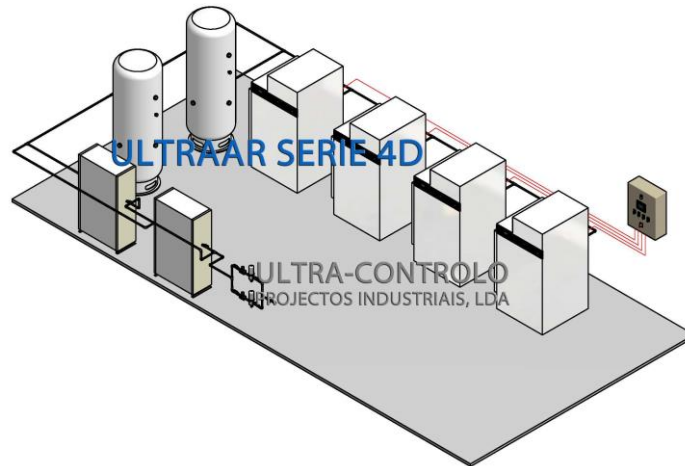


**Medical Air System Totally Oil Free ULTRAAR® Series 4**  
**EN ISO 7396-1 / HTM 0201**  
**220V - 400V / 50Hz – 60Hz**  
**QUADRUPLEX**  
**SPECIFICATION**

**ULTRAAR®**

The ULTRAAR® Combined Medical Air System Totally Oil Free shall conform to ISO 7396-1 and ACSS 03/2006 Health Technical Memorandum. Medical quality to the European Pharmacopoeia monograph shall be delivered at a pressure of 700 kPa (7 bar) gauge for supply of the hospital surgical and medical air systems. The entire system shall be 'duplexed' such that any single functional component failure will not affect the integrity of the medical compressed air supply. The secondary supply will be made up of two compressors. Each compressor will be capable of supplying 50% of the specified volumetric flow.

**Typical Duplex Layout**



**Compressors**

Compressors shall be oilless double stage piston compressors suitable for both continuous and frequent start/stop operation at a nominal outlet pressure of 1000 kPa gauge (10 bar). Compressors shall be supplied with a block and fin style aftercooler with a dedicated quiet running fan to maximize cooling and efficiency. A pre-filter of 5 microns shall be integrated in the inlet port of the compressor, capable to carry the dust before entering into the compressor. Compressor shall have an air suction connection enable to collect fresh air from outside of compressor room. No idle running is acceptable in order to save energy. High efficiency motors rated TEFC, IP55 class F electric shall be used and incorporate maintenance-free greased for life bearings. Each piston compressor shall be supplied with an intelligent user interface to digitally display service and warning indications, working pressure, operating temperatures, number of motor starts, on-load running hours and total running hours. Compressors are to be individually hard-piped to the receiver manifold as standard.

**Air Treatment Unit**

ULTRAAR must be equipped with one of the following units of air treatment:  
 (Choose the unit which better fits in your case)

**FD**

Comprehensive system of drying compressed air ULTRASEC as refrigeration dryer, capacitive trap without air loss for reducing operating costs with dew point indicator (LCD), dry contact alarm for economical and safe operation construction metal cabinet for optimum protection against mechanical



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damage and dust. The air/air heat exchanger with low pressure drop through the new technology in Aluminum, no corrosion and efficient heat transfer achieved with the heat exchanger design cross flow air/air valve and hot gas bypass and stainless steel designed to prevent freezing and to provide a constant dew point.

An effective 1 micron filter to separate drops of oil and solid particles (> 1 micron), effective sub-micro filter UFSM with a high retention capacity for 99.9999% threshold UFM micron filter upstream, high 0.01 micron filtration. Residual oil content of up to 0.01 mg/m<sup>3</sup> at 7 bar and 20°C and validated according to ISO 8573, activated carbon filter UCA adsorption of hydrocarbon vapors and oil with an initial residual aerosol oil > 0003 mg/m<sup>3</sup> input.

## UM

Duplicated air processing chains, ULTRAMED, that fully meets the parameters of the European Pharmacopoeia monograph. Each processing air unit is equipped with:

A pre-filter stage for the removal of oil and water aerosols as well as solid particles down to 0.01 μ a high-performance activated charcoal filter for adsorption of oil vapors and odors with a residual oil content of 0.01 mg/m<sup>3</sup>

A heatless desiccant dryer, that reduces the available water vapor in the air down to a pressure dew point of – 40°C and simultaneously maintains levels of carbon dioxide (CO<sub>2</sub>), nitrogen monoxide (NO), nitrogen dioxide (NO<sub>2</sub>) and sulphure dioxide (SO<sub>2</sub>) below the legally allowed limits

A hopcalite filter at the outlet of the dryer that converts CO by oxidation into CO<sub>2</sub> and abort's CO<sub>2</sub> chemically. A dust filter in the last stage.

## UT

Air treatment units type ULTRATECH, in double, with a certificate of conformity of the air quality product fully meets the parameters of the monograph of the European Pharmacopoeia. Each processing air system is equipped with:

A high efficient oil mist micro filter FM of 1 micron to separate drops of oil and solid particles (> 1 micron), the residual oil aerosol is 0.01 mg/m<sup>3</sup> á 21°C. A sub micro filter SMF 0.01 microns to remove particles (> 0.01 microns) and oil aerosols and water, residual oil aerosol is 0.01 mg/m<sup>3</sup> at 21°C.

Adsorption dryer with columns\* of molecular shieve works on the principle of reverse pressure with cold adsorption columns connected in parallel processed, while the air passes in one hand and dried and degassed, the other side is being regenerated. The dew point provided by the dryer is -46°C /-68°C at the maximum allowable pressure of 16 bar. Each dryer is equipped with an electronic control of relative humidity ULTRAGEST, to save energy.

The ULTRATECH units has a column of activated carbon to remove odors, oil vapors and hydrocarbons. The residual oil aerosol content is less than 0.003 mg/m<sup>3</sup> at 21°C. A catalyst consisting of a column\* transforms the carbon monoxide (CO) to carbon dioxide (CO<sub>2</sub>). The ULTRATECH units can also eliminate much of the CO<sub>2</sub> molecules. The filters are equipped with filter media, without binders, with high contention particles with a very low pressure loss which ensures considerable energy savings.

The filters are equipped with zero loss drains, without loss of air and have test buttons to control the proper operation of the purge units. The monitoring and control system ULTRAGEST makes a drastic reduction in energy consumption using a digital controller linked to a very steady dew point sensor. ULTRATECH is designed with a range of products capable of providing a long-term equipment, 100% operational, without the need for early and frequent maintenance.

The filter and dryer module shall incorporate high efficiency water separators, oil filters, and heatless regenerative desiccant dryer, dust/activated carbon filters, hopcolite filters and sterile filters with autoclavable element. Contaminants in the delivered air downstream of the sterile filters shall be maintained at levels below those shown in the following table:



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Contaminant	Threshold
H2O	67 ppm v/v
Dry particulates	Free from visible particulates in a 75 litre sample
Oil (droplet or mist)	Exempt
CO	5 ppm v/v
CO2	500 ppm v/v
SO2	1 ppm v/v
NO	2 ppm v/v
NO2	2 ppm v/v

The dryer control system shall incorporate a dew point controller for energy savings that shuts off purge air when achieved the dew point required.

## FD-UM

Comprehensive system of drying compressed air ULTRASEC as refrigeration dryer, capacitive trap without air loss for reducing operating costs with dew point indicator (LCD), dry contact alarm for economical and safe operation construction metal cabinet for optimum protection against mechanical damage and dust. The air/air heat exchanger with low pressure drop through the new technology in Aluminum, no corrosion and efficient heat transfer achieved with the heat exchanger design cross flow air/air valve and hot gas bypass and stainless steel designed to prevent freezing and to provide a constant dew point.

Air processing chains, ULTRAMED, that fully meets the parameters of the European Pharmacopoeia monograph. Each processing air unit is equipped with:

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A heatless desiccant dryer, that reduces the available water vapor in the air down to a pressure dew point of - 40°C and simultaneously maintains levels of carbon dioxide (CO<sub>2</sub>), nitrogen monoxide (NO), nitrogen dioxide (NO<sub>2</sub>) and sulphure dioxide (SO<sub>2</sub>) below the legally allowed limits

A hopcalite filter at the outlet of the dryer that converts CO by oxidation into CO<sub>2</sub> and abort's CO<sub>2</sub> chemically. A dust filter in the last stage.

## FD-UT

Comprehensive system of drying compressed air ULTRASEC as refrigeration dryer, capacitive trap without air loss for reducing operating costs with dew point indicator (LCD), dry contact alarm for economical and safe operation construction metal cabinet for optimum protection against mechanical damage and dust. The air/air heat exchanger with low pressure drop through the new technology in Aluminum, no corrosion and efficient heat transfer achieved with the heat exchanger design cross flow air/air valve and hot gas bypass and stainless steel designed to prevent freezing and to provide a constant dew point.

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Adsorption dryer with columns\* of molecular sieve works on the principle of reverse pressure with cold adsorption columns connected in parallel processes, while the air passes in one hand and dried and degassed, the other side is being regenerated. The dew point provided by the dryer is -46°C /-68°C at the maximum allowable pressure of 16 bar. Each dryer is equipped with an electronic control of relative humidity ULTRAGEST, to save energy.

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The filter and dryer module shall incorporate high efficiency water separators, oil filters, and heatless regenerative desiccant dryer, dust/activated carbon filters, hopcolite filters and sterile filters with autoclavable element. Contaminants in the delivered air downstream of the sterile filters shall be maintained at levels below those shown in the following table:

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NO	2 ppm v/v
NO2	2 ppm v/v

The dryer control system shall incorporate an dew point controller for energy savings that shuts off purge air when achieved the dew point required.

## Control System

The central control panel shall operate at extra low voltage and include BMS connections for plant fault, plant emergency, reserve fault and pressure fault. A mechanical back-up facility shall ensure continued operation in the event of malfunction. The control system shall normally employ automatic rotation of lead compressor to maximize compressor life and ensure even wear.

## Receiver Assembly

Air receivers shall comply with EN 286-1, supplied with relevant test certificates. Each air receiver shall be hot dip galvanised inside and out and fitted with a electronic time controlled drain valve. Float type drain valves are not acceptable. The receiver assembly shall be fitted with a pressure safety valve and certified pressure gauge. The receiver shall have additional connections available for emergency back-up systems.

## Dew Point Monitoring

The dryer shall incorporate a ceramic dew point hygrometer with an accuracy of  $\pm 1^\circ\text{C}$  in the range  $-20$  to  $-80^\circ\text{C}$  atmospheric dew point and 4-20mA analogue output for the controller.

Aluminium oxide or palladium wire sensors are not acceptable. An alarm condition shall trigger on the dryer control panel if the dew point exceeds a  $-46^\circ\text{C}$  atmospheric set point. The plant control unit shall incorporate a multifunction LCD displaying, with alarm signalization of a fault condition in the dryer. Volt free contacts shall be included to enable the dew point alarm signal to be connected to a central medical gas alarm system and/or building management system (BMS). To enable periodic calibration of the dew point sensor element, the hygrometer shall be remotely connected downstream of the dryer via a micro-bore tube. It is not acceptable to install the sensor directly into the medical air supply pipeline.

## Reduction Set with Sterilization Filter

The plant should be equipped with a set of pressure reduction, with manometer, and includes air sterilization filter with filter element sterilizable in steam autoclaving. The set should be equipped with sectioning and depressurization valves.

## Basic configuration of the Medical Air Plant, ULTRAAR series 4

- 4 compressor dry piston, 100% oil-free, two-stage compression
- 2 Unit of treatment and air drying
- 1 Controller digital dew
- 2 vertical tank, galvanized, with its accessories of security
- 1 Reduction set with filter sterilization

1 Electrical control panel and control including signaling for remote management

**System Specifications**  
**MEDICAL COMPRESSED AIR SYSTEM - OIL FREE - ULTRAAR**  
**Construction according to ISO 7396-1 for models with 3 or more compressors**  
**Simplex and duplex systems are prepared to ISO 7396-1**  
**380V - 400V / 50Hz – 60Hz**

ULTRAAR Model	HP	KW	System Flow			
			m3/h	l/m	l/s	scfm
<b>QUADRUPLEX</b>						
4.24/800D	5,5	4	48	800	13,3	28,2
4.48/1000D	10	7,5	96	1600	26,6	56,4
4.50/1000D	15	11	100	1667	27,8	58,8
4.70/1500D	15	11	128	2134	35,6	75,2
4.80/1500D	20	15	80	2667	44,4	94
4.100/2000D	25	18,5	200	3334	55,6	117,6
4.130/2000D	30	22	260	4334	72,2	152,8
4.160/2000D	40	30	320	5334	88,8	188

**Medical Air System Totally Oil Free ULTRAAR® Series 4**  
**EN ISO 7396-1 / HTM 0201**  
**400V / 50Hz**  
**QUADRUPLEX**

Model	System capacity (l/min)	Electric motor power(kW)	ULTRAAR				
			400V 50Hz				
			Article Number				
			<i>Accord. to Air Treatment type</i>				
			FD <i>ULTRASEC</i>	UM <i>ULTRAMED</i>	UT <i>ULTRATECH</i>	FD-UM <i>Combined ULTRASEC + ULTRAMED</i>	FD-UT <i>Combined ULTRASEC + ULTRATECH</i>
4.24/800D	800	4	301.01.20300	301.01.10300	301.01.00300	301.01.40300	301.01.30300
4.48/1000D	1600	7,5	301.01.20301	301.01.10301	301.01.00301	301.01.40301	301.01.30301
4.50/1000D	1667	11	301.01.20302	301.01.10302	301.01.00302	301.01.40302	301.01.30302
4.70/1500D	2134	11	301.01.20303	301.01.10303	301.01.00303	301.01.40303	301.01.30303
4.80/1500D	2667	15	301.01.20304	301.01.10304	301.01.00304	301.01.40304	301.01.30304
4.100/2000D	3334	18,5	301.01.20305	301.01.10305	301.01.00305	301.01.40305	301.01.30305
4.130/2000D	4334	22	301.01.20306	301.01.10306	301.01.00306	301.01.40306	301.01.30306
4.160/2000D	5334	30	301.01.20307	301.01.10307	301.01.00307	301.01.40307	301.01.30307

D- with 2 tanks    T- with 3 tanks  
 Smaller or bigger versions under request



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**Medical Air System Totally Oil Free ULTRAAR® Series 4**  
**EN ISO 7396-1 / HTM 0201**  
**380V / 60Hz**  
**QUADRUPLEX**

Model	System capacity (l/min)	Electric motor power(kW)	ULTRAAR				
			380V 60Hz				
			Article Number				
			<i>Accord. to Air Treatment type</i>				
			FD <i>ULTRASEC</i>	UM <i>ULTRAMED</i>	UT <i>ULTRATECH</i>	FD-UM <i>Combined ULTRASEC + ULTRAMED</i>	FD-UT <i>Combined ULTRASEC + ULTRATECH</i>
4.24/800D	800	4	301.01.20900	301.01.10900	301.01.00900	301.01.40900	301.01.30900
4.48/1000D	1600	7,5	301.01.20901	301.01.10901	301.01.00901	301.01.40901	301.01.30901
4.50/1000D	1667	11	301.01.20902	301.01.10902	301.01.00902	301.01.40902	301.01.30902
4.70/1500D	2134	11	301.01.20903	301.01.10903	301.01.00903	301.01.40903	301.01.30903
4.80/1500D	2667	15	301.01.20904	301.01.10904	301.01.00904	301.01.40904	301.01.30904
4.100/2000D	3334	18,5	301.01.20905	301.01.10905	301.01.00905	301.01.40905	301.01.30905
4.130/2000D	4334	22	301.01.20906	301.01.10906	301.01.00906	301.01.40906	301.01.30906
4.160/2000D	5334	30	301.01.20907	301.01.10907	301.01.00907	301.01.40907	301.01.30907

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