Industrial Automation

IMI Norgren

Excelon® Plus
Modular Air Preparation
for All Industrial Applications

IO-Link

Breakthrough engineering for a better world

Contents

Breakthrough engineering for a better world

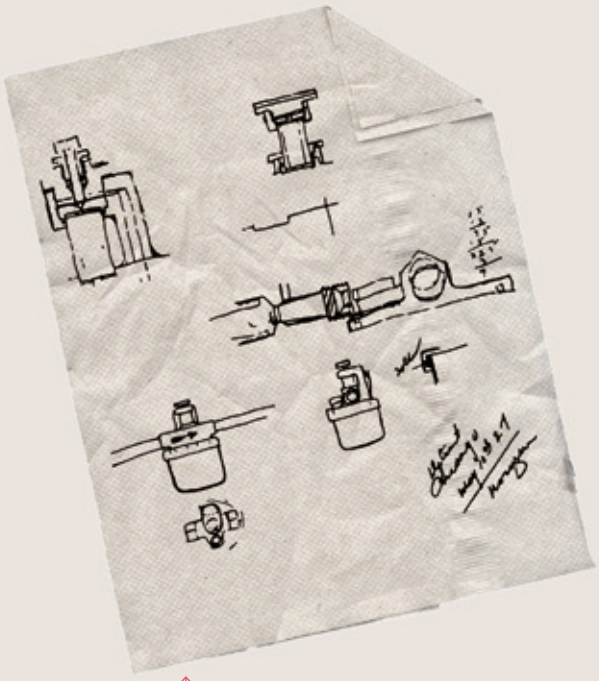
We create solutions for our customers which enable smarter, safer, more productive and sustainable factories, production lines and warehouse operations. Our pneumatic and electric motion systems help machine builders and end users around the world automate and optimise manufacturing and warehousing processes.

We have partnered with customers in industrial automation for over a century, applying our experience and innovation to create lasting value for their businesses. Our solutions support critical industries such as automotive, food and beverage, pharmaceuticals and even the space industry. We support the automation of precision manufacturing, product assembly, testing and packaging.

We use the latest digital technologies in our automation products and constantly innovate in close partnership with our customers. By applying our deep expertise, we can solve their toughest automation challenges, today and tomorrow. Through increased productivity, efficiency and safety, our customers can serve their own customers better, creating sustainable competitive advantage and delivering growth.

Our world-class product portfolio includes IMI Norgren, IMI Bimba, IMI Bahr and IMI Buschjost.

Breakthrough Engineering you can count on.



Automatic airline lubricator
invented in 1925

Air Preparation

Compressed air is used in almost every industry, from building cars to opening bus doors, from food processing to mining and shipbuilding. Excelon® and Olympian® air preparation have been providing clean controlled compressed air to these industries and more for over 40 years.

In 1925, when Carl Norgren invented the automatic airline lubricator, he effectively began the practice of air preparation - delivering air of the right quality to a pneumatic device to enable that device to run at it's optimum efficiency for the longest possible time, keeping life costs to a minimum.

We have continued developing world class air preparation products ever since. Today, IMI Norgren air preparation products are used globally, and are founded on a best-in-class reputation based on quality, reliability & robustness.

IO-Link is revolutionizing Industrial Automation by offering a standardized and seamless communication interface for all IO-Link devices, with simple installation and a complete range of diagnostics functionality. Our air preparation equipment is offering Industry 4.0 connectivity via IO-Link, and allows for remote set-up and visibility of application performance data for improved monitoring – making it an ideal option for machine builders looking to invest in digitally future-proofing their systems.

Compressed Air Systems

Factory Automation

Steel Production

Petrochemical industry

Rail

Compressed air is a safe and reliable source of energy provided it is used and treated correctly.

Compressed air is often wrongly assumed to be a cheap or even 'free' source of power. At point of use, compressed air is approximately the same cost as natural gas, that's why it's vital to install the correct equipment to condition and control the air supply.

Safety

As soon as air is pressurised it has the potential to cause damage to equipment or personnel, so controlling that pressure using shut off valves and regulators, which can be fixed and locked is paramount.

Containing the air in the reservoirs for air treatment also needs to be done safely. Correct assembly of the filters and lubricators after service is also paramount as a loose bowl can be very dangerous even at the lowest pressures.

Safety should always be the first consideration when designing compressed air systems.

Cost reduction

A well designed air preparation assembly ensures costs are optimised by:

- Keeping leaks to a minimum
- Including isolation valves for rarely used parts of a system
- Correct use of pressure regulators - only use the pressure needed for the job
- Using appropriate levels of filtration – over filtering costs money!
- Simplifying circuits - reducing pressure losses
- Correctly sizing air preparation – reducing pressure losses

Maximising Up-time

Correct application of lubricators ensures the system runs efficiently for longer. Correct application of oil can extend the life of an actuator by up to 5 times, however they need to be specified correctly and regularly maintained.

Filters need to have effective draining systems and need to be maintained regularly to ensure downstream air is free from contamination. Excess liquid water is the biggest cause of failure in systems which do not have large plant dryers. Most bulk water as well as coarse particles can be removed with a general purpose filter. However these filters need to be maintained regularly and have effective condensate drain mechanisms to ensure downstream air remains free from contamination.

Correctly specified, well maintained air preparation is essential to the effective operation of any compressed air system. Whether a large factory air supply, or a small high speed processing machine air preparation equipment are the tools to make it safe, optimise the running costs and keep the machines running.

IMI Norgren Excelon® Plus Modular FRL System

IMI Norgren's Excelon® Plus is the latest generation of our Air Preparation equipment developed to meet the needs of today's customer. It offers exceptional performance, is compact and light-weight with no compromise on robustness, and is suitable for all industrial applications.

IMI Norgren Excelon® Plus has been designed with safety in mind, offering built in, tamper proof features and a unique double lock mechanism on the bowls. Maintenance of the unit is simplified with the new system where the element assembly is removed together with the bowl.

The innovative family of Excelon® Plus products can be used where both stand alone units or modular assemblies are required thanks to the slim line Quikclamp system. The one piece Quikclamp assembly with integrated brackets allows installation and removal of the units without breaking a pipe connection.

- Three filter variants
- Two regulator variants with two diaphragm types (relieving and non-relieving) and four spring choices
- Two lubricator variants
- Combination units - standard & IO-Link connected
- Several valve options (Manual, dump, soft start dump)
- Combined Filter Regulator unit

With a long experience in air preparation, we understand the importance of addressing the specific needs of the many arduous and harsh environments that exist in industrial automation including glass and steel production, cement, mining, along with the energy and rail sectors. The Excelon® Plus TR Series is designed perfectly for harsh environments and extended temperatures. Certified for rail to category II shock and vibration and an operating temperature that ranges from -40°C to +80°C. It comes with a broad range of functional equivalents and has a common connection interface with the Excelon® 73/74 range.

General Specifications

- Two body sizes: 1/4", (82 series) and 1/2" (84 series)
- Port sizes 1/4", 3/8", 1/2" or 3/4"
- Thread type ISO G or NPT
- Fluid: Compressed air
- Maximum inlet pressure:
  - Guarded polycarbonate bowl 10 bar
  - Metal bowl 20 bar (17 bar for 1/4" range)
- Maximum temperature:
  - Polycarbonate bowl 60°C
  - Metal bowl 80°C
- All internal and external surfaces are protected with an electrophoretic paint coating providing excellent corrosion and chip resistant protection

IO-Link

Tamper proof options built in

- Padlock features on both shut-off valves and regulator
- Guarantees safe isolation of machines

Rotating Safety Shut-off Valve

- Quarter turn easy to operate full flow device
- Easy to isolate system with no reduction in performance

Flush mounted integrated digital or analogue gauge

- Less vulnerable to damage
- IO-Link connectivity

No compromise on Robustness

- Metal construction - where it matters most
- Quality synonymous with IMI Norgren brand

Double safety lock on bowl

- Bowl clip that clicks, plus safety detent when pressurised
- Impossible to remove the bowl when in use

Easy filter maintenance system

- Element is removed together with the bowl for faster and cleaner servicing
- Best in the market with only 25mm bowl clearance required[1]

Air Purity Filtration Classes to ISO8573

- Particles: Class 7,6,1 & 0
- Class 8 water extraction (Better than 95% @ 100% flow)

Compact size and optimised weight

- Maximises machine real estate
- Smaller and lighter than its predecessor

1 The nearest market equivalent is 40mm

Filtration

General Purpose Filters (Water and particle removal)

The IMI Norgren Excelon® Plus general purpose filter offers 5µm or 40µm particulate removal, with water extraction levels of >98 % (84 Series) and >95 % (82 Series).

Maintenance of these units is quick and easy, as the filtration cartridge remains inside the bowl when it is removed. The cartridge then simply unclips allowing for clean and efficient disposal, and replacement with a new cartridge.

This filter maintenance system also means that the clearance needed below the unit for maintenance is a maximum of 25 mm, reducing the space envelope needed on any machine.

Our general purpose filters are available with lightweight polycarbonate bowls with guards for in bowl visibility, or alternatively with full metal bowls incorporating unique prismatic liquid level indicators for more challenging applications.

All bowls incorporate a unique double lock feature in the design. The bowl has an easy to use release clip to enable the bowl to be removed. This large clip has an audible click feature once the bowl is reassembled, ensuring the bowl is in the correct position for use. A detent in the assembly also engages when the unit is pressurized ensuring that the bowl cannot be rotated whilst in use. This unique double lock feature makes Excelon® Plus the safest filter on the market.

Filters are offered with either a ¼ turn "Q" manual drain or the new lever assisted fast acting float type auto drain which minimizes air wastage during operation.

Class 8 water extraction according to ISO 8573-1

Filter maintenance system

Only 25mm clearance required to remove filter element

Coalescing Filters – (Oil aerosol removal)

The IMI Norgren Excelon® Plus Coalescing filter removes oil down to levels no greater than 0.01mg/m3 - 0.01 micron particulate removal. The pleated element design means this can be achieved in a compact envelope, whilst still keeping pressure drop to a minimum.

The IMI Norgren Excelon® Plus coalescing filters have an integrated pressure drop indicator which changes colour, to indicate when service is needed.

The coalescing filters are offered with the same bowl and drain options as the general purpose filters, and also include in bowl cartridge removal and double safety lock.

Activated Carbon Filters – (Oil vapour removal)

The IMI Norgren Excelon® Plus carbon filter ensures all traces of oil vapour (odour) are removed from the compressed air supply (0.003mg/m3 remaining oil).

Our carbon filters are offered with guarded polycarbonate bowls and metal bowls, and include the in bowl cartridge removal and double safety lock. These filters do not include drains as vapour contamination is retained in the carbon element.

When used together the coalescing and activated carbon filters ensure any compressed air system can be used for most critical Industrial Automation applications, and deliver air purity to class 0 according to ISO 8573-1.

Regulation

General purpose regulator

With primary pressure up to 20 bar (300 psig) Excelon® Plus regulators offer outlet pressure ranges: 4 bar (60 psig), 7 bar (100 psig), 10bar (150psig), 17 bar (250 psig).

The non-rising adjustment knob shows a red band whilst pressure is being adjusted. This disappears once the desired pressure is reached and the knob is pushed down into the fixed position. This action also reveals a padlock hole allowing the regulator to be locked very simply and cost effectively.

The 17 bar version has a metal bonnet and a T bar adjustment. This is necessary to ensure easy operation and accurate pressure control at these higher pressures.

All spring options are available with both relieving and non-relieving diaphragms.

All versions are supplied with an integrated pressure gauge as standard. This high visibility gauge fits inside the main body of the regulator, significantly reducing the risk of damage to the gauge, which has long been the most vulnerable part of the FRL assembly.

General purpose filter regulator

The Excelon® Plus Filter/regulator ('B' unit) combines all the features of the general purpose filters and regulators including built in padlock feature, in bowl filtration cartridge removal and bowl double safety lock.

Pressure Monitoring

Pressure Regulators and Filter-regulators with Integrated Electronic Pressure Sensor (IEPS)

Both general purpose regulators and filter-regulators are available with optional Integrated Electronic Pressure Sensor (IEPS). Offering Industry 4.0 connectivity via IO-Link, the digital gauge allows for remote set-up and visibility of application performance data for improved monitoring – making it an ideal option for machine builders looking to invest in digitally future-proofing their systems.

Electronic monitoring of secondary pressure

- IO-Link capability allows remote set-up and application performance data for improved monitoring
  - Pressure sensor calibration can be adjusted via IO-Link for offset and span correction
  - Built-in diagnostics, self-testing and fault reporting of gauge status offers intelligence for monitoring and measurement
  - Pressure transducer output
  - Operating temperature and supply voltage are transmitted as 'process variables' once per second
- 1.44" full colour graphic display. Excellent Visual Management.
  - Green - At or above pressure setting
  - Amber - System Fault
  - Red - Secondary pressure is below setting
  - White - Setting mode
- Parameter Adjustment via front screen Buttons or Accessed Via IO-Link
- Configurable switching output
- Adjustable settings:
  - Setpoint
  - Tolerance
  - Hysteresis
  - Pressure Units
  - Temperature Units
  - Screen Orientation
  - Digital Output Type (NPN, PNP, Push-Pull)
  - Digital Output State (Normally High, Normally Low)
- Install as a standard digital pressure switch or a pressure transducer with IO-Link

IO-Link

Simple Set-up

Fully Integrated Design

Lubrication

Micro-fog® lubricators

The Excelon® Plus Micro-fog® lubricator has a unique micro mist fog generator built in to the unit creating very fine mist particles – less than 2 micron. These particles are suspended in the air line and can travel very long distances and lubricate very complex air pathways. They allow very fine control, ensuring that the systems are not over lubricated – a common problem with intricate pneumatic circuits, and are perfect for small rapidly moving applications.

This Micro-fog® technology is the best in the industry after more than thirty years.

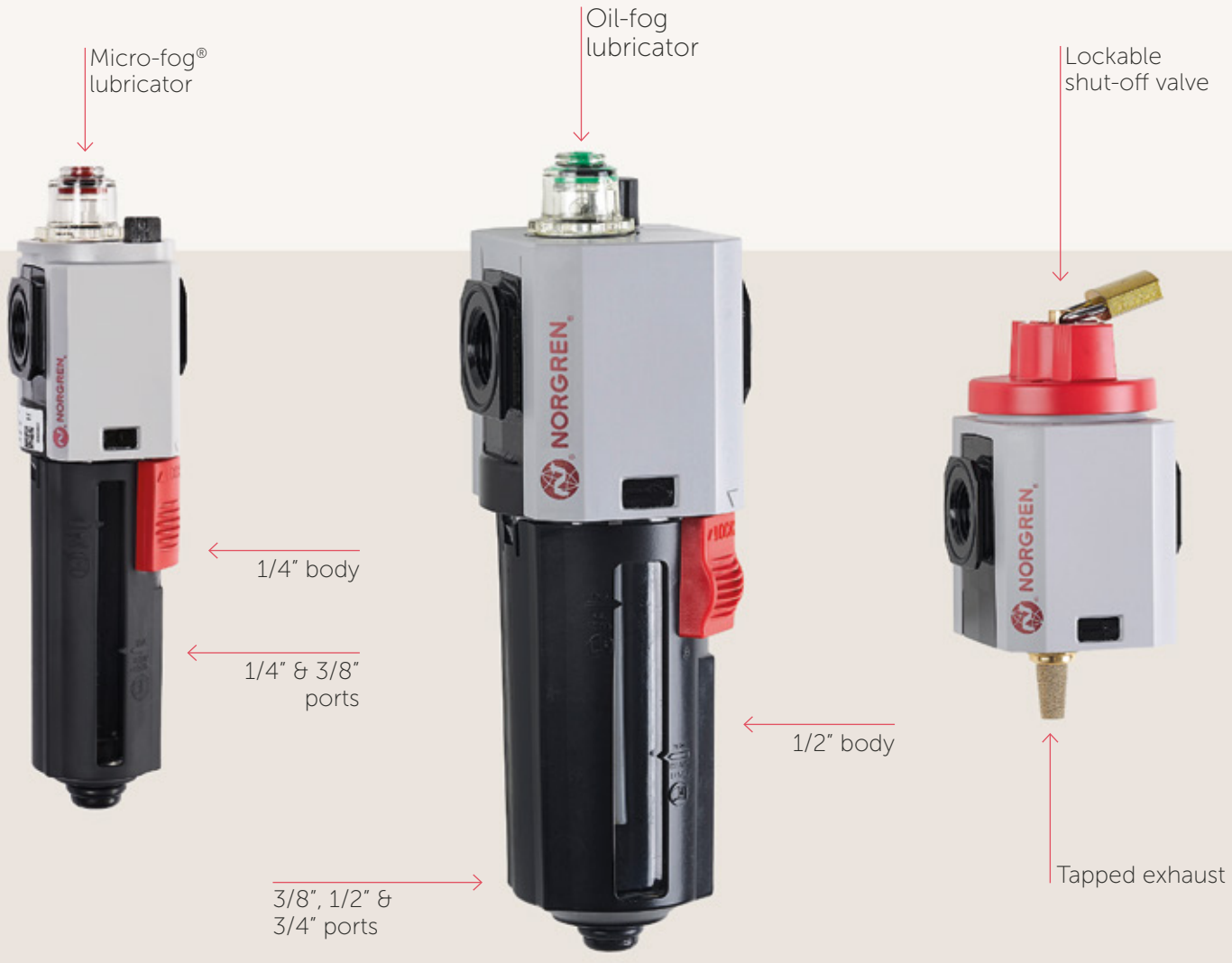
Oil-fog lubricators

The Excelon® Plus Oil-fog lubricator generates a fairly coarse mist - around 100 micron. This lubricator is most commonly used in heavy actuation applications and is best used close to the area requiring lubrication. One benefit of this type of lubricator is that it does allow for the oil reservoir to be filled whilst the system is running.

Both Micro-fog® and Oil-fog lubricators are offered with guarded polycarbonate or full metal bowls, the prismatic sight glass and the double lock safety feature. Bowls for lubricators do not offer any drain feature.

Shut off valves

The Excelon® Plus lockable shut-off valve is available in a 3/2 configuration with threaded exhaust and red knob. It is a full flow rotating ball valve and the restricted ¼ inch exhaust port is threaded to allow fitting of a noise reducing silencer or pipe away exhaust air. The valve has a 'pop up' padlock feature allowing the valve to be locked in the closed position for safety.



Control Valve

Adding to the comprehensive range of manual control valves, IMI offer both air piloted and electrically operated control valves, available in two functions and two body sizes, four port sizes and three voltages.

Soft start dump valves allow downstream pressure to gradually increase on initial start up, before fully opening to deliver line pressure. The dump function allows the system to be exhausted quickly when required, particularly in the event of a power failure or emergency stop.

Technical Specifications

- Port size 1/4", 3/8", 1/2" and 3/4" (ISO G / PTF)
- Two valve function options
  - 3/2 Dump
  - 3/2 Soft Start Dump
- Optional connectors: DIN plug, M12, Flying lead or LEG, all to IP65 standards
- Solenoid version: 15mm solenoid. Flat pin layout to DIN43650 Form C (8mm), 2 pin & earth
- Available in 24V DC (2.0 Watt), 110V AC and 220V AC
- Air piloted version: 1/8" pilot port
- Exhaust flow capacity (cv) ranges from > 1.27 to > 5.6 depending on option

Product Highlights

- Performance Level rated (PLc Cat. 1) Safety function: Safe Venting
- B10 Value(s)
  P82C and P82F: 1.4 million life test cycles
  P84C and P84F: 1.1 million life test cycles
- Increased flow performance
- Lighter and smaller
- In-line or modular installation with Excelon® and Excelon® Plus range (Stand alone or can sit within FRL set on your machine)
- Variable Snap Adjustment on Soft Start option
- Low wattage
- High flow dump facility (Fast Exhausting)
- ATEX version

Auxiliary Products

Pressure sensing block and 51D or 54D pressure switch

The modular Quikclamp system includes a pressure sensing block which enables pilot or auxiliary signals feeding other parts of the pneumatic circuit.

The block can be used to provide an additional port for remote sensing or to directly mount a pressure switch such as the IMI Norgren 51D or 54D.

The 51D electronic pressure switch can be either back mounted at the front of the assembly, or bottom mounted on the top of the assembly. It is compact and easy to use, has a clear digital pressure display with units which are user selectable and has intuitive programming. It has an LED switching status indicator and either 2 x PNP or 2 x NPN digital outputs. It has high accuracy and resolution with vibration resistance 10 – 55 Hz and is rated to IP65.

The 54D electronic pressure switch can be adapted to fit Excelon® Plus. Available with three pressure ranges from vacuum to 16 bar, it is Industry 4.0 Ready, with Digital, Analogue and IO-Link outputs. There is a differential pressure option, two pneumatic inputs, M8 x 4 pin electrical connection and G1/8 port. This switch is lightweight, robust and ideally suited to robotic applications.

Pressure sensing block and 18D pressure switch

The Excelon® Plus accessory range also includes a porting block which has a face for direct mounting of the IMI Norgren 18D pressure switch. This is an electro mechanical switch and is widely used in the Industrial Automation market.

The 18D micro switch is suitable for high cycling applications and can be used in intrinsically safe environments. It is IP 65 rated.

Full Flow Porting Blocks

This porting block allows full flow to be diverted from the main system quickly and effectively. The block can be mounted in either rotation and is useful when only one part of the system requires high levels of filtration for example. Available in two body sizes, 1/4" and 1/2".

●● For full range of Excelon® Plus accessories see individual datasheets. ●●

Ready to install

Standard Combination Units

- Pre-assembled and ready to install
- Everything you need for "best practice air preparation"
- One part number
- Standard FRL boxset (filter, regulator, lubricator)
- Standard filter, regulator and shut-off valve

Standard options are available or you can configure to your specific requirements online.

Online Configurator

- Live visualisation of your configuration
- Download your configuration in your native CAD format. We support 60+ native CAD formats including AutoCAD, SolidWorks, Pro/Engineer, NX and Catia.
- Save your configurations for a later date and view your history anytime
- Purchase your configuration instantly online

TR Series for harsh environments and extended temperatures

Available in 1/2" (84 Series) body size, our Excelon® Plus TR Series is suitable for applications in harsh environments or extended temperatures. The L variants are approved for S & V Cat 2 Rail applications, and the H variant is approved for extreme temperatures from -40°C to +80°C.

EN 61373

+80°C (+176°F)
-40°C (-40°F)

Available variants

- **Filter** LF84, HF84 - General Purpose, Coalescing, Vapour removal filters
  - Metal Bowl only
  - Drain mechanisms as per standard Olympian 64 Series
- **Regulator** LR84, HR84
  - 4, 10 & 17 Bar spring options
  - Relieving and Non-Relieving options
  - Metal Bonnet
- **Filter-regulator** LB84, HB84
  - 4, 10 & 17 Bar spring options
  - Metal Bonnet
  - Metal Bowl only
  - Drain mechanisms as per standard Olympian 64 Series
- **Lubricator** HL84 only
  - Metal Bowl only
- **Shut-off valve** HT84 only

Our Industrial Automation sector operates four global centres of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in Europe, Americas and Asia Pacific.

Supported by distributors worldwide.

For further information, scan this QR code or visit

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