

- For high/medium flows, the dryer applies the ultra-pulse Technology to regulate its drying capacity.
- For low air flows, the dryer utilizes the “thermal storage” operation.

ultra.pulse Technology for high/medium air flows

The refrigerant compressor is permanently ON to achieve a perfect control of the dew point. The microprocessor controls through “impulses” the opening and closing of a solenoid valve installed on the suction pipe of the refrigeration compressor, in partial load conditions then only a small portion of the nominal refrigerant flows through a by-pass calibrated orifice of the solenoid valve to the compressor.

In partial load conditions the compressor compresses less refrigerant than at peak load and therefore it consumes less energy (refrigerant flow control technology).

Thermal storage operation for low air flows

The refrigerant compressor cycles ON/OFF for maximum savings and reliability. Since the refrigeration capacity is greater than the load, the excess capacity cools the all-in-one exchanger that acts like a thermal storage.

Productivity Savings

Compressed air networks rarely operate at full load. Air compressors typically run at 70-80% of capacity for the first shift operation, further decreasing on second and third shifts because of variable process demands as well as seasonal fluctuations in ambient temperature. Ultra.dry saves energy across the full load spectrum and maximizes the bottom line energy savings.

The chart on the next page shows a comparison between a ultra.dry UD 1650 (27,5 m³/min) and a dryer which uses hot gas by-pass control. The ultra.dry UD 1650 ensures an annual energy saving of 8103 kWh corresponding to a cost saving of 810 € and a reduction on annual CO₂ emissions of 2334 kg.



Modell	Volume flow ISO 8573-1 (Class 4) DTP+3°C m ³ /h	Pressure loss dp in bar	Powersupply V/ph/Hz	Nominal absorption power kW	Air connec- tions Rp	Overall dimensions mm						Weight kg
						A	B	C	D	E	F	
UD 0025	25	0,04	230/1/50	0,13	3/8"	319	298	390	70	32	353	18
UD 0035	35	0,08	230/1/50	0,21	3/8"	319	298	390	70	32	353	18
UD 0054	54	0,15	230/1/50	0,22	3/8"	319	298	390	70	32	353	19
UD 0075	75	0,09	230/1/50	0,25	1/2"	359	298	415	70	32	367	22
UD 0110	110	0,18	230/1/50	0,35	1/2"	359	298	415	70	32	367	22
UD 0150	150	0,09	230/1/50	0,42	1"	380	514	625	70	76	480	35
UD 0190	190	0,12	230/1/50	0,63	1"	380	514	625	70	76	480	39
UD 0230	230	0,18	230/1/50	0,71	1"	380	514	625	70	76	480	42
UD 0300	300	0,21	230/1/50	0,98	1"	680	511	860	80	79	685	68
UD 0350	350	0,1	230/1/50	1,01	1 1/2"	680	511	860	120	96	646	75
UD 0450	450	0,16	230/1/50	0,84	1 1/2"	680	511	860	120	96	646	76
UD 0500	500	0,14	230/1/50	0,95	1 1/2"	755	555	995	150	104	751	93
UD 0600	600	0,18	230/1/50	1,1	1 1/2"	755	555	995	150	104	751	94
UD 0850	850	0,26	230/1/50	1,95	2"	883	721	1107	150	123	821	138
UD 1050	1050	0,35	230/1/50	2,65	2"	883	721	1107	150	123	821	140
UD 1175	1175	0,21	230/1/50	2,94	2 1/2"	1170	939	1180	200	165	840	247
UD 1350	1350	0,24	400/3/50	3,17	2 1/2"	1170	939	1180	200	165	840	254
UD 1650	1650	0,28	400/3/50	3,57	2 1/2"	1170	939	1180	200	165	840	255

Data refers to the following working conditions: air FAD 20 °C / 1bar A, pressure 7 bar(g), ambient temperature 25 °C, air inlet temperature 35 °C, according to ISO 8573.1 standard. Weights are net (without packing and for timed drain configuration). Refrigerant fluids: R134a (ultra.dry UD 0025-0600), R404A (ultra.dry UD 0850-1650). Protection class IP22.

Maximum working pressure 16 bar(g); maximum ambient temperature 50 °C; maximum inlet temperature +70 °C (ultra.dry UD 0025-600), +60 °C (ultra.dry UD 0850-1650). The correction factors in the following table should be used as a guide only; for accurate selection at conditions differing from the above the selection software should be utilised. Capacity Correction Factors (indicative values): CAPACITY = RATED VALUE 7 bar(g) x K1 x K2 x K3.

Compressed air inlet temperature °C	30	35	40	45	50	55	60	65	70
Correction factor K2	1,23	1,00	0,81	0,66	0,57	0,52	0,48	0,44	0,4

Dewpoint °C	3	5	7	9
Correction factor K4	1,00	1,24	1,38	1,4

Operating pressure bar (g)	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Correction factor K1	0,71	0,82	0,9	0,96	1	1,04	1,07	1,09	1,11	1,13	1,15	1,16	1,18	1,19

ambient temperature °C	20	25	30	35	40	45	50
Correction factor K3	1,05	1,00	0,95	0,89	0,84	0,78	0,72



Technical alterations reserved.



ultrafilter gmbh
Otto-Hahn-Str. 1 • 40721 Hilden • Germany
Tel: +49 (0) 21 03.33 36 13 • Fax +49 (0) 21 03.33 36 36
e-Mail: info@ultra-filter.de • www.ultra-filter.de



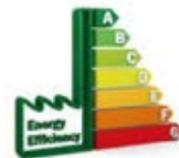
Patented refrigeration dryer ultra.pulse

ultra.pulse Technology

With the introduction of ultra.dry, the new generation of energy-saving refrigeration dryers, Ultrafilter not only renews its product offering for the compressed air treatment but also reinterprets the concept of thermal storage operation, that made the international success of the ultra.dry dryers. The new ultra.pulse technology offers important advantages in terms of energy saving, reliability and operating costs as the ultra.dry dryer is able to adapt itself to the real needs of the compressed air system. The regulation system of the dryer controls the dryer operation granting the most energetically effective method of compressed air drying, achieving high energy saving and ensuring at the same time an excellent dew point stability also in dynamic conditions.

Enhanced Energy Savings

New 3-in-1 high efficiency heat exchanger with optimized fluid dynamics useful to keep the pressure drops to a minimum level. Advanced drying capacity control by ultra.pulses or by thermal storage effect. Enhanced energy savings (up to 80% compared with hot gas by-pass dryers).



Reliable Drying & Separation

The stainless steel demister separator efficiently removes the condensed moisture at all air flows (unlike centrifugal separators). This ensures a high grade of drying all the time.

High Operating Limits

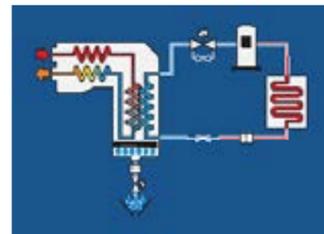
High maximum inlet temperature +70°C (ultra.dry UD 0025 - 0600) +60°C (ultra.dry UD 0850 - 1650) and maximum ambient temperature (+50°C) ensure a fail-safe operation at all times. High maximum operating pressure (16 barg).

Easy Installation

Advanced design makes this dryer extremely compact and lightweight. Small footprint and frontal access for all controls and refrigeration components save valuable plant floor space.

Userfriendly

Ultra.dry automatically adapts itself to any operating condition, without any need to adjust or switch OFF the dryer. User friendly digital control is standard on all the models and shows all the main parameters, providing warnings and alarms to ensure correct dryer operation.



ultra.pulse Technology & Energy Savings

This revolutionary design matches energy consumption to the work load to achieve energy savings while in operation.

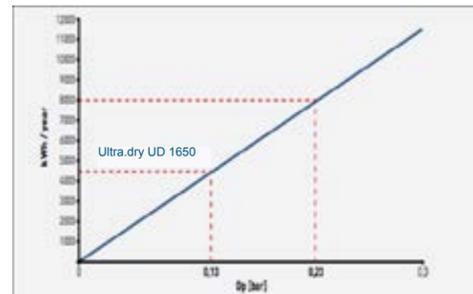
Thanks to some sensors placed on the refrigeration and on the compressed air circuits, the microprocessor controls the dryer operation granting the most effective method of compressed air drying.

Compressed Air flow 35 m3/min		Non cycling dryers	Ultra.dry UD 1650
Energy consumption per year	Kwh	24370	16266
Energy cost per year	€	2430	1626
CO2 emission per year	kg	7018	4684
Energy saving per year	Kwh	-	8103
Cost saving per year	€	-	810
CO2 emission saved per year	kg	-	2334

(*) 6000 hours/year. Load profile: for 4800 h/year, load = 80%; for 1200 h/year, load = 30%. Energy costs = 0,1 €/ kWh.

Low Pressure Drops Savings

The pressure drops generated by a refrigerant dryer must be considered as an extra load that must be overcome by the compressed air compressor to ensure the pressure level required. ultra.dry are designed and optimized from the fluid dynamics point of view to keep the pressure drops to a minimum. The graph represents the increase in power consumption (kWh per year) of a screw compressors 132 kW caused by the pressure drops (6000 working hours per year).



Ultra.dry UD 1650 with a pressure drop 0,28 bar provides a considerable energy saving respect another dryer with higher pressure drop 0,38 bar: Annual Energy Saving = (7945 – 4490) kWh/year = 3454 kWh/year. That corresponds to an yearly cost saving of 345 € (energy cost 0,10 € per kWh) and to a reduction on annual CO2 emissions of 995 kg.

Total Productivity and Low Pressure Drops Savings

ultra.dry UD 1650 (27,5 m3/min)	Total savings per year
Total energy saving per year Kwh	11557
Total cost saving per year €	1156
CO2 emission saved per year kg	3329

How it works

Hot moist compressed air enters the Air-to-Air heat exchanger where it is precooled by the dry air leaving the dryer. The refrigerant compressor compresses the refrigerant gas and push it through the condenser (where it is condensed in high pressure liquid). The refrigerant liquid then passes through a capillary/calibrated orifice that meters it into the evaporator as a low pressure liquid. The microprocessor adapts the working cycle to the real working conditions by controlling through "impulses" the opening and closing of the solenoid valve. In partial load conditions only a small portion of the refrigerant flows through the calibrated orifice of the solenoid valve to the compressor that therefore consumes less energy. The precooled air enters the evaporator where it is cooled to the required dew point by the incoming refrigerant liquid

that changes phase and becomes a low pressure gas suitable to continue the process as it returns to the suction side of the refrigerant compressor. The exiting cold dry compressed air then returns to the Air-to-Air heat exchanger where it is reheated by the incoming air, to prevent sweating in your plant.

Advanced Digital Control

Ultra.dry features advanced microprocessor control technology, with all models fitted with easy to use digital controls. A comprehensive digital display keeps the user fully informed. Maintenance operations are simplified, and remote supervision RS485 can easily be supplied.



- The display shows continuously with icon based menus the following parameters:
 - Status of the dryer (OFF/dry/hdP);
 - Status of the compressor;
 - Status of condensate drain;
 - Energy saving level;
 - Alarms.
- 33 coded alarms ensuring faultless dryer operation.
- Programmable user alarm.
- Service warning, informing user that preventive maintenance should be carried out.
- Condensate drain control and programming, including manual drain test function.
- Remote ON/OFF function.
- Potential-free general alarm contact for remote alarm indication.
- Possibility to connect the dryer to a supervisor system via RS485 Modbus (option).

