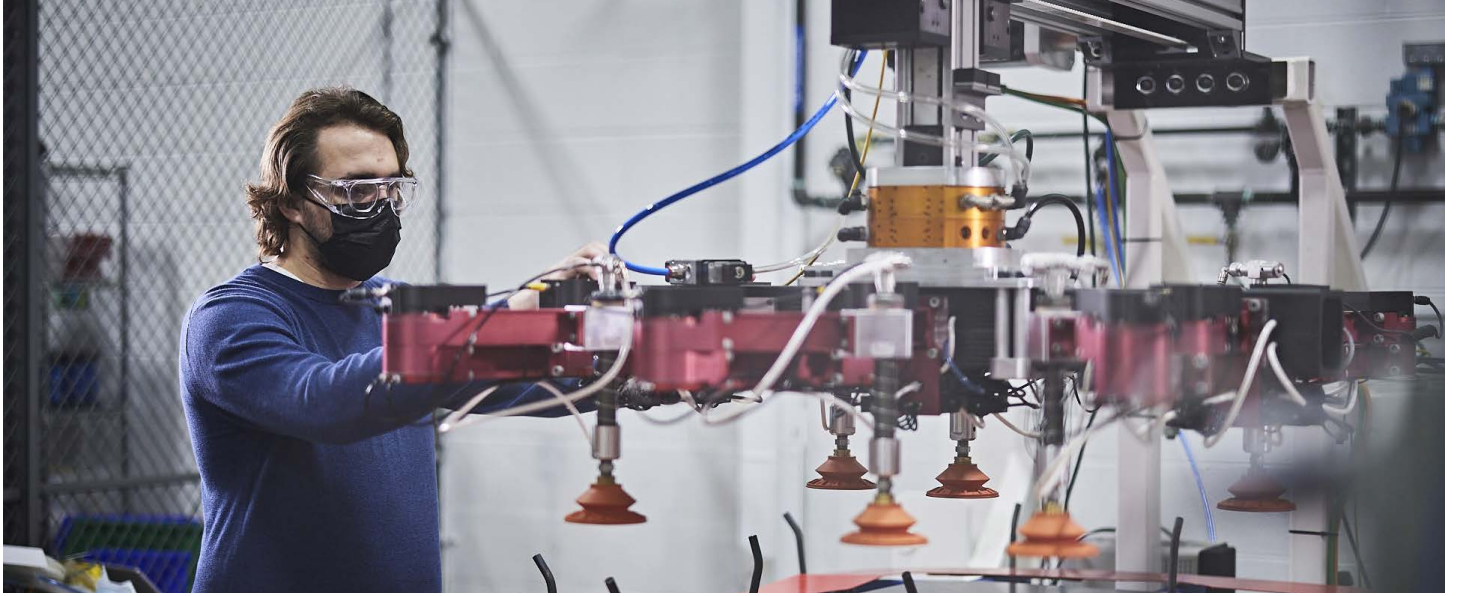


# Vacuum Product Guide





# Breakthrough Engineering for a Better World

Norgren is part of global engineering organisation IMI plc. IMI is at the forefront of delivering the solutions we need in a changing world and is focused on **creating tremendous value by solving key industry problems** in attractive markets and employing the best.

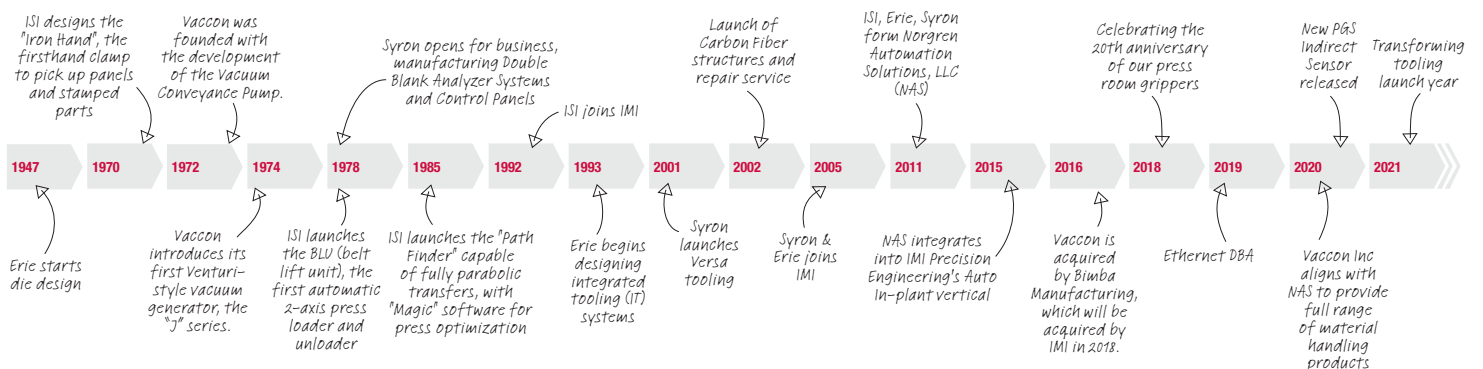
Norgren has a proud history of creating innovative engineering solutions in precise motion control and fluid technology, and we collaborate with our customers across more than 50 countries in critical areas such as Factory Automation, Material Handling, Rail, Energy, Process Control, Life Science and Commercial Vehicles.

From improving speed, productivity, reliability and efficiency of equipment, to generating significant energy and cost savings, or lowering total cost of ownership across many industries, Norgren's high-quality solutions are designed to help customers pursue progress, achieve new goals and overcome problems.

Our world-class portfolio of fluid and motion control products include Norgren, Bimba, Buschjost, FAS, Herion, Kloehn and Maxseal. Supplied either individually or combined into powerful customised solutions to meet customer needs.

With market-leading industry expertise, we offer the capability, resources, engineering intelligence and global support infrastructure to tackle the largest project demands.

## Breakthrough engineering you can count on.



## Venturi Vacuum Generators for Automation and Process Control Applications

Norgren Family of Products



**"Norgren Vacuum Cartridges – The Power Inside"**

**For Norgren Generators & OEM Equipment**

Norgren offers 13 different single-stage venturi vacuum cartridges for the Mini and Mid Series vacuum generators and manifolds. Ideally suited for machine designers, venturi cartridges easily fit into OEM cavities creating an unrecognizable (proprietary) vacuum source. Vacuum cartridges are a combination of interchangeable nozzles and diffusers that enable you to optimize generator performance based on desired vacuum level, vacuum flow, evacuation speed and air consumption.



**Mid and Max Series: Threaded Venturi Vacuum Cartridges**



Norgren offers 23 single-stage threaded venturi vacuum cartridges in the Mid & Max Series. Ideally suited for machine designers, venturi cartridges easily fit into OEM cavities creating an unrecognizable (proprietary) vacuum source.

Norgren threaded venturi vacuum cartridges offer a wide range of performance levels enabling you to optimize generator performance based on desired vacuum level, vacuum flow, evacuation speed, and air consumption. If the product changes in size, porosity, or weight, you can refit the existing equipment with a different cartridge by simply swapping the entire cartridge, or just the nozzle or diffuser.

## Miniature Venturi Vacuum Generator

**Min Series: VP00**



The NVP00 Min Series air-powered venturi vacuum generators are compact, lightweight, dirt tolerant and highly efficient, capable of reaching 28" Hg (948mbar). Dimensions: 2.4" x 0.63"

## Mid-size Venturi Vacuum Generator with Interchangeable Cartridges

**Mid Series: NVP10 & NVP20**



The NVP10 & NVP20 Mid Series air-powered venturi vacuum generators are highly efficient, capable of reaching 28" Hg (948mbar), dirt tolerant, and include a silencer for quiet operation. Light-weight and compact, they can be easily mounted close to the vacuum point for fast response. All Mid Series generators incorporate Norgren's interchangeable venturi cartridge system that allows designers to choose from 11 different cartridge assemblies to optimize generator performance to meet their specific application needs.

## Max-size Venturi Vacuum Generator

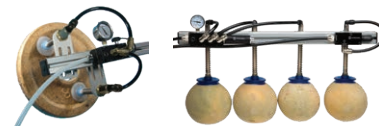
**Max Series**



The Max Series air-powered venturi vacuum generators provide high vacuum flow rates for the rapid evacuation of large volumes of air or for overcoming leakage in order to sustain high vacuum levels while handling porous materials. Highly efficient, capable of reaching 28" Hg (948mbar), the NVP80's & NVP90's are dirt tolerant and include a straight-through silencer. Unlike the Mid Series generators that use interchangeable cartridge assemblies, the Max Series generators (NVP80 & NVP90's) use a non-removable press-fit venturi assembly. Now available with integral solenoid valve.

## Multi-port Venturi Vacuum Generator

**Mid & Max Series: NVP10M, N20M, & N80M 4 Ports**



Norgren's Multi-port venturi vacuum generators combine a venturi with a manifold to distribute vacuum to multiple locations. The result is a compact vacuum generation and distribution system for End-of-Arm Tools and applications where one generator powers multiple cups. NVP10M, NVP20M, and NVP80M generators have 4 vacuum ports that distribute vacuum equally to 4 locations.

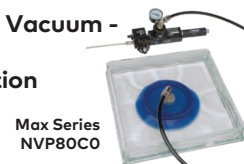
**Max Series: NVP90M 6 Ports**



The NVP90M generators have 6 vacuum ports that distribute vacuum equally to 6 locations, both with "Home-Run" plumbing. The streamlined design minimizes vacuum loss, maximizes vacuum flow and speeds cycle times for safe, efficient lifting operations.

## Generators with Air Saver Technology

**On-Demand Vacuum - Saves Air - Safe Operation**



Norgren's Air Saver generators are an all-pneumatic system that minimizes compressed air usage by creating, monitoring and maintaining vacuum for safe energy efficient operations. For pick and place applications handling non-porous materials, the Air Saver generators will maintain a strong holding force, conserve compressed air, and hold the part even if the compressed air supply is interrupted providing an extra level of safety when handling large loads. For vessel evacuation applications such as wood and composite clamping, Air Saver generators maintain vacuum for long periods of time and only consume compressed air to overcome system leaks resulting in 90% air savings. The system includes a venturi vacuum generator, vacuum check valve, air piloted air valve and all-pneumatic vacuum switch. The switch is adjustable from 0 to 28" Hg (948mbar) and the hysteresis is 3" Hg (102mbar).

## Venturi Vacuum Generators with Pneumatic Blow-off

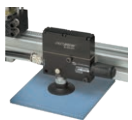


Min NVP0XB0/NVPOXB1



Mid NVP1XB0/NVP1XB1

Norgren's air-powered venturi vacuum generators, are trusted for accurate part placement and rapid part release. Reliable, providing both vacuum and blow-off in one generator using only one compressed air line. No electricity required. The integrated pneumatic high-speed blow off generators provide a fixed duration blow-off based on the volume of the housing. With the NVPOXB1, NVP1XB1, NVP2XB1 and NVP8B1ADJ adjustable vacuum generators, you can control the intensity of the blow-off using one fingertip adjustment knob. Now available with optional integrated valve in the NVP2XB and NVP8XB Series generators.



Mid NVP2XB0 & NVP2XB1



Max NVP8XB0/NVP8XB1

## Solenoid Operated Venturi Vacuum Generators with Pneumatic Blow-off

### All-pneumatic Venturi Vacuum Generators with Air Saver Technology



NVP2XBD

NVP2XB and NVP8XB (Adjustable) air-powered venturi vacuum generators are the solution for accurate part placement and rapid part release operations that require a solenoid-operated generator with a pneumatic blow-off.



NVP2XBD

The NVP2XB and NVP8XB Series generators provide a complete, compact system that includes a pre-plumbed and pre-sized

solenoid-operated control valve. The reliable NVP2XB and NVP8XB Series generators provide both vacuum and blow-off in one generator, using only one compressed air line and one electric signal, minimizing the number of outputs required. The integrated pneumatic high speed blow-off provides a fixed-duration blow-off based on the volume of the chamber. With the NVP2XB and NVP8XB Adjustable generators you can control the intensity of the blow-off using one fingertip control adjustment knob.

## Venturi Vacuum Generators with Integral Solenoid Valve

### NVP01V & NVP20V Series Generators



NVP01B Series



NVP20V Series

Norgren's NVP01V and NVP20V generators are solenoid-controlled venturi vacuum generators that generate vacuum only when needed, minimizing compressed air consumption. The integral solenoid valve provides instantaneous response for high speed assembly and pick & place applications. The Mid Series generators use an interchangeable venturi cartridge system. Light-weight and compact, NVP01V and NVP20V generators are placed directly at the point of use to eliminate plumbing between components and to ensure high cycle rates for increased productivity.

## Venturi Vacuum Generators with Solenoid Operated Vacuum and Blow-off



NVP01V Series

The NVP01V and the NVP20V Series generators are solenoid-controlled venturi vacuum generators that feature a second solenoid to control blow-off air for rapid part release. The integral vacuum and blow-off circuit design of the NVP01V & NVP20V Series provides instantaneous response for high speed assembly and pick & place applications.

The blow-off line is at line pressure, and is internally plumbed so that only one air and vacuum line is required. The design flexibility of the NVP20VD is further increased with our interchangeable venturi cartridge system.

## NVP50 Series Venturi Vacuum Generators

### All-pneumatic Venturi Vacuum Generators with Air Saver Technology



NVP50



NVP50C0



NVP50C1

The all-pneumatic Norgren NVP50 Series represents the latest design innovation in the company's extensive venturi vacuum product line. Developed with the same unique air-saver technology found in many other Norgren generators, the NVP50 Series requires no electrical controls and instead uses a single air supply for all functions. Available in three distinct models, the NVP50 Series offers a controlled pneumatic blow-off, as well as atmospheric release capability, self-regulating vacuum level control, and positive and negative pressure pilot ports for vacuum sensing. The NVP50 Series is the perfect solution when air savings, energy savings and design simplicity are sought, and is especially well suited in robotic end-of-arm tooling environments, and all applications requiring quick release of the load.

Vacuum technology isn't an exact science. To ensure proper selection, Norgren offers free application engineering assistance. Send a sample of your product to our in-house test facility. We will test and size a generator for you and send a video of our product performing your application with your product — so that you know it works!

## High Vacuum Venturi Generator

**HighVac Series:**  
NHVP 100, 200, 300



The HighVac Series of air-powered venturi vacuum generators generate vacuum levels up to 29.5" Hg (999mbar) and offer a wide range of vacuum flow rates. Often used to replace expensive, noisy, heat generating, electric generators, HVP generators are quiet and maintenance free, ideal for degassing viscous liquids such as silicone and other mould compounds, vessel evacuation, and process control for small shops, labs and HVAC applications.

## Cylindrical Venturi Generators

**Ultra-Mini NJ Series:**  
NJS-40UM



The NJS-40UM (Ultra-Mini) cylindrical venturi vacuum generator is the smallest complete venturi vacuum generator that Norgren offers. Incredibly compact and powerful – it measures the size of your finger tip and generates up to 27" Hg (914mbar). Lightweight, quiet and cool operating, NJS-40UM generators fit in confined spaces, where they can be mounted in-line near the point of use for rapid response.

Ideal for gas sampling and analysis, leak testing, portion/drip control for dispensing liquids, liquid transfer, pick and place for small, non-porous parts, and small vessel evacuation. This generator is used as the vacuum source for Norgren's vacuum pencil kit.

## Cylindrical Venturi Generators

**Mini NJ Series:**  
"M" (mini) Version

The NJ Series "M" (Mini) version cylindrical venturi vacuum generators feature a high power-to-size ratio, measuring only 3" L x 3/4" OD. Single stage design allows ingested contaminants to pass through the generator without clogging enduring continuous operations. No seals and no moving parts. Rugged and reliable. Ideal for carton erecting, vessel evacuation, medical and pharmaceutical applications, food processing, high temperature and caustic applications.



**Mid & Max NJ Series**  
NJ100, 150, 200, 250, 300 & 350



The larger NJ Series generators offer higher vacuum flows for rapid evacuation of large vessels and to overcome leakage to sustain high vacuum levels when handling porous materials. The single-stage design allows ingested contaminants to flow through the generator without clogging, ensuring continuous operation. Constructed of a single material, with no seals or moving parts, NJ Series generators are virtually indestructible. NJ Series generators provide a constant vacuum flow, rather than a fluctuating flow typically associated with diaphragm generators. They operate with an instantaneous response in pulsed applications or on a continuous basis. Ideal for carton erecting, vessel evacuation, medical and pharmaceutical applications, food processing, high temperature and caustic applications.

## Cylindrical Generators

**Ideal for Specialty Materials**

The NJ Series generators can be manufactured in a variety of materials, including Teflon®, stainless steel, PVC, PEEK making them ideal for use in adverse operating conditions. With a straight through design, contaminants pass through without clogging. Press fit nozzle, no seals or o-rings. Custom sizes and shapes available.



## Inline Venturi Vacuum Generator

Unlike standard venturi vacuum generators where the vacuum port is 90° from the supply port, Norgren's air-powered NVPI-90H inline venturi vacuum generators feature an air-supply port and vacuum port on the same axis to consolidate space. NVPI-90H generators vertically mount to robotic arms to create single or densely populated arrays of generator/cup to accommodate and lift products of any size, shape, or weight. Internal threads on the vacuum port enable vacuum cups to connect directly to the generator while the external threads attach directly to the end of arm tool. NVPI-90H's feature an additional vacuum port for a vacuum switch/ sensor to ensure accurate part detection or for a connection to an externally supplied blow-off.



## Variable Vacuum/Variable Flow, Extremely Dirt Tolerant Venturi Vacuum Generators

**NVDF Series**

The NVDF Series is a unique Norgren innovation that places the vacuum port and exhaust path inline making a straight-through venturi vacuum generator. These compact generators offer high flow rates up to 120 SCFM (3400 LPM) and high vacuum levels up to 25" Hg (847mbar). Developed for extremely dirty and dusty environments such as foundries, refractory and bagging operations, NVDF generators don't clog, lose suction or require a vacuum filter. NVDF generators are field-adjustable allowing you to regulate the vacuum flow and vacuum level to meet your application requirements. Also available with new factory preset option.



NVDF-37

## Adjustable Air Amplifiers/Blowers

**NCDF Series Air Amplifier Blower: High Output Flow**

The NCDF Series air amplifiers generate high output flow using a small volume of compressed air. This efficient use of air makes NCDF air amplifiers a cost-effective alternative to electric blowers or raw compressed air. Ideal for inflation and deflation, drying, cooling, blowing, air, smoke, mist or fume evacuation. Field adjustable for individual applications. No heat generated, no electricity required. Safe operation.



**CDF Series Air Amplifier Material Handling: High Vacuum Flow**

CDF Series air amplifiers generate high vacuum flow, overcoming leaks inherent in handling porous objects such as foam or fabric and other materials that many consider too challenging to handle with vacuum. With or without a vacuum cup, CDF air amplifiers safely transfer irregular shaped items.



NCDF-50H

To meet a wide range of applications, air velocity and air flow are field adjustable to compensate for the pressure level supplied.

NCDF air amplifiers can achieve amplification ratios as high as 40:1 (output to input). The NCDF air amplifier's straight-through design allows dirt and debris to pass through without clogging providing maintenance-free operation.



## Material Conveying Vacuum Generators

### NDF Series



The NDF Series of high flow material conveying vacuum generators provide a simple, reliable and cost effective method of in-line transfer of bulk materials, complex shapes, individual objects, and selvage. The NDF generator's unique capability to create instantaneous vacuum flow and high air velocity, combined with its straight-through, smooth bore design allows material to pass directly through the generator at high speeds without interference or clogging. Available in 17 standard models with inside diameters from 1/8" (6mm) to 4" (100mm).

### Custom Materials and End Configurations



For chemical compatibility, heat and environmental requirements, food and medical applications, Norgren's NDF Series offers custom materials (Teflon®, stainless steel, PVC, PEEK), special coatings, and modified threads including internal and external threaded exhaust and/or vacuum ports with NPT or G port threads.



## Silencers

### NAA Series Silencers



NAA Series silencers have excellent noise reducing characteristics with minimal resistance to air flow. The large surface of the felt element resists contamination far more than other materials such as sintered bronze, steel mesh or porous polyethylene.

### NST Series Silencers



The NST Series Silencers are designed with a straight through flow path that eliminates clogging by allowing the contaminants to pass directly through the silencer. Even in the most adverse conditions, contaminants pass through the silencer making the NST Series ideal for silencing vacuum generators that are continuously ingesting dirt and debris.

### NSTAA Series Silencers



The NSTAA Series hybrid silencer offers increased noise reduction by combining an NST silencer with an AA silencer. The (closed-end) AA silencer is attached to the end of a modified NST silencer, thus removing the flow through feature of the standard NST Series silencers.

### NFA-51 Series Silencers



The FA-51 Series silencers offer remarkable noise reduction for high volume exhaust applications without causing back pressure. These silencers are ideal for quieting large air valves that must exhaust quickly to maintain high cycle rates.

## Vacuum Cups

### Extensive Variety of Profiles & Materials



Norgren offers cups in an extensive variety of shapes and materials including dual durometer, FDA Approved silicone, rubber, egg vacuum cups, non-marking vacuum cups and metal detectable cups.

### Bellows Cups



Bellows cups have a pliable outer rim that will conform to curved or uneven surfaces while the bellows sections compensate for inconsistent stack heights.

Under vacuum the accordion-style bellows cup will collapse on contact. The collapsing action simulates a short cylinder stroke lifting the product a short distance, possibly saving the need for a separate lifting mechanism.

### Flat Cups



Flat cups without cleats are flexible and work well in applications that do not require lifting heavy loads. Flat cups with cleats are strong with a rigid, low profile that will lift heavy loads. The low profile allows heavy loads to be lifted vertically without the cup "peeling" away from the product surface or deforming the object being lifted. These cups perform well when gripping smooth, flat, heavy objects such as steel, glass (television picture tubes) and coated corrugated.

### Oval Cups

Like cleated cups, oval cups have heavy load capabilities due to their rigid design and large vacuum work area. Oval cups have the largest lifting force because they provide the most surface area for a given footprint.



### Ultra-Miniature Cups



Ultra-Miniature cups are ideal for use in picking up extremely small parts such as computer chips, wafers and electronic components. In high temperature materials, Ultra-miniature cups may be used in laboratory and food processing environments.

### Vacuum Cup Fittings



Designed with large thru bores, Norgren fittings connect to vacuum cups, vacuum generators and spring levers ensuring unrestricted vacuum flow for safe material handling operations. For plumbing flexibility, Norgren offers 25 different fitting groups in black anodized aluminum or brass with NPT, BSPP, M5 or 10-32 male and female threads.

### Vacuum Check Valves



NVCV Series

For vacuum applications requiring high flow and low cracking pressure, Norgren vacuum check valves seal and hold vacuum for safe, energy efficient operations for clamping, pick and place and vessel evacuation applications.

Designed specifically for vacuum applications, they offer high flow capacity with minimal flow restriction and feature extremely low cracking pressures of less than 1"Hg. The large unrestricted flow path ensures high flow at low vacuum levels. The low cracking pressure allows the vacuum system to reach its maximum vacuum level before the check valve seals off the system.

### Vacuum Gauges



Norgren vacuum gauges are used in almost every area of automation including applications in pneumatics, process control, packaging, printing, medical, food and pharmaceutical. For accurate monitoring, these gauges provide easy visual confirmation for the operator, ensuring consistent performance. Available in dry or glycerin filled, two dial sizes, and three mounting positions.

### In-Line Vacuum Filters



Add Norgren's compact in-line vacuum filters to vacuum lines or air-supply lines to trap dirt and debris from entering the process, or to the exhaust port to capture airborne contaminants. Norgren's pleated-element design offers a filter with significantly longer life and much higher flow capacity than non-pleated, porous plastic designs. The large surface area increases filter life while reducing maintenance costs.

### Pneumatic Vacuum Switch



NVSP Series

Converts vacuum signal into pneumatic signal. Norgren's Pneumatic Vacuum Switch provides a repeatable pneumatic output signal when reaching the user-defined vacuum set-point level and is appropriate for use in all vacuum systems. The output signal is a voluminous 2.5 SCFM at 100 PSI, with a response time of 64 ms at 90 PSI. This high flow and fast response makes the switch ideal for high-speed pneumatic circuits with lengthy plumbing lines and for continuously monitored vacuum applications such as vacuum clamping (chucking), vacuum forming, vessel evacuation, and pick & place.

### Adjustable Mechanical Vacuum Switches

NVS-5 Series, NSX-5 Series, NSX-5SB Series



Norgren's Adjustable Mechanical vacuum switches are ideal in automated systems to generate a low current electrical signal for input to a PLC or other logic controllers. The adjustable switches are normally open, diaphragm operated, and contain low-stress deflecting contacts instead of sliding or pivoting parts for high reliability and long life.

NVSW5A Series



NVSM(N or P) Series

Norgren's NVSW5A is a high-current capacity switch capable of switching line voltage loads from 5 Amps to 125 VAC. The sealed vacuum switch is field adjustable from 5 to 28"Hg (169 to 948 mbar). The vacuum level adjustment screw is easily accessed below the DIN connector. Wiring can be either normally open or normally closed. UL & CSA approved.

### Ultra-Mini Electronic Vacuum Switches



Norgren's ultra-miniature electronic vacuum switches provide a switched output for part present detection and can be easily mounted to Norgren's Modular NVP Series generators. Standard with 6" pigtail and Quick Disconnect.

### Miniature Electronic Vacuum Switches



NVXX(N, P)-QD-6 Series

Norgren's miniature electronic vacuum switches monitor vacuum levels in systems and provide a switched output. The NVXX Series has both adjustable set-point and hysteresis and an LED indicator and can be mounted directly onto a wide variety of Norgren generators. Complete with M8, 3-pin connector.

## Electronic Vacuum Switch with Digital Display



NVDX(N, P)-QD-6 Series

The NVDX Series compact all-in-one output device and digital gauge reduces the number of components in your system. With 2 switched outputs it's possible to monitor the high and low limits for vacuum control. The NVDX Series can be directly mounted to a wide variety of Norgren generators. Complete with M8, 4-pin connector.

## Electronic Vacuum Switch and Sensor with Digital Display



NVDS(N, P)-QD-6 Series

The NVDS Series compact all-in-one output device and digital gauge reduces the number of components in your system. With two switched outputs and one analog output, it's possible to monitor the high and low limits for vacuum control and system conditions. These switches are highly flexible due to selectable output functions such as switching point hysteresis and window comparator. Complete with M12, 5-pin connector.

## Electronic Vacuum Switch and Sensor with 3 Color, 3 Section Display



NVDM(P, N)-QD-6 Series

The NVDM Series compact all-in-one output device and digital gauge reduces the number of components in your system. Because the NVDM Series switches offer a choice of two switch outputs and one analog output, it's possible to monitor the high and low limits for pressure control and system conditions.

The analog output allows software control over the entire vacuum and pressure range with the ability to track system vacuum/pressure changes in real time. In pick & place and robotic material handling applications use the first switch for part presence so that the robot or tooling can move, and the second switch to signal the working vacuum level has been achieved.

The NVDM Series offers a multi-colored, multi-section display that provides a visual indication of system vacuum as well as the set-points. The set-point display changes color from red to green when set-point #1 is reached. If two set-points are used, each can be displayed by toggling back and forth using a single push button. The display also indicates when either set-point is reached and an output is activated. Complete with M8, 4-pin connector.

## Ultra-Mini Electronic Vacuum Sensor



NVTMV Series

Norgren's ultra-mini electronic vacuum sensors provide continuous voltage output (1-5v) proportional to the system vacuum level. Connected to a feedback interface such as a digital display or PLC, the VTMV is a cost effective, reliable sensor that maintains application consistency. Sensors can be mounted directly to Norgren's Modular VP Series generators. Standard with 6" pigtail with Quick Disconnect.

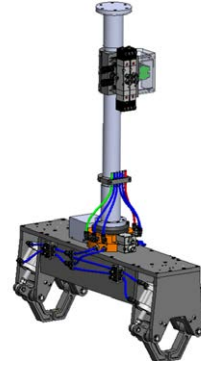
## Electronic Quick Disconnect Cordsets



NQDS Series 3-, 4-, and 5-pin Cordsets

Norgren offers electrical quick disconnect cordsets for Norgren digital and solid-state vacuum switches and sensors. With a screw-plug connection, Norgren quick disconnect cordsets save time and money by eliminating the labor-intensive assembly process of joining/soldering wires together. Norgren's female cordsets offer complete wiring systems for quick, easy and safe connection to system controllers, PLC's, and other electronic extension connectors.

## Norgren End-of-Arm-Tooling Components (EOAT)



All EOAT products are compatible with 1" (25mm) and 1.5" (40mm) extrusions. Norgren's modular End-of-Arm Tooling components offer everything you need to create a complete "wrist-down" EAOT for your material handling operations. Norgren's EOAT innovative component design is modular, lightweight, compact, and easy-to-connect. Using Norgren's EOAT, you can integrate vacuum generators, suction cups, spring levelers, fittings, and manifolds using simple erector-set connectivity in minimum design time. Order EOAT products separately and build your own tooling on-site in minimal time.

## Complete EOAT Solutions Designed, Built & Tested



Norgren offers complete pre-built EOAT solutions fully configured, plumbed, and tested. EOAT solutions ship assembled using one robot-to-EOAT connection for easy, out-of-the-box installation. Take advantage of our extensive vacuum knowledge to select the proper vacuum generator/cup combination and design your tool. Norgren will build your tool and test it using your product at our in-house Test Center, usually within the same day. Call Norgren first. We will save you time and money.



## Spring Levelers - Level Compensators



NVSL (1, 2, 3) Series

When handling sensitive objects such as fruit, Norgren Spring Levelers feature a soft touch allowing compliance for End-of-Arm tools to ensure that all cups make contact. This is especially important when handling large objects such as sheets of plywood that may be warped and the tool has multiple vacuum cups that must make contact. Norgren offers a large range of sizes and travel lengths 0.2" (5mm) to 3.6" (91mm) to accommodate the necessary over-driving by the lifting mechanism to bring all cups in contact. We offer large thru-bores that allow higher vacuum flow to overcome leakage and for rapid evacuation to ensure safe handling operations. The Series 3 Levelers have high performance bearings that prevent binding from side loading, provide a smooth operation over long strokes and prolong leveler life.

## Light Duty Spring Leveler Mounting Brackets



NSLBS (1, 2) / NSLBF (1, 2, 3) Series

Designed for flexible manufacturing operations, NSLBS and NSLBF Series mounting brackets attach to the top, sides or bottom of 1" (25mm) and 1.5" (40mm) extrusions. Easily mounted and adjusted, the Light Duty Spring Leveler Brackets readily rotate, slide or pivot for accurate part alignment. If the part size or process should change, you can reposition the brackets in a matter of seconds. Using your extrusions or ours, NSLBS and NSLBF Series mounting brackets connect to our NVSL Series Spring Levelers and a variety of our venturi vacuum generators to create a simple, off-the-shelf End-of-Arm device.

## Heavy Duty Spring Levelers/ Level Compensators

Norgren's Spring Leveler design surpasses the competition. We offer large thru-bores that allow higher vacuum flow to overcome leakage and for rapid evacuation to ensure safe handling operations. Recommended for applications which require lifting heavy loads without deflection, Norgren Heavy Duty Spring Levelers include a rigid mounting bracket for a strong, solid connection to 1.5" (40mm) extrusions.



NSLB40 (2, 3)

## Adjustable, Fixed Extension Shaft & Mounting Brackets

Adjustable, Fixed Extension Shaft & Bracket is a rigid, non-moving rod that mounts to the top, sides or bottom of 1.5" (40mm) extrusions. Once the shaft is adjusted to meet a specific height requirement, the bracket is clamped into a fixed position. Designed for flexible manufacturing operations, the NFEB40 Series is easily repositioned by simply loosening 2 collar screws and sliding the shaft up or down to meet the new height requirements. For added adjustability, add an adjustable universal bracket to slide the NFEB40 left or right.



NFEB40 (2, 3)

## Vacuum Cup Swivel Joint

Handling curved surfaces is easy with Norgren's Vacuum Cup Swivel Joint. The NCSJ3 swivel joints attach to a spring leveler and vacuum cup providing a full 40° angular movement. To control the degree of swivel, simply tighten the collar nut located on top of the swivel joint to restrict movement. Developed in conjunction with Norgren spring levelers, the NCSJ3 swivel joint assemblies feature exceptionally large flow paths to safely handle porous objects. Depending on height and tooling requirements, Vacuum Cup Swivel Joints are interchangeable with the NVSL3, NSLB40-3, and NFEB40-3 Series spring levelers.



NCSJ3 Series 3

## Universal Mounting Brackets - Standard, Adjustable, Angled



NUB, NUBA, and NAB brackets.

Compatible with 1" (25mm) and 1.5" (40mm) extrusions Universal Mounting Brackets are simple, lightweight connectors that attach Norgren vacuum generators, vacuum cups, spring levelers and manifold blocks to 1" or 1.5" extrusions. Available in 3 models, standard, adjustable or angled, our Universal Brackets are keyed to fit securely in 1/4" (6.5mm) or 5/16" (10mm) T-slots, remain square and increase holding force.

## Vacuum Cup Mount/ Manifold Block

Norgren's combination Cup Mount/Manifold Blocks are compatible with 1" (25mm) and 1.5" (40mm) extrusions. Simplify your End-of-Arm tooling devices using our dual purpose MB Series - Vacuum Cup Mount/Manifold Block. Whether you are mounting vacuum cups to extrusions and/or distributing vacuum to multiple locations, the NMB Series streamlines your design with one multi-functional component. For design and plumbing flexibility, the NMB Series features five vacuum ports and three mounting options that easily connect vacuum generators and cups to 5/16" (10mm) or 1/4" (6.5mm) T-slot extrusions. Extra vacuum ports allow optional accessories to be directly mounted to the manifold block i.e. vacuum gauges or remotely plumbed such as vacuum switches, sensors or blow-off capabilities. High vacuum flow is critical for handling porous objects. Norgren offers up to 3/4" NPT ports to ensure high flow paths.



## Push-to-Connect Fittings

Push-to-Connect (PTC) fittings are a robotic, End-of-Arm tooling component that connects all Norgren vacuum generators, cups, and spring levelers to each other or tubing. Norgren provides complete End-of-Arm tooling devices that can be ordered pre-assembled and tested at the factory or shipped in component format for on-site assembly.



# Our Global Reach

With established manufacturing facilities globally, we have the capability to cope with the most demanding of international projects. With a sales, distributors and service network in 50 countries, we have the reach and capability to ensure continuity of supply and local support where it is needed.

## Global Locations and Partners

### Norgren – Material Handling Locations

#### USA

Norgren Automation Solutions, LLC (NAS)  
2871 Bond Street  
Rochester Hills, MI 48309 USA

Tel: 1-800-272-4511  
Fax: 1-734-429-2981  
Email: NASInsideSales@imi-precision.com  
Web: www.materialhandling.norgren.com/en

#### USA

Norgren Automation Solutions, LLC (NAS)  
1325 Woodland Drive  
Saline, MI 48176 USA

Tel: 1-800-272-4511  
Fax: 1-734-429-2981  
Email: NASInsideSales@imi-precision.com  
Web: www.materialhandling.norgren.com/en

#### Mexico

Norgren S.A. de C.V.  
Av. La Montaña No.120  
Parque Industrial Querétaro  
Sta. Rosa Jáuregui, Querétaro  
Mexico 76220

Tel: +52 442 229 5010  
Email: nas.mexico@imi-precision.com

#### Brazil

IMI Norgren Brazil  
Av. Eng. Alberto de Zagottis 696  
04675-085 - São Paulo - Brazil

Tel: +55 11 5698 4000  
Fax: +55 11 5698 4001  
Email: vendas@imi-precision.com

#### China

Norgren Co., Ltd  
埃迈诺冠商贸（上海）有限公司.

Tel: +86 21 24161800  
sales@imi-precision.com.cn

#### India

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A-62, Sector 63,  
Noida- 201301  
Uttar Pradesh  
India

Tel: +91 (0) 120 4089500  
Fax: +91 (0) 120 4089599  
Email: india@imi-precision.com

#### Spain

IMI Norgren S.A.  
Colom, 391, 2º - Edificio Tecno  
08223 Terrassa

Tel: +34 937489800  
Email: spain@imi-precision.com

#### Thailand

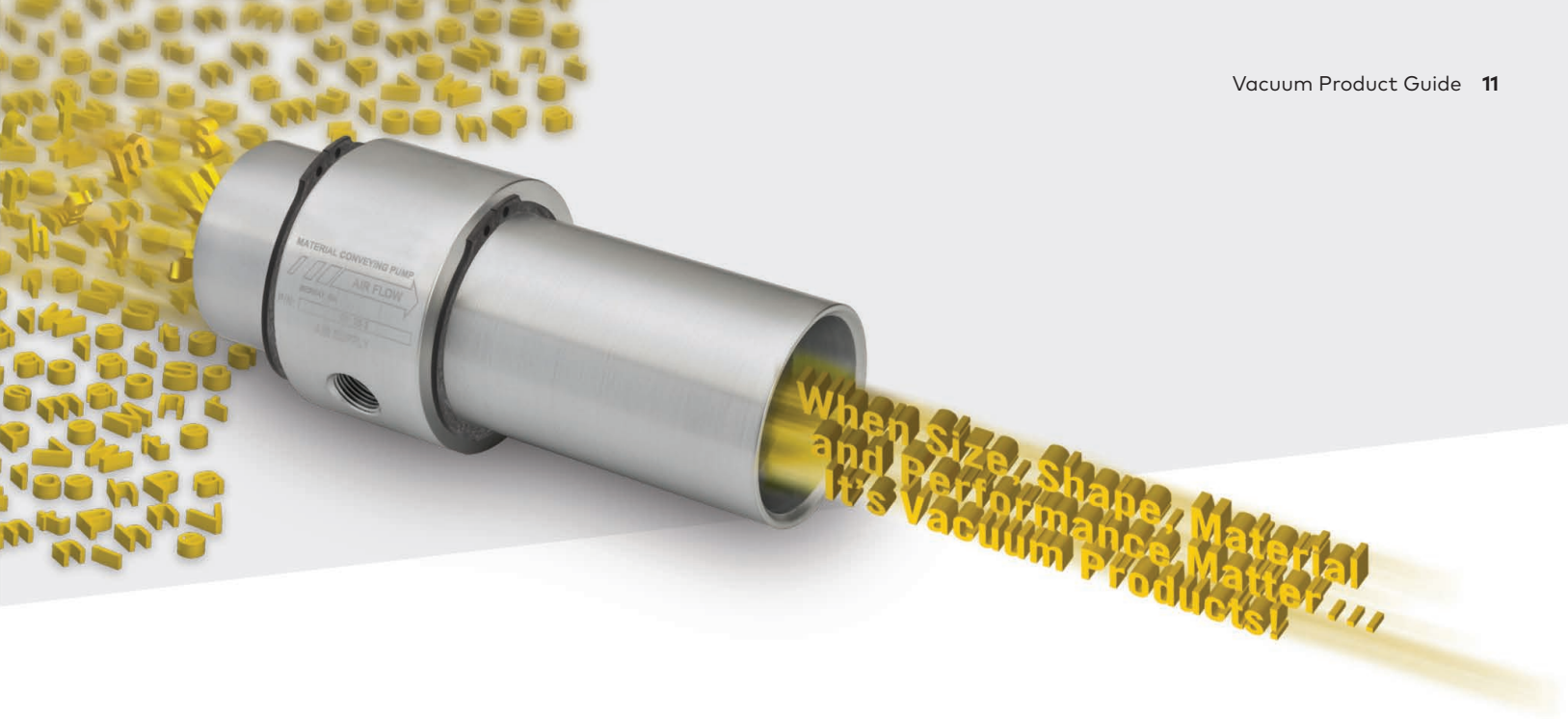
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120/34 M. 12 Rachadhewa, Bangplee  
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10540 Thailand

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### Sales & Service

-  Norgren sales, manufacturing and technical centers
-  Norgren Material Handling locations



**Problem: Customer transferring abrasive materials, even stainless steel generators wear out.**

**Solution: Norgren modified a standard DF material transfer generator so that instead of replacing the entire generator, the customer simply slips out the old body and replaces it with a new one; quickly and easily, saving time and money.**

## Vacuum Products – Accelerating Automation

### Streamlined Designs - High Performance – Low Maintenance

For more than forty-five years, Norgren has led the vacuum industry with innovative solutions. Norgren products are installed in thousands of industrial vacuum applications around the world. From packaging to robotics to flexible automation on the factory floor, our innovative vacuum solutions have increased productivity and lowered operating costs everywhere they are used.

New thinking in automation requires new solutions to meet the challenges of today's global environment and Norgren continues to lead the way. As automation extends upstream from the end-of-line process, Norgren-engineered vacuum solutions are helping to improve process performance and tackle new challenges never attempted with vacuum technology. Tap into our 50+ years of engineering expertise and proven problem solving experience to fast track a custom vacuum solution for your application. Visit our website or call now for immediate attention.

### Vacuum Generators

Norgren's extensive line of venturi vacuum generators include miniature generators, optional single or dual controlled solenoid valves, Air Saver generators (Green Technology), pneumatic blow-offs, Multi-port generators, high vacuum generators, variable vacuum/variable flow vacuum generators, material conveying vacuum generators, air amplifiers/blowers, air-piloted vacuum generators, vacuum manifolds and more.

All Norgren generators are designed to operate in adverse conditions without filters and never lose suction. Their simple, no-moving-parts design means they never wear out, never clog, and their completely maintenance-free operation provides high productivity.

### End-of-Arm Tooling

It's your choice....order a single component or a complete system, Norgren's EOAT product line offers light duty and heavy duty spring levelers and brackets, fixed extension shafts and brackets, vacuum cup swivel joints, universal mounting brackets, manifold block/cup mounts, extrusions, push-to-connect fittings and more.

**Problems are opportunities that are looking for a solution. We can help.**

### Custom & Modified Products

At Norgren, our entrepreneurial spirit loves a challenge. If it doesn't defy the laws of physics, (and sometimes even if it does), we'll try just about anything. We like to think of ourselves as a friend to the OEM - Original Equipment Manufacturers. With Norgren engineering, application and manufacturing capabilities Norgren can provide unique solutions to your specifications. Whether it's as simple as modifying a standard product or more complex requiring a new design, shape, performance levels or specialty materials...

Norgren has the solution!

Norgren operates four global centers of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in Brazil, China, Czech Republic, Germany, India, Mexico UK and the USA.

For information on all Norgren companies visit

[www.norgren.com](http://www.norgren.com)

**Supported by distributors worldwide.**

For further information, scan this QR code or visit  
<https://materialhandling.norgren.com/en>



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Incorporating



**IMI**