

MEDICAL

# Adsorption dryers

FOR BREATHING AIR



**G. Samaras S.A.**  
MEDICAL GAS SYSTEMS



## ADEC Heatless adsorption dryers

### for breathing medical air compressor systems (MACS series CE 0653)

The ADEC dryers, are used to remove moisture from compressed air for medical use as well as for industrial use. After air pre-treatment the dryer removes water vapor down to very low residual concentration of water. The ADEC dryers operate completely automatically and are designed for continuous duty.



ADEC 8-F-D

Nominal flowrate Nm³/h @ 35°C						Optional Purification Tower
Dryers MODEL	Connection IN/OUT	@7bar	@10bar	Bed Volume Lt	Weight Kgr	Weight Kgr
Adsorption (230Volt/1/ 50-60Hz/50W)						
ADEC 3	3/8"	19.2	23.8	4	55	81
ADEC 5	3/8"	31.8	39.5	6	65	96
ADEC 8	3/8"	45.6	56.6	9	71	105
ADEC 12	½"	72.0	89.3	14	87	129
ADEC 18	¾"	111.0	137.6	21	111	165
ADEC 25	1"	150.0	186.0	28	128	190
ADEC 30	1"	180.0	223.0	34	161	240
ADEC 40	1½"	234.0	290.0	44	186	277
ADEC 50	1½"	300.0	371.7	56	232	346
ADEC 60	1½"	372.0	461.0	70	283	423
ADEC 75	2	450.0	558.0	84	305	456
ADEC 90	2	540.0	670.0	100	340	508
ADEC 130	2	768.0	952.0	144	403	603
ADEC 160	2½"	972.0	1205.0	182	485	726

\*All models are optionally available with Purification Tower (Type-P) or with Filters set (Type-F) or in Double configuration (Type-D).

#### Correction factor P for inlet air pressure

Inlet Air Pressure (barg)	4	5	6	7	8	9	10	11	12	13	14	15	16
Factor P	0.6	0.74	0.9	1.0	1.08	1.15	1.23	1.3	1.35	1.4	1.45	1.5	1.55

#### Correction factor T for inlet air temperature

Inlet Temperature (°C)	25	30	35	40	45	50
Factor T	1.10	1.05	1.00	0.95	0.85	0.75

#### Product highlights:

- Full electronic control panel
- Top operational reliability
- Minimum operation cost
- Long life time
- Easy maintenance
- User friendly
- Low installation cost
- Easy and quick installation

#### Features:

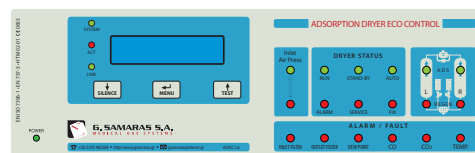
- Economizer function, dew point dependant mode (options of: -20°C, -40°C, -50°C, -70°C or user defined)
- Fix mode of pressure dew points (options of: -20°C, -40°C, -50°C, -70°C or user defined)
- Auto restart mode
- Remote control

- Low pressure drop
- Desiccant of high quality
- Single or double configuration according to EN 7396-1 and HTM 02-01
- Multi-bed option with active carbon or CO and CO<sub>2</sub> reduction bed
- Cyclic operation supported (up to 4 as optional)
- Desiccant bed of 2 layer (water resistant)

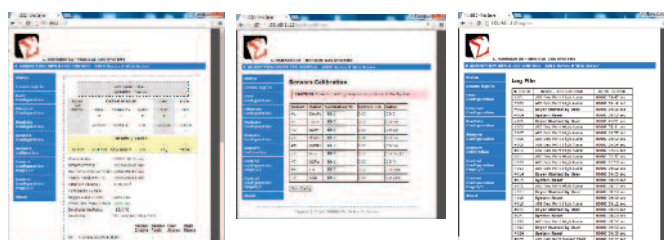
- Long life desiccant service (15 years)
- High quality pressure vessels made in EU
- Vessels galvanized internally and painted externally
- Top quality, extra durable coating
- Ecomode system
- Embedded filter station (optional)

#### Features of the control panel

- Built in LCD screen (2×16 characters) for displaying all measurements (user interface)
- Three push buttons for viewing selection and other monitoring operation (user interface)
- Dew point monitor
- Audible signal for High/Low alarm
- Remote monitoring
- Remote start/stop
- Alarm/event report and log file (up to 200 records)
- Power led indicator and additional three status led indicators
- Built in RJ45 for Ethernet connection (1 port, 10/100 Base-T) for web interface (as standard)
- MODBUS TCP/IP supported for connection to BMS systems (as standard)
- On site firmware update/upgrade capability
- Real time clock capability (option)
- Remote alarm signal (dry contact)
- CO and CO<sub>2</sub> indications (optional)
- Pressure monitor for each bed (optional)



ADEC control panel



Status

Ethernet configuration

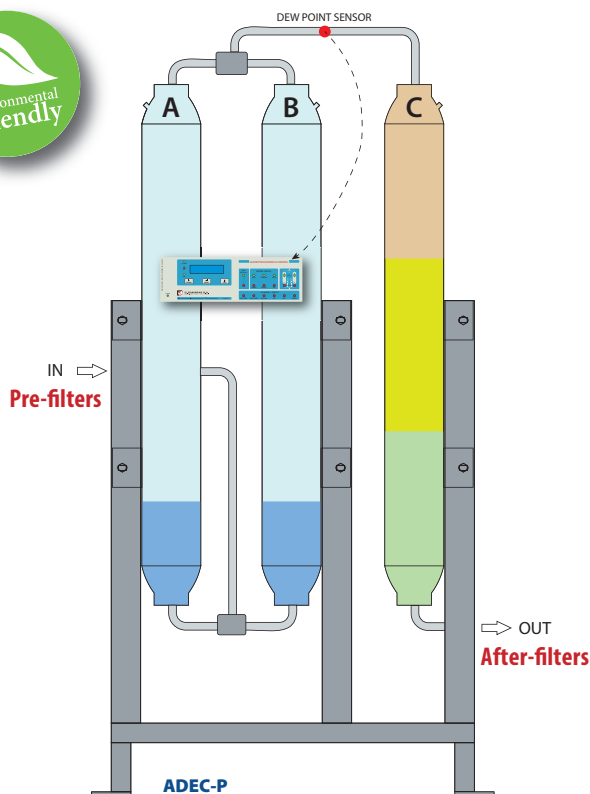
Events logfile

The high quality of the output breathing air is ensured through the following five (5) stages of purification/filtration.

## ADEC dryer with purification tower (Type-P)

C € 0653

**Up to 5 stages  
of air purification/filtration**



- A Left desiccant bed
- B Right desiccant bed
- C Breathing air purification tower

### Desiccant materials

- Water resistant desiccant material
- Desiccant material for -40°C to -70°C
- Oil removal
- CO to CO<sub>2</sub> catalyst
- CO<sub>2</sub> removal

Produced breathing medical air quality specifications according to ISO 8573.1 class 1.2.1 and European Pharmacopoeia 5.4.1.4/5:

Oxygen concentration	≥20,4% and ≤21,4%
Oil concentration	≤0,1mg/m <sup>3</sup> @ 1 bar abs
Carbon monoxide concentration	≤5ml/m <sup>3</sup>
Carbon dioxide concentration	≤500ml/m <sup>3</sup>
Water vapor	≤67ml/m <sup>3</sup>
Sulfur dioxide concentration	≤1ml/m <sup>3</sup>
NO+NO <sub>2</sub> concentration	≤2ml/m <sup>3</sup>

*All values refer to normal conditions of pressure and temperature.*



Double configuration with filters ADEC 8-F-D



## FILTRATION METHOD

*All models are optionally available with Filters set (Type-F).*

### Pre-filters (upstream the dryers):

- 1. WR grade:**  
Min / max temp.: +1/100°C  
Initial ΔP: 30 mbar
- 2. RM grade:**  
Filtration: 10 μ  
Residual oil: 15 ppm  
Filtration efficiency: 90%  
Min / max temp.: +1/80°C  
Initial ΔP<50 mbar  
Initial saturated ΔP<120 mbar

### 3. RB grade:

- Filtration: 1 μ
- Residual oil: 0.1 ppm / 0.1 mg/m<sup>3</sup>
- Filtration efficiency: 99.95%
- Min / max temp.: +1/80°C
- Initial ΔP <60 mbar
- Initial saturated ΔP<140 mbar

### 4. RA grade:

- Filtration: 0.01 μ
- Residual oil: 0.01 ppm / 0.01 mg/m<sup>3</sup>
- Filtration efficiency: 99.9999%
- Min / max temp.: +1/80°C
- Initial ΔP <80 mbar
- Initial saturated ΔP <200 mbar

### After-filters (downstream the dryers):

#### 5. RF grade:

- Filtration: 1 μ
- Filtration efficiency: 99,95%
- Min / max temp.: +1/100°C
- Initial ΔP <60 mbar

#### 6. CA grade:

- Residual oil: 0.003 ppm/0.003 mg/m<sup>3</sup>
- Min / max temp.: +1/50°C
- Initial ΔP<250 mbar
- Substitution: coal saturated

#### 7. Sterile filter:

- Bacteriological stainless steel filters of sterilization.

*The performance of filter elements series BST is tested in accordance with ISO 12500.*

### Upgrade kit for existing dryers:

1. Electronic control panel with economizer
2. Embedded breathing air purification tower





**G. SAMARAS S.A.** is an international multi-regional company located in Thessaloniki, Greece. The company is active in the medical gas field since 1968. Having a track record of continuous growth and a gained leadership in the Greek market, in which it holds more than 85% of the share. The company has a strong reputation due to its *professionalism, reliability-solvency and responsibility*. In addition, the *high qual-*

*ity* of the products and the services that is offered, the know-how of medical gas supply systems, the durability of its products and its flexibility, has lead the company to a strong market position. Further, the company holds a very wide range of products and service portfolio which includes everything on medical gas supply systems. From the very start, G. Samaras S.A. has recognized the importance of international growth. As a result, the company has built up a lengthy export's activity reference list worldwide. The factory, staff offices and the warehouse occupies a building of 4.000m<sup>2</sup> in the Industrial Area of Thermi, Thessaloniki (Northern Greece). Company's skilled personnel consist of electrical and mechanical engineers, graduate and post-graduate economists, licensed welders and electricians. **G. SAMARAS S.A.** personnel is the driving force of the company. All the staff, beside the exceptional professional skills, is characterized by the following attitudes:

- ▶ a bias to act (pro-active behaviour)
- ▶ staying close to the customer
- ▶ productivity through people
- ▶ result orientation
- ▶ autonomy and entrepreneurship

**G. SAMARAS S.A.** is a quality oriented company. In alignment with this aspect the company holds the ISO 9001 and ISO 13485 certifications. All of its products are produced and tested according to European Standards and regulations and they are labeled with CEmark. In addition, complying with the requirements some products are labeled in categories IIa and IIb where it is obligatory or necessary.



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P.O. Box: 60178, 570 01 Thermi, Thessaloniki • Tel: (+30) 2310 463 388 • fax: (+30)2310 464 570  
E-mail: gsamaras@otenet.gr • www.gsamaras.gr  
ATHENS BRANCH: Artemidos 13, 144 52 Metamorfosi • tel: (+30) 6947932035



[www.gsamaras.gr](http://www.gsamaras.gr)

## SERVICES

- Designing - Calculations
- Installations of Medical Gas Systems
- Testing, Commissioning & Certification of Medical Gas Systems
- Maintenance of Medical Gas Systems – After Sales Support
- Training
- GSM/GPRS Remote Monitoring Management

## PRODUCTS

- **Medical Gas Network**
  - Racors / Shut-off valves / Nickel brass valves / Non-return valves for medical use / Electromagnetic motorized valves / Safety valves
  - Special Tools for Pipe Network Instalations
  - Antistatic Tubes - Plastic flexible tubes - Fittings and nipples
- **Medical Gas Central Stations**
  - Supply Systems with Cylinders
  - Oxygen Vessels (LOX)
  - Medical Vacuum Systems (MVCS series)
  - Medical Air Compressor Systems (MACS series)
  - Medical Gases Central Stations Container Cabinets
  - Oxygen - Nitrogen Generators
- **Medical Gas Terminal Units / Outlets**
- **Control and Reducer Panels**
  - Reducers
  - Second Stage Pressure Regulator Units (Y/S GS N S/D)
  - Area valve service unit (klb GS N)
- **Alarm Systems for Medical Gas Panels (IP based)**
  - Sensors
  - MGSAP monitoring and alarm systems
  - Local Alarm Panel - Single Station Alarm Panel / MGSAP L5 / MGSAP L6
  - Central Alarm Panel for Medical Gases MGSAP C1
  - Remote Management System (Medimote) MGSAP G1
- **Bed Head Units**
  - Wall mounted BHU
  - ATHOS series - Ceiling suspended BHU
  - Aluminum structural framing - BR profile
  - Power column / Bed-side locator
  - Aegean series Bridge BHU
  - Single BHU - Gas outlet profile
- **Ceiling Pendant Arms**
  - Ceiling Pendant for OPT
  - Typical ICU lay-out with ceiling pendants Type "Makedonia"
  - Ceiling Pendants Arms accessories for Q38tubes support system
- **OPT Equipment - Control Panel**
  - Internal monitor OPT control panel
  - X ray viewer
  - Electrical power distribution systems
  - Hospital timekeeping systems
  - Scrub up (1/2 positions)
- **OPT Lighting Systems & Examination Lamps**
- **Hospital Beds**
- **Nurse Call Systems**
- **Secondary Medical Equipment**