



## Adsorption technology

Industrial, high pressure and medical breathing air compressed air adsorption dryers using heatless, heated and vacuum-regenerated principles

### System solutions for the stable drying of compressed air and compressed gases, for the implementation of safe and economical production processes all the way to breathing air.

KSI also offers higher-performance drying technologies besides membrane dryers and refrigeration dryers. One of the tasks of adsorption dryers is to reliably provide compressed air and gas of consistently high quality. Depending on the production process the quality level is maintained, measured as the pressure dew point, from -20°C to -70°C. This is the best KSI industrial equipment quality grade which can also be utilized in a high-end system, for example for medical breathing air according to the European Pharmacopoeia or clean room applications etc.

The **ECOTROC®** premium adsorption dryer series is available as part of the highly compact aluminium series for volume flows up to 65 cfm (110m<sup>3</sup>/h) and our quality steel series up to 1794 cfm (3050 m<sup>3</sup>/h). With heatless and heated regeneration, for example in Zero Purge Air (without purge air loss) and Closed Loop versions. High-performance oil vapour adsorbers from our **ECOTROC®** ATC series are a practical complement to the KSI adsorption dryers, using highly effective oil vapour adsorption among other processes.

### KSI's Production Quality is the best Industrial Equipment Grade and High End Quality

We have been developing, constructing and producing intelligent system solutions of premium quality for 16 years in Niederkrüchten, Germany, using high-value components for our adsorption dryer systems. It starts with the internal stainless steel piping that is standard, and is reflected in the high-performance **ECOTROC®** system package. All of the vessels of the **ECOTROC®** AT series (welded version) are manufactured with care according to international guidelines as well as using the current state of the art processes. Special test certificates and approvals can be offered as an option. Among the benefits that this provides for our clients are long and problem free service life cycles, value for money acquisition and low energy and maintenance costs.

### The ECOTROC® AT Plus-Effect +++

- + Protection of production & processes => longer service cycles for machines and installations
- + high-value desiccants => constant pressure dew points, consistent air quality
- + minimized energy requirements => lowers operating costs
- + maximized operating reliability => protection against production and machine failure
- + best industrial equipment quality => long service cycles and lifetime
- + intelligent control => easy to programme and operate
- + brand name system components => simple maintenance
- + easy serviceability => minimized service costs
- + 23 user-oriented performance levels => optimal selection
- + four model series are solution-oriented for almost any application requirement

### Extensive and Experience-Based Manufacturer Competence – Made in Germany

As a result of the in-house production at company headquarters we have complete control to assure our certified KSI industrial equipment quality. For that reason our compressed air treatment components satisfy current as well as also future market demands. This assurance is provided through long-term and continuous cooperation with market specialists, specialized trade channels, the institutes, as well as our ongoing and intensive development work.

**ECOTROC® ATK/-AP, ATO/-AP**  
Heatless Regeneration Adsorption Dryer



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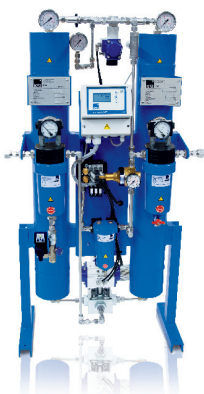
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# ECOTROC® ATK

## Heatless Regenerated High-Performance Adsorption Dryer

### System solutions for compressed air and gases – reliable and safe treatment

Adsorption dryers are used in environments where a specified pressure dew point from -20°C to -70°C has to be assured stably and securely. The **ECOTROC®** AT series dryers are offered in two versions. As a compact aluminium series (AP) for volume flows up to 65 cfm (110 m<sup>3</sup>/h)\*, and with welded vessels for volume flows up to 1794 cfm (3050 m<sup>3</sup>/h)\* as part of the standard series. Higher volume flows are available upon request. Common to both series is consistently high quality compressed air.

\*in reference to normal conditions  
– higher performance upon request

### The ECOTROC® ATK Plus-Effect +++

#### 1. Optimal Operational Reliability

Using first-class materials, KSI produces **ECOTROC®** AT adsorption dryers that distinguish themselves through long service life and exceptional industrial equipment quality. The use of quality desiccants in combination with intelligent controls assures consistent compressed air and compressed gas quality, and stable pressure dew points (from -20°C to -70°C). Non-electric change-over valves assure reliable and risk-free operation. Standardized brand-name blow-down valves extend the operating life, minimize service times, and simplify maintenance significantly.

#### 2. Optimal Cost Effectiveness During Operation and in Price

The cost effective operation and functionality supplements the exceptional price-performance ratio.

The intelligent 10 minute **ECOMATIC** cycle (control cycle for adsorption, regeneration and pressure build-up) requires less regeneration energy than dryers with shorter cycles and saves adsorbents due to the lower number of alternating loads.

The compressor synchronizing circuit that is integrated in the **ECOMATIC** control as standard saves additional regeneration energy because the **ECOTROC®** AT runs only when the compressor is also running. Consequently no regeneration air escapes during standby times.

The highly flow-optimized compressed air and compressed gas conduits are implemented using design features such as consistently large open flow cross sections at inlets and outlets, in internal and external pipe lines, as well as valves and silencers. Integrated and coordinated solutions such as **ECOCLEAN®** compressed air filters and **KONDRAIN®** condensate drains expand the savings potential and increase operational reliability.

## Dryer Function

### Pre-filtration

The **ECOCLEAN® SMA** pre-filter simply separates out any solid and liquid components from the saturated compressed air prior to entering the dryer. Accumulating compressor condensate is ejected reliably and without pressure loss via the electronic, level-controlled **KONDRAIN® N** condensate drain (optional).

### Adsorption

The pre-cleaned compressed air is distributed across the so-called wet zone via the flow divider from the lower end of the adsorption vessel across the desiccant bed for the purpose of pre-drying. This is followed by the actual adsorption through agglomeration of the water molecules to the large internal surface area of desiccant.

### Post-Filtration

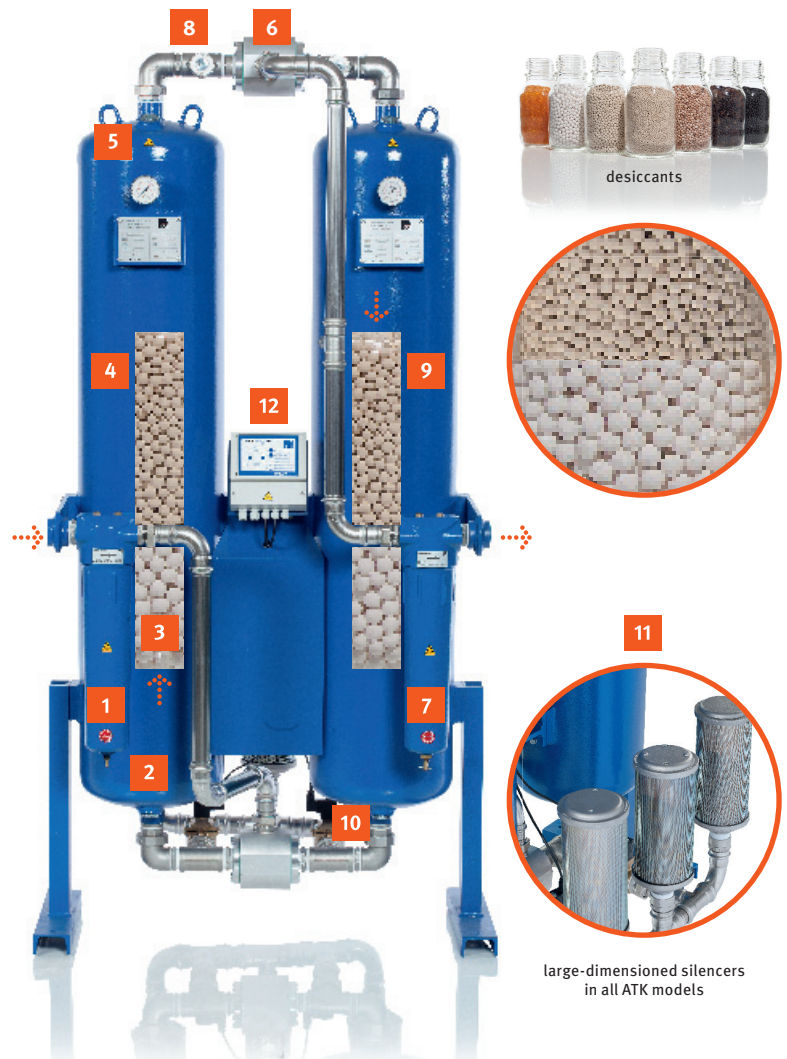
After traversing the entire desiccant bed, the significantly dried compressed air reaches the **ECOCLEAN® MFO** post-filter at the top end of the adsorption vessel for the concluding dust filtration, via a flow optimizer and the change-over valve. High quality pure compressed air is now available.

### Regeneration / Desorption

In parallel with the adsorption in the first vessel the regeneration of the desiccant takes place in the second vessel. To that end a minor part of the already dried compressed air is conveyed via a purging nozzle from adsorption vessel one through the desiccant of vessel two in a counter flow arrangement. Using the physical effect of a pressure release to atmospheric pressure the regeneration purge air dries the moist desiccant highly effectively. The moisture is released to the atmosphere via the blow-down valve and silencer.

### Switch-over

The pressure build-up in the vessel starts after the completed regeneration. The switch from adsorbing vessel to the now regenerated vessel is performed after the operating pressure has been reached. Adsorption now commences in the freshly regenerated vessel, while the other vessel starts its regeneration cycle.



- 1 flow-optimized **ECOCLEAN® SMA** pre-filter
- 2 Inlet diffuser
- 3 Wet zone for pre-drying
- 4 Adsorption phase desiccant vessel
- 5 Outlet diffuser
- 6 Change-over valve
- 7 low-optimized **ECOCLEAN® MFO** post-filter
- 8 Purging nozzle
- 9 Desiccant vessel Regeneration phase
- 10 Blow-down valve
- 11 Silencer
- 12 electronic control **ECOMATIC**

### Service friendly

Exchanging the desiccant with the **ECOTROC® ATK-AP** takes place without complicated dismantling of the plates and profiles via easily accessible service points. More on service friendliness on page 11.



Filling points for desiccant change with ATK-AP

# ECOTROC® ATK-AP and ATO-AP

## Heatless Regeneration Adsorption Dryer of the Compact Series up to 65 cfm (110 m<sup>3</sup>/h)

### Aluminum Profile Series of the Highest Quality

Solid and robust construction offers long operating life, low failure susceptibility, and problem-free installation. All of the design sizes can be fastened to the floor. An aluminium profile that was developed by KSI together with the globally active SAPA group offers optimal flow conditions in the adsorber bed, and also assures a reliable pressure dew point as a result of an over-dimensioned desiccant volume. In the standard version ATK-AP models achieve a reliable pressure dew point of -40°C. In the optimal ATK-AP -70 version they achieve a pressure dew point of -70°C, thereby offering the highest operational and process reliability.

### Simple and quicker service

Structurally the ATK-AP adsorption dryers offer several advantages relative to competitors products. For example, there is no need to replace overpriced cartridges for changing the desiccant, nor do the head and foot plates of the dryer have to be dismantled. These tasks for the dryers of other manufacturers represent significant effort, and always harbour risks during the service call. The generously dimensioned discharge points in the lower plate as well as the filling points in the top plate provide the advantage of facilitating a safer and quicker discharge (possible with vacuum) as well as a quick filling with new desiccant.

Just two Bürkert quality valves, two silencers, two pressure gauges as well as a piston kit are the functional component parts for the two-year service interval.

### Operational reliability in the context of industrial operations

Two large-dimensioned silencers provide significantly more safety during the switch-over cycles than most other devices on the market, which increase the risk of discharging desiccant dust with the use of just one silencer. KSI is convinced that this system offers more safety by essentially eliminating the risk of any discharge of desiccant dust to atmosphere due to the large silencer surface area.

KSI **ECOCLEAN**® SMA and MFO pre- and post-filter are of course part of the delivery scope, and offer optimal pre-filtration of entering particles and water or oil droplets. This increases the operational reliability and service life of the ATK-AP devices significantly. A post-filter assures safe filtration of the unavoidable desiccant dust on the discharge side.

### The oil-free system solution ATO-AP

With the ATO-AP KSI delivers an ATK-AP adsorption dryer with heatless regeneration and an ATC-AP activated carbon adsorber as a high-performance unit with a residual oil content of < 0.003 mg/m<sup>3</sup> (at 20°C inlet temperature).



## Delivery Scope and Performance Levels

### ECOTROC® ATK-AP

**Fully automatic high-performance adsorption dryer with heatless regeneration**

*including:*

- **ECOCLEAN®** SMA pre-filter
  - **ECOCLEAN®** MFO post-filter
  - **ECOMATIC** electronic control
- volume flow output including compressor  
synchronizing circuit: up to 65 cfm (110 m<sup>3</sup>/h)\*  
pressure dew point performance: -20°C to -70°C

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

Type	Output*		Dimensions (mm)			Connection
	cfm	m <sup>3</sup> /h	H	W	D	
ATK-AP 1	3	5	545	393	307	D/1"
ATK-AP 2	6	10	645	393	307	D/1"
ATK-AP 3	12	20	745	393	307	D/1"
ATK-AP 4	21	35	832	465	350	D/1"
ATK-AP 6	29	50	932	465	350	D/1"
ATK-AP 7	35	60	1032	465	350	-"
ATK-AP 8	41	70	924	527	398	-"
ATK-AP 9	53	90	1064	527	398	-"
ATK-AP 10	65	110	1244	527	398	-"

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

### ECOTROC® ATO-AP

#### System Solution:

**Fully automatic high-performance adsorption dryer with heatless regeneration and active carbon adsorber,**

*including:*

- **ECOCLEAN®** SMA pre-filter
  - **ECOCLEAN®** MFO post-filter
  - **ECOMATIC** electronic control
- volume flow output including compressor  
synchronizing circuit: up to 65 cfm (110 m<sup>3</sup>/h)\*  
pressure dew point performance: -20°C to -70°C

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

Type	Output*		Dimensions (mm)			Connection
	cfm	m <sup>3</sup> /h	H	W	D	
ATO-AP 1	3	5	545	509	307	D/1"
ATO-AP 2	6	10	645	509	307	D/1"
ATO-AP 3	12	20	745	509	307	D/1"
ATO-AP 4	21	35	832	615	350	D/1"
ATO-AP 6	29	50	932	615	350	D/1"
ATO-AP 7	35	60	1032	615	350	-"
ATO-AP 8	41	70	924	727	398	-"
ATO-AP 9	53	90	1064	727	398	-"
ATO-AP 10	65	110	1244	727	398	-"

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

# ECOTROC® ATK and ATO

## Heatless Regeneration Adsorption Dryer Series up to 1794 cfm (3050 m<sup>3</sup>/h)

### Operational Reliability and Long Service Life

With the ATK series KSI offers adsorption dryers with heatless regeneration in connection sizes from 1" to DN 150 as well as volume flows from 88-1794 cfm (150 - 3050 m<sup>3</sup>/h).

#### Quality materials for a premium product

All of the vessels of the **ECOTROC®** ATK series, including ATK 110 (706 cfm (1200 m<sup>3</sup>/h)), are designed and manufactured for an operating pressure up to 16 bar, and of course comply with the current German regulations on pressurized vessels (PED). Other approvals, such as for example ASME, BS 5500, ANCC, are also available. The internal piping of the ATK-series, from ATK 15 to ATK 110, is implemented completely in stainless steel.

For the ATK series, just as in the case of the **ECOTROC®** ATK-AP compact series, KSI supplies a very robust readily accessible construction for long uninterrupted service life. The over capacity of desiccant volume also ensures reliable pressure dew points.

#### Operational reliability and service advantages

The **ECOTROC®** ATK series features three large mufflers on the vent side that assure secure and carefree operation because the risk of any discharge of desiccant dust to atmosphere is essentially impossible due to the large silencer surface area. Just some of the advantages of the series are lifting lugs on the vessels, easily accessible discharge and filling ports on the vessels, easily dismantled pipeline connections on the top and the bottom.

As always with KSI: Service made easy and without potential risk for trade-related operations.

#### The oil-free system solution ATO

With the ATO KSI delivers an ATK adsorption dryer with heatless regeneration and an ATC activated carbon adsorber as a high-performance unit with a residual oil content of < 0.003 mg/m<sup>3</sup> (at 20°C inlet temperature).

#### Fully-controlled throughput for adsorption and expansion pathways

The KSI **ECOTROC®** adsorption dryers, starting with 155, distinguish themselves with the following properties that assure optimal cost effectiveness and operational reliability in this performance range starting at 912 cfm (1550 m<sup>3</sup>/h).

- particularly large cross sections in the main and expansion lines
- inlet air distribution via individually controlled butterfly valves
- optimized flow velocity and dwell period of the air in the vessel
- check valves with enlarged interior diameter (as compared to standard valves) on the discharge side
- expansion line uses butterfly valves, resulting in reduced back pressure as compared to a regular valve





## Delivery Scope and Performance Levels

### ECOTROC® ATK

up to 706 cfm (1200 m<sup>3</sup>/h)\*

Fully automatic adsorption dryer with heatless regeneration

including:

- ECOCLEAN® SMA pre-filter
- ECOCLEAN® MFO post-filter
- ECOMATIC electronic control

including compressor synchronizing circuit  
 volume flow output: up to 706 cfm (1200 m<sup>3</sup>/h) \*  
 pressure dew point performance: -20°C to -70°C

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

Type	Output*		Dimensions (mm)			Connection
	cfm	m <sup>3</sup> /h	H	W	D	
ATK 15	88	150	1180	1036	546	1"
ATK 18	106	180	1340	1036	546	1"
ATK 22	124	210	1460	1036	546	1"
ATK 34	200	340	1453	943	773	1-"
ATK 45	282	480	1603	943	773	1-"
ATK 55	353	600	2013	943	773	1-"
ATK 75	482	820	1726	1220	954	2"
ATK 90	588	1000	1906	1220	954	2"
ATK 110	706	1200	2106	1220	954	2"

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

### ECOTROC® ATK

up to 1794 cfm (3050 m<sup>3</sup>/h)\*

Fully automatic adsorption dryer with heatless regeneration

including:

- ECOMATIC electronic control

including compressor synchronizing circuit  
 volume flow output: up to 1794 cfm (3050 m<sup>3</sup>/h)\*  
 pressure dew point performance: -20°C to -70°C

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

Type	Output*		Dimensions (mm)			Connection
	cfm	m <sup>3</sup> /h	H	W	D	
ATK 155	911	1550	2112	1510	776	DN 80
ATK 185	1088	1850	2117	1612	776	DN 80
ATK 205	1206	2050	2127	1713	776	DN 80
ATK 245	1441	2450	2325	1774	912	DN 100
ATK 305	1794	3050	2340	1896	912	DN 100

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

higher output on request

### ECOTROC® ATO

#### System Solution:

Fully automatic adsorption dryer with heatless regeneration and active carbon adsorber

including:

- ECOCLEAN® SMA pre-filter
- ECOCLEAN® MFO post-filter
- ECOMATIC electronic control

including compressor synchronizing circuit  
 volume flow output: up to 706 cfm (1200 m<sup>3</sup>/h)\*  
 pressure dew point performance: -20°C to -70°C  
 residual oil content up to: < 0.003 mg/m<sup>3</sup>

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

Type	Output*		Dimensions (mm)			Connection
	cfm	m <sup>3</sup> /h	H	W	D	
ATO 15	88	150	1178	1447	546	1"
ATO 18	106	180	1393	1447	546	1"
ATO 22	124	210	1458	1447	546	1"
ATO 34	200	340	1453	1546	773	1-"
ATO 45	282	480	1603	1546	773	1-"
ATO 55	353	600	2013	1546	773	1-"
ATO 75	482	820	1726	1980	954	2"
ATO 90	588	1000	1906	1980	954	2"
ATO 110	706	1200	2106	1980	954	2"

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

# The Controls

## Dew Point Controls with Intelligent Functions

A clear plus in reliability and energy savings

### ECOTROCONOMY-Comfort (ET-C)

- available as an option for the entire ECOTROC® AT series
- all ECOTROC® AT adsorbers can be easily upgraded (even older models and models from other manufacturers)
- dew point measurement and display up to -100°C
- demand-based regeneration control by measuring the operational conditions
- integrated variable load counter (facilitates possible vessel inspections at a later date)
- Storage of the operating parameters together with time data (retained and restored after power failure)
- Password protection on all levels (can be changed)
- Connector for optical and acoustic signals (flashing light, horn etc.)
- automatic service indicator
- Service indicator display, adjustable intervals
- Potential-free alarm output
- Interface for data output to PC/software



ECOTROCONOMY Comfort: ET-C

### ECOTROCONOMY-Premium (ET-P)

ET-C functions, plus in addition:

- Pressure measurement at the dryer inlet, and indicator on the control display
- Temperature measurement at the dryer inlet, and indicator on the control panel
- Safety shutdown in the case of deviation from specified values is possible



ECOTROCONOMY Premium: ET-P

## Control with Fixed Cycle Times

### ECOMATIC

Standard scope of supply with all ECOTROC® AT (heatless regeneration)

- Display of adsorption/regeneration cycle
- Fully electronic micro processor
- Energy-saving compressor synchronizing circuit
- Variably adjustable cycle times (selectable)
- Status display and potential-free alarm signal for service requirements
- 24 V optional
- can be used for adsorption dryers from other manufacturers



ECOMATIC

# ECOTROC® AT

## The Advantages at a Glance

### Operational reliability

- Two (ATK-AP) or three (ATK) large dimensioned silencers offer additional safety by essentially eliminating the risk of any discharge of desiccant dust to atmosphere.
- The exclusive use of quality desiccants from well-known manufacturers assures reliability of performance.
- Pre- and post-filter provided as standard (up to ATK 110) offer system reliability.



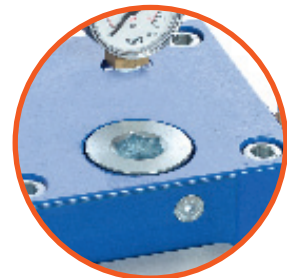
Exclusive use of high quality desiccants.



large-dimensioned silencers on all ATK and ATK-AP models

### Service Friendly for ease of Maintenance

- The desiccant is changed via filler and drain ports in all **ECOTROC®** AT models. This design eliminates the need for awkward and time consuming dismantling of the head and foot plates in the AT-AP compact series.
- The removal of the complete pipeline bridges in the ATK series is accomplished via the simple releasing of two screw couplings. The required service work can therefore be performed in a pleasant work environment and awkward working directly on the dryer are no longer necessary..
- Simple and clear service packages simplify planning and implementation.
- For servicing after two years, a functional component kit for the **ECOTROC®** ATK-AP compact series consists of just two Bürkert valves, two silencers, two pressure gauges and a set of replacement pistons..
- The functional component kit for 2-year servicing of the **ECOTROC®** ATK series consists of just two Bürkert blow-out valves, three silencers, two pressure gauges and a set of replacement pistons.



Filling ports on all ATK and ATK-AP models  
No dismantling of the plates and profiles is required for any of the AT-AP!

### Features

- Regeneration gas recirculation is a standard design feature on all ATK dryers. (this does not apply to ATO models or those with a downstream activated carbon adsorber, or if an activated carbon adsorber is used between the ATK and storage tank).
- The symmetric arrangement of the piping and components facilitates an assembly that is adapted to the room conditions (for example placing the piping and the pre- and post-filter behind the dryer).
- Problem-free installation due to delivery of units ready for connection. (Plug & Play).
- Lifting lugs are provided on all vessels of the ATK series for easier handling and installation.
- The internal piping of the ATK-series, from ATK 15 to ATK 110, is supplied entirely in stainless steel.
- Robust and solid construction of all models of the **ECOTROC®** ATK and ATK-AP series.
- Fastening to the floor is possible using the predrilled holes in the base frame.
- ATK-AP 1 through ATK-AP 3 models can also be delivered with wall mounting, if requested.



Pipeline bridges can be easily removed if service is required



Lifting lugs and filling ports provided on all vessels



KSI service package for the two-year maintenance intervals of an ATK-AP

# ECOTROC® ATC

## High-Performance Activated Carbon Adsorber

### Proven solution for the adsorption of oil vapour from compressed air and gases

The activated carbon adsorption method is a proven solution for operational processes that depend on maximum process reliability. Oil aerosols up to  $0.01 \text{ mg/m}^3$  can be safely removed using filtration technology. Oil aerosols can be separated out using a classic activated carbon adsorber if higher compressed air quality is required. The result is particularly high air quality with a residual oil content of up to  $0.003 \text{ mg/m}^3$ .

### The ECOTROC® ATC Plus-Effect +++

#### Optimal Operational Reliability

- + optimal adsorption of oil vapour (hydrocarbons)
- + highly active activated carbon for air and gases provides maximum efficiency
- + optimized volume distribution across the entire activated carbon bed
- + residual oil content up to a maximum  $0.003 \text{ mg/m}^3$
- + oil indicator for checking the saturation level, standard starting with ATC 15
- + easy accessibility for uncomplicated service
- + 10.000 hours of activated carbon service life\*

\* The application time of the activated carbon depends on the quality and the relative humidity of the medium, as well as the type of compressor.

#### System Solutions and Higher Performance and Pressure Levels

- Upon request, ECOTROC® ATC activated carbon adsorbers can be directly equipped with the KSI ECOTROC® ATK adsorption dryers as a system solution with the ECOTROC® ATO designation (see pages 6 and 8 in this brochure).
- Upon request, ECOTROC® ATC activated carbon adsorbers can be delivered with higher performance levels, as well as for middle and high pressure (up to 500 bar).

## An Effective 3-Stage Process

### 1. Pre-filtration

In the flow-optimized **ECOCLEAN®** SMA pre-filter solid and liquid components (oil aerosols) are separated from the compressed air (or the pressurized gas) according to ISO 8573.1 class 1.

### 2. Adsorption

The pre-cleaned compressed air is conveyed by the flow divider from the upper end of the adsorption vessel through the activated carbon. Physical adsorption forces initiate the agglomeration of the hydrocarbon (of the oil vapour) to the large internal surface area of special activated carbon.

### 3. Post-filtration

The compressed air reaches the **ECOCLEAN®** MFO post-filter at the lower end of the adsorption vessel after traversing the entire activated carbon bed, for the concluding filtration of any particles still present. After this stage highly pure high quality compressed air is available for safe application.



ECOTROC® ATC are available for higher volume flows upon request

## Delivery Scope and Performance Levels

### Activated carbon adsorber ready for connection

including:

- **ECOCLEAN®** MFO post-filter

volume flow output: up to 65 cfm (110 m<sup>3</sup>/h)\*

Residual oil content up to: < 0.003 mg/m<sup>3</sup>

referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

### Activated carbon adsorber ready for connection

including:

- **ECOCLEAN®** MFO post-filter

volume flow output: up to 706 cfm (1200 m<sup>3</sup>/h)\*

Residual oil content up to: < 0.003 mg/m<sup>3</sup>

referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

### Activated carbon adsorber ready for connection

volume flow output: up to 1794 cfm (3050 m<sup>3</sup>/h)\*

Residual oil content up to: < 0.003 mg/m<sup>3</sup>

referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

Type	Output*		Dimensions (mm)			Connection	
	cfm	m <sup>3</sup> /h	H	W	D	input	output
ATC-AP 1	3	5	545	235	120	1"	D/1"
ATC-AP 2	6	10	645	235	120	1"	D/1"
ATC-AP 3	12	20	745	235	120	1"	D/1"
ATC-AP 4	21	35	832	291	160	D/1"	D/1"
ATC-AP 6	29	50	932	291	160	D/1"	D/1"
ATC-AP 7	35	60	1032	291	160	D/1"	1"
ATC-AP 8	41	70	924	363	180	1"	1"
ATC-AP 9	53	90	1064	363	180	1"	1"
ATC-AP 10	65	110	1244	363	180	1"	1"
ATC 15	88	150	1140	508	404	1"	1"
ATC 18	106	180	1300	508	404	1"	1"
ATC 22	124	210	1420	508	404	1"	1"
ATC 34	200	340	1416	460	606	1-1"	1-1"
ATC 45	282	480	1566	460	606	1-1"	1-1"
ATC 55	353	600	1976	460	606	1-1"	1-1"
ATC 75	482	820	1686	582	732	2"	2"
ATC 90	588	1000	1936	582	732	2"	2"
ATC 110	706	1200	2086	582	732	2"	2"
ATC 155	911	1550	2112	698	578	DN 80	DN 80
ATC 185	1088	1850	2117	749	629	DN 80	DN 80
ATC 205	1206	2050	2127	800	680	DN 80	DN 80
ATC 245	1441	2450	2325	865	803	DN 100	DN 100
ATC 305	1794	3050	2340	926	803	DN 100	DN 100

\*referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

# ECOTROC® ATW-V/VG

## KSI High-End Adsorption Dryer Systems, Heated and Vacuum Regenerated

### When the highest precision and performance are required

KSI compressed air installations provide optimal solutions for specific applications. The **ECOTROC®** ATW-V/VG series adsorption dryers distinguish themselves through the highest process and construction-based performance level. It starts with particularly high-performance and long-life adsorbents, and is reflected, among other properties, in the constant and linear pressure dew points with no dew point peaks. **ECOTROC®** ATW-V/VG sets the standard by operating without any purging air loss, and by the regeneration temperature that is low due to vacuum utilization. This is combined with user-friendly and extensive control. The entire system features optimum efficiency and the highest compressed air and gas quality, with constant linear supply at the highest level. For that reason the KSI **ECOTROC®** ATW-V/VG high-end adsorption dryer series is used where

standard installations reach their limits:

For particularly sensitive production processes, such as semiconductor manufacture, data storage media production, pharmaceutical industry, food stuff production etc.

KSI plant construction “Made in Germany”

The new generation of **ECOTROC®** ATW-V/VG adsorption dryers redefines the cost benefit ratio: Highest quality characteristics and operational reliability along with optimum operational efficiency.

According to the ISO 8573-1 : 2010, class 1, 2, and 3.

### Advantageous Features

The process sequence is similar to that of a dryer with heatless regeneration. The intelligently controlled regeneration unit completes the vessels of the **ECOTROC®** ATW-V/VG series that alternate between adsorbing and regenerating. The unit consists of a quality vacuum blower and a microprocessor controlled electro heater.

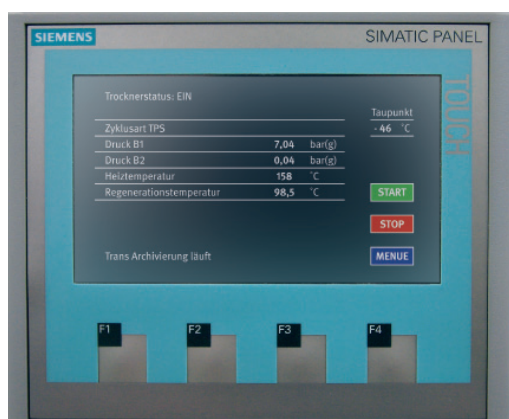
### The ECOTROC® ATW-W/VG Plus-Effect +++

- + high end plant construction => high performance reserves & reliability
- + linear dew points => for constant compressed air quality
- + intelligent process solution => low energy costs
- + high-performance, long life desiccant => constant, high quality compressed air
- + user friendly design => easy to maintain and service
- + brand name components => simplified maintenance & high operational reliability
- + modular system concept => price efficient
- + optional dew point control => a safety plus and energy saving
- + specialized installations possible, for example stainless steel version or vessel approval according to requirements
- + also suited for safe applications in critical environments
- + intelligent control => process reliability & linear pressure dew point
- + energy cost reduction, e.g. transfer system or loop cooler optionally possible
- + alternative energies are optionally possible (e.g superheated steam) => energy efficient
- + thermal vessel insulation option available



Zero Purge  
no purging  
air loss

## The Controls



### Touch Screen EDC Control of the Highest Level

(based on Siemens S7)

Highest user friendliness thanks to touch screen, intuitive menus and exceptional ease of use provide an instant overview of all functions and parameters during operation. Clear messages relate the status of the **ECOTROC®** ATW-V/ VG quickly and unambiguously.

Optionally available as **TPS** dew point control with dew point sensor.

## Implementations and Options

- ATW-V heated and vacuum regenerated in parallel flow mode (page 16)
- ATW-VG heated and vacuum regenerated in counter flow mode (page 17)
- Vessel insulation (through cylindrical position of the vessels, heater pipe and pipeline bridge available under option ISO I)
- Insulation with adsorber heads (Option ISO II)
- TPS pressure dew point control
- Steam regeneration
- Silicone-free implementation
- Transfer switch monitor
- Start-up device
- Sound insulation
- Air intake filter
- Special edition vessel materials (e.g. stainless steel)
- higher volume flows possible
- higher intake temperatures than 35°C possible
- other pressure dew points upon request
- higher operating pressures than 11 bar overpressure possible

## The Service Advantages

- Vacuum blower at work bench height
- Heater at comfortable working height
- Low maintenance plug valves
- Service kits matched to each dryer
- Use of standardized parts; no special tools required
- easily understood controls and simple menu guidance system



Vacuum blower at work bench height for easy servicing

# ECOTROC® ATW-V

## Adsorption Dryer, Heated and Vacuum Regenerated in Parallel Flow Mode

### The System

- Regeneration by means of heated ambient air in parallel flow to adsorption
- Cooling by means of drawn ambient air in parallel flow to adsorption
- Zero purge requirement

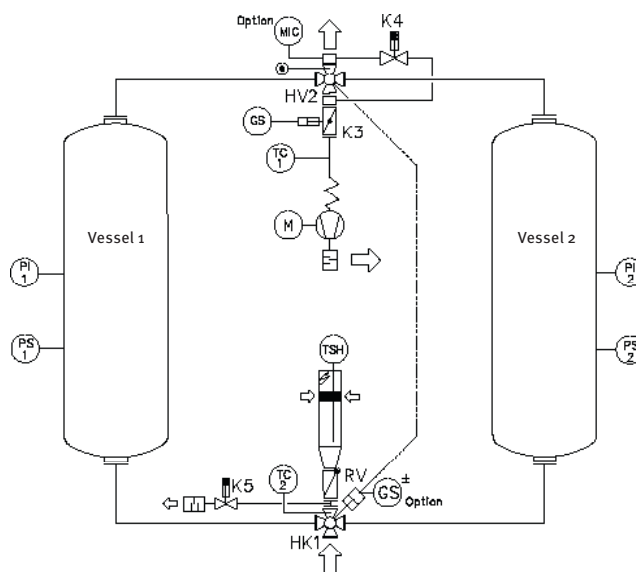


ECOTROC® ATW as part of the scope of delivery

### The Functional Principle

Whilst the drying process is performing in the first adsorption vessel, regeneration commences in parallel in the second vessel. The vacuum pump draws in ambient air from the bottom to the top in parallel with the adsorption process. The ambient air is heated to about 160 °C by the electro heater. The vacuum in the adsorption vessel makes it possible to regenerate at lower temperature than conventional methods. The electro heater is turned off by a thermostat approximately 1.5 hours after the regeneration gas has reached the required temperature. The vacuum pump continues to run in order to maximize cooling of the desiccant. The high-performance EDC control achieves a continuous, linear mode of operation with fully automatic switch-over.

### R&I schematic



## Delivery Scope and Performance Levels

Fully automatic heated and vacuum regenerated high-end adsorption dryers

Linear output, highest quality

including:

- intelligent EDC touch screen control (based on Siemens S7) complete regeneration unit

volume flow output:

other output levels (volume, dew point, pressure) possible

- ECOTROC® ATW-V 250 cfm up to 3088 cfm (5250 m³/h)\* pressure dew point performance: 20°C bis -70°C

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

maximum operating pressure: 11 bar overpressure

maximum inlet temperature: 35°C

Higher performance upon request!

Type	Output*		Dimensions (mm)			Connection
	cfm	m³/h	H	W	D	DN
ATW-V 42	250	425	1980	1260	1120	40
ATW-V 52	306	520	2220	1260	1120	40
ATW-V 63	371	630	2260	1450	1200	50
ATW-V 83	488	830	2290	1450	1200	50
ATW-V 120	706	1200	2670	1530	1280	80
ATW-V 152	894	1520	2710	1610	1330	80
ATW-V 205	1206	2050	2730	1820	1430	80
ATW-V 245	1441	2450	2860	1900	1510	100
ATW-V 296	1741	2960	2890	2060	1550	100
ATW-V 365	2147	3650	2980	2220	1650	100
ATW-V 420	2470	4200	3130	2380	1680	150
ATW-V 480	2823	4800	3200	2400	1720	150
ATW-V 525	3088	5250	3500	2590	1900	150

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure



# ECOTROC® ATW-VG

## Adsorption Dryer, Heated and Vacuum Regenerated in Counter Flow Mode

### The System

- Regeneration by means of heated ambient air in counter flow to adsorption
- Cooling by means of drawn ambient air in parallel flow to adsorption
- Zero purge requirement

For the highest demands, even in critical environments



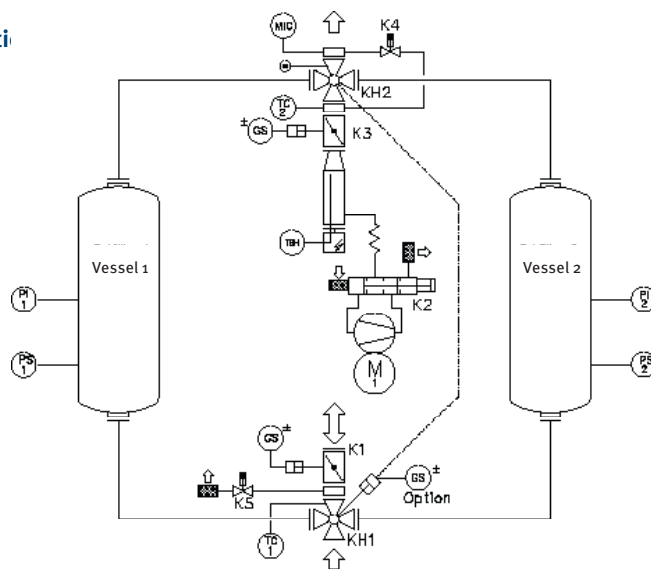
ECOTROC® ATW with optional vessel insulation

### The Functional Principle

The humid compressed air is conveyed through the desiccant bed in the first vessel and dried. At the same time the regeneration commences in the second vessel. The adsorption takes from the bottom to the top; the regeneration takes place in the counter flow: heating from the top to the bottom; cooling from the bottom to the top. The vacuum pump draws the ambient air in across the heater coil. The air is heated to about 160°C (depending on the implementation and the performance data the heating temperature can be up to 200°C and conveyed through the desiccant bed. The cooling of the desiccant is initiated after the cut-off temperature has been reached. In the process the regeneration path is reversed using a special switch-over valve on the vacuum pump without changing the rotational direction of the vacuum pump.

**There is no volume flow difference between heating and cooling because the curvature of the blades of the impeller is designed for just one direction. A technical advantage that saves time and energy!**

### R&I schemati



## Delivery Scope and Performance Levels

Fully automatic heated and vacuum regenerated high-end adsorption dryers

Linear output, highest quality

including:

- intelligent EDC touch screen control (based on Siemens S7) complete regeneration unit

volume flow output:

other output levels (volume, dew point, pressure) possible

- ECOTROC® ATW-VG 250 cfm up to 3088 cfm (5250 m³/h)\*

pressure dew point performance: 20°C bis -70°C

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

maximum operating pressure: 11 bar overpressure

maximum inlet temperature: 35°C

Higher performance upon request!

Type	Output*		Dimensions (mm)			Connection
	cfm	m³/h	H	W	D	DN
ATW-VG 42	250	425	1980	1260	1120	40
ATW-VG 52	306	520	2220	1260	1120	40
ATW-VG 63	371	630	2260	1450	1200	50
ATW-VG 83	488	830	2290	1450	1200	50
ATW-VG 120	706	1200	2670	1530	1280	80
ATW-VG 152	894	1520	2710	1610	1330	80
ATW-VG 205	1206	2050	2730	1820	1430	80
ATW-VG 245	1441	2450	2860	1900	1510	100
ATW-VG 296	1741	2960	2890	2060	1550	100
ATW-VG 365	2147	3650	2980	2220	1650	100
ATW-VG 420	2470	4200	3130	2380	1680	150
ATW-VG 480	2823	4800	3200	2400	1720	150
ATW-VG 525	3088	5250	3500	2590	1900	150

\* referenced to 1 bar (abs.) 20°C at 7 bar above operating pressure

# ECOTROC® ATM

## High End Adsorption Technology for the Generation of Medical Breathing Air from Compressed Air

### With maximum responsibility and reliability

Where health is concerned, operational reliability, air quality and treatment reliability are the deciding factors. With the **ECOTROC® ATM** series we comply with the stringent requirements for medical breathing air, again in combination with a first class price-performance ratio. Consequently this KSI high end solution provides breathing air that complies with the current norms and limits of the European Pharmacopoeia as well as also the Pharmacopée Européenne. Just to make sure!



### KSI Quality Provides Reliability for Highly Pure Breathing Air

The manufacture of KSI filter technology and its mode of operation are certified according to DIN EN ISO 9001. Based on stringent inhouse quality specifications we provide premium solutions with maximum reliability for the user. High cost effectiveness of our installations is as natural as the solution-oriented expert advice of KSI medical product consultants. It goes without saying that we are qualified to perform new installations, expansions and compressed air installation launches for the supply of medical breathing air in an expert manner, according to DIN ISO 7396-1. Providing seamless service from one supplier for the best possible implementation and execution.

### The ECOTROC® ATM/-AP Plus-Effect +++

- + certified high end plant construction => high performance capacity & reliability
- + intelligent system solution => low energy costs
- + high performance special desiccators & catalysts => high breathing air purity
- + user friendly design => easy to maintain and service
- + Brand name components => simplified maintenance & high operational reliability
- + optional dew point control => a safety plus and energy saving
- + intelligent control => process reliability & constant quality
- + tuned process technology => assured compliance to breathing air standards

## Quality Components (Standard Delivery Scope)

Structure of an ECOTROC® ATM treatment unit:

- **ECOCLEAN® MFO/SMA**  
Pre-filter combination (1 micron / 0.01 micron)
- **ECOTROC® ATK**  
Fully automatic adsorption dryer with heatless regeneration and special desiccant filling
- **ECOMATIC**  
Electronic control with compressor synchronizing circuit
- **ECOCLEAN® CA**  
Activated carbon filter (residual oil content <0.003 mg/m³)
- **ECOCLEAN® HC**  
catalyst
- **ECOCLEAN® SMA**  
high performance post-filter (0.01 micron)

## Options

### KONDRAIN® N1

Electronic level-controlled condensate drain, mounted to the ECOCLEAN® MFO / SMA pre-filters.

### ECOTROCONOMY comfort and premium

#### A clear plus in reliability and energy saving

Intelligent dew point control with, among other features:

- Pressure measurement at the dryer inlet, and indicator
- Temperature measurement at the dryer inlet, and indicator
- Safety shutdown possible

Details on page 10



## Limits for Breathing Air

Residual values according to Pharmacopée Européenne / DIN EN ISO 7396-1 and ECOTROC® ATM

				Pharmacopée Européenne	ECOTROC® ATM
Carbon monoxide	CO	(ppm)	<	5	5
Carbon dioxide	CO <sub>2</sub>	(ppm)	<	500	300
Sulphur dioxide		(ppm)	<	67	67
Sulphur dioxide	SO <sub>2</sub>	(ppm)	<	1	1
Nitrous gases	NO <sub>x</sub>	(ppm)	<	2	2
Nitrogen oxide	NO <sub>2</sub>	(ppm)	<	2	2
Oil vapour/residual oil content		(mg/m³)	<	0.1	0.1
Nitrogen	N <sub>2</sub>	(ppm)	<		2
Oxygen	O <sub>2</sub>	%	<	21(+/-1)	20.9(+/-1)
Dirt particles	<			0.01 micron at 99.9999%	

#### Odorous and flavourings

free

The specified values are maximum values (under standard conditions)

## Proper Functioning due to Reliable Process Technology

The contaminants, such as particles, fine dust, moisture and aerosols that are drawn in by the compressor are safely separated out by the ECOTROC® ATM/-AP. KSI treatment technology converts industrial compressed air into high-quality and pure breathing air. In this context the same stringent criteria for the production of medications apply to the breathing air quality. The pre-filter combination separates particles and water (condensate) reliably out. In the adsorption stage the physically induced moisture content (water vapour) is reduced to a pressure dew point of <-40°C. Finally odorous matter, hydrocarbon compounds and undesirable gas components, such as carbon monoxide, sulphur dioxide, among others, are removed from the compressed air in the active carbon and catalyst cleaning stage. Having passed through the post-filter, only high-quality medical-grade breathing air leaves the dryer.

## Performance Levels

Type	Output*		Dimensions (mm)			Connection
	cfm	m³/h	H	B	T	
ATM-AP 1	3,5	6	545	680	307	D/1"
ATM-AP 2	7	12	645	680	307	D/1"
ATM-AP 3	14	24	745	680	307	D/1"
ATM-AP 4	25	42	832	780	350	D/1"
ATM-AP 6	36	61	932	780	350	D/1"
ATM-AP 7	43	73	1032	780	350	-"
ATM-AP 8	49	84	924	845	398	-"
ATM-AP 9	64	109	1064	845	398	-"
ATM-AP 10	79	134	1244	845	398	-"
ATM 15	108	183	1036	1450	546	1"
ATM 18	129	219	1036	1450	546	1"
ATM 22	151	256	1036	1450	546	1"
ATM 34	244	414	943	1380	773	1-"
ATM 45	344	585	943	1550	773	1-"
ATM 55	431	732	943	1604	773	1-"

\*in reference to 1 bar (abs.) and 20°C at 9 bar above operating pressure

# ECOTROC® ATT

## High End Adsorption Technology for the Generation of Industrial Breathing Air from Compressed Air

### When it matters

Breathing air from compressed air helps people remain able and healthy in situations where it really matters. This means that humans can also work in situations where the environmental conditions no longer provide health-preserving breathing air quality. For that reason industrial breathing air offers a high degree of operational safety and the plus of independence besides the protection of health. To achieve goals that require a special effort.

### ECOTROC® ATT Reliable, Safe, Universal

Usable for industrial breathing air requirements:

- Surface treatment and processing
- Sand blasting work
- Fire departments
- Disaster relief
- Paint shops, breathing mask applications in general
- Diver air and deep sea applications, compressed air tank filling
- Civil protection
- Chemical and petrochemical industry
- Mining & tunnel construction
- Tank cleaning
- Bio-laboratories

### The ECOTROC® ATT/-AP Plus-Effect +++

- + certified high end plant construction => high performance capacity & reliability
- + intelligent system solution => low energy costs
- + high-performance, special desiccant & catalyst => higher breathing air purity
- + user friendly design => easy to maintain and service
- + Brand name components => simplified maintenance & high operational reliability
- + Optional dew point control => safety plus
- + intelligent control => process reliability & constant quality
- + tuned process technology => assured compliance to breathing air standards

## Quality Components (standard delivery scope)

Structure of an **ECOTROC®** ATT treatment unit:

- **ECOCLEAN® SMA**  
Pre-filter (1 micron / 0.01 micron)
- **ECOTROC® ATK**  
Fully automatic adsorption dryer with heatless regeneration and special desiccant filling
- **ECOMATIC**  
Electronic control with compressor synchronizing circuit
- **ECOCLEAN® CA**  
Activated carbon filter (residual oil content <0.003 mg/m<sup>3</sup>)
- **ECOCLEAN® HC**  
catalyst
- **ECOCLEAN® SMA**  
high performance post-filter (0.01 micron)

## Options

### KONDRAIN® N1

Electronic level-controlled condensate drain, mounted to the **ECOCLEAN® SMA** pre-filter.

### ECOTROCONOMY comfort and premium

#### A clear plus in reliability and energy savings

Intelligent dew point control with, among other features:

- Pressure measurement at the dryer inlet, and indicator
- Temperature measurement at the dryer inlet, and indicator
- Safety shutdown possible

Details on page 10



## Proper Functioning due to Reliable Process Technology

The contaminants, such as particles, fine dust, moisture and aerosols that are drawn in by the compressor are safely separated out by the **ECOTROC® ATT/-AP**. Industrial compressed air is transformed into the best breathing air for safe industrial applications by the KSI treatment technology.

The **ECOCLEAN®** pre-filter reliably separates out particles with a separation efficiency of 0.01 micron and the water component (condensate). In the adsorption stage the physically induced moisture content of the compressed air (water vapour) is reduced to a pressure dew point of -40°C. Finally undesirable air components, among others also carbon monoxide and sulphur dioxide are removed from the compressed air in the active carbon and catalyst cleaning stage. Having passed through the post-filter, only high-quality medical-grade breathing air leaves the dryer.

## Performance Levels

Type	Output*		Dimensions (mm)			Connection
	cfm	m <sup>3</sup> /h	H	B	T	
ATT-AP 1	3	5	545	590	307	D/1"
ATT-AP 2	6	10	645	590	307	D/1"
ATT-AP 3	12	20	745	590	307	D/1"
ATT-AP 4	21	35	832	690	350	D/1"
ATT-AP 6	29	50	932	690	350	D/1"
ATT-AP 7	35	60	1032	690	350	-"
ATT-AP 8	41	70	924	755	398	-"
ATT-AP 9	53	90	1064	755	398	-"
ATT-AP 10	65	110	1244	755	398	-"
ATT 15	88	150	1036	1320	546	1"
ATT 18	106	180	1036	1320	546	1"
ATT 22	124	210	1036	1320	546	1"
ATT 34	200	340	943	1250	773	1-"
ATT 45	282	480	943	1420	773	1-"
ATT 55	353	600	943	1420	773	1-"

\*in reference to 1 bar (abs.) and 20°C at 7 bar above operating pressure

## Limits for Industrial Breathing Air

Region	Europe	United Kingdom	USA	Australia	ECOTROC® ATT	
Norm	EN 12021	BS 4275	ANSI/CGA	AS 1715		
Carbon monoxide	CO (ppm) <	15	5	10	10	5
Carbon dioxide	CO <sub>2</sub> (ppm) <	500	500	1000	800	300
Sulphur dioxide	H <sub>2</sub> O <	5 °C	5 °C	10 °F	100 mg/m <sup>3</sup>	-40 °C
Nitrous gases	NO <sub>x</sub> (ppm) <	-	-	-	-	2
Nitrogen oxide	NO <sub>2</sub> (ppm) <	-	-	-	-	2
Oil vapour/residual oil content	(mg/m <sup>3</sup> ) <	0.5	0.5	0.5	1.0	0.003
Oxygen	O <sub>2</sub> % <	21(+/-1)	20-23	21,5	-	20.9(+/-1)
Odorous and flavourings		free	free	free	free	free

The specified values are maximum values (under standard conditions)

# ECOTROC® ATK-HP · ATC-HP · ATO-HP

## High-Pressure Adsorption Dryer and Activated Carbon Adsorber

### The cost effective treatment for high-pressure compressed air applications

Top mechanical engineering competency and “Made in Germany” production guarantee safe and reliable treatment in the standard range from 50 bar to 350 bar (up to 500 bar upon request).

The **ECOTROC® ATK-HP** series is based on the globally successful **ECOTROC® ATK** adsorption dryer series. Providing proven construction as well as also process technology for the ATK-HP series.

Perfected with high-pressure components of the best industrial equipment quality, a system solution of exemplary safety and compactness is created with the special price-performance ratio typical for KSI.



### The ECOTROC®AT-HP Plus-Effect +++

- + the new standard of price-performance ratio
- + compact construction
- + Compression ring connections
- + low maintenance valves
- + maximum life time and service cycles
- + robust, torsion-resistant construction and implementation
- + high-value components => long service cycles & life time
- + intelligent control => easy operability & operation
- + easy serviceability and maintenance => minimized service costs
- + inclusion of compressor synchronizing circuit is standard

### Delivery Options

- **ATK-HP** Heatless regeneration high-pressure adsorption dryers
- **ATC-HP** High-pressure activated carbon adsorber
- **ATO-HP** Heatless regeneration high-pressure adsorption dryers with activated carbon adsorber

### AT-HP Scope of supply

**ATK-HP (heatless regeneration) and ATO-HP (heatless regeneration, oil-free):**

*including:*

- **ECOCLEAN®** HP-SMA pre-filter
- **ECOCLEAN®** HP-MFO post-filter
- electronic **ECOMATIC** control including compressor synchronizing circuit
- **ATO-HP:** residual oil content up to < 0.003 mg/m<sup>3</sup> at 20°C  
pressure dew point output: -20°C to -70°C (-40°C standard)

**ATC-HP activated carbon adsorber:**

*including:*

- **ECOCLEAN®** HP-MFO post-filter
- residual oil content up to < 0.003 mg/m<sup>3</sup> at 20°C

## ECOTROC® AT-HP 50

50 bar · up to 376 cfm | 640 m³/h

Type	Type	Type	Output*	
ATK-HP50	ATC-HP50	ATO-HP50	cfm	m³/h
ATK10-HP50	ATC10-HP50	ATO10-HP50	24	40
ATK20-HP50	ATC20-HP50	ATO20-HP50	48	81
ATK30-HP50	ATC30-HP50	ATO30-HP50	94	160
ATK40-HP50	ATC40-HP50	ATO40-HP50	125	213
ATK50-HP50	ATC50-HP50	ATO50-HP50	179	305
ATK60-HP50	ATC60-HP50	ATO60-HP50	241	410
ATK70-HP50	ATC70-HP50	ATO70-HP50	376	640

\*in reference to 1 bar (abs.) and 20°C at 50 bar above operating pressure

## ECOTROC® AT-HP 100

100 bar · up to 374 cfm | 635 m³/h

Type	Type	Type	Output*	
ATK-HP100	ATC-HP100	ATO-HP100	cfm	m³/h
ATK15-HP100	ATC15-HP100	ATO15-HP100	47	80
ATK25-HP100	ATC25-HP100	ATO25-HP100	64	108
ATK35-HP100	ATC35-HP100	ATO35-HP100	112	190
ATK45-HP100	ATC45-HP100	ATO45-HP100	185	315
ATK55-HP100	ATC55-HP100	ATO55-HP100	276	470
ATK65-HP100	ATC65-HP100	ATO65-HP100	374	635

\*in reference to 1 bar (abs.) and 20°C at 50 bar above operating pressure

## ECOTROC® AT-HP 250

250 bar · up to 376 cfm | 640 m³/h

Type	Type	Type	Output*	
ATK-HP250	ATC-HP250	ATO-HP250	cfm	m³/h
ATK15-HP250	ATC15-HP250	ATO15-HP250	53	90
ATK25-HP250	ATC25-HP250	ATO25-HP250	68	115
ATK35-HP250	ATC35-HP250	ATO35-HP250	121	205
ATK45-HP250	ATC45-HP250	ATO45-HP250	188	320
ATK55-HP250	ATC55-HP250	ATO55-HP250	282	480
ATK65-HP250	ATC65-HP250	ATO65-HP250	376	640

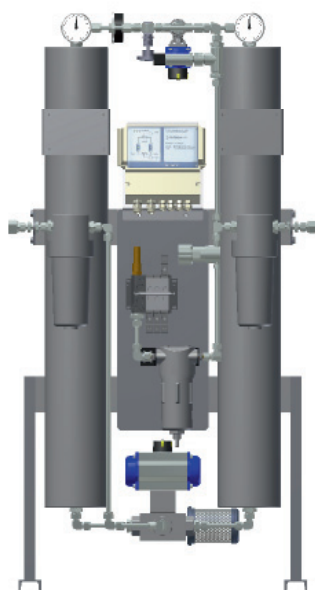
\*in reference to 1 bar (abs.) and 20°C at 50 bar above operating pressure

## ECOTROC® AT-HP 350

350 bar · up to 382 cfm | 650 m³/h

Type	Type	Type	Output*	
ATK-HP350	ATC-HP350	ATO-HP350	cfm	m³/h
ATK15-HP350	ATC15-HP350	ATO15-HP350	74	125
ATK25-HP350	ATC25-HP350	ATO25-HP350	85	145
ATK35-HP350	ATC35-HP350	ATO35-HP350	126	215
ATK45-HP350	ATC45-HP350	ATO45-HP350	194	330
ATK55-HP350	ATC55-HP350	ATO55-HP350	294	500
ATK65-HP350	ATC65-HP350	ATO65-HP350	382	650

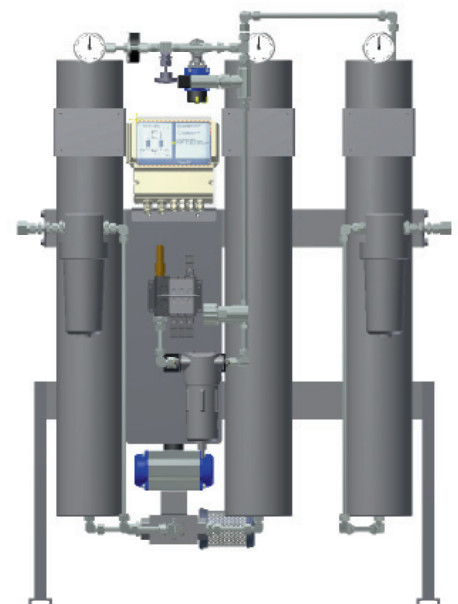
\*in reference to 1 bar (abs.) and 20°C at 50 bar above operating pressure



ECOTROC® ATK-HP



ECOTROC® ATC-HP



ECOTROC® ATO-HP

KSI has designed and continues to develop the **ECOTROC® AT** series of adsorption dryers and activated carbon adsorbers with heatless regeneration. Besides the obvious stipulations of process reliability, long service life of the components and the appealing design, but also with the aim of providing to the industry as KSI customers the capability to perform service in as simple and uncomplicated a manner as possible (see also page 11 of this brochure). As part of this effort it also has to be possible that a manageable number of components can be replaced without reducing the longevity and the function of the dryer.

KSI's competency is not just reflected in the adsorption dryers themselves but goes beyond in this case also, extending in to the area of service and repair. As a result of the close collaboration with the trade channels of the compressed air industry, as well as their service departments, numerous suggestions were taken up and

incorporated over the course of many years to continue increasing the value of our products and to make them more service-friendly. In the end the operator receives a mature and well thought-out product.

All of the service packages are of high value down to the last detail, equipped with premium components and simple to handle. Due to the intelligent construction and its level of quality service times can be reduced enormously as compared to other adsorption dryers. This provides an effective advantage in quality and time. Less dismantling during servicing means at the same time a lower risk potential for the operator. Downtimes are minimized, thereby increasing the installation efficiency.

The service packages are divided into 12 and 24 month packages. These are cost-optimized, thereby offering clear advantages. "Everything included" is our single and unambiguous motto here.



*ATK-AP service package*



*ATK service package*

### Utilized Desiccants

The desiccant fillings or adsorbents are also structured according to adsorber type for all pressure dew points and all application areas, and are supplied as substitute fillings for all **ECOTROC® AT** types. KSI exclusively uses desiccants and adsorbents from well-known German manufacturers, for example BASF. The highest-quality materials are in this case also KSI standard, because poor alternatives often do not yield the desired or necessary result. As usual, KSI nonetheless provides here also a good price performance ratio.

### Service Parts and Desiccants for Adsorption Dryers from other Manufacturers.

KSI also supplies service packages, desiccants and activated carbon for the service of heatless and heat regenerated adsorption dryers from other manufacturers, which match the manufacturers' specifications.

**KSI Filtertechnik GmbH** · Siemensring 54-56 · D-47877 Willich | Tel. +49 · 2154 · 89108-0 · Fax +49 · 2154 · 89108-282 | [www.ksi.eu](http://www.ksi.eu) · [mail@ksi.eu](mailto:mail@ksi.eu)