DIRECT EXPANSION REFRIGERATED AIR DRYER

DDX

27 - 9,000 m³/h | 50Hz

2 YEARS WARRANTY
Compressor & Heat Exchanger

ECO FRIENDLY
REFRIGERANT

www.airdit.com

ABOUT DIT

DIT, Franco-Thai manufacturer with more than two decades of experience as an air treatment specialist, leverages its expertise to develop and design products tailored for industrial use in the compressed air field. DIT is constantly focused on achieving optimal performance and possesses several patents, ensuring a leading position in terms of innovation and an ongoing commitment to excellence in performance.

Emboldened by this expertise and in partnership with industry-leading component suppliers renowned for their cost-effective solutions, DIT provides you with a comprehensive selection of the most efficient products available on the market.

Our technical office and commercial team possess the expertise to assist you worldwide with both standard projects and tailor-made solutions. Through valuable suggestions and in response to your preferences, our team excels at identifying the most fitting solutions to meet your specific requirements, enabling you to respond adeptly and globally to address various challenges with precision and expertise.

At DIT, our foremost mission revolves around ensuring client satisfaction. We take great pride in crafting and tailoring solutions that are uniquely designed to meet YOUR specific needs and requirements.

Our DDX line of direct expansion refrigerated air dryers is a valuable addition to our comprehensive range of compressed air treatment solutions. This line complements a wide array of products, including:

- **Refrigeration dryers**
- **Adsorption dryers**
- **Compressed air treatment unit**
- **Filtration**
- **Drains**
- **Oil/Water separators**
- **After coolers**

Together, these offerings provide a comprehensive suite of compressed air solutions to meet your unique client request with respect of all international standards dedicated to compressed air systems.

OPERATING PRINCIPLE

Introduction to DDX Dryers and Refrigeration Principle

Our DDX dryers work by using a process called direct expansion refrigeration to effectively dry compressed air that comes from the network. With an efficient refrigeration system and our patented 3-in-1 heat exchanger, we achieve optimal drying by efficiently exchanging heat across the entire surface.

Description of Heat Exchanger

Our heat exchanger, made of stainless steel, has has three sections. The first section is an air/air exchanger, which cools down the moist, water-saturated air before it enters. The second section is an air/refrigerant fluid exchanger, which further cools the compressed air to a temperature of +3°C, removing moisture through a built-in separator. This patented heat exchanger, created in collaboration with the one of the largest heat exchanger manufacturer, ensures efficient cooling in various air conditions and ambient temperatures. It also minimizes resistance to the flow of compressed air, resulting in low pressure drop.

Initial Cooling for Efficiency

At the beginning of the process, the hot and moisture-laden compressed air undergoes preliminary cooling within the air/air heat exchanger. This reduces the cooling requirement in the air/refrigerant gas zone, increasing energy efficiency by more than 45%.

Condensate Separation and Removal

The moisture droplets separated within the separator are collected and gravity-fed to the condensate drain. The resulting condensate can be efficiently purged using a fully adjustable high-performance sequential drain or, for greater energy savings, a level-detection drain (available as an option starting from the DDX 0003 model).

Continuous Supply of Dry Air

After being dried and cooled in the air/refrigerant gas exchanger, the compressed air is reheated in the air/air exchanger before it continues through the compressed air network. This ensures a steady and uninterrupted supply of dry air for your processes.

PERFORMANT, USER-FRIENDLY AND ECOLOGIC

Every product in the range is equipped with a standard intelligent Carel controller, which provides several features. These include displaying the dew point under pressure, managing the timing of condensate purging (how long it stays open and how often it opens), protecting the compressor and heat exchanger from freezing through electronic safety mechanisms before being mechanically triggered by a low-pressure switch, and various other attributes that enhance safety and optimize the unit's performance.

DIGITAL CONTROLLER AS STANDARD

Carel PGD

From the DDX 0400 and above, your dryer will have a Carel PGD that will control all the refrigeration circuits via a single centralized regulator.

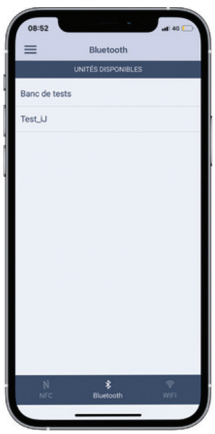
Carel IJ

From the DDX 0030 to 0300, the dryers are equipped with the IJ connected controller that allows remote supervision via an app available on the phone.

Carel Easy

Opting for the DDX 0003 to 0020 model means your dryer will come with a Carel Easy controller, providing effective management of all refrigeration circuits.

The DDX range introduces a significant technological advancement in refrigeration dryers. Thanks to the IJ microprocessors, you can remotely monitor and control your dryer using your mobile phone via Bluetooth communication. The "Applica" interface, available for both Android and iOS, allows comprehensive dryer management and displays the dew point with precision (in °C or °F). You can visualize the dryer's status on your phone, helping you diagnose any issues and ensure it's working perfectly. Various indicators are available, including a red alarm light and sound for refrigeration system faults, activation of the hot gas valve to control circuit temperature and prevent ice buildup, a green light for compressor activity, and a green light for purge time during "drain time" mode.



As soon as the Carel application launches, the phone finds the Carel controller in question and simply select it to connect.

Following the controller selection, the application shows the main menu with the various alarms visible.

By clicking on the purge time, the customer can regulate the duration of this purge time itself.

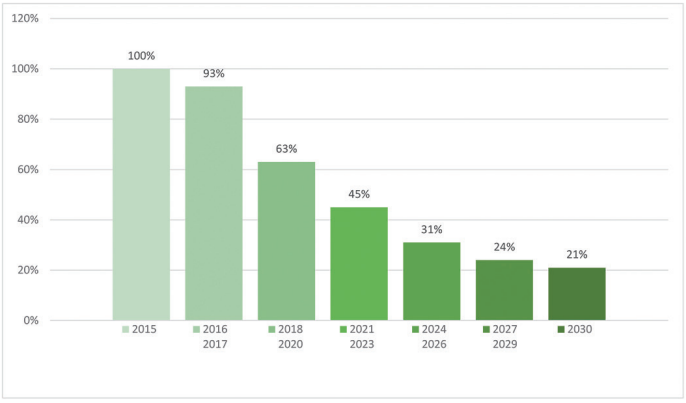
WE COMBINE
ENERGY EFFICIENCY
&
ECOLOGY.

ENVIRONMENTAL IMPACTS

The GWP comes from the translation of Global Warming Potential (GWP) and this designates, as its name suggests, the global warming potential over a period of 100 years for 1 kg of refrigerant emitted into the atmosphere. If the GWP value is large and greater than 1 then the impact of the gas is harmful to the environment.

As Franco-Thai manufacturer, we are committed to integrating the best of both worlds, drawing on the strengths of both cultures. Our high focus on energy efficiency aligns with our adherence to European regulations, which are at the forefront of driving industrial changes in refrigeration. This dedication allows us to ensure that our products not only meet, but exceed, the current standards for environmental responsibility and energy consumption.

F-GAS AVERAGE GOALS



The F-GAS legislation (517-2014) in force aims to reduce the ecological footprint under three decisive axes:

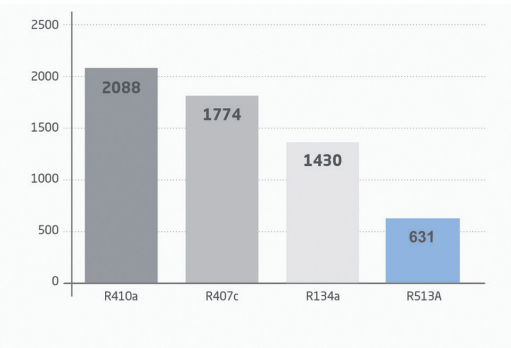
· The inability to use refrigeration appliances powered by gases with a GWP (Global Warming Potential > 2500) by 2020. In this sense, the integrated solutions of R410a are strongly challenged.

· The overall reduction of the European GWP with a decrease from 2017 of 7% compared to 2015, then of 37% from 2018 compared to 2015.

· The introduction of a right to pollute and quota systems to frame Europe's global GWP

At the dawn of 2024, the strengthening of quotas, providing for a 69% decrease in overall GWP consumption compared to the reference years, induces the necessary use of low GWP refrigerants. In this sense, DIT, leader and pioneer of ecological refrigeration solutions is working in this direction with the implementation of the DDX range with high performance and low environmental nuisance.

GWP VALUES OF THE FLUIDS



R513a

A UNIQUE REFRIGERANT FOR ALL MODELS

R513a refrigerant is an excellent fluid with regard to the expectations of the F-Gas 517/2014 regulation since it has a GWP value equal to 631. The latter well below the average of refrigerants available on the market and used in the case of refrigeration dryers allows a serene projection for the years to come." For comparison, in the event of a refrigerant leak, on a dryer equipped with 4 kilograms, the pollution induced for a dryer fed with an HFC R410A fluid will be 8,352 kg of CO2 equivalence, while it will be only 2,524 kg of CO2 equivalence for an DDX R513A dryer.

PRODUCT FEATURES

TECHNICAL FEATURES

3-in-1 Heat exchanger
Constructed with stainless steel brazed plates (AISI316), this heat exchanger offers significant energy savings through its economizer pre-exchanger, minimal pressure drops, and high-performance separator. The stainless-steel plates used in its construction protect against moisture-related corrosion, ensuring exceptional longevity in the market.

Compressors
These hermetic refrigeration compressors (including pistons, rotary, and scroll types) efficiently generate cold air to maintain the dew point under all conditions and usage scenarios.

Controller
For models from DDX 0003 to 0020, the 'Easy' controller ensures optimal dryer control, providing a dew point display, managing condensate purge, and ensuring the refrigeration circuit's proper communication RS485 for IJ + PGD functioning. Models from DDX 0030 and beyond feature the 'IJ' controller, which can transmit all alarms and operational issues effectively. This includes monitoring high and low pressures, high and low ambient temperatures, and temperatures at the entrance of the high and low dew points. The 'IJ' controller also records alarms and events and offers advanced connectivity through Applica or compatible supervision systems.
For DDX 400 and beyond, the PGD controller manages multiple refrigeration circuits simultaneously through a centralized regulator and displays alarms and faults in text format.

Hot Gas Valves
The next-generation direct expansion dryer includes a hot gas valve, enhancing dew point stability during winter and periods of no heat load. This valve ensures high responsiveness and flexibility in the refrigeration circuit. Its robust design enables operation within a wide range of ambient temperatures, up to 50°C and allows for compressed air intake up to 75°C.

Steering and Supervision
Units equipped with IJ microprocessors can independently communicate with the Carel Applica application, enabling remote unit control and easy parameter management. These controllers also simplify remote diagnosis by technicians. This jointly developed program is a valuable asset in unit service management.

ADVANTAGES

Cost Efficient Energy Usage
Our 3-in-1 heat exchanger design ensures exceptional performance with an extremely minimal pressure drop of just 0.15 bar at the specified flow rate.

Easy Setup and Operation
Our direct expansion refrigeration dryer is a plug-and-play product, with all components seamlessly integrated for straightforward use. DDX dryers come equipped with a power cable, allowing for hassle-free commissioning without the need to access the dryer's internals.

Environmental Responsibility
This new line of refrigeration dryers operates using R513a refrigerant. This refrigerant, classified as group A1 (non-harmful and non-flammable), aligns with European regulation F-Gas 517/2014's recommended alternatives due to its low Global Warming Potential (GWP) value of 631, significantly lower than its predecessor R134a (1430). This aligns with the European directive's goals of phasing out and prohibiting refrigerants with a GWP exceeding 750 for industrial refrigeration equipment.

Durability and Sturdiness
The dryer's robust body, coated with baked epoxy paint, guarantees long-term durability, even in harsh and dusty environments. Its high-efficiency condenser, featuring durable fins, ensures easy cleaning and exceptional longevity.

Streamlined Maintenance
Maintenance is simplified with easy access via a single panel, facilitating optimal and quick dryer device maintenance. The DDX dryers are designed for direct access to all components, and technical diagnostics are made easier with pressure taps within the refrigeration circuit and a low-pressure gauge on the condenser side.

Space-Efficient Design and Efficient Connections
The DDX dryer is designed with a vertical orientation to minimize its footprint. Compressed air inlets and outlets are positioned at the rear of the dryer, with a minimum spacing of 12 cm, ensuring ample space for installing upstream and downstream filters while maintaining accessibility for filter element replacement.

TECHNICAL SPECIFICATIONS

	Rated flow			Connections	Power supply	Dimensions(mm)			Weight
Part model	m3/h	m3/min	cfm	BSPP	V/Ph/Hz	W	L	H	kgs
DDX-0003 SA	27	0.5	16	1/2"	230/1/50	363	334	575	30
DDX-0005 SA	39	0.7	23	1/2"	230/1/50	363	334	575	32
DDX-0008 SA	54	0.9	32	1/2"	230/1/50	363	334	575	35
DDX-0010 SA	84	1.4	49	1/2"	230/1/50	363	334	575	38
DDX-0015 SA	108	1.8	64	3/4"	230/1/50	439	384	663	45
DDX-0020 SA	162	2.7	95	3/4"	230/1/50	439	384	663	48
DDX-0030 SA	258	4.3	152	1"	230/1/50	627	570	996	70
DDX-0040 SA	330	5.5	194	1-1/2"	230/1/50	627	570	996	75
DDX-0050 SA	408	6.8	240	1-1/2"	230/1/50	627	570	996	80
DDX-0060 SA	486	8.1	286	1-1/2"	230/1/50	627	570	996	85
DDX-0075 SA	660	11.0	388	2"	230/1/50	807	660	1166	100
DDX-0100 SA	900	15.0	530	2"	230/1/51	807	660	1166	145
DDX-0125 SA	1080	18.0	636	2-1/2"	230/1/52	807	660	1166	165
DDX-0150 SA	1380	23.0	812	2-1/2"	400/3/50	807	660	1166	200
DDX-0200 SA	1800	30.0	1059	2-1/2"	400/3/50	1012	733	1424	320
DDX-0250 SA	2160	36.0	1271	3"	400/3/50	1012	733	1424	350
DDX-0300 SA	2580	43.0	1518	3"	400/3/50	1012	733	1424	390
DDX-0400 SA	3660	61.0	2154	DN 100	400/3/50	1000	1972	1615	650
DDX-0500 SA	4320	72.0	2542	DN 150	400/3/50	1000	1972	1615	780
DDX-0600 SA	4740	79.0	2789	DN 150	400/3/50	1000	1972	1615	820
DDX-0800 SA	6540	109.0	3849	DN 200	400/3/50	1200	2761	1888	1400
DDX-1000 SA	7260	121.0	4273	DN 250	400/3/50	1200	2761	1888	1630
DDX-1200 SA	9000	150.0	5297	DN 250	400/3/50	1200	2761	1888	1850

Specifications	
Unit operating limits	Ambient temperatures from +5˚C to +50˚C - pressure from 4 bar to 16 bar (10bar over 1800m3/h)
Design conditions	Ambient temperatures +25˚C, inlet air temperatures +35˚C, pressure dew point +3˚C, pressure 7 bar(g)
Refrigerant type	R513a (low GWP refrigerant 631)

The advertised product weights are net without packaging and expressed in kilograms.
The maximum operating pressure is 16 bar
The maximum compressed air inlet temperature is 65˚C
The correction factors details are available from our sales and technical teams, or are specified within our selection software, below is an extract of main values

Dryer maximum airflow = Dryer airflow x K1 x K2 x K3 x K4

Correction Factor

K1	Working pressure	(barg)	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Correction factor	(K1)	0.57	0.72	0.82	0.92	1	1.06	1.08	1.11	1.14	1.18	1.19	1.21	1.24	1.26
K2	Ambient temperature	(°C)	20	25	30	35	40	45	50	-	-	-	-	-	-	-
	Correction factor	(K2)	1.04	1	0.96	0.9	0.84	0.76	0.71	-	-	-	-	-	-	-
K3	Air inlet temperature	(°C)	30	35	40	45	50	55	60	65	-	-	-	-	-	-
	Correction factor	(K3)	1.18	1	0.85	0.7	0.61	0.56	0.49	0.43	-	-	-	-	-	-
K4	Dew point	(°C)	3	4	5	6	7	8	9	10	-	-	-	-	-	-
	Correction factor	(K4)	1	1.03	1.07	1.16	1.19	1.22	1.24	1.27	-	-	-	-	-	-

SUSTAINABLE AIR & WATER SOLUTIONS FOR
INDUSTRIAL APPLICATIONS

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