

Compressed Air Filtration

Ultrapure 2000 Standard / Superplus Mini / Midi

Types 0005-0100

MAIN FEATURES & BENEFITS

- Breathing air unit with adsorption dryer, CO-, CO₂-, NO_x- and SO₂ removal as well as prefilter, afterfilter and automatic condensate drain
- Indications for filter elements and desiccant/ purifier cartridges replacement
- Version Superplus with capacity control
- Version Superplus with Economizer Function, online calculation of optimum exchange point of filter elements by continuous evaluation of energy cost versus cost of replacement filter element
- Multifunction unit - all moving parts and all electronic components integrated in a function block, therefore easy and efficient maintenance



Ultrapure 2000 Standard

INDUSTRIES



- Medical application



- Paint and finish industry



- Machine building industry and plant engineering / construction

PRODUCT DESCRIPTION

The Ultrapure 2000 breathing air systems are purification units based on adsorption dryers Ultrapac® 2000 to supply breathing air in excess of all relevant international standards and medical prescriptions.

The purification consists of several stages:

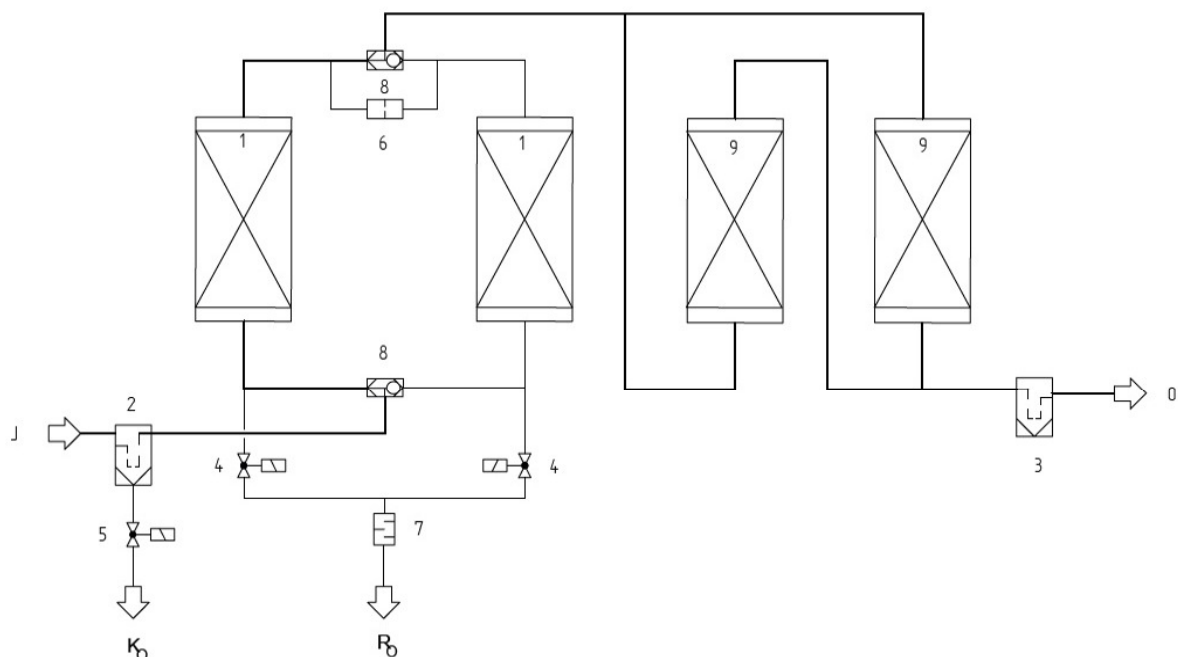
Compressed air is led through the inlet of the unit (J) and across the pre filter (2). At this stage, the air is cleaned from particles and condensate. The condensate is removed via a membrane condensate drain (5). The following desiccant dryer reduces the water vapour content of the compressed air down to a pressure dew point of -40°C (equivalent to a remaining water content of 0.11 g/m^3). In the following purification stages (SP, AK, OX) (9) the content of CO_2 is adsorbed to a level far below 500 ppm the content of SO_2 below 1 ppm and the content of NO_x below 2 ppm. In the AK stage oil vapours, hydrocarbons, taste and odours are adsorbed to a level far below 0.003 mg/m^3 .

In the OX stage a catalyst converts CO to CO_2 and thereby reduces the carbon monoxide level down below 5 ppm.

The final particle filter (3) removes all particles which might be carried over from the adsorption and /or catalyst stages.

The Ultrapure 2000 is designed and developed for the following applications:

- **Breathing air:**
Removal of oil and particles as well as smells and odours, CO , CO_2 , SO_2 and NO_x
- **Laser units:**
Purification of cutting gas ore purging gas
- **Downstream equipment:**
Creation of oil and particle free compressed air for various downstream equipment applications, e.g. packaging machinery



Technical Data Sheet



PRODUCT SPECIFICATIONS

Features Ultrapure 2000 series	Benefits
Purification package including adsorption dryer, CO-, CO ₂ -, NO _x - and SO ₂ removal, pre-, afterfilter and automatic condensate drain	Turnkey System, no additional installation cost; all components from one hand, therefore perfect technical match
Guaranteed and validated separation efficiency	Breathing air quality in excess of all relevant international standards, as e.g. Pharmacopée Européenne; DIN EN 12021; DIN EN ISO 7396-1; BS4275; ANSI/CGA G.7.1; Z180, 1M85; AS2299-1979; NZL5813
Desiccant in cartridges	Easy storage, transport and Installation; optimum fixation of desiccant; no risk of fluidizing of desiccant
Compact, space saving design	Installation in smallest spaces, possible also as retrofit
Component exchange display	High operating safety, due to calculation of optimum exchange point for filter elements and desiccant cartridges.
Unique Multifunction Block	All moving parts and all electronic components integrated in a function block, therefore easy and efficient maintenance

Features Ultrapure 2000 Superplus	Benefits
Intermittent operation standard	Link between dryer and compressor possible on central applications, therefore saving of regeneration air
Capacity control	Adjustment of adsorption cycles to the actual inlet water load, therefore saving of regeneration air and reduction of operating cost
Self-Diagnosis-System	Sensor-controlled monitoring of regeneration air flow, therefore without-gap-monitoring of dryer functions and of system pressure
Text Display	Display of all operating status, of fault indication and maintenance intervals in clear text messages
Info-Channel	Interface for transmission of alarm- and maintenance messages
Economizer-Function	Online calculation of optimum exchange point of filter elements by continuous evaluation of energy cost versus cost of replacement filter element

SIZING / TECHNICAL DATA

Ultrapure 2000	Volume flow in m ³ /h (1 bar, 20°C)*	Regeneration air losses (average) m ³ /h (1 bar, 20°C)	Volume flow out (min.) m ³ /h (1 bar, 20°C)	Pressure loss initial mbar	Prefilter MF	Afterfilter FF	Quantity of cartridges
0005	5	0,85	3,95	65	02/05	02/05	2
0010	10	1,70	7,90	95	03/05	03/05	4
0015	15	2,55	11,85	115	04/10	04/10	6
0025	25	4,25	19,75	250	06/10	06/10	10
0035	35	5,95	27,65	75	04/20	04/20	4
0050	50	8,50	39,50	100	05/20	05/20	6
0065	65	11,05	51,35	125	05/25	05/25	8
0080	80	13,60	63,20	170	07/25	07/25	10
0100	100	17,00	79,00	250	07/25	07/25	12

*Related to 1 bar (abs) and 20 °C at intake of compressor and 7 bar (g) and 35 °C inlet temperature

Sizing

f	4 bar(g)	5 bar(g)	6 bar(g)	7 bar(g)	8 bar(g)	9 bar(g)	10 bar(g)	11 bar(g)	12 bar(g)	13 bar(g)	14 bar(g)	15 bar(g)	16 bar(g)
25°C	0.69	0.82	0.96	1.10	1,24	1,38	1,50	1,50	1,50	1,50	1,50	1,50	1,50
30°C	0.69	0.82	0.96	1.10	1,24	1,38	1,50	1,50	1,50	1,50	1,50	1,50	1,50
35°C	0.63	0.75	0.88	1.00	1,13	1,26	1,38	1,50	1,50	1,50	1,50	1,50	1,50
40°C	0.48	0.58	0.68	0,77	0,87	0,96	1,06	1,16	1,25	1,35	1,45	1,50	1,50
45°C	0.38	0.45	0.53	0,60	0,68	0,75	0,83	0,90	0,98	1,05	1,13	1,20	1,28
50°C	0.30	0.36	0.42	0,48	0,54	0,60	0,66	0,72	0,78	0,84	0,90	0,96	1,02

$$\dot{V}_{\text{corr}} = \frac{\dot{V}_{\text{nom}}}{f}$$

Example: $\dot{V}_{\text{nom}} = 22 \text{ m}^3/\text{h}$, Inlet temperature = 30°C, Operating pressure = 10 bar (g)

$$\dot{V}_{\text{corr}} = \frac{22 \text{ m}^3/\text{h}}{1,50} = 14,66 \text{ m}^3/\text{h}$$

Calculated dryer size: Type 0015

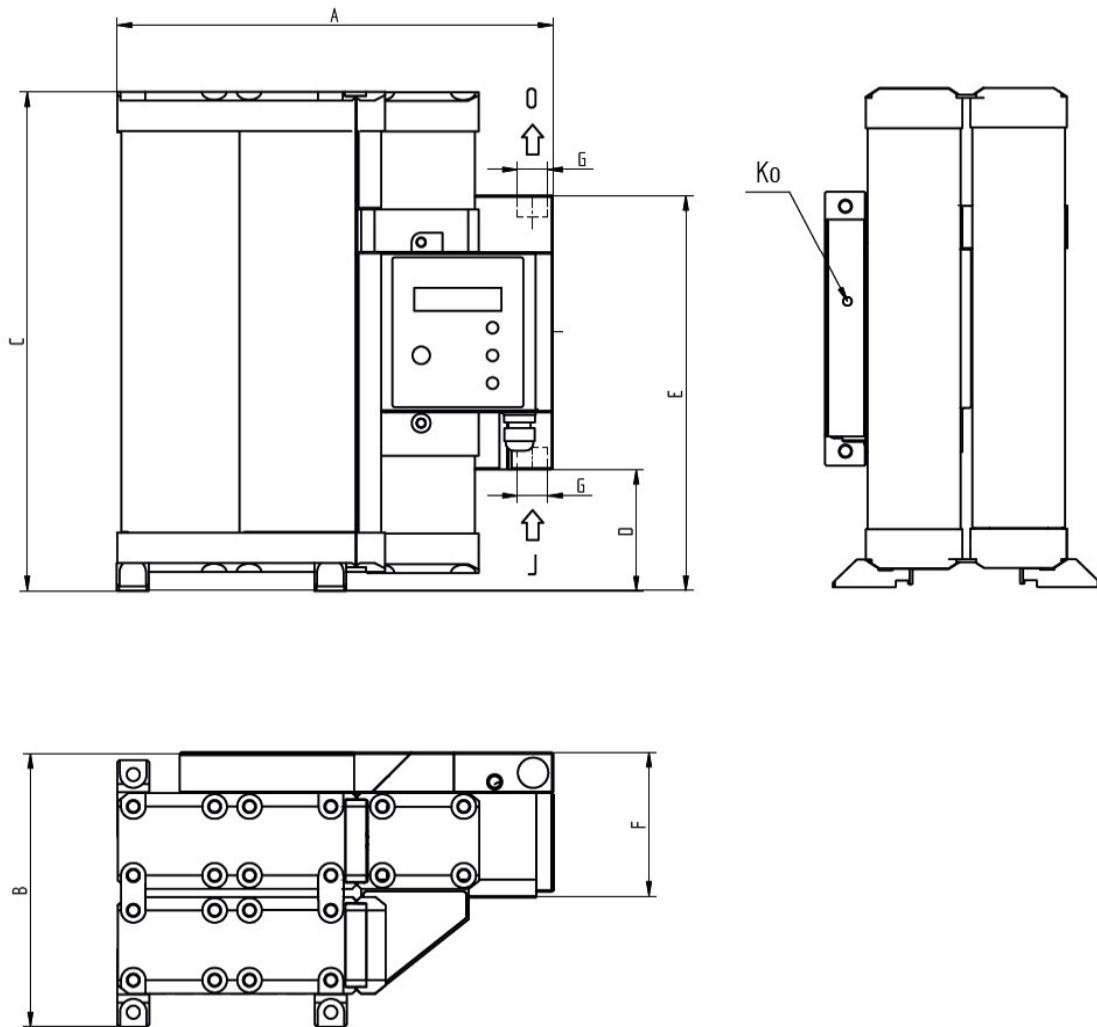
Technical Data		Air quality related to standard inlet conditions:	
Power consumption:	230 V/50 -60 Hz AC; 110 V/50 -60 Hz AC 24 V DC; 24 V AC on request	Particles	Class 2: ISO 8573-1
Power consumption:	approx. 4 W	Residual oil content	< 0,01 mg/m ³ (class 1: ISO 8573-1)
Operating pressure:	min. 4 bar, max. 16 bar	Oil vapour and hydrocarbons	< 0,003 mg/m ³ (class 2: ISO 8573-1)
Medium:	Compressed air	Water vapours	PDP -40°C (= 0,11 g/m ³) (class 2: ISO 8573-1)
Medium temperature:	min. 5 °C, max. 50 °C	CO ₂	< 500 ppm
Ambient temperature:	min. 4 °C, max. 50 °C	CO	< 5 ppm
Compressed air consumption:	17% of the rated flow, in average	SO ₂	< 1 ppm
Declaration of conformity:	acc. to 2014/35/EU and 2014/68/EU	NO _x	< 2 ppm
		Taste and odours	taste and odour free

Technical Data Sheet



DIMENSIONS / MATERIALS

Ultrapure 2000 Standard / Superplus Mini



Materials	
Extruded Profiles:	Anodized Aluminium
Adsorber and Filter lids:	Glass fiber enforced polyamide

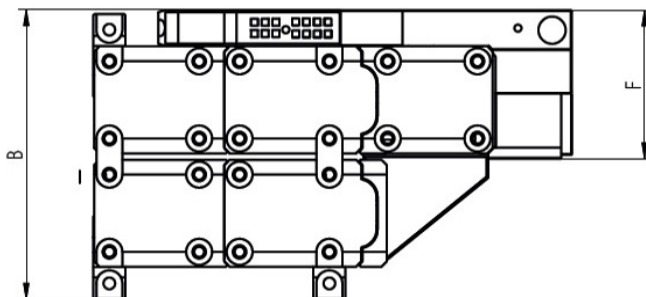
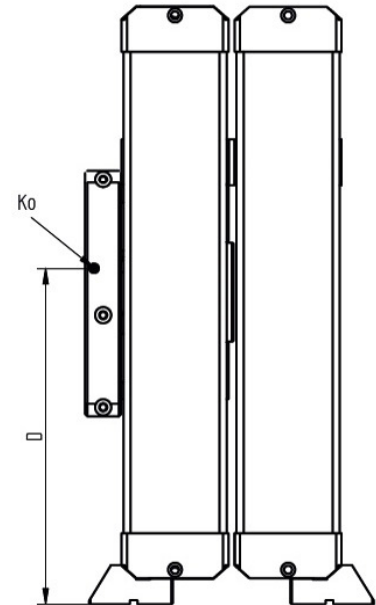
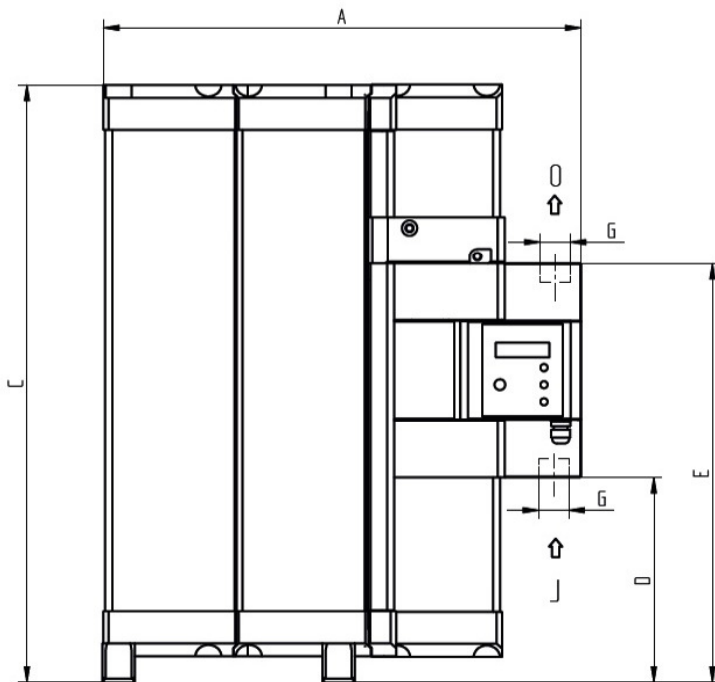
Dimensions							
Type	G "	A mm	B mm	C mm	D mm	E mm	F mm
0005	G 1/2	300	189	343	84	272	100
0010	G 1/2	300	189	591	208	396	100
0015	G 1/2	300	189	853	339	527	100
0025	G 1/2	300	189	1377	601	788	100

Technical Data Sheet



DIMENSIONS / MATERIALS

Ultrapure 2000 Standard / Superplus Midi



Materials	
Extruded Profiles:	Anodized Aluminium
Adsorber and Filter lids:	Glass fiber enforced polyamide

Dimensions							
Type	G "	A mm	B mm	C mm	D mm	E mm	F mm
0035	G 1	532	322	665	230	465	165
0050	G 1	532	322	920	355	595	165
0065	G 1	532	322	1170	485	720	165
0080	G 1	532	322	1420	606	845	165
0100	G 1	532	322	1670	730	970	165

Technical Data Sheet



Dryer Systems

Breathing Air Units

Ultrapure

ALG 80 S - 375 S

MAIN FEATURES & BENEFITS

- Breathing Air System with adsorption dryer, CO - CO₂ – NO_x – and SO₂ - removal
- Two pre filters incl. UltraPleat® M und S and UltraPleat® S as after filter
- All pre filters with electronic level-controlled condensate drain incl. function control and alarm message
- Guaranteed and validated separation efficiency
- Optimal adaptation and generous dimensioning of the components, long life-times of the processing stages, low differential pressure of the unit; result: low operation costs
- All units in cabinet construction
- 6 sizes available, matched to the compressor flows
- Robust design with welded steel vessels and galvanized pipelines and press fittings with aerodynamic and leakage-proof design
- Service-friendly design of shuttle valves and solenoid valves for fast replacement of wear parts



ALG 80 S - 375 S

INDUSTRIES



- Medical application



- Paint and finish industry



- Machine building industry and plant engineering / construction

PRODUCT DESCRIPTION

At the inlet (J) compressed air reaches a two stage filter combination (6,7). In this stage the air is separated from particles and condensate. The condensate is drained off the system via the electronic condensate drain (12).

The following desiccant dryer reduces the water vapour content of the compressed air down to a pressure dew point of $-40\text{ }^{\circ}\text{C}$ (equivalent to a remaining water content of $0,11\text{ g/m}^3$). Further the CO_2 content is reduced below 500 ppm and the content of SO_2 is reduced to a level below 1 ppm and NO_x below 2 ppm.

Oil vapour, hydrocarbon, tastes and odours are held back in the AK-stage up to a residual content below $0,003\text{ mg/m}^3$.

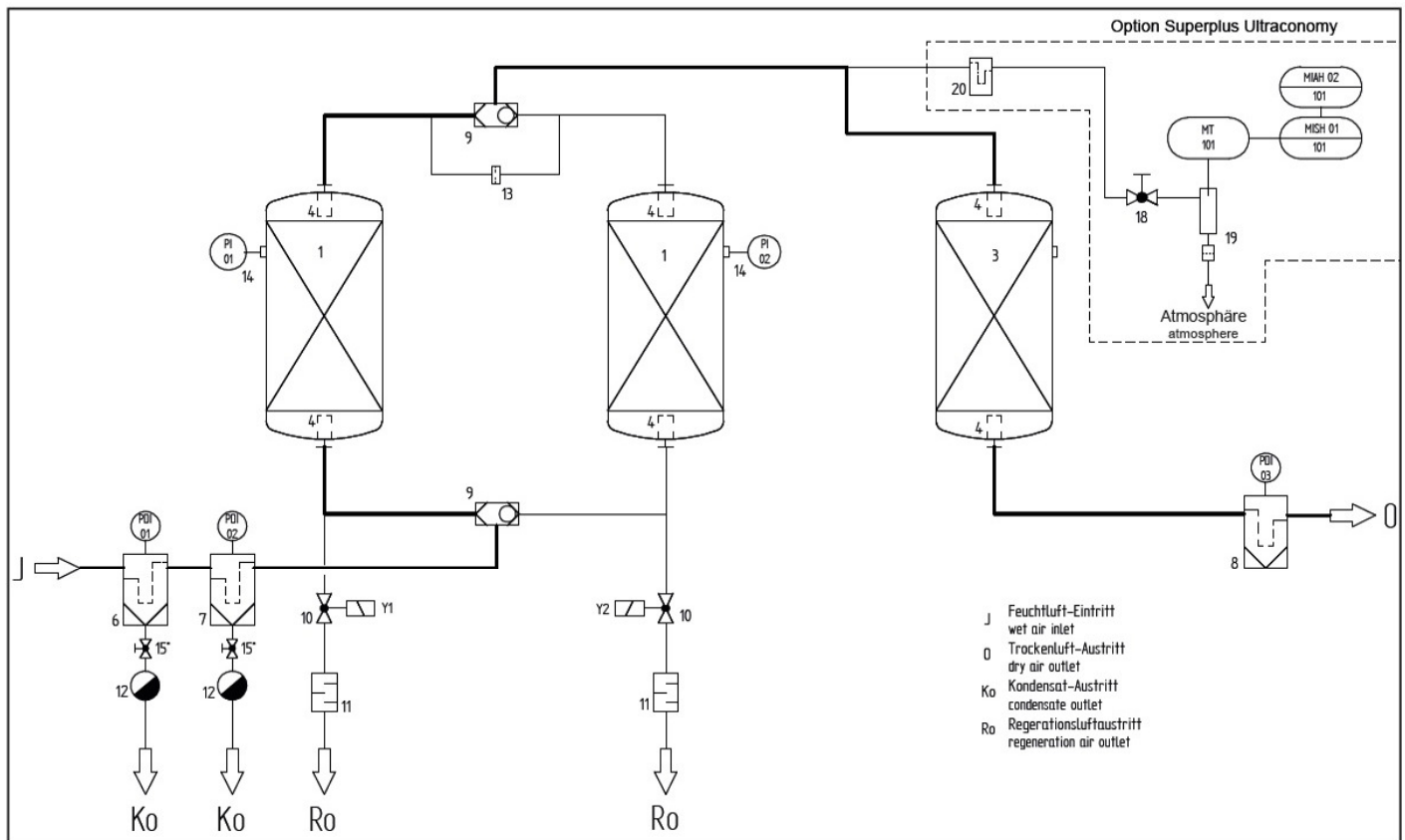
In the OX-stage the existing CO is transformed into CO_2 through a catalytic reaction. In this way the CO content is reduced to $< 5\text{ ppm}$.

In the after filter (dust filter) possible abrasion of the absorber is removed.

Typical applications for the breathing air units are:

- Breathing air:

Removal of oil and particles as well as tastes and odours, CO, CO_2 , SO_2 and NO_x



Technical Data Sheet



PRODUCT SPECIFICATIONS

Features:	Benefits:
Breathing air package incl. absorption dryer, CO -, CO ₂ -, NOx - and SO ₂ - removal	Turnkey system, no additional installation required, all components from one hand, technically perfectly matched to each other
Two pre filters incl. UltraPleat® M and S and UltraPleat® S as after filter	High oil- and water aerosol retention efficiency on pre filter and high particulate retention efficiency on after filter at very low differential pressure
All prefilters with electronic, level controlled condensate drain incl. function control and alarm message	No compressed air losses due to condensate removal, therefore reduction of operating cost
Guaranteed and validated separation efficiency	Breathing air quality in compliance with all relevant international standards, e.g. Pharmacopée Européenne; DIN EN 12021; DIN EN ISO 7396-1; BS4275; ANSI/CGA G.7.1; Z180, 1 M85; AS2299-1979; NZL5813
All dryers are in cabinet construction	Optimum protection against mechanical damage and against dirt
Display of the operating status by LED	High operating safety, since all operating status can be detected easily at any time
Intermittend operation standard	Link between dryer and compressor possible on central applications, therefore saving of compressed air
Optimal adaptation and generous dimensioning of the components	Long life-times of the processing stages, low differential pressure of the unit; result: low operation costs
Welded steel vessels and galvanized pipelines and press fittings	Robust design with aerodynamic and leakage-proof design
Service-friendly design of shuttle valves	Fast replacement of wear parts ensure low service and maintenance cost and reduced downtime
Superplus Version including dewpoint dependent capacity control and text display	Saving of energy and operational cost due to adaption of the purge air consumption to the actual operating conditions. Indication of current dewpoint and function status as well as alarm and service messages on LCD text display in clear text ensures high operating safety of the adsorption dryer.

Technical Data	
Operating pressure:	min. 4 bar (g) / max. 16 bar (g)
Ambient temperature:	min. +4°C / max. +50°C
Medium temperature:	max. +50°C
Medium:	Compressed air
Power supply:	230 V or 115 V AC / 50 – 60 Hz or 24 V DC
Power consumption:	approx. 40 W
Declaration of Conformity	
Types 80 S - 150 S:	acc. to Directive 2014/35/EU
Types 225 S - 375 S:	acc. to PED 2014/68/EU
Pressure vessel – design, manufacture, testing	
Adsorber:	acc. to Directive 2014/29/EU
Filter:	acc. to PED 2014/68/EU

Technical Data Sheet



PRODUCT SPECIFICATIONS

ALG	Nominal flow inlet m ³ /h (1 bar, 20°C)*	Regeneration air flow average m ³ /h (1 bar, 20°C)	Air outlet (min.) m ³ /h (1 bar, 20°C)	Pressure drop new mbar	Prefilter (Afterfilter) M, S (S)
80 S	80	16	65,2	145	0210
100 S	100	20	81,6	175	0210
150 S	150	30	121,7	275	0210
225 S	225	45	183,2	175	0450
300 S	300	60	244,7	225	0450
375 S	375	75	306,1	295	0450

* related to 1 bar (abs) and 20 °C at intake of compressor and 7 bar (g) and 35 °C inlet temperature

residual content of impurity at standard condition at the entry	
Particle	class 1-2 : ISO 8573-1
Oil (liquid phase)	< 0,01 mg/m ³ (class 1, ISO 8573-1)
Oil vapour and hydrocarbon	< 0,003 mg/m ³ (class 1, ISO 8573-1)
Water vapour	DTP -40°C (= 0,11 g/m ³) (class 2, ISO 8573-1)
CO ₂	< 500 ppm
CO	< 5 ppm
SO ₂	< 1 ppm
NOx	< 2 ppm
tastes and odours	tasteless and odourless

SIZING

Operating pressure bar (ü)	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor overpressure (fp)	0,63	0,75	0,88	1,0	1,12	1,25	1,38	1,50	1,63	1,75	1,88	2,0	2,13

Entrance temperature °C	20	25	30	35	40	45	50
Correction value temperature (f _T)	1,1	1,1	1,1	1,0	0,8	0,7	0,5

Example:

$\dot{V}_{nom} = 100 \text{ m}^3/\text{h}$, inlet temperature = 30°C, operating pressure = 10 bar (g),

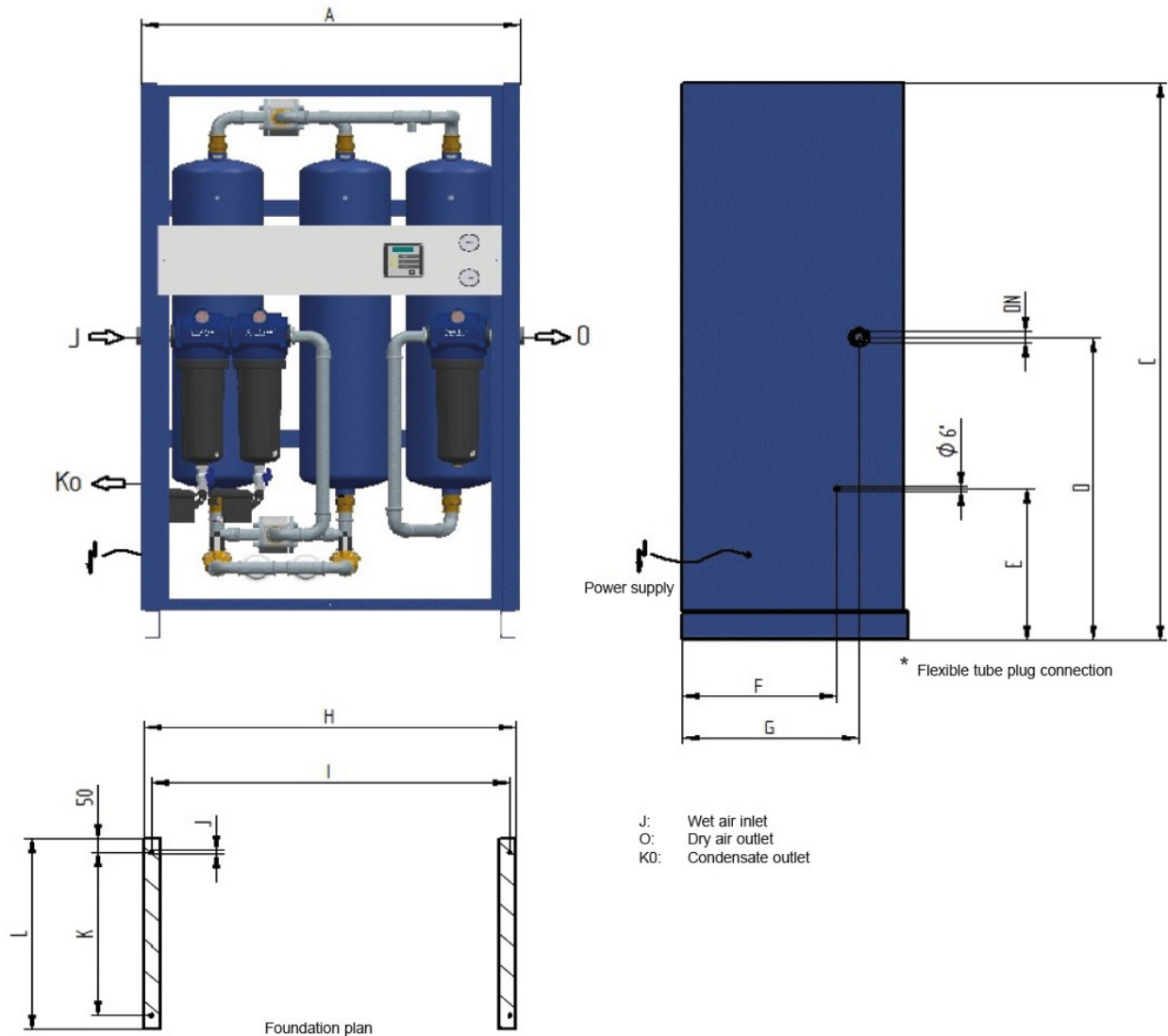
$$\dot{V}_{kor} = \frac{\dot{V}_{nom}}{f} = \frac{100 \text{ m}^3/\text{h}}{1,38 * 1,1} = 65,8 \text{ m}^3/\text{h}$$

Calculated dryer size:
ALG, type 80 S

Technical Data Sheet



DIMENSIONS



Type	DN "	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	Weight kg
80 S	G ¾	940	460	1610	800	415	315	340	920	880	13	360	460	199
100 S	G 1	940	460	1610	800	415	315	340	920	880	13	360	460	240
150 S	G 1	1140	680	1980	1075	535	465	535	1120	1080	13	580	680	288
225 S	G 1½	1140	680	1980	1075	535	465	535	1120	1080	13	580	680	420
300 S	G 1½	1580	770	2190	1250	660	530	620	1560	1520	13	670	770	530
375 S	G 1½	1580	770	2190	1250	660	530	620	1560	1520	13	670	770	795

Technical Data Sheet

