

## ALUMINIUM TECHNOLOGIES DIRECT TO ENERGY SAVING

Frilair improves its range of compressed air dryers with the development of the ACT series (Aluminium Coating Technology), focused to reduce energy consumption. Main features are:

- low pressure drop even with load variations;
  - low power consumption thanks to the ALU-DRY heat exchanger, high efficiency compressors, innovative hot gas by-pass valve and zero loss drain condensate system (from ACT 180 included);
  - constant pressure Dew Point with differing load conditions;
  - functionally even at maximum working conditions (air inlet 70°C and ambient 50°C).
- The components of ACT range, from refrigerant to materials of construction, have been selected with maximum respect for the environment and their ability to be recycled.

## TECHNICAL DETAILS [ACT 3...160]

### CONTROL PANEL

#### DMC3S CONTROLLER (standard)

Operation of the ACT-1 dryer is monitored by DMC3S electronic controller which indicates the DewPoint temperature digitally, controls the condensate drain valve via a timer and the condenser fan via a probe.



#### DMC14 CONTROLLER (optional)

Operation of the models ACT 3...160 is controlled and monitored by DMC14 digital controller. Features a 3 digit display for the visualization of the Dew Point temperature in °C or °F, an electric contact alert for detection of eventual irregularities concerning the Dew Point, and full management of the condensate drain system.



### CONTROL AND PROTECTION DEVICES

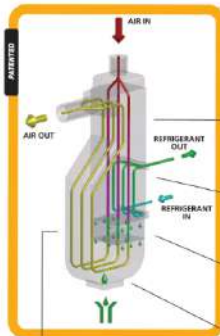
All models are fitted with a fan pressure switch to control the refrigerant condensing.

ACT 30 and larger, come equipped with some specific devices to protect the components of the unit:

- re-set high refrigerant pressure cut-out (for ACT 80...160);
- low refrigerant pressure cut-out (for ACT 80...160);
- re-set high temperature cut-out (for ACT 30...160), which stops the refrigerating compressor when discharge temperature is too high (e.g. clogged or blocked condenser).

### CONDENSATE DRAIN

ACT 3...160 models are fitted with an electronic system to drain the condensate interfaced to the controller. Discharge and pause times are adjustable. Drainage group includes also a ball isolation valve and a strainer. A zero loss drain is available as an option.



## ALU-DRY HEAT EXCHANGER

The air-to-air and the air-to-refrigerant heat exchangers plus the dewister type condensate separator are housed in an unique module. The vertical arrangement eases the wet compressed air flows down to the automatic drain. The counter flows of compressed air ensure maximum heat transfer.

### AIR/AIR HEAT EXCHANGER

Or economizes, pre-cools the air entered into the dryer, in order to reduce the cooling power required when the air subsequently passes into the evaporator. The air exiting the dryer is heated in the same way in order to prevent condensation from forming in the factory pipes.

### EVAPORATOR

The generous dimensions of the air-to-refrigerant heat exchanger plus the counter flow gas streams allow full and complete evaporation of the refrigerant (preventing liquid returning to the compressor).

### DEWISTER TYPE CONDENSATE SEPARATOR

The high efficiency condensate separator is located within the heat exchanger module. No maintenance is required and the coalescing effect results in a high degree of moisture separation.

### LARGE CAPACITY

The large capacity separator is designed to hold condensate airt at high humidity in compressed inlet air.

### LOW PRESSURE DROP

The large cross section of flow channels leads to low air velocities and reduced pressure drop.

## COMPRESSOR

### RECIPROCATING TYPE

Models ACT 3...23 are fitted with high efficiency piston compressors sourced from major producers.



### ROTARY

For models ACT 30...160. This is a new technology applied to refrigerants as an alternative to the traditional piston compressor. Compression of the refrigerant is achieved by way of interaction between a cylindrical stator and a rotating eccentric nucleus. In this method, the parts which come into contact with one another are wear-resistant and therefore more reliable.



### SCROLL

From model ACT 180 on, the type of compressor used is the scroll. Widely used in the air conditioning and refrigeration sectors, the scroll compressor performs well and has low energy consumption. Compression of the refrigerant is achieved by way of two concentric coils, one fixed and the other mobile. The scrolls are wear-resistant, highly reliable and guarantee a high level of noise reduction.



## "HOT GAS" BY-PASS VALVE

The precise and accurate hot gas by-pass valve, which prevents the formation of ice inside the evaporator at any load condition, is a recent development unavailable in the past. The valve is set during final test and no further adjustments are necessary.



## EASY MAINTENANCE

The ACT series has been designed and built to facilitate any inspection and maintenance operations that may prove necessary. The hoods are easily removed and offer immediate access to all parts of the system. The clear layout of the components, the simple composition of the refrigerant circuit and the numbering of the wires in the electrical system, facilitate the operator when carrying out standard controls.

## TECHNICAL DETAILS [ACT 180...1500]

### CONTROL PANEL



#### DMC 24 CONTROLLER

In addition to the characteristics already present in the DMC14 model, this new controller features a new alert-protection function, which allows the user to plan maintenance operations, a working meter and a RS485 interface for connection to a PC. The four temperature probes and pressure transducer record and display the parameters of the dryer when in use and enable the functions A/C (Advanced Fan(s) Control) for the control of refrigerant condensing, and the ASW (Advanced Service Warning) to receive advance warning of defects. Control and protective devices are now included in the DMC24 controller and interfaced to the operator through the functions ADS (Advanced Draining System) for the control of the zero loss drain and AAL (Advanced Alarm Log). The DMC24 includes the protection for monitoring the sequence of the supply phases and the stopping of the compressor in conditions of high or low refrigerant pressure and/or high discharge temperature.



### CONDENSATE DRAIN

ACT 180 dryer and larger are equipped with a zero loss drain system, interfaced to the DMC24, to assure the drainage of the condensed water only with no air loss.



## MAIN STANDARD EQUIPMENTS AND ACCESSORIES

DESCRIPTION	ACT MODELS				
	J...21	30...40	55...80	100...110	183...1500
ALU-DRY aluminum heat exchanger	●	●	●	●	●
High efficiency compressor	●	●	●	●	●
Tropicalised air condenser	●	●	●	●	●
Condenser protection filter	●	●	●	●	●
High efficiency fan(s)	●	●	●	●	●
Water condenser	●	●	●	●	●
Environmental refrigerant	●	●	●	●	●
Automatic hot gas by-pass control device	●	●	●	●	●
Automatic condensing pressure control	●	●	●	●	●
High and low refrigerant safety pressure switch	●	●	●	●	●
High discharge temperature switch protection	●	●	●	●	●
Zero loss drain	●	●	●	●	●
DMC 13 controller	●	●	●	●	●
DMC 14 controller	●	●	●	●	●
DMC 24 controller	●	●	●	●	●

● Standard      ● Optional



FT

FW

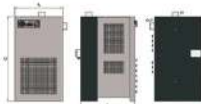
It is mandatory to install a filter of FT or FW series (with filtration grade at least 3 micron) on the dryer inlet side to prevent that rust, scale or other pollutants could clog the ALU-DRY module and the condensate drain.

### CONDENSER

Generous sizing of the condenser ensures maximum performance of the refrigerant circuit and the ability to operate with changes in ambient conditions. Access to the condenser for cleaning and maintenance is straightforward. ACT 180...1500 condensers are equipped with a stainless steel protective front: it can be removed and cleaned. Water cooling option available from ACT 180 model at no charge. Water regulating valve included.

## TECHNICAL FEATURES

Data refer to the following nominal conditions: Ambient temperature of 35°C, with inlet air at 7bar and 42°C and 3°C pressure Dew Point (-22°C atmospheric pressure Dew Point). Max. working conditions: Ambient temperature 50°C, inlet air temperature 70°C and inlet air pressure 14bar (16bar for ACT3...12-T)



Model	Air(g)	Flow rate	Pressure Drop	Compressor	Power Supply	Dimensions (mm)	Weight				
	kg/min	l/min	bar	HP/kW	(V/Hz)	A x B x C	kg				
ACT 5-T	R134a	350	21	12	0.07	G 1/2"	970x590x84	145	420	740	29
ACT 5-T	R134a	350	33	18	0.02	G 1/2"	1020x590	145	420	740	29
ACT 8-T	R134a	850	51	39	0.04	G 1/2"	1030x590x84	145	430	740	31
ACT 12-T	R134a	1,200	72	42	0.06	G 1/2"	1030x590x84	145	430	740	34
ACT 18-T	R134a	1,800	118	64	0.09	G 1"	1030x590	145	430	800	38
ACT 23-T	R134a	2,500	153	88	0.10	G 1"	1030x590	145	455	825	43
ACT 38-T	R407C	3,800	284	120	0.19	G 1.315"	1030x590	145	455	825	46
ACT 48-T	R407C	4,300	346	140	0.19	G 1.315"	1030x590	145	455	825	53
ACT 55-T	R407C	5,300	384	225	0.15	G 1.50"	1030x590	155	540	895	55
ACT 68-T	R407C	6,800	483	240	0.15	G 1.50"	1030x590	155	540	895	63
ACT 88-T	R407C	9,000	543	318	0.08	G 2"	1030x590	155	625	975	82
ACT 100-T	R407C	10,800	648	382	0.13	G 2"	1030x590	155	625	975	94
ACT 130-T	R407C	12,500	750	441	0.08	G 2.50"	1030x590	160	725	1,100	141
ACT 160-T	R407C	16,000	879	552	0.11	G 2.50"	1030x590	165	725	1,100	158
ACT 190-T	R407C	16,000	963	565	0.15	G 2.50"	1030x590	165	725	1,100	158
ACT 190-T	R407C	16,000	1,080	635	0.12	DN 80-PN 16	1400x590	790	1,000	1,405	240
ACT 210-T	R407C	21,000	1,260	742	0.18	DN 80-PN 16	1400x590	790	1,000	1,405	242
ACT 250-T	R407C	26,000	1,480	850	0.19	DN 80-PN 16	1400x590	790	1,000	1,405	275
ACT 300-T	R407C	34,000	2,040	1,282	0.17	DN 80-PN 16	1400x590	790	1,000	1,405	278
ACT 300-T	R407C	30,000	2,340	1,378	0.18	DN 80-PN 16	1400x590	790	1,000	1,405	311
ACT 400-T	R407C	42,000	2,520	1,884	0.19	DN 100-PN 16	1400x590	1,125	1,285	1,750	362
ACT 500-T	R407C	52,000	3,120	1,837	0.11	DN 100-PN 16	1400x590	1,125	1,285	1,750	538
ACT 500-T	R407C	33,000	3,380	2,225	0.19	DN 100-PN 16	1400x590	1,125	1,285	1,750	546
ACT 750-T	R407C	39,000	4,480	2,751	0.18	DN 100-PN 16	1400x590	1,125	1,285	1,750	612
ACT 900-T	R407C	30,000	5,480	3,179	0.20	DN 100-PN 16	1400x590	1,200	1,750	1,810	838
ACT 1100-T	R407C	110,000	6,824	3,893	0.26	DN 100-PN 16	1400x590	1,300	1,750	1,810	946
ACT 1200-T	R407C	120,000	7,200	4,230	0.29	DN 200-PN 16	1400x590	1,400	2,200	1,870	1,255
ACT 1500-T	R407C	147,200	8,632	5,280	0.28	DN 200-PN 16	1400x590	1,400	2,200	1,870	1,230

On request models ACT-T series with 60Hz power supply.

### CORRECTION FACTOR FOR OPERATING PRESSURE CHANGES :

Inlet air pressure	bar(g)	6	5	6	7	8	10	12	14
Factor		0.77	0.84	0.93	1.00	1.05	1.14	1.21	1.27

### CORRECTION FACTOR FOR AMBIENT TEMPERATURE CHANGES :

Ambient temperature	°C	≤ 25	32	35	38	40	43	45	50
Factor		1.00	1.04	1.00	0.94	0.92	0.87	0.83	0.73

### CORRECTION FACTOR FOR INLET AIR TEMPERATURE CHANGES :

Air temperature	°C	≤ 38	42	45	50	55	60	65	70
Factor		1.11	1.03	0.92	0.80	0.70	0.61	0.53	0.46

### CORRECTION FACTOR FOR DEW POINT CHANGES :

Dew Point	°C	3	5	7	18
Factor		1.00	1.09	1.19	1.33

\*Usual means the right to make technical changes without prior notice, unless otherwise specified.

**FRIULAIR**  
Driers

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TROPICAL

# ACT-T Dryer Series



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