

# DFD - DH Series

Desiccant Flexible Dryer & Drying Hopper Systems



# Desiccant Flexible Dryer

## Introduction

Drying of plastics raw materials is crucial in the manufacturing of a high quality product. Labotek's drying equipment is based on the aim of ensuring the highest possible levels of reliability, consistency, simplicity and flexibility.

Labotek is manufacturing a wide range of dry air drying systems, depending of the product being dried. Our comprehensive range of desiccant drying units is starting from 100 m<sup>3</sup>/h and extends up to 8500 m<sup>3</sup>/h. Drying hoppers are sized from 15 litres up to 12000 litres.

Labotek is offering premium solutions in drying, either as single drying units or large centralised drying system solutions. The philosophy behind Labotek's drying equipment is simple: To achieve continuous drying without costly interruptions to production, made possible through high quality equipment, operating at lowest possible emissions.

Please request our separate energy calculator to find out how little the energy requirements are, for operating a Labotek drying solution.

## Desiccant Flexible Dryer 100-450 Series

This series of dryers are the smallest in the Desiccant Flexible Dryer (DFD) series and is targeting the small to medium sized drying requirements and can dry several hygroscopic plastics raw materials simultaneously.

The dryer has a very small footprint, making it ideal for locationing close to the production machinery.

There are 5 sizes in this DFD range: 100, 150, 200, 300 & 450 m<sup>3</sup>/h. The desiccant dryer is combined with one or several drying hoppers (DH), ranging from 15-2500 litres, depending on application. The DFD dryer up to 200 m<sup>3</sup>/h is available as stationary or mobile execution.

An airtight interconnecting ducting system is installed between DFD & DH. Dehumidification of the air is made possible through a twin bed desiccant assembly which contains molecular sieve absorption material.

Regeneration of the drying medium takes place in a closed cycle, thus ensuring optimal dew points and lowest possible energy consumption.

A unique "moisture dependent regeneration system", enables the dryer to regenerate the molecular sieves depending on moisture levels being absorbed, therefore the time between bed changes is flexible and dryer is only utilizing the regeneration energy required, or as option by a set dew point.

The range is capable of supplying dew point down to -40°C. The dryer is fitted with either touch screen microprocessor control or Siemens PLC executions, depending on application. 3 Phase blowers and air/air heat exchangers are standard on DFD 100-200 series.



Desiccant Flexible Dryer 100-200

## Desiccant Flexible Dryer 300-450 Series

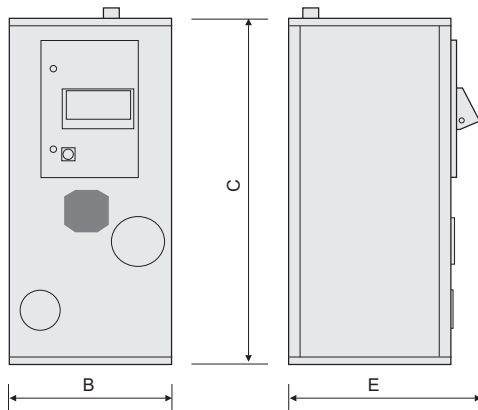
The DFD300-450 series of desiccant dryers is aimed at the medium sized drying requirements and can dry several hygroscopic plastics raw materials simultaneously.

DFD 300-450 has built-in frequency inverter as standard.

The dryer has an extremely small footprint, compared to the air volume achievable. Operating principles are identical to the smaller series, however the DFD 300-450 range is capable of supplying dew point down to  $-40^{\circ}\text{C}$  or better.

### Technical Data DFD 100-450

Specifications	100	150	200	300	450
Supply of compressed air [bar]	-	-	-	5-8	5-8
Installed power [kW]	5.5	5.5	7.3	10	16
Power consumption, average [kW]	2	3.5	5.5	7	10
Supply Voltage	380/480 V - 50/60 Hz				
Connection fuse [Amp]	16	16	16	32	32
Noise level [dBA]	65		68		
Heating element regeneration [kW]	1 x 3.5	1 x 3.5	1 x 3.5	2 x 3.5	3 x 3.5
Dew point temperature [ $^{\circ}\text{C}$ ]	Better than $-40^{\circ}\text{C}$				
Air flow [ $\text{m}^3/\text{h}$ ], approx.	100	150	200	300	450
Net weight [kg]	180	200	215	300	350
Supply of water cooling [kcal/h]	-	-	-	8200	8200
Cooling water temperature, inlet	20 $^{\circ}\text{C}$ (max.)				

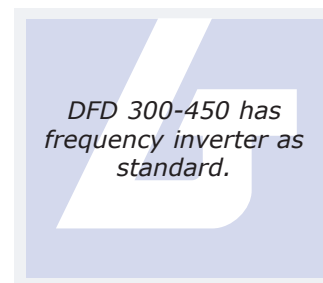


DFD	100 - 200	300 - 450
C - Height	1600	1532
B - Width	660	854
E - Depth	720	1203

All Measurements are stated in mm.



Desiccant Flexible Dryer 300-450



### Options DFD 100-450

- Ventilation kit for tropical performance, control
- Ventilation kit for tropical performance, complete
- Slide valve monitoring, DFD 300-450
- Dew Point, measuring - DFD
- Volatile trap
- Alarm lamp, DFD 100-450
- Alarm lamp, remote, 10 m cable
- Microswitch for filter cover
- Filter alarm
- Water separator
- Frequency Inverter
- Return air cooler, DFD 100-200
- Process air cooler, DFD 300-450
- Thermostat, cooling water DFD 100-200
- Control, cooling water, DFD 300-450

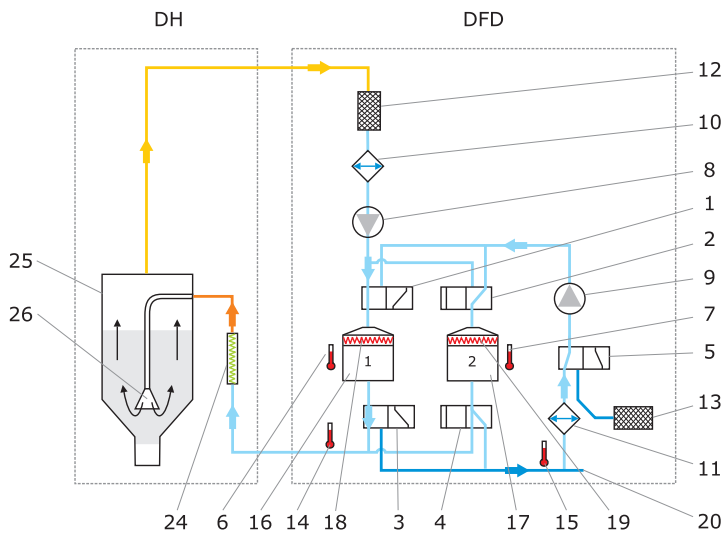
## DFD 600-1700

The DFD 600-1700 range caters for larger drying requirements. There are 4 sizes in this DFD range: 600, 1000, 1500 & 1700 m<sup>3</sup>/h. The desiccant dryer is combined with one or several drying hoppers (DH), depending on application. This series of dryer is an integral part of Labotek's centralized drying systems.

In order to ensure the most stable high quality drying of plastics raw materials, the DFD comprises two separate systems as standard. Two desiccant beds containing molecular sieves are engaged alternately in a closed drying system. One of the beds will always be operative in the drying process, while the other bed will be in regeneration or in stand-by mode, ready to be activated into the process upon next bed change. The system incorporates twin built-in air/water heat exchangers, for process air & regeneration system.

Labotek's unique "moisture dependent regeneration system", enables the dryer to regenerate the molecular sieves depending on moisture levels being absorbed, therefore the time between bed changes is flexible and dryer is only utilizing the regeneration energy required, or as option by a set dew point.

The DFD 600-1700 range is capable of supplying dew point down to -50°C. A compressed air monitoring system is standard on this dryer series. The process air blower is extremely energy efficient. Dryer is fitted with either touch screen microprocessor control or Siemens PLC executions, depending on application. DFD 600-1700 may be supplied with optional frequency inverter.



Desiccant Flexible Dryer 600-1700

## Optional DFD Energy Recovery

Enables to utilize the hot water and transfer into process air, through high efficient air/water heat exchange devices. Depending on the temperature/flow of the water available, considerable electrical power savings can be obtained.

Pos.	Description
1	Inlet slide valve desiccant bed 1
2	Inlet slide valve desiccant bed 2
3	Outlet slide valve desiccant bed 1
4	Outlet slide valve desiccant bed 2
5	Fresh air valve
6	Thermostat regeneration air, desiccant bed 1
7	Thermostat regeneration air, desiccant bed 2
8	Dry air blower
9	Regeneration blower
10	Return air cooler
11	Regeneration air cooler
12	Return air filter
13	Regeneration filter
14	Thermostat for dry air
15	Thermostat for regeneration air
16	Desiccant bed 1
17	Desiccant bed 2
18	Heating element for regeneration, desiccant bed 1
19	Heating element for regeneration, desiccant bed 2
20	Air outlet pipe
21	Control cabinet
22	PLC control
23	Operator panel
24	Heating element
25	Drying hopper
26	Air distributor

Inside view DFD4000-8500 showing multiple desiccant bed assembly.



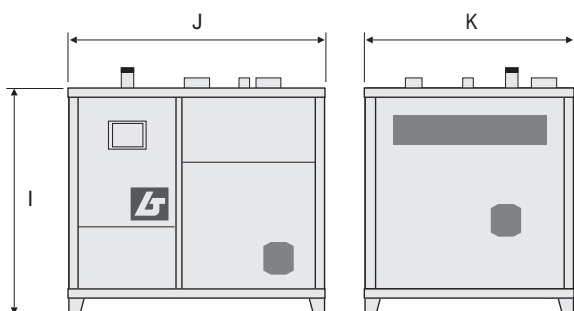
## DFD 4000-8500

The 4000-8500 series of desiccant dryers is targeting the very large drying requirements. The dryer is equipped with multiple desiccant beds (4-6) in order to achieve up to 8500 m<sup>3</sup>/h of dry air.

The series are among the most energy saving large dryers available, owing to the use of high volume air ventilation blower with very low power consumption. DFD operates at noise levels below >79 dBA.

## Technical Data DFD 600-8500

Technical specifications	600	1000	1500	1700	4000	5100	6000	8500
Supply of compressed air [bar]	5-8							
Installed power [kW]	27	41	55	56	66	79	79	86
Power consumption, average [kW]	12	18	24	24	39	47	47	51
Supply Voltage	380/480 V - 50/60 Hz							
Connection fuse [Amp]	50	80	100	100	125	150	150	150
Noise level [dBA]	74.3	73.3			78		79	
Heating element regeneration [kW]	6 x 3.5	9 x 3.5	12 x 3.5	12 x 3.5	12 x 3.5 x 4	12 x 3.5 x 4	12 x 3.5 x 5	12 x 3.5 x 6
Dew point temperature [°C]	Better than -40°C							
Air flow [m <sup>3</sup> /h], approx.	600	1000	1500	1700	4000	5100	6000	8500
Net weight [kg]	630	1070	1140	1160	3420	3520	4360	4560
Supply of water cooling [kcal/h]	14300	38700	38700	38700	154800	135000	135000	135000
Cooling water temperature, inlet	20°C (max.)							



## Options DFD 600-8500

- Ventilation kit for tropical performance, control
- Ventilation kit for tropical performance, complete\*
- Slide valve monitoring\*
- Dew Point, measuring
- Volatile trap
- Alarm lamp, remote, 10 m cable
- Dust cyclone
- Micro switch for filter cover
- Filter alarm
- Water separator
- Process air cooler, for drying < 60° C
- Control, cooling water

\*) Standard on DFD 4000-8500

DFD	600	1000	1500	1700	4000	5100	6000	8500
I - Height	1400	1700	1700	1700	1700	1700	1700	1700
J - Width	1600	2400	2400	2400	6000	6000	8000	8000
K - Depth	1300	1650	1650	1650	2000	2000	2000	2000

All Measurements are stated in mm.



Standard Lab Dry control  
DFD 100-1700



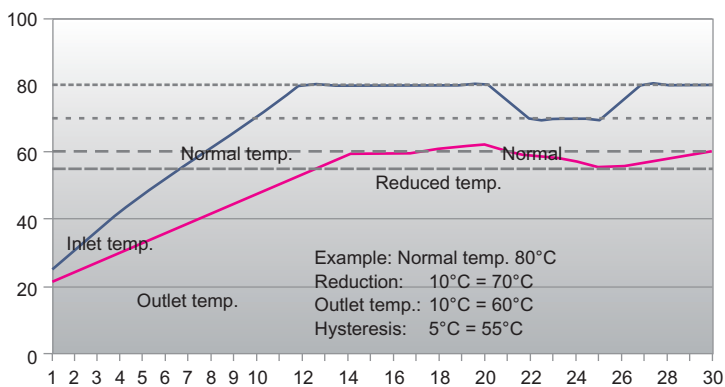
Siemens S7 series control  
DFD 100-8500

# Drying Hopper

## Introduction

The Labotek series of Drying Hopper (DH) are easily connected to the Labotek DFD series via a fixed airtight interconnecting ducting system. A complete standard range of drying hoppers is available from 15-12000 litres, all with interior finish in stainless steel AISI 304. Each drying hopper has individual temperature controller, where desired drying temperature is consistently monitored via solid state relays. All Labotek drying hoppers come with airtight dry air ducting system, separate over temperature thermostat and standard floor stand.

Alternatively the drying hopper may fit direct in mezzanine construction above processing machine.



Labotek Energy Saving System - LESS

### DH 15-800

The DH 15-800 series are supplied with 50 mm insulation, sight glass and exterior finish in stainless steel. Temperature range between 60-140°C as standard, however available in HT versions up to 180°C for PET. DH 200-800 is furthermore supplied with large clean out door as standard.

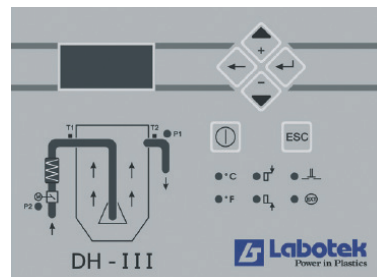


Drying Hopper 15-800



Drying Hopper 1200-12000

The DH controller is as standard capable of handling Labotek Energy Saving System (LESS) allowing temperature lowering when material has been dried in order to prevent over drying, thus saving energy.



DH control



Airflow regulation valve

Also the control is prepared to handle our optional Air Flow Regulation System (AFRS) where air volume to/from drying hopper is regulated according to consumption. This feature, combined with our optional frequency inverter in the DFD series, enables dramatic reduction in energy consumption.

### DH 1200-12000

The DH 1200-12000 series are supplied with 75 mm heavy duty insulation, sight glass & large clean out door and exterior in polished aluminium as standard. Temperature range between 60-100°C as standard, however available in HT versions up to 180°C for PET.



Example Vacuum receiver mounted on DH

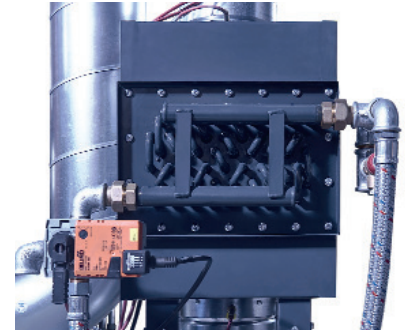


DH200-800 lid is equipped with hinged lid and lock as standard

## Optional - External Heat Recovery (EHR)

Operates with external hot water, ex from compressor cooling, power utility or other processes in the plant. The EHR enables to utilize the hot water and transfer into process air in Labotek drying systems, through high efficient air/water heat exchange devices.

Energy saving are massive and depending on the temperature/flow of the water available, savings of electrical power up to 85% are achievable.

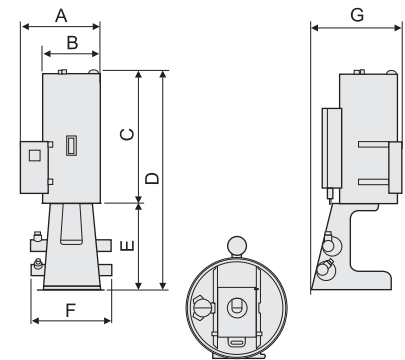


## Technical Data

### DH Dimensions

Type	DH 15	DH 25	DH 40	DH 75	DH 100	DH 200	DH 300	DH 450	DH 600	DH 800
A	620	620	620	700	700	930	910	1165	1165	1165
B	394	394	394	506	506	720	700	876	876	876
C	640	640	830	940	1160	1113	1467	1490	1868	2118
D	1400	1400	1590	1700	1920	1873	2220	2243	2621	2871
E	760	760	760	760	760	753	753	753	753	753
F	700	700	700	700	700	700	900	900	1000	1000
G	750	750	750	800	800	875	845	934	934	934

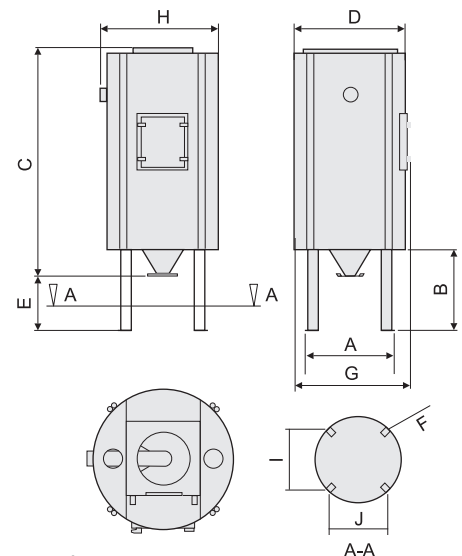
All Measurements are stated in mm.



Lid DH 200-800

Type	DH 1200	DH 1600	DH 2000	DH 2500	DH 3000	DH 4000	DH 6000	DH 8000	DH 10000	DH 12000
A	890	890	1116	1116	1116	1349	1605	1605	1605	1605
B	810	811	798	798	798	797	800	800	800	800
C	2289	2899	2523	2966	3076	3354	3555	4198	4887	5380
D	1112	1112	1431	1431	1431	1708	2068	2068	2068	2068
E	544	544	577	577	577	574	584	584	584	584
F	Ø 13	Ø 13	Ø 13	Ø 13	Ø 13	Ø 18	Ø 18	Ø 18	Ø 18	Ø 18
G	1162	1162	1481	1481	1481	1775	2257	2257	2257	2257
H	1182	1182	1521	1521	1521	1772	2128	2128	2128	2128
I	824	824	1049	1049	1049	1248	1505	1505	1505	1505
J	824	824	1049	1049	1049	1248	1505	1505	1505	1505

All Measurements are stated in mm.



Lid DH 1200-12000

### Options DH 15-800

Catchbox, 1 x Ø 50, man. slide valve, complete

Catchbox, 2 x Ø 32, man. slide valve, complete

Catchbox, 3 x Ø 38, man. slide valve, complete

Catchbox, 1 x Ø 50, pneu. slide valve, complete

Catchbox, 2 x Ø 32, pneu. slide valve, complete

Catchbox, 3 x Ø 38, pneu. slide valve, complete

Closed-Loop, end stop unit

Levellimiter 200 mm, DH25 - 100

Levellimiter 310 mm, DH75 - 100

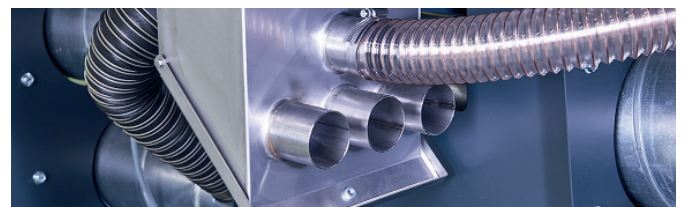
Fanning set, 80 x 80 mm

Solenoid valve, manual

Solenoid valve, remote

Level control

Level control + lamp



Catchbox 3 outlets

### Options DH1200-12000

Catchbox, 3 x Ø 50, man. slide valve, complete

Catchbox, 3 x Ø 50, pneu. slide valve, complete

Solenoid valve, remote

Solenoid valve, manual

**3 years  
warranty**

Labotek offers 3 years warranty  
- excluding wear parts

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