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# PAL<sup>®</sup> System

## Power-Assisted Liposuction



*“The Original  
and  
the Best”*



### MICROAIRE<sup>®</sup>

*For Surgery. For Life.<sup>™</sup>*

More than 200 Installations in India 

Power-Assisted Liposuction System



# PAL<sup>®</sup> Power-Assisted Liposuction System

## PAL Powered Handpiece | PAL-650

The PAL-650 from MicroAire<sup>®</sup> is a powerful, precision instrument designed for small- or large-volume fat extraction, body contouring and fat harvesting.

PAL's smooth reciprocating cannulas glide through tissue, reducing the amount of physical effort required during liposuction, thus reducing O.R. time.<sup>1</sup>

Reciprocation increases control, helping the surgeon gently guide the cannula with greater accuracy, even through dense fibrous tissue. The result is a faster procedure, less fatigue and more precise outcomes.<sup>1</sup>



Weight : 1.1 lb (0.5 kg)

## PAL Cannulas

Small variations in the number of ports, as well as their size and location on the cannula, can have a significant impact on performance and outcomes. MicroAire has developed several port configurations based on clinical studies and surgeon feedback.



### Extraction

Most popular cannulas for large-volume debulking and body contouring.



### Harvesting

Well-suited for producing small, consistent lobules for fat grafting.



### Specialty

PAL reciprocation provides cannula uses that go beyond liposuction.

See the complete listing of PAL Cannulas in the PAL Cannula Brochure online at [www.microaire.com](http://www.microaire.com).

Simple touch-screen interface

### MicroAire Standard Electric Console | 5020

Weight	14 lbs (6.35 kg)
Height	6" (15.24 cm)
Footprint	12"x 14" (30.48 cm x 35.56 cm)
Electrical	300 W, 100-240 V, 50/60 Hz



Controls two PAL handpieces at once

PAL is the most widely used and *preferred* alternative to manual liposuction.<sup>5</sup>



Less Bruising and Swelling<sup>1</sup>

Reduced Surgeon Fatigue<sup>1</sup>

Faster Procedure and Patient Recovery<sup>1</sup>

Proven Cell Viability<sup>2,3,4</sup>



## Unique Features of MicroAire PAL

### Power Control by hand

- The MicroAire PAL hand piece has a sliding power control switch which helps the surgeon to control the reciprocating motion and speed of the system in real time as different body sections have different power and speed requirements.

This can be done by a single switch without the need to stop the handpiece or go to the main console to change speed.



### Availability of Variable Speed

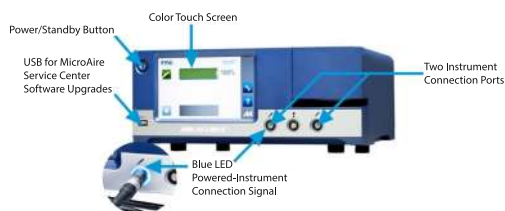
- The hand piece doesn't run on fixed speed. The reciprocating speed of the cannulas can be changed immediately as per requirement.

This eradicates the need to stop the handpiece in the middle of the procedure in order to change the speed.

### Dual Handpiece Attachment

- The power console is a Modular system designed to operate 2 PAL handpieces simultaneously through a single console, with both handpieces operating at different speeds independently.

Two surgeons can operate on a single patient at the same time especially during mega Liposuction cases. This helps to reduce operating time, reduce patient fatigue.



### Touch Display

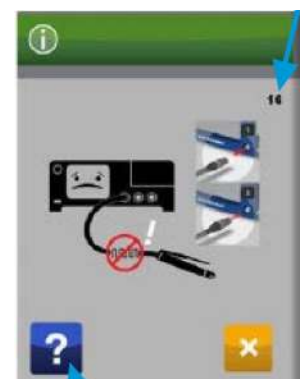
- MicroAire Power console has a touch display which shows us the power/speed being used in real time by the surgeon.

The maximum power available to the handpiece can be easily set by tapping the power bar on the screen.

### Error Display

- The console is designed to immediately alert the surgeon of any technical error that may arise in the system. The type of error along with error code is displayed on the screen, which indicates what part of the system is malfunctioning or requires service.

This safety feature helps prevent any further issues and damages to the rest of the system.



## Unique Features of MicroAire PAL

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### Small Power Tools

- The MicroAire console is designed to support both Power Assisted Liposuction handpiece as well as Small Bone Power Tools.

PAL handpiece, Micro Drills, Burs and saws (oscillating, reciprocating, sagittal), Kwire driver system all can be used on a single console.



### In Built suction tube passage

- The suction tubing connecting the handpiece to the suction machines is designed to be tapered with the thinner end passing through the handpiece. This prevents the suction tube to hinder with the surgeons hand during procedure.



### Option for Wide variety of reusable cannulas for different body procedures. Easy to change during procedure.



### Completely Autoclavable

- All components of the system including handpiece, cable, cannulas can be autoclaved and reused.



### Spare Manual Handpiece is provided with the system

- This handpiece supports all the cannulas and can be used as an alternative to electric handpiece for manual Liposuction using suction.

### Software Upgrade Port

- An USB port is provided in the console. This is used for any future software upgrades that company may offer. This port is also used for trouble shooting in case of any software issues that may arise.



### In Built Irrigation pump for small bone power tools

FDA Approved. MADE IN USA

Long service life. Easy to service and repair

# Ordering Information

## PAL Component Part Numbers

<b>PAL-650</b>	PAL Powered Handpiece
<b>5006-PAL</b>	PAL Cable (for use with the 5020 console)
<b>5020/5025</b>	PAL Electric Console

## PAL Accessories Part Numbers

<b>CAP-600E</b>	PAL Washer Disinfector Cap
<b>PAL-500</b>	PAL Sterilization Case
<b>PAL-730</b>	PAL Wand Manual Handpiece
<b>PAL-1200</b>	PAL 12 ft (3.66 m) Aspiration Tubing (5PK)

## Sterilization Case | PAL-500

- Accommodates two handpieces, electric cable and up to ten cannulas
- Fits in most standard autoclaves



## PAL Wand | PAL-730

- Ergonomic manual handpiece for sensitive areas (such as the neck and back)
- Compatible with all PAL cannulas



# Compare PAL to Traditional Liposuction

## Fast

Clinical studies comparing the PAL system to manual liposuction found that PAL aspirates 31% more volume per minute leading to a 35% reduction in procedure time.<sup>1</sup>

## Precise

PAL is proven to reduce surgeon fatigue by 49%, offering a safer and more precise procedure. These benefits result in superior outcomes and faster healing and recovery rates for patients.<sup>1</sup>

## Viable

The quality of PAL-harvested adipocytes has been shown to be similar to those harvested by manual liposuction; and PAL produces higher yields of loosely adherent stem cells, which may improve graft retention.<sup>2,3,4</sup>

Before

After

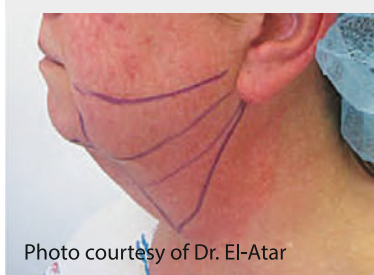


Photo courtesy of Dr. El-Atar



Photo courtesy of David Kaufman, MD



Photo courtesy of Dr. El-Atar



Photo courtesy of Dr. El-Atar



*"It's dramatic how much better patients feel, how much more effectively we can treat them, how much more satisfied they are, and how far superior the results are compared to [traditional liposuction]."*

- Dr. Gerhard Sattler

PAL Cannulas		Tip Style	Multi-Use	Single-Use	Diameter	Length	Port Length
EXTRACTION	<b>Single-Port Cannulas</b>	Single Port	—	PAL-300LL	3mm	30cm	8mm
	<ul style="list-style-type: none"> <li>• 90° of extraction</li> <li>• Non-aggressive</li> <li>• Good for sensitive areas such as the neck and back</li> <li>• Ports can be directed away from the skin to prevent surface irregularities</li> </ul>		—	PAL-300LS	3mm	22cm	8mm
			—	PAL-300SS	3mm	22cm	6mm
			—	PAL-240LS	2.4mm	22cm	7.5mm
			—	PAL-240SS	2.4mm	22cm	5mm
			—	PAL-240LM	2.4mm	15cm	7.5mm
		<b>Mercedes Cannulas</b>	Mercedes	PAL-R504LL	PAL-504LL	5mm	30cm
	<ul style="list-style-type: none"> <li>• 360° of extraction</li> <li>• Moderately aggressive</li> <li>• The most popular cannula style</li> </ul>	PAL-R504LS		PAL-504LS	5mm	22cm	10mm
		PAL-R404LL		PAL-404LL	4mm	30cm	10mm
		PAL-R404LS		PAL-404LS	4mm	22cm	10mm
		PAL-R304LL		PAL-304LL	3mm	30cm	8mm
		PAL-R304LS		PAL-304LS	3mm	22cm	8mm
		PAL-R304LM		PAL-304LM	3mm	15cm	8mm
		PAL-R244LM		PAL-244LM	2.4mm	15cm	7.5mm
		PAL-R404XL		—	4mm	40cm	10mm
		<b>Double Mercedes Cannulas</b>	Double Mercedes	PAL-R505LL	PAL-505LL	5mm	30cm
	<ul style="list-style-type: none"> <li>• 360° of extraction</li> <li>• Aggressive</li> <li>• Good for fibrous tissue and large-volume extraction</li> </ul>	PAL-R505LS		PAL-505LS	5mm	22cm	10mm
		PAL-R405LL		PAL-405LL	4mm	30cm	10mm
		PAL-R405LS		PAL-405LS	4mm	22cm	10mm
		<b>Mirrored Tri-Port II Cannulas</b>	Mirrored Tri-Port II	PAL-R506LL	PAL-506LL	5mm	30cm
<ul style="list-style-type: none"> <li>• 270° of extraction</li> <li>• Aggressive</li> <li>• Ports can be directed away from the skin to prevent surface irregularities</li> </ul>	PAL-R506LS	PAL-506LS		5mm	22cm	10mm	
	PAL-R406LL	PAL-406LL		4mm	30cm	10mm	
	PAL-R406LS	PAL-406LS		4mm	22cm	10mm	
	<b>Tri-Port II Cannulas</b>	Tri-Port II	PAL-R402LL	PAL-402LL	4mm	30cm	10mm
<ul style="list-style-type: none"> <li>• 270° of extraction</li> <li>• Moderately aggressive</li> <li>• Ports can be directed away from the skin to prevent surface irregularities</li> </ul>	PAL-R402LS		PAL-402LS	4mm	22cm	10mm	
	PAL-R302LL		PAL-302LL	3mm	30cm	8mm	
	PAL-R302LS		PAL-302LS	3mm	22cm	8mm	
	<b>Tri-Port III Cannulas</b>	Tri-Port III	PAL-R403LL	PAL-403LL	4mm	30cm	10mm
<ul style="list-style-type: none"> <li>• 90° of extraction</li> <li>• Moderately aggressive</li> <li>• Ports can be directed away from the skin to prevent surface irregularities</li> </ul>	PAL-R403LS		PAL-403LS	4mm	22cm	10mm	
	PAL-R303LL		PAL-303LL	3mm	30cm	8mm	
	PAL-R303LS		PAL-303LS	3mm	22cm	8mm	



PAL Cannulas		Tip Style	Multi-Use	Single-Use	Diameter	Length	Port Length	
HARVESTING	<b>Multi-Hole Cannulas</b>	Multi-Hole	PAL-R30MLL	PAL-30MLL	3mm	30cm	1.9mm	
	<ul style="list-style-type: none"> <li>• 360° of extraction</li> <li>• Non-aggressive</li> <li>• Produces small lobules for small-volume grafting</li> <li>• Also ideal for fine sculpting and feathering</li> <li>• Excellent for removing fat after laser or ultrasonic procedures</li> </ul>		PAL-R30MLS	PAL-30MLS	3mm	22cm	1.9mm	
			PAL-R30MLM	PAL-30MLM	3mm	15cm	1.9mm	
		<b>Del Vecchio Track-12 Cannulas</b>	—	PAL-4012LL	4mm	30cm	6mm	
	<ul style="list-style-type: none"> <li>• 270° of extraction</li> <li>• Aggressive</li> <li>• Designed for harvesting small lobules for grafting</li> </ul>	Track-12	—	PAL-3012LS	3mm	22cm	6mm	
			PAL-R4012XL	—	4mm	40cm	6mm	
SPECIALTY			<b>Helixed Tri-Port III Cannulas</b>	Helixed Tri-Port III	—	PAL-507LL	5mm	30cm
	<ul style="list-style-type: none"> <li>• 270° of extraction</li> <li>• Aggressive</li> <li>• Designed for high-fibrous areas</li> <li>• Ideal for gynecomastia cases</li> </ul>	—	PAL-507LS		5mm	22cm	10mm	
		PAL-R407LL	PAL-407LL		4mm	30cm	10mm	
		PAL-R407LS	PAL-407LS		4mm	22cm	10mm	
<b>Spatula Cannulas</b>		Spatula (Three-Hole)	—	PAL-30S3	3mm	15cm	1.5mm	
<ul style="list-style-type: none"> <li>• 90° of extraction</li> <li>• Short, non-aggressive cannula with a blunt tip</li> <li>• Ideal for delicate areas such as the neck and back</li> </ul>	Spatula (Two-Hole)	—	PAL-30S2	3mm	15cm	1.5mm		
	Spatula (Single-Hole)	—	PAL-24S1	2.4mm	15cm	3mm		
	<b>Flared Mercedes Cannulas</b>	Flared Mercedes	PAL-R508LL	PAL-508LL	5mm	30cm	10mm	
<ul style="list-style-type: none"> <li>• 360° of extraction</li> <li>• Aggressive</li> <li>• Ideal for debulking, dissection, and pre-tunneling</li> <li>• Good for breaking up fat without suction, prior to sculpting and extraction</li> </ul>	PAL-R508LS		PAL-508LS	5mm	22cm	10mm		
	PAL-R408LL		PAL-408LL	4mm	30cm	9mm		
	PAL-R408LS		PAL-408LS	4mm	22cm	9mm		
	PAL-R308LL		PAL-308LL	3mm	30cm	8mm		
	PAL-R308LS		PAL-308LS	3mm	22cm	8mm		
	<b>Bent Cannulas</b>	Bent Flared Mercedes	PAL-R508LLB	PAL-508LLB	5mm	30cm	10mm	
<ul style="list-style-type: none"> <li>• Effective for pre-tunneling</li> <li>• Good for debulking and extraction</li> </ul>	Bent Mercedes	PAL-R408LLB	PAL-408LLB	4mm	30cm	9mm		
	PAL-R404LLB	PAL-404LLB	4mm	30cm	10mm			
	PAL-R304LLB	PAL-304LLB	3mm	30cm	8mm			
TURBO CANNULAS	<b>Turbo Cannulas</b>	Double Mercedes	—	PAL-505LLT	5mm	30cm	10mm	
	<ul style="list-style-type: none"> <li>• Allows air to vent through the tube during liposuction for better low rates</li> <li>• Not recommended for harvesting fat to be re-injected</li> </ul>		—	PAL-405LLT	4mm	30cm	10mm	
		Helixed Tri-Port III	—	PAL-507LLT	5mm	30cm	10mm	
			Mercedes	—	PAL-404LLT	4mm	30cm	10mm
		—		PAL-404LST	4mm	22cm	10mm	
		HIGH DEFINITION	<b>HD Cannulas</b>	Left Bent HD	—	PAL-40HLLB	4mm	30cm
—			PAL-50HLLB		5mm	30cm	10mm	
Straight HD	—		PAL-40HLL	4mm	30cm	10mm		
	—		PAL-50HLL	5mm	30cm	10mm		
Right Bent HD	—		PAL-40HLRB	4mm	30cm	10mm		
	—		PAL-50HLRB	5mm	30cm	10mm		

## Modular Trauma Instrument System

### 5641

#### Dual Trigger Electric SmartDriver DUO®e

- Powered by the 5025 Console with onboard maximum speed setting
- Compliments 5000 Series Electric System
- Dedicated power
- Convenience of portability
- Quiet and smooth operation
- Variable-speed trigger
- Precise control
- Dual trigger forward/reverse and oscillate controls



#### Accessories

5641SC	SmartDriver DUO®e Sterilization Case	p. 28
5025	Electric Instrument Control Console	p. 25
5006-5000	Electric Instrument Cable for 5025 Console	p. 25
5000SC	Sterilization Case holds: Series 5000 Small-Bone Instrument System / 5641 SmartDriver DUO®e w/couplers	p. 27

### 5641-045

#### Automatic Wire Driver Coupler

Operating Speed: 1600 RPM  
0.7mm – 1.6mm  
Fits 5641 SmartDriver DUO®e Handpiece Only



### 5641-050

#### Automatic Pin Driver Coupler

Operating Speed: 1600 RPM  
1.7mm – 3.2mm  
Fits 5641 SmartDriver DUO®e Handpiece Only



Note: For full range of compatible couplers see pages 10 and 11.

## Small-Bone System

### 5000ET

#### Electric Motor Handpiece with Hand Throttle

- Powered by the 5025 Electric Instrument Control Console
- Optional 5401 foot pedal
- Variable-speed throttle
- Also available without ingertip throttle (5000E)

#### Accessories

5000SC	Sterilization Case	p. 27
5025	Electric Instrument Control Console	p. 25
5006-5000	Electric Instrument Cable for 5025 Console	p. 25
5401	Foot pedal for 5025 console	p. 25
5025-5401	Foot pedal cable	p. 25





**5922**  
**Micro Sagittal Saw Module**

Operating Speed: 30,000 CPM  
Sagittal saw module provides the ultimate in control, power, and maneuverability  
Transverse or wedge osteotomies  
Accepts a variety of ultra-thin (.3 mm) straight, angled, bent or offset blades



**5930**  
**Micro Drill Module**

Operating Speed: 30,000 RPM  
The work-horse of small bone surgery  
Sculpting, drilling and reaming intramedullary canals for small bones  
Built-in medium-length bur guard  
Long and extra-long bur guards available

Accessories (See Power Disposables Catalog)	
1100-005	Long Bur Guard
1100-006	Extra-Long Bur Guard
Use with any of MicroAire's extensive selection of ZB-series burs	



**5950**  
**Keyless Hall® Style Sagittal Saw**

Operating Speed: 18,000 CPM  
Powerful saw designed to operate longer and larger sagittal saw blades  
Simple push-button release, eliminates the need for a hex wrench to lock blades  
Blades positioned at any location along a 160° arc  
Good visibility and optimal approach  
Transverse or wedge osteotomies



**5980**  
**Jacobs® Style Drill Module**

Operating Speed: 1,670 RPM	<b>Accessories</b>
	MicroAire 8051 and 8054-series twist drills
	Diameter between 1.0mm and 4.0mm, up to 127mm in length
	1645-004 Key (included)



**5972**  
**Oscillating Saw Module**

Operating Speed: 30,000 CPM  
For use with MicroAire Series 5000 motor module  
Accepts MicroAire ZO series small oscillating blades

Accessories	
1745-001	Locking Key (included)



**5945**  
**Reciprocating Saw Module**

Operating Speed: 16,000 CPM  
Powerful, quick-cutting reciprocating saw  
Oral and maxillofacial surgery  
Shaping, contouring and preparing intramedullary canals of small bones



**5955**  
**Hall® Style Sagittal Saw Module**

Operating Speed: 18,000 CPM  
Powerful saw designed to operate longer and larger sagittal saw blades  
Blades positioned at any location along a 160° arc  
Good visibility and optimal approach  
Transverse or wedge osteotomies  
Blades are secured in place with a 2250-001 Locking Tool (included)

Accessories	
2250-001	Locking Key (included)



**5990**  
**Synthes® Style Drill Module**

Operating Speed: 1,670 RPM	<b>Accessories</b>
	MicroAire 8053-series quick-coupling twist drills
	Diameter between 0.1mm and 3.5mm, up to 127mm in length



## Related Products



1. Katz BE, Bruck MC, Coleman WP. The Benefits of Powered Liposuction Versus Traditional Liposuction: A Paired Comparison Analysis. 2001. *Dermatol Surg*; 27:863-967.
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3. Cytori Commissioned Study, Evaluation of MicroAire Tissue Collection Method on Adipose Tissue and ADCRs. 2011.
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5. Ahmad J, Eaves FF 3rd, Rohrich RJ, Kenkel JM. The American Society for Aesthetic Plastic Surgery (ASAPS) Survey: Current Trends in Liposuction. *Aesthet Surg J*. 2011 Feb;31(2):214-24. doi: 10.1177/1090820X10395508.

**MICROAIRE®**  
For Surgery. For Life.™

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