PoleStar Smart Refrigeration Dryers

PST 120 - 1800

Untreated compressed air is wet. 100% saturated as it leaves the compressor aftercooler, water vapour in the compressed air cools as it enters the air receiver and distribution piping, resulting in the formation of condensed liquid water and water aerosols. Wet compressed air leads to corrosion, the growth of micro-organisms and the formation of oily, acidic compressor condensate.

For a manufacturing facility reliant on compressed air for automation, these contaminants can directly impact safety, productivity and efficiency.

Compressed air treatment is therefore essential and for non-critical uses of compressed air, the refrigeration dryer is an ideal choice.

Refrigeration Dryers

Refrigeration dryers use a closed loop cooling system to lower the temperature of the compressed air to just above freezing, causing condensation of water vapour.

Most of the condensed liquid is then removed by an integral water separator and drained away. Prior to leaving the dryer, the compressed air is re-heated by the incoming compressed air to prevent condensation on the outside of the downstream distribution piping.

Refrigeration dryers should always be installed with general purpose and high efficiency coalescing filters and are an effective way to reduce water vapour, liquid water and water aerosols for general purpose compressed air applications.

Advantages

- Parker PoleStar Smart refrigeration dryers are developed around a state-of-the-art aluminium heat exchanger (SmartPack),
- The SmartPack heat exchanger has a large air/air heat exchanger to pre-cool the incoming compressed air and reduce energy consumption
- The highly efficient SmartPack design results in a refrigerant circuit with lower absorbed power and uses a smaller volume of refrigerant than other comparable dryers
- The SmartPack design utilises low pressure drop, cross flow heat exchangers to reduce operational costs
- The SmartPack heat exchanger includes a high efficiency. Stainless steel demister separator for liquid removal
- All models are equipped as standard with SmartControl controller that provides an indication of compressed air temperature, volt free alarm contact, service reminder and integral timed drain control
- SmartControl Energy Saving feature enables the dryer to save additional energy at partial load by cycling the refrigerant compressor while cooling the inlet air using the cold reserve stored in the SmartPack mass
- PoleStar Smart dryers utilise compliant scroll refrigeration compressors, offering energy savings of up to 20% compared to piston alternatives
- Resistant to liquid refrigerant returns, and with 50% less moving parts than similar technologies, these compressors are extremely reliable and very robust.
- Low vibration levels also serve to prolong the refrigeration circuit life

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Dryer Performance

Dryer Models	Dewpoint (Standard)		Dewpoint (Option 1)		Dewpoint (Option 2)	
	°C	°F	°C	°F	°C	°F
PST	+3	+37	+7	+45	+10	+50

Technical Data

Dryer Models	Min Operating Pressure		Max Operating Pressure		Min Operating Temperature		Max Operating Temperature		Max Ambient Temperature		Electrical Supply (Standard)	Electrical Supply (Optional)	Thread Connections	Noise Level
	bar g	psi g	bar g	psi g	°C	°F	°C	°F	°C	°F				dB(A)
PST 120 - 1800	2	29	14	203	5	41	65	149	50	122	400V 3ph 50Hz	N/A	BSPP & DIN Flange	<75

Flow Rates

Model	Pipe Size	Inlet Flow Rate				Average Power kW
		L/s	m^3/min	m^3/hr	cfm	
PST 120	2"	200	12	720	424	1.13
PST 140	2"	233	14	840	494	1.14
PST 180	2"	300	18	1080	636	1.46
PST 220	2 ½"	367	22	1320	777	1.68
PST 260	2 ½"	433	26	1560	918	2.19
PST 300	2 ½"	500	30	1800	1059	2.41
PST 350	2 ½"	583	35	2100	1236	3.06
PST 460	DN100	767	46	2760	1625	3.14
PST 520	DN100	867	52	3120	1836	3.54
PST 630	DN100	1050	63	3780	2225	4.64
PST 750	DN150	1250	75	4500	2649	5.73
PST 900	DN150	1500	90	5400	3178	7.63
PST 1200	DN150	2000	120	7200	4238	8.92
PST 1500	DN200	2500	150	9000	5297	12.35
PST 1800	DN200	3000	180	10800	6357	15.96

Stated flows are for operation at 7 bar (g) (102 psi g) with reference to 20°C, 1 bar (a), 0% relative water vapour pressure, 25 °C cooling air temperature, 35 °C air inlet temperature and +3°C pressure dewpoint. All models supplied with refrigerant R407C.

For flows at other conditions, apply the correction factors shown below.

Product Selection & Correction Factors

For correct operation, compressed air dryers must be sized using for the maximum (summer) inlet temperature, maximum (summer) ambient temperature, minimum inlet pressure, required outlet dewpoint and maximum flow rate of the installation.

To select a dryer, first calculate the MDC (Minimum Drying Capacity) using the formula below then select a dryer from the flow rate table above with a flow rate equal to or above the MDC.

Minimum Drying Capacity = System Flow x CFIT x CFAT x CFMIP x CFOD

CFIT - Correction Factor Maximum Inlet Temperature

Maximum Inlet Temperature	°C	25	30	35	40	45	50	55	60	65
	°F	77	86	95	104	113	122	131	140	149
Correction Factor		0.81	0.81	1.00	1.19	1.43	1.69	2.00	2.22	2.50

CFAT - Correction Factor Maximum Ambient Temperature

Maximum Ambient Temperature	°C	20	25	30	35	40	45	50
	°F	68	77	86	95	104	113	122
Correction Factor		0.94	1.00	1.05	1.11	1.20	1.30	1.39

CFMIP - Correction Factor Minimum Inlet Pressure

Minimum Inlet Pressure	bar g	3	4	5	6	7	8	9	10	11	12	13	14
	psi g	44	58	73	87	100	116	131	145	160	174	189	203
Correction Factor		1.35	1.20	1.11	1.04	1.00	0.96	0.93	0.93	0.90	0.89	0.88	0.87

CFOD - Correction Factor Outlet Dewpoint

Outlet Dewpoint	°C	+3	+5	+7	+10
	°F	+37	+41	+45	+50
Correction Factor		1.00	0.91	0.83	0.71

Controller Functions

Dryer Models	Controller Function							
	Power On Indication	Visual Fault Indication	Compressed Air Temperature	EST - Energy Saving Technology	Filter Service Indicator	Dryer Service Indicator	Fault Relay: Power Loss	4-20mA Dewpoint Re-transmission
PST	•	•	•	•		•	•	

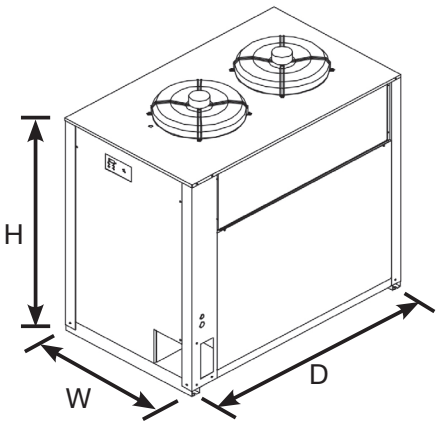
Recommended Filtration

Model	Pipe Size BSPP or NPT	Dryer Inlet	Dryer Outlet
		General Purpose Pre-Filter	High Efficiency Post Filter
PST 120	2"	AOP040H	AAP040H
PST 140	2"	AOP040H	AAP040H
PST 180	2"	AOP045I	AAP045I
PST 220	2 ½"	AOP050I	AAP050I
PST 260	2 ½"	AOP055I	AAP055I
PST 300	2 ½"	AOP055I	AAP055I
PST 350	2 ½"	AOP055I	AAP055I
PST 460	DN100	AO070O	AO070O
PST 520	DN100	AO070O	AA070O
PST 630	DN100	AO070O	AA070O
PST 750	DN150	AO075P	AA075P
PST 900	DN150	AO075P	AA075P
PST 1200	DN150	AO080P	AA080P
PST 1500	DN200	AO085Q	AA085Q
PST 1800	DN200	AO085Q	AA085Q

Filtration Performance	General Purpose Pre-filter	High Efficiency Post Filter
Filtration Grade	Grade AO	Grade AA
Filtration Type	Coalescing	Coalescing
Particle Reduction (inc water & oil aerosols)	Down to 1 micron	Down to 0.01 micron
Maximum Remaining Oil Aerosol Content at 21°C	≤0.5 mg/m³ (≤0.5 ppm(w))	≤0.01 mg/m³ (≤0.01 ppm(w))
Filtration Efficiency	99.925%	99.9999%

Weights & Dimensions

Model	Pipe Size BSPP or NPT	Dimensions						Weight	
		Height (H)		Width (W)		Depth (D)			
		mm	ins	mm	ins	mm	ins	kg	lbs
PST 120	2"	1064	41.9	706	27.8	1046	41.2	145	320
PST 140	2"	1064	41.9	706	27.8	1046	41.2	145	320
PST 180	2"	1064	41.9	706	27.8	1046	41.2	155	342
PST 220	2 ½"	1316	51.8	806	31.7	1166	45.9	230	507
PST 260	2 ½"	1316	51.8	806	31.7	1166	45.9	240	529
PST 300	2 ½"	1316	51.8	806	31.7	1166	45.9	245	540
PST 350	2 ½"	1316	51.8	806	31.7	1166	45.9	250	551
PST 460	DN100	1690	66.5	1007	39.6	1097	43.2	470	1036
PST 520	DN100	1722	67.8	1007	39.6	1097	43.2	490	1080
PST 630	DN100	1722	67.8	1007	39.6	1657	65.2	580	1279
PST 750	DN150	1722	67.8	1007	39.6	1657	65.2	670	1477
PST 900	DN150	1722	67.8	1007	39.6	1657	65.2	690	1521
PST 1200	DN150	2048	80.6	1007	39.6	1657	65.2	830	1830
PST 1500	DN200	2208	86.9	1007	39.6	2257	88.9	1100	2425
PST 1800	DN200	2208	86.9	1007	39.6	2257	88.9	1190	2623



Quality Assurance / IP Rating / Pressure Vessel Approvals

Development / Manufacture	ISO 9001 / ISO 14001
Ingress Protection Rating	IP44 Indoor Use Only
EU	Pressure vessel approved for fluid group 2 in accordance with the Pressure Equipment Directive 2014/68/EU
GUS	TR (formerly GOST-R)
For use with Compressed Air Only	

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