COMPRESSED AIR DRYERS

TDD SERIES

TDD Series

The Company

Since 1986, our company has been known for delivering high quality compressed air and gas system solutions. In moving from being a local sales and service provider to one with a global footprint, we have maintained the small-company, customer-focus that has been the main driver of our success.

Over the years our product portfolio has grown to meet the ever-changing needs of the marketplace. Through the expansion of our design, engineering and manufacturing capabilities, as well as the increased capacity of our newly expanded production facility, we will continue to deliver innovative products that meet and exceed the needs of our valued customers.

The need for clean and dry compressed air

Compressed air is an important source of energy. The need for an air supply to be clean and contaminant free is crucial. So too, is the need for dry air, without traces of water or oil vapor. Any form of moisture in a compressed air line has the potential to cause costly downtime, machine damage and product spoilage.

Energy efficiency

Compressed air accounts for approximately 10% of the energy used in industry today. A compressed air system is one of the most important determinants of overall system efficiency and represents one of the largest opportunities for energy savings on any site. There can also be significant cost benefits of an efficiently designed and maintained compressed air system.

The TDD Series offers a multitude of additional energy saving features, which allows the dryer to be linked with a compressor control system and reduces air consumption during periods of low demand.

The solution

Titus Air Systems features ten highly efficient models in the TDD Series dryer range.

With flow rates from 4 scfm (7 Nm³/h - 1.94 l/s) to 365 scfm (620 Nm³/h - 172 l/s), the entire range can operate at -40ºF (-40ºC) pressure dewpoint as standard, with an option of -100ºF (-70ºC) for more critical applications. The range has been designed and engineered to meet the air purity class in accordance with ISO 8753:1-2001 (E).

The units have an intelligent diagnostic system installed as standard on each model, which is unique to Titus Air Systems. Ease of service has been foremost in the design. Each unit can be serviced without disturbing the surrounding pipework. Desiccant cartridges can also be changed out effectively without causing excessive downtime.

The compact size of the TDD dryer ensures that installation is simple and versatile. The units can be installed in small spaces in either a vertical or horizontal position.

To complement its vast range of operational features, the TDD Series dryer (models TDD004A - TDD035A) can also be floor or wall mounted. Models TDD004A to TDD035A have multiple porting options, with a total of six inlet / outlet connections and many pipework possibilities.

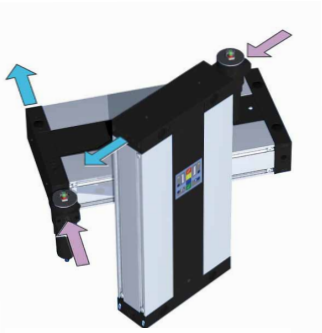
The application

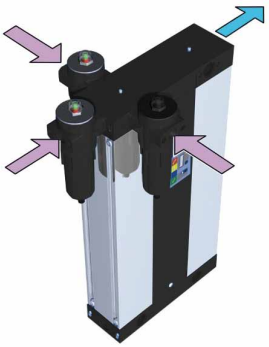
Recognizing that processes operating a compressed air dryer often have differing requirements, the TDD Series is tailored so that it can be utilized to suit various industrial applications.

Typical applications include automotive, power stations, paint spraying, instrumentation, packaging, pharmaceutical, general industrial use and many more.

Dryer Features

- Suitable for worldwide installation
- Multi-voltage capabilities
- Extruded aluminium towers fully painted for corrosion protection
- Removable front panel allows for easy access for servicing
- Standard controller incorporates an optional energy management system that operates in conjunction with dedicated compressors
- Intelligent electronic processor
- Simple purge plug changeout, no need to dismantle units
- Easy and efficient servicing
- Spring loaded desiccant cartridges to avoid desiccant attrition
- Clear cartridges designed to enable visible inspection of desiccant condition
- Internal silencer to reduce noise levels and ensure a smooth chamber depressurization
- Suitable for wall mounting (models TDD004A-TDD035A) and horizontal integration (all models)
- Minimal serviceable spares





Features

Each dryer unit has been designed to suit a multitude of requirements and is suitable for installation in many countries. The TDD Series dryer range adheres to our innovative principles and provides the most essential features needed for the most effective solutions.

Example of model TDD004A - TDD035A

Benefits

✓ Economical to use

Titus Air Systems's high performance dryers provide a host of financial benefits, such as an integral electronic drain and service interval indication, all of which are included in the standard dryer package

✓ Clean & dry air

With F grade 0.01 micron oil removal filtration (supplied as standard on models TDD004A - TDD035A), an integral 1 micron dust filter and a choice of -40ºF (-40ºC) or -100ºF (-70ºC) pressure dewpoints, The TDD Series dryer meets and exceeds the highest standards of purity as specified in ISO 8573:1-2001.

✓ Worldwide installation

The units can recognize any voltage between 100-240 VAC and also any voltage between 12 to 24 VDC, meaning the TDD dryer can be operated anywhere in the world. All dryers are built to be fully compliant with all approvals.

✓ Intelligent processor

A feature of each unit is an intelligent built-in central processing unit (CPU). The optional software interface package provides a sophisticated system, which allows for remote interrogation of the dryer. The CPU is serialized and is housed in an IP65 rated enclosure.

✓ Energy management

The TDD Series dryer offers a multitude of additional energy saving features, which allows the dryer to be linked with a compressor control system and reduces air consumption during periods of low demand.

✓ Condensate management

Condensate management is essential to maximize dryer efficiency. TDD Series dryer is supplied with an integral electronic drain valve that is operated and controlled by the CPU. This drain valve opens at the end of every cycle when an indicator illuminates and the CPU checks for any sign of malfunction in the dryer. Operation of the unit is viewed by the diagnostic control panel located on the front of each unit.

✓ Desiccant Cartridges

An improved desiccant cartridge design with integral handle facilitates a simple and clean change out procedure.

Dryer accessories

12,000 hour service kit includes: desiccant cartridges, spare pre-filter element, pack of sealing 'O' rings and washers, instruction leaflet.

Valve service kit: Shuttle seats, shuttles, pressure plugs, diaphragms, diaphragm brass discs, conical compression springs, exhaust solenoid valves, controller reset cap and a full set of replacement 'O' rings.

Optional energy management, monitoring and diagnostics

Operation

The TDD Series dryer is designed to provide a smooth, controlled, uninterrupted delivery of dry compressed air.

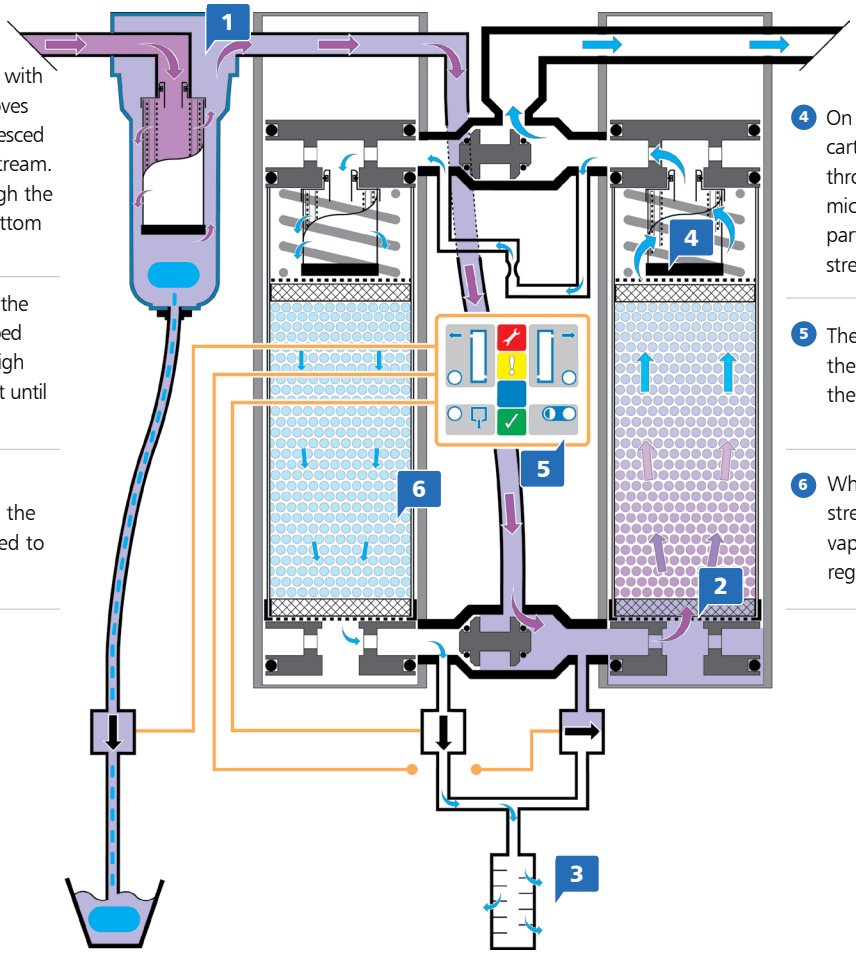
Wet air passes through a pre-filter and travels down to the bottom valve assembly. The air is then fed through the bottom of the desiccant bed and moves through the high performance desiccant until it becomes dry. On exit from the desiccant cartridge, the air is passed through the outlet valve assembly.

During this process, the dryer control system cycles the process air between the two desiccant towers. While one chamber is on stream removing water vapor, the other is being carefully depressurized in preparation for regeneration. The desiccant bed is regenerated by expanding a small amount of dry process air, or purge air, through the saturated desiccant.

Purge air passes to atmosphere through the silencer, which is fitted to an exhaust valve. The chamber is then repressurized, with the control system assuring each chamber is at full operational pressure prior to changeover.

This ensures a reliable and efficient operation. The air stream is switched and the cycle repeats on a continuous basis.

1. The F grade pre-filter with electronic drain removes particulates and coalesced liquids from the air stream. Wet air passes through the filter down to the bottom valve assembly.
2. The air is fed through the bottom of desiccant bed and moves through high performance desiccant until dry.
3. Purge air passes to atmosphere through the silencer, which is fitted to the exhaust valve.



4. On exit from the desiccant cartridge the air passes through the integral 1 micron dust filter removing particulate in the air stream.
5. The control system cycles the process air between the two desiccant towers.
6. While one chamber is on stream removing water vapor, the other is being regenerated.

Intelligent Processor

Optional software interface and diagnostics control

Incorporating the new intelligent processor allows the TDD dryer to be interfaced with a PC. The software interface package provides a sophisticated system allowing users to remotely interrogate the dryer as well as activate the built-in energy management and remote alarm facility.

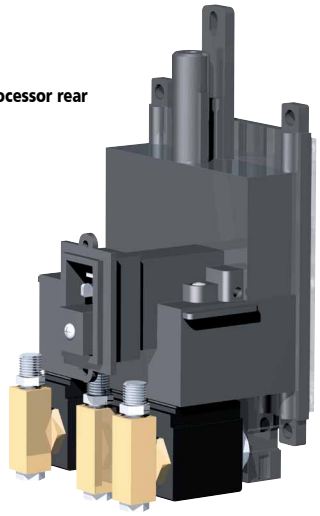
The package also provides a number of additional diagnostic tools, which the user can utilze and evaluate, and if required, modify the flexible operation parameters to ensure the dryer performs to the required conditions.

PROCESSOR SPECIFICATION	
DIN Plug:	GDS Type C Industry Standard
Alarm ready relay rating:	3 amp
Alarm connector:	GDS Type C Industry Standard
Energy management signal:	5VDC
Energy management connector:	GDS Type C Industry Standard
Software interface connector:	RJ45
Processor/PC interface:	RS232
Network processor/PC interface:	RS485
Maximum number of nodes:	31
Environmental rating:	IP65

1. **Stage Times** Time settings for the repressurization of the desiccant towers.
2. **Real Time View** Provides an up-to-the-minute status of dryer conditions.
3. **Drain Valve** The settings for the drain valve function are factory set. Through the use of the software there is the ability to change the settings as required.
4. **Alarm Settings** The user is able to adjust the remote alarm activation from the default values.
5. **Service Information** Indicates the default settings, service history, total hours run, and hours since last service.
6. **Serial Number** Each electronic processor and software package is allocated a unique serial number.
7. **Faults** If a fault occurs in the dryer, both the timings and the errors are logged on the software screen. Full operating history of the dryer is maintained.
8. **Energy Management** To save on the consumption of compressed air, the energy management facility can be activated from this window.
9. **Address** Indicates the network address of the dryer, should several dryers be operated from a single software screen.

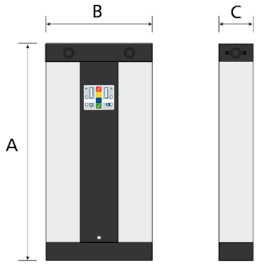
Processor front

Processor rear

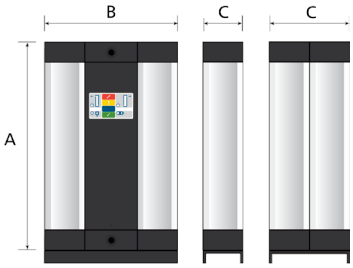


Technical Specification

dryer model	pipe size"	inlet flow rate scfm	Nm³/h	l/sec	dryer configuration	required filtration	supplied as standard	dimension inch A	B	C	weight lbs	Kg	dimension mm A	B	C
TDD004A	3/8"	4	7	1.9	Simplex	THF30	✓	17.5	11	3.6	29	13	445	281	92
TDD006A	3/8"	6	10	2.8	Simplex	THF30	✓	20	11	3.6	31	14	508	281	92
TDD008A	3/8"	8	14	3.8	Simplex	THF30	✓	22	11	3.6	33	15	565	281	92
TDD010A	3/8"	10	17	4.7	Simplex	THF30	✓	25	11	3.6	36	16.5	635	281	92
TDD015A	3/8"	15	25	7.1	Simplex	THF30	✓	32	11	3.6	43	19.5	815	281	92
TDD025A	3/8"	25	42	11.8	Simplex	THF30	✓	42	11	3.6	53	24	1205	281	92
TDD035A	3/8"	35	59	16.5	Simplex	THF65	✓	57.5	11	3.6	68	31	1598	281	92
TDD045A	3/4"	45	76	21.2	Simplex	THF65	✓	28.0	20.5	7.0	117	53	652	520	164
TDD055A	3/4"	55	93	26.0	Simplex	THF65	✓	31.8	20.5	7.0	130	59	752	520	164
TDD065A	3/4"	65	110	30.7	Simplex	THF75	✓	36.0	20.5	7.0	141	64	852	520	164
TDD085A	1"	85	144	40.0	Simplex	THF100	✓	43.5	20.5	7.0	165	75	1052	520	164
TDD105A	1"	105	178	49.6	Simplex	THF150	✓	55.8	20.5	7.0	200	91	1362	520	164
TDD135A	1 1/4"	135	229	63.7	Simplex	THF150	✓	63.5	20.5	7.0	225	102	1562	520	164
TDD175A	1 1/4"	175	297	82.6	Simplex	THF225	✓	79.5	20.5	7.0	271	123	1962	520	164
TDD215A	1 1/2"	215	365	101.5	Duplex	THF225	✓	55.8	20.5	13.5	379	172	1362	520	328
TDD275A	1 1/2"	275	467	129.8	Duplex	THF300	✓	63.5	20.5	13.5	423	192	1562	520	328
TDD365A	1 1/2"	365	620	172.3	Duplex	THF450	✓	79.5	20.5	13.5	511	232	1962	520	328



TDD004A - TDD0035A



TDD0045A - TDD365A

1. Titus Air Systems recommends pre-filtration of P and F grades for models TDD045A to TTDD365.
2. For models TDD045A to TDD365A, the dryer will include a drain adaptor kit to allow assembly of the filter to the dryer. This comprises of 1/4" x 4mm swivel adaptor and tubing.

Specification

Standard pressure dewpoint	-40°F (-40°C)
Optional pressure dewpoint	-100°F (-70°C)
Minimum working pressure	58 psig (4 barg)
Maximum working pressure	232 psig (16 barg)
Power supply	12VDC to 24VDC or 100VAC to 240VAC
Minimum inlet temperature	35°F (1.5°C)
Maximum inlet temperature	122°F (50°C)
Minimum ambient temperature	41°F (5°C)

Dryer correction factors

Operating pressure psig (barg)	58 (4)	72 (5)	87 (6)	100 (7)	116 (8)	130 (9)	145 (10)	160 (11)	174 (12)	189 (13)	203 (14)	218 (15)	232 (16)
Pressure correction factor (PCF)*	0.62	0.75	0.87	1	1.12	1.25	1.37	1.5	1.62	1.75	1.87	2.0	2.12

Temperature °F (°C)	68 (20)	77 (25)	86 (30)	95 (35)	104 (40)	113 (45)	122 (50)
Temp. correction factor (TCF)	1.07	1.06	1.04	1.00	0.88	0.78	0.55

Dewpoint °F (°C)	-40 (-40)	-100 (-70)
Dewpoint correction factor (DCF)	1	0.7

*Always use the pressure correction factor (PCF) closest to the actual inlet pressure condition

Selection

Selection and ordering information

To select the TDD dryer suitable for your application, the following information is required: -

Minimum inlet pressure	Maximum inlet flow
Maximum inlet temperature	Required dewpoint

With the above information, follow the selection example below: -

Compressor outlet pressure @ 100 psig (7 barg) and dryer inlet flow rate @ 41 scfm (70 Nm³/h - 19 l/s)	
Dryer inlet pressure, after pipework, valves, receiver and filtration @ 91 psig (6.3 barg)	
Dryer inlet temperature	77°F (25°C)
Outlet dewpoint	-100°F (-70°C)
Pressure correction factor (PCF)	0.9
Temperature correction factor (TCF)	1.06
Dew point correction factor (DCF)	0.7

Corrected dryer flow rate $= \frac{\text{Compressor flow rate}}{\text{PCF x TCF x DCF}} = \frac{41}{0.9 \times 1.06 \times 0.7} =$ **61 scfm (104 Nm /h - 29 l/s)**

As the above dryer sizing table, the correct dryer for this application, with a corrected flow rate of 61 scfm (104 Nm³/h - 29 l/s) is a TDD065A

TDD Series Dryer service kit 12,000 hours (or 2 years)

Dryer	Description	Kit Number
TDD004A	Desiccant cartridge x 2	TDD004A-DK
TDD006A	Desiccant cartridge x 2	TDD006A-DK
TDD008A	Desiccant cartridge x 2	TDD008A-DK
TDD010A	Desiccant cartridge x 2	TDD010A-DK
TDD015A	Desiccant cartridge x 2	TDD015A-DK
TDD025A	Desiccant cartridge x 2	TDD025A-DK
TDD035A	Desiccant cartridge x 2	TDD035A-DK
TDD045A	Desiccant cartridge x 2	TDD045A-DK
TDD055A	Desiccant cartridge x 2	TDD055A-DK
TDD065A	Desiccant cartridge x 2	TDD065A-DK
TDD085A	Desiccant cartridge x 2	TDD085A-DK
TDD105A	Desiccant cartridge x 4	TDD105A-DK
TDD135A	Desiccant cartridge x 4	TDD135A-DK
TDD175A	Desiccant cartridge x 4	TDD175A-DK
TDD215A	Desiccant cartridge x 8	TDD215A-DK
TDD275A	Desiccant cartridge x 8	TDD275A-DK
TDD365A	Desiccant cartridge x 8	TDD365A-DK

TDD Series VALVE service kit

Dryer	Kit Number
TDD004A	TDD004A-VK
TDD006A	TDD006A-VK
TDD008A	TDD008A-VK
TDD010A	TDD010A-VK
TDD015A	TDD015A-VK
TDD025A	TDD025A-VK
TDD035A	TDD035A-VK
TDD045A	TDD045A-VK
TDD055A	TDD055A-VK
TDD065A	TDD065A-VK
TDD085A	TDD085A-VK
TDD105A	TDD105A-VK
TDD135A	TDD135A-VK
TDD175A	TDD175A-VK
TDD215A	TDD215A-VK
TDD275A	TDD275A-VK
TDD365A	TDD365A-VK

12,000 hour service kit includes Desiccant cartridges, spare pre-filter element, pack of sealing 'O' rings and washers, instruction leaflet

Valve service kit includes exhaust valve diaphragm, exhaust valve solenoids, shuttle valve and 'O' rings, extrusion / valve block 'O' rings

Technical notes - TDD Series

1. All flow rates are based on 100 psig (7.0 barg), at the dryer inlet and not at the compressor. It is important to apply correction factors to ensure the specified dryer performance.
2. Titus Air Systems recommends that an P dust filter should be used in addition to the integral 1 micron dust filter located within the desiccant cartridge.
3. Titus Air Systems highly recommends that a Centrifugal Water Separator be used in conjunction with the standard TDD dryer package.
4. Titus Air Systems supplies a full range of additional fiilters and accessories to suit other applications.
5. Models TDD045A - TDD365A have mounting holes provided on skid base.

Dryer accessories and options

Dryer	Description	Designation
TDD004A - TDD035A	Foot mounting bracket	F
	Wall mounting bracket	W
All models	Energy Management, monitoring & diagnostics	MS

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