



3.2 MEDICAL GAS CENTRAL STATIONS

3.2.1 Supply Systems with Cylinders (MGCYLS series)

The automatic change over decompression unit is designed to supply medical gas (oxygen-nitrous oxide-air-nitrogen-carbon dioxide) of any type of medical gas network, where continuity of supply is essential and where the pipeline is supplied from manifold high pressure gas cylinders.

This product complies with all current safety regulations and laws and is designed and tested to guarantee safe operation.

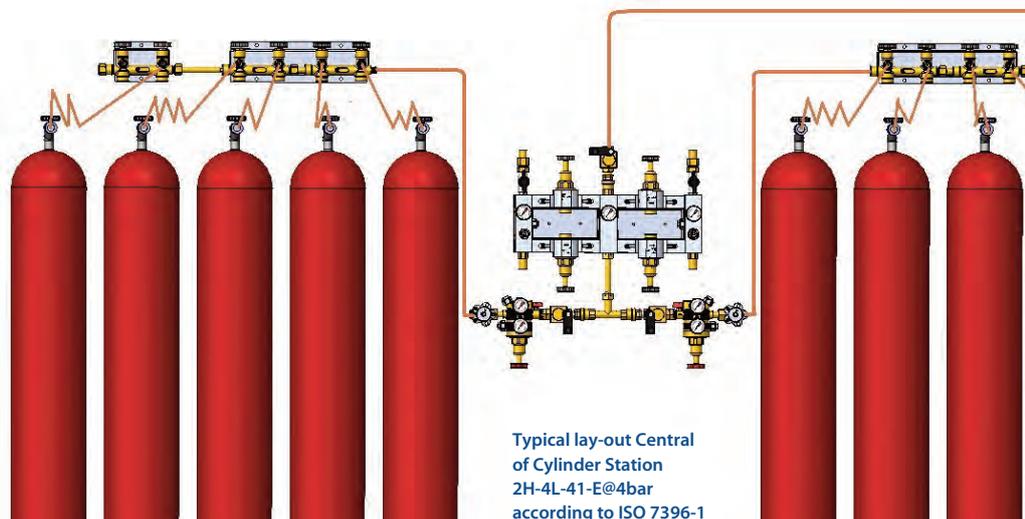
Automatic central manifold system for medical gases (O₂, N₂O, Air, N₂, CO₂) with pressure reducers, high pressure shut-off valves, automatic change over unit, analogue sensors, cylinder ramps, flexible connections, pigtails, cylinder holders and emergency inlet point is according to EN ISO 7396-1, HTM 02-01 and NFPA 99 standards.

I. Main decompression unit

Automatic Change over Decompression Unit for Oxygen, Nitrous Oxide, Air, Nitrogen, Carbon Dioxide

The automatic change-over decompression units are composed of:

- A wall mounted box made of 1.5mm painted steel with door key-operated lock and window for reading pressures gauges.
- Two pressure regulators (OT 58) connected in parallel and linked respectively to the right and to the left manifold of cylinders. Each regulator is fitted with brass safety valve set at 13bar, with one pressure gauge diameter Ø63mm for high pressure (315bar full range) and with outlet pressure adjustment screw.
- Two inlet filters with pressed brass body and bronze filter mesh.
- Two inlet high pressure valves.
- Two outlet low pressure valves.
- One automatic change over device (inverter) which is connected to the outlet of the regulators.
- One pressure gauge to indicate the network pressure.
- Two pressure transmitters for monitoring the pressure in the cylinders.



Typical lay-out Central of Cylinder Station 2H-4L-41-E@4bar according to ISO 7396-1

PRODUCT PORTFOLIO

Medical Gas Central Stations

Main unit Type	Inputs @200bar or @8bar	Outputs @4bar or @8bar	No of Reducers		Outlet Pressure bar	Operation	Alarm embedded
			High (200bar) 200m³h@8bar	Low (8bar) 200m³h@8bar			
1H-M-21	2	1	1	0	8	Manual	0
1H-1L-M-21	2	1	1	1	4	Manual	0
2H-P-21	2	1	2	0	8	Pneumatic	0
2H-E-21	2	1	2	0	8	Electric*	1
2H-1L-P-21	2	1	2	1	4/8	Pneumatic	0
2H-2L-P-21	2	1	2	2	4/8	Pneumatic	0
2H-2L-P-31	3	1	2	2	4/8	Pneumatic	0
3H-2L-P-31	3	1	3	2	4/8	Pneumatic	0
3H-2L-P-41	4	1	3	2	4/8	Pneumatic	0
2H-2L-P-41	4	1	2	2	4/8	Pneumatic	0
2H-2L-E-21	2	1	2	2	4/8	Electric*	1
3H-2L-E-31	3	1	3	2	4/8	Electric*	1
2H-2L-E-31	3	1	2	2	4/8	Electric*	1
3H-2L-E-41	4	1	3	2	4/8	Electric*	1
3H-2L-P-51	5	1	3	2	4/8	Pneumatic	0
2H-4L-P-31	3	1	2	4	4/8	Pneumatic	0
2H-4L-P-22	2	2	2	4	4/8	Pneumatic	0
2H-4L-P-32	3	2	2	4	4/8	Pneumatic	0
2H-4L-E-31	3	1	2	4	4/8	Electric*	1
2H-4L-E-41	4	1	2	4	4/8	Electric*	1
3H-4L-E-41	4	1	3	4	4/8	Electric*	1
1H-1L-E-11	1	1	1	1	4/8	Electric*	1
4H-2L-E-51	5	1	4	2	4/8	Electric*	1
4H-2L-P-51	5	1	4	2	4/8	Pneumatic	0
2H-P-31	3	1	2	0	4/9	Pneumatic	0
3H-P-31	3	1	3	0	4/10	Pneumatic	0

NAME EXPLANATION

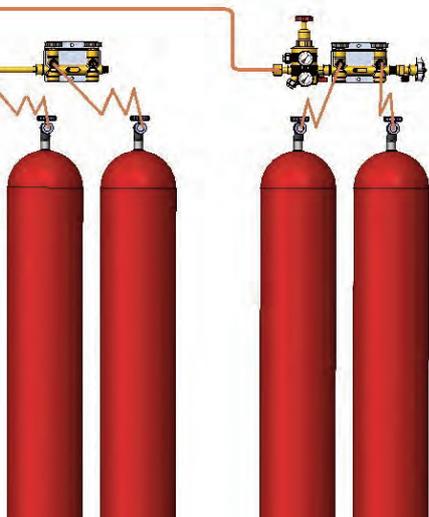
Expression: **hH - lL - t - i-o**

Variables: **h** = Number of high pressure regulators, **l** = Number of middle/low pressure regulators

t = Type (**M**=Manual, **E**=Electric, **P**=Pneumatic), **i** = Number of inputs, **o** = Number of outputs

*Microprocessor based (including alarm)

- Flow rate with nitrogen refers to normal pressure and temperature conditions. For the other gases multiply the values for nitrogen by the following coefficients:
AIR = 0.98, OXYGEN = 0.93, NITROUS OXIDE = 0.79, CARBON DIOXIDE = 0.79
- The main units can be supplied either from hp cylinders through cylinder ramps - pigtails or by special hp cylinder packs (photo) of 9/12/16 pcs or by small, portable low pressure liquid vessels.



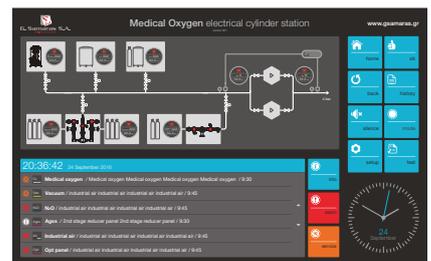
Typical layout of Compact Central Cylinder Station 3H-2L-E-41@4bar with 2x1+1x1 cylinders according to ISO 7396-1



HTM02-01 EN ISO 7396-1, NFPA 99 BAM



O₂ Cylinder Station (electrical change-over) 2H-1L-P-21

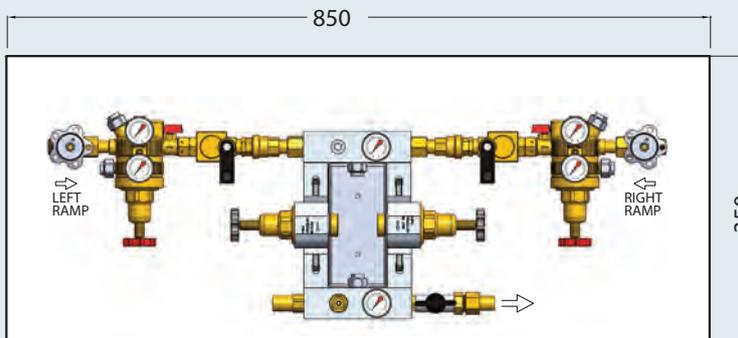


Models available with capacity from 50m³/h to 180m³/h

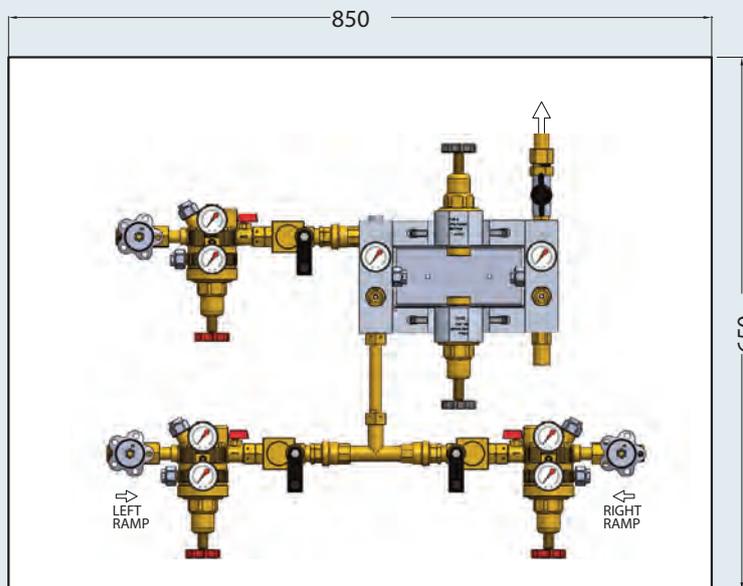
MGCYLS 2x_m+1x_n

m: R/L quantity of cylinders

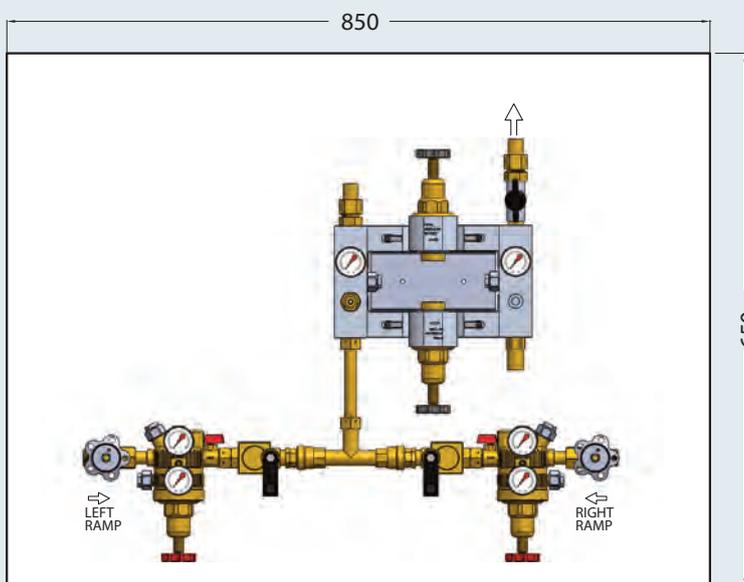
n: quantity of reserve sources/vessels



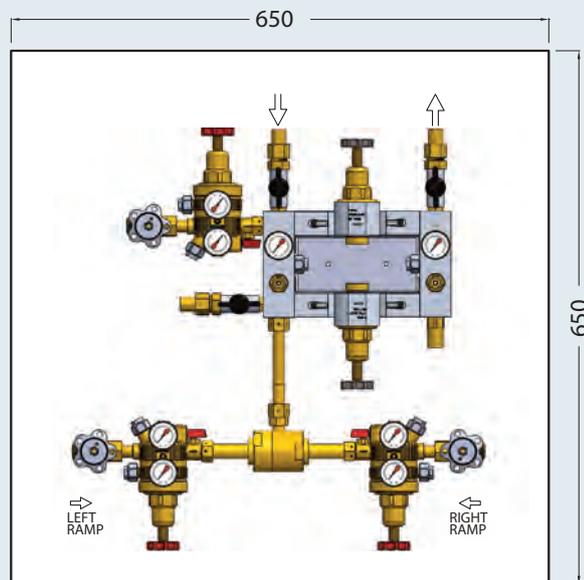
2H-2L-E-21



3H-2L-E-31

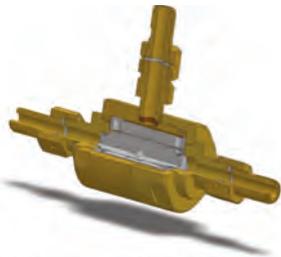


2H-2L-E-31



3H-2L-P-51

IV. Automatic Change-over Valve



Automatic Change-over Valve

The automatic change over valve is being placed in central decompression units with pneumatic change over. Their role is to decide which cylinder ramp (right or left) will supply the decompression unit.

V. Pigtails

Flexible high-pressure cylinder (C-type and S-type)

Ideal for oxygen and oxygen mixtures, acetylene and all other non-corrosive industrial gases.

Technical Data

- Type High Pressure Flexible Hose
- Standard Lengths 600mm, 900mm
- 1800mm, 3600mm (Not Acetylene)
- Safe Working Pressure 300 bar (Acetylene 25 bar)



Stainless steel braided with an anti-whip cable as standard to ensure total safety
According to BS EN ISO 14113
S-type



Copper flexible pigtail (C) for high pressure Ø8, C-type

Available connections

NFS NF E29 650 NFL



BSS BS-341 nr.3 BSL



CGS CGA V-1 nr.540 CGL



DNS DIN 477-1 nr.9 DNL



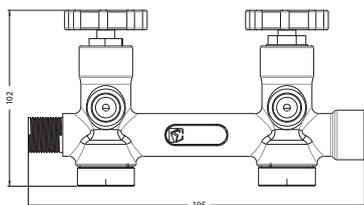
UNS UNI 4406 UNL



VI. Collector – Cylinder Manifolds

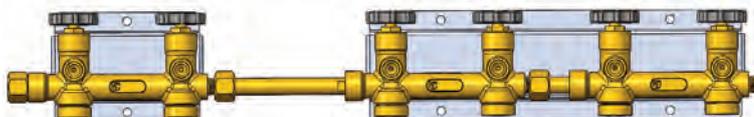


The Cylinder Manifolds are made from hot forging process (brass) for high pressure capability. They are compact in size and they are created with a modular design. It is certified to EN ISO 10524-2 by BAM institute of Germany. The operational pressure is 300 bar.



Manifold Compact GS1 EM

Cylinder Ramp 2 to 6 places	Distance between cylinder place	Application
Small (S)	15cm	for cylinders in small areas
Normal (N)	30cm	normal use
Expanded (E)	60cm	for big liquid oxygen cylinders
Compact (C)	10cm	for cylinders



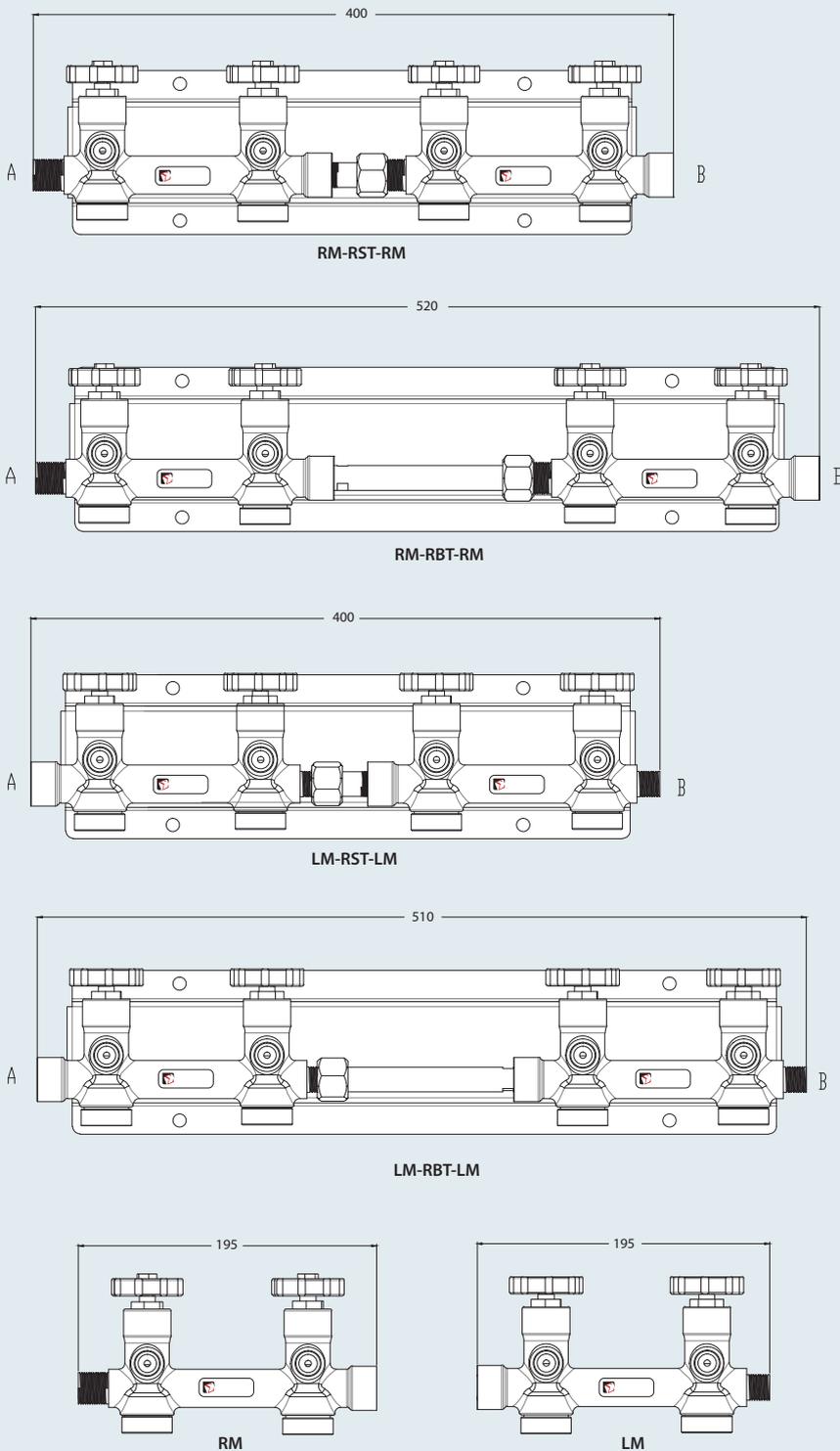
Manifold - Cylinder Ramp

From 2 to 6 places

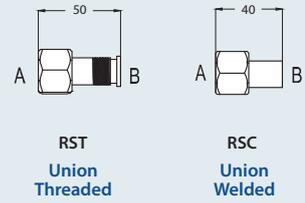
PRODUCT PORTFOLIO

Medical Gas Central Stations

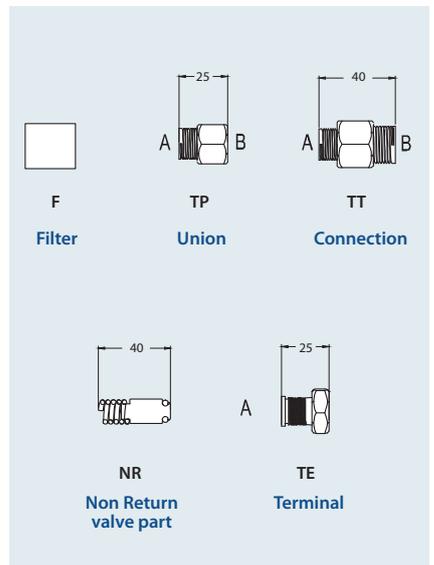
Ramps



Connection of Ramps



PART	A	B
RST	21.8x1.14" (F)	3/8" (M)
RSC	21.8x1.14" (F)	PIPE D13mm
RBT	21.8x1.14" (F)	3/8" (M)
RPT	21.8x1.14" (F)	3/8" (M)
RPR	21.8x1.14" (F)	21.8x1.14" (F)
RST-HPS	3/8" (M)	21.8x1.14" (F)
TE	3/8" (M)	-
TP	3/8" (M)	PIPE D13mm
TT	3/8" (M)	21.8x1.14" (M)
NR	HP Non Return	
F	Filter ramp	
LM	3/8" (F)	21.8x1.14" (M)
LM-RST-LM	3/8" (F)	21.8x1.14" (M)
LM-RBT-LM	3/8" (F)	21.8x1.14" (M)
RM	21.8x1.14" (M)	3/8" (F)
RM-RST-RM	21.8x1.14" (M)	3/8" (F)
RM-RBT-RM	21.8x1.14" (M)	3/8" (F)

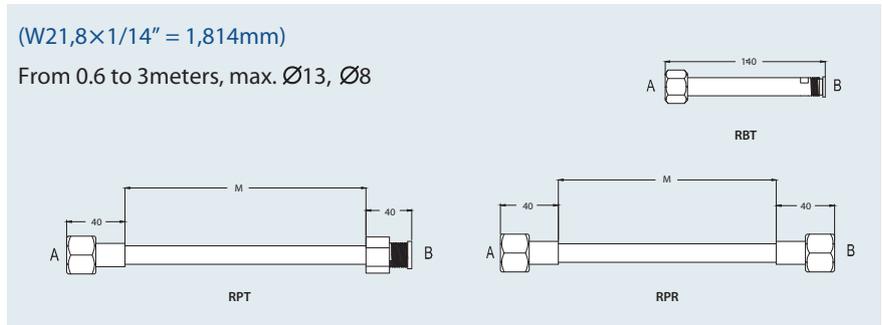




VII. High pressure flexible tubes to connect main decompression unit to manifold ramp (M-R), or manifold to manifold ramp (R-R), or manifold to evacuation valve (R-E).

(W21,8×1/14" = 1,814mm)

From 0.6 to 3meters, max. Ø13, Ø8

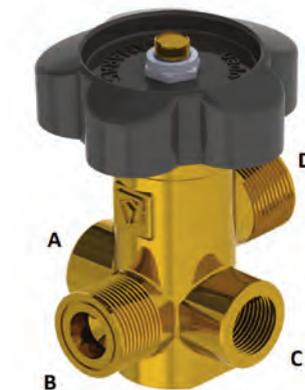


High pressure connection tube (M-R Type S) for 180m³/h stations, copper Ø13



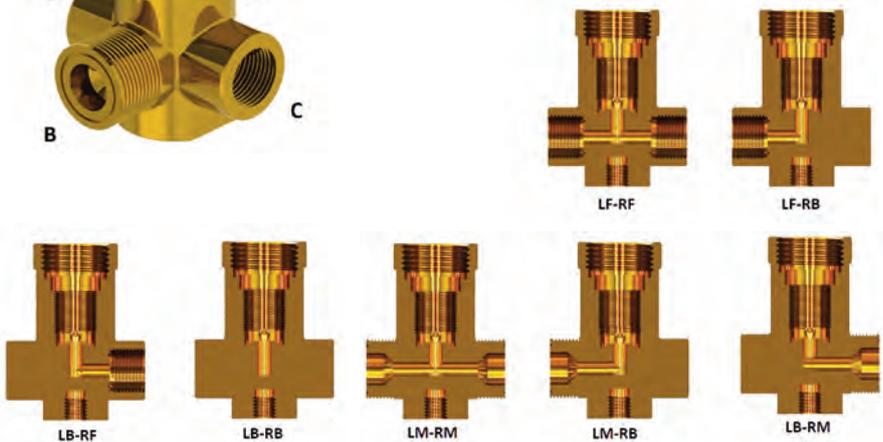
High pressure connection tube for all stations (M-R), manifold to manifold (R-R), manifold to evacuation valve (R-E), copper Ø13

VIII. High pressure valves



High pressure valves for ramps, central stations, evacuation
Operation @ 300bar
*On request valves with thread G 3/8" UNI ISO 228/1 (internal dimension Ø10)

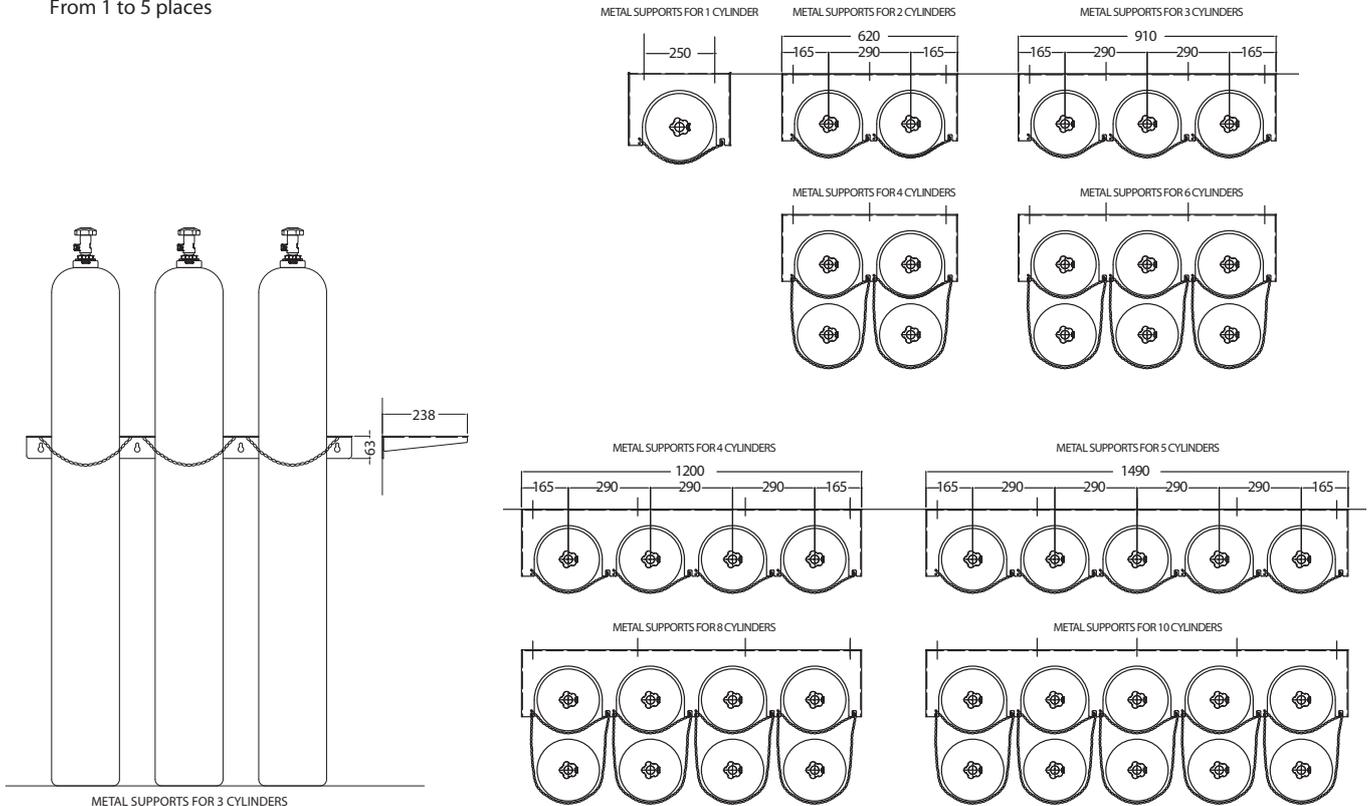
Position	Thread (Option a)	Thread (Option b)	Thread (Option c)
A	G 3/8" F	W21,8×1/14" M	BLIND
B		W21,8×1/14" M	
C	G 3/8" F	W21,8×1/14" M	BLIND
D		W21,8×1/14" M	



IX. HP flexible tubes - Manifolds - HP valves - Holders - Pigtails - Cylinders - Bundles

Cylinder holder U-shape profile

From 1 to 5 places



X. Gas preheater GSVU-GPH 200



Ideal for N₂O and N₂

Max. Working pressure: 300 bar

Voltage: 230V / 50Hz

Power: 200W

Connection: plug with 2m connection cable

Protection class: housing (IP65), plug (IP44)

Switches: Temperature switch 40 ±3°C, Temperature limiter with manual reset 80 ±5°C

Dimensions approx. (L x Diam.): Basic system 150×90mm, with connections 275×90mm

Weight approx.: 2,1–2,5 kg, depending on type

On request other power size can be offered.

3.2.3 MGCYLS - Automatic Center for the Priority Management of Medical Gas Sources CMACU

93/42 MED EN ISO 7396-1 CE 0653

Automatic Center for the Priority Management of Medical Gas Sources manages the priority / power supply of each source up to four sources electrical and one pneumatic (ex. O₂ and/or cylinder lines and/or cryogenic tank) with electronically controlled solenoid switching to ensure continuous and uninterrupted power supply from any source available each time, maintaining the predetermined priority order and constant output pressure.

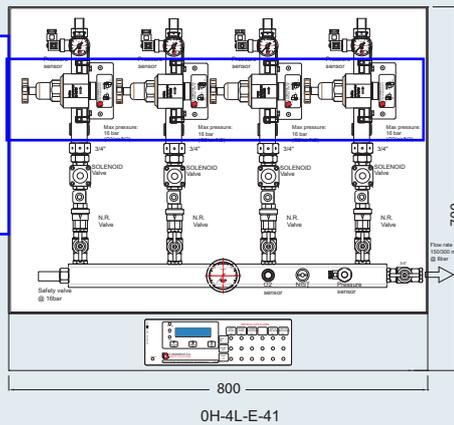


Characteristics:

1. Central control unit with microprocessor
2. Fully programmable operating parameters (priority order, input/output pressure levels, etc.)
3. Visual and acoustic signaling for good Operation / error, 2x16 LCD display
4. Communication, Ethernet, MODBUS TCP / IP
5. Capability of time recording of the function of each source independently (traceability)
6. Capability to manage up to four sources electrical and one pneumatic
7. Use of NO electromagnetic valves to ensure operation in case of interruption of supply
8. Materials suitable for use with medical gases according to EN ISO 7396-1 and EN ISO 15001 (O₂, AIR, N₂O, N₂, CO₂, O₂ / N₂O)
9. Remote monitoring with application of operation – limits

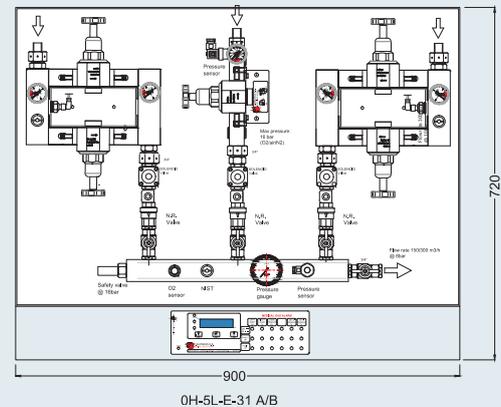
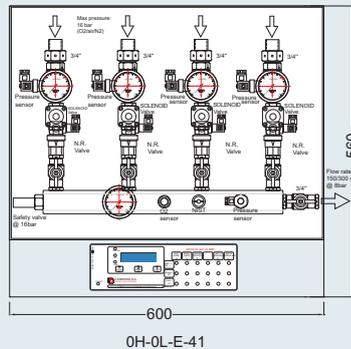
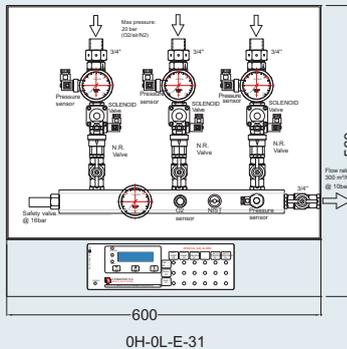
Žr. 5.8 slėgis

Žr. 5.1.1
Sumontuoti reduktoriai leidžia reguliuoti slėgį



Žr. 5.9

Žr. 5.7



Main Unit Type	Inputs	Outputs	No of Reducers		Outlet Pressure bar	Operation	Aperture				
			High (200 bar)	Low (8 bar)			1/2"	3/4"	1"	1 1/4"	1 1/2"
OH-0L-E-21	2	1	0	0	4/8	Electric	•	•	•	•	•
OH-0L-E-31	3	1	0	0	4/8	Electric	•	•	•	•	•
OH-0L-E-41	4	1	0	0	4/8	Electric	•	•	•	•	•
OH-2L-E-21	2	1	0	2	4/8	Electric	•	•	•	•	•
OH-5L-E-31	3	1	0	5	4/8	Electric	•	•	•	•	•
OH-3L-E-31	3	1	0	3	4/8	Electric	•	•	•	•	•
OH-4L-E-41	4	1	0	4	4/8	Electric	•	•	•	•	•
OH-4L-E-21	2	1	0	4	4/8	Electric	•	•	•	•	•
OH-6L-E-31	3	1	0	6	4/8	Electric	•	•	•	•	•
OH-8L-E-41	4	1	0	8	4/8	Electric	•	•	•	•	•

Žr. 5, bus parinkta tinkama konfigūracija pagal poreikį

NAME EXPLANATION

Expression: hH – lL – t – io

Variables: h = Number of high pressure regulators, l = Number of middle/low pressure regulators

t = Type (M=Manual, E=Electric, P=Pneumatic), i = Number of inputs, o = Number of outputs

The major subsystems/elements of Automatic Compressed Medical Air Station are:

1. Three (3) electrically driven air compressors, connected directly with 3Ph electrical motors, that constitute a solid unit
2. Air receivers according to DIN of 4810 (capacity depends on model). The receivers are galvanized inside-outside
3. The required piping
4. A group of double pre-filters in parallel connection (one in operation and one in stand by mode), each rated at full flow rate of the medical Air central station
5. Two (2) absorption or refrigerator type dryers
6. A group of double oil coalescing filter, activated carbon filter, dust filter and a sterile filter is used in order to provide quality medical air as defined ISO 8573.1. This group includes two (2) filters of every type in parallel connection (one in operation and one in stand by mode) each rated at full flow rate of the medical Air central station. **Žr. 3.7**
7. Analogue pressure sensor (transducer) that measures the network pressure. It is the sensing element of the Automatic control unit, used for regulating the air pressure level and alarm monitoring.
8. Analogue sensor (transducer) that measures the network's medical air humidity (dew point level)
9. Emergency inlet point
10. Automatic control-monitor unit, an electronic waterproof control panel which is the operating, indicating and alarm system of the Medical Air Central Station.
11. Analogue sensor that measures CO₂ – CO - SO₂ and NO concentration (optional)



Produced medical air quality - surgical tools air

The quality of produced compressed medical air is according to ISO of 8573.1 group 1.2.1 (0,1µ /-40°C / 0,01ppm – dust / water / oil) and according to the European Pharmacopoeia 5.4.1.4/5 with the following maximum contents in oil 0,5 ppm, humidity 60 ppm, carbon monoxide 5 ppm, carbon dioxide 500 ppm, dust of diameter 0,01 micron, mixture NO and NO₂ 2ppm, SO₂ 1 ppm. All sizes referring to regular conditions of pressure and temperature.

Medical air specifications

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

Surgical tools air specifications

1	Oil concentration	≤0,1mg/m ³ @ 1 bar abs
2	Water vapor concentration	≤67ml/m ³

TYPE GS - BELT

Model	N O M I N A L C A P A C I T Y						Motor Power		Dimensions mm	Weight Kgr	Noise Level dB
	7.5 bar		9.5 bar		12.5 bar		Hp	KW			
	(m³/min)	(m³/h)	(m³/min)	(m³/h)	(m³/min)	(m³/h)					
GSMCSB4	0,6	36	0,5	30	—	—	5,5	4	965×662×1045	185	59
GSMCSB5.5	0,83	49,8	0,69	41,4	0,5	30	7,5	5,5	965×662×1045	195	60
GSMCSB7.5	1,17	70,2	1	60	0,8	48	10	7,5	965×662×1045	215	61
GSMCSB11	1,7	102	1,43	85,8	1,2	72	15	11	965×662×1045	256	61

TYPE GS - DIRECT

Model	N O M I N A L C A P A C I T Y						Motor Power		Dimensions mm	Weight Kgr	Noise Level dB		
	7.5 bar		8.5 bar		10 bar		Hp	KW					
	(m³/min)	(m³/h)	(m³/min)	(m³/h)	(m³/min)	(m³/h)							
GSMCSD15	2.75	165	2.58	155	2.28	137	1.98	119	20	15	1395×835×1220	345	66
GSMCSD19	3.36	204	3.2	192	2.93	176	2.33	140	25	18.5	1395×835×1220	370	67
GSMCSD22	3.9	232	3.76	226	3.3	198	2.8	168	30	22	1395×835×1220	385	68
GSMCSD25	4.3	258	4.06	244	3.8	228	3.33	200	35	26	1395×835×1220	400	70

TYPE L

Model	N O M I N A L C A P A C I T Y						Motor Power		Weight Kgr	Noise Level dB
	7.5 bar		10 bar		13 bar		Hp	KW		
	(m³/min)	(m³/h)	(m³/min)	(m³/h)	(m³/min)	(m³/h)				
GSLAR11	1.93	116.0	1.52	91.0	1.20	72.0	15.0	11.0	460	61
GSLAR15	2.70	162.0	2.20	132.0	1.82	109.0	20.0	15.0	470	62
GSLAR19	3.28	197.0	2.70	162.0	2.31	139.0	25.0	18.5	490	63
GSLAR22	3.78	227.0	3.23	194.0	2.82	169.0	30.0	22.0	496	64
GSLAR26	4.62	277.0	4.02	241.0	3.48	209.0	35.0	26.0	555	67
GSLAR30	4.60	276.0	4.27	256.0	3.68	221.0	40.0	30.0	542	65
GSLAR31	5.63	338.0	4.80	288.0	3.93	236.0	40.0	30.0	790	66
GSLAR36	6.23	374.0	5.17	310.0	4.68	281.0	50.0	37.0	764	69
GSLAR37	6.90	414.0	6.00	360.0	4.73	284.0	50.0	37.0	870	67
GSLAR45	8.17	490.0	7.20	432.0	6.15	369.0	60.0	45.0	875	68
GSLAR55	10.00	601.0	9.00	540.0	7.45	447.0	75.0	55.0	1130	70
GSLAR75	12.90	774.0	11.28	677.0	9.70	582.0	100.0	75.0	1317	71
GSLAR76	14.70	882.0	12.37	742.0	10.48	629.0	100.0	75.0	1570	69
GSLAR90	16.43	986.0	14.63	878.0	12.02	721.0	125.0	90.0	1600	70
GSLAR110	20.63	1238.0	17.88	1073.0	15.12	907.0	150.0	110.0	1800	74
GSLAR111	19.87	1192.0	17.13	1028.0	14.43	866.0	150.0	110.0	2931	75
GSLAR132	23.58	1415.0	20.52	1231.0	16.85	1011.0	180.0	132.0	3020	75
GSLAR160	28.62	1717.0	24.83	1490.0	20.52	1231.0	220.0	160.0	2830	73
GSLAR200	35.50	2130.0	30.80	1848.0	26.20	1572.0	270.0	200.0	4710	77
GSLAR250	40.80	2448.0	37.60	2256.0	—	—	340.0	250.0	4780	78



Screw compressor type L

Žr. 3.1; 3.2; 3.3; 3.4

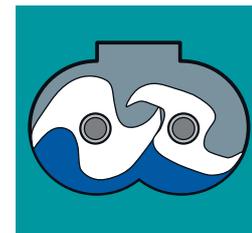
Model	N O M I N A L C A P A C I T Y		Motor Power		Dimensions mm	Weight Kgr	Noise Level dB
	Max Pressure (m³/min)	10 bar (m³/h)	Hp	KW			
GSSTORM 8-10	1	60	10	7.5	820×680×980	185	68
GSSTORM 11-10	1.5	90	15	11	820×680×980	200	69
GSSTORM 15-10	1.85	111	20	15	820×680×980	235	70
GSSTORM 16-10	2.05	122	20	15	820×680×980	240	68
GSSTORM 18.5-10	2.5	150	25	18.5	1360×830×1130	350	66
GSSTORM 22-10	3	180	30	22	1360×830×1130	380	68
GSSTORM 31-10 ES	4.2	252	40	30	1860×910×1440	710	70
GSSTORM 38-10 VS	5.2 / 2.05	312 / 123	50	37	1560×880×1440	725	72
GSSTORM 45-10	6.5	390	60	45	1610×990×1560	910	72
GSSTORM 55-10	7.8	468	75	55	1610×990×1560	952	74
GSSTORM 56-10	8.3	498	75	55	1820×1120×1860	1650	70
GSSTORM 75-10	10.5	630	100	75	1820×1100×1860	1720	72

TYPE S

Model	N O M I N A L C A P A C I T Y						Motor Power		Weight Kgr	Noise Level dB
	7.5 bar		10 bar		13 bar		Hp	KW		
	(m³/min)	(m³/h)	(m³/min)	(m³/h)	(m³/min)	(m³/h)				
GSGA11+	02.03	121.7	1.82	109.1	1.51	90.7	15	11	410	63
GSGA15+	02.63	157.7	2.39	143.3	1.97	118.1	20	15	420	64
GSGA18+	03.26	195.5	2.92	175.3	2.47	148	25	18.5	440	65
GSGA22+	03.87	232.2	3.49	209.2	3.04	182.5	30	22	455	66
GSGA26+	04.57	274.3	4.16	249.5	3.61	216.4	35	26	525	67
GSGA30	05.18	311.0	4.79	287.3	4.12	247.3	40	30	540	68
GSGA30+	05.40	324.0	4.9	294.0	4.3	258.0	40	30	817	65
GSGA37	06.40	384.0	6.0	360.0	4.9	294.0	50	37	905	69
GSGA45	07.60	456.0	7.0	420.0	6.1	366.0	60	45	894	72
GSGA55	09.50	570.0	8.9	534.0	7.6	456.0	75	55	1229	69
GSGA55+	10.40	624.0	9.5	570.0	-	-	75	55	1358	66
GSGA75+	14.10	846.0	12.6	756.0	10.6	636.0	100	75	1413	68
GSGA90	16.50	990.0	15.0	900.0	13.0	780.0	125	90	1425	73

TYPE G

Model	N O M I N A L C A P A C I T Y						Motor Power		Weight Kgr	Noise Level dB
	7.5 bar		8.6 bar		10 bar		Hp	KW		
	(m³/min)	(m³/h)	(m³/min)	(m³/h)	(m³/min)	(m³/h)				
GSZT 15	2.3	135	2.1	126	1.8	108	20	15	975	72
GSZT 18	2.9	174	2.8	168	2.2	132	24	18	995	72
GSZT 22	3.6	216	3.2	192	2.7	162	30	22	1001	72
GSZT 30	4.7	282	4.4	264	-	-	40	30	1201	72
GSZT 37	5.8	348	5.5	330	-	-	50	37	1251	72
GSZT 45	6.9	414	6.5	390	-	-	60	45	1289	72



- Intake
- Transport
- Compression
- Delivery

8. ROTARY VANE AIR COMPRESSORS

Model	NOMINAL CAPACITY 10 bar		Motor Power		Dimensions mm	Weight Kgr	Noise Level dB
	(m ³ /min)	(m ³ /h)	Hp	KW			
GSCMPV01 Tripod	0.12	7.2	1.5	1.1	700×270×470	41	62
GSCMPV02 Tripod	0.23	13.8	3	2.2	700×270×470	41	69
GSCMPV04 RM on a 200Ltr Tank	0.57	34.2	5.33	4	1410×455×990	145	73

C. Aftercoolers

1. AIR COOLED AFTER COOLERS

The aftercoolers reduce the temperature and the dew point of the medical compressed air systems. The compressed air is cooled down to approximately 10°C above ambient temperature. They ensure high protection and top performance of all equipment (cooling dryers, adsorption dryers, filters).

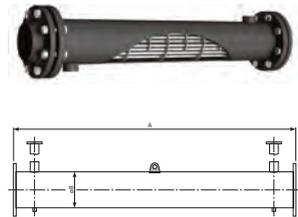
Model	Flow rate		Connection Ø	Power supply Ph/Volt/Fr	Ø (mm)	Fan Dimensions (mm)					Weight Kg
	m ³ /h	l/min				A	B	C	D	E	
GSAFR11	66	1,100	1"	1/230/50	250	850	300	815	595	430	19
GSAFR21	126	2,100	1"	1/230/50	250	850	300	815	595	430	20
GSAFR37	222	3,700	1½"	3/400/50	400	990	310	945	765	415	27
GSAFR49	294	4,900	1½"	3/400/50	400	990	310	945	765	415	29
GSAFR65	390	6,500	2"	3/400/50	500	1,175	440	1,130	1,010	475	44
GSAFR87	522	8,700	2"	3/400/50	500	1,175	440	1,130	1,010	475	48
GSAFR129	774	12,900	2"	3/400/50	600	1,325	490	1,280	1,020	480	61
GSAFR165	990	16,500	2½"	3/400/50	600	1,325	490	1,280	1,020	480	66
GSAFR210	1260	21,000	DN100 PN16	3/400/50	800	1,800	660	1,790	1,980	810	130
GSAFR260	1560	26,000	DN100 PN16	3/400/50	800	1,800	660	1,790	1,980	810	160
GSAFR315	1890	31,500	DN100 PN16	3/400/50	800	1,800	790	1,760	1,960	800	205
GSAFR420	2520	42,000	DN100 PN16	3/400/50	800	2,000	795	1,990	2,080	800	225
GSAFR515	3090	51,500	DN125 PN16	3/400/50	2×800	2,090	830	2,050	3,030	800	250
GSAFR750	4500	75,000	DN125 PN16	3/400/50	2×800	2,300	850	2,260	3,030	800	280



2. WATER COOLED AFTER COOLERS

They are being used to reduce the temperature of the air in the medical compressed air systems. This is achieved when the hot compressed air enters the tubes while cooling water passes around the tubes in reverse flow.

Model	Connection		Flow rate		Operating pressure		Dimensions (mm)	
	Air	Water	Nm ³ /h	Bar	A	B		
GSACW010F	DN50	DN20	132	0-16	806	60.3		
GSACW018F	DN50	DN20	235	0-16	816	60.3		
GSACW030F	DN50	DN20	367	0-16	816	60.3		
GSACW047F	DN50	DN20	661	0-16	870	60.3		
GSACW070F	DN50	DN20	955	0-16	870	60.3		
GSACW094F	DN80	DN20	1,323	0-16	1,500	88.9		
GSACW150F	DN80	DN20	2,205	0-16	1,510	88.9		

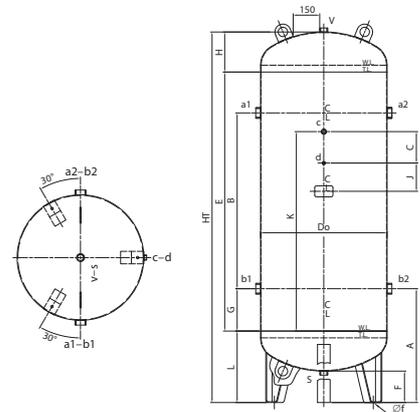


D. Vessels

Air vessels		Painted		Galvanized In-Out		Vitroflex		Pressure (bars)*		Dimensions				Weight kgs
capacity (lt)	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Operation	Test	Diameter	Height	a1/a2	b1/b2		
50		•				•	11.0	15.0	300	926	1/2"	1/2"	15	
90		•				•	11.0	15.0	370	1153	3/4"	3/4"	30	
150		•				•	11.0	15.0	400	1364	1"	1"	45	
200		•				•	11.0	15.0	440	1485	1"	1"	50	
270	•	•				•	11.0	15.0	490	1656	1"	1"	60	
400		•				•	11.0	15.0	490	1656	1"	1"	60	
500		•				•	11.0	15.0	600	2050	1½"	1½"	140	
725		•				•	10.8	15.0	790	1820	1½"	1½"	170	
900	•	•	•	•	•	•	11.0	15.0	790	2313	2"	2"	186	
1000	•	•	•	•	•	•	11.5	16.5	790	2310	2"	2"	220	
1500	•	•	•	•	•	•	11.5	16.5	950	2405	2"	2"	300	
2000	•	•	•	•	•	•	11.5	16.5	1000	2770	2"	2"	400	
3000	•	•	•	•	•	•	11.5	16.5	1200	2929	3"	3"	540	
4000	•	•	•	•	•	•	11.5	16.5	1450	3032	3"	3"	802	
5000	•	•	•	•	•	•	11.5	16.5	1450	3532	3"	3"	932	
6000	•	•	•	•	•	•	11.5	16.5	1650	4070	3"	3"	1057	

*Other pressures available on request (16/21/32/42 bar) **CE 2009/105 for 10,8/11bar ***CE 97/23PED for 11,5/16/21 /32/42bar

****For 16 bar-handhole and manhole upon request. Over 16bar-handhole and manhole are included as per specifications



F.2.2 Compressed Air Duplex Filters

With exceptionally improved performance, the intelligent design combines a two-stage filtration system in a single unit, ensuring twice the filtration capability. The Duplex Filters space saving modular design utilizes deep pleated media technology to deliver market leading performance. The 0.01 micron (DXA grade) element delivers exceptional results in oil aerosol removal and particle retention - with a significantly reduced differential pressure of <125 mbar. The Activated Carbon element utilises a finely divided activated carbon media to remove odours and tastes.

Filter model	Pipe size inches	Inlet flow rate		Dimensions mm				Weight Kg	No. of Elements
		Nm ³ /hr	SCFM	A	B	C	D		
GS AF D119	½	119	70	100	236	240	80	2.3	1/1
GS AF D144	¾	144	85	100	236	240	80	2.3	1/1
GS AF D212	¾	212	125	100	356	360	80	3.1	1/1
GS AF D297	1	297	175	100	356	360	80	3.2	1/1

Pressure correction factors	For maximum flow rate, multiply model flow rate by the correction factor corresponding to the minimum operating pressure								
Operating pressure barg (psig)	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)
7 barg - correction factor	0.76	0.84	0.92	1.00	1.07	1.19	1.31	1.41	1.51

F.2.3 Medical Sterile Filters

Sterile Filters guarantees reliable and outstanding air purity that meets internationally certified medical performance levels. 100% integrity tested, Medical Sterile elements are guaranteed for a minimum of 100 sterilisations at 120°C (248°F), ensuring your compressed air is free from live bacteria and other submicron particles.

Filter model	Pipe size inches	Inlet flow rate		Dimensions mm				Weight Kg
		Nm ³ /hr	SCFM	A	B	C	D	
GS SF119	½	119	70	127	32	285	80	2.1
GS SF144	¾	144	85	127	32	285	80	2.1
GS SF297	1	297	175	127	32	371	80	2.4
GS SF680	1½	680	400	170	53	508	100	5.6
GS SF1189	2	1189	700	170	53	708	100	6.2
GS SF1529	3	1529	900	220	70	736	100	11.6

Pressure correction factors	For maximum flow rate, multiply model flow rate by the correction factor corresponding to the minimum operating pressure								
Operating pressure barg (psig)	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)
7 barg - correction factor	0.76	0.84	0.92	1.00	1.07	1.19	1.31	1.41	1.51

F.2.4 Hopcalite Filter

Filter model	Pipe size inches	Inlet flow rate	
		Nm ³ /hr	SCFM
GS HP25	½	26	6.7
GS HP65	¾	65	18.1
GS HP120	1	120	33.3
GS HP158	1½	158	43.9

*apply at 7 Barg

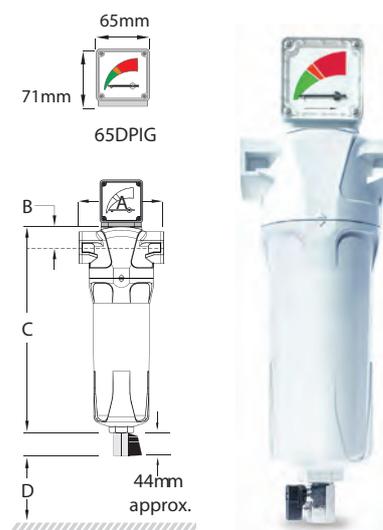
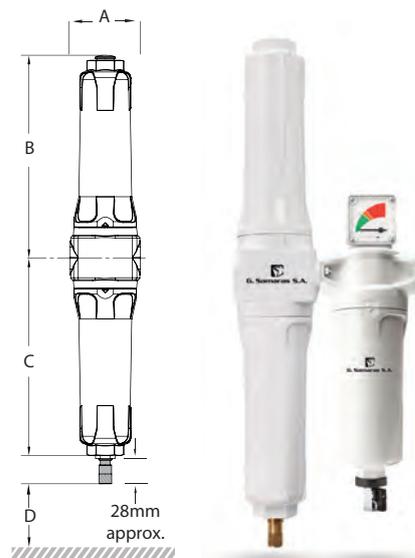
Pressure correction factors	For maximum flow rate, multiply model flow rate by the correction factor corresponding to the minimum operating pressure								
Operating pressure barg (psig)	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)
7 barg - correction factor	0.76	0.84	0.92	1.00	1.07	1.19	1.31	1.41	1.51

B. Condensate Separators

The condensate separators are being used to remove liquids and particles from medical compressed air systems. At the internal of the separator there is controlled rotation of the air flow. In this case the liquids and particles stay at the housing wall and slow down to the bottom of the separator. The turbulent section in the lower part of the cyclone housing prevents condensate from being picked up and "carried over" into the airstream. To remove the condensate from the separator it is important to install an electronic or automatic drain. The condensate drains are available also in stainless steel version.

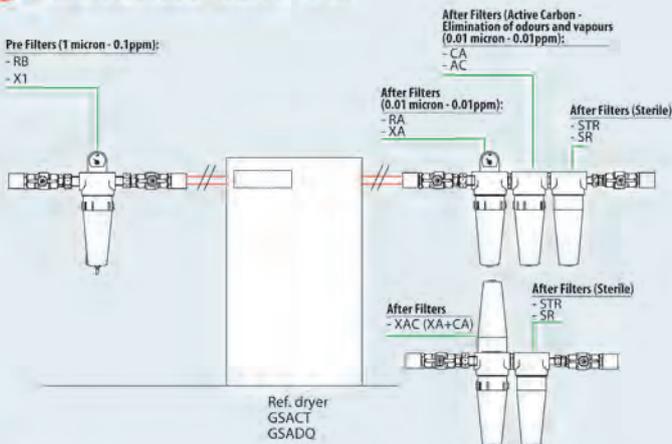
Water Separators

Filter model	Pipe size inches	Inlet flow rate		Dimensions mm				Weight Kg
		Nm ³ /hr	SCFM	A	B	C	D	
GS WS119	½	119	70	127	32	285	80	1.7
GS WS212	¾	212	125	127	32	285	80	1.7
GS WS297	1	297	175	127	32	285	80	1.7
GS WS680	1½	680	400	170	53	508	100	4.9
GS WS1189	2	1189	700	170	53	508	100	4.9
GS WS1444	2½	1444	850	220	70	420	100	8
GS WS2550	3	2550	1500	220	70	420	100	8

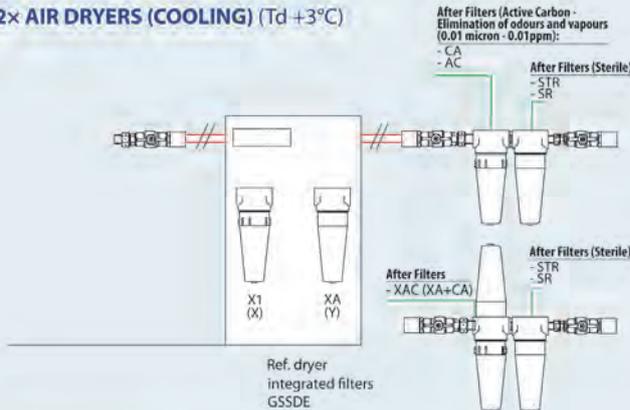


Žr. 3.5
Cikloninis separatorius

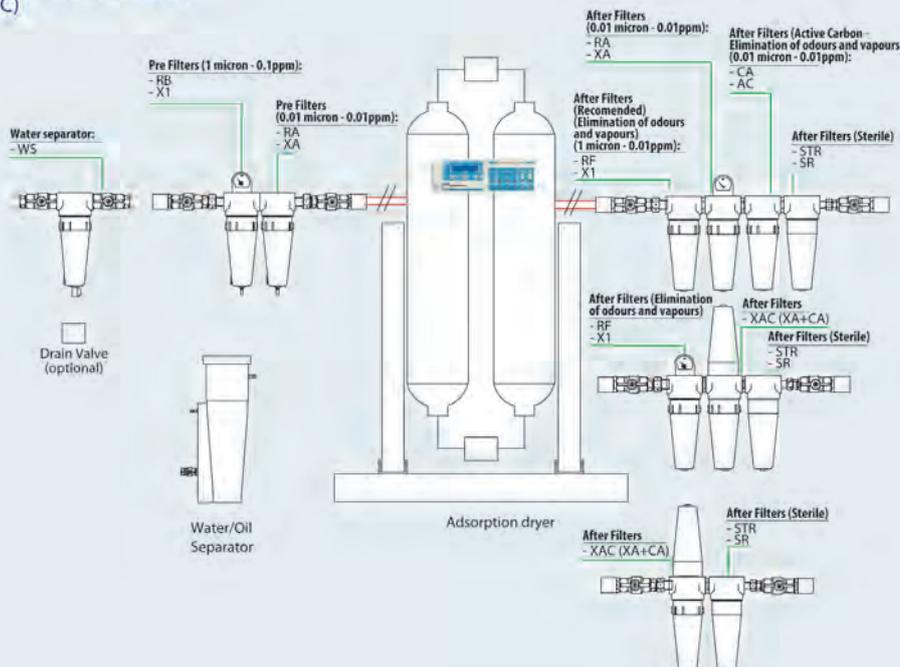
A AIR DRYER (COOLING) (Td +3°C)



B 2x AIR DRYERS (COOLING) (Td +3°C)



C AIR DRYER ADEC (ADSORPTION) (Td -40 or -70°C)



Typical lay-outs for Air Filters - Dryers

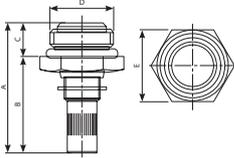
- In cases that extra pre-filtration is needed due to the extended water vapor and the vessel is placed after the pre-filters, then it is recommended the use of an extra set of WR filters or Cyclonic filters before the pre-filters and after the compressors.
WR → RB → RA/WS → X1 → XA
- In case that it is required extra protection of the 1 micro pre-filtration (RB/S/X1/S) and the vessel is placed before the pre-filters, then the use of RM filter is recommended instead of RB/S/X1/S. RM → RA/X25 → XA
- In cases of high temperature of the inlet air it is suggested the use of RF instead of RB filters.
RF → RA/X25 → XA
- For the scroll compressor systems the proposed line of filters is the following:
RB → RA → CA/X1 → XA → AC

G. Condensate drains

Condensate drains are used for discharging the condensate or any other non-aggressive fluids from compressed air systems.



GSOMMCD
Manual condensate drain



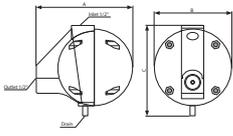
GSOMAOK16B
Automatic condensate drain

Model	Operation	Applications	Pressure bar	Draining capacity l/h	Operating temperature °C	Connection inches	Dimensions mm
GSOMMCD	M	F	0-20	100	1-65	G 1/2"	38×29×24
GSOMAOK16B	P	F	0-16	120	1-65	G 1/2"	90×38
GSOMAOK20B	P	F	0-20	167	1-65	G 1/2"	135×110×130
GSIED	T-E-Z	F	0-16	8	1,5-65	G 1/2"	111×61×60
GSJOEZ-1	T-E	C-F-V	0-16	100	1-55	G 1/2"	43×108×90
GSJOKAPTIV-MD	Z-E	C-F-V	0-16	75	1-50	G 1/2"	123×74×93
GSOMEMD	Z-E	C-F-V	0-16	75	1-65	G 1/2"	133×76×147
GSBEXAE-950T	E	C-F-V	0-16	70	1-60	G 1/4"	100×90×56
GSJOTEC-44/Vac	E	C-F-V	-1-16	75	1-65	G 1/2"	133×76×147
GSJOMAGY-UL	P-Z	C-F-V	0-16	70	1-60	G 1/4"	100×90×56

Medium: condensate (air,water,oil)
M: manual, *E:* electrical, *T:* timer, *Z:* zero loss, *P:* pneumatic
C: cyclonic, *F:* filter, *V:* vessel



GSOMAOK20B
Automatic condensate drain



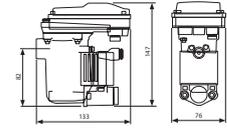
GSIED T-E-Z
Zero loss drain for filters



GSJOMAGY-UL
Zero loss condensate drain



GSOMEMD
Electrical condensate drain



GSBEXAE950T
Electrical automatic drain



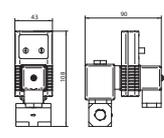
GSJOEZ-1
Timer controlled condensate drain



GSJOTEC-44
Electrical automatic drain
(Suitable for vacuum or AGSS)



GSJOMD
Zero loss condensate drain



H. Water/oil separators

Water/Oil separators are designed to separate compressor oil from condensate without the use of external power. Outlets from condensate drains should be fed into a manifold system to collect condensate. Condensate from the system will enter the Water/Oil separator under pressure and is allowed to expand in the specially designed centrifugal inlet chamber. The cleaned water can be safely discharged without damaging the environment.

Зр.3.5 Elektroninis kondensato nuleidiklis.



GSSEP series



GSJOSEPR series



GSWOS series

MODEL	Capacity m ³ /h	Dimensions mm
GSSEP60ST	102	145×145×220
GSSEP120ST	204	500×215×257
GSSEP360ST	602	654×345×282
GSSEP900ST	1.530	989×432×495
GSSEP1800ST	3.060	989×990×520
GSSEP3500ST	6.000	1270×800×1350
GSSEP7000ST	12.000	1270×1000×1520
GSJOSEPR2	120	230×255×239
GSJOSEPR5	300	190×580×610
GSJOSEPR10	600	240×650×750
GSJOSEPR20	1.200	305×780×900
GSJOSEPR30	1.800	380×970×900
GSWOSm1	60	483×106×106
GSWOSm2	120	816×106×106



MODEL	Maximum performance of the compressor (m ³ /min)							
	Screw compressor				Piston compressor			
	Oil		Synthetic Oil		Oil		Synthetic Oil	
	Turbine LTD	VCL	VCL	PAO	Ester	VCL	PAO	Ester
GSFR WOSS 24	2,4	2,4	1,9	1,9	1,6	1,7	1,4	1,6
GSFR WOSS 49	4,9	4,9	3,8	3,8	3,2	3,4	2,8	3,2
GSFR WOSS 73	7,3	7,3	5,6	5,6	4,8	5,1	4,2	4,9
GSFR WOSS 146	14,6	14,6	11,3	11,3	9,6	10,1	8,4	9,7
GSFR WOSS 293	29,3	29,3	22,5	22,5	19,1	20,3	16,9	19,4
GSFR WOSS 585	58,5	58,5	45,0	45,0	38,3	40,5	33,8	38,8

Synthetic oil: Possible performance deviation (PAO ±20% / Ester ±40%).



GSFRWOSS series

IP based 

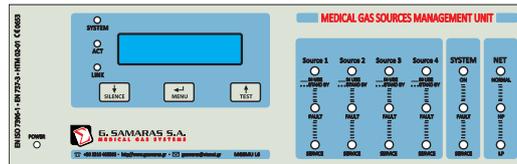
HTM02-01 *EN ISO 7396-1, NFPA 99*

9. Electronic control panel for controlling the operation of the Compressors

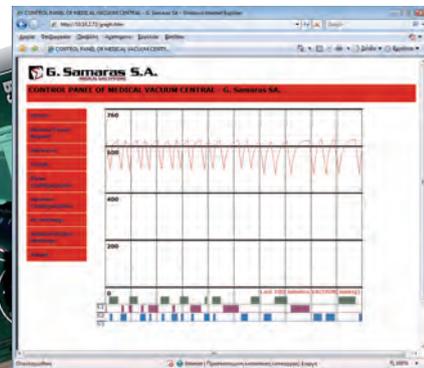
The MGS Compressed Air control panel is a fully electronic, automatic, controller and monitoring device of a complete compressed air plant. The MGS C. AIR control panel is built on latest technology microcontroller and provides superior reliability, functionality and flexibility.



Touch panel version

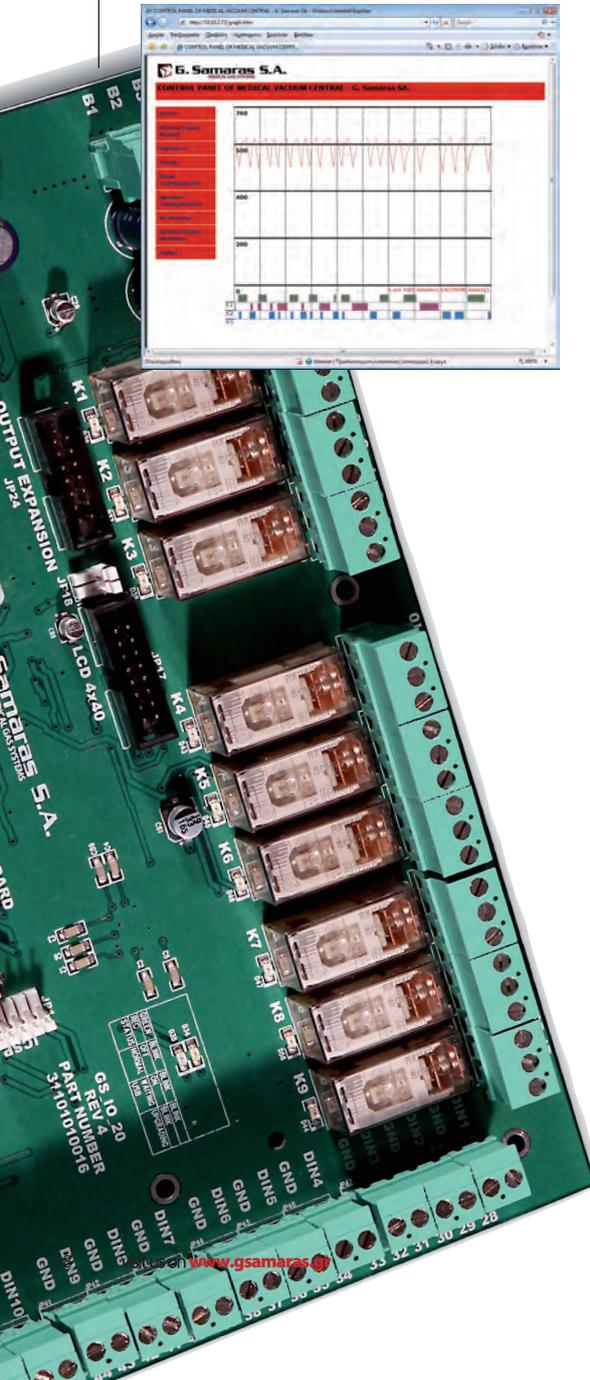


MGSMU L6 (up to 4 sources)



General features of MGS C. AIR control panel:

- built up to four transfer switches for AUTO and MANUAL mode selection, independent for each source. OFF position also included
- microprocessor based design, Ethernet communication supported,
- remote access via Ethernet by any internet browser (no additional software needed).
- On line remote system viewing and additional daily graphs for all Net pressures (data logging function) for plant pressure monitoring and analysis (24 hours depth, 1 sample per 15 sec) (**Medimote**)
- remote parameter settings via Ethernet using any internet browser (code protected area for authorized staff only)
- on site firmware upgrade capability via TFTP (**MGSMU L6**)
- built in buzzer, SILENCE button and TEST button
- user friendly interface via built in LCD screen, 2x16 (**MGSMU L6**) characters and additional led indicators for sources and net work pressure, functionality according to ISO 7396-1, HTM 02-01 and NFPA 99 standards.
- text messages for all conditions, emergency alarms and events for real time status viewing
- user programmable configuration and parameter settings (code protected area for authorized personnel only)
- alarm / events / services report and log file (max 250 records with time stamp) for plant performance analysis and debugging
- cyclic operation of sources based on time balance operation, 4 with time rotation (**MGSMU L6**) for load and run time measurement of each source
- additional capability of primary Net pressure measurement redundancy for enhancing the system's reliability, using an extra digital pressure sensor connected to digital input (built in auto transfer algorithm for operation via the digital pressure switch if the primary analog pressure transducer failed) (**MGSAP C1**)
- self test procedures and diagnostics utilities included for system integrity, communication and wiring testing
- real time clock with battery back up
- 9 (**MGSMU L6**) (4...20 mA transducer).
- 12 digital inputs NO/NC and enabling/disabling capability
- filters performance monitoring
- power supply over/under voltage monitoring
- phase sequence monitoring
- thermal protection and operation status monitoring of each source independently
- 9 digital outputs (**MGSAP C1**) or 6 (**MGSMU L6**) (relay output, 12A/250 Vac)
- dry contacts for remote signaling and interface with other monitoring systems
- Battery back up system and DC UPS capability with mains power failure signaling function
- **ability to connect to MEDIMOTE portal, providing SMS / E-mail alert (www.medimote.gr)**



3.2.7 Oxygen - Nitrogen Generators (MO2CSS series)

Pressure Swing Adsorption (PSA) is a low power consuming solution, efficient and reliable for onsite production of high purity oxygen. It uses the basic principle of passing air over adsorbent material which bound with nitrogen to leave rich stream of oxygen.

G. Samaras S.A can offer different solutions for Oxygen generator in different sizes and different flows. A typical Oxygen generator system comprise from:

HTM02-01

CE0653

EN ISO 7396-1

ISO 10083

93/42 MED

NFPA 99



Compressed Air Systems:

- Air Compressor
- Air Treatment unit by refrigerating dryer and filters
- Air Receiver in proper size

Oxygen Generator:

- PSA Plant
- PLC
- Oxygen Analyser
- Oxygen Receiver & high efficiency O₂ filter

High Pressure Filling System

Booster to fill the cylinders bank (150 bar at 5 bar inlet pressure / 200 bar at 8 bar inlet Pressure).



PRODUCT PORTFOLIO

Medical O₂ Generators

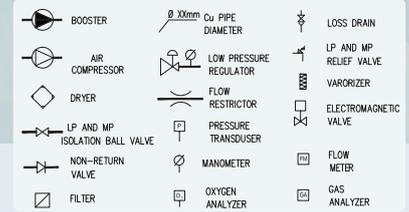
Available types of O₂ generators – MO₂CSS SERIES

Type Generator	Žr. 1.3 93%	O ₂ capacity (m ³ /h) 93±3% @6bar/23°C	Size of pipe or vessel (in)	Max. height (m)	Recommended form (±10% depends from temp and altitude and compressor output)	Recommended Min. air vessels (lt)	Min. vessel O ₂	Recommended from environment conditions min. size of dryer	Dryer	Input connection	IN				OUT		INPUT CODE		OUTPUT CODE	
											WS	XA	XA/CA	CA	XA	Sterile	Pipe input	GS code input filters	Pipe output	GS code output filters
MO ₂ CSS20C1	20	1,0	6"	1,5	13	50	50	26	SDE-50	1/2"	1	1	1		1	1	1/2"	GS119	1/2"	GS 119
MO ₂ CSS20C2	40	2,0	8"	1,8	26	90	90	52	SDE-70	1/2"	1	1	1		1	1	1/2"	GS119	1/2"	GS 119
MO ₂ CSS20C3	60	3,0	10"	1,9	39	150	150	78	SDE-70	1/2"	1	1	1		1	1	1/2"	GS119	1/2"	GS 119
MO ₂ CSS20C4	80	4,0	10"	2,1	52	200	200	104	SDE-100	1/2"	1	1	1		1	1	1/2"	GS119	1/2"	GS 119
MO ₂ CSS20C5	100	5,0	12"	2	65	270	270	130	SDE-100	1/2"	1	1	1		1	1	1/2"	GS119	1/2"	GS 119
MO ₂ CSS20C6	115	5,5	115lt	2,4	70	300	300	156	SDE-160	3/4"	1		1		1	1	1/2"	GS119	1/2"	GS 119
MO ₂ CSS20C7	140	7,0	2×10"	2	91	400	400	182	SDE-190	3/4"	1		1		1	1	3/4"	GS144	1/2"	GS 119
MO ₂ CSS20C8	160	8,0	2×10"	2,4	104	500	500	208	SDE-190	3/4"	1		1		1	1	3/4"	GS144	1/2"	GS 119
MO ₂ CSS20C10	200	10,0	2×12"	2	130	500	500	260	SDE-310	1 1/2"	1		1		1	1	3/4"	GS144	1/2"	GS 119
MO ₂ CSS20S27	270	11,0	270lt	2,2	138	500	500	248	SDE-310	1 1/2"	1		1		1	1	1"	GS297	1/2"	GS 119
MO ₂ CSS20C6-2	230	11,0	2×115lt	2,4	140	500	500	270	SDE-310	1 1/2"	1		1		1	1	1"	GS297	1/2"	GS 119
MO ₂ CSS20S30	300	13,5	300lt	2,2	169	900	900	304	SDE-310	1 1/2"	1		1		1	1	1"	GS297	1/2"	GS 119
MO ₂ CSS20C6-3	345	13,5	15lt	2,4	200	900	900	383	SDE-500 (495)	2"	1		1		1	1	1"	GS297	1/2"	GS 119
MO ₂ CSS20D41	400	13,5	10lt	2,2	225	900	1000	405	SDE-500 (495)	2"	1		1		1	1	1"	GS297	1/2"	GS 119
MO ₂ CSS20S50	500	21,0	500lt	2,25	263	1000	1000	473	SDE-500 (495)	2"	1		1		1	1	1"	GS297	1/2"	GS 119
MO ₂ CSS20C6-4	460	21,5	4×115lt	2,4	270	1500	1500	518	SDE-600 (588)	2"	1	1		1	1	1	1 1/2"	GS680	1/2"	GS 119
MO ₂ CSS20D54	540	22,0	2×270lt	2,2	275	1500	1500	495	SDE-600 (588)	2"	1	1		1	1	1	1 1/2"	GS680	1/2"	GS 119
MO ₂ CSS20D60	600	26,0	2×300lt	2,2	325	1500	1500	585	SDE-600 (588)	2"	1	1		1	1	1	1 1/2"	GS680	1/2"	GS 119
MO ₂ CSS20C6-5	575	26,5	5×115lt	2,4	340	2000	2000	698	SDE-830 (825)	2"	1	1		1	1	1	1 1/2"	GS680	1/2"	GS 119
MO ₂ CSS20C6-6	690	32,0	6×115lt	2,4	440	2000	2000	855	SDE-1100	2"	1	1		1	1	1	1 1/2"	GS680	1/2"	GS 119
MO ₂ CSS20T81	810	33,0	3×270lt	2,2	413	2000	2000	743	SDE-830 (825)	2"	1	1		1	1	1	1 1/2"	GS680	3/4"	GS 144
MO ₂ CSS20C6-7	805	37,0	7×115lt	2,4	500	2×2000	2000	1013	SDE-1100	2"	1	1		1	1	1	1 1/2"	GS680	3/4"	GS 144
MO ₂ CSS20T90	900	40,0	3×300lt	2,2	500	2×2000	2000	900	SDE-1100	2"	1	1		1	1	1	1 1/2"	GS680	3/4"	GS 144
MO ₂ CSS20Q100	1000	42,0	2×500lt	2,25	525	2×2000	2000	945	SDE-1100	2"	1	1		1	1	1	1 1/2"	GS680	3/4"	GS 144
MO ₂ CSS20C6-8	920	43,0	8×115lt	2,4	575	2×2000	2000	1125	SDE-1300 (1331)	3"	1	1		1	1	1	2"	GS765	3/4"	GS 144
MO ₂ CSS20C6-9	1035	48,0	9×115lt	2,4	640	2×2000	2×1500	1238	SDE-1300 (1331)	3"	1	1		1	1	1	2"	GS765	3/4"	GS 144
MO ₂ CSS20C6-10	1150	54,0	10×115lt	2,4	700	2×2000	2×1500	1395	SDE-2200	3"	1	1		1	1	1	2"	GS765	3/4"	GS 144

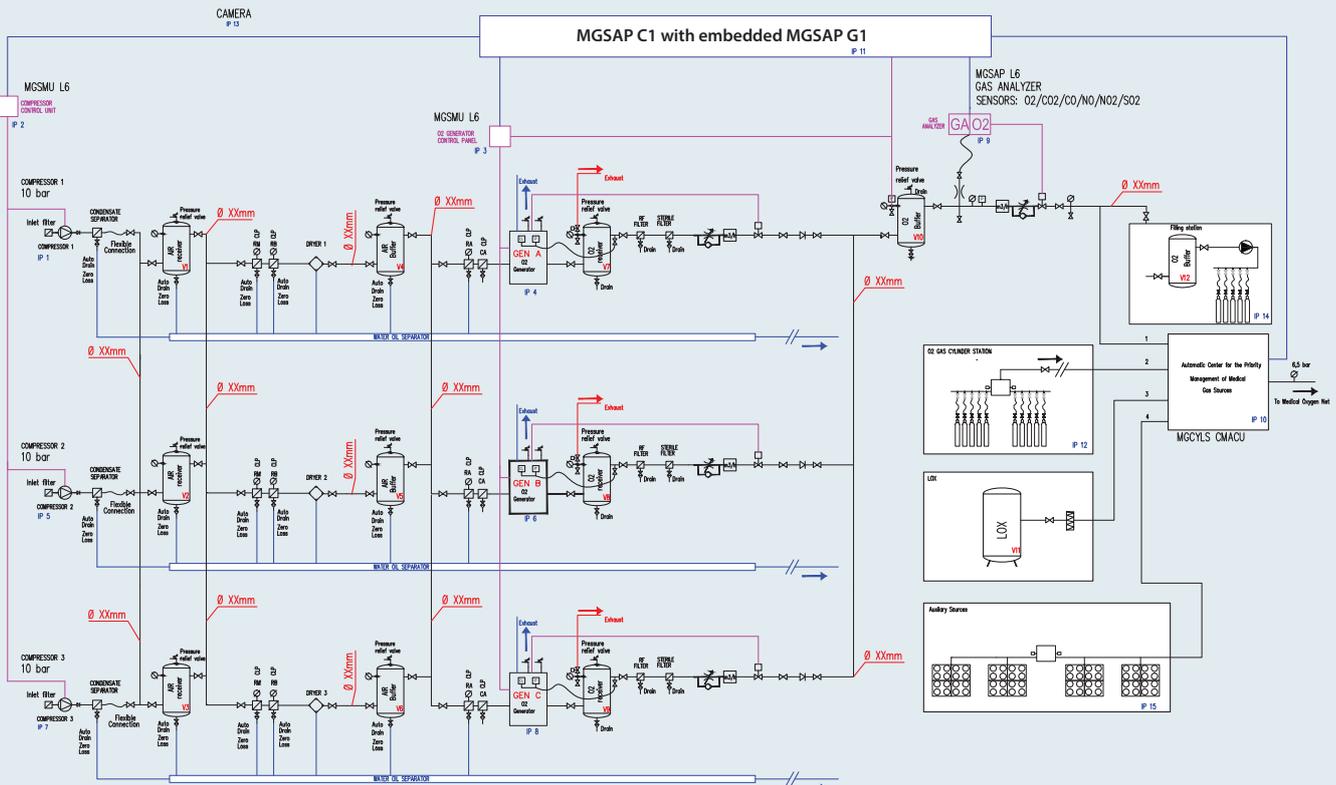
- Purity according to ISO 10083, Oxygen 93 European Pharmacopoeia 7.1, USP Oxygen 93
- Feed Air inlet pressure: 7–10 bar(g)
- Feed Air minimum quality class 1.4.1 acc to ISO 8573.1
- Oxygen pressure: 6 bar(g) ±10%
- Flow rate reference conditions acc to DIN 1343, (0°C, 1013mbar)
- Air compressors and dryers could be oversized in order to compensate tolerances and ambient conditions impact

- Due to a continuous policy of research and development, the manufacturer reserves the right to update and/or modify technical specifications without prior notice.
- All types max inlet pressure 10 bar
- Types with higher capacity upon request

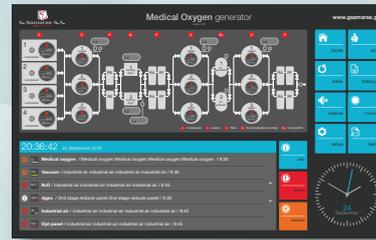
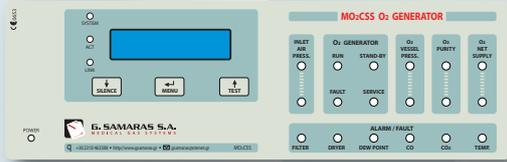
Žr. 1.3



Schematic lay-out of Oxygen Central Station with 3×PSA + 1×LOX + 2×Cylinder Pack + 2 Cylinder Station + Filling Station



OXYGEN / NITROGEN GENERATOR CONTROL PANEL



Product highlights:

- LCD screen, 3 buttons for navigation, 18 leds for visual indication, audible signaling
- O₂ analyzer with long life zirconia sensor, supplied

- Smart algorithm included for O₂ purity protection function (on inlet air pressure over/under range)
- O₂ purity measurement with instant value and min / max value records (available as standard)
- O₂ Flow measurements with instant value (Nm³/h), min, max and total volume counter

- CO/CO₂ sensors (available as an option)
- Report and monitoring SCADA based software (available as an option)
- Remote monitoring panel, remote device with repeater function (available as an option)
- Controller redundancy (available as option)
- ability to connect to MEDIMOTE portal, providing SMS / E-mail: alert (www.medimote.gr)



Žr. 2.5 Automatic restart (on electrical power failure)

Žr. 2.6 Automatic purity recover procedure, if purity falls below a limit (user programmable, code protected)

Žr. 2.7; 2.10.1; 2.10.2 O₂ Flow measurements with instant value (Nm³/h), min, max and total volume counter

Žr. 2.8 O₂ Dew point measurement

Žr. 2.9 Inlet, O₂ product and outlet pressure measurement

Žr. 2.10.1; 2.10.2 Two temperature measurement

Žr. 2.9 Run and service timers

Žr. 2.9 Internal storage up to 200 records for any alarm/event with time/date stamp, unlimited if our report software used (a pc needed)

Žr. 2.9 User friendly WEB interface, using RJ45 port (Ethernet) and any internet browser for on line monitoring and code protected configuration. Multiple users supported.

Žr. 2.13; 2.15 Inlet filters monitoring

Žr. 2.13; 2.15 Alarm signal (dry contacts C/NC/NO) available for any BMS system connection

Žr. 2.13; 2.15 Master / Slave supported

Žr. 2.13; 2.15 Remote control (start/stop) digital inputs

Žr. 2.13; 2.15 MODBUS TCP/IP communication protocol

Žr. 2.14

STANDARDS / REGULATIONS OF CONFORMITY

- ISO 10083:26 Oxygen concentrator supply systems for use with medical gas pipeline systems
- EN ISO 7396-1:2007 Medical gas pipeline systems Part 1: Pipeline systems for compressed medical gases and vacuum
- European Pharmacopoeia 7.1 monograph 4/2011:2455, OXYGEN (93%)
- HTM 02-01
- Directive 93/42/EEC, class IIb
- National Pharmaceuticals Organization (in Greek: ΕΟΦ) 22288/2018.3.2011

Žr. 1.6



Future options:

- GSM/GPRS module for SMS alerts
- 4.3" TFT Touch Screen
- O₂ generator, MO₂CSS+ Series with multiple beds /columns (improved O₂ to air production ratio)

3.4 CONTROL AND REDUCER PANEL

The 2nd stage pressure regulator units are equipped with line pressure regulators of 25–438m³/h

3.4.1 Low and middle pressure reducers up to 30bars

TYPE OF REDUCER	MIN INLET PRESSURE	MAX INLET PRESSURE	MIN OUTLET PRESSURE	MAX OUTLET PRESSURE	Q (m ³ /h)	CONNECTION (inches)
LPR GS1-25-N-S-C	8	12	0.5	10	25(@8bar)	3/8" (s) - 1/2" (d)
LPR GS 5-200-N-S-C	8	20	3	15	200(@10bar)	1/2" (s) - 1" (d)
LPR GS 8-450-N	8	20	3	15	450(@10bar)	1"

Name Type: T M – Q – N – S – C

T: Type of reducer

M: Model

Q: Flow rate

N: Number of reducers (1-4)

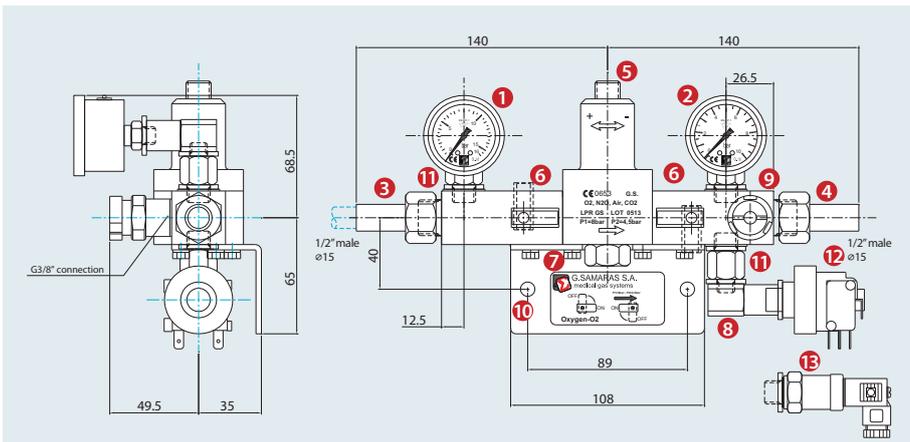
S: Size of the switch (S,L,XL)

C: Switches configuration (ex: S-S-S-S for 4 small switches)

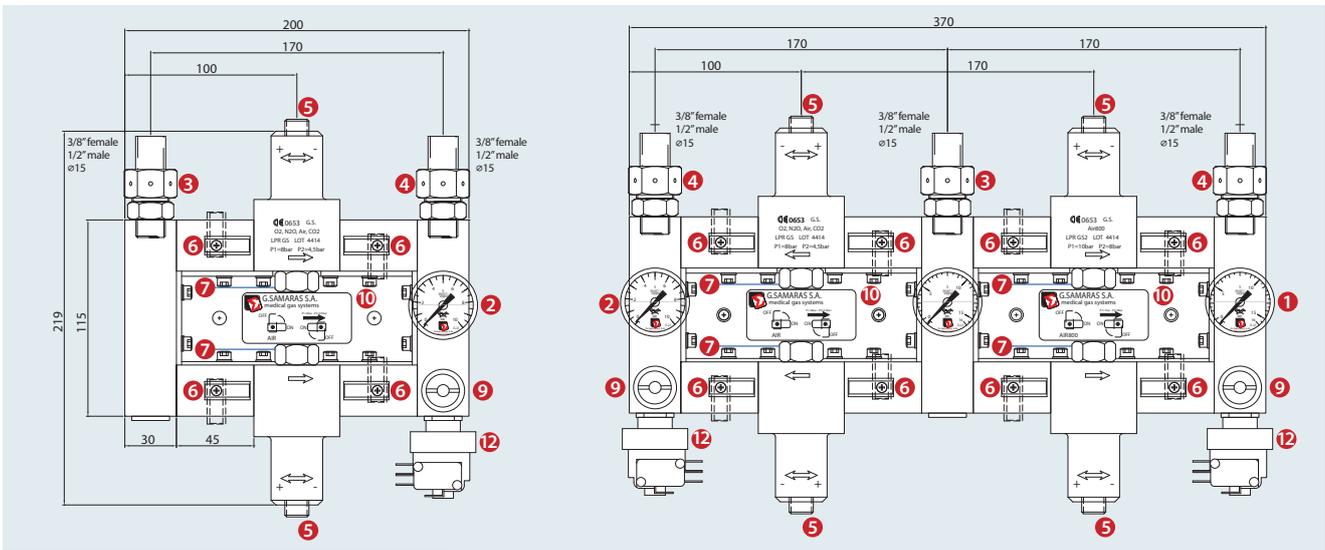
Low and middle pressure reducers

The Low and middle pressure reducers adjust the medical gases (O₂, N₂O, CO₂, Mix, N₂) and are made from strong aluminium alloy according to EN ISO 7396-1, HTM 02-01 and NFPA 99 standards. They combine:

- a) High efficiency (pressure / flowrate), b) Compact Design, c) Common Spare Parts, d) Easy service



LPR GS1-L4, LPR GS2-L8



LPR GS1D-L4S, LPR GS2D-L8S

LPR/GS3D-L4/85

3.4.3 Reducers

High pressure reducers up to 300bars (for different gases)

The High pressure reducers adjust the medical gases (O₂, N₂O, Air, CO₂) and also special gases (C₂H₂, H₂, CH₄, C₃H₈, LPG, O₂). They are made from hot forging process (brass) according to EN ISO 7396-1, HTM 02-01 and NFPA 99 standards.

They combine: **High efficiency (pressure / flowrate), Compact Design, Easy service**

Type of Reducer	Supply Pressure	Pressure Range	Outlet Pressure	Inlet-Outlet Connection	Flow Rate	
	max. bar	bar	bar		m ³ /h	l/min
HPR GS3-DL*	300	0 ... 40	8	G½"	75	1250
HPR GS4-DH*	300	0 ... 40	8	G½"	170	2830
HPR GS6-DL	300	0 ... 40	8	G½"	50	1800
HPR GS7-GS	300	0 ... 40	8	G¾" & G½"	200	3300

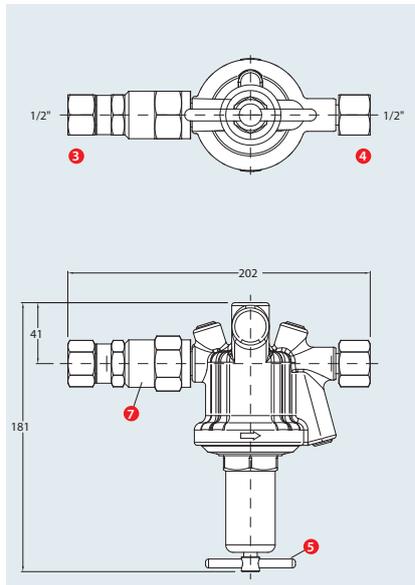
*Metal diaphragm up to 5.0 purity

INDEX

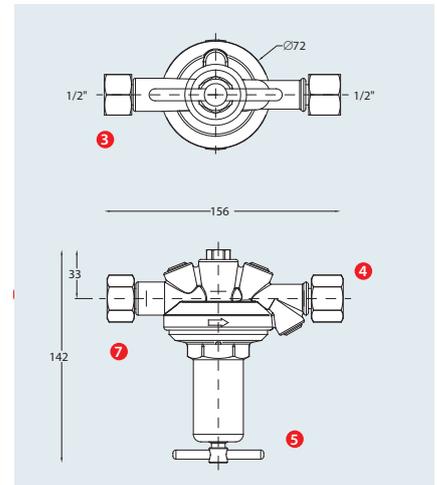
- 1 Manometer Ø40 0÷16bar
- 2 Manometer Ø40 0÷10bar
- 3 Inlet connection (high pressure)
- 4 Outlet connection (low pressure)
- 5 Adjustment screw
- 6 On/off plastic ball valve
- 7 Access plug to the filter and the pressure regulators valve

The index flow rates refer to Air. For other gases multiply the values for Air by the following factors:

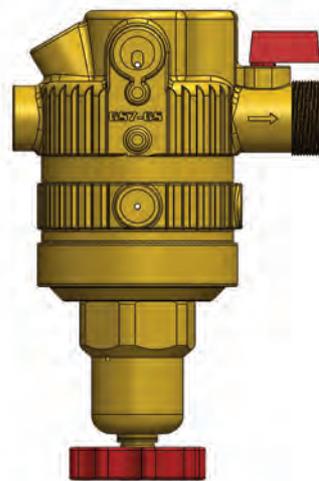
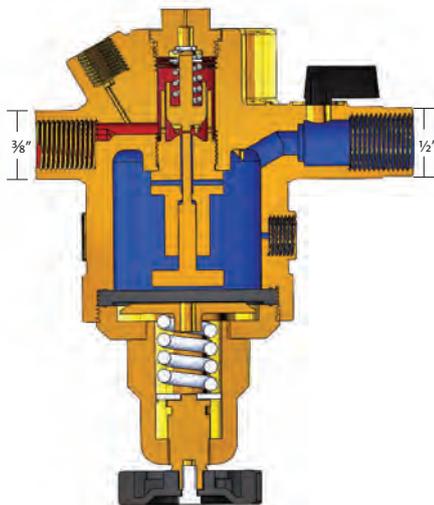
FLOW RATE CORRECTION FACTOR		
Type of Gas		Factor
Compressed Air	Air	1.00
Oxygen	O ₂	0.95
Nitrous Oxide	N ₂ O	0.80
Carbon Dioxide	CO ₂	0.81
Nitrogen	N ₂	1.02
Hydrogen	H ₂	3.80
Argon	Ar	0.85
Helium	He	2.70
Propane	C ₃ H ₈	0.80



High pressure regulator 170m³/h LPR GS4-DH



High pressure regulator 50/75m³/h LPR GS3-DL



High pressure regulator 200m³/h HPR GS7-GS

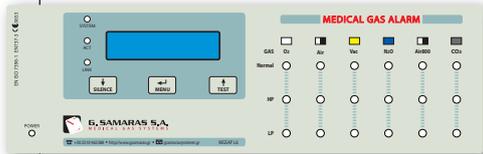
PRODUCT PORTFOLIO

3.5.1 MGSAP monitoring and alarm systems

The monitoring and alarm systems are used to provide all the important information to the control room. They indicate the pressure level of each gas (Low, Normal, High) whereas they can supply with information about a single medical station. Moreover, they are able to send useful data to a remote user.

Code	INPUTS				OUTPUTS					Communication				Clock	Interface	Battery	Extra		
MGSAP	Type	Analog	Digital	BUTTONS Silence / Test / Return	OUT	LED	operational LED	Display	Buzzer	RJ45/10T Base Ethernet	Modbus over TCP/IP	I ² C	RS232 or RS485	PWM		Web page	Optional input		
L6	6 GAS	6	12	3	6 digital outputs (sinking) Alarm	18	3	LCD 2x16	(Double Tone 800/1600 Hz) (Power PWM)	1	yes		1		1 (optional RTC)	yes	yes	2 digital I/O	
L9	9 GAS	6	8	4	8 MOSFET (C/NC/NO SPDT) Alarm	36*	4	graphic display	(Double Tone 800/1600 Hz) (Power PWM)	1	yes	2	1	1	RTC	yes	yes	NFC memory, SD memory	
	extension	4			10xRelay (C/NC/NO SPDT) Alarm	18*						1			RTC			temp. sensor	
Extra card for slots					Wi-fi, blue tooth, CANbus, DirectBus, RS485, LoRa, 3G modem, GPS, HDMI port														
*LED two state																			

3.5.1.1 Local Alarm panel - Single Station Alarm panel / MGSAP L6



Product Features:

- Microprocessor based design providing powerful functionality
- Up to 9 inputs (6 provided as standard and 3 as option), 4...20 mA range, 10 Bit resolution, for measurements of medical gas pressures, flow or other physical value(4...20 mA, two or three wire current loop transducers)
- Up to 12 independent digital inputs for monitoring of medical gas pressures(pressure switches, dry contacts for normal pressure level indication as well as high / low limit-alarm)
- For each measurement visual indicators (3 led, one green led for Normal, one red for High alarm and one red for Low

alarm) acc to HTM 2021 and EN ISO 7396-1

- For each measurement, an output is provided for remote alarm signalling (totally 6 outputs). Each Output is Open Drain as standard or optionally Relay (dry contacts C/NO)
- Three (3) additional independent inputs (4..20 mA, two or three wire current loop transducers) (option)
- Two (2) digital temperature sensors (range -10°C...+85°C, accuracy ±1°C), (option)
- One (1) digital air humidity/Dew point sensor (option)
- Built in LCD screen (2x16 characters) for displaying all measurements
- Three push buttons for viewing selection and other monitoring operations, temporary silence and test function provided
- Audible signal for High/Low alarm condition
- Alarm/event report and log file (up to 100 records)
- Power led indicator, and additional three status led indicators
- Built in RJ45 port for Ethernet connection (1 port, 10/100

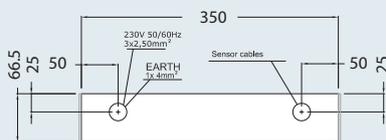


Base-T) for web interface (as standard)

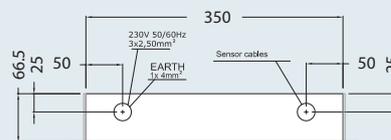
- All names ,units, alarm limits, analog/digital selection etc, are user programmable via user friendly web interface using any internet browser.
- MODBUS TCP/IP supported for connection to BMS systems (as standard)
- On line remote monitoring capability using internet via our portal www.medimote.gr (code protected access). BMS and email alerts provided
- On site firmware update/upgrade capability
- Ready to use, acc to customer specs (customers definitions required before shipping)
- CE declaration of conformity
- Real time clock capability (option)
- Power back up capability (option)
- 230 Vac 50/60 Hz built in power supply (double insulated transformer)

Žr.5.3

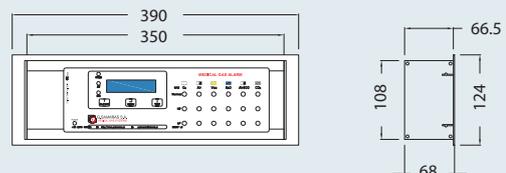
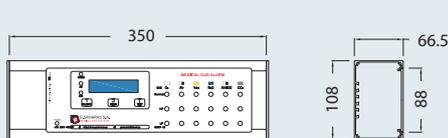
Žr.5.4



Alarm Panel MGSAP L6 (PG-EX) Wall mounted



Alarm Panel MGSAP L6 (PG-EX) Wall embedded



3.5.2 Sensors

The medical gas alarm panels are based on microprocessor technology to provide an alarm system capable of monitoring the complete medical gas services installed in a hospital and transfer all the information through internet (TCP/IP) connection to the control room.



Digital sensor



Analog sensors



DIN175301-803-A



M12/4p



MS-120 Oil vapor sensor

TYPE	Description	Range	Connection	Signal	Alarm limit		Comments
					Low	High	
DIGITAL PRESSURE SWITCH NO/NC							
PS D-2/6bar	all gases	4 bar	6 contacts		3,2 bar	4,8 bar	predefined ±20% operation pressure (minor adjustment possible using a mechanical screw)
PS D-4/9bar	all gases	5 bar	6 contacts		4 bar	6 bar	
PS D-9/15bar	all gases	8 bar	6 contacts		6,4 bar	9,6 bar	
PS D-1500mbar	Vac	/-1bar	6 contacts		400mbar		
ANALOG TRANSDUCERS 4-20mA							
PS A-1bar	Vac	-1 to 0 bar	M12/4p	4-20mA	User programmable	Accuracy F.S.±0,5%	
PS A-16bar	all gases	0-16 bar	DIN175301-803-A	4-20mA			
PS A-16-C bar	all gases	0-16 bar	M12/4p	4-20mA			
PS A-20bar	all gases	0-20 bar	DIN175301-803-A /1mt cable	4-20mA			
PS A-25bar	all gases	0-25 bar	M12/4p	4-20mA			
PS A-250bar	all gases	0-250 bar	DIN175301-803-A	4-20mA			
DIFFERENTIAL ANALOG TRANSDUCERS							
PS DA-1bar	all gases	0-1 bar		4-20mA			

FLOW SENSORS							
ASFL 1/4	Consumption sensor with integrated measuring section	90.1m³/h	1/4"	4-20mA	User programmable	Accuracy ±1.5% of M.V., ±0.05% of F.S. On request	Žr. 5.2 Tikslumas <=+/- 0.05% FS
ASFL 1/2		90m³/h	1/2"	4-20mA			
ASFL 3/4		170m³/h	3/4"	4-20mA			
ASFL 1		290m³/h	1"	4-20mA			
ASFL 1¼		480m³/h	1¼"	4-20mA			
ASFL 1½		552m³/h	1½"	4-20mA			
ASFL 2		900m³/h	2"	4-20mA			
ASFL 300		18m³/h	1/2"	4-20mA			
ASFL 1200	72m³/h	1/2"	4-20mA				

TYPE	Description	Range	Signal	Comments
TEMPERATURE SENSORS				
ASTP	Temperature sensor	-50° to +100°C	4-20mA	<0.5% with possible calibration
ASDT	Temperature sensor	-10° to +85°C	I²C	Accuracy ±1°C

NODE	Gas	Type	I/O	Limits
DEW POINT				
D	Dewpoint	ESHM1-M5	I2C	0~100%
	Temperature	ESHM1-M5	I2C	-20~+125 C°
	Pressure	ESHM1-M5	I2C	0~4 bar

TYPE	Description	Range	Signal	Comments
DEW POINT / RELATIVE HUMIDITY SENSORS				
ASDP -60°C	Dew Point sensor	-60° to +60°C	4-20mA	<0.5% with possible calibration
ASDP -40°C	Dew Point sensor	-40° to +60°C	4-20mA	
ASRH	Relative humidity sensor	0-100%	4-20mA	
ASDDP	Dew Point / Relative humidity / Temperature	-40° to +60°C DP	I²C	Accuracy 0.1% RH @ 0-10%, Temperature ±0.2°C

3.5.3 Remote Management System

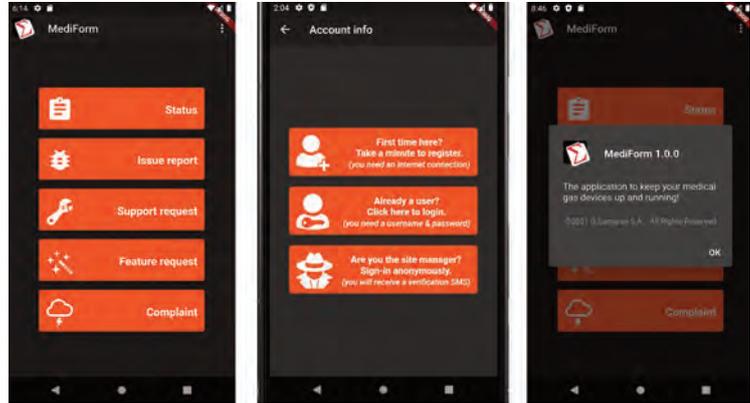


IOT MEDIFORM

MEDIFORM application is used by clients to register support requests, create problem reports, ask for new features or submit a complaint form.

Each ticket is automatically generated and assigned to our technical or support engineers so you can track the status on each stage.

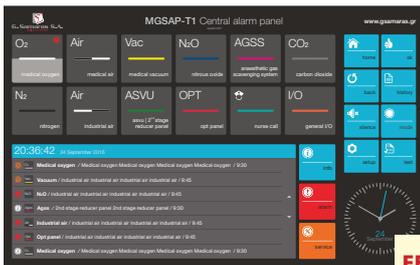
End-users can submit a brief description of the request and attach photos (e.g. of a machine that has a problem), thus creating a transparent channel for technical support information flow.



i MEDITAPP

G. Samaras has created a local surveillance & control system, Meditapp. The hospital using the service medittapp can have a central monitoring / reference point, where through a touch screen can monitor installed systems & alarms.

Touch panel pc which controls and monitors all MEDICAL GAS SOLUTIONS of the hospital. This system enables the user to have real time status of all medical gas plants and provides alerts in cases of faults and service that should be done. Buttons such as set-up and history allows the user to adjust the system according to the local needs and track the recent events. Through a step by step procedure, it might be checked the operation status of each system and of each single major component.

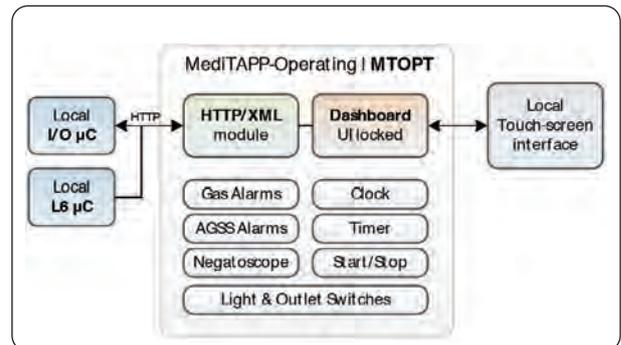
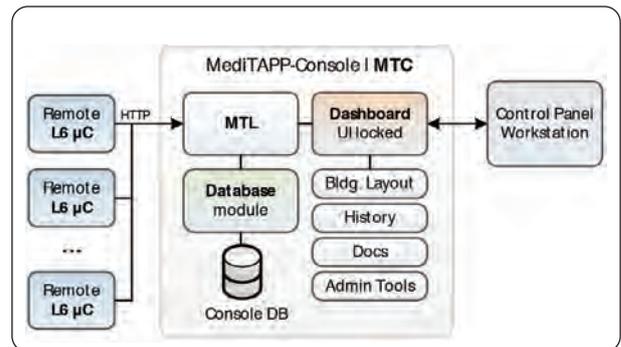
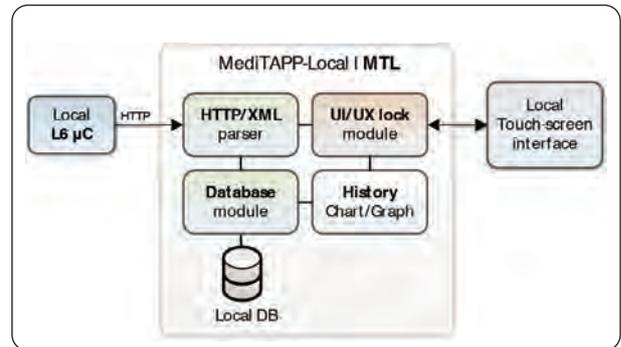


FEATURES:

- Installation & operation locally at the hospital premises
- Touch screen with specially designed software
- Control I/O of remote units

MAIN ADVANTAGES:

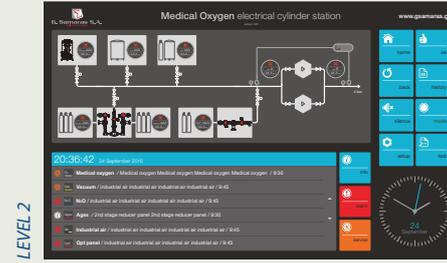
- Ease of cleaning
- Web interphase
- Upgrade options
- Multilingual adjustments
- Search history and record
- Centralized monitoring for faster decisions
- Fully compatible to every user
- Graphs and situational awareness
- Configurable and flexible to every medical gas solution
- Online manuals
- Remote access on a large scale of info



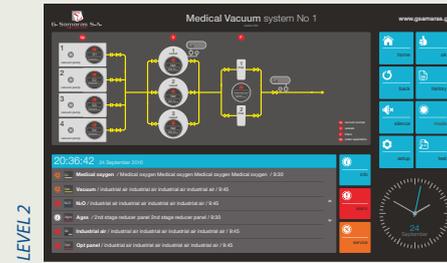
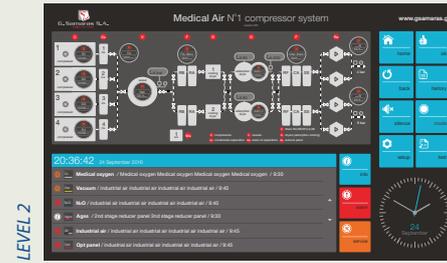
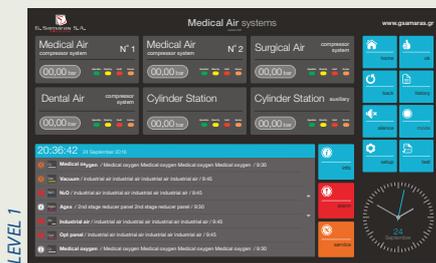
PRODUCT PORTFOLIO

Alarm Systems

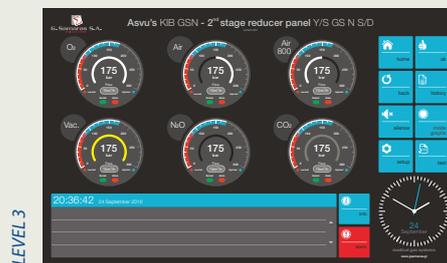
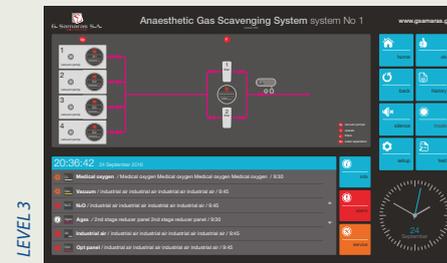
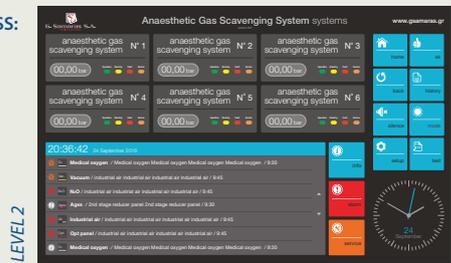
O₂/N₂O/CO₂/N₂/Industrial Air:



Medical Air / Medical Vacuum:



AGSS:



OPT:





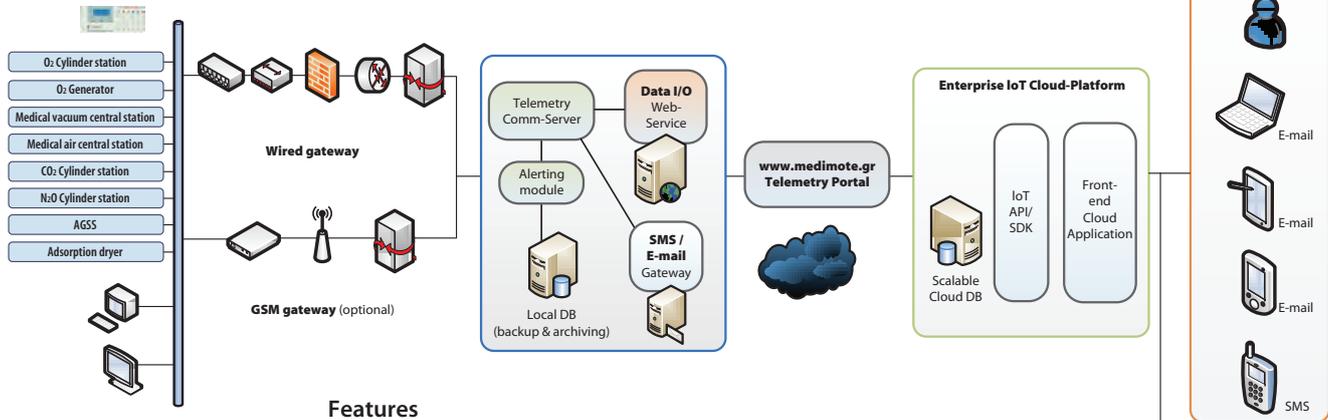
G. Samaras telemetry system can be used to transfer data captured remotely. Any analogue signal, usually from a transducer, or digital signal can be interfaced to the hardware. Also, digital information can be transferred through Modbus and the telemetry system digital (GPRS) to the Web Interface.

Remote monitoring has become an essential part in everyday life. The ability to monitor, control and manage remote devices is an important factor for companies that can't afford equipment failure.

Remote information is transmitted via the HTTP POST protocol to a HTTP server or via TCP/UDP to a server. The data are collected in a database and the readings for each individual station is displayed through the portal. Data is sent at a pre-defined transmission interval via the User Interface at initial installation or from the web application remotely.

If sms alerts have been configured, a registered engineer will receive an sms/e-mail if a threshold/criteria is monitored.

MEDIMOTE II Portal medical gas devices remote monitoring

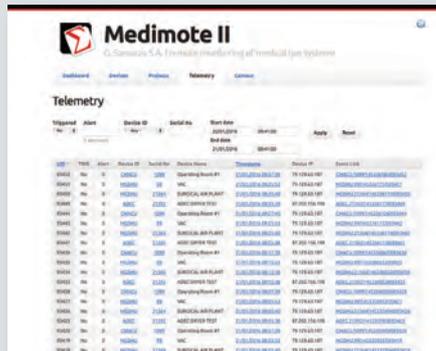


Features

- ▶ Real time monitor of each project (hospital, clinic, department)
- ▶ Real time monitor of each device (cylinder station, compressed air station, dryer, vacuum station, agss, O₂ generator, asvu, second stage reducer panels)
- ▶ **Receive alerts (SMS/email)** Žr. 2.17, 5.5, 5.6
- ▶ Get graphs of each device's operation
- ▶ Easy navigation
- ▶ Operation 365 / 24 / 7



www.medimote.gr



Medimote App is a mobile agent used for direct monitoring of your medical gases equipment, which are registered to the Medimote Telemetry Platform provided by G. Samaras SA. Connect now to your installed medical gas devices, and get the power of telemetry at your fingertips!

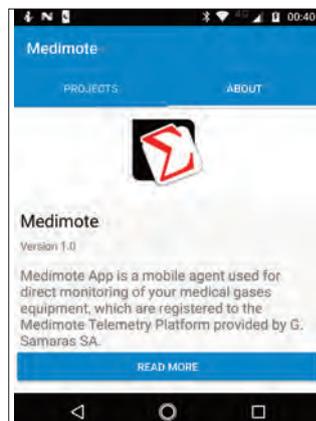
Features:

- Overview of registered projects & clients
- List of installed devices
- Telemetry of medical gas properties (e.g. air pressure, temperature etc.)
- View status of medical gas systems (e.g. compressor standby, run-time etc.)
- Alerts for critical measurements



Žr. 2.17, 5,5, 5.6
Telefono programėlės arba kompiuteryje.

Real time information, graphics and status of each plant through Medimote portal (www.medimote.gr).





MEDINSPECT

G. Samaras has created an inspection & maintenance telemetry system, MedInspect. Through web portal G. Samaras can keep up reports, management files and portal of inspections.

FEATURES:

- Mobile App for recording technicians' visits
- Electronic arrival / departure of the technician's
- Electronic form for registration & storage of Technical Visit Report (CTV) or Fault Report (AB)
- Validation of works with electronic Signature

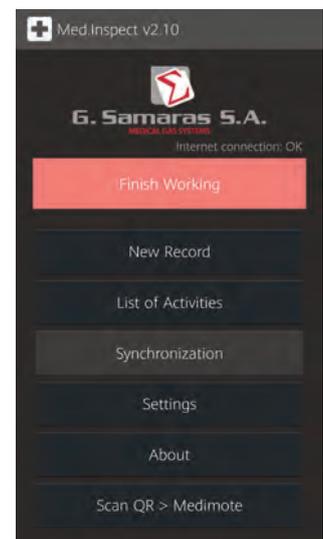
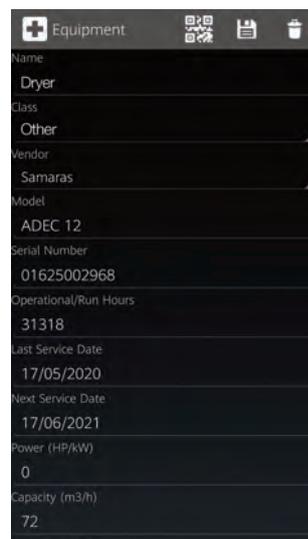
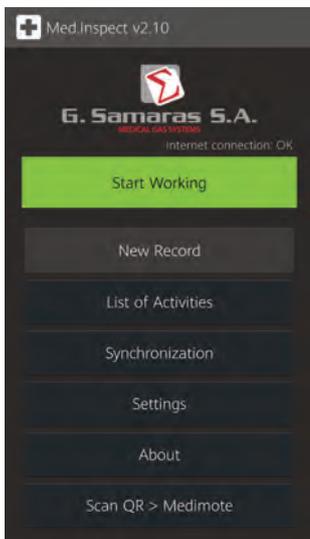
Med-Inspect Portal
Medical Inspection & service field-work database

svc-Air Compressor-Samaras--GFDHH236-site17-1545251700

Equipment: Air Compressor-Samaras--GFDHH236-site17-site17
Last Service: 29/11/2018
Date: 19/12/2018 - 22:35
Run/Op Hours: 70,00 hrs
ABT: Samaras SA

Maintenance Form

AIR COMPRESSOR MAINTENANCE CHECKLIST	
• Visually Inspect Air Compressor	<input checked="" type="checkbox"/>
• Check and Log Drive Motor Bearing Temps	<input checked="" type="checkbox"/>
• Check and Log Fan Motor Bearing Temps	<input checked="" type="checkbox"/>
• Inspect Coupler, Hub and Shaft Seal	<input checked="" type="checkbox"/>
• Check and Log Oil Cooler Temps	<input checked="" type="checkbox"/>
• Check and Log After Cooler Temps	<input checked="" type="checkbox"/>
• Inspect Scavenge Line Check Valve	<input checked="" type="checkbox"/>
• Check Drive Belt condition if applicable	<input checked="" type="checkbox"/>
• Log load and unload pressure settings	<input checked="" type="checkbox"/>
• Check moisture trap or autodrain	<input checked="" type="checkbox"/>
• Perform An Oil Sample Analysis	<input checked="" type="checkbox"/>
• Change Oil Filter	<input checked="" type="checkbox"/>
• Blow Out Coolers	<input checked="" type="checkbox"/>
• Change Air Filter	<input checked="" type="checkbox"/>
• Change Oil/Water Separator	<input checked="" type="checkbox"/>
• Check and log ambient condition	<input checked="" type="checkbox"/>
• Change Oil Separator O-Ring if necessary	<input checked="" type="checkbox"/>
• Change Oil if necessary	<input checked="" type="checkbox"/>



Homepage