



**Fisherbrand™**  
QUALITY. RELIABILITY. VALUE.

Vacuum Pumps

*Pump Selection and Application Guide*

# Vacuum Pumps for Lab & Industry

A range of vacuum pumps precisely tuned to your laboratory applications such as filtration, degassing, desiccation, distillation, concentration and drying





Fisherbrand vacuum pumps combine high tech materials with outstanding engineering. They are designed to fit most laboratory applications, both routine and research.

- High pumping speed
- Wide ultimate vacuum range
- Excellent chemical resistance
- Minimum maintenance
- Long lifetime
- Low consumption
- Small footprint
- Reduced noise level

When choosing a vacuum pump, consider application, sample composition and operating parameters.

### Chemistry Applications

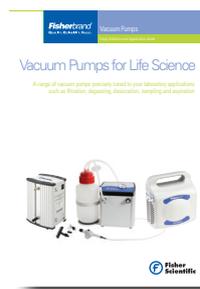
All pump materials must resist vapours from the application. Choose an appropriate chemical-duty pump that can achieve the necessary ultimate pressure in five minutes or less.

Evaporative procedures that provide significant continuous vapour loads require a pump with substantial pumping speed. Less vacuum is needed for filtration or evaporation of volatile substances.

### Life Science Applications

Most life science vacuum applications generate aqueous vapours. Choose a general duty vacuum pump if chemical resistance is not needed.

See our dedicated Life Science brochure to choose the appropriate general duty pumps and aspiration/filtration stations for your application needs.



### Quick Vacuum Pump/System Selection Guide

Operating vacuum range	11533485	12911151	10287097	12981131	12991131	15168886	12901141	12911141	12921141	12931141	12951141	see page
Pressure above atmospheric	X	X										3
Vacuum to 292 mbar	X											4
Vacuum to 100 mbar		X										4
Vacuum to 8 mbar			X	X		X						6
Vacuum to 2 mbar					X							6
Vacuum to 10 <sup>-2</sup> mbar							X					10
Vacuum to 10 <sup>-3</sup> mbar								X	X	X	X	10

Dr. Blue says...

'Our goal is to help you select vacuum technology that suits your laboratory needs. If you require assistance in your product selection process, please see the back cover for you local Fisher Scientific office. Working in consultation with our supply partners, your Fisher Scientific representative will be pleased to assist you'





# Quick Selection Chart for Common Lab Applications

Find the correct vacuum pump/system to address your application needs. The Fisherbrand product line offers a wide range of vacuum pumps — each expertly designed for optimum function in your application.

Cat. No	Applications	Principal Features	Pumping Speed & Vacuum	Model
12981131	General Vacuum Work	Dry running pump, compact and portable	38L/min 8 mbar	
12911151	Vacuum/Pressure Filtration Glass Filtration Assemblies	 Vacuum or pressure capability	15L/min 100 mbar	
12911151	Degassing, Dessiccation, Solvent Degasification	 Compact, portable and maintenance-free	15L/min 100 mbar	
12981131	Rotary Evaporator Volatiles, Low B.P <100°C Samples 0-5L	 Powerful with optional vacuum regulation	38L/min 8 mbar	
15168886	Rotary Evaporator Volatiles, Low B.P <100°C Samples 0-1L	 System with vacuum control package and solvent recovery	16L/min 8 mbar	
12981131	Vacuum Oven Drying Degassing	 Aqueous, acidic or basic samples	38L/min 8 mbar	
12991131	Vacuum Concentrators	Minimum maintenance	33L/min 2 mbar	
12911141		With cold trap	77L/min 2x10 <sup>-3</sup> mbar	 12991131      12911141
12921141	Freeze Dryers Lyophilizing	 Direct driven pump	97L/min 2x10 <sup>-3</sup> mbar	
12921141	Vacuum Manifolds Schlenk Lines	 Compact	97L/min 2x10 <sup>-3</sup> mbar	
15168886	Gel Dryers	 Excellent chemical compatibility	16L/min 8 mbar	
12981131	To Replace Water Jet Pumps	 Dry running pump, portable and compact	38L/min 8 mbar	
12981131	To replace House Vacuum Ports For replacing up to 4 ports	 Multi-user vacuum line for vacuum on demand	38L/min 8 mbar	+ 15311461      12981131

## General Duty Vacuum Pumps

Fisherbrand general purpose oil-free piston pumps and diaphragm pumps for a variety of applications such as low-volume filtrations, degassing, gas transfer and sampling.

### Piston Pump - Cat. No 11533485

Ideal for the basic filtration of non-aggressive solvents.

Design features:

- Lightweight, compact and portable
- Covers most standard applications
- Economically priced but with high performance
- Quick and simple to use with stylish design

Certification: CE marked



### Diaphragm Pump - Cat. No 12911151

Oil-free dry pump helping you to simplify your filtration and sampling procedure.

Design features:

- Improved chemical resistance
- Compact, lightweight and portable
- Quiet operation and very low vibration
- Use in the lab or in the field (with optional adapter)

Certification: CE marked



Dr. Blue says...

'For convenient filtrations where you can always rely on the necessary vacuum, the 12911151 is ideal. 11533485 is not recommended for powerful acidic or other chemical vapours. For a chemical-duty model please see page 6'



### Technical Features

Cat. No	11533485	12911151
Pumping Speed @ 50/60Hz	9.2L/min	15L/min
Ultimate pressure	< 292 mbar	< 100 mbar
Max. overpressure	2.3 bar	2.5 bar
IN / EX hose connector	hose nozzle DN6	hose nozzle DN6, silencer
Sound level @ 50Hz	< 56 db (A)	< 45 db (A)
Motor power	max. 25W	20W
Type of protection (motor)	IP 48	IP 44
Weight	2.3kg	2.0kg
Overall dimensions (LxWxH)	194x114x191 mm	144x127x196 mm
Ship weight	2.7kg	3.5kg
Shipping carton dimensions (LxWxH)	280x180x210 mm	230x170x275 mm

### Ordering information

Cat. No	Description
11533485	230V, 50/60Hz, 1Ph <sup>1</sup>
12695326	90-260V, 50/60Hz <sup>2</sup>

1. With Schuko and UK plug leads
2. With AC/DC adapter, Schuko, UK and US power plug adapters

### Accessories

Cat. No	Description
13504920	Filtration kit & dessicator kit - with vacuum hose and In-line filter
13168266	Vacuum regulator with dial gauge - for 12911151



Regulator



In-line filter

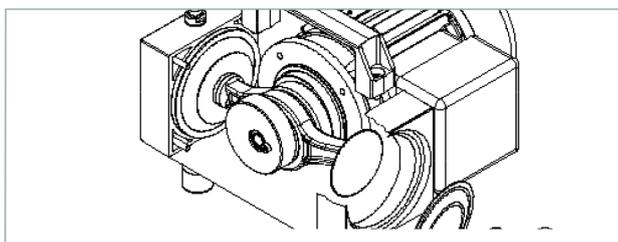


## Features and Benefits of Chemical Duty Diaphragm Pumps

This range of Fisherbrand diaphragm pumps is chemically resistant, making it ideal for applications involving aggressive solvents and acidic vapours. They are an excellent replacement for rotary vane pumps and water aspirators, especially in tough vacuum applications where corrosive vapours are encountered. They are also designed for easy operation with other equipment such as vacuum ovens, filtration devices and as a general lab vacuum source.

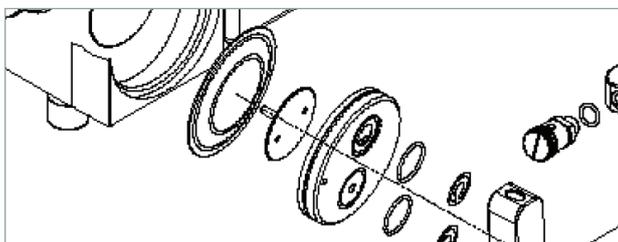
### Design Features

- Pumping speed to 38L/min
- Ultimate pressure to 2mbar



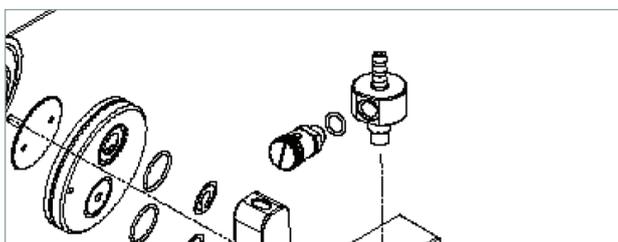
### Construction materials:

Pump heads made from PTFE with carbon fibre reinforcement to handle corrosive and aggressive vapours without damage. Pumping chambers are hermetically separated from the drive space, ensuring extended life of mechanical parts.



### PTFE Sandwiched Diaphragm:

PTFE diaphragms sandwiched to a strong non-wetted backing. PEEK valves have excellent resistance and are extremely hard wearing when compared to elastomer valves.



### Gas Ballast Valve:

Gas ballast valve helps to preserve pump performance when working with condensable vapours

### Economic:

Low cost of ownership, minimal maintenance requirements and sensibly priced spare parts

### Compact Design:

Sits easily on a benchtop or in a fume hood with quick and easy setup and disassembly



Cat. No 12981131

### Pump Selection/Application Chart

Application		10287097	12981131	12991131
<b>Desiccators and pistol drying</b>				
Residual moisture level	Partial drying	X		
	Full drying	X	X	
<b>Rotary evaporators</b>				
Boiling point of solvent used	Low boiling point	X	X	
	High boiling point (DMF)			X
<b>Centrifugal concentrators</b>				
Boiling point of solvent used	Low boiling point		X	
	High boiling point (DMF)			X
<b>Vacuum ovens</b>				
Oven chamber volume	Around 25L		X	
	Around 55L		X	X

### Dr. Blue says...

'Use oil-free diaphragm pumps with rotary evaporators, vacuum concentrators, vacuum ovens and filtration devices. They provide high pumping speed coupled with consistent vacuum while eliminating the mess of oil and the expense of using a water supply'





# Chemical Duty Diaphragm Vacuum Pumps



Cat. No 10287097



Cat. No 12981131



Cat. No 12991131

## Technical Features

Cat. No	10287097	12981131	12991131
Number of heads/stages	2/2	2/2	4/3
Pumping speed @ 50/60Hz	16/18L/min	38/41L/min	33/36L/min
Ultimate pressure	< 8 mbar	< 8 mbar	< 2 mbar
Max. overpressure	1 bar	1 bar	1 bar
IN/EX hose connector	Hose nozzle DN8	Hose nozzle DN8	Hose nozzle DN8
Sound level @ 50Hz	< 44 db (A)	< 44 db (A)	< 44 db (A)
Motor power	60W	180W	90W
Type of protection (motor)	IP 54	IP 54	IP 54
Weight	6.5kg	11.2kg	10.3kg
Overall dimensions (LxWxH)	195x235x145 mm	230x265x169 mm	200x260x150 mm
Ship weight	9.0kg	14.0kg	13.0kg
Shipping carton dimensions (LxWxH)	410x260x250 mm	480x320x300 mm	410x260x250 mm



Dr. Blue says...

'Check the pump on a regular basis for unusual running noises and heat build-up on the surface of the pump. We recommend replacing parts using the service kit after 10,000 operating hours or less, depending upon the application'

## Ordering Information:

Description	Cat. No	Cat. No	Cat. No
230V, 50/60 Hz, 1 Ph <sup>1</sup>	10287097	12981131	12991131
Service kit	13191984	10245242	10402742

See following page for accessories

### 1. With Schuko and UK plug leads

Scope of delivery: Every pump is supplied with ON/OFF switch, carrying handle, vibration isolating feet, DN8 hose nozzle, exhaust silencer and thermal protective switch for the motor. Comes pre-assembled. Certification: CE marked



## Accessories for Chemical Duty Diaphragm Vacuum Pumps and Systems

Accessory Connection Kits for Chemical Duty Pumps 10287097, 12981131, 12991131:

- Choose the appropriate kit below for your specific application needs.

Cat. No	
13514920	<p>Kit 1 - Rotary Evaporator Connection Kit</p> <ul style="list-style-type: none"> <li>• Easy connection of the pump to common rotary evaporator</li> <li>• Connection Kit includes: vacuum hose 18/8x5 (1.5 m), cooling water &amp; chiller connection hose and clamps</li> </ul>
13554920	<p>Kit 2 - Vacuum Oven Connection Kit for vacuum oven with DN16 KF and DN25 KF adapter</p> <ul style="list-style-type: none"> <li>• For standard vacuum oven connection</li> <li>• Connection Kit includes: hose nozzle DN16-8/25-8, clamping ring, centering ring and vacuum hose 18/8x5 (1.5 m)</li> </ul>
13564920	<p>Kit 3 - Advanced Vacuum Oven Connection Kit for vacuum oven with DN16 KF and DN25 KF adapter</p> <ul style="list-style-type: none"> <li>• To prevent particles from entering the pump, specially recommended for dusty drying processes</li> <li>• Connection Kit includes: hose nozzle DN16-8/25-8, dust filter, clamping ring, centering ring and vacuum hose 18/8x5 (1.5 m)</li> </ul>
13504920	<p>Kit 4 - Filtration &amp; Dessicator Connection Kit</p> <ul style="list-style-type: none"> <li>• Connect your manifold easily to the vacuum pump. An in-line filter protects liquid from entering the pump</li> <li>• Connection Kit includes: vacuum hose and hydrophobic in-line filter (DN8)</li> </ul>



Cat. No 13514920



Cat. No 13554920



Cat. No 13564920



Cat. No 13504920

Cat. No	Vacuum Hose
10061242	<p>Thick walled hose for vacuum or pressure applications</p> <ul style="list-style-type: none"> <li>• Rubber red, 18/8x5mm - sold in 1 metre increments</li> </ul>



Cat. No 10061242

Control Packages for Chemical Duty Pumps Cat. Nos. 10287097, 12981131, 12991131:  
- Choose the appropriate vacuum control package below for your specific application needs.

Cat. No	Vacuum Regulator with Dial Gauge
	<ul style="list-style-type: none"> <li>• Regulator valve for intake allows the adjustment of the ultimate pressure</li> <li>• Dial gauge indicates the vacuum level</li> <li>• Air regulator valve mounted directly on the pump</li> </ul>
15549632	For Cat. No 10287097
11896423	For Cat. No 12981131



Cat. No 15549632



Pump Cat. Nos 10287097 & 12991131 shown with dial gauge Cat. No 15549632



Cat. No 11896423



Pump Cat. No 12981131 shown with dial gauge Cat. No 11896423

Cat. No	Digital Vacuum Control Box Model VCB521cv
10810770	<ul style="list-style-type: none"> <li>• VCB controls: vacuum – cooling water – venting valve</li> <li>• Timer function for process termination after prespecified time</li> <li>• Solvent library - 38 solvents preprogrammed to simplify parameter selection</li> <li>• Works with most PTFE dry pumps</li> </ul> <p>Programmable vacuum controller Model VCB521cv with a built-in highly resistant ceramic diaphragm sensor for absolute pressure determination. Two variable independent switch points can be set between 1-1100mbar. Digital display for easy vacuum control; digitally displayed user-friendly operating instructions. Touch function keys stop bumping/foaming or quickly access maximum vacuum.</p>
13504930	<p>Software Kit for VCB521cv</p> <ul style="list-style-type: none"> <li>• Network your controller via PC/laptop. Monitor, control, store and document results</li> <li>• Data acquired can be exported into standard formats and can be analysed in Excel™</li> <li>• Communication between PC and VCB is performed via RS 232 for USB (with optional adapter)</li> <li>• Kit includes software and connection cable.</li> </ul>



Range	Display	Overall Dimensions (LxWxH)	Voltage
1-1100mbar	4" graphic display & large control knob	195x178x105mm	90-260V, 50/60Hz

# Vacuum Systems for Rotary Evaporators

The perfect vacuum system for evaporation and distillation in combination with rotary evaporators and gel dryers. The diaphragm pump is dry-running and all components coming into contact with vapour are chemically resistant even against acidic, basic and organic solvents.

## Design Features

Vapour recovery system protects lab air quality

Digital vacuum display for easy and precise vacuum readout

Vacuum regulator controls effective ultimate pressure

Gas ballast valve helps to preserve pump performance

Separator/liquid trap protects pump from liquid ingress

Chemical duty diaphragm pump for fast stripping of most common solvents



For accessories, see page 7

The Fisherbrand™ Vacuum System (Cat. No 15168886) is fitted with a powerful chemical duty two-stage vacuum pump, achieving <8mbar. It has been specifically designed for wet chemistry applications, such as distillation, evaporation and evacuation of acid and solvent vapours in chemical and pharmaceutical laboratories.

The manual vacuum regulator and digital vacuum gauge provides highly accurate control of the ultimate pressure to prevent bumping and foaming.

An inlet separator prevents particles and liquid droplets from reaching the pump, while the high efficiency emission condenser ensures solvent recovery close to 99%. The condenser can be cooled by tap water or a closed circuit chiller (not included).

A Service and Maintenance Kit (Cat.No: 13191984) is also available, comprising replacement seals and wearable parts for this model and for other diaphragm pumps.

Scope of delivery:  
 Vacuum System is supplied with a chemical duty diaphragm pump (230V, 50/60 Hz 1 Ph), DN8 hose connector, manual vacuum regulator, digital gauge, solvent trap and plug leads (Schuko and UK)  
 Comes pre-assembled and ready to use.  
 Certification: CE marked

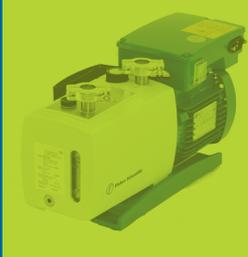
Dr. Blue says...

'Use a flow control valve to adjust the vacuum until bubbles form in the evaporation flask - then back off slightly. Reduce vacuum for fast reaction to bumping and foaming'



## Technical Features/Ordering Information

Cat. No	Pumping speed @ 50/60Hz	Ultimate pressure	Vacuum control	Vacuum gauge	Weight	Overall dimensions (L x W x H)	Ship weight	Shipping carton dimensions (L x W x H)
15168886	16/18L/min	< 8mbar	Manual	Digital	11.6 kg	360x310x445 mm	14 kg	540x410x580 mm



## Features and Benefits of Two-Stage Rotary Vane Pumps

Fisherbrand two-stage direct driven rotary vane pumps provide high water vapour tolerance and are designed for a wide range of laboratory applications and continuous running. Their low weight, small footprint and high pumping speed, as well as increased chemical resistance, are all advantageous features in research and routine processes.

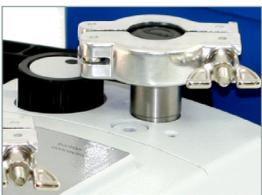
### Design Features

- Pumping speed of 30 to 183L/min
- Ultimate pressure to 2x10<sup>-3</sup> mbar



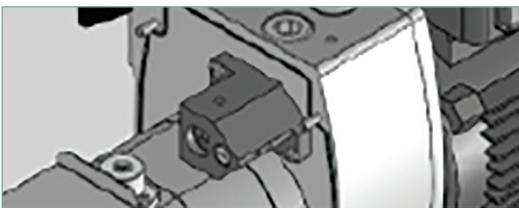
### Technology:

Rugged reliable design, combined with low noise level and ease of use, plus streamlined access to all control and service features. The pumps are designed for continuous operation.



### High water vapour tolerance:

The innovative gas ballast valve and the particular design prevent moisture condensation and permit high tolerance of water and solvent vapours.



### Anti suck-back valve:

The intake line is vacuum-sealed to protect your application from undesired venting and oil back flow after the pump is turned off.



### Easy oil level monitoring:

Vertical side window for monitoring of oil level and oil colour. The easy oil drain plug and oil change kit speed up oil changes.

### Pump Selection/Application Chart

Application	12901141	12911141	12921141	12931141	12951141
<b>Freeze dryers</b>					
Ice holding capacity	up to 2kg	X			
	up to 4.5kg		X		
	up to 6kg			X	
	up to 8kg				X
	up to 12kg				X
<b>Vacuum concentrators</b>					
High boiling point		X			
<b>Glovebox</b>					
Standard for all sizes					X
<b>Vacuum manifolds/High vacuum distillation</b>					
Standard for all sizes	X	X			

Dr. Blue says...

'Rotary vane pumps are not recommended for filtration or drying applications which require basic unregulated vacuums. These pumps are not designed to operate continuously above 10 mbar. A dry ice trap is recommended for vacuum concentrators and vacuum manifolds'





## Two-Stage Rotary Vane Pumps

Fisherbrand Rotary Vane vacuum pumps are designed for easy use with applications like freeze dryers, vacuum concentrators and vacuum manifolds.



Cat. No 12911141 / 12921141



Cat. No 12901141



Cat. No 12931141 / 12951141



Dr. Blue says...

All Fisherbrand rotary vane pumps are supplied with double-distilled Labovac 10 oil which brings out the best possible performance from your pump. Labovac 10 oil has a low vapour pressure and is perfect for general use. Other oils are available for more special applications. Please contact your local Fisher Scientific representative or Technical Support

### Technical Features

Cat. No	12901141	12911141	12921141	12931141	12951141
Number of stages	2	2	2	2	2
Pumping Speed @ 50/60Hz	30/36L/min	77/92L/min	97/110L/min	120/143L/min	183/220L/min
Ultimate pressure					
partial abs	< 1x10 <sup>-3</sup> mbar	< 1x10 <sup>-4</sup> mbar			
without gas ballast total	< 1x10 <sup>-2</sup> mbar	< 1x10 <sup>-3</sup> mbar			
with gas ballast total	< 0.5 mbar	< 1x10 <sup>-2</sup> mbar	< 1x10 <sup>-2</sup> mbar	< 1x10 <sup>-2</sup> mbar	< 1x10 <sup>-2</sup> mbar
Max. allowed intake/exhaust pressure	1 bar				
IN / EX hose connector	DN16 KF	DN16 KF	DN16 KF	DN25 KF	DN25 KF
Sound level	< 48 db (A)	< 49 db (A)			
Motor power	120 W		200 W		550 W
Type of protection (motor)			IP 54		
Water vapour tolerance	33 mbar		60 mbar		35 mbar
Oil capacity	250 mL	530 mL	550 mL	600 mL	1000 mL
Weight	8.0kg	17.5kg	19.5kg	21.5kg	35.0kg
Overall dimensions (LxWxH)	300x120x150 mm	415x150x235 mm	430x150x235 mm	445x150x235 mm	540x170x260 mm
Ship weight	12.3kg	22.0kg	22.0kg	23.0kg	36.5kg
Shipping carton dimensions (LxWxH)	420x270x260 mm	610x210x310 mm	610x210x310 mm	610x210x310 mm	610x210x310 mm

### Ordering Information:

See following page for accessories

Description	Cat. No				
100-120V/200-240V, 50/60 Hz, 1 Ph <sup>1</sup>		12911141	12921141	12931141	12951141
230V, 50/60 Hz, 1 Ph <sup>2</sup>	12901141				
Service kit	10672933	10719398	10165237	10256937	10114957

1. With Schuko, UK and US plug leads
2. With Schuko and UK plug leads

Scope of delivery: Every pump is supplied complete with anti suck-back valve, gas ballast valve, vacuum oil (Labovac 10), centering ring, clamping ring and motor overload protection. Ready for use after oil filling. Certification: CE marked



# Two-Stage Rotary Vane Pumps - Accessories

## Oil Condensers and Filters

Exhaust filters and condensers for Two-stage rotary vane vacuum pumps, Cat. Nos 12901141, 12911141, 12921141, 12931141, 12951141: These compact condensers and filters can be mounted easily on the exhaust port to collect oil expelled during operation and to reduce pump noise. A replaceable filter element within the OME oil filters separates out particulates from the oil within the filter housing. When the filter element becomes saturated simply unscrew for easy replacement.

- Oil mist separator AKD for effective oil mist elimination
- Oil mist filter OME for economical oil mist elimination

## Hose Adapter Kit

- Adapter kit for all Fisherbrand rotary vane vacuum pumps
- Kit contains tubing adaptors and clamps for vacuum tight connections
- Kit include 1.5m of thick walled rubber hose in Size DN10 and DN20



Cat. No	Description
15576335	Hose DN10 / DN20

## Freeze Dryer Adapter Kits

- All-in-one kit for connection to freeze dryers

Cat. No	Description	Size
10084924	Kit 5	DN16 KF
10792097	Kit 6	DN25 KF



Freeze dryer adapter kits include 2-way ball valve, hose connector, hinge clamp ring, centering ring, oil mist separator (AKD) and 1.5m vacuum hose.

## Vacuum Measurement Packages

- Reliable and accurate gauging for a wide range of applications.

Cat. No	Description	Size
15244788	Kit 9	DN16 KF
15202320	Kit 10	DN25 KF



Vacuum measurement package includes vacuum gauge PIZA 111 cr Gold, T-connection, hinge clamp ring and centering ring.

## Labovac 10 Vacuum Pump Oil

- Use Labovac pump oil to reduce oil change cycles and maximize performance. Your warranty is also only effective when using Fisherbrand qualified vacuum pump oil.
- Please note that for demanding applications not all types of Fisherbrand vacuum pump oil can be used. Please contact your local Fisher Scientific representative for further details.

## Ordering Information

Cat. No	Pack Volume	Image
12901151	1L	
10777544	5L	
10420853	20L	

Labovac 10 1 litre      Labovac 10 5 litres

## Accessory

Cat. No	Description
12692885	Oil Change Starter Kit <ul style="list-style-type: none"> <li>• For all Fisherbrand rotary vane pumps</li> </ul>



Cat. No	Description	Connection flange
10211865	AKD 16	DN16 KF
11702483	AKD 25	DN25 KF
10613682	OME 10/16	DN16 KF
10330641	OME 10/25	DN25 KF
10618812	Replacement filter element	



Condenser AKD



Oil mist filter OME

## Dry Ice/Liquid Nitrogen Trap

- Large cold chamber provides rapid condensation of solvent vapours
- Effective foreline cold trap for vacuum manifolds or Schlenk lines.
- Removable centre makes trapping surface easy to clean

Cat. No	Description	Size
15321461	Cold trap	DN10
15301461	Hose adapter kit	DN10



## Vacuum Concentrator Adapter Kits

- All-in-one kit for connection to vacuum concentrators

Cat. No	Description	Size
15331461	Kit 7	DN16 KF
13226349	Kit 8	DN25 KF



Vacuum concentrator adapter kits include hose connector, hinge clamp ring, centering ring and 1.5m vacuum hose.

## Vacuum Control Packages

- A cost-effective package for controlling vacuum pressure up to 0.001 mbar. Easily fits two-stage rotary vane pumps

Cat. No	Description	Size
12850593	Kit 11	DN16 KF
13465778	Kit 12	DN25 KF



Vacuum control package includes MRV 100 control gauge, vacuum sensor, T-connection, solenoid valve, hinge clamp ring and centering ring

## Schlenk line Vacuum Gauge

- Measures 1050 to 0.001 mbar
- Accurate across full range
- Resistant to common laboratory chemicals

Accurate vacuum measurement is critical to fine-tuning many vacuum applications, e.g. sensitive evaporations. Corrosive chemicals often compromise conventional sensors, leading to frequent replacement. Previous commercial efforts to prolong sensor life have also led to insulation of Pirani probes, thereby compromising operating principles.

This precision vacuum sensor sets a new standard for durable instrumentation. The PIZA 111 cr Gold gauge is both chemical resistant and very accurate.

Description	Size	Cat. No
PIZA 111 cr Gold gauge	90-260V, 50/60 Hz <sup>1</sup>	12351653
Schlenk line adapter DN16KF - NS14/23		10270022
Table stand		10580253
Factory calibration certificate		15341461



Cat. No 12351653

1. With AC/DC adapter, Schuko, UK and US plug adapter



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## Vacuum Pumps

*Pump Selection and Application Guide*



For the full range of Fisherbrand products, visit  
[www.eu.fishersci.com/go/fisherbrand](http://www.eu.fishersci.com/go/fisherbrand)

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