FARGON

FDA / FDH series

Adsorption Compressed Air Dryer

Heatless or heater regeneration

FARGON

FDA / FDH series

What's adsorption?

Drying with high efficiency and economy

Some compressed air applications requests a low moisture level (dew point between –5 to –70°C), not being attended by the conventional refrigeration air dryer systems (dew point +3°C). In this case we must use the dryer that operates by adsorption process.

The adsorption is a physical process that fixes determinate gases molecules (in our case water steam) in the surface of solids products named adsorption materials or adsorbents.
This process has high efficiency, being easily regenerated after its saturation (heater or heatless process).

With adsorption systems, we can eliminate the water steam with dew points until -100°C.

The adsorbents are very porous materials with specific surfaces until 500 a 1.000 m² per gr. Is this big surface that creates the essential condition of adsorption phenomenon (compared to the condensation) phenomenon.

The regeneration (also called reactivation) consists in the elimination or evaporation of the water that was retained by the adsorbent. This regeneration can be done by the circulation in the adsorption material of a little quantity of compressed air dry and heat air (heater process – FDH series) or only dry and cold air (heatless process – FDA series).

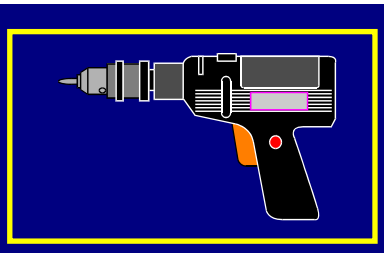
Technical features

FDA / FDH series

- ❒ Heatless (FDA series) or heater regeneration (FDH series)
- ❒ Dew point between –10 and – 65°C
- ❒ Operation fully automatic
- ❒ Easy and low coast maintenance (no special tools neither specialized people)
- ❒ High service life, robust construction
- ❒ Low regeneration air consumption: 10-15% (FDA) and 5-8% (FDH)
- ❒ Maximum operation pressure 10 bar or higher
- ❒ High quality painting
- ❒ Designed to operate continuous

- ❒ Central panel commanded by an exclusive electronic card (AIR TIMER) programmable according to operating conditions.
  Optional: energy save system DRY ENERGY commanded by CLP and dew point meter; remote control system by RS 232 serial port and specific software
- ❒ Several filters configurations to guarantee a complete air treatment (oil/condensed water and particles/dust removal). Optional odors and virus removal
- ❒ Designed according ASME sec. VIII- div.1 / NR 13 rules and individually tested in our factory
- ❒ Permanent technical assistance
- ❒ The Fargon´s dryers are supplied with the following adsorbents options: silica gel, activated alumina, molecular sieves

Designed for ISO 8573 classes 1.1.1 , 1.2.1 , 1.3.1



Typical applications

Air quality recommended

INSTRUMENTATION
The application of dry compressed air guarantees the quality and precision of instruments and controllers, reducing the coasts maintenance of the system.
(Recommended dew point -25°C)

PAINTING
WE eliminate the problems caused by the presence of water and oil in painting process (spots, low adherence), obtaining high quality appearance and adherence.
(Recommended dew point -25°C)

PROCESS AIR AND PNEUMATIC TRANSPORT
We eliminate the oil / water contamination in the process that use compressed air and also in the pneumatic transport of products sensibles to moisture. (for example chlorine movement, pneumatic transport of coffee, hygroscopic materials)
(Recommended dew point -45°C or less)

LIQUEFIED GASES/ COLD CHAMBERS
We eliminate the ice formation in the pneumatic instruments inside the cold chambers, in the expansion compressed air valves and other compressed gases (oxygen, hydrogen, petroleum gases)
(Recommended dew point -25 to -55°C)

THERMICAL TREATMENT PROCESS
The application of compressed in these process avoid the blue spots in the carbon n steel and aluminum product. Protects too the terminal process applications
(Recommended dew point -25°C)

SYSTEMS, MACHINES END PNEUMATIC TOOLS PROTECTION
The systems and pneumatic tools are protected, avoiding corrosion and rust in tubes, connections, valves, internal components of pneumatic motors and cylinders.
(Recommended dew point -25°C)

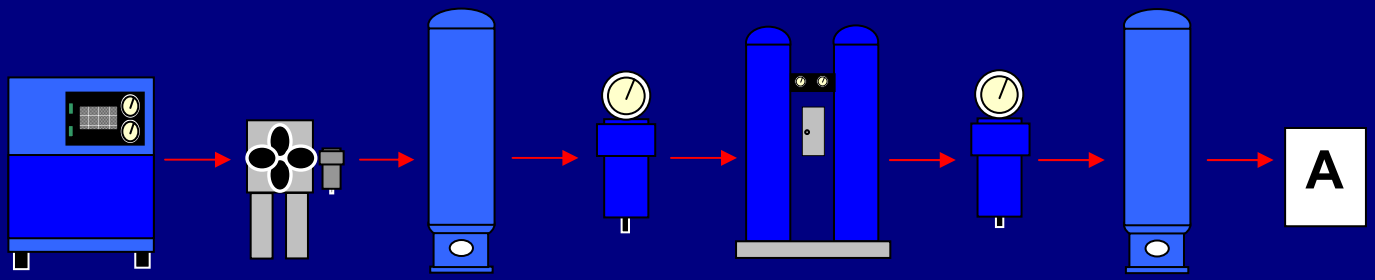
FILM MANUFATURING, OPTICAL FIBERS, ELETRONIC CIRCUITS
To guarantee the total elimination of moisture in the manufacturing process of these components.
(Recommended dew point -25°C)

REFRIGERATION COMPONENTS TESTS
The compressed dry air substitutes the nitrogen in the seal tests of the refrigeration components (valves, exchangers) preparing to refrigeration application.
(Recommended dew point -45°C)

OXYGEN AND NYTROGEN GENERATION PROCESS OBTAINED BY COMPRESSED AIR
Prepare the compressed air for the separation and purification process as oxygen and nitrogen generation by compressed air.
(Recommended dew point -25°C)

Basic installation lay out

See bellow one application example



Compressor | after cooler | moisture air receiver | inlet filter | Dryer **FDA/FDH** | outlet filter | dry air receiver | applications

How the adsorption dryer works

General operation informations

Operation cycle

The compressed air passes for 3 stages during the drying and filtration process:

- First the compressed air passes through one inlet coalescing filters to remove he oil and condensed water that come from compressor. This filter also removes the particles and rust of the tubes with high efficiency (99,9999%). Optionally the dryer is supplied with inlet water separator (for oil free compressors).
- Then the compressed air enters in he dryer by one of the adsorption towers, that removes the water steam by the adsorption process (at the same time the other adsorption tower is regenerated) until the designed values.
- In the last stage, the compressed air, now dried, passes through a particles filter that removes dust and little particles from the adsorption material.

Regeneration cycle

To regenerate the adsorption tower that is saturated, we use a little quantity of dry air that is heated (FDH series) or cold (FDA series).

- To this regeneration, we use about 5-15% of dry air (depending of the model, regeneration process and dew point desired) that, in the outlet line is diverted for a secondary line, passing by one heater (only FDH models) and then passes in the adsorption that is saturated, removing the moisture and finally eliminating it to the atmosphere.
- This regeneration allows a high service life of the adsorbent materials (about 2 to 6 operation years).

Inlet / outlet filters

The perfect complement for the adsorption dryer

The Fargon´s adsorption dryers must be supplied completed with inlet and outlet filters, guarantying then a total end efficient treatment for the compressed air dryer (oil, water, water steam and particles removal) and if necessary odors and virus.

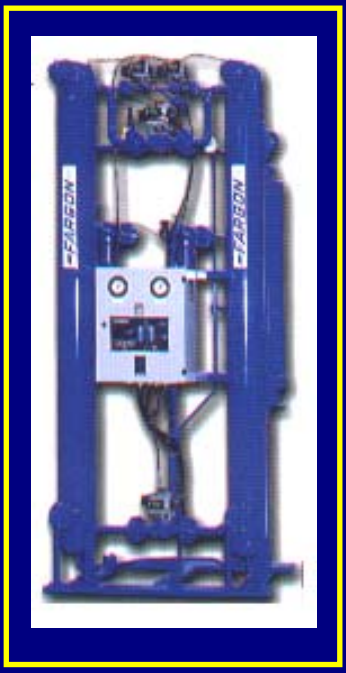
Inlet filter: the inlet filter (coalescing type) guarantees the oil/water removal from the airflow, allowing then a perfect operation of the adsorption towers. IN case of high oil contamination, we recommend the use of 2 coalescing filters (fine and ultra fine grade) for maximum efficiency.

Outlet filter: the outlet filter (paper or sintered material) removes the particles that come from the adsorption materials, avoiding damages in the components of customer applications.

Accessories: Visual element saturation indicator or differential pressure gauge
Manual or automatic drain (float or electronic type)

Optional: Carbon Filter to remove oil odors (food applications)
Sterile filter to remove virus and bacteriums (pharmacist applications)

Depending of the filters configuration, we can obtain the water and oil removal until 0,008 ppm and particles until 0,01 mícron, as well as odors and virus.



FDH series

Heater adsorption type

- *Easy access to all the components for maintenance*
- *Guarantee: 12 operations months*
- *Standard models with visual moisture indicator in the outlet line*
- *Valves tested for compressed air applications with high service life*
- *Optional: operation pressure until 20 bar, painting according customer specifications, special instrumentation*
- *Adsorption towers regeneration using electrical or steam font*
- *Central panel commanded by an exclusive electronic card (AIR TIMER) programmable*
- *Optional:*
  - *dew point meter*
  - *energy save system DRY ENERGY commanded by CLP and dew point meter: controls and adjusts automatically the operation cycle according the air quality requested*
  - *remote control system by RS 232 serial port and specific software*
  - *regeneration system with auxiliary blower: low regeneration air consumption (0,8% medium)*

SELECTION TABLE

Model	Flow rate Pressure 7 bar temper. 38°C DP = -20/-40°C		Inlet/Outlet connections R-thread	Dimensions / weight Without inlet / outlet filters (mm / kg)				Electric Consumption **Electric regeneration**	Steam Consumption **Steam regeneration**	Compressed air Consumption for regeneration
	scfm	Nm³/h	F-flange	Length	Width	Height	Weight	KW	kg/h	
FDH 0030	9	15	1/2" R	1000	750	2000	250	1,5	NA	5-8%
FDH 0050	17	30	1/2" R	1100	750	2300	400	1,5	NA	5-8%
FDH 0120	47	80	3/4" R	1300	950	2500	560	3	NA	5-8%
FDH 0200	76	130	1" R	1300	1230	2700	700	5	NA	5-8%
FDH 0400	147	250	1.1/2" R	1800	1350	2450	1330	7,5	10	5-8%
FDH 0800	294	500	1.1/2" R	1450	1100	2800	2000	15	20	5-8%
FDH 1200	470	800	2" R	1740	1440	3200	2300	20	30	5-8%
FDH 2000	764	1300	2.1/2" R	2500	1650	3100	2900	25	40	5-8%
FDH 3800	1176	2000	3" F	3000	1950	3600	3900	30	60	5-8%
FDH 6500	1882	3200	4" F	3200	2400	3500	7500	50	100	5-8%
FDH 8400	2941	5000	5" F	3930	2450	4000	8500	70	140	5-8%
FDH 14000	5235	8000	6" F	4100	2600	4000	18000	100	200	5-8%
FDH 17500	6470	10500	6" F	4300	3200	4500	20000	130	250	5-8%

Obs: The flow rate above in Nm³/h-scfm was calculated for 7 bar operation pressure, 38°C compressed air temperature and dew point -20°C/-40°C. To select a dryer for another pressure, temperatures and dew point conditions, use the correction table bellow.

To select he correct model to your necessity, use the table bellow
FÓRMULA: Table flow rate = Q X factor F1 X factor F2

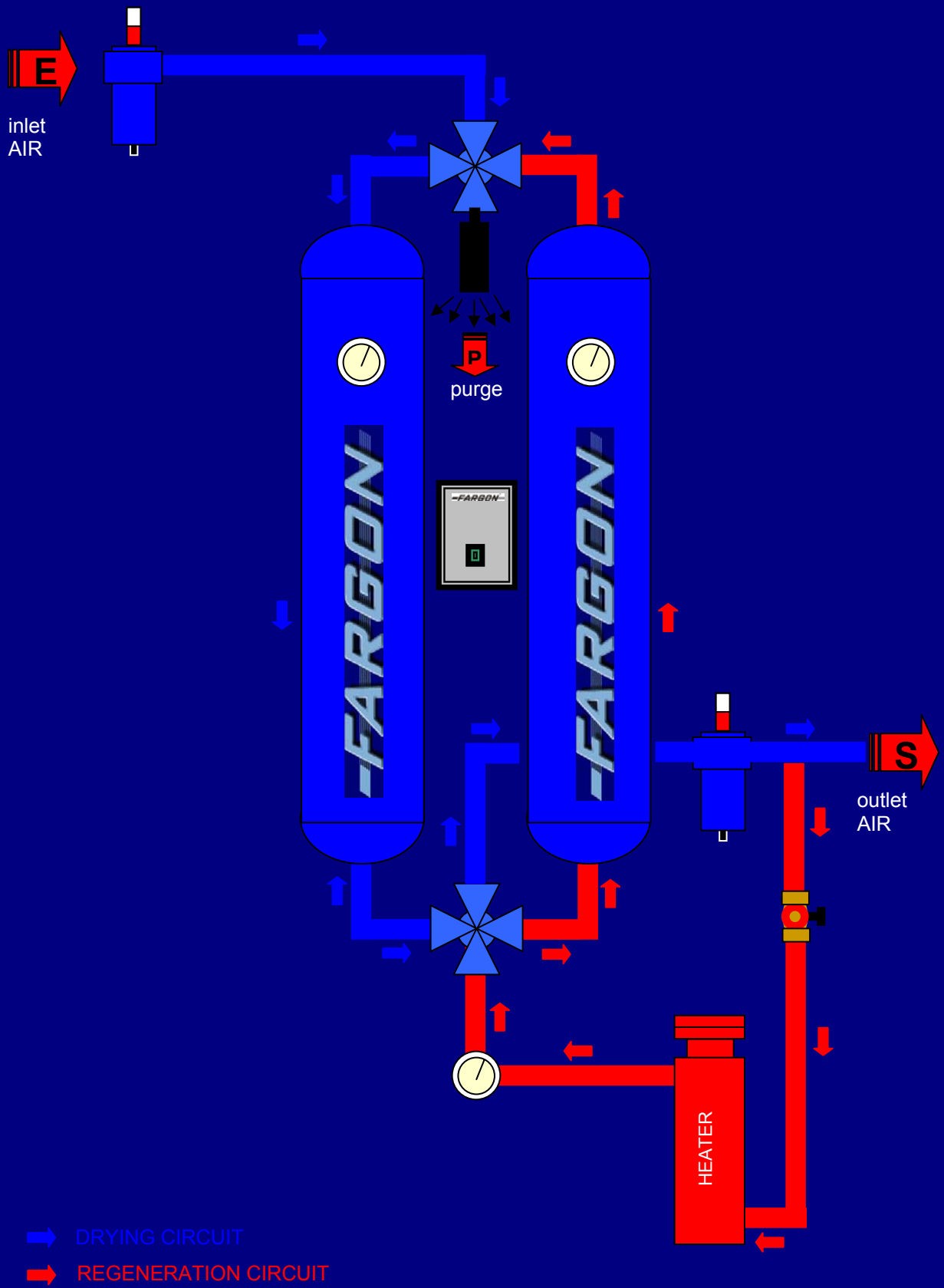
Q	Compressed air flow rate to be treated (Nm³/h or scfm)							
F1	Operation pressure (bar)	4	5	6	7	8	9	10
	Operation pressure correction factor	1,58	1,34	1,14	1	0,88	0,8	0,72
F2	Inlet compressed air temperature (°C)	30	35	38	40	45	50	
	Compressed air temperature correction factor	0,64	0,86	1	1,11	1,43	1,88	
		Table flow rate = Q x F1 x F2						
		Selected dryer						

obs: to dew points -10/-20°C or below -40°C, on request

Example: flow rate to be treated 70 Nm³/h, pressure 10 bar, temperature 45°C
Table flow rate = 70 Nm³/h X 0,72 X 1,43 = 70,07 Nm³/h
Selected dryer **FDH 0120**

FDH series

Adsorption – heater regeneration – operation flow



FDA series

Heatless adsorption type

- *Easy access to all the components for maintenance*
- *Guarantee: 12 operations months*
- *Standard models with visual moisture indicator in the outlet line*
- *Valves tested for compressed air applications with high service life*
- *Optional: operation pressure until 50 bar, painting according customer specifications, special instrumentation*
- *Adsorption towers regeneration using electrical or steam font*
- *Central panel commanded by an exclusive electronic card (AIR TIMER) programmable*
- *Optional:*
  - *dew point meter*
  - *energy save system DRY ENERGY commanded by CLP and dew point meter: controls and adjusts automatically the operation cycle according the air quality requested*
  - *remote control system by RS 232 serial port and specific software*

SELECTION TABLE

Model	Flow rate Pressure 7 bar temper. 38°C DP = -20/-40°C		Inlet/Outlet connections R-thread R-rosca F-flange	Dimensions / weight Without inlet / outlet filters (mm / kg)				Electric Consumption	Compressed air Consumption for regeneration
	scfm	Nm³/h		Length	Width	Height	Weight	W	
FDA 0150	59	100	½" R	400	400	1750	145	50	10-15%
FDA 0250	80	136	¾" R	450	450	1800	240	50	10-15%
FDA 0300	109	185	¾" R	500	450	1700	255	50	10-15%
FDA 0400	135	230	1" R	600	500	2100	270	50	10-15%
FDA 0500	180	306	1.1/2" R	650	650	2100	410	100	10-15%
FDA 0600	235	400	1.1/2" R	650	650	2400	450	100	10-15%
FDA 0900	320	544	1.1/2" R	800	730	2140	480	100	10-15%
FDA 1200	411	700	1.1/2" R	800	730	2400	520	100	10-15%
FDA 1400	500	850	2" R	900	730	2700	670	100	10-15%
FDA 1600	588	1000	2" R	980	800	2600	750	100	10-15%
FDA 2000	758	1290	2.1/2" R	1415	900	2600	1100	100	10-15%
FDA 2800	947	1610	3" F	1600	1350	2800	1500	100	10-15%
FDA 3800	1205	2050	3" F	1900	1500	2900	1800	100	10-15%
FDA 4800	1517	2580	4" F	2000	1650	3000	2100	100	10-15%
FDA 6500	2000	3400	4" F	2200	1750	3200	2900	100	10-15%
FDA 7200	2500	4250	4" F	2450	1900	3200	3500	100	10-15%
FDA 8400	3000	5100	4" F	2850	2100	3300	4300	100	10-15%
FDA 14000	3500	5950	6" F	3100	2300	3500	5200	100	10-15%

Consult catalog for MINI series:
FDA 0010 (3 scfm) - FDA 0020 (9 scfm) - FDA 0090 (20 scfm) - FDA 0120 (35 scfm) - FDA 0130 (35 scfm)

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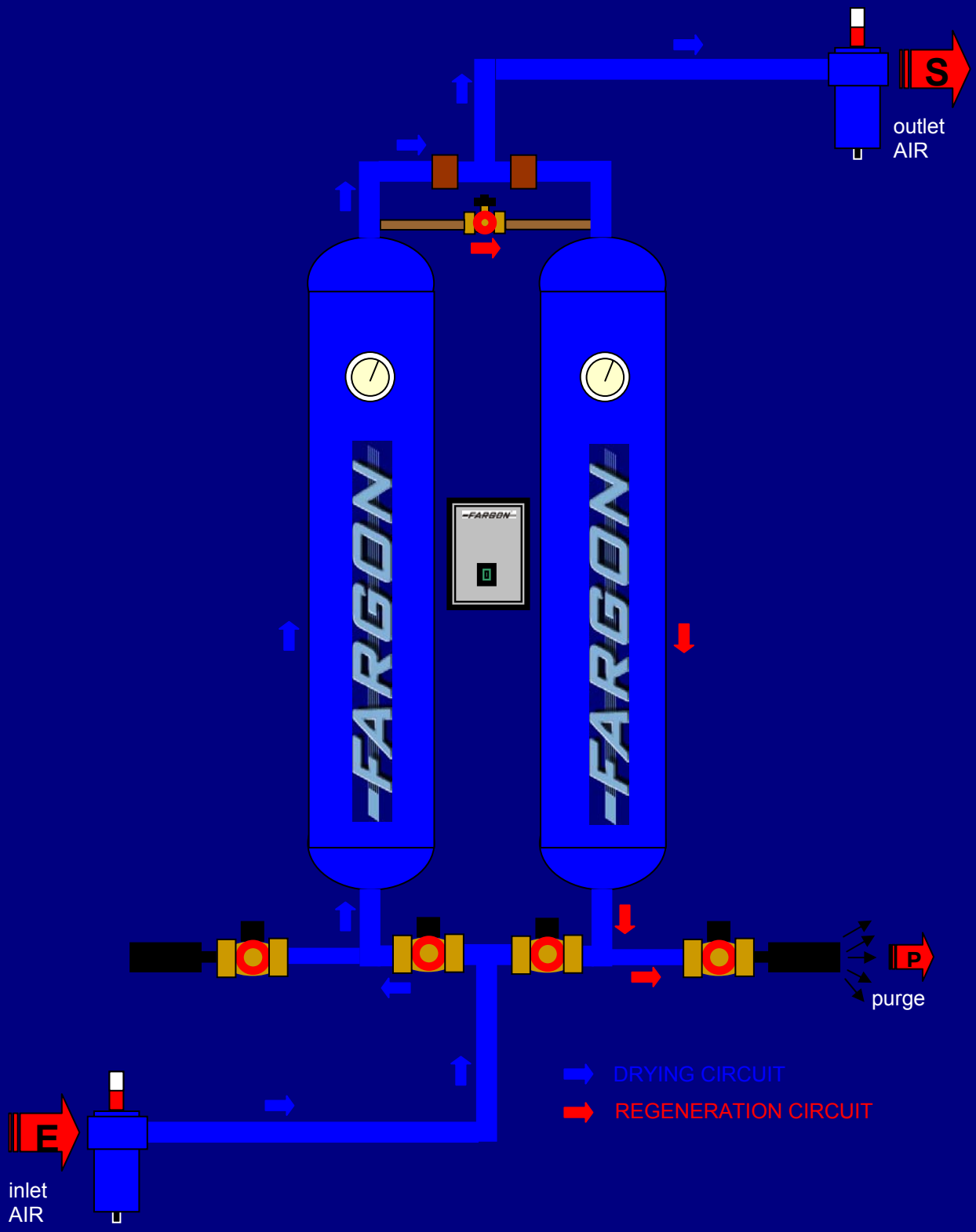
	Compressed air temperature correction factor	0,64	0,86	1	1,11	1,43	1,88	
		Table flow rate = Q x F1 x F2						
		Selected dryer						

obs: to dew points -10/-20°C or below -40°C, on request

Example: flow rate to be treated 70 Nm³/h, pressure 10 bar, temperature 45°C
Table flow rate = 70 Nm³/h X 0,72 X 1,43 = 72,07 Nm³/h
Selected dryer **FDA 0150**

FDA series

Adsorption – heatless regeneration – Operation flow



FARGON®

AIR TREATMENT SINCE 1963

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