

# nano



## D<sup>5</sup>

twin tower desiccant  
compressed air dryers

flow capacity: 200 - 9,000 scfm (340 - 15,300 Nm<sup>3</sup>/hr)

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Leading edge technology and more than 200 years of **experience**...nano-purification solutions, your world-class provider of state-of-the-art compressed air and gas solutions to industry.

Our commitment at n-psi is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

A wealth of experience and leading edge products are only part of the equation. n-psi realize that world-class customer **service** is the most important component to any successful business.

Experience. Customer. Service... **n-psi**



### clean and dry

Clean and dry compressed air is essential in every efficient and profitable manufacturing and process operation worldwide. nano-purification solutions' vast experience includes food, beverage, chemical, laboratory, medical and natural gas applications.

n-psi understands your needs and has created the nano range of high-performance, energy-saving compressed air and gas purification products to provide clean and dry compressed air and gases at an affordable price with unrivaled reliability.



### design

Our extremely experienced team of design engineers at nano-purification solutions are world leading specialists in the design of novel industrial compressed air treatment products and compressed air dryers.



### research & development

A core element of our capabilities - founded on cumulative decades of practical engineering expertise - our R&D team is continually looking for improved performance and reliability.



### manufacture

Our twin tower desiccant air dryers are built here in North America at a state of the art manufacturing facility to the highest standards of quality which ensure equipment reliability and high levels of performance.

# nano D<sup>5</sup> twin tower air dryers

Ambient air contains high levels of moisture, dust, hydrocarbons and other contaminants. Under pressure these contaminants are concentrated to harmful proportions. When left untreated the results are corrosion, bacteria, mold growth and freezing within your compressed air lines. This contamination causes damage to downstream equipment, leading to increasing maintenance, downtime and product spoilage.

While compressed air filters will remove solid particulate, liquids and aerosols, they cannot remove the moisture that remains in the form of vapor. This vapor will continuously condense into liquid water throughout your compressed air system as the pressure and temperature of the compressed air changes.

The nano D<sup>5</sup> twin tower desiccant air dryers are designed to remove water vapor, lowering the pressure dew point of your compressed air stream to -40°F or even -100°F. No liquid water or ice crystals will form even if the temperature of the compressed air falls to 40 degrees below zero!

Designed for the most demanding applications, the nano D<sup>5</sup> twin tower desiccant air dryers are your solution for continuous and uninterrupted clean dry air.



**Reliability is built in... and backed by our 5 year warranty on inlet and purge exhaust valves and 10 year heater warranty<sup>(1)</sup>**

## which dryer is right for you?

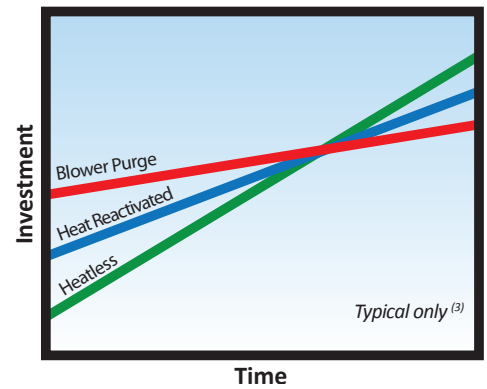
In a twin tower desiccant air dryer, one tower is on-line drying the compressed air while the other is off-line regenerating, which means it is eliminating the water vapor it has collected so it can be used to dry again. The two towers switch back and forth so one is always drying while the other is regenerating.

All nano D<sup>5</sup> twin tower desiccant dryers remove moisture from your compressed air in the same way and to the same exacting standards of performance and reliability. The difference is in how they regenerate and the amount of compressed air and/or power required to do so.

Which dryer to select for a given application is a function of several factors including: initial dryer investment, the cost of operating the dryer and air system capacity. Each of these needs to be considered to ensure the right dryer choice is made.

- **heatless** dryers use expanded dry “purge” air to regenerate the off-line bed. they require the lowest initial investment but require the most purge air<sup>(2)</sup>
- **externally heat reactivated** dryers use an electric heater to heat the dry purge air increasing the dryer’s efficiency. they require a higher initial investment although use less purge air than heatless dryers<sup>(2)</sup>
- **blower purge** dryers use an electric heater and a blower to provide heated ambient air for regeneration. they require the highest initial investment although can use little to no purge air<sup>(2)</sup>

We take pride in our ability to provide you the most cost effective solution for your compressed air treatment needs. Contact [support@n-psi.com](mailto:support@n-psi.com) for help choosing the best D<sup>5</sup> dryer for your application.



(1) when purchased with recommended pre-filtration

(2) heatless dryers require 15% purge. externally heat reactivated dryers require 8% purge. blower purge dryers require 2% purge (averaged over 4-hour cycle) for dry air cooling, however dry air cooling can be turned off allowing zero air loss operation. values are approximate and are a percentage of the maximum rated inlet flow

(3) results will vary with operating conditions. contact [support@n-psi.com](mailto:support@n-psi.com) to determine which dryer is the most cost effective option for your application

# D<sup>5</sup> heatless desiccant air dryers

The advanced D<sup>5</sup> NHL heatless desiccant dryer combines reliable field proven components and a cost effective design with 21<sup>st</sup> century PLC controls and a digital user interface. For clean dry air, there is no better, more dependable, easier to use twin tower dryer available on the market today.

## flexible & functional

- field adjustable cycle timing and purge control lets you maximize performance at any operating conditions
- advanced PLC controls allow you to monitor the operation of the dryer through an easy to read digital display

## unique features

- the purge adjustment valve with visual setting indication allows precision adjustments to the purge flow
- a blend of up to three different desiccants are used in specialty applications to ensure consistent dew point performance

## high quality construction

- rugged field proven valves with stainless steel internals and Teflon<sup>®</sup> seats for long life and minimum maintenance
- primed and epoxy coated external surfaces for optimum corrosion protection

## cost effective design

- efficient nano pre- and after filters combine with high quality desiccant for low pressure drop and consistent dew point performance

## customized to meet your needs

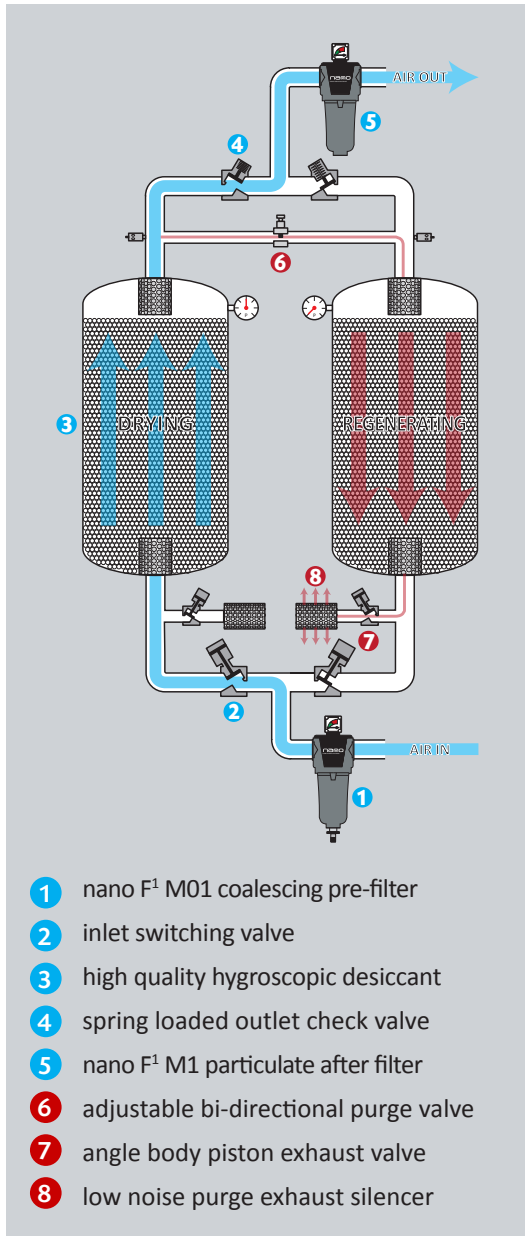
- at nano we understand that every customer and every application is different. that is why we provide a wide range of available options to customize your dryer to your specific needs

## advanced PLC controls

A powerful programmable logic controller monitors and controls each D<sup>5</sup> heatless desiccant air dryer. The system monitors multiple inputs, showing pertinent data on the digital display and controlling the fully automated drying and regeneration cycles.

**ES Energy Saving Option** - The optional "ES" dew point demand system uses a reliable precision hygrometer to continually monitor the outlet dew point and extend the cycle for maximum energy savings. Includes real time outlet dew point indication and high dew point alarm.





## angle body piston valves

- two-way direct acting piston valves with stainless steel internals and Teflon® seats ensure reliable field proven performance
- used for inlet valves on the NHL 200 to 600 and purge exhaust valves for all models



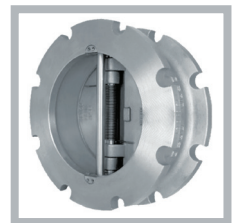
## high performance butterfly valves

- pneumatic actuators ensure precise proportional control and a bubble tight seal
- rugged stainless steel disk construction and Teflon® seats combined with a low pressure drop design
- used for inlet valves on the NHL 800 and larger



## stainless steel check valves

- stainless steel spring return check valves provide worry-free operation and minimal maintenance
- lift style check valves used on the NHL 200 to 600 and wafer style check valves used on the NHL 800 and larger



## precision purge control valve

- purge flow is field adjustable with this precision valve with visual setting indication
- allows the operator to easily adjust the purge flow to match the operating conditions for optimal energy savings



## low noise exhaust mufflers

- these specially designed exhaust mufflers minimize the noise of depressurization and purge exhaust while also minimizing back pressure
- the high flow design reduces blockage extending service life



# options & upgrades

option	description	changes	from	to	benefit
ES	Energy Saving	regeneration cycle	timed operation	dew point dependent operation	significant purge & energy savings
3V	3 Valve Bypass	ability to bypass unit	none	manual 3 valve block & bypass	maintenance without stopping air flow
LDP	Low Dew point	outlet pressure dew point	-40°F (ISO 12500 Class 2)	-100°F (ISO 12500 Class 1)	improves downstream air quality
N4	NEMA 4	electrical protection	NEMA 12	NEMA 4	greater protection against contamination
N4X	NEMA 4X	electrical protection	NEMA 12	NEMA 4X	as above, plus greater corrosion resistance
N7	NEMA 7	electrical protection	NEMA 12	NEMA 7	for explosion proof environments
50HZ	50Hz Power	inlet power supply	120 VAC / 1 Ph / 60 Hz	220 VAC / 1 Ph / 50 Hz	allows 50Hz power supply
PC	Pneumatic Controls	inlet power supply	120 VAC / 1 Ph / 60 Hz	fully pneumatic	eliminates power supply
HP	High Pressure	allowable working pressure	50 to 150 psig	50 to 250 psig	allows higher inlet pressures
LA	Low Ambient	allowable working temp	34 to 120°F	-15°F to 120°F	allows lower ambient temperatures

list is not all inclusive. contact [support@n-psi.com](mailto:support@n-psi.com) for a complete list of available options

# D<sup>5</sup> externally heated & blower purge

The D<sup>5</sup> NEX externally heat reactivated dryers use heat to reduce the use of costly purge air. The NBP blower purge dryers take it a step further using a combination of heat and ambient air to further reduce (or even eliminate) purge air usage. For consistent performance and cost effective operation these dryers are your optimum choice.

## flexible & functional

- advanced PLC controls allow you to monitor the operation of the dryer through an easy to use digital display
- multiple thermocouples control regeneration and provide constant temperature display

## unique features

- secondary heater contactor provides protection against overheating in the event of a primary contactor failure
- visual alarm lights and step by step diagnostics simplify troubleshooting
- selectable “Dry Air Cooling” mode lets you choose between maximum performance and maximum energy savings depending on the needs of your application (NBP only)

## high quality construction

- rugged field proven digitally controlled dual acting high performance butterfly valves and stainless steel spring return wafer check valves ensure long operating life and minimum maintenance
- insulated external electric heaters and high efficiency regenerative blowers for efficient regeneration in all operating conditions

## cost effective design

- nano M01 coalescing pre-filters and NHT M1 high temperature after filters with high quality hygroscopic desiccant ensure low pressure drop and consistent dew point performance

## customized to meet your needs

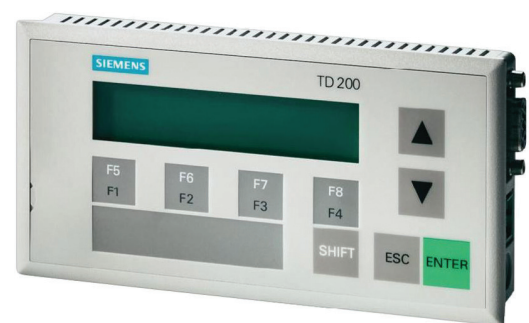
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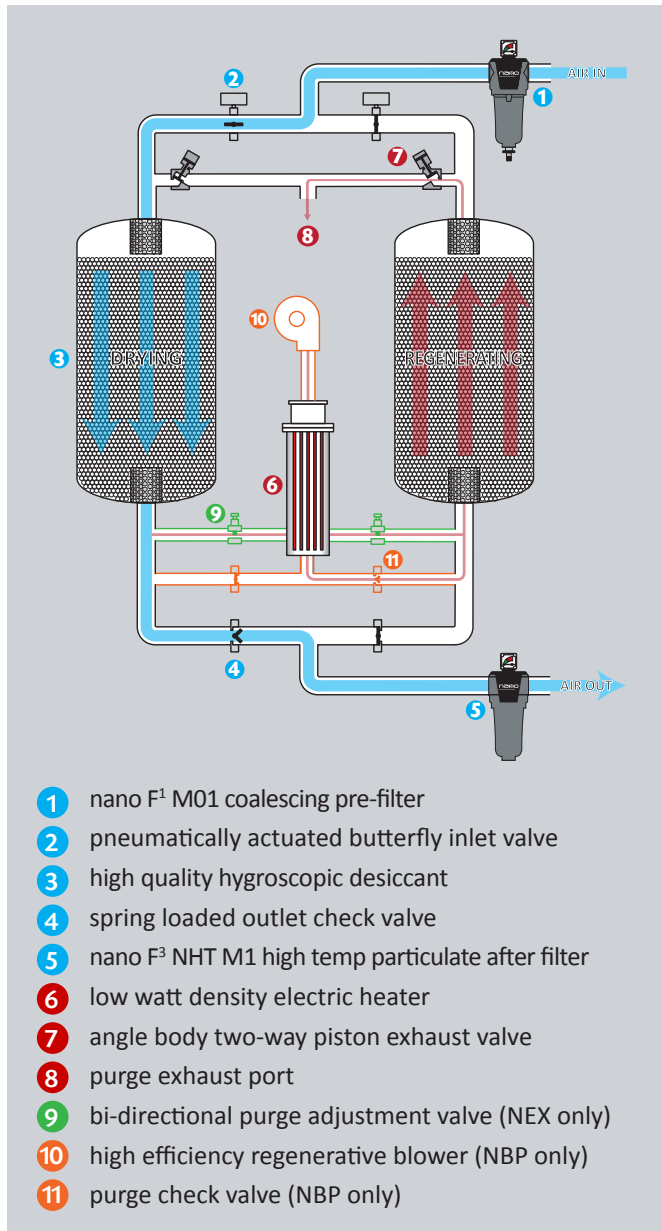


# advanced PLC controls

A powerful S7-200 micro-programmable logic controller monitors and controls operation. The compact design, flexible configuration and powerful instruction set combine to make this the perfect solution for industrial air drying applications. The system monitors multiple inputs displaying pertinent data on the digital user interface and controls the fully automated drying and regeneration cycle.

**ES Energy Saving Option** - The optional “ES” dew point demand system uses a reliable precision hygrometer to continually monitor the outlet dew point and adjust the cycle for maximum energy savings. Includes real time outlet dew point indication and an adjustable high dew point alarm.





## efficient regenerative blower

- field proven high efficiency blower combines reliable performance and a long operating life
- regenerative design for lower noise levels than typical blowers



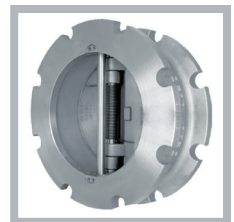
## low watt density heater

- regeneration circuit is fully insulated for maximum efficiency
- specifically designed for a long and dependable operating life in harsh industrial environments



## stainless steel check valves

- metal on metal seats for reliable high temperature operation
- dependable stainless steel spring return check valves provide worry-free operation and minimal maintenance



## high performance butterfly valves

- pneumatic actuators ensure precise proportional control and a bubble tight seal
- stainless steel and Teflon® seats in a reliable and low pressure drop design



## precision purge control valve

- purge flow is field adjustable with this precision valve with visual setting indication (NEX only)
- easily adjust the purge flow to match the operating conditions



# options & upgrades

option	description	changes	from	to	benefit
ES	Energy Saving	regeneration cycle	timed operation	dew point dependent operation	significant purge & energy savings
3V	3 Valve Bypass	ability to bypass unit	none	manual 3 valve block & bypass	maintenance without stopping air flow
LDP	Low Dew point	outlet pressure dew point	-40°F (ISO 12500 Class 2)	-100°F (ISO 12500 Class 1)	improves downstream air quality
TI	Tower Insulation	thermal insulation	heater & regen piping only	heater, towers & heated piping	reduces ambient heat loss
N4	NEMA 4	electrical protection	NEMA 12	NEMA 4	greater protection against contamination
N4X	NEMA 4X	electrical protection	NEMA 12	NEMA 4X	as above, plus greater corrosion resistance
N7	NEMA 7	electrical protection	NEMA 12	NEMA 7	for explosion proof environments
575V	575 Volt Power	inlet power supply	460 VAC / 3 Ph / 60 Hz	575 VAC / 3 Ph / 60 Hz	allows 575V power supply
50HZ	50Hz Power	inlet power supply	460 VAC / 3 Ph / 60 Hz	400 VAC / 3 Ph / 50 Hz	allows 50Hz power supply
HP	High Pressure	allowable working pressure	50 to 150 psig	50 to 250 psig	allows higher inlet pressures
LA	Low Ambient	allowable working temp	34 to 120°F	-15°F to 120°F	allows lower ambient temperatures

list is not all inclusive. contact support@n-psi.com for a complete list of available options

# sizing & specifications

dryer model	inlet & outlet		rated flow <sup>(2)</sup>		dimensions (inches)			approx. weight	recommended filtration <sup>(3)</sup>	
	NPT/FLG <sup>(1)</sup>	scfm	Nm <sup>3</sup> /h	width	depth	height	lbs	pre-filter	after filter	
<b>NHL heatless</b>										
NHL 200	1"	200	340	33	24	84	650	NF 0290 M01	NF 0290 M1	
NHL 250	1 1/2"	250	425	39	24	87	810	NF 0290 M01	NF 0290 M1	
NHL 300	1 1/2"	300	510	39	24	87	810	NF 0325 M01	NF 0325 M1	
NHL 400	2"	400	680	45	26	85	1020	NF 0450 M01	NF 0450 M1	
NHL 500	2"	500	850	45	26	85	1210	NF 0700 M01	NF 0700 M1	
NHL 600	2"	600	1020	45	26	85	1230	NF 0700 M01	NF 0700 M1	
NHL 800	3"	800	1360	66	40	93	2800	NF 1000 M01	NF 1000 M1	
NHL 1000	3"	1000	1700	66	40	93	3250	NF 1000 M01	NF 1000 M1	
NHL 1250	3"	1250	2125	70	40	93	4400	NF 1250 M01	NF 1250 M1	
NHL 1500	3"	1500	2550	70	40	93	4700	NF 1500 M01	NF 1500 M1	
NHL 2000	4"	2000	3400	76	40	97	4900	NFZ 2500 M01	NFZ 2500 M1	
NHL 2500	4"	2500	4250	93	50	109	5600	NFZ 2500 M01	NFZ 2500 M1	
NHL 3000	4"	3000	5100	93	50	109	8100	NFZ 3000 M01	NFZ 3000 M1	
<b>NEX externally heat reactivated</b>										
NEX 200	1"	200	340	30	45	87	610	NF 0290 M01	NHT 0300 M1	
NEX 250	1 1/2"	250	425	35	50	87	810	NF 0290 M01	NHT 0300 M1	
NEX 300	1 1/2"	300	510	40	50	88	1100	NF 0325 M01	NHT 0300 M1	
NEX 400	2"	400	680	45	45	90	1250	NF 0450 M01	NHT 0450 M1	
NEX 500	2"	500	850	45	45	90	1600	NF 0700 M01	NHT 0650 M1	
NEX 600	2"	600	1020	45	45	90	1900	NF 0700 M01	NHT 0650 M1	
NEX 800	3"	800	1360	55	50	95	2500	NF 0850 M01	NHT 1000 M1	
NEX 900	3"	900	1530	55	50	95	2800	NF 1000 M01	NHT 1000 M1	
NEX 1000	3"	1000	1700	65	60	95	3200	NF 1000 M01	NHT 1000 M1	
NEX 1250	3"	1250	2125	65	60	95	3500	NF 1250 M01	NHT 1250 M1	
NEX 1500	3"	1500	2550	98	70	106	4200	NF 1500 M01	NHT 1600 M1	
NEX 2000	4"	2000	3400	110	80	106	4800	NFZ 2500 M01	NFZ 2500 M1HT	
NEX 2500	4"	2500	4250	110	80	106	6200	NFZ 2500 M01	NFZ 2500 M1HT	
NEX 3000	4"	3000	5100	120	85	108	7600	NFZ 3000 M01	NFZ 3000 M1HT	
NEX 3500	6"	3500	5950	120	89	108	8300	NFZ 3500 M01	NFZ 3500 M1HT	
<b>NBP blower purge</b>										
NBP 500	2"	500	850	90	42	90	2890	NF 0700 M01	NHT 0650 M1	
NBP 650	2"	650	1105	90	42	90	3500	NF 0700 M01	NHT 0650 M1	
NBP 800	3"	800	1360	95	55	105	4500	NF 1000 M01	NHT 1000 M1	
NBP 1000	3"	1000	1700	95	55	105	5600	NF 1000 M01	NHT 1000 M1	
NBP 1250	3"	1250	2125	110	70	109	6400	NF 1250 M01	NHT 1250 M1	
NBP 1500	3"	1500	2550	110	70	109	8200	NF 1500 M01	NHT 1600 M1	
NBP 2000	4"	2000	3400	140	75	110	9800	NFZ 2500 M01	NFZ 2500 M1HT	
NBP 2500	4"	2500	4250	140	75	110	12500	NFZ 2500 M01	NFZ 2500 M1HT	
NBP 3000	4"	3000	5100	140	89	120	15000	NFZ 3000 M01	NFZ 3000 M1HT	
NBP 4000	6"	4000	6800	160	94	122	21000	NFZ 4000 M01	NFZ 4000 M1HT	
NBP 5000	6"	5000	8500	180	94	140	27000	NFZ 5000 M01	NFZ 5000 M1HT	
NBP 6000	6"	6000	10200					NFZ 6000 M01	NFZ 6000 M1HT	
NBP 7500	8"	7500	12750					NFZ 7500 M01	NFZ 7500 M1HT	
NBP 9000	8"	9000	15300					NFZ 10000 M01	NFZ 10000 M1HT	

specifications	NHL	NEH	NBP	Options
maximum particle size (ISO Class) <sup>(4)</sup>	Class 2 (1 micron)	Class 2 (1 micron)	Class 2 (1 micron)	Class 1 (0.01 micron)
maximum water content (ISO Class) <sup>(4)</sup>	Class 2 (-40°F pdp)	Class 2 (-40°F pdp)	Class 2 (-40°F pdp)	Consult Factory
design operating pressure range	50 to 150 psig	80 to 150 psig	80 to 150 psig	58 to 250 psig
recommended operating temp range	40 to 100°F	40 to 100°F	40 to 100°F	-
design operating temperature range	35 to 120°F	35 to 120°F	35 to 120°F	< 32°F
power supply requirements	120 VAC / 60 Hz	460 VAC / 60 Hz	460 VAC / 60 Hz	Consult Factory

pressure correction factors <sup>(5)</sup>	60	70	80	90	100	110	130	140	150
inlet air pressure (psig)	60	70	80	90	100	110	130	140	150
correction factor	0.65	0.74	0.83	0.91	1	1.04	1.12	1.16	1.20

temperature & dew point correction factors <sup>(5)</sup>	70	80	90	100	105	110	115	120
inlet air temperature (°F)	70	80	90	100	105	110	115	120
correction factor	1.12	1.10	1.06	1	0.93	0.86	0.80	0.75

(1) 2" and below are NPT threaded. 3" and above are flanged  
(2) at an inlet conditions of 100 psig and 100°F; for all other inlet conditions refer to the correction factors to the left  
(3) recommended for all applications  
(4) per ISO 8573.1:2001 (E)  
(5) to be used as a rough guide only. all applications should be confirmed by n-psi. contact support@n-psi.com

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