

Product data sheet

Dew-point booster DTS HPI

Application

The DTS HPI is a post-dryer that dries predried compressed air to a lower pressure dew-point. reliable and efficient operation can be achieved with predried compressed air at an inlet pressure dew-point of $< +10\text{ }^{\circ}\text{C}$ and an inlet temperature $< +50\text{ }^{\circ}\text{C}$. Its range of performance covers $170\text{ m}^3/\text{h}$ up to $5.100\text{ m}^3/\text{h}$.

Features

The drying of predried compressed air requires the use of adsorption technology. Traditional combinations of fridge dryers and heatless adsorption dryers suffer from uncertain pressure dew-points at variable inlet conditions.

The subsequent drying to very low and sustainable pressure dewpoints put high demands on the desiccant and on the regeneration method. The DTS HPI solves this problem with an optimized coordination between desiccant and the required energy demand for regeneration.

A novelty of the DTS HPI is the specific use of the desiccant as a heat storage. Only the upper layer of the desiccant is heated up to the required regeneration temperature and an equivalent amount of heat is stored therein. This heat is pushed through the desiccant bed during the following cooling phase - with already deactivated heater - and ensures regeneration of the remaining desiccant. Whilst the upper layer is already in a cooling phase, the lower layers are regenerated by the stored heat.

In contrast to common heat regenerated adsorption dryers, the DTS HPI does not heat up the entire vessel, but just applies the necessary amount of heat for regeneration, stores the heat and finally spreads the heat through the entire desiccant bed. In consequence, significant energy savings can be achieved, whilst a very low and sustainable pressure dew-point is ensured. The required amount of purge air is reduced to a minimum (e.g. 3% purge air demand at an inlet pressure dew-point of $+5\text{ }^{\circ}\text{C}$).

The DTS HPI possesses a high system stability. If the fridge dryer fails and no predried compressed air is available, the DTS HPI automatically switches to a Backup mode and operates as a heatless dryer with fixed cycles. A low and reliable pressure dew-point is also ensured in this operation mode. After resolving this failure, the DTS HPI can continue his operation as a heat regenerated adsorption dryer.

An open construction ensures direct and free access to every spare part.



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Basic data

FST	Nom. volume flow (VN) ¹	Installed power ²	Min./Max. operating pressure	Min./Max. operating temperature
DTS15HPI	170 m ³ /h	3,4 kW	4 bar – 16 bar	+2°C – +50°C
DTS20HPI	225 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS25HPI	285 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS30HPI	360 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS40HPI	500 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS60HPI	720 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS80HPI	850 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS100HPI	1.150 m ³ /h	3,4 kW	4 bar – 16 bar	
DTS150HPI	1.750 m ³ /h	9,0 kW	4 bar – 11 bar	
DTS210HPI	2.400 m ³ /h	9,0 kW	4 bar – 11 bar	
DTS240HPI	2.950 m ³ /h	9,0 kW	4 bar – 11 bar	
DTS290HPI	3.400 m ³ /h	9,0 kW	4 bar – 11 bar	
DTS370HPI	4.350 m ³ /h	17,0 kW	4 bar – 11 bar	
DTS510HPI	5.100 m ³ /h	17,0 kW	4 bar – 11 bar	

*1 – related to 1 bar(a) and 20°C at 7 bar operating pressure, pressure dew-point at adsorption dryer inlet <+10°C, pressure dew-point at outlet < -70°C

*2 – with power supply of 230 V / 50 Hz

Configurations, dimensions, connections and weights

FST	Fridge dryer (optional)	Intermediate filter type	after-filter type	Connection Dryer	Height	Width	Depth	Weight
DTS15HPI	DFLO18-ES	FCA110XNDF	FCA110XNDF	G 1"	1820 mm	925 mm	790 mm	170 kg
DTS20HPI	DFLO24-ES	FCA110XNDF	FCA110XNDF	G 1"	1830 mm	950 mm	790 mm	236 kg
DTS25HPI	DFLO30-ES	FCA110XNDF	FCA110XNDF	G 1"	1835 mm	975 mm	820 mm	253 kg
DTS30HPI	DFLO36-ES	FCA115XNDF	FCA115XNDF	G 1 ½"	1935 mm	1080 mm	820 mm	330 kg
DTS40HPI	DFLO48-ES	FCA120XNDF	FCA120XNDF	G 1 ½"	2055 mm	1125 mm	800 mm	390 kg
DTS60HPI	DFLO66-ES	FCA130XNDF	FCA130XNDF	G 1 ½"	2085 mm	1225 mm	825 mm	450 kg
DTS80HPI	DFLO78-ES	FCA140XNDF	FCA140XNDF	G 2"	2130 mm	1290 mm	915 mm	573 kg
DTS100HPI	DFLO100-ES	FCA140XNDF	FCA140XNDF	G 2"	2150 mm	1415 mm	940 mm	657 kg
DTS150HPI	DFLO180-ES	FCA180XNDF	FCA180XNDF	DN 65	2231 mm	1250 mm	950 mm	950 kg
DTS210HPI	DFLO260-ES	FCA190XNDF	FCA190XNDF	DN 65	2305 mm	1340 mm	1060 mm	1180 kg
DTS240HPI	DFLO320-ES _{eco}	FWS200XNDF	FWS200XNDF	DN 80	2380 mm	1520 mm	1120 mm	1400 kg
DTS290HPI	DFLO420-ES _{eco}	FWS300XNDF	FWS300XNDF	DN 80	2400 mm	1585 mm	1150 mm	1590 kg
DTS370HPI	DFLO480-ES _{eco}	FWS300XNDF	FWS300XNDF	DN 100	2540 mm	1850 mm	1280 mm	2030 kg
DTS510HPI	DFLO530-ES	FWS400XNDF	FWS400XNDF	DN 100	2800 mm	1870 mm	1300 mm	2490 kg

Purity classes according to ISO 8573-1

Contamination	
Solid particles ²	(Class 2)
Water content ²	Class 1–3 ³
Total oil content ²	Class 1 ⁴

*2 – typical result, on the assumption that the suitable inlet concentrations and operating and marginal conditions are given

*3 – depending on the design

*4 – the oil vapour content is not taken into account, it may reduce the purity class

Version: 2.4.0	Author: Tassilo Tappe	Date: 06.05.2024
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Volume flow conversion factors

«F1» - Pressure in bar (g)

4 bar	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

«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 VN_{min}
$VK = VN \times F1 \times F2$	$VN_{min} = VK / F1 / F2$

VK : Converted volume flow calculated for the operating conditions

VN_{min} : Nominal required volume flow calculated for the operating conditions, based on the volume flow at operating conditions

Maintenance rules

	Maintenance interval and maintenance activities
All sizes	<ul style="list-style-type: none"> • Weekly: <ul style="list-style-type: none"> – Check differential pressure on the prefilter and afterfilter – Check function of the condensate drain on the prefilter • Annually: <ul style="list-style-type: none"> – Replace filter elements on prefilter and afterfilter – Check expansion silencer, clean or replace, if required – Replace activated carbon and oil indicator tube (type DPS..A)^{*7} – Calibrate dew point sensor (option H) (interchange principle possible) • Every 24 months: <ul style="list-style-type: none"> – Replace non-return valves and solenoid valves • Every 48 months: <ul style="list-style-type: none"> – Replace desiccant, perforated sheets, demister and seals^{*6*7} – Replace solenoid coil • Every 5/10 years: <ul style="list-style-type: none"> – Pressure vessel inspection according to Ordinance on Industrial Safety and Health of Sep 27th, 2002 (BGBl. I p.3777) §1 – Inside check every 5 years – Strength test every 10 years, carried out by an authorized inspection agency, see page 5

*6 – The regular service life of the desiccant is 3-5 years, however, it is very much depending on the contamination level of the incoming compressed air and the operating temperature. In order to achieve the specified service life of the desiccant, it is vital to exchange the filter elements as described above.

*7 – The desiccant and the activated carbon must be disposed of according to the European waste code. A possible oil contamination needs to be taken into account.

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Product specific data

Specification	
Pressure dew points	-40 °C / -70 °C
Electrical connection	230 V 50/60 Hz
Power consumption	max. 3,4 kW
Protection class	IP 54

Materials

Component	
Vessels, supports	Steel (P265GH, ST37.0, ST35.8), Steel
Coating	Outside: complete vessel sand blasted SA2,5 (ISO8501); Coating of parts outside of the isolation (e.g. frame): 1-component primer on alkyd resin base dry thickness of approx. 40 µm (e.g. DuPont Primer PercoTop 021 or similar) and 2-component acrylic resin paint, dry thickness approx. 40 µm (e.g. DuPont PercoTop 9600 2K MS, or similar)
Desiccant support screen	Stainless steel
Pipe coatings	Steel, galvanized (press fittings)
Valve block	Aluminium
Valve housing, valve seats	Ms58, reinforced plastic
Sealing materials	HNBR
Screws	5.6, zinc-plated (at valve blocks 8.8 V2A)
Desiccant filling	100 % molecular sieve
Mounted pre-filter and after-filter	see product data sheets for filter housing and filter elements

Classification according to Pressure Equipment Directive 2014/68/EU for group 2 fluids

Size	Volume	Category
DTS15HPI	29,0 litre	II
DTS20HPI	37,0 litre	II
DTS25HPI	48,0 litre	II
DTS30HPI	60,0 litre	II
DTS40HPI	71,0 litre	III
DTS60HPI	101,0 litre	III
DTS80HPI	132,0 litre	III
DTS100HPI	175,0 litre	III
DTS150HPI	280,0 litre	IV
DTS210HPI	395,0 litre	IV
DTS240HPI	470,0 litre	IV
DTS290HPI	570,0 litre	IV
DTS370HPI	660,0 litre	IV
DTS510HPI	980,0 litre	IV

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Other directives

Baugröße	ECM directive 2014/30/EU	Low voltage directive 2014/34/EU	Machinery directive 2006/42/EU
All sizes	Inspection scope for control system, solenoid valves and dew point measurement Emitted interference acc.: <ul style="list-style-type: none"> EN 55011:2009 / A1:2010 (limit value class: B) EN 61000-3-2:2014 EN 61000-3-3:2013 Interference resistance acc.: <ul style="list-style-type: none"> EN 61000-6-2:2005 / AC:2005 	<ul style="list-style-type: none"> EN 60204-1:2006 / A1:2009 EN60730-1:2011 	is not applicable

