Lab Gas

EXPANDABLE NITROGEN

Is it Time for On-Site Nitrogen Generation?

If you are using more than one or two nitrogen cylinders or dewars a month, on-site nitrogen generation may offer significant advantages. Having a reliable source of nitrogen could mean a substantial reduction in operating costs, a savings of valuable floor space and an improvement in employee safety by eliminating the transport and handling of high pressure gas cylinders.

Another consideration is not having to worry about nitrogen delivery snags interrupting production schedules. In many instances, the lack of nitrogen from a late delivery can shut down an entire line, costing thousands in lost production.

TNX Series: Expandable Nitrogen Generators for the Laboratory Environment

The new TNX Series of on-site Nitrogen Generators from Titus Nitrogen offers a revolutionary solution to the problem of meeting future nitrogen capacity needs without having to make excessively large up-front capital equipment expenditures.

Typically, businesses are squeezed between today's budgetary concerns and future growth needs. A system purchased to meet today's requirements may have to be scrapped for a larger system next year. An over-sized system to meet next year's production requirements not only adversely impacts the current budget, but it results in excessive operation and maintenance costs in the interim. In either scenario, significant time and money may be wasted.

The expandable TNX, on the other hand, gives businesses the flexibility to buy the capacity they need today and easily increase that capacity (up to a factor of 4 from base models) as their nitrogen needs grow. The TNX Series gives companies the ability to make high quality nitrogen from virtually any compressed air source, making it the economical choice compared to transporting, storing and handling nitrogen cylinders and dewars.

Because companies purchase the TNX Series sized for current needs, they can benefit from the lowest cost of ownership now, and only make the additional investment in capacity when it is needed in the future. That's smart engineering. That's TNX.

Laboratory Nitrogen Applications:

Gas Chromatography (GC)

When utilizing a Flame Ionization Detector for GC analysis, the detector usually requires three separate gas supplies together with their precise flow regulators. Normally, hydrogen is used for combustion, nitrogen for the carrier gas and oxygen as the combustion agent. Using zero grade nitrogen is an inexpensive solution.

Liquid Chromatography/ Mass Spectrometry (LC/MS)

LC/MS is applied to the identification and quantification of low volatile organic and inorganic compounds in samples. A continuous supply of nitrogen is required for nebulizing gas, curtain or supply, evaporative light scattering detectors and sparging.

Zero Air Generation (ZAG)

Zero Air generators remove hydrocarbons from compressed air by means of catalytic conversion. The result is hydrocarbon-free air at a purity of 0.1 ppm or better, making it suitable for a variety of laboratory applications.

TNX Options Can Address Various Needs...

Budget-Conscious?

TNX comes standard with a cost effective yet informative monitoring package that

provides the key control and operating parameters to ensure optimum performance.

Hazardous or Remote Areas?

In environments where electricity is unavailable or where a spark hazard may exist, TNX is available in an intrinsically-safe, non-electric design.

No Compressed Air?

For many applications a source of compressed air may not be available. TNX can be provided with either an onboard compressor for small applications, or with a larger scale, complete turn-key package for large nitrogen consumers.

The Award-Winning Expandable TNX Series Nitrogen Generator

Flexible Capacity & Purity Capabilities:

Expand your capacity as needed (up to a factor of 4 from base models). Capacities range from 10 to 2800 SCFH with purities ranging from 95 to 99.9%.

TNX Expansion Kit

Premium Electrical Package

The optional Premium Electrical Package (shown) features a touchscreen interface that allows easy system monitoring and control, including changing units of measure, diagnostic readouts, remote alarm capabilities, maintenance indicators & real-time monitoring.

Proven Filter Technology:

TNX filters feature 1 micron particulate followed by .01 micron coalescing for optimum system protection.

Purity Control System:

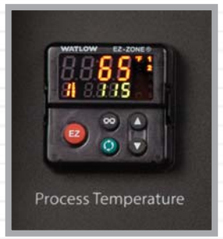
Maintains flow–guarantees preset purity level. Field adjustable as conditions or requirements change.

Small Footprint:

Compact design takes up minimal amount of space.

Temperature Control System:

Allows adjustment of capacity or purity for greater flexibility of on-site needs. On the standard control package, the temperature is set by a PID controller (shown). With the Premium Electrical Package, it is controlled through the PLC and touchscreen interface.



Maintenance-Friendly Design:

Easy front panel access for filter element replacement or oxygen analyzer service (optional) makes TNX the most maintenance-friendly unit on the market.

Plant Engineering PRODUCT of the YEAR Winner 2011

The TNX Series was recently voted a 2011 Product of the Year winner by the readers of Plant Engineering magazine, which recognizes manufacturing and engineering innovation for new products.

The New TNX Series Provides the Perfect Combination of Innovation and Practicality

At the heart of TNX is the proven and reliable PRISM® Membrane technology from Air Products and Chemicals, Inc. Proudly made in America, the TNX Series has been designed with features that provide the perfect combination of innovation and practicality.

In addition, TNX offers a range of optional equipment to better match customer requirements, including:

- **Premium Electrical Package (PEP)** – This robust package provides the optimum level of control, monitoring and alarm capability to protect downstream processes from off-spec nitrogen.
- **Auto Bypass System** – (Available on any unit equipped with PEP) Allows for the automatic or manual switchover to a back-up source of nitrogen (customer-supplied). If an off-spec condition, compressed air system failure, or routine maintenance requirement should occur, downstream processes can be kept on-line at all times through the auxiliary nitrogen source.
- **Digital Nitrogen Flow Monitor** – Available on any system, provides a continuous digital readout of the nitrogen flow and an output signal for remote monitoring. When integrated with the PEP, local and remote alarm capability is also included.
- **Nitrogen Storage Tank** – For applications when intermittent demand events may occur, a nitrogen storage tank can provide a cost effective means of protecting the nitrogen generator from an over-flow condition and downstream processes from off-spec nitrogen. This is sized by application, as customer needs may vary widely.
- **Hydrocarbon Removal Packages** – For applications where even small concentrations of hydrocarbon vapor may be damaging to downstream equipment or processes, these packages provide optimal protection. As with nitrogen storage, the requirement for hydrocarbon removal may vary widely so these packages are available in a range of sizes and configurations to precisely meet customer needs.

TNX Series Nitrogen Generator

Specifications & Flow Rates

Non-Heated

Specifications												
TNX Non-Heated	Atmospheric Dew Point	Operating Pressure		Inlet Air Temperature		Maximum Inlet Air Dew Point	Electrical Requirements			Connections		Dimensions (Inches) H X W X D	Shipping Weight (lbs.)
		Min	Max[1]	Min	Max		Power	Amps	Kw	In	Out		
TNX1010BN												52 X 24 X 17-1/4	210
TNX1020BN												52 X 24 X 17-1/4	215
TNX1030BN												52 X 24 X 25-1/4	260
TNX1040BN												52 X 24 X 25-1/4	270
TNX1110BN												52 X 24 X 17-1/4	210
TNX1120BN	To -90°F Typical	70 PSIG	150 PSIG	70°F	130°F	60°F	Not Applicable			3/4" NPT	1/2" NPT	52 X 24 X 17-1/4	220
TNX1130BN												52 X 24 X 25-1/4	270
TNX1140BN												52 X 24 X 25-1/4	280
TNX1210BN												52 X 24 X 17-1/4	215
TNX1220BN												52 X 24 X 17-1/4	230
TNX1230BN												52 X 24 X 25-1/4	285
TNX1240BN												52 X 24 X 25-1/4	300

1 Higher operating pressures are available. Please consult factory for details.

TNX Non-Heated Flow Rates (SCFH) @ 100 PSIG, 80°F Inlet Air Conditions†													
TNX Non-Heated	95% Purity		96% Purity		97% Purity		98% Purity		99% Purity		99.5% Purity		99.9% Purity	
	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2
TNX1010BN	90.2	43.3	82.7	36.4	75.5	29.9	68.2	23.6	60.4	16.8	55.4	12.5	48.9	7.1
TNX1020BN	180.4	86.6	165.4	72.8	151.0	59.8	136.4	47.2	120.8	33.6	110.8	25.0	97.8	14.2
TNX1030BN	270.6	129.9	248.1	109.2	226.5	89.7	204.6	70.8	181.2	50.4	166.2	37.5	146.7	21.3
TNX1040BN	360.8	173.2	330.8	145.6	302.0	119.6	272.8	94.4	241.6	67.2	221.6	50.0	195.6	28.4
TNX1110BN	153.0	73.2	140.0	61.6	128.0	50.6	115.0	39.9	102.0	28.4	93.7	21.2	82.8	12.0
TNX1120BN	306.0	146.4	280.0	123.2	256.0	101.2	230.0	79.8	204.0	56.8	187.4	42.4	165.6	24.0
TNX1130BN	459.0	219.6	420.0	184.8	384.0	151.8	345.0	119.7	306.0	85.2	281.1	63.6	248.4	36.0
TNX1140BN	612.0	292.8	560.0	246.4	512.0	202.4	460.0	159.6	408.8	113.6	374.8	84.8	331.2	48.0
TNX1210BN	270.0	130.0	248.0	109.0	226.0	89.7	204.0	70.6	181.0	50.2	166.0	37.6	147.0	21.3
TNX1220BN	540.0	260.0	496.0	218.0	452.0	179.4	408.0	141.2	362.0	100.4	332.0	75.2	294.0	42.6
TNX1230BN	810.0	390.0	744.0	327.0	678.0	269.1	612.0	211.8	543.0	150.6	498.0	112.8	441.0	63.9
TNX1240BN	1080.0	520.0	992.0	436.0	904.0	358.8	816.0	282.4	724.0	200.8	664.0	150.4	588.0	85.2

† For Non-Heated units pre-drying of compressed air is required.

Heated

Specifications												
TNX Heated	Atmospheric Dew Point	Operating Pressure		Inlet Air Temperature		Maximum Inlet Air Dew Point	Electrical Requirements[2]			Connections		Dimensions (Inches) H X W X D	Shipping Weight (lbs.)
		Min	Max[1]	Min	Max		Power	Amps	Kw	In	Out		
TNX1010CH								0.70	0.10			52 X 24 X 17-1/4	230
TNX1020CH								1.10	1.10			52 X 24 X 17-1/4	235
TNX1030CH								1.50	0.20			52 X 24 X 25-1/4	280
TNX1040CH								1.80	0.20			52 X 24 X 25-1/4	290
TNX1110CH								0.90	0.10			52 X 24 X 17-1/4	230
TNX1120CH	To -90°F Typical	70 PSIG	150 PSIG	70°F	120°F	120°F	115/1/60	1.30	0.10	3/4" NPT	1/2" NPT	52 X 24 X 17-1/4	240
TNX1130BN								1.80	0.20			52 X 24 X 25-1/4	290
TNX1140CH								2.20	0.20			52 X 24 X 25-1/4	300
TNX1210CH								1.20	0.10			52 X 24 X 17-1/4	235
TNX1220CH								2.10	0.20			52 X 24 X 17-1/4	250
TNX1230CH								2.90	0.30			52 X 24 X 25-1/4	305
TNX1240CH								3.70	0.40			52 X 24 X 25-1/4	320

1 Higher operating pressures are available. Please consult factory for details.

2 Values represent average consumption based on inlet air conditions of 80°F, 100 PSIG & outlet nitrogen purity of 97%. For electrical consumption based on other conditions or for sizing of electrical service components, consult factory.

TNX Heated Flow Rates (SCFH) @ 100 PSIG, 105°F, 100% RH Inlet Air Conditions													
TNX Heated	95% Purity		96% Purity		97% Purity		98% Purity		99% Purity		99.5% Purity		99.9% Purity	
	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2	Inlet Air	Outlet N_2
TNX1010CH	156.0	66.7	144.0	55.7	133.0	45.3	121.0	35.1	109.0	24.2	101.0	17.6	91.2	9.2
TNX1020CH	312.0	133.4	288.0	111.4	266.0	90.6	242.0	70.2	218.0	48.4	202.0	35.2	182.4	18.4
TNX1030CH	468.0	200.1	432.0	167.1	399.0	135.9	363.0	105.3	327.0	72.6	303.0	52.8	273.6	27.6
TNX1040CH	624.0	266.8	576.0	222.8	532.0	181.2	484.0	140.4	436.0	96.8	404.0	70.4	364.8	36.8
TNX1110CH	264.0	113.0	244.0	94.2	224.0	76.6	205.0	59.4	184.0	41.0	171.0	29.7	154.0	15.6
TNX1120CH	528.0	226.0	488.0	188.4	448.0	153.2	410.0	118.8	368.0	82.0	342.0	59.4	308.0	31.2
TNX1130CH	792.0	339.0	732.0	282.6	672.0	229.8	615.0	178.2	552.0	123.0	513.0	89.1	462.0	46.8
TNX1140CH	1056.0	452.0	976.0	376.8	896.0	306.4	820.0	237.6	736.0	164.0	684.0	118.8	616.0	62.4
TNX1210CH	468.0	200.0	432.0	167.0	397.0	136.0	363.0	105.0	326.0	72.6	303.0	52.6	273.0	27.5
TNX1220CH	936.0	400.0	864.0	334.0	794.0	272.0	726.0	210.0	652.0	145.2	606.0	105.2	546.0	55.0
TNX1230CH	1404.0	600.0	1296.0	501.0	1191.0	408.0	1089.0	315.0	978.0	217.8	909.0	157.8	819.0	82.5
TNX1240CH	1872.0	800.0	1728.0	668.0	1588.0	544.0	1452.0	420.0	1304.0	290.4	1212.0	210.4	1092.0	110.0

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