



# Airstream® Airstream® RELIANT



Airstream® Reliant Class II Type A2  
Biosafety Cabinet, Model AR2-4S9  
(for US, Taiwan, and Canada market only)



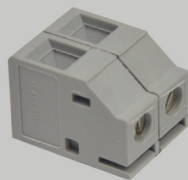
Airstream® Class II Type A2  
Biosafety Cabinet, Model AC2-4S9-NS

## Class II Type A2 Biological Safety Cabinets

The World's Leading Energy-Efficient, Quiet, and  
Ergonomic Biosafety Cabinet



**ESCO**  
WORLD CLASS. WORLDWIDE.



RS 232 SERIAL  
INTERFACE PORT



## RS 232 Serial Interface Port and Voltage Relay Contact

(Not Applicable for AR2)

- Send operational information to Building Management System (BMS)
- Zero Volt Relay Contact to turn ON/OFF exhaust blower and signal the building alarm

ESCO

Esco AC2  
Airflow: OK  
I: 0.53 m/s  
Socket: OK

15:34

Sash: OK

D: 0.38 m/s



MENU

✓BET

DIAGNOSTICS



Sentinel<sup>™</sup> GOLD

MICROPROCESSOR CONTROL SYSTEM

## Sentinel<sup>™</sup> Gold Microprocessor Controller (for AC2)

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation

ESCO



UV Timer

## Rocker Switches and Pressure Gauge (for AR2)

- Easy to use switches
- Displays filter loading status
- Manually adjustable UV timer

## Single-Piece Wall

- Easy to reach service fixture and outlets
- Large radius for easy cleaning

## Single-piece Work Tray

- Recessed to contain spillage
- Sloped perimeter that's easy to wipe

## Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture

Available in 0.9, 1.2, 1.5 and 1.8 meter width (3', 4' 5" and 6')



NSF 49



UL 61010

Airstream<sup>®</sup> / Airstream<sup>®</sup> • RELIANT

Class II Type A2 • Biological Safety Cabinet



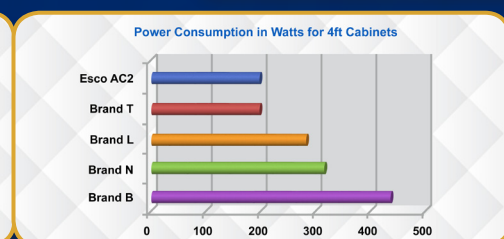
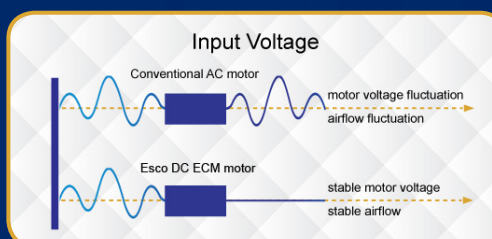
## Airflow Sensor (Not Applicable for AR2)

- Monitors real-time airflow for safety
- Alert the user if airflow is insufficient



## Energy-Efficient DC ECM Motor

- The leading energy efficient Class II Type A2 Biosafety Cabinet in the world with 70% Energy savings compared to AC motor
- Stable airflow, despite building voltage fluctuations & filter loading
- Stand by mode to further reduce power consumption by 60%

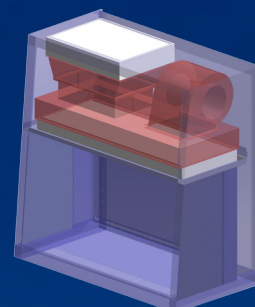


## ULPA Filter

- 10x Filtration efficiency of HEPA filter
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5

## Dynamic Chamber

- Blower plenum and side walls are surrounded by negative pressure
- Prevent contaminants from escaping outside



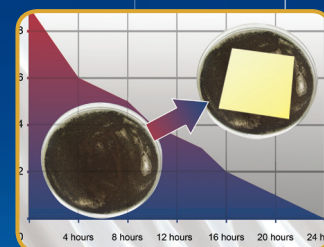
■ Positive pressure  
■ Negative pressure

## Angled Sash

- 5° angled front to optimize user comfort, reduce glare and maximize reach into the work area

## ISOCIDE™ Powder Coat

- Silver-ion impregnated powder coat
- Inhibit microbial growth to improve safety



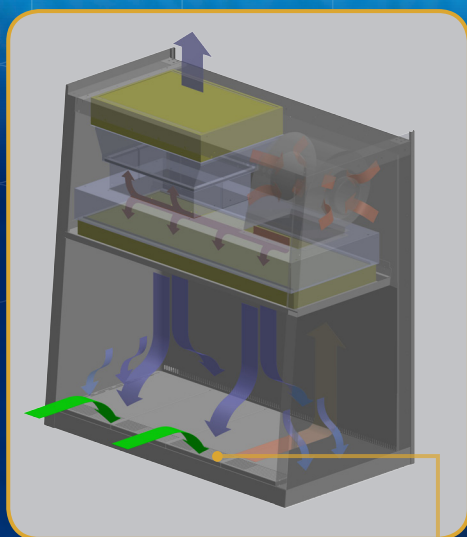
## Removable Paper Catch

- Easy to clean
- Optional pre-filter can be fitted



## Certification

	Biosafety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	NSF / ANSI 49 NSF*	ISO 14644.1, Class 3, Worldwide JIS B9920, Class 3, Japan JIS B55295, Class 3, Japan US Fed Std 209E, Class 1 USA	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	UL-61010A-1, USA CSA22.2, No.1010-192, Canada EN-61010-1, Europe IEC61010-1, Worldwide



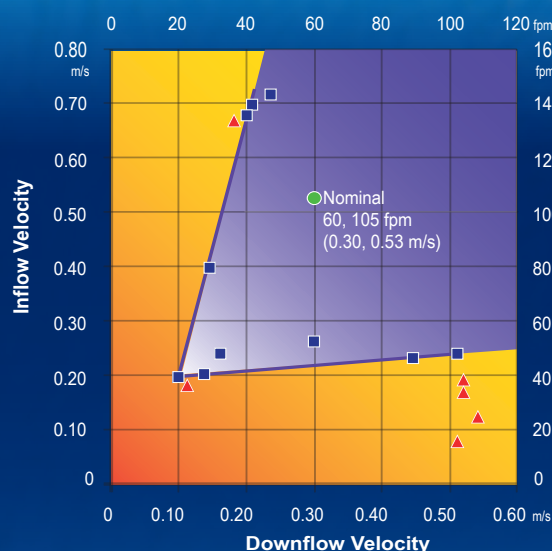
- ULPA-filtered air
- Unfiltered / potentially contaminated air
- Room air / Inflow air

## Cabinet Filtration System

- Ambient air is pulled through front grille to create inflow, without going into the work surface. Inflow is joined by half of the downflow, to create front air curtain that is fine-tuned to create a large performance envelope. The combined air stream travels through the back air column towards the blower.
- Approximately 1/3 of the air in the common plenum is exhausted through the ULPA filter to the room. The remaining 2/3 of the air is passed through the downflow ULPA filter and into the work area as a vertical laminar flow air to create ISO Class 3 work surface and prevents cross contamination.
- Near the work surface, the downflow splits. About Half goes to the front grille, and half goes to the rear grille. A small portion enters the side capture zones to prevent dead air corners (small blue arrows)
- The design was optimized to give large performance envelope, that provides operator and product protection at wide Inflow and Downflow variation from the Nominal point.

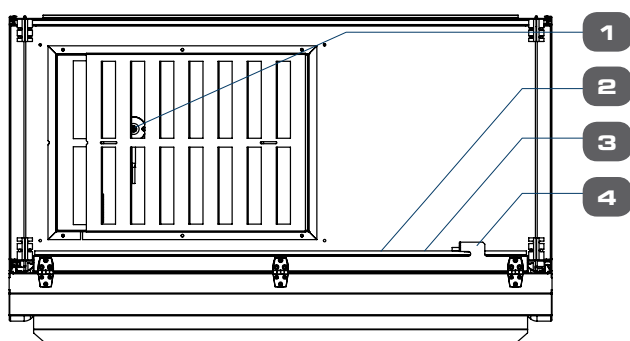
Dynamic air barrier, where inflow and forward-directed downflow air converge

## Performance Envelope Test of AC2-NS

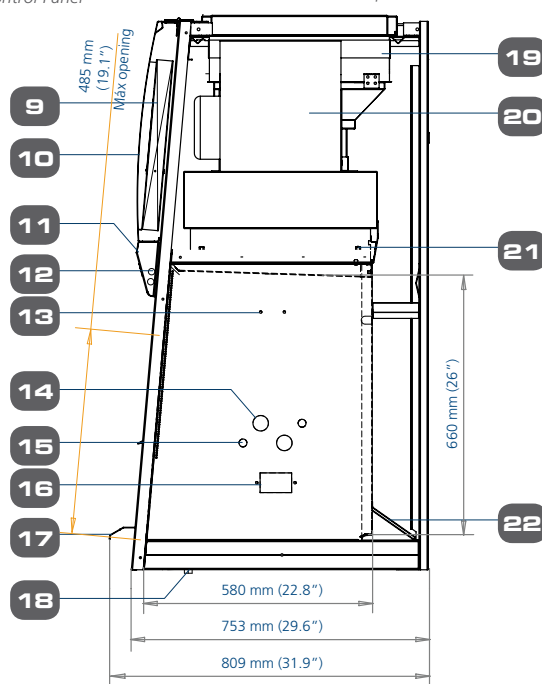
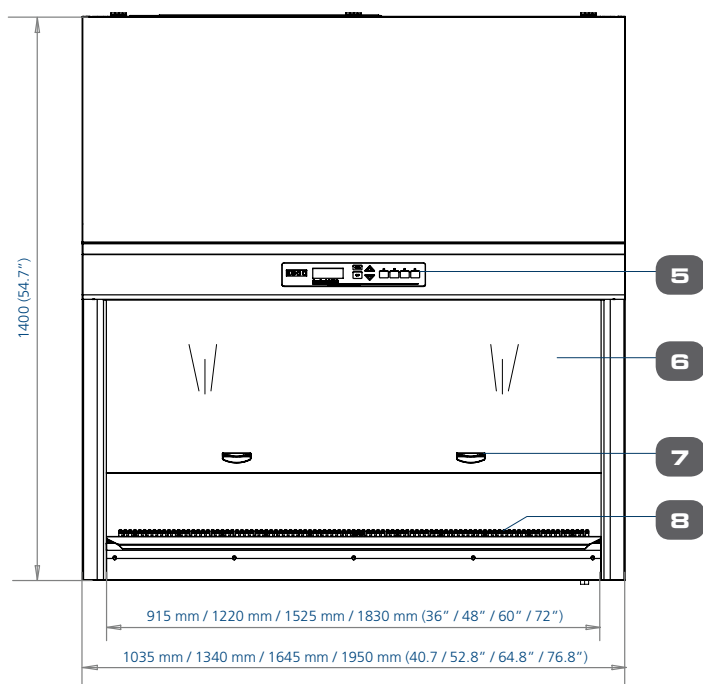


- Nominal Airflow
- Personnel / Product Protection
- Area of Personnel and Product Protection
- ▲ NO Personnel / Product Protection
- Area of NO Personnel and Product Protection

## AC-NS Biological Safety Cabinet Engineering Drawing



1. Airflow Sensor
2. Free Relay Contact
3. RS232 Port
4. Power Inlet
5. Esco Sentinel™ Gold Microprocessor Control System
6. Tempered Glass Sliding Sash Window
7. Ergonomic Sash Handle
8. Single Piece Stainless Steel Work Tray
9. Electrical Panel
10. Curved Front Panel
11. Control Panel
12. Energy-efficient T5 Fluorescent Lamps
13. IV Bar Retrofit Kit Provision
14. Steris VHP / Bioquell HPV Provision (Optional)
15. 1 x Vacuum Service Fixture
16. Duplex GFCI Electrical Outlets (1 on each side)
17. Stainless Steel Arm Rest
18. Drain Hole
19. Exhaust ULPA Filter
20. DC ECM Blower (Self-compensating & Lower Noise)
21. Downflow ULPA Filter
22. Paper Catch



**Note:** The dimensions of the Side Wall and Work Tray, Fan System, Filters, and Control System can be customized as required. Specifications of the same model may vary in different countries. For further details, please contact your local Esco office.

Airstream® / Airstream® •RELIANT

Class II Type A2 • Biological Safety Cabinet

## TECHNICAL SPECIFICATIONS OF AC2-NS

Model	110-130VAC 50/60Hz	AC2-3S8-NS 2010946	AC2-4S8-NS 2010747	AC2-5S8-NS 2010978	AC2-6S8-NS 2010963
		AC2-3S9-NS 2010945	AC2-4S9-NS 2010752	AC2-5S9-NS 2010977	AC2-6S9-NS 2010925
		AR2-3S9 2010982	AR2-4S9 2010753	AR2-5S9 2010984	AR2-6S9 2010986
External Dimensions (W x D x H) mm		1035 x 753 x 1400 (40.7" x 29.5" x 55.1")	1340 x 753 x 1400 (52.75" x 29.5" x 55.1")	1645 x 753 x 1400 (64.75" x 29.5" x 55.1")	1950 x 753 x 1400 (76.75" x 29.5" x 55.1")
Gross Internal Dimensions (W x D x H) mm		915 x 580 x 660 (36" x 22.75" x 26")	1220 x 580 x 660 (48" x 22.75" x 26")	1525 x 580 x 660 (60" x 22.75" x 26")	1830 x 580 x 660 (72" x 22.75" x 26")
Usable Work Area		0.42 m² (4.5 ft²)	0.56 m² (6.0 ft²)	0.70 m² (7.5 ft²)	0.86 m² (9.3 ft²)
Tested Opening		203 mm (8")			
Average Inflow Velocity		0.53 m/s (105 fpm)			
Average Downflow Velocity		0.30 m/s (60 fpm)			
Airflow Volume	Inflow	354 cmh (208 cfm)	473 cmh (278 cfm)	591 cmh (348 cfm)	709 cmh (417 cfm)
	Downflow	553 cmh (325 cfm)	738 cmh (434 cfm)	922 cmh (543 cfm)	1107 cmh (652 cfm)
	Exhaust	354 cmh (208 cfm)	473 cmh (278 cfm)	591 cmh (348 cfm)	709 cmh (417 cfm)
	Required Exhaust With Optional Thimble Exhaust Collar	531 cmh (313 cfm)	710 cmh (418 cfm)	887 cmh (522 cfm)	1064 cmh (626 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	32 Pa / 0.12 in H <sub>2</sub> O	45 Pa / 0.18 in H <sub>2</sub> O	57 Pa / 0.23 in H <sub>2</sub> O	68 Pa / 0.27 in H <sub>2</sub> O
HEPA/ULPA Filter Typical Efficiency		>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA >99.999% at MPPS, H14 as per EN 1822 EU >99.999% at 0.3 micron size particle by PAO test (filter leakage test according to NSF49)			
Sound Emission per NSF / ANSI 49*		57.5 dBA		58.5 dBA	60.5 dBA
Fluorescent Lamp Intensity (lux)		1983 lux (184 foot candles)	1700 lux (158 foot candles)	1200 lux (95 foot candles)	1647 lux (153 foot candles)
Cabinet Construction	Main body	1.2 mm (0.08") / 18 gauge EG Steel With Isocide™ Oven-Baked Epoxy-Polyester Powder Coating			
	Work Zone	1.5 mm (0.06") / 16 gauge, SS 304, 4B finish			
	Side Walls	1.5 mm (0.06") / 16 gauge, SS 304, 4B finish			
Electrical 220-240 VAC 50/60 Hz	Cabinet Full Load Amps (FLA)	8.5	8.6	9.5	12
	Heat Load (BTU / Hr)	472	569	613	849
	Nominal Power Consumption (W)	150	181	195	270
Electrical 110-130 VAC 50/60 Hz	Cabinet Full Load Amps (FLA)	11	11.5	12.5	15
	Heat Load (BTU / Hr)	503	628	698	999
	Nominal Power Consumption (W)	160	200	222	318
Net Weight**		188 Kg (414 lbs)	230 Kg (507 lbs)	288 Kg (634 lbs)	346 Kg (763 lbs)
Shipping Weight**		216 Kg (476 lbs)	285 Kg (628 lbs)	356 Kg (784 lbs)	428 Kg (944 lbs)
Shipping Dimensions, Maximum (W x D x H)**		1120 x 820 x 1760 mm (44" x 32" x 69")	1450 x 820 x 1760 mm (57" x 32" x 69")	1720 x 820 x 1760 mm (68" x 32" x 69")	2050 x 820 x 1760 mm (80" x 32" x 69")
Shipping Volume, Maximum**		1.62 m³ (57 ft³)	2.09 m³ (74 ft³)	2.48 m³ (88 ft³)	2.96 m³ (105 ft³)

Specifications are subject to change without notice.

\* Noise reading in open field condition / anechoic chamber. Noise reading in normal room varies by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values.

\*\* Cabinet only, excludes optional stand.

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## AC2 and AR2 Cabinets Save Money and Environment



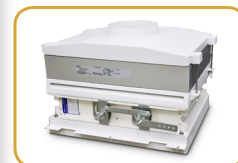
Description	AC2-4S9-NS /AR2 with DC ECM blower	AC2-4S8-NS with DC ECM blower	Typical BSC with AC Blower	Savings		Units
				AC2-4S9 / AR2	AC2-4S8	
Instantaneous Power	200	160	800	600		Watt
Hours of Operation in a year	2000					Hours
Energy	400	320	1600	1200		kWh
Energy cost in USA at \$ 0.10 / kWh	40	32	160	120		USD
Energy cost in EU at € 0.20 / kWh	80	64	320	240		Euro
CO <sub>2</sub> released in USA at 1 lbs / kWh	400	320	1600	1200		lbs
CO <sub>2</sub> emission in EU at 0.35 Kg / kWh	140	112	560	420		Kg

### Accessories for AC2-NS and AR2 Biological Safety Cabinets

Cabinet	Standard Unit	AC2-3S9-NS 2010945	AC2-4S9-NS 2010752	AC2-5S9-NS 2010978	AC2-6S9-NS 2010963
		AR2-3S9 2010982	AR2-4S9 2010753	AR2-5S9 2010984	AR2-6S9 2010986
		AC2-3S8-NS 2010946	AC2-4S8-NS 2010747	AC2-5S8-NS 2010978	AC2-6S8-NS 2010963
	Unit with Cable Port	AC2-3S9-NS-PORT 2011014	AC2-4S9-NS-PORT 2011015	AC2-5S9-NS-PORT 2011016	AC2-6S9-NS-PORT 2011017
		AR2-3S9-PORT 2010018	AR2-4S9-PORT 2010019	AR2-5S9-PORT 2010020	AR2-6S9-PORT 2010021
		AC2-3S8-NS-PORT 2011010	AC2-4S8-NS-PORT 2011011	AC2-5S8-NS-PORT 2011012	AC2-6S8-NS-PORT 2011013
Hydrogen Peroxide Decontamination Kit	Anti-blowback Valve 10 inches		ABBV-10P 5170352		
	Tri-safe Exhaust Collar with Alarm (not applicable for AR2)		TEM-4 2010606		
	Thimble Exhaust Collar with Alarm (not applicable for AR2)		ECO-A-AC23 5170618	ECO-A-AC24 5170619	ECO-A-AC25 5170620
	Exhaust Damper		B2-DAMPER 5170352		



B2-ABBV1

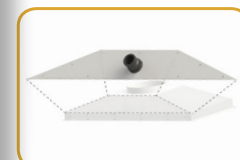


TEM-4

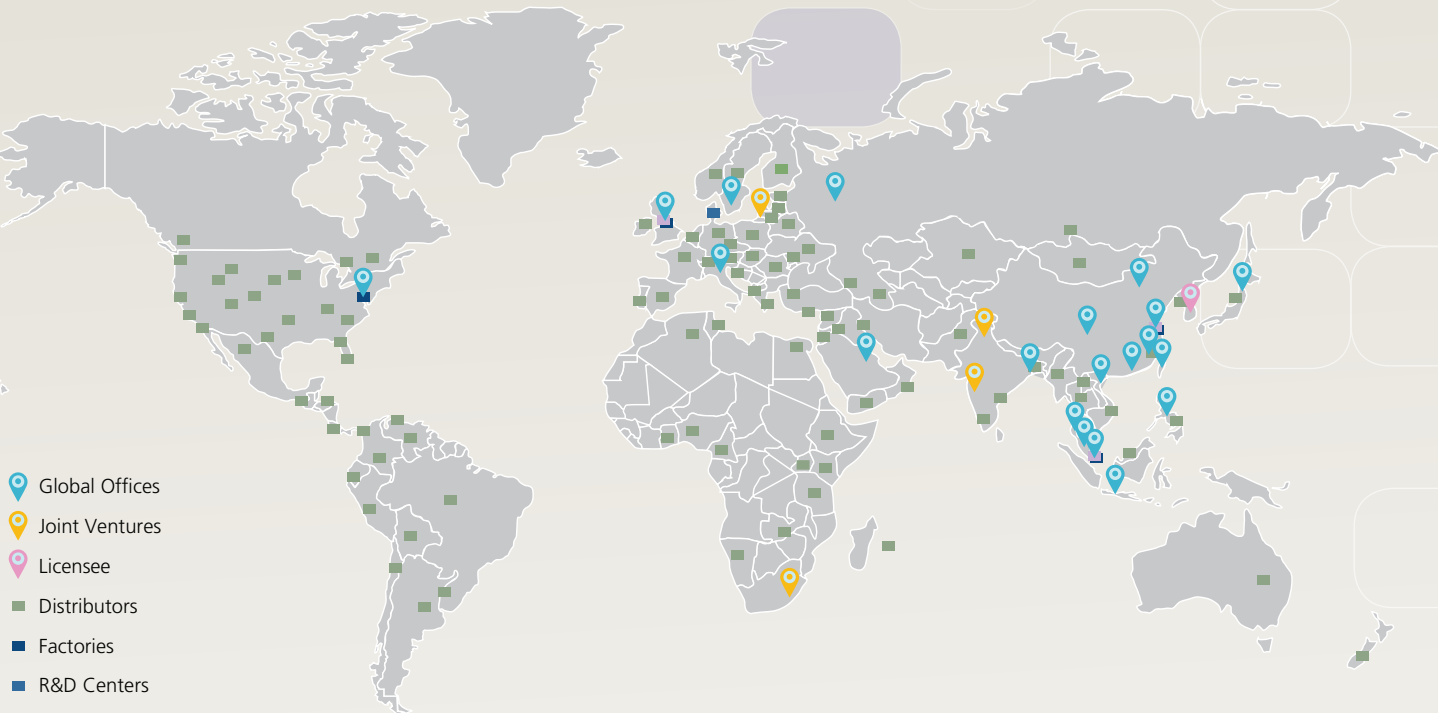
Thimble Exhaust Collar  
with Alarm

B2-DAMPER

Hydrogen Peroxide Decontamination Kit	VHP In Port (Ø 1")	VHP-IN PORT 5170552			
	VHP Out Box for Cabinet WITH Exhaust Collar Installed (Ø 1")	VHP-ECO/OUT 5170554	VHP-ECO/OUT 5170615	VHP-ECO/OUT 5170616	VHP-ECO/OUT 5170617
	VHP Out Top Box for Cabinet WITHOUT Exhaust Collar Installed (Ø 1")	VHP OUT TOP BOX 3ft 5170553	VHP OUT TOP BOX 4ft 5170612	VHP OUT TOP BOX 5ft 5170613	VHP OUT TOP BOX 6ft 5170614
Work zone	UV Lamp	UV-15A 5170251	UV-30A-L 5170255		
	IV Bar	IV-910 5170499	IV-1215 5170231	IV-1520 5170500	IV-1825 5170501
	Pre-filter	PF-41 5090061	PF-42 5090062	PF-43 5090063	PF-44 5090064
Electrical outlet	Direct Mounted / GFCI	EO- <sub>—</sub>			
Service Fixtures	EU SF-Gas-20 mm	SF-1G20 5170410			
	EU SF-Vacuum-20 mm	SF-1V20 5170457			
	EU SF-Air-20 mm	SF-1A20 5170502			
	EU SF-Nitrogen-20 mm	SF-1N20 5170503			
	EU SF-Water-20 mm	SF-1W20 5170458			
	US SF-Universal-22 mm	SF-2U22 5170504			
Support Stands, Ships Flat	Fixed Stand with Leveling Feet, 28" height	SAL-3A0 Gen 2 5130170	SAL-4A0 Gen 2 5130134	SAL-5A0 Gen 2 5130171	SAL-6A0 Gen 2 5130172
	Fixed Stand with Leveling Feet, 34" height	SAL-3B0 Gen 2 5130174	SAL-4B0 Gen 2 5130175	SAL-5B0 Gen 2 5130176	SAL-6B0 Gen 2 5130177
	Fixed Stand with Caster Wheels, 28" height	SPC-3A0 Gen 2 5130155	SPC-4A0 Gen 2 5130152	SPC-5A0 Gen 2 5130162	SPC-6A0 Gen 2 5130154
	Fixed Stand with Caster Wheels, 34" height	SPC-3B0 Gen 2 5130165	SPC-4B0 Gen 2 5130166	SPC-5B0 Gen 2 5130167	SPC-6B0 Gen 2 5130168
	Telescopic Stand with Leveling Feet, 1" adjustment	STL-3A0 5130050	STL-4A0 5130051	STL-5A0 5130052	STL-6A0 5130053
	Telescopic Stand with Caster Wheels, 1" adjustment	STC-3A0 5130055	STC-4A0 5130056	STC-5A0 5130057	STC-6A0 5130058
	Motorized Height Stand with Caster Wheels	SPM-3A2 5130093	SPM-4A2 5130047	SPM-5A2 5130100	SPM-6A2 5131141
Misc	IQ OQ Protocol	9010179			



# ESCO GLOBAL NETWORK



- Global Offices
- Joint Ventures
- Licensee
- Distributors
- Factories
- R&D Centers
- Regional Distribution Centers



- ART Equipment
- Biological Safety Cabinets
- CO<sub>2</sub> Incubators
- Compounding Pharmacy Equipment
- Containment / Pharma Products
- Ductless Fume Hoods
- Freeze Dryers
- Lab Animal Research Products
- Laboratory Centrifuges
- Laboratory Fume Hoods
- Laboratory Ovens and Incubators
- Laboratory Shakers
- Laminar Flow Clean Benches
- PCR Cabinets
- PCR Thermal Cyclers
- Powder Weighing Balance Enclosures
- Ultra-low Temperature Freezers

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Life Science • Chemical Research • Assisted Reproductive Technology (ART) • Pharmaceutical Equipment • General Equipment

# ESCO

## WORLD CLASS. WORLDWIDE.

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