or wide) and the speed of zooming according the angle
- zoom speed potentiometer (2) ajustement defines the maximum speed of zooming
- External video – “RET” switch (7) displays the external video on the viewfinder
- Record -“VTR” switch(8) starts and stops the recorder
- switch AIF- Pressure on AIF switch (6) allows to go to the long focal length from all zoom positions to adjust focus by focus ring or focus handle
- connection of focus remote control (10)

Function -Auto cruise zoom

Start zooming see saw lever and settle speed, press AIF switch and release see saw lever, you will keep the same speed for the remaining zooming

Pressing a second time zoom lever will reset this function .

4 2 2 Other functions – PRO

- Zoom position preset function (Focus can be memorized simultaneously if preset is done with digital function)

This function allows to preset a zoom position.

Memorizing process :

- Set the zoom position with see saw
- Pushing switch “PRESET” (5) then switch “MEMO” (9)

Call back stored positions :

- Call back zoom position by pushing swicth “MEMO” (9)

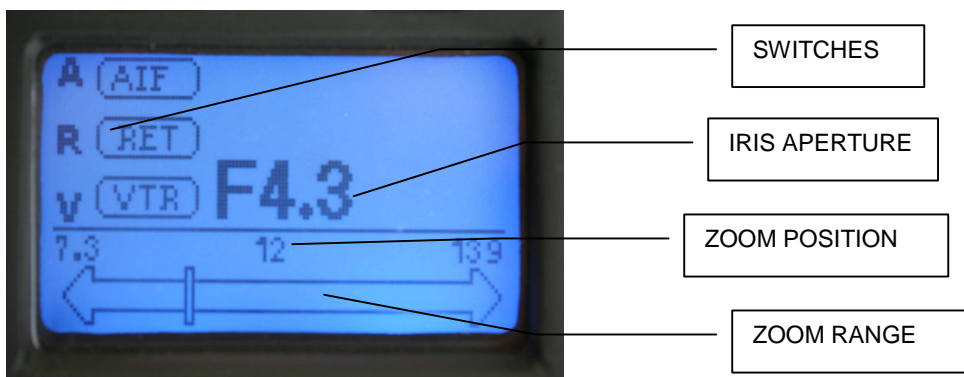
- Zoom limitation function

- Define the short focal length you need with the see saw lever
- Pushing switch “PRESET” (5)
- Zoom range is flashing on the display
- Move the lens with the see saw lever to the long focal length you need
- Release switch “PRESET” (5)

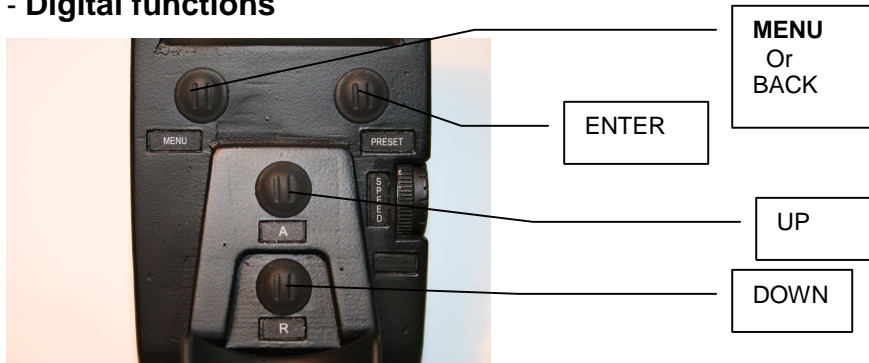
Pushing switch “PRESET” (5) to reset the limitation function .

- Display

HOME SCREEN –



- Digital functions



MENU SCREEN will be reached with the **MENU** switch (4) – same switch is used for exit

During this step , the switches take the functions as defined above

All digital functions can be reached



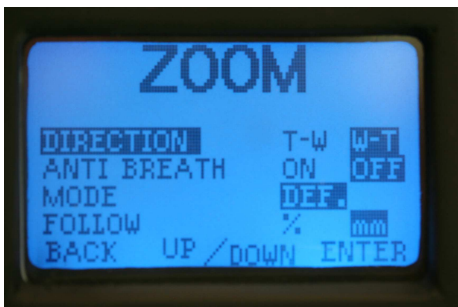
HOW TO SELECT A NEW FUNCTION

1/ From MENU screen

2/ Move with UP an DOWN switches for your choice between sub menus - ZOOM , FOCUS....

3/ ZOOM for example

use ENTER switch to reach a new screen = ZOOM



4/ Move with UP an DOWN switches for your choice between sub menus – DIRECTION , ANTI BREATHING

5/ DIRECTION for example

use ENTER switch = DIRECTION is flashing

6/ Move with UP an DOWN switches for your choice T-W or W -T

use ENTER switch

7/ BACK switch allows to return in MENU screen

Use the same ways as above in all sub menus to preset all functions you need on the ZOOM CONTROL HANDLE .

DIGITAL FUNCTIONS AVAILABLE :

ZOOM SCREEN

DIRECTION
ANTI BREATHING
MODE
FOLLOW

reverse the direction of zooming of the see saw handle
see information page 13
zoom laws - see information page 12
zoom range information on display in mm focal lengths or %

FOCUS SCREEN

MEMO

MODE

focus position preset allowed with zoom position preset
See 422
focus laws - see information page 12

IRIS SCREEN

RAMPING
EXT COMP

ramping correction ON / OFF - see information page 13
see information page 13

DISPLAY SCREEN

CONTRAST
BRIGHTNESS

SWITCH SCREEN

R

V

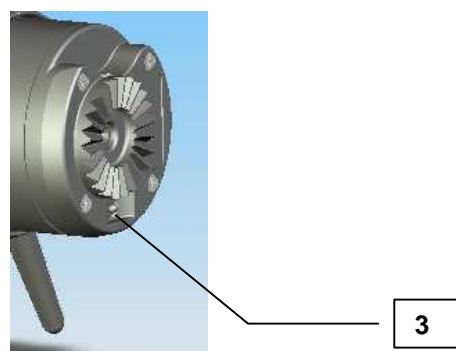
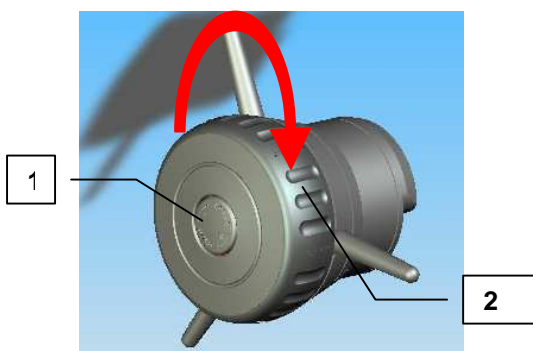
allow to change **the function of this switch for AIF or RET**
allow to change **the function of this switch for AIF or VTR**

DEFAULT SCREEN

DEFAULT

return to factory settings

4 3 Focus remote control



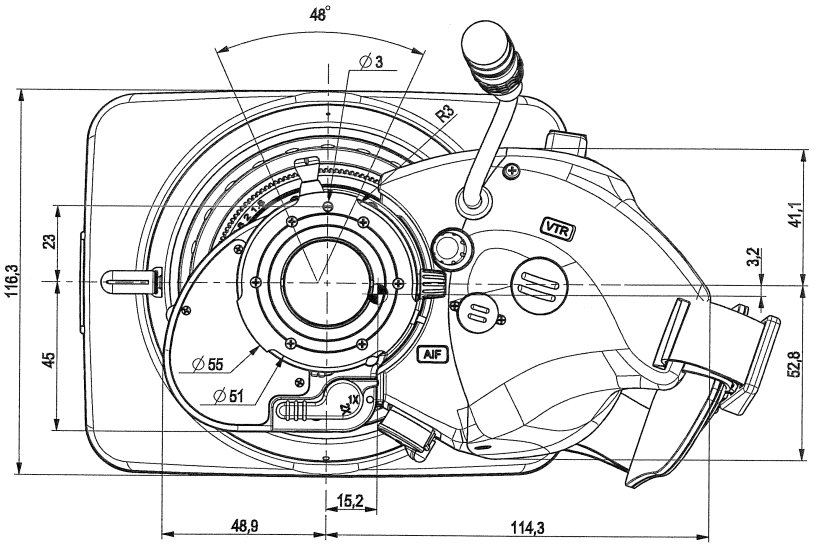
Push the button 1 and rotate the ring 2 of the handle to decrease or increase the torque .
Switch to reverse the direction of focusing (infinity / near)

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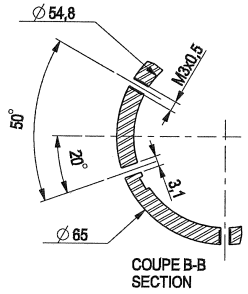
Document qui contient des informations confidentielles de la société THALES Angénieux. Il ne peut être réproduit, communiqué, ni communiqué à des tiers sans l'autorisation écrite de la Direction Générale de la Recherche et Développement de la société Angénieux.

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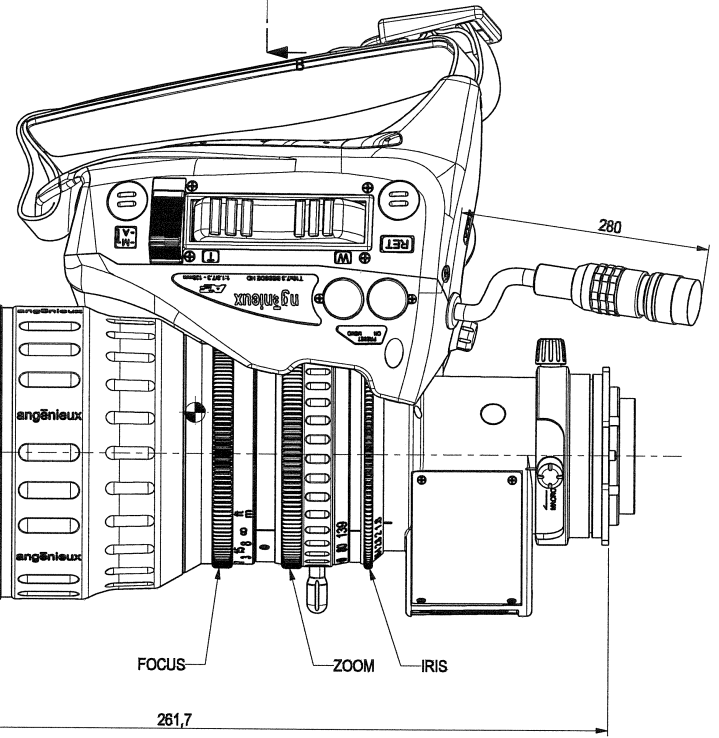
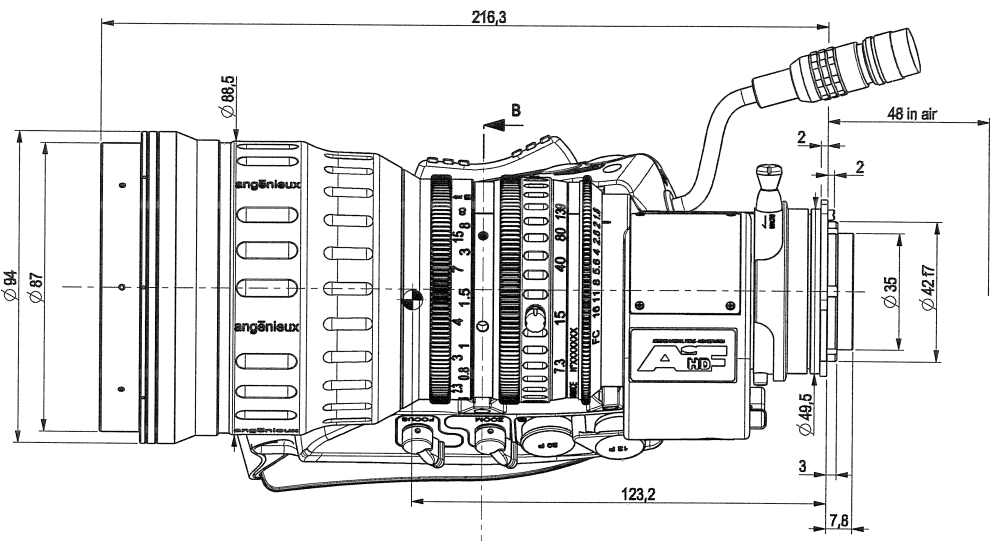
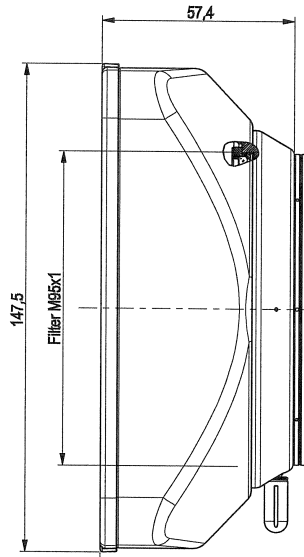
REV	DATE	N° modif	Révisé par	Nature de l'évolution - N° d'engagement	
RESSIE	VERIF	Change	Change	Change	Amélioration
Montage L	Tolérances Gdn	Tolérances Gdn	Tolérances Gdn	Usinage	Requis
DATE	DATE	MATIERE	TRAITEMENT	Angle	Dossier
VISA	VISA	MATIERE	TRAITEMENT	Angle	Masse
ECH. 622				REV	THALES
1/1				A	ANGENIEUX
Zoom Complet 19x7.3 - Mufti 2x				APPROVED	1/1
Encombrement				F2281	
A2				0302166-041	

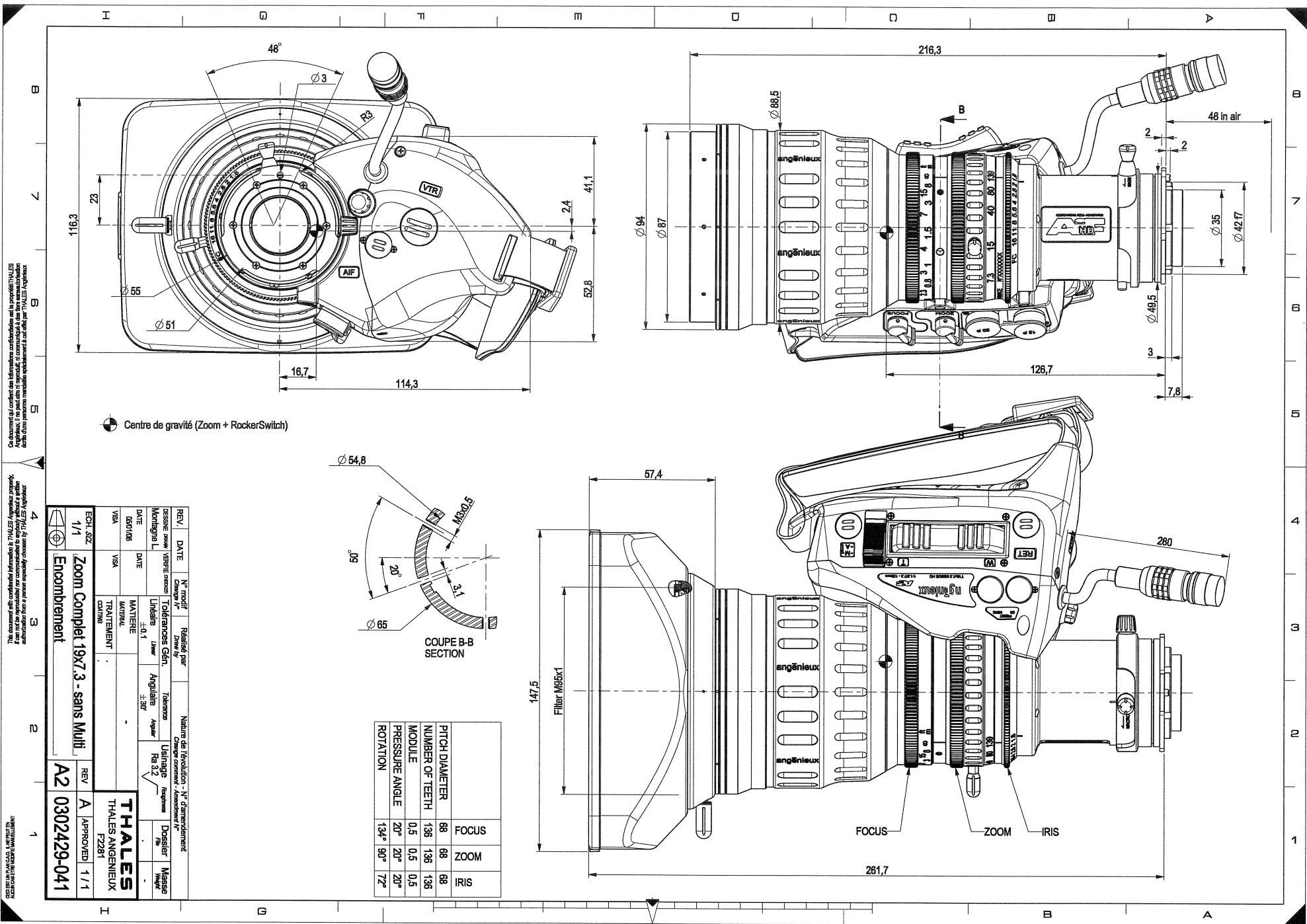


Centre de gravité (Zoom + Rocker/Switch)



PITCH DIAMETER	86	FOCUS	88
NUMBER OF TEETH	136	ZOOM	88
MODULE	0.5	IRIS	88
PRESSURE ANGLE	20°		
ROTATION	134°		



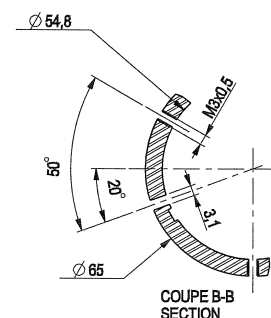


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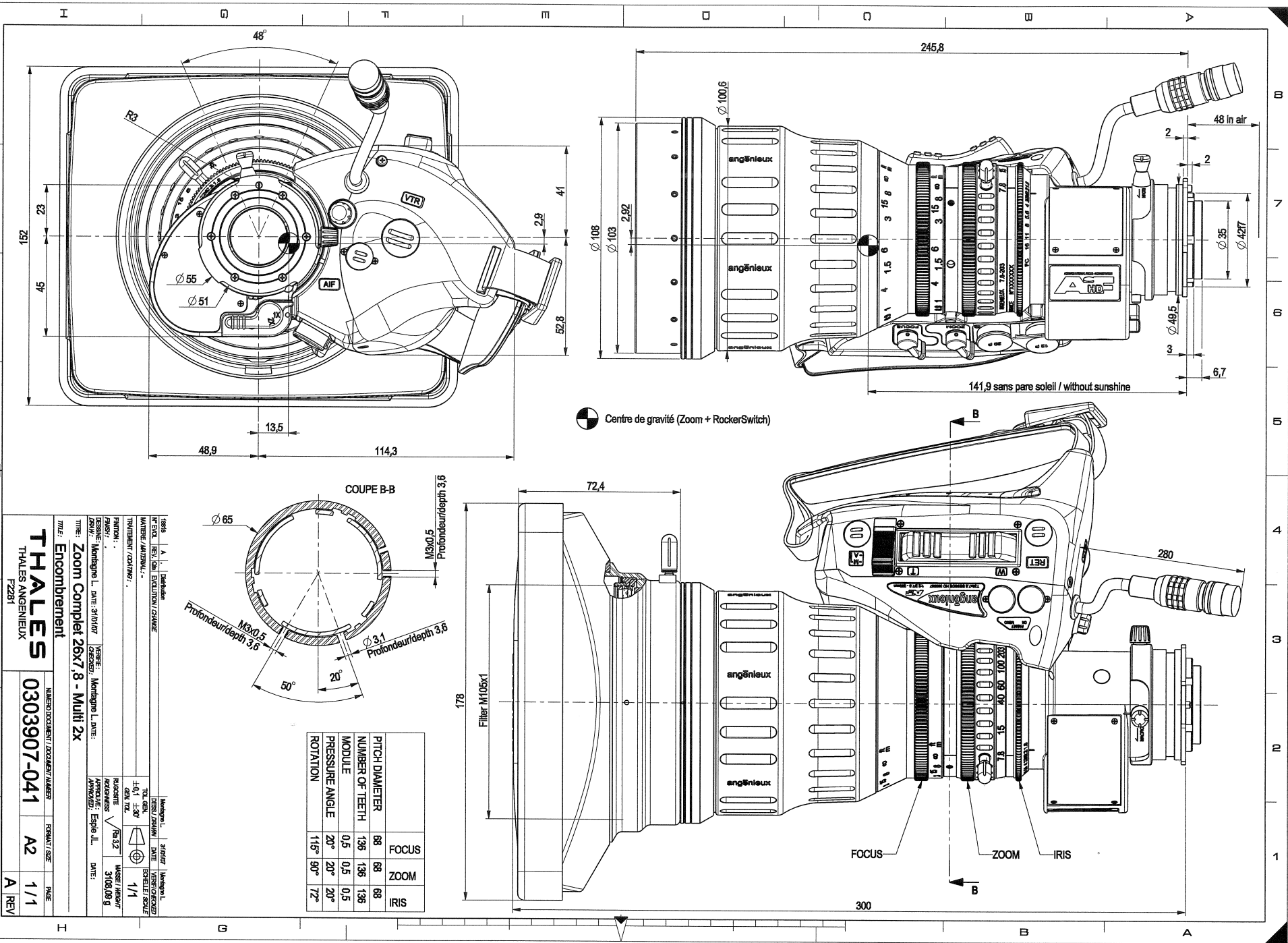
Centre de gravité (Zoom + RockerSwitch)



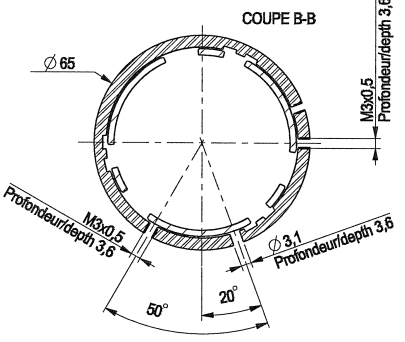
PITCH DIAMETER	88	88	88	FOCUS
NUMBER OF TEETH	136	136	136	ZOOM
MODULE	0,5	0,5	0,5	IRIS
PRESSURE ANGLE	20°	20°	20°	
ROTATION	134°	90°	72°	

REV. DATE	N° modif	Révisé par	Nature de l'opération	N° d'approbation
1/1				
DATE	Version	Utilisée	Angle	
18/07/08			±30°	
DATE	MATIERE	Traitement		
VISA	VISA			
Zoom Complet 19x7.3 - sans Mult				
Encombrement				
REV. DATE	Approuvé			
A	1/1			
THALES ANGÉNIEUX				
F2281				
0302429-041				

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Centre de gravité (Zoom + RockerSwitch)



	FOCUS	ZOOM	IRIS
PITCH DIAMETER	88	88	88
NUMBER OF TEETH	136	136	136
MODULE	0,5	0,5	0,5
PRESSURE ANGLE	20°	20°	20°
ROTATION	115°	90°	72°

THALES		THALES ANGENIEUX		FZ281	
0303907-041	A2	1/1	1/1	A	REV

REVISION	DESCRIPTION	DATE	BY	APP
1	1/1			

PROPERTY	VALUE
DESIGNER	Montaigne L.
DRAWN	Montaigne L.
CHECKED	Montaigne L.
APPROVED	Esplan J.L.