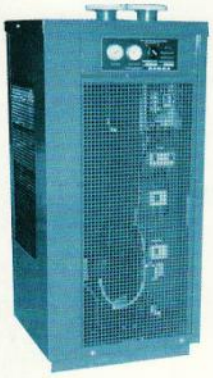
AUSTRALIA'S OWN

'FRIGEMATIC'

compressed AIR DRYERS

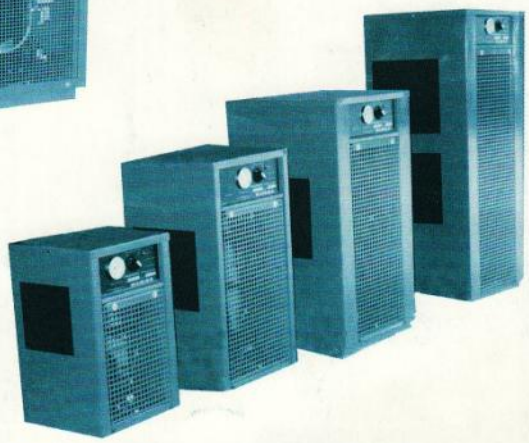
since 1960

For Installation convenience
Models ADX1090 to ADX5040 are supplied with dual INLET & OUTLET Flanges at front & rear.



ADX Series

Brochure update May 2002



Made in Australia for reliable performance in this **sunburnt country**

with a **20 years warranty** against refrigerant leaks of compressed air heat exchangers.

Performance and longevity of compressed air dryers are CRITICALLY DEPENDENT on the QUALITY of their COMPRESSED AIR HEAT EXCHANGERS.

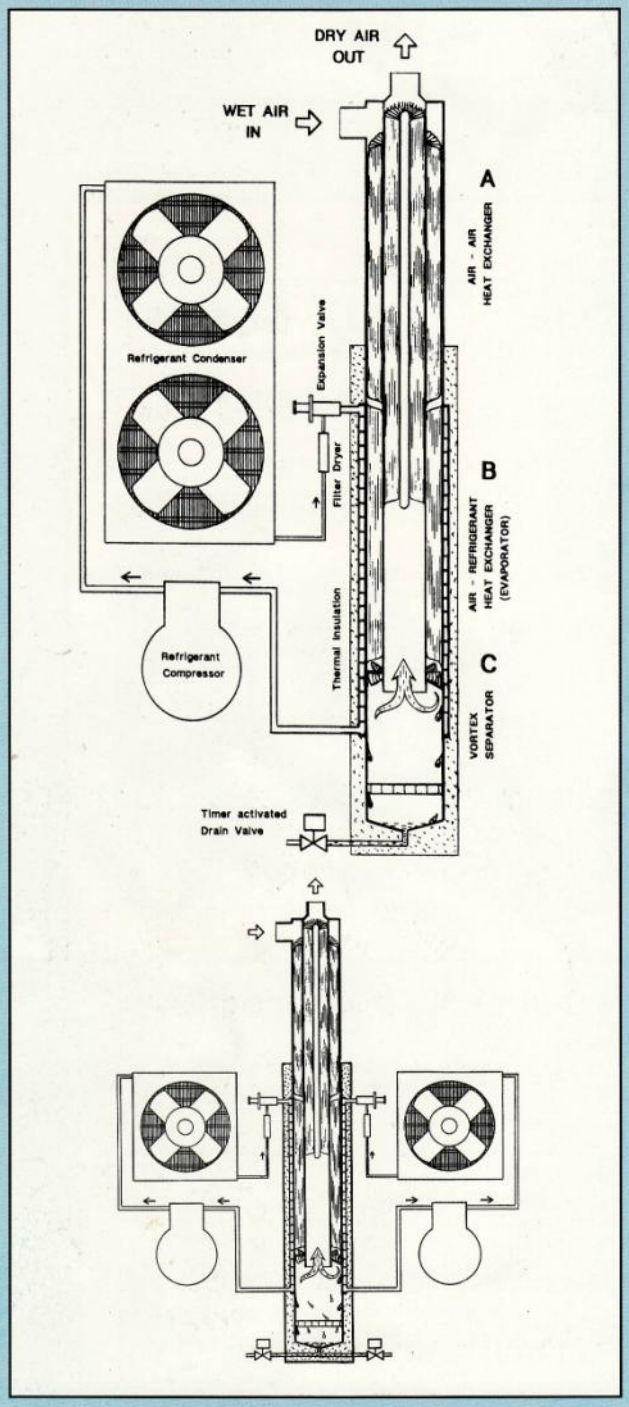
Refrigerant leaks in compressed air heat exchangers are caused by internal corrosion or joint failures or tube bursting through ice expansion on freeze-up. Consequential air entry into the refrigeration systems leads to its destruction.

Since purchasers are not able to assess the quality of an air dryer's heat exchangers PRUDENCE DICTATES to insist on a LONG TERM MANUFACTURERS WARRANTY against refrigerant leaks of compressed air heat exchangers.

AVAILABLE FROM

LUNA solutions.
www.lunasolutions.com.au
Contact: David Penaluna
Ph: 0418 396 308
Nitro Professionals

The 'Frigematic' Air Dryer System (non-cycling)



The unique 'Frigematic' air chiller/separator modules are of all copper construction.
This eliminates internal corrosion and guarantees undiminshed performance for decades as is proven in thousands of installations since 1960. Ongoing repeat orders from major corporations for plant expansion testify to the outstanding performance and reliability of 'Frigematic' air dryers under demanding conditions.

In the drying process - warm and wet compressed air flows first through the AIR-to-AIR HEAT EXCHANGER (A) in which it is precooled by the outflowing cold air. Then it flows through the AIR-to-REFRIGEANT HEAT EXCHANGER (B) where it is cooled to its design dewpoint temperature.

As the air cools, its watervapour condenses to liquid on the large area heat exchange fins which also act as efficient coalescer for entrained oil. The vertical down flow ensures that condensate and oil are carried with the air stream into the cold VORTEX SEPARATOR (C) where induced spin separates water and oil from air. The separated liquids are ejected from the 'quiet-zone sump' via a TIMER activated DRAIN SOLENOID VALVE.

The cold & dry air flows centrally upward from the separator through the AIR-to-AIR HEAT EXCHANGER (A) where it absorbs heat from the warm incoming air before entering the plant pipe system. This important ENERGY RECOVERY reduces the otherwise required cooling capacity and power consumption by over 50%. The complete drying and separating process takes place with very low friction losses.

Cooling of the compressed air is by non-cycling refrigeration process with CONSTANT PRESSURE EXPANSION VALVE for refrigerant flow and capacity control to maintain a constant dewpoint temperature from no air flow to maximum rated flow. Oversized, air cooled condensers ensure reliable drying performance at high ambient temperatures.

The refrigeration compressor is protected against thermal overload. No compressor damage is possible due to overheating from recirculating hot gas or from liquid slugging or from lack of lubrication due to oil retention in flooded evaporators.

'Frigematic' DUPLEX Air Dryers with TWO independent cooling systems for applications where 50% or 100% stand-by capacity is required without the need for flowpath switching of compressed air.

'Frigematic' special purpose air & gas dryers.

- High pressure dryers — barg 31 41 100 235 345 / psig 450 600 1450 3400 5000
- Low pressure dryers — for Hydrogen gas, innert gas, etc.
- Laboratory gas dryers — with stainless steel heat exchangers
- Split systems dryers — for hazardous environment or for cooling by chilled water from central supply.
- 'ADA' AutoDryAir — for Rail & Road Transport Vehicles and for Mobile Air Compressors.

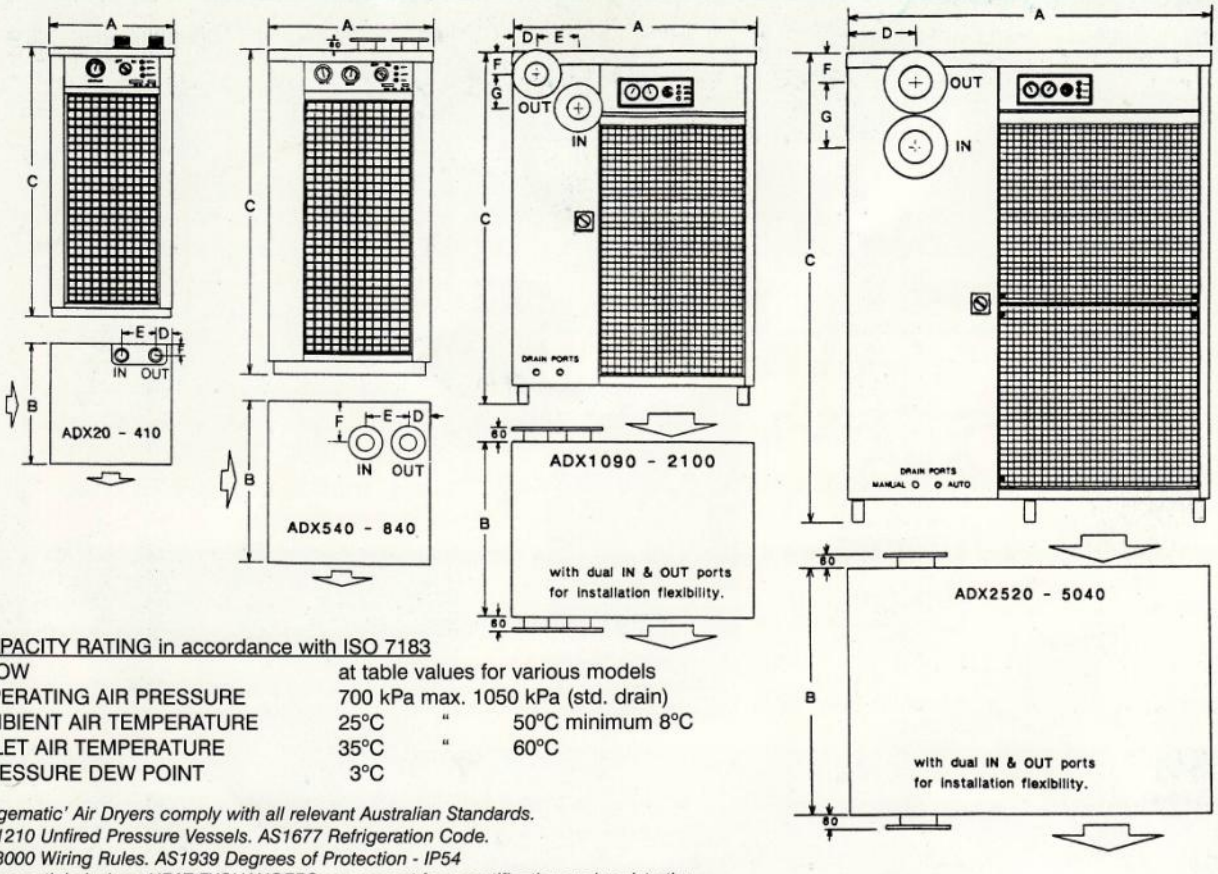
By the way -

Rapid internal corrosion of compressed air systems is due to the universal presence of SALT in atmospheric air. Entrained salt dissolves when water vapour condenses to liquid. The resulting electrolyte causes destructive metal corrosion. Internal salt cocentration increases over time due to the large volumes of air being compressed.

Compressed air dryers prevent electrolysis in air systems.

However - some air dryer heat exchangers get destroyed themselves by electrolysis after only a short service life.

A long term warranty is essential to protect a buyers investment.



CAPACITY RATING in accordance with ISO 7183

FLOW	at table values for various models		
OPERATING AIR PRESSURE	700 kPa max.	1050 kPa (std. drain)	
AMBIENT AIR TEMPERATURE	25°C	"	50°C minimum 8°C
INLET AIR TEMPERATURE	35°C	"	60°C
PRESSURE DEW POINT	3°C		

'Frigematic' Air Dryers comply with all relevant Australian Standards.
AS1210 Unfired Pressure Vessels. AS1677 Refrigeration Code.
AS3000 Wiring Rules. AS1939 Degrees of Protection - IP54
'Frigematic' air dryer HEAT EXCHANGERS are exempt from certification and registration.

MODEL (scfm)	FLOW (f.a.d.) l/s	m/h	Δp bar	DIMENSIONS A	B	C	D	E	F	G	WEIGHT kg	AIR Connection	ELECTRICAL kw	V/Hz/PH
ADX 20	9.5	34	0.07	340	340	590	60	100	60	-	28	3/4"PT-M	0.12	240V / 50Hz / 1phase c/w 2m power cable & 3 pin plug
ADX 30	14	51	0.07	"	"	"	"	"	"	-	31	"	0.15	
ADX 40	19	68	0.08	"	"	"	"	"	"	-	33	"	0.20	
ADX 60	28	102	0.10	400	400	790	60	150	60	-	47	1"PT-M	0.27	
ADX 80	38	136	0.12	"	"	"	"	"	"	-	53	"	0.34	
ADX 100	47	170	0.14	"	"	"	"	"	"	-	56	"	0.42	
ADX 150	71	255	0.07	500	500	1000	80	150	80	-	64	1 1/2"PT-M	0.65	
ADX 200	94	340	0.08	"	"	"	"	"	"	-	69	"	0.86	
ADX 260	123	442	0.10	500	500	1200	80	150	80	-	78	2" PT-M	1.1	
ADX 330	156	560	0.13	"	"	"	"	"	"	-	86	"	1.4	
ADX 410	193	696	0.15	"	"	"	"	"	"	-	98	"	1.7	
ADX 540	255	917	0.10	700	700	1475	100	200	230	-	220	3" Flg. 'E'	2.2	415V/50Hz/3 phase & neutral
ADX 680	321	1155	0.12	"	"	"	"	"	"	-	235	"	2.7	
ADX 840	396	1426	0.15	"	"	"	"	"	"	-	260	"	3.4	
ADX 1090*	514	1851	0.13	1020	780	1560	100	180	100	150	295	4" Flg. 'E'	4.2	
ADX 1260*	594	2139	0.15	"	"	"	"	"	"	-	315	"	4.5	
ADX 1680*	792	2853	0.15	1280	880	1560	100	180	100	150	380	"	6.3	
ADX 2100*	991	3566	0.15	"	"	"	"	"	"	-	445	"	8.2	
ADX 2520*	1189	4279	0.15	1600	880	1740	300	--	130	290	550	6" Flg. 'E'	9.7	
ADX 2940*	1387	4992	0.15	"	"	"	"	"	"	-	610	"	11.2	
ADX 3360*	1585	5706	0.15	"	"	"	"	"	"	-	670	"	12.8	
ADX 4200*	1981	7132	0.15	1800	1080	2080	300	-	130	290	790	"	16.0	
ADX 5040*	2377	8558	0.15	"	"	"	"	"	"	-	860	"	19.0	

* available in DUPLEX version without change in external dimensions.

STANDARD COMPLEMENTS: ON/OFF switch POWER 'ON' indicator light, DIAL Thermometer (separator temperature) DRAIN SOLENOID VALVE and adjustable DRAIN CYCLE TIMER.
plus for 3 PHASE Models - AIR PRESSURE GAUGE, HIGH & LOW refrig. pressure safety cut out, INDICATOR LIGHTS to signal 'FAULT' electric overload and 'FAULT' refrigerant pressure. AUTOMATIC FAN CONTROL.
OPTIONAL - all models - HIGH DEW POINT ALARM THERMOSTAT with voltage free SPDT contacts for remote fault indication.

AIR DRYING SIZING & SELECTION

To calculate the required air dryer capacity for other than rated conditions use the relevant correction factors from TABLES 'A','B' & 'C'. Multiply the plant flow (air compressor free air delivery) by the various factors to obtain the required air dryer capacity.

'A'

AIR PRESSURE kPa	300	400	500	600	700	800	900	1000
CORRECTION FACTOR	1.24	1.15	1.08	1.03	1	0.97	0.95	0.93

'B'

DRYER INLET TEMP °C	30	35	40	45	50	55	60
CORRECTION FACTOR	0.81	1	1.21	1.46	1.74	2.03	2.34

'C'

AMBIENT AIR TEMP °C	25	30	35	40	45	50
CORRECTION FACTOR	1	1	1	1.06	1.12	1.19

'D'

LOAD FACTOR 1	1.04	1.07	1.10	1.13	1.16	1.19	1.22	1.26	1.29	1.32	1.35
PRES DEWPOINT 3	4	5	6	7	8	9	10	11	12	13	14

FORMULA

Plant flow CFM	fact 'A'	fact 'B'	fact 'C'	calculated capacity
_____	x _____	x _____	x _____	= _____

Select a model with rated flow capacity nearest to the calculated flow capacity and determine the load factor as follow:

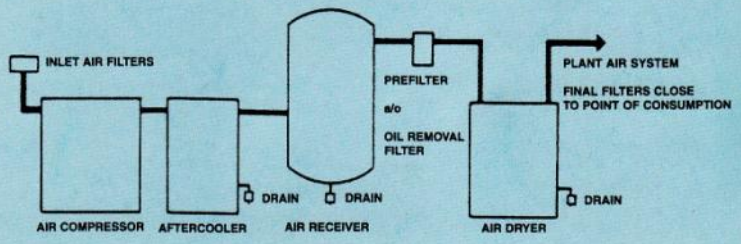
divide CALCULATED CAPACITY _____
by RATED MODEL CAPACITY _____ = _____ LOAD FACTOR

If load factor exceeds 1.0 determine from Table 'D' the outlet pressure dewpoint PDP = _____ °C

INSTALLATION

The installation diagram shows the correct location of an air dryer relative to air compressor, aftercooler and air receiver

Deviation from this arrangement can result. in negative consequences.



AFTERCOOLER is essential to reduce discharge air temperature except for small compressor sets which operate intermittently and where the air receiver acts as an aftercooler and separator. Reliable condensate drainage from an aftercooler or receiver is essential.

Modern air compressor packs incorporate aftercoolers which cool the discharge air to within 5-10K of ambient temperature. The impact of high inlet temperature on air dryer sizing is shown in Table 'B'.

AIR RECEIVER In addition to its main function of storing compressed air, an air receiver also acts as an additional aftercooler and condensate separator.

WARNING If the air receiver is located downstream of the air dryer these benefits are lost. But more critical problems arise from condensate precipitation in the air receiver during pump-up to operating pressure. Air which is dried at atmospheric pressure holds nearly eight times the mass of watervapour than air which is dried at 700 kPa pressure. The precipitated condensate will only slowly evaporate and more may be added if daily pump-up takes place. If downstream location of the air receiver is needed for intermittent high air demand a minimum pressure valve must be fitted down stream of the air dryer to ensure that all air is dried at operating pressure.

PREFILTER and/or oil removal filter is essential to prevent solid particles and oil entering the air dryer where contaminants interfere with heat exchange and reliable condensate drainage.

Solid contaminants can result from pipe and component corrosion or from debris left in pipes on installation.

Note: Heat exchangers of 'Frigematic' air dryers are of copper construction from face of inlet connection to face of outlet connection. The heat exchangers will not corrode except if compressed air is contaminated with chemicals which attack copper such as ammonia gas etc.

PIPEWORK Piping to and from the air dryer must be supported so that no undue stress and weight is imposed on the air connection fittings.

WARNING It must not be assumed that new pipes are internally clean. During transport, storage and erection debris can enter pipes which can cause substantial problems if permitted to enter the air dryer. Modifications to existing pipework can result in dislodging of rust particles and scale which will cause serious problems if not prevented from entering the air dryer.

Installation personnel and contractors must be informed and supervised to prevent problems.

LOCATION **Air dryer must be located in ventilated area and not be exposed to waterspray, excessive dust, corrosive atmosphere and direct heat radiation. If located outside it should be protected against direct sun radiation.**

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