

# STANDARD PRODUCTS



ARGUS 900 VIDEO LINE

Designer of endoscopic tools since 1980, EFER ENDOSCOPY has an established reputation in the NDT world. In addition to a STANDARD PRODUCTS line covering all endoscopy and videoendoscopy applications fields in industrial environments, EFER ENDOSCOPY has developed a line of DEDICATED PRODUCTS allowing endoscopic implementation, in remote access locations, of measurement, micro-blending, and non-destructive testing procedures.

## STANDARD PRODUCTS



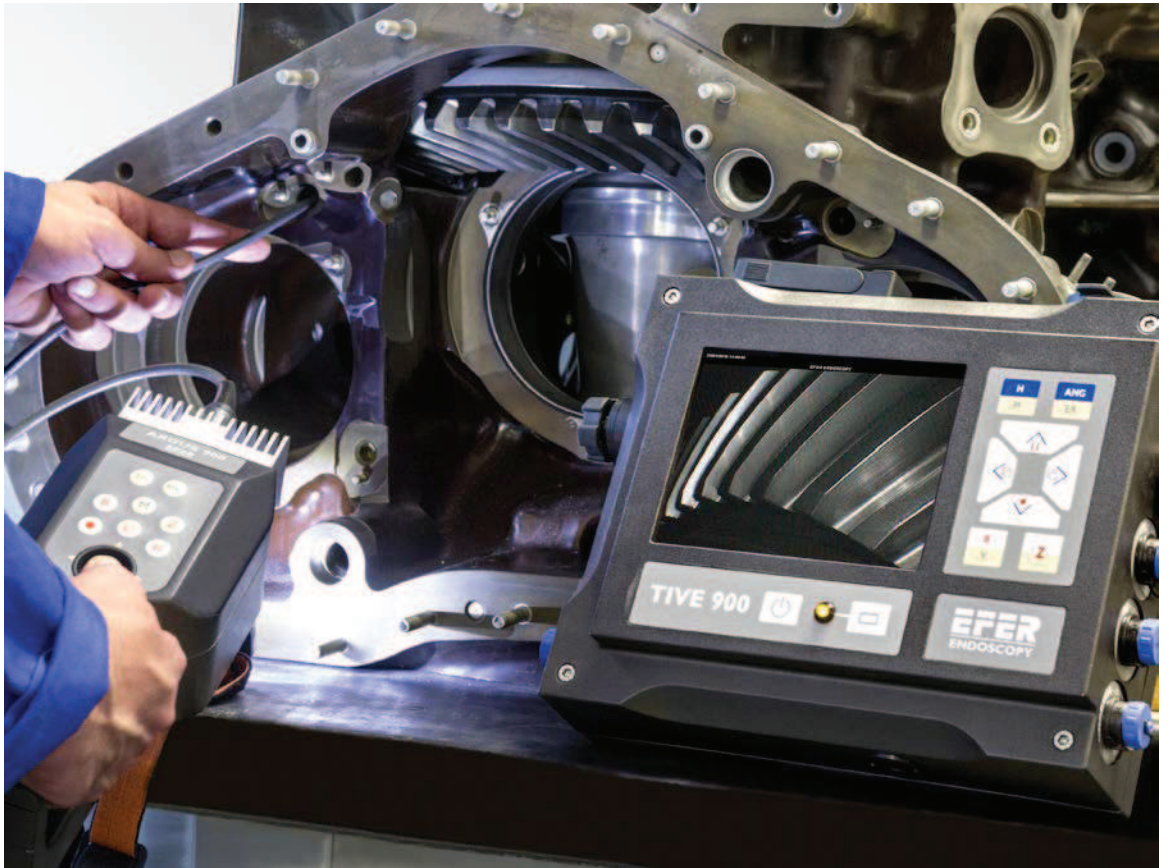
EASY videoscopes  
FLASHER videoscopes  
ARGUS video system  
PIKO video system  
JUMBO video system  
EXPLORATOR video system  
Video TURRETS  
OPTIC line  
ULTRA-VIOLET line

## DEDICATED PRODUCTS



Endo FPI system  
Endo Blast system  
Endo Blend system  
Blade erosion  
Nuclear fuel  
Heat exchangers  
Flat probes  
Endo rescue





## ARGUS 900 VIDEOENDOSCOPE

**Expertise and measurement equipment comprised of an ARGUS 900 probe with operating unit.**

**ARGUS 900 videoendoscopic probes**, connectable to FLASHPACK 900 and TIVE 900 units, feature interchangeable tips and integrated LED lighting.

- Diameter 4 mm up to 3 m length
- Diameters 6 mm and 8 mm up to 8 m length
- Axial and lateral interchangeable tips with standard or stereo viewing
- Distal temperature alarm
- Orbital tip articulation by joystick
- Probe video functions controls and full remote control of associated operating unit

**TIVE 900 operating unit** implements the 3DSIZER algorithm. Used with ARGUS probes fitted with distal stereo tips, the system becomes a powerful metrology tool allowing three-dimensional defect measurement.

- 6.4 inch VGA screen
- **3DSIZER** three-dimensional stereo measurement
- Real time zoom
- Image/audio and video/audio recording
- Removable battery, chargeable in unit
- VGA streaming output

**FLASHPACK 900 operating unit** is designed for recording images and videos generated by ARGUS 900 probes equipped with interchangeable tips, providing a powerful expertise tool.

- 5 inch VGA 5 screen
- Real time zoom
- Image and video recording
- Removable battery, chargeable in unit
- SVGA streaming output

Equipment complies to standards **CE**



ISO 13485:2003 ISO 9001:2008

## ARGUS 900 VIDEOENDOSCOPIC PROBES



### TECHNICAL FEATURES

<b>MODEL</b>	<b>ARGUS 900</b>
Vocation	Industrial endoscopy
Tip articulation	Orbital articulation
Probe sheathing	Impregnated tungsten
Sensor sizes	Ø 4 mm 1/10 inch Ø 6 mm 1/6 inch Ø 8 mm 1/4 inch
Autoshutter	Automatic
Autoshutter reference point	15 positions
White balance	Fixed and auto-lock
Image analysis surfaces	Full/spot
Blue level adjustment	15 positions
Red level adjustment	15 positions
Lighting	LED
Umbilical cable	Interchangeable 2 m length
Weight (handle)	1.100 kg
Weight (probe Ø6, Lg 3m)	1.500 kg
Maximum operating temperature (in air)	Working length 0° to +100°C Other parts 0° to +40°C

### INTERFACE CONNECTION

- TIVE, FLASHPACK, POLYCAM 900 units

### SUPPLIED ACCESSORY

- Interchangeable umbilical cable 2m length REF. CA900-01

### DIRECT FUNCTIONS

- Zoom, boost, image freeze
- Image and video recording and review
- Joystick articulation control and home position
- Joystick navigation in menu
- Access to probe and operating units adjustments menu

## ARGUS 900 PROBES DIAMETER 4 MM

DIAMETER	REFERENCE	WORKING LENGTH	ORBITAL TIP ARTICULATION
4.0 mm	VSD-40-A2-200-ST9	2 m	150°
	VSD-40-A2-300-ST9	3 m	

## ARGUS 900 PROBES DIAMETER 6 MM

DIAMETER	REFERENCE	WORKING LENGTH	ORBITAL TIP ARTICULATION
6.0 mm	VSD-60-A2-200-ST9	2 m	150°
	VSD-60-A2-300-ST9	3 m	
	VSD-60-A2-600-ST9	6 m	120°
	VSD-60-A2-800-ST9	8 m	90°

## ARGUS 900 PROBES DIAMETER 8 MM

DIAMETER	REFERENCE	WORKING LENGTH	ORBITAL TIP ARTICULATION
8.4 mm	VSD-80-A2-200-ST9	2 m	150°
	VSD-80-A2-300-ST9	3 m	
	VSD-80-A2-600-ST9	6 m	120°
	VSD-80-A2-800-ST9	8 m	90°

## INTERCHANGEABLE TIPS FOR ARGUS 900 PROBES DIAMETER 4 MM

PROBE Ø	TYPE	VIEWING	FOV	REFERENCE	FOCUSING	NUMBER
4.0 mm	Standard	Axial	80°	TV40-A80 (1)	6 mm to 80 mm	AB41
		Lateral	80°	TV40-L80	4 mm to 80 mm	LB41
	Stereo Measurement	Axial	40°/40°	TV40-SA40	5 mm to 45 mm	SB41
		Lateral		TV40-SL40	4 mm to 45 mm	SB42



(1) Tip supplied with each probe diameter 4 mm

## INTERCHANGEABLE TIPS FOR ARGUS 900 PROBES DIAMETER 6 MM

PROBE Ø	TYPE	VIEWING	FOV	REFERENCE	FOCUSING	NUMBER	
6.0 mm	Standard	Axial	50°	TV60B-A50-Y41	100 mm to infinite	A61	
				TV60B-A50-V82	50 mm to infinite	A62	
				TV60B-A50-K164	12 mm to 200 mm	A63	
			80°	TV60B-A80-N82 (2)	20 mm to infinite	A64	
				TV60B-A80-E164	3 mm to 20 mm	A65	
				100°	TV60B-A100-F106	5 mm to 120 mm	A66
		Lateral	50°	TV60B-L50-V82	45 mm to infinite	L61	
				TV60B-L50-K164	9 mm to 200 mm	L62	
			80°	TV60B-L80-D164	1 mm to 20 mm	L63	
				TV60B-L80-N82	20 mm to infinite	L64	
	Stereo Measurement	Axial	50°/50°	TV60B-SA50-F98	5 mm to 80 mm	S61	
				Lateral	TV60B-SL50-F98	2 mm to 80 mm	S62
				Axial	TV60B-SA50-N62	20 mm to infinite	S63
		Lateral		TV60B-SL50-N62		S64	



(2) Tip supplied with each probe diameter 6 mm

## INTERCHANGEABLE TIPS FOR ARGUS 900 PROBES DIAMETER 8 MM

PROBE Ø	TYPE	VIEWING	FOV	REFERENCE	FOCUSING	NUMBER
8.4 mm	Standard	Axial	20°	TV80-A20-M54	50 cm to infinite	A81
			50°	TV80-A50-Y61	100 mm to infinite	A82
				TV80-A50-V98	50 mm to infinite	A83
			80°	TV80-A80-P93 (3)	25 mm to infinite	A84
		120°	TV80-A120-H66	5 mm to 200 mm	A85	
		Lateral	50°	TV80-L50-Y61	100 mm to infinite	L81
			80°	TV80-L80-P93	25 mm to infinite	L82
	120°		TV80-L120-H66	4 mm to 200 mm	L83	
	Stereo Measurement	Axial	50°/50°	TV60B-SA50-F123	5 mm to 80 mm	S81
		Lateral		TV60B-SL50-F123		S82



(3) Tip supplied with each probe diameter 8 mm

## STEREO MEASUREMENT TEST BLOCKS



PROBE DIAMETER	REFERENCE
4.0 mm	BTS-40
6.0 mm	BTS-60
8.4 mm	BTS-80

## TIVE 900 UNIT



- 6.4 inch VGA screen
- **3DSIZER** three-dimensional stereo measurement
- JPEG image and MPEG4 video recording
- Recording on USB key or internal storage
- Thumbnail or full screen image review
- Real-time zoom, image freeze
- VGA streaming output
- Universal thread mount
- AC or battery powering
- Removable battery, chargeable in probe

### GENERAL FUNCTIONS

#### DIRECT FUNCTIONS

- Zoom, boost, image freeze
- Image/video recording and review
- Joystick articulation control and home position of the ARGUS probe
- Menu navigation keys
- Battery charge level

#### MENU FUNCTIONS

- 3DSIZER stereo measurement
- Comparison measurement
- Circle gauge measurement
- Split-screen
- Mirror
- Comment and arrows annotations
- Video processor setting
- Date and time setting
- Language selection
- External memory formatting
- Internal or external memory selection
- Image and video delete
- Light ON/OFF

#### ON-SCREEN INDICATIONS

- Date and time
- Comment and arrows annotations
- Zoom, boost, image freeze, recording
- Thumbnail or full screen image/video review
- Distal temperature alarm

#### CONNECTION INTERFACE

- AC power supply and charger
- USB key
- Audio headset
- EXPLORATOR remote control
- ARGUS, EXPLORATOR, JUMBO probes, MUCAM T900
- VGA streaming output

### TECHNICAL FEATURES

#### REFERENCE

#### TIVE 900

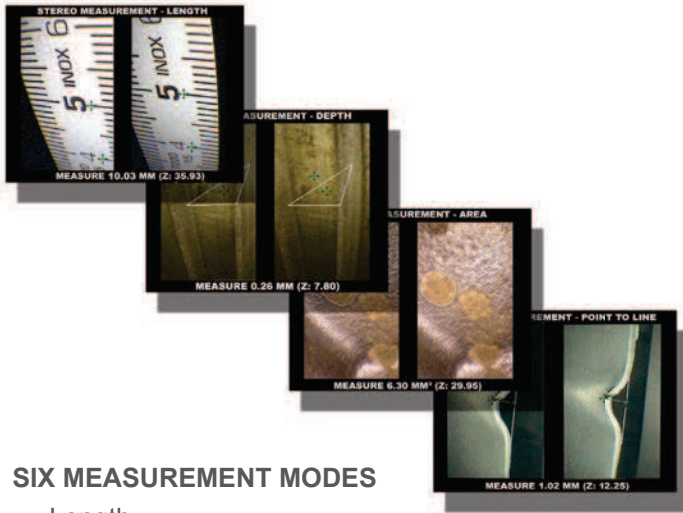
Vocation	Industrial endoscopy
Screen	VGA 6.4 inch
Recording formats	JPEG image MPEG4 video
Audio recording	Associated to image or video
Recording supports	USB key 1 Go internal memory
Variable zoom	3 X
Menu text languages	French, English, German, Italian, Portuguese, Spanish, Polish
Probe connector	For probes ARGUS 900, EXPLORATOR 900, JUMBO 900, MUCAM T900
Audio headset	2 jacks 3.5 mm
Video output	VGA connector
AC power supply	NiMH 15A integrated battery About 3 hours autonomy
External power supply	AC 90-250V 50/60 Hz
Operation temperatures	0° to + 40° C
Dimensions	L260 X H235 x D76 mm
Weight	4.300 Kg

### SUPPLIED ACCESSORIES

- AC powering Ref. **S800-01**
- Integrated battery Ref. **BW800-07**
- Fast battery charger Ref. **CR-800-01**
- USB key



## 3DSIZER THREE-DIMENSIONAL STEREO MEASUREMENT



### SIX MEASUREMENT MODES

- Length
- Point to line
- Surface
- Depth
- Segment addition
- Perimeter

Commonly known as «stereo measurement», this in-situ metrology method results from implementation of:

- A patented, image splitting optical tip which forms, on an ARGUS probe distal sensor photosensitive surface, two distinct images corresponding to two different viewing angles of the target to measure
- A 3DSIZER algorithm, running on a TIVE 900 unit, allowing to determine the tridimensional spatial coordinates of each point on the target using inputs from cursor placement on both portions of viewing images.

### MEASUREMENT IN FIVE STEPS

- Identification of target using an ARGUS 900 probe fitted with vision tip
- Acquisition of target composite image using an ARGUS 900 probe fitted with stereo vision tip
- Selection of measurement mode on TIVE 900 unit
- Target definition by cursor placement on both portions of composite image displayed on TIVE 900 unit
- Display of measured value on TIVE 900 unit

## FLASHPACK 900 UNIT



- 5 inch VGA screen
- JPEG image and MPEG4 video recording
- Recording on SD memory card
- Thumbnail or full screen image review
- Real-time zoom, image freeze
- SVGA streaming output
- Universal thread mount
- AC or battery powering
- Removable battery, chargeable in probe

### GENERAL FUNCTIONS

#### DIRECT FUNCTIONS

- Zoom, boost, image freeze
- Image/video recording and review
- Menu navigation keys

#### MENU FUNCTIONS

- Mirror
- Comment annotations
- Video processor setting
- Probe white balance setting
- Date and time setting
- Memory formatting
- Image and video delete
- Light ON/OFF

#### ON-SCREEN INDICATIONS

- Date and time
- Battery charge level
- Comment
- Zoom, boost, image freeze, recording
- Thumbnail or full screen image/video review
- Distal temperature alarm

#### CONNECTION INTERFACE

- AC power supply and charger
- SD memory card
- ARGUS, JUMBO probes, MUCAM T900
- VGA streaming output

### TECHNICAL FEATURES

#### REFERENCE

Vocation  
Screen  
Recording formats

Recording support  
Zoom  
Probe connector

Video output  
AC power supply

External power supply  
Operating temperature  
Dimensions  
Weight

#### FLASHPACK 900

Industrial endoscopy  
VGA 5 inch  
JPEG image  
MPEG4 video  
SD memory card  
By 2  
For probes ARGUS 900,  
JUMBO 900, MUCAM T900  
SVGA connector  
Lithium-ion 7.8 Ah battery  
About 3 hours autonomy  
AC 90-250V 50/60 Hz  
0° to + 40° C  
L200 X H175 x D65 mm  
1.200 Kg

### SUPPLIED ACCESSORIES

- AC powering Ref. **AS900-01**
- Integrated battery Ref. **BW900-01**
- Fast battery charger Ref. **CR-900-01**
- VGA cable length 2 meters with FLASHPACK 900 connector and VGA connector Ref. **CAVG900-01**

## MUCAM T900 VIDEO CAMERA



### VIDEO COUPLER

REFERENCE	OTV-Z18-35-EL
Vocation	Industrial endoscopy
Variable focal length	18 to 35 mm
Focus adjustment	Rotating ring
Image size adjustment	Rotating ring
Coupler/eyepiece connection	32 mm standard eyepiece
Coupler/camera connection	C mount standard

### TECHNICAL FEATURES

REFERENCE	MUCAM T900
Vocation	Industrial endoscopy
CCD sensor size	1/3 inch
Autoshutter	Automatic
Autoshutter reference point	15 positions
White balance	Fixed and autolock
Image analysis surfaces	Full/spot
Blue level adjustment	15 positions
Red level adjustment	15 positions
Probe connector	For TIVE 900, POLYCAM 900 FLASHPACK 900
Remote control	2 recording buttons
Camera/coupler connection	C mount standard
Waterproofing	Fully immersible
Operating temperature	0° to + 40° C
Head dimensions (Dia/L)	30 mm / 100 mm
Cable dimensions (Dia/L)	4 mm / 3 meters
Weight	80 gr

## ACCESSORIES

### TRANSPORT CASES

- Transport case for **ARGUS 900** probe up to 3 meters and **FLASHPACK 900** Ref. **VAAF-900-SH** dimensions 63 x 50 x 30 cm
- Transport case for **ARGUS 900** probe of length higher than 3 meters and **FLASHPACK 900** Ref. **VAAF-900-LO** dimensions 63 x 50 x 30 cm
- Transport case for **ARGUS 900** probe up to 3 meters and **TIVE 900** Ref. **VAAT-900-SH** dimensions 63 x 50 x 30 cm
- Transport case for **ARGUS 900** probe of length higher than 3 meters and **TIVE 900** Ref. **VAAT-900-LO** dimensions 63 x 50 x 30 cm

## RIGID GUIDE TUBES



PROBE Ø	TUBE Ø	W. LGTH	TOTAL LGTH	REFERENCE
4 mm	5.0 mm	30 cm	40 cm	TGR-040-050-030
		40 cm	50 cm	TGR-040-050-040
6 mm	8.0 mm	40 cm	50 cm	TGR-060-080-040
		100 cm	110 cm	TGR-060-080-100
8 mm	10.0 mm	40 cm	50 cm	TGR-080-100-040
		100 cm	110 cm	TGR-080-100-100

## CENTERING DEVICES



CENTERING DEVICE	Ø 6 MM PROBE	Ø 8 MM PROBE
Ø 15 mm	CTV-60-150	CTV-80-150
Ø 38 mm	CTV-60-380	CTV-80-380
Ø 76 mm	CTV-60-760	CTV-80-760

## FLEXIBLE ARTICULATING GUIDE TUBE



PROBE Ø	TUBE Ø	W. LGTH	TOTAL LGTH	REFERENCE
6 mm	12.7 mm	129 cm	154 cm	TGE-127-D2-129

## RIGID ARTICULATING GUIDE TUBE



PROBE Ø	TUBE Ø	W. LGTH	TOTAL LGTH	REFERENCE
6 mm	13.0 mm	37 cm	60 cm	TGR-130-D1-037

## MOUNTING ACCESSORIES



- Universal hinged arm with super clamp (from diameter 13 mm to 55 mm) and universal thread mount for video probe REF. **BA143PS**

- Swivel head with super clamp (from diameter 13 mm to 55 mm) and quick-lock attachment for video probe REF. **VIDEO-HED**





Concepteur d'outils endoscopiques depuis 1980, EFER ENDOSCOPY jouit d'une réputation reconnue dans le monde du contrôle non destructif. Outre une gamme de **PRODUITS STANDARD** couvrant tous les champs d'application de l'endoscopie et de la vidéoendoscopie en milieu industriel, EFER ENDOSCOPY a en effet développé une gamme de **PRODUITS DEDIES** permettant de contrôler, par voie endoscopique, la mise en oeuvre, dans des zones difficiles d'accès, de méthodes de mesure, de micro-usinage et de contrôle non destructif.

## PRODUITS STANDARD

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- Vidéoscopes EASY
- Vidéoscopes FLASHER
- Système vidéo ARGUS
- Système vidéo PIKO
- Système vidéo JUMBO
- Système vidéo EXPLORATOR
- TOURELLES vidéo
- Gamme OPTIC
- Gamme ULTRA-VIOLET

## PRODUITS DEDIES

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- Ressuage endoscopique
- Nettoyage endoscopique
- Blending endoscopique
- Erosion d'aubes
- Combustible nucléaire
- Echangeurs de température
- Sabres vidéo
- Recherche de victimes



**EFER**  
**ENDOSCOPY**

EFER ENDOSCOPY - Athelia I - I3600 La Ciotat - France

Tel : +33 (0)4 42 71 51 01 - Fax : +33 (0)4 42 83 33 25

[www.efer.com](http://www.efer.com) - [efer@efer.com](mailto:efer@efer.com)

GPS : LAT 43° 12'5". LONG 5° 35'33"