

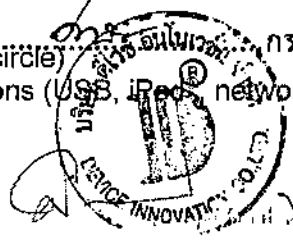
2 Tablet for Synergy^{UHD4} (AR-3200-1013)

2.1 Specifications

- Screen diagonal: 10.1 inch
- Screen resolution: 1200 x 1920 pixel
- Screen ratio: 16:10
- Display Type: PLS LCD capacitive touchscreen
- Dimensions Tablet (W x H x D): 254.2 mm x 155.3 mm x 8.2 mm
- Dimensions Tablet with Cradle (W x H x D): 280 mm x 162 mm x 42 mm
- Weight approx.: 0.78 kg / weight with cradle and cable approx.: 0.95 kg
- Installed and connected via USB or can be used wirelessly
- Booting time until ready for use: approx. 35 sec. (when CCU is already running)
- Tablet operating system: Android; Arthrex Controller running in Kiosk (closed) mode
- Class according to Medical Device Directive: I
- Legal Manufacturer: Foreseason Custom Displays, Inc. | 2210 East Winston Road | Anaheim, California 92806 | USA

2.2 Functions

- **Clinic-specific settings:**
 - Languages: EN, GER, FR, ES, IT, NLD, SWE, DK, NO, FI, CHN, JAP, KOR, RU
 - Streaming quality: set live stream bitrate to "Standard", "Medium" or "High"
 - Print settings: select information appearing on printout and PDF (facility name, logo, surgeon name, patient name and DOB, patient ID, procedure type, date, notes)
 - Network settings: static IP address or DHCP; LDAP settings
 - Network storage: destination/path for video and image storage, secondary location for PDF files (optional)
 - DICOM: Modality Worklist Server & PACS Server (Send/Commitment)
- **Surgeon-specific settings:**
 - Create a list of surgeons with their specific settings
 - Assigning procedures to a surgeon with specific procedure settings
 - Individual assignment of camera button functions
 - Max. video recording time, create video chapters with specific length
 - Print settings: photos per page, number of copies, auto-print, orientation, format, print as PDF
 - Photo and video recording settings
 - Settings and create a password for live stream access
 - Selection of auto-export destinations: iPad®, USB or network (file server)
- **Procedure-specific settings:**
 - Create a list of procedures with specific settings
 - Image settings: brightness, zoom, color/gama curve settings, gain, auto-exposure window, contrast, light source settings
- **Planning, beginning and ending a case via tablet:**
 - Select surgeon and procedure from drop-down
 - 2.4.2 ○ Enter patient data (name, patient ID, DOB, gender, procedure date, notes)
 - Patient data can be retrieved from a worklist (MVL/DICOM).....โปรแกรมการ
 - Multiple cases can be added and stored
 - Start procedure with white balance ๒.ลงชื่อ.....กรรมการ
 - After ending the case, stills and videos can be reviewed
 - Annotate photos with text and graphical shapes (arrow, circle).....กรรมการ
 - 2.4.5 ○ Photos and videos can be exported to different destinations (USB, iPad®, network file server, only photos: PACS via DICOM)
 - Automatic or manual export



Synergy HD3

On-Screen info on main monitor available

Before start of procedure:

- Info about programmed camera head buttons functions
- Surgeon Name, Procedure, Patient Name
- Device Status of Printer, IPAD, Network
- Indicator for whitebalance

During the procedure:

- On-Screen Display of the last taken image or of the last 4 taken images
- On-Screen Icon indicating recording

On-Screen info on Tablet during procedure:

- Device Status of Printer, IPAD, Network
- Recorded stills
- Recorded videos
- Stream of the camera image
- Direct transfer of still images and videos to the iPad (Surgeon App on iPad), 2.4.5 .
USB and Network(DICOM)

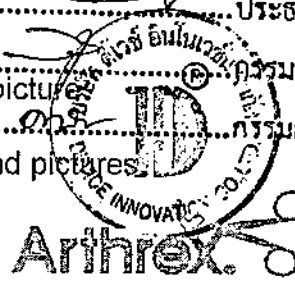
Available Functions on Tablet during procedure:

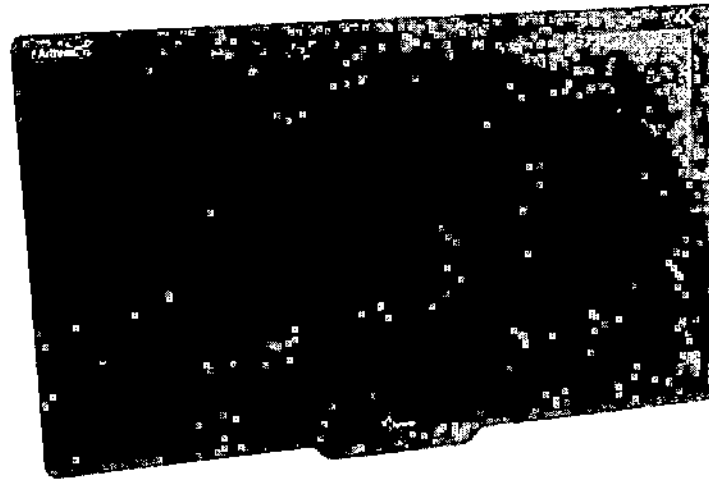
- Change settings of camera head button functions
- Brightness control
- Zoom
- Color Setting
- White Balance
- Light Source On/Standby
- Display Picture-In-Picture of Video Input
- Switch between camera image and Video-Input
- Printer Settings (stills per page, number of prints, autoprint, orientation, still format)

Surgeon APP(lication) for IPAD

IPAD application provides physicians with tools to manage stills, video recordings and patient education. Utilizing an iPad® physicians can review, edit, annotate and tag stills and video recordings, as well as create and instantly transmit images, videos and educational postoperative reports to patients. 2.4,5 .

Direct transfer of still images and videos to the IPAD, during procedure
 Export of stills to the camera roll of the IPAD or via Email
 Export of videos to the video library of the IPAD, or via Email
 Adjustment of stills – brightness, contrast, saturation and edit pictures
 Annotation of stills with a circle or an arrow with a text
 Creation of a report with a predefined text, links, documents and pictures





Monitor, UHD/4K, 32", BARCO 2.5 , 2.5.1
AR-3250-3211

View eDFU

View eDFU

Related Pages



IMAGING AND RESECTION

Monitors

Product



Disclaimers

Ⓢ Certain products may not be approved for sale in all countries.

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๑.ลงชื่อ.....ประธานกรรมการ

๒.ลงชื่อ.....กรรมการ

๓.ลงชื่อ.....กรรมการ

	Indicates the range ³ of humidity to which the device can be safely exposed when being stored.
	Indicates the range ³ of atmospheric pressure to which the device can be safely exposed when being stored.

6.9 Legal disclaimer

Disclaimer notice

Although every attempt has been made to achieve technical accuracy in this document, the manufacturer assumes no responsibility for errors that may be found. As the goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

Product specifications are subject to change without notice.

Trademarks

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Copyright notice

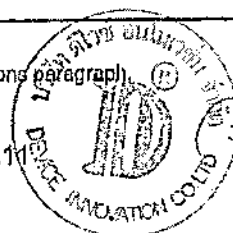
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6.10 Technical specifications

Overview

Screen technology	TFT AM LCD / LED backlight / Medical grade	2.5.1
Active screen size (diagonal)	32" (813 mm)	
Active screen size (H x V)	708 x 399 mm	
Aspect ratio	16:9	
Resolution	3840 x 2160 pixels	2.5.2
Pixel pitch	0.1845 mm	
Color support	1 billion (10 bit color depth)	คณะกรรมการพิจารณาผลการประกวดราคาอิเล็กทรอนิกส์
Color gamut	Native: 94% NTSC	๑. ลงชื่อ..... ประธานกรรมการ
Color calibration	ITU-709, DCI-P3	๒. ลงชื่อ..... กรรมการ
Viewing angle	178° Hor / 178° Ver	๓. ลงชื่อ..... one..... กรรมการ
Luminance	Native: 850 cd/m ² (typical) Default setting: 550 cd/m ² stabilized @6500K & Native color space	2.5.5
Contrast ratio	1350:1 (Typical)	

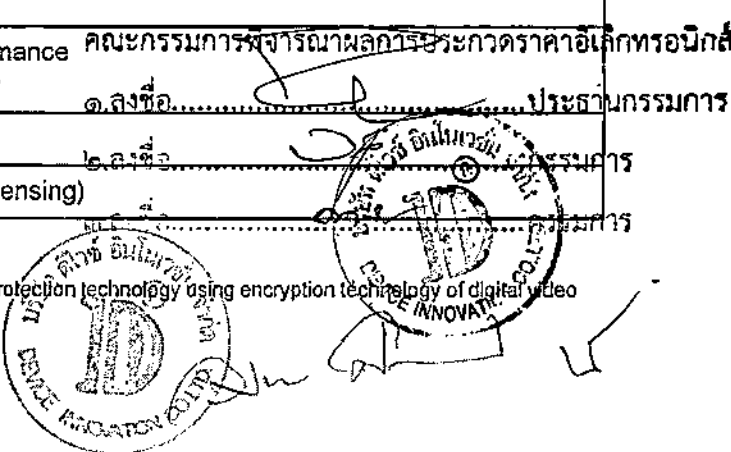
2. Values for xx and yy can be found in the technical specifications paragraph.



Important information

Response time	$T_{on} + T_{off} = 18 \text{ msec (typical)}$
White point	Calibrated: 5600K, 6500K, 7600K, 9300K
Gamma curve	Native, 1.8, 2.0, 2.2, 2.4, Video1, Video2, DICOM (review level)
Front protection screen	2-side anti-reflective alkali-aluminosilicate glass with anti-fingerprint coating
Keyboard	Front: 5-key capacitive touch - user programmable Rear: 5-key membrane
Video inputs	<p>2.5.4</p> <ul style="list-style-type: none"> 4K-UHD input <ul style="list-style-type: none"> 1x DP 1.2 SST / MST up to 3840 x 2160 @ 50/60 Hz (user configurable) 2x HDMI 2.0 up to 3840 x 2160 @ 50/60 Hz FHD input (upscaled to UHD): <ul style="list-style-type: none"> 1x DVI 1x 3G-SDI <p>Note: DP, HDMI and DVI all support HDCP 1.4⁴</p>
Video outputs	<p>2.5.3</p> <ul style="list-style-type: none"> DP 1.2 SST (main input copy) 3G-SDI (loop-through)
Other connectivity	USB-A (Field FW update with USB stick) USB-B (remote control serial protocol)
Display features	User-programmable function keys, Picture-in-Picture, Picture-by-Picture, Image Mirror and Rotation, Zoom, Pan, Failover mode, User profiles, High quality upscaling from SD / FHD input to UHD, FW upload from memory stick
Power consumption	Max. 100W / 24V ± 10% Low power mode: 2.0W typical
External power supply	<p>2.5.6</p> AC input: 100 - 240 VAC / 47-63 Hz auto-switch DC output: +25 VDC / 8 A Dimensions: 204 x 81 x 43 mm (8.0 x 3.2 x 1.7') Weight: 0.9 kg (2 lbs)
DC power output	DP connector: +3.3 V / 500 mA USB connector: +5 V / 1 A
Dimensions (W x H x D)	768 x 480 x 83 mm (30.2 x 18.9 x 3.3')
Dimensions packaged (W x H x D)	900 x 720 x 170 mm (35.4 x 28.3 x 6.7')
Net weight (display only)	12.7 kg (28.0 lbs)
Net weight packaged	19.5 kg (43.0 lbs)
Mounting standard	VESA 100 x 100 mm
Operating temperature	0°C to 35 °C for performance 0 °C to 40 °C for safety
Storage temperature	-20 °C to 60 °C
Operating humidity	20% to 85% (non-condensing)

4. HDCP (High-bandwidth Digital Content Protection) is a copyright protection technology using encryption technology of digital video signals.





2.0 Product Description

2.1 Product Description and Intended Use

The Arthrex AR-8305 Synergy^{Resection} Shaver System is a motorized, suction/cutting device used for the resection and aspiration of soft tissue, cartilage and bone during arthroscopic surgical procedures.

3.1.1 The console is microprocessor controlled and features two fully functional channels that allow optional simultaneous handpiece operation. Both channels can be operated with a single foot switch or individually when a second foot switch is attached to the console. The Synergy^{Resection} has a maximum speed of 8,000 revolutions per minute providing precise burr control during surgical procedures.

The Synergy^{Resection} console is designed for continuous operation. The handpieces are individually protected by a resetting thermal fuse. In the event of a motor overload fault (e.g., excess current) the fuse heats up and the device is deactivated. When the fault is removed and the fuse cools down (typically about 30 seconds) operation resumes at the pre-failure settings.

The cable and all handpieces can be sterilized, so handpieces can be changed during the surgical procedure without endangering surgical sterility.

The AR-8305 Synergy^{Resection} Console and included Applied Parts and Accessories:

- AR-8305 Console with power cord
- User's Guide Optional

Applied Parts

- 3.1.2
- Footswitch Controlled (FC) Shaver Handpieces
 - Handpiece Controlled (HC) Shaver Handpieces
 - Drill Handpiece with key for Jacobs chuck
 - Sagittal Saw Handpiece with wrench
 - Small Joint Shaver

Other Optional Accessories:

- Accessory Handpiece Cable
- Gas Pedal Footswitch
- Corded Multi-Function Footswitch
- Wireless Multi-Function Footswitch

Save the packaging for later transport of the device.



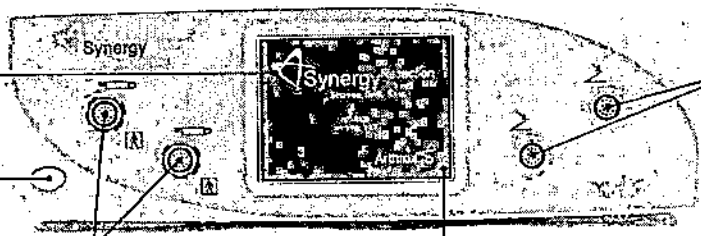
3

Synergy Console

3.1.5

Bright Screen
Readable in a bright OR

Easy-to-Use Console
Power to console, plug-in handpiece



Multituse
Use up to two different shavers, a drill, or saw handpieces at one time

Intuitive User Interface
With an easy-to-navigate menu

Multituse
Up to two different footswitches can be used simultaneously

This versatile Synergy^{Resection} system was designed for multiple orthopedic procedures and operates like 2 consoles in 1 chassis. It can simultaneously operate 2 accessory handpieces completely independent of each other. Operators can also use 1 or 2 foot pedals to control each of the accessory handpieces. Shaver handpieces offer 3 oscillating modes depending on the application or surgeon's preference: standard, efficient, or aggressive.

When the Synergy^{Resection} console is integrated with the DualWave™ or Continuous Wave™ 4 arthroscopy pump, the pump detects when the shaver handpiece is active and automatically compensates for the loss of distention by increasing the pressure while the shaver is active.

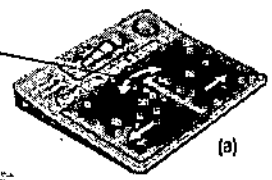
Integration of the Synergy^{Resection} console with a Synergy video management system enables the heads-up display feature and allows for easy visibility of the shaver system settings on the monitor.

Product Description	Item Number
Synergy ^{Resection} Console	AR-8305 3.1

Footswitches

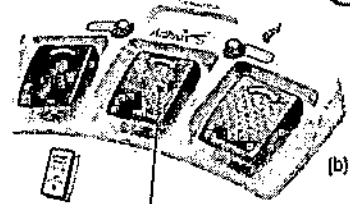
Low-Profile Footswitch

- Ergonomic design for less fatigue during use



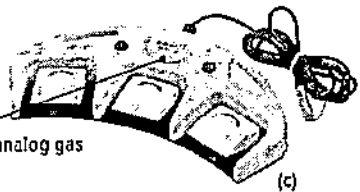
Multifunction/Wireless

- Radio frequency, wireless communication without line-of-sight concerns
- Digital on/off or analog gas pedal operation



Multifunction/Cable

- Digital on/off or analog gas pedal operation
- Cabled for secure operation



Low-Profile Footswitch

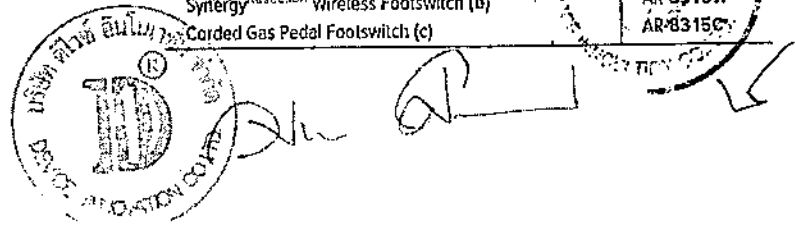
The low-profile footswitch minimizes user fatigue while maintaining control of all functions. Control direction and speed by pressing the appropriate pad.

Press the toggle dome switch to change control between the console's dual channels if 2 handpieces are plugged in. If 1 handpiece is plugged in, the toggle dome switch will toggle between the 3 oscillation modes.

Wireless and Corded Multifunction Footswitches

The wireless and corded multifunction footswitches feature user selectable functionality of either standard footswitch or gas pedal modes. All speed, direction, cruise, and toggle controls are accessible on either of these user-friendly accessories and the active mode is displayed on the console.

Product Description	Item Number
Low-Profile Footswitch (a)	AR-8310
Synergy ^{Resection} Wireless Footswitch (b)	AR-8315W
Corded Gas Pedal Footswitch (c)	AR-8315C



WARNING

Use this device only under the supervision of a trained and licensed physician. This device should not be used by untrained personnel or used for indications other than those described in this *User's Guide*.

2.2 Product Features

2.2.1 AR-8305 Console - Front View

Figure 1 shows the front panel of the AR-8305 console. Features and symbols are identified in Table 1 below.

Figure 1 Front Panel of Console

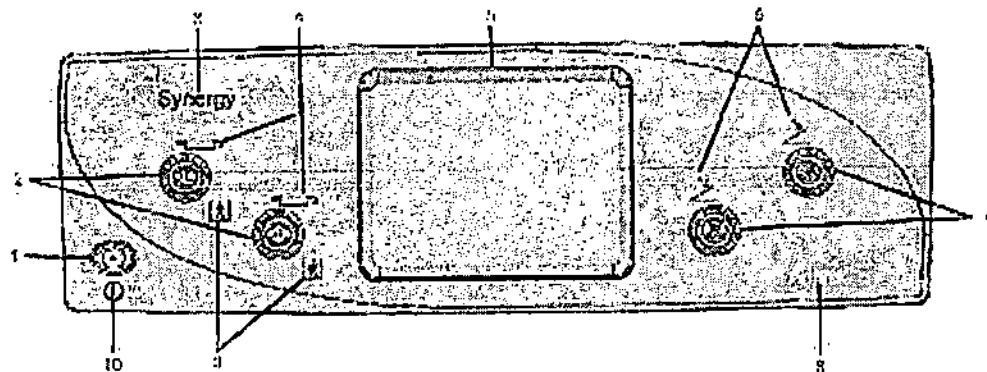
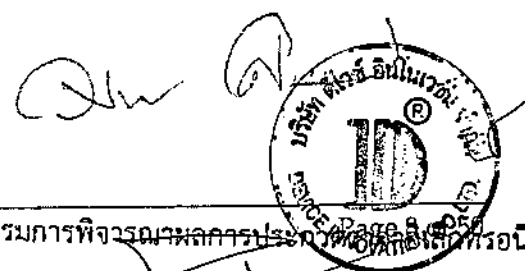


Table 1 Front Panel Elements

- | | |
|-------|---|
| | 1. On / Off Power Switch |
| 3.1.3 | 2. Handpiece Connectors |
| | 3. Synergy Product Logo |
| | 4. Handpiece Symbols |
| 3.1.5 | 5. Touch Panel Visual Display |
| 3.1.4 | 6. Footswitch Symbols |
| | 7. Footswitch Connectors |
| | 8. Arthrex Logo |
| | 9. Type BF Symbols (Electric Shock Protection) |
| | 10. Power Switch IEC 60417-5010 symbol (On / Off) |





5.12 Accessory Handpiece Speed Limits and Deltas

The console supports individual handpiece motor-speed limits, defaults, and speed increment and decrement "deltas". These are defined below for the supported handpieces.

Table 20 Accessory Handpiece Speed Limits and Delta

Handpiece	Forward / Reverse Speeds (RPM)			Oscillation Speeds (RPM)		
	Min.	Max.	Speed Delta	Min.	Max.	Speed Delta
Shaver	500	8000	300	500	3000	250
Drill	100	1400	See Drill Speeds Section	N/A	N/A	N/A
Sag Saw	18000	18000	N/A	N/A	N/A	N/A
SJ Shaver	500	6200	300	500	3000	250

5.12.1 Drill-Speeds

The drill supports only 100, 300, 500, 900, and 1400 (RPM). It does not cycle through regular increments.

NOTE: While operating handpieces, the settings can be changed without risk of damaging the motor or console.

W A R N I N G

Do not have the device in direct contact with patient if high-frequency devices are in use or if the patient requires defibrillation.

5.12.2 Console Speed Controls

The Speed Increase and Speed Decrease buttons adjust the speed. Each time a button is pressed, the speed is adjusted as shown in Table 20. The commands are ignored if multiple buttons are pressed simultaneously.

To make the handpiece speed increase or decrease automatically, press the Speed Increase or Speed Decrease button for more than 1 second. The values will not exceed the minimum and maximum values defined for the attachment.

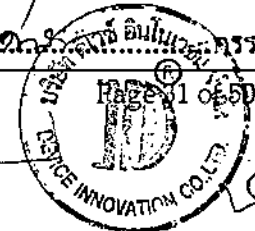
Table 21 Handpiece Accuracy

Handpiece	ACCURACY
All Shavers	±5 % OR ±100 RPM (greater of the two)
Drill	±5 % OR ±20 RPM (greater of the two)
Sag Saw	±6 %

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 ประธานกรรมการ
 กรรมการ
 ๒. ลงชื่อ.....
 ๓. ลงชื่อ.....



Handwritten signature





3.0 Technical Specifications

3.1 Console

Table 6 AR-8305 Console Specifications

Width	40.64cm (16.00 inches)
Height	13.335cm (5.250 inches)
Depth	30.686cm (12.081 inches)
Weight	6.8kg (15 lbs.)
Water protection	IP22
Mains cable	10 A/250 V
Power entry module	IEC 320/C13
Fuse value	6.3 A, 250 V~, 2.0 cm (0.75 inches) Type T
3.1.9 AC input	100-240V~, 50/60Hz, 6.3A
Applied Part Type	BF
Cleaning, disinfecting and sterilization	Refer to Sections 6.0 Cleaning and Disinfecting and 7.0 Sterilization

3.2 Standard Footswitch

Table 7 Standard Footswitch Specifications

Functions	Reverse, Forward, Oscillation, Speed Increase, and Toggle
Width	23.6 cm (9.3 inches)
Height	2.5 cm (1.0 inches)
Depth	20.8 cm (8.2 inches)
Weight	2.2 kg (5 lbs.)
Water protection	IP68
Cleaning, disinfecting, and sterilization	Refer to Sections 6.0 Cleaning and Disinfecting and Section 7.0 Sterilization

3.3 Ambient Conditions for Operation

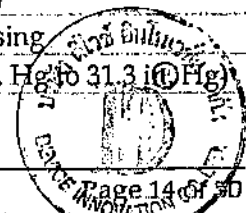
Table 8 AR-8305 Ambient Conditions for Operation

Temperature	10° to 40°C (50° to 104°F)
Relative humidity	30 % to 75 %
Air Pressure	700 hPa to 1060 hPa (21 in. Hg to 31.3 in. Hg)

3.4 Ambient Conditions for Storage (in shipping packaging)

Table 9 AR-8305 Ambient Conditions for Storage

Temperature	-30° to 70°C (-22° to 158°F)
Relative humidity	10 % to 90 %, non-condensing
Air Pressure	500 hPa to 1060 hPa (15 in. Hg to 31.3 in. Hg)



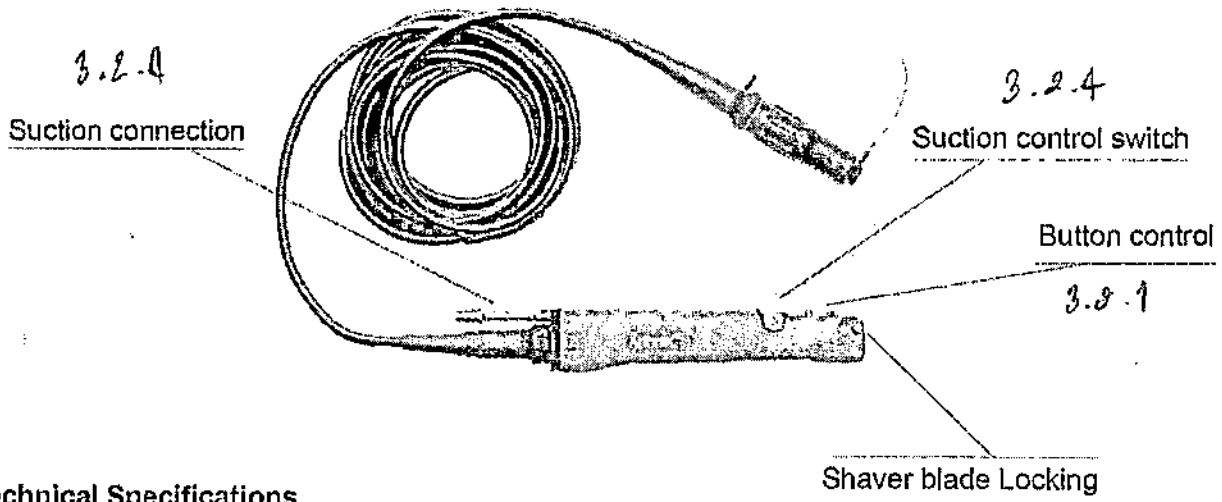
คณะกรรมการพิจารณาผลการประเมินราคาอิเล็กทรอนิกส์
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 ๒.ลงชื่อ.....กรรมการ
 ๓.ลงชื่อ.....กรรมการ

3.2

Hand - Control Handpiece Shaver



AR-8332H 3.2.1



Technical Specifications

Forward / Reverse Speeds	500 - 8000 RPM
Oscillation Speeds	500 - 3000 RPM
Cable Length	3.6 m 3.2.5

Sterilisation

Sterilization can be accomplished by ETO, Steris and steam autoclavable or soaked in glutaraldehyde solutions

3.2.3.



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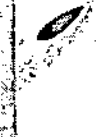






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๓.ลงชื่อ.....กรรมการ



Large Hub Options: Fit Large Shaver Handpieces

3.2.2

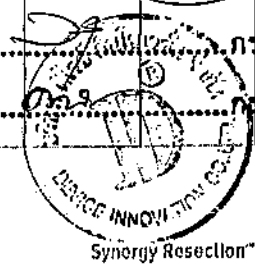
	Description	2 (Ø mm)	3 (Ø mm)	3.5 (Ø mm)	3.8 (Ø mm)	4 (Ø mm)	4.2 (Ø mm)	5 (Ø mm)	5.5 (Ø mm)	
	Excallbur Sharp-toothed blade makes this the most aggressive shaver for extensive soft-tissue debridement				AR-838DEX	AR-8400EX AR-8400CEX (curved)	AR-6420EX ¹ AR-6420CEX ²	AR-8500EX	AR-8550EX	Most aggressive
	Torpedo™ Blade Tapered tip and scissor-like cutting action make for easy access into joint space and rapid soft-tissue resection; outer oval window to limit tissue size and help reduce clogging			AR-7350TD ³		AR-7400TD ³ AR-8400TD AR-8400CTD (curved)	AR-6420TD ¹ AR-6420CTD ²	AR-8500TD		
	SabreTooth Wide-toothed blade for bulk soft-tissue debridement			AR-8350ST	AR-8380ST	AR-8400ST AR-8400CST (curved)	AR-6420CST ²	AR-8500ST	AR-8550ST	
	Bone Cutter Dual-purpose blade designed for fast and aggressive tissue debridement when in oscillation mode and for bone removal when run in the forward or reverse direction				AR-8380BC	AR-8400BC AR-8400CBC (curved)	AR-6420BC ¹ AR-6420CBC ²	AR-8500BC	AR-8550BC	
	Dissector Sharp inner-toothed blade with a tear-drop-shaped outer window for less iatrogenic chondroplasties and soft-tissue removal		AR-7300DS ³	AR-8350DS AR-8350CDS (curved)	AR-8380DS	AR-8400DS AR-8400CDS (curved)	AR-6420DS ¹ AR-6420CDS ²	AR-8500DS	AR-8550DS	
	Double Cut Dual inner-cutting windows provide efficient soft-tissue resection; elongated outer window minimizes tissue size entering the blade thus reduces clogging				AR-8380DC	AR-8400DC AR-8400CDC (curved)			AR-8550DC	
	Sabre Smooth tear-drop-shaped outer window for general soft-tissue resection that leaves smooth anatomic edges	AR-7200SR ²	AR-7300SR ³		AR-8380SR	AR-8400SR AR-8400CSR		AR-8500SR	AR-8550SR	
	Slotted Whisker Double-slotted outer window enables precise tissue resection					AR-8380SW				

Color bars reflect family color shown on the adapter

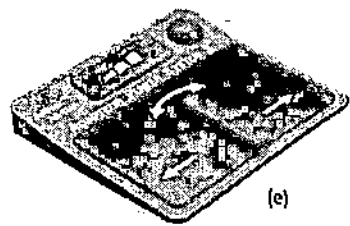
- 1. Hip-length, straight
- 2. Hip-length, curved
- 3. Small-joint-length, large hub



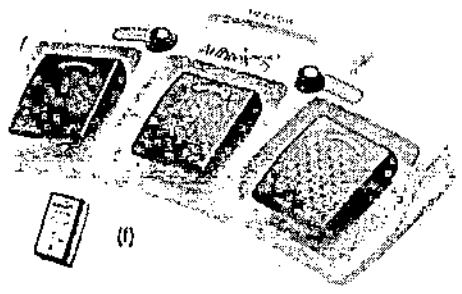
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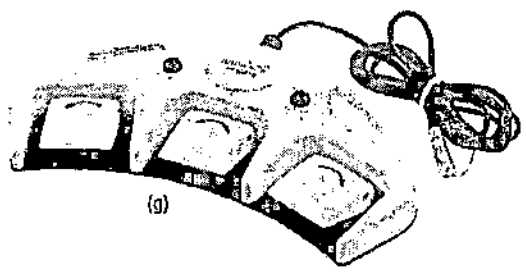
Footswitches



(e)



(f)



(g)

Low-Profile Footswitch

The low-profile footswitch minimizes user fatigue while maintaining control of all functions. Control direction and speed by pressing the appropriate pad.

Press the toggle dome-switch to change control between the console's dual channels if two handpieces are plugged in. If one handpiece is plugged in, the toggle dome-switch will toggle between the three oscillation modes.

Wireless and Corded Multifunction Footswitches

The wireless and corded multifunction footswitches feature user selectable functionality of either standard footswitch or gas pedal modes. All speed, direction, cruise, and toggle controls are accessible on either of these user-friendly accessories and the active mode is displayed on the console.

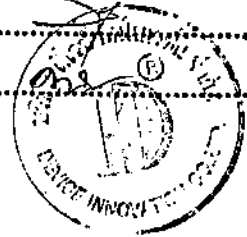
Product Description	Item Number
Low-Profile Footswitch (e)	AR-8310
Synergy ^{Resection} Wireless Footswitch (f)	AR-8315W
Corded Gas Pedal Footswitch (g)	AR-8316C

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2.3 Applied Parts and Accessory Features

2.3.1 Standard Footswitch (AR-8310) 3.3

Figure 3 shows the Standard Footswitch. Features and symbols are identified in Table 5 below.

Figure 3 Standard Footswitch - Description

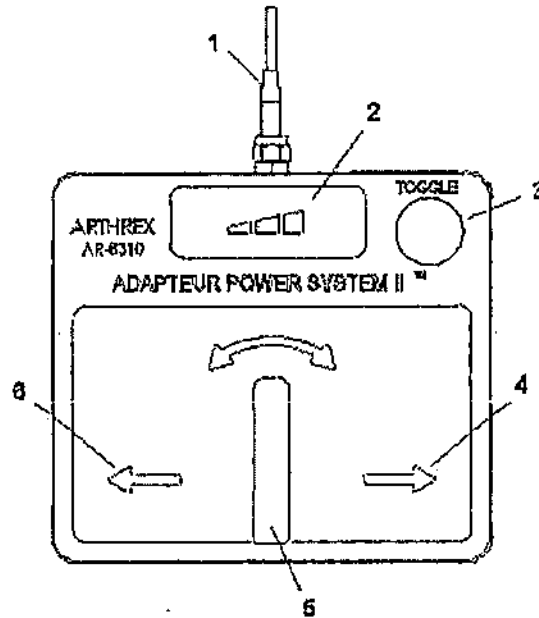


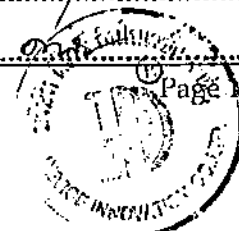
Table 5 Elements of the Standard Footswitch

	1. Cable
	2. Speed Increase button
3.3-2	3. Toggle button
3.3-1	4. Forward pedal
	5. Oscillation pedal
	6. Reverse pedal



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Curettes, Arthroscopic Probes, Osteotomes

Curette
150 mm,
one side cut,
Ø 5.4 mm ring
AR-20010



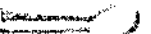
Curette
220 mm, both sides
cutting, Ø 5.4 mm
ring, with handle
AR-20020



Curette
220 mm, one side
cutting, Ø 5.4 mm
ring, with handle
AR-20030



Curette
220 mm, one side
cutting, Ø 3.4 mm
ring, with handle
AR-21010



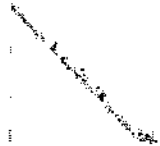
Curette
220 mm, both sides
cutting, Ø 3.4 mm
ring, with handle
AR-21020



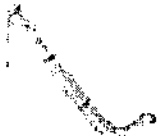
Probe - Hook
150 mm shaft,
5.4 mm tip
AR-10000



Probe - Hook
150 mm shaft,
3.4 mm lip
with 5 mm markings
4.1 AR-10010



Probe - Hook
125 mm shaft,
5.4 mm lip,
stainless steel
AR-10020



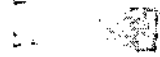
Probe - Hook
140 mm shaft,
7.7 mm lip
AR-10100



Probe - Hook
Small Joint,
71 mm shaft,
3.4 mm tip
AR-30000



Chondro Osteotome
AR-1767



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Straight Punches

Straight tip punches are available in three bite sizes with a 2.75 mm shaft and four bite sizes with a 3.4 mm shaft.

Bite Size	
2.75 mm shaft	3.4 mm shaft
0.7 mm, slender	0.9 mm, slender
1.4 mm, standard	1.7 mm, standard
2.5 mm, large	2.6 mm, medium
	3.4 mm, large

Slender Punch Tips



Standard Punch Tips



Standard Punch 15° Up Tips



Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11100
15° up curved shaft	AR-11110
30° right curved shaft	AR-11120
30° left curved shaft	AR-11130
3.4 mm shaft diameter	
Straight shaft	AR-12100
15° up curved shaft	AR-12110
30° right curved shaft	AR-12120
30° left curved shaft	AR-12130

Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11000
15° up curved shaft	AR-11010
30° right curved shaft	AR-11020
30° left curved shaft	AR-11030
3.4 mm shaft diameter	
Straight shaft	AR-12000
15° up curved shaft	AR-12010
30° right curved shaft	AR-12020
30° left curved shaft	AR-12030

Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11050
15° up curved shaft	AR-11060
30° right curved shaft	AR-11070
30° left curved shaft	AR-11080
3.4 mm shaft diameter	
Straight shaft	AR-12050
15° up curved shaft	AR-12060
30° right curved shaft	AR-12070
30° left curved shaft	AR-12080

WishBone™ Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11100W
15° up curved shaft	AR-11110W
30° right curved shaft	AR-11120W
30° left curved shaft	AR-11130W
3.4 mm shaft diameter	
Straight shaft	AR-12100W
15° up curved shaft	AR-12110W
30° right curved shaft	AR-12120W
30° left curved shaft	AR-12130W

WishBone Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11000W
15° up curved shaft	AR-11010W
30° right curved shaft	AR-11020W
30° left curved shaft	AR-11030W
3.4 mm shaft diameter	
Straight shaft	AR-12000W
15° up curved shaft	AR-12010W
30° right curved shaft	AR-12020W
30° left curved shaft	AR-12030W

WishBone Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11050W
15° up curved shaft	AR-11060W
30° right curved shaft	AR-11070W
30° left curved shaft	AR-11080W
3.4 mm shaft diameter	
Straight shaft	AR-12050W
15° up curved shaft	AR-12060W
30° right curved shaft	AR-12070W
30° left curved shaft	AR-12080W



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Medium Punch Tips



Series I Instruments

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft	AR-12300
15° up curved shaft	AR-12310
30° right curved shaft	AR-12320
30° left curved shaft	AR-12330

WishBone™ Instruments

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft	AR-12300W
15° up curved shaft	AR-12310W
30° right curved shaft	AR-12320W
30° left curved shaft	AR-12330W

Medium Punch 15° Up Tips



Series I Instruments

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft 4.3	AR-12350
15° up curved shaft	AR-12360
30° right curved shaft	AR-12370
30° left curved shaft	AR-12380

WishBone Instruments

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft	AR-12350W
15° up curved shaft	AR-12360W
30° right curved shaft	AR-12370W
30° left curved shaft	AR-12380W

Large Punch Tips



Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11200
15° up curved shaft	AR-11210
30° right curved shaft	AR-11220
30° left curved shaft	AR-11230
3.4 mm shaft diameter	
Straight shaft	AR-12200
15° up curved shaft	AR-12210
30° right curved shaft	AR-12220
30° left curved shaft	AR-12230

WishBone Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11200W
15° up curved shaft	AR-11210W
30° right curved shaft	AR-11220W
30° left curved shaft	AR-11230W
3.4 mm shaft diameter	
Straight shaft	AR-12200W
15° up curved shaft	AR-12210W
30° right curved shaft	AR-12220W
30° left curved shaft	AR-12230W

Large Punch Tips 15° Up Tips

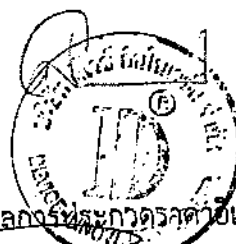


Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11250
15° up curved shaft	AR-11260
30° right curved shaft	AR-11270
30° left curved shaft	AR-11280

WishBone Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11250W
15° up curved shaft	AR-11260W
30° right curved shaft	AR-11270W
30° left curved shaft	AR-11280W



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Angled, Reverse, and Rotary Punches

45° Angled Tip Punches are available in two bite sizes with a 2.75 mm shaft and three bite sizes with a 3.4 mm shaft.

Bite Size	
2.75 mm shaft	3.4 mm shaft
— 0.7 mm, slender	— 0.9 mm, slender
— 1.4 mm, standard	— 1.7 mm, standard
	— 2.5 mm, medium

Slender Punch, Angled Tips



Standard Punch, Angled Tips



Standard/Medium Punch, Reverse Tips



Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
45° right, straight shaft	AR-11420
45° left, straight shaft	AR-11430
45° R, 15° right curved shaft	AR-11440
45° L, 15° left curved shaft	AR-11450
3.4 mm shaft diameter	
45° right, straight shaft	AR-12420
45° left, straight shaft	AR-12430
45° R, 15° right curved shaft	AR-12440 4.4
45° L, 15° left curved shaft	AR-12450 4.5

WishBone™ Instruments

Product Description	Item Number
2.75 mm shaft diameter	
45° right, straight shaft	AR-11420W
45° left, straight shaft	AR-11430W
45° R, 15° right curved shaft	AR-11440W
45° L, 15° left curved shaft	AR-11450W
3.4 mm shaft diameter	
45° right, straight shaft	AR-12420W
45° left, straight shaft	AR-12430W
45° R, 15° right curved shaft	AR-12440W
45° L, 15° left curved shaft	AR-12450W

Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
45° right, straight shaft	AR-11460
45° left, straight shaft	AR-11470
45° R, 15° right curved shaft	AR-11480
45° L, 15° left curved shaft	AR-11490
3.4 mm shaft diameter	
45° right, straight shaft	AR-12460
45° left, straight shaft	AR-12470
45° R, 15° right curved shaft	AR-12480
45° L, 15° left curved shaft	AR-12490

WishBone Instruments

Product Description	Item Number
2.75 mm shaft diameter	
45° right, straight shaft	AR-11460W
45° left, straight shaft	AR-11470W
45° R, 15° right curved shaft	AR-11480W
45° L, 15° left curved shaft	AR-11490W
3.4 mm shaft diameter	
45° right, straight shaft	AR-12460W
45° left, straight shaft	AR-12470W
45° R, 15° right curved shaft	AR-12480W
45° L, 15° left curved shaft	AR-12490W

Series I Instruments (Standard)

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft, standard, reverse	AR-12520
Straight shaft, standard, 15° up, reverse	AR-12560

WishBone Instruments (Standard)

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft, standard, reverse	AR-12520W
Straight shaft, standard, 15° up, reverse	AR-12560W

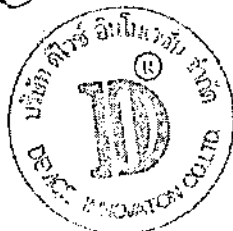
Series I Instruments (Medium)

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft, medium, reverse	AR-12530
Straight shaft, medium, 15° up, reverse	AR-12570

WishBone Instruments (Medium)

Product Description	Item Number
3.4 mm shaft diameter	
Straight shaft, medium, reverse	AR-12530W
Straight shaft, medium, 15° up, reverse	AR-12570W

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Graspers

Graspers are available in 2.75 mm, 3.4 mm, and 4.2 mm shafts. Series I NR graspers are made with nonratcheting handles and are nonlocking. Series I SR graspers feature a self-releasing locking mechanism. All WishBone™ graspers feature a ratcheting lock mechanism that can be disengaged for nonlocking operation.

Blunt Tip Grasper



Alligator Graspers/Hook Tips



ACL/PCL Graft Passing Forceps



Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft, nonratcheting	AR-11500NR
15° up curved shaft, nonratcheting	AR-11510NR
Straight shaft, self-releasing	AR-11500SR
15° up curved shaft, self-releasing	AR-11510SR
3.4 mm shaft diameter	
Straight shaft, nonratcheting	AR-12500NR
15° up curved shaft, nonratcheting	AR-12510NR
Straight shaft, self-releasing	AR-12500SR
15° up curved shaft, self-releasing	AR-12510SR
4.2 mm shaft diameter	
Straight shaft	AR-13500NR
Straight shaft	AR-13500SR

WishBone™ Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11500W
15° up curved shaft	AR-11510W
3.4 mm shaft diameter	
Straight shaft	AR-12500W
15° up curved shaft	AR-12510W
4.2 mm shaft diameter	
Straight shaft	AR-13500W

Series I Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11600NR
15° up curved shaft	AR-11610NR
Straight shaft	AR-11600SR
15° up curved shaft	AR-11610SR
3.4 mm shaft diameter	
Straight shaft	AR-12600NR
Straight shaft	AR-12600SR
15° up curved shaft	AR-12610NR
4.2 mm shaft diameter	
Straight shaft	AR-13600NR
Straight shaft	AR-13600SR

WishBone Instruments

Product Description	Item Number
2.75 mm shaft diameter	
Straight shaft	AR-11600W
15° up curved shaft	AR-11610W
3.4 mm shaft diameter	
Straight shaft	AR-12600W
15° up curved shaft	AR-12610W
4.2 mm shaft diameter	
Straight shaft	AR-13600W

Series I Instruments

Product Description	Item Number
4.2 mm shaft diameter	
Straight shaft	AR-13400NR
Straight shaft	AR-13400SR

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Product Description	Item Number
4.2 mm shaft diameter	
Straight shaft	AR-13400W

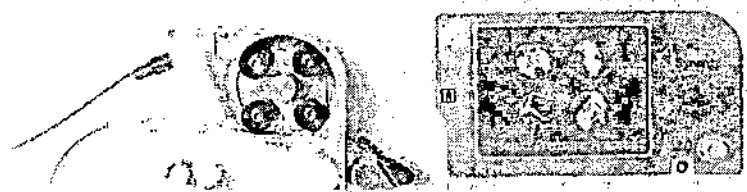
4.6



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Continuous Wave™ 4 Arthroscopy Pump and Accessories

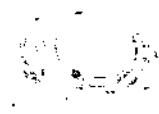


5.1

AR-6485 Continuous Wave 4 Arthroscopy Pump



AR-6410 Main Pump Tubing



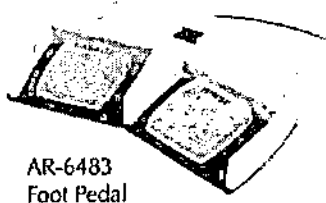
AR-6220 Extension Tubing



AR-6482 Autoclavable Remote Control



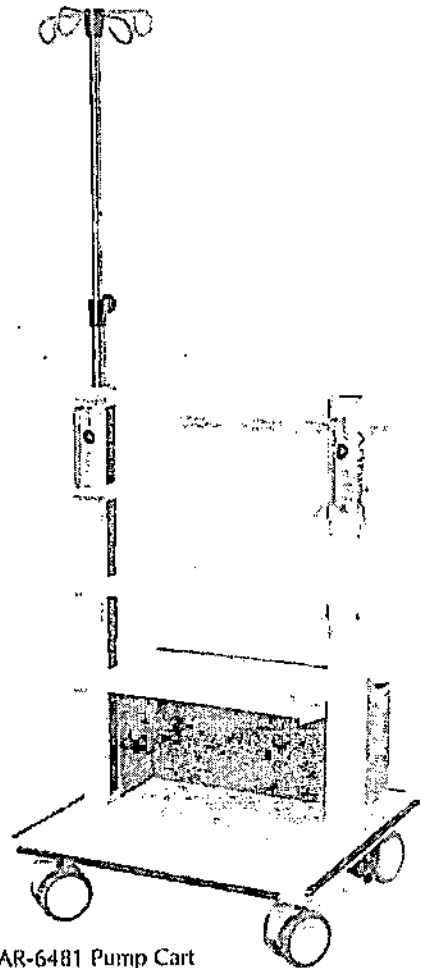
AR-6411 ReDeuce™ Pump Tubing



AR-6483 Foot Pedal



AR-6421 ReDeuce Patient Tubing



AR-6481 Pump Cart



AR-6215 Y-Tubing Adapter



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2.2 Product Features

2.2.1 AR-6485 Console: Front View

Figure 1 uses a *numeric* callout system to identify the main elements of the console's front panel, which are listed and labeled in Table 1. These callouts are referenced throughout this *User's Guide*.

Figure 1 Front Panel of Console

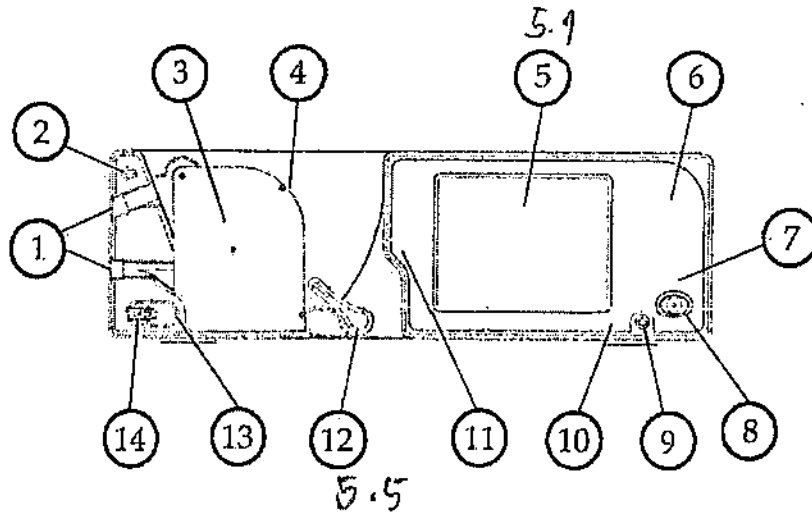
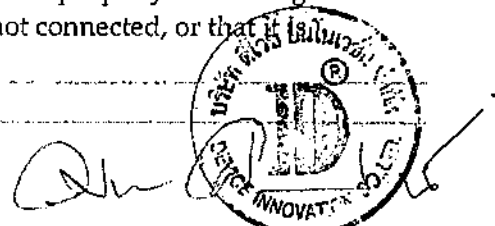
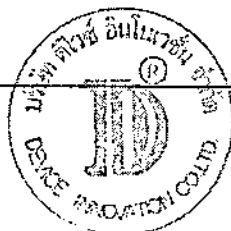


Table 1	Front Panel Elements
1.	Inflow tubing track
2.	Inflow tubing alignment marker
3.	Inflow roller assembly
4.	Inflow roller housing door
5.1	Operator display
6.	Synergy Product Logo
7.	Power Switch IEC 60417-5009 symbol (Stand-by)
8.	Stand-by power switch
9.	Remote control or foot pedal connector
10.	Remote control or foot pedal symbols
11.	Type BF Symbols (Electric Shock Protection)
5.5	Inflow door locking mechanism
13.	Tubing sensor coupler indicator LED. A steady green LED indicates that the tubing is connected properly. A flashing red LED indicates that the tubing is not connected, or that it is connected incorrectly
14.	Tubing sensor coupler



one



3.0 Technical Specifications

3.1 Console

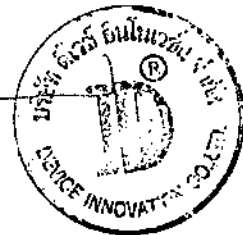
Width	42 cm (16.5 in.)
Height	13.5 cm (5.3 in.)
Depth	29.2 cm (11.5 in.)
Weight	6.24 kg (13.75 lbs.)
5.3 Maximum flow rate	≥ 1500 ml/minute
5.2 Pressure	10 – 120 increments of 5.
Overpressure control	300 mmHg ± 5
5.7 Pressure control	Continuous pressure checking
5.8 Protection	IP22
Main cable	10 A/250 V
Connector	CEE 7/7
AC mains power input plug	IEC 60320 C13/C14
5.9 AC Input	100-240 V, 50/60 Hz, 1.5A Max/100VAC, 0.7A Max/240VAC
Mains fuse	T2AH250V (5 x 20 mm)
Applied part type	BF
Cleaning	Surface cleaning with mild detergent
Sterilization	Must not be sterilized

Temperature	10° to 40 °C (50° to 104 °F)
Relative Humidity	20% to 75%, non-condensing
Barometric pressure	700 hPa (10.15 PSI) to 1060 hPa (15.37 PSI)

Temperature	-30° to +70°C (-22° to 158°F)
Relative Humidity	10% to 90%, non-condensing
Barometric pressure	500 hPa (7.25 PSI) to 1060 hPa (15.37 PSI)



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WARNING

User-programmed "Pressure Set" values are increased by as much as 50%, but not to exceed a pump pressure of 120 during the LAVAGE function. Exercise caution to avoid injury to the patient.

1. Press the LAVAGE button [Table 3, i or I] to enable this function. The LAVAGE button should turn dark blue in color and begin a countdown. The pressure will be increased to the factory default of a 50% increase for 120 seconds or to the user-defined parameters.
2. The LAVAGE mode will stop when the countdown reaches zero, or if the user presses the LAVAGE button a second time.

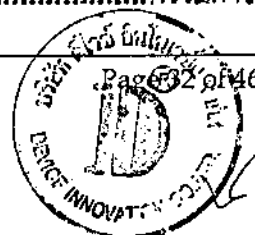
5.4 How to Operate the Flow Control on the AR-6485

The AR-6485 has a flow control setting with in the default menu that allows for the maximum fluid flow rate to the joint space to be increased or decreased by a 10 percent on a scale of 50 percent to 100 percent. 5.4



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1. The surgical staff removes the sterile extension or patient tubing from its sterile pack and hands the connector [h or k] for the pump tubing set to the circulating nurse.
2. The circulating nurse connects the two tubing systems together ([h] to [h] in Figure 5 or [k] to [k] in Figure 6).
3. At the end of each case, detach the extension or patient tubing set and attach the sterile connector cap (supplied with each extension or patient tubing set) to the patient-end of the pump tubing.

NOTE: Following each surgery, detach and discard the extension or patient tubing set.

W A R N I N G !

The sterile connector cap must be used to cover the pump tubing set connector after each surgical procedure. This maintains sterility of the pump tubing and ensures its safe operation throughout the entire surgical day.

4.10 How to Change the Language Setting

5.6 The AR-6485 supports English, French, German, Italian, and Spanish. The default language is English. To change the language setting for operator display messaging, follow these instructions.

1. Power ON the stand-by power switch [8] on the AR-6485.
2. Press the Menu button.
3. Press the Language button.
4. Select the desired language.
5. Press ok. The language is now stored in the memory.

4.11 How to Test the Power Supply Voltages

1. Performed automatically as part of the power-up sequence.

4.12 Safe Setup and Performance

4.12.1 Abnormal Operation

The AR-6485 employs a dual-pressure sensor design. Microcontroller-based internal circuitry monitors the sensors, as well as other circuit parameters, to ensure that the pump remains within normal operating limits. In the event of a fault, the pump motor is automatically disabled and an error message is displayed on the operator display [5]. See Table 3 for a complete list of operator display messages and section 10.0 for troubleshooting information.

NOTE: If abnormal console operation cannot be corrected, disinfect the pump, repackage in the original shipping materials, and return to Arthrex.



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