

Medical Compressed Air System - MEDIAR® Série 4

EN ISO 7396-1

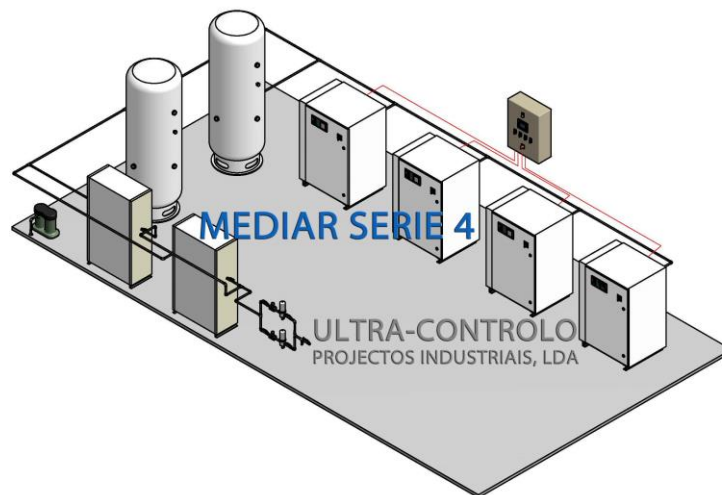
208V - 440V / 50Hz – 60Hz , 10 Bar

QUADRUPLEX SPECIFICATIONS

MEDIAR

The MEDIAR Combined Medical Air System 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 (via separate regulators) 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 Quadruplex Layout



Compressors

Compressors shall be oil injected rotary screw compressors suitable for both continuous and frequent start/stop operation at a nominal outlet pressure of 950 kPa gauge (9.5 bar).

Compressors shall be supplied with a block and fin style aftercooler with a dedicated quiet running fan to maximize cooling and efficiency. A multi-stage oil separator capable of achieving 2ppm oil carry over shall be fitted to minimize contamination and maintenance. High efficiency motors rated TEFC, IP55 class F electric shall be used and incorporate maintenance-free greased for life bearings. Motors with low efficiency ratings are not acceptable. Each screw 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

MEDIAR 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 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



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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/m³ 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/m³ 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/m³

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 (CO₂), nitrogen monoxide (NO), nitrogen dioxide (NO₂) and sulphure dioxide (SO₂) below the legally allowed limits

A hopcalite filter at the outlet of the dryer that converts CO by oxidation into CO₂ and abort's CO₂ 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/m³ 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/m³ 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/m³ at 21°C. A catalyst consisting of a column* transforms the carbon monoxide (CO) to carbon dioxide (CO₂). The ULTRATECH units can also eliminate much of the CO₂ 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, hopcalite 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:

Contaminant	Threshold
H ₂ O	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
CO ₂	500 ppm v/v
SO ₂	1 ppm v/v
NO	2 ppm v/v
NO ₂	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.



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FD-UM

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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 (CO₂), nitrogen monoxide (NO), nitrogen dioxide (NO₂) and sulphure dioxide (SO₂) below the legally allowed limits

A hopcalite filter at the outlet of the dryer that converts CO by oxidation into CO₂ and abort's CO₂ chemically. A dust filter in the last stage.

FD-UT

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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 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°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°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

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.

Condensate separator

The plant will have a network of condensate collecting that will be processed by the automatic oil/water separator for environmental protection and accomplish the control regulation about industrial waste and emission of domestic sewage.

Basic configuration of the Medical Air Plant, MEDIAR series 4

- 4 Rotary screw compressor oil lubricated, including cyclonic separator
- 2 Air dryer and treatment unit with dew point digital controller
- 2 Vertical tank, galvanized, with security devices
- 1 Reduction set with sterilization filter
- 1 Electrical control panel and control including signaling for remote management
- 1 Automatic oil/water separator for condensate treatment

**System Specifications
MEDICAL COMPRESSED AIR SYSTEM
MEDIAR**

**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 / 10bar**

MEDIAR Standard Models	HP	KW	System Flow			
			m3/h	l/m	l/s	scfm
QUADRUPLEX						
4.15/500D	3	2,2	28	466,66	7,7778	16,464
4.20/500D	4	3	43,2	720	12	25,402
4.30/500D	5,5	4	63,6	1060	17,6666	37,396
4.40/500D	7,5	5,5	81,6	1360	22,666	47,98
4.60/500D	10	7,5	127,2	2120	35,334	74,794
4.100/800D	15	11	192,2	3203,4	53,388	113,014
4.130/1000D	20	15	271,2	4520	75,334	159,466
4.170/1500D	25	18,5	328,8	5480	91,332	193,334
4.200/2000D	30	22	385,2	6420	107	226,5
4.300/2000T	40	30	603,4	10056,6	167,61	354,8
4.370/2000T	50	37	742,8	12380	206,34	436,76
4.420/2000T	60	45	842,4	14040	234	495,34
4.450/2000T	60	45	890,4	14840	247,34	523,56
4.600/2000T	74	55	1144,8	19080	318	673,14
4.750/2000T	100	75	1497,6	24960	416	880,58

Medical Compressed Air System - MEDIAR® Série 4
EN ISO 7396-1
400V / 50Hz, 10 Bar
QUADRUPLEX

Model	System capacity (l/min)	Electric motor power(kW)	MEDIAR				
			10 BAR Outlet				
			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>			
4.15/500D	466,66	2,2	303.01.20300	303.01.10300	303.01.00300	303.01.40300	303.01.30300
4.20/500D	720	3	303.01.20301	303.01.10301	303.01.00301	303.01.40301	303.01.30301
4.30/500D	1060	4	303.01.20302	303.01.10302	303.01.00302	303.01.40302	303.01.30302
4.40/500D	1360	5,5	303.01.20303	303.01.10303	303.01.00303	303.01.40303	303.01.30303
4.60/500D	2120	7,5	303.01.20304	303.01.10304	303.01.00304	303.01.40304	303.01.30304
4.100/800D	3203,4	11	303.01.20305	303.01.10305	303.01.00305	303.01.40305	303.01.30305
4.130/1000D	4520	15	303.01.20306	303.01.10306	303.01.00306	303.01.40306	303.01.30306
4.170/1500D	5480	18,5	303.01.20307	303.01.10307	303.01.00307	303.01.40307	303.01.30307
4.200/2000D	6420	22	303.01.20308	303.01.10308	303.01.00308	303.01.40308	303.01.30308
4.300/2000T	10057	30	303.01.20309	303.01.10309	303.01.00309	303.01.40309	303.01.30309
4.370/2000T	12380	37	303.01.20310	303.01.10310	303.01.00310	303.01.40310	303.01.30310
4.420/2000T	14040	45	303.01.20311	303.01.10311	303.01.00311	303.01.40311	303.01.30311
4.450/2000T	14840	45	303.01.20312	303.01.10312	303.01.00312	303.01.40312	303.01.30312
4.600/2000T	19080	55	303.01.20313	303.01.10313	303.01.00313	303.01.40313	303.01.30313
4.750/2000T	24960	75	303.01.20314	303.01.10314	303.01.00314	303.01.40314	303.01.30314

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

Medical Compressed Air System - MEDIAR® Série 4
EN ISO 7396-1
380V / 60Hz, 10 Bar
QUADRUPLEX

Model	System capacity (l/min)	Electric motor power(kW)	MEDIAR				
			10 BAR Outlet				
			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>			
4.15/500D	466,66	2,2	303.01.20900	303.01.10900	303.01.00900	303.01.40900	303.01.30900
4.20/500D	720	3	303.01.20901	303.01.10901	303.01.00901	303.01.40901	303.01.30901
4.30/500D	1060	4	303.01.20902	303.01.10902	303.01.00902	303.01.40902	303.01.30902
4.40/500D	1360	5,5	303.01.20903	303.01.10903	303.01.00903	303.01.40903	303.01.30903
4.60/500D	2120	7,5	303.01.20904	303.01.10904	303.01.00904	303.01.40904	303.01.30904
4.100/800D	3203,4	11	303.01.20905	303.01.10905	303.01.00905	303.01.40905	303.01.30905
4.130/1000D	4520	15	303.01.20906	303.01.10906	303.01.00906	303.01.40906	303.01.30906
4.170/1500D	5480	18,5	303.01.20907	303.01.10907	303.01.00907	303.01.40907	303.01.30907
4.200/2000D	6420	22	303.01.20908	303.01.10908	303.01.00908	303.01.40908	303.01.30908
4.300/2000T	10057	30	303.01.20909	303.01.10909	303.01.00909	303.01.40909	303.01.30909
4.370/2000T	12380	37	303.01.20910	303.01.10910	303.01.00910	303.01.40910	303.01.30910
4.420/2000T	14040	45	303.01.20911	303.01.10911	303.01.00911	303.01.40911	303.01.30911
4.450/2000T	14840	45	303.01.20912	303.01.10912	303.01.00912	303.01.40912	303.01.30912
4.600/2000T	19080	55	303.01.20913	303.01.10913	303.01.00913	303.01.40913	303.01.30913
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D- with 2 tanks T- with 3 tanks
 Smaller or bigger versions under request