

STANDARD PRODUCTS



ARGUS 900 VIDEO LINE

Efer
NDT VISION

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

ARGUS 900 VIDEOENDOSCOPIC PROBES



TECHNICAL FEATURES

MODEL	ARGUS 900
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	
				TV60B-A100-F106	5 mm to 120 mm	A66	
		Lateral	120°	TV60B-A120-F70	4 mm to 190 mm	A67	
			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-L100-F106	4 mm to 120 mm	L65	
				TV60B-SA50-F98	5 mm to 80 mm	S61	
				TV60B-SL50-F98	2 mm to 80 mm	S62	
				TV60B-SA50-N62	20 mm to infinite	S63	
				TV60B-SL50-N62		S64	
		Lateral					

(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°	TV80-SA50-F123	5 mm to 80 mm	S81	
		Lateral		TV80-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

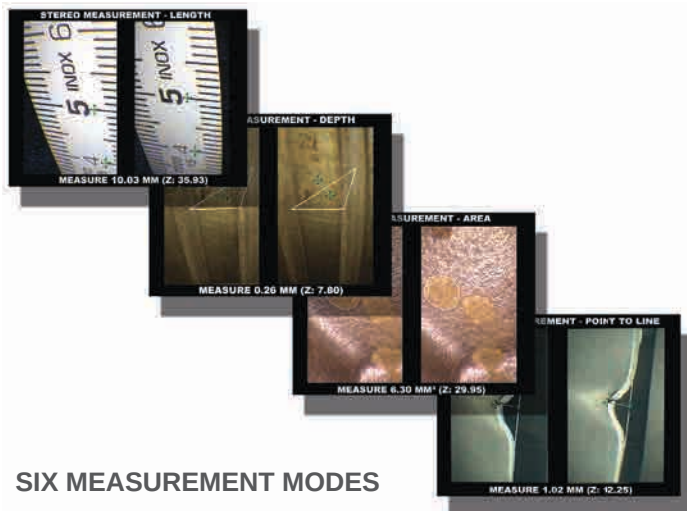
TIVE 900

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**
- VGA cable Ref. **CAVG900-01**
- 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 and **FLASHPACK 900** Ref. **VAAF-900**
Dimensions 56 x 43 x 21 cm
- Transport case for **ARGUS 900** probe and **TIVE 900** Ref. **VAAT-900**
Dimensions 56 x 43 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**



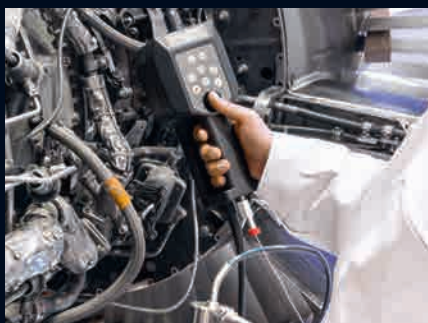
Concepteur d'outils endoscopiques depuis 1980, EFER ENDOSCOPY jouit d'une réputation reconnue dans le monde du contrôle non destructif. Outre une gamme de PRODUITS STANDARD couvrant tous les champs d'application de l'endoscopie et de la vidéoendoscopie en milieu industriel, EFER ENDOSCOPY a en effet 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



- 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



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



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