

Breathing Air Dryer - Industrial Volume Flow

UDPS3-BI



Applications

- ✓ Breathing air supply to EN 12021 for industrial use
- ✓ Compressed air breathing apparatus and airline respirators
- ✓ Spray painting and surface coating booths
- ✓ Automotive workshops and production
- ✓ Laboratories
- ✓ Petrochemical plant and refineries
- ✓ General manufacturing
- ✓ Food and beverage processing
- ✓ General industrial compressed air systems

Description

The UDPS3-BI is a heatless adsorption dryer for compressed air that people breathe, rated at 25 m³/h. It dries to a pressure dew point of -40 °C and, with its catalyst and activated carbon beds working alongside the desiccant, holds carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxides and sulphur dioxide below the limits set by EN 12021 for industrial breathing air. A super fine pre-filter protects the desiccant from solid and liquid contaminants and a general purpose after-filter keeps desiccant and carbon dust out of the downstream system, both flanged straight to the valve block so the unit needs no interconnecting pipework. The C1 processor control shows operating state, faults, run times and service messages on a two-line plain text display, and provides a compressor synchronising contact that lowers regeneration air consumption. The unit runs at 4 to 16 bar(g) and inlet temperatures from +2 °C to +50 °C, connects at G 3/8, and complies with the Pressure Equipment Directive 2014/68/EU.

Features

- ✓ Nominal flow 25 m³/h at 7 bar
- ✓ Operating range 4 to 16 bar(g), +2 °C to +50 °C
- ✓ Pressure dew point -40 °C standard, -15 °C and -70 °C available
- ✓ Certified to EN 12021 for industrial breathing air
- ✓ Removes CO, CO₂, hydrocarbons, nitrogen oxides and SO₂ as well as moisture
- ✓ Desiccant, catalyst and activated carbon beds in a single unit
- ✓ Super fine pre-filter and general purpose after-filter fitted as standard
- ✓ Filters flanged directly to the valve block, no interconnecting pipework
- ✓ Valves and flow paths integrated in aluminium valve blocks
- ✓ Four individually controlled pilot-operated diaphragm valves
- ✓ Expansion silencer fitted to cut blow-down noise
- ✓ C1 processor control, two-line plain text display, IP 65 housing
- ✓ Compressor synchronising contact reduces regeneration air consumption
- ✓ Dew point dependent operation available with the sensor option
- ✓ G 3/8 inlet and outlet connections
- ✓ 875 x 412 x 185 mm, 27 kg
- ✓ PED 2014/68/EU Category I

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Specifications

Ultramax Code	UDPS3-BI
Flow Rate (m3/h)	25
Flow Rate (scfm)	14.7
Maximum Pressure (bar)	16
Filter Allocation and Type	Pre-filter FCA 25 XNF (super fine), after-filter FCA 25 ZNM (general purpose)
Thread Type	BSPP
Pressure Range (Bar)	4 - 16
Operating Temperature	+2 C to +50 C
Power	<50 W
Ingress Protection	IP 65
Voltage	230 V standard. 115 V 50/60 Hz or 24 V DC alternatives
Volume	3.7 litre
Media	80% molecular sieve 4A and 20% silica gel, with catalyst and activated carbon beds
Connection Size	G 3/8
Controller	C1 processor control, 2-line plain text display, 3 operating keys, IP 65 housing
Absorbed Power (kW)	<0.05
Max. Inlet Temperature (°C)	50
Controller Type	C1
Weight (kg)	27
Width (cm)	41.2
Height (cm)	87.5
Depth (cm)	18.5

Volume flow conversion factor F1, pressure in bar(g)

4 bar*2	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar	11 bar	12 bar	13 bar	14 bar	15 bar	16 bar
0,63	0,75	0,88	1,00	1,13	1,25	1,38	1,50	1,63	1,75	1,88	2,00	2,13

Volume flow conversion factor F2, inlet temperature in C

25	30	35	40	45	50
1,00	1,00	1,00	0,97	0,87	0,80

Calculation of the converted volume flow

Converted volume flow VK	Nominal required volume flow VNmin
$VK = VN \times F1 \times F2$	$VNmin = VK / F1 / F2$

VK: converted volume flow calculated for the operating conditions

VNmin: nominal required volume flow calculated for the operating conditions, based on the volume flow at operating conditions

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Maintenance rules, all sizes

Interval	Maintenance activity
Weekly	Check differential pressure on the pre-filter and after-filter (only for UDPS 6-8)
Weekly	Check function of the condensate drain on the pre-filter
Annually	Replace filter elements on pre-filter and after-filter
Annually	Check expansion silencer, clean or replace if required
Annually	Calibrate dew point sensor (option H)
Annually (every 2 years if installation is redundant, each dryer with 50% use)	Replace catalyst and activated carbon in the 3rd column*3, replace demister and seals
Annually (every 2 years if installation is redundant, each dryer with 50% use)	Replace pilot valves of main inlet and expansion valves
Every 2 years	Replace desiccant (Activated Alumina F200) on the first 2 vessels*3, and demister and seals
Every 2 years	Replace solenoid coils

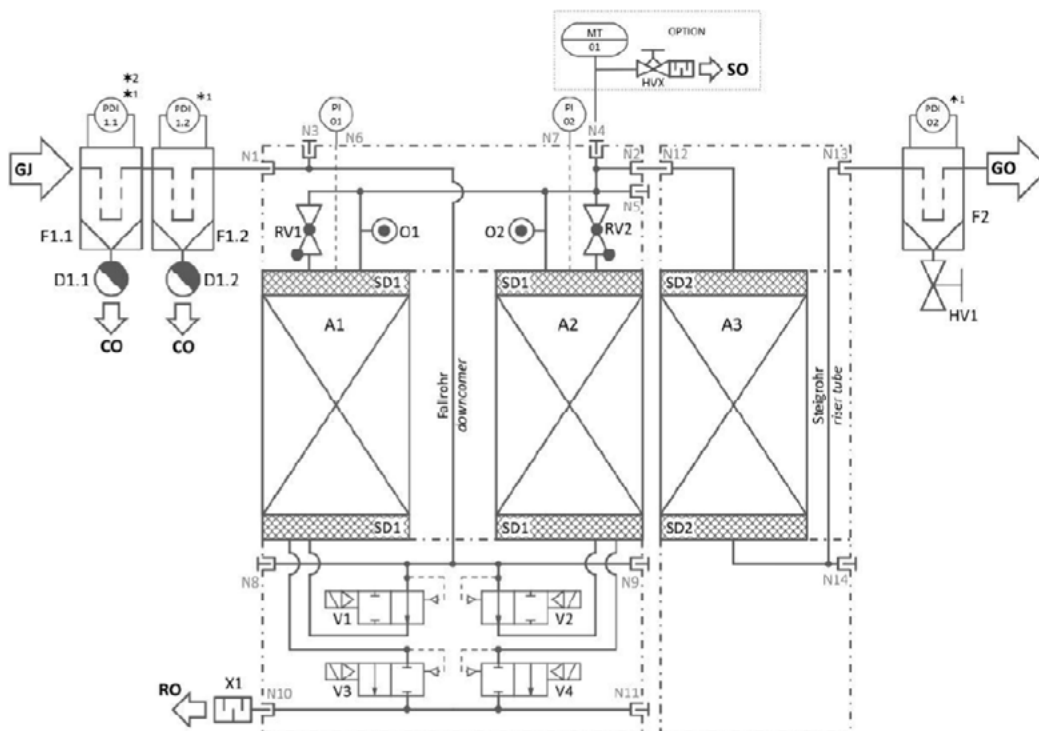
Materials

Component	Material
Extruded aluminium profile	Aluminium AlMg0,7Si, Chrome III passivated
Valve block housing	Aluminium AlMg, anodised
Coating (aluminium profile outside)	1-component powder coating on polyester resin basis (free of TGIC), layer thickness approx. 80 micron
Demister	Stainless steel 304
Valve body, valve seats	Brass, plastic
Sealing materials	NBR, PA (polyamide)
Screws	5.6 steel, zinc-plated
Pipe connection	None (flow paths are integrated in the valve block)
Adjustable feet, wall bracket	Steel, zinc-plated
Desiccant filling	80% molecular sieve 4A and 20% silica gel
Mounted pre-filter and after-filter	See product data sheets for filter housing and filter elements

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Flow Diagram



Tag	Description
A 1+2	Dryer vessel
A3	Filter
F	Valve
V	Manual valve
HV	Non return valve
RV	Demister
SD	Support screen
X	Silencer for expansion
D	Condensate drain
O	Orifice for regeneration flow
PI	Pressure gauge
DPI	Differential pressure gauge (only for UDPS 6-8)
MT	Pressure dew point transmitter
GJ	Gas inlet
GO	Gas outlet
RO	Regeneration air outlet
CO	Condensate outlet
*2	2nd pre-filter only on the medical version

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Residual values acc. EN 12021

Contamination	Stipulated residual value acc. EN 12021	Residual value with the BI version*4
Water content (H ₂ O)	max. 50 mg/m ³ at atmospheric pressure (equates to a pressure dew point of -25 °C at 10 bar(g))	Pressure dew point -40 °C (at 10 bar(g)) = 10,6 mg/m ³
Lubricants (oil)	< 0,5 mg/m ³	< 0,003 mg/m ³
Carbon dioxide (CO ₂)	< 500 ppm (< 500 ml/m ³)	< 150 ppm (< 150 ml/m ³)
Carbon monoxide (CO)	< 15 ppm (< 15 ml/m ³)	< 2 ppm (< 2 ml/m ³)
Oxygen content	21 +/- 1 vol. %	20,9 +/- 0,2 vol. %

Other directives

Directive	Detail
EMC directive 2014/30/EU	Inspection scope for control system, solenoid valves and dew point measurement. Emitted interference acc. EN 55011:2009 / A1:2010 (limit value class B), EN 61000-3-2:2014, EN 61000-3-3:2013. Interference resistance acc. EN 61000-6-2:2005 / AC:2005
Low voltage directive 2014/34/EU	EN 60204-1:2006 / A1:2009, EN 60730-1:2011
Machinery directive 2006/42/EU	Is not applicable

Accessories

Accessory	Part reference	Description
Switch-over control system	DA-CM1-230	Controls two redundant dryers in one compressed air system, operating them alternately with automatic switch-over. Any dryer with a remote start/stop contact or compressor synchronisation contact connects directly. Also controls the required shut-off valves, which are not part of the supply, and accepts alarm inputs for condensate drains and differential pressure gauges.
GSM module	DA-ETR-107	Extension for dryers with an alarm contact. Sends an SMS to up to six recipients, or an email where the provider supports it, carrying the dryer type and serial number. Runs on 5-32 V DC with an internal battery giving up to 120 hours of backup. Integrated antenna, external antenna connectable. SIM card not supplied.
Start-up device (minimum pressure valve)	DA-VPM-B../16 (G 1/2 to G 2 1/2)	Protects the dryer from overload caused by high flow velocities while the system builds pressure. Spring loaded angle valve, opening pressure 3-5 bar, standard 3,5 bar.
Start-up device (minimum pressure valve)	DA-VPM-F../11 (DN 80 to DN 250)	Butterfly valve with pneumatic actuator, operated by the working pressure, opening at 3 bar with full cross-section at 4 bar. Special versions with adjustable opening pressure or working pressures to 450 bar on request.
Differential pressure gauge with alarm contact	FAD01C	Potential free alarm contact that links pre-filter and after-filter differential pressure to the dryer common alarm. An alarm delay can be set in the dryer control unit so that start-up conditions and short peaks do not raise a false alarm.

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