FST GmbH
Filtrations-Separations-Technik

DTS HPI

the intelligent dew-point booster up to 1.000 m^3/h

DTS HPI – the dew-point booster

The DTS HPI is a post-dryer that dries predried compressed air to a lower pressure dew-point. Before, the air is predried typically by a fridge drier. A technical device, which improves a generated physical value, is called booster. In consequence, the DTS HPI is a pressure dew-point booster.

The system convinces by its modular design. The DTS HPI can be integrated in existing compressed air installations as an individual device or together with a fridge dryer as a skid system. The DTS HPI can easily and efficiently be combined with existing purification systems, or with compressors using integrated fridge dryers.

The DTS HPI offers various advantages. A reliable and efficient operation can be achieved with predried compressed air at an inlet pressure dew-point of < +10 °C and an inlet temperature < +50°C. In consequence, this system can be used worldwide and independent from the ambient conditions.

With a performance range of 150 m³/h to 1.000 m³/h an economical purification at very low and reliable pressure dew-points can be achieved, providing significant advantages when applying the DTS HPI as a small heat regenerated adsorption dryer.

Adsorption technology

The subsequent 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 dew-points 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.

Use of heat storage

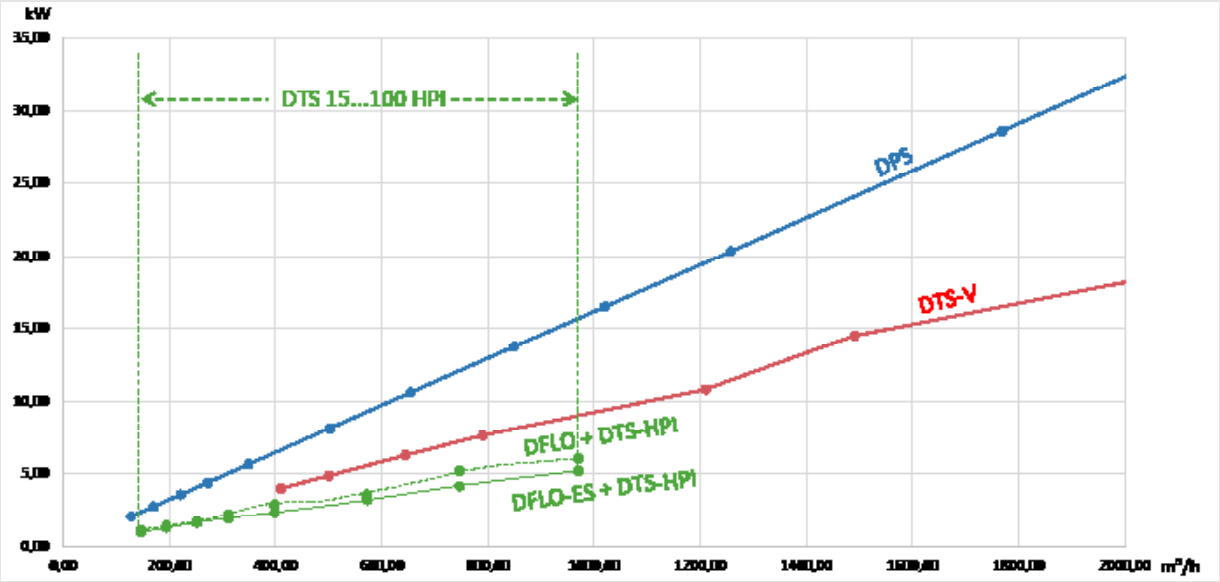
A novelty of the DTS HPI is the specific use of the desiccant as a heat storage. Only the upper layer of the desiccant is heated up to the required regeneration temperature and an equivalent amount of heat is stored therein. This heat is pushed through the desiccant bed during the following cooling phase - 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 °C).

Service friendly design

Due to the open construction, direct and free access to every spare part is ensured.

Comparison between energy consumption vs. volume flow at outlet



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PRESSURE DEW-POINT BOOSTER

Reliable control

The DTS HPI is equipped with a reliable control C1H that is easy to operate. The control is installed in a stainless steel housing, with protection class IP65 and is equipped with 3 operating keys.

The clear text display is used for direct indication of the operating state, errors, runtimes, service messages etc. If a pressure dew-point sensor (option H) is connected, the current pressure dew-point of the compressed air is also directly shown on the display and provided as a 4-20 mA signal. The pressure dew-point measurement (option H) allows for dew-point dependent operation of the dryer. A BUS gateway - optional - can forward all operating parameters to a central monitoring station.

System stability

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 the determination of this failure, the DTS HPI can continue his operation as a heat regenerated adsorption dryer.

Easy installation

The DTS HPI can be installed at any position or distance to the fridge dryer. The dryer is therefore suitable for an installation in a central compressor room, but also for improving the pressure dew-point in decentral applications.

„Plug & Play“ by 230 V power supply (16A fuse at max. 3,3 kW).

The advantages...

✓ **High reliability in operation**

- **Continuous pressure dew-points up to -70°C** and better
- Inlet conditions: up to **+50 °C compressed air inlet** and **+10 °C pressure dew-point** at inlet
- Rugged and proven valve technology
- Soft activation of heating elements
- Power failure safety of heating elements

✓ **High process safety**

- Automatic detection of failures and switch-over to **BACKUP-Mode** if the fridge dryer fails

✓ **Economy of scale**

- Lowest possible heat losses
- Optimized regeneration phase
- Up to 70 % energy savings compared to heat-less adsorption dryers
- Up to 33.5% energy savings compared to heat regenerated adsorption dryers

✓ **Flexible solution**

- Available as an individual device for the combination with existing fridge dryers, or in combination with integrated systems
- Available as skid frame with fridge dryer as a space saving solution
- Closed system for a worldwide installation, independent from ambient conditions

✓ **Plug & Play Installation**

- Installation in any distance to the fridge dryer
- 230 V (16A fuse at max. 3,3 kW)

..result in a dryer..

✓ with maximum operational reliability

✓ minimum total operating costs

✓ easy plug & play installation

✓ improved service-friendly design

Model

Model	Nominal Volume Flow*1	Installed Power*2	Min. / Max. Operating Pressure	Min. / Max. Operating Temperature
DTS 15 HPI	150 m³/h	3,4 kW	4 - 16 bar	+2°C - +60°C
DTS 20 HPI	200 m³/h	3,4 kW		
DTS 25 HPI	260 m³/h	3,4 kW		
DTS 30 HPI	320 m³/h	3,4 kW		
DTS 40 HPI	410 m³/h	3,4 kW		
DTS 60 HPI	590 m³/h	3,4 kW		
DTS 80 HPI	770 m³/h	3,4 kW		
DTS 100 HPI	1000 m³/h	3,4 kW		

*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 (and better)

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

Configurations

Model	Pre-filter (optional)	Fridge Dryer*3 (optional)	Intermediate Filter	Adsorption Dryer	After-filter
DTS 15 HPI	FCA 110 XNDF	DFLO-ES 18	FCA 110 XNDF	**DTS 15 HPI**	FCA 110 ZNDM
DTS 20 HPI	FCA 110 XNDF	DFLO-ES 24	FCA 110 XNDF	**DTS 20 HPI**	FCA 110 ZNDM
DTS 25 HPI	FCA 110 XNDF	DFLO-ES 30	FCA 110 XNDF	**DTS 25 HPI**	FCA 110 ZNDM
DTS 30 HPI	FCA 115 XNDF	DFLO-ES 36	FCA 115 XNDF	**DTS 30 HPI**	FCA 115 ZNDM
DTS 40 HPI	FCA 120 XNDF	DFLO-ES 48	FCA 120 XNDF	**DTS 40 HPI**	FCA 120 ZNDM
DTS 60 HPI	FCA 130 XNDF	DFLO(-ES) 66	FCA 130 XNDF	**DTS 60 HPI**	FCA 130 ZNDM
DTS 80 HPI	FCA 140 XNDF	DFLO(-ES) 78	FCA 140 XNDF	**DTS 80 HPI**	FCA 140 ZNDM
DTS 100 HPI	FCA 140 XNDF	DFLO(-ES) 100	FCA 140 XNDF	**DTS 100 HPI**	FCA 140 ZNDM

*3 - DFLO-ES: Fridge dryer with energy saving regulation

Purity Classes according to ISO 8573-1

Contamination	
Solid particles *4	(Class 2)
Water content *4	Classes 1-3 *5
Total oil content *4	Class 1 *6

*4 - typical result, assuming according inlet conditions as well as operating and marginal conditions
*5 - best possible pressure dew-point = -55°C
*6 - oil vapor content is not taken into consideration and can reduce the purity class

Volume flow conversion factors

« F1 » - Operating pressure in bar (g)

4*7	5	6	7	8	9	10	11	12	13	14	15	16
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

*7 - for operating pressures lower than 4 bar (g) an external control air supply of at least 4 bar (g) is necessary

« F2 » - Inlet temperature in °C

25	30	35	40	45	50
1,00	1,00	1,00	1,00	1,00	1,00

Calculation of the converted volume flow

Converted volume flow VK	**Nominal required volume flow VN_{min}**
VK = VN x F1 x 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
Every Model	• Once a week: - Check differential pressure at prefilter and afterfilter - Check operation of condensate drain on prefilter • Every 12 month: - Replace filter elements in prefilter and afterfilter - Check expansion silencer, clean or replace, if required - Calibrate dew-point sensor (option...H) (interchange principle is possible) • Every 24 months: - replace pilot valve and diaphragm of the main and expansion valves • Every 48 months: - Replace desiccant and seals *8*9 - Replace solenoid • Every 5/10 years: - Pressure vessel inspection according to Ordinance on Industrial Saftey and Health of Sep 27th, 2002 (BGBI. I p.3777) §15 - Inside check every 5 years - Strength test every 10 years, carried out by an authorized inspection agency, see page 5

*8 - 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.
*9 - 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.

Product Specific Data

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

Materials

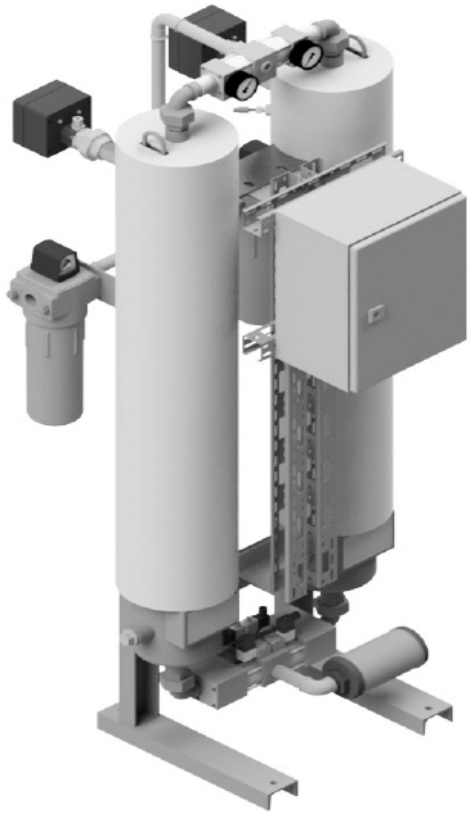
Component	
Vessels, Supports	Steel (P265GH, ST37.0, ST35.8), Steel
Coating	Outside: complete vessel sand blasted SA2,5 (ISO8501); Coating of parts outside of the isolation (e.g. frame): 1-component primer on alkyd resin base dry thickness of approx. 40 µm (e.g. DuPont Primer PercoTop 021 or similar) and 2-component acylic 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	Aluminum
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

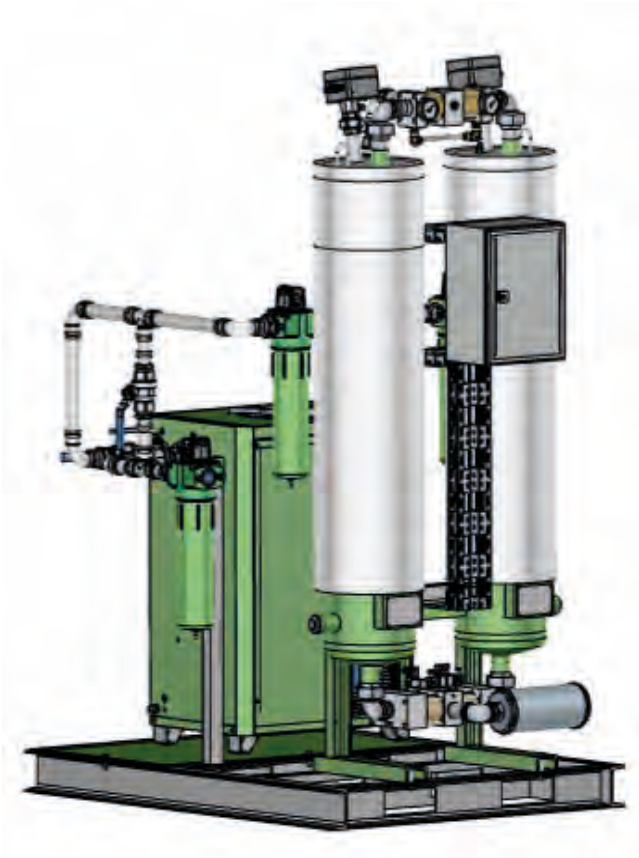
Dimensions

Model	Height	Width	Depth	Weight
DTS 15 HPI	1830 mm	675 mm	775 mm	173 kg
DTS 20 HPI	1845 mm	675 mm	800 mm	215 kg
DTS 25 HPI	1860 mm	675 mm	825 mm	259 kg
DTS 30 HPI	1960 mm	740 mm	850 mm	295 kg
DTS 40 HPI	2060 mm	800 mm	820 mm	333 kg
DTS 60 HPI	2090 mm	840 mm	890 mm	400 kg
DTS 80 HPI	2130 mm	1100 mm	910 mm	520 kg
DTS 100 HPI	2175 mm	1150 mm	1040 mm	615 kg

Further data

Model	Connection Inlet / Outlet	Max. Operating Pressure	Volume of Vessel	Classification according to Pressure Equipment Directive 2014/68/EU for group 2 fluids
DTS 15 HPI	G 1	16 bar	29 l	Category II
DTS 20 HPI	G 1	16 bar	37 l	Category II
DTS 25 HPI	G 1	16 bar	48 l	Category II
DTS 30 HPI	G 1 1/2	16 bar	60 l	Category II
DTS 40 HPI	G 1 1/2	16 bar	71 l	Category III
DTS 60 HPI	G 1 1/2	16 bar	101 l	Category III
DTS 80 HPI	G 2	16 bar	132 l	Category III
DTS 100 HPI	G 2	16 bar	175 l	Category III





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