

# For highest levels of purity

Gas purification systems

## Individual gas purification – versatile, quick and clean

### Proven technology

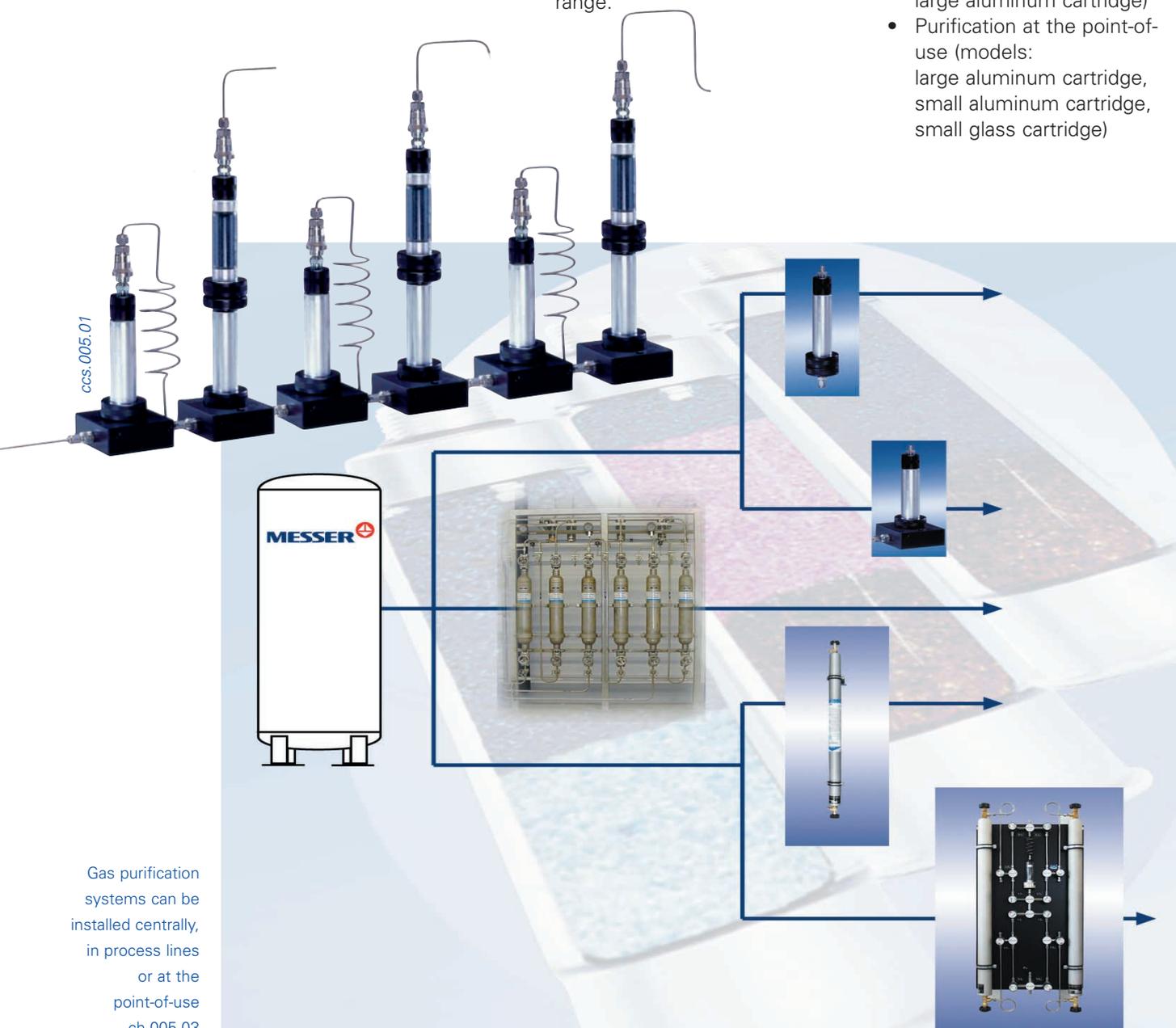
For several decades, MESSER has been offering you a range of gas purification systems which process gases to the highest levels of purity. MESSER has now developed a standardized purification system for a number of applications, such as the removal of traces of oxygen or moisture from gases.

All of our gas purification system modules can be used universally, quickly and safely in laboratories and technical sectors. They have been designed to be particularly user-friendly, a feature which gives them a clear advantage. By various cartridge sizes some 100 m<sup>3</sup> of gas per hour can be purified just as easily as small gas volumes, in the millilitre range.

The processes involved are based on physisorption, chemisorption or catalytic conversion on suitable carrier materials.

A gas purification system can be used as:

- Central gas purification (models: R20 or R200)
- Gas purification in process lines (models: R20, R200 or large aluminum cartridge)
- Purification at the point-of-use (models: large aluminum cartridge, small aluminum cartridge, small glass cartridge)



Gas purification systems can be installed centrally, in process lines or at the point-of-use  
ch.005.03

# Point-of-use purifier for laboratory applications

## Summary



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### Ambient temperature adsorbers

Description	Application	Contaminants removed
<b>OXISORB®</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, saturated HC <b>not suitable for oxygen, compressed air and nonsaturated HC</b>	Oxygen, moisture (side effect)
<b>Hydrosorb</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, saturated HC, halogenated HC, nitrous oxide, compressed air, oxygen	Moisture, carbon dioxide
<b>Accosorb</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, methane, compressed air, <b>not suitable for oxygen</b>	Hydrocarbons, oil vapour
<b>Sulfosorb</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide saturated HC, compressed air, <b>not suitable for oxygen</b>	Mercaptan, carbonyl sulphide, carbon disulphide, hydrogen sulphide, sulphur dioxide, nitrogen monoxide

# Point-of-use purifier

## OXISORB®

### Small cartridges, large cartridges

#### Specification and supply forms

<b>Applications:</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, saturated HC <b>not suitable for oxygen, compressed air and non-saturated HC</b>		
<b>Contaminants:</b>	Oxygen, moisture (side effect)		
<b>Process:</b>	Chemisorption: Oxygen is <b>chemically bound</b> to the adsorption material and therefore permanently removed from the gas flow. This process is independent on the ambient temperature and pressure. As a side effect, moisture is adsorptively removed.		
<b>Description</b>	<b>Small cartridge OXISORB®</b>	<b>Small cartridge OXISORB®-W</b>	<b>Large cartridge OXISORB®</b>
<b>Cartridge</b>			
<b>Material:</b>	Aluminum	Glass <sup>3)</sup>	Aluminum
<b>Shield gas:</b>	Helium	Helium	Argon
<b>Supply forms:</b>	Double pack ex stock	Double pack ex stock	Single pack ex stock
<b>Part no.</b>	792 40225	792 52099	792 30893
<b>Specification</b>			
<b>Guaranteed final purities (input 10 ppm each):</b>	Oxygen < 5 ppb <sup>1)</sup> Moisture < 30 ppb	Oxygen < 5 ppb <sup>1)</sup> Moisture < 30 ppb	Oxygen < 5 ppb Moisture < 30 ppb
<b>Capacity:</b>	Oxygen 0,1 l Moisture 0,5 l	Oxygen 0,1 l Moisture 0,5 l	Oxygen 9 l Moisture 45 l
<b>Optical load indication:</b>	None	Colour change from blue to brown	None
<b>Maximum throughput: (1 bar; 15° C)</b>	1 m <sup>3</sup> /h	1 m <sup>3</sup> /h	10 m <sup>3</sup> /h
<b>Maximum pressure:</b>	10/200 bar <sup>2)</sup>	10 bar	10 bar
<b>Length:</b>	125 mm	130 mm	1170 mm
<b>Diameter:</b>	29 mm	30 mm	71 mm
<b>Mounting system VARIOSORB®</b> <i>(see pages 8 and 9)</i>	<b>Low pressure holder systems for small cartridges</b> <ul style="list-style-type: none"> <li>• LP single holder for installation in pipelines</li> <li>• LP bench/wall mount</li> <li>• LP combination system</li> </ul> <b>High pressure holder systems for small cartridges</b> <ul style="list-style-type: none"> <li>• High pressure housing PN 200</li> </ul> <sup>1)</sup> Not valid for LP single holder for installations in pipelines (< 100 ppb) <sup>2)</sup> High pressure housing PN 200 is required for system pressure > 10 bar (max. 200 bar). <sup>3)</sup> Please note: use only with Splinter protection.		<b>Low pressure holder systems for large cartridges</b> <ul style="list-style-type: none"> <li>• Single holder</li> <li>• Wall-mounting bracket with flushing facility</li> </ul> <i>(see page 10)</i>

# Point-of-use purifier

## Hydrosorb

### Small cartridges, large cartridges

#### Specification and supply forms

<b>Applications:</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, saturated HC halogenated HC, nitrous oxide, compressed air, oxygen	
<b>Contaminants:</b>	Moisture (carbon dioxide is absorbed, if the mentioned above gases are dry)	
<b>Process:</b>	Physisorption: Moisture and carbon dioxide are <b>physically bound</b> to a porous material and therefore removed from the gas flow. This adsorption process is dependent on the ambient temperature and pressure.	
<b>Description</b>	<b>Small cartridge Hydrosorb</b>	<b>Large cartridge Hydrosorb</b>
<b>Cartridge</b>		
<b>Material:</b>	Aluminum	Aluminum
<b>Shield gas:</b>	Helium	Argon
<b>Supply forms:</b>	Double pack ex stock	Single pack ex stock
<b>Part no.</b>	792 40226	792 54831
<b>Specification</b>		
<b>Guaranteed final purity (input 10 ppm each):</b>	Moisture < 20 ppb <sup>1)</sup>	Moisture < 20 ppb
<b>Capacity:</b>	Moisture 1 l	Moisture 100 l
<b>Optical load indication:</b>	None	None
<b>Maximum throughput: (1 bar; 15° C)</b>	1 m <sup>3</sup> /h	10 m <sup>3</sup> /h
<b>Maximum pressure:</b>	10/200 bar <sup>2)</sup>	10 bar
<b>Length:</b>	125 mm	1170 mm
<b>Diameter:</b>	29 mm	71 mm
<b>Mounting system VARIOSORB®</b> (see pages 8 and 9)	<p><b>Low pressure holder systems for small cartridges</b></p> <ul style="list-style-type: none"> <li>• LP single holder for installation in pipelines</li> <li>• LP bench/wall mount</li> <li>• LP combination system</li> </ul> <p><b>High pressure holder systems for small cartridges</b></p> <ul style="list-style-type: none"> <li>• High pressure housing PN 200</li> </ul> <p><sup>1)</sup> Not valid for LP single holder for installations in pipelines (&lt; 100 ppb)</p> <p><sup>2)</sup> High pressure housing PN 200 is required for system pressure &gt; 10 bar (max. 200 bar).</p>	<p><b>Low pressure holder systems for large cartridges</b></p> <ul style="list-style-type: none"> <li>• Single holder</li> <li>• Wall-mounting bracket with flushing facility</li> </ul> <p>(see page 10)</p>

# Point-of-use purifier

## Accosorb

### Small cartridges, large cartridges

#### Specification and supply forms

<b>Applications:</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, methane, compressed air, <b>not suitable for oxygen</b>	
<b>Contaminants:</b>	Hydrocarbons, oil vapour	
<b>Process:</b>	Physisorption: Hydrocarbons and oil vapour are <b>physically bound</b> to a porous material and therefore removed from the gas flow. This adsorption process is dependent on the ambient temperature and pressure.	
<b>Description</b>	<b>Small cartridge Accosorb</b>	<b>Large cartridge Accosorb</b>
<b>Cartridge</b>		
<b>Material:</b>	Aluminum	Aluminum
<b>Shield gas:</b>	Helium	Argon
<b>Supply forms:</b>	Double pack ex stock	Single pack ex stock
<b>Part no.</b>	792 40228	792 54832
<b>Specification</b>		
<b>Guaranteed final purity:</b>	Total hydrocarbons < 10 ppb <sup>1)</sup>	Total hydrocarbons < 10 ppb
<b>Capacity:</b>	Ethane            1 mg Propane          180 mg Higher AC        180 mg Oil vapour        8 g	Ethane            55 mg Propane          9.000 mg Higher AC        9.000 mg Oil vapour        450 g
<b>Optical load indication:</b>	None	None
<b>Maximum throughput: (1 bar; 15° C)</b>	1 m <sup>3</sup> /h	10 m <sup>3</sup> /h
<b>Maximum pressure:</b>	10/200 bar <sup>2)</sup>	10 bar
<b>Length:</b>	125 mm	1170 mm
<b>Diameter:</b>	29 mm	71 mm
<b>Mounting system VARIOSORB®</b> <i>(see pages 8 and 9)</i>	<b>Low pressure holder systems for small cartridges</b> <ul style="list-style-type: none"> <li>• LP single holder for installation in pipelines</li> <li>• LP bench/wall mount</li> <li>• LP combination system</li> </ul> <b>High pressure holder systems for small cartridges</b> <ul style="list-style-type: none"> <li>• High pressure housing PN 200</li> </ul> <sup>1)</sup> Not valid for LP single holder for installations in pipelines (< 100 ppb) <sup>2)</sup> High pressure housing PN 200 is required for system pressure > 10 bar (max. 200 bar).	<b>Low pressure holder systems for large cartridges</b> <ul style="list-style-type: none"> <li>• Single holder</li> <li>• Wall-mounting bracket with flushing facility</li> </ul> <i>(see page 10)</i>

# Point-of-use purifier Sulfosorb

## Small cartridges, large cartridges Specification and supply forms

<b>Applications:</b>	Rare gases, nitrogen, hydrogen, carbon monoxide, carbon dioxide, saturated HC, compressed air, <b>not suitable for oxygen</b>	
<b>Contaminants:</b>	Mercaptan, carbonyl sulphide, carbon disulphide, hydrogen sulphide, sulphur dioxide, nitrogen monoxide	
<b>Process:</b>	Chemisorption: Sulphur compounds (e.g. mercaptan, carbonyl sulphide, carbon disulphide, hydrogen sulphide, sulphur dioxide, nitrogen monoxide) are <b>chemically bound</b> to a porous adsorber material and therefore permanently removed from the gas flow	
<b>Description</b>	<b>Small cartridge Sulfosorb</b>	<b>Large cartridge Sulfosorb</b>
<b>Cartridge</b>		
<b>Material:</b>	Aluminum	Aluminum
<b>Shield gas:</b>	Helium	Argon
<b>Supply forms:</b>	Double pack ex sock	Single pack ex sock
<b>Part no.</b>	792 40229	792 54834
<b>Specification</b>		
<b>Guaranteed final purity (input 10 ppm):</b>	Hydrogen sulphide < 1 ppm	
<b>Capacity:</b>	Sulphur dioxide            0,5 g Nitrogen monoxide        0,05 g Hydrogen sulphide         0,5 g	Sulphur dioxide        28,0 g Nitrogen monoxide     2,8 g Hydrogen sulphide     28,0 g
<b>Optical load indication:</b>	None	
<b>Maximum throughput: (1 bar 15° C)</b>	1 m <sup>3</sup> /h	10 m <sup>3</sup> /h
<b>Maximum pressure:</b>	10/200 bar <sup>1)</sup>	10 bar
<b>Length:</b>	125 mm	1170 mm
<b>Diameter:</b>	29 mm	71 mm
<b>Mounting system VARIOSORB®</b> <i>(see pages 8 and 9)</i>	<p><b>Low pressure holder systems for small cartridges</b></p> <ul style="list-style-type: none"> <li>• LP single holder for installation in pipelines</li> <li>• LP bench/wall mount</li> <li>• LP combination system</li> </ul> <p><b>High pressure holder systems for small cartridges</b></p> <ul style="list-style-type: none"> <li>• High pressure housing PN 200</li> </ul> <p><sup>1)</sup> Not valid for LP single holder for installations in pipelines (&lt; 100 ppb)</p> <p><sup>2)</sup> High pressure housing PN 200 is required for system pressure &gt; 10 bar (max. 200 bar).</p>	<p><b>Low pressure holder systems for large cartridges</b></p> <ul style="list-style-type: none"> <li>• Single holder</li> <li>• Wall-mounting bracket with flushing facility</li> </ul> <p><i>(see page 10)</i></p>

# Point-of-use purifier for laboratory applications

## VARIOSORB® mounting system for small cartridges

### VARIOSORB® Low pressure (LP) mounting system for small cartridges<sup>3)</sup>

Description	Scope of delivery	Part no.	Fittings <sup>1)</sup>	Part no.
<p><b>LP single holder for installation in pipelines</b></p>  <p>ccs.002.01</p>	<p>Upper and lower section and union nut made from black plastic (HOSTAFORM®). Fittings are offered separately.</p>	795 10733	<p>ES 3 mm<sup>2)</sup></p> <p>ES 6 mm<sup>2)</sup></p> <p>ES 8 mm<sup>2)</sup></p> <p>ES 1/4''<sup>2)</sup></p> <p>ES 1/8''<sup>2)</sup></p> <p>ES quick-release fittings</p> <p><sup>1)</sup> Note: Two pieces (inlet and outlet) required</p> <p><sup>2)</sup> Stainless steel compression fitting</p> <p><sup>3)</sup> Note: Install holder so that cartridges are mounted vertically</p>	<p>0291 281</p> <p>0291 280</p> <p>0049 033</p> <p>770 31374</p> <p>795 10829</p> <p>796 07937</p>
<p><b>LP bench/wall-mount</b></p>  <p>ccs.008.01</p>	<p>Upper and lower section and union nut made from black plastic (HOSTAFORM®). The standard delivery includes screws and rawl plugs for wall mounting. Fittings are offered separately.</p>	79424364	<p>ES 3 mm<sup>2)</sup></p> <p>ES 6 mm<sup>2)</sup></p> <p>ES 8 mm<sup>2)</sup></p> <p>ES 1/4''<sup>2)</sup></p> <p>ES 1/8''<sup>2)</sup></p> <p>ES quick-release fittings</p> <p><sup>1)</sup> Note: Two pieces (inlet and outlet) required</p> <p><sup>2)</sup> Stainless steel compression fitting</p> <p><sup>3)</sup> Note: Install holder so that cartridges are mounted vertically</p>	<p>0291 281</p> <p>0291 280</p> <p>0049 033</p> <p>770 31374</p> <p>795 10829</p> <p>796 07937</p>

# Point-of-use purifier for laboratory and special applications

Ambient temperature adsorbers: Small cartridges, large cartridges  
**VARIOSORB® mounting system for small cartridges**

## VARIOSORB® Low pressure (LP) mounting system for small cartridges

Description	Scope of delivery	Part no.	
<b>LP combination system</b>  	<b>1) Vertical VARIOSORB® LP combination</b> Adaptor and union nut made from black plastic (HOSTAFORM®). This connection unit allows, in conjunction with the single LP holder or the LP bench/wall mount, for serial installation of two or more small cartridges to remove various contaminants from the gas flow.	794 24363	 
	<b>2) Horizontal VARIOSORB® LP combination</b> Quick release fitting, coil and 3 mm compression fitting made from stainless steel. This connection unit allows, in conjunction with the LP bench/wall mount, for serial installation of two or more small cartridges to remove various contaminants from the gas flow.	770 33042	
<b>Splinter protection</b> 	For safety reasons required for glass cartridges	792 52101	

## VARIOSORB® High pressure (HP) mounting system for small cartridges

Description	Scope of delivery	Part no.	Fittings <sup>1)</sup>	Part no.
<b>HP-housing PN 200</b> 	Stainless steel housing for installation in pipelines: A wall-mounting bracket is part of the standard delivery. A HP holder PN 200 is required for system pressure > 10 bar max. 200 bar). Fittings are offered separately.	792 43386	ES 3 mm <sup>2)</sup> ES 6 mm <sup>2)</sup> ES 8 mm <sup>2)</sup> ES 1/4'' <sup>2)</sup> ES 1/8'' <sup>2)</sup> ES VCR fittings <sup>1)</sup> Note: Two pieces (inlet and outlet) required <sup>2)</sup> Stainless steel compression fitting <sup>3)</sup> Note: Install holder so that cartridges are mounted vertically	0291 281 0291 280 0049 033 770 31374 795 10829 on request

# Point-of-use purifier for laboratory applications

## Ambient temperature adsorbers: Small cartridges, large cartridges VARIOSORB® mounting system for large cartridges

### VARIOSORB® Low pressure (LP) mounting system for large cartridges

Description	Scope of delivery	Part no.	Fittings <sup>1)</sup>	Part no.
<b>Single holder for a large aluminum cartridge</b>  <b>Fig. 1</b>	Two wall-mounting brackets incl. screws and rawl plugs; inlet and outlet valves of the large cartridge are sealed with a 1/4" dummy plug. After removing this plug, NPT 1/4" pipe fittings with NPT 1/4" male threads can be inserted. Fittings are offered separately.	796 04537	ES 3 mm <sup>2)</sup>	0291 281
			ES 6 mm <sup>2)</sup>	0291 280
			ES 8 mm <sup>2)</sup>	0049 033
			ES 1/4'' <sup>2)</sup>	770 31374
			ES 1/8'' <sup>2)</sup>	795 10829
<b>Wall-mounting bracket for one large cartridge with flushing facility</b>  <b>Fig. 2</b>	Wall-mounting bracket with facility for flushing the pipeline after cartridge replacement; incl. safety, shut-off and flushing valves. Fittings are pre-assembled on a panel for wall-mounting. Materials: stainless steel, chrome-plated brass. Inlet and outlet: NPT 1/4" female threads. Fittings are offered separately.	796 04822	ES VCR-fittings	on request
			<sup>1)</sup> Note: Two pieces (inlet and outlet) required <sup>2)</sup> Stainless steel compression fitting <sup>3)</sup> Note: Install holder so that cartridges are mounted vertically	
<b>Double mounting bracket with flushing facility for the connection of two large aluminum cartridges in conjunction with OXISORB®, small glass cartridge for optical load indication</b>  <b>Fig. 3</b>	Double mounting bracket with optical load indication and facility for flushing the connected pipeline after cartridge replacement; incl. safety, shut-off and flushing valves. LP mounting bracket for small cartridge; fittings preassembled on a panel for wall-mounting. Materials: stainless steel, chrome-plated brass. Inlet and outlet: NPT 1/4" female threads. Fittings are offered separately.	795 10976		

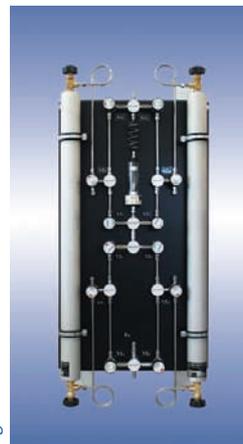
Fig.1 ch.002.03



Fig.2 ch.003.03



Fig.3 ch.004.03



# Bulk purifier for large-scale technical applications

## Renewable gas purification units for large-scale technical applications

For higher gas throughput, adsorbers type R 20 (operating pressure < 25 bar) and type R 200 (operating pressure < 230 bar) are available. These gas purification cylinders offer, contrary to the gas purification systems for laboratory applications, the advantage of being able to be regenerated.

### Large adsorber R 20 (low pressure range):

- OXISORB® (65 l oxygen capacity)
- Hydrosorb (430 l water vapour capacity)
- EM-KAT - This removes traces of oxygen from hydrogen or gases containing hydrogen by catalytic reaction. In this process, oxygen reacts at the surfaces of the catalyst with the excess to form hydrogen moisture. Because of the moisture created by this process, the gas generally requires subsequent drying.
- Accosorb
- Sulfosorb

### Large adsorber R 200 (high pressure range)

- OXISORB® (41 l oxygen capacity)
- Hydrosorb (270 l water vapour capacity)
- EM-KAT
- Accosorb
- Sulfosorb

Gas purification systems for the installation of R 20 or R 200 cylinders in large-scale technical applications

- are complete units, requiring only to be connected to the gas pipeline system on site
- always comprise a safety valve, shut-off and test valves as well as particle filters
- require no auxiliary energy for their function
- are completely maintenance free, except for the replacement of loaded with regenerated cylinders.

Every large adsorber is designed for a gas throughput of 100 m³/h. Installing several adsorbers in parallel allows for purifying several hundred cubic meters per hour. The various optional applications of these large adsorbers require individual solutions, which we will design for you on request.



ch.008.03



ch.006.03

ch.007.03

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